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# Preliminary Design Report La Contenta Wastewater Treatment Facility Phase 3 Improvement Project

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## SECTION 1 - INTRODUCTION

In accordance with our Scope of Services dated May 30, 2024, this Preliminary Design Report (PDR) presents the recommended criteria and configuration of Phase 3 improvements to the La Contenta Wastewater Treatment Facility (WWTF). This PDR was informed by the *La Contenta Wastewater Collection System Improvement Project and Wastewater Treatment Facility Phase 3 Improvement Project Predesign Report* (CCWD, 2024) (“2024 Predesign Report”), confirmation of design criteria by HydroScience, and review of data collected from the District and in the field. The 2024 Predesign Report is included in **Appendix A**. Our preliminary design drawings are included in **Appendix B**.

HydroScience worked collaboratively with Calaveras County Water District (District) engineering and operations staff to develop the proposed preliminary design described herein to meet the following key objectives:

- Add a new extended aeration activated sludge basin with an integral clarifier to provide additional treatment capacity to the existing Biolac treatment system for Phase 3 flows. The combined capacity of the existing and new basin and clarifiers should be suited for Buildout projected flows. The capacity of the new basin and clarifier alone should be suited for Phase 3 flows.
- Add conveyance, metering, and flow splitting of mixed liquor between the existing and new basins.
- Add additional blower capacity in the existing treatment plant building for the new activated sludge aeration basin.
- Evaluate a new separate clarifier and Return Activated Sludge and Waste Activated Sludge (RAS/WAS) pump station as an alternative to an integral clarifier.
- Add a new permanent pumping station at the Upper Effluent Storage Pond (UESP) to convey stored effluent back to the treatment process. This includes evaluating two different pump station configurations: a floating barge pump station in the pond or a wet well submersible pump station, with an option to convert the existing Return Lift Station into a combined facility for both existing process drains and the UESP.
- Perform associated improvements to yard piping, power distribution, utility power supply, instrumentation, and PLC/SCADA controls. The improvements include a new masonry electrical building to house the new MCC equipment with provisions for future expansion. The electrical portion of the project will include a wholesale replacement of the existing power distribution and standby power systems for the entire WWTF. Ageing power distribution panels in the existing control room/lab will be demolished. The utility power service will be upsized. Facilities will be designed for Phase 3 with provisions for Buildout.

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## SECTION 2 - CONDITION OF EXISTING WWTP

The District previously prepared an engineering report (2024 Predesign Report) evaluating existing WWTF conditions, projecting increases to plant flows and loads, and presenting preliminary recommended facility improvements. That report provides a summary of the wastewater planning criteria, current unit processes, equipment, WWTF design criteria, expected collection and WWTF improvements, recent upgrades, and other pertinent facts about the existing facility. This section provides an overview of the findings of that report, summarizes HydroScience’s evaluation of its findings, and presents updated information and recommended criteria for detailed design.

Based on an updated analysis prepared by HydroScience, **Table 2-1** presents 2023 influent wastewater flows. **Table 2-2** presents 2020-2023 average influent concentrations.

**Table 2-1: 2020-2023 Influent Flows**

Flow Parameter	gpd	gal/day/EDU <sup>5</sup>	gpm
Average Dry Weather Flow (ADWF)	154,000	137	107
Average Day Flow (ADF)	200,000 <sup>4</sup>	180 <sup>4</sup>	139
Maximum Day Flow (MDF)	660,000 <sup>4</sup>	595 <sup>4</sup>	458

Notes:

1. Based on Influent Flow Data presented in 2024 Predesign Report, augmented with data for the remainder of 2023.
2. Average Daily: The average flow occurring over a 24-hr period.
3. Max. Day: The maximum daily flow in the record examined.
4. HydroScience updated analysis identified four unusually high readings between 12/31/2022 and 01/16/2023. These readings ranged between 0.710-0.980 MGD. The high flows on those days correspond to a flooding event that impacted the collection system and has since been resolved. After discussion with the District, these readings were removed from the influent flow data analysis and the ADF and MDF were recalculated as presented in the table as well as the corresponding gal/day/EDU.
5. Number EDUs in service area for year 2023 is 1,110.

**Table 2-2: 2020-2023 Influent Average Concentrations**

Constituent	Concentration	units
BOD <sub>5</sub> , mg/L	143 <sup>1</sup>	mg/L
Total Suspended Solids (TSS), mg/L	Sampling underway <sup>2</sup>	mg/L
Total Kjeldahl Nitrogen (TKN), mg/L	Sampling underway <sup>2</sup>	mg/L
Nitrogen, N, mg/L	Sampling underway <sup>2</sup>	mg/L
pH	Sampling underway <sup>2</sup>	pH
Temperature	Sampling underway <sup>2</sup>	C

Notes:

1. Average value from District data from 1/1/2022 to 12/31/2023.
2. These influential concentrations are not part of the routine monitoring program. The District is gathering this data to inform the design phase of this project. Assumed values for preliminary design are discussed later in this Report.

The monitoring reports between January 2021 and March 2024 have been reviewed and the data applicable to the improvements discussed in this PDR are presented in the following tables (Table 2-3 through Table 2-5):

**Table 2-3: Aeration Basin Ditch Concentrations**

Aeration Basin MLSS Concentration	Criteria	Units
Minimum	2,110	mg/L
Maximum	4,610	mg/L
Average	3,246	mg/L
Design Average	3,000	mg/L
Design Capacity	4,000 <sup>1</sup>	mg/L

Notes:

1. Based on typical MLSS range for extended aeration processes of 3,000-6,000 mg/L per Metcalf & Eddy, Inc., *Wastewater Engineering: Treatment and Reuse*, 4th Ed., R. Tchobanoglous, 2003 and on design recommendations by the treatment equipment manufacturers.

**Table 2-4: Current RAS System Parameters**

Parameter	Criteria	Units
Average RAS Flow	0-417	gpm
Average Monthly Influent Flow	400,000	gpd
% Average RAS/ Average Influent Flow	0%	
% Peak RAS/ Average Influent Flow	150%	

Notes:

1. Based on as-built WWTF Plans, KASL Consulting Engineers, 1991. Design RAS range is 0-150% of Average Daily Flow. Design Average Daily Flow is 400,000 gpd.

**Table 2-5: Current RAS/WAS MLSS Concentrations**

RAS MLSS Concentration	Criteria	Units
Minimum <sup>1</sup>	3,570	mg/L
Maximum <sup>1</sup>	10,060	mg/L
Average <sup>1</sup>	6,938	mg/L
Design	7,000	mg/L

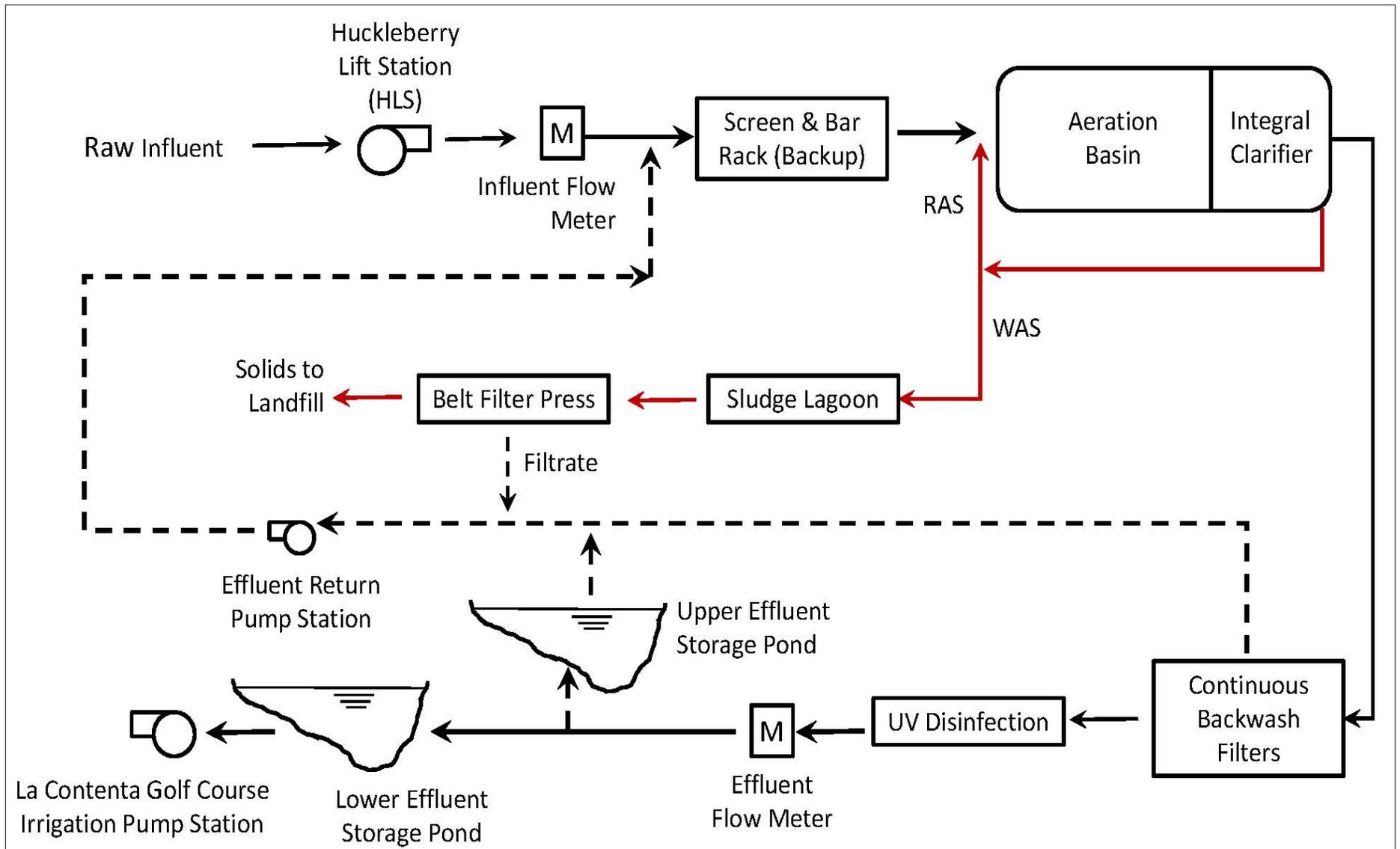
Notes:

1. Values extract from District data running from 01/01/2022 to 12/31/2023.

A process flow diagram of the existing facility is shown in **Figure 2-1**.

The District has reported the following concerns and issues experienced with the existing WWTF that should be addressed by this project:

- The WWTF is undersized for projected Phase 3 flows.
- The existing Biolac sometimes fails to meet effluent water quality criteria. This is suspected to arise from the shortcomings of the integral clarifier design, which utilizes a curtain wall to separate the biological process from the clarification process. High flows passing through the curtain wall openings cause short-circuiting and impact settling, resulting in excessive turbidity and TSS in the clarified effluent.



Source: La Contenta Wastewater Master Plan, 2018, Kennedy Jenks Consultants

Figure 2-1: Existing WWTP Process Flow Diagram

- The existing integral clarifier is difficult to maintain because it can't be isolated, shut down, and drained. Divers must be used for repairs.
- The existing process fails to adequately remove nitrogen to meet a potential future discharge permit limitation of 10 mg/L Total Nitrogen as N.
- The existing airlift RAS pump is difficult to control and has no flowmeter.
- The UESP is currently serving as a holding pond for non-compliant effluent. Effluent is pumped back to headworks for a second pass through treatment when flow capacity allows. This is done with a portable submersible pump and a hose, which is labor intensive.
- The District desires a permanent UESP pump station.
- The District desires to eliminate the incidences of non-compliant effluent so that UESP can be returned to seasonal storage of recycled water that is fully compliant with Title 22.
- The existing MCC is old and located in an operations and lab workspace. It does not meet current electrical codes.
- The existing PLC control panel is old and should be replaced.
- The existing pipeline from the treatment plant to the LESP is undersized for Phase 3 and Buildout flows.
- There is an existing holding pond located at the proposed site of the new aeration basin containing about 500 CY of water and sludge. This Project will include dewatering and discharge to the WWTF, sludge removal and stockpiling at a designated site on-property, and overexcavation of unsuitable material in accordance with Geotechnical recommendations.

### SECTION 3 - PHASE 3 AND BUILDOUT DESIGN FLOWS AND CONCENTRATIONS

This section establishes the design flow rates and preliminary influent concentrations for the Phase 3 (this Project) and Buildout (future) expansions of the WWTF. The proposed design criteria are based on the findings of the 2024 Predesign Report and additional preliminary design calculations provided by the District, modified to reflect the most recent available operating data, and incorporate consistent equivalent single-family unit (ESFU) estimates and unit flow generation factors.

HydroScience reviewed current and projected design flow data provided in the 2024 Predesign Report, preliminary design calculation spreadsheets provided by the District, and more recent flow data provided by CCWD.

The 2024 Predesign Report established the current La Contenta WWTF service area at 1,110 ESFUs. To estimate growth, the report considered the 2020 California Department of Finance population projections, current approved development, the 2020 Calaveras County General Plan, and the quantity and makeup of vacant properties within the La Contenta service area that could be developed and connected in the future. The report estimates up to an additional 1,140 ESFUs are possible within the service area at Buildout based on vacant property zoning and assumed property utilization levels for those vacant properties. It should be noted that projections utilize a unit flow generation factor (gpd/ESFU) for average dry weather and average annual flows that are more conservative than existing data indicates. If the actual unit flow generation is less than allowed for, then more units could be served.

The 2024 Predesign Report presented various estimates of average daily unit flow and peaking factors for average annual, average dry weather, maximum month, maximum day, peak hour, and minimum day flows (AAF, ADWF, MMF, MDF, PHF). The Phase 3 Design influent flows presented in the 2024 Predesign Report are shown on **Table 3-1**. The District’s preliminary design calculations for Buildout are presented in **Table 3-2**.

**Table 3-1: 2024 Pre-Design Report Phase 3 Design Flows**

Parameter	PF	gpd/esfu	gpm	gpd
AAF	1.0	200	219	315,000
ADWF	0.8	150	165	237,000
MMF	1.5	300	328	473,000
MDF	2.5	500	548	789,000
PHF	4.0	800	876	1,262,000
Minimum Day	0.3	50	55	79,000

Source: 2024 Pre-Design Report, adapted from CCWD Water and Wastewater Design and Construction Standards.

**Table 3-2: 2024 Pre-Design Report Buildout Design Flows**

Parameter	PF	gpd/esfu	gpm	gpd
AAF	1.0	200	313	450,000
ADWF	0.8	150	235	338,000
MMF <sup>1</sup>	1.5	300	469	675,000
MDF	2.5	500	781	1,125,000 <sup>1</sup>
PHF	4.0	800	1250	1,800,000
Minimum Day	0.3	50	78	113,000

Source: 2024 Pre-Design Report, adapted from CCWD Water and Wastewater Design and Construction Standards.  
Notes:

1. MDF value was recalculated and adjusted from the 2024 Pre-Design Report. A value of 600 will be used, instead of 500 included in that report, as discussed below.

HydroScience reviewed the factors and projections presented in the 2024 Predesign Report and preliminary design calculations, and our findings are as follows:

- 2024 Predesign Report values in Table 7 of the report are consistent with calculated values as shown in Table 3-2 except for Phase 3 MDF. The unit MDF in 2023 was calculated to be 595, rounded to 600 gpd/esfu. This higher factor will be used for Phase 3 and Buildout flow projections, below.
- 2023 flow data was analyzed and revealed a few high data points. The District agreed that these values were due to unusual circumstances with creek/drainage flooding in the collection system that entered the sewers, and that these could be removed.

The District is currently implementing the design of an upgrade to the Huckleberry PS. The recommended pumping configuration and discharge flow rates are addressed in **Section 4.1**. The station is expected to be designed with a maximum discharge flow rate of 1,400 gpm (2.0 MGD). The station will further have the capability to operate in emergency mode where two high flow pumps operate at full speed to discharge approximately 1,550 gpm (2.23 MGD).

The WWTF has two primary return flow streams back to headworks for treatment: filtrate/drainage from the belt filter press, and backwash from the continuous backwash filters. These flows must be added to projected wastewater flows from the service area and pumping rates from Huckleberry Lift Station. **Table 3-3** presents estimate of the flows from these two processes:

**Table 3-3: WWTF Return Streams**

Source	Maximum backwash flow per cell	Number of Operating Filter Cells <sup>3</sup>	Total Return Stream Flow, gpm	Total Return Stream Flow, gpd
Filter Backwash – Phase 3 – MDF <sup>1</sup>	14 gpm	5	88	126,720
Filter Backwash – Buildout – MDF <sup>1</sup>	14 gpm	7	123	177,120
Belt Filter Press – Phase 3 and Buildout <sup>2</sup>	--	--	96	138,240
<b>Total Return Stream Flow – Phase 3</b>	--	--	--	<b>264,960</b>
<b>Total Return Stream Flow – Buildout</b>	--	--	--	<b>315,360</b>

Notes:

1. Includes 25% safety factor.
2. District to confirm that sufficient sludge processing hours are available to treat Buildout flows with the existing belt press without expansion. This is stated in the 2018 Master Plan.
3. District to confirm number of operating filter cells in each scenario.

**Table 3-4** presents recommended Phase 3 design and **Table 3-5** presents the Buildout design flows. The development of design criteria for calculating the hydraulic profile and hydraulic capacities of unit processes was approached as follows:

- Flows pumped from Huckleberry PS to the WWTF influent junction box are calculated from 1577 ESFUs for Phase 3 and 2250 ESFUs for Buildout, multiplied by the flow generation factors presented previously. The exception to this is PHF.
- For PHF under the Buildout condition, the normal design peak pumping rate for Huckleberry PS is used. This rate is 1,400 gpm or 2,016,000 gpd per the Huckleberry Draft PDR. The “emergency” peak pumping rate of 1,550 gpm is not formally reflected in the design criteria. The impacts of this additional flow on process performance are expected to be minimal.
- For PHF under the Phase 3 condition, it is assumed that the Huckleberry PS peak discharge rate will be capped in the control system at a peak value of 876 gpm or 1,260,000 gpd, equal to the calculated PHF based on EDUs.
- WWTF internal return flows from filter backwash and solids dewatering (Table 3-3) are added to Huckleberry PS flows at a new influent junction box to be installed immediately upstream of the headworks screen.
- The UESP pump station is assumed to not be operating during peak flow conditions, and therefore is not factored into the hydraulic profile as an additive flow.
- RAS will normally be pumped from either the aeration basin integral clarifier or a separate secondary clarifier, depending on the option selected by the District. RAS will discharge to the influent side of each aeration basin. Each aeration/clarification process train will have its own closed RAS loop dedicated to that process train. Each aeration/clarification process train will be hydraulically sized for the sum of flows from Huckleberry PS, the filtration and solids dewatering return streams, and the RAS flow rate.
- An alternate RAS discharge point at the influent junction box is provided to facilitate transitions between process trains, but this is not the normal mode of operation. It’s assumed that when this is used, the RAS flow rate to the influent junction box will be managed to keep the overall flow rate through headworks at or below the values listed in Table 3-4 and Table 3-5.

**Table 3-4: Recommended Phase 3 Design Flows (1577 esfu)**

Parameter	PF	gpd/esfu	gpm	Influent Flow gpd	Return Flow <sup>3</sup> gpd	Total Flow gpd
AAF	1.0	200	219	315,400	--	--
ADWF	0.8	150	165	237,000	--	--
MMF	1.5	300	328	473,000	--	--
MDF <sup>1</sup>	2.5	600	548	950,000	264,960	1,214,960
PHF	4.0	800	876	1,260,000	264,960	1,524,960
Huckleberry LS Max Discharge Flow <sup>2</sup>	--	--	876	1,260,000	--	--

Notes:

1. MDF gpd/esfu changed increased to 600 based on a review of the 2024 flow records. The 2024 Pre-Design Report used a value of 500.
2. Assumes PLC controls will be programmed to limit Phase 3 peak flow to WWTF to the design PHF.
3. Return flow will occur under all flow scenarios. Only the MDF and PHF impacts are calculated here to determine the design flows for hydraulic capacities.

**Table 3-5: Recommended Buildout Design Flows (2250 esfu)**

Parameter	PF	gpd/esfu	gpm	Influent Flow gpd	Return Flow <sup>3</sup> gpd	Total Flow gpd
AAF	1.0	200	313	450,000	--	--
ADWF	0.8	150	235	338,000	--	--
MMF	1.5	300	469	675,000	--	--
MDF <sup>1</sup>	2.5	600	781	1,350,000	315,360	1,665,360
PHF	4.0	800	1250	1,800,000	--	--
Huckleberry LS Max Discharge Flow <sup>2</sup>	--	--	1,400 (1,550 emergency)	2,016,000 (2,232,000 emergency)	315,360	2,331,360

Notes:

1. MDF gpd/esfu changed increased to 600 based on a review of the 2024 flow records. The 2024 Pre-Design Report used a value of 500.
2. Emergency discharge is reserved for unusually high I/I events. WWTF facilities will be designed for the non-emergency peak and checked for acceptable short-term operations at the emergency peak.
3. Return flow will occur under all flow scenarios. Only the MDF and PHF impacts are calculated here to determine the design flows for hydraulic capacities.
4. Phase 3 design assumes that, at buildout, these design flows are split 50/50 between the new process train and the existing. The existing aeration/clarification process train will be upgraded in a future project to achieve this capacity.

For operational convenience, the new aeration basin and clarifier will be designed to handle all Phase 3 flow scenarios with the existing aeration basin and clarifier on dry standby. This strategy will avoid the need for Operations to bring the existing aeration basin and clarifier online during Phase 3 peak flows, which would involve labor-intensive biological process seeding and stabilization.

At Buildout, it is assumed that the flows will be evenly split between the existing and new aeration basins under all scenarios. Therefore, all new facilities downstream of the splitter box will be hydraulically sized for either 50% of the Buildout flow or 100% of the Phase 3 flow, whichever is higher. Required upgrades to the existing aeration basin, clarifier, blowers, and yard piping would take place in a future project.

Design influent wastewater constituent concentrations are shown in **Table 3-6**. These are based on the values stated in the 2024 Pre-Design Report that the manufacturers have provided quotations for. The measured influent BOD from 1/1/2022 to 12/31/2023 averaged 152 mg/L (Table 2-2). The District does not routinely sample influent TSS, TKN, or N. However, an influent sampling program was initiated in fall of 2024 to gather several months of this data to inform an update of the criteria prior to finalizing a technical specification for aeration basin and clarifier supply.

**Table 3-6: Preliminary Design Influent Constituent Concentrations and Loads**

Constituent	Concentration	Units	Phase 3 Load <sup>1</sup>	Units
BOD <sub>5</sub> , mg/L	200	mg/L	789	lbs/d
Suspended Solids, mg/L	200	mg/L	789	lbs/d
Nitrogen, N, mg/L	35	mg/L	138	lbs/d
pH	6.0 – 9.0		--	--
Low Temperature	10.0	C	--	--
Design Temperature	20.0	C	--	--

Notes:

1. Based on Phase 3 MMF of 473,000 gpd. Flows above the MMF are assumed to be diluted with I/I.



## SECTION 4 – WWTF IMPROVEMENTS

Recommended WWTF improvements are described in the following subsections. The preliminary design plans are referenced below and provided in **Appendix B**. The improvements addressed by this project are limited to only those Phase 3 Improvements from the 2024 Predesign Report that were selected by the District for implementation in this project.

### 4.1 Huckleberry Pump Station

Huckleberry PS was identified as a Phase 3 improvement which is currently in design by others. HydroScience reviewed the *Huckleberry Replacement Pump System Basis of Design Report*, September 2024, Lumos & Associates. The report recommends the following improvements to the pumping system that will convey raw wastewater to the La Contenta WWTF:

- Two low flow submersible pumps
  - Constant speed drives (District considering variable speed option)
  - 150 gpm with 1 pump operating
  - 300 gpm with 2 pumps operating
- Three high flow submersible pumps
  - Variable speed drives
  - 1,200 gpm with 1 pump operating at full speed
  - 1,400 gpm with 2 pumps operating at setpoint speed for max design flow
  - ~1,550 gpm with 2 pumps operating at max speed (emergency pumping mode)

The effect of these peak flows on the Project design criteria was discussed in Section 3.

### 4.2 Headworks and Pretreatment

Influent flows pumped from Huckleberry PS undergo debris removal in an existing screen channel located in between the two existing buildings. **Table 4-1** presents data on the existing screen. The screen has sufficient wastewater flow capacity to screen Phase 3 flows at or above the calculated PHF of 1.26 MGD. However, the maximum rated wastewater flow capacity is 0.08 MGD below the PHF plus internal return streams, which total 1.52 MGD. Because flows in this range will be diluted with I/I or relatively clean return stream flows, we are assuming that this small exceedance will not become an issue since the clear water capacity is higher than this value. This should be monitored as flows increase, since hydraulic capacity is affected by the volume of screenings in the wastewater.

The screen capacity is well below the Buildout PHF plus return streams total flow of 2.33 MGD. Therefore, the screen and likely the screen channel will need to be upgraded with the Buildout expansion.

**Table 4-1: Existing Headworks Criteria**

Criteria	Value	Units
<b><u>Headworks</u></b>		
Channel Width	2.0	ft
Water Depth <sup>1</sup>	Normal: 0.88 Max: 1.13 (approximate)	ft
<b><u>Influent Pretreatment</u></b>		
No. Of Units	1	Ea.
Type	Rotary Basket	
Manufacturer	HUBER Technology, Inc.	
Model	Rotamat® Ro9/400/6	
<b><u>Maximum Hydraulic Capacity</u></b>		
with Clear Water	2.17 (1,507)	MGD (gpm)
with Wastewater	1.44 (1,000)	MGD (gpm)

Source: Equipment cutsheets provided by District.

Notes:

1. The District provided the following approximate depth measurements upstream of the headworks screen:
  - a. Normal water depth with Huckleberry PS on: 0.88 ft
  - b. Max water depth based on wall discoloration: 1.13 ft (approximate)

### 4.3 Flow Splitting and Hydraulic Profile

Sheet **G004** in **Appendix B** presents the preliminary hydraulic profile for the project. The following discusses key considerations and features of the hydraulic design and items to be further investigated and resolved in final design. The hydraulic profile is based on the following assumptions:

- Hydraulic structures and pipelines conveying all flow that are modified or installed as part of this project will be sized for the Buildout condition (Table 3-5).
- Hydraulic structures and pipelines conveying flow downstream of the splitter box to the new aeration/clarification process train will be sized for Phase 3 total flows (Table 3-4) without splitting of flows. This flow is higher than 50% of the Buildout flow.
- Under the Buildout condition, it is assumed that flows will be equally split between the two process trains. The District will make required upgrades to the existing process train and yard piping prior to Buildout.
- Return Activated Sludge (RAS) will be pumped from either the new integral clarifier or the new independent circular clarifier back to the influent side of the new aeration basin, matching the configuration of the existing aeration basin.
- A piping branch and two valves will be provided to also allow RAS to be diverted to a new junction box upstream of headworks. This is only to be used when transitioning from one aeration basin to the other. The input point will allow re-screening of the RAS as an added benefit. The additive RAS flow impacts on headworks and the new splitter box is not included, because it is assumed that RAS will not be diverted to headworks during peak winter flows. Therefore, the PHF condition without RAS flow governs the sizing of those upstream facilities.

- The Return Pump Station peak flows from filter backwash and dewatering filtrate are added to the influent flows from Huckleberry PS to calculate plant hydraulics and drive process sizing. It is assumed that the UESP will not be drained during winter peak flow conditions.
- The HGL for the Phase 3 project is calculated backwards from the existing max water surface elevation (WSE) in the filter influent box. This is based on the as-built max WSE of 741.75 plus a 2.6 ft correction factor for the change of survey datum. This is the typical calculated difference between surveyed spot elevations around the treatment units compared to the as-built drawing elevations.
- The hydraulic design for the Phase 3 project assumes that the District will upgrade filtration (add cells) and UV (replace with two channel system) when flows increase, so that the WSE in the filter influent channel will not rise above the current maximum value. This project does not evaluate or contemplate upgrades to the hydraulic capacities of unit processes downstream of clarification or any increase in the driving head required.

The addition of a second aeration/clarification process train will require splitting of raw wastewater flows downstream of the screen. There is an existing wye-shaped splitter structure with aluminum slide gates and a pipe stub out for the future aeration basin. The splitter structure lacks any weirs for accurate management of flow split and there are no flowmeters downstream to measure flow to each unit.

Our current hydraulic profile, civil layout, and mechanical design (Sheets **G005**, **C104**, and **M400**) show a new flow splitter box with weirs to be installed near the existing box between the headworks channel and the aeration basins to evenly split flows. The existing box would be demolished. A challenge with this approach is that there is very little elevation fall between the headworks channel and the aeration basin. The elevation difference between the channel floor upstream of the screen and the design WSE of the existing integral clarifier is only 0.5 ft (749.1 – 748.6 ft). This provides insufficient head to allow for a flow split using weirs unless static water surface is allowed to be maintained in the headworks channel even when Huckleberry PS is not pumping. There is also insufficient head to allow full pipe magnetic flowmeter measurement downstream of the splitter box. For that reason, flowmeters are shown as future on the drawings.

The District may wish to consider deferring the splitter box improvement until Buildout, instead using the existing wye-shaped splitter structure to manage flows to aeration for Phase 3. It is designed to operate at a low liquid level. The existing box would be assessed and refurbished as necessary as part of the project, including the aluminum slide gates to provide a reliable means of isolating a basin. The lack of a weir would reduce or eliminate the static water level in the screen channel. HydroScience would update the hydraulic profile calculation to confirm the hydraulic impacts of this change.

Flow splitting would not be routinely used in Phase 3, since all flow is expected to be treated in the new aeration basin and clarifier with the existing serving as a dry standby. If the existing basin is needed, the District can operate the slide gates to either approximately split flows or to redirect all flow to the existing aeration basin.

At Buildout, a new splitter box with weirs and flowmeters can be designed in conjunction with a new, raised screening facility. The screening facility would be located north of the building in a location that is roughly equidistant to both aeration basins, resulting in similar pipe losses. The Huckleberry PS design would need to account for a few additional feet of static and dynamic head to pump to a higher channel that is located farther from the incoming force main.

During Buildout, total flow would typically be split equally between the two aeration basins, although an uneven flow split is possible by adjusting the weirs differently or installing motorized weir gates or pinch valves. The new basin will be larger than the existing in Phase 3, as discussed below, but the existing can be enlarged in the future to provide matching volume and the integral clarifier can be replaced with a separate circular clarifier.

The available elevation drop between the existing integral clarifier weir as well as the matching new clarifier weir (integral or separate) and the filter influent channel maximum water surface elevation is 4.25 ft based on the 1991 as-builts corrected for the current datum. The existing yard piping from the clarifier to the filters is 12". The filters are designed for a maximum differential head of about 3 ft. A static mixer for coagulant injection, EMI Model F12-2E-F, is installed in a vault upstream of the individual filters. The head loss of this mixer is not available but is assumed to be 1 ft for the purposes of this PDR. This will need to be confirmed during final design.

The preliminary hydraulic profile indicates that a new integral or independent clarifier with a weir elevation matching the existing integral clarifier provides enough elevation fall to drive flow through the existing filters at the maximum differential filter head of 3 ft. This will require a 12" diameter clarified effluent pipe in the integral clarifier alternative, and a 12" diameter pipe for the stand-alone clarifier alternative. This finding is subject to confirmation of the static mixer losses and assumes the addition of future filter cells at Buildout..

#### **4.4 Aeration Basin System With Integrated Clarifier**

The existing aeration and clarification process is a Biolac system manufactured by Parkson Corporation. HydroScience coordinated with and collected budgetary proposals from Parkson and Bioworks North America, who manufactures a similar competing extended aeration product. Bioworks was started by engineers who originally worked on the Biolac product and then left to start their own venture and implement improvements to the design. Parkson has also made various improvements to their offering since the original La Contenta WWTF was built.

The preferred approach for specifying this system is to list both manufacturers in the specification and prohibit "or equals". HydroScience has verified that both Parkson and Bioworks supply products of comparable quality and features. Bioworks provided a partial list of US installations that included 6 facilities installed from 2012 to 2018. Contact numbers were provided. Both manufacturers are able to offer a performance guarantee. Other potential equals are lesser known and may not provide a comparable product or comparable service and support.

Budgetary proposal and supporting information from both manufacturers are provided in **Appendix C**.

Both manufacturers were provided the current project design criteria, including Phase 3 and Buildout flows and loads and the intent to route all Phase 3 flows (Table 3-4) through only the new process train and to equally split the flows in Buildout (Table 3-5). The recommended process sizing provided in their proposals differed slightly but were generally in agreement with a few exceptions. **Table 4-2** provides the effluent requirements given to each manufacturer. **Table 4-3** provides the preliminary criteria that each manufacturer proposed for their systems to meet these flow, load, and effluent quality requirements. Each proposal includes a biological nutrient removal (BNR) feature to meet the desired effluent nitrogen concentration. Parkson refers to this as “Wave-Ox” and Bioworks refers to it as “DyNOX”. The feature consists of sequential nitrification and denitrification by alternating air flow to the floating headers using control valves to create anoxic zones for denitrification.

**Table 4-2: Effluent Requirements**

Parameter	Effluent Requirement
BOD	10 mg/l
TSS	15 mg/l
TN	10 mg/l
NH <sub>3</sub> -N	1 mg/l

Source: 2024 Predesign Report.

**Table 4-3: Preliminary Aeration Basin and Integral Clarifier Sizing**

Parameter	Existing Biolac	Parkson Biolac	Bioworks
Active volume	500,000 gal	620,000 gal	600,000 gal
Side slope	1.5:1	1.5:1	1.5:1
Sidewater depth	10 ft	10 ft	10 ft
At-grade dimensions	91' x 105'	94' x 148'	90' x 126'
Clarifier dimensions	50' x 23'	TBD	56' x 31.5'
Qty of floating headers	7	9	11
BNR	NO	YES	YES
Design MLSS	3,000 mg/l	3,000 mg/l	3,000 mg/l
Maximum MLSS	Typically operates at 3,600 mg/l	4,000 mg/l	4,000 mg/l
Air demand, excluding denitrification credit	880 scfm	1,185 scfm	900 scfm
Quantity of blowers	3	3	3
Size, each	510 scfm	600 scfm	450 scfm
Horsepower, each	25 hp	TBD	30 hp
VFD	NO	YES	YES

Source: Equipment supplier proposals in Appendix C.

#### 4.4.1 Integral Clarifiers

The default integral clarifier offering from each manufacturer is configured differently. If an integral clarifier is chosen for the project, the differences will affect how the specification is written, the project is bid, and the clarifier is operated and maintained.

##### **Parkson**

Parkson's current integral clarifier design is similar to the District's existing integral clarifier, with the following improvements (see Appendix C for typical drawings):

- The curtain wall arrangement has been replaced with a reinforced concrete partition wall and an influent distribution channel to evenly distribute flows. Flow is introduced to the channel through a slide gate connecting to the basin.
- Dual cone bottoms and flocculating rake-skimmers are used.
- Both airlift and centrifugal RAS/WAS pump options are offered. We specified that pumps shall be used since the District has had challenges with the airlift pumps in the past.
- Duplex clarifiers with internal isolation can be provided if desired. These can be sized for 50% or 100% of the flow in each clarifier.

Aside from these features and options, the Parkson clarifier design is similar to the existing clarifier. It uses a flocculator rake-skimmer with chains to collect solids and carry scum to the scum beach. Sludge is collected on v-channels on the bottom of the clarifier and pulled by suction into perforated pipes cast into the v-notch.

##### **Bioworks**

Bioworks defaults to a different style of rectangular clarifier than the Parkson offering (see Appendix C for a clarifier brochure). Similar to Parkson, a concrete wall separates the biological treatment zone from the clarification zone. Bioworks utilizes a travelling bridge scum and sludge removal system. Suction headers travel along the bottom of the clarifier. Pumps remove the sludge and convey it to a channel where it flows by gravity to the inlet of the basin. Scum is removed by a skimming board attached to the bridge which conveys scum to a rotating pipe trough. Sludge is wasted via an automated valve.

If specified, Bioworks can offer an equivalent clarifier of the type that Parkson offers. Parkson does not offer a traveling bridge clarifier like Bioworks.

The differences in the clarifier styles could present some challenges to preparing a bidding specification open to both manufacturers if the District is interested in the traveling bridge style, which is more costly to manufacture than the Parkson-style clarifier. However, if the District selects an independent clarifier option, then the manufacturers would propose the basin alone and these differences would not be a factor.

Like Parkson, Bioworks can offer their integrated clarifiers in a duplex arrangement upon request.

#### 4.4.2 Configuration

HydroScience specified that the new basins be constructed at the same 1.5:1 side slopes as existing. Our default approach for lining the basins would be to use the same reinforced concrete liner approach as the existing. This has provided good service life at this facility, allows for cleaning without liner damage, and avoids sun exposure issues compared to a synthetic liner.

HydroScience specified a 10' sidewater depth to match existing. Bioworks has offered that if the basin were increased to 12' depth, this would reduce the flat floor dimension to 87' x 50' and the at-grade dimensions of 108' x 92'. Air required would drop from 900 SCFM to 750 SCFM (non-denitrification), requiring proportionately less diffusers (9 chains instead of 11). However, this would make the new basin deeper than the existing and could present issues with hard rock excavation (geotechnical report is pending and will be reviewed once available). For the time being, a 10' sidewater depth is considered the project default to match existing.

#### 4.4.3 Comparative Equipment Costs

HydroScience requested that each supplier provide budgetary pricing for a number of configuration options. **Table 4-4** presents the costs quoted. Note that these only cover manufacturers' scopes of supply. They do not include civil construction, concrete, or installation. Duplex clarifiers would require more concrete than a simplex clarifier.

**Table 4-4: Aeration Equipment Options Budgetary Quotations**

Alternative	Parkson	Bioworks
A. Single full-flow integral clarifier	\$790,000	\$710,000
B. Two integral clarifiers, each at 50% Q	\$850,000	\$900,000
C. Two integral clarifiers, each at 100% Q	\$880,000	\$975,000
D. Clarifier by others	\$700,000	\$495,000

The following summarizes our observations regarding these quotations:

- The quotations from both suppliers for Option A (the default option) are relatively similar.
- The incremental cost for a duplex clarifier, based on equipment only, ranges from 8-27% of the base cost. This excludes the additional concrete, which will add to the cost difference.
- The cost of equipment for the aeration basin alone (Option D) is 70-89% of the cost with integral clarifier. There are potentially significant savings to apply to an independent clarifier. The Bioworks quotation is 30% lower than the Parkson quotation for this option.

#### 4.5 Aeration Blower System

The existing blower system includes three blowers with space for two additional blowers. These are installed in a room in the Treatment Plant Building. The air discharge manifold is buried beneath the building slab. Options for expanding air supply to feed the new aeration basin and the existing include installing new blowers in the available spaces in the blower room, or installing a separate blower system dedicated to the new aeration basin.

Given that the new aeration/clarification system will be sized larger than the existing to address all Phase 3 flow scenarios, the airflow requirements will be higher for the new system compared to the existing system. Additionally, the new basin will operate in BNR mode while the existing will not until it is upgraded in a future project to serve Buildout conditions. BNR mode requires finer control of basin dissolved oxygen (DO) to optimally achieve effluent quality requirements.

To optimize operations, HydroScience does not recommend expanding the existing blower facility with two new blowers so that it can serve both process units. This approach would severely limit the operator's ability to balance airflow between the two basins and independently manage the DO in each basin. Installation of an isolation valve on the existing air discharge manifold to split air control is difficult or infeasible because the manifold is buried under the slab and not accessible.

Therefore, HydroScience recommends constructing a dedicated blower facility to serve the new unit process. This would be constructed in the adjacent chlorine gas room. Chlorine gas is no longer used and that equipment has been removed. The room is currently used for storage and the District has indicated that it can be cleaned out and reused. **Sheet M600** in Appendix B shows our recommended approach. Three blowers would be installed in the adjacent room. The discharge manifold would be surface mounted on the floor and penetrate the south wall before transitioning below grade. A tie in would be made to the existing buried air supply stubout for the second aeration basin. A valve would be installed and kept normally closed to isolate the air supplies to the two basins except during abnormal operating circumstances such as if the existing blower facility fails.

The new blowers will be VFD controlled. A total of three blowers will be installed: two duty blowers and one standby blower. These will be positive displacement blowers similar to the existing blowers.

#### 4.6 Independent Secondary Clarifier Option

For this alternative, a conventional circular secondary clarifier would be constructed to clarify mixed liquor from the new aeration basin. It would be located southwest of the aeration basin adjacent to an existing gravel access road. A RAS/WAS pump station would be constructed next to the clarifier to collect and pump sludge back to the front of the aeration basin with a side stream controlled by an actuated valve to waste a specific volume of sludge to solids dewatering. Two pump configuration options are evaluated for this station:

- Submersible centrifugal chopper pumps in deep wet well
- Double disc pumps on concrete pad similar to Arnold WWTP

The following criteria was used to evaluate the clarifier design:

1. Detention Time (DT), hrs = Tank Volume (MG) x 24 hours / Day / Flow into Tank (MGD)
2. Surface Overflow Rate (SOR), gal/d/ft<sup>2</sup> = Flow (gpd) / Surface Area (ft<sup>2</sup>)
3. Weir Overflow Rate (WOR), gal/d/ft = Flow (gpd) / Length of Weir (ft)
4. Solids Loading Rate (SLR), lbs/d/ft<sup>2</sup> = Solids (lbs/day) / Surface Area (ft<sup>2</sup>)

The same flow criteria for Phase 3 and Buildout used to size the aeration basin will be used to size the clarifier. RAS will recirculate from the clarifier to the front of the aeration basin in the same process train. Each aeration basin will have an independent clarifier and RAS/WAS pumping system. If an independent secondary clarifier is constructed for the new aeration basin as part of this project, it is assumed that the future Buildout upgrade project will include removing the existing integral clarifier and constructing a second separate secondary clarifier and RAS/WAS pump station.

Typical design values for the clarifier loading design are shown in **Table 4-5**.

**Table 4-5: Typical Clarifier Loading Criteria**

Clarifier Loading Criteria	Typical Design Value	Units	Condition
DT	2 - 3 hours	hours	Peak Hour Flow
SOR <sup>1</sup>	400 - 800	gal/d/ft <sup>2</sup>	Maximum Day Flow
WOR	10,000	gal/d/ft	Peak Hour Flows
SLR <sup>2</sup>	25-30	lbs/d/ft <sup>2</sup>	Maximum Day Flow at 4,000 mg/L

Notes:

1. Typical design for SOR of 200 - 400 gal/d/ft<sup>2</sup> (average) and 600 - 800 gal/d/ft<sup>2</sup> (peak) for secondary clarifiers settling following extended aeration is shown in Metcalf & Eddy, Inc., *Wastewater Engineering: Treatment and Reuse*, 4th Ed., R. Tchobanoglous, 2003.
2. Typical design for SLR of 4.8 - 24 lbs/d/ft<sup>2</sup> (average) and 33.6 lbs/d/ft<sup>2</sup> (peak) for secondary clarifiers following extended aeration is shown in Metcalf & Eddy, Inc., *Wastewater Engineering: Treatment and Reuse*, 4th Ed., R. Tchobanoglous, 2003.

The recommended clarifier configuration is a spiral blade clarifier as manufactured by Westech, Inc, ClearStream Environmental, RockWater Equipment, or approved equal. A budgetary proposal was solicited from Westech and is included in **Appendix D**. A premium coating system or stainless steel will be specified for all submerged metallic equipment.

At this diameter, the equipment for this clarifier would be one of the smaller units that Westech provides. It is recommended to install the launder on the outside of the basin to give space between the scum collector and the clarifier mechanism. HydroScience recommends a 12-foot clarifier depth to optimize settling performance.

A precision bearing drive design is proposed for this project. Westech has indicated that this type of bearing is only available in a grease lubrication option. The main bearing and reducer can be grease or oil lubricated. The loading criteria summary for the existing and new clarifiers are shown in **Table 4-6**. The complete process calculations are included in Appendix D.

**Table 4-6: New Clarifier Loading Criteria Summary**

Parameter	Value	Units
Weir Diameter	38.0	ft
Diameter	40.0	ft
Side Wall Depth	14.0	ft
Side Water Depth	12.0	ft
Volume	113,000	gal
Design MLSS	3,000	mg/L
RAS SS	7,000	mg/L
DT @ MDF	3.8	hrs
Min DT @ 10°C	3.0	hrs
SOR @ MDF	695.3	gal/d/ft <sup>2</sup>
SOR Peak Typical	400-800	gal/d/ft <sup>2</sup>
WOR @ PHF	10,571	gal/d/ft <sup>2</sup>
Max WOR	10,000	gal/d/ft <sup>2</sup>
SLR @ MDF	27.5	lbs/d/ft <sup>2</sup>
SLR Typical	25-30	lbs/d/ft <sup>2</sup>

A plan and section of the proposed layout is shown on **Sheet M300**. A detail for scum flushing will be developed during design.

**Table 4-7** below presents the comparative costs for the independent clarifier versus an integral clarifier based on current budgetary pricing. Choosing an independent clarifier adds between \$713,710 and \$986,592 to the project cost after contingencies, depending on the type of RAS/WAS pump station selected.

**Table 4-7: Clarifier Options Cost Comparison**

Alternative	Capital Cost (Equipment, concrete, and installation)
<b>Aeration Basin with Integral Clarifier</b>	<b>\$3,833,045</b>
<b>Aeration Basin with Separate Clarifier and RAS/WAS Pump Station</b>	<b>\$4,521,405</b>
Aeration Basin	\$2,310,797
Secondary Clarifier	\$1,729,700
RAS/WAS Pump Station <sup>1</sup>	\$332,930
Additional Yard Piping	\$10,616
Additional Electrical	\$137,362
<b>Cost Difference</b>	<b>\$688,360</b>
<b>Cost Difference with Contingencies and Time Escalation</b>	<b>\$986,592</b>

Notes:

1. The more expensive of the two options, submersible chopper pump station, is assumed. If a double-disc pump station is selected, the savings to this option would be \$273,582 including contingencies and time escalation. The resulting cost adder for an independent clarifier would be \$713,710

## 4.7 RAS/WAS Pump Station

If a separate clarifier is pursued, a separate RAS/WAS pump station will need to be constructed to recirculate settled sludge to the front end of the process train and waste the appropriate pounds of solids to the dewatering process each day. **Table 4-8** presents the estimated return flow rate based on biological concentrations in Table 2-5.

**Table 4-8: Design RAS Flows (Each Clarifier)**

	WWTF AAF (gpm)	RAS Multiplier	Max RAS Flow (gpm)	Max RAS Flow (gpd)
Phase 3 <sup>2</sup>	219	1.5	329	437,760
Buildout <sup>3</sup>	313	1.5	469	675,360

Notes:

1. RAS flows were estimated based on a RAS concentration of 7,000 mg/L and MLSS concentration of 4,000 mg/L.
2. RAS flow for Phase 3 is assumed to be coming from the new clarifier.
3. RAS flow at buildout is the total RAS flow from the 2 clarifiers. 50% of this RAS flow will be pumped from each clarifier separately by a dedicated RAS/WAS pump station.

Various pump station configurations are available for this facility, including at-grade and submersible pumping systems. HydroScience performed a similar comparative evaluation of RAS pumping approaches for the Arnold WWTF (*Draft Preliminary Design Report, Arnold WWTF*, November 2021, HydroScience Engineers). For that project, double disc pumps were selected to match existing, eliminate the cost of excavation and a concrete wet well, and be able to handle larger solids and debris.

A similar evaluation is presented herein. The evaluation included submersible chopper pumps, double disc pumps, and progressing cavity pumps for this application considering the installation requirements, flow range/ turndown, solids passing, maintenance requirements, and capital cost. **Table 4-9** presents these considerations and compares the pump options.

**Table 4-9: RAS Pump Comparison**

Parameter	Submersible Chopper	Progressing Cavity	Double Disc
<b>Installation Requirements</b>	Requires wet well	Seal water required; pad on grade (no wet well)	Compact layout; pad on grade (no wet well); requires pulsation dampener and discharge pressure switch
<b>Flow Range/ Turndown</b>	75 to 100% of pump flow capacity	50 to 100% of pump flow capacity	20:1 turndown
<b>Solids Passing</b>	Specifically designed to pump waste solids at heavy consistencies without plugging – passes 4-inch solids	Less tolerant of grit and debris (max 0.6-inch solids)	Passes 2-inch solids
<b>Maintenance Requirements</b>	Typical pump maintenance	Full service-in-place design	No mechanical seals, glands, oil (zero routine maintenance)
<b>Capital Cost (Equipment, concrete, and installation)</b>	\$332,930	Not recommended; Not priced	\$190,882
<b>Advantages</b>	Lower equipment cost Common pump type for RAS systems Can fully drain the clarifier	Not recommended	Lower installed cost Better flow turndown Can provide up to 25 ft of suction lift for draining clarifier District operating experience at Arnold WWTF
<b>Disadvantages</b>	Wet well required Higher installed cost Reduced flow turndown	Vulnerable to large debris; therefore not recommended Requires below-grade vault for flooded suction or separate tank dewatering pumps	Installed at grade Higher equipment cost Requires trash pump to fully drain the clarifier

Submersible chopper pumps will require a wet well, which adds to the construction cost. The wet well should be constructed to a depth below the bottom of the clarifier to provide flooded suction while draining the tank.

Progressing cavity (PC) pumps are sometimes used for this type of application. PC pumps can be provided with easily disassembled stators for maintenance and typical have large turndown ratios. PC pumps operate on a close tolerance fit between the rotating metal rotor and the stationary rubber stator and can only pass a 0.6 inch solid. Given the following factors, there is reasonable potential for screenings and larger debris in the existing Biolac:

- The WWTF is 33 years old.
- The headworks screen was replaced and upgraded after original facility construction. It is assumed the prior headworks screen may have failed to remove all large debris at some point.
- The plant has a single process drain. The existing Biolac has probably never been drained or cleaned.

As a result, PC pumps are not recommended due to the potential presence of significant debris in the Biolac which would present risk of accelerated pump wear should this debris end up the settled sludge. Furthermore, there is risk of running the PC pumps dry unless they are installed in a below-grade vault to always assure flooded suction (including when draining the tank, unless a separate drainage system is constructed). The clarifier is expected to be constructed partially below grade. A below grade pump vault could involve confined space entry and the need for a sump pump to keep the space dry.

The remaining options for the District's consideration are double disc pumps or submersible chopper pumps. Advantages and disadvantages of each are presented in the previous table. HydroScience will incorporate the District's input into the final version of this PDR.

**Sheet M500** shows the preliminary RAS/WAS pump station layout utilizing a submersible chopper pump approach. The Arnold WWTF drawings (provided separately) provide an example of a double disc arrangement. For the double disc approach, a side motor mount frame is shown, but this pump can be installed with the motor piggyback for an additional cost. A space heater is recommended for outdoor installation due to diurnal temperature swings which can cause motor condensation. Shaft grounding rings are optional. These prevent degradation of main pump bearings and shaft from possible stray electrical currents when running a pump on a VFD. These pumps require a pulsation dampener and discharge pressure switch.

The existing Biolac sets a wasting rate based on a timer that opens a motorized wasting valve. The District operates RAS flows at a fixed setpoint that does not vary with flow but is adjusted from time to time based on measured MLSS and process performance.

**Table 4-10** shows the recommended design criteria based on a typical average RAS flow of 50-75% of average and a peak RAS flow of 100-150% of average flow (Wastewater Engineering Treatment and Reuse, Metcalf & Eddy, 2003) for secondary clarification with extended aeration. This sizing approach was confirmed by the aeration system manufacturers.

**Table 4-10: RAS/WAS Pump Station Design Criteria**

Parameter	Criteria	Units
Type of Pumps	Double Disc or Submerged	
Number of Pumps	1 Duty + 1 Standby	
<b>Phase 3 Design Criteria, one Process Train</b>		
Average Monthly Influent Flow	315	gpd x 1000
Average RAS Flow	197	gpd x 1000
Low RAS Flow	158	gpd x 1000
Peak RAS Flow	473	gpd x 1000
% Peak RAS Flow/ Average Influent Flow	150%	
RAS Design Flow	328	gpm
<b>Buildout Design Criteria, per Process Train</b>		
Average Monthly Influent Flow	225	gpd x 1000
Average RAS Flow	141	gpd x 1000
Low RAS Flow	113	gpd x 1000
Peak RAS Flow	338	gpd x 1000
% Peak RAS Flow/ Average Influent Flow	150%	
RAS Design Flow	234	gpm

The data sheets for both the submersible and double disc options are included in **Appendix E**.

#### **4.8 Upper Effluent Storage Pond (UESP) Pump Station**

Currently the District does not have an adequate permanent pumping and piping system to drain the UESP pond which currently discharges to the existing Return Lift Station (also referred to as the Effluent Return Pump Station) (RPS). The temporary system includes a portable submersible pump and above ground temporary PVC piping across the UESP west levee. Effluent is pumped to the RPS wet well and pumped back to treatment with the existing submersible pumps.

Existing data shows that the pond is currently drained during the drier months (May – September). Data provided by the District shows pumping may range from 285 – 500 gpm when the pond is drained within a one-month period. Typical open storage pumping designs allow stored effluent to be drained over several months, typically during the summer May/June through the end of September. Assuming a 5-month drainage period, pumping 8 hours per day, 5 days a week, a flow rate of 300 gpm is adequate. This pumping rate is also within the target range proposed by the District.

Several pump station alternatives were evaluated to determine the most feasible, cost-effective, and operator-friendly approach. The pump station alternatives that will be addressed in this PDR are the following:

- Option A (base option): Construct a submersible wet well pump station on the levee, fed by a deep gravity inlet pipe.
- Option B: Replace the existing RPS with a new larger submersible pump station facility sized for existing drainage flows (primarily filter backwash and solids dewatering reject flows) plus UESP flows. UESP gravity flows into the wet well would be throttled by an inlet valve to avoid overwhelming the pump station or risking a spill.
- Option C: A floating pump station barge installed in the reservoir with submersible non-clog pumps. This option would not require an inlet pipe.

For all configurations, it is proposed that a single pump will handle the design flow with a unit in standby. Option B assumes VFD driven motors to manage the rate of flow to headworks. The other options can use soft-starter constant speed drives.

HydroScience also considered an option to install self-priming pumps on a concrete pad on the levee with a shallow buried suction line to the bottom of the reservoir. This option was eliminated after calculating the high suction lift required during low UESP levels. Additionally, the District has concerns about maintaining pump prime and does not have this type of pump at any other District facility. Therefore, this option was eliminated from further consideration.

For Option B, the existing wet well peak influent flows were estimated to determine a suitable design flow with the addition of the UESP flows. Existing flows to the RPS are primarily backwash waste from the Dynasand filtration system and filtrate from the solids handling system.

The existing RPS 8" discharge force main currently ties into the 12" SFM from the Huckleberry PS prior to entering the headworks channel (adjacent to the treatment plant building). The engineer preparing the Huckleberry PS design wishes to remove all flow inputs into the Huckleberry force main to facilitate predictable pumping hydraulics for that station. Therefore, the new force main from this WWTF pump station will separately discharge to headworks at a new below-grade junction box installed immediately upstream of the headworks channel. Process controls will be configured to prevent the combined flow (Huckleberry PS plus return flows) from exceeding the design capacity of the mechanical bar screening facility or downstream processes at any time.

The three alternatives identified for further evaluation of a new UESP pump station are as follows:

### Option A (base option):

The submersible pump station in a deep wet well alternative results in a deep excavation through the levee and a fully drained pond for installation of equipment. This option requires a circular 8' ID precast wet well approximately 22 feet deep and deep inlet with a strainer. A concrete pad and pipe support would be installed in the pond sump area to support the suction pipe at minimum water levels. The valving and manifold will be next to the wet well on grade for operator access. A 6" discharge force main is expected for the proposed design flow of 300 gpm. This option would also require a wider access road around the pump station and possible re-grading of the exterior pond berm to maintain the 2:1 slope. The wet well and pond will be hydrostatically connected and would maintain an equal water level throughout pumping operations.

This option is presented in civil sheet **Sheet C105A** and mechanical **Sheet M200**.

### Option B:

The existing RPS is a duplex submersible wet well pump station with constant speed pumps. The pumps were configured to operate in lead-lag mode, with a single pump capacity of appx. 430 gpm (target design flow of 305 gpm). Operational staff has indicated that a single pump still runs at full capacity typically during a belt press operation. It was also noted that typical flows from the RPS are calculated at appx. 183 gpm since no flow meter currently exists at this pump station, and the pumps alternate between startups.

The existing operational volume of the wet well is insufficient to meet typical pump cycling criteria with the additional flow from the UESP (max 6 pump starts/hour). This eliminates the possibility of refurbishing the existing wet well the additional UESP flows. For the purposes of this PDR, it is assumed that a new lift station will be constructed for UESP and plant drainage flows. This would provide the District the added benefit of having a new pumping facility for existing flows.

An operational volume of approximately 4,125 gallons is needed to satisfy pumping cycles assuming an incoming peak flow of 605 gpm (RPS single pump design flow 305 gpm + UESP pond drain rate 300 gpm). The pumping rate would be designed for appx. 650 gpm output. This results in a 12' ID precast wet well approximately 14 feet deep and flooded suction inlet with a strainer. The suction line would enter the wet well at the floor bottom. The new wet well location would be constructed within the vicinity of the existing RPS for similar grade elevations. This option would require a valve at the inlet from the pond to control the flow not-to-exceed 300 gpm at any time. Additional appurtenances/equipment would be required to protect upstream processes if a suction pipe or valve failure occurs with a full reservoir.

Unlike the other options, this approach requires close operator attention on wet well levels and pumping rates when the UESP drain valve is open to verify that UESP flows do not exceed the pump station's capacity. The max WSE of the UESP is 735.3 ft and finished grade at existing RPS is 720.6 ft. Therefore, the replacement RPS if installed at the same elevation would be about 15 ft below the max UESP WSE. A throttling valve would be installed to regulate flows into the wet well, and an upstream isolation valve would be installed as a secondary safety shutoff. Valves would need to be regularly exercised to ensure proper functionality.

Existing plant drainage flows will need to be re-routed to the new lift station. This would include an additional 4-5' ID manhole and approximately 70 linear feet of 8" pipe. The invert elevation at the wet well from the plant drainage flows will set the high-level alarm elevation for the new UESP pump station to prevent backflow. An 8" discharge force main is expected for this option due to the higher flow.

For this alternative the existing RPS pump loads would be replaced with new pump loads. This option is presented in **Sheet C105B**.

### **Option C:**

This alternative is hydraulically similar to Option A. The advantage of this option is that no deep trenching is required and the pond may be full during installation. This option would include a floating platform/barge with duplex pumps, check valves and semi-flexible discharge piping in the water with isolation valves and manifold piping on top of the berm. This requires a single concrete pad for the valve and manifold piping and trenching for the discharge manifold pipe, typically 3'-4' below grade. This option is available with vertical turbine or submersible pumps with differences only in pump efficiency, solids handling and mounting configuration within the floating barge structure. The pumps are mounted inside the barge/structure while the discharge piping penetrates through the top center of the barge. The bottom of the barge is an open cavity for water intake. The barge is designed to withstand rocky and uneven surfaces. Access for pumps and equipment on a floating platform would require a boat or floating walkways for access. Given the nature of pond water and potential for solids/debris to accumulate, submersible non-clog pumps are preferred with a minimum 3-inch solids passing.

Another alternative to this configuration is a permanent dock with submersible pumps on rails. This configuration would require draining the pond for dock construction.

The design options are summarized in **Table 4-1** below.

Figure 4-1: UESP Pump Station Options

	A. Submersible Pumps in Wet Well at Levee	B. New Dual-Purpose Replacement Return Pump Station	C. Submersible Pumps on Floating Station Barge
<b>Installation Requirements</b>	Requires deep excavation for inlet and wet well, fully drained pond for construction	Requires deep excavation for suction line, fully drained pond for construction	No deep excavation required, valves and accessories at the top of levee
<b>Wet Well Size</b>	8 ft internal diam x 22 ft deep	12 ft internal diam x 14 ft deep	none
<b>Pump HP Requirements</b>	10 hp	15 hp	10 hp
<b>Other Considerations</b>	Re-grading of exterior pond slope and widened access road within vicinity of equipment	Flooded suction condition requires throttling valve at inlet, isolation system for possible inlet pipe breach, impacts larger area/footprint for installation	Pond does not need to be fully drained for installation
<b>Maintenance Requirements</b>	Typical pump maintenance	Typical pump maintenance Regular exercising and checking of pond isolation valves into wet well.	Requires boat, floating walkway or permanent dock for pump access <sup>1</sup>
<b>Capital Cost (Equipment, concrete, and installation)</b>	\$586,243	\$993,607	\$426,341
<b>Advantages</b>	Moderate cost Avoids spill risk from deep pipe	Renews and upgrades an existing pumping facility and combines functionality with UESP pumping Easy to access for maintenance	Lowest cost Avoids deep excavation or need to drain UESP Avoids spill risk from deep pipe
<b>Disadvantages</b>	Results in an additional pumping facility at WWTF Requires deep excavation and draining UESP	Highest cost Requires deep excavation and draining UESP Spill risk if valves or pipe fails PS can be overwhelmed if flow not regulated	Results in an additional pumping facility at WWTF Barge ramp or pulling to shore required for maintenance; difficult when pond level is low Unfamiliar facility type to District

Notes:  
Permanent dock would require fully drained pond for construction.

When the UESP is being pumped back to headworks, it will flow through a new dedicated force main to a new junction box installed on the influent side of the headworks. The UESP pump station will be automated and have a dedicated flowmeter. The control logic would be programmed to limit or stop UESP pumping when Huckleberry PS flow plus UESP flow would exceed the peak hydraulic capacity of the WWTF. Generally, UESP is expected to be pumped down in the summer when this would not be an issue.

#### 4.9 Treated Effluent Pipeline to Lower Effluent Storage Pond

An evaluation of the existing pipeline was conducted in the 2024 Predesign Report and has been further refined. The existing pipeline consists of a 12-inch pipeline exiting the Parshall flume and transitions to an 8-inch pipeline that is outside the perimeter berm of the UESP. The 8-inch pipeline interconnects with the UESP valve assembly located south of the UESP, comprising approximately 1,100 ft of piping. The effluent is conveyed south to the Lower Effluent Storage Pond (LESP) across approximately 2,980 ft of pipeline. The controlling water surface elevation at the Parshall flume is 736.64 ft and the maximum elevation at the LESP was historically 700 ft but has been increased to 702.3 ft based on the recent survey data. The maximum losses in the existing pipe should not exceed the total vertical change of 34.34 ft. The existing 8-inch piping and fittings are estimated to allow a maximum of 0.73 MGD to the LESP with total head losses of 34.34 ft using the Hazen Williams equation.

To accommodate existing and future peak hour flows, a parallel pipeline has been preliminarily designed to convey a minimum of 1.40 MGD to the LESP, which would increase the total maximum flow from 0.73 MGD to 2.00 MGD or more. The pipeline varies from 10 to 12-inch nominal diameter due to the head conditions and losses in the system, which are presented in **Figure 4-2**. Due to the minimal elevation drop between the Parshall flume and the UESP valve assembly, the 1,100 ft length of piping between these components is sized to 12-inch nominal diameter to minimize head loss. Beyond the UESP valve assembly, as the pipeline elevation decreases the static head increases significantly and the pipe is reduced to 10-inch diameter for the remaining 2,415 ft (total run of 3,515 ft for the new pipeline).

As shown in the drawings Appendix B and **Appendix G**, the treated effluent pipeline has been designed with bypass capabilities at the UESP valve assembly so that either the existing or new pipeline can be bypassed. There is also an interconnection proposed at the LESP to use the lower outlet alone (to avoid bank scour when LESP levels are low) or to bypass the LESP.

When both parallel pipelines are in service, they will reach an equilibrium head condition where the flow rates will adjust until head losses in both pipelines will equal one another. The flow scenarios of the pipelines are summarized in **Table 4-11** below. At a flow rate of 2 MGD, 0.60 MGD would be conveyed in the 8-inch pipeline and 1.4 MGD in the 10-inch pipeline with total head losses of approximately 23.80 ft. The maximum flow rate of the two pipelines is 2.48 MGD which would utilize the 34.34 ft of elevation drop in the form of head losses.

Additional flows greater than 2.48 MGD may be conveyed through the parallel pipelines, however it would likely increase the upstream water surface elevation in the Parshall flume to overcome the additional head losses.

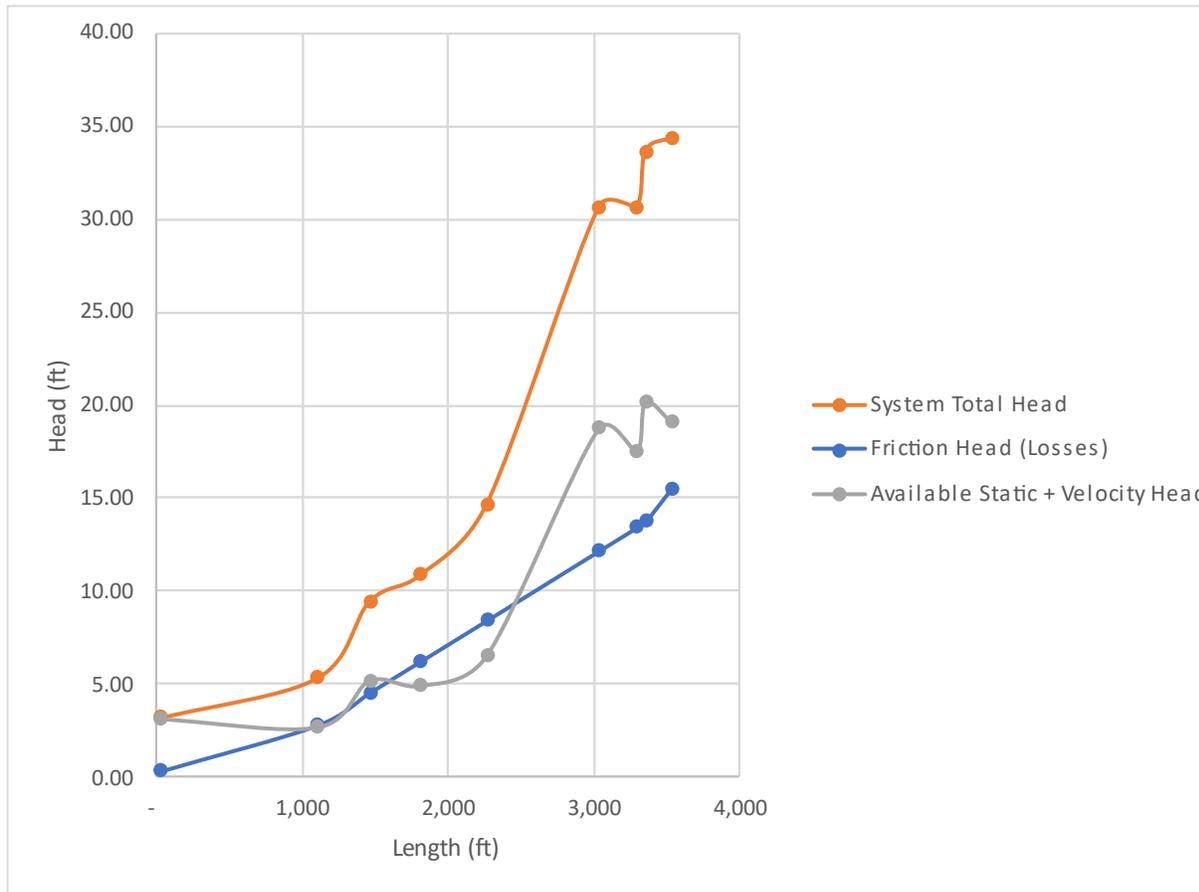


Figure 4-2: 10 inch Treated Effluent Pipeline Head Calculated Conditions at 1.40 MGD

Table 4-11: Summarized Treated Effluent Pipeline Flow Scenario Calculations

Flow Scenario	Flow Rate (MGD)	Total Head Losses (ft)	Flow Velocity (ft/s)
Existing 8 inch Pipeline Full Flow	0.73	34.34	3.25
8 inch and 10 inch Pipelines in Parallel	8 inch: 0.60 10 inch: 1.40 Total: 2.00	23.80	8 inch: 2.65 10 inch: 3.98
8 inch and 10 inch Pipelines in Parallel, Full Flow to both Outlets	8 inch: 0.73 10 inch: 1.75 Total: 2.48	34.34	8 inch: 3.25 10 inch: 4.95
8 inch and 10 inch Pipelines Full Flow to Single 8 inch Outlet	8 inch: 0.47 10 inch: 1.11 Total: 1.58	34.34	8 inch (parallel): 2.09 10 inch (parallel): 3.14 8 inch (combined): 6.99

The 10-inch pipeline outfall is proposed at the LESP at a maximum elevation of 702.3 ft to match the maximum water level. Concerns regarding the potential erosion of the LESP exist for areas where the slopes are greater than 6% or where constrictions to the flow cross sectional area may occur when the LESP is being filled by the 10-inch pipeline outfall. To prevent slope erosion and scour, the District may utilize the lower outfall of the 8 inch pipeline at 1.58 MGD until the LESP reaches 692.3 ft water surface elevation (approximately 50 Acre-feet volume). After the 692.3 ft elevation is reached, the slopes between the water surface and the outfall of the 10-inch pipeline are gentler (i.e. generally less than 6%) and less likely to erode, allowing both outfalls to be utilized to completely fill the pond to 702.3 feet water surface elevation (172 Acre-feet volume) at flow rates from 2.0 to 2.48 MGD.

#### **4.9.1 Pipeline Replacement Alternative**

Although the current design proposes a 10-inch parallel pipeline, the District may prefer to abandon in place the existing 8-inch pipeline and construct a larger singular pipeline to convey the 2 MGD of effluent to the LESP. During the evaluation of the site survey data, it became apparent that portions of the existing pipeline appear to lie outside the legal easement area which makes it difficult to legally access and maintain. A preliminary evaluation indicates a larger pipeline consisting of 1,092 LF of 14-inch and 2,423 LF of 12-inch nominal diameter pipe may be installed within the legal easement area to convey at least 2 MGD to the LESP. Because the WWTF must discharge effluent flow to the LESP at all times, the construction approach would need to keep the existing pipeline in service until the new pipeline is completed, tested, and commissioned.

#### **4.9.2 Preliminary Evaluation of Subsurface Conditions**

Four test pits (TPs) and seismic refraction lines (SRs) were completed along the proposed pipeline alignment to assess the likelihood of encountering rock to be excavated. The Draft Geotechnical Report was not available at the time of this writing but will be incorporated prior to finalizing this PDR. The Geotechnical Engineer provided this preliminary narrative:

Based on published geologic mapping, the TP excavations, and SR surveys, we anticipate the proposed pipeline alignment generally consists of at least 1 to 6 feet of lean clay, clayey sand, and clayey gravel underlain by weathered rock (sandstone and slate). Based on the TPs and results of our SR surveys we anticipate the soil and weathered rock is generally excavatable to the anticipated pipeline depths using a large excavator such as a CAT 336D (or equivalent).

Most of the thinly foliated/bedded rock (slate) will likely break down upon excavation to dimensions of 4 inches or less; however, excavation may become more difficult with depth due to the tight rock condition and increasing hardness with depth. Isolated locations of more massive rock (such as hard sandstone) may also be encountered. These isolated occurrences of harder rock may require chiseling or drilling and splitting to facilitate removal and may result in generation of large bouldery material.

The actual excavation effort/progress will depend on the equipment type and methods used, experience and skill of the operator, and the amount of wear and tear and progress acceptable to the contractor. The contractor is responsible for the selection of the appropriate excavation equipment, means, and methods.

The preliminary geotechnical narrative provided above indicates that the rock is expected to be generally excavatable with a large excavator, although the presence of isolated locations of more massive rock requiring hard rock removal methods may also be encountered. The existing pipeline located by the District prior to survey shows sudden jogs in alignment at various locations including the vicinity of STA 116+00, 117+30, 125+40, and 129+00. It is possible that these jogs were made to avoid such rock formations.

The locations of the TPs and SRs are provided on the pipeline plan and profile sheets (C200 through C207). Excavation of the TPs was completed using a small backhoe which often met practical refusal at shallower depths than a full size excavator likely would.

**Table 4-12**

Based on the evaluated SRs and TPs, the hardened slate and sandstone materials appear more likely to be encountered where seismic velocities increase above 5,000 ft/s. The highest likelihood of encountering these materials appears to be between STA 114+50 to STA 122+00. For this 550-foot segment of pipeline the proposed burial depth transitions from 5 ft to more than 18 ft, which may require up to approximately 500 CY of rock excavation for a 2-foot-wide trench where sound rock and boulders are estimated to be encountered at a typical depth of 5 ft or greater. The characterization of the likelihood of requiring rock excavation or encountering boulders and hard sandstone is summarized in **Table 4-12** below.

**Table 4-12: Preliminary Subsurface Characterization**

Characteristic	SRL 1	TP 1 SR 2 & 3	TP 2 SR 3 & 4	TP 3 SR 4	TP 4
Applicable Proposed Pipeline Stationing	STA 100+00 to STA 111+00	STA 111+00 to STA 120+00	STA 120+00 to STA 126+00	STA 126+00 to STA 130+00	STA 130+00 to STA 134+00
Approx. Depth to Hard Material	10 to 15 ft	5 to 7 ft	8 to 12 ft	10 to 15 ft	>15 ft
Proposed Pipeline Burial Depth	4 to 10 ft	4 to 18 ft	4 to 5.5	4 ft	4 to 6 ft
Likelihood of Boulders or Sandstone	Moderate	High	Moderate / Low	Low	Low

Following completion and review of the geotechnical report and selection by the District of an approach to increase pipeline capacity (parallel pipes or full replacement and abandonment), HydroScience will seek opportunities to optimize the pipeline design to reduce risk of hard rock excavation. This may include realigning the pipe and/or installing in the existing pipe trench above the existing pipe. However, this would require a record boundary survey of the easement to confirm limits and possible widening of the easement to follow the existing pipe alignment. The hydraulics will need to be recalculated for a shallower pipe depth if the new pipe conflicts with the existing. HydroScience will also include a rock clause in the contract documents with an assumed quantity based on the final alignment and geotechnical report.

## 4.10 Electrical Power

The existing power distribution system consists of a utility power feed supplied by a PG&E pad-mounted transformer, which supplies a NEMA 3R, 480/277VAC, 1200A Main Switchboard (MSB). This MSB includes a PG&E meter, an automatic transfer switch (ATS), and a switchboard (SWB) with two feeders that supply power to SWB-E and MCC-1. Backup power is provided by a 750kW diesel generator with an above ground fuel tank.

The project includes new electrical loads to support the additional and upgraded process units and pumping facilities, which will require additional utility power and distribution capacity including breakers, conduit, and wire. The new Main Switchboard 'MSB' will be needed to handle the additional loads required for the next phases. The MSB will include a utility meter with a main breaker and a 4-pole ATS rated at 2000 Amps, 480/277VAC, 60Hz, 3-phase, 4-wire, and a 65,000 AIC rating. It will be installed in the new Electrical Building. This additional load will also require a larger generator to handle the new loads. The new diesel generator will be Tier 2 to meet Calaveras County Air Pollution Control District (APCD) requirements.

The existing 800-amp motor control center (MCC-E), located in the Operations Building, is currently supplied by a 400-amp feeder breaker from switchboard SWB-E. MCC-E distributes 480VAC, 3-phase power to most motors and equipment, along with a 75kVA, 3-phase, 480VAC to 120/208VAC transformer. The transformer feeds Panel LP-2, a 120/208VAC distribution panel that powers various electrical loads.

Due to space constraints in the Operations Building, the need to enhance safety by removing 480VAC power from occupied areas, and the need to comply with current electrical codes, the District has decided to construct a new Electrical Building. This new building will house a replacement MCC with expanded capacity and space. Moving power distribution out of the Operations Building will resolve workspace limitations and improve safety by isolating high-voltage equipment from areas occupied by staff.

The new Electrical Building will measure approximately 38' x 15' and will feature a single door at one end and a double door at the other, meeting NEC requirements for workspace and egress. The building will house transformers and VFDs, both of which generate significant heat, necessitating an AC system to maintain optimal equipment temperature. LED lighting will be installed both inside and outside. The building will also accommodate a future MCC and process control panels, with minimal openings to reduce dust and pest intrusion.

The new PG&E pad mounted transformer, generator, fuel tank, main switchboard, switchgear and MCC-2 will be installed prior to demolition of any existing electrical gear. A belly fuel tank is typically recommended to reduce installation requirements and footprint, but a separate fuel tank can instead be specified (similar to existing) if so desired by the District.

The new switchgear will have an 800A breaker installed to backfeed the existing switchgear. PG&E will power the new switchgear from the new transformer. The existing generator will be left in place to provide a backup to the existing switchgear. Once both the existing and new switchgear are energized the process of cutting the existing loads to the new MCC-2 will begin. Once all existing and new loads are wired to the new MCC-2, the existing equipment can be removed.

HydroScience has developed a preliminary one-line diagram reflecting the anticipated existing and new MCC loads. This is provided on **Sheet E010**. HydroScience has developed a preliminary layout of new electrical equipment and the Electrical Building. This layout involves grading a flat area adjacent to the new aeration basin located west of the existing electrical gear. See **Sheet E-100**.

#### **4.11 Controls**

The project includes field instrumentation to support the upgrades, which will require landing additional analog and discrete inputs/outputs (I/Os) on the Main Control Panel 'MCP' and additional PLC programming and SCADA screens to incorporate new, remote monitoring and control, and process automation.

The existing MCP is located in the Operations Building. This Panel will be demolished and replaced with a new Main Control Panel, 'MCP'. The MCP shall include as a minimum, an Allen-Bradley CompactLogix to match the PLCs at other Calaveras County Water District sites, an Uninterruptable Power Supply, and an HMI. The existing PLC and I/O modules are Schneider Electric TSX Quantum, which is an obsolete system. Similar to the MCC, the District decided to fully replace the PLC and SCADA system as part of this project. The PLC shall include enough I/O for the required amount plus an additional thirty percent as spares and empty slots to allow for future expansion. The PLC upgrade will include transfer of existing control logic from the existing PLC to the new PLC, augmented with additional control logic and modifications to support the Phase 3 upgrades based on control strategy narratives prepared by HydroScience.

A new computer and ancillary equipment to run the SCADA system shall be acquired and installed in the Operations Building to replace the original. The SCADA programming shall match the original format plus the additional equipment. The field devices, I/Os, and PLC interconnections required to support Phase 3 are included in the preliminary Process and Instrumentation Diagrams (P&IDs). See **Sheets I001-I109**.

## SECTION 5 – PROJECT RECOMMENDATIONS

**Table 5-1** below summarizes the key decisions needed to fully define the scope of improvements and presents our comments and initial recommendations for the District’s consideration.

**Table 5-1: Key Project Decisions and Initial Recommendations**

Project Component	Decision Required	HydroScience Initial Recommendation	Factors/Comments
Headworks screen and channel	Confirm no upgrade to be added in this phase. Discuss upgrade plans for Buildout phase.	Replace the screen and the screen channel at Buildout. Construct new channel at higher elevation to facilitate flow split and flow measurement. Centralize facility location to provide similar length pipe runs to aeration.	Screen capacity is insufficient for Buildout flows. Channel elevation is too low for proper flow split and flow metering. Hydraulics needs to be coordinated with Huckleberry PS design.
Hydraulic grade line	Implement or defer splitter box upgrade.	Defer to Buildout after confirmation of hydraulics through existing wye-splitter	See discussion in Section 4.3
Aeration/Clarification	Construct integral clarifier or independent clarifier and RAS/WAS pump station	District preference. Choosing an independent clarifier adds between \$713,710 and \$986,592 to the project cost after contingencies, depending on the type of RAS/WAS pump station selected.	Separate clarifier simplifies specifications and procurement, provides District familiarity, and reliable performance
Aeration/Clarification	Allow Bioworks traveling bridge style clarifier or require Parkson style clarifier	None	Decision only pertinent if independent clarifier is not selected.
Aeration/Clarification	Construct simplex or duplex integral clarifier. If duplex, each would be either 50% or 100% of rated flow capacity.	Construct simplex clarifier and rely on the existing aeration/clarification process as a standby. Note that this will require seeding the biological unit process.	Decision only pertinent if independent clarifier is not selected.
Aeration/Clarification	Expand existing blower facility or construct a dedicated blower facility for new basin.	Construct a dedicated blower facility to avoid DO control challenges.	Tie in between headers with isolation valve provided to enhance operational flexibility.
RAS/WAS Pump Station	If independent clarifier selected, select from submersible chopper pump or double disc pump station option.	District preference	See discussion in Section 4.7
UESP Pump Station	Select type of pumping facility	District preference	See discussion in Section 4.8
Treated Effluent Pipeline	Size for parallel pipe operation or full replacement & abandonment of existing pipe	Pending geotechnical results, additional survey services, and updated costs.	

Notes:

**Table 5-2** below lists design elements that are to be resolved or reconciled during the detailed design phase of the project.

**Table 5-2: Design Issues to be Resolved in Detailed Design**

Project Component	Issue	Comments
Aeration/Clarification	Reconcile blower size	Bioworks and Parkson air flow requirements differ more than expected
Aeration/Clarification	Reconcile basin dimensions	Select a default length to width ratio for final design
Aeration/Clarification	Field-measure weir v-notch elevation	HGL based on elevation estimated from as-builts and survey points
Aeration/Clarification	District to complete influent sampling program to inform updated design loadings.	HydroScience to reflect updated loadings in final aeration basin specifications
Filter static mixer	Confirm head losses in the mixer (provide O&M cutsheet or similar)	Affects hydraulic grade line calculations. May need to be upsized for Buildout
Return Pump Station	Confirm solids dewatering reject flow rate for Phase 3 and Buildout	An estimate is currently used
Solids Dewatering	Confirm that existing 2 meter belt press is lightly utilized and can be operated more hours per day to accommodate Phase 3 wasting rates.	Per 2024 Predesign Report and 2018 Master Plan, existing lagoons and belt filter press are lightly loaded and have sufficient capacity for expansion
Filtration	Confirm number of operating cells in Phase 3 and Buildout	Affects backwash rate calculation
Survey	Record boundary survey and possible easement adjustment	Needed to finalize plan for new pipe alignment and conveyance option
Geotech	Review final geotechnical report and confirm excavatability of rock at pipeline depths	
Construction Sequencing	District to provide input on maximum summer WWTF shutdown duration available for process and electrical/controls transitions.	

## SECTION 6 - PRELIMINARY CONSTRUCTION SEQUENCING PLAN

Construction of the majority of the improvements will be completed while the existing treatment plant is in operation. Facility improvements will be fully constructed up to the connection points. Tie ins at the connection points will be coordinated with facility shutdowns and will allow time for dewatering, tie-in, and testing prior to coming back online. These are expected to be dry weather flow shutdowns. HydroScience will coordinate with the District during development of the construction sequencing specification to identify maximum allowed durations for these shutdowns based on the District's capability to hold flow at Huckleberry PS.

Construction and commissioning of the improvements will be coordinated with construction and commissioning of Huckleberry PS, depending on timing of the upgrade project. HydroScience will work with the District during detailed design to define the related sequencing requirements and reflect this in the final Contract Documents and construction schedule.

The comprehensive electrical and control upgrades included in this project will require a series of construction sequencing steps to implement. This will be the same overall approach taken on the Arnold WWTF, which is currently at the 100% design completion stage awaiting funding. The specifications for that project provide a detailed list of sequencing requirements for the contractor. These will largely be duplicated on this project. In general, the steps are summarized as follows:

1. Construct buried conduit ductbanks from the new Electrical Building to all new and existing WWTF facilities. Terminate at junction boxes adjacent to field loads.
2. Construct new Electrical Building. Install new electrical panels.
3. Install new plant control panel (CP) in the existing operations room.
4. Set the new PG&E transformer pad and wire it to the new service entrance.
5. Construct new generator pad and install the generator.
6. Pull power and control cables from MCC and CP to field devices and loads. Land cables on all new processes and equipment. At existing equipment, spool cable for future connection during planned transitions.
7. Install a temporary backfeed from the new switchboard SWB-2 to the existing Switchboard. Note: if PG&E has the capacity to energize the new transformer without deenergizing the old, then the backfeeding step can be eliminated and certain other steps can be streamlined. However, this is unlikely to be feasible.
8. Test all new equipment and conductors.
9. PG&E to energize the new transformer and deenergize the existing transformer.
10. In a stepwise fashion, transition existing unit processes from existing to new power and control cables. These will require planned shutdowns. HydroScience will develop an optimized sequence during detailed design.

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## SECTION 7 - ESTIMATE OF PROBABLE CONSTRUCTION COST

The updated estimate of probable construction cost, based on the scope of improvements described in this PDR and presented in the Appendix B drawings, is included in **Appendix H. Table 7-1** below presents a summary of the costs.

**Table 7-1: Preliminary Opinion of Probable Construction Cost Summary**

Activity	Baseline Project <sup>1</sup>	Alternate Project <sup>2</sup>	Alternate Options <sup>3</sup>
Sitework	\$ 634,277	\$ 634,277	
Splitter Box	\$ 105,722	\$ 105,722	
Flow Meter Vaults	\$ 178,438	\$ 178,438	
Aeration Basin w/ Integral Clarifier	\$ 3,833,045		
Aeration Basin w/o Integral Clarifier		\$ 2,310,797	
Independent Clarifier		\$ 1,729,700	
Baseline Integral Clarifier Yard Piping	\$ 740,301		
Independent Clarifier Yard Piping		\$ 750,917	
Electrical Building	\$ 371,471	\$ 371,471	
RAS/WAS PS (Submersible Option)		\$ 332,930	
RAS/WAS PS (Double Disc Pump Option)			\$ 190,882
Influent Junction Box	\$ 203,579	\$ 203,579	
Effluent PS (Baseline)	\$ 586,243	\$ 586,243	
Effluent PS (Barge Option)			\$ 426,341
Effluent PS (Replacement combined Return PS)			\$ 993,607
Effluent Pipeline (Operate in parallel with existing)	\$ 1,303,800	\$ 1,303,800	
Effluent Pipeline (Fully replace and abandon exist)			\$ 1,450,000
Electrical Work (New MCC/PLC/Generator)	\$ 3,112,638	\$ 3,250,000	
<b>TOTAL DIRECT COSTS</b>	<b>\$ 11,069,514</b>	<b>\$ 11,757,874</b>	
<b>CONTINGENCY (30%)</b>	<b>\$ 3,320,854</b>	<b>\$ 3,527,362</b>	
<b>ESCALATION (2 YEARS @ 5% YOY)</b>	<b>\$ 1,162,299</b>	<b>\$ 1,234,577</b>	
<b>TOTAL OPCC</b>	<b>\$ 15,552,667</b>	<b>\$ 16,519,813</b>	

Notes:

1. Baseline cost assumes aeration basin with integral simplex clarifier, stand-alone UESP pump station constructed on levee, and 10-12 inch diameter effluent pipeline operating in parallel with the existing pipeline.
2. Alternate project assumes independent secondary clarifier and submersible centrifugal RAS/WAS pump station.
3. This column presents alternative costs for (1) double disc RAS/WAS pump station, (2) barge style UESP pump station, (3) a combined new Return Pump Station pumping existing plant drain and backwash flows and UESP flows, and (4) enlarged 12-14 inch effluent pipeline conveying all flows (up to 2 mgd) with abandonment of existing.

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**APPENDIX A**  
Calaveras County Water District  
Phase 3 Improvement Project Predesign Report (“2024  
Predesign Report”)

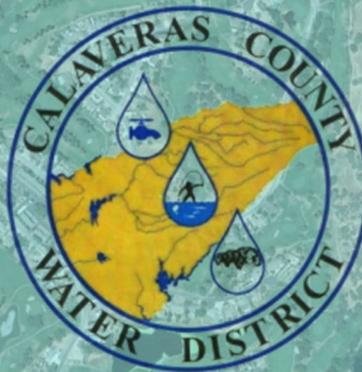
Valley Springs

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**LA CONTENTA  
WASTEWATER COLLECTION SYSTEM  
IMPROVEMENT PROJECT  
AND  
WASTEWATER TREATMENT FACILITY  
PHASE 3 IMPROVEMENT PROJECT  
PREDESIGN REPORT**

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**February 11, 2024**



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## 1. INTRODUCTION

This report was developed as a guide for miscellaneous facility improvements to the La Contenta wastewater collection system, and Phase 3 improvements to the Wastewater Treatment Facility (WWTF). This report provides an update to the *December 2017 La Contenta Wastewater Master (Master Plan)* and describes facilities which are required to serve the community at build-out. While currently the WWTF and associated sewer collection system are adequate for service demands, facility improvements will be necessary if significant growth occurs in Valley Springs. This report includes improvements to address current operational issues identified by District Operations staff.

May potential issues impact current and future sewer service in the La Contenta area. This report attempts to address these issues, including:

- Age and condition along with asset management of existing facilities.
- Known facility deficiencies.
- Probable service area buildout size and requirements.
- Rate of growth within service area.
- Inflow and Infiltration (I/I) issues, especially related to Cosgrove Creek.
- Treated effluent storage capacity required for buildout.
- Treated effluent disposal capacity required for buildout.
- Future regulatory compliance requirements.

In 2020 the District purchased a parcel approximately 408 *acres*, APN 073-042-127, located immediately north of the Lower Effluent Storage Pond (LESP) for future use as a land application disposal site and to permit expansion of the WWTF's treated effluent storage capacity. Photographs of the existing facilities and preliminary project drawings associated with this report are located in **Appendix A**.

## 2. WASTEWATER PLANNING CRITERIA

### 2.1 FACILITY SERVICE AREA

Calaveras County Water District (District) La Contenta service area is approximately 1,600 *acres* in size. The current wastewater service area is shown in **Figure 1**. However, the service area does not include Jenny Lind Elementary School, or the emergency connection to Valley Public Utility District’s sewer system.

A portion of the service area is either open land or currently not zoned for development requiring sewer service. In addition, several parcels near Cosgrove Creek as identified by FEMA, see **Figure 2**, are subject to flooding. This includes the parcel where the Huckleberry Lift Station is located.

#### 2.1.1 Existing Service Area Customers

There are currently 1,054 sewer services in La Contenta equaling 1,110 Equivalent Dwelling Units (*EDUs*). Number of EDU in the service area from 2018 to 2023 are listed in **Table 1**. Information concerning historic number of sewer services is contained in the *Master Plan*. A complete list of current sanitary sewer services, by Assessor’s Parcel Number (APN), is located in **Appendix B**.

Table 1. Number EDUs in Service Area from 2018 through 2023	
<u>Year</u>	<u>EDU</u>
2018	1,087
2019	1,092
2020	1,097
2021	1,101
2022	1,106
2023	1,110

#### 2.1.2 Approved Development

In the La Contenta service area, there are three District Memorandums of Understanding (MOU) related to development and community sewer service. The MOUs concern Gold Creek Subdivision Unit 3, Homes North Vista Plaza Project, and Jenny Lind Elementary School. In addition, the District has service obligations for infill in portions of the community. The Relevant portions of each MOU including number EDUs related to each MOU is located in **Appendix C**.

#### 2.1.3 Infill and Potential Future Development

The amount and rate of future development is difficult to determine. However, current District planning anticipates that growth in the County will continue in the area of the La Contenta.

Excluding approved development, the La Contenta service area currently contains 113 vacant residential properties which may require future sewer service. A list of vacant parcels, by APN, with associated zoning is located in **Appendix D**.

Valley Springs was identified as a Community Planning Element in the **September 22, 2020, Calaveras County General Plan (General Plan)**. In the *General Plan*, various land use categories have been identified with specific zoning, occupancy density, and projected property utilization at buildout. Public lands, roads etc., zoned parks and recreation, public institutions (CCWD), were not included in this report.

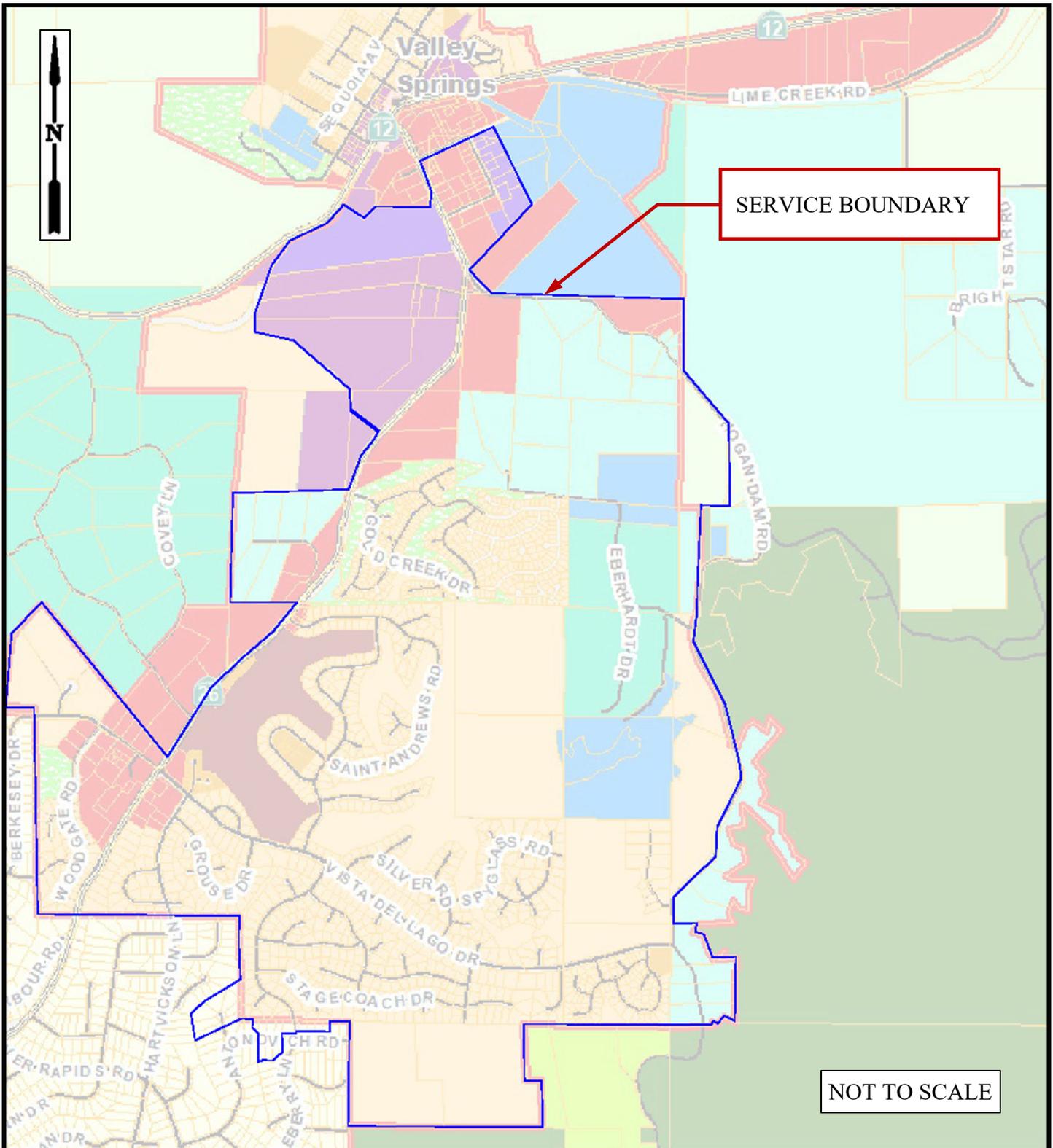
Buildout service size, including existing services, approved development, and potential future development is presented in **Table 2**. Projected number of EDUs at buildout is 2,250, a reduction from the projected number of 2,695 in the *Master Plan*.

Table 2. Buildout Projection for La Contenta Wastewater Service Area				
<u>Parcel Type/Development/Service</u>	<u>Area, acres</u>	<u>Maximum Utilization</u>	<u>EDU/ acre</u>	<u>EDU</u>
Existing Sewer Services	-	-	-	1,110
Residential Parcel Infill	-	100%	-	113
<u>Approved Development (MOU)</u>				
Gold Creek Unit 3	-	100%	-	164
North Vista Plaza Project	-	100%	-	156
Jenny Lind Elem. School	-	100%	-	34
<b>Service Commitments</b>				<b>1,577</b>
<u>Potential Development Sites</u>				
Commercial Parcels	153	20%	7.5	230
Residential Parcels	177	50%	5.0	443
<b>Buildout/Phase 3</b>				<b>2,250</b>

#### 2.1.4 Calaveras County Growth and Population Projection

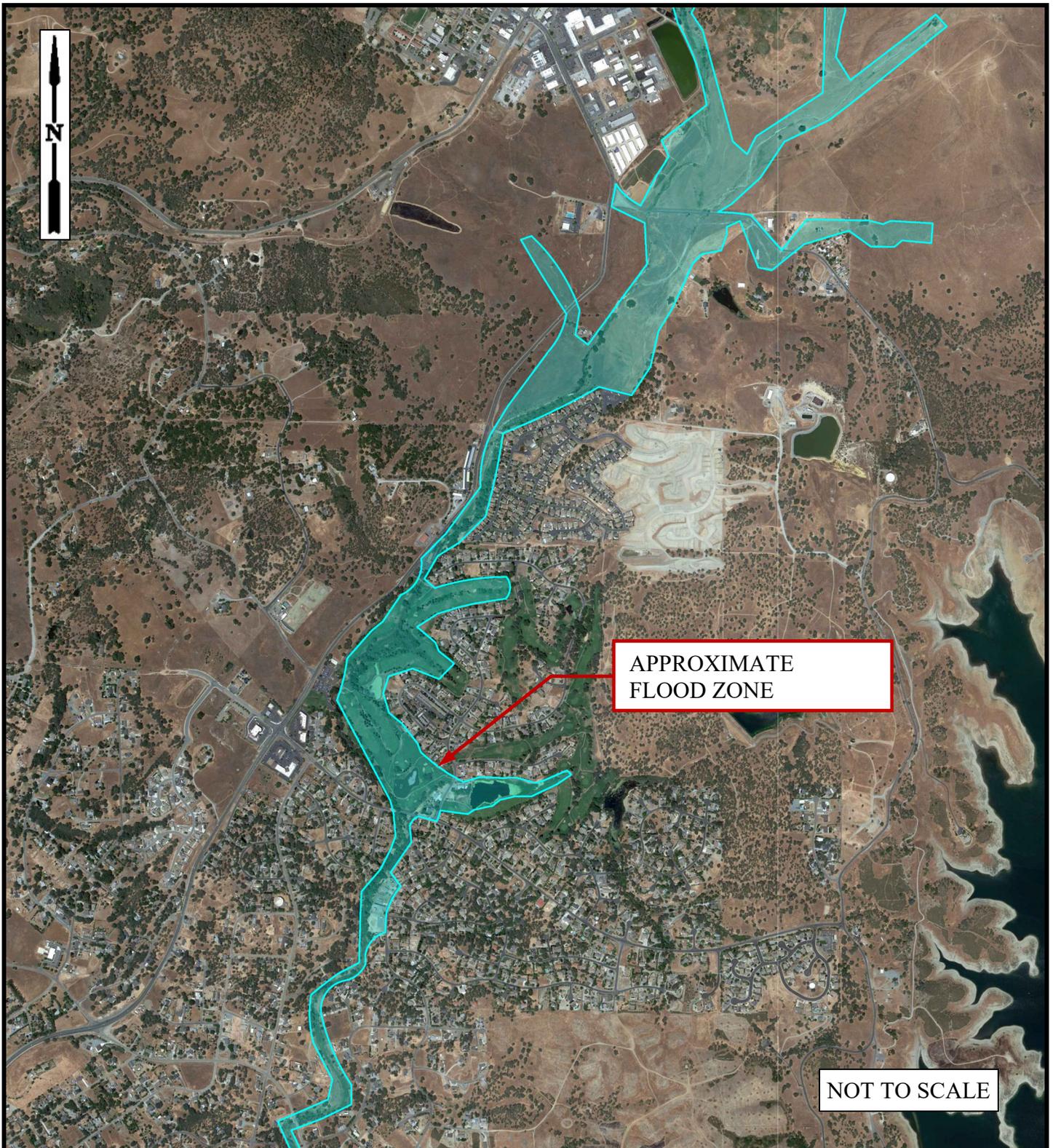
The California Department of Finance (CDF) 2020 County population anticipates decline of approximately 18-percent by 2060. Impacts caused by a decrease in population in the County and related impact to the La Contenta service area are unknown. A summary of the CDF population projection for the County are presented in **Table 3**.

Table 3. CDF Population Projection for Calaveras County					
	<u>2023</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>	<u>2060</u>
<u>California Department of Finance</u>					
Population	44,744	43,735	40,752	37,686	36,445
Change in Population	-	(1,009)	(2,983)	(3,066)	(1,241)
Percent Change	-	-2.26%	-6.82%	-7.52%	-3.29%



**WASTEWATER SERVICE AREA**  
**La Contenta Wastewater Treatment Facility**  
*Calaveras County Water District / La Contenta Predesign Report*  
*December 2023*

**FIGURE 1**



**COSGROVE CREEK FLOOD ZONE**  
**La Contenta Wastewater Treatment Facility**  
*Calaveras County Water District / La Contenta Predesign Report*  
*December 2023*

**FIGURE 2**

### 3. WASTEWATER CHARACTERIZATION

#### 3.1 INFLUENT WASTEWATER FLOWRATES

The influent wastewater Average Dry Weather Flow (ADWF), July to September, in million gallons per day (*MGD*), for the La Contena service area, 2018 through 2023, is presented in **Table 4**. The average daily and maximum daily influent flowrates for the WWTF are presented in **Table 5**. The ADWF per EDU remains similar to the reported values in the *Master Plan, Section 2*. However, the maximum daily flowrate increased significantly in 2022-23 and exceeds District standards. Daily flowrate records associated with **Table 4** and **Table 5** are located in **Appendix E** and **Appendix F**, respectively.

Table 4. 2018 through 2023 Average Dry Weather Flow		
<u>Year</u>	<u>MGD</u>	<u>gal./day/EDU</u>
2018	0.134	123
2019	0.148	136
2020	0.139	127
2021	0.143	130
2022	0.147	133
2023	0.152	137

Table 5. 2020 through 2023 Flowrates				
<u>Season</u>	<u>Average, MGD</u>	<u>Average, gal./day/EDU</u>	<u>Maximum Day, MGD</u>	<u>Maximum Day, gal./day/EDU</u>
2020-21	0.154	139	0.483	435
2021-22	0.176	158	0.590	532
2022-23	0.207	187	0.980	883

#### 3.2 INFLUENT WASTEWATER STRENGTH

For the period of October 2020 to September 2023, the Biochemical Oxygen Demand, 5-day ( $BOD_5$ ) averaged 150 *mg/L*, or 251 *lbs./day*. For the subject period, monthly laboratory results for influent wastewater  $BOD_5$  concentrations are located in **Appendix G** and summarized in **Table 6**.

Table 6. 2020 through 2023 Influent Wastewater Pollutant Loading		
<u>Influent <math>BOD_5</math></u>	<u>mg/L</u>	<u>lbs./day</u>
Average	150	259
Maximum Monthly	390	675

### 3.3 RECOMMENDED DESIGN CRITERIA

Based upon current flow data, recent laboratory results, and *Master Plan*, the following design recommended criteria is presented in **Table 7**. For Phase 3, the design average flow is 0.450 *MGD*.

Table 7. Recommended Phase 3 Design Criteria			
<u>Criteria</u>	<u>Unit Flow, gal./day/EDU</u>	<u>Ratio to Avg. Flow</u>	<u>Phase 3, MGD</u>
<u>Flow</u>			
Average	200	1.00	0.450
Average Dry Weather	150	0.80	0.338
Maximum Month	300	1.50	0.675
Maximum Day	500	2.50	1.250
Peak Hour	800	4.00	1.800
Minimum Day	50	0.25	0.113
<u>BOD<sub>5</sub> &amp; TSS</u>	<u>mg/L</u>		<u>lbs./day</u>
Average	200	1.00	841
Maximum Month	300	1.50	1,261
Maximum Day	400	2.00	1,681
<u>TKN as Nitrogen</u>			
Average	50	-	188

#### 4. EVALUATION OF EXISTING WASTEWATER TREATMENT FACILITIES

This Section serves as a supplement to the *Master Plan*. Additional information and details can be found in the *Master Plan, Section 3.2*.

##### 4.1 COLLECTION SYSTEM

Recently, beginning around 2020, wet weather flowrates have increased significantly as compared to ADWF. In 2023, the maximum daily flow was 0.980 MGD. Investigation into the cause of this increase is required.

##### 4.2 HUCKLEBERRY LIFT STATION

There are currently multiple operational issues regarding the lift station. These include:

- The site of lift station is potentially subject to flooding by Cosgrove Creek.
- The inability to match influent flowrates during low flow conditions requiring frequent cycling of pumps and discharge at high flowrates.
- A high static discharge head, 186.5 – 190.5 *ft.*, limiting ability to properly operate motors and pumps with variable frequency drive (VFD) units.
- Higher than predicted dynamic head losses.
- The Area Drain (Return) Lift Station at WWTF discharging into the same forcemain.
- High discharge head and limitations of typical wastewater single open impeller, solids handling pumps to operate at required discharge pressure.
- Potential need for increased capacity to meet buildout service requirements.

Design criteria related to the lift station forcemain is provided in **Table 8**. Condition and capacity of the lift station is described in **Table 9** with additional information in the *Master Plan*. Updated hydraulic calculations for the lift station are located in **Appendix H**.

Table 8. Huckleberry Lift Station Forcemain	
<u>Discharge Forcemain</u>	
Diameter	12 inches
Length	12,350 <i>ft.</i>
Type	AWWA C900
Static Head	186.5 to 190.5 <i>ft.</i>

Table 9. Huckleberry Lift Station Pumping Criteria	
<u>Criteria</u>	<u>Value</u>
<u>Pumps</u>	
No. of Units (Lead-Lag/Standby)	2/1
Type	Submersible w/VFD
Manufacturer	Flygt
Model	CP-3300-462
Motor Size	88 HP
<u>Pump Capacity</u>	
<u>One Pump (60 Hz)</u>	
Flowrate	900 <i>gpm</i> (1.3 MGD)
Discharge Head	204 <i>ft.</i>
<u>Two Pumps (60 Hz)</u>	
Flowrate	1200 <i>gpm</i> (1.7 MGD)
Discharge Head	220 <i>ft.</i>

#### 4.3 HEADWORKS AND PRETREATMENT

Since adoption of the *Master Plan*, the District has replaced the automatic screen system at the headworks. The new unit currently operates satisfactorily but may not be adequate anticipated future higher influent flow rates. Design criteria concerning the headworks and associated pretreatment system is presented in **Table 10**.

Table 10. Headworks and Influent Pretreatment	
<u>Criteria</u>	<u>Value</u>
<u>Headworks</u>	
Channel Width	1.50 <i>ft.</i>
Max. Water Depth	2.0 <i>ft.</i>
Velocity @ 1,200 <i>gpm</i>	0.89 <i>ft./min.</i>
<u>Influent Pretreatment</u>	
No. of Units	1
Type	Rotary Basket
Manufacturer	HUBER Technology, Inc.
Model	Rotamat® Ro9/400/6
Basket Size	400 <i>mm</i>
Perforation Diameter	2 <i>mm</i>
Motor Size,	1.5 HP
<u>Maximum Hydraulic Capacity</u>	
with Clear Water	1.26 MGD (870 <i>gpm</i> )
with Wastewater	0.72 MGD (500 <i>gpm</i> )

#### 4.4 EVALUATION OF ACTIVATED SLUDGE SYSTEM

Currently the Parkson Biolac® treatment system is adequate and anticipated to be adequate for Phase 3, flowrate and waste constituents. However, the Biolac® integral clarifier doesn't currently operate satisfactorily. Potential improvements to the treatment system are discussed in the *Master Plan*. Design characteristics of the Biolac system are shown in **Table 11**. Further discussion of the activated sludge system, including clarifier are discussed in Section 5.

Table 11. Biolac® Basin and Clarifier Characteristics	
<u>Criteria</u>	<u>Value</u>
<u>Aeration Basin</u>	
Type of Aeration	Bubbler/Diffuser
Volume	514,000 gal.
Surface Area	9,350 ft <sup>2</sup>
Operating Depth	0 to 10.0 ft.
<u>Integral Clarifier</u>	
Volume	58,000 gal.
Operating Depth	5 to 10 ft.
Surface Area	1,199 ft <sup>2</sup>
Length of Weir	90.0 ft.
<u>Maximum Rate</u>	
Solids Loading	35 lbs./day/ft <sup>2</sup>
Surface Loading	0.83 gpm/ft <sup>2</sup>
Weir Overflow	10,000 gal/day/ft.

#### 4.5 TERTIARY FILTRATION SYSTEM

Tertiary treatment consists of five (5) Parkson DynaSand® filters for a total capacity of 1,000 gpm, when four (4) filters are operating, and one is on standby.

#### 4.6 UV DISINFECTION SYSTEM

The capacity of the four (4) bank Trojan UV3000 Plus® UV system is 890 gpm, with one module in standby mode. Each UV bank consists of four (4) modules with each module containing six (6) lamps. Refer to *Master Plan Table 10* for additional information.

#### 4.7 ADDITIONAL TREATMENT AND MISCELLANEOUS FACILITIES

##### 4.7.1 Biosolids Stabilization and Solids Dewatering

The existing biosolids facilities, at La Contenta WWTF, are sufficient for requirements at build-out. Refer to the *Master Plan Table 10* for additional discussion.

#### 4.7.2 Area Drain (Return) Pump Station

The piping system for the UESP drain system which discharges to the Area Drain (Return) Lift Station is not adequate and requires replacement.

#### 4.7.3 Treated Effluent Pipeline to LESP

The existing 8-*inch* pipeline, which transitions from a 12-*inch* pipeline immediately east of the effluent Parshall flume, is not adequate for current effluent flowrates to the LESP, nor adequate for Phase 3 projected flowrate. The pipeline is approximately 3,700 *ft.* in length. Capacity calculations are located in **Appendix I**.

#### 4.8 HISTORICAL PRECIPITATION AT LA CONTENTA

Total annual precipitation at the La Contenta WWTF for the 2022-23 season measured 40.1 *inches*. This total exceeded the 200-year rainfall occurrence. Annual precipitation at the La Contenta WWTF and the New Hogan Dam (NHW) is summarized in **Table 12** and daily rainfall totals for 2020 through 2023 are contained in **Appendix J**.

Table 12. 2020 through 2023 Rainfall at La Contenta WWTF and New Hogan Dam		
<u>Season/Year</u>	Rainfall at WWTF, <i>inches</i>	Rainfall at NHW, <i>inches</i>
2021	13.85	15.76
2022	18.70	19.64
2023	40.10 <sup>1.</sup>	45.12 <sup>2.</sup>
<u>Predicted Rainfall</u>		
Mean <sup>1.</sup>	20.42 <sup>3.</sup>	-
100-Yr. <sup>1.</sup> Recurrence	36.38 <sup>3.</sup>	-
1,000-Yr. <sup>1.</sup> Recurrence	43.07 <sup>3.</sup>	-

<sup>1.</sup> 2023 Annual rainfall measure 39.38 *inches* at the Copper Cove WWTF.

<sup>2.</sup> 2017 Annual rainfall measured 40.94 *inches* at NHW station.

<sup>3.</sup> California Department of Water Resources Bulletin No. 195, October 1976.

#### 4.9 EFFLUENT STORAGE

Currently the effluent storage capacity at La Contenta is marginally adequate for Phase 3 projected flowrate. Daily season treated effluent storage volume, both in the UESP and LESP, for 2020 through 2023, is located in **Appendix K**. Corresponding daily pond elevation information is located in **Appendix L**. Water balances at ADWF of 0.200 *MGD* and 0.237 *MGD* ADWF are located in **Appendix M**.

#### 4.10 EFFLUENT DISPOSAL

Irrigation water demand at the golf course has increased. Volume of effluent and irrigation water volume totals for 2020 through 2023 are shown in **Table 13**. Daily effluent and irrigation demand for 2020 through 2023 is located in **Appendix N**.

Table 13. 2020 through 2023 Effluent Volume and Irrigation Demand		
<u>Season</u>	<u>Effluent, <i>acre-ft.</i></u>	<u>Irrigation Demand, <i>acre-ft.</i></u>
2020-21	214.23	429.06
2021-22	204.41	353.82
2022-23	244.55	336.74

## 5. COLLECTION SYSTEM IMPROVEMENTS

### 5.1 SERVICE AREA COLLECTION SYSTEM IMPROVEMENTS

Evaluation of the existing collection system for the purposes of mitigating I/I impact from wet weather. A number of steps should be considered and implemented in an attempt to control I/I. These include:

- Temporarily sever service connection to the incomplete Gold Creek Unit 3 development to prevent rainfall runoff from entering the collection system.
- Monitor flows in the collection system during wet weather to isolate areas of high I/I. Potential locations for the monitoring are shown on drawings C101 and C102 located in **Appendix A**. Vendor information concerning flow monitoring equipment can be found in **Appendix 0**.
- Elevate and install additional manhole protection at locations near Cosgrove Creek potentially subject to flooding.
- Slip line sewers lines and replace service laterals at locations identified to high intrusion of I/I to the sewer collection system.

### 5.2 HUCKLEBERRY LIFT STATION IMPROVEMENTS

Improvements to the Huckleberry Lift Station are required to provide adequate capacity at build-out and to provide facility reliability. Existing lift station details can be found on drawings C111 and C112 along with drawing reference below are located in **Appendix A**. Improvements for consideration include:

- Installation of second wetwell adjacent to the existing pump station containing low-flow, jockey pumps to prevent frequent cycling of the primary pumping system. Operate low-flow pumps motors with variable speed/frequency drives. Refer to drawings C113 and C114 for example jockey pump installation.
- Replacement of the existing three submersible pumps with larger capacity pumps to provide a firm capacity of 1.80 *MGD* at 235.0-240.0 *ft.* TDH when two pumps operate, and the third pump is available as standby. The replacement pumps should operate at constant speed. One concern regarding installation of replacement pumps is the physical limitation of an open impellor, non-clog, single stage pump related to maximum discharge head. Required discharge TDH may exceed actual manufacturer capabilities. Therefore, it might be necessary to increase existing discharge capacity with the installation of a booster pump system comprised of additional pumps to create a two-stage pump system. An example of potential booster pump installation is shown on drawing C113.
- Upgrade and replace electrical equipment including standby power generation required for operation of two pumps at peak hourly flow of 1.80 *MGD*, and miscellaneous equipment onsite.

## **6. WASTEWATER TREATMENT FACILITY IMPROVEMENTS**

A number of improvements are required for the facility to have necessary treatment, seasonal effluent storage, and effluent disposal capacity to meet build-out requirements. At this time, it is unclear how effluent capacity and disposal capacity can be increased sufficiently to meet build-out capacity. No location can be identified with sufficient size required for the construction of additional effluent and land application of treated effluent.

It is anticipated that future effluent water quality requirements will remain similar to the current requirements described in *WDR Order R5-2013-0133* with the exception of a nitrate limitation of 10.0 mg/L. Future facility design should consider the need for denitrification.

### **6.1 PHASE 3 PROJECT IMPROVEMENTS**

A comprehensive list of improvements to the WWTF has been developed. The total number of improvements required to meet build-out capacity for the community exceeds District funding ability. Therefore, needed improvements have been prioritized with the urgent identified as part of the Phase 3 Improvement Project. Preliminary drawings are located in **Appendix A**.

#### **6.1.1 Headworks Improvements**

Modification to the existing headworks is required to meet the future peak pumping capacity of Huckleberry Lift Station. Screening facilities will have to be sufficient for a minimum flow of 1.80 MGD. The current headworks channel appears adequate in size. However, the existing HUBER Rotamat® screen is not adequate. A larger screen is required. Alternatively, a second parallel channel and screen must be added.

#### **6.1.2 Influent Splitter Box and Flow Meters**

The installation of a second Biolac® activated sludge secondary treatment system will require the addition of an influent splitter box and flow meters downstream of the facility. Tentative location for these additional items is shown on drawing C122.

#### **6.1.3 Second Aerated Activated Sludge Treatment System**

To provide adequate treatment of wastewater at build-out will require the construction of a second aerated activated sludge treatment system. The District has second a Parkson™ Biolac® system. Proposed location Biolac® basin is shown on drawings C122 and C122A. Preliminary design calculation from Parkson™ for basin design are located in **Appendix P** with supplemental calculations in **Appendix Q**.

#### **6.1.4 Secondary Clarifier and RAS/WAS Pump Station**

Provided funding is adequate, the District would like to utilize a circular clarifier design and independent RAS/WAS pump station for the proposed second Biolac® basin. Refer to drawing

C122A for preliminary location of the clarifier and RAS/WAS pump station. Calculations for proposed circular clarifier for basin are located in **Appendix Q**.

### **6.1.5 New Electrical Building and Control Systems**

Replacement of facility electrical and control systems will be required. Tentative site of proposed electrical building to house new equipment is shown on drawing C122.

### **6.1.6 Area Drain (Return) Pump Station and UESP Drain System**

Operations staff have identified the need to replace the UESP drain piping system to the Return Pump Station and make improvements to the pump station. The location of the Return Pump Station is shown drawing C121.

### **6.1.7 Capacity of Treated Effluent Pipeline to LESP**

The current size, diameter, of the effluent pipeline between the WWTF and LESP is inadequate and either a second parallel line installed to meet minimum flowrate at build-out or replaced.

## **6.2 NECESSARY FUTURE IMPROVEMENTS**

Future improvements, beyond those described in Section 6.1, will be required before the WWTF can provide service at community build-out. These improvements, excluding effluent storage and reuse, are shown on drawing C123 and include:

- Replacement of existing Biolac® integral clarifier system including RAS/WAS pump system is similar to the alternative clarifier design proposed for Phase 3.
- Replacement of the existing aeration equipment and conversion of the Biolac® basin system to allow denitrification.
- Secondary effluent flow equalization for operation of the tertiary filter system during low and high flow conditions
- Additional UV disinfection capacity equal to peak hourly flowrate at service area build-out.
- Additional seasonal tertiary effluent storage capacity.
- Addition recycled water reuse or other effluent disposal method.

Evaluation and design of the improvements above was not exhaustive. Further, it is not clear how the District will be able to provide sufficient treated effluent storage and water reuse needed at buildout. A step towards a solution is the increase of the LESP capacity and construction of sprayfields adjacent to the LESP shown on drawing C131. Additional analysis and design is required.

# **APPENDIX A**

**PHOTOGRAPHS AND  
PRELIMINARY DESIGN DRAWINGS**

APPENDIX A

LA CONTENTA WASTEWATER FACILITIES PHOTOGRAPHS



Photo: Existing Biolac® Basin and Clarifier



Photo: Tertiary Filters, Blower Bldg. and UV Disinfection System



Photo: UV Disinfection System Channel

APPENDIX A



Photo: Biosolids Dewatering Facilities



Photo: Biosolids Dewatering Filter Press



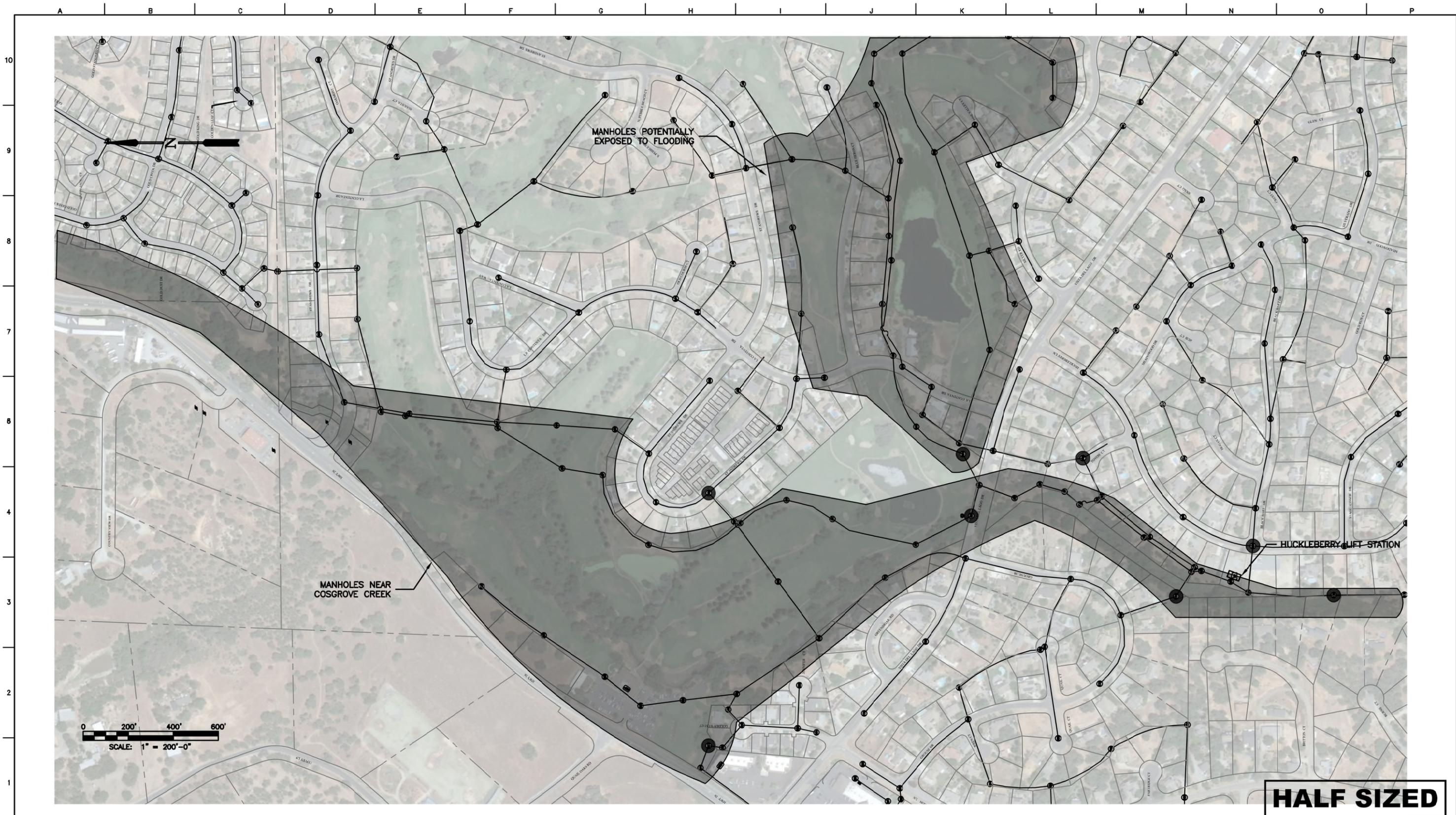
Photo: Upper Effluent Storage Pond (UESP)

APPENDIX A



Photo: Lower Effluent Storage Pond (LESP)

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**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
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PHONE: (209) 754-3543

**SANITARY SEWER GRAVITY COLLECTION SYSTEM  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C101
DRAWING NUMBER - OF -
SHEET NUMBER



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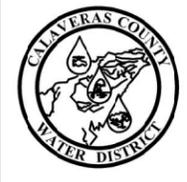
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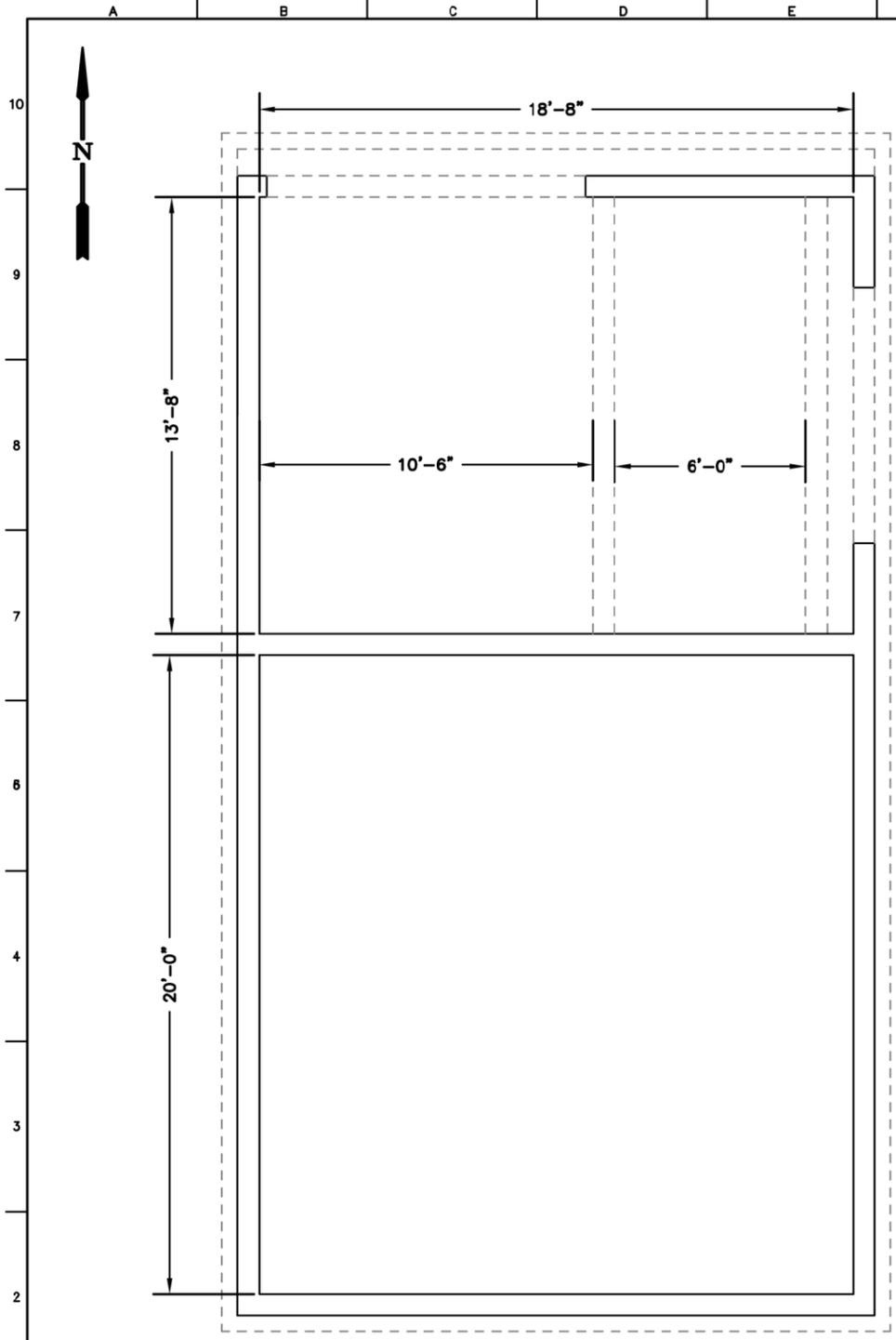
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

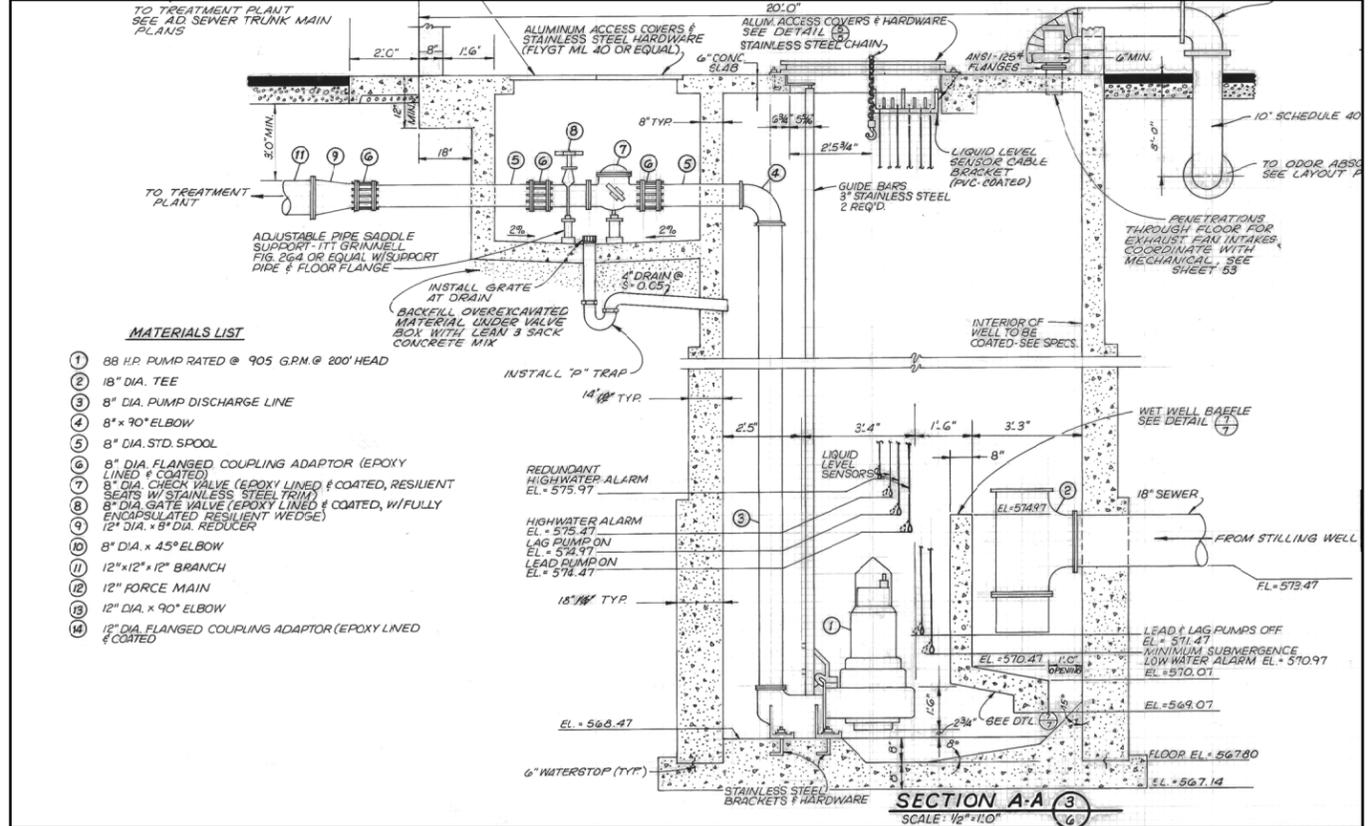
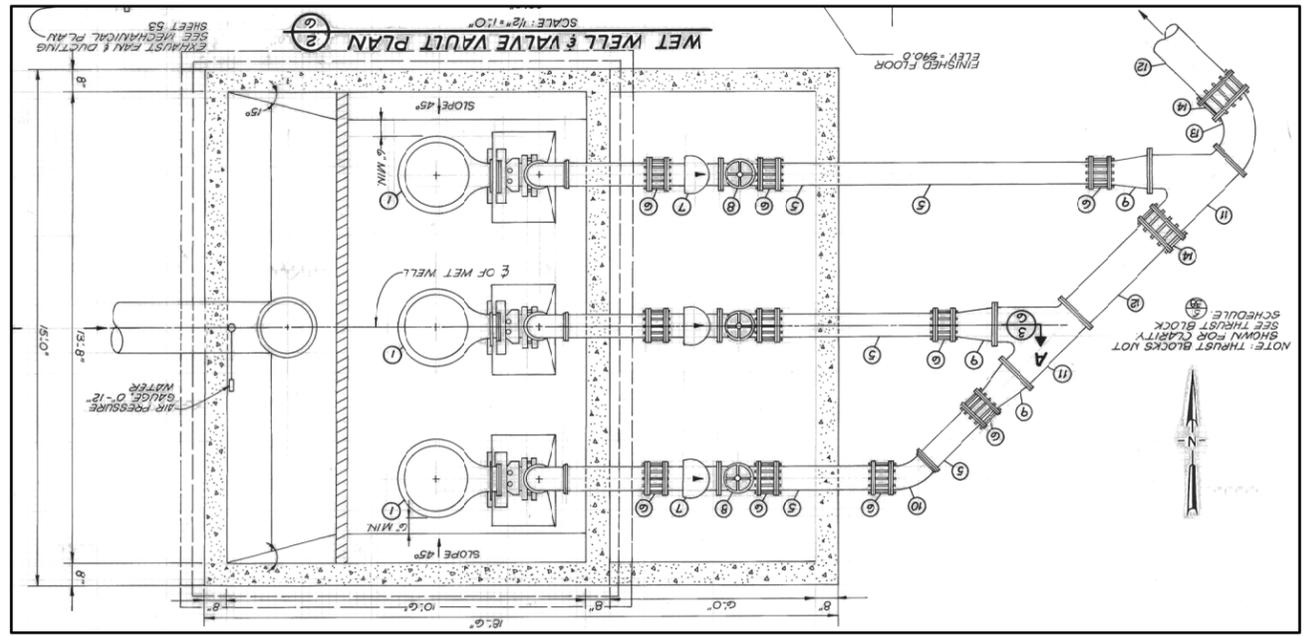
**HUCKLEBERRY LIFT STATION  
EXIST SITE PLAN  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C111
DRAWING NUMBER - OF -
SHEET NUMBER

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**HUCKLEBERRY LIFT STATION**  
SCALE: 3/8" = 1'-0"



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R. GODWIN				
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DATE:				
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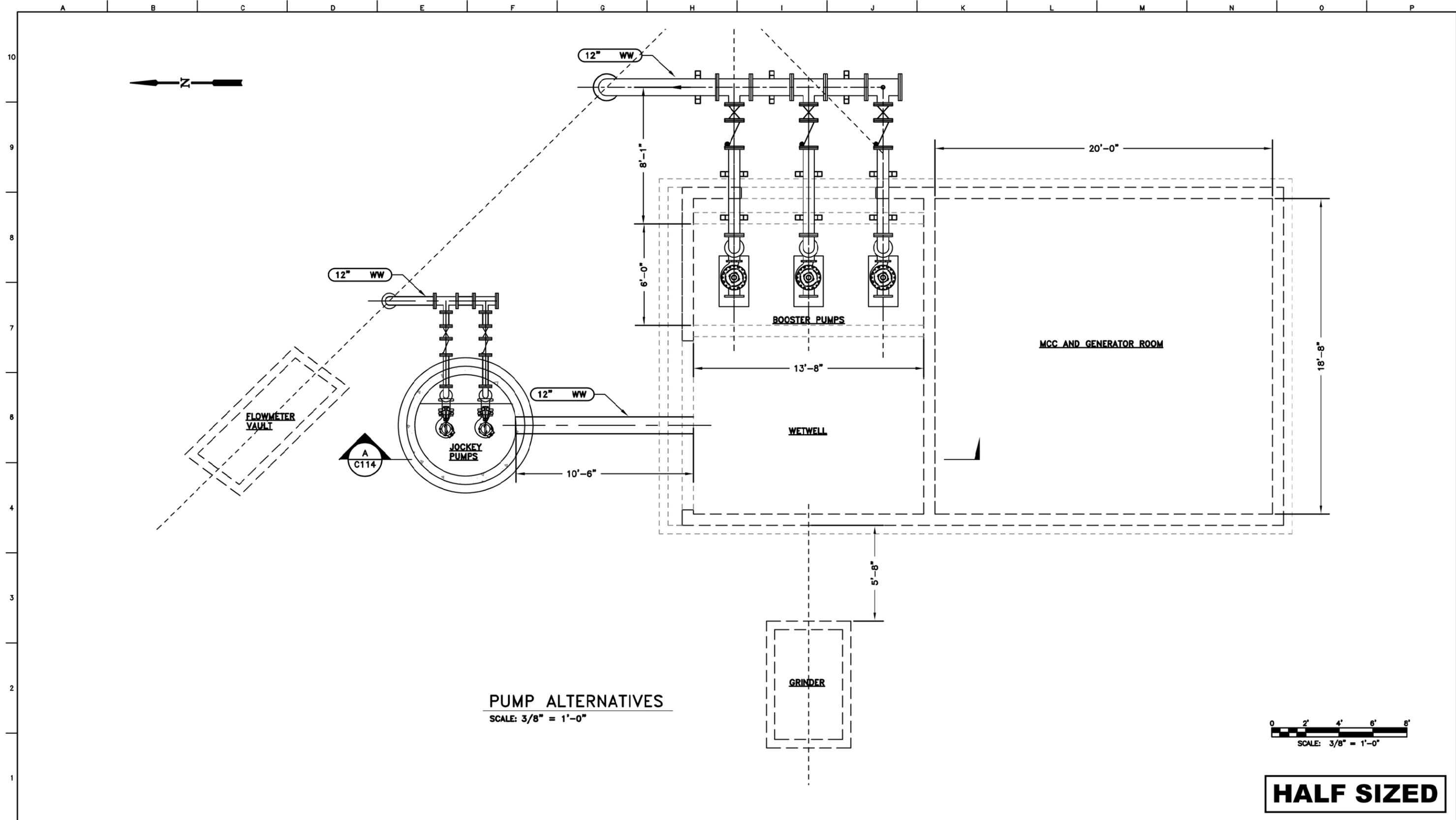
**CALAVERAS COUNTY WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANGELES, CALIFORNIA 95249  
PHONE: (209) 754-3543

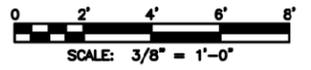
**HUCKLEBERRY LIFT STATION  
DETAILS AND SECTIONS  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C112
DRAWING NUMBER - OF -
SHEET NUMBER

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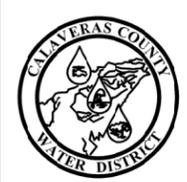


**PUMP ALTERNATIVES**  
SCALE: 3/8" = 1'-0"



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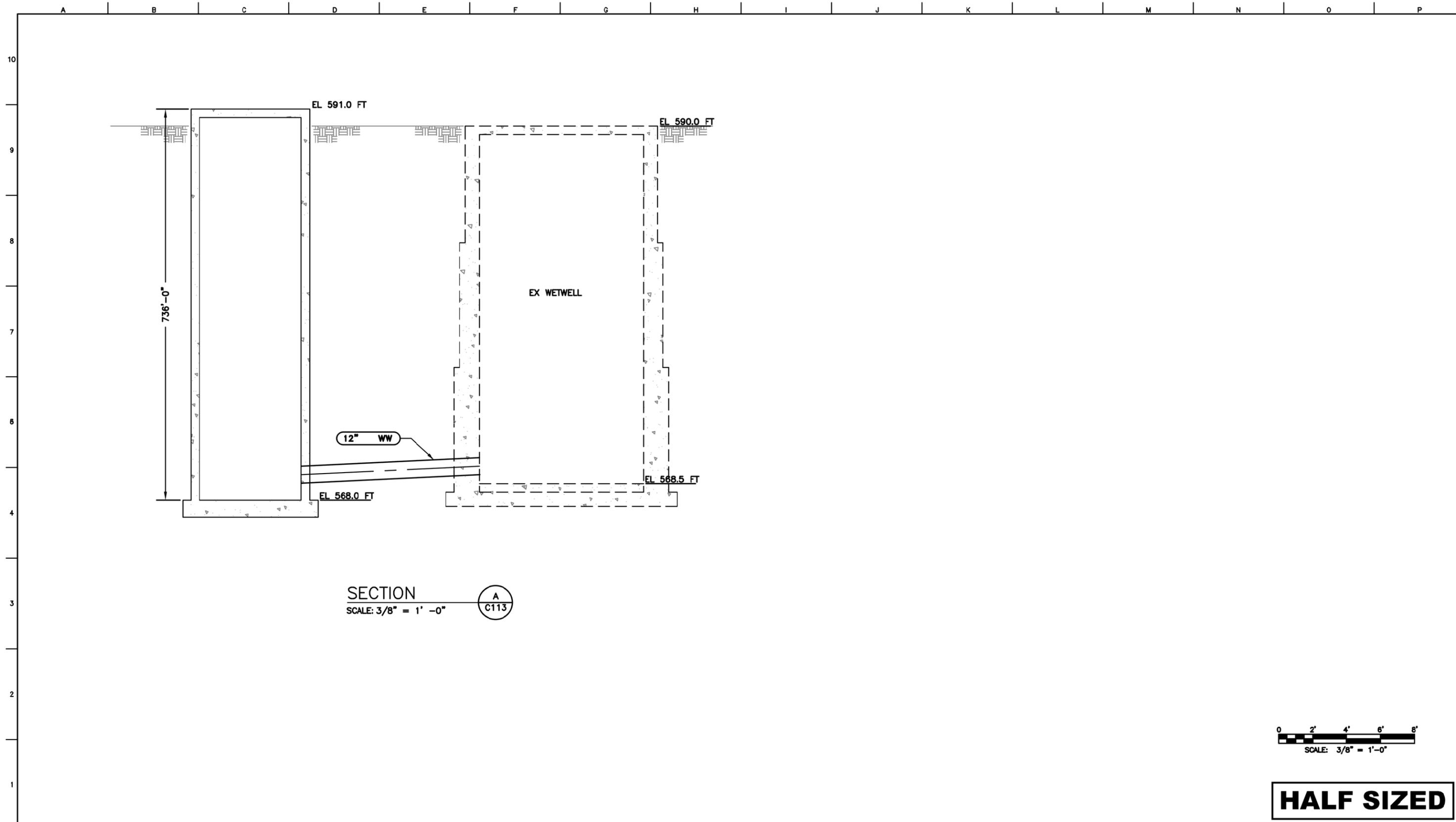
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**HUCKLEBERRY LIFT STATION  
JOCKEY PUMP AND BOOSTER PUMP ALTERNATIVES  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C113
DRAWING NUMBER - OF -
SHEET NUMBER

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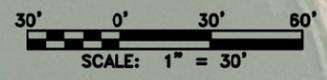
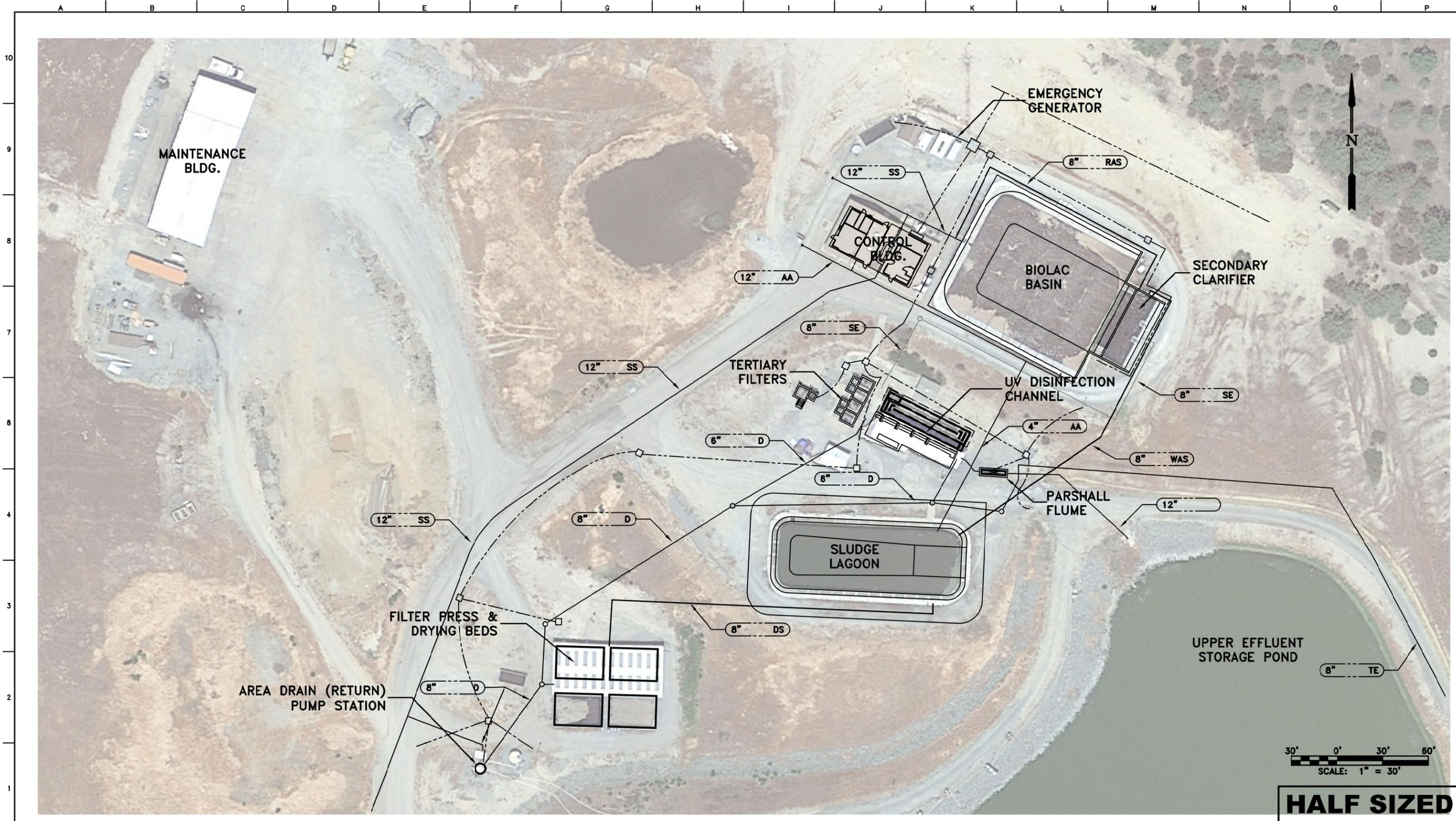
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**HUCKLEBERRY LIFT STATION  
BOOSTER PUMP ALTERNATIVE SECTIONS  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C114
DRAWING NUMBER - OF -
SHEET NUMBER

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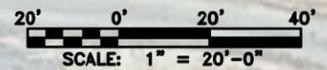
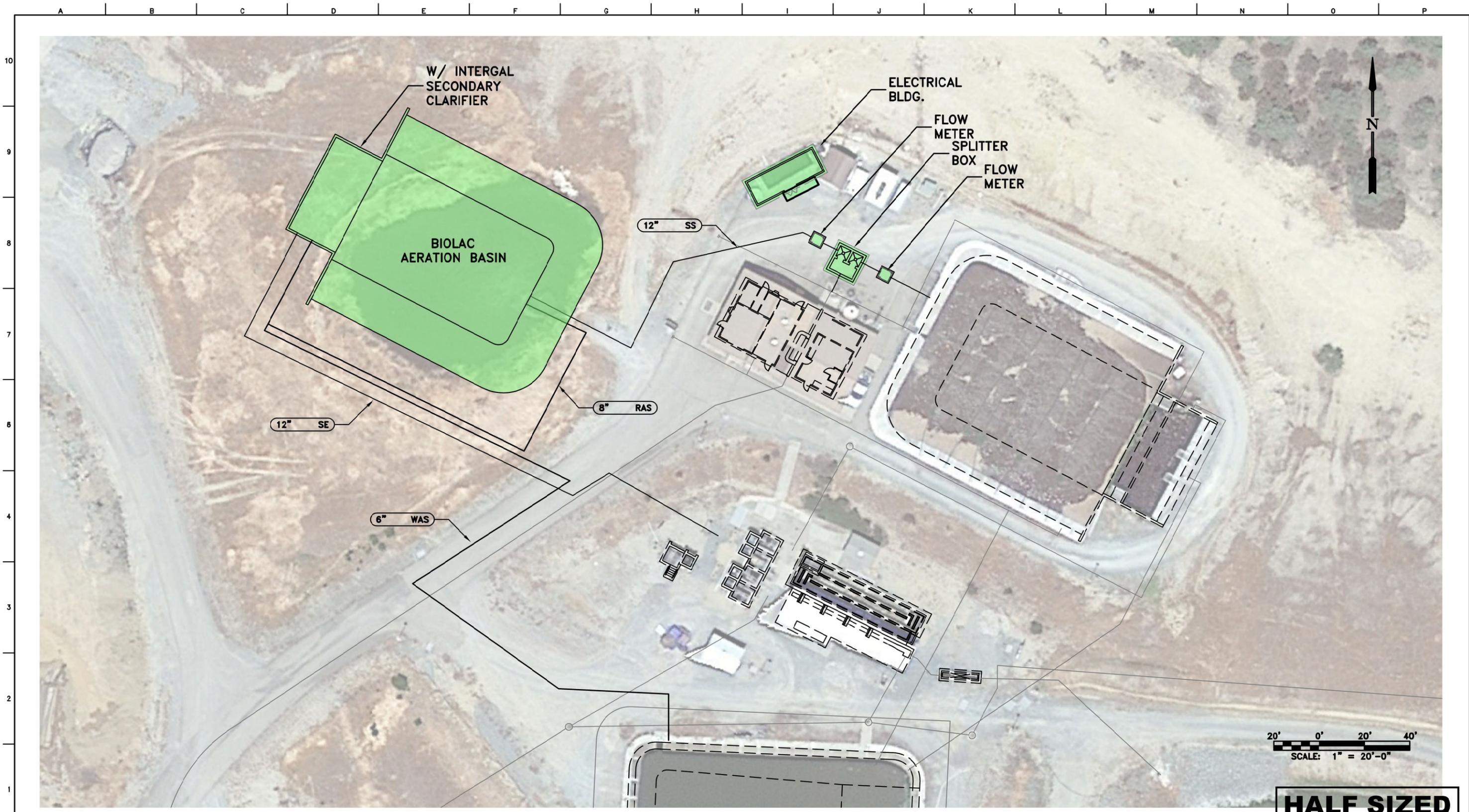
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**WASTEWATER TREATMENT FACILITY  
EXISTING SITE PLAN  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
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DRAWING NUMBER - OF -
SHEET NUMBER

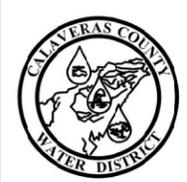
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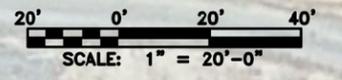
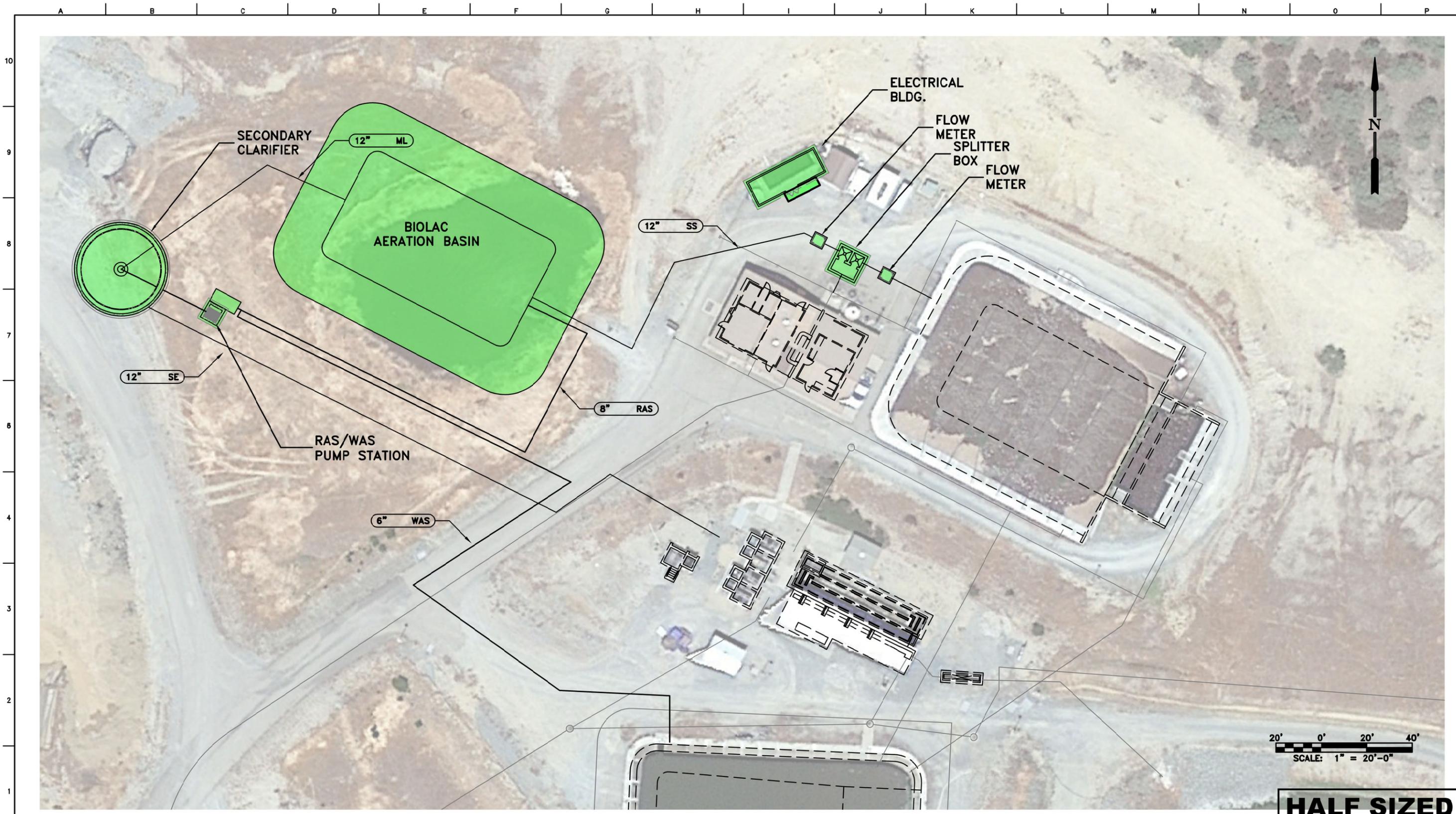


**CALAVERAS COUNTY  
 WATER DISTRICT**

120 TOMA COURT  
 POST OFFICE BOX 846  
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 PHONE: (209) 754-3543

**PHASE 3 IMPROVEMENTS SITE PLAN  
 PARKSON BIOLAC BASIN AND CLARIFIER  
 PHASE 3 IMPROVEMENT PROJECT  
 LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097  
 PROJECT NUMBER  
 C122  
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 - OF -  
 SHEET NUMBER



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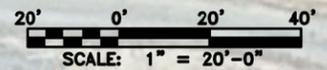
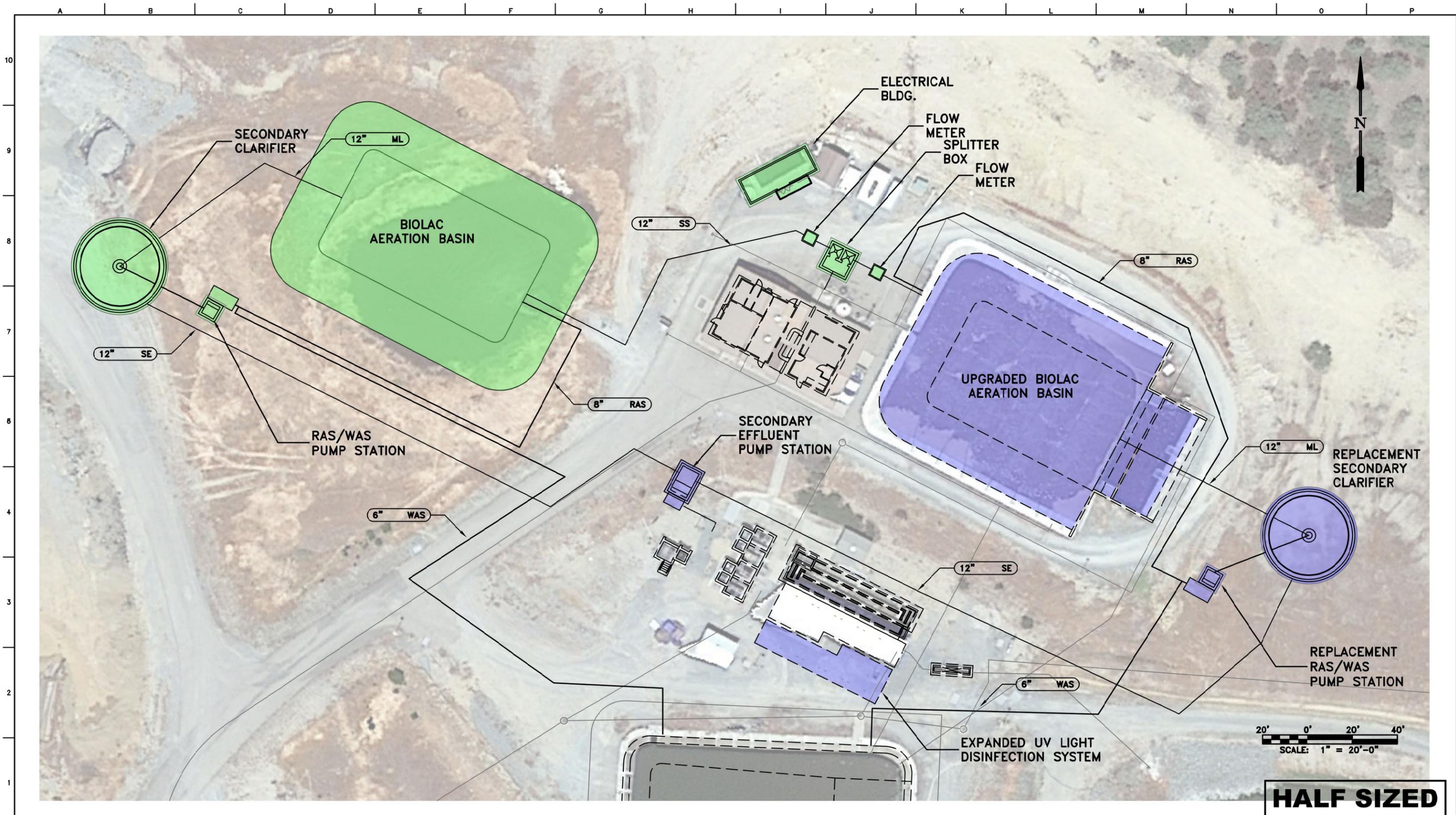
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
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**PHASE 3 IMPROVEMENTS  
ALTERNATIVE SITE PLAN  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C122A
DRAWING NUMBER - OF -
SHEET NUMBER

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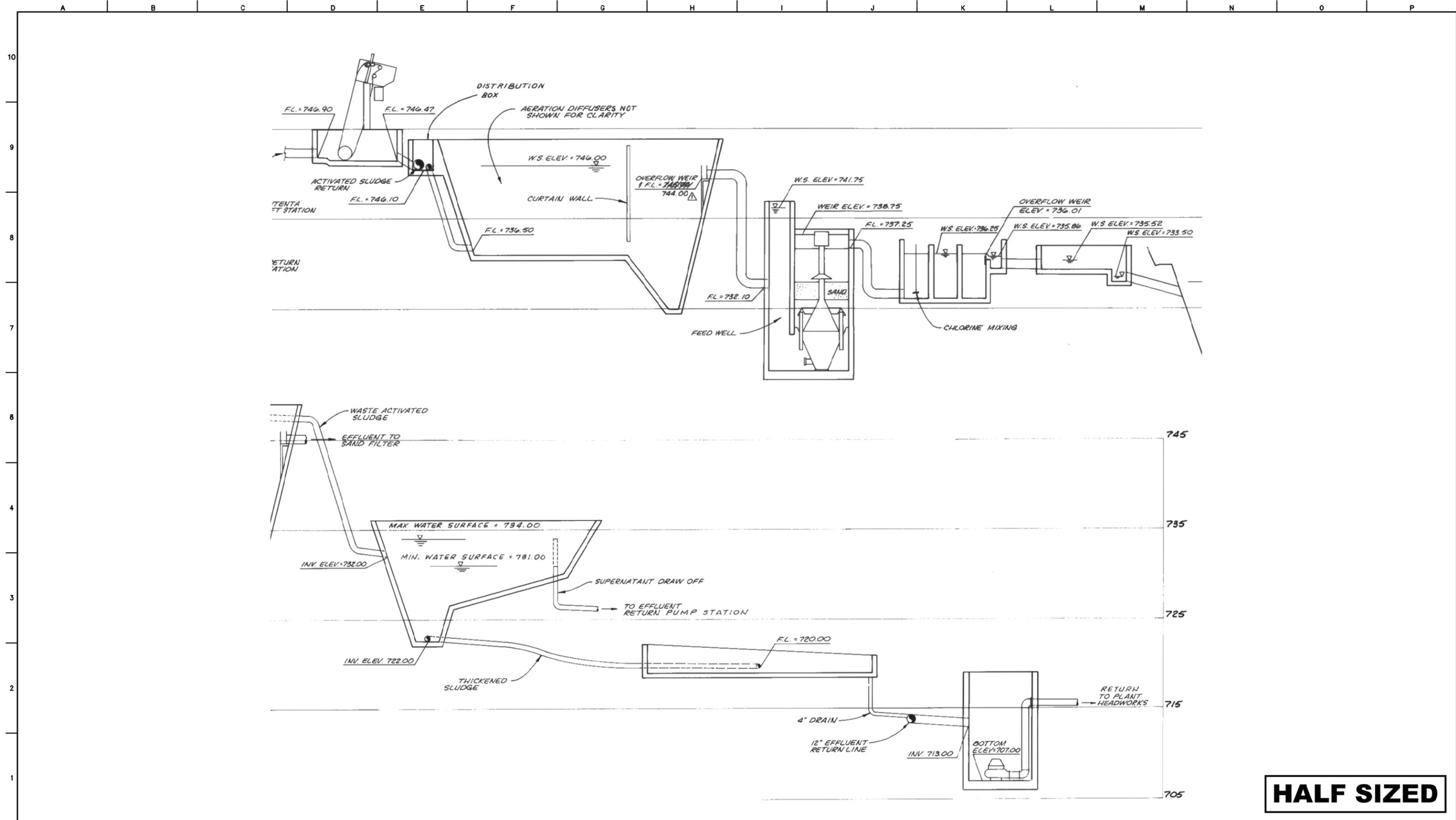
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**FACILITY AT BUILD-OUT SITE PLAN  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C123
DRAWING NUMBER - OF -
SHEET NUMBER

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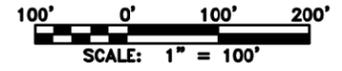
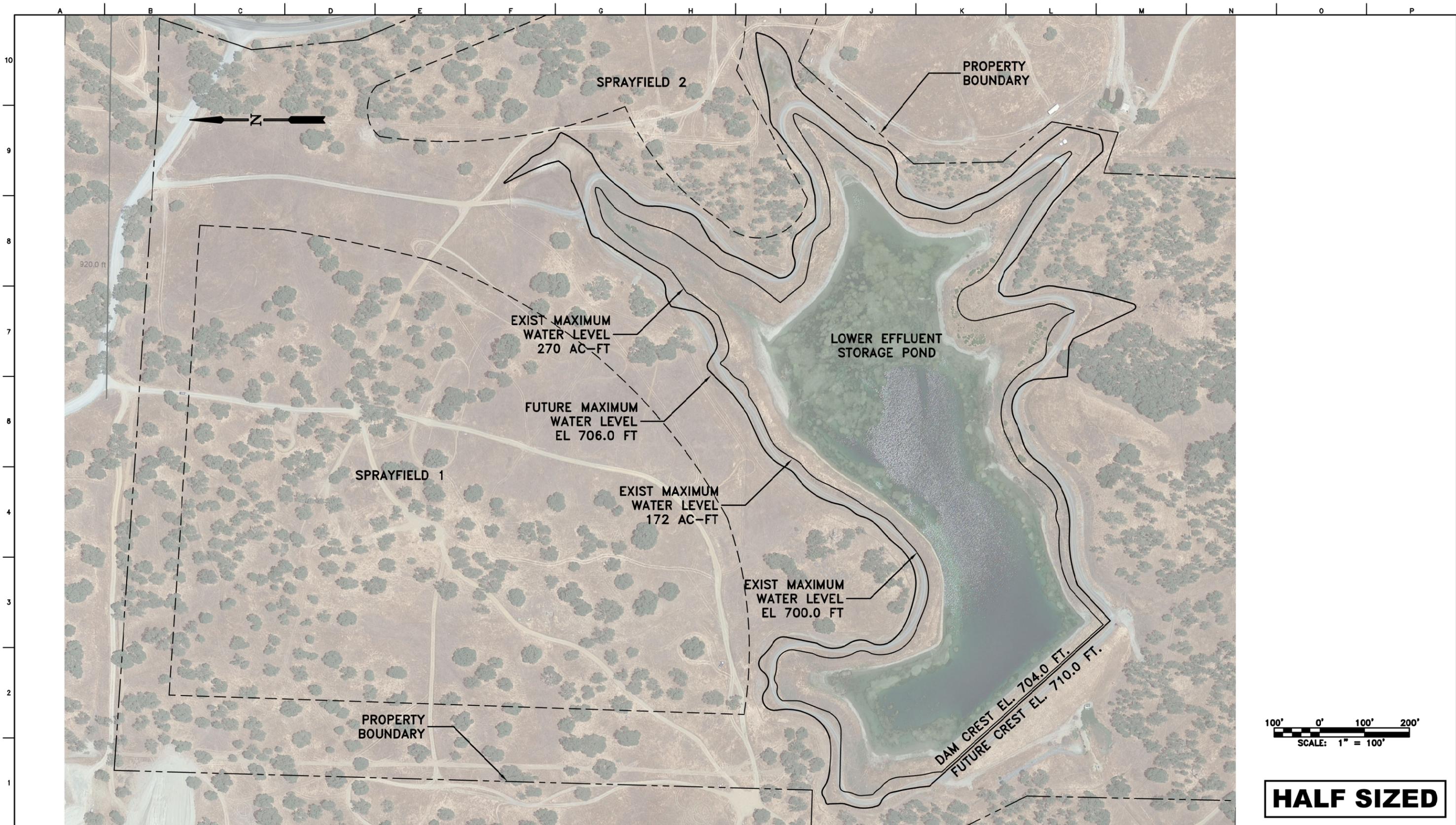
**CALAVERAS COUNTY  
 WATER DISTRICT**

120 TOMA COURT  
 POST OFFICE BOX 846  
 SAN ANDREAS, CALIFORNIA 95249  
 PHONE: (209) 754-3543

**WASTEWATER TREATMENT FACILITY  
 EXISTING HYDRAULIC PROFILE  
 PHASE 3 IMPROVEMENT PROJECT  
 LA CONTENTA WASTEWATER TREATMENT FACILITY**

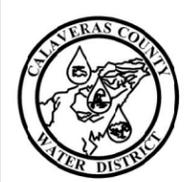
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DRAWING NUMBER - OF -
SHEET NUMBER

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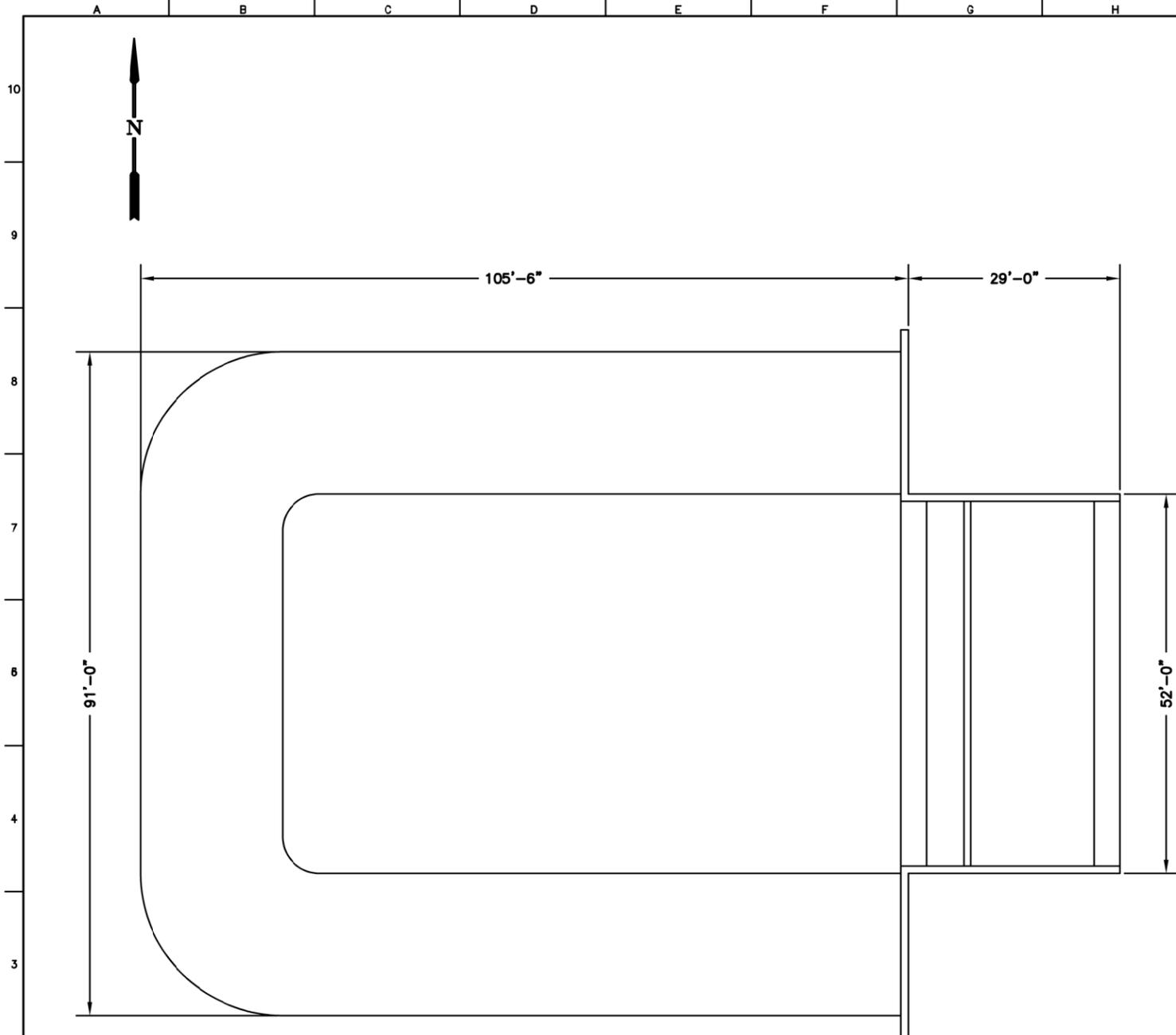
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANGELES, CALIFORNIA 95249  
PHONE: (209) 754-3543

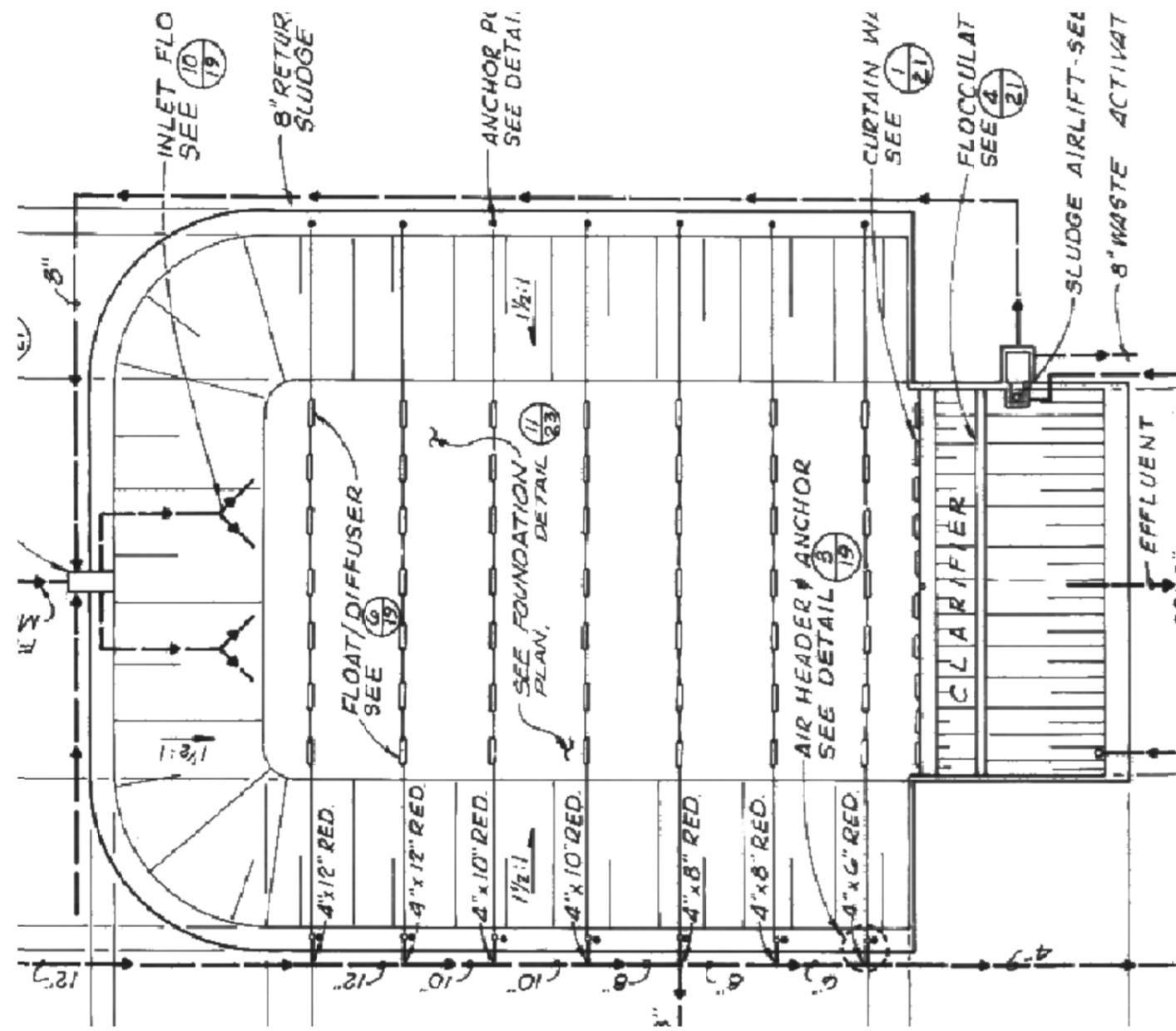
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PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

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DRAWING NUMBER - OF -
SHEET NUMBER

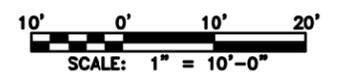
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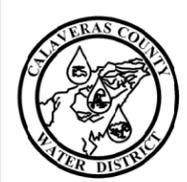


EXISTING BIOLAC BASIN  
SCALE: 1" = 10'-0"



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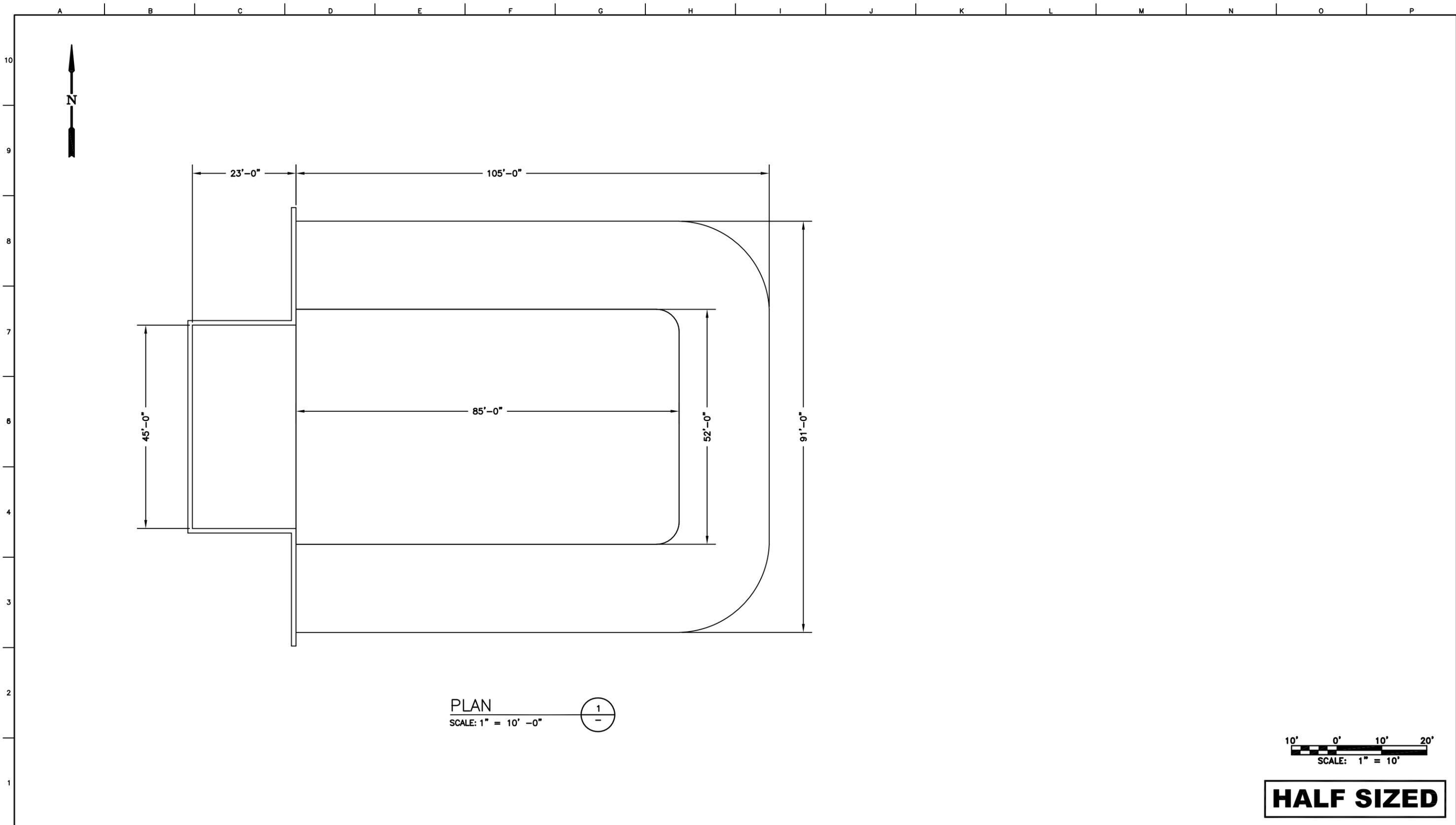
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**EXISTING BIOLAC BASIN PLAN  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

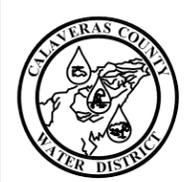
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PROJECT NUMBER C201
DRAWING NUMBER - OF -
SHEET NUMBER

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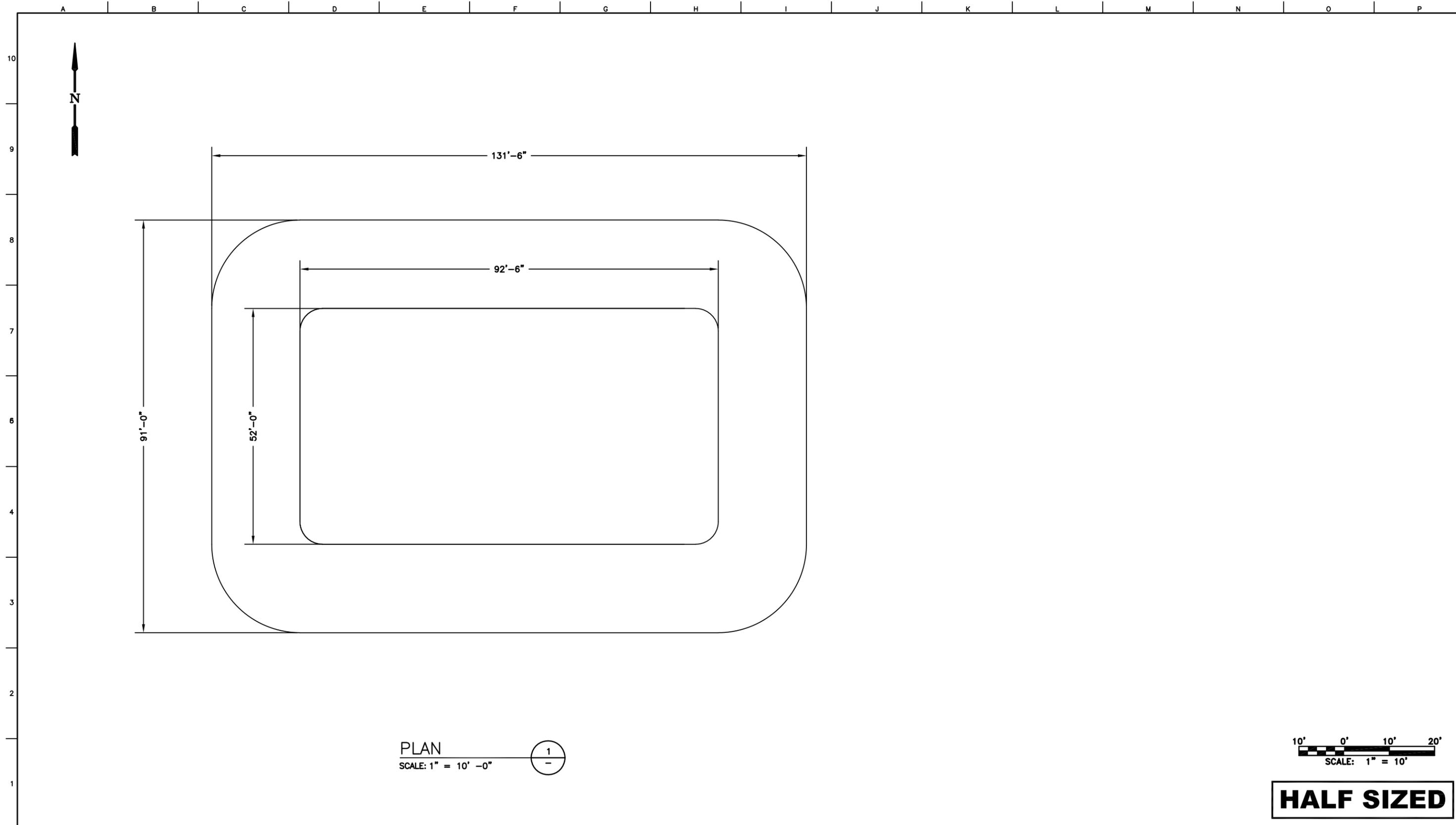
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**PARKSON BIOLAC BASIN AND CLARIFIER PLAN  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C202
DRAWING NUMBER - OF -
SHEET NUMBER

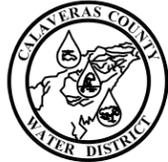
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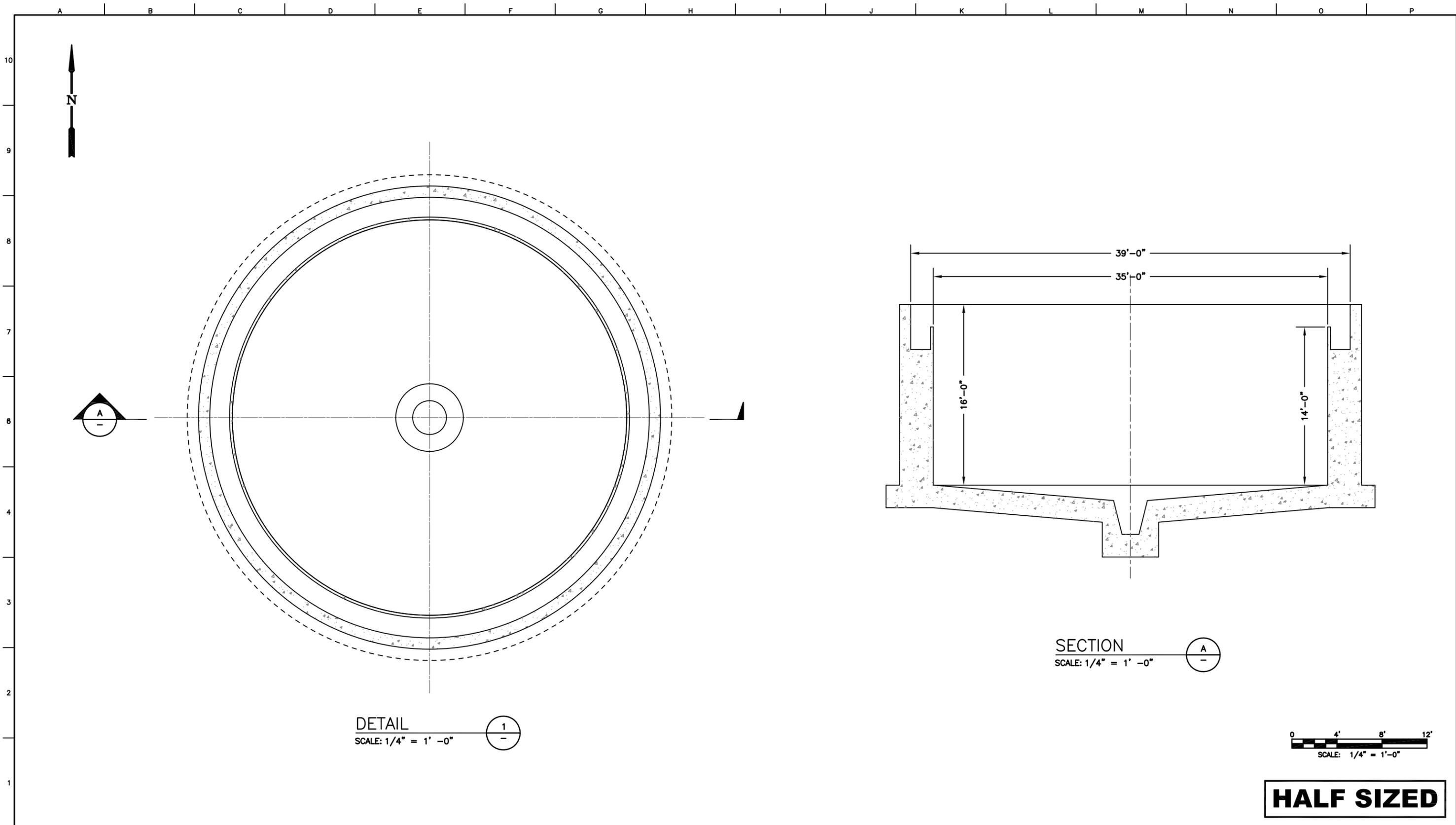
**CALAVERAS COUNTY  
 WATER DISTRICT**

120 TOMA COURT  
 POST OFFICE BOX 846  
 SAN ANDREAS, CALIFORNIA 95249  
 PHONE: (209) 754-3543

**BIOLAC BASIN ALTERNATIVE PLAN  
 PHASE 3 IMPROVEMENT PROJECT  
 LA CONTENTA WASTEWATER TREATMENT FACILITY**

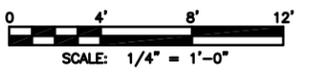
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DRAWING NUMBER - OF -
SHEET NUMBER

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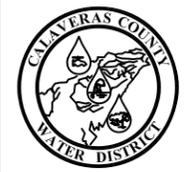
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SECTION  
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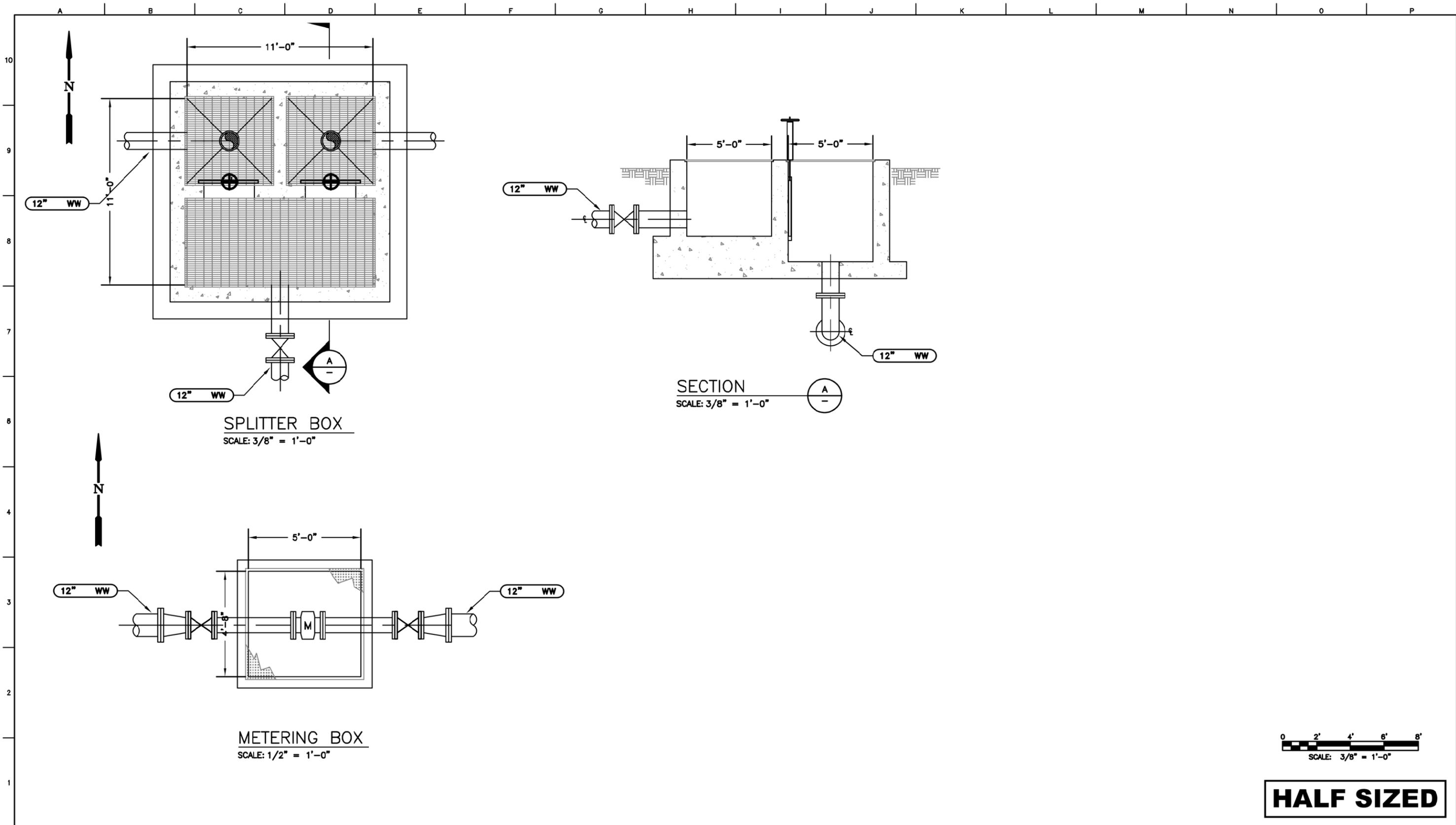
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**SECONDARY CLARIFIER  
DETAILS AND SECTION  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER
C211
DRAWING NUMBER
- OF -
SHEET NUMBER

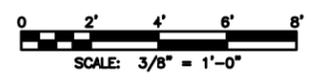
c:\Users\jacob.godwin\Documents\Calaveras County Project Files\LA\_CONTENTA\15097\MASTER\_COMPOSITE\MASTER\M151\_SPLITTER\_BOX\METER\_15097.DWG 11/24/23 3:44pm Bob Godwin



**SPLITTER BOX**  
SCALE: 3/8" = 1'-0"

**SECTION A-A**  
SCALE: 3/8" = 1'-0"

**METERING BOX**  
SCALE: 1/2" = 1'-0"



**HALF SIZED**

DESIGNED BY: <u>R. GODWIN</u>	REVISION:	DESCRIPTION:	DATE:	BY:
DRAFTED BY: <u>R. GODWIN</u>				
CHECKED BY:				
DATE: <u>11/22/23</u>				
SCALE: <u>AS INDICATED</u>				
BAR LENGTH ONE INCH ON SCALED DRAWING				



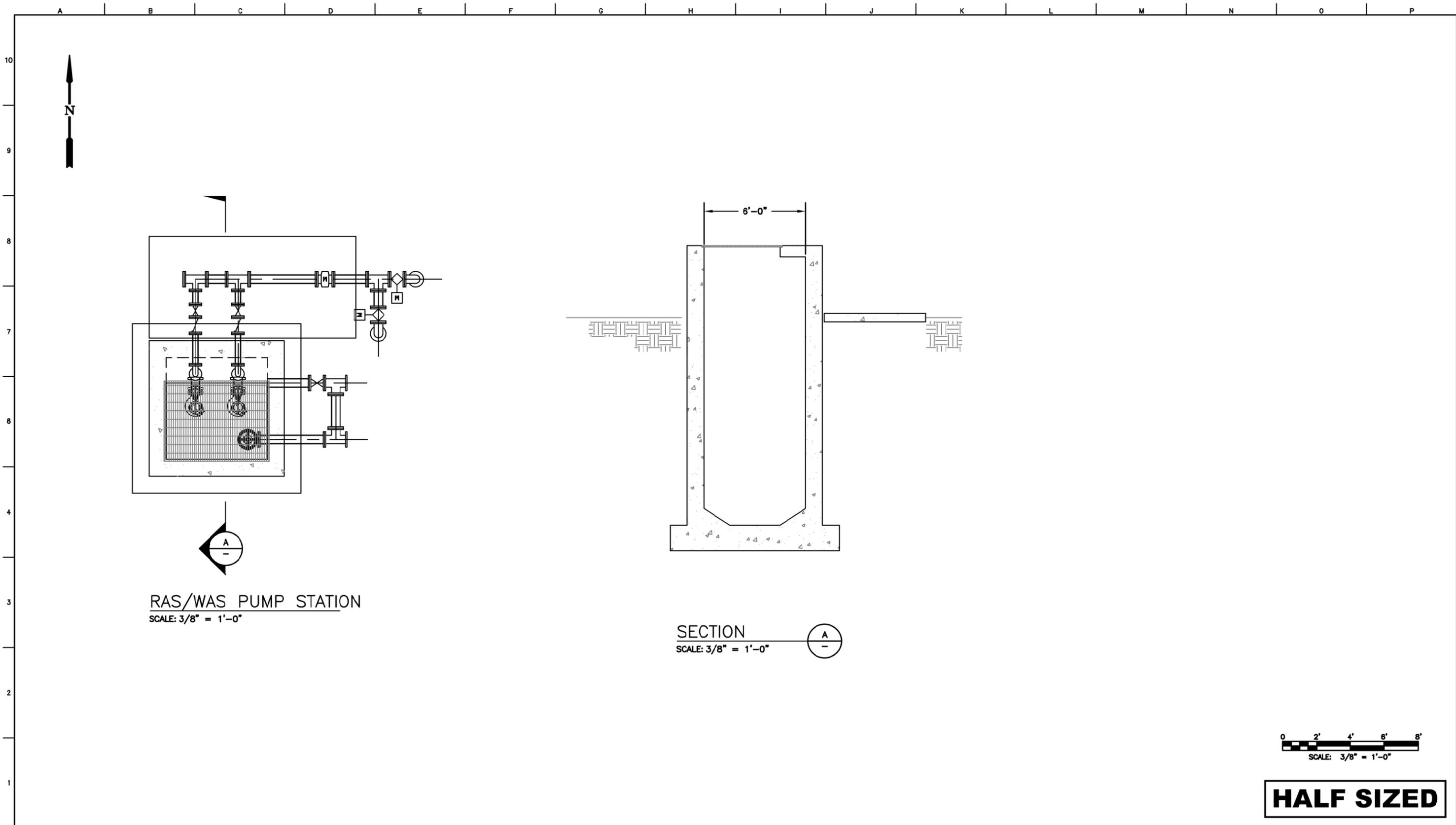
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**INFLUENT SPLITTER BOX AND METERING BOX  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

<b>15097</b>
PROJECT NUMBER <b>M151</b>
DRAWING NUMBER <b>- OF -</b>
SHEET NUMBER

c:\Users\Bob Godwin\Documents\Calaveras County Project Files\LA\_CONTENTA\15097\MASTER\_COMPOSITE\MASTER\M251\_RAS\_WAS\_PUMP\_STATION\_15097.DWG 11/24/23 3:47pm Bob Godwin



**RAS/WAS PUMP STATION**  
SCALE: 3/8" = 1'-0"

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

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

**HALF SIZED**

DESIGNED BY: <u>R. GODWIN</u>	REVISION:	DESCRIPTION:	DATE:	BY:
DRAFTED BY: <u>R. GODWIN</u>				
CHECKED BY:				
DATE: <u>11/22/23</u>				
SCALE: <u>AS INDICATED</u>				
BAR LENGTH ONE INCH ON SCALED DRAWING				



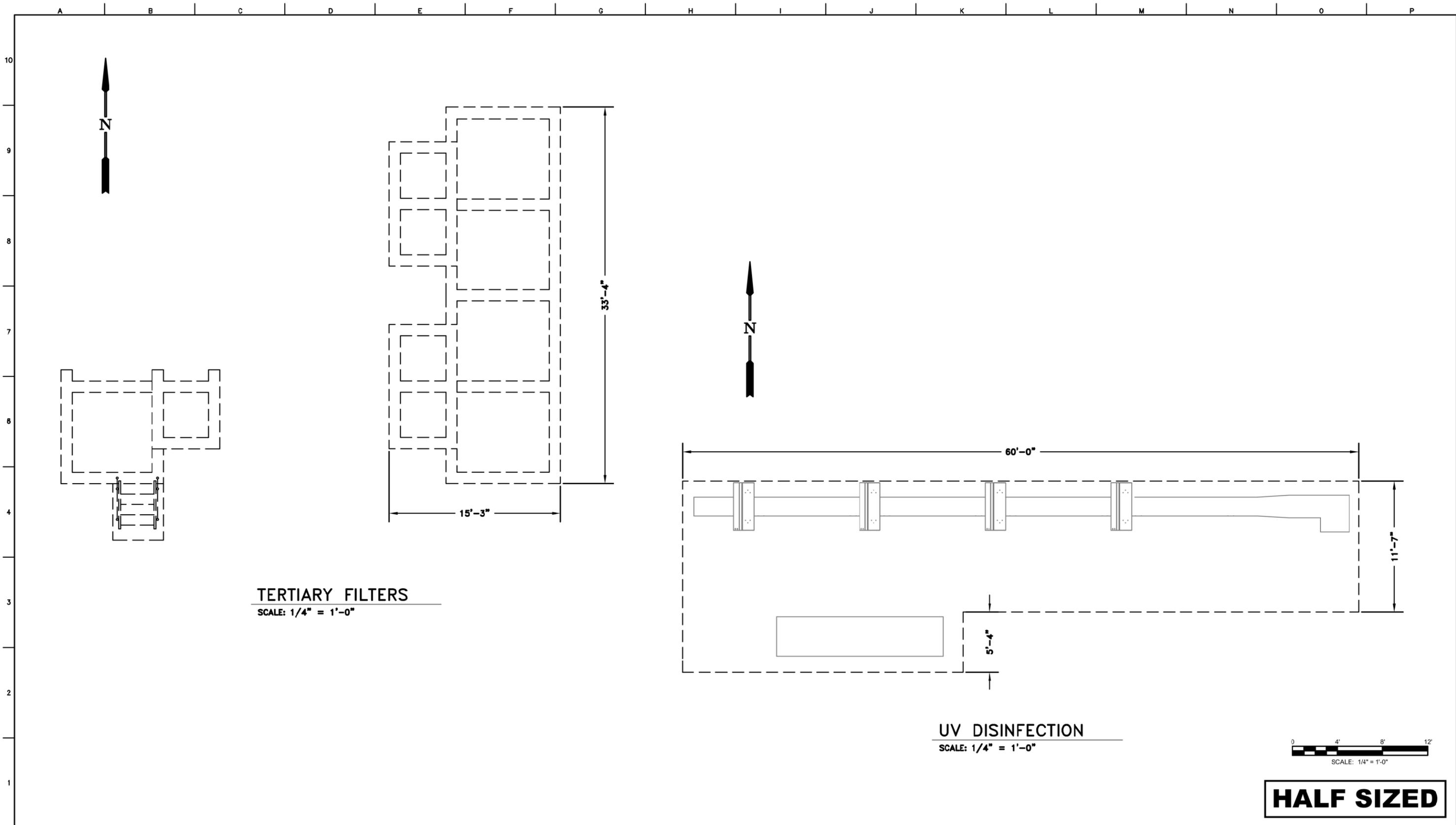
**CALAVERAS COUNTY  
WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**RAS/WAS PUMP STATION  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

<b>15097</b>
PROJECT NUMBER <b>M251</b>
DRAWING NUMBER <b>- OF -</b>
SHEET NUMBER

c:\Users\Bob Godwin\Documents\Calaveras County Project Files\LA\_Contenta\15097\15097\_MASTER\_COMPOSITE\MASTER\C301\_EXIST\_TERTIARY.dwg 2/9/24 8:08pm Bob Godwin

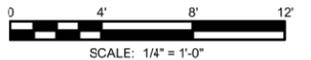


**TERTIARY FILTERS**

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

**UV DISINFECTION**

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



**HALF SIZED**

DESIGNED BY:	REVISION:	DESCRIPTION:	DATE:	BY:
R. GODWIN				
DRAFTED BY:				
R. GODWIN				
CHECKED BY:				
DATE:				
2/9/24				
SCALE:				
AS INDICATED				
BAR LENGTH ONE INCH ON SCALED DRAWING				



**CALAVERAS COUNTY WATER DISTRICT**

120 TOMA COURT  
POST OFFICE BOX 846  
SAN ANDREAS, CALIFORNIA 95249  
PHONE: (209) 754-3543

**EXISTING TERTIARY FILTERS AND UV DISINFECTION SYSTEM  
PHASE 3 IMPROVEMENT PROJECT  
LA CONTENTA WASTEWATER TREATMENT FACILITY**

15097
PROJECT NUMBER C301
DRAWING NUMBER - OF -
SHEET NUMBER

## **APPENDIX B**

EXISTING CUSTOMER SERVICES BY APN AND ADDRESS

APPENDIX B

APN	Street Number	Street Name	EDU
46016054	145	MANGILI RD	4.00
46016055	75	MANGILI RD	1.00
46016066	351	HWY 26	1.00
46016078	2	NOVE WAY	1.00
46016079	10	NOVE WAY	3.00
46036009	53	NOVE WAY	1.00
46036011	13	MAIN ST	1.00
46036012	25	MAIN ST	1.00
46036017	127	MAIN ST	1.00
46036018	139	MAIN ST	1.00
46036023	148	MAIN ST	1.00
46036026	94	MAIN ST	1.00
46036027	76	MAIN ST	1.00
46036028	42	MAIN ST	1.00
46036029	18	MAIN ST	1.00
46036044	65	MAIN ST	1.00
46036045	53	MAIN ST	1.00
46036047	44	JEAN ST - STE #1	1.00
46036047	44	JEAN ST - STE #2	1.00
46036047	44	JEAN ST - STE #3	1.00
46036048	44	JEAN ST - STE #4	1.00
46036048	44	JEAN ST - STE #5	1.00
46036051	161	HWY 26	1.20
46036052	50	JEAN ST	2.65
46036056	177	HWY 26	6.50
46036059	10	MAIN ST	1.00
46036060	105	MAIN ST	1.00
46036061	31	NOVE WAY	1.00
46036062	7	NOVE WAY	2.50
72010001	3531	ANTONOVICH RD	1.00
72010002	3521	ANTONOVICH RD	1.00
72010003	3497	ANTONOVICH RD	1.00
72010004	3489	ANTONOVICH RD	1.00
72010006	3455	ANTONOVICH RD	1.00
72010007	3474	ANTONOVICH RD	1.00
72010008	3484	PRISCILLA CT	1.00
72010009	3498	PRISCILLA CT	1.00
72010010	3500	PRISCILLA CT	1.00
72010011	3499	PRISCILLA CT	1.00
72010012	3481	PRISCILLA CT	1.00
72011001	3547	ANTONOVICH RD	1.00
72011002	3565	ANTONOVICH RD	1.00
72011003	3778	HUCKLEBERRY LN	1.00
72011004	3611	ANTONOVICH RD	1.00

APPENDIX B

APN	Street Number	Street Name	EDU
72011005	3627	ANTONOVICH RD	1.00
72011006	3649	ANTONOVICH RD	1.00
72011023	3538	ANTONOVICH RD	1.00
72013006	3526	ANTONOVICH RD	1.00
73042090	1653	HWY 26	4.49
73042091	1653	HWY 26	1.00
73042091	795	LA CONTENTA DR	1.00
73042091	0	ST ANDREWS DR	1.90
73042102	667	SPYGLASS RD	1.00
73042103	669	SPYGLASS RD	1.00
73042111	30	VISTA DEL LAGO WEST DR	1.00
73042114	10	VISTA DEL LAGO WEST DR A	1.90
73042114	10	VISTA DEL LAGO WEST DR B	1.00
73044015	1390	COUNTRY VIEW DR	1.00
73044016	1323	COUNTRY VIEW DR	1.00
73044016	1323	COUNTRY VIEW DR	3.00
73045001	2909	ROBIN RD	1.00
73045002	2917	ROBIN RD	1.00
73045003	2925	ROBIN RD	1.00
73045004	2908	ROBIN RD	1.00
73045005	2916	ROBIN RD	1.00
73045006	1052	MOCKINGBIRD HILL LN	1.00
73045007	1058	MOCKINGBIRD HILL LN	1.00
73045008	8	PELICAN PL	1.00
73045009	16	PELICAN PL	1.00
73045010	24	PELICAN PL	1.00
73045011	32	PELICAN PL	1.00
73045012	34	PELICAN PL	1.00
73045013	35	PELICAN PL	1.00
73045014	33	PELICAN PL	1.00
73045015	29	PELICAN PL	1.00
73045016	19	PELICAN PL	1.00
73045017	17	PELICAN PL	1.00
73045018	15	PELICAN PL	1.00
73045019	13	PELICAN PL	1.00
73045020	11	PELICAN PL	1.00
73045021	1072	MOCKINGBIRD HILL LN	1.00
73045022	1082	MOCKINGBIRD HILL LN	1.00
73045023	1094	MOCKINGBIRD HILL LN	1.00
73045024	1110	MOCKINGBIRD HILL LN	1.00
73045025	1114	MOCKINGBIRD HILL LN	1.00
73045026	1122	MOCKINGBIRD HILL LN	1.00
73045027	1125	MOCKINGBIRD HILL LN	1.00
73045028	1119	MOCKINGBIRD HILL LN	1.00

APPENDIX B

APN	Street Number	Street Name	EDU
73045029	1107	MOCKINGBIRD HILL LN	1.00
73045030	1103	MOCKINGBIRD HILL LN	1.00
73045031	1097	MOCKINGBIRD HILL LN	1.00
73045032	1089	MOCKINGBIRD HILL LN	1.00
73045033	1085	MOCKINGBIRD HILL LN	1.00
73045034	1077	MOCKINGBIRD HILL LN	1.00
73045035	1069	MOCKINGBIRD HILL LN	1.00
73045036	1061	MOCKINGBIRD HILL LN	1.00
73045037	1053	MOCKINGBIRD HILL LN	1.00
73045038	1049	MOCKINGBIRD HILL LN	1.00
73045039	1045	MOCKINGBIRD HILL LN	1.00
73046001	20	PARAKEET CT	1.00
73046002	16	PARAKEET CT	1.00
73046003	8	PARAKEET CT	1.00
73046004	1020	MOCKINGBIRD HILL LN	1.00
73046005	1016	MOCKINGBIRD HILL LN	1.00
73046006	1009	MOCKINGBIRD HILL LN	1.00
73046007	1004	MOCKINGBIRD HILL LN	1.00
73046008	17	PARAKEET CT	1.00
73046009	1040	MOCKINGBIRD HILL LN	1.00
73046010	11	PARAKEET CT	1.00
73046011	1035	MOCKINGBIRD HILL LN	1.00
73046012	1033	MOCKINGBIRD HILL LN	1.00
73046013	1029	MOCKINGBIRD HILL LN	1.00
73046014	1021	MOCKINGBIRD HILL LN	1.00
73046015	1011	MOCKINGBIRD HILL LN	1.00
73046016	1005	MOCKINGBIRD HILL LN	1.00
73046018	16	WOODPECKER CT	1.00
73046019	24	WOODPECKER CT	1.00
73046020	32	WOODPECKER CT	1.00
73046021	1128	PARADISE PEAK RD	1.00
73046022	1124	PARADISE PEAK RD	1.00
73046030	1088	PARADISE PEAK RD	1.00
73046031	1084	PARADISE PEAK RD	1.00
73046032	1076	PARADISE PEAK RD	1.00
73046036	1011	PARADISE PEAK RD	12.00
73046039	1085	PARADISE PEAK RD	1.00
73046040	1089	PARADISE PEAK RD	1.00
73046041	1091	PARADISE PEAK RD	1.00
73046043	1099	PARADISE PEAK RD	1.00
73046044	1103	PARADISE PEAK RD	1.00
73046045	1105	PARADISE PEAK RD	1.00
73046046	1111	PARADISE PEAK RD	1.00
73047001	51	WELLNESS WAY	9.50

APPENDIX B

APN	Street Number	Street Name	EDU
73047002	313	VISTA DEL LAGO WEST	1.56
73048004	2271	LAKE VIEW CIR	1.00
73048005	2247	LAKE VIEW CIR	1.00
73048006	2221	LAKE VIEW CIR	1.00
73048007	2203	LAKE VIEW CIR	1.00
73048008	2202	LAKE VIEW CIR	1.00
73048009	2220	LAKE VIEW CIR	1.00
73048010	2246	LAKE VIEW CIR	1.00
73048011	2270	LAKE VIEW CT	1.00
73048014	2355	LAKE VIEW CIR	1.00
73048015	2299	LAKE VIEW CIR	1.00
73048016	2323	LAKE VIEW CIR	1.00
73051001	127	GOLD NUGGET DR	1.00
73051002	135	GOLD NUGGET DR	1.00
73051003	141	GOLD NUGGET DR	1.00
73051004	149	GOLD NUGGET DR	1.00
73051005	157	GOLD NUGGET DR	1.00
73051006	163	GOLD NUGGET DR	1.00
73051007	169	GOLD NUGGET DR	1.00
73051008	125	NORTH BRANCH CT	1.00
73051009	133	NORTH BRANCH CT	1.00
73051010	141	NORTH BRANCH CT	1.00
73051011	117	NORTH BRANCH CT	1.00
73051012	149	NORTH BRANCH CT	1.00
73051013	157	NORTH BRANCH CT	1.00
73051014	165	NORTH BRANCH CT	1.00
73051015	173	NORTH BRANCH CT	1.00
73051016	181	NORTH BRANCH CT	1.00
73051018	176	NORTH BRANCH CT	1.00
73051019	160	NORTH BRANCH CT	1.00
73051020	111	LAST CHANCE CT	1.00
73051021	115	LAST CHANCE CT	1.00
73051022	127	LAST CHANCE CT	1.00
73051023	128	LAST CHANCE CT	1.00
73051024	122	LAST CHANCE CT	1.00
73051025	120	LAST CHANCE CT	1.00
73051026	185	GOLD NUGGET DR	1.00
73051027	191	GOLD NUGGET DR	1.00
73051028	199	GOLD NUGGET DR	1.00
73051029	205	GOLD NUGGET DR	1.00
73051030	103	GOLD KING DR	1.00
73051031	111	GOLD KING DR	1.00
73051032	119	GOLD KING DR	1.00
73051033	127	GOLD KING DR	1.00

APPENDIX B

APN	Street Number	Street Name	EDU
73051034	135	GOLD KING DR	1.00
73051035	130	GOLD KING DR	1.00
73051037	124	GOLD KING DR	1.00
73051038	118	GOLD KING DR	1.00
73051039	112	GOLD KING DR	1.00
73051040	104	GOLD KING DR	1.00
73051041	162	GOLD NUGGET DR	1.00
73051042	152	GOLD NUGGET DR	1.00
73051043	144	GOLD NUGGET DR	1.00
73051044	138	GOLD NUGGET DR	1.00
73051045	130	GOLD NUGGET DR	1.00
73052001	104	GOLD DUST DR	1.00
73052002	200	GOLD CREEK DR	1.00
73052003	194	GOLD CREEK DR	1.00
73052004	186	GOLD CREEK DR	1.00
73052005	178	GOLD CREEK DR	1.00
73052006	172	GOLD CREEK DR	1.00
73052007	164	GOLD CREEK DR	1.00
73052008	156	GOLD CREEK DR	1.00
73052009	150	GOLD CREEK DR	1.00
73052010	107	GOLD NUGGET DR	1.00
73052011	115	GOLD NUGGET DR	1.00
73052012	121	GOLD NUGGET DR	1.00
73052013	116	GOLD NUGGET DR	1.25
73052019	175	GOLD CREEK DR	1.00
73052020	179	GOLD CREEK DR	1.00
73052021	189	GOLD CREEK DR	1.00
73052022	201	GOLD CREEK DR	1.00
73052023	209	GOLD CREEK DR	1.00
73052024	217	GOLD CREEK DR	1.00
73052025	206	GOLD KING DR	1.00
73052026	200	GOLD KING DR	1.00
73052027	105	HAPPY JACK CT	1.00
73052028	111	HAPPY JACK CT	1.00
73052029	121	HAPPY JACK CT	1.00
73052030	120	HAPPY JACK CT	1.00
73052031	112	HAPPY JACK CT	1.00
73052032	106	HAPPY JACK CT	1.00
73052033	162	GOLD KING DR	1.00
73052034	154	GOLD KING DR	1.00
73052035	146	GOLD KING DR	1.00
73052036	138	GOLD KING DR	1.00
73052038	143	GOLD KING DR	1.00
73052039	151	GOLD KING DR	1.00

## APPENDIX B

APN	Street Number	Street Name	EDU
73052040	159	GOLD KING DR	1.00
73052041	167	GOLD KING DR	1.00
73052042	175	GOLD KING DR	1.00
73052043	183	GOLD KING DR	1.00
73052044	191	GOLD KING DR	1.00
73052045	199	GOLD KING DR	1.00
73052046	207	GOLD KING DR	1.00
73053001	196	GOLD DUST CT	1.00
73053002	188	GOLD DUST CT	1.00
73053003	180	GOLD DUST CT	1.00
73053004	172	GOLD DUST DR	1.00
73053005	164	GOLD DUST DR	1.00
73053006	158	GOLD DUST DR	1.00
73053007	150	GOLD DUST DR	1.00
73053008	142	GOLD DUST DR	1.00
73053009	134	GOLD DUST DR	1.00
73053010	128	GOLD DUST DR	1.00
73053011	120	GOLD DUST DR	1.00
73053012	112	GOLD DUST DR	1.00
73053013	109	GOLD DUST DR	1.00
73053014	212	GOLD CREEK DR	1.00
73053015	127	GOLD DUST DR	1.00
73053016	135	GOLD DUST DR	1.00
73053017	141	GOLD DUST DR	1.00
73053018	147	GOLD DUST DR	1.00
73053019	153	GOLD DUST DR	1.00
73053020	159	GOLD DUST	1.00
73053021	280	GOLD KING DR	1.00
73053022	272	GOLD KING DR	1.00
73053023	260	GOLD KING DR	1.00
73053024	254	GOLD KING DR	1.00
73053025	246	GOLD KING DR	1.00
73053026	240	GOLD KING DR	1.00
73053027	236	GOLD KING DR	1.00
73053028	218	GOLD CREEK DR	1.00
73053029	224	GOLD KING DR	1.00
73053030	227	GOLD KING DR	1.00
73053031	233	GOLD KING DR	1.00
73053032	241	GOLD KING DR	1.00
73053033	249	GOLD KING DR	1.00
73053034	257	GOLD KING DR	1.00
73053035	263	GOLD KING DR	1.00
73053036	267	GOLD KING DR	1.00
73053037	271	GOLD KING DR	1.00

## APPENDIX B

APN	Street Number	Street Name	EDU
73053038	275	GOLD KING DR	1.00
73053039	279	GOLD KING DR	1.00
73053040	283	GOLD KING DR	1.00
73053041	289	GOLD KING DR	1.00
73053042	295	GOLD KING DR	1.00
73053043	179	GOLD DUST DR	1.00
73053044	187	GOLD DUST CT	1.00
73054001	275	GOLD CREEK DR	1.00
73054002	281	GOLD CREEK DR	1.00
73054003	287	GOLD CREEK DR	1.00
73054004	293	GOLD CREEK DR	1.00
73054005	299	GOLD CREEK DR	1.00
73054006	305	GOLD CREEK DR	1.00
73054007	311	GOLD CREEK DR	1.00
73054008	317	GOLD CREEK DR	1.00
73054009	323	GOLD CREEK DR	1.00
73054010	329	GOLD CREEK DR	1.00
73054011	335	GOLD CREEK DR	1.00
73054012	341	GOLD CREEK DR	1.00
73054013	347	GOLD CREEK DR	1.00
73054014	353	GOLD CREEK DR	1.00
73054015	107	BULLION HILL DR	1.00
73054016	113	BULLION HILL DR	1.00
73054017	119	BULLION HILL DR	1.00
73054019	125	BULLION HILL DR	1.00
73054020	131	BULLION HILL DR	1.00
73054021	137	BULLION HILL DR	1.00
73054022	143	BULLION HILL DR	1.00
73054023	149	BULLION HILL DR	1.00
73054024	155	BULLION HILL DR	1.00
73054025	154	BULLION HILL DR	1.00
73054026	146	BULLION HILL DR	1.00
73054027	138	BULLION HILL DR	1.00
73054028	132	BULLION HILL DR	1.00
73054029	116	BULLION HILL DR	1.00
73054030	110	BULLION HILL DR	1.00
73054031	104	BULLION HILL DR	1.00
73054032	360	GOLD CREEK DR	1.00
73054033	354	GOLD CREEK DR	1.00
73054034	103	GOLDEN LEAF CT	1.00
73054035	109	GOLDEN LEAF CT	1.00
73054036	114	LITTLE DIPPER CT	1.00
73054037	120	LITTLE DIPPER CT	1.00
73054039	111	LITTLE DIPPER CT	1.00

## APPENDIX B

APN	Street Number	Street Name	EDU
73054040	105	LITTLE DIPPER CT	1.00
73054041	133	GOLDEN LEAF CT	1.00
73054042	139	GOLDEN LEAF CT	1.00
73054043	145	GOLDEN LEAF CT	1.00
73054044	151	GOLDEN LEAF CT	1.00
73054045	157	GOLDEN LEAF CT	1.00
73054046	161	GOLDEN LEAF CT	1.00
73054047	162	GOLDEN LEAF CT	1.00
73054048	158	GOLDEN LEAF CT	1.00
73054049	154	GOLDEN LEAF CT	1.00
73054050	148	GOLDEN LEAF CT	1.00
73054051	142	GOLDEN LEAF CT	1.00
73054052	136	GOLDEN LEAF CT	1.00
73054053	130	GOLDEN LEAF CT	1.00
73054054	324	GOLD CREEK DR	1.00
73054055	316	GOLD CREEK DR	1.00
73054056	308	GOLD CREEK DR	1.00
73054057	302	GOLD CREEK DR	1.00
73054058	296	GOLD CREEK DR	1.00
73054059	290	GOLD CREEK DR	1.00
73054060	286	GOLD CREEK DR	1.00
73054061	280	GOLD CREEK DR	1.00
73054062	274	GOLD CREEK DR	1.00
73055003	208	BULLION HILL DR	1.00
73055004	202	BULLION HILL DR	1.00
73055005	196	BULLION HILL DR	1.00
73055006	105	GOLDEN STAR DR	1.00
73055007	174	BULLION HILL DR	1.00
73055008	168	BULLION HILL DR	1.00
73055009	162	BULLION HILL DR	1.00
73055011	107	GOLD STANDARD CT	1.00
73055012	113	GOLD STANDARD CT	1.00
73055013	119	GOLD STANDARD CT	1.00
73055014	123	GOLD STANDARD CT	1.00
73055015	118	GOLD STANDARD CT	1.00
73055016	112	GOLD STANDARD CT	1.00
73055017	106	GOLD STANDARD CT	1.00
73055018	165	BULLION HILL DR	1.00
73055019	169	BULLION HILL DR	1.00
73055020	173	BULLION HILL DR	1.00
73055021	179	BULLION HILL DR	1.00
73055022	185	BULLION HILL DR	1.00
73055023	191	BULLION HILL DR	1.00
73055024	197	BULLION HILL DR	1.00

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APN	Street Number	Street Name	EDU
73055025	203	BULLION HILL DR	1.00
73057001	2400	LAKE VIEW CIR	1.00
73057002	2350	LAKE VIEW CIR	1.00
73057003	2302	LAKE VIEW CIR	1.00
73057004	2288	LAKE VIEW CIR	1.00
73058001	100	ROBINWOOD PL	1.00
73058002	120	ROBINWOOD PL	1.00
73058003	132	ROBINWOOD PL	1.00
73058004	138	ROBINWOOD PL	1.00
73058005	152	ROBINWOOD PL	1.00
73058006	164	ROBINWOOD PL	1.00
73058007	159	ROBINWOOD PL	1.00
73058008	125	ROBINWOOD PL	1.00
73058009	346	WOODGATE RD	1.00
73058010	362	WOODGATE RD	1.00
73058011	385	WOODGATE RD	1.00
73058012	373	WOODGATE RD	1.00
73058013	351	WOODGATE RD	1.00
73058014	319	WOODGATE RD	1.00
73058015	293	WOODGATE RD	1.00
73058016	257	WOODGATE RD	1.00
73059001	394	WOODGATE RD	1.00
73059002	116	WARMWOOD PL	1.00
73059003	130	WARMWOOD PL	1.00
73059004	138	WARMWOOD PL	1.00
73059005	156	WARMWOOD PL	1.00
73059006	157	WARMWOOD PL	1.00
73059007	151	WARMWOOD PL	1.00
73059008	143	WARMWOOD PL	1.00
73059010	488	WOODGATE RD	1.00
73059014	521	WOODGATE RD	1.00
73059015	503	WOODGATE RD	1.00
73059016	491	WOODGATE RD	1.00
73059017	475	WOODGATE RD	1.00
73059018	459	WOODGATE RD	1.00
73059019	433	WOODGATE RD	1.00
73059020	427	WOODGATE RD	1.00
73059021	415	WOODGATE RD	1.00
73059022	411	WOODGATE RD	1.00
74001009	1962	VISTA DEL LAGO DR	1.00
74001010	1957	VISTA DEL LAGO DR	1.00
74001011	2029	GREENBRIAR RD	1.00
74001012	2037	GREENBRIAR RD	1.00
74001013	2049	GREENBRIAR RD	1.00

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APN	Street Number	Street Name	EDU
74001015	2060	GREENBRIAR RD	1.00
74001016	2034	GREENBRIAR RD	1.00
74001017	2023	GREENBRIAR RD	1.00
74001019	1906	VISTA DEL LAGO DR	8.46
74001020	1900	VISTA DEL LAGO DR	2.00
74001022	1919	VISTA DEL LAGO #1	1.00
74001022	1919	VISTA DEL LAGO #10	1.00
74001022	1919	VISTA DEL LAGO #11	2.40
74001022	1919	VISTA DEL LAGO #2	1.00
74001022	1919	VISTA DEL LAGO #3	1.00
74001022	1919	VISTA DEL LAGO #4	1.00
74001022	1919	VISTA DEL LAGO #5	1.47
74001022	1919	VISTA DEL LAGO #6	1.00
74001022	1919	VISTA DEL LAGO #7	1.00
74001022	1919	VISTA DEL LAGO #9A	1.00
74001022	1919	VISTA DEL LAGO #9B	1.54
74002006	2083	HWY 26	1.00
74002007	2101	HWY 26	1.00
74002008	2166	PARTRIDGE DR	1.00
74002012	2062	HARTVICKSON LN	1.00
74002013	2046	HARTVICKSON LN	1.00
74002015	2010	HARTVICKSON LN	1.00
74002016	2085	HARTVICKSON LN	1.00
74002017	2067	HARTVICKSON LN	1.00
74002018	2049	HARTVICKSON LN	1.00
74002019	2031	HARTVICKSON LN	1.00
74002020	2016	GROUSE DR	1.00
74002021	2078	WREN CT	1.00
74002022	2096	WREN CT	1.00
74002024	2097	WREN CT	1.00
74002025	2079	WREN CT	1.00
74002026	2083	GROUSE DR	1.00
74002027	2065	GROUSE DR	1.00
74002028	2047	GROUSE DR	1.00
74002029	2029	GROUSE DR	1.00
74002030	2011	GROUSE DR	1.00
74002031	2008	VISTA DEL LAGO DR	1.00
74002032	2036	VISTA DEL LAGO DR	1.00
74002033	2101	GROUSE DR	1.00
74002034	2078	HARTVICKSON LN	1.00
74002035	2130	PARTRIDGE DR	1.00
74002037	2045	HWY 26	1.00
74002038	2025	HWY 26	1.00
74002041	2065	HWY 26	1.00

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APN	Street Number	Street Name	EDU
74003001	2111	HARTVICKSON LN	1.00
74003002	2127	HARTVICKSON LN	1.00
74003003	2153	HARTVICKSON LN	1.00
74003004	2333	PARTRIDGE CT	1.00
74003005	2341	PARTRIDGE CT	1.00
74003007	2342	PARTRIDGE CT	1.00
74003008	2209	HARTVICKSON LN	1.00
74003009	2300	PARTRIDGE DR	1.00
74003010	2288	PARTRIDGE DR	1.00
74003011	2274	PARTRIDGE DR	1.00
74003012	2258	PARTRIDGE DR	1.00
74003014	2226	PARTRIDGE DR	1.00
74003015	2210	PARTRIDGE DR	1.00
74003017	2178	PARTRIDGE DR	1.00
74003018	2115	HWY 26	1.00
74003019	2133	HWY 26	1.00
74003020	2151	HWY 26	1.00
74003021	2169	HWY 26	1.00
74003022	2187	HWY 26	1.00
74003024	2295	PARTRIDGE DR	1.00
74003025	2281	PARTRIDGE DR	1.00
74003026	2249	PARTRIDGE DR	1.00
74003028	2153	PARTRIDGE DR	1.00
74003029	2129	PARTRIDGE DR	1.00
74004001	2115	GROUSE DR	1.00
74004002	2108	QUAIL CT	1.00
74004003	2092	QUAIL CT	1.00
74004004	2084	QUAIL CT	1.00
74004005	2287	GROUSE DR	1.00
74004006	2275	GROUSE DR	1.00
74004007	2245	GROUSE DR	1.00
74004008	2209	GROUSE DR	1.00
74004009	2177	GROUSE DR	1.00
74004011	2099	QUAIL CT	1.00
74004012	2085	QUAIL CT	1.00
74004017	2157	QUAIL CT	1.00
74004019	2166	GROUSE DR	1.00
74004020	2182	GROUSE DR	1.00
74004021	2196	GROUSE DR	1.00
74004023	2226	GROUSE DR	1.00
74004024	2240	GROUSE DR	1.00
74004025	2254	GROUSE DR	1.00
74004026	2268	GROUSE DR	1.00
74004027	2278	GROUSE DR	1.00

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APN	Street Number	Street Name	EDU
74004028	2288	GROUSE DR	1.00
74004029	2158	QUAIL CT	1.00
74004030	2168	QUAIL CT	1.00
74005001	2088	GREENBRIAR RD	1.00
74005002	2077	GREENBRIAR RD	1.00
74005003	2089	GREENBRIAR RD	1.00
74005004	2103	GREENBRIAR RD	1.00
74005006	2044	VISTA DEL LAGO	1.00
74005007	2062	VISTA DEL LAGO DR	1.00
74005008	2076	VISTA DEL LAGO DR	1.00
74005009	2090	VISTA DEL LAGO DR	1.00
74005010	2323	GROUSE DR	1.00
74005011	2322	GROUSE DR	1.00
74005012	2162	VISTA DEL LAGO DR	1.00
74005013	2202	VISTA DEL LAGO DR	1.00
74005014	2222	VISTA DEL LAGO DR	1.00
74005015	2244	VISTA DEL LAGO DR	1.00
74005016	2304	HUCKLEBERRY LN	1.00
74005017	2334	HUCKLEBERRY LN	1.00
74005018	2361	TOYON CT	1.00
74005019	2345	TOYON CT	1.00
74005020	2337	TOYON CT	1.00
74006001	2303	HUCKLEBERRY LN	1.00
74006002	2310	VISTA DEL LAGO DR	1.00
74006003	2326	VISTA DEL LAGO DR	1.00
74006005	2385	MEADOWOOD DR	1.00
74006006	2331	HUCKLEBERRY LN	1.00
74006007	2369	TOYON CT	1.00
74006008	2368	TOYON CT	1.00
74006009	2352	TOYON CT	1.00
74006010	2340	TOYON CT	1.00
74006011	2426	HUCKLEBERRY LN	1.00
74006012	2442	HUCKLEBERRY LN	1.00
74006013	2458	HUCKLEBERRY LN	1.00
74006015	2476	HUCKLEBERRY LN	1.00
74006016	2492	HUCKLEBERRY LN	1.00
74006019	2499	HUCKLEBERRY LN	1.00
74006020	2481	HUCKLEBERRY LN	1.00
74006021	2463	HUCKLEBERRY LN	1.00
74006022	2441	HUCKLEBERRY LN	1.00
74006023	2421	HUCKLEBERRY LN	1.00
74006024	2393	HUCKLEBERRY LN	1.00
74006025	2375	HUCKLEBERRY LN	1.00
74006026	2364	MEADOWOOD DR	1.00

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APN	Street Number	Street Name	EDU
74006027	2380	MEADOWOOD DR	1.00
74006028	2400	MEADOWOOD DR	1.00
74006030	2439	HUB CT	1.00
74006031	2442	HUB CT	1.00
74006032	2493	HOGAN CT	1.00
74006033	2494	HOGAN CT	1.00
74006034	2502	HOGAN CT	1.00
74006035	2514	HOGAN CT	1.00
74006036	2530	HOGAN CT	1.00
74006037	2544	HOGAN CT	1.00
74006038	2547	BLACK BART DR	1.00
74006039	2523	HOGAN CT	1.00
74006040	2503	HOGAN CT	1.00
74007001	2450	MEADOWOOD DR	1.00
74007002	2472	MEADOWOOD DR	1.00
74007003	2494	MEADOWOOD DR	1.00
74007004	2693	BLACK BART DR	1.00
74007005	2679	BLACK BART DR	1.00
74007006	2661	BLACK BART DR	1.00
74007007	2643	BLACK BART DR	1.00
74007008	2615	BLACK BART DR	1.00
74007009	2581	BLACK BART DR	1.00
74007010	2539	HUCKLEBERRY LN	1.00
74007011	2524	BLACK BART DR	1.00
74007012	2544	BLACK BART DR	1.00
74007013	2566	BLACK BART DR	1.00
74007014	2582	BLACK BART DR	1.00
74007015	2600	BLACK BART DR	1.00
74007016	2620	BLACK BART DR	1.00
74007017	2638	BLACK BART DR	1.00
74007018	2656	BLACK BART DR	1.00
74007019	2676	BLACK BART DR	1.00
74007020	2694	BLACK BART DR	1.00
74007021	2712	BLACK BART DR	1.00
74007022	2726	BLACK BART DR	1.00
74007024	2574	MEADOWOOD DR	1.00
74007025	2589	GOLD RUN CT	1.00
74007026	2569	GOLD RUN CT	1.00
74007027	2553	GOLD RUN CT	1.00
74007030	2515	GOLD RUN CT	1.00
74007031	2514	GOLD RUN CT	1.00
74007032	2522	GOLD RUN CT	1.00
74007033	2536	GOLD RUN CT	1.00
74007034	2556	GOLD RUN CT	1.00

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APN	Street Number	Street Name	EDU
74008002	2548	HUCKLEBERRY LN	1.00
74008004	2584	HUCKLEBERRY LN	1.00
74008005	2600	HUCKLEBERRY LN	1.00
74008006	2612	HUCKLEBERRY LN	1.00
74008008	2668	MALLARD CT	1.00
74008010	2653	MALLARD CT	1.00
74008011	2646	HUCKLEBERRY LN	1.00
74008012	2676	HUCKLEBERRY LN	1.00
74008013	2706	HUCKLEBERRY LN	1.00
74008014	2709	HUCKLEBERRY LN	1.00
74008015	2695	HUCKLEBERRY LN	1.00
74008016	2677	HUCKLEBERRY LN	1.00
74008017	2655	HUCKLEBERRY LN	1.00
74008018	2629	HUCKLEBERRY LN	1.00
74008019	2597	HUCKLEBERRY LN	1.00
74008020	2616	STAGE COACH DR	1.00
74008021	2640	STAGE COACH DR	1.00
74008022	2668	STAGE COACH DR	1.00
74008023	2686	STAGE COACH DR	1.00
74008024	2704	STAGE COACH DR	1.00
74008025	2750	TEAL CT	1.00
74008027	2757	TEAL CT	1.00
74008028	2744	STAGE COACH DR	1.00
74008029	2768	STAGE COACH DR	1.00
74008030	2570	GOLD RUN CT	1.00
74008031	2618	MEADOWOOD DR	1.00
74008032	2787	STAGE COACH DR	1.00
74008033	2767	STAGE COACH DR	1.00
74008034	2747	STAGE COACH DR	1.00
74008037	2695	STAGE COACH DR	1.00
74008038	2679	STAGE COACH DR	1.00
74008039	2661	STAGE COACH DR	1.00
74008040	2645	STAGE COACH DR	1.00
74008041	2629	STAGE COACH DR	1.00
74008042	2613	STAGE COACH DR	1.00
74008043	2593	STAGE COACH DR	1.00
74009001	2593	MEADOWOOD DR	1.00
74009002	2613	SILVERADO DR	1.00
74009003	2637	SILVERADO DR	1.00
74009004	2662	SILVERADO DR	1.00
74009005	2682	SILVERADO DR	1.00
74009006	2700	SILVERADO DR	1.00
74009007	2705	SILVERADO DR	1.00
74009008	2723	SILVERADO DR	1.00

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APN	Street Number	Street Name	EDU
74009009	2737	SILVERADO DR	1.00
74009010	2761	SILVERADO DR	1.00
74009011	2796	SILVERADO DR	1.00
74009012	3011	STAGE COACH DR	1.00
74009013	2993	STAGE COACH DR	1.00
74009015	2967	STAGE COACH DR	1.00
74009016	2947	STAGE COACH DR	1.00
74009017	2931	STAGE COACH DR	1.00
74009019	2893	STAGE COACH DR	1.00
74009020	2871	STAGE COACH DR	1.00
74009021	2853	STAGE COACH DR	1.00
74009022	2833	STAGE COACH DR	1.00
74009024	2856	OAK CT	1.00
74009025	2872	OAK CT	1.00
74009027	2857	OAK CT	1.00
74009028	2880	STAGE COACH DR	1.00
74009030	2914	STAGE COACH DR	1.00
74009031	2932	STAGE COACH DR	1.00
74009032	2984	CEDAR CT	1.00
74009034	2997	CEDAR CT	1.00
74009035	2985	CEDAR CT	1.00
74009036	2992	STAGE COACH DR	1.00
74009037	3010	STAGE COACH DR	1.00
74010001	2478	VISTA DEL LAGO DR	1.00
74010002	2498	VISTA DEL LAGO	1.00
74010003	2518	VISTA DEL LAGO DR	1.00
74010004	2538	VISTA DEL LAGO DR	1.00
74010005	2560	VISTA DEL LAGO DR	1.00
74010006	2584	VISTA DEL LAGO DR	1.00
74010007	2610	VISTA DEL LAGO DR	1.00
74010008	2778	SILVERADO DR	1.00
74010009	2760	SILVERADO DR	1.00
74010010	2736	SILVERADO DR	1.00
74010011	2718	SILVERADO DR	1.00
74010012	2661	GLEN CT	1.00
74010013	2649	GLEN CT	1.00
74010014	2633	GLEN CT	1.00
74010018	2559	CREST CT	1.00
74010019	2519	MEADOWOOD DR	1.00
74010021	2551	MEADOWOOD DR	1.00
74010022	2561	MEADOWOOD DR	1.00
74010023	2630	SILVERADO DR	1.00
74010024	2644	SILVERADO DR	1.00
74010025	2660	GLEN CT	1.00

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APN	Street Number	Street Name	EDU
74010026	2648	GLEN CT	1.00
74011001	2359	VISTA DEL LAGO DR	1.00
74011002	2375	VISTA DEL LAGO DR	1.00
74011003	2391	VISTA DEL LAGO DR	1.00
74011004	2407	VISTA DEL LAGO DR	1.00
74011005	2423	VISTA DEL LAGO DR	1.00
74011006	2441	VISTA DEL LAGO DR	1.00
74011007	2457	VISTA DEL LAGO DR	1.00
74011009	2489	VISTA DEL LAGO DR	1.00
74011010	2505	VISTA DEL LAGO DR	1.00
74011011	2521	VISTA DEL LAGO DR	1.00
74011012	2535	VISTA DEL LAGO DR	1.00
74011013	2549	VISTA DEL LAGO DR	1.00
74011014	2457	SNAG CT	1.00
74011015	2475	SNAG CT	1.00
74011016	2486	SNAG CT	1.00
74011017	2476	SNAG CT	1.00
74011018	2458	SNAG CT	1.00
74011019	2398	VISTA DEL LAGO DR	1.00
74011020	2378	VISTA DEL LAGO DR	1.00
74011021	2362	VISTA DEL LAGO DR	1.00
74011022	2346	VISTA DEL LAGO DR	1.00
74011023	2425	MEADOWOOD DR	1.00
74011024	2445	MEADOWOOD DR	1.00
74011025	2461	MEADOWOOD DR	1.00
74011026	2471	MEADOWOOD DR	1.00
74011027	2495	MEADOWOOD DR	1.00
74011028	2473	VISTA DEL LAGO DR	1.00
74012001	2841	VISTA DEL LAGO DR	1.00
74012002	2751	VISTA DEL LAGO DR	1.00
74012003	2723	VISTA DEL LAGO DR	1.00
74012006	2648	SHADOW LN	1.00
74012007	2625	VISTA DEL LAGO DR	1.00
74012009	2587	VISTA DEL LAGO DR	1.00
74012010	2695	VISTA DEL LAGO DR	1.00
74012011	2647	SHADOW LN	1.00
74013001	2870	CASCADE LN	1.00
74013002	2816	VISTA DEL LAGO DR	1.00
74013003	2800	VISTA DEL LAGO DR	1.00
74013004	2774	VISTA DEL LAGO DR	1.00
74013005	2742	VISTA DEL LAGO DR	1.00
74013006	2718	VISTA DEL LAGO DR	1.00
74013007	2702	VISTA DEL LAGO DR	1.00
74013008	2686	VISTA DEL LAGO DR	1.00

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APN	Street Number	Street Name	EDU
74013010	2678	SHADOW LN	1.00
74013011	2698	SHADOW LN	1.00
74013012	2612	SILVERADO DR	1.00
74013013	3031	STAGE COACH CT	1.00
74013015	2709	SHADOW LN	1.00
74013016	3083	STAGE COACH CT	1.00
74013017	3099	STAGE COACH CT	1.00
74013018	3117	STAGE COACH CT	1.00
74013021	3151	STAGE COACH CT	1.00
74013023	2944	CASCADE LN	1.00
74013026	2939	CASCADE LN	1.00
74013027	2951	CASCADE LN	1.00
74013029	3136	STAGE COACH CT	1.00
74013030	3116	STAGE COACH CT	1.00
74013031	3100	STAGE COACH CT	1.00
74013032	3082	STAGE COACH CT	1.00
74013033	2767	SHADOW LN	1.00
74013035	2770	SHADOW LN	1.00
74013036	2786	SHADOW LN	1.00
74013037	3135	STAGE COACH CT	1.00
74013038	3147	STAGE COACH CT	1.00
74015001	185	ST ANDREWS RD	1.00
74015002	167	ST ANDREWS RD	1.00
74015003	151	ST ANDREWS RD	1.00
74015006	101	ST ANDREWS RD	1.00
74015007	85	ST ANDREWS RD	1.00
74015008	67	ST ANDREWS RD	1.00
74015009	43	ST ANDREWS RD	1.00
74015011	15	ST ANDREWS RD	3.00
74015017	84	ST ANDREWS RD	1.00
74015020	134	ST ANDREWS RD	1.00
74015021	150	ST ANDREWS RD	1.00
74015022	166	ST ANDREWS RD	1.00
74015023	186	ST ANDREWS RD	1.00
74015024	316	LA CONTENTA DR	1.00
74015025	346	LA CONTENTA DR	1.00
74015026	362	LA CONTENTA DR	1.00
74015027	378	LA CONTENTA DR	1.00
74015028	394	LA CONTENTA DR	1.00
74015029	410	LA CONTENTA DR	1.00
74015037	14	ST ANDREWS RD	2.25
74015039	36	ST ANDREWS RD	1.00
74015040	50	ST ANDREWS RD	1.00
74015041	66	ST ANDREWS RD	1.00

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APN	Street Number	Street Name	EDU
74015042	117	ST ANDREWS RD	1.00
74015043	135	ST ANDREWS RD	1.00
74016001	201	ST ANDREWS RD	1.00
74016002	217	ST ANDREWS RD	1.00
74016003	229	ST ANDREWS RD	1.00
74016004	236	OAKMONT CT	1.00
74016005	216	OAKMONT CT	1.00
74016006	198	OAKMONT CT	1.00
74016007	184	OAKMONT CT	1.00
74016008	180	OAKMONT CT	1.00
74016009	185	OAKMONT CT	1.00
74016010	203	OAKMONT CT	1.00
74016012	295	ST ANDREWS RD	1.00
74016013	317	ST ANDREWS RD	1.00
74016015	299	AUGUSTA CT	1.00
74016016	311	AUGUSTA CT	1.00
74016017	323	AUGUSTA CT	1.00
74016019	335	AUGUSTA CT	1.00
74016020	336	AUGUSTA CT	1.00
74016021	324	AUGUSTA CT	1.00
74016022	274	ST ANDREWS RD	1.00
74016023	260	ST ANDREWS RD	1.00
74016024	238	ST ANDREWS RD	1.00
74017001	408	LA CONTENTA WY	1.00
74017002	381	LA CONTENTA DR	1.00
74017003	399	LA CONTENTA DR	1.00
74017004	425	LA CONTENTA DR	1.00
74017005	465	LA CONTENTA DR	1.00
74017006	493	LA CONTENTA DR	1.00
74017007	440	LA CONTENTA DR	1.00
74017008	538	LA CONTENTA DR	1.00
74017009	520	LA CONTENTA DR	1.00
74017010	506	LA CONTENTA DR	1.00
74017011	490	LA CONTENTA DR	1.00
74017012	476	LA CONTENTA DR	1.00
74017013	462	LA CONTENTA DR	1.00
74017014	450	LA CONTENTA DR	1.00
74017016	371	LA CONTENTA WY	1.00
74017017	387	LA CONTENTA DR	1.00
74017018	405	LA CONTENTA WY	1.00
74017019	423	LA CONTENTA DR	1.00
74017020	445	LA CONTENTA WY	1.00
74017021	543	LA CONTENTA DR	1.00
74017022	438	LA CONTENTA DR	1.00

APPENDIX B

APN	Street Number	Street Name	EDU
74017023	424	LA CONTENTA DR	1.00
74018001	561	LA CONTENTA DR	1.00
74018003	615	OLD COURSE CT	1.00
74018005	643	OLD COURSE CT	1.00
74018007	642	OLD COURSE CT	1.00
74018008	630	OLD COURSE CT	1.00
74018009	614	OLD COURSE CT	1.00
74018010	629	LA CONTENTA DR	1.00
74018011	643	LA CONTENTA DR	1.00
74018012	648	ST ANDREWS RD	1.00
74018013	628	ST ANDREWS RD	1.00
74018014	612	ST ANDREWS RD	1.00
74018016	580	ST ANDREWS RD	1.00
74018016	596	ST ANDREWS RD	1.00
74018018	548	ST ANDREWS RD	1.00
74018019	528	ST ANDREWS RD	1.00
74018020	510	ST ANDREWS RD	1.00
74018024	421	S PEBBLE BEACH CT	1.00
74018026	441	S PEBBLE BEACH CT	1.00
74018028	418	S PEBBLE BEACH CT	1.00
74018032	381	N PEBBLE BEACH CT	1.00
74018033	397	N PEBBLE BEACH CT	1.00
74018034	415	N PEBBLE BEACH CT	1.00
74018035	437	N PEBBLE BEACH CT	1.00
74018036	499	ST ANDREWS RD	1.00
74018037	515	ST ANDREWS RD	1.00
74018038	531	ST ANDREWS RD	1.00
74018039	547	ST ANDREWS RD	1.00
74019001	556	LA CONTENTA DR	1.00
74019002	576	LA CONTENTA DR	1.00
74019003	596	LA CONTENTA DR	1.00
74019005	636	LA CONTENTA DR	1.00
74019006	724	ST ANDREWS DR	1.00
74019007	746	ST ANDREWS DR	1.00
74019008	762	ST ANDREWS DR	1.00
74019009	778	ST ANDREWS DR	1.00
74019010	794	ST ANDREWS DR	1.00
74019011	808	ST ANDREWS DR	1.00
74019012	820	ST ANDREWS DR	1.00
74019013	832	ST ANDREWS DR	1.00
74019016	868	ST ANDREWS DR	1.00
74019017	880	ST ANDREWS DR	1.00
74019019	890	ST ANDREWS DR	1.00
74019020	900	ST ANDREWS DR	1.00

## APPENDIX B

APN	Street Number	Street Name	EDU
74019021	910	ST ANDREWS DR	1.00
74019027	670	LA CONTENTA DR	1.00
74019028	686	LA CONTENTA DR	1.00
74019029	700	LA CONTENTA DR	1.00
74020001	926	ST ANDREWS DR	1.00
74020002	942	ST ANDREWS DR	1.00
74020003	960	ST ANDREWS DR	1.00
74020004	720	LA CONTENTA DR	1.00
74020005	740	LA CONTENTA DR	1.00
74020006	717	LA CONTENTA DR	1.00
74020007	693	LA CONTENTA DR	1.00
74020008	689	ST ANDREWS RD	1.00
74020009	671	ST ANDREWS RD	1.00
74020010	643	ST ANDREWS DR	1.00
74020011	703	BLUE HERON CT	1.00
74020012	721	BLUE HERON CT	1.00
74020013	741	BLUE HERON CT	1.00
74021001	627	ST ANDREWS RD	1.00
74021002	611	ST ANDREWS RD	1.00
74021003	595	ST ANDREWS RD	1.00
74021004	579	ST ANDREWS RD	1.00
74021005	563	ST ANDREWS RD	1.00
74021007	572	BLUE HERON CT	1.00
74021008	556	BLUE HERON CT	1.00
74021009	542	BLUE HERON CT	1.00
74021010	536	BLUE HERON CT	1.00
74021011	537	BLUE HERON CT	1.00
74021012	563	BLUE HERON CT	1.00
74021013	581	BLUE HERON CT	1.00
74021014	597	BLUE HERON CT	1.00
74021015	611	BLUE HERON CT	1.00
74021016	629	BLUE HERON CT	1.00
74021017	649	BLUE HERON CT	1.00
74021018	667	BLUE HERON CT	1.00
74021019	685	BLUE HERON CT	1.00
74022001	800	LA CONTENTA DR	1.00
74022002	822	LA CONTENTA DR	1.00
74022003	840	LA CONTENTA DR	1.00
74022004	856	LA CONTENTA DR	1.00
74022005	855	LA CONTENTA DR	1.00
74022006	2253	VISTA DEL LAGO DR	1.00
74022007	2267	VISTA DEL LAGO DR	1.00
74022008	2285	VISTA DEL LAGO DR	1.00
74022011	505	SILVER RD	1.00

## APPENDIX B

APN	Street Number	Street Name	EDU
74022012	493	SILVER RD	1.00
74022013	475	SILVER RD	1.00
74023001	525	SILVER RD	1.00
74023002	531	SILVER RD	1.00
74023003	526	PINE VALLEY CT	1.00
74023004	506	PINE VALLEY CT	1.00
74023005	488	PINE VALLEY CT	1.00
74023006	470	PINE VALLEY CT	1.00
74023007	464	PINE VALLEY CT	1.00
74023009	473	PINE VALLEY CT	1.00
74023010	501	PINE VALLEY CT	1.00
74023011	525	PINE VALLEY CT	1.00
74023012	618	PEACHTREE CT	1.00
74023013	602	PEACHTREE CT	1.00
74023015	586	PEACHTREE CT	1.00
74023017	601	PEACHTREE CT	1.00
74023018	619	PEACHTREE CT	1.00
74024001	597	SILVER RD	1.00
74024002	623	SILVER RD	1.00
74024003	643	SILVER RD	1.00
74024004	652	PEACHTREE CT	1.00
74024005	634	PEACHTREE CT	1.00
74024006	641	PEACHTREE CT	1.00
74024007	679	SILVER RD	1.00
74024008	700	SPYGLASS RD	1.00
74024009	760	SILVER RD	1.00
74024010	721	SPYGLASS CT	1.00
74024012	747	SPYGLASS CT	1.00
74024013	750	SPYGLASS CT	1.00
74024014	734	SPYGLASS CT	1.00
74024017	618	SILVER RD	1.00
74024018	602	SILVER RD	1.00
74024019	588	SILVER RD	1.00
74024020	572	SILVER RD	1.00
74024021	550	SILVER RD	1.00
74024022	538	SILVER RD	1.00
74024023	528	SILVER RD	1.00
74024024	502	SILVER RD	1.00
74024025	478	SILVER RD	1.00
74024026	636	SILVER RD	1.00
74025001	679	SPYGLASS RD	1.00
74025002	731	SILVER RD	1.00
74025003	777	LODE CT	1.00
74025004	795	LODE CT	1.00

## APPENDIX B

APN	Street Number	Street Name	EDU
74025006	792	LODE CT	1.00
74025007	802	LODE CT	1.00
74025009	2644	SHADOW LN	1.00
74025010	2643	SHADOW LN	1.00
74025012	622	STANFORD CT	1.00
74025013	630	STANFORD CT	1.00
74025014	623	STANFORD CT	1.00
74025015	615	STANFORD CT	1.00
74025016	603	STANFORD CT	1.00
74025017	561	OAK RIDGE RD	1.00
74025018	574	BROOKLINE CT	1.00
74025019	584	BROOKLINE CT	1.00
74025020	587	BROOKLINE CT	1.00
74025022	575	BROOKLINE CT	1.00
74025023	908	CARSON DR	1.00
74025024	892	CARSON DR	1.00
74025025	880	CARSON DR	1.00
74025026	870	CARSON DR	1.00
74025027	877	CARSON DR	1.00
74025028	891	CARSON DR	1.00
74025029	907	CARSON DR	1.00
74025030	2645	SHADOW LN	1.00
74026002	487	OAK RIDGE RD	1.00
74026003	503	OAK RIDGE RD	1.00
74026004	519	OAK RIDGE RD	1.00
74026005	531	OAK RIDGE RD	1.00
74026006	532	OAK RIDGE RD	1.00
74026007	512	OAK RIDGE RD	1.00
74026008	484	OAK RIDGE RD	1.00
74026009	537	BROOKLINE CT	1.00
74026010	534	BROOKLINE CT	1.00
74026011	593	SPYGLASS RD	1.00
74026012	609	SPYGLASS RD	1.00
74026013	538	BROOKLINE CT	1.00
74026014	622	OAK RIDGE RD	1.00
74026015	600	OAK RIDGE RD	1.00
74026016	572	OAK RIDGE RD	1.00
74026017	604	STANFORD CT	1.00
74026019	657	SPYGLASS RD	1.00
74026020	645	SPYGLASS RD	1.00
74026021	664	SPYGLASS RD	1.00
74026022	654	SPYGLASS RD	1.00
74026023	632	SPYGLASS RD	1.00
74026024	606	SPYGLASS RD	1.00

## APPENDIX B

APN	Street Number	Street Name	EDU
74026025	586	SPYGLASS RD	1.00
74026027	471	OAK RIDGE RD	1.00
74027001	570	SPYGLASS RD	1.00
74027002	562	SPYGLASS RD	1.00
74027003	546	SPYGLASS RD	1.00
74027004	504	BAYWOOD CT	1.00
74027005	500	BAYWOOD CT	1.00
74027006	503	BAYWOOD CT	1.00
74027007	519	BAYWOOD CT	1.00
74027010	474	SPYGLASS RD	1.00
74027011	456	SPYGLASS RD	1.00
74027012	414	OAK RIDGE CT	1.00
74027014	384	OAK RIDGE CT	1.00
74027020	421	SPYGLASS RD	1.00
74027021	451	SPYGLASS RD	1.00
74027022	495	HAGGIN CT	1.00
74027023	503	HAGGIN CT	1.00
74027024	496	HAGGIN CT	1.00
74027025	480	HAGGIN CT	1.00
74027029	569	SPYGLASS RD	1.00
74027033	492	SPYGLASS RD	1.00
74027034	392	OAK RIDGE CT	1.00
74027035	389	OAK RIDGE CT	1.00
74027036	401	OAK RIDGE CT	1.00
74027037	419	OAK RIDGE CT	1.00
74027038	391	SPYGLASS RD	1.00
74027040	508	SPYGLASS RD	1.00
74029001	845	ST ANDREWS DR	1.00
74029002	845	ST ANDREWS DR	1.00
74029003	845	ST ANDREWS DR	1.00
74029004	845	ST ANDREWS DR	1.00
74029005	845	ST ANDREWS DR	1.00
74029006	845	ST ANDREWS DR	1.00
74029007	845	ST ANDREWS DR	1.00
74029008	845	ST ANDREWS DR	1.00
74030001	747	ST ANDREWS DR	1.00
74030002	747	ST ANDREWS DR	1.00
74030003	747	ST ANDREWS DR	1.00
74030004	747	ST ANDREWS DR	1.00
74030005	747	ST ANDREWS DR	1.00
74030006	747	ST ANDREWS DR	1.00
74030007	747	ST ANDREWS DR	1.00
74030008	747	ST ANDREWS DR	1.00
74030009	903	ST ANDREWS DR	1.00

## APPENDIX B

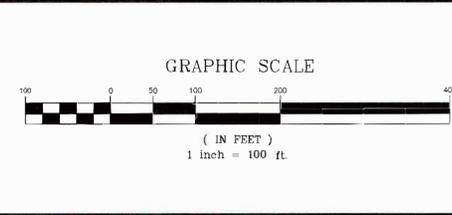
APN	Street Number	Street Name	EDU
74030010	905	ST ANDREWS DR	1.00
74030011	907	ST ANDREWS DR	1.00
74030012	909	ST ANDREWS DR	1.00
74030013	911	ST ANDREWS DR	1.00
74030014	915	ST ANDREWS DR	1.00
74030015	915	ST ANDREWS DR	1.00
74030016	915	ST ANDREWS DR	1.00
74030017	915	ST ANDREWS DR	1.00
74030018	793	ST ANDREWS DR	1.00
74030019	791	ST ANDREWS DR	1.00
74030020	789	ST ANDREWS DR	1.00
74030021	787	ST ANDREWS DR	1.00
74030022	785	ST ANDREWS DR	1.00
74030023	781	ST ANDREWS DR	1.00
74030024	779	ST ANDREWS DR	1.00
74030025	777	ST ANDREWS DR	1.00
74030026	775	ST ANDREWS DR	1.00
74031001	891	ST ANDREWS DR	1.00
74031002	891	ST ANDREWS DR	1.00
74031003	891	ST ANDREWS DR	1.00
74031004	891	ST ANDREWS DR	1.00
74031005	891	ST ANDREWS DR	1.00
74031006	891	ST ANDREWS DR	1.00
74031007	891	ST ANDREWS DR	1.00
74031008	891	ST ANDREWS DR	1.00
74031009	891	ST ANDREWS DR	1.00
74031010	891	ST ANDREWS DR	1.00
74032001	169	GOLDEN WEST CT	1.00
74032002	165	GOLDEN WEST CT	1.00
74032003	153	GOLDEN WEST CT	1.00
74032004	143	GOLDEN WEST CT	1.00
74032005	133	GOLDEN WEST CT	1.00
74032006	121	GOLDEN WEST CT	1.00
74032007	113	GOLDEN WEST CT	1.00
74032008	10	JENNIFER CT	1.00
74032009	20	JENNIFER CT	1.00
74032010	30	JENNIFER CT	1.00
74032013	23	JENNIFER CT	1.00
74032014	130	GOLDEN WEST CT	1.00
74032015	140	GOLDEN WEST CT	1.00
74032016	150	GOLDEN WEST CT	1.00
74032018	168	GOLDEN WEST CT	1.00

# **APPENDIX C**

## **MEMORANDUMS OF UNDERSTANDING**

**LEGEND**

- SANITARY SEWER (SS) — 6" SS —
- SS SERVICE LATERAL —
- SANITARY SEWER MANHOLE —
- WATER MAIN — 8"W —
- WATER SERVICE LATERAL —



REV.	DATE	DESCRIPTION
1	3/18/2019	CCPW PLAN CHECK NO. 1
2	5/31/2019	CCPW PLAN CHECK NO. 2
3	5/28/2020	CCPW PLAN CHECK NO. 3
4	7/17/2020	CCPW PLAN CHECK NO. 4

**GREEN MOUNTAIN ENGINEERING**  
1314 Paloma Ave. Stockton, CA 95209 209.478.6525

**GOLD CREEK SUBDIVISION, UNIT 3**

IMPROVEMENT PLANS  
OVERALL SANITARY SEWER & WATER UTILITY PLANS

VALLEY SPRINGS  
CALAVERAS COUNTY, CALIFORNIA

PROJECT NO.	180
DRAWN BY:	GME
DESIGN BY:	DJL
CHECK BY:	DG
SCALE:	AS SHOWN
DATE:	1/14/2019
CAD FILE:	A08_190115_IP_PC4.DWG

SHEET NO.

**U-3**

OF

23

SHEETS

2020-07-16 180

## **WATER AND WASTEWATER SERVICE FACILITIES AGREEMENT**

THIS AGREEMENT is executed on December 14, 2022, by and between the **CALAVERAS COUNTY WATER DISTRICT**, a County Water District organized pursuant to Water Code §§ 30000 *et seq.*, hereinafter called DISTRICT, and **LGI Homes – California, LLC**, a California limited liability company, hereinafter called OWNER.

**WHEREAS**, the OWNER has filed with the County of Calaveras a Final Subdivision Tract Map No. 2005-190 for **156 single family residential parcels** (Assessor's Parcel Numbers APN 73-056-001, -002, -003, -009 and -013), said developed property to be known as NORTH VISTA PLAZA, hereinafter called PROJECT. Said Final Map is attached hereto and incorporated herein as **ATTACHMENT 'A'**; and

**WHEREAS**, OWNER has requested that DISTRICT provide water and wastewater services to the PROJECT, and DISTRICT agrees to provide such services consistent with the terms and conditions set forth herein.

**IT IS MUTUALLY AGREED** by and between DISTRICT and OWNER as follows:

1. INCORPORATION OF RECITALS. The foregoing recitals are hereby incorporated by reference.
  
2. IMPROVEMENT PLAN. Prior to construction of the PROJECT, OWNER shall prepare and submit to DISTRICT for review all design and engineering calculations, plans, specifications, cost estimates, and construction schedules for water and wastewater systems required by DISTRICT to serve the PROJECT. OWNER shall prepare and submit legal property descriptions and public utility easements intended to be dedicated to DISTRICT. Conveyance to the DISTRICT of interests in real property shall be free and clear of encumbrance, liability, or obligation other than non-lien encumbrances of record as of the date of this Agreement and encumbrances such as easements granted in connection with construction of the Improvement System. The foregoing calculations, plans, specifications, cost estimates, schedules, conveyances, and assurances, and any related submissions required by DISTRICT, are hereafter collectively referred to as the "Improvement Plans." The Improvement Plans shall be reviewed by DISTRICT for conformance with DISTRICT Improvement Standards and Standard Construction Specifications (collectively "Improvement Standards") and other DISTRICT rules in effect at the time the Improvement Plans are provided to the District in a final form for review and approval. OWNER understands and agrees that should it delay in submitting its plans and commencing construction the current Improvement Standards of District may change and OWNER may have to update its Improvement Plans. DISTRICT shall bear no responsibility for the accuracy or reliability of the Improvement Plan, design, and engineering calculations, plans, specifications, or underlying data.

The Improvement Plans will be furnished for District approval in three sets, with each set being an "Improvement Plan:

- a. "On-Site Water and Sewer Utilities": the water and wastewater infrastructure depicted on the 12/3/2022 draft of improvement plans submitted by OWNER, which are attached hereto as **Attachment C**
- b. "On-Site Lift Stations":
  - i. Lift Station A located on Lot A which will pump wastewater flows through a 1,526-foot force main pipeline southeast up I Street, then southwest up E Street into a gravity manhole at the intersection of E Street and Vista Del Lago Dr.
- c. Lift Station B located on Lot K which will pump wastewater flows through a 322-foot force main pipeline northwest up D Street, then southwest up C Street into a gravity manhole in C Street. "Off-Site Improvements": the off-site sewer improvements detailed in Attachment B #1.

The On-Site Water and Sewer Utilities, On-Site Lift Stations, and Off-Site Improvements are collectively the "Improvement System".

3. IMPROVEMENT SYSTEM. OWNER shall design, construct, and install, and modify the Improvement System in compliance with the Improvement Plans, Improvement Standards, and other DISTRICT rules, and in compliance with all other requirements of each and every governmental authority having any jurisdiction whatsoever in connection with the PROJECT. OWNER is solely responsible for ensuring that the Improvement System is in compliance with all applicable legal requirements, including the Improvement Standards and other DISTRICT rules, and DISTRICT shall have no responsibility for same. Once DISTRICT has reviewed an Improvement Plan for conformity with the Improvement Standards and other DISTRICT rules, and the Improvement Plan is "Released for Construction" per Improvement Standards § 1.2.11, OWNER shall at its sole expense construct all facilities and do all other work required by the Improvement Plan and this Agreement.

4. COSTS. OWNER shall pay (a) all costs arising from construction of the Improvement System, subject to reimbursement described in **Attachment B** #1 or as otherwise agreed in writing by both parties, and (b) its portion of the Huckleberry Impact Costs detailed in **Attachment B** #2. Where "costs," "fees," or "charges," and similar terms are referenced in this Agreement, the use of a particular term may incorporate references to other terms such as, for example, rates, fees, charges, assessments, or other levies by DISTRICT. Unless stated otherwise in this Agreement, regardless of the terminology used, in all instances OWNER is solely responsible for any and all costs associated with the Improvement Plan and Improvement System, and OWNER is solely responsible for full and timely payment of any and all costs identified by DISTRICT.

**LEGEND**

- ⊙ SET STREET MONUMENT PER 2015 CALTRANS STANDARD PLANS DETAIL A74 TYPE D
- DIMENSION POINT, NOTHING FOUND OR SET
- FOUND MONUMENT AS NOTED
- ⊗ SET 5/8" REBAR AND CAP TAGGED LS8501
- SEARCH NOT FOUND
- SET 5/8" REBAR AND CAP TAGGED LS8501
- ⊗ SET 3/8" REBAR AND CAP TAGGED LS8501
- PROPERTY LINE
- - - EXISTING RIGHT-OF-WAY
- - - EASEMENT
- ROAD CENTERLINE
- ADJOINER PARCEL

**NOTES**

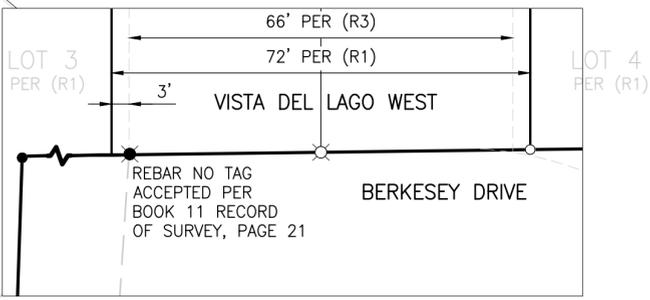
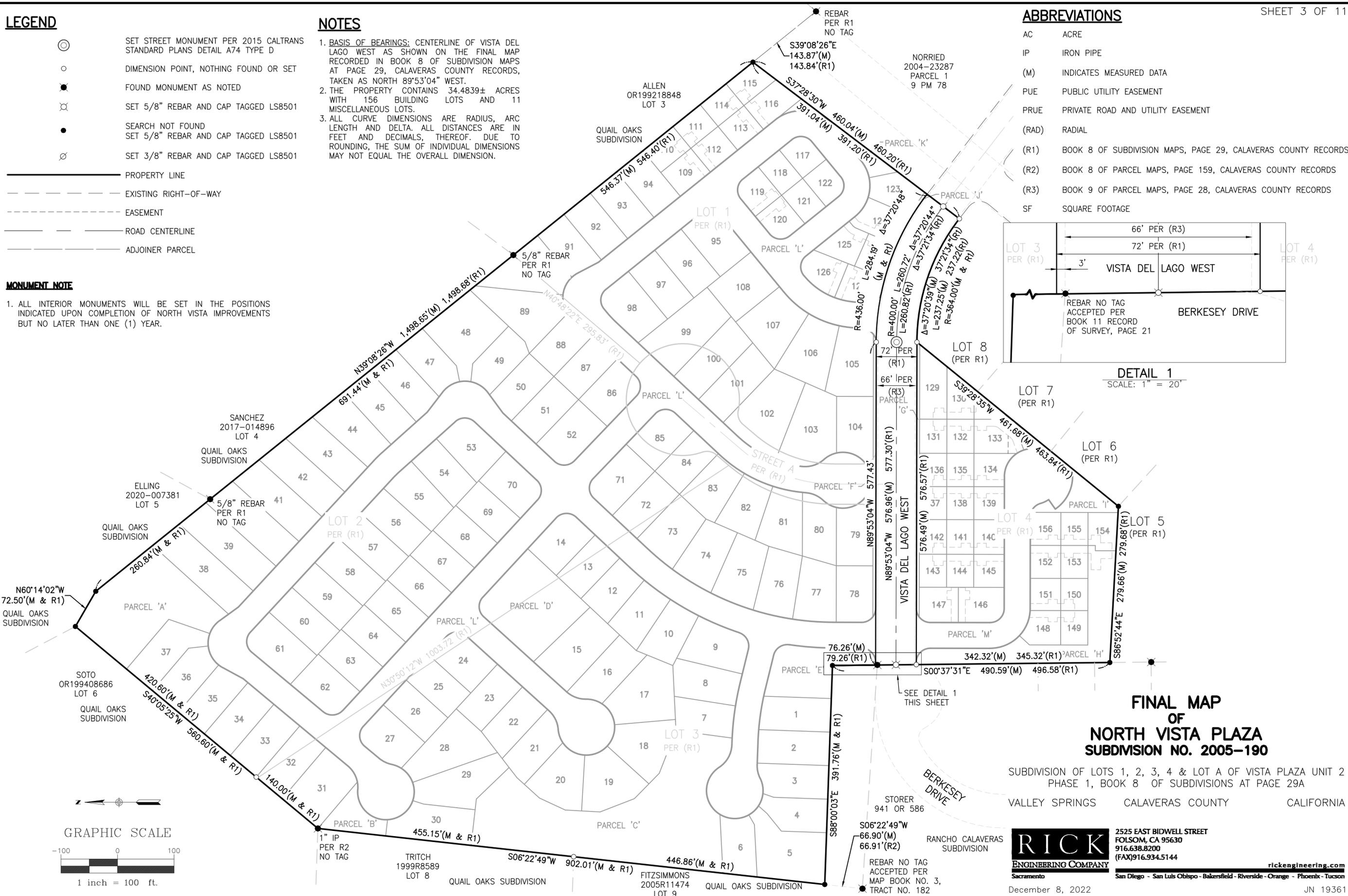
1. BASIS OF BEARINGS: CENTERLINE OF VISTA DEL LAGO WEST AS SHOWN ON THE FINAL MAP RECORDED IN BOOK 8 OF SUBDIVISION MAPS AT PAGE 29, CALAVERAS COUNTY RECORDS, TAKEN AS NORTH 89°53'04" WEST.
2. THE PROPERTY CONTAINS 34.4839± ACRES WITH 156 BUILDING LOTS AND 11 MISCELLANEOUS LOTS.
3. ALL CURVE DIMENSIONS ARE RADIUS, ARC LENGTH AND DELTA. ALL DISTANCES ARE IN FEET AND DECIMALS, THEREOF. DUE TO ROUNDING, THE SUM OF INDIVIDUAL DIMENSIONS MAY NOT EQUAL THE OVERALL DIMENSION.

**ABBREVIATIONS**

- AC ACRE
- IP IRON PIPE
- (M) INDICATES MEASURED DATA
- PUE PUBLIC UTILITY EASEMENT
- PRUE PRIVATE ROAD AND UTILITY EASEMENT
- (RAD) RADIAL
- (R1) BOOK 8 OF SUBDIVISION MAPS, PAGE 29, CALAVERAS COUNTY RECORDS
- (R2) BOOK 8 OF PARCEL MAPS, PAGE 159, CALAVERAS COUNTY RECORDS
- (R3) BOOK 9 OF PARCEL MAPS, PAGE 28, CALAVERAS COUNTY RECORDS
- SF SQUARE FOOTAGE

**MONUMENT NOTE**

1. ALL INTERIOR MONUMENTS WILL BE SET IN THE POSITIONS INDICATED UPON COMPLETION OF NORTH VISTA IMPROVEMENTS BUT NO LATER THAN ONE (1) YEAR.



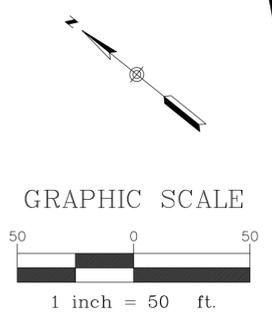
DETAIL 1  
SCALE: 1" = 20'

**FINAL MAP OF NORTH VISTA PLAZA SUBDIVISION NO. 2005-190**

SUBDIVISION OF LOTS 1, 2, 3, 4 & LOT A OF VISTA PLAZA UNIT 2 PHASE 1, BOOK 8 OF SUBDIVISIONS AT PAGE 29A  
VALLEY SPRINGS CALAVERAS COUNTY CALIFORNIA

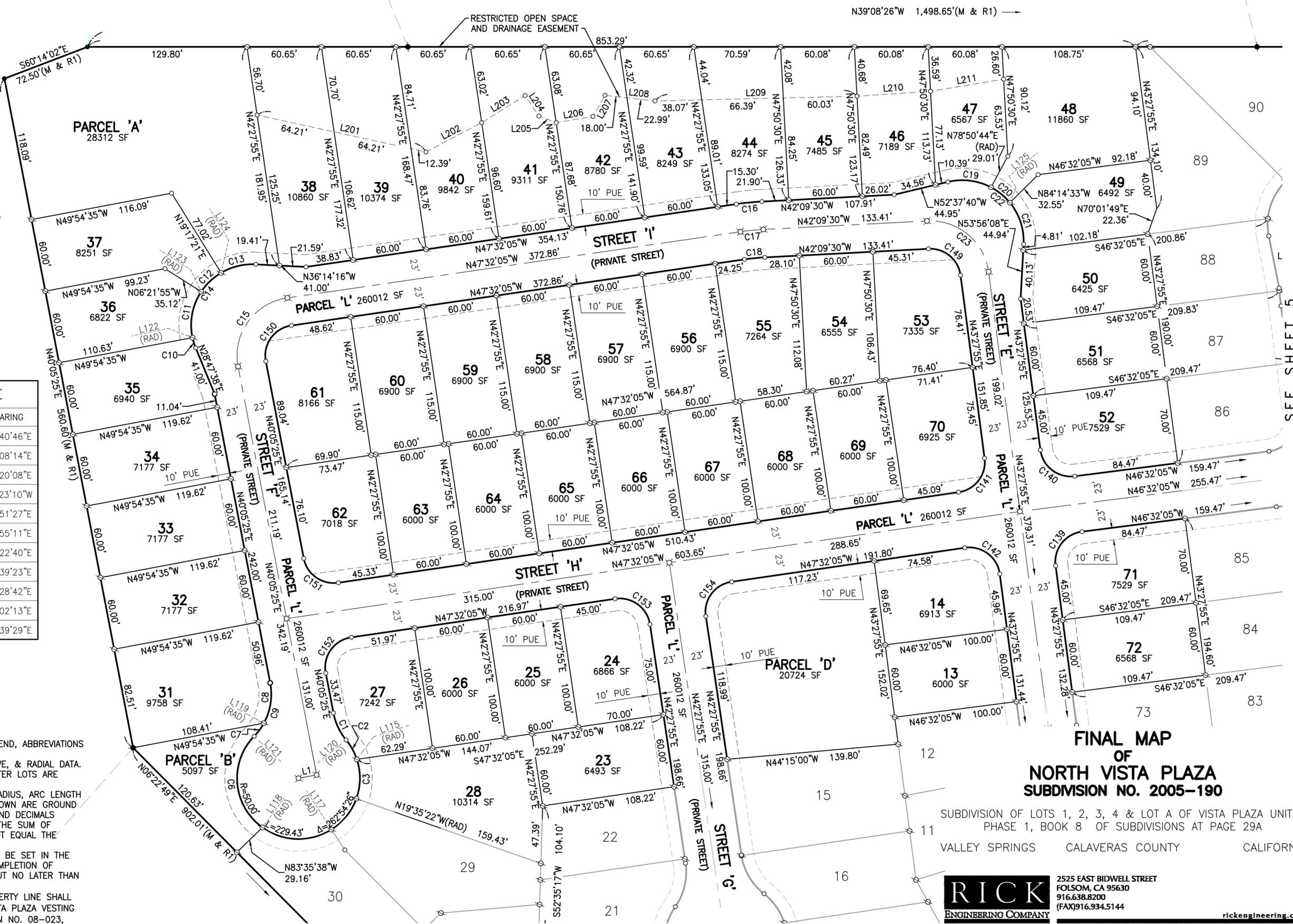


2525 EAST BIDWELL STREET  
FOLSOM, CA 95630  
916.638.8200  
(FAX)916.934.5144



OPEN SPACE		
LINE NO.	LENGTH	BEARING
L201	140.80'	S26°40'46"E
L202	51.40'	S67°08'14"E
L203	41.85'	S71°20'08"E
L204	20.22'	S17°23'10"W
L205	15.13'	S17°51'27"E
L206	30.31'	S48°55'11"E
L207	20.02'	N80°22'40"E
L208	40.99'	S32°39'23"E
L209	164.49'	S40°28'42"E
L210	60.01'	S43°02'13"E
L211	60.39'	S48°39'29"E

- NOTES:**
- SEE SHEET 3 FOR NOTES, LEGEND, ABBREVIATIONS AND BASIS OF BEARINGS.
  - SEE SHEET 11 FOR LINE, CURVE, & RADIAL DATA.
  - ACCESS EASEMENTS FOR CLUSTER LOTS ARE SHOWN ON SHEETS 8 & 9.
  - ALL CURVE DIMENSIONS ARE RADIUS, ARC LENGTH AND DELTA. ALL DISTANCES SHOWN ARE GROUND DISTANCES AND ARE IN FEET AND DECIMALS THEREOF. DUE TO ROUNDING, THE SUM OF INDIVIDUAL DIMENSIONS MAY NOT EQUAL THE OVERALL DIMENSION.
  - ALL INTERIOR MONUMENTS WILL BE SET IN THE POSITIONS INDICATED UPON COMPLETION OF NORTH VISTA IMPROVEMENTS BUT NO LATER THAN ONE (1) YEAR.
  - BUILDING SETBACK FROM PROPERTY LINE SHALL BE PER EXHIBIT 7 (NORTH VISTA PLAZA VESTING TENTATIVE MAP) OF RESOLUTION NO. 08-023, PASSED AND ADOPTED ON 01/22/2008.



SEE SHEET 6

**FINAL MAP  
OF  
NORTH VISTA PLAZA  
SUBDIVISION NO. 2005-190**

SUBDIVISION OF LOTS 1, 2, 3, 4 & LOT A OF VISTA PLAZA UNIT 2  
PHASE 1, BOOK 8 OF SUBDIVISIONS AT PAGE 29A  
VALLEY SPRINGS CALAVERAS COUNTY CALIFORNIA

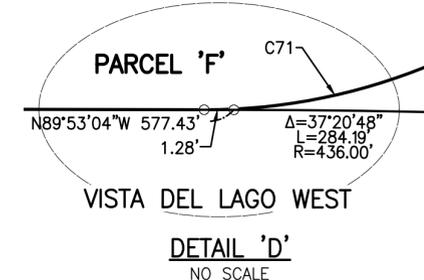
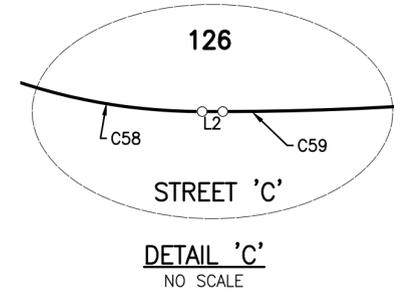
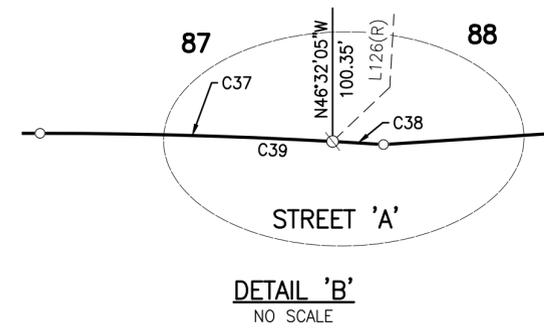
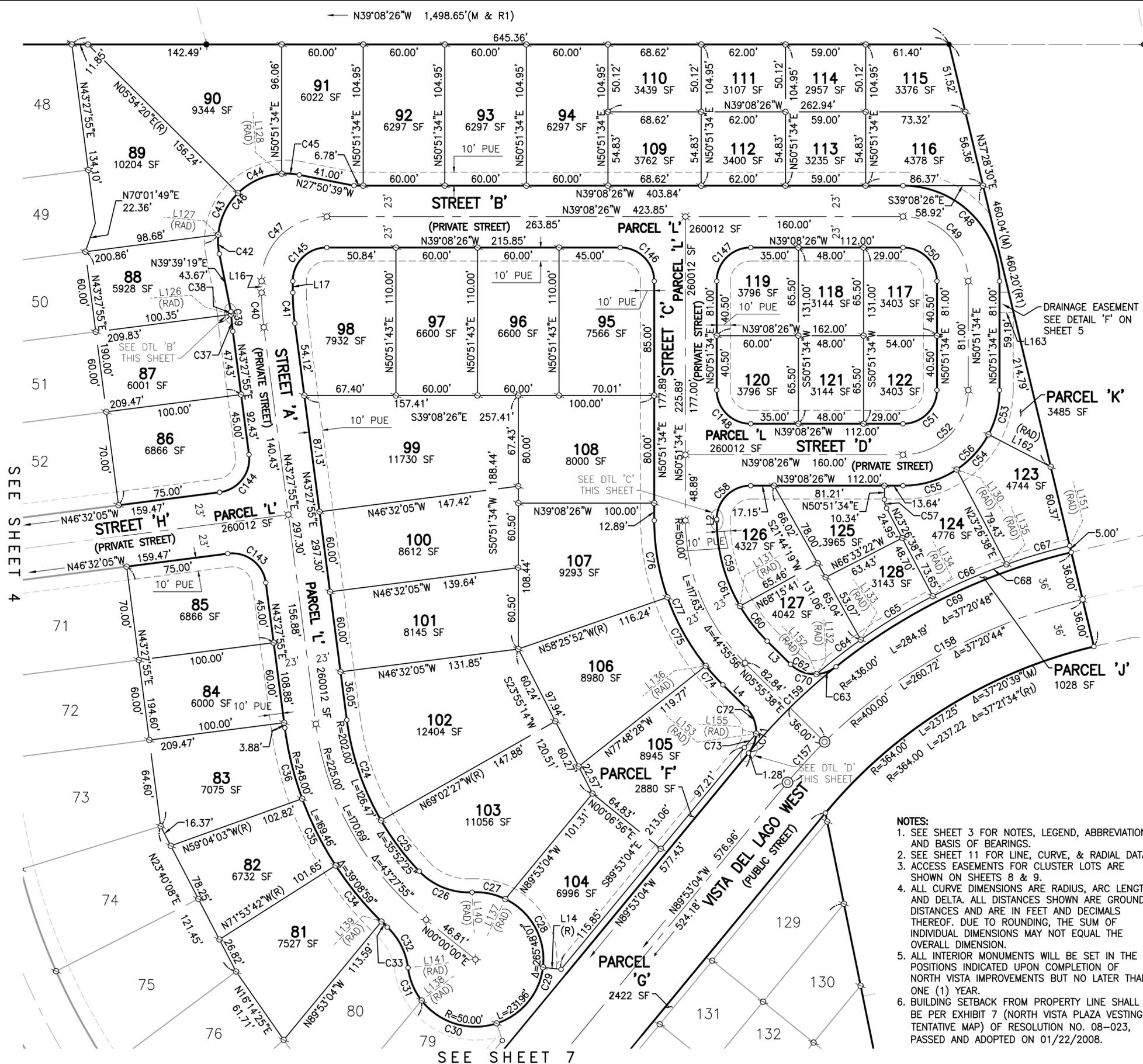


2525 EAST BIDWELL STREET  
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916.638.8200  
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December 8, 2022

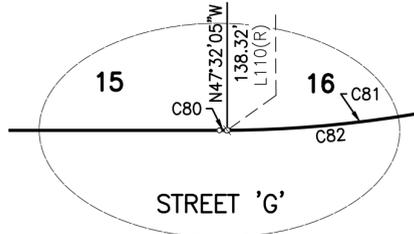
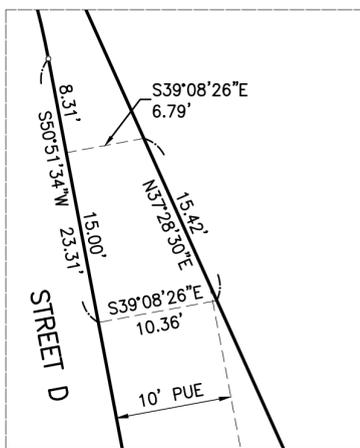
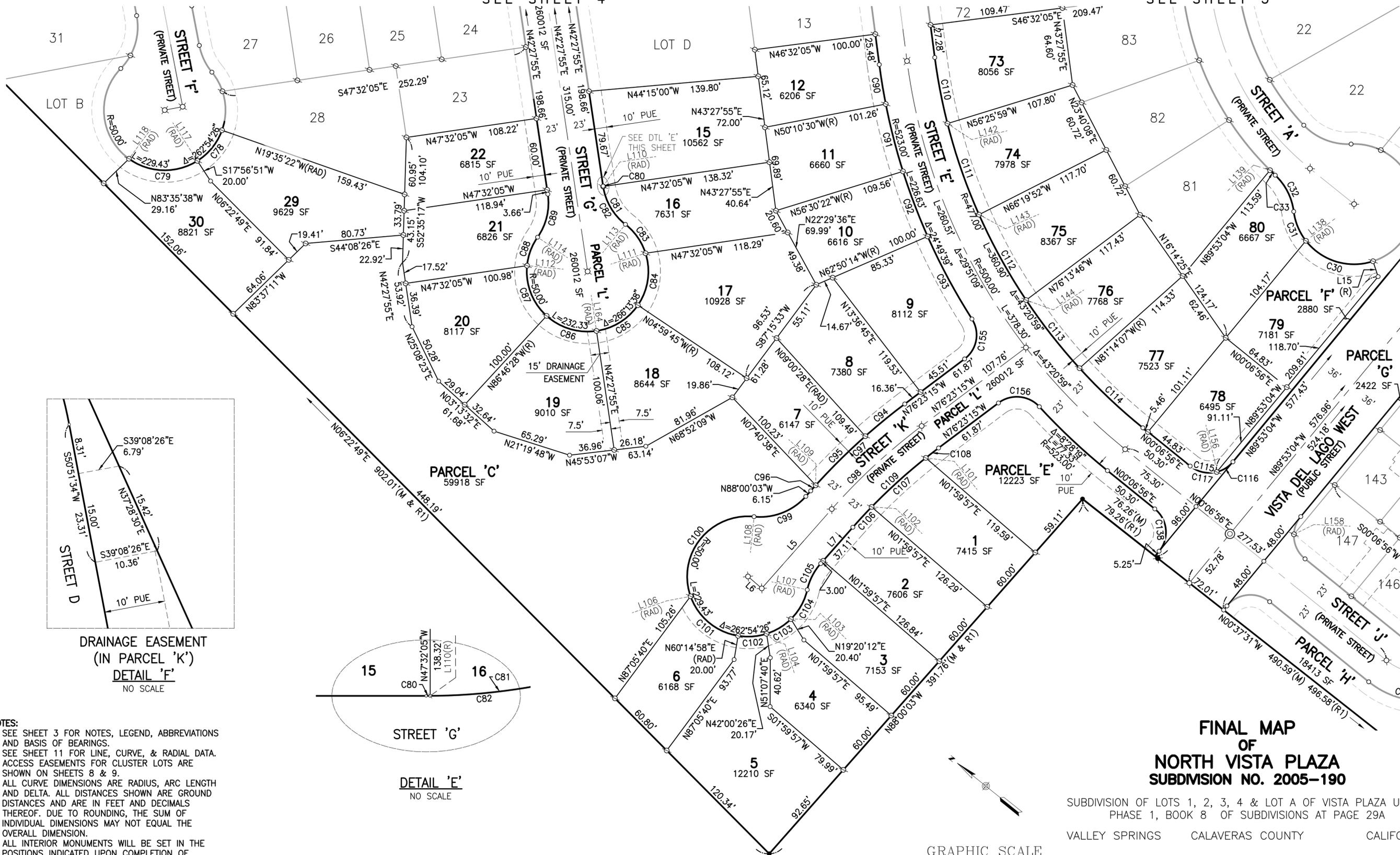
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JN 19361

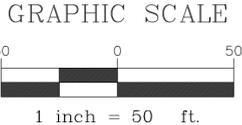


SEE SHEET 4

SEE SHEET 5



- NOTES:**
1. SEE SHEET 3 FOR NOTES, LEGEND, ABBREVIATIONS AND BASIS OF BEARINGS.
  2. SEE SHEET 11 FOR LINE, CURVE, & RADIAL DATA.
  3. ACCESS EASEMENTS FOR CLUSTER LOTS ARE SHOWN ON SHEETS 8 & 9.
  4. ALL CURVE DIMENSIONS ARE RADIUS, ARC LENGTH AND DELTA. ALL DISTANCES SHOWN ARE GROUND DISTANCES AND ARE IN FEET AND DECIMALS THEREOF. DUE TO ROUNDING, THE SUM OF INDIVIDUAL DIMENSIONS MAY NOT EQUAL THE OVERALL DIMENSION.
  5. ALL INTERIOR MONUMENTS WILL BE SET IN THE POSITIONS INDICATED UPON COMPLETION OF NORTH VISTA IMPROVEMENTS BUT NO LATER THAN ONE (1) YEAR.
  6. BUILDING SETBACK FROM PROPERTY LINE SHALL BE PER EXHIBIT 7 (NORTH VISTA PLAZA VESTING TENTATIVE MAP) OF RESOLUTION NO. 08-023, PASSED AND ADOPTED ON 01/22/2008.



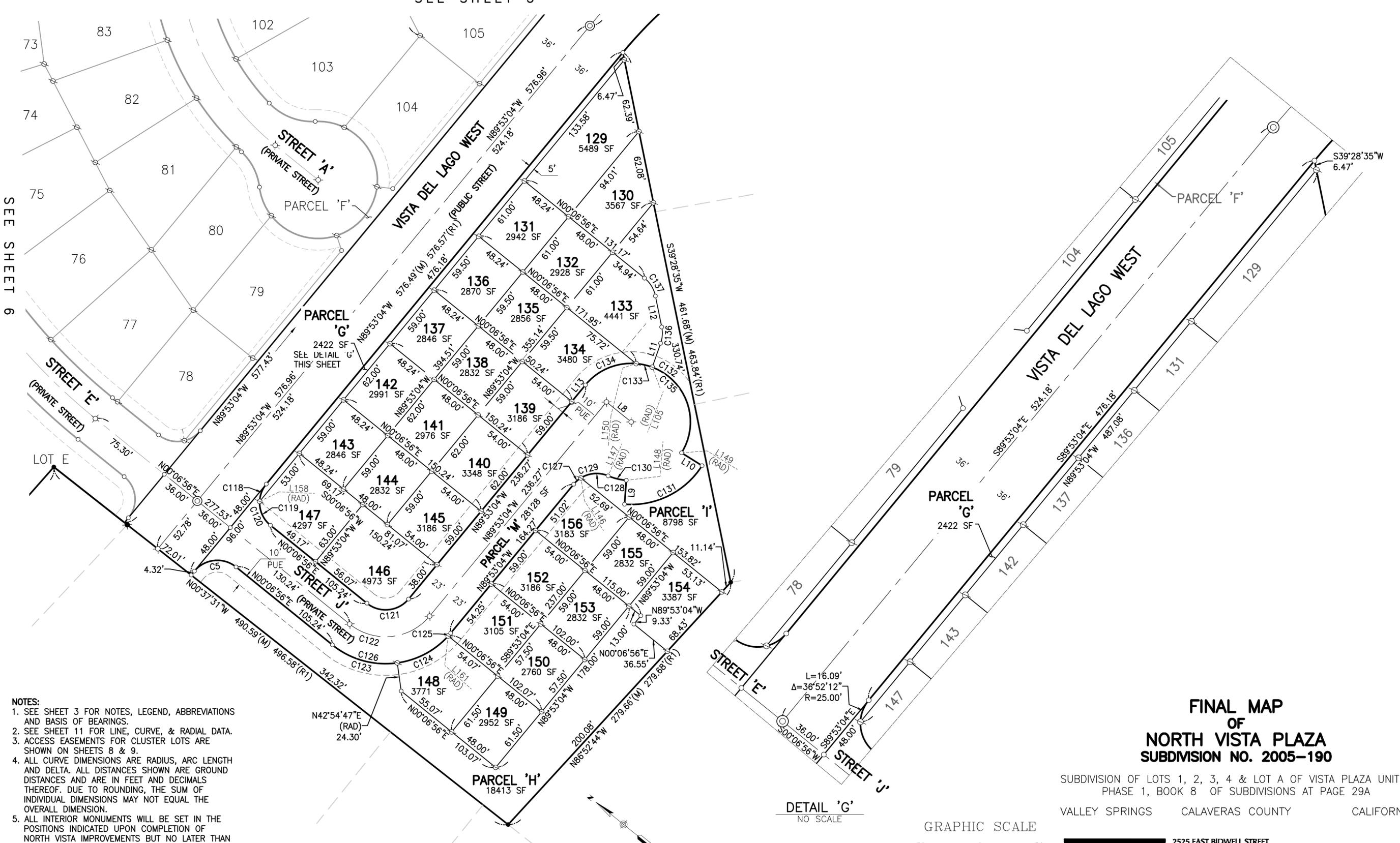
**FINAL MAP OF NORTH VISTA PLAZA SUBDIVISION NO. 2005-190**

SUBDIVISION OF LOTS 1, 2, 3, 4 & LOT A OF VISTA PLAZA UNIT 2 PHASE 1, BOOK 8 OF SUBDIVISIONS AT PAGE 29A  
VALLEY SPRINGS CALAVERAS COUNTY CALIFORNIA

**RICK ENGINEERING COMPANY**  
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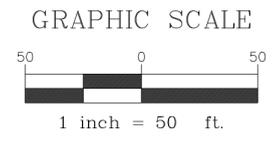
SEE SHEET 5

SEE SHEET 6



- NOTES:**
1. SEE SHEET 3 FOR NOTES, LEGEND, ABBREVIATIONS AND BASIS OF BEARINGS.
  2. SEE SHEET 11 FOR LINE, CURVE, & RADIAL DATA.
  3. ACCESS EASEMENTS FOR CLUSTER LOTS ARE SHOWN ON SHEETS 8 & 9.
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  5. ALL INTERIOR MONUMENTS WILL BE SET IN THE POSITIONS INDICATED UPON COMPLETION OF NORTH VISTA IMPROVEMENTS BUT NO LATER THAN ONE (1) YEAR.
  6. BUILDING SETBACK FROM PROPERTY LINE SHALL BE PER EXHIBIT 7 (NORTH VISTA PLAZA VESTING TENTATIVE MAP) OF RESOLUTION NO. 08-023, PASSED AND ADOPTED ON 01/22/2008.

DETAIL 'G'  
NO SCALE



**FINAL MAP  
OF  
NORTH VISTA PLAZA  
SUBDIVISION NO. 2005-190**

SUBDIVISION OF LOTS 1, 2, 3, 4 & LOT A OF VISTA PLAZA UNIT 2  
PHASE 1, BOOK 8 OF SUBDIVISIONS AT PAGE 29A  
VALLEY SPRINGS CALAVERAS COUNTY CALIFORNIA



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December 8, 2022

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**MEMORANDUM OF UNDERSTANDING BETWEEN  
CALAVERAS UNIFIED SCHOOL DISTRICT  
AND  
CALAVERAS COUNTY WATER DISTRICT**

**THIS MEMORANDUM OF UNDERSTANDING (“MOU”)** is made and entered into this 13<sup>th</sup> day of December, 2018 (“Effective Date”), by and between the Calaveras Unified School District (hereinafter “CUSD”), a California public school district duly organized and existing under Chapter 1 of Division 3 of Title 2 of the Education Code of the State of California, and the Calaveras County Water District (hereinafter “CCWD”), a California water district duly organized and existing under Part 2 of Division 13 of the California Water Code (either of which is individually a “Party,” and which are collectively “the Parties”).

**WHEREAS**, CUSD owns and operates a private wastewater treatment facility on its Jenny Lind Elementary School property (hereinafter the “JLE Facility”), which meets the CUSD’s wastewater treatment and disposal requirements from the Regional Water Quality Control Board (RWQCB); and

**WHEREAS**, the JLE Facility has reached the end of its useful life and requires significant retrofit in order to continue reliable wastewater treatment as required by the RWQCB; and

**WHEREAS**, CUSD is eligible to receive a grant from the State Revolving Fund (hereinafter “SRF”) for 100% of the costs of all planning and construction to either retrofit the JLE Facility or to Regionalize with another publicly owned wastewater plant in the area (to an \$8 million maximum); and

**WHEREAS**, after careful study of these two alternatives, and in close collaboration with CCWD, the CUSD’s preferred approach is to regionalize with the CCWD by way of new lift stations and a new pipeline to the existing CCWD wastewater plant (hereinafter the “Project”), and ultimately removing the JLE Facility from active service; and

**WHEREAS**, the JLE Facility is estimated to require a maximum month **average daily flow of 5,400-gpd or 36 equivalent single family units (esfu’s)** which CCWD requires a one-time payment by CUSD of capacity fees in the amount of \$700,056 (36 esfu x \$19,446/esfu) to the La Contenta system to be made in order for the Project to proceed; and

**WHEREAS**, the Parties contemplate that, upon completion of the Project, the CUSD would transfer the ownership of the newly constructed lift stations and pipelines to the CCWD, and CCWD would undertake all compliance and operational responsibilities attendant to the JLE Facility; and

**WHEREAS**, the Parties wish to collaborate in the Project in accordance with the terms and conditions set forth in this MOU.

**NOW, THEREFORE**, the Parties hereto agree as follows:

1. The recitals and exhibits attached hereto, if any, are hereby accepted and incorporated into this MOU.
2. CUSD shall be the lead agency for all grant funding requests and CCWD shall cooperate, as necessary and appropriate, in this process. The Project shall be contingent upon CUSD securing full funding from the SRF for all costs of the Project. Absent said funding, this MOU shall terminate without liability of either Party as to the other.
3. Each party shall designate in writing a main contact person for regular Project communications at the time this MOU is executed.
4. SRF must approve all Project contract documents in order for a funding award to be made. CUSD shall be the lead in preparing construction contract documents that are consistent with SRF guidelines.
5. All documents prepared for the procurement of a Project contractor shall be subject to approval by the respective governing bodies of CUSD and CCWD. The Parties agree that time is of the essence in obtaining said approvals throughout the term of this MOU.
6. CUSD shall retain necessary consultant(s) to design the Project. However, the Parties agree that the work of the Project shall comply with CCWD engineering standards and all applicable local, state, and federal requirements, and that CCWD shall have the right to review Project design documents and submit comments during the Project's design phase.
7. CUSD shall procure a Project contractor in accordance with applicable public project competitive bidding requirements.
8. CUSD shall, at its sole cost, provide all project management, construction management, and quality control for the Project. CCWD is welcome to attend any and all construction management meetings at its own costs.
9. Upon completion of the Project, CUSD agrees to transfer to CCWD all newly constructed assets ("Asset Transfer"), necessary access and utility easements including deeds to real property upon which sewer lift stations, pipelines and associated facilities are situated. The Parties shall in good faith prepare any documents and take all actions needed to accomplish said Asset Transfer. Such Asset Transfer, access and easements shall allow unencumbered and unobstructed access by CCWD to said facilities without prohibitions or restrictions regarding operation, maintenance, upgrades, improvements and reconstruction. CCWD will make every effort to operate and maintain said facilities in a manner that minimizes impacts and is compatible with school schedules, classroom activities and student safety. CCWD will notify CUSD in the event of any emergencies or non-routine activities relating to its work on the subject facilities.
10. Upon completion of the Asset Transfer, CCWD shall assume full and complete responsibility for the wastewater operation and infrastructure beginning at the inlet to the new lift station (i.e., the "interceptor") including new lift stations, force mains and associated buildings, equipment and electrical systems. CUSD shall have no ownership

interest in, or responsibility for, infrastructure for transmission, treatment or disposal of wastewater from the JLE. CUSD shall, however, continue to own the pre-existing private sewer lateral at the JLE. CUSD shall be responsible for all sewer collection systems within the JLE facility ground including all sewers and manholes serving all buildings and structures on the site. CUSD responsibility shall end at the point the JLE facility's on-site sewer first enters the interceptor lift station.

11. Upon completion of the transfer of assets provided for in section 9, above, CUSD will be responsible to properly abandon its regulatory permit from the RWQCB.
12. CUSD shall further relinquish any and all interest in future connections to the wastewater infrastructure that CCWD may authorize, as long as the wastewater capacity of JLE School is the primary design consideration to ensure continuous service at its full build-out along the wastewater pipeline. That is, the Parties agree that JLE School has priority rights to the full capacity assigned to it in the Project design for the new pipeline, treatment plant, and disposal and thus has a priority right to use 100% of its assigned capacity.
13. The Parties agree that CUSD shall have a right to acquire wastewater capacity from CCWD at a one-time capacity fee of \$700,056 (or 36 esfu's x \$19,446/esfu) based upon standard fees effective July 1, 2018 until such time as the current Project application and funding are approved by SRF. CCWD will reserve capacity for CUSD for the duration of the subject SRF project application and subsequent construction until startup and operation of the facilities. If the current Project under consideration is not approved by the SRF, CUSD will relinquish any reservation of capacity or agreed fees previously granted by CCWD.
14. CUSD shall pay standard bi-monthly rates same as other CCWD customers subject to change and increases adopted by general Prop.218 proceedings. The initial bi-monthly rate shall be based on 20 esfu's (e.g. for 2019 a bi-monthly rate of \$187.23 per esfu or \$3,744.60 is applicable). Thereafter, according to CCWD standard policy, commercial accounts can be periodically reviewed every two (2) years, or after improvements are made to the school, or when school enrollment significantly changes (increases or decreases), in order to adjust bi-monthly charges for wastewater usage. Unless subsequently amended by both parties in writing, the following schedule shall apply:

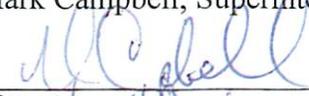
Max. Month Average Daily Flow (gpd)	Equivalent Single Family Unit Flow (gpd/esfu)	Equivalents (Bi-monthly Rate Factor)
3,000	150	20
3,300	150	22
3,600	150	24
3,900	150	26
4,200	150	28
4,500	150	30
4,800	150	32
5,100	150	34
5,400	150	36

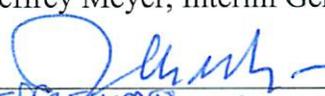
15. Upon Project completion and Asset Transfer to CCWD, the Parties agree to enter into a long-term agreement for service under which CCWD will continue to provide CUSD sewer service for JLE School at its standard bi-monthly rates, as stated above. This service agreement may have a temporary provision for an initial startup and optimization period at an adjusted annual cost that takes into consideration the value, beyond normal capacity fees, and benefits of a regionalization project recognized by CCWD under this MOU. The Engineering team will continue project design discussions after the SRF funding commitment is in place (likely in spring 2019).
16. Each Party, at its sole cost and expense, shall procure and maintain such policies of general and other insurance as shall be necessary to insure its employees, agents and affiliates against any claim or claims for damages arising by reason of personal injuries or death occasioned directly or indirectly in connection with the performance of each Party's obligations under this MOU, the use of any property and facility.
17. During the project period funded by the State Revolving Fund (SRF), CCWD shall indemnify, hold harmless and defend CUSD and each of its officers, officials, employees, agents and volunteers from any and all loss, liability, fines, penalties, forfeitures, costs and damages (whether in contract, tort or strict liability, including but not limited to personal injury, death at any time and property damage) incurred by CUSD or any other person, and from any and all claims, demands and actions in law or equity (including attorney's fees and litigation expenses), arising directly or indirectly from the negligent or intentional acts or omissions of CCWD or any of its officers, directors, board members, employees, agents or volunteers in the performance of this MOU; provided nothing herein shall constitute a waiver of governmental immunities including California Government Code Section 810 et seq.
18. During the project period funded by the State Revolving Fund (SRF), CUSD shall indemnify, hold harmless and defend CCWD and each of its officers, directors, trustees, employees, agents and volunteers from any and all loss, liability, fines, penalties, forfeitures, costs and damages (whether in contract, tort or strict liability, including but not limited to personal injury, death at any time and property damage) incurred by CCWD or any other person, and from any and all claims, demands and actions in law or equity (including attorney's fees and litigation expenses), arising directly or indirectly from the negligent or intentional acts or omissions of CUSD or any of its officers, officials, employees, agents or volunteers in the performance of this MOU; provided nothing herein shall constitute a waiver of governmental immunities including California Government Code Section 810 et seq.
19. This MOU contains the entire agreement between the Parties with respect to the matters covered herein, and supersedes all prior agreements, written or oral, between the Parties. No other agreement, statement, or promise made by any Party not contained herein shall be binding or valid. This MOU shall be construed as one document and all of the agreements herein are in exchange for and in consideration of the commitments of each and all of the Parties herein as set out above.

20. This MOU may be amended only by a writing signed by the Parties.
21. Should any provision of this MOU be declared or determined by any court of competent jurisdiction to be illegal, invalid, or unenforceable, the legality, validity, and enforceability of the remaining parts, terms, or provisions shall not be affected thereby and said illegal, unenforceable, or invalid part, term, or provision shall be deemed not to be part of this MOU.
22. This MOU shall be construed, determined and enforced in accordance with the laws of the State of California with venue in Calaveras County, California.
23. The Parties agree that each Party has independently reviewed this MOU; and that any rules of construction to the effect that ambiguities are to be resolved against the drafting Party shall not apply in any interpretation of this MOU or any amendments or exhibits thereto.
24. This MOU may be executed in any number of counterparts, each of which shall be deemed an original and all of which shall constitute together one and the same instrument.
25. If either party is required to commence any proceeding or legal action to enforce or interpret any term, covenant or condition of this MOU, the prevailing party in such proceeding or action shall be entitled to recover from the other party its reasonable attorney's fees and legal expenses.
26. CUSD and CCWD are acting as independent contractors. Neither party, nor any of its officers, associates, agents, or employees shall be deemed an employee, partner, or agent of the other for any purpose.
27. Neither party shall use discriminatory practices in their respective performance under this MOU on the basis of race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, sex, age, sexual orientation, and ethnicity, status as a disabled veteran or veteran of the Vietnam era.
28. The waiver by either party of a breach by the other of any provision of this MOU shall not constitute a continuing waiver or a waiver of any subsequent breach of either the same or a different provision of this MOU. No provisions of this MOU may be waived unless in writing and signed by all parties to this MOU. Waiver of any one provision herein shall not be deemed to be a waiver of any other provision herein.
29. The Parties, through their authorized representatives, have executed this MOU as of the day and year first written above.
30. All notices and other communications required hereunder or related hereto shall be directed, respectively, to:

Calaveras Unified School District  
Mark Campbell, Superintendent

Calaveras County Water District  
Jeffrey Meyer, Interim General Manager

  
\_\_\_\_\_  
mcampbe1@calaveras.k12.ca (email)  
209-754-2215 (facsimile)  
209-754-2301 (telephone)

  
\_\_\_\_\_  
jeffrey.meyer@ccwd.org (email)  
209-754-1069 (facsimile)  
209-754-3028 (telephone)

**IN WITNESS WHEREOF** the Parties hereto have executed this MOU as of the date first above written.

DATED: December 11, 2018

CALAVERAS UNIFIED SCHOOL DISTRICT

By: Lynne M. McThom

DATED: December 19, 2018

CALAVERAS COUNTY WATER DISTRICT

By: Deborah DeHeer

APPROVED AS TO FORM:

  
\_\_\_\_\_  
Bryan G. Martin, Legal Counsel for  
Calaveras Unified School District

  
\_\_\_\_\_  
Dave Cameron, Legal Counsel for  
Calaveras County Water District

## **APPENDIX D**

### **CURRENT UNSERVED PARCELS BY APN**

APPENDIX D

COMMERCIAL PARCELS		
APN	Zone	Area, acres
46001117	C2	6.25
46001153	M4-PD	27.81
46001154	R3-PD/C1-DR	11.26
46016025	C2	13.94
46016026	C2	5.52
46016027	C2	15.91
46016052	C2	0.51
46016053	C2	0.43
46016072	C2/M4	29.79
46016080	M2-PX	2.19
46016081	M2-PX	2.40
46036010	C2	0.52
46036022	M2	0.49
46036025	M2	1.08
46036032	C2	0.33
46036046	C2-PX	0.24
46036055	C2	0.46
73042110	C2-PD-PX	1.76
73042112	C2-PD-PX	1.02
73042113	C2-PD-PX	1.00
73044010	CP	3.37
73044011	CP	2.20
73047003	C2-PD-PX	0.14
73047009	C2-PD-PX	1.26
73047010	C2-PD-PX	0.23
73047011	C2-PD-PX	0.20
73049007	C2-PD-PX	2.33
73049010	C2-PD-PX	5.45
73049011	C2-PD-PX	1.36
73049012	C2-PD-PX	1.24
73049013	C2-PD-PX	2.84
73056004	C2	1.02
73056005	C2	1.07
73056006	C2	1.18
73056010	C2	1.07
73056011	C2	1.00
73056012	C2	1.23
74001021	C1	0.45
74002014	C1	0.59
74002039	C1	0.58
74002040	C1	1.12
74015033	C1	0.18
TOTAL AREA, acres		153.0

RESIDENTIAL PARCELS		
Number	Zone	Area, acres
73042028	RR-5	45.21
73042087	R1/REC-PD	30.81
73042131	RR-5	41.05
73044002	RR-5	5.01
73044003	RR-5	5.01
73044004	RR-5	5.00
73044007	RR-5	5.01
73057005	R1/REC-PD	28.87
73057006	R1/REC-PD	11.02
TOTAL AREA, acres		177.0

## APPENDIX D

RESIDENTIAL INFILL		
APN	Zone	Area, acres
72010005	RR-1	0.36
72011007	RR-0.5	0.50
73042125	R1	0.29
73045040	R1-MH-PD	0.30
73045041	R1-MH-PD	0.29
73045042	R1-MH-PD	0.44
73046017	R1-MH-PD	0.17
73046023	R1-MH-PD	0.21
73046024	R1-MH-PD	0.20
73046025	R1-MH-PD	0.19
73046026	R1-MH-PD	0.19
73046027	R1-MH-PD	0.16
73046028	R1-MH-PD	0.14
73046029	R1-MH-PD	0.16
73046033	R1-MH-PD	0.19
73046034	R1-MH-PD	0.14
73046035	R1-MH-PD	0.20
73046037	R1-MH-PD	0.31
73046038	R1-MH-PD	0.21
73046042	R1-MH-PD	0.65
73046047	R1-MH-PD	0.45
73052014	R1-MH-PD	0.15
73052015	R1-MH-PD	0.14
73052016	R1-MH-PD	0.13
73052017	R1-MH-PD	0.12
73052018	R1-MH-PD	0.13
73059009	R1	0.29
73059011	R1	0.41
73059012	R1	0.73
74001014	R1	0.26
74002009	R1	0.44
74002023	R1	0.35
74003006	R1	0.41
74003013	R1	0.88
74003016	R1	0.40
74003027	R1	0.52
74003030	R1	1.32
74004010	R1	0.33
74004013	R1	0.34
74004016	R1	0.40

## APPENDIX D

RESIDENTIAL INFILL		
APN	Zone	Area, acres
74004018	R1	0.38
74004022	R1	0.75
74005005	R1	0.28
74006004	R1	0.40
74006029	R1	0.32
74007023	R1	0.33
74007028	R1	0.42
74007029	R1	0.30
74008003	R1	0.44
74008007	R1	0.61
74008009	R1	0.48
74008026	R1	0.38
74008035	R1	0.29
74008036	R1	0.33
74009014	R1	0.32
74009018	R1	0.30
74009023	R1	1.01
74009026	R1	0.41
74009029	R1	0.55
74009033	R1	0.42
74010015	R1	0.42
74010016	R1	0.44
74010017	R1	0.50
74010020	R1	0.46
74010027	R1	0.33
74012008	R1	0.48
74013009	R1	0.51
74013014	R1	0.41
74013022	R1	0.64
74013024	R1	0.61
74013025	R1	0.57
74013028	R1	0.90
74013034	R1	0.35
74015010	R1	0.14
74015018	R1	0.30
74015019	R1	0.30
74016011	R1	0.39
74016014	R1	0.49
74016025	R1	0.34
74016027	R1	0.61

APPENDIX D

RESIDENTIAL INFILL		
APN	Zone	Area, acres
74016028	R1	0.44
74018002	R1	0.52
74018004	R1	0.47
74018006	R1	0.43
74018015	R1	0.28
74018017	R1	0.28
74018021	R1	0.26
74018022	R1	0.31
74018023	R1	0.24
74018025	R1	0.24
74018027	R1	0.21
74018029	R1	0.45
74018030	R1	0.35
74018031	R1	0.56
74019004	R1	0.31
74019014	R1	0.32
74019015	R1	0.32
74019018	R1	0.32
74021006	R1	0.27
74023014	R1	0.26
74023016	R1	0.30
74024011	R1	0.35
74024015	R1	0.33
74025005	R1	0.31
74025008	R1	0.32
74025021	R1	0.30
74026018	R1	0.27
74027019	R1	0.38
74027026	R1	0.30
74027027	R1	0.33
74027028	R1	0.32
74032011	R3-PD	0.46
74032012	R3-PD	0.20
74032017	R3-PD	0.13
TOTAL LOTS		113

# **APPENDIX E**

LA CONTENTA WWTF  
2018 TO 2023 AVERAGE DRY WEATHER FLOWRATES

APPENDIX E

2018 ADWF		2019 ADWF		2020 ADWF		2021 ADWF		2022 ADWF		2023 ADWF	
Date	Influent, MGD										
7/1/2018	0.150	7/1/2019	0.168	7/1/2020	0.104	7/1/2021	0.144	7/1/2022	0.159	7/1/2023	0.154
7/2/2018	0.170	7/2/2019	0.157	7/2/2020	0.147	7/2/2021	0.164	7/2/2022	0.146	7/2/2023	0.190
7/3/2018	0.158	7/3/2019	0.164	7/3/2020	0.154	7/3/2021	0.122	7/3/2022	0.177	7/3/2023	0.135
7/4/2018	0.136	7/4/2019	0.140	7/4/2020	0.151	7/4/2021	0.152	7/4/2022	0.155	7/4/2023	0.172
7/5/2018	0.159	7/5/2019	0.157	7/5/2020	0.145	7/5/2021	0.124	7/5/2022	0.150	7/5/2023	0.153
7/6/2018	0.133	7/6/2019	0.152	7/6/2020	0.155	7/6/2021	0.157	7/6/2022	0.148	7/6/2023	0.160
7/7/2018	0.141	7/7/2019	0.149	7/7/2020	0.180	7/7/2021	0.148	7/7/2022	0.150	7/7/2023	0.153
7/8/2018	0.138	7/8/2019	0.177	7/8/2020	0.116	7/8/2021	0.131	7/8/2022	0.160	7/8/2023	0.154
7/9/2018	0.146	7/9/2019	0.216	7/9/2020	0.151	7/9/2021	0.139	7/9/2022	0.139	7/9/2023	0.177
7/10/2018	0.147	7/10/2019	0.114	7/10/2020	0.133	7/10/2021	0.143	7/10/2022	0.194	7/10/2023	0.167
7/11/2018	0.139	7/11/2019	0.152	7/11/2020	0.156	7/11/2021	0.157	7/11/2022	0.121	7/11/2023	0.156
7/12/2018	0.143	7/12/2019	0.168	7/12/2020	0.129	7/12/2021	0.137	7/12/2022	0.144	7/12/2023	0.155
7/13/2018	0.132	7/13/2019	0.154	7/13/2020	0.130	7/13/2021	0.147	7/13/2022	0.145	7/13/2023	0.149
7/14/2018	0.128	7/14/2019	0.152	7/14/2020	0.225	7/14/2021	0.146	7/14/2022	0.136	7/14/2023	0.165
7/15/2018	0.138	7/15/2019	0.154	7/15/2020	0.066	7/15/2021	0.130	7/15/2022	0.150	7/15/2023	0.154
7/16/2018	0.152	7/16/2019	0.196	7/16/2020	0.137	7/16/2021	0.140	7/16/2022	0.136	7/16/2023	0.150
7/17/2018	0.130	7/17/2019	0.129	7/17/2020	0.151	7/17/2021	0.152	7/17/2022	0.171	7/17/2023	0.173
7/18/2018	0.123	7/18/2019	0.150	7/18/2020	0.145	7/18/2021	0.144	7/18/2022	0.125	7/18/2023	0.154
7/19/2018	0.135	7/19/2019	0.136	7/19/2020	0.154	7/19/2021	0.142	7/19/2022	0.156	7/19/2023	0.147
7/20/2018	0.138	7/20/2019	0.154	7/20/2020	0.128	7/20/2021	0.147	7/20/2022	0.118	7/20/2023	0.135
7/21/2018	0.127	7/21/2019	0.163	7/21/2020	0.171	7/21/2021	0.137	7/21/2022	0.155	7/21/2023	0.142
7/22/2018	0.146	7/22/2019	0.141	7/22/2020	0.114	7/22/2021	0.132	7/22/2022	0.141	7/22/2023	0.145
7/23/2018	0.139	7/23/2019	0.173	7/23/2020	0.147	7/23/2021	0.141	7/23/2022	0.136	7/23/2023	0.175
7/24/2018	0.140	7/24/2019	0.150	7/24/2020	0.154	7/24/2021	0.123	7/24/2022	0.160	7/24/2023	0.148
7/25/2018	0.128	7/25/2019	0.145	7/25/2020	0.137	7/25/2021	0.156	7/25/2022	0.138	7/25/2023	0.157
7/26/2018	0.152	7/26/2019	0.151	7/26/2020	0.154	7/26/2021	0.150	7/26/2022	0.144	7/26/2023	0.136
7/27/2018	0.114	7/27/2019	0.143	7/27/2020	0.150	7/27/2021	0.135	7/27/2022	0.131	7/27/2023	0.139
7/28/2018	0.133	7/28/2019	0.155	7/28/2020	0.148	7/28/2021	0.131	7/28/2022	0.164	7/28/2023	0.149
7/29/2018	0.145	7/29/2019	0.139	7/29/2020	0.145	7/29/2021	0.136	7/29/2022	0.135	7/29/2023	0.129
7/30/2018	0.145	7/30/2019	0.182	7/30/2020	0.134	7/30/2021	0.154	7/30/2022	0.143	7/30/2023	0.187
7/31/2018	0.136	7/31/2019	0.116	7/31/2020	0.140	7/31/2021	0.119	7/31/2022	0.153	7/31/2023	0.125

APPENDIX E

2018 ADWF		2019 ADWF		2020 ADWF		2021 ADWF		2022 ADWF		2023 ADWF	
Date	Influent, MGD										
8/1/2018	0.126	8/1/2019	0.184	8/1/2020	0.172	8/1/2021	0.165	8/1/2022	0.159	8/1/2023	0.143
8/2/2018	0.133	8/2/2019	0.142	8/2/2020	0.116	8/2/2021	0.148	8/2/2022	0.143	8/2/2023	0.132
8/3/2018	0.115	8/3/2019	0.140	8/3/2020	0.145	8/3/2021	0.138	8/3/2022	0.137	8/3/2023	0.156
8/4/2018	0.125	8/4/2019	0.150	8/4/2020	0.156	8/4/2021	0.141	8/4/2022	0.129	8/4/2023	0.144
8/5/2018	0.138	8/5/2019	0.165	8/5/2020	0.109	8/5/2021	0.134	8/5/2022	0.144	8/5/2023	0.147
8/6/2018	0.137	8/6/2019	0.129	8/6/2020	0.146	8/6/2021	0.149	8/6/2022	0.166	8/6/2023	0.201
8/7/2018	0.119	8/7/2019	0.157	8/7/2020	0.136	8/7/2021	0.130	8/7/2022	0.143	8/7/2023	0.146
8/8/2018	0.131	8/8/2019	0.143	8/8/2020	0.150	8/8/2021	0.153	8/8/2022	0.157	8/8/2023	0.146
8/9/2018	0.129	8/9/2019	0.151	8/9/2020	0.138	8/9/2021	0.159	8/9/2022	0.160	8/9/2023	0.145
8/10/2018	0.138	8/10/2019	0.132	8/10/2020	0.158	8/10/2021	0.141	8/10/2022	0.124	8/10/2023	0.157
8/11/2018	0.129	8/11/2019	0.166	8/11/2020	0.150	8/11/2021	0.130	8/11/2022	0.133	8/11/2023	0.137
8/12/2018	0.132	8/12/2019	0.145	8/12/2020	0.110	8/12/2021	0.137	8/12/2022	0.143	8/12/2023	0.139
8/13/2018	0.148	8/13/2019	0.153	8/13/2020	0.132	8/13/2021	0.150	8/13/2022	0.149	8/13/2023	0.185
8/14/2018	0.128	8/14/2019	0.122	8/14/2020	0.147	8/14/2021	0.153	8/14/2022	0.168	8/14/2023	0.151
8/15/2018	0.129	8/15/2019	0.128	8/15/2020	0.146	8/15/2021	0.131	8/15/2022	0.160	8/15/2023	0.147
8/16/2018	0.137	8/16/2019	0.157	8/16/2020	0.138	8/16/2021	0.145	8/16/2022	0.149	8/16/2023	0.154
8/17/2018	0.131	8/17/2019	0.131	8/17/2020	0.141	8/17/2021	0.153	8/17/2022	0.130	8/17/2023	0.155
8/18/2018	0.121	8/18/2019	0.141	8/18/2020	0.157	8/18/2021	0.157	8/18/2022	0.138	8/18/2023	0.158
8/19/2018	0.132	8/19/2019	0.162	8/19/2020	0.108	8/19/2021	0.127	8/19/2022	0.147	8/19/2023	0.132
8/20/2018	0.147	8/20/2019	0.164	8/20/2020	0.128	8/20/2021	0.146	8/20/2022	0.148	8/20/2023	0.192
8/21/2018	0.144	8/21/2019	0.097	8/21/2020	0.128	8/21/2021	0.136	8/21/2022	0.130	8/21/2023	0.141
8/22/2018	0.133	8/22/2019	0.147	8/22/2020	0.149	8/22/2021	0.149	8/22/2022	0.154	8/22/2023	0.139
8/23/2018	0.127	8/23/2019	0.138	8/23/2020	0.150	8/23/2021	0.174	8/23/2022	0.148	8/23/2023	0.138
8/24/2018	0.132	8/24/2019	0.130	8/24/2020	0.136	8/24/2021	0.179	8/24/2022	0.148	8/24/2023	0.149
8/25/2018	0.122	8/25/2019	0.155	8/25/2020	0.159	8/25/2021	0.099	8/25/2022	0.123	8/25/2023	0.145
8/26/2018	0.148	8/26/2019	0.139	8/26/2020	0.109	8/26/2021	0.134	8/26/2022	0.139	8/26/2023	0.132
8/27/2018	0.132	8/27/2019	0.164	8/27/2020	0.134	8/27/2021	0.151	8/27/2022	0.142	8/27/2023	0.155
8/28/2018	0.142	8/28/2019	0.118	8/28/2020	0.140	8/28/2021	0.140	8/28/2022	0.147	8/28/2023	0.178
8/29/2018	0.145	8/29/2019	0.146	8/29/2020	0.115	8/29/2021	0.158	8/29/2022	0.159	8/29/2023	0.134
8/30/2018	0.118	8/30/2019	0.143	8/30/2020	0.146	8/30/2021	0.179	8/30/2022	0.155	8/30/2023	0.130
8/31/2018	0.137	8/31/2019	0.158	8/31/2020	0.137	8/31/2021	0.164	8/31/2022	0.134	8/31/2023	0.156

APPENDIX E

2018 ADWF		2019 ADWF		2020 ADWF		2021 ADWF		2022 ADWF		2023 ADWF	
Date	Influent, MGD										
9/1/2018	0.118	9/1/2019	0.150	9/1/2020	0.146	9/1/2021	0.133	9/1/2022	0.136	9/1/2023	0.241
9/2/2018	0.130	9/2/2019	0.136	9/2/2020	0.110	9/2/2021	0.152	9/2/2022	0.139	9/2/2023	0.133
9/3/2018	0.129	9/3/2019	0.185	9/3/2020	0.129	9/3/2021	0.142	9/3/2022	0.129	9/3/2023	0.194
9/4/2018	0.160	9/4/2019	0.133	9/4/2020	0.140	9/4/2021	0.137	9/4/2022	0.140	9/4/2023	0.107
9/5/2018	0.137	9/5/2019	0.149	9/5/2020	0.131	9/5/2021	0.147	9/5/2022	0.154	9/5/2023	0.181
9/6/2018	0.135	9/6/2019	0.146	9/6/2020	0.140	9/6/2021	0.154	9/6/2022	0.166	9/6/2023	0.139
9/7/2018	0.116	9/7/2019	0.127	9/7/2020	0.145	9/7/2021	0.157	9/7/2022	0.136	9/7/2023	0.143
9/8/2018	0.131	9/8/2019	0.151	9/8/2020	0.162	9/8/2021	0.131	9/8/2022	0.134	9/8/2023	0.139
9/9/2018	0.127	9/9/2019	0.153	9/9/2020	0.098	9/9/2021	0.140	9/9/2022	0.142	9/9/2023	0.129
9/10/2018	0.143	9/10/2019	0.153	9/10/2020	0.134	9/10/2021	0.135	9/10/2022	0.159	9/10/2023	0.161
9/11/2018	0.127	9/11/2019	0.130	9/11/2020	0.133	9/11/2021	0.134	9/11/2022	0.172	9/11/2023	0.130
9/12/2018	0.123	9/12/2019	0.140	9/12/2020	0.133	9/12/2021	0.161	9/12/2022	0.159	9/12/2023	0.185
9/13/2018	0.129	9/13/2019	0.146	9/13/2020	0.140	9/13/2021	0.141	9/13/2022	0.139	9/13/2023	0.126
9/14/2018	0.127	9/14/2019	0.126	9/14/2020	0.156	9/14/2021	0.142	9/14/2022	0.141	9/14/2023	0.142
9/15/2018	0.114	9/15/2019	0.158	9/15/2020	0.143	9/15/2021	0.129	9/15/2022	0.155	9/15/2023	0.140
9/16/2018	0.143	9/16/2019	0.156	9/16/2020	0.111	9/16/2021	0.151	9/16/2022	0.167	9/16/2023	0.146
9/17/2018	0.144	9/17/2019	0.172	9/17/2020	0.134	9/17/2021	0.113	9/17/2022	0.126	9/17/2023	0.205
9/18/2018	0.137	9/18/2019	0.120	9/18/2020	0.136	9/18/2021	0.136	9/18/2022	0.173	9/18/2023	0.121
9/19/2018	0.117	9/19/2019	0.144	9/19/2020	0.138	9/19/2021	0.157	9/19/2022	0.143	9/19/2023	0.140
9/20/2018	0.127	9/20/2019	0.153	9/20/2020	0.147	9/20/2021	0.157	9/20/2022	0.161	9/20/2023	0.145
9/21/2018	0.130	9/21/2019	0.140	9/21/2020	0.130	9/21/2021	0.137	9/21/2022	0.151	9/21/2023	0.143
9/22/2018	0.116	9/22/2019	0.141	9/22/2020	0.127	9/22/2021	0.124	9/22/2022	0.144	9/22/2023	0.149
9/23/2018	0.121	9/23/2019	0.154	9/23/2020	0.137	9/23/2021	0.137	9/23/2022	0.181	9/23/2023	0.138
9/24/2018	0.151	9/24/2019	0.155	9/24/2020	0.143	9/24/2021	0.146	9/24/2022	0.129	9/24/2023	0.153
9/25/2018	0.124	9/25/2019	0.131	9/25/2020	0.137	9/25/2021	0.133	9/25/2022	0.145	9/25/2023	0.171
9/26/2018	0.127	9/26/2019	0.132	9/26/2020	0.128	9/26/2021	0.156	9/26/2022	0.159	9/26/2023	0.149
9/27/2018	0.109	9/27/2019	0.142	9/27/2020	0.144	9/27/2021	0.158	9/27/2022	0.140	9/27/2023	0.140
9/28/2018	0.145	9/28/2019	0.128	9/28/2020	0.132	9/28/2021	0.137	9/28/2022	0.129	9/28/2023	0.158
9/29/2018	0.114	9/29/2019	0.143	9/29/2020	0.152	9/29/2021	0.137	9/29/2022	0.131	9/29/2023	0.139
9/30/2018	0.137	9/30/2019	0.154	9/30/2020	0.122	9/30/2021	0.142	9/30/2022	0.151	9/30/2023	0.132

# **APPENDIX F**

LA CONTENTA WWTF  
2020 TO 2023 DAILY FLOWRATES

APPENDIX F

2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
10/1/2020	0.128	0.160
10/2/2020	0.126	0.154
10/3/2020	0.144	0.180
10/4/2020	0.151	0.192
10/5/2020	0.184	0.228
10/6/2020	0.117	0.149
10/7/2020	0.123	0.148
10/8/2020	0.119	0.149
10/9/2020	0.137	0.203
10/10/2020	0.128	0.172
10/11/2020	0.174	0.228
10/12/2020	0.139	0.184
10/13/2020	0.155	0.211
10/14/2020	0.108	0.150
10/15/2020	0.128	0.183
10/16/2020	0.126	0.169
10/17/2020	0.131	0.186
10/18/2020	0.136	0.193
10/19/2020	0.140	0.195
10/20/2020	0.133	0.193
10/21/2020	0.138	0.188
10/22/2020	0.114	0.156
10/23/2020	0.131	0.180
10/24/2020	0.131	0.173
10/25/2020	0.142	0.190
10/26/2020	0.152	0.204
10/27/2020	0.165	0.221

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
10/1/2021	0.117	0.119
10/2/2021	0.146	0.144
10/3/2021	0.152	0.123
10/4/2021	0.166	0.137
10/5/2021	0.144	0.128
10/6/2021	0.126	0.124
10/7/2021	0.150	0.139
10/8/2021	0.134	0.143
10/9/2021	0.166	0.131
10/10/2021	0.113	0.136
10/11/2021	0.165	0.158
10/12/2021	0.131	0.125
10/13/2021	0.138	0.135
10/14/2021	0.131	0.131
10/15/2021	0.135	0.140
10/16/2021	0.147	0.191
10/17/2021	0.150	0.163
10/18/2021	0.144	0.155
10/19/2021	0.160	0.164
10/20/2021	0.133	0.132
10/21/2021	0.140	0.151
10/22/2021	0.142	0.175
10/23/2021	0.158	0.143
10/24/2021	0.189	0.221
10/25/2021	0.590	0.004
10/26/2021	0.357	0.000
10/27/2021	0.249	0.048

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
10/1/2022	0.134	0.154
10/2/2022	0.150	0.177
10/3/2022	0.145	0.156
10/4/2022	0.137	0.174
10/5/2022	0.134	0.166
10/6/2022	0.140	0.177
10/7/2022	0.143	0.195
10/8/2022	0.186	0.220
10/9/2022	0.152	0.183
10/10/2022	0.110	0.125
10/11/2022	0.141	0.168
10/12/2022	0.143	0.173
10/13/2022	0.130	0.157
10/14/2022	0.133	0.191
10/15/2022	0.149	0.170
10/16/2022	0.151	0.169
10/17/2022	0.162	0.180
10/18/2022	0.142	0.158
10/19/2022	0.138	0.155
10/20/2022	0.138	0.161
10/21/2022	0.141	0.168
10/22/2022	0.142	0.153
10/23/2022	0.155	0.164
10/24/2022	0.162	0.171
10/25/2022	0.150	0.165
10/26/2022	0.131	0.146
10/27/2022	0.145	0.178

APPENDIX F

2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
10/28/2020	0.099	0.137
10/29/2020	0.117	0.167
10/30/2020	0.143	0.196
10/31/2020	0.127	0.165
11/1/2020	0.183	0.226
11/2/2020	0.130	0.162
11/3/2020	0.135	0.273
11/4/2020	0.128	0.337
11/5/2020	0.114	0.137
11/6/2020	0.128	0.160
11/7/2020	0.141	0.040
11/8/2020	0.154	0.196
11/9/2020	0.146	0.178
11/10/2020	0.140	0.167
11/11/2020	0.104	0.126
11/12/2020	0.133	0.161
11/13/2020	0.136	0.185
11/14/2020	0.133	0.162
11/15/2020	0.140	0.168
11/16/2020	0.134	0.164
11/17/2020	0.146	0.195
11/18/2020	0.141	0.195
11/19/2020	0.172	0.225
11/20/2020	0.136	0.182
11/21/2020	0.141	0.185
11/22/2020	0.146	0.194
11/23/2020	0.156	0.205

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
10/28/2021	0.154	0.131
10/29/2021	0.186	0.194
10/30/2021	0.164	0.141
10/31/2021	0.189	0.160
11/1/2021	0.180	0.163
11/2/2021	0.172	0.152
11/3/2021	0.172	0.153
11/4/2021	0.147	0.132
11/5/2021	0.168	0.151
11/6/2021	0.160	0.141
11/7/2021	0.176	0.167
11/8/2021	0.198	0.183
11/9/2021	0.174	0.168
11/10/2021	0.157	0.151
11/11/2021	0.165	0.162
11/12/2021	0.167	0.160
11/13/2021	0.169	0.167
11/14/2021	0.176	0.160
11/15/2021	0.195	0.176
11/16/2021	0.161	0.142
11/17/2021	0.149	0.139
11/18/2021	0.152	0.139
11/19/2021	0.152	0.148
11/20/2021	0.165	0.170
11/21/2021	0.203	0.195
11/22/2021	0.161	0.148
11/23/2021	0.174	0.157

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
10/28/2022	0.137	0.194
10/29/2022	0.139	0.173
10/30/2022	0.158	0.192
10/31/2022	0.153	0.161
11/1/2022	0.183	0.203
11/2/2022	0.110	0.120
11/3/2022	0.167	0.175
11/4/2022	0.151	0.157
11/5/2022	0.138	0.155
11/6/2022	0.185	0.200
11/7/2022	0.159	0.183
11/8/2022	0.175	0.185
11/9/2022	0.243	0.223
11/10/2022	0.183	0.180
11/11/2022	0.144	0.146
11/12/2022	0.168	0.169
11/13/2022	0.177	0.182
11/14/2022	0.158	0.165
11/15/2022	0.159	0.173
11/16/2022	0.150	0.172
11/17/2022	0.148	0.162
11/18/2022	0.160	0.171
11/19/2022	0.133	0.157
11/20/2022	0.154	0.176
11/21/2022	0.165	0.186
11/22/2022	0.159	0.182
11/23/2022	0.143	0.170

APPENDIX F

2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
11/24/2020	0.123	0.169
11/25/2020	0.129	0.177
11/26/2020	0.141	0.183
11/27/2020	0.142	0.188
11/28/2020	0.140	0.185
11/29/2020	0.144	0.192
11/30/2020	0.151	0.200
12/1/2020	0.120	0.168
12/2/2020	0.137	0.161
12/3/2020	0.138	0.179
12/4/2020	0.128	0.178
12/5/2020	0.125	0.158
12/6/2020	0.160	0.206
12/7/2020	0.131	0.169
12/8/2020	0.117	0.167
12/9/2020	0.139	0.197
12/10/2020	0.140	0.197
12/11/2020	0.155	0.000
12/12/2020	0.129	0.122
12/13/2020	0.147	0.189
12/14/2020	0.214	0.270
12/15/2020	0.139	0.174
12/16/2020	0.148	0.187
12/17/2020	0.156	0.194
12/18/2020	0.158	0.210
12/19/2020	0.134	0.164
12/20/2020	0.150	0.208

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
11/24/2021	0.154	0.140
11/25/2021	0.151	0.137
11/26/2021	0.193	0.177
11/27/2021	0.153	0.142
11/28/2021	0.187	0.180
11/29/2021	0.168	0.164
11/30/2021	0.161	0.149
12/1/2021	0.171	0.162
12/2/2021	0.145	0.131
12/3/2021	0.165	0.186
12/4/2021	0.146	0.174
12/5/2021	0.164	0.155
12/6/2021	0.195	0.174
12/7/2021	0.199	0.180
12/8/2021	0.109	0.097
12/9/2021	0.157	0.140
12/10/2021	0.195	0.172
12/11/2021	0.165	0.136
12/12/2021	0.177	0.158
12/13/2021	0.269	0.244
12/14/2021	0.461	0.292
12/15/2021	0.316	0.025
12/16/2021	0.271	0.242
12/17/2021	0.254	0.224
12/18/2021	0.296	0.250
12/19/2021	0.220	0.195
12/20/2021	0.210	0.179

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
11/24/2022	0.158	0.184
11/25/2022	0.160	0.196
11/26/2022	0.155	0.194
11/27/2022	0.167	0.217
11/28/2022	0.165	0.206
11/29/2022	0.160	0.174
11/30/2022	0.139	0.155
12/1/2022	0.159	0.228
12/2/2022	0.238	0.254
12/3/2022	0.162	0.200
12/4/2022	0.340	0.287
12/5/2022	0.254	0.215
12/6/2022	0.224	0.210
12/7/2022	0.187	0.160
12/8/2022	0.166	0.155
12/9/2022	0.185	0.228
12/10/2022	0.174	0.172
12/11/2022	0.526	0.106
12/12/2022	0.389	0.009
12/13/2022	0.294	0.252
12/14/2022	0.204	0.178
12/15/2022	0.206	0.185
12/16/2022	0.210	0.193
12/17/2022	0.180	0.167
12/18/2022	0.197	0.182
12/19/2022	0.213	0.188
12/20/2022	0.182	0.163

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2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
12/21/2020	0.164	0.233
12/22/2020	0.179	0.218
12/23/2020	0.117	0.153
12/24/2020	0.138	0.180
12/25/2020	0.147	0.194
12/26/2020	0.150	0.193
12/27/2020	0.161	0.217
12/28/2020	0.165	0.227
12/29/2020	0.146	0.196
12/30/2020	0.179	0.249
12/31/2020	0.115	0.150
1/1/2021	0.134	0.191
1/2/2021	0.143	0.195
1/3/2021	0.160	0.201
1/4/2021	0.150	0.194
1/5/2021	0.138	0.179
1/6/2021	0.138	0.199
1/7/2021	0.158	0.248
1/8/2021	0.140	0.182
1/9/2021	0.119	0.162
1/10/2021	0.178	0.230
1/11/2021	0.128	0.184
1/12/2021	0.146	0.220
1/13/2021	0.153	0.229
1/14/2021	0.140	0.182
1/15/2021	0.135	0.179
1/16/2021	0.132	0.167

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
12/21/2021	0.187	0.162
12/22/2021	0.210	0.183
12/23/2021	0.235	0.218
12/24/2021	0.469	0.071
12/25/2021	0.356	0.326
12/26/2021	0.406	0.375
12/27/2021	0.393	0.355
12/28/2021	0.451	0.305
12/29/2021	0.310	0.274
12/30/2021	0.307	0.280
12/31/2021	0.279	0.244
1/1/2022	0.263	0.226
1/2/2022	0.236	0.204
1/3/2022	0.254	0.217
1/4/2022	0.216	0.184
1/5/2022	0.214	0.192
1/6/2022	0.200	0.167
1/7/2022	0.203	0.179
1/8/2022	0.222	0.187
1/9/2022	0.208	0.186
1/10/2022	0.241	0.213
1/11/2022	0.178	0.152
1/12/2022	0.187	0.162
1/13/2022	0.205	0.148
1/14/2022	0.195	0.192
1/15/2022	0.192	0.189
1/16/2022	0.216	0.185

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
12/21/2022	0.178	0.165
12/22/2022	0.188	0.162
12/23/2022	0.184	0.180
12/24/2022	0.190	0.173
12/25/2022	0.201	0.178
12/26/2022	0.174	0.161
12/27/2022	0.342	0.202
12/28/2022	0.420	0.014
12/29/2022	0.278	0.231
12/30/2022	0.317	0.259
12/31/2022	0.980	0.098
1/1/2023	0.710	0.000
1/2/2023	0.424	0.020
1/3/2023	0.364	0.284
1/4/2023	0.302	0.277
1/5/2023	0.356	0.343
1/6/2023	0.436	0.400
1/7/2023	0.362	0.347
1/8/2023	0.338	0.310
1/9/2023	0.331	0.315
1/10/2023	0.598	0.515
1/11/2023	0.660	0.532
1/12/2023	0.417	0.391
1/13/2023	0.310	0.320
1/14/2023	0.399	0.355
1/15/2023	0.896	0.100
1/16/2023	0.920	0.374

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2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
1/17/2021	0.158	0.197
1/18/2021	0.141	0.180
1/19/2021	0.196	0.251
1/20/2021	0.101	0.126
1/21/2021	0.155	0.201
1/22/2021	0.126	0.161
1/23/2021	0.148	0.199
1/24/2021	0.183	0.238
1/25/2021	0.173	0.237
1/26/2021	0.177	0.213
1/27/2021	0.188	0.232
1/28/2021	0.430	0.495
1/29/2021	0.483	0.561
1/30/2021	0.229	0.263
1/31/2021	0.243	0.252
2/1/2021	0.200	0.255
2/2/2021	0.191	0.219
2/3/2021	0.232	0.216
2/4/2021	0.210	0.242
2/5/2021	0.190	0.223
2/6/2021	0.195	0.247
2/7/2021	0.196	0.210
2/8/2021	0.182	0.216
2/9/2021	0.179	0.237
2/10/2021	0.158	0.194
2/11/2021	0.162	0.202
2/12/2021	0.212	0.271

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
1/17/2022	0.190	0.160
1/18/2022	0.206	0.167
1/19/2022	0.187	0.166
1/20/2022	0.168	0.171
1/21/2022	0.208	0.207
1/22/2022	0.170	0.196
1/23/2022	0.206	0.205
1/24/2022	0.204	0.199
1/25/2022	0.163	0.161
1/26/2022	0.188	0.184
1/27/2022	0.184	0.178
1/28/2022	0.178	0.182
1/29/2022	0.169	0.214
1/30/2022	0.215	0.206
1/31/2022	0.174	0.164
2/1/2022	0.202	0.194
2/2/2022	0.159	0.150
2/3/2022	0.163	0.156
2/4/2022	0.195	0.205
2/5/2022	0.209	0.257
2/6/2022	0.166	0.170
2/7/2022	0.209	0.211
2/8/2022	0.161	0.166
2/9/2022	0.183	0.185
2/10/2022	0.158	0.157
2/11/2022	0.177	0.179
2/12/2022	0.180	0.231

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
1/17/2023	0.477	0.322
1/18/2023	0.270	0.326
1/19/2023	0.312	0.310
1/20/2023	0.319	0.353
1/21/2023	0.290	0.344
1/22/2023	0.293	0.357
1/23/2023	0.246	0.290
1/24/2023	0.288	0.368
1/25/2023	0.210	0.264
1/26/2023	0.235	0.305
1/27/2023	0.234	0.321
1/28/2023	0.210	0.299
1/29/2023	0.250	0.344
1/30/2023	0.201	0.271
1/31/2023	0.242	0.337
2/1/2023	0.216	0.307
2/2/2023	0.184	0.263
2/3/2023	0.222	0.322
2/4/2023	0.187	0.241
2/5/2023	0.212	0.249
2/6/2023	0.256	0.269
2/7/2023	0.238	0.276
2/8/2023	0.181	0.217
2/9/2023	0.202	0.242
2/10/2023	0.207	0.249
2/11/2023	0.211	0.258
2/12/2023	0.247	0.292

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2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
2/13/2021	0.196	0.250
2/14/2021	0.202	0.252
2/15/2021	0.200	0.253
2/16/2021	0.196	0.245
2/17/2021	0.183	0.226
2/18/2021	0.175	0.219
2/19/2021	0.170	0.216
2/20/2021	0.178	0.226
2/21/2021	0.211	0.260
2/22/2021	0.178	0.222
2/23/2021	0.159	0.201
2/24/2021	0.151	0.190
2/25/2021	0.175	0.219
2/26/2021	0.156	0.175
2/27/2021	0.167	0.216
2/28/2021	0.168	0.218
3/1/2021	0.193	0.242
3/2/2021	0.148	0.189
3/3/2021	0.160	0.205
3/4/2021	0.159	0.205
3/5/2021	0.166	0.216
3/6/2021	0.166	0.224
3/7/2021	0.168	0.213
3/8/2021	0.213	0.274
3/9/2021	0.105	0.134
3/10/2021	0.178	0.255
3/11/2021	0.156	0.231

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
2/13/2022	0.202	0.231
2/14/2022	0.180	0.199
2/15/2022	0.187	0.177
2/16/2022	0.176	0.168
2/17/2022	0.160	0.165
2/18/2022	0.168	0.223
2/19/2022	0.196	0.216
2/20/2022	0.195	0.215
2/21/2022	0.168	0.183
2/22/2022	0.177	0.169
2/23/2022	0.175	0.173
2/24/2022	0.157	0.158
2/25/2022	0.185	0.181
2/26/2022	0.186	0.222
2/27/2022	0.192	0.186
2/28/2022	0.170	0.171
3/1/2022	0.197	0.195
3/2/2022	0.181	0.179
3/3/2022	0.181	0.183
3/4/2022	0.168	0.265
3/5/2022	0.205	0.167
3/6/2022	0.166	0.118
3/7/2022	0.189	0.185
3/8/2022	0.182	0.178
3/9/2022	0.169	0.170
3/10/2022	0.155	0.163
3/11/2022	0.173	0.180

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
2/13/2023	0.177	0.198
2/14/2023	0.216	0.248
2/15/2023	0.195	0.233
2/16/2023	0.196	0.237
2/17/2023	0.200	0.254
2/18/2023	0.188	0.233
2/19/2023	0.214	0.270
2/20/2023	0.180	0.229
2/21/2023	0.197	0.247
2/22/2023	0.180	0.231
2/23/2023	0.183	0.270
2/24/2023	0.183	0.194
2/25/2023	0.314	0.333
2/26/2023	0.336	0.054
2/27/2023	0.372	0.189
2/28/2023	0.398	0.180
3/1/2023	0.538	0.461
3/2/2023	0.417	0.390
3/3/2023	0.195	0.187
3/4/2023	0.264	0.257
3/5/2023	0.277	0.271
3/6/2023	0.314	0.291
3/7/2023	0.284	0.278
3/8/2023	0.215	0.219
3/9/2023	0.258	0.263
3/10/2023	0.431	0.409
3/11/2023	0.522	0.172

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2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
3/12/2021	0.175	0.256
3/13/2021	0.133	0.208
3/14/2021	0.173	0.247
3/15/2021	0.186	0.346
3/16/2021	0.142	0.230
3/17/2021	0.182	0.291
3/18/2021	0.163	0.262
3/19/2021	0.213	0.265
3/20/2021	0.157	0.194
3/21/2021	0.204	0.243
3/22/2021	0.201	0.257
3/23/2021	0.148	0.184
3/24/2021	0.168	0.209
3/25/2021	0.174	0.212
3/26/2021	0.160	0.196
3/27/2021	0.145	0.216
3/28/2021	0.183	0.274
3/29/2021	0.158	0.253
3/30/2021	0.167	0.268
3/31/2021	0.142	0.198
4/1/2021	0.156	0.231
4/2/2021	0.161	0.238
4/3/2021	0.140	0.210
4/4/2021	0.191	0.286
4/5/2021	0.152	0.236
4/6/2021	0.225	0.281
4/7/2021	0.085	0.227

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
3/12/2022	0.211	0.223
3/13/2022	0.141	0.160
3/14/2022	0.201	0.214
3/15/2022	0.163	0.176
3/16/2022	0.188	0.194
3/17/2022	0.164	0.168
3/18/2022	0.175	0.176
3/19/2022	0.177	0.191
3/20/2022	0.186	0.188
3/21/2022	0.191	0.195
3/22/2022	0.186	0.209
3/23/2022	0.181	0.195
3/24/2022	0.171	0.194
3/25/2022	0.155	0.195
3/26/2022	0.178	0.200
3/27/2022	0.176	0.216
3/28/2022	0.175	0.194
3/29/2022	0.172	0.188
3/30/2022	0.161	0.180
3/31/2022	0.156	0.161
4/1/2022	0.205	0.248
4/2/2022	0.171	0.171
4/3/2022	0.188	0.199
4/4/2022	0.176	0.179
4/5/2022	0.172	0.163
4/6/2022	0.175	0.156
4/7/2022	0.150	0.206

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
3/12/2023	0.351	0.351
3/13/2023	0.505	0.463
3/14/2023	0.394	0.423
3/15/2023	0.450	0.390
3/16/2023	0.331	0.329
3/17/2023	0.290	0.303
3/18/2023	0.244	0.262
3/19/2023	0.285	0.298
3/20/2023	0.249	0.257
3/21/2023	0.232	0.239
3/22/2023	0.283	0.291
3/23/2023	0.304	0.326
3/24/2023	0.311	0.334
3/25/2023	0.236	0.255
3/26/2023	0.310	0.324
3/27/2023	0.186	0.188
3/28/2023	0.222	0.251
3/29/2023	0.344	0.356
3/30/2023	0.366	0.377
3/31/2023	0.322	0.342
4/1/2023	0.250	0.289
4/2/2023	0.290	0.331
4/3/2023	0.244	0.280
4/4/2023	0.218	0.248
4/5/2023	0.208	0.246
4/6/2023	0.230	0.367
4/7/2023	0.215	0.201

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2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
4/8/2021	0.146	0.213
4/9/2021	0.152	0.234
4/10/2021	0.144	0.165
4/11/2021	0.159	0.275
4/12/2021	0.158	0.121
4/13/2021	0.169	0.333
4/14/2021	0.159	0.227
4/15/2021	0.147	0.205
4/16/2021	0.152	0.218
4/17/2021	0.143	0.208
4/18/2021	0.156	0.232
4/19/2021	0.160	0.258
4/20/2021	0.146	0.195
4/21/2021	0.137	0.212
4/22/2021	0.160	0.260
4/23/2021	0.148	0.259
4/24/2021	0.146	0.246
4/25/2021	0.147	0.259
4/26/2021	0.239	0.239
4/27/2021	0.216	0.216
4/28/2021	0.224	0.224
4/29/2021	0.154	0.192
4/30/2021	0.171	0.212
5/1/2021	0.159	0.208
5/2/2021	0.214	0.273
5/3/2021	0.163	0.217
5/4/2021	0.151	0.198

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
4/8/2022	0.181	0.208
4/9/2022	0.170	0.221
4/10/2022	0.132	0.192
4/11/2022	0.238	0.224
4/12/2022	0.185	0.205
4/13/2022	0.179	0.206
4/14/2022	0.162	0.197
4/15/2022	0.179	0.211
4/16/2022	0.208	0.278
4/17/2022	0.218	0.250
4/18/2022	0.181	0.206
4/19/2022	0.203	0.235
4/20/2022	0.180	0.210
4/21/2022	0.146	0.178
4/22/2022	0.230	0.289
4/23/2022	0.207	0.229
4/24/2022	0.205	0.231
4/25/2022	0.200	0.221
4/26/2022	0.176	0.208
4/27/2022	0.177	0.208
4/28/2022	0.160	0.214
4/29/2022	0.181	0.195
4/30/2022	0.167	0.226
5/1/2022	0.189	0.224
5/2/2022	0.195	0.227
5/3/2022	0.163	0.200
5/4/2022	0.178	0.224

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
4/8/2023	0.195	0.257
4/9/2023	0.237	0.299
4/10/2023	0.216	0.269
4/11/2023	0.169	0.214
4/12/2023	0.196	0.237
4/13/2023	0.207	0.222
4/14/2023	0.188	0.208
4/15/2023	0.174	0.191
4/16/2023	0.219	0.239
4/17/2023	0.188	0.141
4/18/2023	0.191	0.278
4/19/2023	0.172	0.159
4/20/2023	0.193	0.250
4/21/2023	0.190	0.222
4/22/2023	0.165	0.202
4/23/2023	0.218	0.236
4/24/2023	0.185	0.199
4/25/2023	0.162	0.176
4/26/2023	0.177	0.197
4/27/2023	0.171	0.200
4/28/2023	0.170	0.182
4/29/2023	0.159	0.208
4/30/2023	0.190	0.212
5/1/2023	0.183	0.202
5/2/2023	0.172	0.200
5/3/2023	0.160	0.197
5/4/2023	0.170	0.195

APPENDIX F

2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
5/5/2021	0.166	0.229
5/6/2021	0.160	0.222
5/7/2021	0.159	0.201
5/8/2021	0.171	0.219
5/9/2021	0.174	0.224
5/10/2021	0.151	0.190
5/11/2021	0.176	0.212
5/12/2021	0.156	0.211
5/13/2021	0.155	0.217
5/14/2021	0.136	0.192
5/15/2021	0.163	0.226
5/16/2021	0.162	0.205
5/17/2021	0.185	0.224
5/18/2021	0.152	0.185
5/19/2021	0.153	0.199
5/20/2021	0.151	0.198
5/21/2021	0.152	0.214
5/22/2021	0.160	0.258
5/23/2021	0.174	0.242
5/24/2021	0.169	0.238
5/25/2021	0.168	0.244
5/26/2021	0.145	0.177
5/27/2021	0.154	0.165
5/28/2021	0.156	0.162
5/29/2021	0.199	0.215
5/30/2021	0.140	0.167
5/31/2021	0.149	0.161

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
5/5/2022	0.145	0.188
5/6/2022	0.171	0.219
5/7/2022	0.167	0.223
5/8/2022	0.196	0.253
5/9/2022	0.174	0.228
5/10/2022	0.168	0.226
5/11/2022	0.160	0.220
5/12/2022	0.174	0.226
5/13/2022	0.177	0.214
5/14/2022	0.156	0.199
5/15/2022	0.182	0.212
5/16/2022	0.180	0.212
5/17/2022	0.181	0.208
5/18/2022	0.166	0.202
5/19/2022	0.151	0.190
5/20/2022	0.170	0.234
5/21/2022	0.166	0.215
5/22/2022	0.176	0.194
5/23/2022	0.165	0.181
5/24/2022	0.171	0.192
5/25/2022	0.158	0.184
5/26/2022	0.154	0.179
5/27/2022	0.157	0.175
5/28/2022	0.154	0.209
5/29/2022	0.177	0.193
5/30/2022	0.160	0.167
5/31/2022	0.182	0.206

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
5/5/2023	0.175	0.194
5/6/2023	0.156	0.187
5/7/2023	0.203	0.230
5/8/2023	0.194	0.226
5/9/2023	0.175	0.224
5/10/2023	0.163	0.209
5/11/2023	0.167	0.207
5/12/2023	0.163	0.211
5/13/2023	0.166	0.209
5/14/2023	0.203	0.219
5/15/2023	0.157	0.162
5/16/2023	0.173	0.201
5/17/2023	0.149	0.178
5/18/2023	0.165	0.223
5/19/2023	0.175	0.207
5/20/2023	0.160	0.202
5/21/2023	0.185	0.226
5/22/2023	0.175	0.194
5/23/2023	0.169	0.180
5/24/2023	0.142	0.175
5/25/2023	0.161	0.184
5/26/2023	0.162	0.209
5/27/2023	0.155	0.218
5/28/2023	0.198	0.241
5/29/2023	0.151	0.188
5/30/2023	0.166	0.197
5/31/2023	0.191	0.234

APPENDIX F

2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
6/1/2021	0.165	0.178
6/2/2021	0.163	0.175
6/3/2021	0.144	0.159
6/4/2021	0.148	0.164
6/5/2021	0.197	0.204
6/6/2021	0.100	0.103
6/7/2021	0.178	0.183
6/8/2021	0.129	0.130
6/9/2021	0.164	0.151
6/10/2021	0.151	0.152
6/11/2021	0.140	0.141
6/12/2021	0.156	0.158
6/13/2021	0.160	0.167
6/14/2021	0.152	0.162
6/15/2021	0.157	0.181
6/16/2021	0.152	0.165
6/17/2021	0.134	0.142
6/18/2021	0.149	0.151
6/19/2021	0.142	0.167
6/20/2021	0.154	0.148
6/21/2021	0.170	0.167
6/22/2021	0.136	0.160
6/23/2021	0.158	0.147
6/24/2021	0.140	0.138
6/25/2021	0.128	0.126
6/26/2021	0.152	0.146
6/27/2021	0.150	0.151

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
6/1/2022	0.157	0.187
6/2/2022	0.165	0.196
6/3/2022	0.154	0.209
6/4/2022	0.153	0.217
6/5/2022	0.175	0.204
6/6/2022	0.179	0.206
6/7/2022	0.165	0.195
6/8/2022	0.166	0.198
6/9/2022	0.186	0.220
6/10/2022	0.179	0.193
6/11/2022	0.139	0.179
6/12/2022	0.167	0.185
6/13/2022	0.179	0.213
6/14/2022	0.152	0.202
6/15/2022	0.149	0.184
6/16/2022	0.143	0.177
6/17/2022	0.158	0.206
6/18/2022	0.147	0.187
6/19/2022	0.173	0.199
6/20/2022	0.139	0.163
6/21/2022	0.153	0.187
6/22/2022	0.156	0.193
6/23/2022	0.132	0.166
6/24/2022	0.160	0.222
6/25/2022	0.147	0.197
6/26/2022	0.172	0.203
6/27/2022	0.144	0.000

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
6/1/2023	0.132	0.169
6/2/2023	0.163	0.231
6/3/2023	0.153	0.250
6/4/2023	0.198	0.310
6/5/2023	0.149	0.189
6/6/2023	0.170	0.222
6/7/2023	0.140	0.188
6/8/2023	0.163	0.231
6/9/2023	0.170	0.269
6/10/2023	0.153	0.227
6/11/2023	0.175	0.250
6/12/2023	0.177	0.270
6/13/2023	0.160	0.261
6/14/2023	0.164	0.272
6/15/2023	0.167	0.288
6/16/2023	0.163	0.278
6/17/2023	0.154	0.222
6/18/2023	0.195	0.245
6/19/2023	0.153	0.202
6/20/2023	0.176	0.217
6/21/2023	0.158	0.190
6/22/2023	0.164	0.195
6/23/2023	0.165	0.236
6/24/2023	0.168	0.220
6/25/2023	0.163	0.219
6/26/2023	0.185	0.223
6/27/2023	0.170	0.232

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2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
6/28/2021	0.151	0.154
6/29/2021	0.147	0.149
6/30/2021	0.136	0.137
7/1/2021	0.144	0.147
7/2/2021	0.164	0.184
7/3/2021	0.122	0.147
7/4/2021	0.152	0.156
7/5/2021	0.124	0.121
7/6/2021	0.157	0.159
7/7/2021	0.148	0.161
7/8/2021	0.131	0.130
7/9/2021	0.139	0.159
7/10/2021	0.143	0.176
7/11/2021	0.157	0.167
7/12/2021	0.137	0.143
7/13/2021	0.147	0.158
7/14/2021	0.146	0.149
7/15/2021	0.130	0.138
7/16/2021	0.140	0.179
7/17/2021	0.152	0.173
7/18/2021	0.144	0.165
7/19/2021	0.142	0.170
7/20/2021	0.147	0.177
7/21/2021	0.137	0.163
7/22/2021	0.132	0.133
7/23/2021	0.141	0.176
7/24/2021	0.123	0.180

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
6/28/2022	0.164	0.000
6/29/2022	0.142	0.157
6/30/2022	0.149	0.180
7/1/2022	0.159	0.187
7/2/2022	0.146	0.173
7/3/2022	0.177	0.207
7/4/2022	0.155	0.175
7/5/2022	0.150	0.172
7/6/2022	0.148	0.167
7/7/2022	0.150	0.161
7/8/2022	0.160	0.184
7/9/2022	0.139	0.161
7/10/2022	0.194	0.207
7/11/2022	0.121	0.132
7/12/2022	0.144	0.147
7/13/2022	0.145	0.114
7/14/2022	0.136	0.206
7/15/2022	0.150	0.179
7/16/2022	0.136	0.176
7/17/2022	0.171	0.197
7/18/2022	0.125	0.153
7/19/2022	0.156	0.199
7/20/2022	0.118	0.143
7/21/2022	0.155	0.184
7/22/2022	0.141	0.169
7/23/2022	0.136	0.154
7/24/2022	0.160	0.109

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
6/28/2023	0.155	0.207
6/29/2023	0.156	0.211
6/30/2023	0.162	0.223
7/1/2023	0.154	0.202
7/2/2023	0.190	0.229
7/3/2023	0.135	0.177
7/4/2023	0.172	0.227
7/5/2023	0.153	0.203
7/6/2023	0.160	0.240
7/7/2023	0.153	0.214
7/8/2023	0.154	0.213
7/9/2023	0.177	0.206
7/10/2023	0.167	0.212
7/11/2023	0.156	0.210
7/12/2023	0.155	0.193
7/13/2023	0.149	0.190
7/14/2023	0.165	0.211
7/15/2023	0.154	0.198
7/16/2023	0.150	0.181
7/17/2023	0.173	0.206
7/18/2023	0.154	0.191
7/19/2023	0.147	0.186
7/20/2023	0.135	0.179
7/21/2023	0.142	0.184
7/22/2023	0.145	0.190
7/23/2023	0.175	0.222
7/24/2023	0.148	0.190

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2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
7/25/2021	0.156	0.150
7/26/2021	0.150	0.151
7/27/2021	0.135	0.134
7/28/2021	0.131	0.133
7/29/2021	0.136	0.140
7/30/2021	0.154	0.208
7/31/2021	0.119	0.126
8/1/2021	0.165	0.177
8/2/2021	0.148	0.163
8/3/2021	0.138	0.156
8/4/2021	0.141	0.157
8/5/2021	0.134	0.154
8/6/2021	0.149	0.173
8/7/2021	0.130	0.221
8/8/2021	0.153	0.267
8/9/2021	0.159	0.271
8/10/2021	0.141	0.143
8/11/2021	0.130	0.132
8/12/2021	0.137	0.135
8/13/2021	0.150	0.185
8/14/2021	0.153	0.229
8/15/2021	0.131	0.144
8/16/2021	0.145	0.164
8/17/2021	0.153	0.174
8/18/2021	0.157	0.177
8/19/2021	0.127	0.133
8/20/2021	0.146	0.149

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
7/25/2022	0.138	0.219
7/26/2022	0.144	0.171
7/27/2022	0.131	0.143
7/28/2022	0.164	0.189
7/29/2022	0.135	0.169
7/30/2022	0.143	0.176
7/31/2022	0.153	0.176
8/1/2022	0.159	0.181
8/2/2022	0.143	0.168
8/3/2022	0.137	0.171
8/4/2022	0.129	0.152
8/5/2022	0.144	0.168
8/6/2022	0.166	0.210
8/7/2022	0.143	0.174
8/8/2022	0.157	0.185
8/9/2022	0.160	0.190
8/10/2022	0.124	0.163
8/11/2022	0.133	0.175
8/12/2022	0.143	0.191
8/13/2022	0.149	0.209
8/14/2022	0.168	0.196
8/15/2022	0.160	0.183
8/16/2022	0.149	0.182
8/17/2022	0.130	0.159
8/18/2022	0.138	0.173
8/19/2022	0.147	0.210
8/20/2022	0.148	0.165

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
7/25/2023	0.157	0.218
7/26/2023	0.136	0.206
7/27/2023	0.139	0.196
7/28/2023	0.149	0.223
7/29/2023	0.129	0.178
7/30/2023	0.187	0.229
7/31/2023	0.125	0.151
8/1/2023	0.143	0.172
8/2/2023	0.132	0.170
8/3/2023	0.156	0.199
8/4/2023	0.144	0.176
8/5/2023	0.147	0.188
8/6/2023	0.201	0.258
8/7/2023	0.146	0.249
8/8/2023	0.146	0.119
8/9/2023	0.145	0.184
8/10/2023	0.157	0.189
8/11/2023	0.137	0.175
8/12/2023	0.139	0.169
8/13/2023	0.185	0.207
8/14/2023	0.151	0.162
8/15/2023	0.147	0.172
8/16/2023	0.154	0.174
8/17/2023	0.155	0.159
8/18/2023	0.158	0.174
8/19/2023	0.132	0.149
8/20/2023	0.192	0.213

APPENDIX F

2020 - 2021 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
8/21/2021	0.136	0.135
8/22/2021	0.149	0.155
8/23/2021	0.174	0.188
8/24/2021	0.179	0.152
8/25/2021	0.099	0.159
8/26/2021	0.134	0.158
8/27/2021	0.151	0.201
8/28/2021	0.140	0.166
8/29/2021	0.158	0.163
8/30/2021	0.179	0.185
8/31/2021	0.164	0.166
9/1/2021	0.133	0.142
9/2/2021	0.152	0.149
9/3/2021	0.142	0.147
9/4/2021	0.137	0.138
9/5/2021	0.147	0.155
9/6/2021	0.154	0.165
9/7/2021	0.157	0.166
9/8/2021	0.131	0.141
9/9/2021	0.140	0.148
9/10/2021	0.135	0.168
9/11/2021	0.134	0.140
9/12/2021	0.161	0.174
9/13/2021	0.141	0.150
9/14/2021	0.142	0.151
9/15/2021	0.129	0.124
9/16/2021	0.151	0.147

2021 - 2022 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
8/21/2022	0.130	0.169
8/22/2022	0.154	0.181
8/23/2022	0.148	0.189
8/24/2022	0.148	0.192
8/25/2022	0.123	0.183
8/26/2022	0.139	0.197
8/27/2022	0.142	0.205
8/28/2022	0.147	0.214
8/29/2022	0.159	0.210
8/30/2022	0.155	0.210
8/31/2022	0.134	0.175
9/1/2022	0.136	0.163
9/2/2022	0.139	0.186
9/3/2022	0.129	0.167
9/4/2022	0.140	0.179
9/5/2022	0.154	0.188
9/6/2022	0.166	0.205
9/7/2022	0.136	0.167
9/8/2022	0.134	0.164
9/9/2022	0.142	0.173
9/10/2022	0.159	0.196
9/11/2022	0.172	0.216
9/12/2022	0.159	0.190
9/13/2022	0.139	0.174
9/14/2022	0.141	0.153
9/15/2022	0.155	0.176
9/16/2022	0.167	0.187

2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
8/21/2023	0.141	0.152
8/22/2023	0.139	0.162
8/23/2023	0.138	0.171
8/24/2023	0.149	0.172
8/25/2023	0.145	0.166
8/26/2023	0.132	0.158
8/27/2023	0.155	0.179
8/28/2023	0.178	0.195
8/29/2023	0.134	0.141
8/30/2023	0.130	0.157
8/31/2023	0.152	0.186
9/1/2023	0.241	0.167
9/2/2023	0.133	0.165
9/3/2023	0.194	0.226
9/4/2023	0.107	0.118
9/5/2023	0.181	0.188
9/6/2023	0.139	0.164
9/7/2023	0.143	0.163
9/8/2023	0.139	0.173
9/9/2023	0.129	0.165
9/10/2023	0.161	0.200
9/11/2023	0.130	0.165
9/12/2023	0.185	0.234
9/13/2023	0.126	0.161
9/14/2023	0.142	0.180
9/15/2023	0.140	0.179
9/16/2023	0.146	0.186

APPENDIX F

2020 - 2021 Daily Flows			2021 - 2022 Daily Flows			2022 - 2023 Daily Flows		
Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>	Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>	Date	Influent, <i>million gal</i>	Effluent, <i>million gal</i>
9/17/2021	0.113	0.114	9/17/2022	0.126	0.138	9/17/2023	0.205	0.259
9/18/2021	0.136	0.142	9/18/2022	0.173	0.190	9/18/2023	0.121	0.158
9/19/2021	0.157	0.155	9/19/2022	0.143	0.159	9/19/2023	0.140	0.181
9/20/2021	0.157	0.158	9/20/2022	0.161	0.176	9/20/2023	0.145	0.180
9/21/2021	0.137	0.138	9/21/2022	0.151	0.162	9/21/2023	0.143	0.196
9/22/2021	0.124	0.117	9/22/2022	0.144	0.162	9/22/2023	0.149	0.217
9/23/2021	0.137	0.135	9/23/2022	0.181	0.238	9/23/2023	0.138	0.168
9/24/2021	0.146	0.142	9/24/2022	0.129	0.150	9/24/2023	0.153	0.187
9/25/2021	0.133	0.125	9/25/2022	0.145	0.169	9/25/2023	0.171	0.205
9/26/2021	0.156	0.147	9/26/2022	0.159	0.183	9/26/2023	0.149	0.190
9/27/2021	0.158	0.140	9/27/2022	0.140	0.168	9/27/2023	0.140	0.177
9/28/2021	0.137	0.129	9/28/2022	0.129	0.157	9/28/2023	0.158	0.202
9/29/2021	0.137	0.093	9/29/2022	0.131	0.159	9/29/2023	0.139	0.181
9/30/2021	0.142	0.123	9/30/2022	0.151	0.218	9/30/2023	0.132	0.175

# **APPENDIX G**

LA CONTENTA WWTF  
OCTOBER 2020 TO SEPTEMBER 2023  
LABORATORY RESULTS

APPENDIX G

Oct. 2020 - Sept. 2023		
Date	Influent BOD <sub>5</sub> , mg/L	Influent BOD <sub>5</sub> , lbs/day
10/8/2020	264	441
11/12/2020	101	169
12/2/2020	333	557
1/6/2021	60	100
2/4/2021	23	38
3/3/2021	94	157
4/21/2021	390	652
5/5/2021	75	125
6/17/2021	162	271
7/15/2021	357	597
8/5/2021	65	109
9/8/2021	389	650
10/13/2021	24	40
11/10/2021	107	179
12/8/2021	40	67
1/6/2022	161	269
2/3/2022	257	430
3/10/2022	130	217
4/7/2022	57	95
5/11/2022	364	609
6/2/2022	107	179
7/6/2022	81	135
8/4/2022	78	130
9/14/2022	311	520
10/6/2022	198	331
11/3/2022	232	388
12/15/2022	161	269
1/11/2023	42	70
2/1/2023	51	85
3/8/2023	39	65
4/19/2023	50	84
5/24/2023	84	140
6/8/2023	101	169
7/13/2023	199	333
8/23/2023	32	54
9/13/2023	195	326

# **APPENDIX H**

## **HUCKLEBERRY LIFT STATION PRELIMINARY HYDRAULIC CALCULATIONS**

APPENDIX H

By: Bob Godwin

Date: November 22, 2023

Subject: Huckleberry Lift Station

**Objective:** Design calculations for the Huckleberry Lift Station (La Contenta

**Static Head**

Static Head = Forcemain High Point - Water Level in Huckleberry Pump Station

Static Head =	762.00 feet	Static Head =	762.00 feet
High Water Level in LS =	575.50 feet	All Pumps off at LS =	571.50 feet
<hr/>		<hr/>	
Total Static Head at (min) =	186.50 feet	Total Static Head at (max) =	190.50 feet

**Friction Losses**

For this calculation the Hazen-Williams (H-W) equation will be used.

Hazen-Williams equation: 
$$h_f = 10.5 * L * (Q/C)^{1.85} * D^{-4.87}$$
 where Q = discharge, gpm  
 C = pipe friction coefficient  
 D = pipe diameter, inches

12" Pipeline - Forcemain from Huckleberry Pump Station to the La Contenta WWTF

Flow (gpm)	0	200	300	500	1,000	1,200	1,400	1,600	1,800	2,000	2,200
Flow (cfs)	0.00	0.45	0.67	1.11	2.23	2.67	3.12	3.57	4.01	4.46	4.90
Length (ft)	11,300	11,300	11,300	11,300	11,300	11,300	11,300	11,300	11,300	11,300	11,300
Diameter (in)	12	12	12	12	12	12	12	12	12	12	12
Old Pipe Friction Coefficient	120	120	120	120	120	120	120	120	120	120	120
New Pipe Friction Coefficient	140	140	140	140	140	140	140	140	140	140	140
Maximum $h_f$ (ft)	0.0	1.7	3.6	9.2	33.28	46.6	62.0	79.4	98.7	120.0	143.1
Minimum $h_f$ (ft)	0.0	1.3	2.7	6.9	25.02	35.1	46.6	59.7	74.2	90.2	107.6

APPENDIX H

By: Bob Godwin

Date: November 22, 2023

Subject: Huckleberry Lift Station

**Fitting and Valve Losses**

Fitting and Valve Loss,  $h_{fv} = (K * v^2) / 2g$  where K = headloss coefficient v = velocity, ft./s

Description	Quantity	K	Total K
45 Degree Elbow	10	0.25	2.50
Exit	1	1.00	1.00
8"x12" Reducing Tee	1	0.75	0.75
Check Valve	1	1.75	1.75
Gate Valve	5	0.30	1.50
Total			7.50

**12" Fitting and Valve Losses**

Flow (gpm)	0	200	300	500	1,000	1,200	1,400	1,600	1,800	2,000	2,200
Flow (cfs)	0.00	0.45	0.67	1.11	2.23	2.67	3.12	3.57	4.01	4.46	4.90
Diameter (in)	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
K	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
Area (ft <sup>2</sup> )	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Velocity (fps)	0.00	0.57	0.85	1.42	2.84	3.40	3.97	4.54	5.11	5.67	6.24
$v^2/2g$ (ft)	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.6
<b><math>h_f</math> (ft)</b>	<b>0.0</b>	<b>0.0</b>	<b>0.1</b>	<b>0.2</b>	<b>0.9</b>	<b>1.3</b>	<b>1.8</b>	<b>2.4</b>	<b>3.0</b>	<b>3.7</b>	<b>4.5</b>

**Total Dynamic Head**

Flow (gpm)	0	100	300	500	1,000	1,200	1,400	1,600	1,800	2,000	2,200
Maximum TDH (ft)	190.5	192.2	194.2	200.0	224.7	238.5	254.4	272.3	292.3	314.2	338.1
Minimum TDH (ft)	186.5	187.8	189.3	193.7	212.5	222.9	235.0	248.6	263.8	280.5	298.6

APPENDIX H

By: Bob Godwin

Date: November 22, 2023

Subject: Huckleberry Lift Station

<b>One Pump</b>	88 HP CP3300.181 with 462 impeller								
Flow (gpm)	0	250	500	750	1,000	1,250	1,500	1,750	2,000
Head (ft)	0.0	240.0	227.0	213.0	199.0	186.0	174.0	162.0	149.0

<b>Two Pumps</b>									
Flow (gpm)	0	500	1,000	1,500	2,000	2,500	3,000	3,500	4,000
Head (ft)	0.0	240.0	227.0	213.0	199.0	186.0	174.0	162.0	149.0

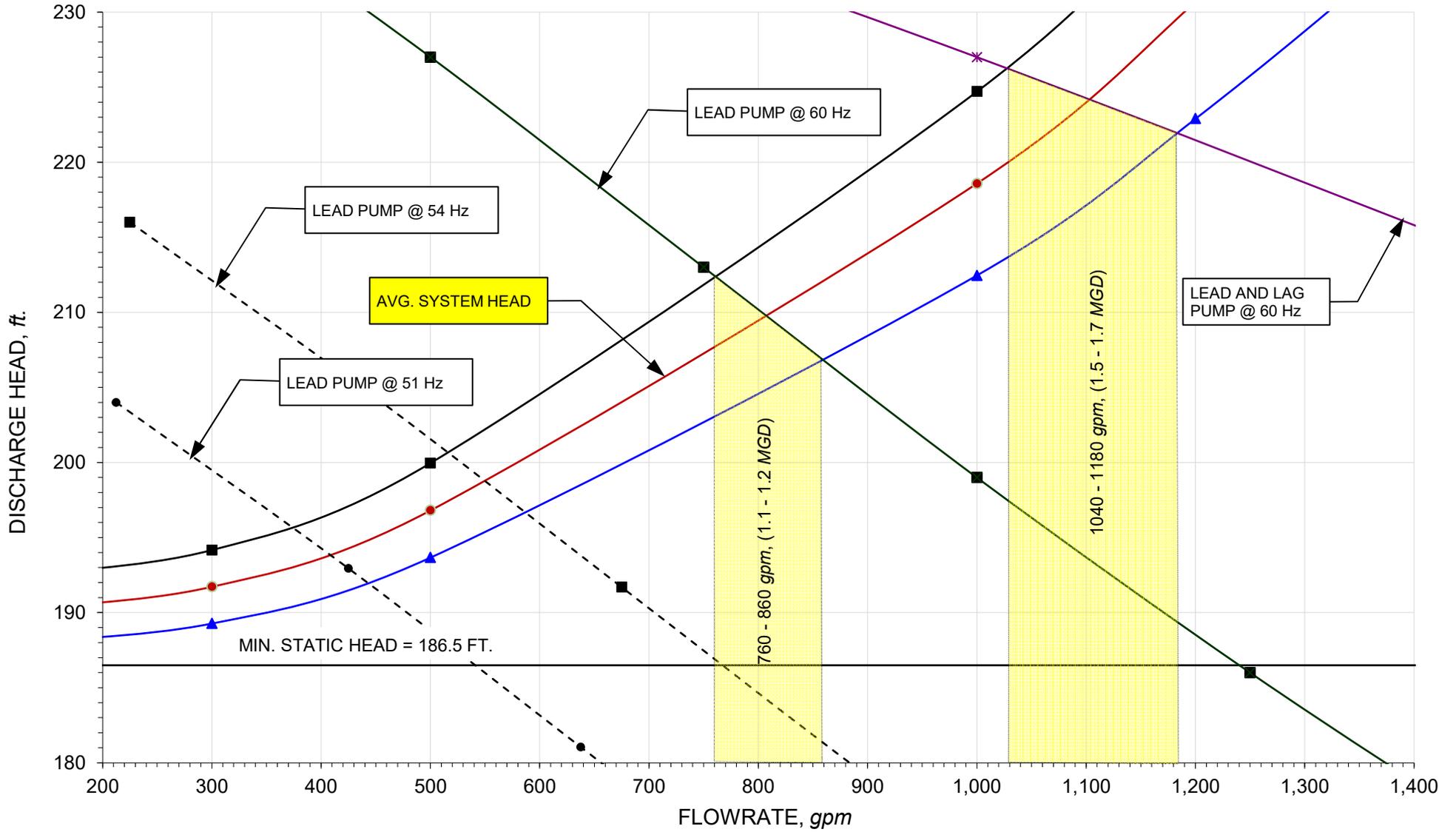
<b>One Pump</b>	<b>Pump @ 54 Hz</b>								
Flow (gpm)	0	225	450	675	900	1,125	1,350	1,575	1,800
Head (ft)	0.0	216.0	204.3	191.7	179.1	167.4	156.6	145.8	134.1

<b>One Pump</b>	<b>Pump @ 51 Hz</b>								
Flow (gpm)	0	213	425	638	850	1,063	1,275	1,488	1,700
Head (ft)	0.0	204.0	193.0	181.1	169.2	158.1	147.9	137.7	126.7

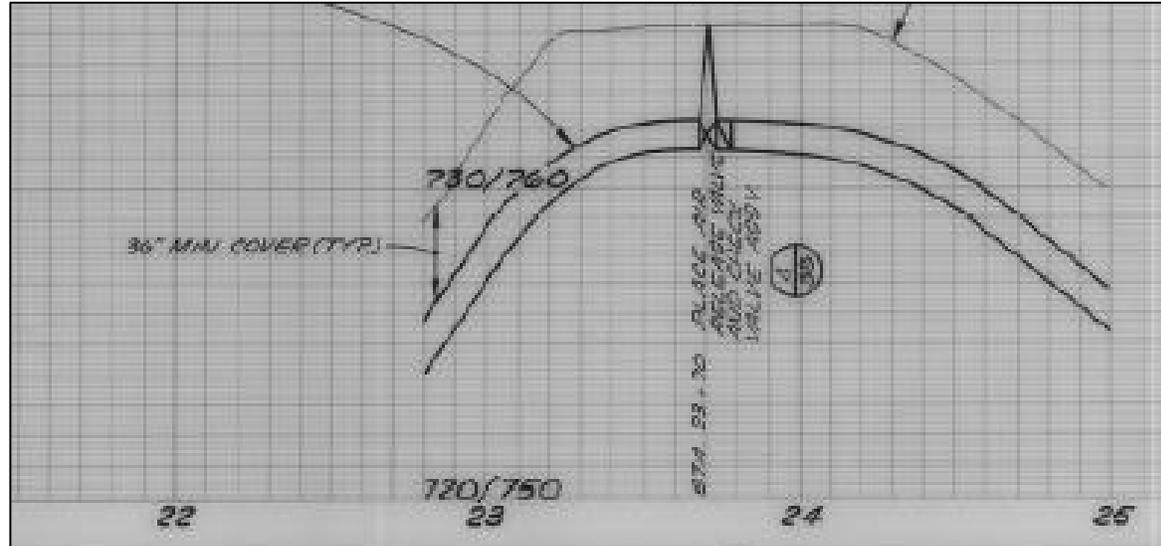
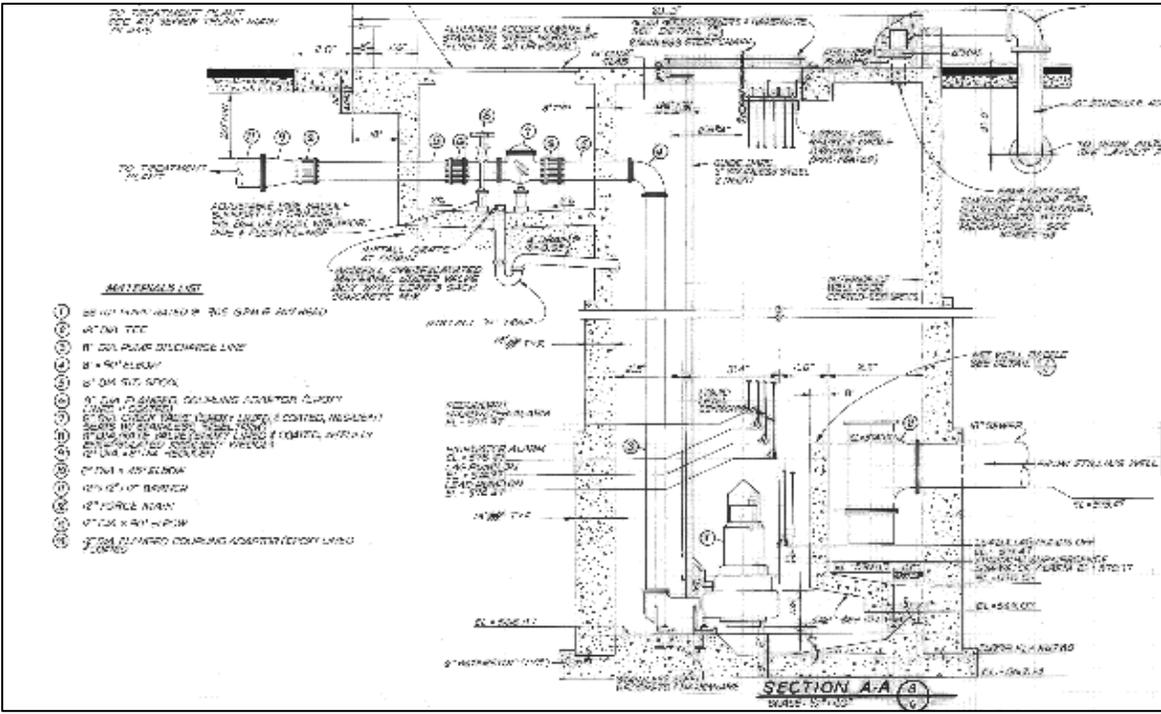
<b>One Pump</b>	<b>Pump @ 48 Hz</b>								
Flow (gpm)	0	200	400	600	800	1,000	1,200	1,400	1,600
Head (ft)	0.0	192.0	181.6	170.4	159.2	148.8	139.2	129.6	119.2

APPENDIX H

HUCKLEBERRY LIFT STATION SYSTEM CURVE



Sheet Stations, ft	Accum. Length, ft	Crown Elevation, ft	Notes
100		568.5	Bottom of wetwell
100	100	581.0	Forcemain A
1500	1,500	585.0	
0	1,500	585.0	Forcemain B
1080	2,580	615.0	
2270	3,770	621.0	
2800	4,300	626.0	
38	4,300	626.0	Forcemain C
670	4,932	687.0	
780	5,042	686.0	
1340	5,602	642.0	
1647	5,909	659.0	
2010	6,272	628.0	
2264	6,526	646.0	
2500	6,762	626.0	
2845	7,107	657.0	
100	7,107	657.0	Forcemain D
360	7,367	632.5	
1300	8,307	692.0	
1398	8,405	704.0	
2370	9,377	762.0	High Point
3000	10,007	711.5	
3350	10,357	741.0	
3760	10,767	706.0	
550	11,317	748.0	Inside treatment plant
<b>TOTAL</b>	<b>11,300</b>		



<b>FORCE MAIN D</b>	<h1 style="margin: 0;">KASL</h1> <p style="margin: 0;">CONSULTING ENGINEERS, INC.          Civil-Environmental 916-929-8187          4206 North Forester Blvd., Suite 1          Sacramento, Ca. 95834</p>
<b>AS BUILT</b>	

**Calaveras County Water District  
Motor and Site Information**

253

Site: La Contenta Main Lift Station  
 Address: 25118 Huckleberry, Valley Springs

**Motor/Pump Information**

Make/Catalog Number: Flygt 3300.091-5196 15

Serial/Model Number: 9180009 462

HP: 65KW - 88 HP Code: \_\_\_\_\_ Frame: \_\_\_\_\_ Type: \_\_\_\_\_

Shaft: \_\_\_\_\_ Volts/Hz 400V 60HZ TDH: \_\_\_\_\_ Seal/Pack: \_\_\_\_\_

RPM: 1700 Elec/Str: \_\_\_\_\_ Size: \_\_\_\_\_ GPM: \_\_\_\_\_

Phase: 3 Amps: 105A Suc/Dis: \_\_\_\_\_ Design: \_\_\_\_\_

Upper Bearing: \_\_\_\_\_ Lower Bearing: \_\_\_\_\_

Enclosure: \_\_\_\_\_ Oil Capacity/Type: \_\_\_\_\_

Pump Manufacturer: \_\_\_\_\_

Pump Model #: \_\_\_\_\_

Information Taken By: Rudy

Location: P G & E 9T2682 60080101

Other: TA-0010 51% IEC 3471969 cl.f 1100KG

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

## SHAPE, INC. SUBMITTAL

**Submitted To:** ALAN A. BRADFORD, Inc.  
4970 Peabody Road  
Fairfield, CA 94533

**Date:** 9/19/91

**Submittal No.:** 76495-S3803-A

**Project Name:** NEW HOGAN/LA CONTENTA

**Engineer:** NOLTE & Assoc.

**Equip. Specification  
Number & Name:**

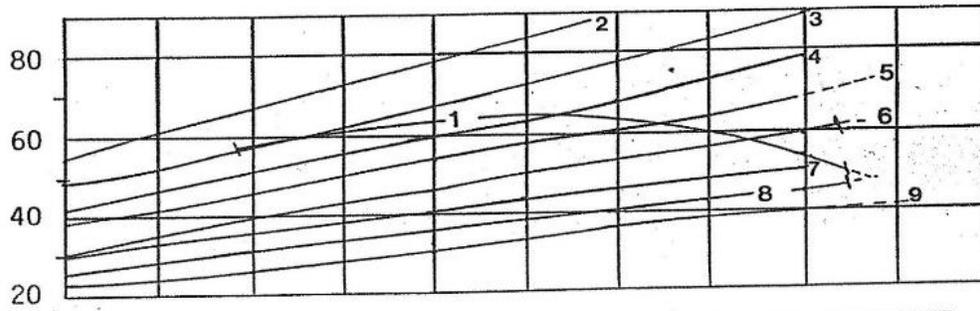
**Salesman No.:** 224

**Mark:** MAIN LIFT STATION (Triplex Station)

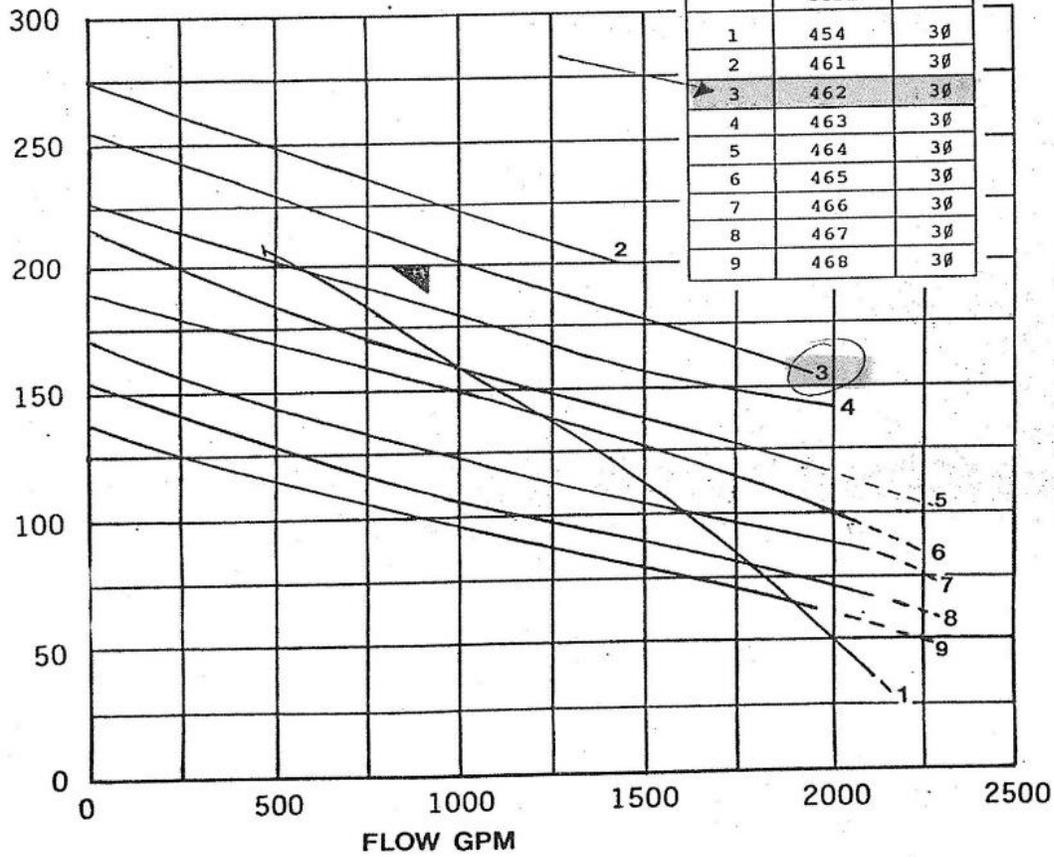
**SHAPE P.O.#:** 5548FL

QTY	DESCRIPTION				
3	<p><b>Pump Model:</b> CP-3300-462      <b>Manufacturer:</b> FLYGT      <b>BasinDepth:</b></p> <p><b>Installation:</b> Explosion Proof      <b>Design Conditions:</b></p> <p style="padding-left: 40px;"><b>GPM:</b> 905      <b>IDH:</b> 200 Ft.</p> <p><b>Shut off: Ft.:</b></p> <p><b>Suction:</b>      <b>Discharge:</b></p> <p style="padding-left: 40px;">8 Inch, Flanged</p> <p><b>Options:</b> 45 38 Ft. Power Cord (Contractor needs to verify cord length needed).</p>				
	<b>Motor:</b>	<b>Frame:</b>	<b>H.P.:</b>	<b>Insulation:</b>	<b>NEMA:</b>
	<b>Volts:</b>	<b>Phase:</b>	<b>Hertz:</b>	<b>R.P.M.:</b>	<b>S.F.:</b>
	460	3	60	1750	
	<b>Description:</b> Explosion Proof				
1	<p><b>Accessories:</b> <u>NO FLS SWITCHES WILL BE SUBMITTED UPON. THE PUMP WILL NOT HAVE THEM.</u></p> <p>Set of Spare Parts:</p> <ul style="list-style-type: none"> <li>(1) Upper Seal Assembly</li> <li>(1) Lower Seal Assembly</li> <li>(1) Upper Bearing</li> <li>(1) Lower Bearing</li> <li>(1) "O" Ring Kit</li> </ul>				

APPENDIX H



CURVE	IMPELLER CODE	PHASE
1	454	3Ø
2	461	3Ø
3	462	3Ø
4	463	3Ø
5	464	3Ø
6	465	3Ø
7	466	3Ø
8	467	3Ø
9	468	3Ø



# **APPENDIX I**

LA CONTENTA EFFLUENT PIPELINE TO LESP  
PRELIMINARY HYDRAULIC CALCULATIONS

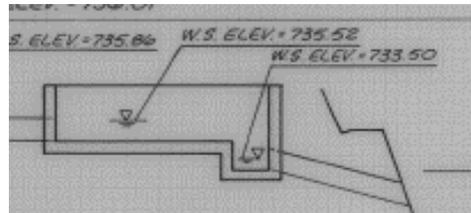
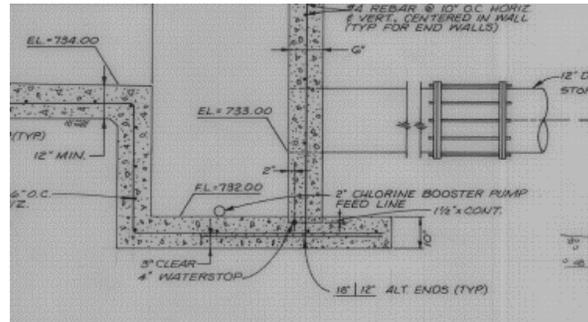
APPENDIX I

La Contenta 8-inch Diameter Tertiary Effluent Pipeline Capacity										
UV System Elev. ft.	LESP Elev., ft.	Diameter, ft.	Length, ft.	Area, A, ft <sup>2</sup>	Wetted Perimeter, P, ft.	Hydraulic Radius, R, ft.	n, Manning Eq.	Slope, S, ft./ft.	Capacity, gal/min.	Capacity, MGD
735.5	680.0	0.67	3,700	0.349	2.094	0.167	0.010	0.015	863	1.24
735.5	700.0	0.67	3,700	0.349	2.094	0.167	0.012	0.010	575	0.83

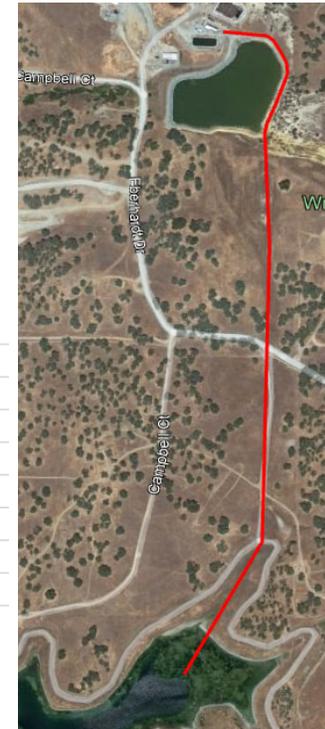
Note: Add 20% to calculated losses for minor and unknown losses.

Effluent Pipeline Capacity

Q = 0.69 1.04 MGD



4/23/2023	729.7	697.7
4/24/2023	729.6	698.0
4/25/2023	729.6	698.0
4/26/2023	729.6	698.0
4/27/2023	729.6	698.0
4/28/2023	729.6	698.0
4/29/2023	729.6	698.0
4/30/2023	729.6	698.0



# **APPENDIX J**

LA CONTENTA WWTF  
2020 TO 2023 DAILY PRECIPITATION

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
10/1/2020	0.00	0.00
10/2/2020	0.00	0.00
10/3/2020	0.00	0.00
10/4/2020	0.00	0.00
10/5/2020	0.00	0.00
10/6/2020	0.00	0.00
10/7/2020	0.00	0.00
10/8/2020	0.00	0.00
10/9/2020	0.00	0.00
10/10/2020	0.00	0.00
10/11/2020	0.00	0.00
10/12/2020	0.00	0.00
10/13/2020	0.00	0.00
10/14/2020	0.00	0.00
10/15/2020	0.00	0.00
10/16/2020	0.00	0.00
10/17/2020	0.00	0.00
10/18/2020	0.00	0.00
10/19/2020	0.00	0.00
10/20/2020	0.00	0.00
10/21/2020	0.00	0.00
10/22/2020	0.00	0.00
10/23/2020	0.00	0.00
10/24/2020	0.00	0.00
10/25/2020	0.00	0.00
10/26/2020	0.00	0.00
10/27/2020	0.00	0.00

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
10/1/2021	0.00	0.00
10/2/2021	0.00	0.00
10/3/2021	0.00	0.00
10/4/2021	0.00	0.00
10/5/2021	0.00	0.00
10/6/2021	0.00	0.00
10/7/2021	0.00	0.00
10/8/2021	0.10	0.10
10/9/2021	0.00	0.10
10/10/2021	0.00	0.10
10/11/2021	0.00	0.10
10/12/2021	0.00	0.10
10/13/2021	0.00	0.10
10/14/2021	0.00	0.10
10/15/2021	0.00	0.10
10/16/2021	0.00	0.10
10/17/2021	0.00	0.10
10/18/2021	0.10	0.20
10/19/2021	0.00	0.20
10/20/2021	0.00	0.20
10/21/2021	0.05	0.25
10/22/2021	0.20	0.45
10/23/2021	0.00	0.45
10/24/2021	1.60	2.05
10/25/2021	4.60	6.65
10/26/2021	0.10	6.75
10/27/2021	0.00	6.75

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
10/1/2022	0.00	0.00
10/2/2022	0.00	0.00
10/3/2022	0.00	0.00
10/4/2022	0.00	0.00
10/5/2022	0.00	0.00
10/6/2022	0.00	0.00
10/7/2022	0.00	0.00
10/8/2022	0.00	0.00
10/9/2022	0.00	0.00
10/10/2022	0.00	0.00
10/11/2022	0.00	0.00
10/12/2022	0.00	0.00
10/13/2022	0.00	0.00
10/14/2022	0.00	0.00
10/15/2022	0.00	0.00
10/16/2022	0.00	0.00
10/17/2022	0.00	0.00
10/18/2022	0.00	0.00
10/19/2022	0.00	0.00
10/20/2022	0.00	0.00
10/21/2022	0.00	0.00
10/22/2022	0.00	0.00
10/23/2022	0.00	0.00
10/24/2022	0.00	0.00
10/25/2022	0.00	0.00
10/26/2022	0.00	0.00
10/27/2022	0.00	0.00

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
10/28/2020	0.00	0.00
10/29/2020	0.00	0.00
10/30/2020	0.00	0.00
10/31/2020	0.00	0.00
11/1/2020	0.00	0.00
11/2/2020	0.00	0.00
11/3/2020	0.00	0.00
11/4/2020	0.00	0.00
11/5/2020	0.00	0.00
11/6/2020	0.00	0.00
11/7/2020	0.00	0.00
11/8/2020	0.00	0.00
11/9/2020	0.00	0.00
11/10/2020	0.00	0.00
11/11/2020	0.00	0.00
11/12/2020	0.00	0.00
11/13/2020	0.00	0.00
11/14/2020	0.00	0.00
11/15/2020	0.00	0.00
11/16/2020	0.00	0.00
11/17/2020	0.00	0.00
11/18/2020	0.70	0.70
11/19/2020	0.60	1.30
11/20/2020	0.00	1.30
11/21/2020	0.00	1.30
11/22/2020	0.00	1.30
11/23/2020	0.00	1.30

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
10/28/2021	0.00	6.75
10/29/2021	0.00	6.75
10/30/2021	0.00	6.75
10/31/2021	0.00	6.75
11/1/2021	0.00	6.75
11/2/2021	0.00	6.75
11/3/2021	0.00	6.75
11/4/2021	0.00	6.75
11/5/2021	0.00	6.75
11/6/2021	0.00	6.75
11/7/2021	0.00	6.75
11/8/2021	0.00	6.75
11/9/2021	0.40	7.15
11/10/2021	0.10	7.25
11/11/2021	0.00	7.25
11/12/2021	0.00	7.25
11/13/2021	0.00	7.25
11/14/2021	0.00	7.25
11/15/2021	0.00	7.25
11/16/2021	0.00	7.25
11/17/2021	0.00	7.25
11/18/2021	0.00	7.25
11/19/2021	0.00	7.25
11/20/2021	0.00	7.25
11/21/2021	0.00	7.25
11/22/2021	0.00	7.25
11/23/2021	0.00	7.25

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
10/28/2022	0.00	0.00
10/29/2022	0.00	0.00
10/30/2022	0.00	0.00
10/31/2022	0.00	0.00
11/1/2022	0.00	0.00
11/2/2022	0.50	0.50
11/3/2022	0.30	0.80
11/4/2022	0.00	0.80
11/5/2022	0.00	0.80
11/6/2022	0.10	0.90
11/7/2022	0.50	1.40
11/8/2022	0.80	2.20
11/9/2022	0.80	3.00
11/10/2022	0.00	3.00
11/11/2022	0.00	3.00
11/12/2022	0.00	3.00
11/13/2022	0.00	3.00
11/14/2022	0.00	3.00
11/15/2022	0.00	3.00
11/16/2022	0.00	3.00
11/17/2022	0.00	3.00
11/18/2022	0.00	3.00
11/19/2022	0.00	3.00
11/20/2022	0.00	3.00
11/21/2022	0.00	3.00
11/22/2022	0.00	3.00
11/23/2022	0.00	3.00

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
11/24/2020	0.00	1.30
11/25/2020	0.00	1.30
11/26/2020	0.00	1.30
11/27/2020	0.00	1.30
11/28/2020	0.00	1.30
11/29/2020	0.00	1.30
11/30/2020	0.00	1.30
12/1/2020	0.00	1.30
12/2/2020	0.00	1.30
12/3/2020	0.00	1.30
12/4/2020	0.00	1.30
12/5/2020	0.00	1.30
12/6/2020	0.00	1.30
12/7/2020	0.00	1.30
12/8/2020	0.00	1.30
12/9/2020	0.00	1.30
12/10/2020	0.00	1.30
12/11/2020	0.00	1.30
12/12/2020	0.80	2.10
12/13/2020	0.10	2.20
12/14/2020	0.70	2.90
12/15/2020	0.00	2.90
12/16/2020	0.00	2.90
12/17/2020	0.30	3.20
12/18/2020	0.10	3.30
12/19/2020	0.00	3.30
12/20/2020	0.00	3.30

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
11/24/2021	0.00	7.25
11/25/2021	0.00	7.25
11/26/2021	0.00	7.25
11/27/2021	0.00	7.25
11/28/2021	0.00	7.25
11/29/2021	0.00	7.25
11/30/2021	0.00	7.25
12/1/2021	0.00	7.25
12/2/2021	0.00	7.25
12/3/2021	0.00	7.25
12/4/2021	0.00	7.25
12/5/2021	0.00	7.25
12/6/2021	0.00	7.25
12/7/2021	0.20	7.45
12/8/2021	0.00	7.45
12/9/2021	0.30	7.75
12/10/2021	0.20	7.95
12/11/2021	0.00	7.95
12/12/2021	0.00	7.95
12/13/2021	1.00	8.95
12/14/2021	1.50	10.45
12/15/2021	0.30	10.75
12/16/2021	0.40	11.15
12/17/2021	0.00	11.15
12/18/2021	0.00	11.15
12/19/2021	0.00	11.15
12/20/2021	0.00	11.15

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
11/24/2022	0.00	3.00
11/25/2022	0.00	3.00
11/26/2022	0.00	3.00
11/27/2022	0.00	3.00
11/28/2022	0.00	3.00
11/29/2022	0.00	3.00
11/30/2022	0.00	3.00
12/1/2022	0.05	3.05
12/2/2022	1.10	4.15
12/3/2022	0.05	4.20
12/4/2022	1.50	5.70
12/5/2022	0.00	5.70
12/6/2022	0.00	5.70
12/7/2022	0.20	5.90
12/8/2022	0.00	5.90
12/9/2022	0.10	6.00
12/10/2022	0.20	6.20
12/11/2022	2.30	8.50
12/12/2022	0.30	8.80
12/13/2022	0.00	8.80
12/14/2022	0.00	8.80
12/15/2022	0.00	8.80
12/16/2022	0.00	8.80
12/17/2022	0.00	8.80
12/18/2022	0.00	8.80
12/19/2022	0.00	8.80
12/20/2022	0.00	8.80

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
12/21/2020	0.00	3.30
12/22/2020	0.00	3.30
12/23/2020	0.00	3.30
12/24/2020	0.00	3.30
12/25/2020	0.00	3.30
12/26/2020	0.10	3.40
12/27/2020	0.00	3.40
12/28/2020	0.00	3.40
12/29/2020	0.00	3.40
12/30/2020	0.00	3.40
12/31/2020	0.10	3.50
1/1/2021	0.00	3.50
1/2/2021	0.00	3.50
1/3/2021	0.00	3.50
1/4/2021	0.10	3.60
1/5/2021	0.10	3.70
1/6/2021	0.00	3.70
1/7/2021	0.00	3.70
1/8/2021	0.00	3.70
1/9/2021	0.00	3.70
1/10/2021	0.00	3.70
1/11/2021	0.00	3.70
1/12/2021	0.00	3.70
1/13/2021	0.00	3.70
1/14/2021	0.00	3.70
1/15/2021	0.00	3.70
1/16/2021	0.00	3.70

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
12/21/2021	0.00	11.15
12/22/2021	0.30	11.45
12/23/2021	0.35	11.80
12/24/2021	0.85	12.65
12/25/2021	0.25	12.90
12/26/2021	0.50	13.40
12/27/2021	0.60	14.00
12/28/2021	0.30	14.30
12/29/2021	0.20	14.50
12/30/2021	0.20	14.70
12/31/2021	0.00	14.70
1/1/2022	0.00	14.70
1/2/2022	0.00	14.70
1/3/2022	0.00	14.70
1/4/2022	0.00	14.70
1/5/2022	0.00	14.70
1/6/2022	0.00	14.70
1/7/2022	0.00	14.70
1/8/2022	0.00	14.70
1/9/2022	0.00	14.70
1/10/2022	0.00	14.70
1/11/2022	0.00	14.70
1/12/2022	0.00	14.70
1/13/2022	0.00	14.70
1/14/2022	0.00	14.70
1/15/2022	0.00	14.70
1/16/2022	0.00	14.70

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
12/21/2022	0.00	8.80
12/22/2022	0.00	8.80
12/23/2022	0.00	8.80
12/24/2022	0.00	8.80
12/25/2022	0.00	8.80
12/26/2022	0.00	8.80
12/27/2022	1.50	10.30
12/28/2022	0.30	10.60
12/29/2022	0.25	10.85
12/30/2022	0.50	11.35
12/31/2022	2.40	13.75
1/1/2023	2.75	16.50
1/2/2023	0.00	16.50
1/3/2023	0.30	16.80
1/4/2023	0.10	16.90
1/5/2023	0.40	17.30
1/6/2023	0.50	17.80
1/7/2023	0.00	17.80
1/8/2023	0.40	18.20
1/9/2023	0.60	18.80
1/10/2023	0.75	19.55
1/11/2023	1.10	20.65
1/12/2023	0.10	20.75
1/13/2023	0.00	20.75
1/14/2023	1.10	21.85
1/15/2023	2.20	24.05
1/16/2023	2.30	26.35

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
1/17/2021	0.00	3.70
1/18/2021	0.00	3.70
1/19/2021	0.00	3.70
1/20/2021	0.00	3.70
1/21/2021	0.00	3.70
1/22/2021	0.10	3.80
1/23/2021	0.40	4.20
1/24/2021	0.00	4.20
1/25/2021	0.90	5.10
1/26/2021	0.00	5.10
1/27/2021	0.30	5.40
1/28/2021	1.90	7.30
1/29/2021	1.80	9.10
1/30/2021	0.00	9.10
1/31/2021	0.00	9.10
2/1/2021	0.00	9.10
2/2/2021	0.20	9.30
2/3/2021	0.60	9.90
2/4/2021	0.00	9.90
2/5/2021	0.00	9.90
2/6/2021	0.00	9.90
2/7/2021	0.00	9.90
2/8/2021	0.00	9.90
2/9/2021	0.00	9.90
2/10/2021	0.00	9.90
2/11/2021	0.00	9.90
2/12/2021	0.70	10.60

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
1/17/2022	0.00	14.70
1/18/2022	0.00	14.70
1/19/2022	0.00	14.70
1/20/2022	0.00	14.70
1/21/2022	0.00	14.70
1/22/2022	0.00	14.70
1/23/2022	0.00	14.70
1/24/2022	0.00	14.70
1/25/2022	0.00	14.70
1/26/2022	0.00	14.70
1/27/2022	0.00	14.70
1/28/2022	0.00	14.70
1/29/2022	0.00	14.70
1/30/2022	0.00	14.70
1/31/2022	0.00	14.70
2/1/2022	0.00	14.70
2/2/2022	0.00	14.70
2/3/2022	0.00	14.70
2/4/2022	0.00	14.70
2/5/2022	0.00	14.70
2/6/2022	0.00	14.70
2/7/2022	0.00	14.70
2/8/2022	0.00	14.70
2/9/2022	0.00	14.70
2/10/2022	0.00	14.70
2/11/2022	0.00	14.70
2/12/2022	0.00	14.70

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
1/17/2023	0.30	26.65
1/18/2023	0.00	26.65
1/19/2023	0.30	26.95
1/20/2023	0.00	26.95
1/21/2023	0.00	26.95
1/22/2023	0.00	26.95
1/23/2023	0.00	26.95
1/24/2023	0.00	26.95
1/25/2023	0.00	26.95
1/26/2023	0.00	26.95
1/27/2023	0.00	26.95
1/28/2023	0.00	26.95
1/29/2023	0.00	26.95
1/30/2023	0.00	26.95
1/31/2023	0.00	26.95
2/1/2023	0.00	26.95
2/2/2023	0.00	26.95
2/3/2023	0.00	26.95
2/4/2023	0.00	26.95
2/5/2023	0.40	27.35
2/6/2023	0.25	27.60
2/7/2023	0.00	27.60
2/8/2023	0.00	27.60
2/9/2023	0.00	27.60
2/10/2023	0.00	27.60
2/11/2023	0.00	27.60
2/12/2023	0.00	27.60

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
2/13/2021	0.10	10.70
2/14/2021	0.10	10.80
2/15/2021	0.30	11.10
2/16/2021	0.10	11.20
2/17/2021	0.00	11.20
2/18/2021	0.00	11.20
2/19/2021	0.00	11.20
2/20/2021	0.10	11.30
2/21/2021	0.20	11.50
2/22/2021	0.00	11.50
2/23/2021	0.00	11.50
2/24/2021	0.00	11.50
2/25/2021	0.00	11.50
2/26/2021	0.00	11.50
2/27/2021	0.00	11.50
2/28/2021	0.00	11.50
3/1/2021	0.00	11.50
3/2/2021	0.00	11.50
3/3/2021	0.00	11.50
3/4/2021	0.00	11.50
3/5/2021	0.00	11.50
3/6/2021	0.20	11.70
3/7/2021	0.00	11.70
3/8/2021	0.00	11.70
3/9/2021	0.00	11.70
3/10/2021	0.40	12.10
3/11/2021	0.10	12.20

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
2/13/2022	0.00	14.70
2/14/2022	0.00	14.70
2/15/2022	0.00	14.70
2/16/2022	0.00	14.70
2/17/2022	0.00	14.70
2/18/2022	0.00	14.70
2/19/2022	0.00	14.70
2/20/2022	0.00	14.70
2/21/2022	0.00	14.70
2/22/2022	0.00	14.70
2/23/2022	0.00	14.70
2/24/2022	0.00	14.70
2/25/2022	0.00	14.70
2/26/2022	0.00	14.70
2/27/2022	0.00	14.70
2/28/2022	0.00	14.70
3/1/2022	0.00	14.70
3/2/2022	0.00	14.70
3/3/2022	0.00	14.70
3/4/2022	0.00	14.70
3/5/2022	0.10	14.80
3/6/2022	0.00	14.80
3/7/2022	0.00	14.80
3/8/2022	0.00	14.80
3/9/2022	0.00	14.80
3/10/2022	0.00	14.80
3/11/2022	0.00	14.80

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
2/13/2023	0.00	27.60
2/14/2023	0.00	27.60
2/15/2023	0.00	27.60
2/16/2023	0.00	27.60
2/17/2023	0.00	27.60
2/18/2023	0.00	27.60
2/19/2023	0.00	27.60
2/20/2023	0.00	27.60
2/21/2023	0.00	27.60
2/22/2023	0.00	27.60
2/23/2023	0.00	27.60
2/24/2023	0.30	27.90
2/25/2023	1.20	29.10
2/26/2023	0.25	29.35
2/27/2023	0.40	29.75
2/28/2023	0.80	30.55
3/1/2023	0.80	31.35
3/2/2023	0.00	31.35
3/3/2023	0.00	31.35
3/4/2023	0.00	31.35
3/5/2023	0.60	31.95
3/6/2023	0.20	32.15
3/7/2023	0.05	32.20
3/8/2023	0.05	32.25
3/9/2023	0.30	32.55
3/10/2023	1.20	33.75
3/11/2023	0.40	34.15

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
3/12/2021	0.00	12.20
3/13/2021	0.00	12.20
3/14/2021	0.00	12.20
3/15/2021	0.30	12.50
3/16/2021	0.30	12.80
3/17/2021	0.00	12.80
3/18/2021	0.00	12.80
3/19/2021	0.90	13.70
3/20/2021	0.00	13.70
3/21/2021	0.00	13.70
3/22/2021	0.00	13.70
3/23/2021	0.00	13.70
3/24/2021	0.00	13.70
3/25/2021	0.00	13.70
3/26/2021	0.00	13.70
3/27/2021	0.00	13.70
3/28/2021	0.00	13.70
3/29/2021	0.00	13.70
3/30/2021	0.00	13.70
3/31/2021	0.00	13.70
4/1/2021	0.00	13.70
4/2/2021	0.00	13.70
4/3/2021	0.00	13.70
4/4/2021	0.00	13.70
4/5/2021	0.00	13.70
4/6/2021	0.00	13.70
4/7/2021	0.00	13.70

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
3/12/2022	0.00	14.80
3/13/2022	0.00	14.80
3/14/2022	0.00	14.80
3/15/2022	0.30	15.10
3/16/2022	0.20	15.30
3/17/2022	0.00	15.30
3/18/2022	0.00	15.30
3/19/2022	0.00	15.30
3/20/2022	0.10	15.40
3/21/2022	0.00	15.40
3/22/2022	0.00	15.40
3/23/2022	0.00	15.40
3/24/2022	0.00	15.40
3/25/2022	0.00	15.40
3/26/2022	0.00	15.40
3/27/2022	0.00	15.40
3/28/2022	0.30	15.70
3/29/2022	0.25	15.95
3/30/2022	0.00	15.95
3/31/2022	0.00	15.95
4/1/2022	0.00	15.95
4/2/2022	0.00	15.95
4/3/2022	0.00	15.95
4/4/2022	0.00	15.95
4/5/2022	0.00	15.95
4/6/2022	0.00	15.95
4/7/2022	0.00	15.95

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
3/12/2023	0.40	34.55
3/13/2023	0.80	35.35
3/14/2023	0.60	35.95
3/15/2023	0.30	36.25
3/16/2023	0.00	36.25
3/17/2023	0.00	36.25
3/18/2023	0.00	36.25
3/19/2023	0.15	36.40
3/20/2023	0.10	36.50
3/21/2023	0.00	36.50
3/22/2023	0.70	37.20
3/23/2023	0.30	37.50
3/24/2023	0.10	37.60
3/25/2023	0.00	37.60
3/26/2023	0.00	37.60
3/27/2023	0.00	37.60
3/28/2023	0.00	37.60
3/29/2023	1.00	38.60
3/30/2023	0.50	39.10
3/31/2023	0.00	39.10
4/1/2023	0.00	39.10
4/2/2023	0.00	39.10
4/3/2023	0.00	39.10
4/4/2023	0.00	39.10
4/5/2023	0.00	39.10
4/6/2023	0.00	39.10
4/7/2023	0.10	39.20

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
4/8/2021	0.00	13.70
4/9/2021	0.00	13.70
4/10/2021	0.00	13.70
4/11/2021	0.00	13.70
4/12/2021	0.00	13.70
4/13/2021	0.00	13.70
4/14/2021	0.00	13.70
4/15/2021	0.00	13.70
4/16/2021	0.00	13.70
4/17/2021	0.00	13.70
4/18/2021	0.00	13.70
4/19/2021	0.00	13.70
4/20/2021	0.00	13.70
4/21/2021	0.00	13.70
4/22/2021	0.00	13.70
4/23/2021	0.00	13.70
4/24/2021	0.00	13.70
4/25/2021	0.00	13.70
4/26/2021	0.15	13.85
4/27/2021	0.00	13.85
4/28/2021	0.00	13.85
4/29/2021	0.00	13.85
4/30/2021	0.00	13.85
5/1/2021	0.00	13.85
5/2/2021	0.00	13.85
5/3/2021	0.00	13.85
5/4/2021	0.00	13.85

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
4/8/2022	0.00	15.95
4/9/2022	0.00	15.95
4/10/2022	0.00	15.95
4/11/2022	0.20	16.15
4/12/2022	0.15	16.30
4/13/2022	0.00	16.30
4/14/2022	0.05	16.35
4/15/2022	0.20	16.55
4/16/2022	0.40	16.95
4/17/2022	0.05	17.00
4/18/2022	0.00	17.00
4/19/2022	0.00	17.00
4/20/2022	0.00	17.00
4/21/2022	0.40	17.40
4/22/2022	0.70	18.10
4/23/2022	0.00	18.10
4/24/2022	0.00	18.10
4/25/2022	0.00	18.10
4/26/2022	0.00	18.10
4/27/2022	0.00	18.10
4/28/2022	0.00	18.10
4/29/2022	0.00	18.10
4/30/2022	0.00	18.10
5/1/2022	0.00	18.10
5/2/2022	0.00	18.10
5/3/2022	0.00	18.10
5/4/2022	0.00	18.10

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
4/8/2023	0.00	39.20
4/9/2023	0.00	39.20
4/10/2023	0.00	39.20
4/11/2023	0.00	39.20
4/12/2023	0.00	39.20
4/13/2023	0.00	39.20
4/14/2023	0.00	39.20
4/15/2023	0.00	39.20
4/16/2023	0.00	39.20
4/17/2023	0.00	39.20
4/18/2023	0.00	39.20
4/19/2023	0.00	39.20
4/20/2023	0.00	39.20
4/21/2023	0.00	39.20
4/22/2023	0.00	39.20
4/23/2023	0.00	39.20
4/24/2023	0.00	39.20
4/25/2023	0.00	39.20
4/26/2023	0.00	39.20
4/27/2023	0.00	39.20
4/28/2023	0.00	39.20
4/29/2023	0.00	39.20
4/30/2023	0.00	39.20
5/1/2023	0.00	39.20
5/2/2023	0.10	39.30
5/3/2023	0.00	39.30
5/4/2023	0.00	39.30

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
5/5/2021	0.00	13.85
5/6/2021	0.00	13.85
5/7/2021	0.00	13.85
5/8/2021	0.00	13.85
5/9/2021	0.00	13.85
5/10/2021	0.00	13.85
5/11/2021	0.00	13.85
5/12/2021	0.00	13.85
5/13/2021	0.00	13.85
5/14/2021	0.00	13.85
5/15/2021	0.00	13.85
5/16/2021	0.00	13.85
5/17/2021	0.00	13.85
5/18/2021	0.00	13.85
5/19/2021	0.00	13.85
5/20/2021	0.00	13.85
5/21/2021	0.00	13.85
5/22/2021	0.00	13.85
5/23/2021	0.00	13.85
5/24/2021	0.00	13.85
5/25/2021	0.00	13.85
5/26/2021	0.00	13.85
5/27/2021	0.00	13.85
5/28/2021	0.00	13.85
5/29/2021	0.00	13.85
5/30/2021	0.00	13.85
5/31/2021	0.00	13.85

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
5/5/2022	0.00	18.10
5/6/2022	0.00	18.10
5/7/2022	0.00	18.10
5/8/2022	0.00	18.10
5/9/2022	0.00	18.10
5/10/2022	0.00	18.10
5/11/2022	0.00	18.10
5/12/2022	0.00	18.10
5/13/2022	0.00	18.10
5/14/2022	0.00	18.10
5/15/2022	0.00	18.10
5/16/2022	0.00	18.10
5/17/2022	0.00	18.10
5/18/2022	0.00	18.10
5/19/2022	0.00	18.10
5/20/2022	0.00	18.10
5/21/2022	0.00	18.10
5/22/2022	0.00	18.10
5/23/2022	0.00	18.10
5/24/2022	0.00	18.10
5/25/2022	0.00	18.10
5/26/2022	0.00	18.10
5/27/2022	0.00	18.10
5/28/2022	0.00	18.10
5/29/2022	0.00	18.10
5/30/2022	0.00	18.10
5/31/2022	0.00	18.10

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
5/5/2023	0.00	39.30
5/6/2023	0.25	39.55
5/7/2023	0.20	39.75
5/8/2023	0.00	39.75
5/9/2023	0.00	39.75
5/10/2023	0.00	39.75
5/11/2023	0.00	39.75
5/12/2023	0.00	39.75
5/13/2023	0.00	39.75
5/14/2023	0.00	39.75
5/15/2023	0.00	39.75
5/16/2023	0.00	39.75
5/17/2023	0.00	39.75
5/18/2023	0.00	39.75
5/19/2023	0.00	39.75
5/20/2023	0.00	39.75
5/21/2023	0.00	39.75
5/22/2023	0.00	39.75
5/23/2023	0.00	39.75
5/24/2023	0.00	39.75
5/25/2023	0.00	39.75
5/26/2023	0.00	39.75
5/27/2023	0.00	39.75
5/28/2023	0.00	39.75
5/29/2023	0.00	39.75
5/30/2023	0.00	39.75
5/31/2023	0.00	39.75

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
6/1/2021	0.00	13.85
6/2/2021	0.00	13.85
6/3/2021	0.00	13.85
6/4/2021	0.00	13.85
6/5/2021	0.00	13.85
6/6/2021	0.00	13.85
6/7/2021	0.00	13.85
6/8/2021	0.00	13.85
6/9/2021	0.00	13.85
6/10/2021	0.00	13.85
6/11/2021	0.00	13.85
6/12/2021	0.00	13.85
6/13/2021	0.00	13.85
6/14/2021	0.00	13.85
6/15/2021	0.00	13.85
6/16/2021	0.00	13.85
6/17/2021	0.00	13.85
6/18/2021	0.00	13.85
6/19/2021	0.00	13.85
6/20/2021	0.00	13.85
6/21/2021	0.00	13.85
6/22/2021	0.00	13.85
6/23/2021	0.00	13.85
6/24/2021	0.00	13.85
6/25/2021	0.00	13.85
6/26/2021	0.00	13.85
6/27/2021	0.00	13.85

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
6/1/2022	0.00	18.10
6/2/2022	0.00	18.10
6/3/2022	0.00	18.10
6/4/2022	0.00	18.10
6/5/2022	0.10	18.20
6/6/2022	0.00	18.20
6/7/2022	0.00	18.20
6/8/2022	0.00	18.20
6/9/2022	0.00	18.20
6/10/2022	0.00	18.20
6/11/2022	0.00	18.20
6/12/2022	0.00	18.20
6/13/2022	0.00	18.20
6/14/2022	0.00	18.20
6/15/2022	0.00	18.20
6/16/2022	0.00	18.20
6/17/2022	0.00	18.20
6/18/2022	0.00	18.20
6/19/2022	0.00	18.20
6/20/2022	0.00	18.20
6/21/2022	0.00	18.20
6/22/2022	0.00	18.20
6/23/2022	0.00	18.20
6/24/2022	0.00	18.20
6/25/2022	0.00	18.20
6/26/2022	0.00	18.20
6/27/2022	0.00	18.20

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
6/1/2023	0.00	39.75
6/2/2023	0.00	39.75
6/3/2023	0.00	39.75
6/4/2023	0.00	39.75
6/5/2023	0.00	39.75
6/6/2023	0.00	39.75
6/7/2023	0.00	39.75
6/8/2023	0.00	39.75
6/9/2023	0.00	39.75
6/10/2023	0.00	39.75
6/11/2023	0.00	39.75
6/12/2023	0.00	39.75
6/13/2023	0.00	39.75
6/14/2023	0.00	39.75
6/15/2023	0.00	39.75
6/16/2023	0.00	39.75
6/17/2023	0.00	39.75
6/18/2023	0.00	39.75
6/19/2023	0.00	39.75
6/20/2023	0.00	39.75
6/21/2023	0.00	39.75
6/22/2023	0.00	39.75
6/23/2023	0.00	39.75
6/24/2023	0.00	39.75
6/25/2023	0.00	39.75
6/26/2023	0.00	39.75
6/27/2023	0.00	39.75

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2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
6/28/2021	0.00	13.85
6/29/2021	0.00	13.85
6/30/2021	0.00	13.85
7/1/2021	0.00	13.85
7/2/2021	0.00	13.85
7/3/2021	0.00	13.85
7/4/2021	0.00	13.85
7/5/2021	0.00	13.85
7/6/2021	0.00	13.85
7/7/2021	0.00	13.85
7/8/2021	0.00	13.85
7/9/2021	0.00	13.85
7/10/2021	0.00	13.85
7/11/2021	0.00	13.85
7/12/2021	0.00	13.85
7/13/2021	0.00	13.85
7/14/2021	0.00	13.85
7/15/2021	0.00	13.85
7/16/2021	0.00	13.85
7/17/2021	0.00	13.85
7/18/2021	0.00	13.85
7/19/2021	0.00	13.85
7/20/2021	0.00	13.85
7/21/2021	0.00	13.85
7/22/2021	0.00	13.85
7/23/2021	0.00	13.85
7/24/2021	0.00	13.85

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
6/28/2022	0.00	18.20
6/29/2022	0.00	18.20
6/30/2022	0.00	18.20
7/1/2022	0.00	18.20
7/2/2022	0.00	18.20
7/3/2022	0.00	18.20
7/4/2022	0.00	18.20
7/5/2022	0.00	18.20
7/6/2022	0.00	18.20
7/7/2022	0.00	18.20
7/8/2022	0.00	18.20
7/9/2022	0.00	18.20
7/10/2022	0.00	18.20
7/11/2022	0.00	18.20
7/12/2022	0.00	18.20
7/13/2022	0.00	18.20
7/14/2022	0.00	18.20
7/15/2022	0.00	18.20
7/16/2022	0.00	18.20
7/17/2022	0.00	18.20
7/18/2022	0.00	18.20
7/19/2022	0.00	18.20
7/20/2022	0.00	18.20
7/21/2022	0.00	18.20
7/22/2022	0.00	18.20
7/23/2022	0.00	18.20
7/24/2022	0.00	18.20

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
6/28/2023	0.00	39.75
6/29/2023	0.00	39.75
6/30/2023	0.00	39.75
7/1/2023	0.00	39.75
7/2/2023	0.00	39.75
7/3/2023	0.00	39.75
7/4/2023	0.00	39.75
7/5/2023	0.00	39.75
7/6/2023	0.00	39.75
7/7/2023	0.00	39.75
7/8/2023	0.00	39.75
7/9/2023	0.00	39.75
7/10/2023	0.00	39.75
7/11/2023	0.00	39.75
7/12/2023	0.00	39.75
7/13/2023	0.00	39.75
7/14/2023	0.00	39.75
7/15/2023	0.00	39.75
7/16/2023	0.00	39.75
7/17/2023	0.00	39.75
7/18/2023	0.00	39.75
7/19/2023	0.00	39.75
7/20/2023	0.00	39.75
7/21/2023	0.00	39.75
7/22/2023	0.00	39.75
7/23/2023	0.00	39.75
7/24/2023	0.00	39.75

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2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
7/25/2021	0.00	13.85
7/26/2021	0.00	13.85
7/27/2021	0.00	13.85
7/28/2021	0.00	13.85
7/29/2021	0.00	13.85
7/30/2021	0.00	13.85
7/31/2021	0.00	13.85
8/1/2021	0.00	13.85
8/2/2021	0.00	13.85
8/3/2021	0.00	13.85
8/4/2021	0.00	13.85
8/5/2021	0.00	13.85
8/6/2021	0.00	13.85
8/7/2021	0.00	13.85
8/8/2021	0.00	13.85
8/9/2021	0.00	13.85
8/10/2021	0.00	13.85
8/11/2021	0.00	13.85
8/12/2021	0.00	13.85
8/13/2021	0.00	13.85
8/14/2021	0.00	13.85
8/15/2021	0.00	13.85
8/16/2021	0.00	13.85
8/17/2021	0.00	13.85
8/18/2021	0.00	13.85
8/19/2021	0.00	13.85
8/20/2021	0.00	13.85

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
7/25/2022	0.00	18.20
7/26/2022	0.00	18.20
7/27/2022	0.00	18.20
7/28/2022	0.00	18.20
7/29/2022	0.00	18.20
7/30/2022	0.00	18.20
7/31/2022	0.00	18.20
8/1/2022	0.00	18.20
8/2/2022	0.00	18.20
8/3/2022	0.00	18.20
8/4/2022	0.00	18.20
8/5/2022	0.00	18.20
8/6/2022	0.00	18.20
8/7/2022	0.00	18.20
8/8/2022	0.00	18.20
8/9/2022	0.00	18.20
8/10/2022	0.00	18.20
8/11/2022	0.00	18.20
8/12/2022	0.00	18.20
8/13/2022	0.00	18.20
8/14/2022	0.00	18.20
8/15/2022	0.00	18.20
8/16/2022	0.00	18.20
8/17/2022	0.00	18.20
8/18/2022	0.00	18.20
8/19/2022	0.00	18.20
8/20/2022	0.00	18.20

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
7/25/2023	0.00	39.75
7/26/2023	0.00	39.75
7/27/2023	0.00	39.75
7/28/2023	0.00	39.75
7/29/2023	0.00	39.75
7/30/2023	0.00	39.75
7/31/2023	0.00	39.75
8/1/2023	0.00	39.75
8/2/2023	0.00	39.75
8/3/2023	0.00	39.75
8/4/2023	0.00	39.75
8/5/2023	0.00	39.75
8/6/2023	0.00	39.75
8/7/2023	0.00	39.75
8/8/2023	0.00	39.75
8/9/2023	0.00	39.75
8/10/2023	0.00	39.75
8/11/2023	0.00	39.75
8/12/2023	0.00	39.75
8/13/2023	0.00	39.75
8/14/2023	0.10	39.85
8/15/2023	0.00	39.85
8/16/2023	0.00	39.85
8/17/2023	0.00	39.85
8/18/2023	0.00	39.85
8/19/2023	0.00	39.85
8/20/2023	0.00	39.85

APPENDIX J

2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
8/21/2021	0.00	13.85
8/22/2021	0.00	13.85
8/23/2021	0.00	13.85
8/24/2021	0.00	13.85
8/25/2021	0.00	13.85
8/26/2021	0.00	13.85
8/27/2021	0.00	13.85
8/28/2021	0.00	13.85
8/29/2021	0.00	13.85
8/30/2021	0.00	13.85
8/31/2021	0.00	13.85
9/1/2021	0.00	13.85
9/2/2021	0.00	13.85
9/3/2021	0.00	13.85
9/4/2021	0.00	13.85
9/5/2021	0.00	13.85
9/6/2021	0.00	13.85
9/7/2021	0.00	13.85
9/8/2021	0.00	13.85
9/9/2021	0.00	13.85
9/10/2021	0.00	13.85
9/11/2021	0.00	13.85
9/12/2021	0.00	13.85
9/13/2021	0.00	13.85
9/14/2021	0.00	13.85
9/15/2021	0.00	13.85
9/16/2021	0.00	13.85

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
8/21/2022	0.00	18.20
8/22/2022	0.00	18.20
8/23/2022	0.00	18.20
8/24/2022	0.00	18.20
8/25/2022	0.00	18.20
8/26/2022	0.00	18.20
8/27/2022	0.00	18.20
8/28/2022	0.00	18.20
8/29/2022	0.00	18.20
8/30/2022	0.00	18.20
8/31/2022	0.00	18.20
9/1/2022	0.00	18.20
9/2/2022	0.00	18.20
9/3/2022	0.00	18.20
9/4/2022	0.00	18.20
9/5/2022	0.00	18.20
9/6/2022	0.00	18.20
9/7/2022	0.00	18.20
9/8/2022	0.00	18.20
9/9/2022	0.00	18.20
9/10/2022	0.00	18.20
9/11/2022	0.00	18.20
9/12/2022	0.00	18.20
9/13/2022	0.00	18.20
9/14/2022	0.00	18.20
9/15/2022	0.00	18.20
9/16/2022	0.00	18.20

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
8/21/2023	0.00	39.85
8/22/2023	0.00	39.85
8/23/2023	0.00	39.85
8/24/2023	0.00	39.85
8/25/2023	0.00	39.85
8/26/2023	0.00	39.85
8/27/2023	0.00	39.85
8/28/2023	0.00	39.85
8/29/2023	0.00	39.85
8/30/2023	0.00	39.85
8/31/2023	0.00	39.85
9/1/2023	0.00	39.85
9/2/2023	0.05	39.90
9/3/2023	0.10	40.00
9/4/2023	0.00	40.00
9/5/2023	0.00	40.00
9/6/2023	0.00	40.00
9/7/2023	0.00	40.00
9/8/2023	0.00	40.00
9/9/2023	0.00	40.00
9/10/2023	0.00	40.00
9/11/2023	0.00	40.00
9/12/2023	0.00	40.00
9/13/2023	0.00	40.00
9/14/2023	0.00	40.00
9/15/2023	0.00	40.00
9/16/2023	0.00	40.00

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2020 - 2021 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
9/17/2021	0.00	13.85
9/18/2021	0.00	13.85
9/19/2021	0.00	13.85
9/20/2021	0.00	13.85
9/21/2021	0.00	13.85
9/22/2021	0.00	13.85
9/23/2021	0.00	13.85
9/24/2021	0.00	13.85
9/25/2021	0.00	13.85
9/26/2021	0.00	13.85
9/27/2021	0.00	13.85
9/28/2021	0.00	13.85
9/29/2021	0.00	13.85
9/30/2021	0.00	13.85

2021 - 2022 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
9/17/2022	0.00	18.20
9/18/2022	0.00	18.20
9/19/2022	0.10	18.30
9/20/2022	0.40	18.70
9/21/2022	0.00	18.70
9/22/2022	0.00	18.70
9/23/2022	0.00	18.70
9/24/2022	0.00	18.70
9/25/2022	0.00	18.70
9/26/2022	0.00	18.70
9/27/2022	0.00	18.70
9/28/2022	0.00	18.70
9/29/2022	0.00	18.70
9/30/2022	0.00	18.70

2022 - 2023 Seasonal Rainfall		
Date	Daily, inches	Accumulative, inches
9/17/2023	0.00	40.00
9/18/2023	0.00	40.00
9/19/2023	0.00	40.00
9/20/2023	0.00	40.00
9/21/2023	0.00	40.00
9/22/2023	0.00	40.00
9/23/2023	0.00	40.00
9/24/2023	0.00	40.00
9/25/2023	0.00	40.00
9/26/2023	0.00	40.00
9/27/2023	0.00	40.00
9/28/2023	0.00	40.00
9/29/2023	0.00	40.00
9/30/2023	0.10	40.10

# **APPENDIX K**

LA CONTENTA WWTF  
UESP AND LESP  
2020 TO 2023 DAILY STORED VOLUMES

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
10/1/2022	7.4	1.3	8.7	212.3
10/2/2022	7.4	1.3	8.7	212.3
10/3/2022	7.4	1.3	8.7	212.3
10/4/2022	7.4	1.3	8.7	212.3
10/5/2022	7.4	1.3	8.7	212.3
10/6/2022	7.4	1.3	8.7	212.3
10/7/2022	7.4	1.3	8.7	212.3
10/8/2022	7.4	1.3	8.7	212.3
10/9/2022	7.4	1.3	8.7	212.3
10/10/2022	7.4	1.3	8.7	212.3
10/11/2022	7.4	1.3	8.7	212.3
10/12/2022	7.4	1.3	8.7	212.3
10/13/2022	7.4	1.3	8.7	212.3
10/14/2022	7.4	1.3	8.7	212.3
10/15/2022	7.4	1.3	8.7	212.3
10/16/2022	7.4	1.3	8.7	212.3
10/17/2022	7.4	2.8	10.2	210.8
10/18/2022	7.4	2.8	10.2	210.8
10/19/2022	7.4	2.8	10.2	210.8
10/20/2022	7.4	2.8	10.2	210.8
10/21/2022	7.4	2.8	10.2	210.8
10/22/2022	7.4	2.8	10.2	210.8
10/23/2022	7.4	2.8	10.2	210.8
10/24/2022	7.4	4.5	11.9	209.1
10/25/2022	7.4	4.5	11.9	209.1
10/26/2022	7.4	4.5	11.9	209.1
10/27/2022	7.4	4.5	11.9	209.1
10/28/2022	7.4	4.5	11.9	209.1
10/29/2022	7.4	4.5	11.9	209.1
10/30/2022	7.4	4.5	11.9	209.1
10/31/2022	7.4	4.5	11.9	209.1
11/1/2022	7.4	4.5	11.9	209.1
11/2/2022	7.4	4.5	11.9	209.1
11/3/2022	7.4	4.5	11.9	209.1
11/4/2022	7.4	4.5	11.9	209.1
11/5/2022	7.4	4.5	11.9	209.1
11/6/2022	7.4	4.5	11.9	209.1
11/7/2022	7.4	7.2	14.6	206.4
11/8/2022	7.4	7.2	14.6	206.4

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
11/9/2022	7.4	7.2	14.6	206.4
11/10/2022	7.4	7.2	14.6	206.4
11/11/2022	7.4	7.2	14.6	206.4
11/12/2022	7.4	7.2	14.6	206.4
11/13/2022	7.4	7.2	14.6	206.4
11/14/2022	7.4	7.2	14.6	206.4
11/15/2022	7.4	7.2	14.6	206.4
11/16/2022	7.4	7.2	14.6	206.4
11/17/2022	7.4	7.2	14.6	206.4
11/18/2022	7.4	7.2	14.6	206.4
11/19/2022	7.4	7.2	14.6	206.4
11/20/2022	7.4	7.2	14.6	206.4
11/21/2022	7.4	10.8	18.2	202.8
11/22/2022	7.4	10.8	18.2	202.8
11/23/2022	7.4	10.8	18.2	202.8
11/24/2022	7.4	10.8	18.2	202.8
11/25/2022	7.4	10.8	18.2	202.8
11/26/2022	7.4	10.8	18.2	202.8
11/27/2022	7.4	10.8	18.2	202.8
11/28/2022	7.4	10.8	18.2	202.8
11/29/2022	7.4	10.8	18.2	202.8
11/30/2022	7.4	10.8	18.2	202.8
12/1/2022				
12/2/2022				
12/3/2022				
12/4/2022				
12/5/2022				
12/6/2022				
12/7/2022				
12/8/2022				
12/9/2022				
12/10/2022				
12/11/2022				
12/12/2022				
12/13/2022				
12/14/2022				
12/15/2022				
12/16/2022				
12/17/2022				

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
12/18/2022				
12/19/2022				
12/20/2022				
12/21/2022				
12/22/2022				
12/23/2022				
12/24/2022				
12/25/2022				
12/26/2022				
12/27/2022				
12/28/2022				
12/29/2022				
12/30/2022				
12/31/2022				
1/1/2023	20.6	26.3	46.9	174.1
1/2/2023	20.6	26.3	46.9	174.1
1/3/2023	20.6	26.3	46.9	174.1
1/4/2023	20.6	26.3	46.9	174.1
1/5/2023	20.6	26.3	46.9	174.1
1/6/2023	20.6	26.3	46.9	174.1
1/7/2023	20.6	26.3	46.9	174.1
1/8/2023	20.6	26.3	46.9	174.1
1/9/2023	20.6	26.3	46.9	174.1
1/10/2023	20.6	26.3	46.9	174.1
1/11/2023	24.4	40.7	65.1	155.9
1/12/2023	24.4	40.7	65.1	155.9
1/13/2023	24.4	40.7	65.1	155.9
1/14/2023	24.4	40.7	65.1	155.9
1/15/2023	24.4	40.7	65.1	155.9
1/16/2023	24.4	40.7	65.1	155.9
1/17/2023	24.4	40.7	65.1	155.9
1/18/2023	32.1	53.9	86.0	135.0
1/19/2023	32.1	53.9	86.0	135.0
1/20/2023	32.1	53.9	86.0	135.0
1/21/2023	32.1	53.9	86.0	135.0
1/22/2023	32.1	53.9	86.0	135.0
1/23/2023	32.1	53.9	86.0	135.0
1/24/2023	32.1	53.9	86.0	135.0
1/25/2023	32.1	53.9	86.0	135.0

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
1/26/2023	32.1	53.9	86.0	135.0
1/27/2023	32.1	53.9	86.0	135.0
1/28/2023	32.1	53.9	86.0	135.0
1/29/2023	32.1	53.9	86.0	135.0
1/30/2023	32.1	53.9	86.0	135.0
1/31/2023	32.1	53.9	86.0	135.0
2/1/2023	28.2	53.9	82.0	139.0
2/2/2023	28.2	53.9	82.0	139.0
2/3/2023	28.2	53.9	82.0	139.0
2/4/2023	28.2	53.9	82.0	139.0
2/5/2023	28.2	53.9	82.0	139.0
2/6/2023	28.2	70.0	98.2	122.8
2/7/2023	28.2	70.0	98.2	122.8
2/8/2023	28.2	70.0	98.2	122.8
2/9/2023	28.2	70.0	98.2	122.8
2/10/2023	28.2	70.0	98.2	122.8
2/11/2023	28.2	70.0	98.2	122.8
2/12/2023	28.2	70.0	98.2	122.8
2/13/2023	28.2	70.0	98.2	122.8
2/14/2023	28.2	70.0	98.2	122.8
2/15/2023	28.2	70.0	98.2	122.8
2/16/2023	28.2	70.0	98.2	122.8
2/17/2023	28.2	70.0	98.2	122.8
2/18/2023	28.2	70.0	98.2	122.8
2/19/2023	28.2	70.0	98.2	122.8
2/20/2023	28.2	70.0	98.2	122.8
2/21/2023	28.2	70.0	98.2	122.8
2/22/2023	28.2	70.0	98.2	122.8
2/23/2023	28.2	70.0	98.2	122.8
2/24/2023	28.2	70.0	98.2	122.8
2/25/2023	28.2	70.0	98.2	122.8
2/26/2023	28.2	70.0	98.2	122.8
2/27/2023	28.2	70.0	98.2	122.8
2/28/2023	28.2	70.0	98.2	122.8
3/1/2023	28.2	88.5	116.7	104.4
3/2/2023	28.2	88.5	116.7	104.4
3/3/2023	28.2	88.5	116.7	104.4
3/4/2023	28.2	88.5	116.7	104.4
3/5/2023	28.2	88.5	116.7	104.4

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
3/6/2023	28.2	88.5	116.7	104.4
3/7/2023	28.2	88.5	116.7	104.4
3/8/2023	28.2	88.5	116.7	104.4
3/9/2023	28.2	88.5	116.7	104.4
3/10/2023	28.2	88.5	116.7	104.4
3/11/2023	28.2	88.5	116.7	104.4
3/12/2023	28.2	88.5	116.7	104.4
3/13/2023	32.1	98.5	130.6	90.4
3/14/2023	32.1	98.5	130.6	90.4
3/15/2023	32.1	98.5	130.6	90.4
3/16/2023	32.1	98.5	130.6	90.4
3/17/2023	32.1	98.5	130.6	90.4
3/18/2023	32.1	98.5	130.6	90.4
3/19/2023	32.1	98.5	130.6	90.4
3/20/2023	32.1	98.5	130.6	90.4
3/21/2023	32.1	98.5	130.6	90.4
3/22/2023	32.1	98.5	130.6	90.4
3/23/2023	32.1	98.5	130.6	90.4
3/24/2023	32.1	98.5	130.6	90.4
3/25/2023	32.1	98.5	130.6	90.4
3/26/2023	32.1	98.5	130.6	90.4
3/27/2023	32.1	109.2	141.3	79.7
3/28/2023	32.1	109.2	141.3	79.7
3/29/2023	32.1	109.2	141.3	79.7
3/30/2023	32.1	109.2	141.3	79.7
3/31/2023	32.1	109.2	141.3	79.7
4/1/2023	32.1	120.5	152.6	68.4
4/2/2023	32.1	120.5	152.6	68.4
4/3/2023	32.1	120.5	152.6	68.4
4/4/2023	32.1	120.5	152.6	68.4
4/5/2023	32.1	120.5	152.6	68.4
4/6/2023	32.1	120.5	152.6	68.4
4/7/2023	32.1	120.5	152.6	68.4
4/8/2023	32.1	120.5	152.6	68.4
4/9/2023	32.1	120.5	152.6	68.4
4/10/2023	32.1	120.5	152.6	68.4
4/11/2023	32.1	120.5	152.6	68.4
4/12/2023	32.1	120.5	152.6	68.4
4/13/2023	32.1	120.5	152.6	68.4

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
4/14/2023	32.1	120.5	152.6	68.4
4/15/2023	32.1	120.5	152.6	68.4
4/16/2023	32.1	120.5	152.6	68.4
4/17/2023	32.1	120.5	152.6	68.4
4/18/2023	32.1	120.5	152.6	68.4
4/19/2023	32.1	120.5	152.6	68.4
4/20/2023	32.1	120.5	152.6	68.4
4/21/2023	32.1	120.5	152.6	68.4
4/22/2023	32.1	120.5	152.6	68.4
4/23/2023	32.1	120.5	152.6	68.4
4/24/2023	32.1	134.4	166.5	54.5
4/25/2023	32.1	134.4	166.5	54.5
4/26/2023	32.1	134.4	166.5	54.5
4/27/2023	32.1	134.4	166.5	54.5
4/28/2023	32.1	134.4	166.5	54.5
4/29/2023	32.1	134.4	166.5	54.5
4/30/2023	32.1	134.4	166.5	54.5
5/1/2023	32.1	120.5	152.6	68.4
5/2/2023	32.1	120.5	152.6	68.4
5/3/2023	32.1	120.5	152.6	68.4
5/4/2023	32.1	120.5	152.6	68.4
5/5/2023	32.1	120.5	152.6	68.4
5/6/2023	32.1	120.5	152.6	68.4
5/7/2023	32.1	120.5	152.6	68.4
5/8/2023	32.1	120.5	152.6	68.4
5/9/2023	32.1	120.5	152.6	68.4
5/10/2023	32.1	120.5	152.6	68.4
5/11/2023	32.1	120.5	152.6	68.4
5/12/2023	32.1	120.5	152.6	68.4
5/13/2023	32.1	120.5	152.6	68.4
5/14/2023	32.1	120.5	152.6	68.4
5/15/2023	32.1	109.2	141.3	79.7
5/16/2023	32.1	109.2	141.3	79.7
5/17/2023	32.1	109.2	141.3	79.7
5/18/2023	32.1	109.2	141.3	79.7
5/19/2023	32.1	109.2	141.3	79.7
5/20/2023	32.1	109.2	141.3	79.7
5/21/2023	32.1	109.2	141.3	79.7
5/22/2023	28.2	98.5	126.7	94.3

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
5/23/2023	28.2	98.5	126.7	94.3
5/24/2023	28.2	98.5	126.7	94.3
5/25/2023	28.2	98.5	126.7	94.3
5/26/2023	28.2	98.5	126.7	94.3
5/27/2023	28.2	98.5	126.7	94.3
5/28/2023	28.2	98.5	126.7	94.3
5/29/2023	28.2	88.5	116.7	104.4
5/30/2023	28.2	88.5	116.7	104.4
5/31/2023	28.2	88.5	116.7	104.4
6/1/2023	28.2	88.5	116.7	104.4
6/2/2023	28.2	88.5	116.7	104.4
6/3/2023	28.2	88.5	116.7	104.4
6/4/2023	28.2	88.5	116.7	104.4
6/5/2023	28.2	88.5	116.7	104.4
6/6/2023	28.2	88.5	116.7	104.4
6/7/2023	28.2	88.5	116.7	104.4
6/8/2023	28.2	88.5	116.7	104.4
6/9/2023	28.2	88.5	116.7	104.4
6/10/2023	28.2	88.5	116.7	104.4
6/11/2023	28.2	88.5	116.7	104.4
6/12/2023	24.4	70.0	94.4	126.6
6/13/2023	24.4	70.0	94.4	126.6
6/14/2023	24.4	70.0	94.4	126.6
6/15/2023	24.4	70.0	94.4	126.6
6/16/2023	24.4	70.0	94.4	126.6
6/17/2023	24.4	70.0	94.4	126.6
6/18/2023	24.4	70.0	94.4	126.6
6/19/2023	24.4	70.0	94.4	126.6
6/20/2023	24.4	70.0	94.4	126.6
6/21/2023	24.4	70.0	94.4	126.6
6/22/2023	24.4	70.0	94.4	126.6
6/23/2023	24.4	70.0	94.4	126.6
6/24/2023	24.4	70.0	94.4	126.6
6/25/2023	24.4	70.0	94.4	126.6
6/26/2023	20.6	53.9	74.5	146.5
6/27/2023	20.6	53.9	74.5	146.5
6/28/2023	20.6	53.9	74.5	146.5
6/29/2023	20.6	53.9	74.5	146.5
6/30/2023	20.6	53.9	74.5	146.5

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
7/1/2023	20.6	53.9	74.5	146.5
7/2/2023	20.6	53.9	74.5	146.5
7/3/2023	20.6	53.9	74.5	146.5
7/4/2023	20.6	53.9	74.5	146.5
7/5/2023	20.6	53.9	74.5	146.5
7/6/2023	20.6	53.9	74.5	146.5
7/7/2023	20.6	53.9	74.5	146.5
7/8/2023	20.6	53.9	74.5	146.5
7/9/2023	20.6	53.9	74.5	146.5
7/10/2023	20.6	40.7	61.3	159.7
7/11/2023	20.6	40.7	61.3	159.7
7/12/2023	20.6	40.7	61.3	159.7
7/13/2023	20.6	40.7	61.3	159.7
7/14/2023	20.6	40.7	61.3	159.7
7/15/2023	20.6	40.7	61.3	159.7
7/16/2023	20.6	40.7	61.3	159.7
7/17/2023	20.6	30.6	51.2	169.8
7/18/2023	20.6	30.6	51.2	169.8
7/19/2023	20.6	30.6	51.2	169.8
7/20/2023	20.6	30.6	51.2	169.8
7/21/2023	20.6	30.6	51.2	169.8
7/22/2023	20.6	30.6	51.2	169.8
7/23/2023	20.6	30.6	51.2	169.8
7/24/2023	20.6	30.6	51.2	169.8
7/25/2023	20.6	30.6	51.2	169.8
7/26/2023	20.6	30.6	51.2	169.8
7/27/2023	20.6	30.6	51.2	169.8
7/28/2023	20.6	30.6	51.2	169.8
7/29/2023	20.6	30.6	51.2	169.8
7/30/2023	20.6	30.6	51.2	169.8
7/31/2023	20.6	26.3	46.9	174.1
8/1/2023	20.6	22.4	43.1	178.0
8/2/2023	20.6	22.4	43.1	178.0
8/3/2023	20.6	22.4	43.1	178.0
8/4/2023	20.6	22.4	43.1	178.0
8/5/2023	20.6	22.4	43.1	178.0
8/6/2023	20.6	22.4	43.1	178.0
8/7/2023	20.6	22.4	43.1	178.0
8/8/2023	20.6	22.4	43.1	178.0

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, AF	LESP Volume, AF	Total Volume, AF	Avail. Vol., AF
8/9/2023	20.6	22.4	43.1	178.0
8/10/2023	20.6	22.4	43.1	178.0
8/11/2023	20.6	22.4	43.1	178.0
8/12/2023	20.6	22.4	43.1	178.0
8/13/2023	20.6	22.4	43.1	178.0
8/14/2023	20.6	10.8	31.4	189.6
8/15/2023	20.6	10.8	31.4	189.6
8/16/2023	20.6	10.8	31.4	189.6
8/17/2023	20.6	10.8	31.4	189.6
8/18/2023	20.6	10.8	31.4	189.6
8/19/2023	20.6	10.8	31.4	189.6
8/20/2023	20.6	10.8	31.4	189.6
8/21/2023	20.6	3.6	24.2	196.8
8/22/2023	20.6	3.6	24.2	196.8
8/23/2023	20.6	3.6	24.2	196.8
8/24/2023	20.6	3.6	24.2	196.8
8/25/2023	20.6	3.6	24.2	196.8
8/26/2023	20.6	3.6	24.2	196.8
8/27/2023	20.6	3.6	24.2	196.8
8/28/2023	20.6	0.0	20.6	200.4
8/29/2023	20.6	0.0	20.6	200.4
8/30/2023	20.6	0.0	20.6	200.4
8/31/2023	20.6	0.0	20.6	200.4
9/1/2023				
9/2/2023				
9/3/2023				
9/4/2023				
9/5/2023				
9/6/2023				
9/7/2023				
9/8/2023				
9/9/2023				
9/10/2023				
9/11/2023				
9/12/2023				
9/13/2023				
9/14/2023				
9/15/2023				
9/16/2023				

APPENDIX K

2022 - 2023 Seasonal Pond Storage Condition				
Date	UESP Volume, <i>AF</i>	LESP Volume, <i>AF</i>	Total Volume, <i>AF</i>	Avail. Vol., <i>AF</i>
9/17/2023				
9/18/2023				
9/19/2023				
9/20/2023				
9/21/2023				
9/22/2023				
9/23/2023				
9/24/2023				
9/25/2023				
9/26/2023				
9/27/2023				
9/28/2023				
9/29/2023				
9/30/2023				

# **APPENDIX L**

**LA CONTENTA WWTF  
UESP AND LESP  
2020 TO 2023 DAILY WATER LEVELS**

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
10/1/2020	726.6	684.0
10/2/2020	726.6	684.0
10/3/2020	726.6	684.0
10/4/2020	726.6	684.0
10/5/2020	726.6	684.0
10/6/2020	726.6	684.0
10/7/2020	726.6	684.0
10/8/2020	726.6	684.0
10/9/2020	726.6	684.0
10/10/2020	726.6	684.0
10/11/2020	726.6	684.0
10/12/2020	726.6	684.0
10/13/2020	726.6	684.0
10/14/2020	726.6	684.0
10/15/2020	726.6	684.0
10/16/2020	726.8	685.0
10/17/2020	726.8	685.0
10/18/2020	726.8	685.0
10/19/2020	726.8	685.0
10/20/2020	726.8	685.0
10/21/2020	727.0	686.0
10/22/2020	727.0	686.0
10/23/2020	727.0	686.0
10/24/2020	727.0	686.0
10/25/2020	727.0	686.0
10/26/2020	727.0	686.0
10/27/2020	727.0	686.0

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
10/1/2021	726.6	684.0
10/2/2021	726.6	684.0
10/3/2021	726.6	684.0
10/4/2021	726.6	684.0
10/5/2021	726.6	684.0
10/6/2021	726.6	684.0
10/7/2021	726.6	684.0
10/8/2021	726.6	684.0
10/9/2021	726.6	684.0
10/10/2021	726.6	684.0
10/11/2021	726.6	684.0
10/12/2021	726.6	684.0
10/13/2021	726.6	684.0
10/14/2021	726.6	684.0
10/15/2021	726.6	684.0
10/16/2021	726.8	685.0
10/17/2021	726.8	685.0
10/18/2021	726.8	685.0
10/19/2021	726.8	685.0
10/20/2021	726.8	685.0
10/21/2021	727.0	686.0
10/22/2021	727.0	686.0
10/23/2021	727.0	686.0
10/24/2021	727.0	686.0
10/25/2021	727.0	686.0
10/26/2021	727.0	686.0
10/27/2021	727.0	686.0

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
10/1/2022	722.7	673.5
10/2/2022	722.7	673.5
10/3/2022	722.7	673.5
10/4/2022	722.7	673.5
10/5/2022	722.7	673.5
10/6/2022	722.7	673.5
10/7/2022	722.7	673.5
10/8/2022	722.7	673.5
10/9/2022	722.7	673.5
10/10/2022	722.6	673.0
10/11/2022	722.6	673.0
10/12/2022	722.6	673.0
10/13/2022	722.6	673.0
10/14/2022	722.6	673.0
10/15/2022	722.6	673.0
10/16/2022	722.6	673.0
10/17/2022	722.6	674.0
10/18/2022	722.6	674.0
10/19/2022	722.6	674.0
10/20/2022	722.6	674.0
10/21/2022	722.6	674.0
10/22/2022	722.6	674.0
10/23/2022	722.6	674.0
10/24/2022	722.5	676.0
10/25/2022	722.5	676.0
10/26/2022	722.5	676.0
10/27/2022	722.5	676.0

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
10/28/2020	727.3	687.0
10/29/2020	727.3	687.0
10/30/2020	727.3	687.0
10/31/2020	727.3	687.0
11/1/2020	723.8	675.0
11/2/2020	723.8	675.0
11/3/2020	723.8	675.0
11/4/2020	723.8	675.0
11/5/2020	723.8	675.0
11/6/2020	723.8	675.0
11/7/2020	723.8	675.0
11/8/2020	723.8	675.0
11/9/2020	724.7	675.0
11/10/2020	724.7	675.0
11/11/2020	724.7	675.0
11/12/2020	724.7	675.0
11/13/2020	724.7	675.0
11/14/2020	724.7	675.0
11/15/2020	724.7	675.0
11/16/2020	724.6	677.0
11/17/2020	724.6	677.0
11/18/2020	724.6	677.0
11/19/2020	724.6	677.0
11/20/2020	724.6	677.0
11/21/2020	724.6	677.0
11/22/2020	724.6	677.0
11/23/2020	724.5	679.0

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
10/28/2021	727.3	687.0
10/29/2021	727.3	687.0
10/30/2021	727.3	687.0
10/31/2021	727.3	687.0
11/1/2021	726.0	680.0
11/2/2021	726.0	680.0
11/3/2021	726.0	680.0
11/4/2021	726.0	680.0
11/5/2021	726.0	680.0
11/6/2021	726.0	680.0
11/7/2021	726.2	680.0
11/8/2021	726.2	680.5
11/9/2021	726.2	680.5
11/10/2021	726.2	680.5
11/11/2021	726.2	680.5
11/12/2021	726.2	680.5
11/13/2021	726.2	680.5
11/14/2021	726.2	680.5
11/15/2021	726.2	681.0
11/16/2021	726.2	681.0
11/17/2021	726.2	681.0
11/18/2021	726.2	681.0
11/19/2021	726.2	681.0
11/20/2021	726.2	681.0
11/21/2021	726.2	681.0
11/22/2021	726.2	682.0
11/23/2021	726.2	682.0

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
10/28/2022	722.5	676.0
10/29/2022	722.5	676.0
10/30/2022	722.5	676.0
10/31/2022	722.5	676.0
11/1/2022	722.5	677.5
11/2/2022	722.5	677.5
11/3/2022	722.5	677.5
11/4/2022	722.5	677.5
11/5/2022	722.5	677.5
11/6/2022	722.5	677.5
11/7/2022	722.5	678.5
11/8/2022	722.5	678.5
11/9/2022	722.5	678.5
11/10/2022	722.5	678.5
11/11/2022	722.5	678.5
11/12/2022	722.5	678.5
11/13/2022	722.5	678.5
11/14/2022	722.6	679.5
11/15/2022	722.6	679.5
11/16/2022	722.6	679.5
11/17/2022	722.6	679.5
11/18/2022	722.6	679.5
11/19/2022	722.6	679.5
11/20/2022	722.6	679.5
11/21/2022	722.5	680.8
11/22/2022	722.5	680.8
11/23/2022	722.5	680.8

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
11/24/2020	724.5	679.0
11/25/2020	724.5	679.0
11/26/2020	724.5	679.0
11/27/2020	724.5	679.0
11/28/2020	724.5	679.0
11/29/2020	724.5	679.0
11/30/2020	724.5	680.0
12/1/2020	724.5	680.0
12/2/2020	724.5	680.0
12/3/2020	724.5	680.0
12/4/2020	724.5	680.0
12/5/2020	724.5	680.0
12/6/2020	724.5	680.0
12/7/2020	724.5	680.5
12/8/2020	724.5	680.5
12/9/2020	724.5	680.5
12/10/2020	724.5	680.5
12/11/2020	724.5	680.5
12/12/2020	724.5	680.5
12/13/2020	724.5	680.5
12/14/2020	724.7	681.0
12/15/2020	724.7	681.0
12/16/2020	724.7	681.0
12/17/2020	724.7	681.0
12/18/2020	724.7	681.0
12/19/2020	724.7	681.0
12/20/2020	724.7	681.0

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
11/24/2021	726.2	682.0
11/25/2021	726.2	682.0
11/26/2021	726.2	682.0
11/27/2021	726.2	682.0
11/28/2021	726.2	682.0
11/29/2021	726.2	683.0
11/30/2021	726.2	683.0
12/1/2021	726.3	685.0
12/2/2021	726.3	685.0
12/3/2021	726.3	685.0
12/4/2021	726.3	685.0
12/5/2021	726.3	685.0
12/6/2021	726.3	685.0
12/7/2021	726.3	685.0
12/8/2021	726.3	685.0
12/9/2021	726.3	685.0
12/10/2021	726.3	685.0
12/11/2021	726.3	685.0
12/12/2021	726.3	685.0
12/13/2021	726.5	685.5
12/14/2021	726.5	685.5
12/15/2021	726.5	685.5
12/16/2021	726.5	685.5
12/17/2021	726.5	685.5
12/18/2021	726.5	685.5
12/19/2021	726.5	685.5
12/20/2021	726.7	686.0

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
11/24/2022	722.5	680.8
11/25/2022	722.5	680.8
11/26/2022	722.5	680.8
11/27/2022	722.5	680.8
11/28/2022	722.5	681.8
11/29/2022	722.5	681.8
11/30/2022	722.5	681.8
12/1/2022	733.0	
12/2/2022	733.0	
12/3/2022	733.0	
12/4/2022	733.0	
12/5/2022	733.0	
12/6/2022	733.0	
12/7/2022	733.0	
12/8/2022	733.0	
12/9/2022	733.0	
12/10/2022	733.0	
12/11/2022	733.0	
12/12/2022	733.0	
12/13/2022	733.0	
12/14/2022	733.0	
12/15/2022	733.0	
12/16/2022	733.0	
12/17/2022	733.0	
12/18/2022	733.0	
12/19/2022	733.0	
12/20/2022	733.0	

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
12/21/2020	724.7	681.5
12/22/2020	724.7	681.5
12/23/2020	724.7	681.5
12/24/2020	724.7	681.5
12/25/2020	724.7	681.5
12/26/2020	724.7	681.5
12/27/2020	724.7	681.5
12/28/2020	724.7	682.0
12/29/2020	724.7	682.0
12/30/2020	724.7	682.0
12/31/2020	724.7	682.0
1/1/2021	726.6	684.0
1/2/2021	726.6	684.0
1/3/2021	726.6	684.0
1/4/2021	726.6	684.0
1/5/2021	726.6	684.0
1/6/2021	726.6	684.0
1/7/2021	726.6	684.0
1/8/2021	726.6	684.0
1/9/2021	726.6	684.0
1/10/2021	726.6	684.0
1/11/2021	726.6	684.0
1/12/2021	726.6	684.0
1/13/2021	726.6	684.0
1/14/2021	726.6	684.0
1/15/2021	726.6	684.0
1/16/2021	726.8	685.0

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
12/21/2021	726.7	686.0
12/22/2021	726.7	686.0
12/23/2021	726.7	686.0
12/24/2021	726.7	686.0
12/25/2021	726.7	686.0
12/26/2021	726.7	686.0
12/27/2021	726.7	686.0
12/28/2021	726.7	686.0
12/29/2021	727.3	686.5
12/30/2021	727.3	686.5
12/31/2021	727.3	686.5
1/1/2022	727.6	687.0
1/2/2022	727.6	687.0
1/3/2022	727.6	687.0
1/4/2022	727.6	687.0
1/5/2022	727.6	687.0
1/6/2022	727.6	687.0
1/7/2022	727.6	687.0
1/8/2022	727.6	687.0
1/9/2022	727.6	687.0
1/10/2022	727.7	687.5
1/11/2022	727.7	687.5
1/12/2022	727.7	687.5
1/13/2022	727.7	687.5
1/14/2022	727.7	687.5
1/15/2022	727.7	687.5
1/16/2022	727.7	687.5

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
12/21/2022	733.0	
12/22/2022	733.0	
12/23/2022	733.0	
12/24/2022	733.0	
12/25/2022	733.0	
12/26/2022	733.0	
12/27/2022	733.0	
12/28/2022	733.0	
12/29/2022	733.0	
12/30/2022	733.0	
12/31/2022	733.0	
1/1/2023	726.8	685.5
1/2/2023	726.8	685.5
1/3/2023	726.8	685.5
1/4/2023	726.8	685.5
1/5/2023	726.8	685.5
1/6/2023	726.8	685.5
1/7/2023	726.8	685.5
1/8/2023	726.8	685.5
1/9/2023	726.8	685.5
1/10/2023	726.8	685.5
1/11/2023	727.8	688.7
1/12/2023	727.8	688.7
1/13/2023	727.8	688.7
1/14/2023	727.8	688.7
1/15/2023	727.8	688.7
1/16/2023	727.8	688.7

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
1/17/2021	726.8	685.0
1/18/2021	726.8	685.0
1/19/2021	726.8	685.0
1/20/2021	726.8	685.0
1/21/2021	727.0	686.0
1/22/2021	727.0	686.0
1/23/2021	727.0	686.0
1/24/2021	727.0	686.0
1/25/2021	727.0	686.0
1/26/2021	727.0	686.0
1/27/2021	727.0	686.0
1/28/2021	727.3	687.0
1/29/2021	727.3	687.0
1/30/2021	727.3	687.0
1/31/2021	727.3	687.0
2/1/2021	726.3	686.5
2/2/2021	726.3	686.5
2/3/2021	726.3	686.5
2/4/2021	726.3	686.5
2/5/2021	726.3	686.5
2/6/2021	726.3	686.5
2/7/2021	726.3	686.5
2/8/2021	726.8	687.1
2/9/2021	726.8	687.1
2/10/2021	726.8	687.1
2/11/2021	726.8	687.1
2/12/2021	726.8	687.1

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
1/17/2022	727.7	687.5
1/18/2022	727.7	687.5
1/19/2022	727.7	688.0
1/20/2022	727.7	688.0
1/21/2022	727.7	688.0
1/22/2022	727.7	688.0
1/23/2022	727.7	688.0
1/24/2022	727.6	688.3
1/25/2022	727.6	688.3
1/26/2022	727.6	688.3
1/27/2022	727.6	688.3
1/28/2022	727.6	688.3
1/29/2022	727.6	688.3
1/30/2022	727.6	688.3
1/31/2022	727.6	688.3
2/1/2022	727.5	688.7
2/2/2022	727.5	688.7
2/3/2022	727.5	688.7
2/4/2022	727.5	688.7
2/5/2022	727.5	688.7
2/6/2022	727.5	688.7
2/7/2022	727.4	689.3
2/8/2022	727.4	689.3
2/9/2022	727.4	689.3
2/10/2022	727.4	689.3
2/11/2022	727.4	689.3
2/12/2022	727.4	689.3

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
1/17/2023	727.8	688.7
1/18/2023	729.7	690.2
1/19/2023	729.7	690.2
1/20/2023	729.7	690.2
1/21/2023	729.7	690.2
1/22/2023	729.7	690.2
1/23/2023	729.7	690.2
1/24/2023	729.7	690.2
1/25/2023	729.8	690.8
1/26/2023	729.8	690.8
1/27/2023	729.8	690.8
1/28/2023	729.8	690.8
1/29/2023	729.8	690.8
1/30/2023	729.8	690.8
1/31/2023	729.8	690.8
2/1/2023	728.9	691.6
2/2/2023	728.9	691.6
2/3/2023	728.9	691.6
2/4/2023	728.9	691.6
2/5/2023	728.9	691.6
2/6/2023	728.5	692.1
2/7/2023	728.5	692.1
2/8/2023	728.5	692.1
2/9/2023	728.5	692.1
2/10/2023	728.5	692.1
2/11/2023	728.5	692.1
2/12/2023	728.5	692.1

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
2/13/2021	726.8	687.1
2/14/2021	726.8	687.1
2/15/2021	727.0	687.8
2/16/2021	727.0	687.8
2/17/2021	727.0	687.8
2/18/2021	727.0	687.8
2/19/2021	727.0	687.8
2/20/2021	727.0	687.8
2/21/2021	727.0	687.8
2/22/2021	727.0	688.1
2/23/2021	727.0	688.1
2/24/2021	727.0	688.1
2/25/2021	727.0	688.1
2/26/2021	727.0	688.1
2/27/2021	727.0	688.1
2/28/2021	727.0	688.1
3/1/2021	726.8	688.4
3/2/2021	726.8	688.4
3/3/2021	726.8	688.4
3/4/2021	726.8	688.4
3/5/2021	726.8	688.4
3/6/2021	726.8	688.4
3/7/2021	726.8	688.4
3/8/2021	726.9	688.7
3/9/2021	726.9	688.7
3/10/2021	726.9	688.7
3/11/2021	726.9	688.7

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
2/13/2022	727.4	689.3
2/14/2022	727.3	689.7
2/15/2022	727.3	689.7
2/16/2022	727.3	689.7
2/17/2022	727.3	689.7
2/18/2022	727.3	689.7
2/19/2022	727.3	689.7
2/20/2022	727.3	689.7
2/21/2022	727.2	690.2
2/22/2022	727.2	690.2
2/23/2022	727.2	690.2
2/24/2022	727.2	690.2
2/25/2022	727.2	690.2
2/26/2022	727.2	690.2
2/27/2022	727.2	690.2
2/28/2022	727.2	690.2
3/1/2022	727.2	690.4
3/2/2022	727.2	690.4
3/3/2022	727.2	690.4
3/4/2022	727.2	690.4
3/5/2022	727.2	690.4
3/6/2022	727.2	690.4
3/7/2022	727.1	690.6
3/8/2022	727.1	690.6
3/9/2022	727.1	690.6
3/10/2022	727.1	690.6
3/11/2022	727.1	690.6

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
2/13/2023	728.4	692.5
2/14/2023	728.4	692.5
2/15/2023	728.4	692.5
2/16/2023	728.4	692.5
2/17/2023	728.4	692.5
2/18/2023	728.4	692.5
2/19/2023	728.4	692.5
2/20/2023	728.4	692.5
2/21/2023	728.4	692.5
2/22/2023	728.4	692.5
2/23/2023	728.3	693.1
2/24/2023	728.3	693.1
2/25/2023	728.3	693.1
2/26/2023	728.3	693.1
2/27/2023	728.2	693.7
2/28/2023	728.2	693.7
3/1/2023	728.9	694.5
3/2/2023	728.9	694.5
3/3/2023	728.9	694.5
3/4/2023	728.9	694.5
3/5/2023	728.9	694.5
3/6/2023	728.9	694.5
3/7/2023	728.9	694.5
3/8/2023	728.9	694.5
3/9/2023	728.9	694.5
3/10/2023	728.9	694.5
3/11/2023	728.9	694.5

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
3/12/2021	726.9	688.7
3/13/2021	726.9	688.7
3/14/2021	726.9	688.7
3/15/2021	727.7	688.8
3/16/2021	727.7	688.8
3/17/2021	727.7	688.8
3/18/2021	727.7	688.8
3/19/2021	727.7	688.8
3/20/2021	727.7	688.8
3/21/2021	727.7	688.8
3/22/2021	728.5	689.0
3/23/2021	728.5	689.0
3/24/2021	728.5	689.0
3/25/2021	728.5	689.0
3/26/2021	728.5	689.0
3/27/2021	728.5	689.0
3/28/2021	728.5	689.0
3/29/2021	728.9	689.4
3/30/2021	728.9	689.4
3/31/2021	728.9	689.4
4/1/2021	728.8	689.8
4/2/2021	728.8	689.8
4/3/2021	728.8	689.8
4/4/2021	728.8	689.8
4/5/2021	728.8	689.8
4/6/2021	728.8	689.8
4/7/2021	728.8	689.8

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
3/12/2022	727.1	690.6
3/13/2022	727.1	690.6
3/14/2022	727.1	691.0
3/15/2022	727.1	691.0
3/16/2022	727.1	691.0
3/17/2022	727.1	691.0
3/18/2022	727.1	691.0
3/19/2022	727.1	691.0
3/20/2022	727.1	691.0
3/21/2022	727.0	691.4
3/22/2022	727.0	691.4
3/23/2022	727.0	691.4
3/24/2022	727.0	691.4
3/25/2022	727.0	691.4
3/26/2022	727.0	691.4
3/27/2022	727.0	691.4
3/28/2022	727.0	691.8
3/29/2022	727.0	691.8
3/30/2022	727.0	691.8
3/31/2022	727.0	691.8
4/1/2022	726.9	692.2
4/2/2022	726.9	692.2
4/3/2022	726.9	692.2
4/4/2022	726.9	692.2
4/5/2022	726.9	692.2
4/6/2022	726.9	692.2
4/7/2022	726.9	692.2

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
3/12/2023	728.9	694.5
3/13/2023	729.5	695.2
3/14/2023	729.5	695.2
3/15/2023	729.5	695.2
3/16/2023	729.5	695.2
3/17/2023	729.5	695.2
3/18/2023	729.5	695.2
3/19/2023	729.5	695.2
3/20/2023	729.7	695.9
3/21/2023	729.7	695.9
3/22/2023	729.7	695.9
3/23/2023	729.7	695.9
3/24/2023	729.7	695.9
3/25/2023	729.7	695.9
3/26/2023	729.7	695.9
3/27/2023	729.7	696.5
3/28/2023	729.7	696.5
3/29/2023	729.7	696.5
3/30/2023	729.7	696.5
3/31/2023	729.7	696.5
4/1/2023	729.7	697.0
4/2/2023	729.7	697.0
4/3/2023	729.7	697.0
4/4/2023	729.7	697.0
4/5/2023	729.7	697.0
4/6/2023	729.7	697.0
4/7/2023	729.7	697.0

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
4/8/2021	728.8	689.8
4/9/2021	728.8	689.8
4/10/2021	728.8	689.8
4/11/2021	728.8	689.8
4/12/2021	728.7	690.1
4/13/2021	728.7	690.1
4/14/2021	728.7	690.1
4/15/2021	728.7	690.1
4/16/2021	728.7	690.1
4/17/2021	728.7	690.1
4/18/2021	728.7	690.1
4/19/2021	728.6	690.4
4/20/2021	728.6	690.4
4/21/2021	728.6	690.4
4/22/2021	728.6	690.4
4/23/2021	728.6	690.4
4/24/2021	728.6	690.4
4/25/2021	728.6	690.4
4/26/2021	728.6	690.7
4/27/2021	728.6	690.7
4/28/2021	728.6	690.7
4/29/2021	728.6	690.7
4/30/2021	728.6	690.7
5/1/2021	728.8	689.8
5/2/2021	728.8	689.8
5/3/2021	728.8	689.8
5/4/2021	728.8	689.8

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
4/8/2022	726.9	692.2
4/9/2022	726.9	692.2
4/10/2022	726.9	692.5
4/11/2022	726.9	692.5
4/12/2022	726.9	692.5
4/13/2022	726.9	692.5
4/14/2022	726.9	692.5
4/15/2022	726.9	692.5
4/16/2022	726.9	692.5
4/17/2022	726.8	692.5
4/18/2022	726.8	692.8
4/19/2022	726.8	692.8
4/20/2022	726.8	692.8
4/21/2022	726.8	692.8
4/22/2022	726.8	692.8
4/23/2022	726.8	692.8
4/24/2022	726.8	692.8
4/25/2022	726.8	693.1
4/26/2022	726.8	693.1
4/27/2022	726.8	693.1
4/28/2022	726.8	693.1
4/29/2022	726.8	693.1
4/30/2022	726.8	693.1
5/1/2022	726.7	693.4
5/2/2022	726.7	693.4
5/3/2022	726.7	693.4
5/4/2022	726.7	693.4

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
4/8/2023	729.7	697.0
4/9/2023	729.7	697.0
4/10/2023	729.7	697.4
4/11/2023	729.7	697.4
4/12/2023	729.7	697.4
4/13/2023	729.7	697.4
4/14/2023	729.7	697.4
4/15/2023	729.7	697.4
4/16/2023	729.7	697.4
4/17/2023	729.7	697.7
4/18/2023	729.7	697.7
4/19/2023	729.7	697.7
4/20/2023	729.7	697.7
4/21/2023	729.7	697.7
4/22/2023	729.7	697.7
4/23/2023	729.7	697.7
4/24/2023	729.6	698.0
4/25/2023	729.6	698.0
4/26/2023	729.6	698.0
4/27/2023	729.6	698.0
4/28/2023	729.6	698.0
4/29/2023	729.6	698.0
4/30/2023	729.6	698.0
5/1/2023	729.4	697.5
5/2/2023	729.4	697.5
5/3/2023	729.4	697.5
5/4/2023	729.4	697.5

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
5/5/2021	728.8	689.8
5/6/2021	728.8	689.8
5/7/2021	728.8	689.8
5/8/2021	728.8	689.8
5/9/2021	728.8	689.8
5/10/2021	728.6	689.0
5/11/2021	728.6	689.0
5/12/2021	728.6	689.0
5/13/2021	728.6	689.0
5/14/2021	728.6	689.0
5/15/2021	728.6	689.0
5/16/2021	728.6	689.0
5/17/2021	728.4	687.6
5/18/2021	728.4	687.6
5/19/2021	728.4	687.6
5/20/2021	728.4	687.6
5/21/2021	728.4	687.6
5/22/2021	728.4	687.6
5/23/2021	728.4	687.6
5/24/2021	728.2	687.0
5/25/2021	728.2	687.0
5/26/2021	728.2	687.0
5/27/2021	728.2	687.0
5/28/2021	728.2	687.0
5/29/2021	728.2	687.0
5/30/2021	728.2	687.0
5/31/2021	728.0	687.3

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
5/5/2022	726.7	693.4
5/6/2022	726.7	693.4
5/7/2022	726.7	693.4
5/8/2022	726.7	693.4
5/9/2022	726.6	693.6
5/10/2022	726.6	693.6
5/11/2022	726.6	693.6
5/12/2022	726.6	693.6
5/13/2022	726.6	693.6
5/14/2022	726.6	693.6
5/15/2022	726.6	693.6
5/16/2022	726.5	693.8
5/17/2022	726.5	693.8
5/18/2022	726.5	693.8
5/19/2022	726.5	693.8
5/20/2022	726.5	693.8
5/21/2022	726.5	693.8
5/22/2022	726.5	693.8
5/23/2022	726.3	694.0
5/24/2022	726.3	694.0
5/25/2022	726.3	694.0
5/26/2022	726.3	694.0
5/27/2022	726.3	694.0
5/28/2022	726.3	694.0
5/29/2022	726.3	694.0
5/30/2022	726.1	694.2
5/31/2022	726.1	694.2

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
5/5/2023	729.4	697.5
5/6/2023	729.4	697.5
5/7/2023	729.4	697.5
5/8/2023	729.2	697.0
5/9/2023	729.2	697.0
5/10/2023	729.2	697.0
5/11/2023	729.2	697.0
5/12/2023	729.2	697.0
5/13/2023	729.2	697.0
5/14/2023	729.2	697.0
5/15/2023	729.0	696.4
5/16/2023	729.0	696.4
5/17/2023	729.0	696.4
5/18/2023	729.0	696.4
5/19/2023	729.0	696.4
5/20/2023	729.0	696.4
5/21/2023	729.0	696.4
5/22/2023	728.8	695.7
5/23/2023	728.8	695.7
5/24/2023	728.8	695.7
5/25/2023	728.8	695.7
5/26/2023	728.8	695.7
5/27/2023	728.8	695.7
5/28/2023	728.8	695.7
5/29/2023	728.5	694.9
5/30/2023	728.5	694.9
5/31/2023	728.5	694.9

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
6/1/2021	728.0	687.3
6/2/2021	728.0	687.3
6/3/2021	728.0	687.3
6/4/2021	728.0	687.3
6/5/2021	728.0	687.3
6/6/2021	728.0	687.3
6/7/2021	727.8	687.5
6/8/2021	727.8	687.5
6/9/2021	727.8	687.5
6/10/2021	727.8	687.5
6/11/2021	727.8	687.5
6/12/2021	727.8	687.5
6/13/2021	727.8	687.5
6/14/2021	727.6	686.2
6/15/2021	727.6	686.2
6/16/2021	727.6	686.2
6/17/2021	727.6	686.2
6/18/2021	727.6	686.2
6/19/2021	727.6	686.2
6/20/2021	727.6	686.2
6/21/2021	727.4	686.1
6/22/2021	727.4	686.1
6/23/2021	727.4	686.1
6/24/2021	727.4	686.1
6/25/2021	727.4	686.1
6/26/2021	727.4	686.1
6/27/2021	727.4	686.1

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
6/1/2022	725.9	692.6
6/2/2022	725.9	692.6
6/3/2022	725.9	692.6
6/4/2022	725.9	692.6
6/5/2022	725.9	692.6
6/6/2022	725.9	692.6
6/7/2022	725.9	692.6
6/8/2022	725.9	692.6
6/9/2022	725.9	692.6
6/10/2022	725.9	692.6
6/11/2022	725.9	692.6
6/12/2022	725.9	692.6
6/13/2022	725.8	691.8
6/14/2022	725.8	691.8
6/15/2022	725.8	691.8
6/16/2022	725.8	691.8
6/17/2022	725.8	691.8
6/18/2022	725.8	691.8
6/19/2022	725.8	691.8
6/20/2022	725.7	691.4
6/21/2022	725.7	691.4
6/22/2022	725.7	691.4
6/23/2022	725.7	691.4
6/24/2022	725.7	691.4
6/25/2022	725.7	691.4
6/26/2022	725.7	691.4
6/27/2022	725.5	690.8

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
6/1/2023	728.0	694.2
6/2/2023	728.0	694.2
6/3/2023	728.0	694.2
6/4/2023	728.0	694.2
6/5/2023	728.0	694.2
6/6/2023	728.0	694.2
6/7/2023	728.0	694.2
6/8/2023	728.0	694.2
6/9/2023	728.0	694.2
6/10/2023	728.0	694.2
6/11/2023	728.0	694.2
6/12/2023	727.5	693.6
6/13/2023	727.5	693.6
6/14/2023	727.5	693.6
6/15/2023	727.5	693.6
6/16/2023	727.5	693.6
6/17/2023	727.5	693.6
6/18/2023	727.5	693.6
6/19/2023	727.5	693.6
6/20/2023	727.5	693.6
6/21/2023	727.0	692.9
6/22/2023	727.0	692.9
6/23/2023	727.0	692.9
6/24/2023	727.0	692.9
6/25/2023	727.0	692.9
6/26/2023	726.9	691.4
6/27/2023	726.9	691.4

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
6/28/2021	727.2	685.1
6/29/2021	727.2	685.1
6/30/2021	727.2	685.1
7/1/2021	727.0	684.0
7/2/2021	727.0	684.0
7/3/2021	727.0	684.0
7/4/2021	727.0	684.0
7/5/2021	727.0	684.0
7/6/2021	727.0	684.0
7/7/2021	727.0	684.0
7/8/2021	727.0	684.0
7/9/2021	727.0	684.0
7/10/2021	727.0	684.0
7/11/2021	727.0	684.0
7/12/2021	726.8	684.0
7/13/2021	726.8	684.0
7/14/2021	726.8	684.0
7/15/2021	726.8	684.0
7/16/2021	726.8	685.0
7/17/2021	726.8	685.0
7/18/2021	726.8	685.0
7/19/2021	726.6	685.0
7/20/2021	726.6	685.0
7/21/2021	726.6	686.0
7/22/2021	726.6	686.0
7/23/2021	726.6	686.0
7/24/2021	726.6	686.0

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
6/28/2022	725.5	690.8
6/29/2022	725.5	690.8
6/30/2022	725.5	690.8
7/1/2022	725.2	691.0
7/2/2022	725.2	691.0
7/3/2022	725.2	691.0
7/4/2022	725.2	691.0
7/5/2022	725.2	691.0
7/6/2022	725.2	691.0
7/7/2022	725.2	691.0
7/8/2022	725.2	691.0
7/9/2022	725.2	691.0
7/10/2022	725.2	691.0
7/11/2022	724.9	689.8
7/12/2022	724.9	689.8
7/13/2022	724.9	689.8
7/14/2022	724.9	689.8
7/15/2022	724.9	689.8
7/16/2022	724.9	689.8
7/17/2022	724.9	689.8
7/18/2022	724.7	688.5
7/19/2022	724.7	688.5
7/20/2022	724.7	688.5
7/21/2022	724.7	688.5
7/22/2022	724.7	688.5
7/23/2022	724.7	688.5
7/24/2022	724.7	688.5

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
6/28/2023	726.9	691.4
6/29/2023	726.9	691.4
6/30/2023	726.9	691.4
7/1/2023	726.9	690.4
7/2/2023	726.9	690.4
7/3/2023	726.9	690.4
7/4/2023	726.9	690.4
7/5/2023	726.9	690.4
7/6/2023	726.9	690.4
7/7/2023	726.9	690.4
7/8/2023	726.9	690.4
7/9/2023	726.9	690.4
7/10/2023	726.8	688.8
7/11/2023	726.8	688.8
7/12/2023	726.8	688.8
7/13/2023	726.8	688.8
7/14/2023	726.8	688.8
7/15/2023	726.8	688.8
7/16/2023	726.8	688.8
7/17/2023	726.7	687.2
7/18/2023	726.7	687.2
7/19/2023	726.7	687.2
7/20/2023	726.7	687.2
7/21/2023	726.7	687.2
7/22/2023	726.7	687.2
7/23/2023	726.7	687.2
7/24/2023	726.6	686.5

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
7/25/2021	726.6	686.0
7/26/2021	726.4	686.0
7/27/2021	726.4	686.0
7/28/2021	726.4	687.0
7/29/2021	726.4	687.0
7/30/2021	726.4	687.0
7/31/2021	726.4	687.0
8/1/2021	726.2	676.0
8/2/2021	726.2	676.0
8/3/2021	726.2	676.0
8/4/2021	726.2	676.0
8/5/2021	726.2	676.0
8/6/2021	726.2	676.0
8/7/2021	726.2	676.0
8/8/2021	726.2	676.0
8/9/2021	725.7	677.5
8/10/2021	725.7	677.5
8/11/2021	725.7	677.5
8/12/2021	725.7	677.5
8/13/2021	725.7	677.5
8/14/2021	725.7	677.5
8/15/2021	725.7	677.5
8/16/2021	725.5	672.0
8/17/2021	725.5	672.0
8/18/2021	725.5	672.0
8/19/2021	725.5	672.0
8/20/2021	725.5	672.0

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
7/25/2022	724.7	688.5
7/26/2022	724.7	688.5
7/27/2022	724.4	687.0
7/28/2022	724.4	687.0
7/29/2022	724.4	687.0
7/30/2022	724.4	687.0
7/31/2022	724.4	687.0
8/1/2022	724.1	686.5
8/2/2022	724.1	686.5
8/3/2022	724.1	686.5
8/4/2022	724.1	686.5
8/5/2022	724.1	686.5
8/6/2022	724.1	686.5
8/7/2022	724.1	686.5
8/8/2022	723.8	686.0
8/9/2022	723.8	686.0
8/10/2022	723.8	686.0
8/11/2022	723.8	686.0
8/12/2022	723.8	686.0
8/13/2022	723.8	686.0
8/14/2022	723.8	686.0
8/15/2022	723.6	685.5
8/16/2022	723.6	685.5
8/17/2022	723.6	685.5
8/18/2022	723.6	685.5
8/19/2022	723.6	685.5
8/20/2022	723.6	685.5

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
7/25/2023	726.6	686.5
7/26/2023	726.6	686.5
7/27/2023	726.6	686.5
7/28/2023	726.6	686.5
7/29/2023	726.6	686.5
7/30/2023	726.6	686.5
7/31/2023	726.6	685.5
8/1/2023	726.4	684.0
8/2/2023	726.4	684.0
8/3/2023	726.4	684.0
8/4/2023	726.4	684.0
8/5/2023	726.4	684.0
8/6/2023	726.4	684.0
8/7/2023	726.4	684.0
8/8/2023	726.4	684.0
8/9/2023	726.4	684.0
8/10/2023	726.4	684.0
8/11/2023	726.4	684.0
8/12/2023	726.4	684.0
8/13/2023	726.4	684.0
8/14/2023	726.3	680.0
8/15/2023	726.3	680.0
8/16/2023	726.3	680.0
8/17/2023	726.3	680.0
8/18/2023	726.3	680.0
8/19/2023	726.3	680.0
8/20/2023	726.3	680.0

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
8/21/2021	725.5	672.0
8/22/2021	725.5	672.0
8/23/2021	725.5	672.0
8/24/2021	725.5	672.0
8/25/2021	725.5	672.0
8/26/2021	725.5	674.0
8/27/2021	725.5	674.0
8/28/2021	725.5	674.0
8/29/2021	725.5	674.0
8/30/2021	725.5	674.0
8/31/2021	725.3	675.0
9/1/2021	725.3	677.5
9/2/2021	725.3	677.5
9/3/2021	725.3	677.5
9/4/2021	725.3	677.5
9/5/2021	725.3	677.5
9/6/2021	725.3	677.5
9/7/2021	725.3	677.5
9/8/2021	725.3	677.5
9/9/2021	725.3	677.5
9/10/2021	725.3	677.5
9/11/2021	725.3	677.5
9/12/2021	725.3	677.5
9/13/2021	725.3	679.0
9/14/2021	725.3	679.0
9/15/2021	725.3	679.0
9/16/2021	725.3	679.0

2021 - 2022 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
8/21/2022	723.6	685.5
8/22/2022	723.3	684.0
8/23/2022	723.3	684.0
8/24/2022	723.3	684.0
8/25/2022	723.3	684.0
8/26/2022	723.3	684.0
8/27/2022	723.3	684.0
8/28/2022	723.3	684.0
8/29/2022	723.0	682.0
8/30/2022	723.0	682.0
8/31/2022	723.0	682.0
9/1/2022	722.7	677.0
9/2/2022	722.7	677.0
9/3/2022	722.7	677.0
9/4/2022	722.7	677.0
9/5/2022	722.7	677.0
9/6/2022	722.7	677.0
9/7/2022	722.7	677.0
9/8/2022	722.7	677.0
9/9/2022	722.7	677.0
9/10/2022	722.7	677.0
9/11/2022	722.7	677.0
9/12/2022	722.7	678.0
9/13/2022	722.7	678.0
9/14/2022	722.7	678.0
9/15/2022	722.7	678.0
9/16/2022	722.7	678.0

2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.
8/21/2023	726.1	675.5
8/22/2023	726.1	675.5
8/23/2023	726.1	675.5
8/24/2023	726.1	675.5
8/25/2023	726.1	675.5
8/26/2023	726.1	675.5
8/27/2023	726.1	675.5
8/28/2023	726.0	670.0
8/29/2023	726.0	670.0
8/30/2023	726.0	670.0
8/31/2023	726.0	670.0
9/1/2023	733.0	
9/2/2023	733.0	
9/3/2023	733.0	
9/4/2023	733.0	
9/5/2023	733.0	
9/6/2023	733.0	
9/7/2023	733.0	
9/8/2023	733.0	
9/9/2023	733.0	
9/10/2023	733.0	
9/11/2023	733.0	
9/12/2023	733.0	
9/13/2023	733.0	
9/14/2023	733.0	
9/15/2023	733.0	
9/16/2023	733.0	

APPENDIX L

2020 - 2021 Seasonal Pond Water Elevation			2021 - 2022 Seasonal Pond Water Elevation			2022 - 2023 Seasonal Pond Water Elevation		
Date	UESP Elev., ft.	LESP Elev., ft.	Date	UESP Elev., ft.	LESP Elev., ft.	Date	UESP Elev., ft.	LESP Elev., ft.
9/17/2021	725.3	679.0	9/17/2022	722.7	678.0	9/17/2023	733.0	
9/18/2021	725.3	679.0	9/18/2022	722.7	678.0	9/18/2023	733.0	
9/19/2021	725.3	674.0	9/19/2022	722.7	678.0	9/19/2023	733.0	
9/20/2021	725.2	674.0	9/20/2022	722.7	679.0	9/20/2023	733.0	
9/21/2021	725.2	674.0	9/21/2022	722.7	679.0	9/21/2023	733.0	
9/22/2021	725.2	674.0	9/22/2022	722.7	679.0	9/22/2023	733.0	
9/23/2021	725.2	674.0	9/23/2022	722.7	679.0	9/23/2023	733.0	
9/24/2021	725.2	674.0	9/24/2022	722.7	679.0	9/24/2023	733.0	
9/25/2021	725.2	674.0	9/25/2022	722.7	679.0	9/25/2023	733.0	
9/26/2021	725.2	674.0	9/26/2022	722.7	675.0	9/26/2023	733.0	
9/27/2021	725.2	672.0	9/27/2022	722.7	675.0	9/27/2023	733.0	
9/28/2021	725.2	672.0	9/28/2022	722.7	675.0	9/28/2023	733.0	
9/29/2021	725.2	672.0	9/29/2022	722.7	675.0	9/29/2023	733.0	
9/30/2021	725.2	672.0	9/30/2022	722.7	675.0	9/30/2023	733.0	

# **APPENDIX M**

## **LA CONTENTA WWTF WATER BALANCES**

APPENDIX M

NORMAL - PRECIPITATION  
 WATER BALANCE FOR EFFLUENT STORAGE AND DISPOSAL  
 LA CONTENTA WASTEWATER TREATMENT FACILITY

YEAR		INFLUENT FLOW				CLIMATE DATA				INFLOW			OUTFLOW			STORAGE	
Month	Days	ADWF, gal/day	ADWF, AF	I&I, AF	ADWF + I&I, AF	Mean Rainfall, inches	Design Rainfall, inches	Eto Zone 12, inches	Net ETo inches	Flow Q + I&I AF	Pond Precip., AF	Accum. Inflow, AF	Irrigation, AF	Pond Evap., AF	Accum. Outflow, AF	Net Storage, AF	Avail. Storage, AF
Oct	31	200,000	19.0	2.2	21.2	1.1	1.1	3.7	2.6	21.2	2.1	23.3	21.6	5.9	27.5	0.0	221.0
Nov	30	200,000	18.4	4.8	23.2	2.5	2.5	1.8	0.0	23.2	4.7	51.2	0.0	2.9	30.4	20.9	200.1
Dec	31	200,000	19.0	5.9	24.9	3.1	3.1	0.9	0.0	24.9	5.7	81.9	0.0	1.5	31.8	50.1	170.9
Jan	31	200,000	19.0	7.3	26.3	3.8	3.8	1.2	0.0	26.3	7.1	115.3	0.0	2.0	33.8	81.5	139.5
Feb	28	200,000	17.2	6.6	23.8	3.4	3.4	2.0	0.0	23.8	6.4	145.6	0.0	3.1	36.9	108.7	112.3
Mar	31	200,000	19.0	6.3	25.4	3.3	3.3	3.4	0.1	25.4	6.2	177.1	1.0	5.4	43.3	133.8	87.2
Apr	30	200,000	18.4	3.5	21.9	1.8	1.8	5.1	3.3	21.9	3.4	202.4	27.4	8.1	78.8	123.7	97.3
May	31	200,000	19.0	1.5	20.5	0.8	0.8	6.8	6.0	20.5	1.5	224.4	50.3	10.8	139.9	84.6	136.4
Jun	30	200,000	18.4	0.5	18.9	0.2	0.2	7.8	7.6	18.9	0.5	243.8	63.0	12.4	215.2	28.6	192.4
Jul	31	200,000	19.0	0.1	19.1	0.0	0.0	8.1	8.0	19.1	0.1	263.0	66.8	12.8	294.8	0.0	221.0
Aug	31	200,000	19.0	0.1	19.1	0.1	0.1	7.1	7.1	19.1	0.1	282.2	58.9	11.3	365.0	0.0	221.0
Sep	30	200,000	18.4	0.6	19.0	0.3	0.3	5.4	5.1	19.0	0.5	301.7	42.6	8.6	416.1	0.0	221.0
Total	365		224.0	39.4	263.4	20.4	20.4	53.4	39.8	263.4	38.3	301.7	331.6	84.5	416.1		

Storage Pond Areas and Capacities				
Criteria	Units	LESP	UESP	Total
Surface Area	acres	14.5	4.5	19.0
Catchment Areas	acres	17.0	5.5	22.5
Storage Capacities	AF	172.0	49.0	221.0

I/I from Rainfall	
Rainfall, inch	I/I, AF
1	1.93

New Hogan Dam Rainfall			
Return Period	Units	Rainfall	% Normal
200-Yr.	inches/yr.	38.5	188%
100-Yr.	inches/yr.	36.4	178%
Mean	inches/yr.	20.4	100%

Irrigation Areas		
Site	Units	Total
Golf Course	acres	100.0

APPENDIX M

100 YR - PRECIPITATION  
 WATER BALANCE FOR EFFLUENT STORAGE AND DISPOSAL  
 LA CONTENTA WASTEWATER TREATMENT FACILITY

YEAR		INFLUENT FLOW				CLIMATE DATA				INFLOW			OUTFLOW			STORAGE	
Month	Days	ADWF, gal/day	ADWF, AF	I&I, AF	ADWF + I&I, AF	Mean Rainfall, inches	Design Rainfall, inches	Eto Zone 12, inches	Net ETo inches	Flow Q + I&I AF	Pond Precip., AF	Accum. Inflow, AF	Irrigation, AF	Pond Evap., AF	Accum. Outflow, AF	Net Storage, AF	Avail. Storage, AF
Oct	31	200,000	19.0	3.9	22.9	1.1	2.0	3.7	1.7	22.9	3.8	26.7	14.3	5.9	20.2	6.5	214.5
Nov	30	200,000	18.4	8.6	27.0	2.5	4.5	1.8	0.0	27.0	8.4	62.0	0.0	2.9	23.0	39.0	182.0
Dec	31	200,000	19.0	10.5	29.5	3.1	5.4	0.9	0.0	29.5	10.2	101.8	0.0	1.5	24.5	77.3	143.7
Jan	31	200,000	19.0	13.0	32.0	3.8	6.7	1.2	0.0	32.0	12.6	146.4	0.0	2.0	26.5	120.0	101.0
Feb	28	200,000	17.2	11.8	29.0	3.4	6.1	2.0	0.0	29.0	11.5	186.9	0.0	3.1	29.6	157.3	63.7
Mar	31	200,000	19.0	11.3	30.3	3.3	5.9	3.4	0.0	30.3	11.0	228.2	0.0	5.4	35.0	193.3	27.7
Apr	30	200,000	18.4	6.2	24.6	1.8	3.2	5.1	1.9	24.6	6.1	258.9	15.6	8.1	58.6	200.3	20.7
May	31	200,000	19.0	2.7	21.7	0.8	1.4	6.8	5.4	21.7	2.6	283.3	45.2	10.8	114.6	168.6	52.4
Jun	30	200,000	18.4	0.8	19.2	0.2	0.4	7.8	7.4	19.2	0.8	303.3	61.4	12.4	188.4	114.9	106.1
Jul	31	200,000	19.0	0.1	19.2	0.0	0.1	8.1	8.0	19.2	0.1	322.6	66.6	12.8	267.7	54.9	166.1
Aug	31	200,000	19.0	0.2	19.2	0.1	0.1	7.1	7.0	19.2	0.2	342.0	58.6	11.3	337.6	4.5	216.5
Sep	30	200,000	18.4	1.0	19.4	0.3	0.5	5.4	4.9	19.4	1.0	362.4	40.6	8.6	386.8	0.0	221.0
Total	365		224.0	70.2	294.2	20.4	36.4	53.4	36.3	294.2	68.2	362.4	302.3	84.5	386.8		

Storage Pond Areas and Capacities				
Criteria	Units	LESP	UESP	Total
Surface Area	acres	14.5	4.5	19.0
Catchment Areas	acres	17.0	5.5	22.5
Storage Capacities	AF	172.0	49.0	221.0

I/I from Rainfall	
Rainfall, inch	I/I, AF
1	1.93

New Hogan Dam Rainfall			
Return Period	Units	Rainfall	% Normal
200-Yr.	inches/yr.	38.5	188%
100-Yr.	inches/yr.	36.4	178%
Mean	inches/yr.	20.4	100%

Irrigation Areas		
Site	Units	Total
Golf Course	acres	100.0

APPENDIX M

2022-23 - RAINFALL AND 152,000 gal/day ADFW  
 WATER BALANCE FOR EFFLUENT STORAGE AND DISPOSAL  
 LA CONTENTA WASTEWATER TREATMENT FACILITY

YEAR		INFLUENT FLOW				CLIMATE DATA				INFLOW			OUTFLOW			STORAGE	
Month	Days	ADWF, gal/day	ADWF, AF	I&I, AF	ADWF + I&I, AF	Mean Rainfall, inches	Design Rainfall, inches	Eto Zone 12, inches	Net ETo, inches	Flow Q + I&I, AF	Pond Precip., AF	Accum. Inflow, AF	Irrigation, AF	Pond Evap., AF	Accum. Outflow, AF	Net Storage, AF	Avail. Storage, AF
Oct	31	152,000	14.5	0.0	14.5	1.1	0.0	3.7	3.7	14.5	0.0	14.5	31.0	5.9	36.9	0.0	214.0
Nov	30	152,000	14.0	0.8	14.8	2.5	3.0	1.8	0.0	14.8	5.6	34.9	0.0	2.9	2.9	32.0	182.0
Dec	31	152,000	14.5	10.5	25.0	3.1	10.8	0.9	0.0	25.0	20.2	80.0	0.0	1.5	4.3	75.7	138.3
Jan	31	152,000	14.5	22.1	36.5	3.8	13.2	1.2	0.0	36.5	24.8	141.3	0.0	2.0	6.3	135.0	79.0
Feb	28	152,000	13.1	6.3	19.3	3.4	3.6	2.0	0.0	19.3	6.8	167.4	0.0	3.1	9.4	158.0	56.0
Mar	31	152,000	14.5	7.9	22.3	3.3	8.6	3.4	0.0	22.3	16.0	205.8	0.0	5.4	14.8	191.0	23.0
Apr	30	152,000	14.0	14.8	28.8	1.8	0.1	5.1	5.0	28.8	0.2	234.8	41.7	8.1	64.5	170.3	43.7
May	31	152,000	14.5	4.5	19.0	0.8	0.6	6.8	6.3	19.0	1.0	254.8	52.3	10.8	127.6	127.2	86.8
Jun	30	152,000	14.0	3.8	17.8	0.2	0.0	7.8	7.8	17.8	0.0	272.6	65.0	12.4	204.9	67.7	146.3
Jul	31	152,000	14.5	3.9	18.3	0.0	0.0	8.1	8.1	18.3	0.0	290.9	67.2	12.8	284.9	6.1	207.9
Aug	31	152,000	14.5	1.6	16.0	0.1	0.1	7.1	7.0	16.0	0.2	307.1	58.6	11.3	354.7	0.0	214.0
Sep	30	152,000	14.0	1.2	15.2	0.3	0.3	5.4	5.2	15.2	0.5	322.8	42.9	8.6	406.2	0.0	214.0
Total	365		170.3	77.4	247.6	20.4	40.1	53.4	43.0	247.6	75.2	322.8	358.6	84.5	406.2		

Storage Pond Areas and Capacities				
Criteria	Units	LESP	UESP	Total
Surface Area	acres	14.5	4.5	19.0
Catchment Areas	acres	17.0	5.5	22.5
Storage Capacities	AF	172.0	42.0	214.0

I/I from Rainfall	
Rainfall, inch	I/I, AF
1	1.93

New Hogan Dam Rainfall			
Return Period	Units	Rainfall	% Normal
200-Yr.	inches/yr.	38.5	188%
100-Yr.	inches/yr.	36.4	178%
2022-23 Precipitation	inches/yr.	40.1	196%
Mean	inches/yr.	20.4	100%

Irrigation Areas		
Site	Units	Total
Golf Course	acres	100.0

2022-23 ADWF, Actual Influent Volume, Rainfall, and Effluent Storage						
Month	Days	ADWF, AF	Influent, AF	I&I, AF	Rainfall, inches	Avail. Vol., AF
October	31	14.4	13.7	0.0	0.00	209.1
November	30	14.0	14.8	0.8	3.00	202.8
December	31	14.4	25.0	10.5	10.75	-
January	31	14.4	36.5	22.1	13.20	135.0
February	28	13.0	19.3	6.3	3.60	122.8
March	31	14.4	22.3	7.9	8.55	79.7
April	30	14.0	28.8	14.8	0.10	54.5
May	31	14.4	18.9	4.5	0.55	104.4
June	30	14.0	17.8	3.8	0.00	146.5
July	31	14.4	18.3	3.9	0.00	174.1
August	31	14.4	16.0	1.6	0.10	200.4
September	30	14.0	15.2	1.2	0.25	-

2022-23 I/I and Rainfall Summary		
	I/I, AF	Rainfall, inches
Total	77.37	40.10

APPENDIX M

NORMAL - PRECIPITATION  
PHASE 3  
LA CONTENTA WASTEWATER TREATMENT FACILITY

YEAR		INFLUENT FLOW				CLIMATE DATA				INFLOW			OUTFLOW				STORAGE	
Month	Days	ADWF, gal/day	ADWF, AF	I&I, AF	ADWF + I&I, AF	Mean Rainfall, inches	Design Rainfall, inches	Eto Zone 12, inches	Net ETo inches	Flow Q + I&I AF	Pond Precip., AF	Accum. Inflow, AF	Irrigation Golf Course, AF	Irrigation Sprayfield, AF	Pond Evap., AF	Accum. Outflow, AF	Net Storage, AF	Avail. Storage, AF
Oct	31	237,000	22.5	2.2	24.7	1.1	1.1	3.7	2.6	24.7	4.9	29.6	21.6	9.3	5.9	36.8	0.0	221.0
Nov	30	237,000	21.8	4.8	26.7	2.5	2.5	1.8	0.0	26.7	11.0	67.2	0.0	4.5	2.9	44.2	23.1	197.9
Dec	31	237,000	22.5	5.9	28.4	3.1	3.1	0.9	0.0	28.4	13.4	109.0	0.0	2.3	1.5	48.0	61.1	159.9
Jan	31	237,000	22.5	7.3	29.8	3.8	3.8	1.2	0.0	29.8	16.6	155.4	0.0	3.1	2.0	53.0	102.4	118.6
Feb	28	237,000	20.4	6.6	27.0	3.4	3.4	2.0	0.0	27.0	15.0	197.5	0.0	4.9	3.1	61.0	136.4	84.6
Mar	31	237,000	22.5	6.3	28.9	3.3	3.3	3.4	0.1	28.9	14.4	240.8	1.0	8.5	5.4	75.9	164.8	56.2
Apr	30	237,000	21.8	3.5	25.3	1.8	1.8	5.1	3.3	25.3	7.9	274.0	27.4	12.8	8.1	124.2	149.8	71.2
May	31	237,000	22.5	1.5	24.1	0.8	0.8	6.8	6.0	24.1	3.4	301.5	50.3	17.1	10.8	202.3	99.2	121.8
Jun	30	237,000	21.8	0.5	22.3	0.2	0.2	7.8	7.6	22.3	1.1	324.8	63.0	19.5	12.4	297.1	27.7	193.3
Jul	31	237,000	22.5	0.1	22.6	0.0	0.0	8.1	8.0	22.6	0.2	347.6	66.8	20.2	12.8	396.9	0.0	221.0
Aug	31	237,000	22.5	0.1	22.7	0.1	0.1	7.1	7.1	22.7	0.3	370.6	58.9	17.8	11.3	484.9	0.0	221.0
Sep	30	237,000	21.8	0.6	22.4	0.3	0.3	5.4	5.1	22.4	1.3	394.2	42.6	13.5	8.6	549.5	0.0	221.0
Total	365		265.5	39.4	304.9	20.4	20.4	53.4	39.8	304.9	89.3	394.2	331.6	133.4	84.5	549.5		

Storage Pond Areas and Capacities					
Criteria	Units	LESP	UESP	Sprayfield	Total
Surface Area	acres	14.5	4.5		19.0
Catchment Areas	acres	17.0	5.5	30.0	52.5
Storage Capacities	AF	172.0	49.0		221.0

I/I from Rainfall	
Rainfall, inch	I/I, AF
1	1.93

New Hogan Dam Rainfall			
Return Period	Units	Rainfall	% Normal
200-Yr.	inches/yr.	38.5	188%
100-Yr.	inches/yr.	36.4	178%
Mean	inches/yr.	20.4	100%

Irrigation Areas		
Site	Units	Total
Sprayfield	acres	30.0

APPENDIX M

NORMAL - PRECIPITATION  
PHASE 3  
LA CONTENTA WASTEWATER TREATMENT FACILITY

YEAR		INFLUENT FLOW				CLIMATE DATA				INFLOW			OUTFLOW				STORAGE	
Month	Days	ADWF, gal/day	ADWF, AF	I&I, AF	ADWF + I&I, AF	Mean Rainfall, inches	Design Rainfall, inches	Eto Zone 12, inches	Net ETo inches	Flow Q + I&I AF	Pond Precip., AF	Accum. Inflow, AF	Irrigation Golf Course, AF	Irrigation Sprayfield, AF	Pond Evap., AF	Accum. Outflow, AF	Net Storage, AF	Avail. Storage, AF
Oct	31	237,000	22.5	2.2	24.7	1.1	1.1	3.7	2.6	24.7	4.9	29.6	21.6	9.3	5.9	36.8	0.0	221.0
Nov	30	237,000	21.8	4.8	26.7	2.5	2.5	1.8	0.0	26.7	11.0	67.2	0.0	4.5	2.9	44.2	23.1	197.9
Dec	31	237,000	22.5	5.9	28.4	3.1	3.1	0.9	0.0	28.4	13.4	109.0	0.0	2.3	1.5	48.0	61.1	159.9
Jan	31	237,000	22.5	7.3	29.8	3.8	3.8	1.2	0.0	29.8	16.6	155.4	0.0	3.1	2.0	53.0	102.4	118.6
Feb	28	237,000	20.4	6.6	27.0	3.4	3.4	2.0	0.0	27.0	15.0	197.5	0.0	4.9	3.1	61.0	136.4	84.6
Mar	31	237,000	22.5	6.3	28.9	3.3	3.3	3.4	0.1	28.9	14.4	240.8	1.0	8.5	5.4	75.9	164.8	56.2
Apr	30	237,000	21.8	3.5	25.3	1.8	1.8	5.1	3.3	25.3	7.9	274.0	27.4	12.8	8.1	124.2	149.8	71.2
May	31	237,000	22.5	1.5	24.1	0.8	0.8	6.8	6.0	24.1	3.4	301.5	50.3	17.1	10.8	202.3	99.2	121.8
Jun	30	237,000	21.8	0.5	22.3	0.2	0.2	7.8	7.6	22.3	1.1	324.8	63.0	19.5	12.4	297.1	27.7	193.3
Jul	31	237,000	22.5	0.1	22.6	0.0	0.0	8.1	8.0	22.6	0.2	347.6	66.8	20.2	12.8	396.9	0.0	221.0
Aug	31	237,000	22.5	0.1	22.7	0.1	0.1	7.1	7.1	22.7	0.3	370.6	58.9	17.8	11.3	484.9	0.0	221.0
Sep	30	237,000	21.8	0.6	22.4	0.3	0.3	5.4	5.1	22.4	1.3	394.2	42.6	13.5	8.6	549.5	0.0	221.0
Total	365		265.5	39.4	304.9	20.4	20.4	53.4	39.8	304.9	89.3	394.2	331.6	133.4	84.5	549.5		

Storage Pond Areas and Capacities					
Criteria	Units	LESP	UESP	Sprayfield	Total
Surface Area	acres	14.5	4.5		19.0
Catchment Areas	acres	17.0	5.5	30.0	52.5
Storage Capacities	AF	172.0	49.0		221.0

I/I from Rainfall	
Rainfall, inch	I/I, AF
1	1.93

New Hogan Dam Rainfall			
Return Period	Units	Rainfall	% Normal
200-Yr.	inches/yr.	38.5	188%
100-Yr.	inches/yr.	36.4	178%
Mean	inches/yr.	20.4	100%

Irrigation Areas		
Site	Units	Total
Sprayfield	acres	30.0

APPENDIX M

100 YR - PRECIPITATION  
PHASE 3  
LA CONTENTA WASTEWATER TREATMENT FACILITY

YEAR		INFLUENT FLOW				CLIMATE DATA				INFLOW			OUTFLOW				STORAGE	
Month	Days	ADWF, gal/day	ADWF, AF	I&I, AF	ADWF + I&I, AF	Mean Rainfall, inches	Design Rainfall, inches	Eto Zone 12, inches	Net ETo inches	Flow Q + I&I AF	Pond Precip., AF	Accum. Inflow, AF	Irrigation Golf Course, AF	Irrigation Sprayfield, AF	Pond Evap., AF	Accum. Outflow, AF	Net Storage, AF	Avail. Storage, AF
Oct	31	237,000	22.5	3.9	26.4	1.1	2.0	3.7	1.7	26.4	3.8	30.2	14.3	9.3	5.9	29.5	0.7	220.3
Nov	30	237,000	21.8	8.6	30.4	2.5	4.5	1.8	0.0	30.4	8.4	69.0	0.0		2.9	32.3	36.6	184.4
Dec	31	237,000	22.5	10.5	33.0	3.1	5.4	0.9	0.0	33.0	10.2	112.2	0.0		1.5	33.8	78.4	142.6
Jan	31	237,000	22.5	13.0	35.6	3.8	6.7	1.2	0.0	35.6	12.6	160.4	0.0		2.0	35.8	124.6	96.4
Feb	28	237,000	20.4	11.8	32.2	3.4	6.1	2.0	0.0	32.2	11.5	204.0	0.0		3.1	38.9	165.2	55.8
Mar	31	237,000	22.5	11.3	33.9	3.3	5.9	3.4	0.0	33.9	11.0	248.9	0.0		5.4	44.3	204.6	16.4
Apr	30	237,000	21.8	6.2	28.1	1.8	3.2	5.1	1.9	28.1	6.1	283.0	15.6	12.8	8.1	80.7	202.3	18.7
May	31	237,000	22.5	2.7	25.2	0.8	1.4	6.8	5.4	25.2	2.6	310.9	45.2	17.1	10.8	153.7	157.1	63.9
Jun	30	237,000	21.8	0.8	22.6	0.2	0.4	7.8	7.4	22.6	0.8	334.3	61.4	19.5	12.4	247.0	87.3	133.7
Jul	31	237,000	22.5	0.1	22.7	0.0	0.1	8.1	8.0	22.7	0.1	357.1	66.6	20.2	12.8	346.5	10.7	210.3
Aug	31	237,000	22.5	0.2	22.7	0.1	0.1	7.1	7.0	22.7	0.2	380.1	58.6	17.8	11.3	434.1	0.0	221.0
Sep	30	237,000	21.8	1.0	22.8	0.3	0.5	5.4	4.9	22.8	1.0	403.9	40.6	13.5	8.6	496.8	0.0	221.0
Total	365		265.5	70.2	335.7	20.4	36.4	53.4	36.3	335.7	68.2	403.9	302.3	110.1	84.5	496.8		

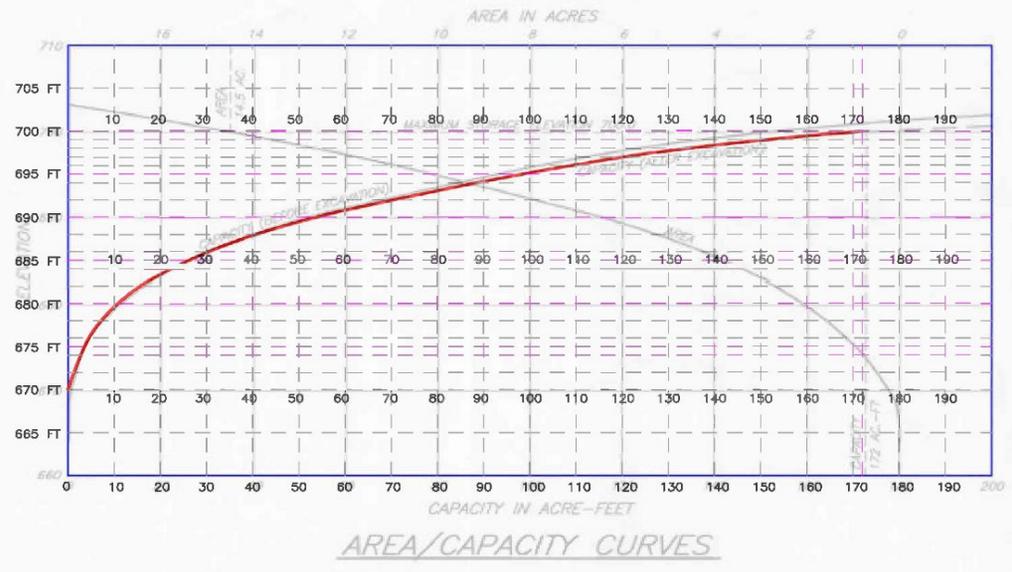
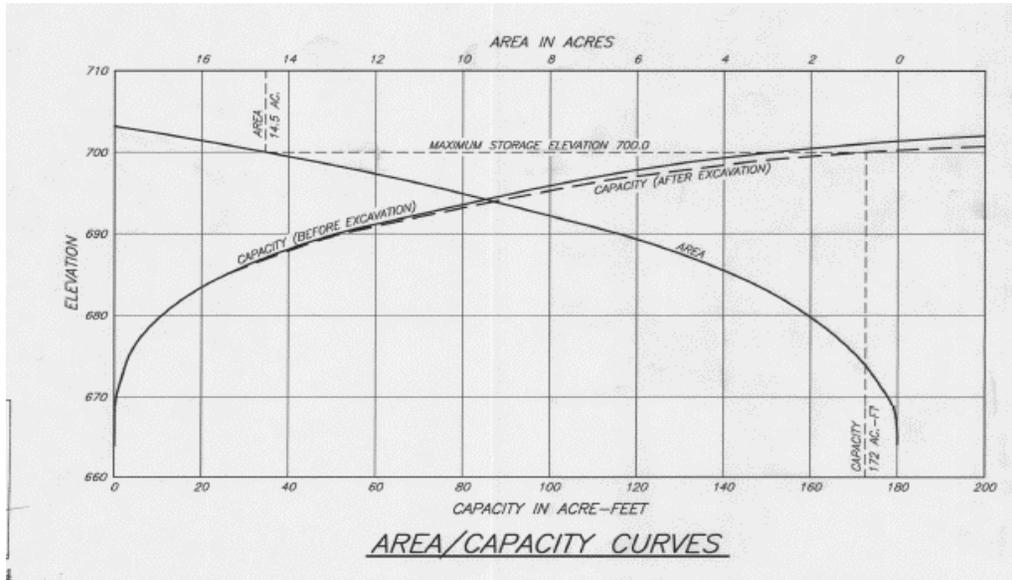
Storage Pond Areas and Capacities					
Criteria	Units	LESP	UESP	Sprayfield	Total
Surface Area	acres	14.5	4.5		19.0
Catchment Areas	acres	17.0	5.5	0.0	22.5
Storage Capacities	AF	172.0	49.0		221.0

I/I from Rainfall	
Rainfall, inch	I/I, AF
1	1.93

New Hogan Dam Rainfall			
Return Period	Units	Rainfall	% Normal
200-Yr.	inches/yr.	38.5	188%
100-Yr.	inches/yr.	36.4	178%
Mean	inches/yr.	20.4	100%

Irrigation Areas		
Site	Units	Total
Sprayfield	acres	30.0

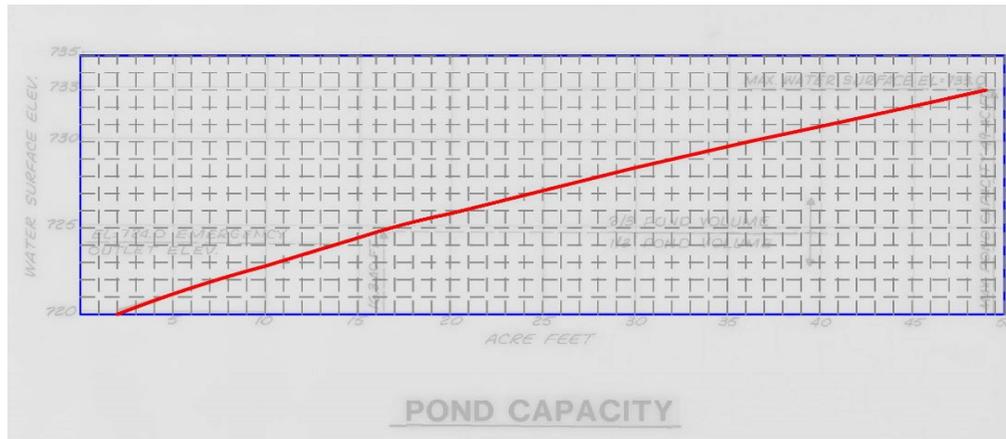
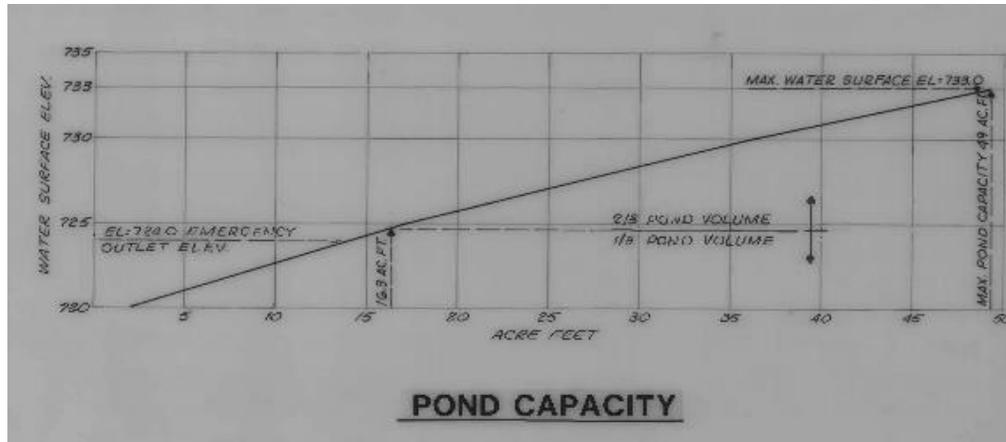
# APPENDIX M



CALIFORNIA  
MONTHLY AVERAGE PAN EVAPORATION (INCHES)

PERIOD OF RECORD	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR		
ANTIOCH POND PLANT 3	1955-2005	1.17	1.99	4.25	6.27	8.96	10.84	10.06	7.77	4.91	2.07	1.12	71.11		
ARBUR DAM FROCKI	1970-1984	1.42	1.89	3.13	4.89	7.73	10.08	11.66	10.70	8.03	5.00	1.97	67.91		
AYERLY S SSE	1955-1961	1.00	2.90	6.20	9.39	12.96	16.73	15.67	16.37	12.41	8.05	3.89	44.11		
BACOS POND	1948-1963	2.05	3.86	6.77	9.80	12.65	15.93	16.92	15.98	12.19	8.01	4.28	99.12		
BEAUMONT PUMPING PLANT	1948-1975	2.90	3.29	4.08	5.03	6.40	8.15	10.64	9.37	7.90	5.87	3.22	70.35		
BEAUMONT 1 E	1948-2001	3.10	3.73	4.59	5.23	7.60	9.92	10.97	10.66	8.68	6.53	3.16	95.95		
BERRYESSA LAKE	1957-1970	1.53	2.15	3.79	5.82	8.90	11.00	13.22	12.06	8.47	5.72	2.48	66.77		
BICA	1948-2005	0.00	0.00	0.00	0.00	0.69	5.32	10.32	9.69	6.43	4.32	0.00	45.25		
BRANHAM ISLAND	1965-1977	1.15	1.74	4.36	7.03	10.49	12.99	13.51	12.02	9.03	4.90	1.63	78.43		
CACONIA LAKE	1952-2005	2.44	3.53	4.41	6.01	7.55	8.56	9.50	8.98	7.00	5.42	3.49	77.99		
CAMP FRISSE	1948-2005	0.72	1.12	2.32	4.18	7.04	9.48	11.17	9.50	6.51	3.77	1.40	67.72		
CHICO EXPERIMENT STN	1906-2005	1.26	2.13	3.82	5.63	8.23	10.11	11.49	9.71	7.36	4.46	2.09	1.30	67.63	
CINOLA VALLEY	1948-2005	2.01	3.48	5.03	6.06	6.76	6.96	7.63	7.48	6.21	5.02	3.50	62.77		
COW CREEK	1948-1961	3.21	5.62	9.70	13.88	17.25	21.37	21.89	20.17	18.36	10.71	4.91	3.85	149.10	
DAVIS 1 SW	1948-2005	1.49	2.34	4.54	7.13	10.19	12.17	12.77	11.20	9.09	6.35	3.69	44.5	81.60	
DEATH VALLEY	1961-2005	3.93	5.30	9.10	13.00	16.76	18.11	20.99	18.96	13.95	9.78	5.54	3.75	140.14	
DUTTONS LANDING	1955-1977	1.42	2.05	3.87	5.70	7.74	9.34	9.34	8.27	6.75	4.65	2.25	1.46	62.88	
FALL RIVER HILLS INTAKE	1948-2005	0.00	0.00	2.47	5.80	7.84	9.48	12.14	10.37	7.59	3.78	1.14	0.50	60.51	
FERNDALE 2 NW	1963-1973	0.70	1.17	2.26	3.21	3.95	4.38	4.49	4.07	3.59	2.06	1.04	0.72	31.64	
FOLSON DAM	1955-1963	0.92	1.90	3.47	5.21	8.07	9.91	11.12	9.93	7.45	4.69	2.06	1.25	66.18	
FRISANT GOVERNMENT CAMP	1948-2005	1.46	2.12	3.82	5.89	8.42	12.07	13.96	12.47	9.00	5.76	2.61	1.37	75.95	
GRIFFIN ISLAND REFUGE	1971-1977	1.45	2.25	4.00	5.72	8.07	9.92	10.69	9.93	6.88	4.23	2.10	1.58	65.79	
HETCH HETCHY	1931-2005	0.00	0.00	0.00	0.00	3.84	5.31	7.34	8.78	7.86	5.95	3.23	1.74	0.00	43.95
INDIO FIRE STATION	1927-2005	2.85	4.38	7.15	9.88	12.73	14.85	14.85	13.59	10.80	7.40	3.94	2.49	105.35	
INTERTOWN CILI 1 SSE	1955-2005	1.73	2.69	5.80	8.32	11.75	14.27	16.41	14.74	10.82	7.50	3.46	1.74	96.03	
INYOIS FERRY 2 ESE	1948-1977	1.00	1.49	3.14	5.65	8.54	10.14	11.60	10.31	7.74	4.62	2.69	1.00	69.12	
LAKE FOLSOM 2	1948-1970	0.88	1.42	3.01	4.62	7.41	8.88	10.31	9.35	6.93	3.61	1.19	0.87	67.60	
LAKEHSORE 2	1948-1972	1.09	1.68	2.97	4.78	6.15	7.43	9.71	8.79	6.44	3.40	1.41	0.95	54.80	
LAKE SOLLANO	1975-2005	1.48	2.37	4.29	6.66	9.54	11.24	11.83	9.66	7.58	5.26	2.59	1.67	73.74	
LAKE SPANGLING	1948-2003	0.00	0.00	0.00	0.00	4.57	6.52	8.16	6.78	4.54	1.98	0.00	0.00	32.85	
LAKE SPANGLING DAM	1958-1971	0.00	0.00	0.00	0.00	7.20	9.96	12.08	11.88	9.34	6.65	0.00	0.00	86.99	
LITTLE PANOCHES DET DAM	1968-1975	1.77	2.89	5.97	9.39	14.56	16.31	18.45	16.63	12.46	8.00	3.44	1.78	110.75	
LOGS	1948-2005	1.19	1.95	3.82	6.01	8.60	9.92	10.63	9.11	6.68	4.08	1.86	1.07	64.92	
LOS BANOS DET RESV	1968-2005	1.87	2.71	5.44	8.34	14.18	16.58	17.88	16.63	11.07	7.49	3.94	1.82	107.82	
MANDEVILLE ISLAND	1955-1965	1.10	2.38	4.77	6.95	8.55	10.44	11.22	9.71	7.41	5.12	2.47	1.13	71.25	
MARICCA	1948-1977	1.31	1.71	4.04	6.33	9.00	10.82	11.64	10.32	7.15	4.13	2.30	1.17	69.17	
MARSHLEY COVE	1970-2005	1.03	1.51	3.03	4.80	7.33	9.60	10.82	9.45	6.99	4.35	1.75	1.01	61.67	
MCCARTY	1948-2005	0.00	4.68	6.48	9.97	13.69	15.82	17.01	16.03	12.19	8.76	5.54	3.59	111.59	
MONTICELLO DAM	1957-1970	1.02	1.83	3.24	4.96	7.35	9.36	11.20	10.07	7.56	4.82	1.98	1.08	64.47	
NACIMIENTO DAM	1957-1978	1.58	2.20	3.82	5.53	7.92	9.85	11.28	10.43	7.76	5.16	2.57	1.46	69.86	

# APPENDIX M



APPENDIX M

PRECIPITATION DEPTH-DURATION-FREQUENCY TABLE

STATION NO. BSN NUMBER P20 4018	STATION NAME HOGAN DAM	ELEV 749	SFC 31	TWP 04N	RNC 11E	LOT H	DIR M	LONGITUDE 3P-15E	COUNTY 120-814 CALAVERAS		
MAXIMUM PRECIPITATION (IN) FOR INDICATED DURATION D-DAYS HH:MM:SS											
RETURN PERIOD IN YEARS	1M	10M	1+M	30M	1H	2H	3H	6H	12H	24H	5-YR
2	0.0	0.0	0.30	0.40	0.52	0.75	0.90	1.25	1.63	2.22	19.93
5	0.0	0.0	0.40	0.54	0.69	1.01	1.20	1.67	2.17	2.96	25.22
10	0.0	0.0	0.46	0.63	0.81	1.17	1.38	1.94	2.53	3.44	28.28
20	0.0	0.0	0.52	0.71	0.91	1.32	1.57	2.19	2.85	3.89	30.96
25	0.0	0.0	0.54	0.73	0.94	1.37	1.63	2.26	2.96	4.03	31.77
40	0.0	0.0	0.55	0.74	0.96	1.39	1.66	2.30	3.01	4.09	33.41
50	0.0	0.0	0.60	0.81	1.04	1.51	1.80	2.50	3.26	4.44	34.15
100	0.0	0.0	0.65	0.88	1.13	1.65	1.96	2.73	3.56	4.85	36.38
200	0.0	0.0	0.70	0.95	1.23	1.78	2.12	2.95	3.85	5.24	38.64
1000	0.0	0.0	0.82	1.11	1.43	2.09	2.48	3.45	4.40	6.13	43.07
10000	0.0	0.0	0.99	1.33	1.72	2.50	2.97	4.13	5.39	7.34	49.07
PMP	0.0	0.0	1.04	2.62	3.38	4.92	5.84	8.12	10.60	14.44	109.56
MEAN	0.0	0.0	0.317	0.429	0.552	0.804	0.956	1.328	1.734	2.362	20.421
CLDXY HR. COP.	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
CALCULATED S/F W	0.0	0.0	2.147	1.417	1.507	1.465	0.673	-0.086	0.349	0.550	0.507
REGIONAL SKEW	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	0.500
SKEW USED	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100	0.500
SLOPE OF LOG INTENSITY / LOG TIME = -0.455											
INTERCEPT (TIME=1 HOUR) = 0.580											
COEFFICIENT OF DETERMINATION = 0.998											
1HR INTERCEPT / MEAN YR = 0.02941											
AVERAGE CALC CV / USED CV = 0.95											
KURTOSIS	0.0	0.0	9.237	5.771	6.944	6.560	3.254	2.878	3.676	2.967	3.084
RECORD N	0	0	12	12	12	12	12	12	12	12	13
RECORD N	0	0	1964	1964	1964	1964	1964	1964	1967	1967	1967
RECORD MAXIMUM	0.0	0.0	0.720	0.880	0.970	1.260	1.320	1.720	2.310	3.290	24.600
RECORD MAX	0.0	0.0	2.796	2.444	2.546	2.527	1.812	1.446	1.978	1.815	1.729
CALC. COEFF. VAR	0.0	0.0	0.453	0.430	0.297	0.225	0.210	0.204	0.168	0.297	0.260
RECORD COEFF. VAR	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.291
USED COEFF. VAR	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.341	0.291
MEAN/A	0.0	0.0	0.0155	0.0210	0.0271	0.0394	0.0468	0.0650	0.0849	0.1157	1.0000
RP10/A	0.0	0.0	0.0227	0.0304	0.0394	0.0574	0.0682	0.0948	0.1238	0.1685	1.3850
RP25/A	0.0	0.0	0.0265	0.0358	0.0461	0.0671	0.0798	0.1108	0.1447	0.1971	1.5558
RP50/A	0.0	0.0	0.0293	0.0395	0.0509	0.0741	0.0881	0.1224	0.1598	0.2176	1.6725
RP100/A	0.0	0.0	0.0319	0.0431	0.0554	0.0808	0.0961	0.1335	0.1743	0.2374	1.7815
RP1000/A	0.0	0.0	0.0403	0.0545	0.0702	0.1021	0.1214	0.1687	0.2203	0.3000	2.1090
RP10000/A	0.0	0.0	0.0483	0.0653	0.0841	0.1224	0.1455	0.2022	0.2640	0.3596	2.4030
PMP/A	0.0	0.0	0.0951	0.1285	0.1654	0.2408	0.2862	0.3978	0.5193	0.7072	5.3650

PEARSON TYPE III DISTRIBUTION USED  
PROBABLY MAXIMUM PRECIPITATION ESTIMATE BASED ON 1% STANDARD DEVIATIONS  
WHERE N IS SMALL (<25) RESULTS ARE NOT DEPENDABLE

Department of  
Water Resources

Bulletin No. 195

# Rainfall Analysis for Drainage Design

Volume I.  
Short-Duration Precipitation  
Frequency Data

1

October 1976

# APPENDIX M

**NOAA ATLAS 14 POINT PRECIPITATION FREQUENCY ESTIMATES: CA**

**Data description**  
 Data type: [Precipitation depth] Units: [English] Time series type: [Partial duration]

**Select location**

1) Manually:  
 a) By location (decimal degrees, use "" for S and W): Latitude [ ] Longitude [ ] [Submit]  
 b) By station (list of CA stations): [Select station]  
 c) By address [Search] [Q]

2) Use map:



**Location information:**  
 Name: Valley Springs, California, USA\*  
 Latitude: 36.1793°  
 Longitude: -120.8177°  
 Elevation: 753 ft \*\*

\* Source: ESRI Maps  
 \*\* Source: USGS

<b>PDS-based precipitation frequency estimates with 90% confidence intervals (in inches)<sup>1</sup></b>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
24-hr	1.89 (1.71-2.14)	2.29 (2.07-2.59)	2.80 (2.52-3.17)	3.21 (2.86-3.66)	3.74 (3.23-4.43)	4.15 (3.50-5.02)	4.55 (3.74-5.65)	4.96 (3.96-6.34)	5.49 (4.20-7.34)	5.90 (4.35-8.18)
2-day	2.32 (2.10-2.61)	2.83 (2.56-3.20)	3.47 (3.13-3.93)	3.97 (3.54-4.54)	4.60 (3.97-5.45)	5.07 (4.27-6.13)	5.52 (4.53-6.85)	5.96 (4.75-7.62)	6.52 (4.98-8.72)	6.94 (5.11-9.62)
3-day	2.67 (2.42-3.02)	3.30 (2.98-3.72)	4.05 (3.65-4.59)	4.63 (4.13-5.29)	5.36 (4.62-6.34)	5.88 (4.95-7.11)	6.37 (5.24-7.91)	6.86 (5.47-8.77)	7.46 (5.70-9.97)	7.91 (5.82-11.0)
4-day	3.01 (2.72-3.39)	3.73 (3.37-4.21)	4.59 (4.14-5.20)	5.24 (4.68-5.99)	6.05 (5.21-7.16)	6.62 (5.58-8.01)	7.16 (5.68-8.89)	7.67 (6.12-9.81)	8.31 (6.35-11.1)	8.78 (6.46-12.2)
7-day	3.66 (3.31-4.12)	4.57 (4.12-5.16)	5.63 (5.07-6.38)	6.41 (5.72-7.32)	7.36 (6.34-8.70)	8.00 (6.75-9.69)	8.60 (7.07-10.7)	9.17 (7.32-11.7)	9.86 (7.53-13.2)	10.3 (7.61-14.3)
10-day	4.14 (3.75-4.67)	5.20 (4.70-5.88)	6.42 (5.78-7.27)	7.30 (6.52-8.34)	8.35 (7.20-9.88)	9.06 (7.64-11.0)	9.71 (7.98-12.1)	10.3 (8.23-13.2)	11.0 (8.43-14.7)	11.5 (8.50-16.0)
20-day	5.51 (4.98-6.21)	6.97 (6.30-7.88)	8.63 (7.78-9.78)	9.81 (8.76-11.2)	11.2 (9.65-13.2)	12.1 (10.2-14.6)	12.9 (10.6-16.1)	13.7 (10.9-17.5)	14.6 (11.1-19.5)	15.2 (11.2-21.0)
30-day	6.74 (6.10-7.60)	8.55 (7.72-9.66)	10.6 (9.54-12.0)	12.0 (10.7-13.7)	13.7 (11.8-16.2)	14.8 (12.5-17.9)	15.8 (13.0-19.6)	16.7 (13.3-21.4)	17.8 (13.6-23.7)	18.5 (13.6-25.6)
45-day	8.40 (7.60-9.48)	10.6 (9.61-12.0)	13.2 (11.8-14.9)	14.9 (13.3-17.1)	17.0 (14.6-20.1)	18.4 (15.5-22.2)	19.6 (16.1-24.3)	20.7 (16.5-26.4)	22.0 (16.8-29.3)	22.8 (16.8-31.6)
60-day	10.0 (9.09-11.3)	12.7 (11.4-14.3)	15.6 (14.1-17.7)	17.7 (15.8-20.2)	20.1 (17.3-23.8)	21.7 (18.3-26.3)	23.1 (19.0-28.7)	24.4 (19.5-31.2)	25.9 (19.8-34.6)	26.9 (19.8-37.3)

APPENDIX M

## NEW HOGAN WEATHER (NHW)

Elevation: 554' · CALAVERAS RIVER basin  
Query executed Monday at 14:52:21

Provisional data, subject to change.  
Select a sensor type for a plot of data.

### DAILY DATA

Earlier

DATE / TIME (PST)	PPT INC INCHES	RAIN INCHES
09/27/2021	0.00	15.76
09/28/2021	0.00	15.76
09/29/2021	0.00	15.76
09/30/2021	0.00	15.76

## NEW HOGAN WEATHER (NHW)

Elevation: 554' · CALAVERAS RIVER basin · Operator: US Army Corps of Engineers  
Query executed Monday at 14:52:06

Provisional data, subject to change.  
Select a sensor type for a plot of data.

### DAILY DATA

Earlier

DATE / TIME (PST)	PPT INC INCHES	RAIN INCHES
09/27/2022	0.00	19.64
09/28/2022	0.00	19.64
09/29/2022	0.00	19.64
09/30/2022	0.00	19.64

## NEW HOGAN WEATHER (NHW)

Elevation: 554' · CALAVERAS RIVER basin · Operator: US Army Corps of Engineers  
Query executed Monday at 14:38:39

Provisional data, subject to change.  
Select a sensor type for a plot of data.

### DAILY DATA

Earlier

DATE / TIME (PST)	PPT INC INCHES	RAIN INCHES
09/27/2023	0.00	44.96
09/28/2023	0.00	44.96
09/29/2023	0.00	44.96
09/30/2023	0.16	45.12

# **APPENDIX N**

**LA CONTENTA WWTF  
2020 TO 2023**

**DAILY EFFLUENT AND IRRIGATION DEMAND**

APPENDIX N

2020 - 2021 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
10/1/2020	12.300	37.750
10/2/2020	0.000	0.000
10/3/2020	0.000	0.000
10/4/2020	0.000	0.000
10/5/2020	3.230	9.913
10/6/2020	0.000	0.000
10/7/2020	0.000	0.000
10/8/2020	0.000	0.000
10/9/2020	0.000	0.000
10/10/2020	0.000	0.000
10/11/2020	0.000	0.000
10/12/2020	0.000	0.000
10/13/2020	0.000	0.000
10/14/2020	2.639	8.099
10/15/2020	0.000	0.000
10/16/2020	0.000	0.000
10/17/2020	0.000	0.000
10/18/2020	0.000	0.000
10/19/2020	0.000	0.000
10/20/2020	0.000	0.000
10/21/2020	0.000	0.000
10/22/2020	2.332	7.157
10/23/2020	0.000	0.000
10/24/2020	0.000	0.000
10/25/2020	0.000	0.000
10/26/2020	0.000	0.000
10/27/2020	0.000	0.000
10/28/2020	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
10/1/2021	0.000	0.000
10/2/2021	0.000	0.000
10/3/2021	0.000	0.000
10/4/2021	0.000	0.000
10/5/2021	0.000	0.000
10/6/2021	0.000	0.000
10/7/2021	0.000	0.000
10/8/2021	0.000	0.000
10/9/2021	0.000	0.000
10/10/2021	0.000	0.000
10/11/2021	0.000	0.000
10/12/2021	0.000	0.000
10/13/2021	0.000	0.000
10/14/2021	0.000	0.000
10/15/2021	0.000	0.000
10/16/2021	0.000	0.000
10/17/2021	0.000	0.000
10/18/2021	0.000	0.000
10/19/2021	0.000	0.000
10/20/2021	0.000	0.000
10/21/2021	0.000	0.000
10/22/2021	0.000	0.000
10/23/2021	0.000	0.000
10/24/2021	0.000	0.000
10/25/2021	0.000	0.000
10/26/2021	0.000	0.000
10/27/2021	0.000	0.000
10/28/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
10/1/2022	0.000	0.000
10/2/2022	0.000	0.000
10/3/2022	0.000	0.000
10/4/2022	0.000	0.000
10/5/2022	0.000	0.000
10/6/2022	0.000	0.000
10/7/2022	1.279	3.925
10/8/2022	0.000	0.000
10/9/2022	0.000	0.000
10/10/2022	0.000	0.000
10/11/2022	0.000	0.000
10/12/2022	0.000	0.000
10/13/2022	0.000	0.000
10/14/2022	0.000	0.000
10/15/2022	0.000	0.000
10/16/2022	0.000	0.000
10/17/2022	0.000	0.000
10/18/2022	0.000	0.000
10/19/2022	0.000	0.000
10/20/2022	0.000	0.000
10/21/2022	0.000	0.000
10/22/2022	0.000	0.000
10/23/2022	0.000	0.000
10/24/2022	3.700	11.356
10/25/2022	0.000	0.000
10/26/2022	0.000	0.000
10/27/2022	0.000	0.000
10/28/2022	0.000	0.000

APPENDIX N

2020 - 2021 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
10/29/2020	0.000	0.000
10/30/2020	1.403	4.306
10/31/2020	0.000	0.000
11/1/2020	0.000	0.000
11/2/2020	0.000	0.000
11/3/2020	0.000	0.000
11/4/2020	0.000	0.000
11/5/2020	0.000	0.000
11/6/2020	0.000	0.000
11/7/2020	0.000	0.000
11/8/2020	0.000	0.000
11/9/2020	0.000	0.000
11/10/2020	0.000	0.000
11/11/2020	0.000	0.000
11/12/2020	0.000	0.000
11/13/2020	0.000	0.000
11/14/2020	0.000	0.000
11/15/2020	0.000	0.000
11/16/2020	0.000	0.000
11/17/2020	0.000	0.000
11/18/2020	0.000	0.000
11/19/2020	0.000	0.000
11/20/2020	0.000	0.000
11/21/2020	0.000	0.000
11/22/2020	0.000	0.000
11/23/2020	0.000	0.000
11/24/2020	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
10/29/2021	0.000	0.000
10/30/2021	0.000	0.000
10/31/2021	4.600	14.118
11/1/2021	0.000	0.000
11/2/2021	0.000	0.000
11/3/2021	0.000	0.000
11/4/2021	0.000	0.000
11/5/2021	0.000	0.000
11/6/2021	0.000	0.000
11/7/2021	0.000	0.000
11/8/2021	0.000	0.000
11/9/2021	0.000	0.000
11/10/2021	0.000	0.000
11/11/2021	0.000	0.000
11/12/2021	0.000	0.000
11/13/2021	0.000	0.000
11/14/2021	0.000	0.000
11/15/2021	0.000	0.000
11/16/2021	0.000	0.000
11/17/2021	0.000	0.000
11/18/2021	0.000	0.000
11/19/2021	0.000	0.000
11/20/2021	0.000	0.000
11/21/2021	0.000	0.000
11/22/2021	0.000	0.000
11/23/2021	0.000	0.000
11/24/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
10/29/2022	0.000	0.000
10/30/2022	0.000	0.000
10/31/2022	0.000	0.000
11/1/2022	0.000	0.000
11/2/2022	0.000	0.000
11/3/2022	0.000	0.000
11/4/2022	0.000	0.000
11/5/2022	0.000	0.000
11/6/2022	0.000	0.000
11/7/2022	0.000	0.000
11/8/2022	11.424	35.063
11/9/2022	0.000	0.000
11/10/2022	0.000	0.000
11/11/2022	0.000	0.000
11/12/2022	0.000	0.000
11/13/2022	0.000	0.000
11/14/2022	0.000	0.000
11/15/2022	0.000	0.000
11/16/2022	0.000	0.000
11/17/2022	0.000	0.000
11/18/2022	0.000	0.000
11/19/2022	0.000	0.000
11/20/2022	0.000	0.000
11/21/2022	0.000	0.000
11/22/2022	0.000	0.000
11/23/2022	0.000	0.000
11/24/2022	0.000	0.000

APPENDIX N

2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
11/25/2020	0.000	0.000
11/26/2020	0.000	0.000
11/27/2020	0.000	0.000
11/28/2020	0.000	0.000
11/29/2020	0.000	0.000
11/30/2020	6.991	21.456
12/1/2020	0.000	0.000
12/2/2020	0.000	0.000
12/3/2020	0.000	0.000
12/4/2020	0.000	0.000
12/5/2020	0.000	0.000
12/6/2020	0.000	0.000
12/7/2020	0.000	0.000
12/8/2020	0.000	0.000
12/9/2020	0.000	0.000
12/10/2020	0.000	0.000
12/11/2020	0.000	0.000
12/12/2020	0.000	0.000
12/13/2020	0.000	0.000
12/14/2020	0.000	0.000
12/15/2020	0.000	0.000
12/16/2020	0.000	0.000
12/17/2020	0.000	0.000
12/18/2020	0.000	0.000
12/19/2020	0.000	0.000
12/20/2020	0.000	0.000
12/21/2020	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
11/25/2021	0.000	0.000
11/26/2021	0.000	0.000
11/27/2021	0.000	0.000
11/28/2021	0.000	0.000
11/29/2021	0.000	0.000
11/30/2021	0.000	0.000
12/1/2021	0.000	0.000
12/2/2021	0.000	0.000
12/3/2021	0.000	0.000
12/4/2021	0.000	0.000
12/5/2021	0.000	0.000
12/6/2021	0.000	0.000
12/7/2021	0.000	0.000
12/8/2021	0.000	0.000
12/9/2021	0.000	0.000
12/10/2021	0.000	0.000
12/11/2021	0.000	0.000
12/12/2021	0.000	0.000
12/13/2021	0.000	0.000
12/14/2021	0.000	0.000
12/15/2021	0.000	0.000
12/16/2021	0.000	0.000
12/17/2021	0.000	0.000
12/18/2021	0.000	0.000
12/19/2021	0.000	0.000
12/20/2021	0.000	0.000
12/21/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
11/25/2022	0.000	0.000
11/26/2022	0.000	0.000
11/27/2022	0.000	0.000
11/28/2022	0.000	0.000
11/29/2022	0.000	0.000
11/30/2022	0.000	0.000
12/1/2022	0.000	0.000
12/2/2022	0.000	0.000
12/3/2022	0.000	0.000
12/4/2022	0.000	0.000
12/5/2022	0.000	0.000
12/6/2022	0.000	0.000
12/7/2022	0.000	0.000
12/8/2022	0.000	0.000
12/9/2022	0.000	0.000
12/10/2022	0.000	0.000
12/11/2022	0.000	0.000
12/12/2022	0.000	0.000
12/13/2022	0.000	0.000
12/14/2022	0.000	0.000
12/15/2022	0.000	0.000
12/16/2022	0.000	0.000
12/17/2022	0.000	0.000
12/18/2022	0.000	0.000
12/19/2022	0.000	0.000
12/20/2022	0.000	0.000
12/21/2022	0.000	0.000

APPENDIX N

2020 - 2021 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
12/22/2020	0.000	0.000
12/23/2020	0.000	0.000
12/24/2020	0.000	0.000
12/25/2020	0.000	0.000
12/26/2020	0.000	0.000
12/27/2020	0.000	0.000
12/28/2020	0.000	0.000
12/29/2020	0.000	0.000
12/30/2020	0.000	0.000
12/31/2020	0.000	0.000
1/1/2021	0.000	0.000
1/2/2021	0.000	0.000
1/3/2021	0.000	0.000
1/4/2021	0.000	0.000
1/5/2021	0.000	0.000
1/6/2021	0.000	0.000
1/7/2021	0.000	0.000
1/8/2021	0.000	0.000
1/9/2021	0.000	0.000
1/10/2021	0.000	0.000
1/11/2021	0.000	0.000
1/12/2021	0.000	0.000
1/13/2021	0.000	0.000
1/14/2021	0.000	0.000
1/15/2021	0.000	0.000
1/16/2021	0.000	0.000
1/17/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
12/22/2021	0.000	0.000
12/23/2021	0.000	0.000
12/24/2021	0.000	0.000
12/25/2021	0.000	0.000
12/26/2021	0.000	0.000
12/27/2021	0.000	0.000
12/28/2021	0.000	0.000
12/29/2021	0.000	0.000
12/30/2021	0.000	0.000
12/31/2021	0.000	0.000
1/1/2022	0.000	0.000
1/2/2022	0.000	0.000
1/3/2022	0.000	0.000
1/4/2022	0.000	0.000
1/5/2022	0.000	0.000
1/6/2022	0.000	0.000
1/7/2022	0.000	0.000
1/8/2022	0.000	0.000
1/9/2022	0.000	0.000
1/10/2022	0.000	0.000
1/11/2022	0.000	0.000
1/12/2022	0.000	0.000
1/13/2022	0.000	0.000
1/14/2022	0.000	0.000
1/15/2022	0.000	0.000
1/16/2022	0.000	0.000
1/17/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
12/22/2022	0.000	0.000
12/23/2022	0.000	0.000
12/24/2022	0.000	0.000
12/25/2022	0.000	0.000
12/26/2022	0.000	0.000
12/27/2022	0.000	0.000
12/28/2022	0.000	0.000
12/29/2022	0.000	0.000
12/30/2022	0.000	0.000
12/31/2022	0.000	0.000
1/1/2023	0.000	0.000
1/2/2023	0.000	0.000
1/3/2023	0.000	0.000
1/4/2023	0.000	0.000
1/5/2023	0.000	0.000
1/6/2023	0.000	0.000
1/7/2023	0.000	0.000
1/8/2023	0.000	0.000
1/9/2023	0.000	0.000
1/10/2023	0.000	0.000
1/11/2023	0.000	0.000
1/12/2023	0.000	0.000
1/13/2023	0.000	0.000
1/14/2023	0.000	0.000
1/15/2023	0.000	0.000
1/16/2023	0.000	0.000
1/17/2023	0.000	0.000

APPENDIX N

2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
1/18/2021	0.000	0.000
1/19/2021	0.000	0.000
1/20/2021	0.000	0.000
1/21/2021	0.000	0.000
1/22/2021	0.000	0.000
1/23/2021	0.000	0.000
1/24/2021	0.000	0.000
1/25/2021	0.000	0.000
1/26/2021	0.000	0.000
1/27/2021	0.000	0.000
1/28/2021	0.000	0.000
1/29/2021	0.000	0.000
1/30/2021	0.000	0.000
1/31/2021	0.000	0.000
2/1/2021	0.000	0.000
2/2/2021	0.000	0.000
2/3/2021	0.000	0.000
2/4/2021	0.000	0.000
2/5/2021	0.000	0.000
2/6/2021	0.000	0.000
2/7/2021	0.000	0.000
2/8/2021	0.000	0.000
2/9/2021	0.000	0.000
2/10/2021	0.000	0.000
2/11/2021	0.000	0.000
2/12/2021	0.000	0.000
2/13/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
1/18/2022	0.000	0.000
1/19/2022	0.000	0.000
1/20/2022	0.000	0.000
1/21/2022	0.000	0.000
1/22/2022	0.000	0.000
1/23/2022	0.000	0.000
1/24/2022	0.000	0.000
1/25/2022	0.000	0.000
1/26/2022	0.000	0.000
1/27/2022	0.000	0.000
1/28/2022	0.000	0.000
1/29/2022	0.000	0.000
1/30/2022	0.000	0.000
1/31/2022	0.000	0.000
2/1/2022	0.000	0.000
2/2/2022	0.000	0.000
2/3/2022	0.000	0.000
2/4/2022	0.000	0.000
2/5/2022	0.000	0.000
2/6/2022	0.000	0.000
2/7/2022	0.000	0.000
2/8/2022	0.000	0.000
2/9/2022	0.000	0.000
2/10/2022	0.000	0.000
2/11/2022	0.000	0.000
2/12/2022	0.000	0.000
2/13/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
1/18/2023	0.000	0.000
1/19/2023	0.000	0.000
1/20/2023	0.000	0.000
1/21/2023	0.000	0.000
1/22/2023	0.000	0.000
1/23/2023	0.000	0.000
1/24/2023	0.000	0.000
1/25/2023	0.000	0.000
1/26/2023	0.000	0.000
1/27/2023	0.000	0.000
1/28/2023	0.000	0.000
1/29/2023	0.000	0.000
1/30/2023	0.000	0.000
1/31/2023	0.000	0.000
2/1/2023	0.000	0.000
2/2/2023	0.000	0.000
2/3/2023	0.000	0.000
2/4/2023	0.000	0.000
2/5/2023	0.000	0.000
2/6/2023	0.000	0.000
2/7/2023	0.000	0.000
2/8/2023	0.000	0.000
2/9/2023	0.000	0.000
2/10/2023	0.000	0.000
2/11/2023	0.000	0.000
2/12/2023	0.000	0.000
2/13/2023	0.000	0.000

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2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
2/14/2021	0.000	0.000
2/15/2021	0.000	0.000
2/16/2021	0.000	0.000
2/17/2021	0.000	0.000
2/18/2021	0.000	0.000
2/19/2021	0.000	0.000
2/20/2021	0.000	0.000
2/21/2021	0.000	0.000
2/22/2021	0.000	0.000
2/23/2021	0.000	0.000
2/24/2021	0.000	0.000
2/25/2021	0.000	0.000
2/26/2021	0.000	0.000
2/27/2021	0.000	0.000
2/28/2021	0.000	0.000
3/1/2021	0.000	0.000
3/2/2021	0.000	0.000
3/3/2021	0.000	0.000
3/4/2021	0.000	0.000
3/5/2021	0.000	0.000
3/6/2021	0.000	0.000
3/7/2021	0.000	0.000
3/8/2021	0.000	0.000
3/9/2021	0.000	0.000
3/10/2021	0.000	0.000
3/11/2021	0.000	0.000
3/12/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
2/14/2022	0.000	0.000
2/15/2022	0.000	0.000
2/16/2022	0.000	0.000
2/17/2022	0.000	0.000
2/18/2022	0.000	0.000
2/19/2022	0.000	0.000
2/20/2022	0.000	0.000
2/21/2022	0.000	0.000
2/22/2022	0.000	0.000
2/23/2022	0.000	0.000
2/24/2022	0.000	0.000
2/25/2022	0.000	0.000
2/26/2022	0.000	0.000
2/27/2022	0.000	0.000
2/28/2022	0.000	0.000
3/1/2022	0.000	0.000
3/2/2022	0.000	0.000
3/3/2022	0.000	0.000
3/4/2022	0.000	0.000
3/5/2022	0.000	0.000
3/6/2022	0.000	0.000
3/7/2022	0.000	0.000
3/8/2022	0.000	0.000
3/9/2022	0.000	0.000
3/10/2022	0.000	0.000
3/11/2022	0.000	0.000
3/12/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
2/14/2023	0.000	0.000
2/15/2023	0.000	0.000
2/16/2023	0.000	0.000
2/17/2023	0.000	0.000
2/18/2023	0.000	0.000
2/19/2023	0.000	0.000
2/20/2023	0.000	0.000
2/21/2023	0.000	0.000
2/22/2023	0.000	0.000
2/23/2023	0.000	0.000
2/24/2023	0.000	0.000
2/25/2023	0.000	0.000
2/26/2023	0.000	0.000
2/27/2023	0.000	0.000
2/28/2023	0.000	0.000
3/1/2023	0.000	0.000
3/2/2023	0.000	0.000
3/3/2023	0.000	0.000
3/4/2023	0.000	0.000
3/5/2023	0.000	0.000
3/6/2023	0.000	0.000
3/7/2023	0.000	0.000
3/8/2023	0.000	0.000
3/9/2023	0.000	0.000
3/10/2023	0.000	0.000
3/11/2023	0.000	0.000
3/12/2023	0.000	0.000

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2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
3/13/2021	0.000	0.000
3/14/2021	0.000	0.000
3/15/2021	0.000	0.000
3/16/2021	0.000	0.000
3/17/2021	0.000	0.000
3/18/2021	0.000	0.000
3/19/2021	0.000	0.000
3/20/2021	0.000	0.000
3/21/2021	0.000	0.000
3/22/2021	0.000	0.000
3/23/2021	0.000	0.000
3/24/2021	0.000	0.000
3/25/2021	0.000	0.000
3/26/2021	0.000	0.000
3/27/2021	0.000	0.000
3/28/2021	0.000	0.000
3/29/2021	0.000	0.000
3/30/2021	0.000	0.000
3/31/2021	0.000	0.000
4/1/2021	0.000	0.000
4/2/2021	0.000	0.000
4/3/2021	0.000	0.000
4/4/2021	0.000	0.000
4/5/2021	0.000	0.000
4/6/2021	0.000	0.000
4/7/2021	0.000	0.000
4/8/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
3/13/2022	0.000	0.000
3/14/2022	0.000	0.000
3/15/2022	0.000	0.000
3/16/2022	0.000	0.000
3/17/2022	0.000	0.000
3/18/2022	0.000	0.000
3/19/2022	0.000	0.000
3/20/2022	0.000	0.000
3/21/2022	0.000	0.000
3/22/2022	0.000	0.000
3/23/2022	0.000	0.000
3/24/2022	0.000	0.000
3/25/2022	0.000	0.000
3/26/2022	0.000	0.000
3/27/2022	0.000	0.000
3/28/2022	0.000	0.000
3/29/2022	0.000	0.000
3/30/2022	0.000	0.000
3/31/2022	0.000	0.000
4/1/2022	0.000	0.000
4/2/2022	0.000	0.000
4/3/2022	0.000	0.000
4/4/2022	10.516	32.274
4/5/2022	0.000	0.000
4/6/2022	0.000	0.000
4/7/2022	0.000	0.000
4/8/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
3/13/2023	0.000	0.000
3/14/2023	0.000	0.000
3/15/2023	0.000	0.000
3/16/2023	0.000	0.000
3/17/2023	0.000	0.000
3/18/2023	0.000	0.000
3/19/2023	0.000	0.000
3/20/2023	0.000	0.000
3/21/2023	0.000	0.000
3/22/2023	0.000	0.000
3/23/2023	0.000	0.000
3/24/2023	0.000	0.000
3/25/2023	0.000	0.000
3/26/2023	0.000	0.000
3/27/2023	0.000	0.000
3/28/2023	0.000	0.000
3/29/2023	0.000	0.000
3/30/2023	0.000	0.000
3/31/2023	0.000	0.000
4/1/2023	0.000	0.000
4/2/2023	0.000	0.000
4/3/2023	0.000	0.000
4/4/2023	0.000	0.000
4/5/2023	0.000	0.000
4/6/2023	0.000	0.000
4/7/2023	0.000	0.000
4/8/2023	0.000	0.000

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2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
4/9/2021	0.000	0.000
4/10/2021	0.000	0.000
4/11/2021	0.000	0.000
4/12/2021	0.000	0.000
4/13/2021	0.000	0.000
4/14/2021	0.000	0.000
4/15/2021	0.000	0.000
4/16/2021	0.000	0.000
4/17/2021	0.000	0.000
4/18/2021	0.000	0.000
4/19/2021	0.000	0.000
4/20/2021	0.000	0.000
4/21/2021	0.000	0.000
4/22/2021	0.000	0.000
4/23/2021	0.000	0.000
4/24/2021	0.000	0.000
4/25/2021	0.000	0.000
4/26/2021	0.000	0.000
4/27/2021	0.000	0.000
4/28/2021	0.000	0.000
4/29/2021	0.000	0.000
4/30/2021	9.123	27.998
5/1/2021	0.000	0.000
5/2/2021	0.000	0.000
5/3/2021	0.000	0.000
5/4/2021	0.000	0.000
5/5/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
4/9/2022	0.000	0.000
4/10/2022	0.000	0.000
4/11/2022	0.000	0.000
4/12/2022	0.000	0.000
4/13/2022	0.000	0.000
4/14/2022	0.000	0.000
4/15/2022	0.000	0.000
4/16/2022	0.000	0.000
4/17/2022	0.000	0.000
4/18/2022	0.000	0.000
4/19/2022	0.000	0.000
4/20/2022	0.000	0.000
4/21/2022	0.000	0.000
4/22/2022	0.000	0.000
4/23/2022	0.000	0.000
4/24/2022	0.000	0.000
4/25/2022	0.000	0.000
4/26/2022	0.000	0.000
4/27/2022	0.000	0.000
4/28/2022	0.000	0.000
4/29/2022	0.000	0.000
4/30/2022	0.000	0.000
5/1/2022	0.000	0.000
5/2/2022	0.000	0.000
5/3/2022	0.000	0.000
5/4/2022	6.814	20.913
5/5/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
4/9/2023	0.000	0.000
4/10/2023	0.000	0.000
4/11/2023	0.000	0.000
4/12/2023	0.000	0.000
4/13/2023	0.000	0.000
4/14/2023	0.000	0.000
4/15/2023	0.000	0.000
4/16/2023	0.000	0.000
4/17/2023	0.000	0.000
4/18/2023	0.000	0.000
4/19/2023	0.000	0.000
4/20/2023	0.000	0.000
4/21/2023	0.000	0.000
4/22/2023	0.000	0.000
4/23/2023	0.000	0.000
4/24/2023	0.000	0.000
4/25/2023	0.000	0.000
4/26/2023	0.000	0.000
4/27/2023	4.587	14.076
4/28/2023	0.000	0.000
4/29/2023	0.000	0.000
4/30/2023	0.000	0.000
5/1/2023	0.000	0.000
5/2/2023	0.000	0.000
5/3/2023	0.000	0.000
5/4/2023	0.000	0.000
5/5/2023	0.000	0.000

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2020 - 2021 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
5/6/2021	0.000	0.000
5/7/2021	2.153	6.607
5/8/2021	0.000	0.000
5/9/2021	0.000	0.000
5/10/2021	0.000	0.000
5/11/2021	0.000	0.000
5/12/2021	0.000	0.000
5/13/2021	0.000	0.000
5/14/2021	0.000	0.000
5/15/2021	0.000	0.000
5/16/2021	6.937	21.289
5/17/2021	0.000	0.000
5/18/2021	0.000	0.000
5/19/2021	0.000	0.000
5/20/2021	0.000	0.000
5/21/2021	0.000	0.000
5/22/2021	0.000	0.000
5/23/2021	2.979	9.142
5/24/2021	0.000	0.000
5/25/2021	0.000	0.000
5/26/2021	0.000	0.000
5/27/2021	0.000	0.000
5/28/2021	6.329	19.424
5/29/2021	0.000	0.000
5/30/2021	0.000	0.000
5/31/2021	0.000	0.000
6/1/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
5/6/2022	0.000	0.000
5/7/2022	0.000	0.000
5/8/2022	0.000	0.000
5/9/2022	0.000	0.000
5/10/2022	0.000	0.000
5/11/2022	0.000	0.000
5/12/2022	0.000	0.000
5/13/2022	0.000	0.000
5/14/2022	0.000	0.000
5/15/2022	0.000	0.000
5/16/2022	0.000	0.000
5/17/2022	0.000	0.000
5/18/2022	0.000	0.000
5/19/2022	0.000	0.000
5/20/2022	0.000	0.000
5/21/2022	0.000	0.000
5/22/2022	0.000	0.000
5/23/2022	0.000	0.000
5/24/2022	0.000	0.000
5/25/2022	0.000	0.000
5/26/2022	0.000	0.000
5/27/2022	0.000	0.000
5/28/2022	0.000	0.000
5/29/2022	0.000	0.000
5/30/2022	0.000	0.000
5/31/2022	0.000	0.000
6/1/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>
5/6/2023	2.973	9.125
5/7/2023	0.000	0.000
5/8/2023	0.000	0.000
5/9/2023	0.000	0.000
5/10/2023	0.000	0.000
5/11/2023	0.000	0.000
5/12/2023	0.000	0.000
5/13/2023	0.000	0.000
5/14/2023	0.000	0.000
5/15/2023	0.000	0.000
5/16/2023	0.000	0.000
5/17/2023	3.985	12.229
5/18/2023	0.000	0.000
5/19/2023	0.000	0.000
5/20/2023	0.000	0.000
5/21/2023	0.000	0.000
5/22/2023	0.000	0.000
5/23/2023	0.000	0.000
5/24/2023	2.947	9.043
5/25/2023	0.000	0.000
5/26/2023	0.000	0.000
5/27/2023	0.000	0.000
5/28/2023	0.000	0.000
5/29/2023	0.000	0.000
5/30/2023	0.000	0.000
5/31/2023	4.172	12.805
6/1/2023	0.000	0.000

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2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
6/2/2021	0.000	0.000
6/3/2021	0.000	0.000
6/4/2021	0.000	0.000
6/5/2021	0.000	0.000
6/6/2021	0.000	0.000
6/7/2021	0.000	0.000
6/8/2021	0.000	0.000
6/9/2021	0.000	0.000
6/10/2021	4.125	12.661
6/11/2021	7.555	23.187
6/12/2021	0.000	0.000
6/13/2021	0.000	0.000
6/14/2021	0.000	0.000
6/15/2021	0.000	0.000
6/16/2021	3.107	9.536
6/17/2021	0.000	0.000
6/18/2021	0.000	0.000
6/19/2021	0.000	0.000
6/20/2021	0.000	0.000
6/21/2021	0.000	0.000
6/22/2021	0.000	0.000
6/23/2021	0.000	0.000
6/24/2021	0.000	0.000
6/25/2021	0.000	0.000
6/26/2021	0.000	0.000
6/27/2021	0.000	0.000
6/28/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
6/2/2022	14.364	44.084
6/3/2022	0.000	0.000
6/4/2022	0.003	0.008
6/5/2022	8.158	25.036
6/6/2022	0.000	0.000
6/7/2022	0.000	0.000
6/8/2022	0.000	0.000
6/9/2022	0.000	0.000
6/10/2022	0.000	0.000
6/11/2022	0.000	0.000
6/12/2022	4.309	13.224
6/13/2022	0.000	0.000
6/14/2022	0.000	0.000
6/15/2022	0.000	0.000
6/16/2022	0.000	0.000
6/17/2022	2.437	7.480
6/18/2022	0.000	0.000
6/19/2022	0.000	0.000
6/20/2022	0.000	0.000
6/21/2022	0.000	0.000
6/22/2022	0.000	0.000
6/23/2022	1.593	4.888
6/24/2022	0.000	0.000
6/25/2022	0.000	0.000
6/26/2022	0.000	0.000
6/27/2022	0.000	0.000
6/28/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
6/2/2023	0.000	0.000
6/3/2023	0.000	0.000
6/4/2023	0.000	0.000
6/5/2023	0.000	0.000
6/6/2023	0.000	0.000
6/7/2023	0.000	0.000
6/8/2023	0.000	0.000
6/9/2023	5.342	16.395
6/10/2023	0.000	0.000
6/11/2023	0.000	0.000
6/12/2023	0.000	0.000
6/13/2023	0.000	0.000
6/14/2023	0.000	0.000
6/15/2023	0.000	0.000
6/16/2023	0.000	0.000
6/17/2023	0.000	0.000
6/18/2023	4.179	12.825
6/19/2023	0.000	0.000
6/20/2023	0.000	0.000
6/21/2023	0.000	0.000
6/22/2023	0.000	0.000
6/23/2023	0.000	0.000
6/24/2023	0.000	0.000
6/25/2023	0.000	0.000
6/26/2023	5.808	17.824
6/27/2023	0.000	0.000
6/28/2023	0.000	0.000

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2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
6/29/2021	0.000	0.000
6/30/2021	10.721	32.904
7/1/2021	0.000	0.000
7/2/2021	0.000	0.000
7/3/2021	0.000	0.000
7/4/2021	0.000	0.000
7/5/2021	0.000	0.000
7/6/2021	0.000	0.000
7/7/2021	0.000	0.000
7/8/2021	0.000	0.000
7/9/2021	0.000	0.000
7/10/2021	0.000	0.000
7/11/2021	0.000	0.000
7/12/2021	4.544	13.947
7/13/2021	0.000	0.000
7/14/2021	0.000	0.000
7/15/2021	0.000	0.000
7/16/2021	0.000	0.000
7/17/2021	0.000	0.000
7/18/2021	0.000	0.000
7/19/2021	0.000	0.000
7/20/2021	0.000	0.000
7/21/2021	0.000	0.000
7/22/2021	0.000	0.000
7/23/2021	0.000	0.000
7/24/2021	0.000	0.000
7/25/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
6/29/2022	0.000	0.000
6/30/2022	0.000	0.000
7/1/2022	10.540	32.348
7/2/2022	0.000	0.000
7/3/2022	0.000	0.000
7/4/2022	0.000	0.000
7/5/2022	0.000	0.000
7/6/2022	0.000	0.000
7/7/2022	0.000	0.000
7/8/2022	0.000	0.000
7/9/2022	0.000	0.000
7/10/2022	1.930	5.925
7/11/2022	0.000	0.000
7/12/2022	0.000	0.000
7/13/2022	0.000	0.000
7/14/2022	2.811	8.628
7/15/2022	0.000	0.000
7/16/2022	0.000	0.000
7/17/2022	0.000	0.000
7/18/2022	0.000	0.000
7/19/2022	0.000	0.000
7/20/2022	0.000	0.000
7/21/2022	0.000	0.000
7/22/2022	0.000	0.000
7/23/2022	0.000	0.000
7/24/2022	5.501	16.882
7/25/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
6/29/2023	0.853	2.616
6/30/2023	0.000	0.000
7/1/2023	3.857	11.837
7/2/2023	0.000	0.000
7/3/2023	0.000	0.000
7/4/2023	0.000	0.000
7/5/2023	0.000	0.000
7/6/2023	0.000	0.000
7/7/2023	0.000	0.000
7/8/2023	0.000	0.000
7/9/2023	0.000	0.000
7/10/2023	5.999	18.410
7/11/2023	0.000	0.000
7/12/2023	0.000	0.000
7/13/2023	0.000	0.000
7/14/2023	0.000	0.000
7/15/2023	0.000	0.000
7/16/2023	0.000	0.000
7/17/2023	4.359	13.378
7/18/2023	0.000	0.000
7/19/2023	0.000	0.000
7/20/2023	4.905	15.055
7/21/2023	0.000	0.000
7/22/2023	0.000	0.000
7/23/2023	1.638	5.028
7/24/2023	0.000	0.000
7/25/2023	0.000	0.000

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2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
7/26/2021	4.165	12.783
7/27/2021	0.000	0.000
7/28/2021	11.781	36.158
7/29/2021	0.000	0.000
7/30/2021	0.000	0.000
7/31/2021	0.000	0.000
8/1/2021	0.000	0.000
8/2/2021	0.000	0.000
8/3/2021	0.000	0.000
8/4/2021	0.000	0.000
8/5/2021	0.000	0.000
8/6/2021	0.000	0.000
8/7/2021	0.000	0.000
8/8/2021	0.000	0.000
8/9/2021	0.000	0.000
8/10/2021	0.000	0.000
8/11/2021	0.000	0.000
8/12/2021	0.000	0.000
8/13/2021	0.000	0.000
8/14/2021	0.000	0.000
8/15/2021	0.000	0.000
8/16/2021	3.222	9.889
8/17/2021	0.000	0.000
8/18/2021	0.000	0.000
8/19/2021	0.000	0.000
8/20/2021	0.000	0.000
8/21/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
7/26/2022	0.000	0.000
7/27/2022	0.000	0.000
7/28/2022	0.000	0.000
7/29/2022	4.724	14.497
7/30/2022	0.000	0.000
7/31/2022	5.794	17.782
8/1/2022	0.000	0.000
8/2/2022	0.000	0.000
8/3/2022	0.000	0.000
8/4/2022	0.000	0.000
8/5/2022	0.000	0.000
8/6/2022	0.000	0.000
8/7/2022	0.000	0.000
8/8/2022	0.000	0.000
8/9/2022	0.000	0.000
8/10/2022	0.000	0.000
8/11/2022	0.000	0.000
8/12/2022	0.000	0.000
8/13/2022	3.741	11.482
8/14/2022	0.000	0.000
8/15/2022	0.000	0.000
8/16/2022	0.000	0.000
8/17/2022	0.000	0.000
8/18/2022	0.000	0.000
8/19/2022	0.000	0.000
8/20/2022	0.000	0.000
8/21/2022	4.080	12.522

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
7/26/2023	0.000	0.000
7/27/2023	0.000	0.000
7/28/2023	0.000	0.000
7/29/2023	0.000	0.000
7/30/2023	0.000	0.000
7/31/2023	0.000	0.000
8/1/2023	4.334	13.303
8/2/2023	0.000	0.000
8/3/2023	0.000	0.000
8/4/2023	4.129	12.673
8/5/2023	0.000	0.000
8/6/2023	0.000	0.000
8/7/2023	0.000	0.000
8/8/2023	0.000	0.000
8/9/2023	0.000	0.000
8/10/2023	0.000	0.000
8/11/2023	4.216	12.940
8/12/2023	0.000	0.000
8/13/2023	0.000	0.000
8/14/2023	0.000	0.000
8/15/2023	0.000	0.000
8/16/2023	0.000	0.000
8/17/2023	4.149	12.733
8/18/2023	0.000	0.000
8/19/2023	0.000	0.000
8/20/2023	0.000	0.000
8/21/2023	0.000	0.000

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2020 - 2021 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
8/22/2021	0.000	0.000
8/23/2021	0.000	0.000
8/24/2021	0.000	0.000
8/25/2021	0.000	0.000
8/26/2021	0.000	0.000
8/27/2021	0.000	0.000
8/28/2021	0.000	0.000
8/29/2021	0.000	0.000
8/30/2021	0.000	0.000
8/31/2021	16.467	50.538
9/1/2021	0.000	0.000
9/2/2021	0.000	0.000
9/3/2021	0.000	0.000
9/4/2021	0.000	0.000
9/5/2021	0.000	0.000
9/6/2021	0.000	0.000
9/7/2021	0.000	0.000
9/8/2021	0.000	0.000
9/9/2021	0.000	0.000
9/10/2021	0.000	0.000
9/11/2021	0.000	0.000
9/12/2021	0.000	0.000
9/13/2021	0.000	0.000
9/14/2021	0.000	0.000
9/15/2021	0.000	0.000
9/16/2021	0.000	0.000
9/17/2021	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
8/22/2022	0.000	0.000
8/23/2022	0.000	0.000
8/24/2022	0.000	0.000
8/25/2022	0.000	0.000
8/26/2022	0.000	0.000
8/27/2022	0.000	0.000
8/28/2022	0.000	0.000
8/29/2022	6.260	19.214
8/30/2022	0.000	0.000
8/31/2022	0.000	0.000
9/1/2022	0.010	0.031
9/2/2022	0.000	0.000
9/3/2022	0.000	0.000
9/4/2022	0.000	0.000
9/5/2022	5.455	16.742
9/6/2022	0.000	0.000
9/7/2022	0.000	0.000
9/8/2022	0.000	0.000
9/9/2022	0.000	0.000
9/10/2022	0.000	0.000
9/11/2022	0.000	0.000
9/12/2022	0.000	0.000
9/13/2022	0.000	0.000
9/14/2022	0.000	0.000
9/15/2022	0.000	0.000
9/16/2022	0.000	0.000
9/17/2022	0.000	0.000

2021 - 2022 Seasonal Irrigation Volume		
Date	million gal.	acre-ft.
8/22/2023	0.000	0.000
8/23/2023	0.000	0.000
8/24/2023	3.896	11.958
8/25/2023	0.000	0.000
8/26/2023	0.000	0.000
8/27/2023	0.000	0.000
8/28/2023	0.000	0.000
8/29/2023	0.000	0.000
8/30/2023	0.000	0.000
8/31/2023	0.000	0.000
9/1/2023	3.865	11.863
9/2/2023	0.000	0.000
9/3/2023	0.000	0.000
9/4/2023	0.000	0.000
9/5/2023	0.000	0.000
9/6/2023	0.000	0.000
9/7/2023	0.000	0.000
9/8/2023	0.000	0.000
9/9/2023	0.000	0.000
9/10/2023	0.000	0.000
9/11/2023	0.000	0.000
9/12/2023	0.000	0.000
9/13/2023	0.000	0.000
9/14/2023	0.000	0.000
9/15/2023	0.000	0.000
9/16/2023	0.000	0.000
9/17/2023	0.000	0.000

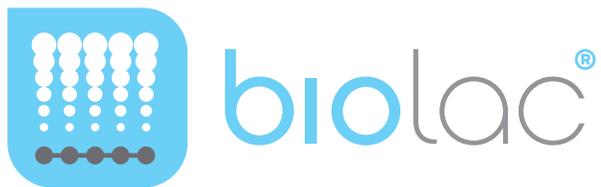
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2020 - 2021 Seasonal Irrigation Volume			2021 - 2022 Seasonal Irrigation Volume			2021 - 2022 Seasonal Irrigation Volume		
Date	<i>million gal.</i>	<i>acre-ft.</i>	Date	<i>million gal.</i>	<i>acre-ft.</i>	Date	<i>million gal.</i>	<i>acre-ft.</i>
9/18/2021	0.000	0.000	9/18/2022	0.000	0.000	9/18/2023	0.000	0.000
9/19/2021	0.000	0.000	9/19/2022	0.000	0.000	9/19/2023	0.000	0.000
9/20/2021	0.000	0.000	9/20/2022	0.000	0.000	9/20/2023	0.000	0.000
9/21/2021	0.000	0.000	9/21/2022	0.000	0.000	9/21/2023	0.000	0.000
9/22/2021	4.567	14.017	9/22/2022	0.000	0.000	9/22/2023	0.000	0.000
9/23/2021	0.730	2.241	9/23/2022	0.000	0.000	9/23/2023	0.000	0.000
9/24/2021	0.266	0.816	9/24/2022	3.700	11.356	9/24/2023	0.000	0.000
9/25/2021	0.000	0.000	9/25/2022	0.000	0.000	9/25/2023	0.000	0.000
9/26/2021	0.000	0.000	9/26/2022	6.369	19.546	9/26/2023	0.000	0.000
9/27/2021	0.000	0.000	9/27/2022	0.000	0.000	9/27/2023	0.000	0.000
9/28/2021	0.000	0.000	9/28/2022	0.000	0.000	9/28/2023	0.000	0.000
9/29/2021	0.540	1.656	9/29/2022	0.000	0.000	9/29/2023	0.000	0.000
9/30/2021	11.593	35.581	9/30/2022	1.578	4.842	9/30/2023	13.126	40.285

## **APPENDIX O**

### **LA CONTENTA WWTF VENDOR INFORMATION**

1. Parkson™ Biolac® System Brochure
2. Teledyne ISCO® DuraTracker® Portable Flowmeter and Logger Brochure



## Extended Aeration Treatment System

- Low-loaded activated sludge technology
- High oxygen transfer efficiency delivery system
- Exceptional mixing energy from controlled aeration chain movement
- Simple system construction
- Low biosolids production



# Extended sludge age biological technology

The Biolac® system is an innovative activated sludge process using extended retention of biological solids to create an extremely stable, easily operated system.

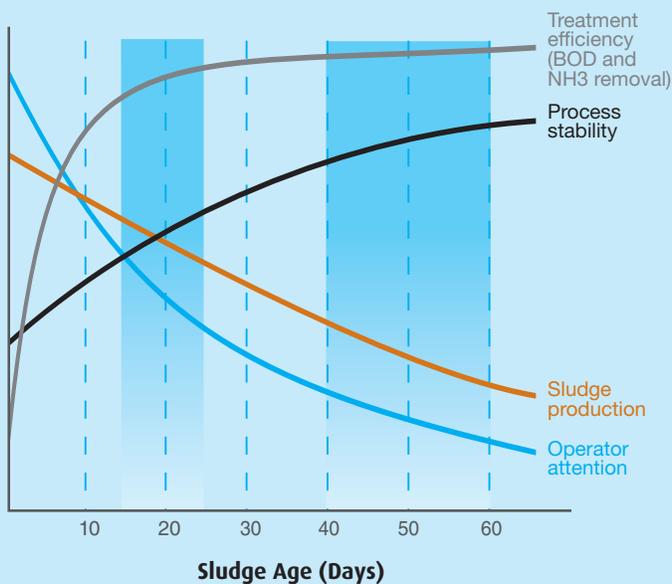
The capabilities of this unique technology far exceed ordinary extended aeration treatment. The Biolac® process maximizes the stability of the operating environment and provides high-efficiency treatment. The design ensures the lowest-cost construction and guarantees operational simplicity. Over 800 Biolac® systems are installed throughout North America treating municipal wastewater and many types of industrial wastewater.

The Biolac® system utilizes a long sludge age design. Sludge age, also known as SRT (Solids Retention Time) or MCRT (Mean Cell Residence Time), defines the operating characteristics of any aerobic biological treatment system. A longer sludge age dramatically lowers effluent BOD and ammonia levels, especially



**Conventional  
extended  
aeration, batch  
reactors and  
oxidation ditches**

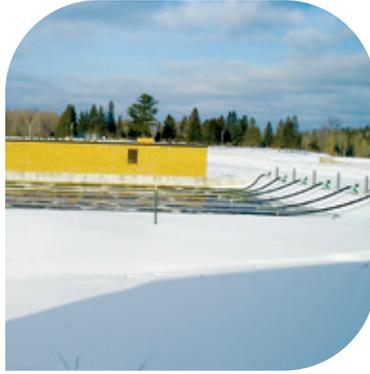
**Biolac System**



in colder climates. The Biolac® long sludge age process produces BOD levels of less than 10 mg/L and complete nitrification (less than 1 mg/L ammonia). Minor modifications to the system will extend its capabilities to denitrification and biological phosphorus removal.

While most extended aeration systems reach their maximum mixing capability at sludge ages of approximately 15-25 days, the Biolac® system efficiently and uniformly mixes the aeration volumes associated with a 30-70 day sludge age.

The large quantity of biomass treats widely fluctuating loads with very few operational changes. Extreme sludge stability allows sludge wasting to non-aerated sludge ponds or basins and long storage times.



# Aeration Components

## Simple Process Control and Operation

Parkson provides a very easy to use system to control both the process and aeration. Additional controls required for denitrification, phosphorus removal, dissolved oxygen control and SCADA communications are also easily implemented.

## Aeration System Components

The ability to mix large basin volumes using minimal energy is a critical function of the unique BioFlex® moving aeration chains and the attached BioFuser® fine bubble diffuser assemblies. The gentle, controlled, back and forth motion of the chains and diffusers distributes the oxygen transfer and mixing energy evenly throughout the basin area. No additional airflow is required to maintain mixing.

Stationary fine-bubble aeration systems require 8-10 CFM of air per 1000 cu. ft. of aeration basin volume. The Biolac® system maintains the required mixing of the activated sludge and suspension of the solids at only 4 CFM per 1000 cu.ft. of aeration basin volume. Mixing of a Biolac® basin typically requires 35-50 percent of the energy of the design oxygen requirement. Therefore, air delivery

to the basin can be reduced during periods of low loading while maintaining effective food to biomass contact and without the risk of solids settling out of the wastewater.

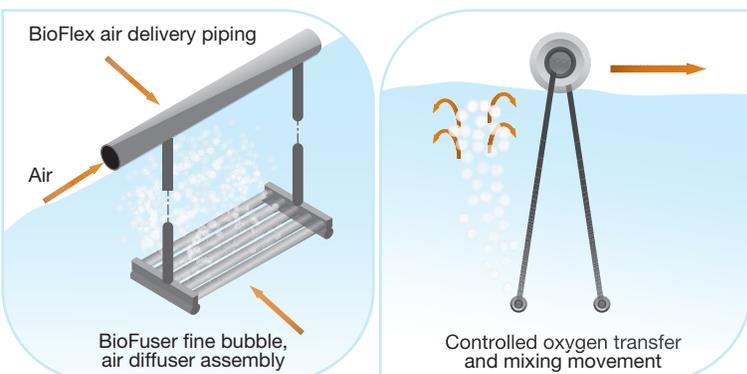
## System Construction

A major advantage of the Biolac® system is its low installed cost. Most systems require costly in-ground concrete basins for the activated sludge portion of the process. Biolac® systems can be installed in earthen basins, either lined or unlined. The BioFuser® fine bubble diffusers require no mounting to basin floors or associated anchors and leveling. The diffusers are suspended from the BioFlex® floating aeration chains; The only concrete structural work required is for the simple internal clarifier(s) and blower/control buildings.

## Biological Nutrient Removal

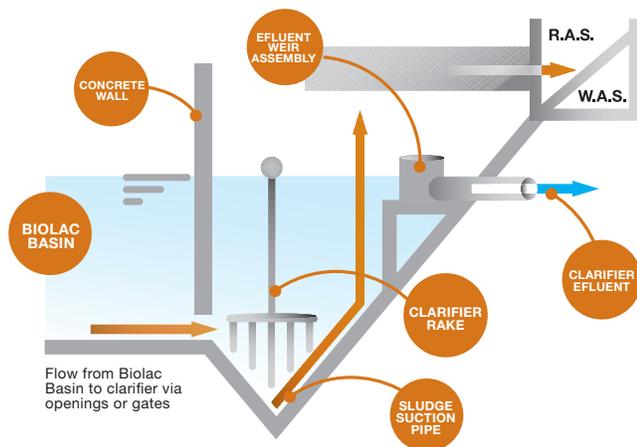
Simple control of the air distribution to the BioFlex® chains creates moving waves of oxic and anoxic zones within the basin. This repeated cycling of environments nitrifies and denitrifies the wastewater without recycle pumping of mixed liquor or additional external basins. This mode of Biolac® operation is known as the Wave Oxidation process. No additional in-basin equipment is required and simple timer-operated actuator valves regulate manipulation of the air distribution.

Biological phosphorus removal can also be accomplished by incorporating an anaerobic zone.



## Integral Clarifier

Land space and hydraulic efficiencies are maximized using the integral clarifier. The clarifier design incorporates a common wall between the clarifier and aeration basin. The inlet ports in the bottom of the wall create negligible hydraulic headloss and promote efficient solids removal by filtering the flow through the upper layer of the sludge blanket. Parkson offers multiple configurations of integral clarifiers. One of the most common integral clarifier configuration is the hopper-style bottom clarifier. The hopper-style bottom simplifies sludge concentration and removal, and minimizes clarifier HRT. The sludge return airlift pump provides important flexibility in RAS flows with no moving parts. All maintenance is performed from the surface without dewatering the clarifier.



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# Biolac<sup>®</sup> EZClear<sup>™</sup> Clarifier

## Advanced Gravity Separation

For years, a key part of the Biolac System has been the simple, common wall secondary clarifier that completes the system. Efficient liquid-solids separation is critical to maintaining high quality effluent and the Biolac<sup>®</sup> clarifier has proven to perform with excellent reliability. Many plants produce effluent TSS between 5 and 10 mg/l. Along with hundreds of successful installation over the past 25 years comes the experience and learning that leads to new innovation and development.

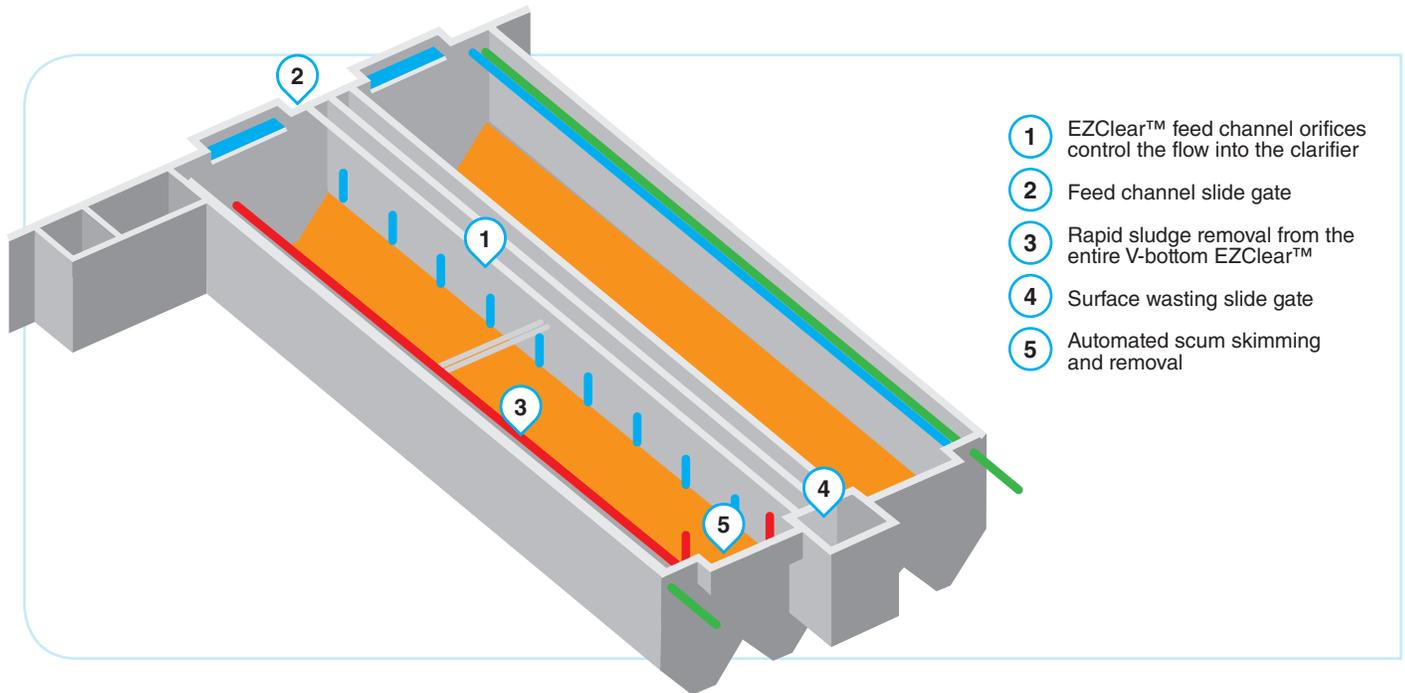
The EZClear<sup>™</sup> design builds on the successful innovation of the existing Biolac<sup>®</sup> clarifier while maintaining all the features and benefits that owners want.

- Low effluent TSS
- Rapid sludge removal
- Simple maintenance of all equipment from the surface
- Gravity RAS flow option
- Low hydraulic profile



With lengths up to 100 feet, the EZClear<sup>™</sup> almost doubles the available surface area per clarifier, expanding the range of application and further reducing operation and maintenance requirements while improving effluent quality.

# Biolac® EZClear™ Clarifier



- 1 EZClear™ feed channel orifices control the flow into the clarifier
- 2 Feed channel slide gate
- 3 Rapid sludge removal from the entire V-bottom EZClear™
- 4 Surface wasting slide gate
- 5 Automated scum skimming and removal

Features	Benefits
Effluent TSS guaranteed – as low as 10 mg/l TSS	Provides the owner with the confidence and security of a successful EZClear™ installation
Turned 90° from the original Biolac™ clarifier, the EZClear™ Clarifier is available in lengths up to 100 feet.	The surface area available per clarifier is increased by over 80%, providing higher flow capacity for lower total cost
Vertical, common wall construction with the Biolac™ treatment basin and other structures	Reduces the amount of concrete and excavation required, lowering the cost of construction. Clarifier/RAS footprint is at least 30% less than with separate circular clarifiers
Low-velocity, equally distributed crossflow design	Inlet distribution pipes ensure superior hydraulic efficiency and eliminates the density currents that destroy clarifier performance
EZClear™ feed channel orifices control the flow into the clarifier	Controlled equalization can automatically be provided in the Biolac® treatment basin, dampening short term peak clarifier loading, improving performance
Feed channel slide gate	Provides easy isolation of each EZClear™ from the Biolac® treatment basin
Rapid sludge removal from the entire EZClear™ V-bottom	Keeps sludge healthy and in the process treating wastewater – no danger of denitrification or P re-release in the sludge collection zone
Automated sludge wasting	Improves process stability and performance while reducing operator time and attention
Surface wasting slide gate	Allows for removal of poor settling floc/scum from the clarifier feed. The operator decides when and how much to waste this way
Automated scum skimming and removal	Minimizes scum flow while reducing operator time and attention
Both airlift pumps with gravity RAS flow, and mechanical pumps with pumped RAS flow are available	Design flexibility depending on plant hydraulics and operator preference



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# DuraTracker<sup>®</sup>

## Flowmeter



With the new DuraTracker flowmeter, we've built upon the market-leading 2100 portable logger by adding expanded capabilities into a proven product solution.

*Optimize flow monitoring, cost effectively.*

The DuraTracker flowmeter is the most efficient and reliable flow monitoring solution on the market today for a wide range of open channel flow measurement applications. It supports flow measurement technologies including non-contact laser area velocity, submerged Doppler area velocity, and ultrasonic. The flowmeter calculates flow using standard open channel level-to-flow and area velocity conversions, user defined equations, level to area data points, or level to flow data points.

The DuraTracker package cost-effectively integrates cellular communications and multiple flow technologies within a single module. The standard Bluetooth capabilities make the programming, sensor calibration, and data retrieval job easy through wireless devices. A field upgradable remote cell phone communication option is also available.



*For permanent applications without the battery compartment and an exposed desiccant.*

*Portable version comes with two compartments for off-the-shelf batteries and desiccant.*

## DURA TRACKER<sup>®</sup>

### Applications:

- Collection system flow monitoring
- Surface water flow monitoring
- Industrial pretreatment flow monitoring
- WWTP flow monitoring

### Standard Features:

- Rugged, submersible enclosure meets IP68 environmental specs
- Quick connect plug-and-play multiple sensors connectivity: Ultrasonic, AV, and laser
- pH and sampler interface
- Bluetooth communication interface with wireless devices
- USB interface
- MODBUS output
- Replaceable high-capacity internal desiccant cartridge and Gortex filter protect sensor air reference port from water entry and internal moisture
- Variable data-rate storage
- Compatible with off-the-shelf batteries

## DuraTracker® Flowmeter Specifications

<b>Size (H x W x D):</b>	
<b>DuraTracker:</b>	12.25 x 6.25 x 12.75 in (31.12 x 15.88 x 32.39 cm)
<b>DuraTracker w/o Battery Box:</b>	13.375 x 8.625 x 4.5 in (33.97 x 21.91 x 11.43 cm)
<b>Weight</b>	
<b>DuraTracker:</b>	14.3 lbs. (6.49 kg) without batteries
<b>DuraTracker w/o Battery Box:</b>	5.3 lbs. (2.4 kg)
<b>Materials:</b>	ABS, Delrin, Stainless Steel
<b>Enclosure:</b>	IP68
<b>Temperature Range:</b>	Operating: -40 to 140 °F (-40 to 60 °C) Storage: -40 to 140 °F (-40 to 60 °C)
<b>Power Source:</b>	2 x Alkaline Lantern Batteries
<b>(each bank)</b>	8 x Alkaline D Cell Batteries 4 x Lithium Thionyl Chloride (Low Temperature Applications)
<b>Battery Life:</b>	310 Ex Ultrasonic Sensor: 18 months <sup>a</sup>
<b>(1 battery bank)</b>	350 Ex AV Sensor: 8 months <sup>a</sup> 360 Ex LaserFlow Sensor: 9 months <sup>a</sup>
<b>Power Required</b>	
<b>DuraTracker:</b>	9–15 Vdc
<b>External Power:</b>	7–28 Vdc

## Built-in Conversions

<b>Flow Rate Conversions:</b>	Up to 2 independent level-to-area conversions and/or level-to-flow rate conversions
<b>Level-to-Area Conversions:</b>	Channel Shapes—round, U-shaped, rectangular, trapezoidal, elliptical, with silt correction; Data Points—Up to 50 level-area points
<b>Level-to-Flow Conversions:</b>	Most common weirs and flumes; Manning Formula; Data Points (up to 50 level-flow points); 2-term polynomial equation
<b>Total Flow Calculations:</b>	Up to 2 independent, net, positive or negative, based on either flow rate conversion

## Optional Interfaces

<b>pH input</b>	TIENet 301 pH Interface
<b>Sampler enabling</b>	TIENet 306 sampler interface

<sup>a</sup> Data shows 5 Parameter, 15 min data rate interval. Battery life determined by the number of devices and parameters logged. If a second bank of batteries is used, the battery life will double.

<sup>b</sup> Turbidity > 20 NTU; Distance from liquid surface to bottom of sensor < 48 inches

<sup>c</sup> Maximum non-linearity, hysteresis, and temperature error from actual liquid level

<sup>d</sup> Uniform velocity profile

## Data Handling and Communications

<b>Data Storage:</b>	Non-volatile flash; retains stored data during program updates. Capacity 8 MB (1.3 million readings or 2700 days with 5 parameters logged at 15 minute intervals, reports once per day).
<b>Data Types:</b>	Level, velocity, flow rate 1, flow rate 2, flow rate 3, flow rate 4, total flow 1, total flow 2, total flow 3, total flow 4, input voltage, temperature
<b>Storage Mode:</b>	Rollover; 5 bytes per reading Storage Interval: 15 or 30 seconds; 1, 2, 5, 15, or 30 minutes; or 1, 2, 4, 12, or 24 hours. Storage rate variable based on level, velocity, flow rate, total flow, or input voltage
<b>Communication Interface:</b>	USB, Remote Cellular, Bluetooth, MODBUS ASCII/RTU
<b>Optional Cellular Communication:</b>	LTE

## TIENet® Measurement Technologies

### TIENet 310 Ex Ultrasonic Level Sensor

<b>Level Measurement Range:</b>	0.3 to 3.3 m (1 to 11 ft)
<b>Level Accuracy:</b>	±0.006 m (0.02 ft) at ≤1 ft level change ±0.012 m (0.04 ft) at >1 ft level change

### TIENet 350 Ex Area Velocity Sensor

<b>Velocity Measurement Range:</b>	-1.5 to 6.1 m/s (-5 to 20 ft/s)
<b>Velocity Measurement:</b>	Bi-directional
<b>Velocity Accuracy:</b>	±0.03 m/s (±0.1 ft/s) from -5 to 5 ft/s <sup>d</sup> ±2% of reading from 5 to 20 ft/s <sup>c</sup>
<b>Level Measurement Range:</b>	0.01 to 3.05 m (0.033 to 10 ft)
<b>Level Accuracy:</b>	±0.10% Full Scale <sup>c</sup>

### TIENet 360 LaserFlow (including Ex) Area Velocity Sensor

<b>Flow Accuracy:</b>	±4% of reading. (Typical, under normal flow conditions)
<b>Velocity Measurement Range:</b>	-15 ft/s to 15 ft/s (-4.6 m/s to 4.6 m/s)
<b>Velocity Measurement:</b>	Bi-directional <sup>b</sup>
<b>Velocity Accuracy:</b>	±0.5% of reading ±0.03 m/s (0.1 ft/s) <sup>d</sup>
<b>Level Measurement Range:</b>	0 to 3.05 m (0 to 10 ft)
<b>Level Accuracy:</b>	±0.006 m (0.02 ft) at ≤1 ft level change ±0.012 m (0.04 ft) at >1 ft level change

## Multi-sensor Connectivity

4 TIENet devices of any combination of 350 Ex, 310 Ex, 306 or 301

1 TIENet 360/360 Ex and up to 3 other TIENet devices (350 Ex, 310 Ex, 306 or 301)

## Teledyne ISCO

P.O. Box 82531, Lincoln, Nebraska, 68501 USA  
Toll-free: (800) 228-4373 • Phone: (402) 464-0231 • Fax: (402) 465-3091

teledyneisco.com



Teledyne ISCO is continually improving its products and reserves the right to change product specifications, replacement parts, schematics, and instructions without notice.



L-2304 Rev 2.0  
5/19/2023

# AUTOMATED WATER SAMPLING

## Refrigerated Samplers



### BLZZRD™

#### Portable Peristaltic Pump Sampler

A sequential or composite refrigerated sampler featuring our legendary 6712 controller allowing you to select different programming modes to assure the most suitable routine for your application. The power-saving cooling system remains on standby until the first sample is drawn, and only then switches on to preserve the collected samples for pickup.

- 12 Vdc or 110/220 Vac power
- Indoor/outdoor use
- Optional mobility cart
- Composite and sequential sampling (14 bottles)
- Intelligent sampling with rain input, SDI-12 interface, and 700 module input for parameter monitoring and triggering



### 5800

#### Permanent Peristaltic Pump Sampler

The 5800 Refrigerated Sampler is Teledyne ISCO's answer to the rigorous demands of water monitoring. With user-friendly controls and task accommodating features, the 5800 is the only choice for stationary sampling in both municipal and industrial wastewater applications. The tough, double-wall LLDPE cabinet shrugs off exposure to weather and harsh environments.

- 110/220 Vac
- Indoor/outdoor use
- Composite and sequential sampling—wide choice for bottle configurations
- Modular design
- Slide-out bottle rack
- Certified to MCERTS



### 6712FR

#### Permanent Peristaltic Pump Sampler

A sequential or composite refrigerated sampler featuring our legendary 6712 controller allowing you to select different programming modes to assure the most suitable routine for your application. The corrosion-proof refrigerator cabinet molded from polyester resin fiberglass and supported by a stainless steel frame.

- 110/220 Vac
- Indoor/outdoor use
- Composite and sequential sampling—wide choice for bottle configurations
- Fiberglass reinforced plastic with UV-resistant gel coat
- Intelligent sampling with rain input, SDI-12 interface, and 700 module input for parameter monitoring and triggering



Teledyne ISCO samplers set the stage for being first in many categories. Our advances include the first non-contacting liquid detector, first outdoor refrigerated sampler, and first sampler with interchangeable modules for measuring flow and parameters. Through listening to our customers, continuous innovation and improvement, and emphasis on quality and reliability, Teledyne ISCO continues to lead the way with samplers for every application:

- Industrial pretreatment compliance monitoring
- Storm water runoff monitoring
- Combined Sewer Overflow monitoring
- Regulatory compliance monitoring
- Water quality research
- Specialized applications, such as hazardous locations and monitoring for radio nuclides



# AUTOMATED WATER SAMPLING

## Portable Samplers and Accessories

All Teledyne ISCO brand portable samplers are built to withstand harsh environments and for easy manhole installation and removal.

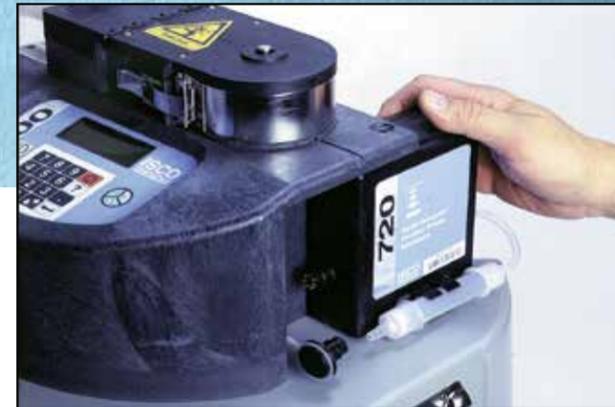
- Vacuum-formed ABS plastic shell withstands exposure and abuse.
- Twin-wall construction with foamed-in-place insulation maximizes structural integrity along with the efficiency of ice used for sample preservation.
- NEMA 4X, 6 (IP67) controller rating for submersible, watertight, dust-tight, and corrosion resistant service.



### 6712 Sequential/Composite

Intelligent sampling with integrated flow and parameter measurement capabilities.

- Rugged ABS plastic exterior with insulated center section and base for preserving samples
- Accurate, repeatable sample volumes
- High-performance peristaltic pump
- Optional Teledyne ISCO 700 series modules
- Certified to MCERTS



### 700 Series Plug-in Modules

Teledyne ISCO 700 Series modules add versatility. Monitor flow or pH with the field interchangeable modules that are environmentally sealed. Data is logged by your 6712 series sampler and can be retrieved for analysis.

#### 701 pH and Temperature Module

Accurate pH and temperature monitoring in a single module. Activate your 6712 sampler at user-selected pH or temperature ranges and save by collecting and analyzing only samples outside normal parameters.

#### 720 Submerged Probe Flow Module

A differential pressure transducer provides accurate measurement where wind, steam, foam, turbulence, or air temperature fluctuations exist—even if the probe gets covered with silt or sand.

#### 730 Bubbler Flow Module

Unaffected by changing stream conditions, the 730 delivers accurate level measurement despite temperature fluctuations and exposure to harsh chemicals.

#### 750 Area Velocity Flow Module

Get accurate measurement where weirs and flumes aren't practical—or where submerged, full-pipe, surcharged, and reverse flow conditions may occur. No need to estimate channel slope or roughness. Sensor uses patented Doppler technology to directly measure average flow velocity.

#### 780 Analog Input Module

Add intelligent interpretation of any 4–20 mA signal. Characterize analog signals as flow rate or percentage of full scale. Pace or trigger your 6712 Sampler and store data for retrieval and analysis.



### GLS Composite

Especially designed for general purpose and priority pollutant applications where a full-size sampler is too large.

- Small and lightweight
- Simplified programming for quick, easy setup
- Two keystroke program recall and one-button program start



# OPEN CHANNEL FLOW MEASUREMENT



Shown with 2191 Battery Module

## 2110 Ultrasonic Flow Module

Accurate, non-contact liquid level measurement with built-in flow conversion software.

- Measurement technology: Ultrasonic
- Microprocessor-based digital sensor
- Self-tuned power control
- Unique sensor design minimizes “deadband”
- Vertical sensor face avoids condensation problems
- Variable rate data storage



Shown with 2191 Battery Module

## 2150 Area Velocity Flow Module

Advanced area velocity technology in modular form.

- Measurement technology: Continuous Wave Doppler
- Microprocessor-based low profile sensor
- Span calibration not required
- No temperature drift
- Automatic gain control
- No “draw down” effect
- Variable rate data storage

## 2160 LaserFlow Module

2100 Series modularity with advanced non-contacting laser Doppler technology

- Rugged, submersible enclosure fulfills IP68 enclosure requirements
- The quick-connect sensor can be easily removed and interchanged in the field without requiring recalibration
- Modbus output interface



## TIENet® LaserFlow® and LaserFlow® Ex Non-Contact, Sub-Surface Sensors

Remotely measure flow in open channels with non-contact Laser Doppler Velocity technology and non-contact Ultrasonic Level technology. Compatible with DuraTracker and Signature flowmeters.

- Single or multipoint velocity measurement below the liquid’s surface
- The non-contact sensor avoids the need for unsafe and time-consuming confined space entry for preventive maintenance
- LaserFlow EX for intrinsically safe applications in Class 1, Division 1, ATEX Zone 0 areas, ATEX Category 1G
- Certified to MCERTS Class 2



MCERTS  
Sira MCI40265/03



## DuraTracker® and DuraTracker® Ex Flowmeter

The DuraTracker flowmeter is the most efficient and reliable flow monitoring solution on the market today for a wide range of open channel flow measurement applications. It supports flow measurement technologies including non-contact laser area velocity, submerged Doppler area velocity, and ultrasonic. The flowmeter calculates flow using standard open channel level-to-flow and area velocity conversions, user defined equations, level-to-area data points, or level-to-flow data points.

The DuraTracker package cost-effectively integrates cellular communications and multiple flow technologies within a single module. The standard Bluetooth capabilities make the programming, sensor calibration, and data retrieval job easy through wireless devices. A field upgradable remote cell phone communication option is also available.

The DuraTracker Ex is suitable for intrinsically safe applications in Class I, Div 1, Zone 0, ATEX Category 1G.



Above Left: DuraTracker portable with battery compartments.

Above Right: DuraTracker Ex for intrinsically safe environments.

Left: DuraTracker for permanent applications without the battery compartment and an exposed desiccant container.

## TIENet® Sensors

Teledyne ISCO Environmental Network—TIENet—devices provide seamless integration of a variety of sensors to the flowmeter of your choice. Compatible with DuraTracker and Signature flowmeters.

- TIENet input and output devices use a common, proprietary interface protocol.
- Low system integration cost with multiple measurement technologies, input/outputs, protocols and communication options.
- Configurable and upgradable without hardware or firmware changes.
- Quick set-up with an identifiable, unique address for each device.
- Easy trouble-shooting with built in device diagnostics.



Area Velocity



Ultrasonic Level

Ex MCERTS  
Sira MCI40265/03



MCERTS  
Sira MCI40265/03

# OPEN CHANNEL FLOW MEASUREMENT



## 2103LTE Cellular Modem Module

The 2103LTE modem modules enable remote two-way, dial-up communication with 2100 Series instruments via cell phone modem and your desktop computer equipped with Teledyne ISCO Flowlink software.

- Field instrument connectivity via internet
- Gather data with cell phone speed and convenience
- LTE cellular communication



## 2105LTE Interface Module

An advanced interface and communication device.

The 2105LTE integrates multiple field instruments and provides a common platform for logging and remote communication. Teledyne ISCO 2100 Series flow modules, pulse Doppler flowmeters, and rain gauges are directly compatible. It can also interface with non-Teledyne ISCO instruments that have SDI-12 or Modbus output. Additional inputs (4–20 mA) are possible using readily available aftermarket converters.

The 2105 will monitor recorded data and take intelligent action, such as sampler enabling and multiple alarm generation based on user-defined conditions. Features include a built-in cell phone modem and remote or online data access.

LTE cellular communication options are available.

## ICell—Hassle-free, Budget-friendly Cellular Service

When you need a flowmeter or automated sampler that's durable and adaptable, yet hi-tech and precise, you turn to Teledyne ISCO. Now, when you need cellular service for two-way communication with those units, you can turn to us, too. Introducing ICell. Dedicated cellular service for ISCO products with set-up, account management and customer service—all from Teledyne ISCO. Just email or call the same number you do for all your flowmeter and sampler needs.

We're your one-stop-shop for all your ISCO-related cellular communications, taking the confusion out of finding the right cellular service at the right price.

- Trouble-free, communication from modem modules used in Teledyne ISCO flowmeters and samplers.
- Quick and easy connection with LTE speeds.
- Cost-savings with our volume-discount purchasing power.
- Backed by 70 years of industry experience.

We'll walk you through the process to get you running out of the gate. Think about it: cellular service will be one less thing to think about.



## Signature® Flowmeter

Highly flexible monitoring platform, adapting right along with your current needs and any future changes in your monitoring requirements.

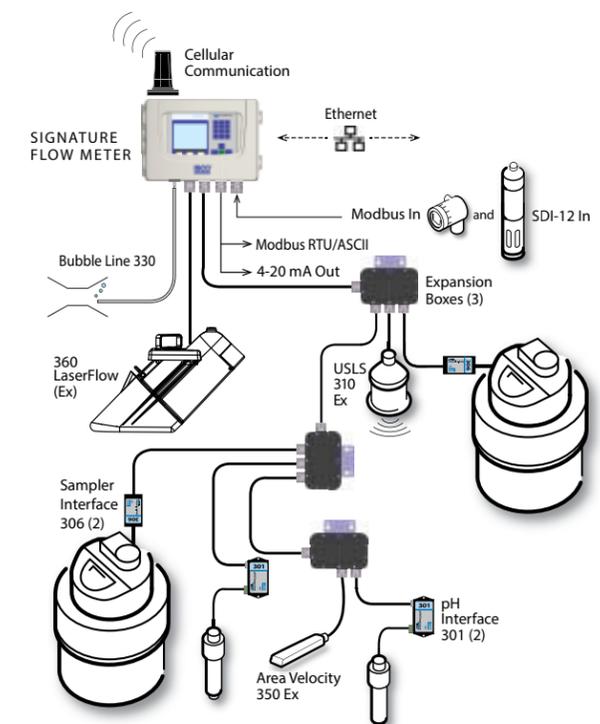
- Cost-effective and easy installation with simple programming and interchangeable sensors
- Integration with multiple input, output and communications options
- Provides a common data recording, reporting and communication platform for multiple parameters
- Easy data retrieval options
- Certified to MCERTS



Photo credit: John Morris Group

## Simplified Plant Integration

Acting as a system hub, the Signature records and transmits data, generates reports, and takes intelligent action in response to multiple simultaneous inputs, communicating with SCADA systems using RS-485 Modbus ASCII or RTU, or optional 4–20 mA analog. With a diverse array of possible inputs and an industry-standard output, the Signature is a one-stop access point for process monitoring and control.





## Flowlink CIPHER

Flowlink CIPHER represents the latest advancement in Teledyne ISCO's Flowlink series of data management solutions. Now an advanced cloud-based solution, Flowlink CIPHER allows site managers to view and manage all data at multiple sites through an easy-to-use and powerful browser-based user interface. Centralized, secure, cloud-based access to device status, site status, and flow data occurs through desktops, laptops and tablet mobile devices with no need for client software or mobile app. With AWS hosting security, there is no better protection from service interruptions or data loss. Advanced user administration provides five levels of access with user profiles including View Only, Editor, Analyst, Site Manager, and Administrator.

Flowlink CIPHER is built for speed and accuracy. Adding sites, devices and desired data sets is fast and easy, as is graph creation using drag-and-drop tools to bring data directly into graphical format. A broad range of controls for graph design and built-in mathematical calculations allows site managers to develop state-of-the-art data analysis with insightful views and reporting, without the need for expensive analysts or time-consuming data export and data manipulation procedures.

### Flowlink and Flowlink LE

Analyze data, conduct advanced studies, and generate sophisticated reports.

Set up and retrieve data from these Teledyne ISCO instruments:

- 2100 Series Flow Modules
- Signature Flowmeter
- 4200 Series Flowmeters
- ADFM Pro20 & accQmin Flow Loggers
- 6712 samplers and BLZZRD, with 700 Series Modules
- 676 rain gauge logger

### Flowlink Pro

A server/client package for municipalities and service providers.

Facilitates management of multi-site wastewater and flow measurement networks.



### 674 Rain Gauge

The Teledyne ISCO 674 rain gauge connects directly to 6712 Series samplers and 4200 flowmeters to log rainfall along with sampler and flow data. Our 676 Logging System records rainfall at sites where no sampler or flowmeter is deployed.

- Tipping bucket mechanism with jeweled pivot for maximum accuracy



### Power Products

Rugged, reliable batteries and chargers for environmental monitoring applications.

### Street Level Tools

Minimize or eliminate manhole entry.

Versatile accessories that allow a single worker to quickly and safely insert and remove a variety of sensors in manholes as deep as 5 meters.



### IRent—Equipment Rental Program

Introducing IRent, the way to obtain Teledyne ISCO water and wastewater flow measurement and sampling products on a temporary basis. Want to take something for a test spin? Looking to suit a specific project within a limited timeframe? Just need additional equipment for that one big job? IRent is what you're after.

IRent is the practical, cost-effective alternative to purchasing equipment you can't use full time. You get only the specific hardware you need for the job at hand. Since IRent originates directly from our factory, you receive the best rates available, along with fast, personalized service. Our large factory inventory assures timely delivery of first-rate equipment containing the latest upgrades.

#### Common jobs suited to renting over buying include

- Needs that can't wait for your company's formal purchasing process (Teledyne ISCO delivers on short-term notice, typically shipping within 24-48 hours)
- Wastewater Based Surveillance (WBS)
- Large flow studies
- Storm water monitoring
- Short-term, one-time studies
- Supplementing existing equipment





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## Northern California, Nevada

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# **APPENDIX P**

**PARKSON™ BIOLAC® BASIN AND  
INTERGAL CLARIFIER VENDOR CALCULATIONS**



biolac®

La Contenta, CA  
Preliminary Design Proposal  
February 1, 2024



Preliminary Design Proposal



<b>To:</b>	<b>Bob Godwin, P.E.</b>	<b>Date:</b>	<b>2/1/2024</b>
<b>Company:</b>	<b>Calaveras County Water District</b>	<b>From:</b>	<b>Robert Rolette</b>
<b>Tel.:</b>		<b>Tel.:</b>	<b>913-745-1234</b>
<b>cc:</b>	<b>Marty Unger, Brad Linsey, Kevin Bunting - Parkson Ross Tate, Brad Leidecker, Brian Villacorta (Coombs-Hopkins)</b>		
<b>Subject:</b>	<b>Parkson Biolac® Treatment System, Preliminary Design Proposal for La Contenta, CA - Upgrade</b>		

Thank you for your interest in Parkson's Biolac® Treatment System. Based upon the data provided for this project, we developed the Biolac® design described in this proposal. We believe that this Biolac® design not only meets effluent quality requirements, but also provides the most cost effective solution for this municipality.

We look forward to working with you on this project. Should you have any questions or need clarifications, please do not hesitate to contact me at (913) 745-1234. Thanks.

Sincerely,

PARKSON CORPORATION

An Axel Johnson, Inc. Company

Robert Rolette  
Application Engineer  
rrolette@parkson.com



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## 1. Design Basis

### 1.1. Influent and Effluent Specifications

The proposed system design is based on wastewater influent with the following characteristics:

**Table 1.1 – Design Influent flow requirements**

PARAMETER	UNITS	AVERAGE
Start-Up Flow	MGD	0.24
Flow to be split between two (2) identical basins		<b>Phase 1</b>
Max Month Flow– Design Flow	MGD	0.45
Max Day Flow	MGD	1.25
Peak Flow	MGD	1.80

*Note: Customer must confirm these final design flows to assure accuracy of the hydraulic calculations.*

**Table 1.2 - Influent Water Quality**

PARAMETER	UNITS	AVERAGE
Design Temperature	Deg C	20
Minimum Temperature	Deg C	10
		<b>Phase 1</b>
BOD <sub>5</sub>	mg/L	200
Total Suspended Solids	mg/L	200
TKN	mg/L	50
NH <sub>3</sub> -N	mg/L	35
Total Phosphorous (TP)	mg/L	6
pH	-	6 to 9
Alkalinity	mg/L as CaCO <sub>3</sub>	500

*Note: Customer must confirm Influent loading conditions for any associated process warranty.*

In order to offer this proposal, Parkson Corporation must make the following assumptions. Deviations from these assumptions should be brought to the attention of the designer of this system as modifications maybe required:



Preliminary Design Proposal



- a. The wastewater will be pretreated to remove debris and grit using a fine influent screen.
- b. Sufficient alkalinity is present or will be added to allow nitrification to proceed uninhibited.
- c. The incoming oil, grease, chemical and metals concentrations are within biologically treatable levels.
- d. Sufficient nutrients (P, N, etc.) are present in the influent for biomass growth or will be added by the plant operating staff.
- e. A qualified operator will supervise plant activities and performance.

Based on the specified influent water quality, Parkson anticipates that the proposed Biolac® system will provide the following effluent quality:

**Table 1.3 - Effluent Water Quality**

PARAMETER	UNITS	QUALITY
<b>BOD<sub>5</sub></b>	mg/L	10
<b>Total Suspended Solids</b>	mg/L	15
<b>NH<sub>3</sub>-N</b>	mg/L	1
<b>Total Nitrogen (TN)</b>	Mg/L	10

**1.2. Selected Design Parameters**

Based on the design loading information described above, the proposed Biolac® System will be derived as follows:

<b>F/M Ratio</b>	<b>0.03</b>	<b>MLSS</b>	<b>3000 mg/l</b>
<b>SRT</b>	<b>50-70 days</b>	<b>Plant Elevation (above sea level)</b>	<b>750 ft</b>



## 2. System Description

The Biolac® Biological Nutrient Removal System is an innovative complete mix activated sludge process using extended retention of biological solids to create an extremely stable and easily operated system. The Biolac® process can be applied to a wide range of wastewater treatment applications, whether for municipal application or industrial application. Biolac® has over 800 installations in North American and over 1000 installations globally.

Some of the advantages of the Biolac® BNR process include:

- a. Economical construction: Most Biolac® systems are installed in earthen basins which reduces construction cost tremendously by eliminating the need for sophisticated concrete structures and complex piping systems for recycling.
- b. Biolac® BNR systems are typically designed with a sludge age greater than 30 days. The extended sludge age provides stable operation, low sludge production, low production of well stabilized biosolids, and high effluent quality.
- c. Economical process in terms of operation and maintenance cost.
- d. Comprehensive electrical control system to optimize air delivery and provide peace of mind to plant operator.
- e. Utilization of fine bubble aeration using extremely high mixing efficiency of 4 CFM per 1000 ft<sup>3</sup> which is over 50% improvement in comparison to the mixing efficiency achieved by stationary fine bubble diffusers.
- f. Ease of aeration expansion capability simply by adding additional Biofuser® tubes to modules.
- g. Biological nutrient removal is implemented using the Wave-Ox™ design by Parkson's process experts. The Wave-Ox™ process is designed to achieve sequential nitrification / denitrification which results in oxygen and alkalinity recovery and translates into an energy efficient and stable operation.
- h. Integral clarifier design using common walls with the Biolac® basin, designed to make the most efficient use of the available footprint.



- i. Elimination of the need to drain the aeration basin(s) with the Biolac® system since all components can be cleaned and maintained from the surface.

The Biolac® process is characterized by excellent BOD removal, complete nitrification, enhanced denitrification, and biosolids stabilization. It uses fine bubble membrane diffusers attached to floating aeration chains, which are moved across the basin propelled by the air release from the diffusers. The moving aeration chains equipped with the Biofuser® diffuser assemblies provide efficient mixing of the basin contents as well as high oxygen transfer at low energy usage.

The Biofuser® system does not have submerged aeration piping or any other components to be installed, leveled, or secured on the basin floor. The BioFlex® chains with BioFusers do not contact or harm the basin liner. Each BioFlex® chain can be individually controlled by independent air valve providing excellent flexibility in fine-tuning the system to meet the oxygen demand. The individual control capability of the BioFlex chains is used to create alternating oxic and anoxic zones (Wave-Ox™) to allow denitrification in a single basin without internal mixed liquor recycle or complex controls. The moving aeration chain design is not mixing limited so the horsepower required for mixing is typically half of that required for aeration. A turndown capability of 50-70% during low loaded periods is typical without sacrificing mixing due to the movement of the BioFlex aeration chains. Inspection and service of the BioFusers is done quickly and easily without dewatering the basin, keeping maintenance costs low and eliminating the need for redundant aeration basins. In case of cold climates, the fine bubble diffusion beneath the water surface eliminates icing and minimizes wastewater cooling.

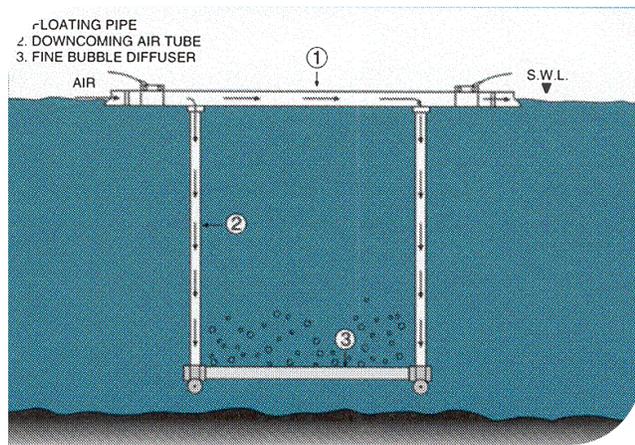
Earthen basins can be used rather than expensive concrete tanks making this extended aeration/activated sludge design the lowest cost alternative available on the market. Integral clarifier(s) are installed using common-wall construction with the extended aeration basin to settle and recycle the stable extended aeration solids.

### 3. System Components

The Biolac® aeration system consists mainly of suspended aeration chains, fine bubble diffusers, motorized and controlled air valves, clarification equipment, blowers and automatic electrical control system.

#### 3.1. Moving Aeration Chain System

The moving aeration chain suspends fine bubble diffusers near the bottom of the basin. The aeration system is designed so that there are no points of attachment to the bottom of the basin. The aeration system is completely suspended above the basin bottom and is not supported or rested on the bottom. This arrangement allows for ease of access for service and maintenance without dewatering the basin or having a complete aeration system shut down.



The aeration chain system is designed to be self-propelled and to move back and forth systematically in the wastewater to provide high mixing efficiency of the basin's content. This capability is critical to allow turndown flexibility in the aeration system while maintaining a completely mixed environment.

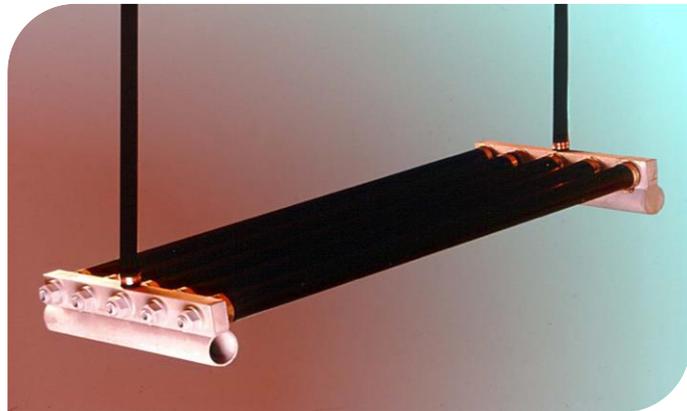


Air is delivered to each aeration chain from one side and connects to the air main through individual branches with butterfly valves. The butterfly valve provides individual control or isolation of the airflow to each chain.

The moving aeration chain is constructed of a single continuous polyethylene header. The moving aeration chain is connected to the Biofuser® by EPDM hose.

### 3.2. Diffuser Frame

The diffuser frame is formed from an extruded polypropylene compound with sufficient strength to prevent warping or deflection. The end connections of each frame shall be sealed using mechanical welding procedures providing a connection stronger than the unwelded tube.



The suspended air diffuser assembly consists of a fully functioning unit capable of housing up to five (5) diffuser tubes total.

### 3.3. System Integral Clarifier

The existing Biolac® system includes an integral clarifier. The integral clarifier is located downstream of the Biolac® system. The clarifier is typically designed using conventional solids and hydraulic loading rates.

Each clarifier has a flocculating rake mechanism which consists of a drive assembly and non-drive / pulley assembly.

The sludge removal system includes an airlift pump and a sludge suction pipe and the Return Sludge will flow by gravity upstream of the Biolac® basin. The sludge suction piping for removing the settled solids from the clarifier is located along the length of



the clarifier hopper bottom. Holes are placed along the length of the suction pipe for uniform removal of the sludge.

Each integral clarifier includes a fixed overflow weir to control the liquid level in the clarifier and Biolac® basin as well as control the flow to the effluent pipe.

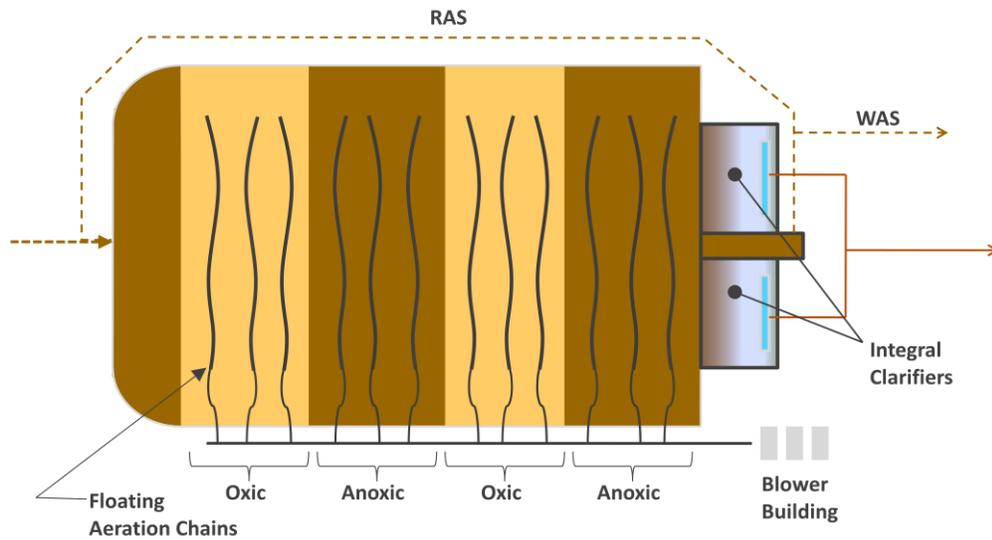
A scum baffle is included in the integral clarifier as well to prevent floating objects from passing over the overflow weir.

### 3.4. Aeration Design

- a. The estimated air and energy requirements and the number of BioFlex© moving aeration headers and Biofuser® units estimated are given in Table 1. A typical BioFlex aeration header and Biofuser® assembly is shown in Drawing SD-**Error! Reference source not found.** and SD-37.
- b. The required air for Biolac® basin will be supplied by two (2), 25 Hp (Phase 1). One (1) additional blower is provided as an installed spare. Less than one (1) blower is necessary for mixing. Therefore, it is possible to operate one blower and cut energy usage substantially during periods of low load, such as nighttime operation. The blowers are expected to be located on a concrete pad next to the aeration basins or in a blower building as dictated by local requirements.

## 4. Wave-Ox™ Biological Nutrient Removal

Biological Nutrient Removal (BNR) is simplified and affordable with the Biolac® Wave Ox™ process. Simple control of the air flow distribution to the Biolac's moving aeration chains varies the basin dissolved oxygen content by creating a unique moving wave of multiple oxic and anoxic zones. This repeated cycling of environments nitrifies and denitrifies the wastewater without recycle pumping or additional external basins.



Biological phosphorus removal can also be accomplished by incorporating an upstream anaerobic zone.

The Biolac Wave-Ox™ process not only produces BNR effluent quality with low effluent total nitrogen and total phosphorus, but also includes main features such as

- Single basin BNR process resulting in major construction costs savings by eliminating the need for baffle walls to create independent zones.
- Reduced energy consumption by eliminating the need for internal recycle pumps and mixers for anoxic zones



## 5. Biolac® Treatment System Preliminary Design Information

<b>Biolac Extended Aeration Basin</b>	
<b>Number of Biolac® Basin(s)</b>	1
<b>Approximate Dimensions at Grade (ft)</b>	105 x 91
<b>Approximate Bottom Dimensions (ft)</b>	85 x 52
<b>Side Slope</b>	1.5:1
<b>Side Water Depth (ft)</b>	10
<b>Basin Volume (MG)</b>	0.46
<b>Clarifier Design Hydraulic Loading Rate (gpd/ft²)</b>	220
<b>Integral Clarifier Size (ft)</b>	45 x 23 ea.
<b>Number of Clarifiers per basin</b>	1
<b>Estimated SOR (lbs/hr)</b>	
<b>Oxidation-only</b>	84
<b>Wave Oxidation (including denite credit)</b>	55
<b>Estimated SCFM (excluding airlift requirements)</b>	
<b>Oxidation-only</b>	486
<b>Wave Oxidation (including denite credit)</b>	324
<b>Estimated Brake HP (excluding airlift requirements)</b>	
<b>Oxidation-only</b>	16.7
<b>Wave Oxidation (including denite credit)</b>	11
<b># Diffusers</b>	105
<b># Biofuser® Assemblies</b>	35
<b># BioFlex® Headers</b>	7

## 6. Equipment and Services Supplied

Parkson will supply the following equipment and services for the Biolac® treatment system described above:



### **Existing Clarifier Internals (Basin 1)**

- One (1) new design rake assembly with single side skimming feature, for existing integral clarifier equipment including flocculating mechanism for single side skimming, rake drive with cable and limit switches.
- Final installation inspection, start-up supervision and operator training.
- Existing biosolids removal piping, sludge suction pipe, effluent overflow weir, scum pumps, scum weir and clarifier controls (in existing Biolac panel) are EXCLUDED and will be reused.

### **Buildout (ONLY NEW BASIN)**

- Complete BioFlex<sup>®</sup> moving chains for only the new basin, with BioFuser<sup>®</sup> aeration units including, reinforced hi-temperature connecting hose, HDPE piping, restraining cable system and required hardware.
- Electric motor actuated butterfly valves for individual control of each BioFlex aeration chain. valves for individual control of each BioFlex aeration chain.
- Qty two (2) complete, 25 Hp, blower assemblies (Centrifugal blowers) including motor and required backflow prevention valves, pressure gauges and accessories (includes one installed spare blower for redundancy). Blower proposed are only for the new basin.
- One (1) EZClear clarifier equipment for the new basin, including biosolids removal piping, sludge suction pipe, flocculating mechanism with single side skimming features, scum removal pipe and overflow weir. Internal components for existing clarifier for basin #1 are EXCLUDED and will be reused.
- One (1) dissolved oxygen probes and analyzers.
- PLC based remote-mounted control system with HMI for operation of the Biolac<sup>®</sup> Wave-Ox<sup>™</sup> System and clarifiers for both basins, including control enclosure, VFDs, relays and control switches for all motors, and components in the system.
- Final installation inspection, start-up supervision and operator training.



## 7. Cost Estimate and Term

- a. The budget price for the equipment and services supplied is
  - Existing Clarifier Rake Assembly – new design (Basin 1 only).....\$
  - New Basin Equipment .....\$

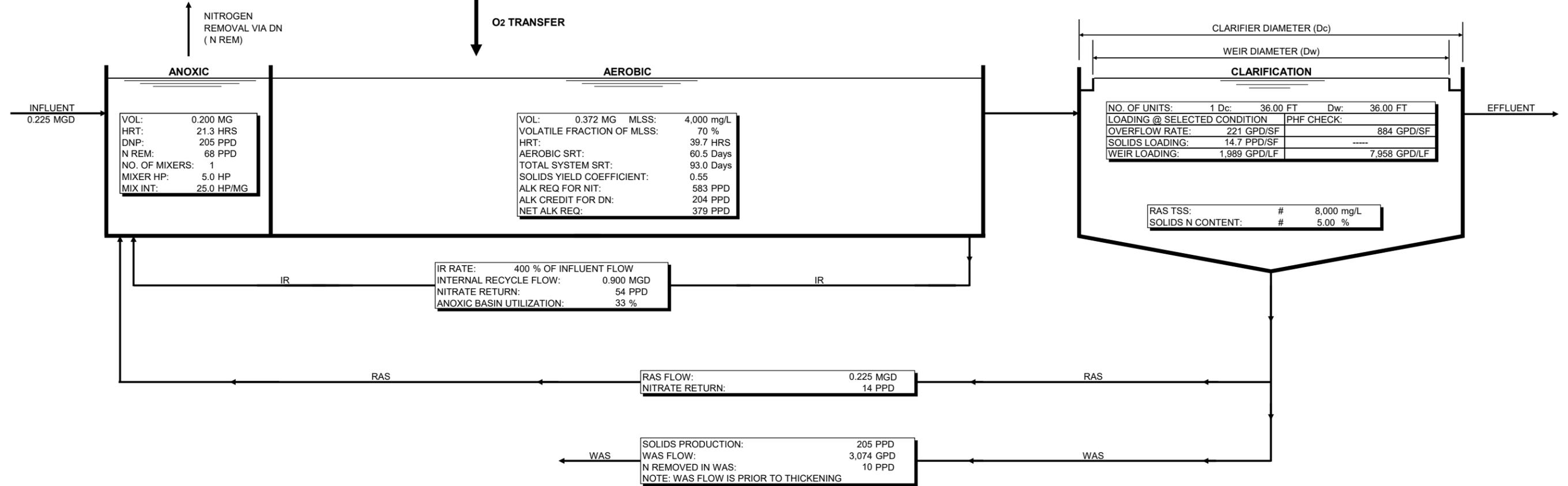
FOB Factory, Freight Allowed.
- b. Terms are 90% net 30, 10% upon startup.
- c. Approval drawings-typically 8-12 weeks after receipt of written order.
- d. Equipment Shipment - typically 16-20 weeks after complete release for manufacture.

# **APPENDIX Q**

## **GENERAL WWTF ACTIVATED SLUDGE AND CLARIFIER PROCESS CALCULATIONS**

FLOW CHARACTERISTICS		INFLUENT CHARACTERISTICS		CONDITION	TEMPERATURE	EFFLUENT QUALITY	
AVERAGE DAILY FLOW:	0.225 MGD	CBOD <sub>5</sub> :	200 mg/L	<input type="checkbox"/> ADF	<input type="checkbox"/> 10 DEG. C	SOL CBOD <sub>5</sub> :	1.6 mg/L
MMF PEAKING FACTOR:	1.50	TSS:	200 mg/L	<input type="checkbox"/> MMF	<input type="checkbox"/> 20 DEG. C	REFRACT ORG N:	1.0 mg/L
MDF PEAKING FACTOR:	2.50	TKN:	50 mg/L	<input type="checkbox"/> MDF	<input type="checkbox"/> 30 DEG. C	AMMONIA, AS N:	0.0 mg/L
PHF FACTOR:	4.00	REFRACT ORG N:	1.0 mg/L			NITRATE, AS N:	7.3 mg/L
		TP:	8 mg/L			TN:	8.3 mg/L
						TP:	6.7 mg/L

OXYGEN REQUIREMENTS		OPERATING DO		DIFFUSED AERATION	
O <sub>2</sub> REQ FOR CBOD <sub>5</sub> REM:	560 PPD	@ ADF:	1.75 mg/L	ALPHA:	0.65
O <sub>2</sub> REQ FOR NIT:	376 PPD	@ MMF:	1.25 mg/L	BETA:	0.98
DENIT CREDIT:	195 PPD	@ MDF:	1.00 mg/L	SOTE:	20.00 %
NET O <sub>2</sub> REQ:	741 PPD			EFF SAT D:	5.00 FT
MECH AER	<input type="checkbox"/>	DIFF AER	<input checked="" type="checkbox"/>	REQ AIR FLOW:	279 SCFM



ABBREVIATIONS			
ADF	AVERAGE DAILY FLOW	ALK	ALKALINITY AS CALCIUM CARBONATE
MMF	MAXIMUM MONTHLY FLOW	MLSS	MIXED LIQUOR SUSPENDED SOLIDS
MDF	MAXIMUM DAILY FLOW	N	NITROGEN
PHF	PEAK HOURLY FLOW	NIT	NITRIFICATION
MGD	MILLION GALLONS PER DAY	DN	DENITRIFICATION
GPD	GALLONS PER DAY	DNP	DENITRIFICATION POTENTIAL
PPD	POUNDS PER DAY	HRT	HYDRAULIC RETENTION TIME
DEG C	DEGREES CENTIGRADE	SRT	SOLIDS RETENTION TIME
CBOD <sub>5</sub>	5-DAY CARBONACEOUS BIOCHEMICAL OXYGEN DEMAND	HRS	HOURS
TSS	TOTAL SUSPENDED SOLIDS	RAS	RETURN ACTIVATED SLUDGE
TKN	TOTAL KJELDAHL NITROGEN, AS N	WAS	WASTE ACTIVATED SLUDGE
REFRACT ORG N	REFRACTORY ORGANIC NITROGEN, AS N	IR	INTERNAL RECYCLE
TP	TOTAL PHOSPHORUS	NO.	NUMBER
COD	CHEMICAL OXYGEN DEMAND	MIX INT	MIXING INTENSITY
mg/L	MILLIGRAMS PER LITER	ATM P	ATMOSPHERIC PRESSURE
SOL	SOLUBLE	RH	RELATIVE HUMIDITY
VOL	VOLUME	DIFF AER	DIFFUSED AERATION
MG	MILLION GALLONS	MECH AER	MECHANICAL AERATION
REQ	REQUIRED	SOR	STANDARD OXYGENATION RATE
LF	LINEAL FOOT	SOTE	STANDARD OXYGEN TRANSFER EFFICIENCY
SF	SQUARE FOOT	EFF SAT D	EFFECTIVE SATURATION DEPTH
O <sub>2</sub>	OXYGEN	HP	HORSEPOWER
DO	DISSOLVED OXYGEN	SCFM	STANDARD CUBIC FEET PER MINUTE

## LA CONTENTA WASTEWATER TREATMENT FACILITY

### PROCESS ANALYSIS AND EXPECTED PERFORMANCE FOR PROJECTED FLOWS AND LOADING

PROJECT: 15097

DATE: FEBRUARY 8, 2024

PREPARED BY: ROG

**LA CONTENTA WASTEWATER TREATMENT FACILITY PROCESS  
ANALYSIS AND EXPECTED PERFORMANCE FOR PROJECTED  
FLOWS AND LOADING**

Parameter	Unit	Wastewater Temp. = 20 Deg. C			
		ADF	MMF	MDF	PHF
<b>Flows &amp; Influent Characteristics</b>					
Flow	MGD	0.225	0.338	0.563	0.900
Influent CBOD5 Concentration	mg/L	200	200	200	---
Influent TSS Concentration	mg/L	200	200	200	---
Influent TKN Concentration	mg/L	50	50	50	---
Influent TP Concentration	mg/L	8	8	8	---
<b>Process Input Parameters</b>					
Anoxic Volume	MG	0.200	0.200	0.200	---
Aerobic Volume	MG	0.372	0.372	0.372	---
MLSS	mg/L	4,000	4,000	4,000	---
Volatile Fraction Of MLSS	Percent	70	70	70	---
RAS TSS Concentration	mg/L	8,000	8,000	8,000	---
Internal Recycle Flow As Percent Of Influent Flow	Percent	400	400	400	---
Internal Recycle Flow	MGD	0.900	1.350	2.250	---
Refractory Organic Nitrogen Concentration	mg/L	1.0	1.0	1.0	---
Nitrogen Content Of WAS Solids	Percent	5.00	5.00	5.00	---
<b>HRT, SRT, Yield, Effluent CBOD5, &amp; Effluent Ammonia</b>					
RAS Flow Rate	MGD	0.225	0.338	0.563	---
Anoxic HRT	Hours	21.3	14.2	8.5	---
Aerobic HRT	Hours	39.7	26.5	15.9	---
Total HRT	Hours	61.0	40.7	24.4	---
Aerobic SRT	Days	60.5	36.3	18.7	---
Total System SRT	Days	93.0	55.8	28.8	---
Yield Coefficient	Lb./Lb.	0.55	0.61	0.71	---
Solids Production	PPD	205	342	662	---
WAS Flow	GPD	3,074	5,123	9,923	---
Effluent Soluble CBOD5 Concentration	mg/L	1.6	1.8	2.4	---
Effluent Ammonia Concentration	mg/L	0.0	0.0	0.1	---
<b>Nitrification Analysis</b>					
Influent TKN	PPD	94	141	235	---
Less Nitrogen Required For Cell Synthesis	PPD	10	17	33	---
Less Effluent Ammonia	PPD	0	0	0	---
Less Refractory Organic Nitrogen	PPD	2	3	5	---
TKN To Be Nitrified	PPD	82	121	196	---
<b>Denitrification Potential &amp; Nitrate Removal @ Specified IR Flow</b>					
Anoxic Stage Denitrification Potential	PPD	205	210	222	---
Anoxic Stage Nitrate Removal	PPD	68	101	164	---
<b>Clarifier Loadings</b>					
Number Of Units	Each	1	1	1	1
Clarifier Diameter	Feet	36.00	36.00	36.00	36.00
Surface Area	SF	1,018	1,018	1,018	1,018
Weir Diameter	Feet	36.00	36.00	36.00	36.00
Weir Length	Feet	113	113	113	113
RAS Flow	MGD	0.225	0.338	0.563	---
Overflow Rate	GPD/SF	221	332	553	884
Weir Loading	GPD/LF	1,989	2,984	4,974	7,958
Solids Loading	PPD/SF	14.7	22.1	36.9	---

**LA CONTENTA WASTEWATER TREATMENT FACILITY PROCESS  
ANALYSIS AND EXPECTED PERFORMANCE FOR PROJECTED  
FLOWS AND LOADING**

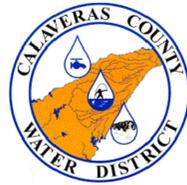
Parameter	Unit	Wastewater Temp. = 20 Deg. C			
		ADF	MMF	MDF	PHF
<b>Flows &amp; Influent Characteristics</b>					
Flow	MGD	0.225	0.338	0.563	0.900
Influent CBOD5 Concentration	mg/L	200	200	200	---
Influent TSS Concentration	mg/L	200	200	200	---
Influent TKN Concentration	mg/L	50	50	50	---
Influent TP Concentration	mg/L	8	8	8	---
<b>Process Input Parameters</b>					
Anoxic Volume	MG	0.200	0.200	0.200	---
Aerobic Volume	MG	0.372	0.372	0.372	---
MLSS	mg/L	4,000	4,000	4,000	---
Volatile Fraction Of MLSS	Percent	70	70	70	---
RAS TSS Concentration	mg/L	8,000	8,000	8,000	---
Internal Recycle Flow As Percent Of Influent Flow	Percent	400	400	400	---
Internal Recycle Flow	MGD	0.900	1.350	2.250	---
Refractory Organic Nitrogen Concentration	mg/L	1.0	1.0	1.0	---
Nitrogen Content Of WAS Solids	Percent	5.00	5.00	5.00	---
<b>HRT, SRT, Yield, Effluent CBOD5, &amp; Effluent Ammonia</b>					
RAS Flow Rate	MGD	0.225	0.338	0.563	---
Anoxic HRT	Hours	21.3	14.2	8.5	---
Aerobic HRT	Hours	39.7	26.5	15.9	---
Total HRT	Hours	61.0	40.7	24.4	---
Aerobic SRT	Days	60.5	36.3	18.7	---
Total System SRT	Days	93.0	55.8	28.8	---
Yield Coefficient	Lb./Lb.	0.55	0.61	0.71	---
Solids Production	PPD	205	342	662	---
WAS Flow	GPD	3,074	5,123	9,923	---
Effluent Soluble CBOD5 Concentration	mg/L	1.6	1.8	2.4	---
Effluent Ammonia Concentration	mg/L	0.0	0.0	0.1	---
<b>Nitrification Analysis</b>					
Influent TKN	PPD	94	141	235	---
Less Nitrogen Required For Cell Synthesis	PPD	10	17	33	---
Less Effluent Ammonia	PPD	0	0	0	---
Less Refractory Organic Nitrogen	PPD	2	3	5	---
TKN To Be Nitrified	PPD	82	121	196	---
<b>Denitrification Potential &amp; Nitrate Removal @ Specified IR Flow</b>					
Anoxic Stage Denitrification Potential	PPD	205	210	222	---
Anoxic Stage Nitrate Removal	PPD	68	101	164	---
<b>Clarifier Loadings</b>					
Number Of Units	Each	1	1	1	1
Clarifier Diameter	Feet	36.00	36.00	36.00	36.00
Surface Area	SF	1,018	1,018	1,018	1,018
Weir Diameter	Feet	36.00	36.00	36.00	36.00
Weir Length	Feet	113	113	113	113
RAS Flow	MGD	0.225	0.338	0.563	---
Overflow Rate	GPD/SF	221	332	553	884
Weir Loading	GPD/LF	1,989	2,984	4,974	7,958
Solids Loading	PPD/SF	14.7	22.1	36.9	---

**LA CONTENTA WASTEWATER TREATMENT FACILITY  
PROCESS ANALYSIS AND EXPECTED PERFORMANCE  
FOR PROJECTED FLOWS AND LOADING**

Parameter	Unit	Wastewater Temp. = 20 Deg. C			
		ADF	MMF	MDF	PHF
<b>Anoxic Basin Mixing Analysis</b>					
Number Of Anoxic Mixers	Each	1	1	1	---
Anoxic Mixer Horsepower, Each	HP	5.0	5.0	5.0	---
Anoxic Basin Mixing Intensity	HP/MG	25.0	25.0	25.0	---
<b>Alkalinity Balance</b>					
Alkalinity Coefficient For Nitrification	Lb./Lb.	7.14	7.14	7.14	---
Alkalinity Coefficient For Denitrification	Lb./Lb.	3.00	3.00	3.00	---
Alkalinity Required For Nitrification	PPD	583	862	1,402	---
Alkalinity Credit For Denitrification	PPD	204	302	491	---
Net Alkalinity Required	PPD	379	560	911	---
<b>Oxygen Requirements</b>					
Influent CBOD <sub>5</sub>	PPD	375	563	938	---
Effluent CBOD <sub>5</sub>	PPD	3	5	11	---
CBOD <sub>5</sub> Removed	PPD	372	558	927	---
Oxygen Coefficient For CBOD <sub>5</sub> Removal	Lb./Lb.	1.50	1.37	1.21	---
Oxygen Required For CBOD <sub>5</sub> Removal	PPD	560	765	1,126	---
Oxygen Coefficient For Nitrification	Lb./Lb.	4.60	4.60	4.60	---
TKN Converted To Nitrate	PPD	82	121	196	---
Oxygen Required For Nitrification	PPD	376	555	903	---
Oxygen Coefficient For Denitrification Credit	Lb./Lb.	2.86	2.86	2.86	---
Denitrification Credit	PPD	195	288	468	---
Net Oxygen Requirement	PPD	741	1,032	1,562	---
<b>Clarifier Loadings</b>					
Number Of Units	Each	1	1	1	1
Clarifier Diameter	Feet	36.00	36.00	36.00	36.00
Surface Area	SF	1,018	1,018	1,018	1,018
Weir Diameter	Feet	36.00	36.00	36.00	36.00
Weir Length	Feet	113	113	113	113
RAS Flow	MGD	0.225	0.338	0.563	---
Overflow Rate	GPD/SF	221	332	553	884
Weir Loading	GPD/LF	1,989	2,984	4,974	7,958
Solids Loading	PPD/SF	14.7	22.1	36.9	---
<b>Diffused Aeration System Analysis</b>					
Actual Oxygenation Rate (AOR)	PPD	741	1,032	1,562	---
Aerobic SRT	Days	60.5	36.3	18.7	---
Alpha	---	0.65	0.65	0.65	---
Beta	---	0.98	0.98	0.97	---
DO Saturation In Clean Water @ 20 Deg. C & 100% RH	mg/L	9.09	9.09	9.09	---
DO Saturation In Clean Water @ Specified Temp. & 100% RH	mg/L	9.09	9.09	9.09	---
Tau	---	1.00	1.00	1.00	---
Standard Atmospheric Pressure	psi	14.70	14.70	14.70	---
Barometric Pressure	psi	14.70	14.70	14.70	---
Saturated Vapor Pressure of Water @ 20 Deg. C	psi	0.34	0.34	0.34	---
Saturated Vapor Pressure of Water @ Specified Temperature	psi	0.34	0.34	0.34	---
Effective Saturation Depth	Feet	5.00	5.00	5.00	---
Omega	---	1.00	1.00	1.00	---
Corrected DO Saturation In Clean Water @ 20 Deg. C & 100% RH	mg/L	10.46	10.46	10.46	---
Operating DO	mg/L	1.75	1.25	1.00	---
OTRf/SOTR	---	0.53	0.56	0.57	---
Standard Oxygen Transfer Efficiency	Percent	20.00	20.00	20.00	---
Field Oxygen Transfer Efficiency	Percent	10.59	11.15	11.38	---
Air Flow Required For Biological Process	SCFM	279	369	547	---

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**APPENDIX B**  
Calaveras County Water District  
La Contenta WWTF Improvement Project  
Preliminary Design Submittal



# CALAVERAS COUNTY WATER DISTRICT

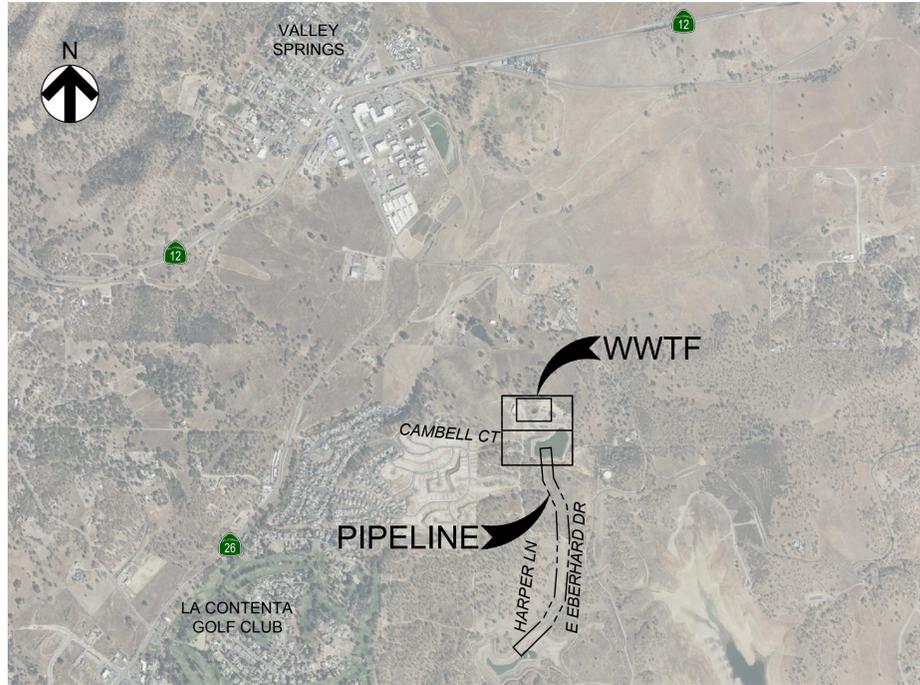
HYDROSCIENCE PROJECT NO.: 483-003

## LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

30% SUBMITTAL  
NOVEMBER 2024



VICINITY MAP  
NTS



LOCATION MAP  
NTS

### DRAWING INDEX

SHEET NO.	DWG NO.	DRAWING TITLE	SHEET NO.	DWG NO.	DRAWING TITLE	SHEET NO.	DWG NO.	DRAWING TITLE	SHEET NO.	DWG NO.	DRAWING TITLE
<b>GENERAL</b>			<b>MECHANICAL</b>			<b>ELECTRICAL</b>			<b>INSTRUMENTATION</b>		
1	G001	TITLE SHEET, VICINITY MAP, LOCATION MAP & DRAWING INDEX	26	M200	UESP PUMP STATION MECHANICAL PLAN, SECTION & DETAIL	54	E001	STANDARD ELECTRICAL SYMBOLS, LEGENDS & ABBREVIATIONS	79	I001	STANDARD PROCESS & INSTRUMENTATION SYMBOLS, LEGENDS & ABBREVIATIONS
2	G002	STANDARD SHEET REFERENCING, SERVICE ID, SYMBOLS & ABBREVIATIONS	27	M300	SECONDARY CLARIFIER PLAN & SECTION	55	E010	SINGLE LINE DIAGRAM	80	I100	PROCESS AND INSTRUMENTATION DIAGRAM
3	G003	GENERAL NOTES	28	M301	SECONDARY CLARIFIER SECTIONS & DETAILS	56	E011	PANEL ELEVATIONS	81	I101	PROCESS AND INSTRUMENTATION DIAGRAM
4	G004A	PROCESS FLOW DIAGRAM BASE SCOPE: INTEGRAL CLARIFIER	29	M400	FLOW SPLITTER BOX PLAN & SECTIONS	57	E020	ELECTRICAL SCHEDULES	82	I102	PROCESS AND INSTRUMENTATION DIAGRAM
4	G004B	PROCESS FLOW DIAGRAM SEPARATE CLARIFIER & RAS/WAS PUMP STATION	30	M500	MECHANICAL PLAN OPTION 1: SEPARATE CLARIFIER AND RAS/WAS PUMP STATION	58	E021	ELECTRICAL SCHEDULES	83	I103	PROCESS AND INSTRUMENTATION DIAGRAM
5	G005	HYDRAULIC PROFILE & DESIGN DATA	31	M600	BLOWER ROOM MODIFICATION PLAN	59	E030	WIRING DIAGRAM	84	I104	PROCESS AND INSTRUMENTATION DIAGRAM
6	G006	KEY MAP	32	M601	BLOWER ROOM MODIFICATION SECTION	60	E031	WIRING DIAGRAM	85	I105	PROCESS AND INSTRUMENTATION DIAGRAM
<b>CIVIL</b>			33	M700	TBD	61	E032	WIRING DIAGRAM	86	I106	PROCESS AND INSTRUMENTATION DIAGRAM
7	C100	EXISTING WWTf SITE PLAN SHEET 1 OF 2	34	M900	MECHANICAL DETAILS - 1	62	E040	TBD	87	I107	PROCESS AND INSTRUMENTATION DIAGRAM
8	C101	EXISTING WWTf SITE PLAN SHEET 2 OF 2	35	M901	MECHANICAL DETAILS - 2	63	E041	TBD	88	I108	PROCESS AND INSTRUMENTATION DIAGRAM
9	C102	WWTf SITE DEMOLITION PLAN SHEET 1 OF 2	36	M902	MECHANICAL DETAILS - 3	64	E042	TBD	89	I109	PROCESS AND INSTRUMENTATION DIAGRAM
10	C103	WWTf SITE DEMOLITION PLAN SHEET 2 OF 2	<b>BUILDING</b>			65	E043	TBD	90	I900	INSTRUMENTATION DETAILS
11	C104A	WWTf SITE AND PIPING PLAN BASE SCOPE: INTEGRAL CLARIFIER SHEET 1 OF 2	37	B100	ELECTRICAL BUILDING PLANS	66	E044	TBD			
11	C104B	WWTf SITE AND PIPING PLAN OPTION 1: SEPARATE CLARIFIER AND RAS/WAS PUMP STATION SHEET 1 OF 2	38	B300	ELECTRICAL BUILDING ELEVATIONS	67	E045	TBD			
12	C105A	WWTf/UESP PUMP STATION SITE AND PIPING PLAN BASE SCOPE: INTEGRAL CLARIFIER PLAN SHEET 2 OF 2	39	B301	ELECTRICAL BUILDING DETAILS-1	68	E046	TBD			
12	C105B	WWTf/UESP PUMP STATION SITE AND PIPING PLAN OPTION 1: SEPARATE CLARIFIER AND RAS/WAS PUMP STATION SHEET 2 OF 2	40	B302	ELECTRICAL BUILDING DETAILS-2	69	E047	TBD			
13	C106A	GRADING & PAVING PLAN BASE SCOPE: INTEGRAL CLARIFIER	<b>STRUCTURAL</b>			70	E048	TBD			
13	C106B	AERATION BASIN GRADING & PAVING PLAN OPTION 1: SEPARATE CLARIFIER & RAS/WAS PUMP STATION	41	S001	TYPICAL STRUCTURAL NOTES - 1	71	E049	TBD			
14	C200	PIPELINE PLAN AND PROFILE STA: 100+00 TO 104+50	42	S002	TYPICAL STRUCTURAL NOTES - 2	72	E100	ELECTRICAL SITE PLAN SHEET 1 OF 2			
15	C201	PIPELINE PLAN AND PROFILE STA: 104+50 TO 109+50	43	S003	TYPICAL STRUCTURAL DETAILS - 1	73	E101	ELECTRICAL SITE PLAN SHEET 2 OF 2			
16	C202	PIPELINE PLAN AND PROFILE STA: 109+50 TO 113+50	44	S004	TYPICAL STRUCTURAL DETAILS - 2	74	E300	SECONDARY CLARIFIER PLAN & SECTION			
17	C203	PIPELINE PLAN AND PROFILE STA: 113+50 TO 118+00	45	S005	TYPICAL STRUCTURAL DETAILS - 3	75	E500	RAS/WAS PUMP STATION STRUCTURAL PLAN			
18	C204	PIPELINE PLAN AND PROFILE STA: 118+00 TO 122+50	46	S006	TYPICAL STRUCTURAL DETAILS - 4	76	E600	BLOWER ROOM MODIFICATION PLAN			
19	C205	PIPELINE PLAN AND PROFILE STA: 122+50 TO 127+00	47	S200	UESP PUMP STATION STRUCTURAL PLAN, SECTION & DETAIL	77	E900	ELECTRICAL DETAILS - 1			
20	C206	PIPELINE PLAN AND PROFILE STA: 127+00 TO 131+50	48	S300	SECONDARY CLARIFIER STRUCTURAL PLAN	78	E901	ELECTRICAL DETAILS - 2			
21	C207	PIPELINE PLAN AND PROFILE STA: 131+50 TO 132+75	49	S301	SECONDARY CLARIFIER SECTIONS						
22	C900	CIVIL DETAILS - 1	50	S500	FLOW SPLITTER BOX & METER BOX STRUCTURAL PLAN & SECTIONS						
23	C901	CIVIL DETAILS - 2	51	S600	RAS/WAS PUMP STATION STRUCTURAL PLAN						
24	C902	CIVIL DETAILS - 3	52	S601	BLOWER ROOM STRUCTURAL PLAN						
25	C903	CIVIL DETAILS - 4	53	S700	TBD						

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CALAVERAS COUNTY WATER DISTRICT

LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

TITLE SHEET, VICINITY MAP, LOCATION MAP & DRAWING INDEX

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G001

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SHEET 1 OF 90

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**LINE LEGENDS**

**GENERAL LEGEND**

	CENTERLINE
	BUILDING
	CONCRETE
	EQUIPMENT
	EXISTING FEATURES, EQUIPMENT OR STRUCTURES
	PROPERTY LINE
	MATCH LINE
	RIGHT OF WAY
	FENCE
	HANDRAIL
	GRADE BREAK
	SWALES OR DITCH
	EDGE OF WATER
	MAJOR CONTOURS
	MINOR CONTOURS
	EXISTING GUARD RAIL
	DENSE BRUSH

**CIVIL LEGEND**

	PIPING TO BE ABANDONED OR REMOVED
	WATER MAIN PIPE
	EXISTING WATER MAIN PIPE
	SEWER FORCE MAIN
	EXISTING SEWER FORCE MAIN
	RECYCLED WATER PIPE
	EXISTING RECYCLED WATER PIPE
	SANITARY SEWER PIPE
	EXISTING SANITARY SEWER PIPE
	STORM DRAIN LINE
	EXISTING STORM DRAIN LINE
	OVER FLOW LINE
	EXISTING OVER FLOW LINE
	DRAIN LINE
	EXISTING DRAIN LINE
	ELECTRICAL CONDUIT
	EXISTING ELECTRICAL CONDUIT
	ELECTRICAL GROUND
	CULVERT
	EXISTING CULVERT
	EXISTING UNKNOWN PIPE
	EXISTING GAS LINE
	EXISTING NATURAL GAS LINE

**GENERAL SYMBOLS**

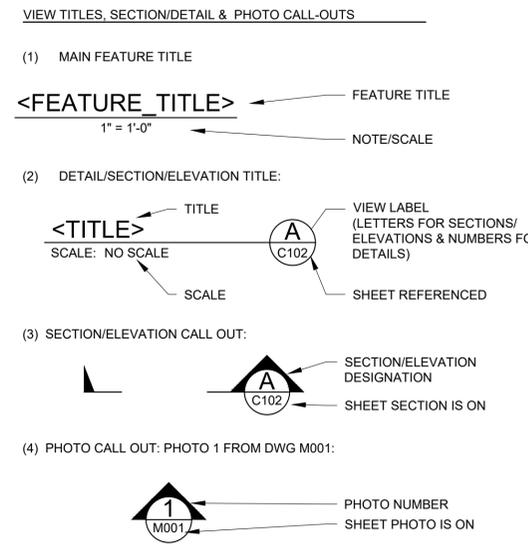
**MISCELLANEOUS SYMBOLS**

	SINGLE LINE CONTINUATION
	DOUBLE LINE CONTINUATION
	GENERAL CONTINUATION
	WATERLINE
	POTHOLE
	BORING HOLE
	NORTH ARROW
	INTERSTATE HIGHWAY
	HIGHWAY
	TREE
	UTILITY BOX
	POWER POLE

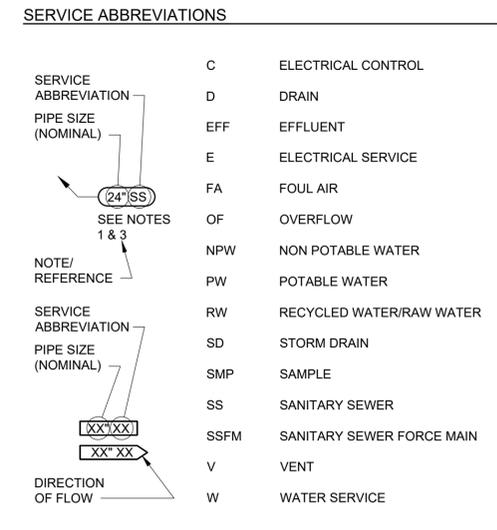
**TYPICAL PIPING SYMBOLS**

	SANITARY SEWER MANHOLE
	STORM DRAIN MANHOLE
	GATE VALVE
	BUTTERFLY VALVE
	PLUG VALVE
	CHECK VALVE
	REDUCER
	FLOW METER
	BACKFLOW PREVENTER
	DROP INLET
	FIRE HYDRANT
	CAP
	BLIND FLANGE
	HOSE BIBB
	CLEAN OUT

**REFERENCE LABELS**



**SERVICE IDENTIFICATION SYSTEM**



**PATTERNS LEGEND**

NEW		EXISTING	
	N/A		DEMOLITION AREA
			AC W/ AB (SECTION VIEW)
			NATURAL GROUND OR GRADE
			COMPACTED BACKFILL
			AB (SECTION VIEW)
			CONCRETE
			CHECKER PLATE
			STEEL OR STAINLESS STEEL
			AC PAVEMENT (PLAN VIEW) OR GROUT (SECTION VIEW)
			GRATING
			MISCELLANEOUS MATERIAL
	N/A		HIGHLIGHTED AREA

**ABBREVIATIONS**

<b>A</b>	ANCHOR BOLT/AGGREGATE BASE	<b>F</b>	FUTURE	<b>M</b>	MAXIMUM	<b>S</b>	SOUTH	<b>W</b>	WATER/WEST
<b>A/C</b>	AIR CONDITIONER	<b>FA</b>	FOUL AIR	<b>MECH</b>	MECHANICAL	<b>SBL</b>	SET BACK LINE	<b>W/</b>	WITH
<b>AC</b>	ASPHALT CONCRETE	<b>FACP</b>	FIRE ALARM CONTROL PANEL	<b>MFR</b>	MANUFACTURER	<b>SCH</b>	SCHEDULE	<b>W/O</b>	WITHOUT
<b>AFF</b>	ABOVE FINISHED FLOOR	<b>FCA</b>	FLEX COUPLING	<b>MGD</b>	MILLION GALLONS PER DAY	<b>SD</b>	STORM DRAIN	<b>WL</b>	WATER LEVEL
<b>AI</b>	ANALOG INPUT	<b>FD</b>	FLOOR DRAIN/FIRE DAMPER	<b>MH</b>	MANHOLE	<b>SDMH</b>	STORM DRAIN MANHOLE	<b>WS</b>	WATER SURFACE
<b>AL</b>	ALUMINUM	<b>FE</b>	FLOW-METER	<b>MIN</b>	MINIMUM/MINUTE	<b>SDR</b>	STANDARD DIMENSION RATIO	<b>WSTP</b>	WATER-STOP
<b>ALT</b>	ALTERNATE	<b>FF</b>	FINISHED FLOOR	<b>MINS</b>	MINUTES	<b>SEC</b>	SECONDARY SECTION	<b>WT</b>	WATERTIGHT/WEIGHT
<b>APPROX</b>	APPROXIMATE(LY)	<b>FG</b>	FINISHED GRADE	<b>MISC</b>	MISCELLANEOUS	<b>SECT</b>	SECTION	<b>WV</b>	WATER VALVE
<b>AUX</b>	AUXILIARY	<b>FI</b>	FLOW INDICATOR	<b>MJ</b>	MECHANICAL JOINT	<b>SFM</b>	SEWER FORCE-MAIN	<b>WW</b>	WASTEWATER
<b>AVE</b>	AVENUE	<b>FL</b>	FLOW LINE	<b>MOV</b>	MOTOR OPERATED VALVE	<b>SHT</b>	SHEET	<b>WWF</b>	WELED WIRE FABRIC
<b>B</b>	BLIND FLANGE	<b>FLX</b>	FLEXIBLE	<b>MTD</b>	MANUAL TRANSFER SWITCH	<b>SPEC</b>	SPECIFICATION(S)	<b>WWTP</b>	WASTEWATER TREATMENT PLANT
<b>B/C</b>	BOTTOM FACE OF CURB	<b>FLG</b>	FLANGE(D)	<b>MTR</b>	MOTOR	<b>SS</b>	SANITARY SEWER		
<b>BFV</b>	BUTTERFLY VALVE	<b>FLR</b>	FLOOR			<b>SSMH</b>	SANITARY SEWER MANHOLE		
<b>BLDG</b>	BUILDING	<b>FO</b>	FIBER OPTIC/FAIL OPEN			<b>SST</b>	STAINLESS STEEL		
<b>BM</b>	BEAM/BENCHMARK	<b>FRP</b>	FIBERGLASS REINFORCED PIPE			<b>ST</b>	STREET		
<b>BTM</b>	BOTTOM	<b>FS</b>	FIRE SERVICE/FLOW SWITCH			<b>STA</b>	STATION		
<b>BV</b>	BALL VALVE	<b>FT</b>	FEET			<b>STD</b>	STANDARD		
<b>C</b>	CAST IN PLACE CONSTRUCTION JOINT	<b>FTG</b>	FOOTING			<b>STL</b>	STEEL		
<b>CJ</b>	CONCRETE	<b>FTS</b>	FLOAT SWITCH			<b>STRUCT</b>	STRUCTURE		
<b>CONC</b>	CONCRETE					<b>SV</b>	SOLENOID VALVE		
<b>CONT</b>	CONTAINMENT								
<b>CPLG</b>	COUPLING								
<b>CV</b>	CONTROL VALVE								
<b>D</b>	DEMOLISH								
<b>D</b>	DRAIN								
<b>DET</b>	DETAIL								
<b>DI</b>	DROP INLET								
<b>DIA</b>	DIAMETER								
<b>DIP</b>	DUCTILE IRON PIPE DRAWING								
<b>DWG</b>	DRAWING								
<b>E</b>	EXISTING								
<b>(E)</b>	EAST								
<b>EA</b>	EACH								
<b>EG</b>	EXISTING GRADE								
<b>EL</b>	ELEVATION								
<b>ELL</b>	ELBOW								
<b>EMBED</b>	EMBEDDED								
<b>EMERG</b>	EMERGENCY								
<b>EP</b>	EDGE OF PAVEMENT								
<b>EQUIP</b>	EQUIPMENT								
<b>EW</b>	EACH WAY								
<b>EXIST</b>	EXISTING								
<b>EW T&amp;B</b>	EACH WAY/TOP AND BOTTOM								
<b>EXP</b>	EXPANSION								
<b>EXT</b>	EXTERIOR								
<b>G</b>	GAS								
<b>GALV</b>	GALVANIZED								
<b>GEN</b>	GENERAL								
<b>GPM</b>	GALLONS PER MINUTE								
<b>GRT</b>	GROUT/GRATE								
<b>GSN</b>	GENERAL STRUCTURAL NOTES								
<b>GSP</b>	GALVANIZED STEEL PIPE								
<b>GV</b>	GATE VALVE								
<b>H</b>	HIGH								
<b>HI</b>	HORIZONTAL								
<b>HORIZ</b>	HORIZONTAL								
<b>HP</b>	HIGH PRESSURE/HIGH POINT /HORSEPOWER								
<b>HPS</b>	HIGH PRESSURE SODIUM								
<b>HSS</b>	HOLLOW STRUCTURE STEEL								
<b>HT</b>	HEIGHT/HIGH								
<b>HWL</b>	HIGH WATER LEVEL								
<b>HYD</b>	HYDRAULIC								
<b>I</b>	INVERT ELEVATION								
<b>IE</b>	INCH								
<b>IN</b>	INSTRUMENTATION								
<b>INST</b>	INVERT								
<b>INV</b>	IRRIGATION								
<b>IRR</b>	JOINT								
<b>J</b>	LENGTH								
<b>JT</b>									
<b>L</b>									
<b>L</b>									
<b>O</b>	OPEN								
<b>OC</b>	ON CENTER								
<b>OD</b>	OUTSIDE DIAMETER								
<b>OF</b>	OUTSIDE FACE, OVERFLOW								
<b>OFMH</b>	OVERFLOW MANHOLE								
<b>P</b>	PLAIN END								
<b>PE</b>	PROPERTY LINE/PIPELINE/PLATE								
<b>PL/r</b>	PUMP								
<b>PMP</b>	FURNISH, INSTALL AND CONNECT								
<b>PROVIDE</b>									
<b>PSI</b>	POUNDS PER SQUARE INCH								
<b>PV</b>	PLUG VALVE								
<b>PVC</b>	POLYVINYLCHLORIDE								
<b>PVT</b>	PAVEMENT								
<b>PW</b>	POTABLE WATER								
<b>Q</b>	RATE OF FLOW								
<b>QCPLG</b>	QUICK COUPLING								
<b>R</b>	RADIUS/RIGHT								
<b>R/C</b>	REINFORCED CONCRETE								
<b>RCP</b>	REINFORCED CONCRETE PIPE								
<b>RD</b>	ROAD								
<b>RED</b>	REDUCER								
<b>REF</b>	REFERENCE								
<b>REINF</b>	REINFORCE/REINFORCING								
<b>REL</b>	RELAY								
<b>RGS</b>	RIGID GALVANIZED STEEL								
<b>RMS</b>	ROOT MEAN SQUARE								
<b>RW</b>	RECYCLED WATER								
<b>T</b>	TOP AND BOTTOM								
<b>T&amp;B</b>	TELECOMMUNICATIONS								
<b>T, TEL</b>	TOP OF PIPE								
<b>TOP</b>	TOP OF BANK								
<b>T/B</b>	TERMINAL BLOCK								
<b>TB</b>	TOP BACK OF CURB								
<b>TBC</b>	TOP OF CURB/TOP OF CONCRETE								
<b>TC</b>	TOP OF CURB DROP INLET								
<b>TCDI</b>	TEMPERATURE								
<b>TEMP</b>	TOP OF PAVEMENT								
<b>TP</b>	TYPICAL								
<b>TYP</b>									
<b>U</b>	UTILITY BOX								
<b>UB</b>	UNDERGROUND								
<b>UG</b>	UNION								
<b>UN</b>	UNKNOWN								
<b>UNKN</b>	UNLESS OTHERWISE NOTED								
<b>UON</b>									
<b>V</b>	VERTICAL								
<b>VERT</b>	VARIABLE FREQUENCY DRIVE								
<b>VFD</b>	VALVE								
<b>VLV</b>									

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REV	DESCRIPTION	DATE	APVD

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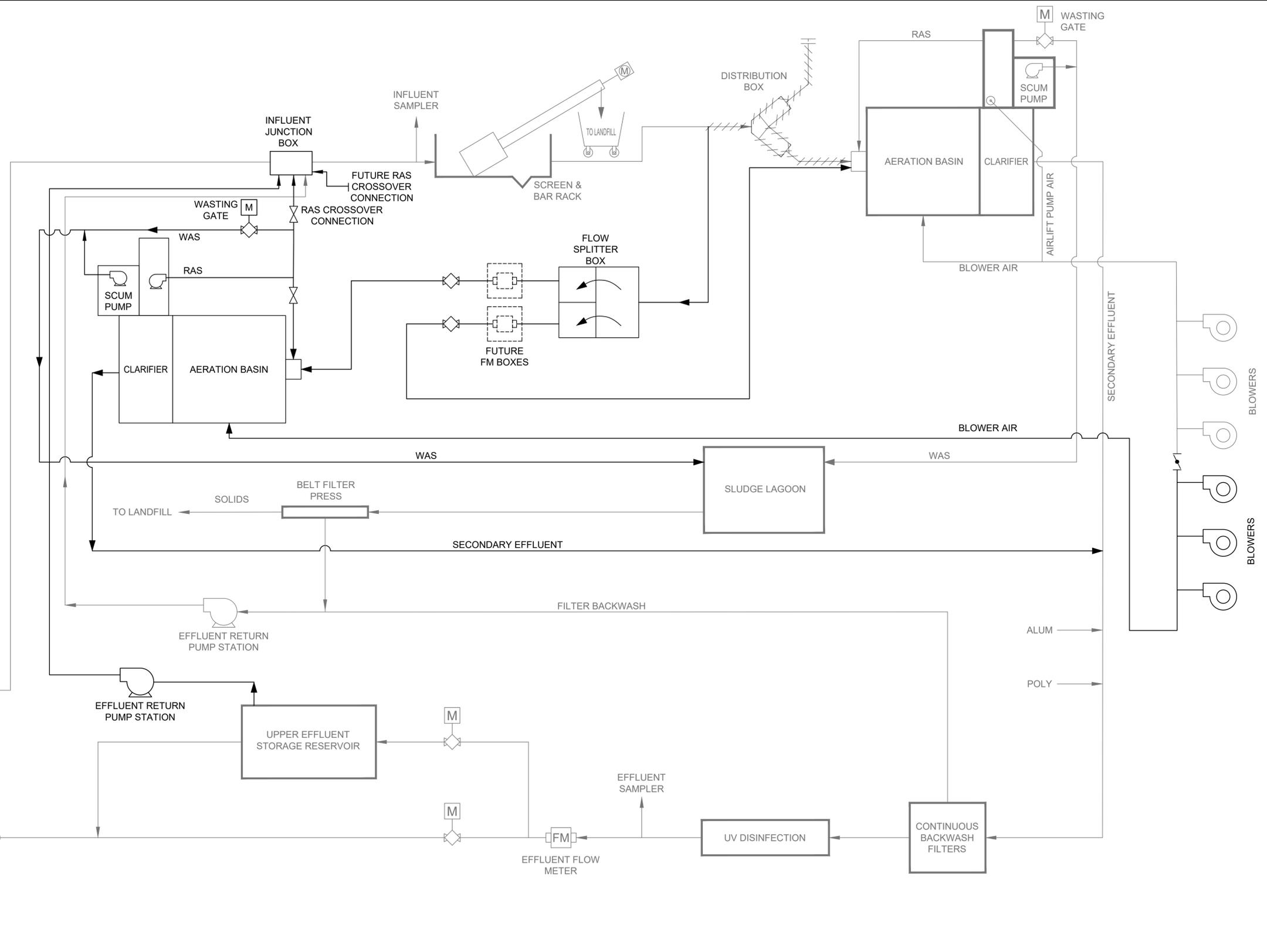
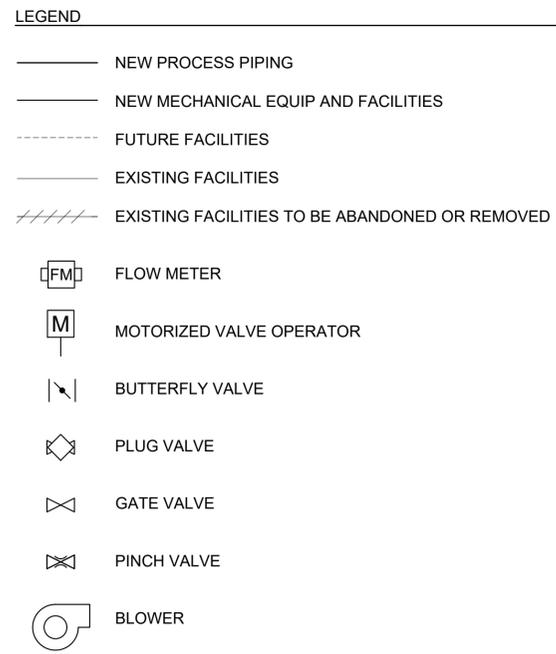
LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

STANDARD SHEET REFERENCING, SERVICE ID, SYMBOLS & ABBREVIATIONS

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G002 DRAWING NUMBER SHEET 2 OF 90

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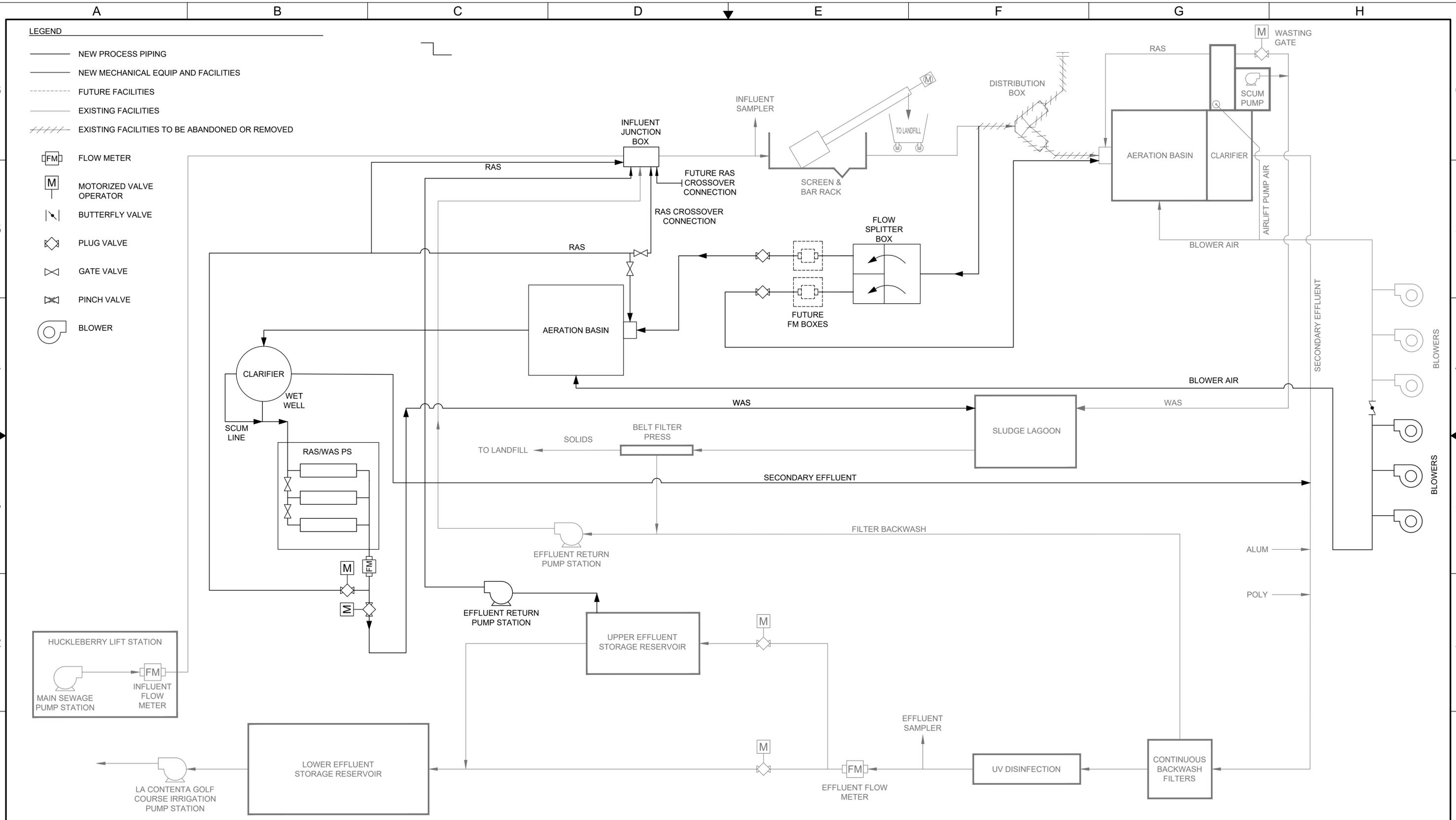
LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

PROCESS FLOW DIAGRAM  
BASE SCOPE: INTEGRAL CLARIFIER

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LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

PROCESS FLOW DIAGRAM OPTION 1: SEPARATE CLARIFIER & RAS/WAS PUMP STATION

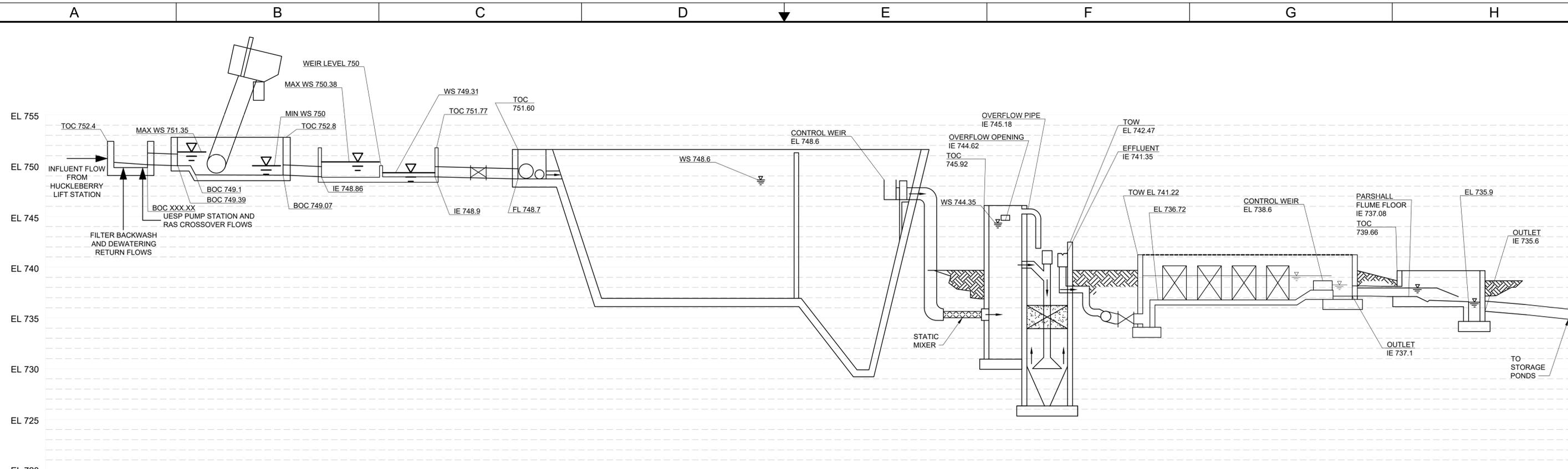
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**INFLUENT JUNCTION BOX**

**MECHANICAL SCREEN AND MANUAL BAR RACK**

**INFLUENT SPLITTER BOX**

**BIOLOGICAL BASIN W/INTERGATED CLARIFIER**

**EXISTING SAND FILTERS**

**UV DISINFECTION SYSTEM**

**EXISTING PARSHALL FLUME**

INFLUENT FLOWS (GPD)		
	PHASE 3	BUILDOUT
ADWF	237,000	338,000
MMF	473,000	675,000
MDF	950,000	1,350,000
PHF	1,260,000	2,016,000

Note: Buildout PHF is based on Huckleberry Lift Station max discharge flow.

PHASE 3 INFLUENT LOAD				
	CONCENTRATION	UNITS	LOAD	UNITS
BOD5	200	MG/L	789	LBS/D
SUSPENDED SOLIDS	200	MG/L	789	LBS/D
NITROGEN, N	35	MG/L	138	LBS/D

WWTF RETURN STREAMS (GPD)		
	PHASE 3	BUILDOUT
FILTER BACKWASH	127,000	177,000
SOLIDS DEWATERING	138,000	138,000
TOTAL	265,000	315,000

RAS FLOW (GPD)		
	PHASE 3	BUILDOUT
RAS FLOW	474,000	675,000

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LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

HYDRAULIC PROFILE & DESIGN DATA

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KEY MAP  
NTS

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REV	DESCRIPTION	DATE	APVD
REVISIONS			

CALAVERAS COUNTY  
WATER DISTRICT

LA CONTENTA  
WASTEWATER  
TREATMENT FACILITY  
PHASE 3 IMPROVEMENTS

KEY MAP

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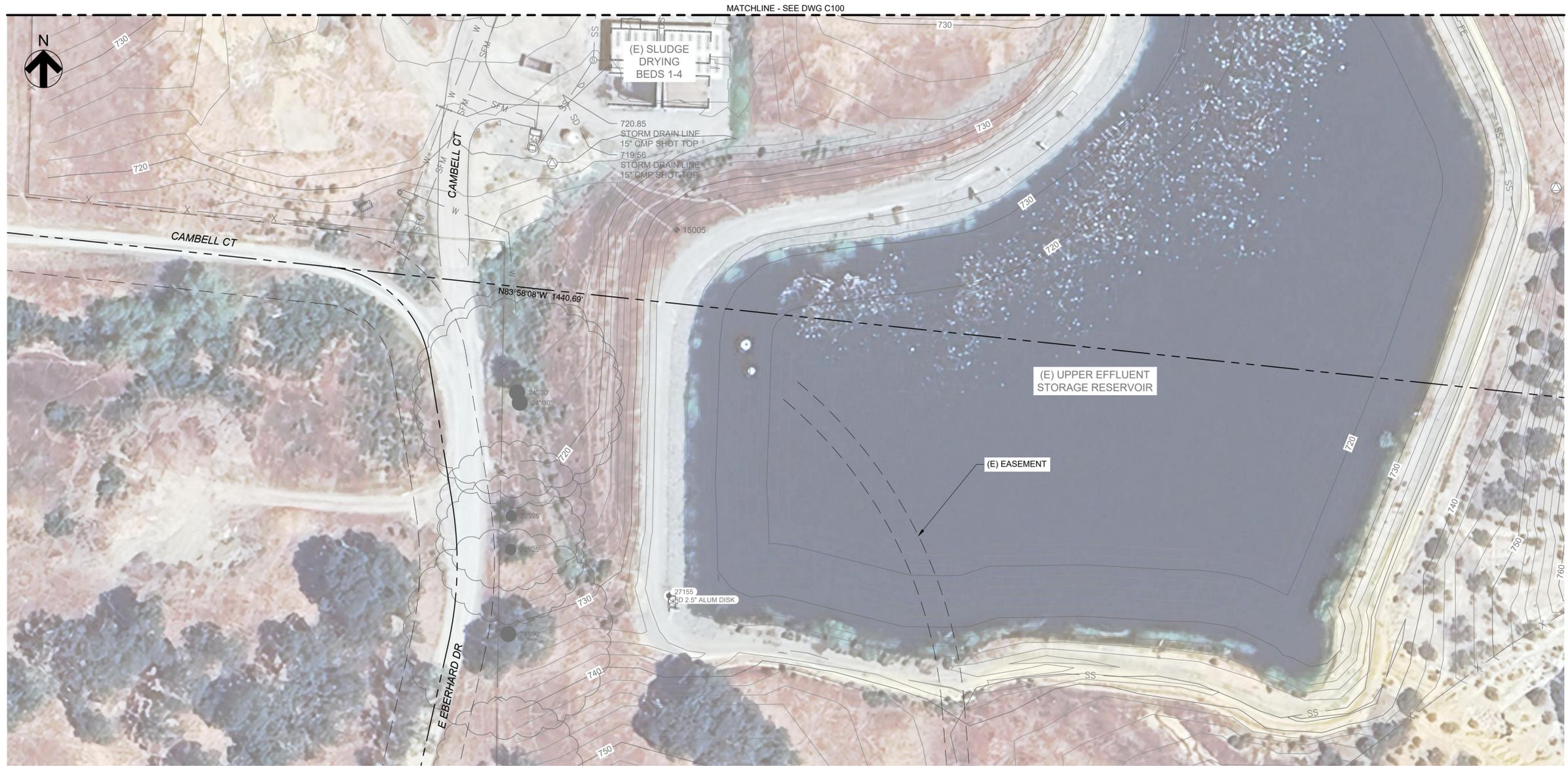
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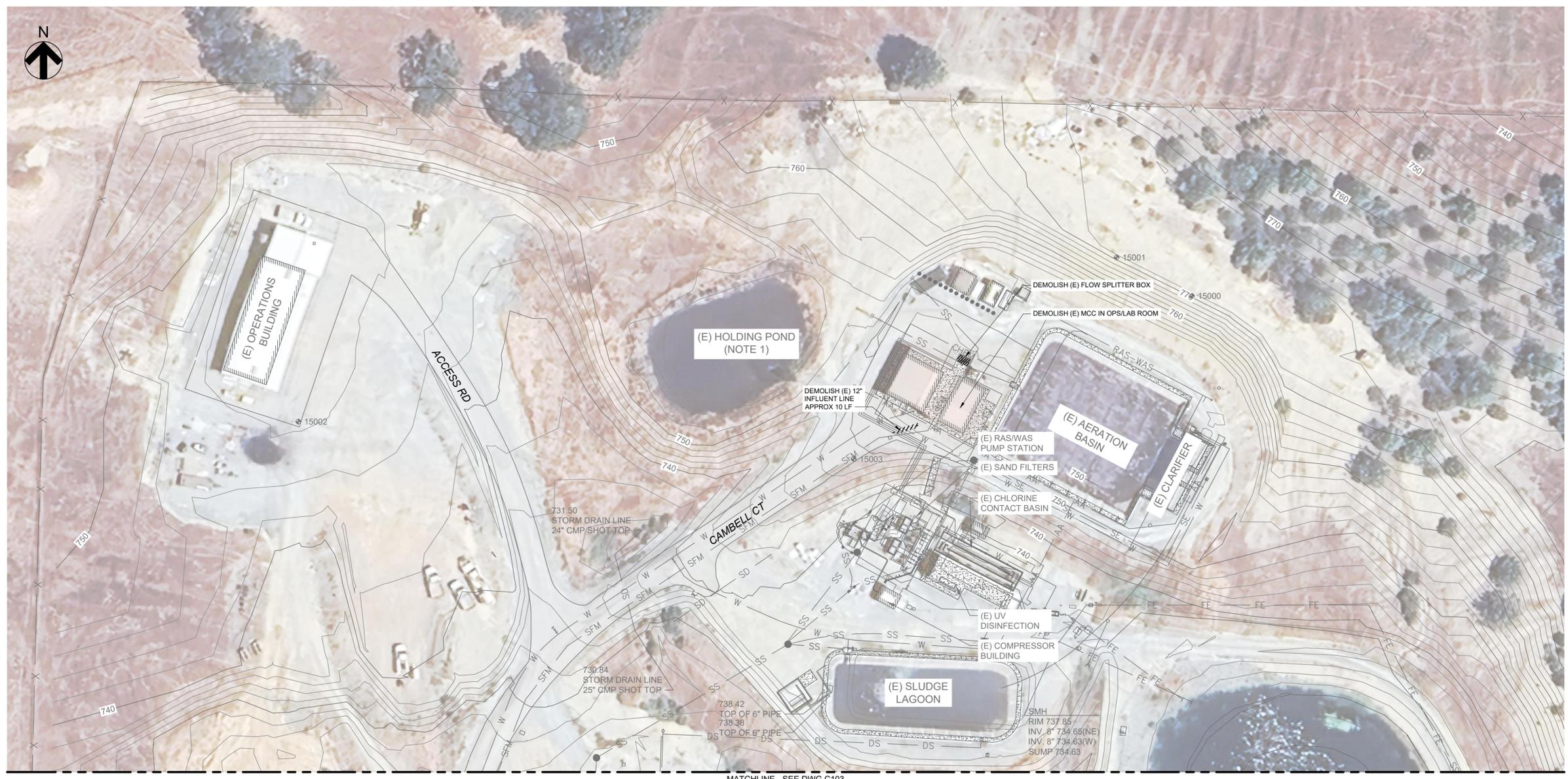
**EXISTING WWTF SITE PLAN**  
SCALE: 1" = 40'-0"

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		REV		DESCRIPTION	DATE	APVD										
DATE: 11/13/2024 DRAWN BY: BF/AGP DESIGNED BY: BF PROJ. MGR.: WJS																

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- NOTES**
- CONTRACTOR SHALL DEWATER HOLDING POND AND REMOVE SLUDGE AND UNSUITABLE SOILS AT THE DISCRETION OF THE GEOTECHNICAL ENGINEER. CONTRACTOR TO STOCKPILE MATERIALS IN A DISTRICT-DESIGNATED LOCATION ON THIS WWTF SITE. ASSUME A TOTAL VOLUME OF 600 CY OF WATER, SLUDGE, AND UNSUITABLE SOILS, 15% OF WHICH IS WATER.

**WWTF SITE DEMOLITION PLAN**  
 SCALE: 1" = 40'-0"

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REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY  
 WATER DISTRICT

LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

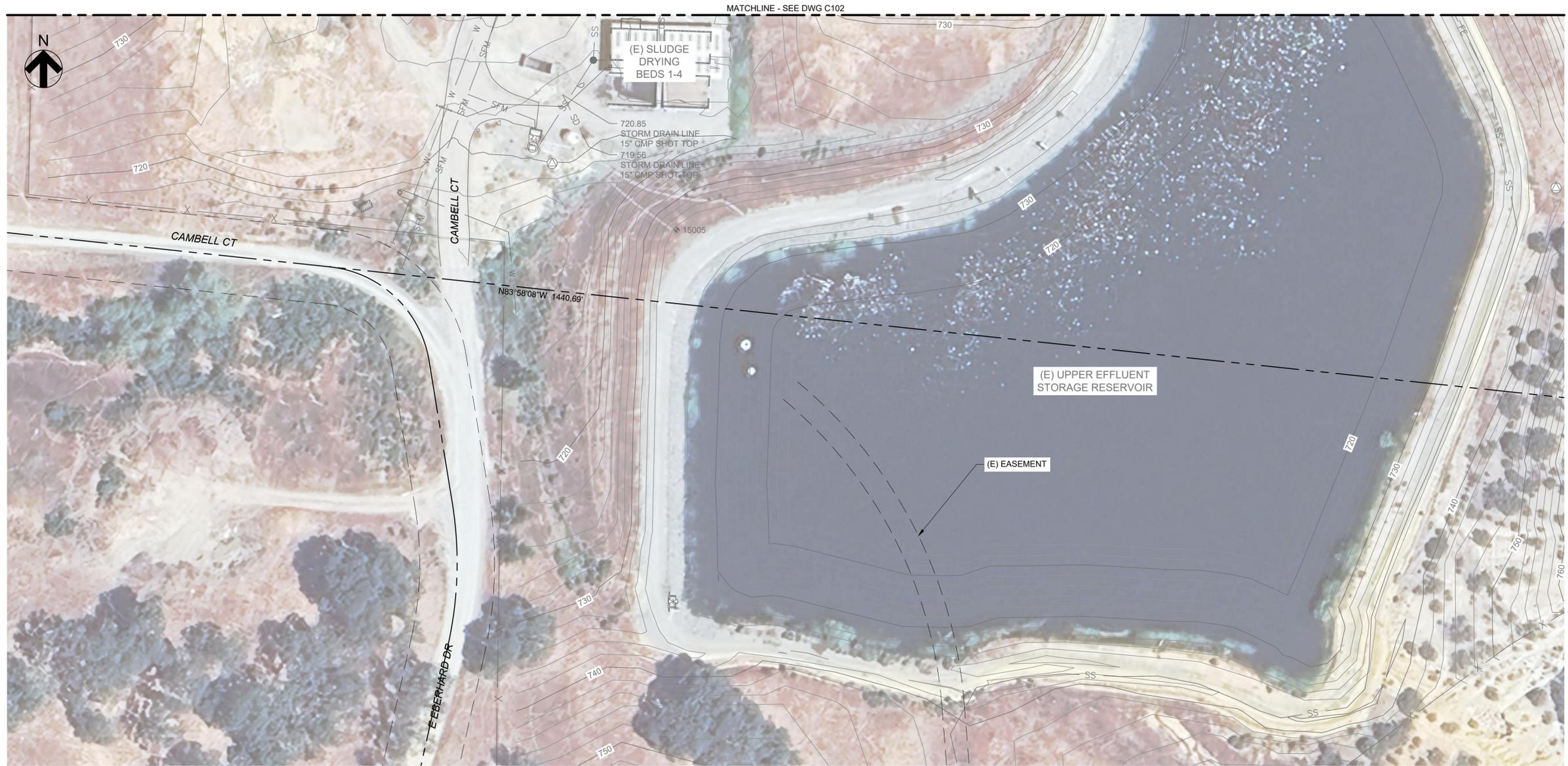
WWTF SITE DEMOLITION PLAN  
 SHEET 1 OF 2

30%  
 SUBMITTAL  
 NOV 2024

**C102**  
 DRAWING NUMBER  
 SHEET 9 OF 90

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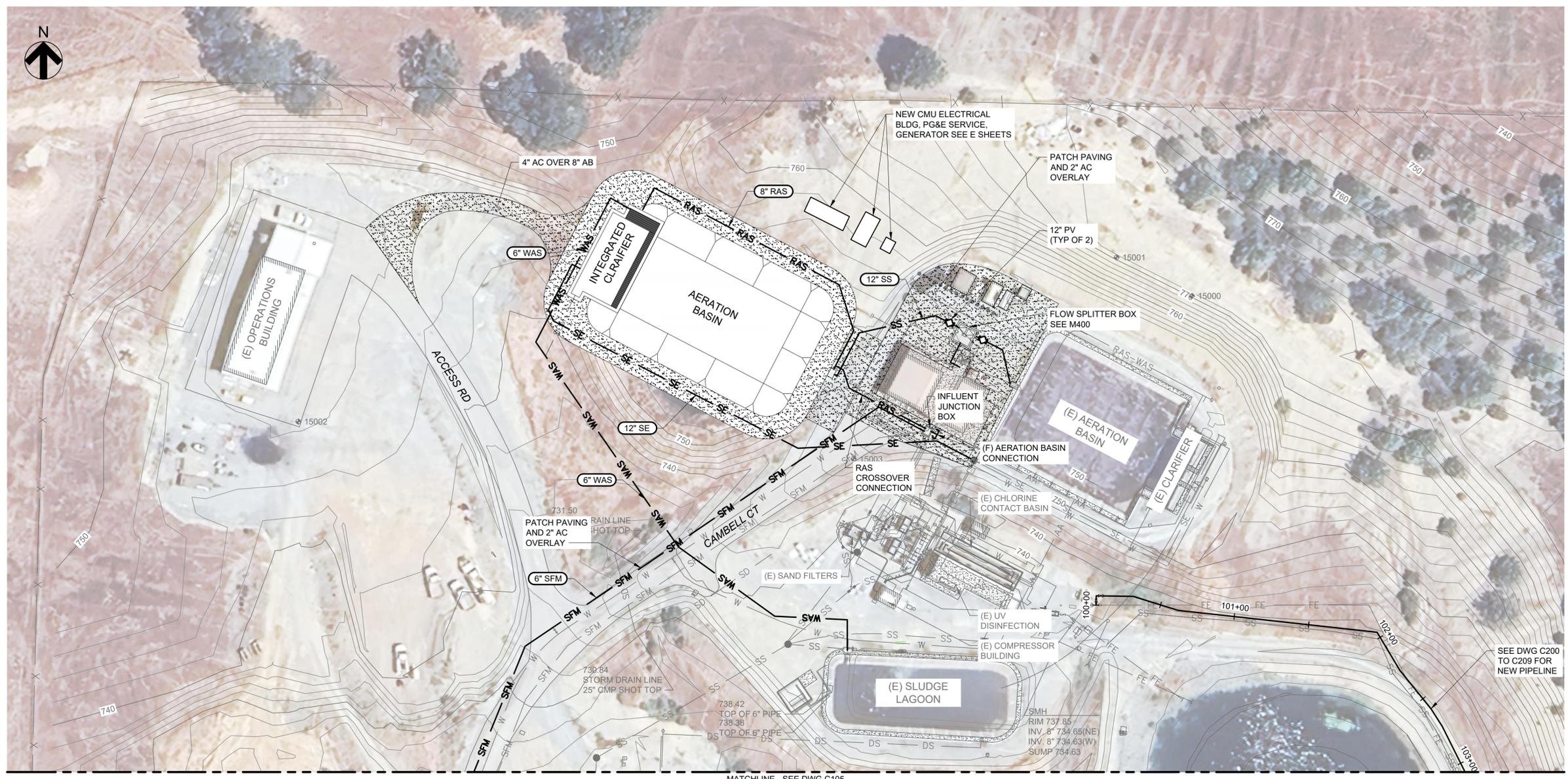
**WWTF SITE DEMOLITION PLAN**  
SCALE: 1" = 40'-0"

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	REV	DESCRIPTION	DATE	APVD																				
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**WWTF SITE AND PIPING PLAN**  
 SCALE: 1" = 40'-0"

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REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY  
 WATER DISTRICT

LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

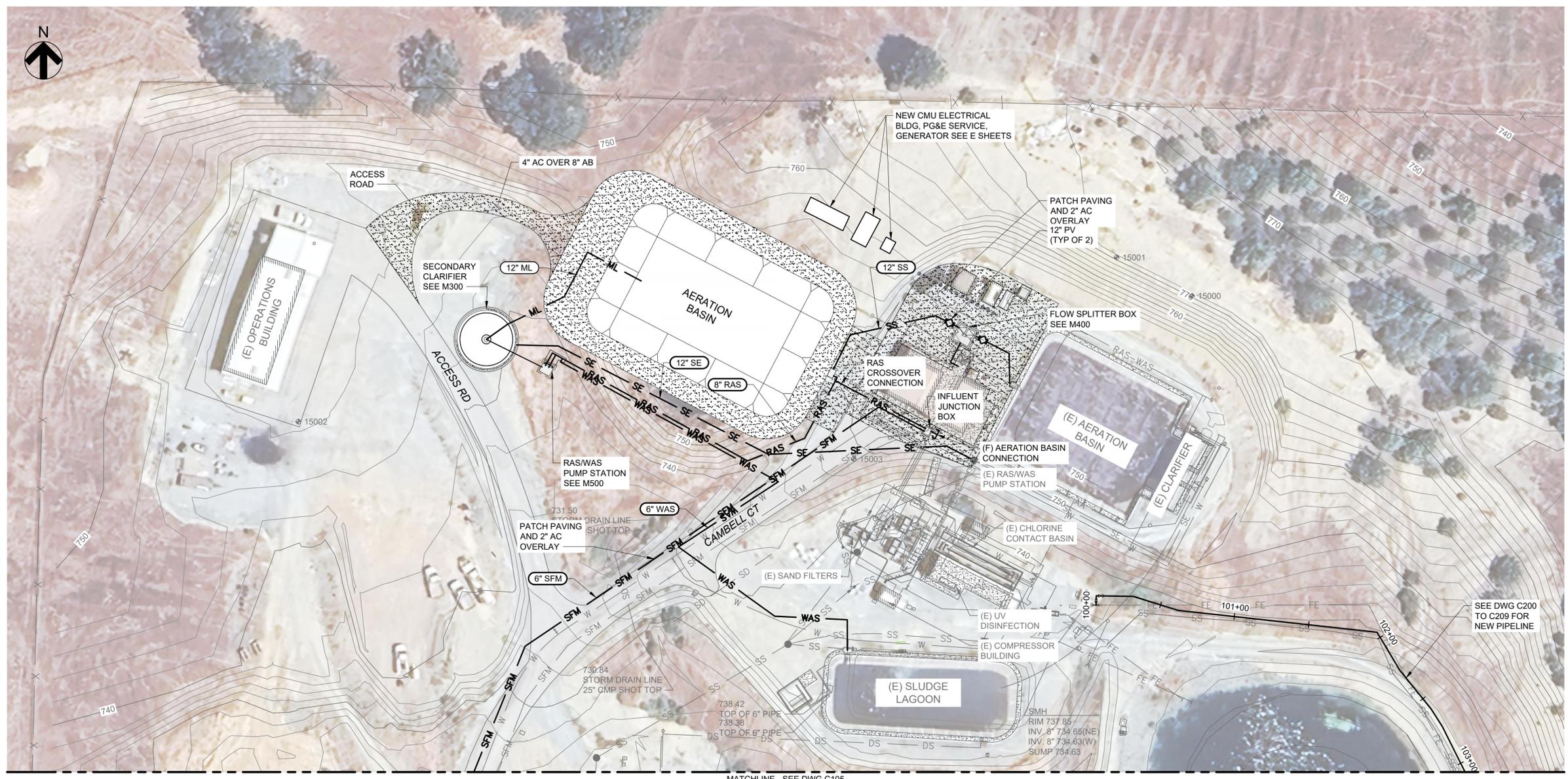
WWTF SITE AND PIPING PLAN  
 BASE SCOPE: INTEGRAL CLARIFIER  
 SHEET 1 OF 2

30%  
 SUBMITTAL  
 NOV 2024

**C104A**  
 DRAWING NUMBER  
 SHEET 11 OF 90

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**WWTF SITE AND PIPING PLAN**  
 SCALE: 1" = 40'-0"

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**CALAVERAS COUNTY  
 WATER DISTRICT**

**LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS**

**WWTF SITE AND PIPING PLAN  
 OPTION 1: SEPARATE CLARIFIER  
 AND RAS/WAS PUMP STATION  
 SHEET 1 OF 2**

**30%  
 SUBMITTAL  
 NOV 2024**

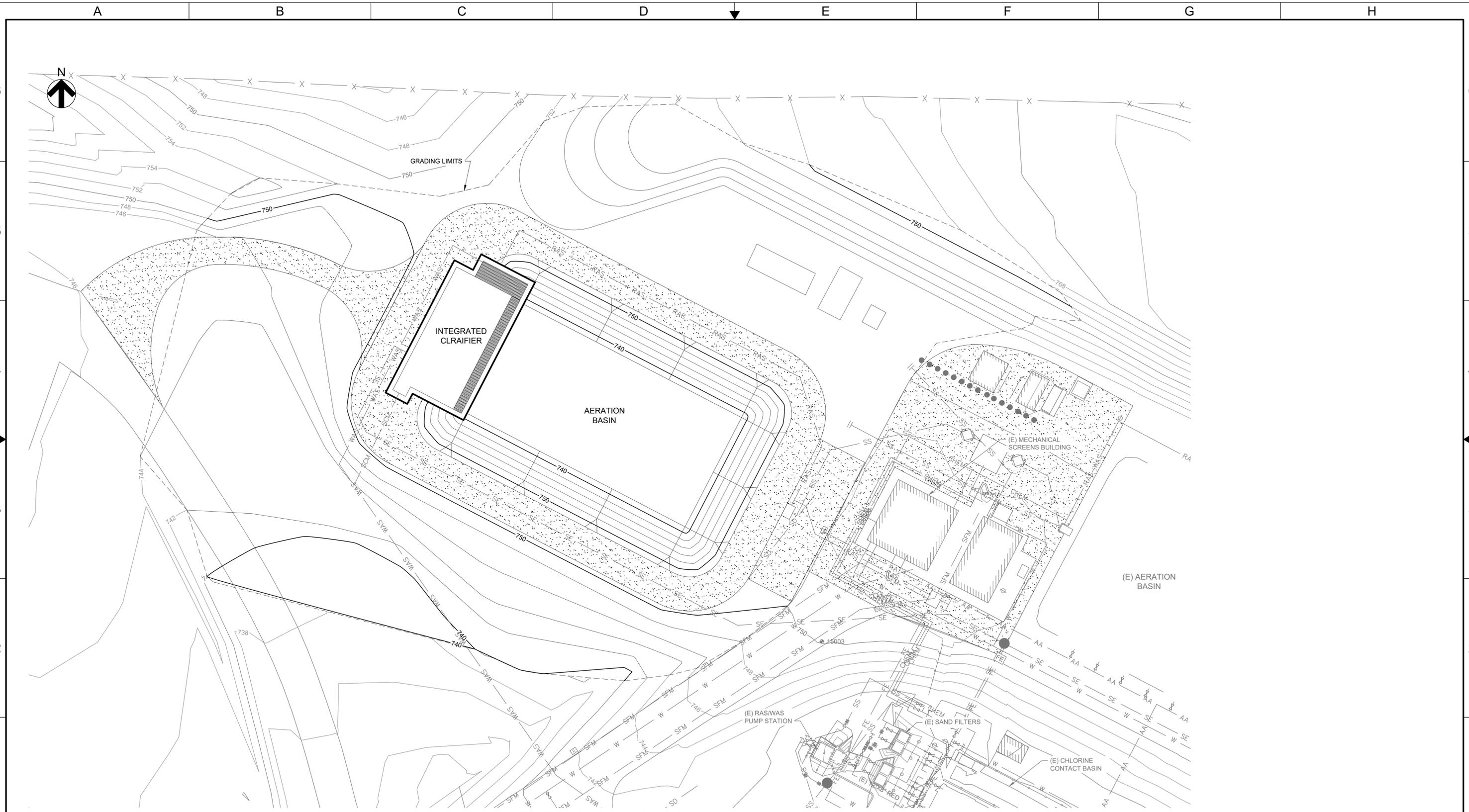
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 SHEET 11 OF 90

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**AERATION BASIN GRADING PLAN**  
SCALE: 1" = 20'-0"

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REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY  
WATER DISTRICT

LA CONTENTA  
WASTEWATER  
TREATMENT FACILITY  
PHASE 3 IMPROVEMENTS

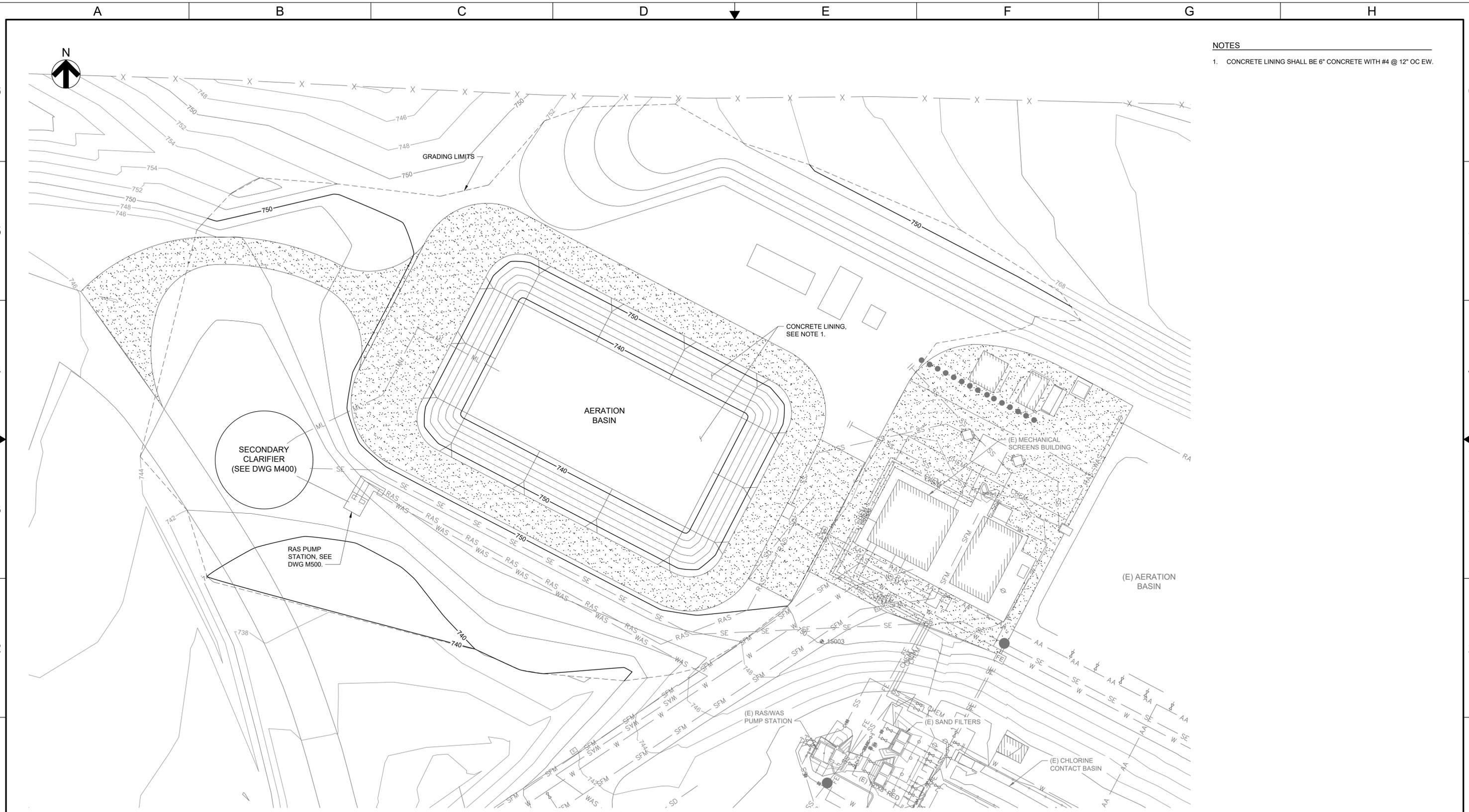
AERATION BASIN GRADING  
AND PAVING PLAN  
BASE SCOPE: INTEGRAL  
CLARIFIER

30%  
SUBMITTAL  
NOV 2024

**C106A**  
DRAWING NUMBER  
SHEET 13 OF 90

**NOTES**  
 1. CONCRETE LINING SHALL BE 6" CONCRETE WITH #4 @ 12" OC EW.

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**AERATION BASIN GRADING PLAN**  
 SCALE: 1" = 20'-0"

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REV	DESCRIPTION	DATE	APVD

**CALAVERAS COUNTY WATER DISTRICT**

**LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS**

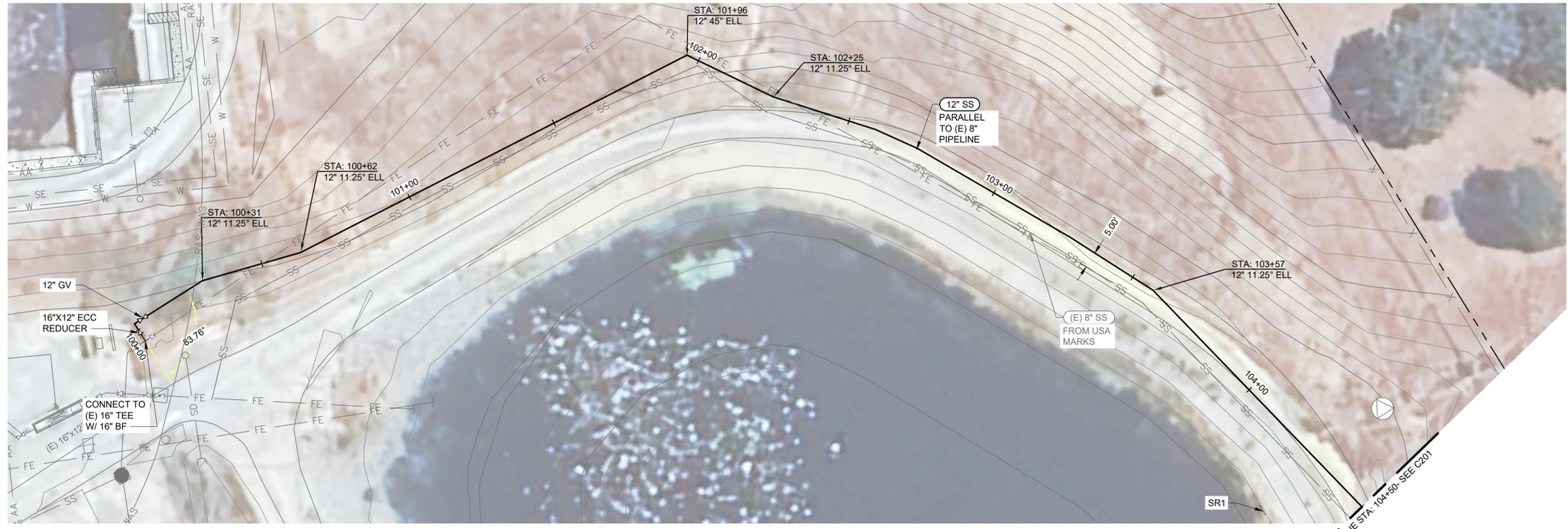
**AERATION BASIN GRADING AND PAVING PLAN  
 OPTION 1: SEPARATE CLARIFIER AND RAS/WAS PUMP STATION**

**30% SUBMITTAL  
 NOV 2024**

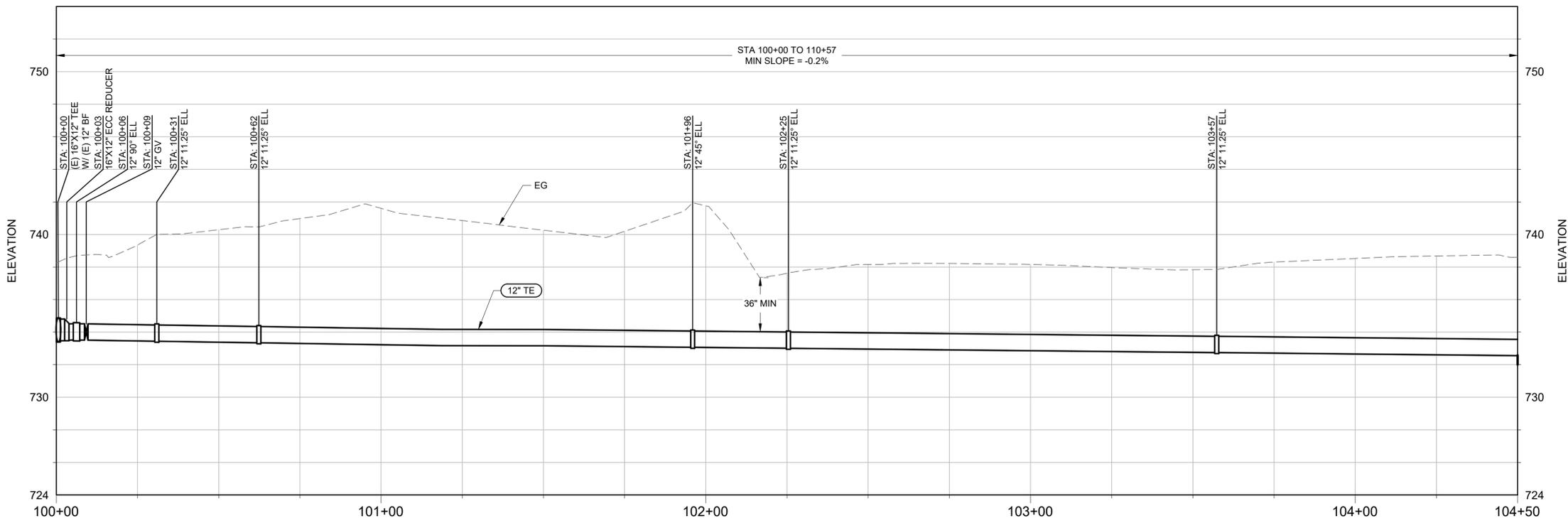
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 SHEET 13 OF 90

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 Plotted By: ANTHONY PEREZ  
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**PLAN - STA: 100+00 TO 104+50**  
 SCALE: 1" = 20'-0"



**PROFILE - STA: 100+00 TO 104+50**  
 HORIZONTAL SCALE: 1" = 20'-0"  
 VERTICAL SCALE: 1" = 4'-0"

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 PROJ. MGR.: WJS

REV	DESCRIPTION	DATE	APVD
REVISIONS			

CALAVERAS COUNTY  
 WATER DISTRICT

LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

PIPELINE PLAN AND PROFILE  
 STA: 100+00 TO 104+50

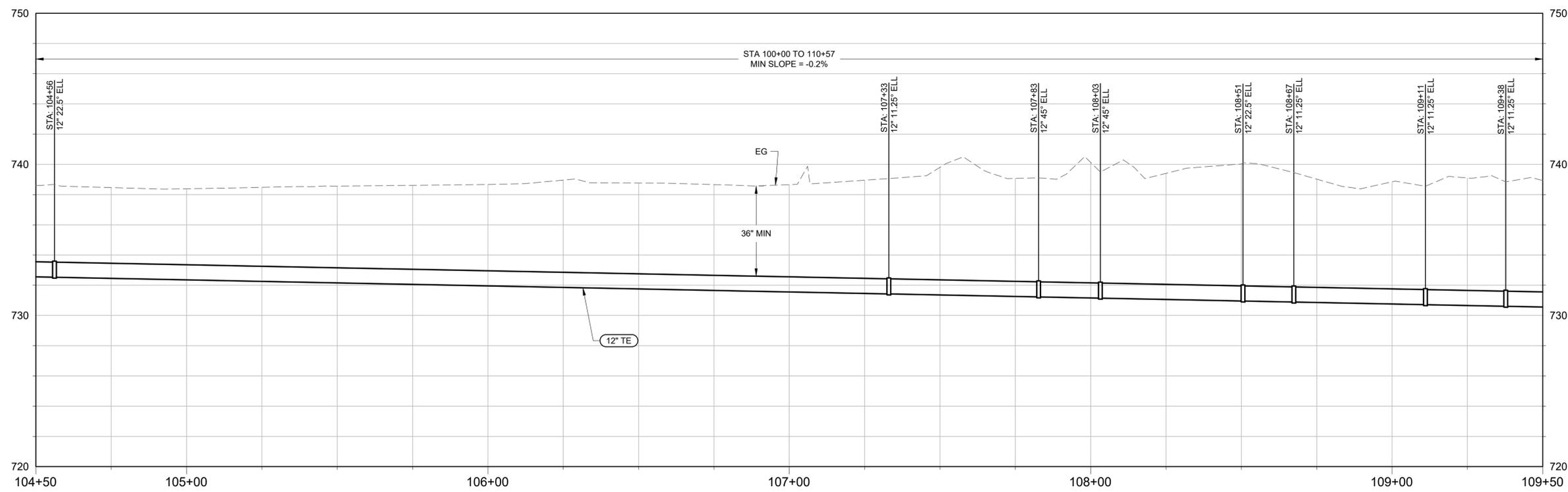
30%  
 SUBMITTAL  
 NOV 2024

**C200**  
 DRAWING NUMBER  
 SHEET 14 OF 90

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**PLAN - STA: 104+50 TO 109+50**  
 SCALE: 1" = 20'-0"



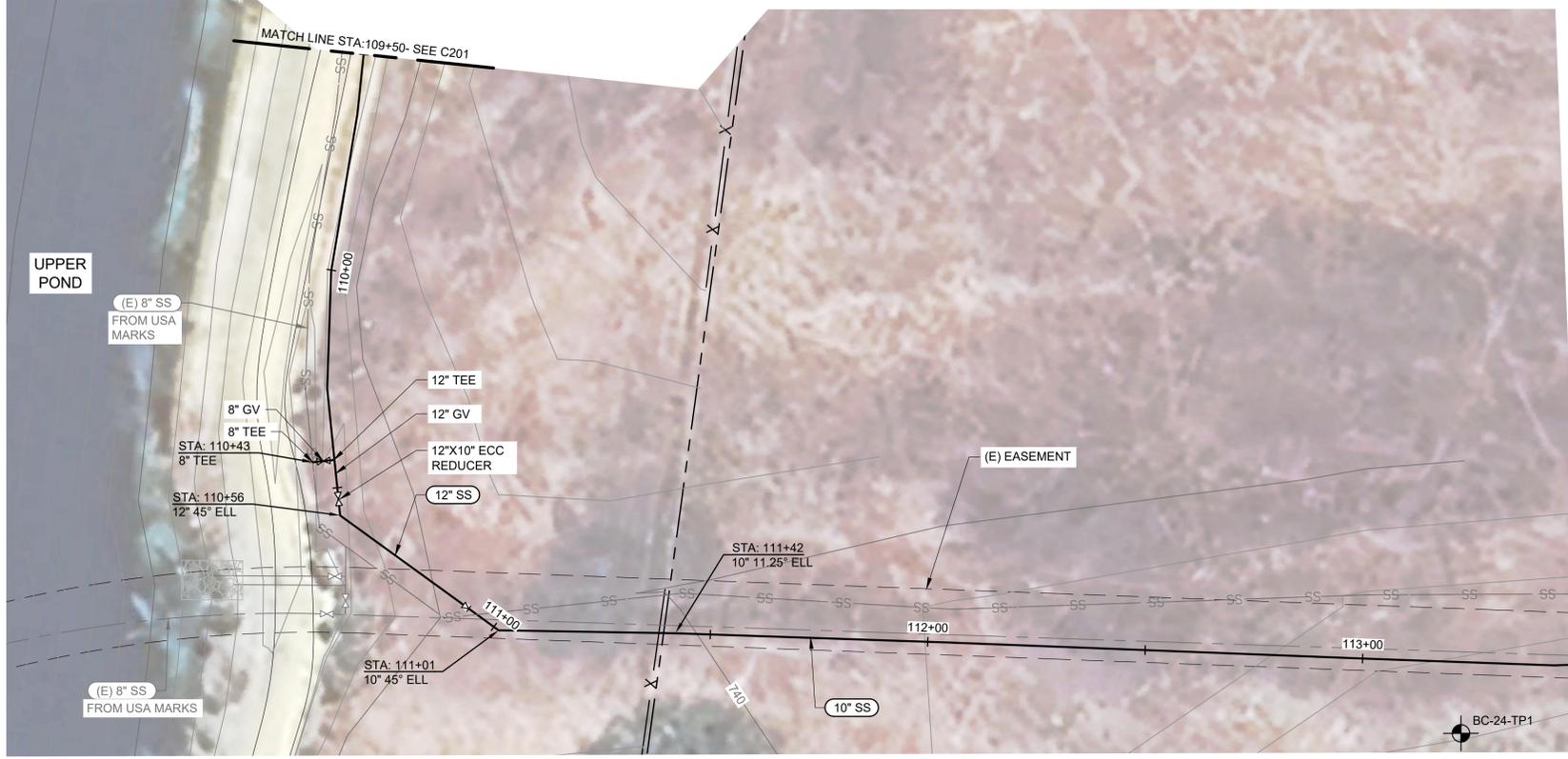
**PROFILE - STA: 104+50 TO 109+50**  
 HORIZONTAL SCALE: 1" = 20'-0"  
 VERTICAL SCALE: 1" = 4'-0"

NOT FOR CONSTRUCTION

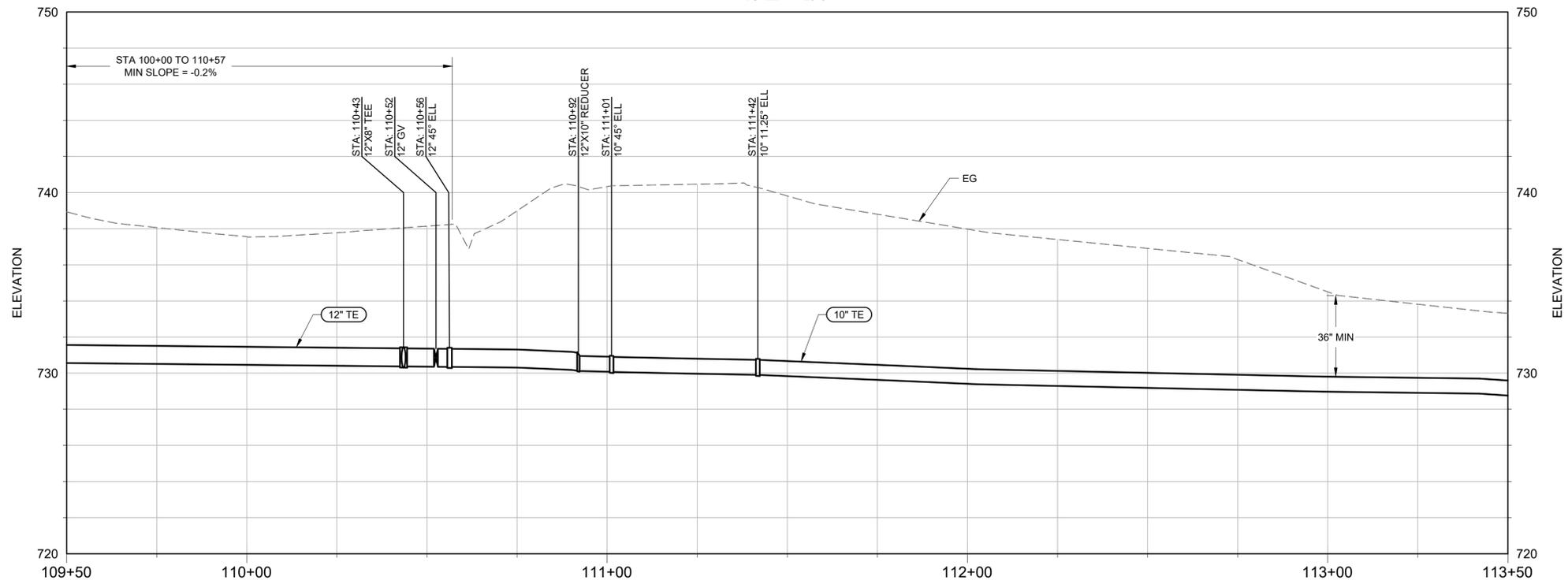
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			REV	DESCRIPTION	DATE	APVD									

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**PLAN - STA: 109+50 TO 113+50**  
 SCALE: 1" = 20'-0"



**PROFILE - STA: 109+50 TO 113+50**  
 HORIZONTAL SCALE: 1" = 20'-0"  
 VERTICAL SCALE: 1" = 4'-0"

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REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY  
 WATER DISTRICT

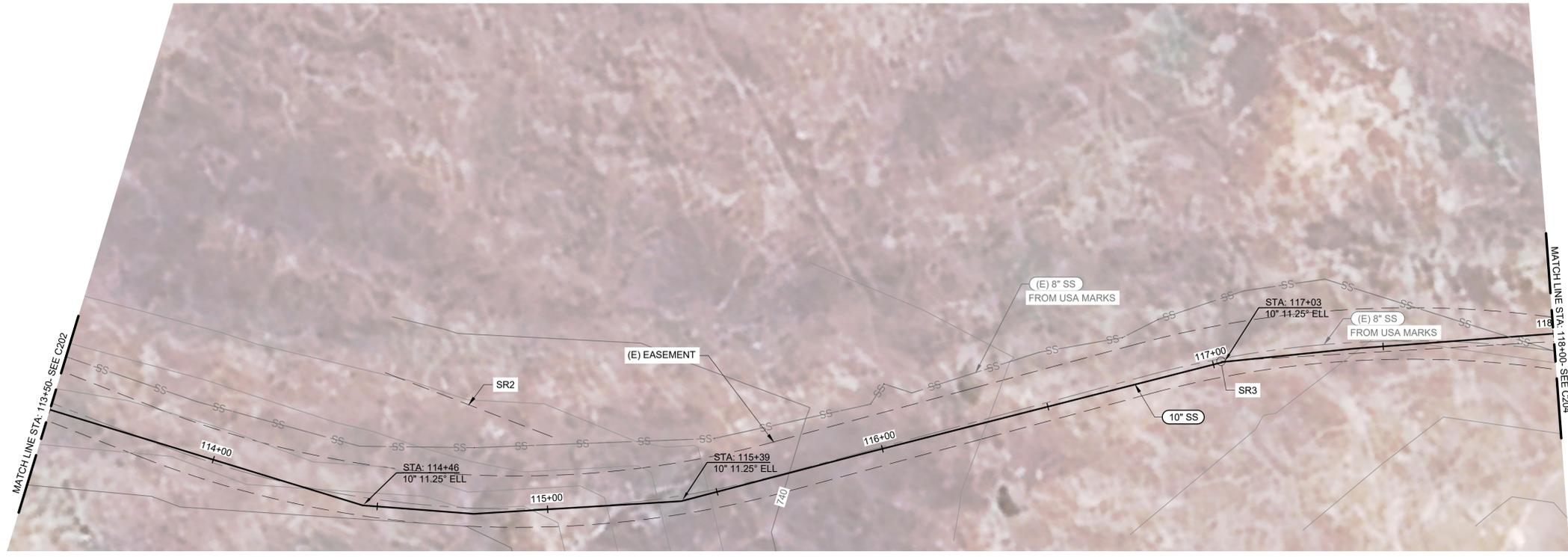
LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

PIPELINE PLAN AND PROFILE  
 STA: 109+50 TO 113+50

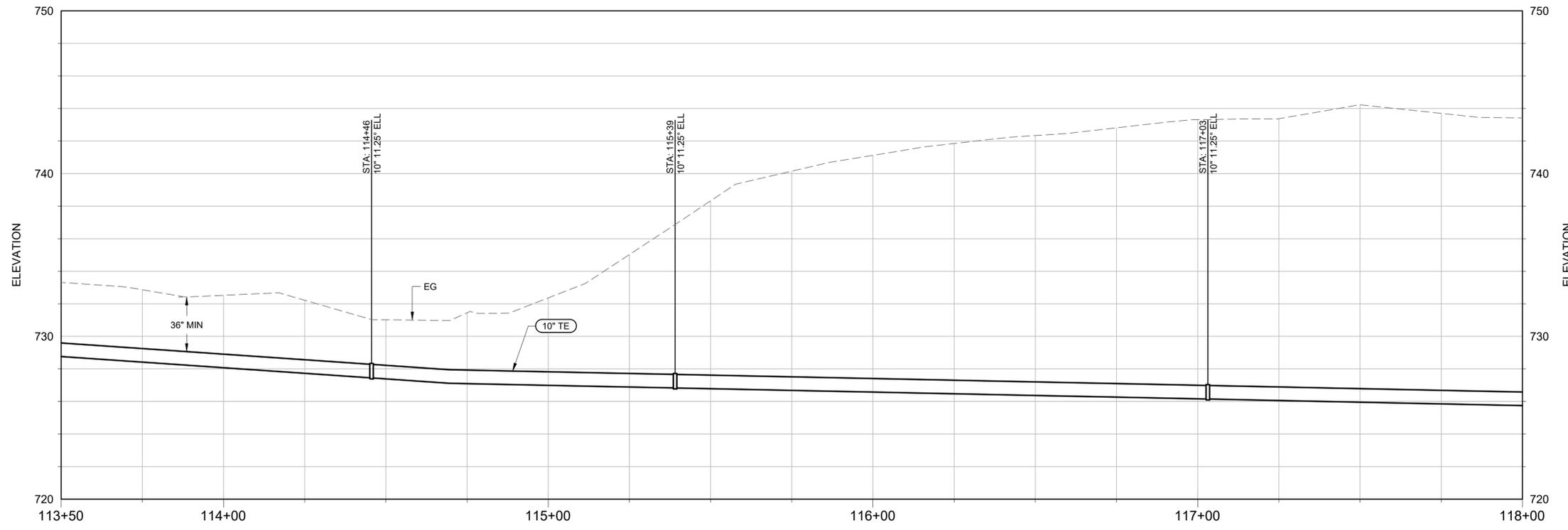
30%  
 SUBMITTAL  
 NOV 2024

**C202**  
 DRAWING NUMBER  
 SHEET 16 OF 90

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**PLAN - STA: 113+50 TO 118+00**  
 SCALE: 1" = 20'-0"



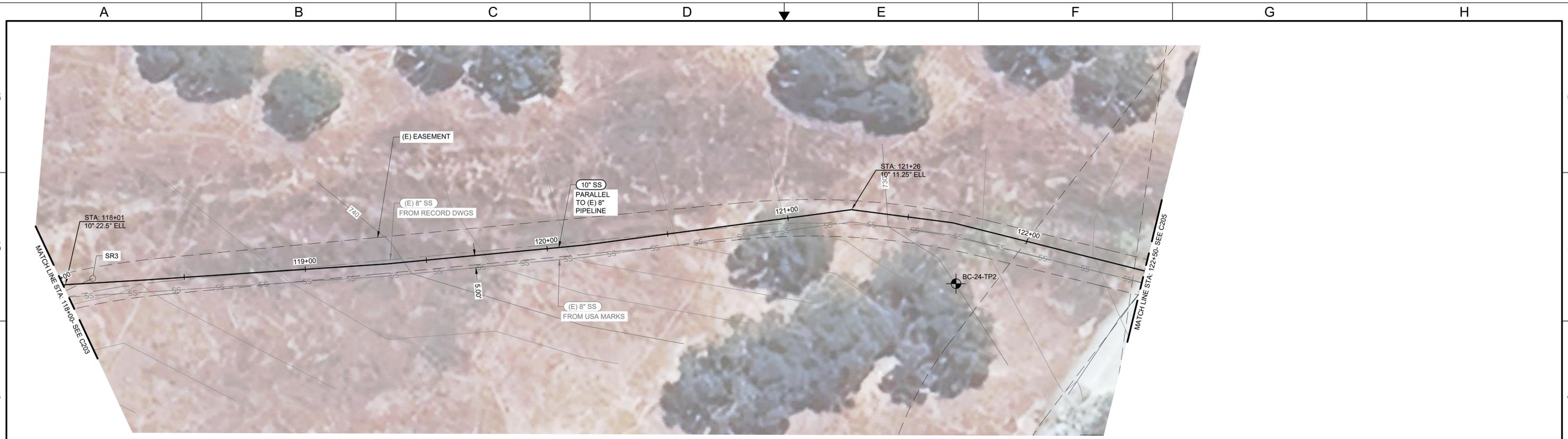
**PROFILE - STA: 113+50 TO 118+00**  
 HORIZONTAL SCALE: 1" = 20'-0"  
 VERTICAL SCALE: 1" = 4'-0"

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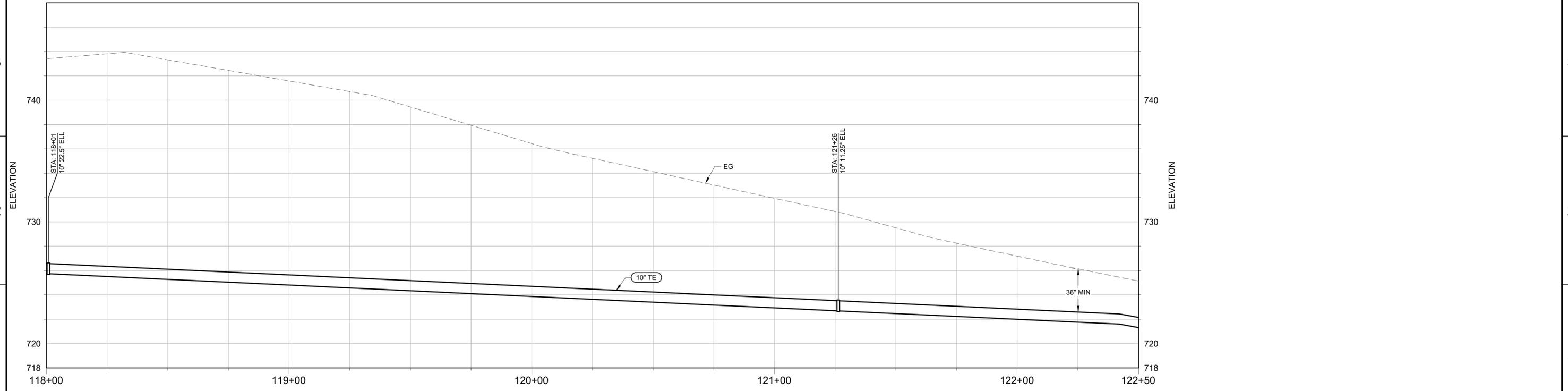
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SHEET 17 OF 90																

A                      B                      C                      D                      E                      F                      G                      H

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**PLAN - STA: 118+00 TO 122+50**  
 SCALE: 1" = 20'-0"



**PROFILE - STA: 118+00 TO 122+50**  
 HORIZONTAL SCALE: 1" = 20'-0"  
 VERTICAL SCALE: 1" = 4'-0"

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REV	DESCRIPTION	DATE	APVD
REVISIONS			

CALAVERAS COUNTY  
 WATER DISTRICT

LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

PIPELINE PLAN AND PROFILE  
 STA: 118+00 TO 122+50

30%  
 SUBMITTAL  
 NOV 2024

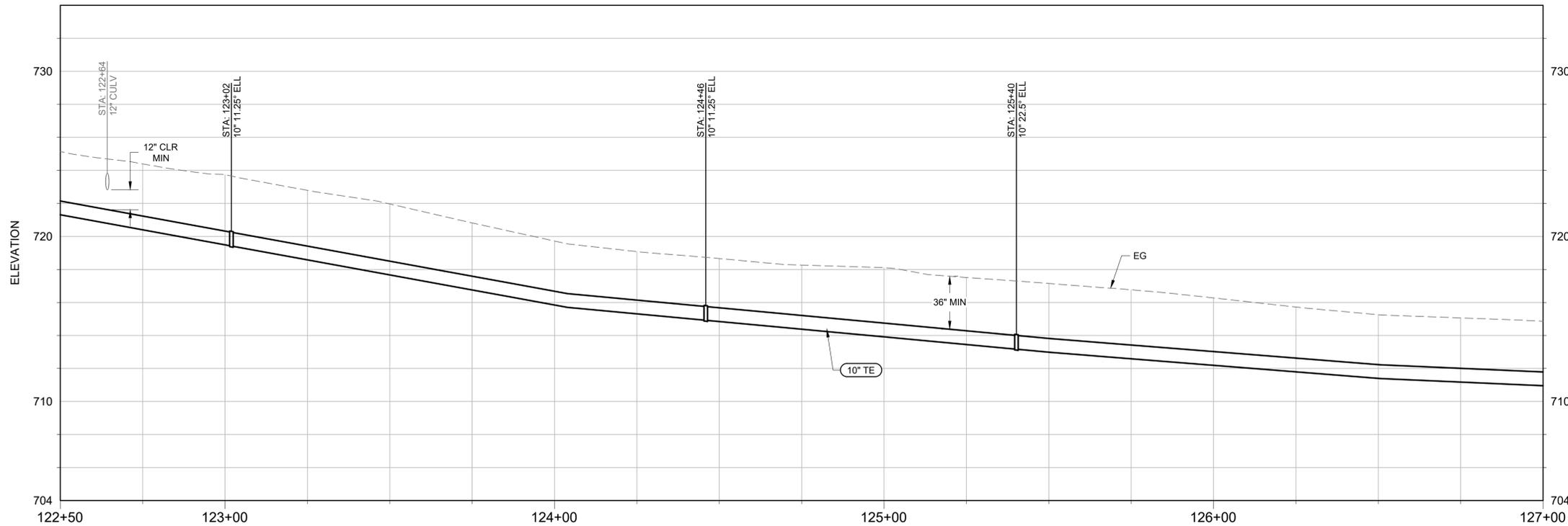
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 Plot Date: 11/13/2024 10:48 AM



PLAN - STA: 122+50 TO 127+00  
 SCALE: 1" = 20'-0"



PROFILE - STA: 122+50 TO 127+00  
 HORIZONTAL SCALE: 1" = 20'-0"  
 VERTICAL SCALE: 1" = 4'-0"

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REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY  
 WATER DISTRICT

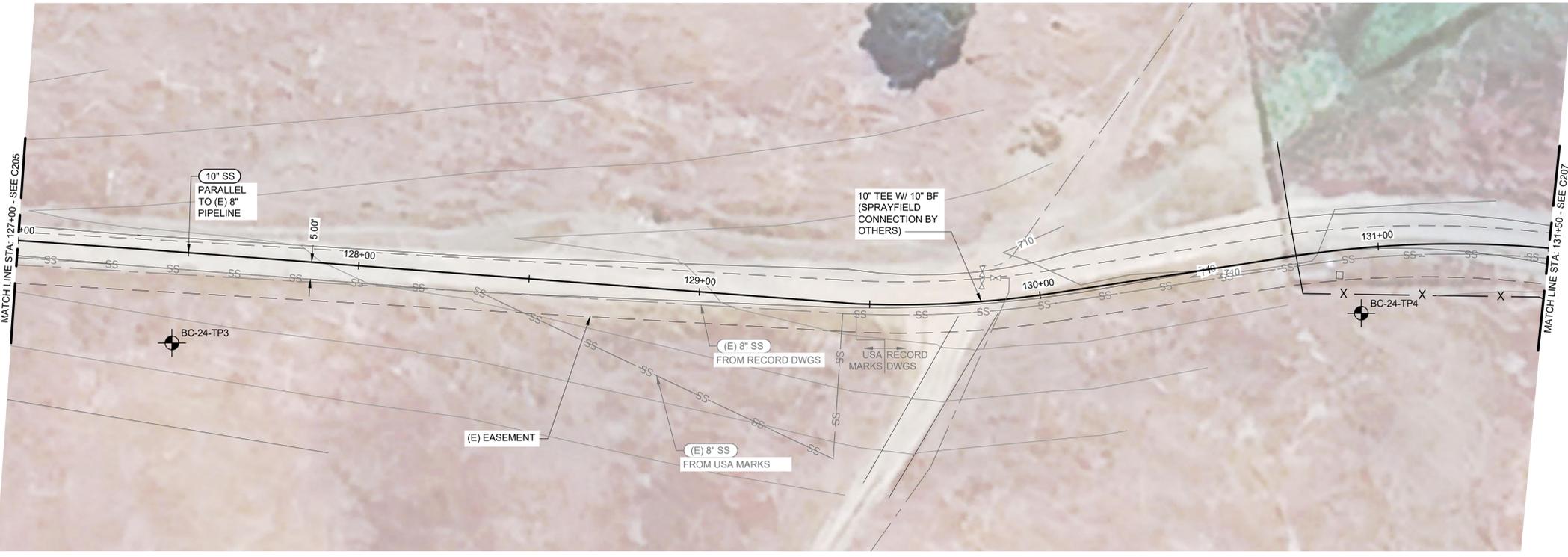
LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

PIPELINE PLAN AND PROFILE  
 STA: 122+50 TO 127+00

30%  
 SUBMITTAL  
 NOV 2024

C205  
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 SHEET 19 OF 90

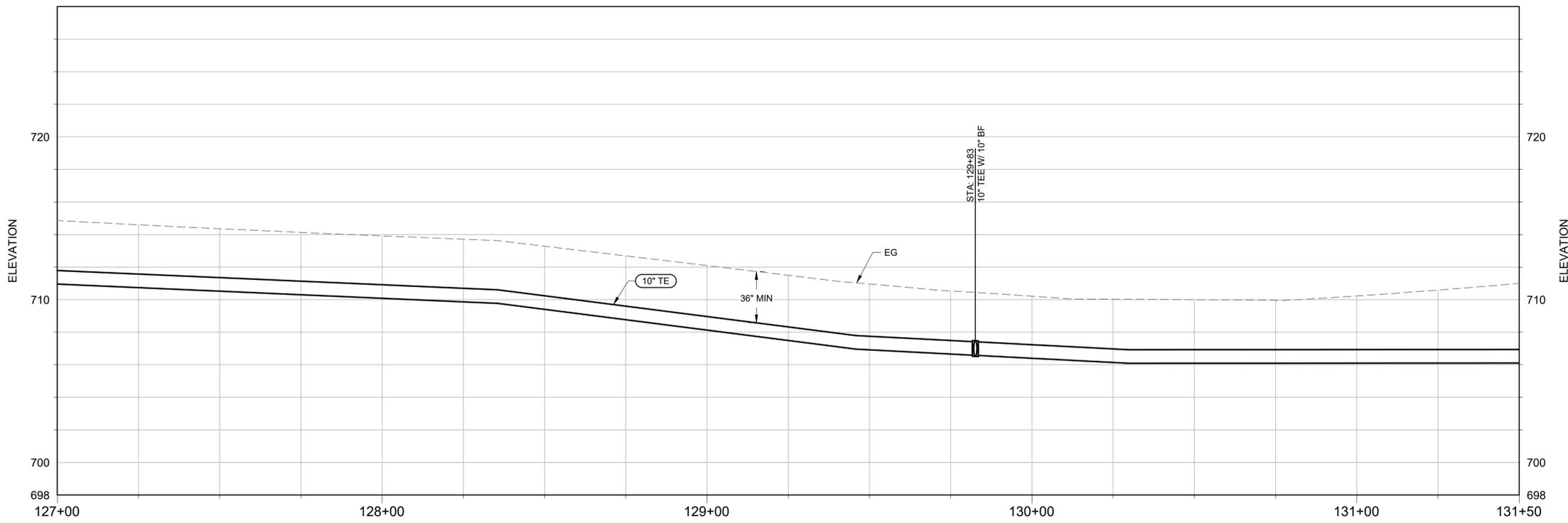
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**PLAN - STA: 127+00 TO 131+50**  
 SCALE: 1" = 20'-0"

**NOTES**

- LOCATION OF (E) 8" SS IS APPROXIMATE FROM STA 29+60 TO STA XX+XX. PRIOR TO TRENCHING OR EXCAVATING WITHIN 5 FT OF THE (E) 8" FE APPROX LOCATION, CONTRACTOR SHALL HAND DIG AND LOCATE (E) 8" FE AND PROTECT IT FROM DAMAGE.



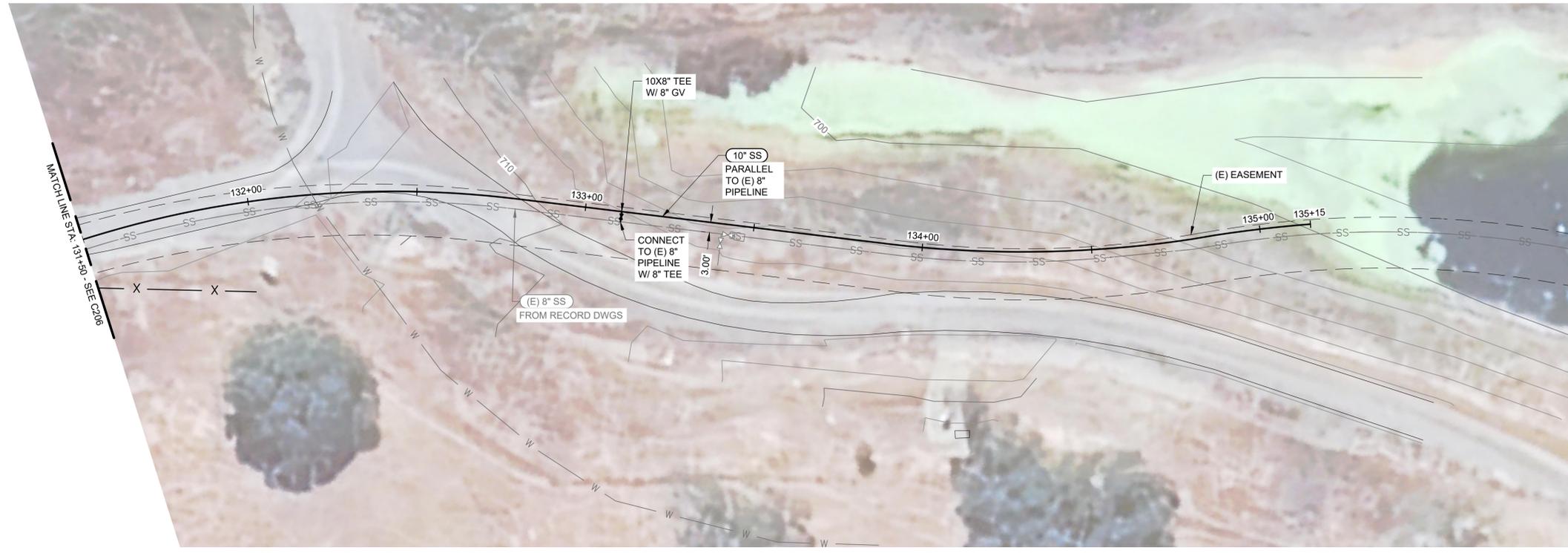
**PROFILE - STA: 127+00 TO 131+50**  
 HORIZONTAL SCALE: 1" = 20'-0"  
 VERTICAL SCALE: 1" = 4'-0"

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REV	DESCRIPTION	DATE	APVD													

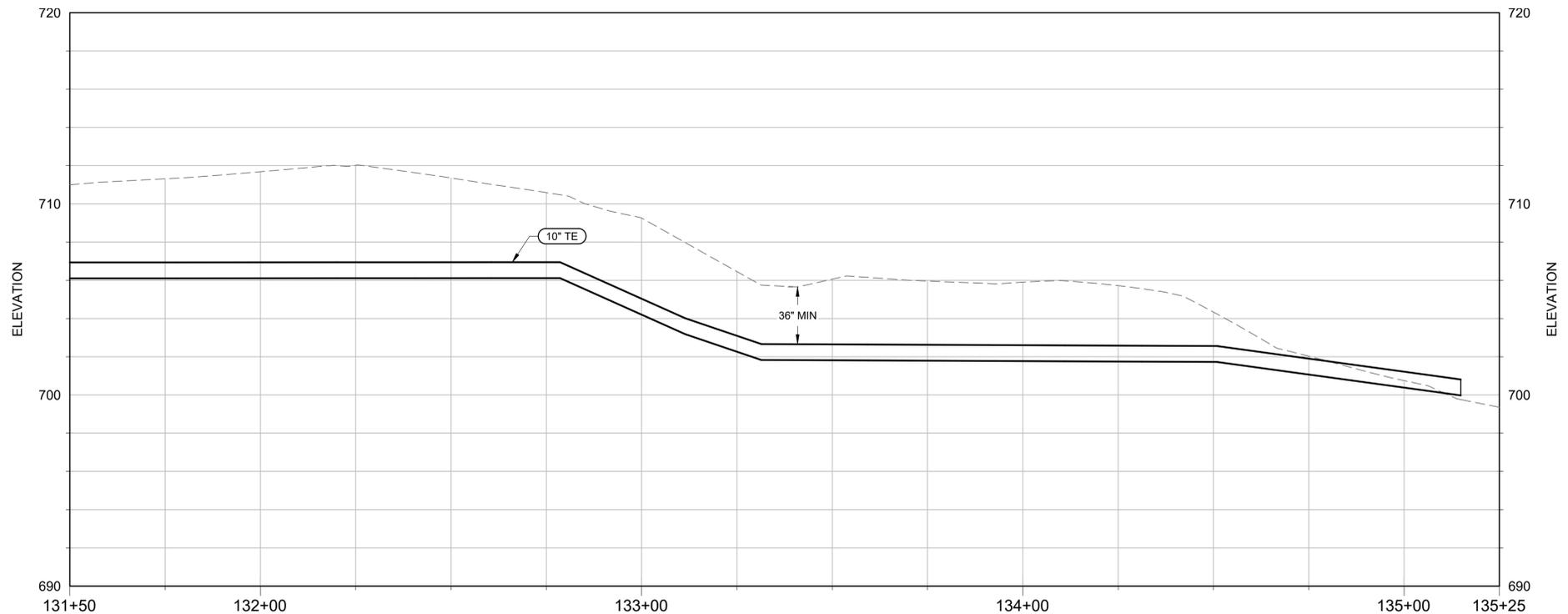
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 Plotted By: ANTHONY PEREZ  
 Plot Date: 11/13/2024 10:48 AM



**PLAN - STA: 131+50 TO 135+75**  
 SCALE: 1" = 20'-0"

- NOTES**
1. LOCATION OF (E) 8" SS IS APPROXIMATE FROM STA 29+60 TO STA XX+XX. PRIOR TO TRENCHING OR EXCAVATING WITHIN 5 FT OF THE (E) 8" FE APPROX LOCATION, CONTRACTOR SHALL HAND DIG AND LOCATE (E) 8" FE AND PROTECT IT FROM DAMAGE.



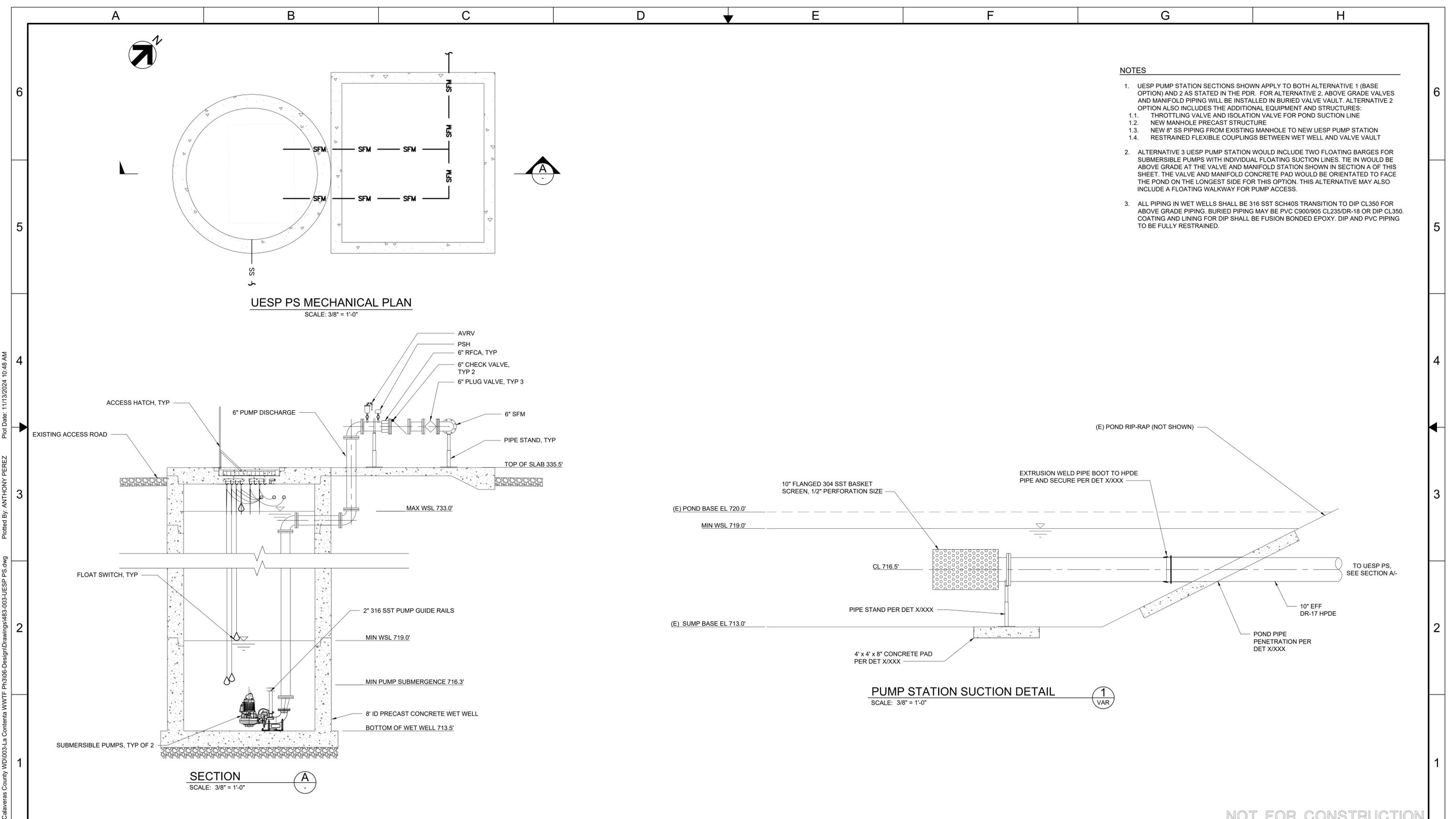
**PROFILE - STA: 131+50 TO 135+25**  
 HORIZONTAL SCALE: 1" = 20'-0"  
 VERTICAL SCALE: 1" = 4'-0"

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 10569 OLD PLACERVILLE RD SACRAMENTO, CA 95827 OFFICE: (916)364-1490 www.hydroscience.com	PAPER SIZE: 22X34 (ANSI D) 0" 1/2" 1" THIS BAR IS 1 INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY.	JOB NO.: 483-003 DATE: 11/13/2024 DRAWN BY: BF/AGP DESIGNED BY: BF PROJ. MGR.: WJS	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 5%;">REV</th> <th style="width: 60%;">DESCRIPTION</th> <th style="width: 15%;">DATE</th> <th style="width: 20%;">APVD</th> </tr> </thead> <tbody> <tr> <td colspan="4" style="text-align: center;">REVISIONS</td> </tr> </tbody> </table>	REV	DESCRIPTION	DATE	APVD	REVISIONS				CALAVERAS COUNTY WATER DISTRICT	LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS	PIPELINE PLAN AND PROFILE STA: 131+50 TO 135+25	30% SUBMITTAL NOV 2024	<b>C207</b> DRAWING NUMBER SHEET 21 OF 90
	REV	DESCRIPTION	DATE	APVD												
REVISIONS																
A	B	C	D	E	F	G	H									



File Name: S:\common\projects\483-Calaveras County\WD0003-La Contenta WWTF Ph3\06-Design\Drawings\483-003-UESP-PS.dwg  
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**UESP PS MECHANICAL PLAN**

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

**SECTION**

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

**PUMP STATION SUCTION DETAIL**

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

**NOTES**

1. UESP PUMP STATION SECTIONS SHOWN APPLY TO BOTH ALTERNATIVE 1 (BASE OPTION) AND 2 AS STATED IN THE PDR. FOR ALTERNATIVE 2, ABOVE GRADE VALVES AND MANIFOLD PIPING WILL BE INSTALLED IN BURIED VALVE VAULT. ALTERNATIVE 2 OPTION ALSO INCLUDES THE ADDITIONAL EQUIPMENT AND STRUCTURES:
  - 1.1. THROTTLING VALVE AND ISOLATION VALVE FOR POND SUCTION LINE
  - 1.2. NEW MANHOLE PRECAST STRUCTURE
  - 1.3. NEW 8" SS PIPING FROM EXISTING MANHOLE TO NEW UESP PUMP STATION
  - 1.4. RESTRAINED FLEXIBLE COUPLINGS BETWEEN WET WELL AND VALVE VAULT
2. ALTERNATIVE 3 UESP PUMP STATION WOULD INCLUDE TWO FLOATING BARGES FOR SUBMERSIBLE PUMPS WITH INDIVIDUAL FLOATING SUCTION LINES. TIE IN WOULD BE ABOVE GRADE AT THE VALVE AND MANIFOLD STATION SHOWN IN SECTION A OF THIS SHEET. THE VALVE AND MANIFOLD CONCRETE PAD WOULD BE ORIENTATED TO FACE THE POND ON THE LONGEST SIDE FOR THIS OPTION. THIS ALTERNATIVE MAY ALSO INCLUDE A FLOATING WALKWAY FOR PUMP ACCESS.
3. ALL PIPING IN WET WELLS SHALL BE 316 SST SCH40S TRANSITION TO DIP CL350 FOR ABOVE GRADE PIPING. BURIED PIPING MAY BE PVC C900/905 CL235/DR-18 OR DIP CL350. COATING AND LINING FOR DIP SHALL BE FUSION BONDED EPOXY. DIP AND PVC PIPING TO BE FULLY RESTRAINED.

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 DESIGNED BY: DESIGNED\_BY  
 PROJ. MGR.: PROJ\_MAN

REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY WATER DISTRICT

LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

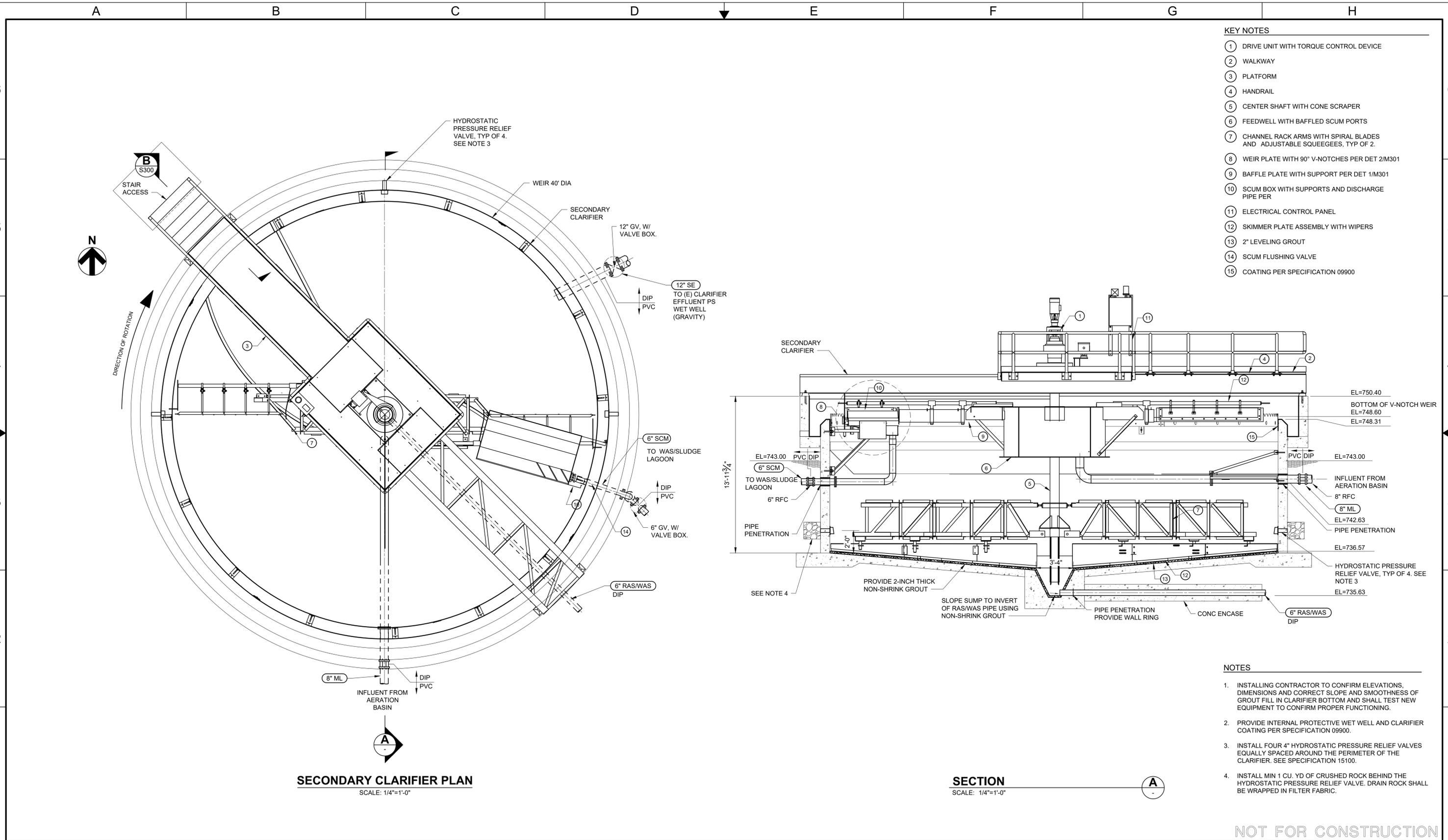
UESP PS MECHANICAL PLAN & SECTION

30% SUBMITTAL NOV 2024

M200  
 DRAWING NUMBER  
 SHEET 26 OF 90

A B C D E F G H

File Name: S:\common\projects\483-Calaveras County\WD0003-La Contenta WWTF Ph3\106-Design\Drawings\483-003-M300 2ndary Clarifier P&S.dwg  
 Plotted By: ANTHONY PEREZ  
 Plot Date: 11/13/2024 10:48 AM



- KEY NOTES**
- ① DRIVE UNIT WITH TORQUE CONTROL DEVICE
  - ② WALKWAY
  - ③ PLATFORM
  - ④ HANDRAIL
  - ⑤ CENTER SHAFT WITH CONE SCRAPER
  - ⑥ FEEDWELL WITH BAFFLED SCUM PORTS
  - ⑦ CHANNEL RACK ARMS WITH SPIRAL BLADES AND ADJUSTABLE SQUEEGEES, TYP OF 2.
  - ⑧ WEIR PLATE WITH 90° V-NOTCHES PER DET 2/M301
  - ⑨ BAFFLE PLATE WITH SUPPORT PER DET 1/M301
  - ⑩ SCUM BOX WITH SUPPORTS AND DISCHARGE PIPE PER
  - ⑪ ELECTRICAL CONTROL PANEL
  - ⑫ SKIMMER PLATE ASSEMBLY WITH WIPERS
  - ⑬ 2" LEVELING GROUT
  - ⑭ SCUM FLUSHING VALVE
  - ⑮ COATING PER SPECIFICATION 09900

**SECONDARY CLARIFIER PLAN**  
SCALE: 1/4"=1'-0"

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

- NOTES**
1. INSTALLING CONTRACTOR TO CONFIRM ELEVATIONS, DIMENSIONS AND CORRECT SLOPE AND SMOOTHNESS OF GROUT FILL IN CLARIFIER BOTTOM AND SHALL TEST NEW EQUIPMENT TO CONFIRM PROPER FUNCTIONING.
  2. PROVIDE INTERNAL PROTECTIVE WET WELL AND CLARIFIER COATING PER SPECIFICATION 09900.
  3. INSTALL FOUR 4" HYDROSTATIC PRESSURE RELIEF VALVES EQUALLY SPACED AROUND THE PERIMETER OF THE CLARIFIER. SEE SPECIFICATION 15100.
  4. INSTALL MIN 1 CU. YD OF CRUSHED ROCK BEHIND THE HYDROSTATIC PRESSURE RELIEF VALVE. DRAIN ROCK SHALL BE WRAPPED IN FILTER FABRIC.

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 PROJ. MGR.: WJS

REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY  
 WATER DISTRICT

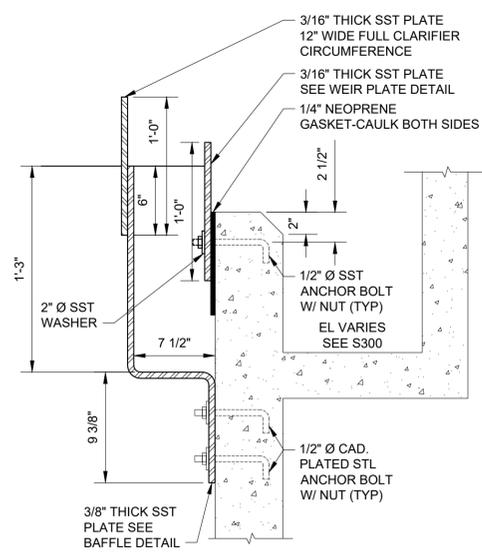
LA CONTENTA  
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 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

SECONDARY CLARIFIER  
 PLAN & SECTION

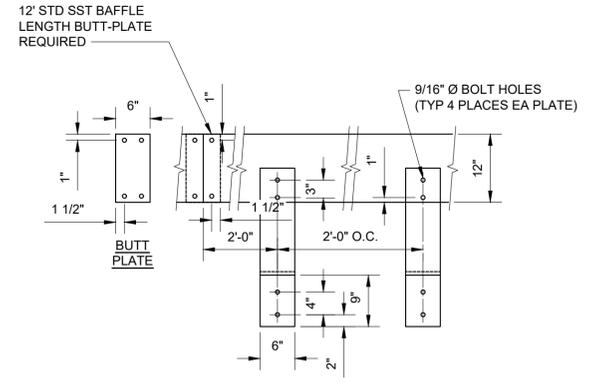
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 NOV 2024

M300  
 DRAWING NUMBER  
 SHEET 27 OF 90

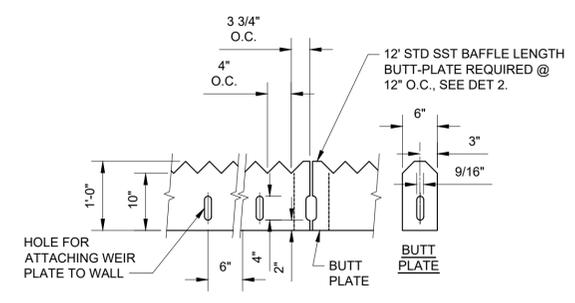
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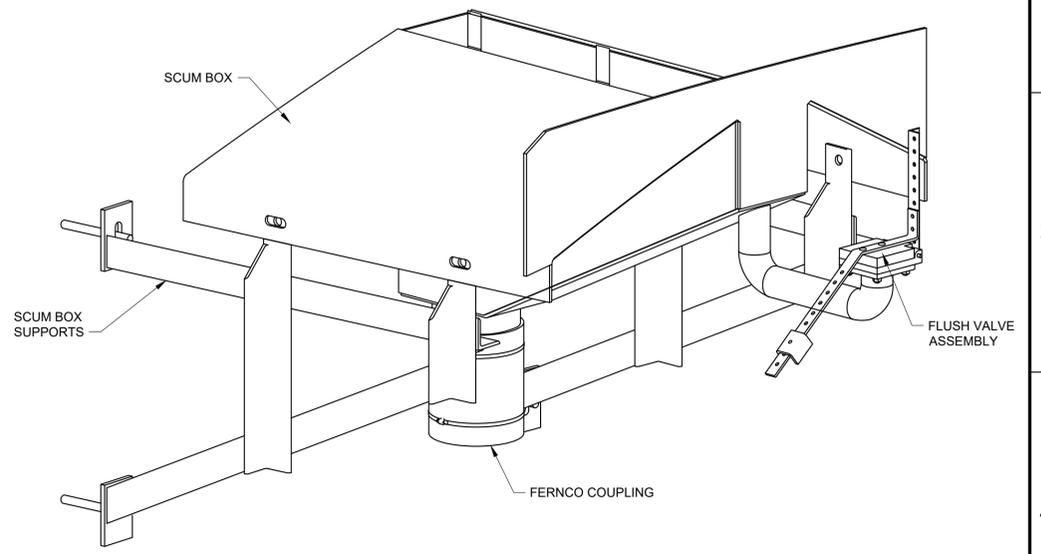
**SECTION A**  
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NOTE: GAF



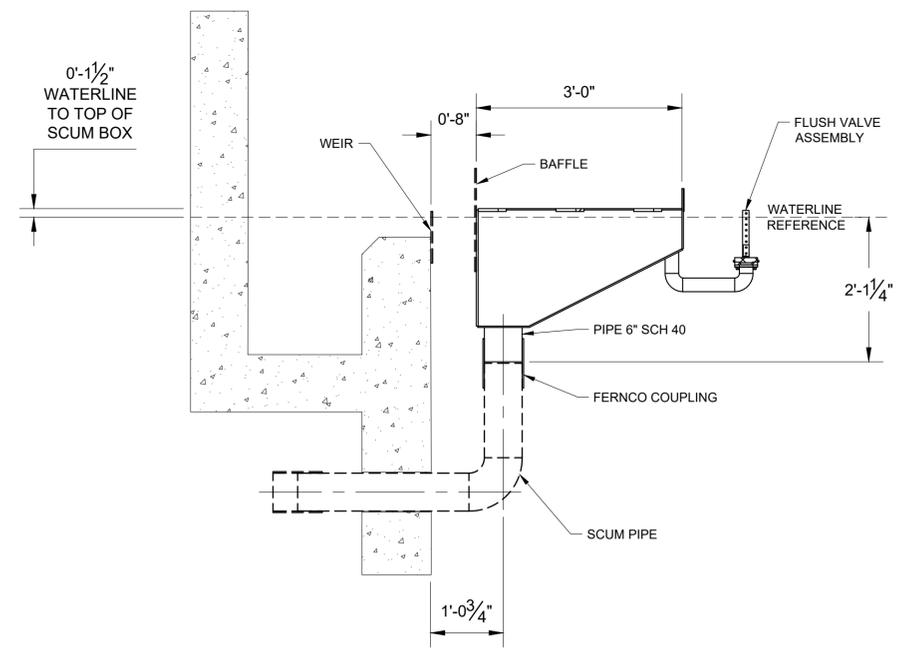
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SCALE: NTS  
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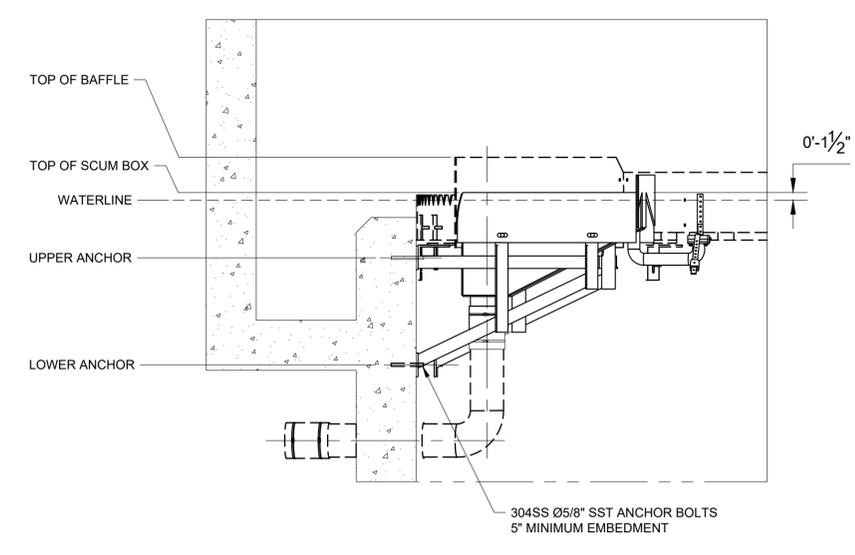
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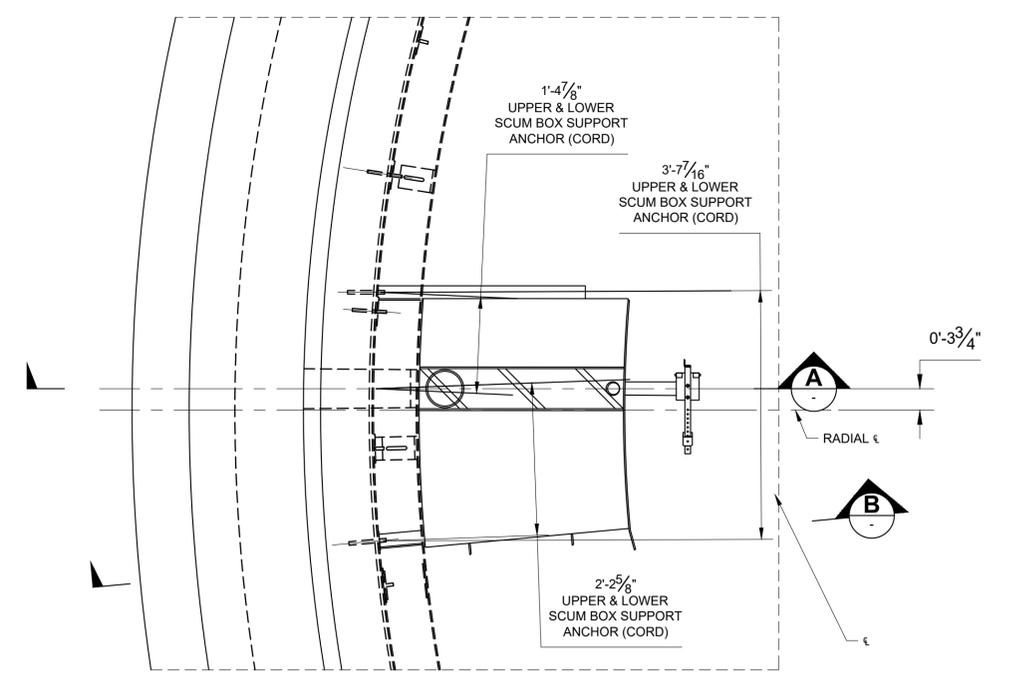
**ISOMETRIC**  
SCALE: NTS



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



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



**PARTIAL PLAN**  
SCALE: 3/4"=1'-0"

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PROJ. MGR.: WJS

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CALAVERAS COUNTY  
WATER DISTRICT

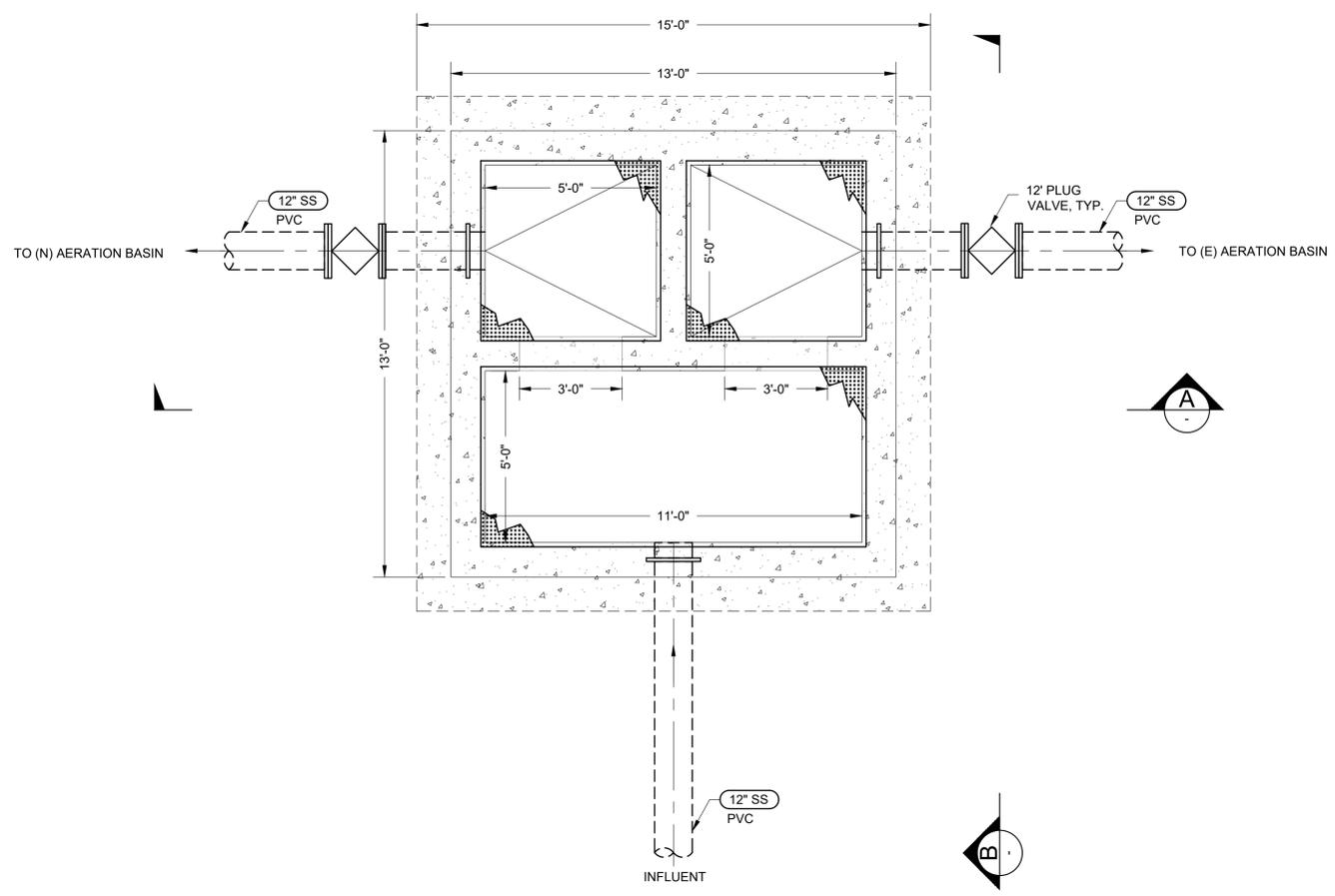
LA CONTENTA  
WASTEWATER  
TREATMENT FACILITY  
PHASE 3 IMPROVEMENTS

SECONDARY CLARIFIER  
SECTION & DETAILS

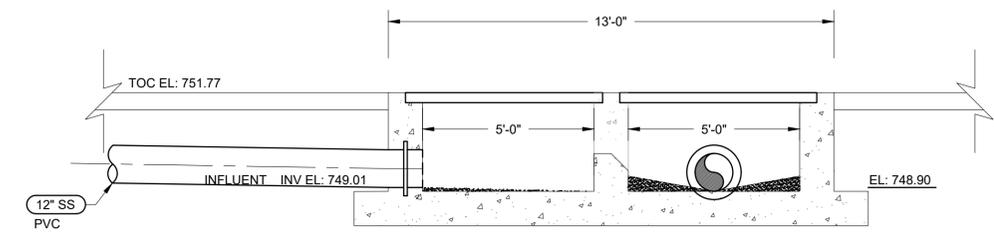
30%  
SUBMITTAL  
NOV 2024

M301  
DRAWING NUMBER  
SHEET 28 OF 90

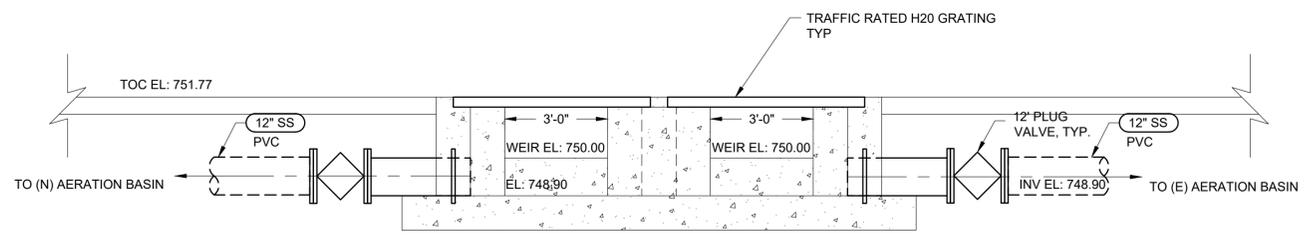
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**FLOW SPLITTER BOX BOX PLAN**  
 SCALE: 3/8" = 1'-0"



**SECTION B**  
 SCALE: 3/8" = 1'-0"



**SECTION A**  
 SCALE: 3/8" = 1'-0"

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 PHASE 3 IMPROVEMENTS

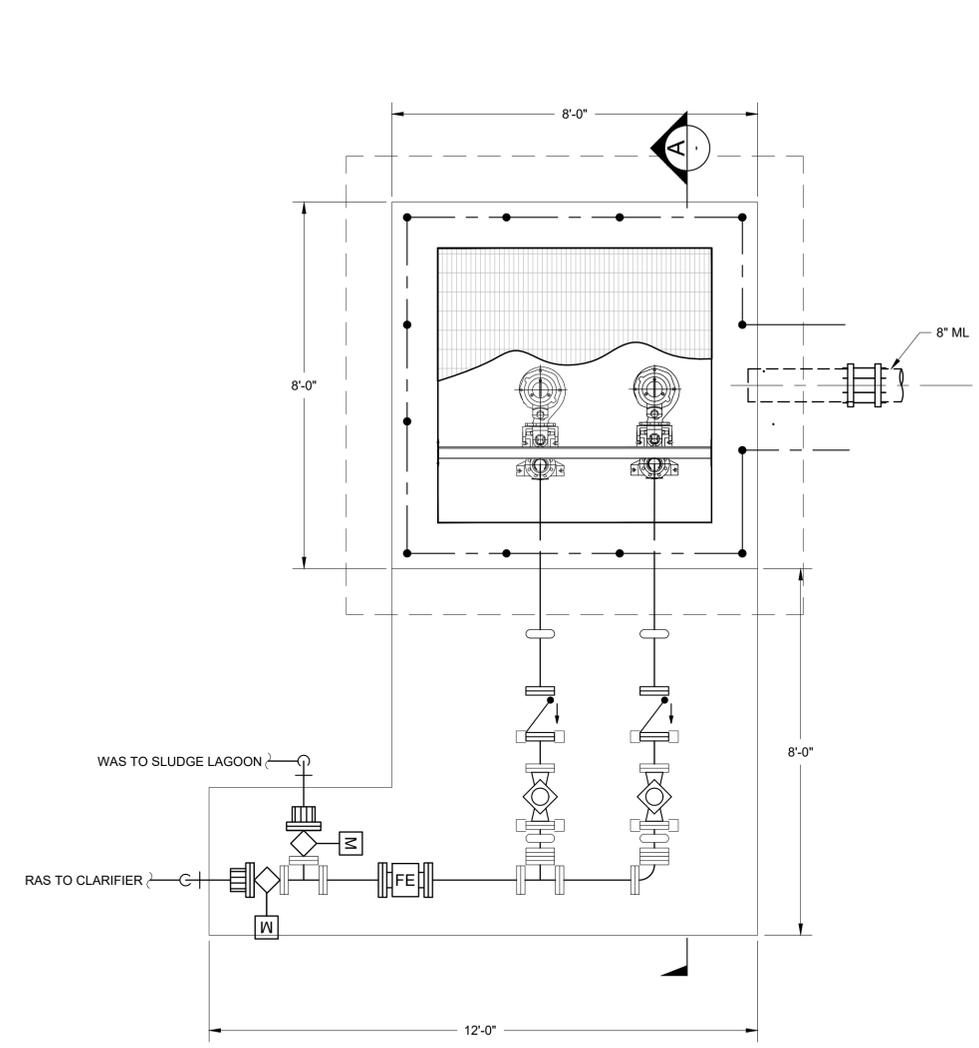
FLOW SPLITTER BOX  
 PLAN & SECTIONS

30%  
 SUBMITTAL  
 NOV 2024

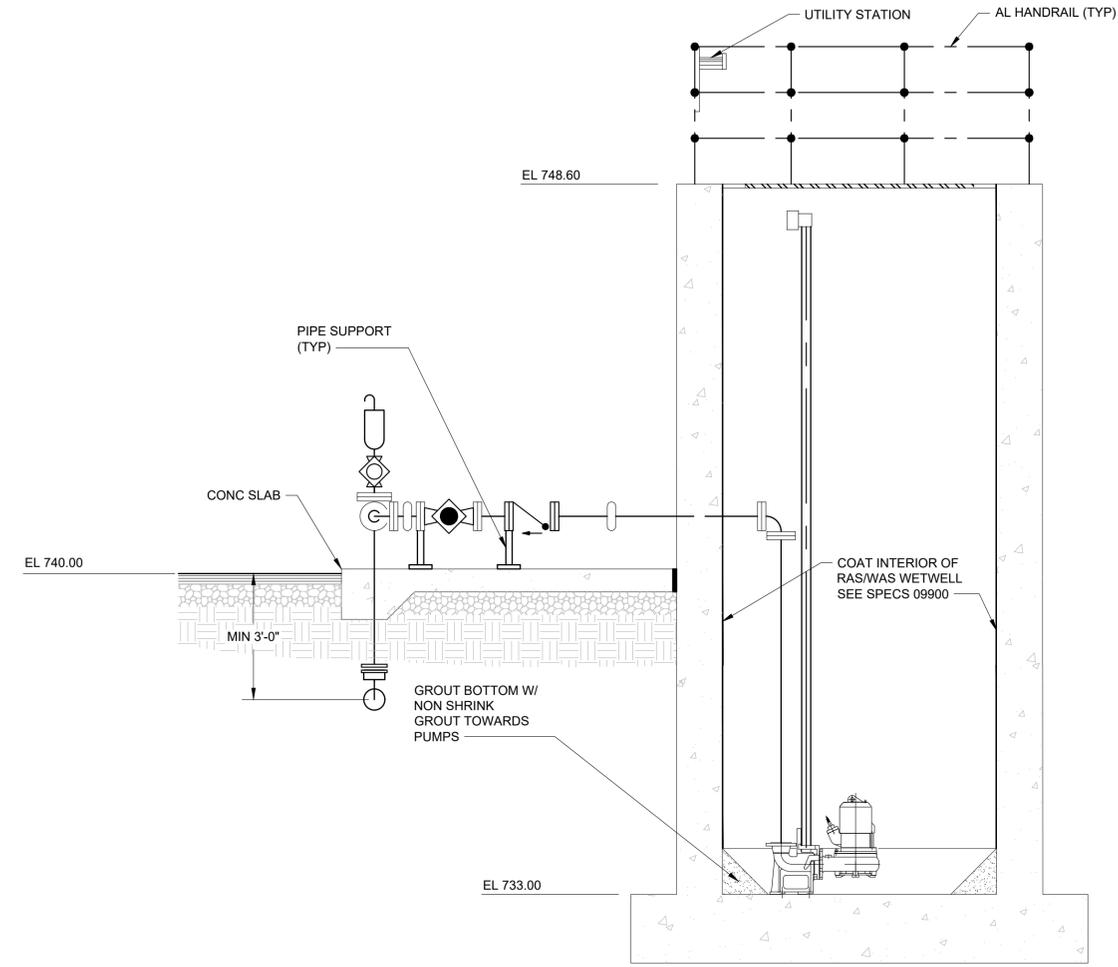
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**RAS/WAS PS PLAN**  
 1/2" = 1'-0"



**RAS/WAS PS SECTION**  
 SCALE: 1/2" = 1'-0"

**OPTION 1B: SUBMERSIBLE PUMPS IN PRECAST WET WELL**

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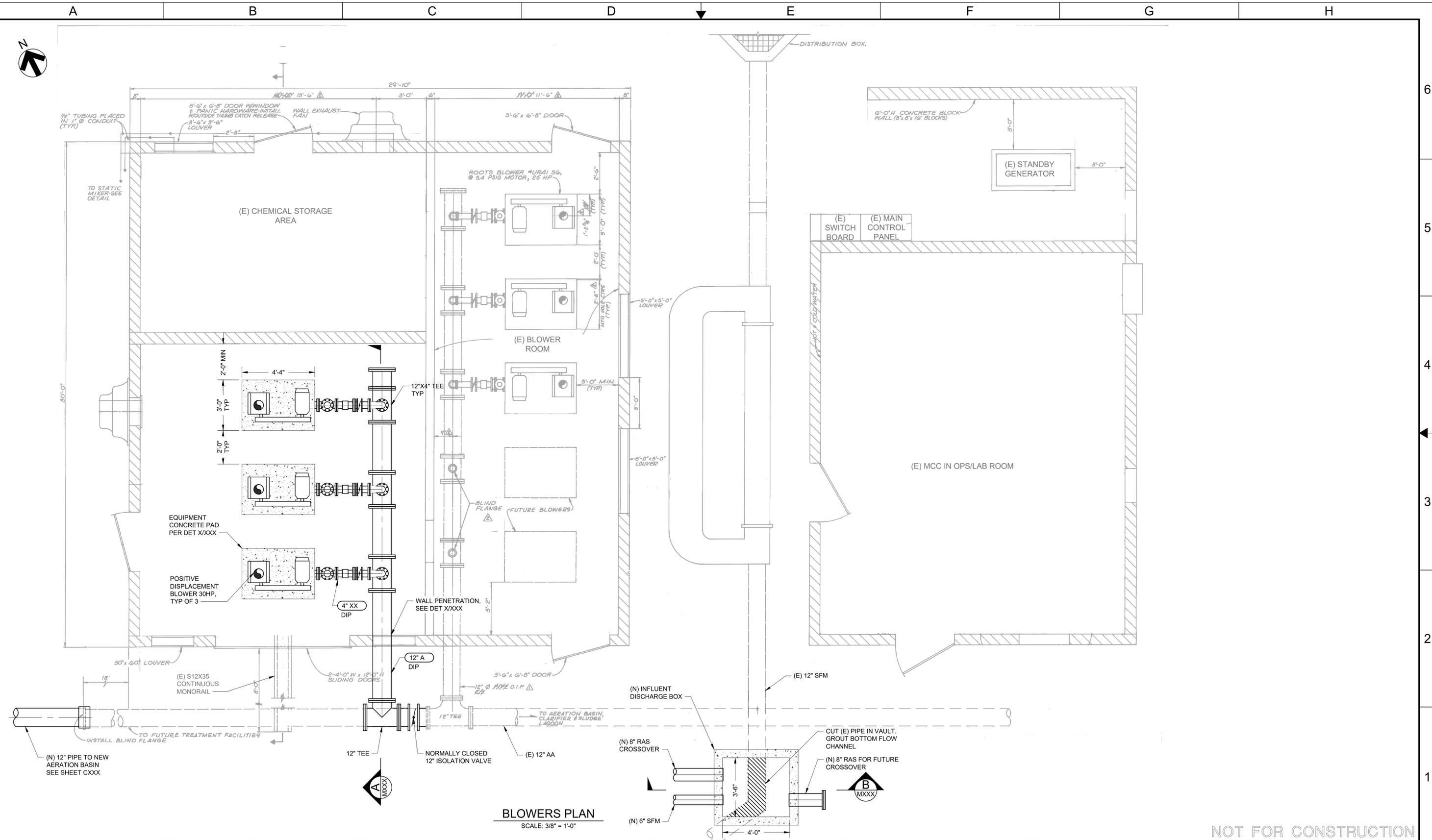
LA CONTENTA  
 WASTEWATER  
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 PHASE 3 IMPROVEMENTS

MECHANICAL PLAN  
 OPTION 1: SEPARATE CLARIFIER  
 AND RAS/WAS PUMP STATION

30%  
 SUBMITTAL  
 NOV 2024

**M500**  
 DRAWING NUMBER  
 SHEET 30 OF 90

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File Name: S:\common\projects\483-Calaveras County\WD0003-La Contenta\WWT\Ph3\106-Design\Drawings\483-003-M600 BLOWER.dwg



**BLOWERS PLAN**  
SCALE: 3/8" = 1'-0"

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	REVISIONS										

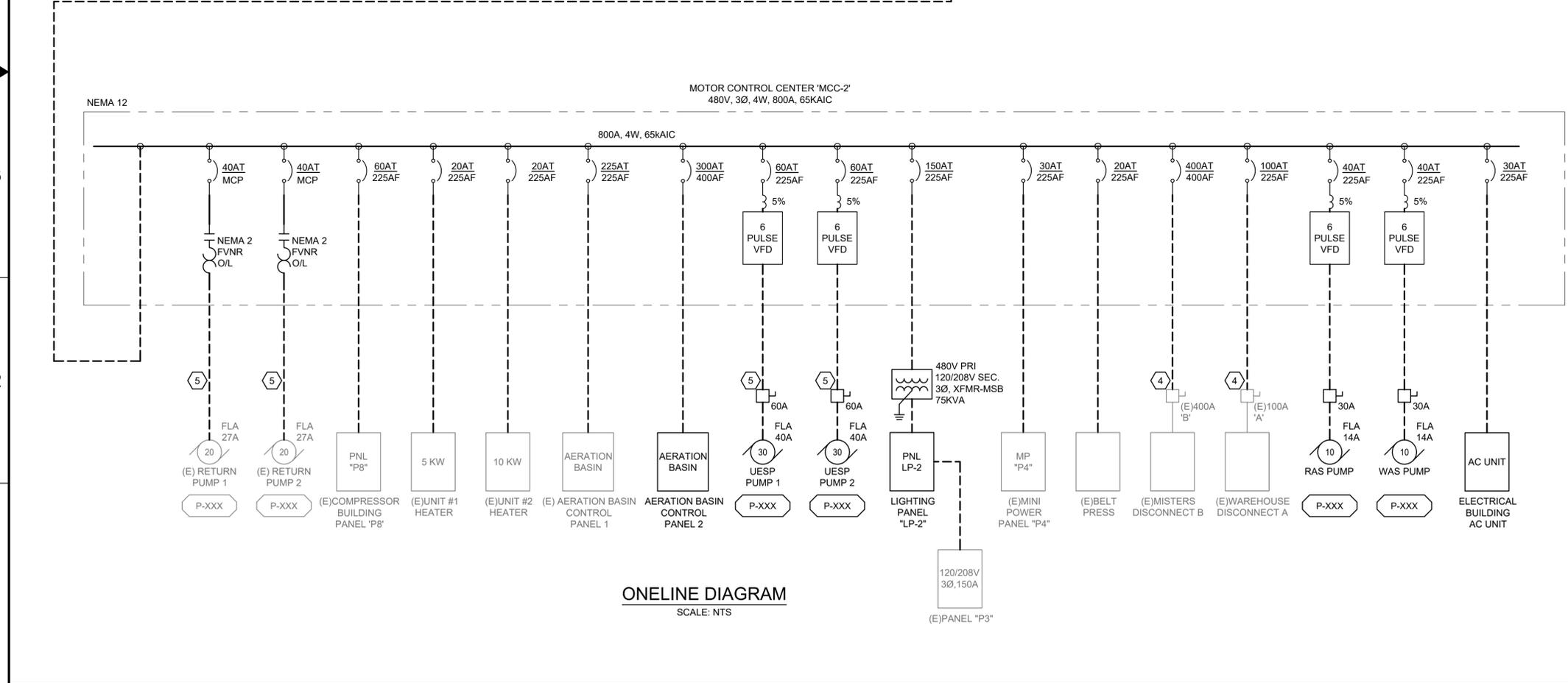
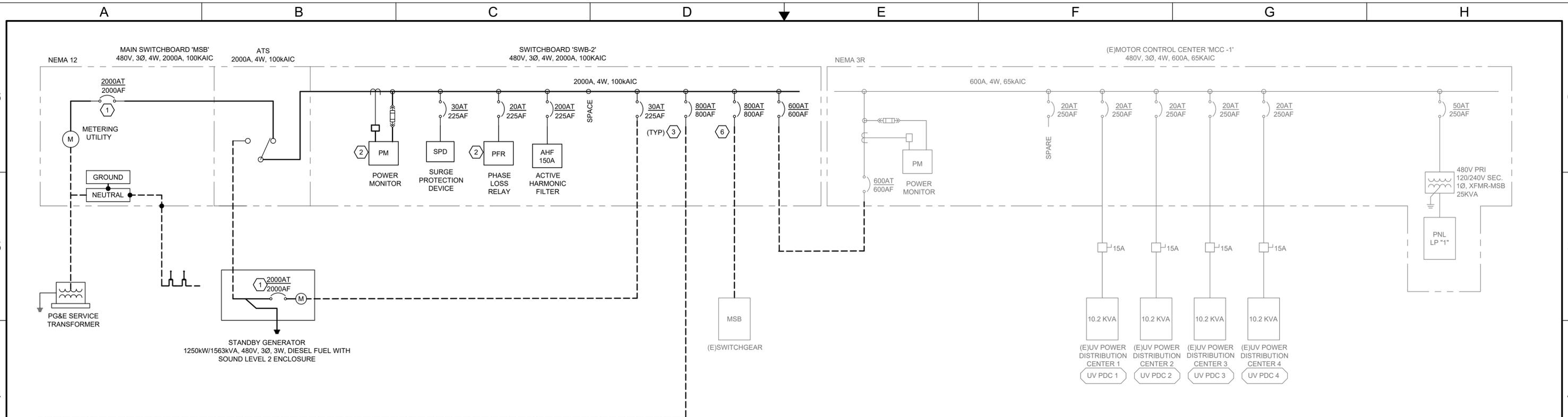
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<h3 style="text-align: center;">WIRING &amp; CONDUIT - CONNECTIONS</h3> <p>— PANEL OR EQUIPMENT WIRING  - - - FIELD WIRING  - - - EXISTING WIRING</p> <p>— CONDUCTORS - NOT CONNECTED  — CONDUCTORS - CONNECTED</p> <p>— GROUND  — CHASSIS OR FRAME GROUND</p> <p>— PLUG AND RECEPTACLE  — INCOMING LINE  — SHIELDED CABLE</p> <p>— CONDUIT CONCEALED IN WALL OR CEILING 3/4"C-2#12, 1#12GND UON  - - - CONDUIT, IN SLAB OR BELOW GRADE 3/4"C-2#12, 1#12GND UON  - - - CONDUIT, EXPOSED 3/4"C-2#12, 1#12GND UON  — CONDUIT STUBBED OUT AND CAPPED CONDUIT</p> <p>— BENDS TOWARD OBSERVER CONDUIT  — BENDS AWAY FROM OBSERVER</p> <p>— BARE COPPER GROUND WIRE  — GROUND CONNECTION BOLTED TYPE  — GROUND CONNECTION EXOTHERMIC WELD</p>	<h3 style="text-align: center;">SWITCHES - OPERATORS</h3> <p>— TOGGLE OR DISCONNECT SWITCH  — PUSHBUTTON - NORMALLY OPEN, MOMENTARY ACTION  — PUSHBUTTON- NORMALLY CLOSED, MOMENTARY ACTION  — LEVEL SWITCH - OPENS UPON INCREASING</p> <p>OFF  HAND AUTO  — LEVEL SELECTOR SWITCH, 3 POSITION- CONTACT STATUS SHOWN EXISTS AT POSITION OF H-HAND, O-OFF, A-AUTO</p> <p>— 3-POLE SWITCH</p>	<h3 style="text-align: center;">DEVICES - MISCELLANEOUS</h3> <p>— AUDIBLE ALARM  — HTR HEATER  — MOTOR, # = MOTOR HORSEPOWER  — TRANSFORMER  — GENERATOR  — SMOKE DETECTOR</p> <p>— DISCONNECT, 3 POLE CONTACT ON LINE 28 AND NORMALLY CONTACT ON LINE 111</p> <p>— CIRCUIT BREAKER, 3 POLE TM = THERMAL MAGNETIC MCP = MOTOR CIRCUIT PROTECTOR</p> <p>— THERMAL OVERLOAD CONTACT  — THERMAL OVERLOAD ELEMENT  — FUSE WITH BLOWN FUSE INDICATOR LIGHT  — FUSE  — CIRCUIT BREAKER</p>	<h3 style="text-align: center;">SYMBOLS - PLAN</h3> <p>— DISCONNECT SWITCH  — FIELD MOUNTED DEVICE  — SPECIAL RECEPTACLE, SIZE AS INDICATED  — JUNCTION BOX  — CONTROL STATION  — WALL MOUNTED LIGHT FIXTURE  — SITE LIGHT FIXTURE  — LED LIGHT FIXTURE LIGHT</p> <p>— EMERGENCY EXIT LIGHTING  — CONDUIT AND CONDUCTOR DESIGNATION SEE SCHEDULE FOR SIZE  — 3 PHASE SPECIAL RECEPTACLE, SIZE AS INDICATED  — TELEPHONE OUTLET  — TAMPER SWITCH  — FLOW SWITCH  — THERMOSTAT AT +48" UON  — REMOVE I/O DATA OUTLET  — FIBER OPTIC OUTLET  — GROUND ROD, 3/4" X 10'-0" GW INDICATES GROUND ROD IN GROUND ROD BOX SEE GROUND ROD DETAIL.  — INTERCEPTION POINT - DEMO PLANS: EXISTING TO REMAIN TO EXISTING TO BE REMOVED NEW PLANS: EXISTING TO NEW  — MOTION DETECTOR  — PHOTOCELL  — GROUND ROD, 3/4" X 10'-0" GR INDICATES GROUND ROD IN CONCRETE HANDHOLE TEST WELL.</p>																																																																																																																																																																															
<h3 style="text-align: center;">SWITCHES - PROCESS</h3> <p>— FLOW SWITCH - CLOSSES UPON INCREASING FLOW  — FLOW SWITCH - OPENS UPON INCREASING FLOW  — LEVEL SWITCH - CLOSSES UPON INCREASING LEVEL  — LEVEL SWITCH - OPENS UPON INCREASING LEVEL  — PRESSURE SWITCH - CLOSSES UPON INCREASING PRESSURE (INCREASING VACUUM)  — PRESSURE SWITCH - OPENS UPON INCREASING PRESSURE (INCREASING VACUUM)  — PRESSURE SWITCH - OPENS UPON INCREASING PRESSURE (INCREASING VACUUM)  — TEMPERATURE SWITCH - CLOSSES UPON INCREASING TEMPERATURE  — TEMPERATURE SWITCH - OPENS UPON INCREASING TEMPERATURE  — LIMIT SWITCH - CLOSSES AT SET  — LIMIT SWITCH - OPENS AT SET LIMIT</p> <p>— PROXIMITY SWITCH - CLOSSES UPON DECREASING DISTANCE  — PROXIMITY SWITCH - CLOSSES UPON DECREASING DISTANCE  — TORQUE SWITCH - CLOSSES UPON INCREASING TORQUE  — TORQUE SWITCH - OPENS UPON INCREASING TORQUE</p>	<h3 style="text-align: center;">DEVICES - RELAY</h3> <p>— CR 1 CONTROL RELAY CR1 WITH NORMALLY OPEN CONTACT ON LINE 28 AND NORMALLY CONTACT ON LINE 111  — TR 2 TIME DELAY RELAY TR2 - ADJUSTABLE TIME DELAY RANGE AND SETTING AS SHOWN  — TDE TIME DELAY RELAY ON ENERGIZATION  — TDD TIME DELAY RELAY ON DE-ENERGIZATION  — M1 CONTACTOR OR STARTER M1</p> <p>— SOLENOID</p> <p>— CR-1 NORMALLY OPEN RELAY CONTACT- ACTUATED BY RELAY CR-1 COIL ON LINE 105  — CR-1 NORMALLY CLOSED RELAY CONTACT- ACTUATED BY RELAY CR-1 COIL</p> <p>— NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT CLOSSES AFTER RELAY IS ENERGIZED  — NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER RELAY IS ENERGIZED  — NORMALLY OPEN, TIME DELAY RELAY CONTACT - CONTACT OPENS AFTER RELAY IS DEENERGIZED  — NORMALLY CLOSED, TIME DELAY RELAY CONTACT - CONTACT CLOSSES AFTER RELAY IS DEENERGIZED</p>	<h3 style="text-align: center;">ELECTRICAL ABBREVIATIONS</h3> <table style="width:100%; font-size: small;"> <tr> <td>A AMPERES</td> <td>GEN GENERATOR</td> <td>NC NORMALLY CLOSED</td> <td>SEQ SEQUENCE</td> </tr> <tr> <td>AFF ABOVE FINISHED FLOOR</td> <td>GFCI GROUND FAULT CIRCUIT INTERRUPT</td> <td>NIC NOT IN CONTRACT</td> <td>SHLD SHIELDED</td> </tr> <tr> <td>AI ANALOG INPUT</td> <td>GND GROUND</td> <td>NL NIGHT LIGHT</td> <td>SP SET POINT</td> </tr> <tr> <td>AIC AMPS INTERRUPTING CAPACITY, SYMM</td> <td>GR GROUND ROD</td> <td>NO NORMALLY OPEN</td> <td>SPD SURGE PROTECTION DEVICE</td> </tr> <tr> <td>AM AMMETER</td> <td>GRS GALVANIZED RIGID STEEL CONDUIT</td> <td>O OPEN</td> <td>SPEC SPECIFICATION</td> </tr> <tr> <td>AO ANALOG OUTPUT</td> <td>GW GROUND WELL</td> <td>OI OPERATOR INTERFACE</td> <td>SPST SINGLE POLE, SINGLE THROW</td> </tr> <tr> <td>ATS AUTOMATIC TRANSFER SWITCH</td> <td>HI HIGH</td> <td>OL OVERLOAD</td> <td>SR SENSING RELAY</td> </tr> <tr> <td>AUX AUXILIARY</td> <td>HID HIGH INTENSITY DISCHARGE</td> <td>P POLE, PRESSURE</td> <td>SS SOFT STARTER, SURGE SUPPRESSOR</td> </tr> <tr> <td>AWG AMERICAN WIRE GAUGE</td> <td>HOA HAND-OFF-AUTO</td> <td>PB PULL BOX, PUSHBUTTON</td> <td>STA STATION</td> </tr> <tr> <td>BATT BATTERY</td> 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<h3 style="text-align: center;">DEVICES - FRONT PANEL</h3> <p>— INDICATING LIGHT, LETTER INDICATES COLOR R=RED, G=GREEN, A=AMBER, W=WHITE Y=YELLOW, B=BLUE</p> <p>— PTT INDICATING LIGHT, PUSH TO TEST</p> <p>— ETM ELAPSED TIME METER</p>																																																																																																																																																																																		

NOT FOR CONSTRUCTION

<p style="font-size: x-small;">10569 OLD PLACERVILLE RD SACRAMENTO, CA 95827 OFFICE: (916)364-1490 www.hydroscience.com</p>	<p>PAPER SIZE: 22X34 (ANSI D)</p> <p>0" 1/2" 1"</p> <p>THIS BAR IS 1 INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY.</p>	<p>JOB NO. : 483-003</p> <p>DATE: 11/13/2024</p> <p>DRAWN BY: MLE</p> <p>DESIGNED BY: TTL</p> <p>PROJ. MGR.: WLS</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>REV</th> <th>DESCRIPTION</th> <th>DATE</th> <th>APVD</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REV	DESCRIPTION	DATE	APVD					<p style="font-size: large; font-weight: bold;">CALAVERAS COUNTY WATER DISTRICT</p>	<p style="font-size: large; font-weight: bold;">LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS</p>	<p style="font-size: large; font-weight: bold;">STANDARD ELECTRICAL SYMBOLS, LEGENDS &amp; ABBREVIATIONS</p>	<p style="font-size: large; font-weight: bold;">30% SUBMITTAL NOV 2024</p>	<p style="font-size: large; font-weight: bold;">E001</p> <p style="font-size: x-small;">DRAWING NUMBER</p> <p style="font-size: x-small;">SHEET 54 OF 90</p>
REV	DESCRIPTION	DATE	APVD													

File Name: S:\common\projects\483-Calaveras County\WD0003-La Contenta\WWT\Ph3\106-Design\Drawings\483-003-Electrical.dwg Plotted By: ANTHONY PEREZ Plot Date: 11/13/2024 10:50 AM



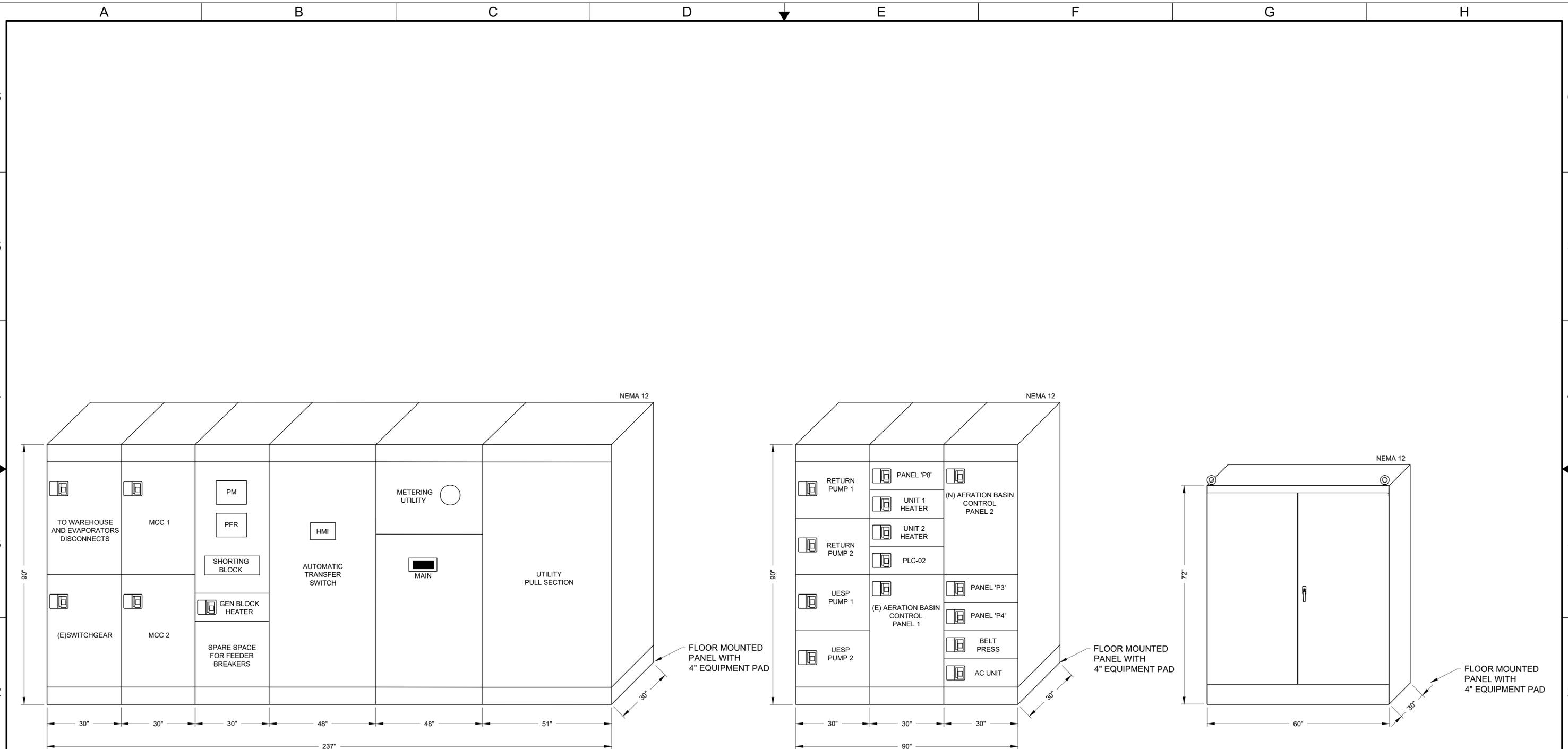
LOAD CALCULATION 'MSB'	
LOAD DESCRIPTION	LOAD
EXISTING MCC-1	69.0
EXISTING LOADS	572.0
BIOLAC SYSTEM	250.0
PLANT DRAIN PUMPS	28.0
RETURN PUMPS	54.0
FUTURE LOADS	400.0
25% LARGEST MOTOR	8.5
25% CONTINUOUS LOADS	160.3
<b>TOTAL</b>	<b>1541.8</b>
480Y/277V, 3 PHASE =	1541.8 AMP
480Y/277V, 3 PHASE =	1281.8 kVA

- NOTES**
1. MAIN CIRCUIT BREAKER SHALL BE 100% RATED WITH ELECTRONIC TRIP UNIT (LSIG) AND ARCLASH REDUCTION MAINTENANCE SYSTEM FEATURE.
  2. FEEDER CIRCUIT BREAKER SHALL BE EQUIPPED WITH ELECTRONIC TRIP UNIT (LSI).
  3. CONNECT PHASE/POWER FAILURE ALARM TO PLC.
  4. REMOVE CIRCUIT FROM EXISTING SWB-E AND RE-FEED EXISTING DISCONNECT SWITCH.
  5. OPTIONALLY: THERE COULD BE A SEPARATE CLAIRIFIER WHICH WILL ADD A CONTROL PANEL FOR THE RAS/WAS PUMPS. THERE COULD BE LARGER RETURN PUMPS ADDED INSTEAD OF RETURN PUMPS 3 AND 4.
  6. THIS CIRCUIT WILL FEED THE EXISTING SWITCHGEAR (MSB) UNTIL THE NEW EQUIPMENT IS INSTALLED AND CUTOVER.

NOT FOR CONSTRUCTION

<p>10569 OLD PLACERVILLE RD SACRAMENTO, CA 95827 OFFICE: (916)364-1490 www.hydroscience.com</p>	<p>PAPER SIZE: 22X34 (ANSI D)</p> <p>0" 1/2" 1"</p> <p>THIS BAR IS 1 INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY.</p>	<p>JOB NO. : 483-003</p> <p>DATE: 11/13/2024</p> <p>DRAWN BY: MLE</p> <p>DESIGNED BY: MLE</p> <p>PROJ. MGR.: WJS</p>	<table border="1"> <thead> <tr> <th>REV</th> <th>DESCRIPTION</th> <th>DATE</th> <th>APVD</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		REV	DESCRIPTION	DATE	APVD					<p>CALAVERAS COUNTY WATER DISTRICT</p>	<p>LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS</p>	<p>SINGLE LINE DIAGRAM</p>	<p>30% SUBMITTAL NOV 2024</p>	<p>E010 DRAWING NUMBER</p>
		REV	DESCRIPTION	DATE	APVD												
<p>NOT FOR CONSTRUCTION</p>		<p>REVISIONS</p>		<p> </p>		<p> </p>		<p>SHEET 55 OF 90</p>									

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 Plot Date: 11/13/2024 10:50 AM



**MSB PANEL ELEVATION**  
SCALE: NONE

**MCC 2 PANEL ELEVATION**  
SCALE: NONE

**AERATION BASIN 2 CONTROL PANEL ELEVATION**  
SCALE: NONE

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REV	DESCRIPTION	DATE	APVD
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**CALAVERAS COUNTY WATER DISTRICT**

**LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS**

**PANEL ELEVATION**

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 NOV 2024

**E011**  
 DRAWING NUMBER  
 SHEET 56 OF 90

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MATCHLINE - SEE DWG E101  
**ELECTRICAL SITE PLAN**  
 SCALE: 1" = 40'-0"

- NOTES**
1. REFER TO P&ID DRAWINGS LOCATION OF INSTRUMENTS.
  2. BOND ALL PUMPS, STEEL, FIELD MOUNTED CONTROL PANELS AND TANKS TO GROUNDING GRID WITH 250KMCIL BSC.
  3. THE GROUND FAULT PROTECTION SYSTEM SHALL BE PERFORMANCE TESTED WHEN FIRST INSTALLED ON SITE. THE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH INSTRUCTIONS THAT SHALL BE PROVIDED WITH THE EQUIPMENT. A WRITTEN RECORD OF THIS TEST SHALL BE MADE AND SHALL BE AVAILABLE TO THE BUILDING INSPECTOR.
  4. OUTDOOR RECEPTACLES SHALL BE WEATHER PROOF AND GFCI.
  5. ALL UNDERGROUND SERVICE CONDUITS SHALL BE SEALED.
  6. THE EXISTING PG&E TRANSFORMER, SWITCHGEAR, STANDBY GENERATOR AND GENERATOR FUEL TANK WILL BE DEMOLISHED AFTER THE CUTOVER OF ALL EQUIPMENT.

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REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY  
 WATER DISTRICT

LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

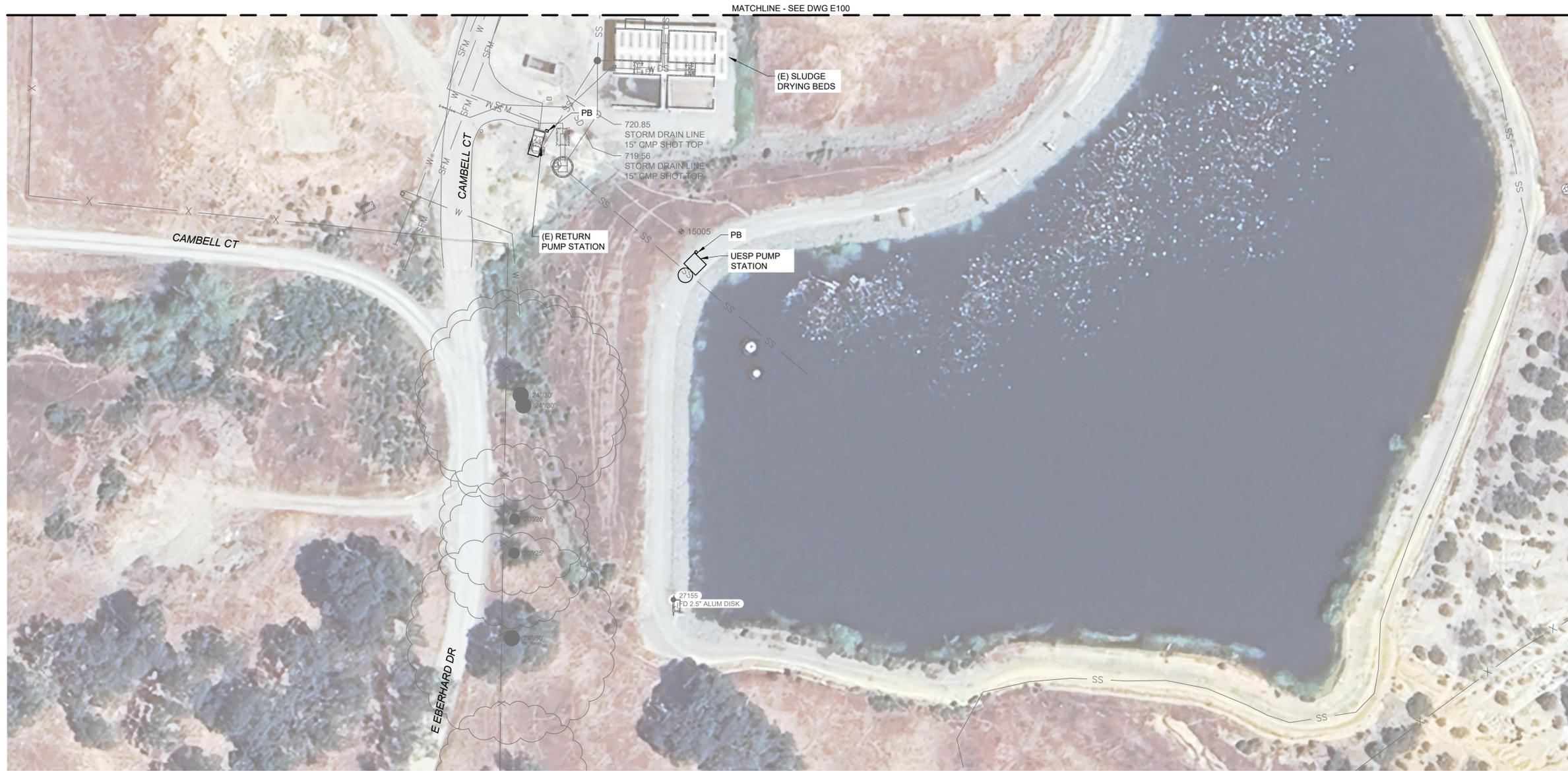
ELECTRICAL SITE PLAN  
 SHEET 1 OF 2

30%  
 SUBMITTAL  
 NOV 2024

**E100**  
 DRAWING NUMBER  
 SHEET 72 OF 90

A B C D E F G H

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- NOTES**
- REFER TO P&ID DRAWINGS LOCATION OF INSTRUMENTS.
  - BOND ALL PUMPS, STEEL, FIELD MOUNTED CONTROL PANELS AND TANKS TO GROUNDING GRID WITH 250KMCIL BSC.
  - THE GROUND FAULT PROTECTION SYSTEM SHALL BE PERFORMANCE TESTED WHEN FIRST INSTALLED ON SITE. THE TEST SHALL BE CONDUCTED IN ACCORDANCE WITH INSTRUCTIONS THAT SHALL BE PROVIDED WITH THE EQUIPMENT. A WRITTEN RECORD OF THIS TEST SHALL BE MADE AND SHALL BE AVAILABLE TO THE BUILDING INSPECTOR.
  - OUTDOOR RECEPTACLES SHALL BE WEATHER PROOF AND GFCI.
  - ALL UNDERGROUND SERVICE CONDUITS SHALL BE SEALED.

**ELECTRICAL SITE PLAN**  
SCALE: 1" = 40'-0"

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CALAVERAS COUNTY WATER DISTRICT	LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS	ELECTRICAL SITE PLAN SHEET 2 OF 2	30% SUBMITTAL NOV 2024	E101 DRAWING NUMBER SHEET 73 OF 90
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**MISCELLANEOUS MECHANICAL EQUIPMENT SYMBOLS**

	CENTRIFUGAL PUMP		VARIABLE FREQUENCY DRIVE		FIELD MOUNTED INSTRUMENT
	SUBMERSIBLE PUMP		TANK		FACE MOUNTED INSTRUMENT ON LOCAL PANEL, OPERATOR ACCESSIBLE
	PROPELLER FAN		SLUICE GATE (NORMALLY OPEN)		INSTRUMENT MOUNTED IN LOCAL PANEL, OPERATOR INACCESSIBLE
	BLOWER OR FAN		SLUICE GATE (NORMALLY CLOSED)		FACE MOUNTED INSTRUMENT ON FIELD PANEL, OPERATOR ACCESSIBLE
	COMPRESSOR		SLIDE GATE (NORMALLY OPEN)		INSTRUMENT MOUNTED IN FIELD PANEL, OPERATOR INACCESSIBLE
	ROTARY LOBE COMPRESSOR, BLOWER OR PUMP		SLIDE GATE (NORMALLY CLOSED)		OPERATION PERFORMED WITH LOGIC OR HARDWIRED DEVICES - REFERENCE ELEMENTARY DWG. #
	PROGRESSIVE CAVITY PUMP		STATIC MIXER		LAMP INDICATION (STATUS OR ALARM)
	WEIR GATE		BAFFLE WALL		ANNUNCIATOR WINDOW
	WEIR		SILENCER		COMMUNICATIONS POINT
	STOP GATE / LOGS		INLET AIR FILTER-SILENCER		PLC/RTU OR COMPUTER FUNCTION
	CHOPPER PUMP		EQUIPMENT MOTOR		TELESCOPING VALVE
	BARREL PUMP		METERING PUMP		GROUND
			SHEET NOTE TAG		INSTRUMENT PANEL MOUNTED WITH COMPUTING, CONVERTING, OR INTERFACE FUNCTION
			VERTICAL TURBINE PUMP		

**VALVE AND ACTUATOR SYMBOLS**

	THREE WAY VALVE		PRESSURE AND VACUUM RELIEF VALVE
	GATE VALVE (NORMALLY OPEN)		VACUUM RELIEF VALVE
	GATE VALVE (NORMALLY CLOSED)		PRESSURE RELIEF VALVE
	PLUG VALVE (NORMALLY OPEN)		MULTI-FUNCTION VALVE
	PLUG VALVE (NORMALLY CLOSED)		PRESSURE REDUCING REGULATOR (SELF-CONTAINED)
	BALL VALVE (NORMALLY OPEN)		BACK PRESSURE REGULATOR (SELF-CONTAINED)
	BALL VALVE (NORMALLY CLOSED)		PRESSURE REDUCING VALVE
	BUTTERFLY VALVE		BACK PRESSURE REDUCING VALVE
	GLOBE VALVE		SOLENOID (PILOT) VALVE
	DIAPHRAGM VALVE		DIAPHRAGM OPERATED VALVE
	ANGLE VALVE		PRESSURE BALANCE OPERATED VALVE
	FLOAT VALVE		PNEUMATIC OPERATED VALVE (FOR VALVE TYPE - SEE SPECS)
	PINCH VALVE		MOTOR OPERATED VALVE (FOR VALVE TYPE - SEE SPECS)
	NEEDLE VALVE		3-WAY CONTROL VALVE PNEUMATIC OPERATOR
	DOUBLE LEAF CHECK VALVE		PNEUMATIC CYLINDER OPERATED VALVE
	CHECK VALVE		VALVE ACTUATOR
	BALL CHECK VALVE		VALVE POSITIONER
	KNIFE GATE VALVE		
	FLAP GATE		
	BALANCING COCK		
	CIRCUIT SETTER		
	THERMOSTATICALLY CONTROLLED VALVE		

**INSTRUMENT ABBREVIATIONS**

CODE LETTER	FIRST LETTER(S)		SUCCEEDING LETTER(S)		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		AUTO/LAG
B	BURNER FLAME				
C	CHLORINE			CONTROL	CLOSE
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		ELEMENT, SENSOR		LEAD
F	FLOW	RATIO	FUEL		FAILURE
G	GAUGING		VIEWING DEVICE		
H	HAND				HIGH/HAND
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		PILOT LIGHT		LOW/LOCAL
M	MOISTURE/MOTOR	MOMENTARY	MOTOR		MIDDLE/MANUAL
N	STATUS				
O	OPERATOR		ORIFICE		OPEN/OVERLOAD
P	PRESSURE		POINT		
Q	EVENT	TOTALIZE	TOTAL		
R	RESET		RECORD		RUNNING/REMOTE
S	SPEED	SAFETY		SWITCH	STOP/SPEED
T	TEMPERATURE		TEST	TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION		
V	VIBRATION			VALVE	
W	FORCE, WEIGHT		WELL		
X	TELEMETRY INTERFACE				
Y	COMPUTER INTERFACE			COMPUTE/RELAY/ CONVERTER	
Z	POSITION			ACTUATE	POSITION

**PIPE LINE DEVICE SYMBOLS**

	STRAINER		BLIND FLANGE		CALIBRATION TUBE
	MANUAL AIR VENT		FLEXIBLE COUPLING		AIR VACUUM RELEASE VALVE OR AIR RELEASE VALVE
	AUTOMATIC AIR VENT		QUICK CONNECTOR		HYDRANT
	CLEANOUT		FLOW METER		HOSE BIBB
	EXPANSION JOINT		DRAIN		DIAPHRAGM SEAL
	UNION		AIR VENT		
	AUDIBLE ALARM (BUZZER OR HORN)		EMERGENCY SHOWER/EYEWASH STATION		
	REDUCER		BACKFLOW PREVENTER		
	CAP OR PLUG		DIAPHRAGM SEAL		

**NOTES AND EQUIP. ABBREVIATIONS**

**NOTES**

- THE PROCESS SCHEMATIC ARE PRESENTED IN DIAGRAMMATIC FORM TO SHOW PROCESS FLOWS CONTROL CONCEPTS AND UNIT OPERATING PARAMETERS, AND AS SUCH ARE NOT INTENDED TO SHOW ALL VALVING PIPING AND INSTRUMENTATION SYSTEMS.
- PROCESS SYMBOLS ARE FOR REFERENCE ONLY. NOT ALL SYMBOLS ARE USED IN THESE CONTRACT DRAWINGS.

EQUIPMENT ABBREVIATIONS	DESCRIPTION
ARV	AIR RELIEF VALVE
BLDG	BUILDING
CV	CHECK VALVE
FLR	FLARE
FN	FAN
LVR	LOUVER
MBR	MEMBRANE BIOREACTOR
MF	MOTOR FIXED
MOD	MODULE
P	PUMP
PNL	PANEL
TK	TANK

**PROCESS FLOW LINE LEGEND**

	FUTURE ELECTRIC SIGNAL
	ELECTRICAL SIGNAL
	ELECTRIC POWER/CONTROL
	PNEUMATIC SIGNAL
	CAPILARY TUBING (FILLED SYSTEM)
	HYDRAULIC SIGNAL
	SONIC OR ELECTROMAGNETIC SIGNAL
	FUTURE PROCESS LINE
	MAIN PROCESS LINE
	SECONDARY PROCESS LINE
	AUXILIARY PROCESS LINE
	DIRECTION OF FLOW
	MANUFACTURER'S PRE-WIRING
	LOGIC OR DATA SIGNAL

**TYPICAL PROCESS DIAGRAM CROSS REFERENCE LEGEND**

- ON DWG. P3 CONTINUATION IS SHOWN AS:
- ON DWG. P4 THIS CONTINUATION IS SHOWN AS:
- SYSTEM FLOW BOTH DIRECTIONS

**WATER SURFACE ELEVATION SYMBOL**

WATER SURFACE ELEVATION

**PLC I/O SIGNAL TYPE LEGEND**

	DI SIGNAL		DO SIGNAL		AI SIGNAL		AO SIGNAL
--	-----------	--	-----------	--	-----------	--	-----------

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CALAVERAS COUNTY  
WATER DISTRICT

LA CONTENTA  
WASTEWATER  
TREATMENT FACILITY  
PHASE 3 IMPROVEMENTS

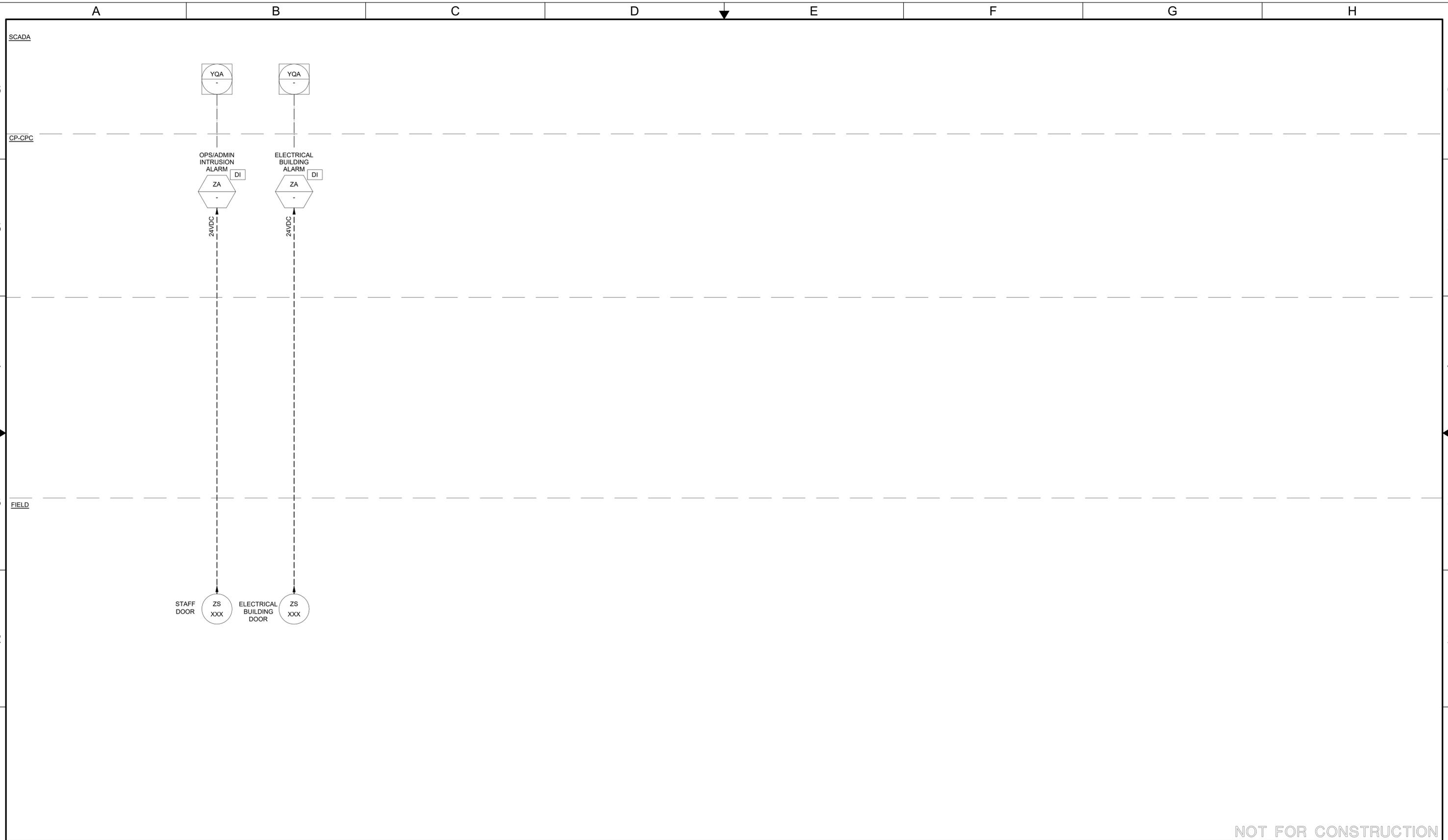
STANDARD PROCESS &  
INSTRUMENTATION SYMBOLS,  
LEGENDS & ABBREVIATIONS

30%  
SUBMITTAL  
NOV 2024

I001  
DRAWING NUMBER  
SHEET 79 OF 90

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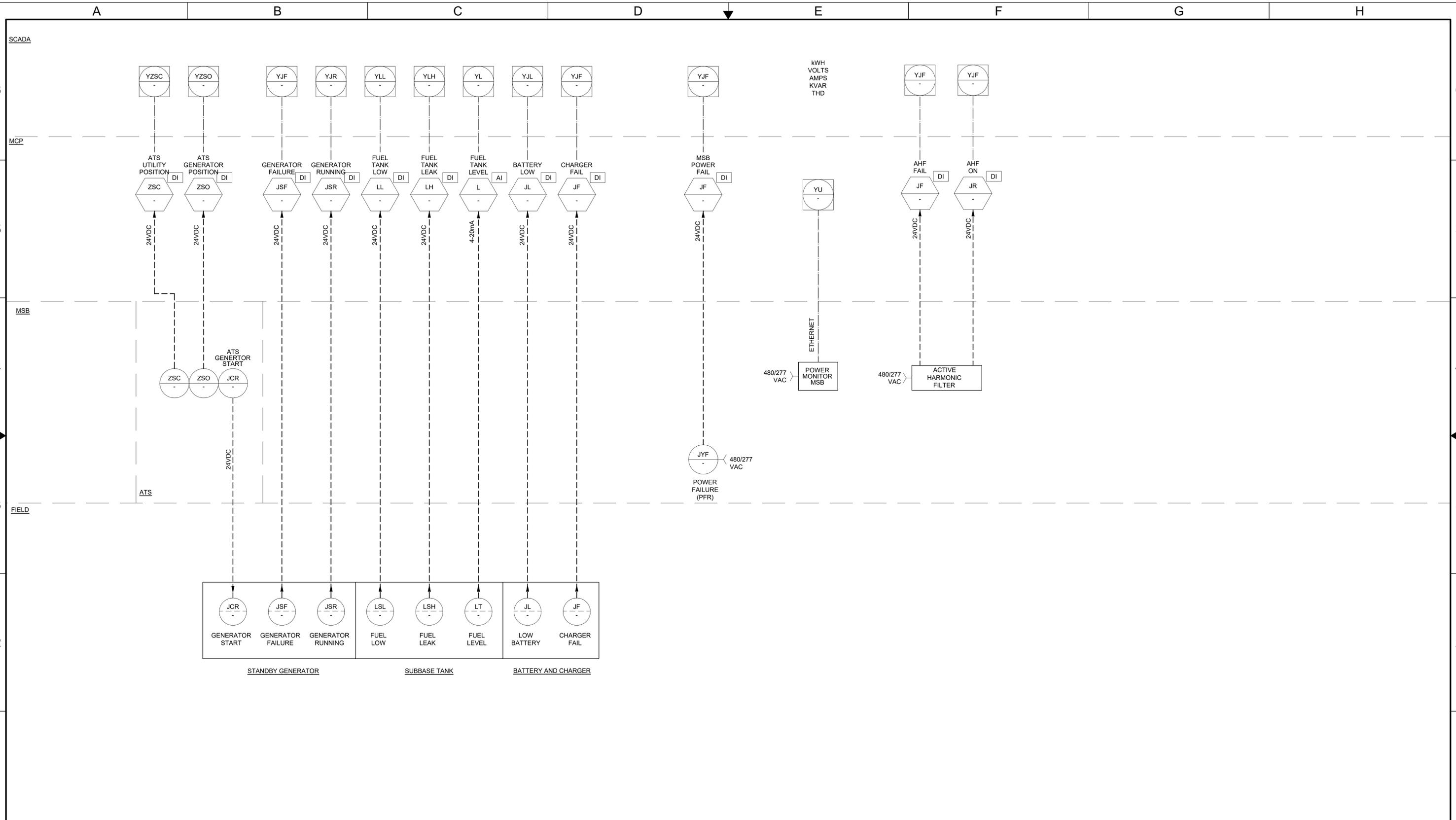
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CALAVERAS COUNTY WATER DISTRICT

LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

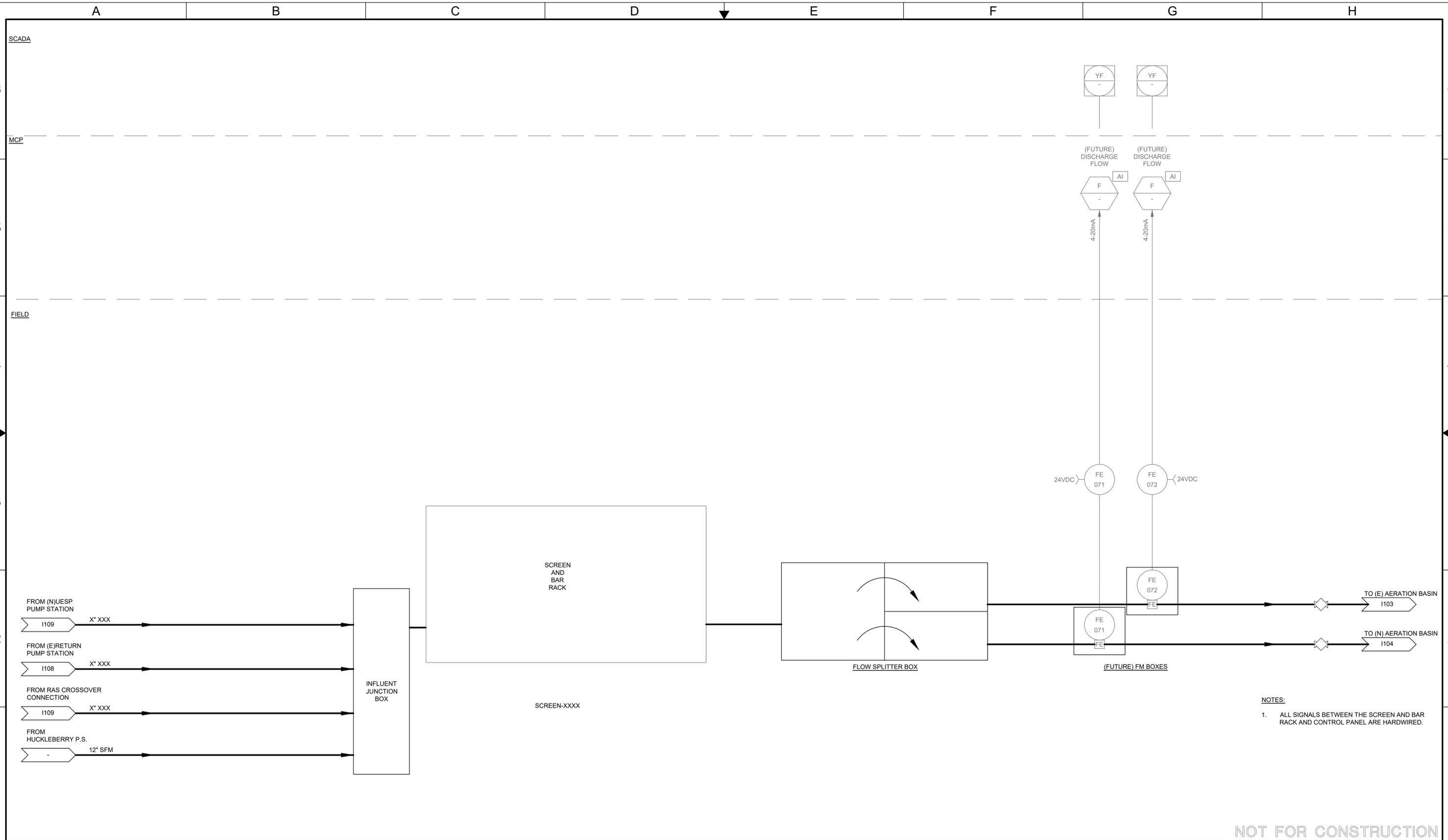
PROCESS AND INSTRUMENTATION DIAGRAM

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I101  
DRAWING NUMBER  
SHEET 81 OF 90

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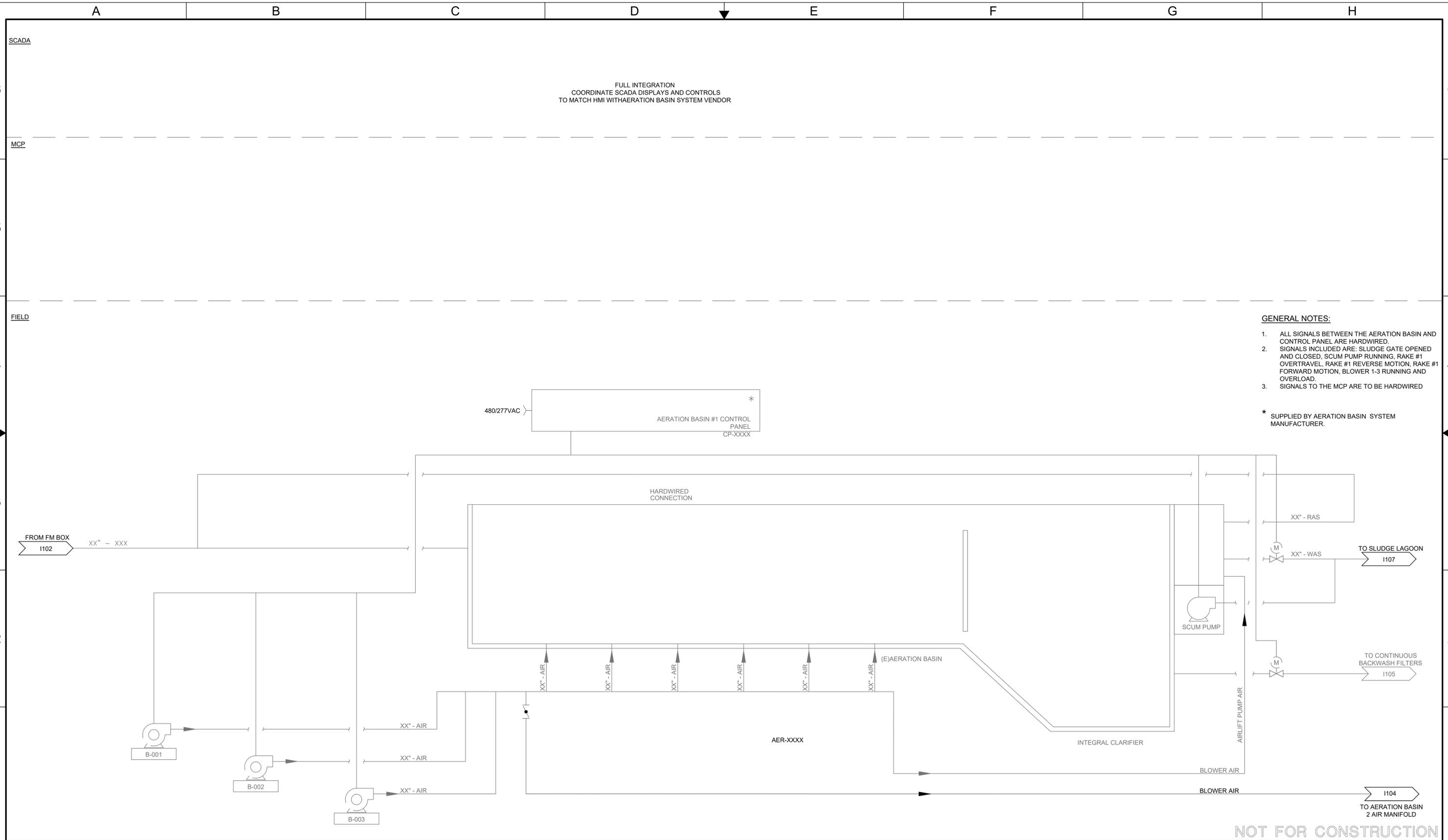


**NOTES:**  
 1. ALL SIGNALS BETWEEN THE SCREEN AND BAR RACK AND CONTROL PANEL ARE HARDWIRED.

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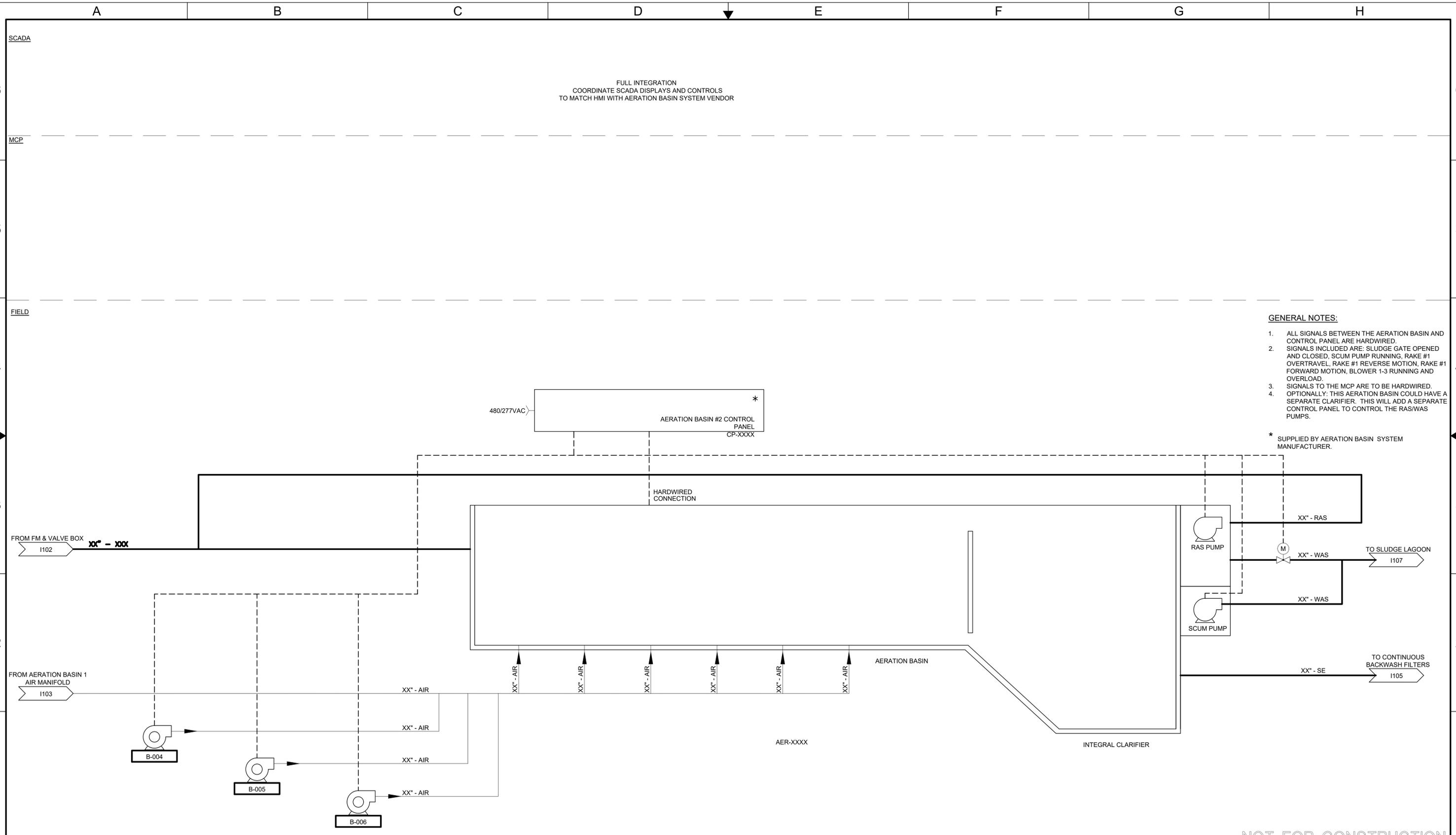
 10569 OLD PLACERVILLE RD SACRAMENTO, CA 95827 OFFICE: (916)364-1490 www.hydroscience.com	PAPER SIZE: 22X34 (ANSI D) 0" 1/2" 1" THIS BAR IS 1 INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY.	JOB NO.: 483-003 DATE: 11/13/2024 DRAWN BY: MLE DESIGNED BY: TTL PROJ. MGR.: WLS	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV</th> <th>DESCRIPTION</th> <th>DATE</th> <th>APVD</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>				REV	DESCRIPTION	DATE	APVD					CALAVERAS COUNTY WATER DISTRICT	LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS	PROCESS AND INSTRUMENTATION DIAGRAM	30% SUBMITTAL NOV 2024	<b>I102</b> <small>DRAWING NUMBER</small>
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			REVISIONS						SHEET 82 OF 90										

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- GENERAL NOTES:**
1. ALL SIGNALS BETWEEN THE AERATION BASIN AND CONTROL PANEL ARE HARDWIRED.
  2. SIGNALS INCLUDED ARE: SLUDGE GATE OPENED AND CLOSED, SCUM PUMP RUNNING, RAKE #1 OVERTRAVEL, RAKE #1 REVERSE MOTION, RAKE #1 FORWARD MOTION, BLOWER 1-3 RUNNING AND OVERLOAD.
  3. SIGNALS TO THE MCP ARE TO BE HARDWIRED.
  4. OPTIONALLY, THIS AERATION BASIN COULD HAVE A SEPARATE CLARIFIER. THIS WILL ADD A SEPARATE CONTROL PANEL TO CONTROL THE RAS/WAS PUMPS.

\* SUPPLIED BY AERATION BASIN SYSTEM MANUFACTURER.

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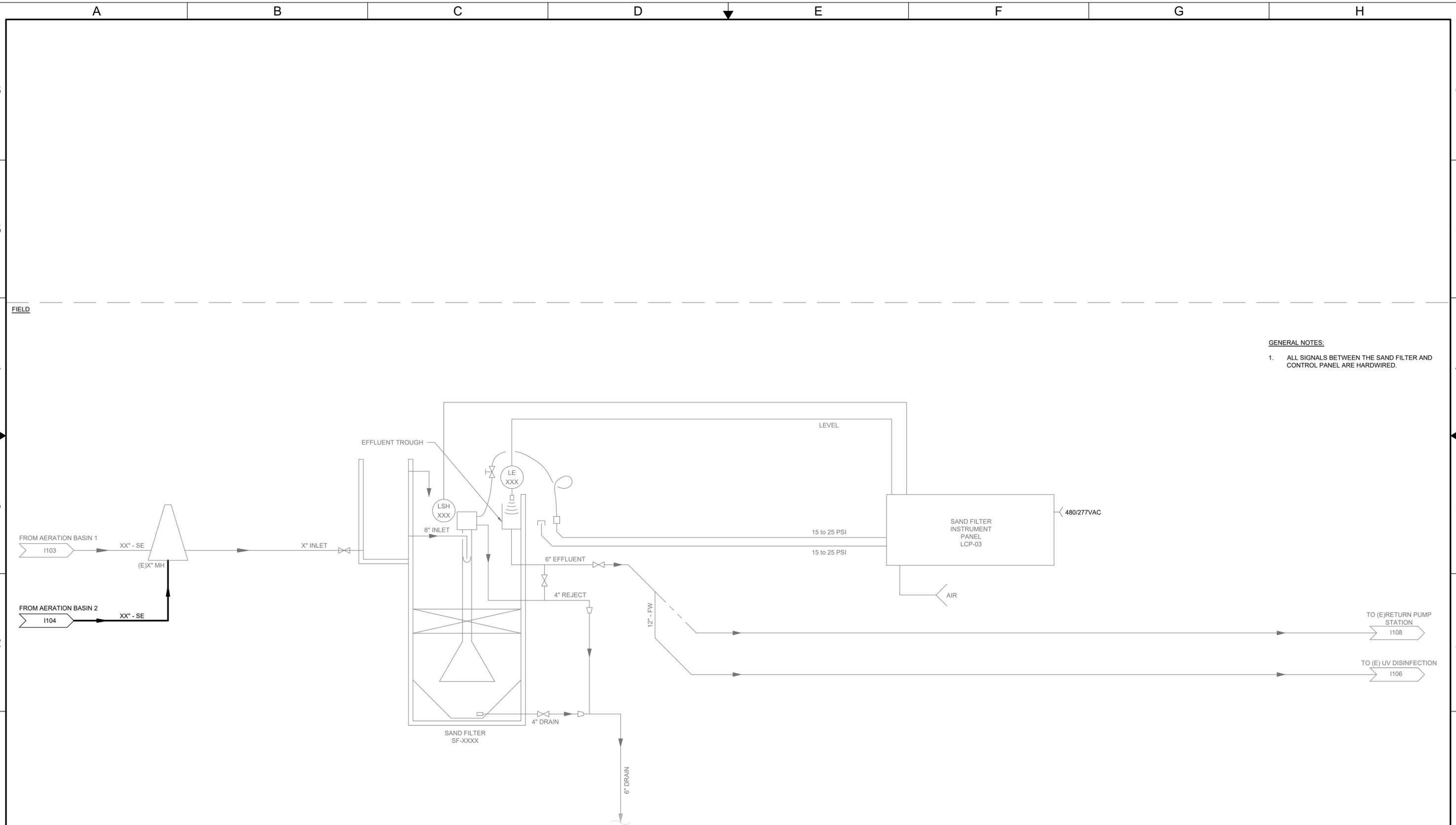
LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

PROCESS AND INSTRUMENTATION DIAGRAM

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I104  
DRAWING NUMBER  
SHEET 84 OF 90

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**GENERAL NOTES:**  
 1. ALL SIGNALS BETWEEN THE SAND FILTER AND CONTROL PANEL ARE HARDWIRED.

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CALAVERAS COUNTY WATER DISTRICT

LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

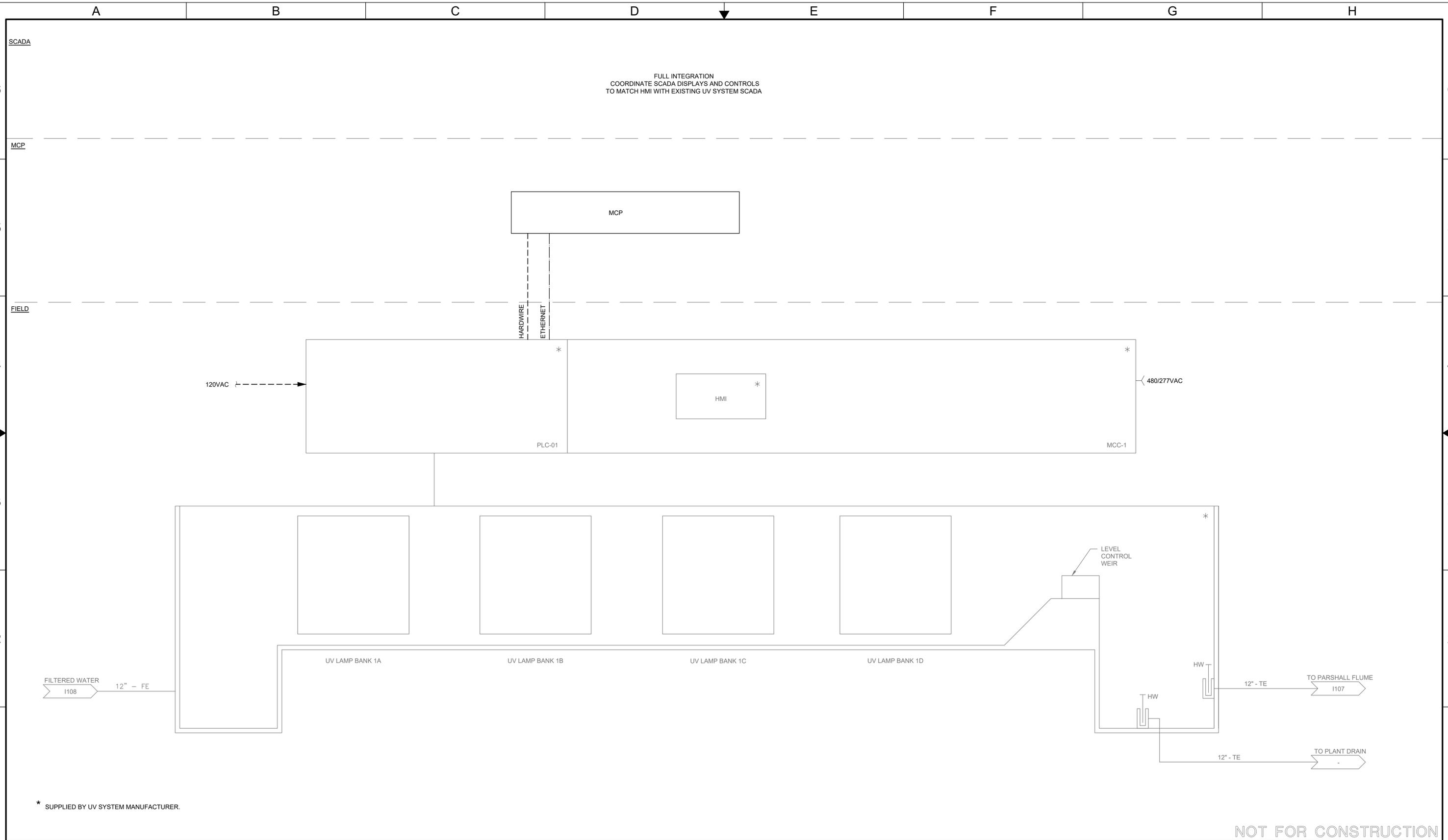
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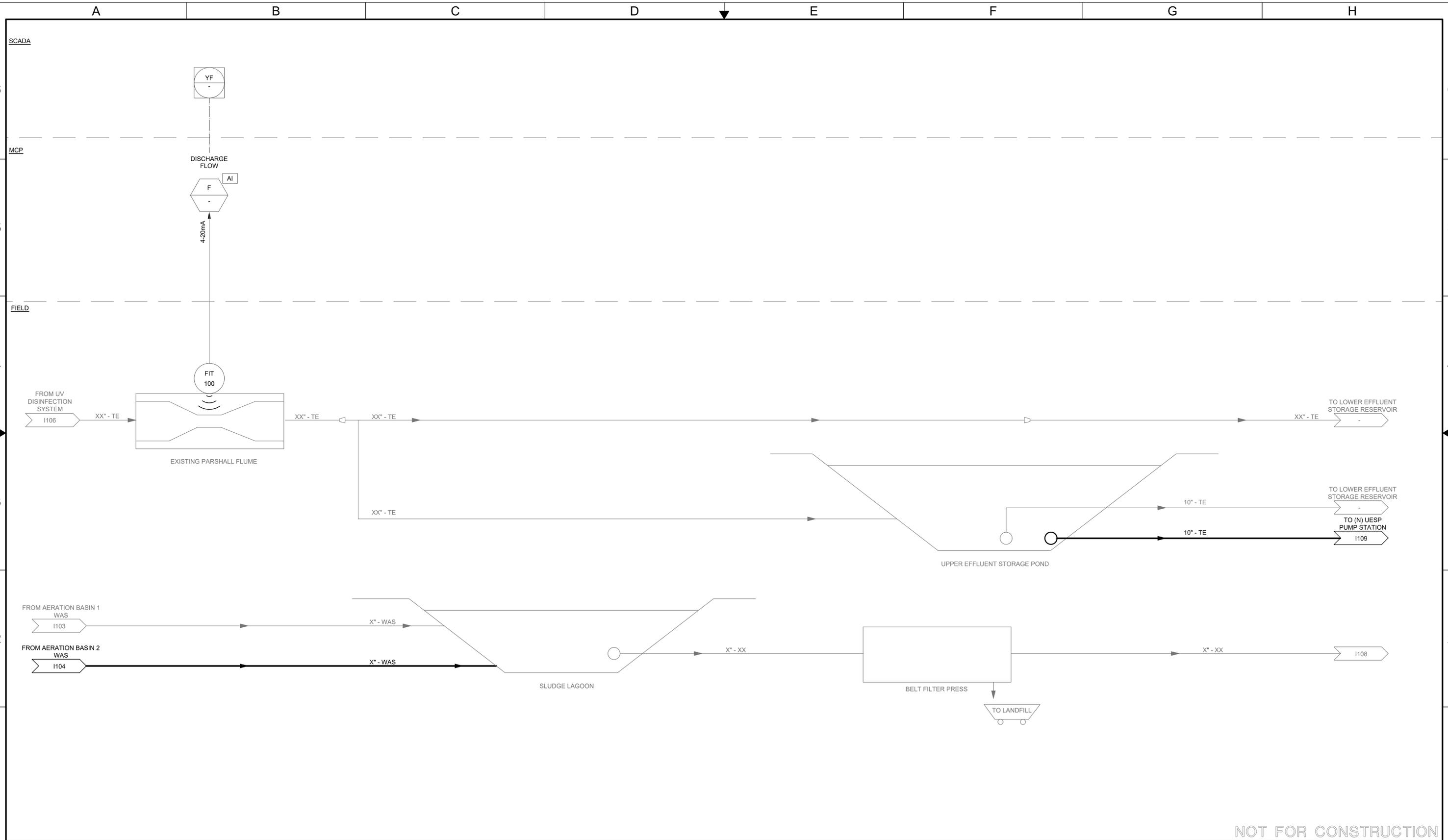


\* SUPPLIED BY UV SYSTEM MANUFACTURER.

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<p style="font-size: 8px; margin-top: 5px;">10569 OLD PLACERVILLE RD SACRAMENTO, CA 95827 OFFICE: (916)364-1490 www.hydroscience.com</p>	<p style="font-size: 8px;">PAPER SIZE: 22X34 (ANSI D)</p> <p style="font-size: 8px;">THIS BAR IS 1 INCH AT FULL SCALE. IF NOT, SCALE ACCORDINGLY.</p>	<p style="font-size: 8px;">JOB NO.: 483-003 DATE: 11/13/2024 DRAWN BY: MLE DESIGNED BY: TTL PROJ. MGR.: WLS</p>	<table border="1" style="width: 100%; border-collapse: collapse; font-size: 8px;"> <thead> <tr> <th style="width: 5%;">REV</th> <th style="width: 60%;">DESCRIPTION</th> <th style="width: 15%;">DATE</th> <th style="width: 20%;">APVD</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>			REV	DESCRIPTION	DATE	APVD					<p style="font-size: 10px; margin: 0;">CALAVERAS COUNTY WATER DISTRICT</p>	<p style="font-size: 10px; margin: 0;">LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS</p>	<p style="font-size: 10px; margin: 0;">PROCESS AND INSTRUMENTATION DIAGRAM</p>	<p style="font-size: 10px; margin: 0;">30% SUBMITTAL NOV 2024</p>	<p style="font-size: 12px; margin: 0;">I106</p> <p style="font-size: 8px; margin: 0;">DRAWING NUMBER</p> <p style="font-size: 8px; margin: 0;">SHEET 86 OF 90</p>
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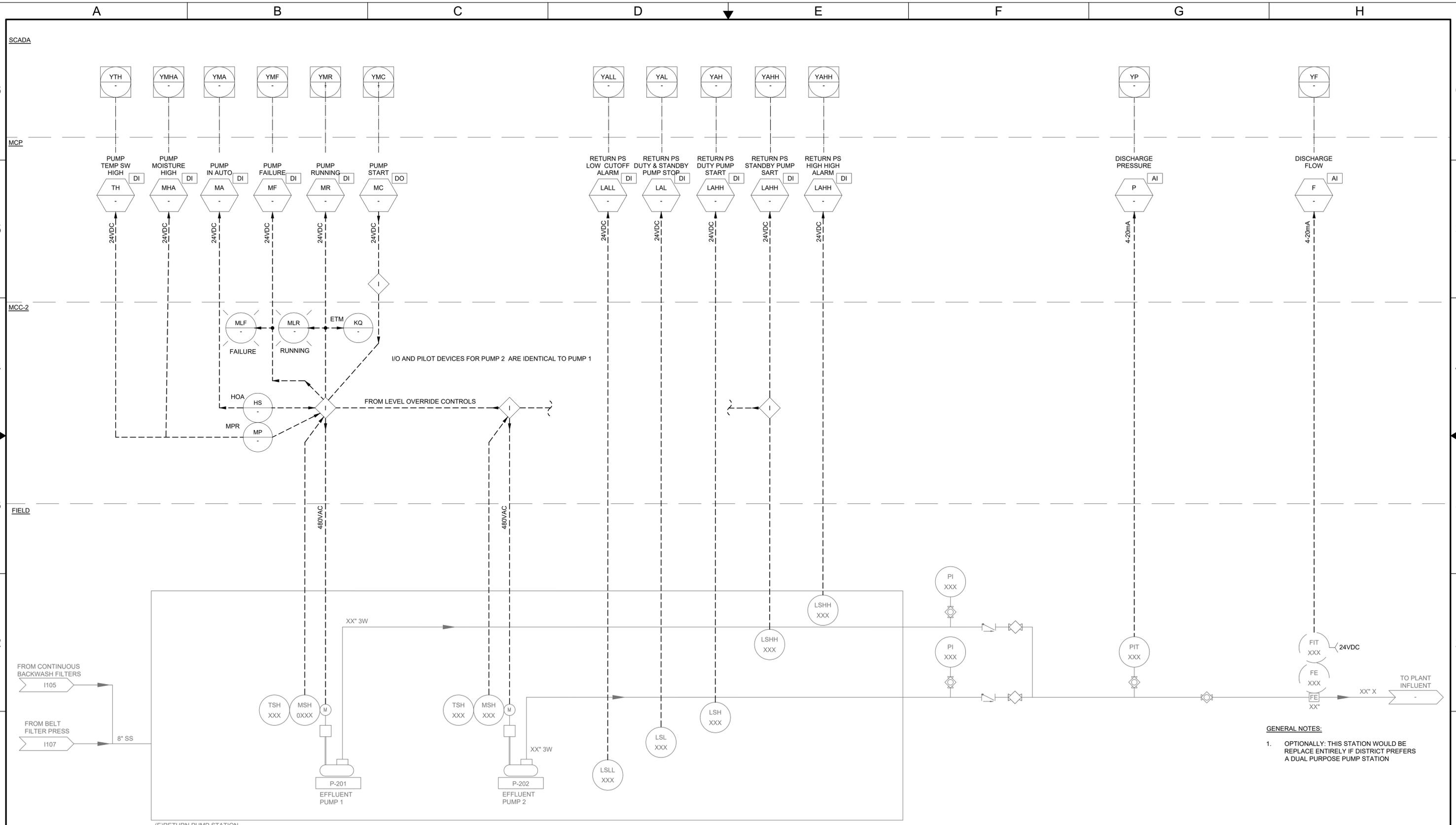
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**GENERAL NOTES:**  
 1. OPTIONALLY: THIS STATION WOULD BE REPLACE ENTIRELY IF DISTRICT PREFERS A DUAL PURPOSE PUMP STATION

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CALAVERAS COUNTY WATER DISTRICT

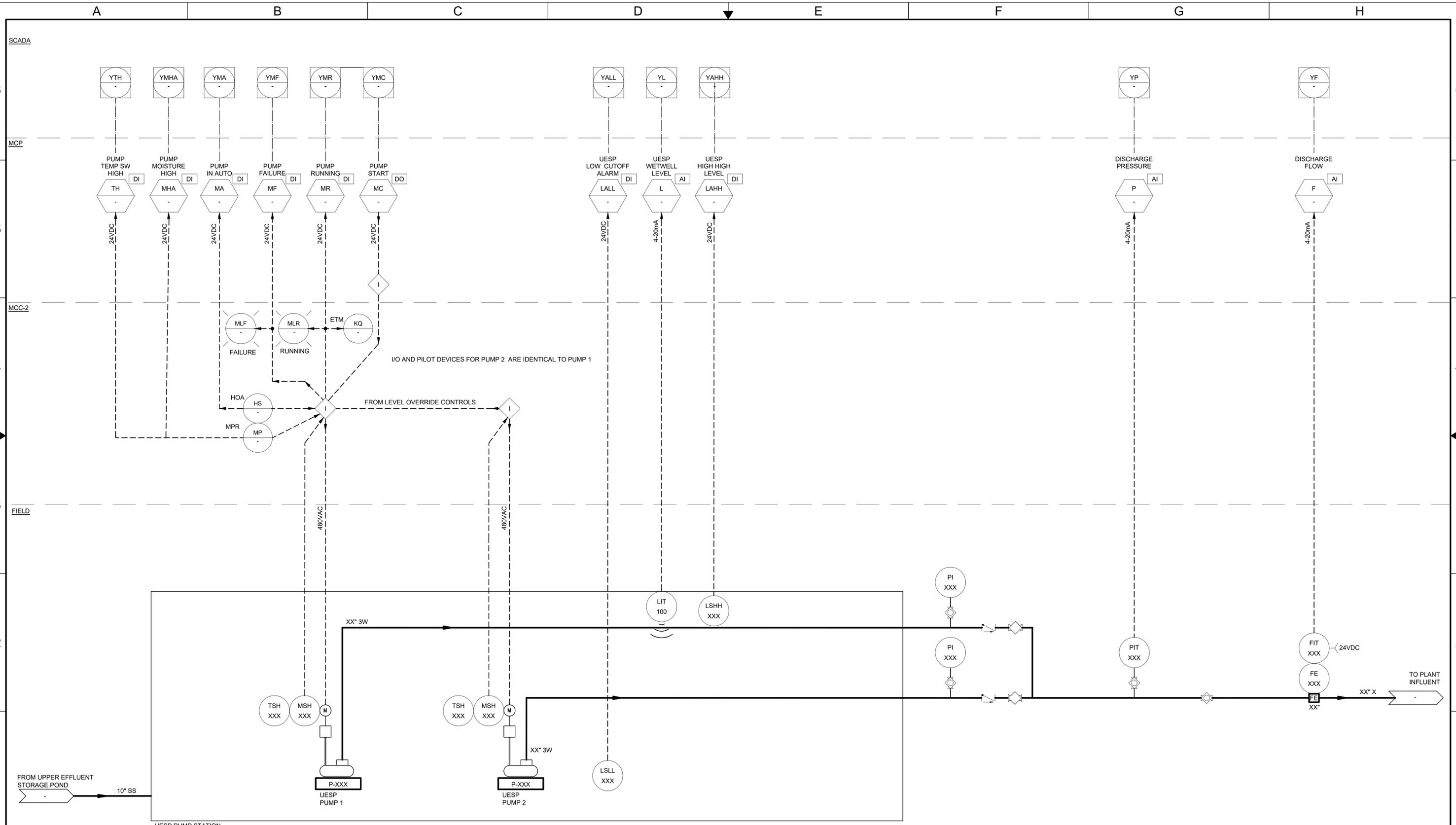
LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS

PROCESS AND INSTRUMENTATION DIAGRAM

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REV	DESCRIPTION	DATE	APVD

CALAVERAS COUNTY  
 WATER DISTRICT

LA CONTENTA  
 WASTEWATER  
 TREATMENT FACILITY  
 PHASE 3 IMPROVEMENTS

PROCESS AND  
 INSTRUMENTATION  
 DIAGRAM

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**APPENDIX C**  
Calaveras County Water District  
Aeration Basin and Integral Secondary Clarifier Equipment Data  
Sheets and Budgetary Proposals



## Preliminary Budget Proposal

Date: September 24, 2024

To: Hydrosience Engineers

Attn: Mr. Bill Slenter, Ms. Bya Founas  
Project Engineer

Re: La Contenta WWTF  
Calaveras County, CA  
Preliminary Aeration System Design

Dear Bill, Bya,

Bioworks NA is pleased to offer this preliminary budget proposal for a long sludge age extended aeration plant, in accordance with the preliminary design criteria provided with your request. Please note that the following is a preliminary estimate and can be adjusted as needed.

In particular, the exact basin dimensions could be adjusted, as can the scope and equipment details.

The process design is based upon the influent biological load values that you've provided:

Flow	0.45 MGD
Bod/TSS/TKN/TP	200/200/50/6 mg/l
Alkalinity	500 mg/l as CaCO <sub>3</sub>
Temp	10-20 degrees C

The effluent requirements are:

BOD	10 mg/l
TSS	15 mg/l
TN	10 mg/l

The Process system will incorporate at least:

1. A fine screen, not included in Bioworks' scope. The screen opening size should be no more than 6 mm and no rags should be passed into the aeration basin.
2. Two lined earthen aeration basins, with three sloping sides (the fourth side is the concrete wall of the clarifier) and with the liner by others. Please note that we suggest using a slightly more rectangular basin geometry that you'd mentioned as it yields a little better layout for the denitrification process. The exact dimensions are not cast in stone, though, and can be adjusted.
3. Bioworks' fine bubble aeration system, with floating & moving air headers, by Bioworks. OXIRISE is included, allowing for the operator to bring the diffusers to the surface from the basin shore

4. DyNOX, Bioworks' denitrification system, is included. The system may be operated without denitrification if desired.
5. Secondary Clarifiers, with options as shown below
6. PLC based controls, provided by Bioworks (VFD's for the blowers are included, as are controls for the electrically operated header valves for the DyNOX system)

## Plant Design Data

Design flow	See above	
Plant elevation	1,100 ft ASL	
Number of trains (aeration basins, clarifiers)	1	
Approx. Aeration Basin Dimensions (ea) , LxW		
Flat Floor	108' x 54'	
At Grade (approx.)	126' x 90'	HydroScience checking if 1.5:1 ok with concrete liner
Side slope (3 sides)	2.25:1	
Side Water Depth (min)	10'	
Diffuser depth	9'	
Basin Volume (ea)	0.6 MG	
Estimated SOTR, Lbs/Hr		
Non-denitrification	156 Lbs/hr	
DyNOX (with denite credit)	110 Lbs/hr	
Air required, SCFM		
Non-denitrification	900 SCFM	
DyNOX	650 SCFM	
Blowers (by others)		
No. blowers	3 (one a spare - to be discussed)	
Blower Type	Standard rotary lobe	
SCFM per blower	450	
Motor nameplate HP (estimated)	30	
VFD included	Yes	
Aeration System		
No. floating headers per basin	11	
No. OXIWORKS per header	5	
No. tubes per OXIWORKS	4	
OXIRISE Included	Yes	
Headers operating (DyNOX)	8	
Clarifiers	See below	

## Clarifier Options

**Option 1** ... Two Bioworks Crossflow clarifiers, each designed to handle the full design flow and designed to allow isolation

Clarifier number:	2
Clarifier LxW:	42 feet x 24
Sludge removal system:	Bioworks suction scraper

The clarifiers are located right after the aeration basin, separated from it by a concrete wall. To make sure we can isolate them if we need to, the activated sludge flows through a channel before entering the clarifier through an opening at the basin bottom of the channel. The channel runs the whole length of the partition wall between the ASB and clarifier. The clarifier can be isolated manually using the penstock located at the inlet openings from ASB to channel. The clarifier is divided into two separate compartments. Both clarifiers are completely separated from each other.

The clarifier depth is the same as in ASB.

**Option 2 ...** Same as above except that each is designed for half the flow

This design is very similar to above, except that each clarifier length is reduced to 32 feet.



## General Description

This system is designed to remove BOD and TSS, and to denitrify if required, using a system that is cost-effective, easy & inexpensive to operate and simple to maintain. We have not included screens, grit removal, blowers, clarifiers or a disinfection system in this budget, but those items are readily available.

Bioworks offers experience, extensive process know-how, high quality equipment, and expert support from preliminary design through successful plant operation. Our components are the most modern in design and performance, providing excellent process results, high efficiency, easy operation, and simple maintenance.

So long as we have control over the main process components (aeration basin design, aeration system, clarifier, RAS design, blowers, controls), Bioworks offers a comprehensive effluent quality guarantee covering BOD, TSS, ammonia and Total N.

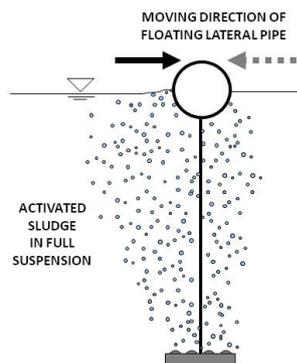
The Bioworks system is reliable, robust and can be designed using either a lined earthen aeration basin or a concrete aeration basin. The lined earthen basin approach is most common, and is most cost-effective.

It should be noted that no sludge handling system is included in our budget offer. A separate sludge holding basin might be used, or sludge dewatering might be added.

Because of the long HRT and SRT, the system is very forgiving and flexible. No equalization is normally required. Excellent process performance is easy to obtain, including BOD/TSS/Ammonia levels after the clarifier of 10/15/1 mg/l and total TN of 10 mg/l.

The heart of the system is the floating fine bubble aeration system, designed in such a way that nothing is affixed to the basin floor and the diffusers move laterally. This movement maximizes oxygen transfer efficiency and assures full mixing in a wide area. Because of this approach, unlike other extended aeration systems the Bioworks system is rarely, if ever, mixing limited.

The diffusers themselves are state-of-the-art in design and performance. Using silicone membranes and a large number of very small perforations, the diffusers offer the most energy efficient performance on the market.



We have included a major labor-saving device, the OXIRISE<sup>®</sup> system that allows the plant operators to raise each diffuser to the surface automatically from the basin shore. This makes maintenance as easy and mess-free as possible, and makes flexing a simple and painless procedure. Operators love this system.



The sludge wasted from the system will be well digested and stabilized, due to the long sludge age.

The end result is a system that's cost-effective to install, easy to operate, simple to maintain, and which yield excellent process performance.



Our offer consists of:

1. Process summary and guarantee basics.
2. Process design approach
3. Equipment & services summary
4. Cost estimate

## 1. Process Summary and Guarantee Basics

Our design is based upon the influent data shown above.

Monthly average effluent results are guaranteed, assuming that the water temperature will be 8 degrees C or above, and based upon the loadings shown above as:

BOD <sub>5</sub>	10 mg/l
TSS	15 mg/l
TN	10 mg/l

**Bioworks will provide a comprehensive process guarantee, as described herein – a sample copy is attached.**

Design bases ... our design and guaranteed performance are based upon:

- a. The wastewater will be screened using a 6 mm (or finer) screen. All wastewater is to be screened. Grit is to be removed if expected in appreciable amounts. Comminution or grinding is not recommended.
- b. Sufficient alkalinity will be present (or added by the plant personnel) to allow the nitrification process to proceed uninhibited.
- c. Incoming FOG, chemicals and metals will be with treatable limits.
- d. Sufficient nutrients (P, N, etc) will be present in the influent for biosolids growth (or will be added by the plant personnel).
- e. A qualified operator will supervise plant activities and performance, and the plant will be operated in accordance with Bioworks' recommended procedures.

## 2. Process Design Approach

- a. Design basics
  - a. Design F/M ratio is approximately 0.05 at the design loading, with attendant long HRT and sludge age. We have assumed an operating MLSS level of 3,000 mg/l. This long sludge age will assure essentially complete nitrification at any reasonable water temperature, even in the winter.
  - b. The long sludge age also assures that the waste sludge will be well digested and stabilized, making disposal uncomplicated.
  - c. Bioworks uses the most modern and energy efficient fine bubble aeration system available. The tentative number of floating headers ("chains") is shown above.
  - d. We are including the OXIRISE<sup>®</sup> system, making maintenance as simple as possible.
- b. Blowers
  - a. The number and size of the blowers are shown above.
  - b. Unless you prefer a different approach we suggest using basic rotary lobe blowers (Gardner Denver or equal)
  - c. Blowers speed will be controlled using VFD's, from a DO feedback loop. Bioworks will provide the DO probe & analyzer, as well as the VFD's.

- c. Controls
  - a. Bioworks includes a control panel, to be installed in a building adjacent to the system.
  - b. Included are the NEMA 12 enclosure, PLC control system for all motors, switches, etc, and D.O. monitoring.
  - c. VFD's for the blower motors will be included
  - d. The control system will also operate the electrically controlled valves on each header.
- d. Clarifiers (see above)

### **3. Equipment & Services Summary – items supplied by Bioworks**

- a. OXIWORKS<sup>®</sup> aeration system, consisting of hi-temperature connecting hoses, HDPE floating aeration headers, stainless steel restraining cable system and required hardware.
- b. OXIRISE<sup>®</sup> system, consisting of shore-mounted control panels and in-basin tubing. Also included is the “shop compressor” required for the system.
- c. Electrically operated (1/60/120 power) butterfly valves for each aeration header.
- d. One Dissolved Oxygen probe and analyzer per basin.
- e. PLC based remote controls, as previously described.
- f. Two Clarifiers, as described above (optional)
- g. Descriptive specifications and aeration basin drawings on CAD, for use by the Engineer in developing plans & specs.
- h. Approval submittals
- i. Installation, operation & maintenance manuals
- j. Field service for final installation inspection, start-up supervision and operator training. Bioworks will furnish a trained technician to oversee and assist in assembly and installation of the aeration system, for a period of approximately five days. He will require the assistance of 4 of the contractor's personnel. Also included is a visit for extended operator training, after the plant has been in operation for several months.
- k. Additional field startup service by a Bioworks controls engineer and a technician from the blower supplier.
- l. Spare parts
  - a. Four complete OXIWORKS tube diffusers
  - b. Ten spare diffuser membranes, with hardware.
  - c. Fifty clamps, gaskets & o-rings used in the diffuser assemblies,

### **4. The following are to be supplied by others:**

- a. Fine screen(s)
- b. Grit removal when appropriate
- c. Liners for aeration basin
- d. Disinfection system if required
- e. Air mains – all piping between blowers and aeration basin.
- f. Building for controls and blowers
- g. Wiring, etc between controls and components
- h. Anchor posts for aeration system
- i. Field painting, if required
- j. Installation
- k. Plant operation

## 5. Estimated Cost

- a. The budget price for the equipment and services supplied by Bioworks is:

<b>Above Scope with two full-flow clarifiers</b>	<b>\$975,000</b>
<b>Above scope with two half-flow clarifiers</b>	<b>\$900,000</b>
<b>Above scope with no clarifiers</b>	<b>\$495,000</b>
<b>Above scope with one full flow clarifier</b>	<b>\$710,000</b>

- b. Approval drawings can normally be supplied approximately 8-10 weeks after acceptance of an order.
- c. Equipment can normally be delivered 18-20 weeks after approval and release for manufacture.

## 6 References

Bioworks is a world-wide company, with hundreds of installations throughout the globe. In America we have several dozen, including a number on the west coast.

The attached partial reference list shows a selection of our installations. The nearest installations to you, in which we supplied the full system (including clarifiers) are Myrtle Point, OR and South Fork, ID.

Bioworks NA thanks you for your interest in our products & services, and looks forward to working with you on this project and in the future.

If you'll be attending WEFTEC in New Orleans please be sure to stop at our booth (2254). We also suggest meeting at your office at any mutually convenient time.

Should you have any questions, please do not hesitate to contact us or our local representative, Brian Oswalt of Rockwell Solutions at 916-616-8492.

Best regards,

David Gibson  
Bioworks NA  
479-856-4044



# BIOWORKS

NORTH AMERICA Inc.

the  
clear  
solution



## **OXIWORKS® HIGH EFFICIENCY FINE BUBBLE DIFFUSER SYSTEM**





# BIOWORKS

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## The OXIWORKS® Diffuser

The OXIWORKS® fine bubble diffuser system brings high efficiency aeration to both activated sludge and lagoon treatment systems.

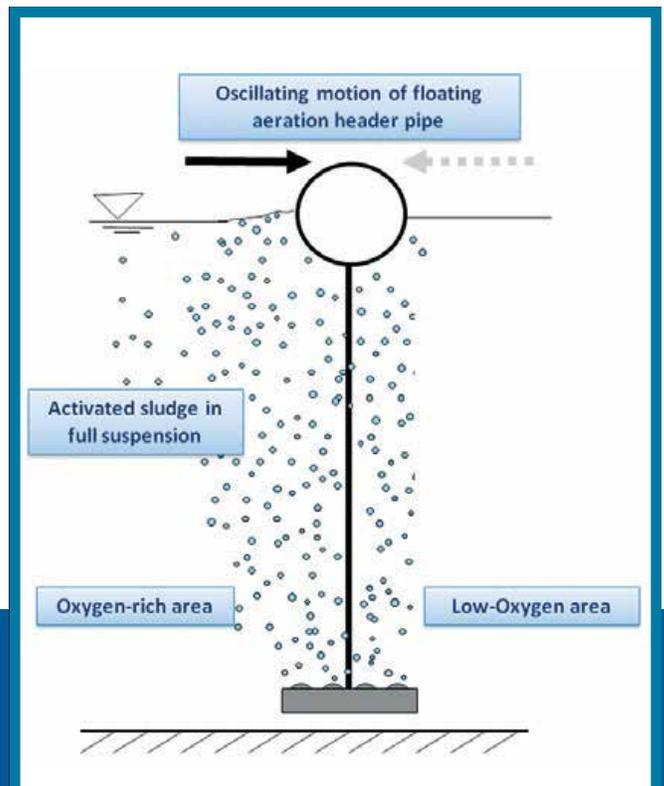
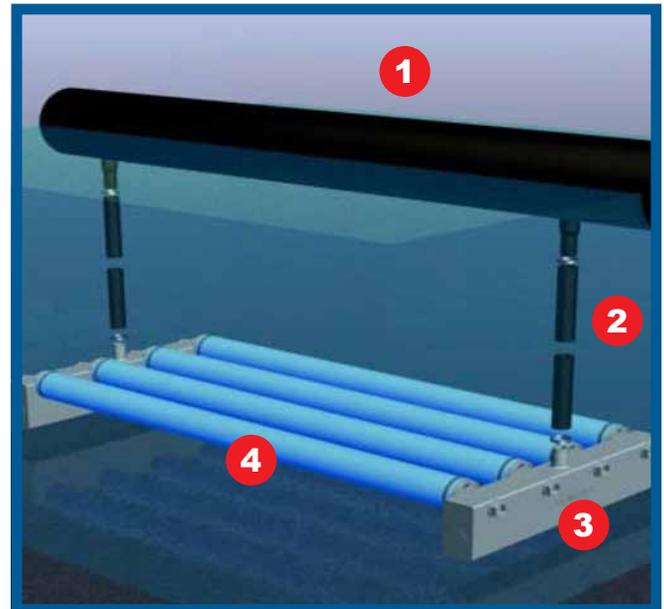
### How it works

Air is supplied from the blowers to the air main to each floating lateral header (1). The air then flows through the downcomer hoses (2) into the OXIWORKS® diffuser assembly (3 & 4).

In the diffuser assembly, the air is distributed through high efficiency fine bubble tubular membranes creating 1mm fine bubbles for aeration and mixing.

The system is designed to allow the lateral floating headers with suspended diffusers to move in the basin creating significant advantages:

- The oxygen transfer is maximized because the diffusers are continually move towards areas of low dissolved oxygen. Along with using high efficiency fine bubble diffusers, this increases the overall efficiency of the system.
- Moving diffusers mix a significantly larger area than other systems because the laterals oscillate over a wide area. OXIWORKS® can reduce the required amount of mixing air by 30% compared to fixed aeration systems.



## OXIRISE® Maintenance and Retrieval System

Bioworks has created a simple and effective system to minimize manual labor for system maintenance.

### How it Works

The OXIRISE® system allows the operator to raise each diffuser assembly to the surface without ever entering the basin by simply activating a switch at the side of the basin. The benefits of the OXIRISE® system are:

- When work on the diffusers are necessary, they can be retrieved from the surface without reaching under diffuser headers and pulling up of the diffuser assemblies suspended in the basin creating an easier safer way to perform maintenance.
- When the OXIRISE® system is activated periodically, it flexes the fine bubble diffusers, maximizing the life of the membranes.

## Applications

The Bioworks OXIWORKS® moving suspended aeration system utilizing earthen or concrete basins combines a highly stable biological process with minimal investment, operating costs, and maintenance to provide a high quality effluent.

### MUNICIPAL APPLICATIONS:

- Aerated Lagoons
- Activated Sludge Systems
- Biological nitrogen and phosphorus removal

### INDUSTRIAL APPLICATIONS:

- Food and Meat Processing Plants
- Pulp and Paper Processing Plants
- Industrial Pretreatment Lagoons
- Aerated Lagoons
- Activated Sludge Processes





## Bioworks North America, Inc.

Bioworks is a company that helps consulting engineers and customers consistently and professionally meet their objectives: state-of-the-art process design assistance, clean effluent to improve our environment, reduced energy usage, and easy plant operation and maintenance.

Bioworks creates value by designing each project specifically for our customers' needs and our aim is to exceed expectations in terms of design, costs, support, and operation of our systems. We guarantee our process designs and provide industry leading warranties on the equipment we provide.

Bioworks North America Inc. is the US subsidiary of the BIOWORKS group which provides a broad range of wastewater treatment processes worldwide.



## Why choose Bioworks?

- We help from the start (the process design) to the finish (installation and then operational support)
- Guaranteed results
- Low energy usage - our diffused aeration system is the finest of its kind
- Simple, low cost operation
- Easy maintenance

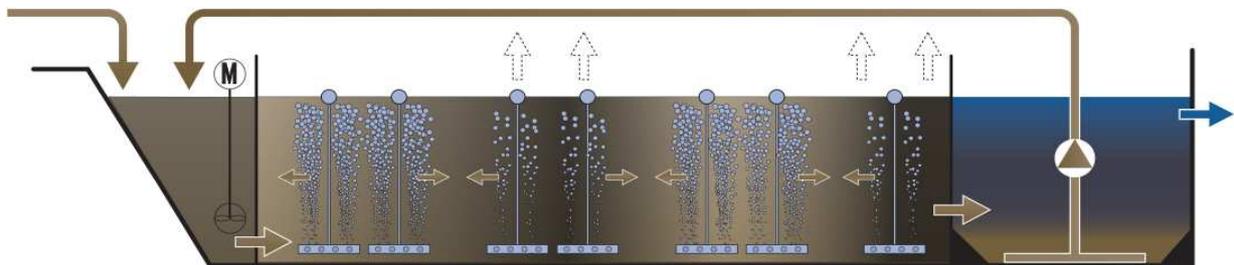


4858 N. Powerline Road  
Deerfield Beach, FL 33073  
(912) 445-5021

## Cross Flow Clarifier

Bioworks recommends our rectangular, suction clarifier, using a travelling bridge approach. It's simple, effective and easy to operate & maintain.

At the end of the activated sludge basin, the biological treatment is complete, and the sludge must be separated from the clear water in the clarifier stage. Bioworks has designed the clarifier so that it's embedded at the end of the activated sludge basin and separated by a common wall. Due to the inlet openings distributed all along the common wall, the inlet velocities are very low and influent into the clarifier is turbulence free.



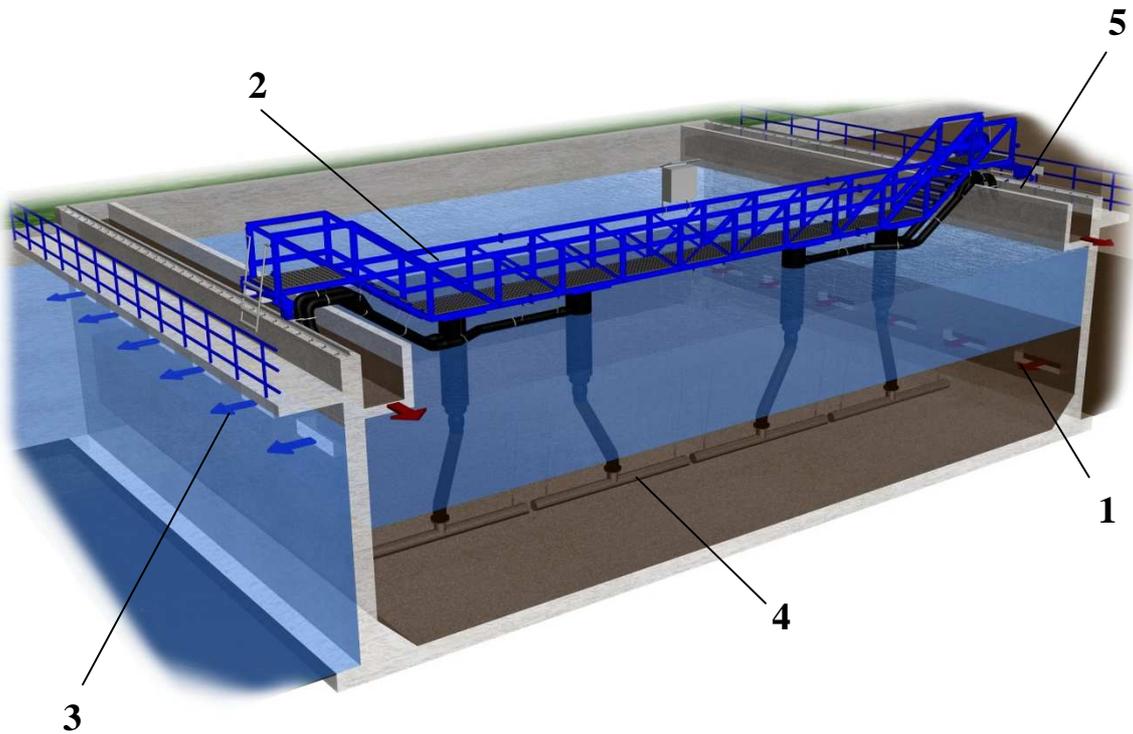
*Sketch of embedded clarifier*

The inside of the clarifier is completely turbulence free and the biological mass (sludge floc) and the clear water will separate by gravity. Please see the illustration below. The mixed liquor enters the clarifier structure through openings (1) in the separation wall. In the clarifier, the floc will settle to the bottom and will be removed by perforated suction pipes (4) from the bottom of the clarifier by a moving scraper bridge (2).

The RAS (recycle activated sludge) is then pumped into lateral collecting troughs (5) and then flow by gravity – in a concrete channel - to the inlet of the activated sludge basin.

Return sludge flow can be controlled by VFD if desired. The clear water overflows to the effluent and joins the effluent from other clarifiers – depending on design - in a common channel. The return sludge pumps are installed in vertical standpipes and can be accessed from the top for maintenance, so all servicing can take place in the filled basin. The clarifier bridge is constantly moving back and forth – guided by simple railtracks – and driven by 2 motors, each with a power of less than 0.5 hp. Power is provided by a cable reel.

Scum can be removed by a skimming board attached to the bridge and a rotating pipe trough. Waste sludge is removed when desired directly from the return sludge stream, either by an automated valve – in small plants – or in larger plants by a submerged pump which is connected to the return sludge channel.

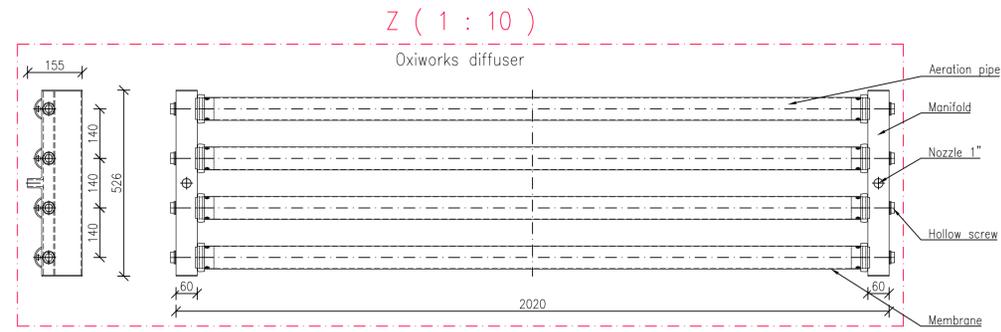
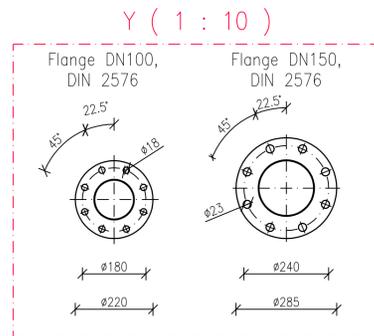
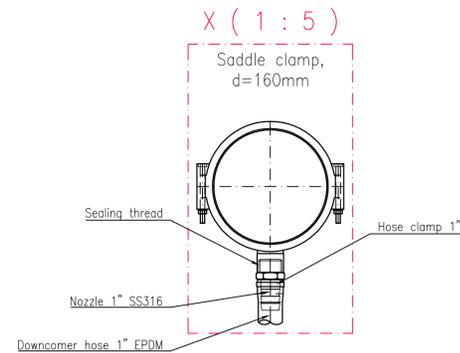
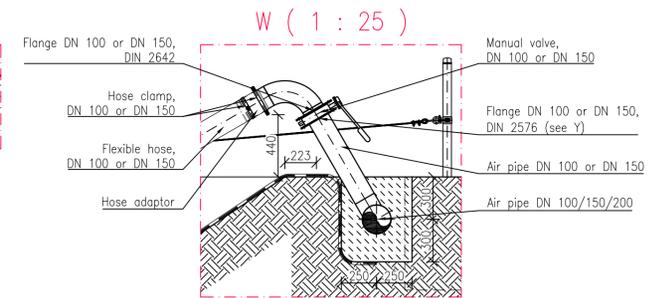
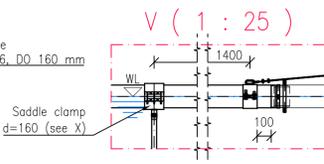
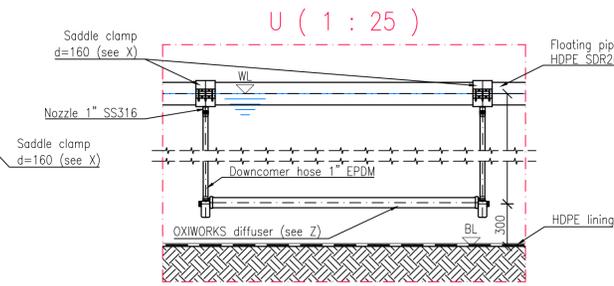
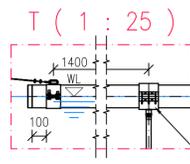
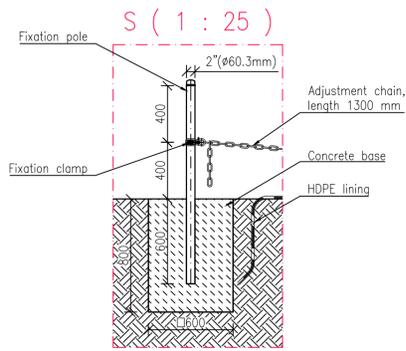


*Illustration of BIOWORKS® rectangular cross clarifier with moving scraper bridge*

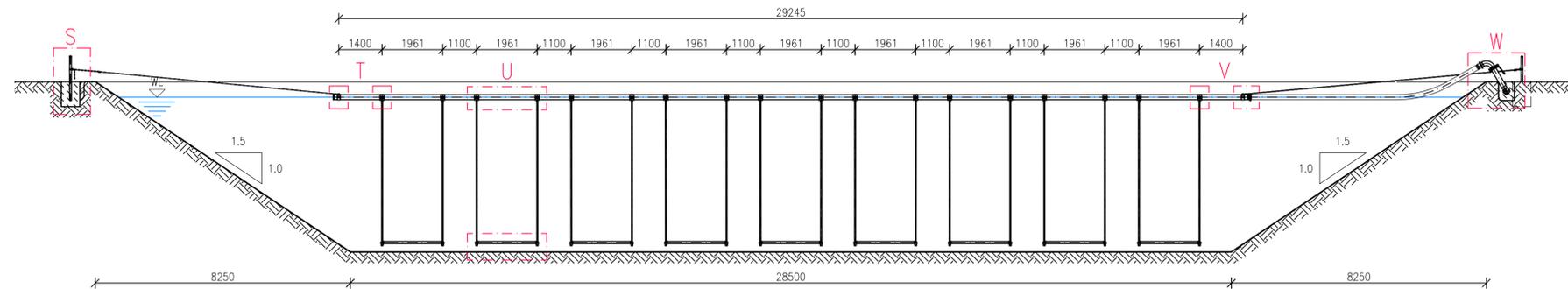
- 1. Inlet openings*
- 2. Moving scraper bridge*
- 3. Clear water effluent openings*
- 4. Sludge suction pipes*
- 5. Sludge transport troughs*



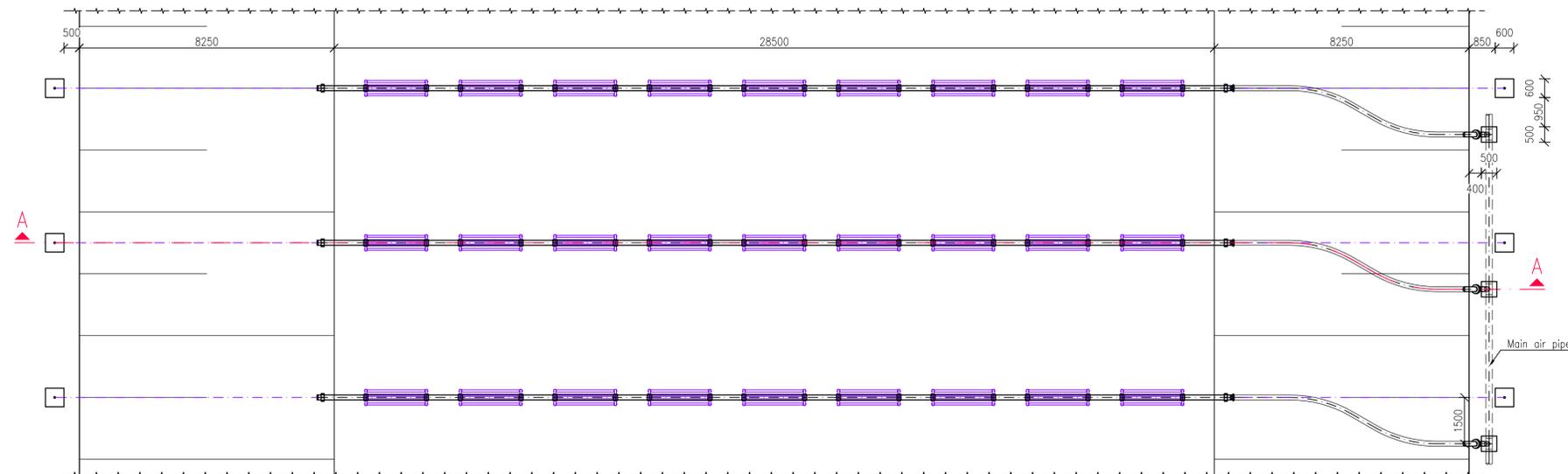
*BIOWORKS® clarifier in operation*



Section A-A ( 1 : 100 )



Top view ( 1 : 100 )



A	21.07.16	New		TN	JS
Rev.	Date	Revised		Drawn:	Check:



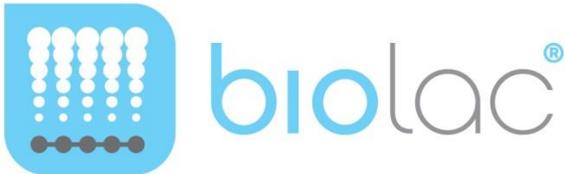
Project name: **Example drawing**  
**Aeration OXIWORKS in earth basins**

Content:

Drawing number:	Project number	Project phase	Type of drawing	Plant section	Serial no.	Sheet no.	Revision	Sheet:
0002 . 1 . 2 . 00 . 1 . 1 . A								1 of 1

Scale: 1:100, 1:25, 1:10, 1:5

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La Contenta, CA rev2  
Preliminary Design Proposal  
October 29, 2024



Preliminary Design Proposal



<b>To:</b>	<b>Bob Godwin, P.E.</b>	<b>Date:</b>	<b>10/7/2024</b>
<b>Company:</b>	<b>Calaveras County Water District</b>	<b>From:</b>	<b>Robert Rolette</b>
<b>Tel.:</b>		<b>Tel.:</b>	<b>913-745-1234</b>
<b>cc:</b>	<b>Marty Unger, Brad Linsey, Kevin Bunting - Parkson Ross Tate, Brad Leidecker, Brian Villacorta (Coombs-Hopkins)</b>		
<b>Subject:</b>	<b>Parkson Biolac® Treatment System, Preliminary Design Proposal for La Contenta, CA - Upgrade</b>		

Thank you for your interest in Parkson's Biolac® Treatment System. Based upon the data provided for this project, we developed the Biolac® design described in this proposal. We believe that this Biolac® design not only meets effluent quality requirements, but also provides the most cost effective solution for this municipality.

We look forward to working with you on this project. Should you have any questions or need clarifications, please do not hesitate to contact me at (913) 745-1234. Thanks.

Sincerely,

PARKSON CORPORATION

An Axel Johnson, Inc. Company

Robert Rolette  
Application Engineer  
rrolette@parkson.com



## 1. Design Basis

### 1.1. Influent and Effluent Specifications

The proposed system design is based on wastewater influent with the following characteristics:

**Table 1.1 – Design Influent flow requirements**

PARAMETER	UNITS	AVERAGE
Start-Up Flow	MGD	0.24
		<b>Phase 1</b>
Max Month Flow– Design Flow	MGD	0.45
Max Day Flow	MGD	1.25
Peak Flow	MGD	1.80

*Note: Customer must confirm these final design flows to assure accuracy of the hydraulic calculations.*

**Table 1.2 - Influent Water Quality**

PARAMETER	UNITS	AVERAGE
Design Temperature	Deg C	20
Minimum Temperature	Deg C	10
		<b>Phase 1</b>
BOD <sub>5</sub>	mg/L	200
Total Suspended Solids	mg/L	200*
TKN	mg/L	50*
NH <sub>3</sub> -N	mg/L	35*
Total Phosphorous (TP)	mg/L	6*
pH	-	6 to 9*
Alkalinity	mg/L as CaCO <sub>3</sub>	500*

*\*assumed*

*Note: Customer must confirm Influent loading conditions for any associated process warranty.*

In order to offer this proposal, Parkson Corporation must make the following assumptions. Deviations from these assumptions should be brought to the attention of the designer of this system as modifications maybe required:



## Preliminary Design Proposal



- a. The wastewater will be pretreated to remove debris and grit using a fine influent screen.
- b. Sufficient alkalinity is present or will be added to allow nitrification to proceed uninhibited.
- c. The incoming oil, grease, chemical and metals concentrations are within biologically treatable levels.
- d. Sufficient nutrients (P, N, etc.) are present in the influent for biomass growth or will be added by the plant operating staff.
- e. A qualified operator will supervise plant activities and performance.

Based on the specified influent water quality, Parkson anticipates that the proposed Biolac® system will provide the following effluent quality:

**Table 1.3 - Effluent Water Quality**

PARAMETER	UNITS	QUALITY
<b>BOD<sub>5</sub></b>	mg/L	10
<b>Total Suspended Solids</b>	mg/L	15
<b>NH<sub>3</sub>-N</b>	mg/L	1
<b>Total Nitrogen (TN)</b>	Mg/L	10

### 1.2. Selected Design Parameters

Based on the design loading information described above, the proposed Biolac® System will be derived as follows:

<b>F/M Ratio</b>	<b>0.03</b>	<b>MLSS</b>	<b>3000 mg/l</b>
<b>SRT</b>	<b>40-50 days</b>	<b>Plant Elevation (above sea level)</b>	<b>750 ft</b>



## 2. System Description

The Biolac® Biological Nutrient Removal System is an innovative complete mix activated sludge process using extended retention of biological solids to create an extremely stable and easily operated system. The Biolac® process can be applied to a wide range of wastewater treatment applications, whether for municipal application or industrial application. Biolac® has over 800 installations in North American and over 1000 installations globally.

Some of the advantages of the Biolac® BNR process include:

- a. Economical construction: Most Biolac® systems are installed in earthen basins which reduces construction cost tremendously by eliminating the need for sophisticated concrete structures and complex piping systems for recycling.
- b. Biolac® BNR systems are typically designed with a sludge age greater than 30 days. The extended sludge age provides stable operation, low sludge production, low production of well stabilized biosolids, and high effluent quality.
- c. Economical process in terms of operation and maintenance cost.
- d. Comprehensive electrical control system to optimize air delivery and provide peace of mind to plant operator.
- e. Utilization of fine bubble aeration using extremely high mixing efficiency of 4 CFM per 1000 ft<sup>3</sup> which is over 50% improvement in comparison to the mixing efficiency achieved by stationary fine bubble diffusers.
- f. Ease of aeration expansion capability simply by adding additional Biofuser® tubes to modules.
- g. Biological nutrient removal is implemented using the Wave-Ox™ design by Parkson's process experts. The Wave-Ox™ process is designed to achieve sequential nitrification / denitrification which results in oxygen and alkalinity recovery and translates into an energy efficient and stable operation.
- h. Integral clarifier design using common walls with the Biolac® basin, designed to make the most efficient use of the available footprint.



- i. Elimination of the need to drain the aeration basin(s) with the Biolac® system since all components can be cleaned and maintained from the surface.

The Biolac® process is characterized by excellent BOD removal, complete nitrification, enhanced denitrification, and biosolids stabilization. It uses fine bubble membrane diffusers attached to floating aeration chains, which are moved across the basin propelled by the air release from the diffusers. The moving aeration chains equipped with the Biofuser® diffuser assemblies provide efficient mixing of the basin contents as well as high oxygen transfer at low energy usage.

The Biofuser® system does not have submerged aeration piping or any other components to be installed, leveled, or secured on the basin floor. The BioFlex® chains with BioFusers do not contact or harm the basin liner. Each BioFlex® chain can be individually controlled by independent air valve providing excellent flexibility in fine-tuning the system to meet the oxygen demand. The individual control capability of the BioFlex chains is used to create alternating oxic and anoxic zones (Wave-Ox™) to allow denitrification in a single basin without internal mixed liquor recycle or complex controls. The moving aeration chain design is not mixing limited so the horsepower required for mixing is typically half of that required for aeration. A turndown capability of 50-70% during low loaded periods is typical without sacrificing mixing due to the movement of the BioFlex aeration chains. Inspection and service of the BioFusers is done quickly and easily without dewatering the basin, keeping maintenance costs low and eliminating the need for redundant aeration basins. In case of cold climates, the fine bubble diffusion beneath the water surface eliminates icing and minimizes wastewater cooling.

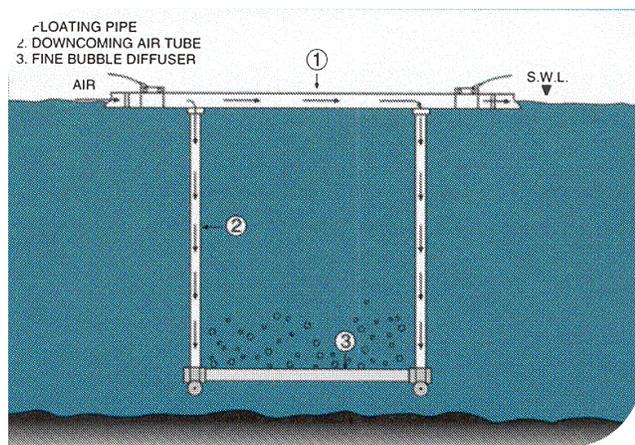
Earthen basins can be used rather than expensive concrete tanks making this extended aeration/activated sludge design the lowest cost alternative available on the market. Integral clarifier(s) are installed using common-wall construction with the extended aeration basin to settle and recycle the stable extended aeration solids.

### 3. System Components

The Biolac® aeration system consists mainly of suspended aeration chains, fine bubble diffusers, motorized and controlled air valves, clarification equipment, blowers and automatic electrical control system.

#### 3.1. Moving Aeration Chain System

The moving aeration chain suspends fine bubble diffusers near the bottom of the basin. The aeration system is designed so that there are no points of attachment to the bottom of the basin. The aeration system is completely suspended above the basin bottom and is not supported or rested on the bottom. This arrangement allows for ease of access for service and maintenance without dewatering the basin or having a complete aeration system shut down.



The aeration chain system is designed to be self-propelled and to move back and forth systematically in the wastewater to provide high mixing efficiency of the basin's content. This capability is critical to allow turndown flexibility in the aeration system while maintaining a completely mixed environment.

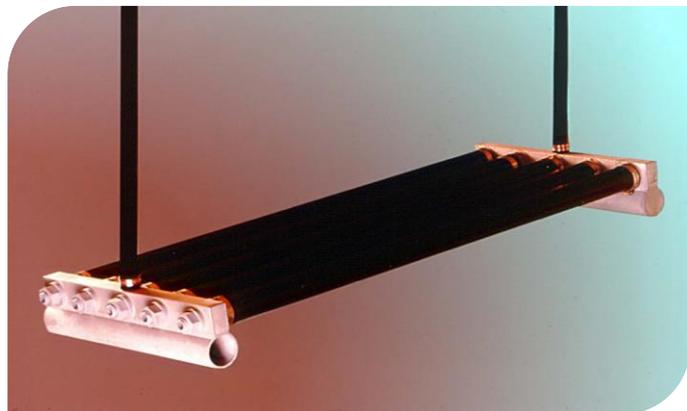


Air is delivered to each aeration chain from one side and connects to the air main through individual branches with butterfly valves. The butterfly valve provides individual control or isolation of the airflow to each chain.

The moving aeration chain is constructed of a single continuous polyethylene header. The moving aeration chain is connected to the Biofuser® by EPDM hose.

### 3.2. Diffuser Frame

The diffuser frame is formed from an extruded polypropylene compound with sufficient strength to prevent warping or deflection. The end connections of each frame shall be sealed using mechanical welding procedures providing a connection stronger than the unwelded tube.



The suspended air diffuser assembly consists of a fully functioning unit capable of housing up to five (5) diffuser tubes total.

### 3.3. System Integral Clarifier

The existing Biolac® system includes an integral clarifier. The integral clarifier is located downstream of the Biolac® system. The clarifier is typically designed using conventional solids and hydraulic loading rates.

Each clarifier has a flocculating rake mechanism which consists of a drive assembly and non-drive / pulley assembly.

The sludge removal system includes an airlift pump and a sludge suction pipe and the Return Sludge will flow by gravity upstream of the Biolac® basin. The sludge suction piping for removing the settled solids from the clarifier is located along the length of



the clarifier hopper bottom. Holes are placed along the length of the suction pipe for uniformal removal of the sludge.

Each integral clarifier includes a fixed overflow weir to control the liquid level in the clarifier and Biolac® basin as well as control the flow to the effluent pipe.

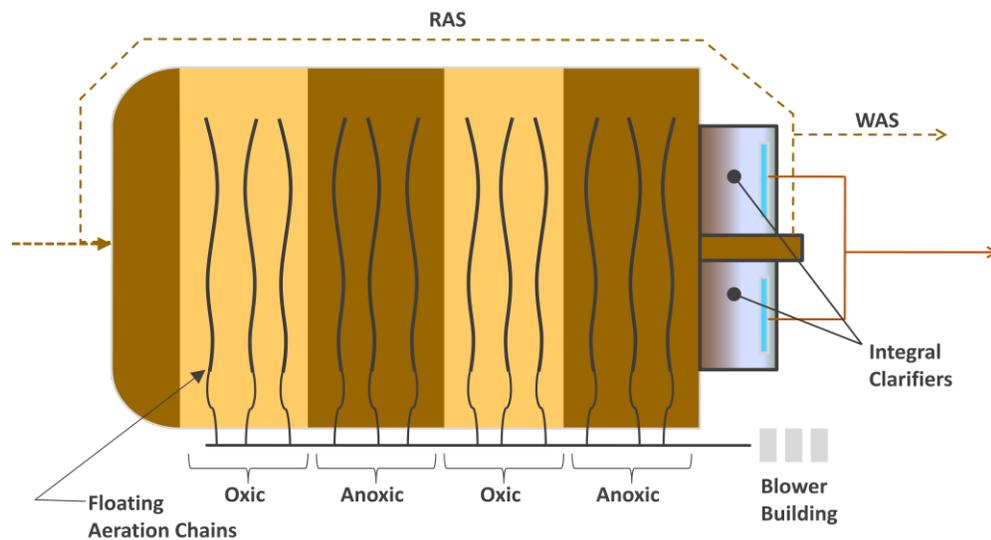
A scum baffle is included in the integral clarifier as well to prevent floating objects from passing over the overflow weir.

### 3.4. Aeration Design

- a. The estimated air and energy requirements and the number of BioFlex© moving aeration headers and Biofuser® units estimated are given in Table 1. A typical BioFlex aeration header and Biofuser® assembly is shown in Drawing SD23 and SD-37.
- b. The required air for Biolac® basin will be supplied by two (2), 25 Hp (Phase 1). One (1) additional blower is provided as an installed spare. Less than one (1) blower is necessary for mixing. Therefore, it is possible to operate one blowers and cut energy usage substantially during periods of low load, such as nighttime operation. The blowers are expected to be located on a concrete pad next to the aeration basins or in a blower building as dictated by local requirements.

## 4. Wave-Ox™ Biological Nutrient Removal

Biological Nutrient Removal (BNR) is simplified and affordable with the Biolac® Wave Ox™ process. Simple control of the air flow distribution to the Biolac's moving aeration chains varies the basin dissolved oxygen content by creating a unique moving wave of multiple oxic and anoxic zones. This repeated cycling of environments nitrifies and denitrifies the wastewater without recycle pumping or additional external basins.



Biological phosphorus removal can also be accomplished by incorporating an upstream anaerobic zone.

The Biolac Wave-Ox™ process not only produces BNR effluent quality with low effluent total nitrogen and total phosphorus, but also includes main features such as

- Single basin BNR process resulting in major construction costs savings by eliminating the need for baffle walls to create independent zones.
- Reduced energy consumption by eliminating the need for internal recycle pumps and mixers for anoxic zones



## 5. Biolac® Treatment System Preliminary Design Information

<b>Biolac Extended Aeration Basin</b>	
<b>Number of Biolac® Basin(s)</b>	1
<b>Approximate Dimensions at Grade (ft)</b>	148 x 86
<b>Approximate Bottom Dimensions (ft)</b>	128 x 47
<b>Side Slope</b>	1.5:1
<b>Side Water Depth (ft)</b>	10
<b>Basin Volume (MG)</b>	0.62
<b>Clarifier Design Hydraulic Loading Rate (gpd/ft<sup>2</sup>) (ADF/PHF)</b>	218/874
<b>Clarifier Design Solids Loading Rate (lbd/ft<sup>2</sup>) (ADF)</b>	21
<b>Clarifier Design Weir Loading Rate (gpd/ft) (ADF/PHF)</b>	5000/20000
<b>Integral Clarifier Size (ft)</b>	90 x 23 ea.
<b>Number of Clarifiers per basin</b>	1
<b>Estimated SOR (lbs/hr)</b>	
<b>Oxidation-only</b>	199
<b>Wave Oxidation (including denite credit)</b>	118
<b>Estimated SCFM (excluding airlift requirements)</b>	
<b>Oxidation-only</b>	1185
<b>Wave Oxidation (including denite credit)</b>	716
<b>Estimated Brake HP (excluding airlift requirements)</b>	
<b>Oxidation-only</b>	41
<b>Wave Oxidation (including denite credit)</b>	25
<b># Diffusers</b>	216
<b># Biofuser® Assemblies</b>	54
<b># BioFlex® Headers</b>	9

## 6. Equipment and Services Supplied

Parkson will supply the following equipment and services for the Biolac® treatment system described above:



### **Buildout (ONLY NEW BASIN)**

- Complete BioFlex<sup>®</sup> moving chains for only the new basin, with BioFuser<sup>®</sup> aeration units including, reinforced hi-temperature connecting hose, HDPE piping, restraining cable system and required hardware.
- Electric motor actuated butterfly valves for individual control of each BioFlex aeration chain.
- Qty three (3) complete, 25 Hp, blower assemblies (PD blowers) including motor and required backflow prevention valves, pressure gauges and accessories (includes one installed spare blower for redundancy). Blower proposed are only for the new basin.
- One (1) EZClear clarifier equipment for the new basin, including biosolids removal piping, sludge suction pipe, flocculating mechanism with single side skimming features, scum removal pipe and overflow weir. Internal components for existing clarifier for basin #1 are EXCLUDED and will be reused.
- Two (2) Submersible Centrifugal Pumps shall be provided for RAS (one as spare). Each pump will be selected to deliver 468 GPM at a total pump head of 15 ft. Each pump will be furnished complete with elbow discharge connection, 30 ft. power cable, thermal overload / seal failure protection, retrieval guide rails and guide rail brackets, stainless steel lifting cable, and a 10 Hp, 460 volt, 3 ph, 60 hz, submersible motor.
- Three (3) modulating 4" electric actuating plug valves.
- One (1) dissolved oxygen probes and analyzers.
- PLC based remote-mounted control system with HMI for operation of the Biolac<sup>®</sup> Wave-Ox<sup>™</sup> System and clarifiers for both basins, including control enclosure, VFDs, relays and control switches for all motors, and components in the system.
- Final installation inspection, start-up supervision and operator training.

## 7. Cost Estimate and Term

- a. The budget price for the equipment and services supplied is
- New Basin Equipment .....\$
  - Clarifier Option 1 (Two integral clarifiers, each sized for half flow).....\$
  - Clarifier Option 2 (Two integral clarifiers, each sized for full flow) .....\$
  - Clarifier Option 3 (Clarifier By others) .....\$

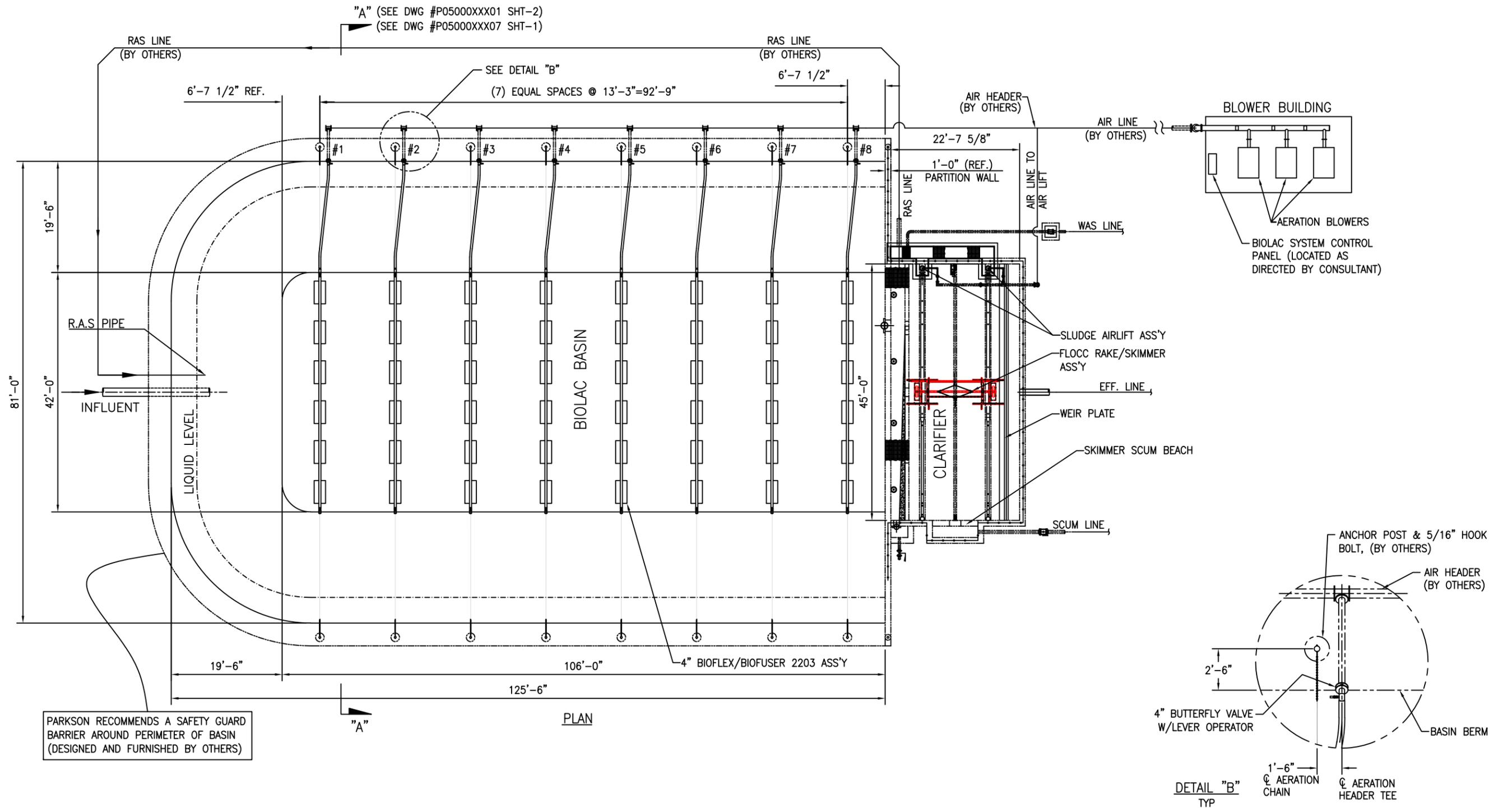
FOB Factory, Freight Allowed.

- b. Terms are 90% net 30, 10% upon startup.
- c. Approval drawings-typically 8-12 weeks after receipt of written order.
- d. Equipment Shipment - typically 16-20 weeks after complete release for manufacture.

Alternative	Parkson
A. Single full-flow integral clarifier	\$795,000
B. Two integral clarifiers, each at 50% Q	\$835,000
C. Two integral clarifiers, each at 100% Q	\$895,000
D. Clarifier by others	\$715,000

**NOTES:**

1. CIVIL AND CONCRETE DESIGN NOT BY PARKSON.
2. REFER TO DRAWING P05000XXX01 SHT-2 FOR GENERAL ARRANGEMENT SECTIONS AND DETAILS.
3. REFER TO DRAWING P05000XXX01 SHT-3 FOR CLARIFIER LAYOUT.
4. REFER TO DRAWING P05000XXX01 SHT-4 FOR CLARIFIER SECTIONS.
5. REFER TO DRAWING P05000XXX07 SHT-1 FOR 4" BIOFLEX/BIOFUSER 2203 ASSEMBLY.



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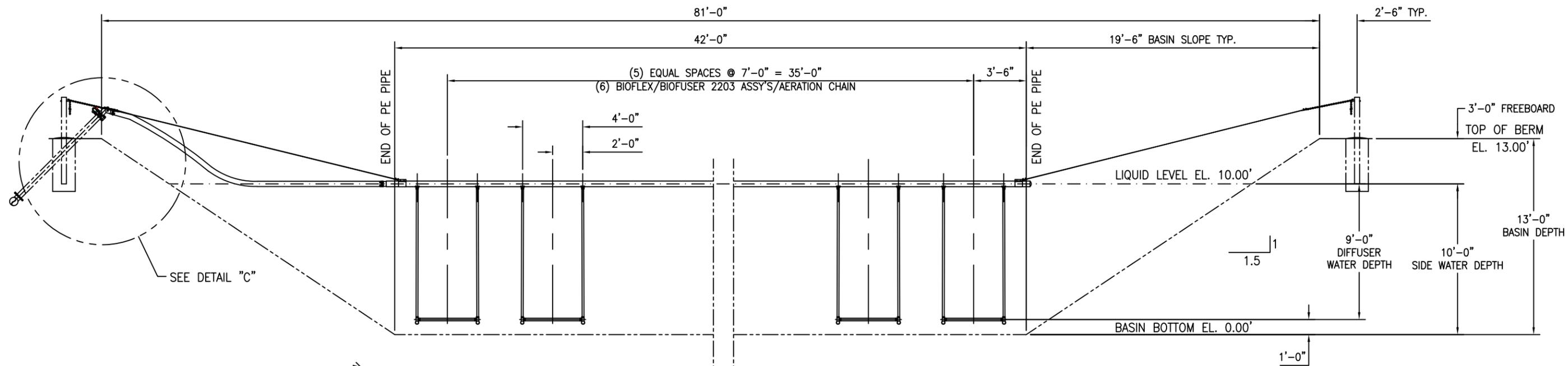
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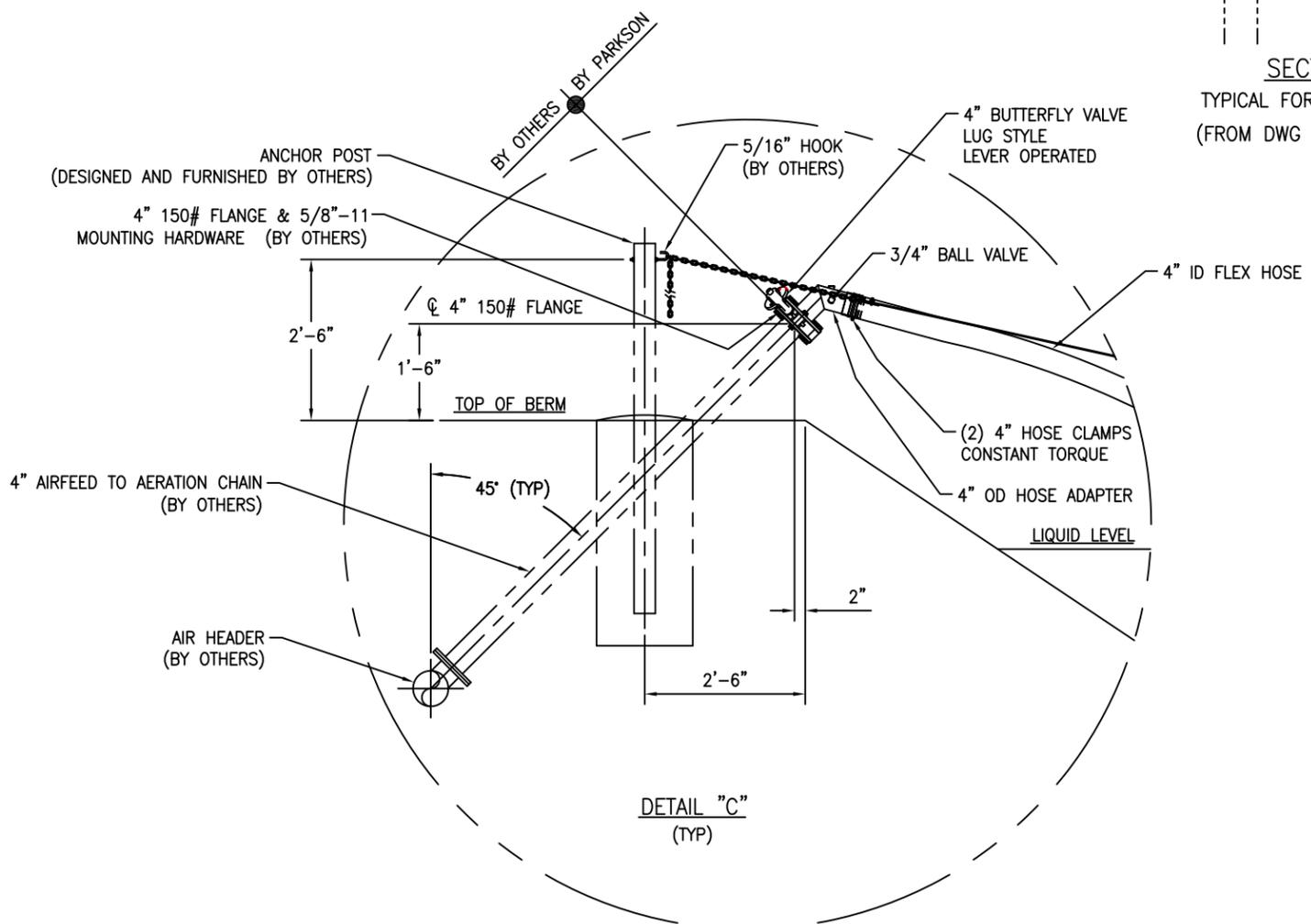


PROJECT NAME	TITLE
PROJECT NUMBER P05000XXX OAK GROVE, LA	BIOLAC (R) SYSTEM GENERAL ARRANGEMENT
REFERENCE INFORMATION	DRAWING NO
	P05000XXX01

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SHEET 1 OF 4	



SECTION "A"-"A"  
TYPICAL FOR ALL AERATION CHAINS  
(FROM DWG #P05000XXX01 SHT-1)



DETAIL "C"  
(TYP)

- NOTES:
1. CIVIL AND CONCRETE DESIGN NOT BY PARKSON.
  2. FOR GENERAL ARRANGEMENT SEE DWG #P05000XXX01-1.

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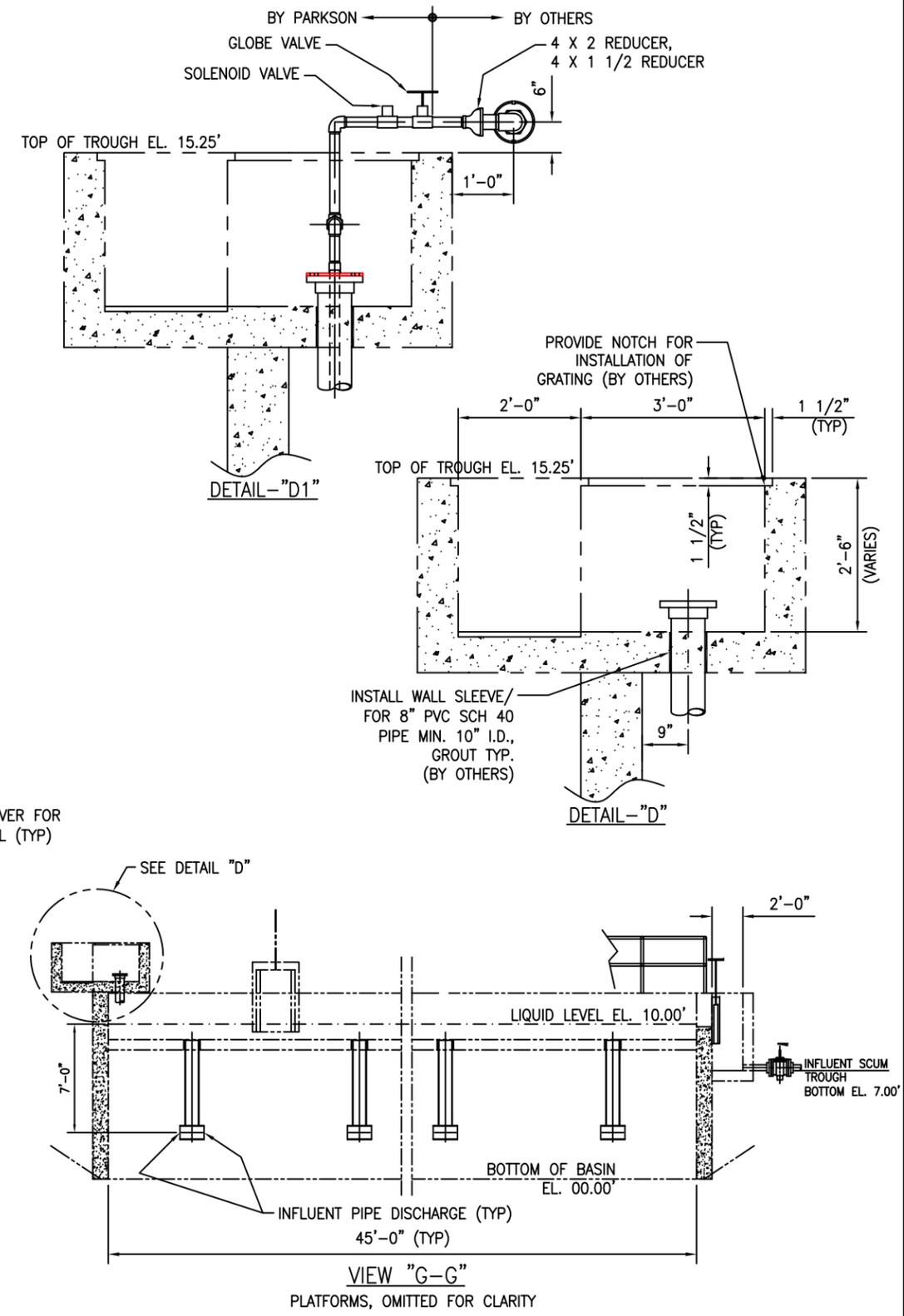
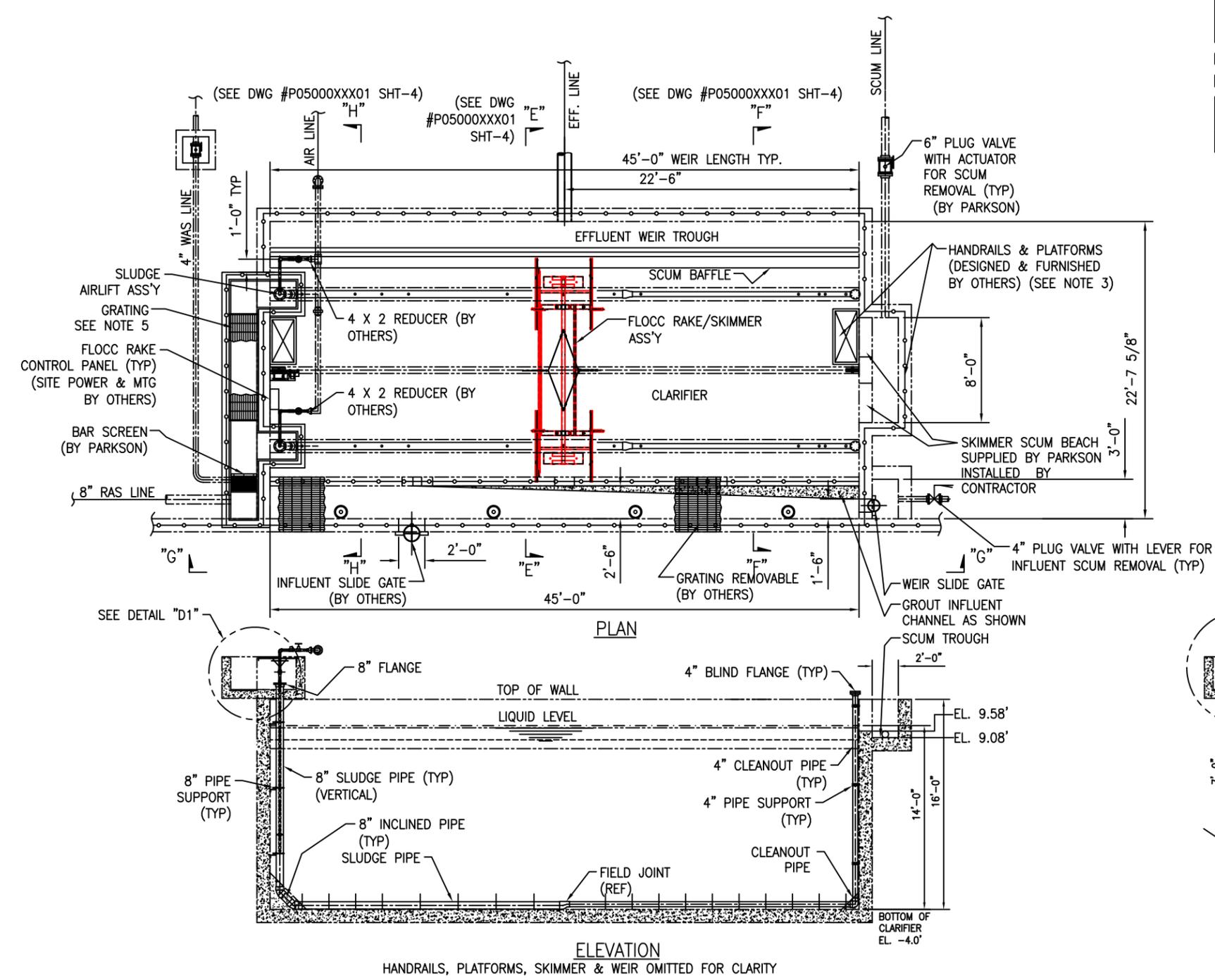
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SCALE	SIZE
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PROJECT NAME	TITLE
PROJECT NUMBER P05000XXX OAK GROVE, LA	BIOLAC (R) SYSTEM SECTION "A-A" & DETAIL "C"
REFERENCE INFORMATION	DRAWING NO
	P05000XXX01

	REV
	0
SHEET 2 OF 4	

- NOTES:**
1. CIVIL AND CONCRETE DESIGN NOT BY PARKSON.
  2. SERVICE WATER FOR CLARIFIER MAINTENANCE RECOMMENDED.
  3. PARKSON CORP. RECOMMENDS INSTALLATION OF OSHA APPROVED HANDRAILS AND PLATFORMS FOR MAINTENANCE & SAFETY W/ KICKPLATES ATTACHED TO HANDRAILS TO PREVENT DEBRIS FROM ENTERING CLARIFIER. (DESIGNED AND FURNISHED BY OTHERS)
  4. ALL PIPING WALL SLEEVES, AS REQUIRED, PROVIDED BY OTHERS.
  5. GRATING (BY OTHERS) TO BE DESIGNED W/REMOVABLE SECTION OVER SCREEN AND SUMP FOR MAINTENANCE ACCESS.



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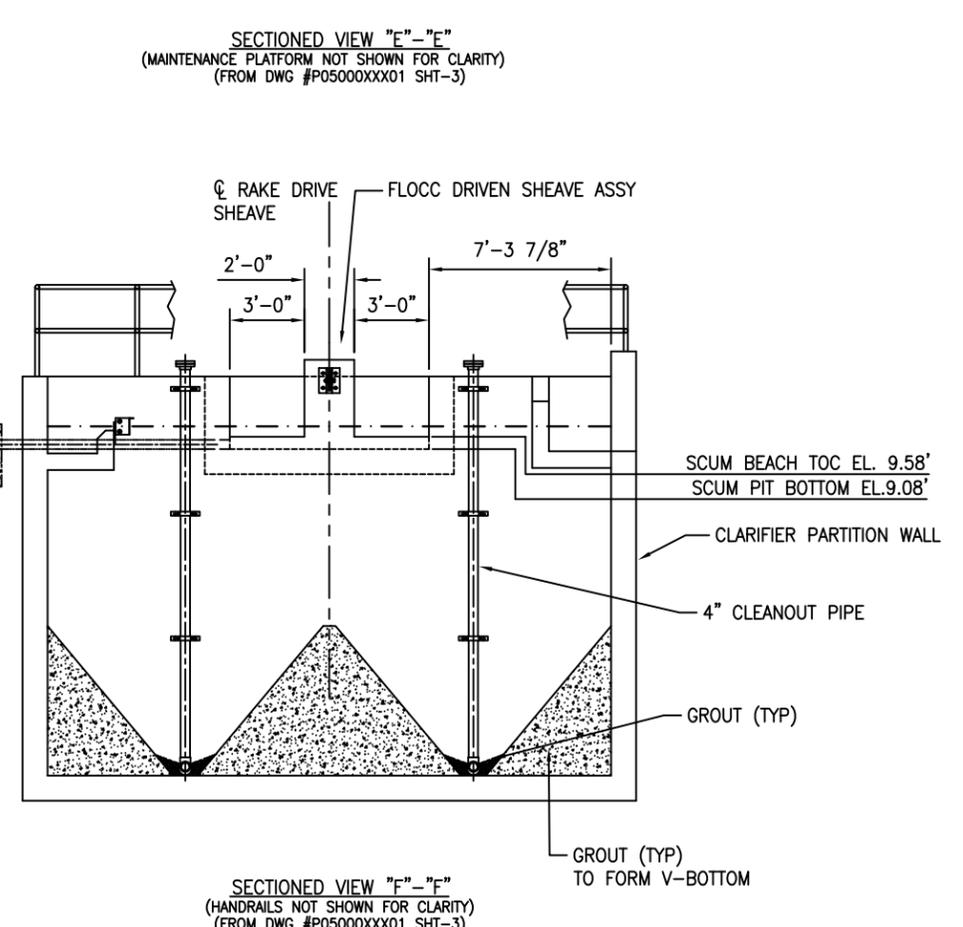
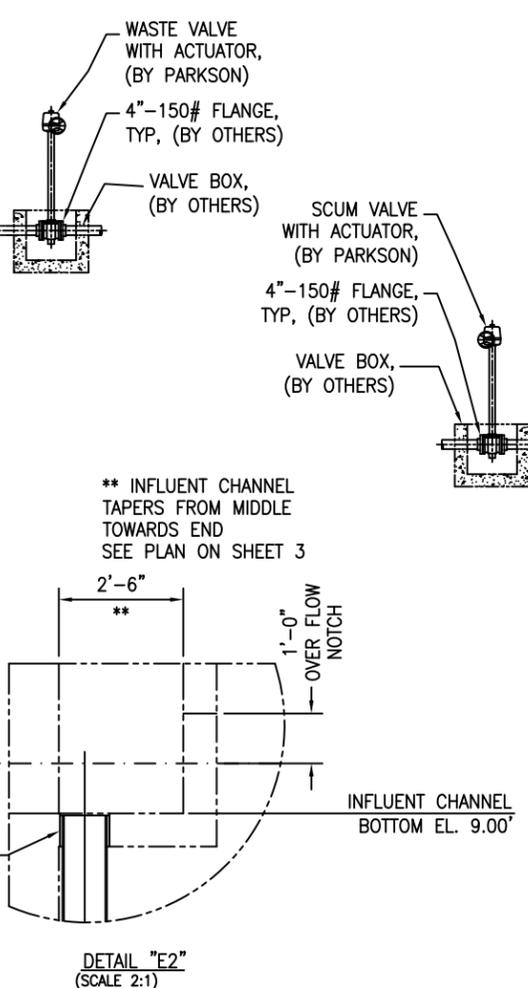
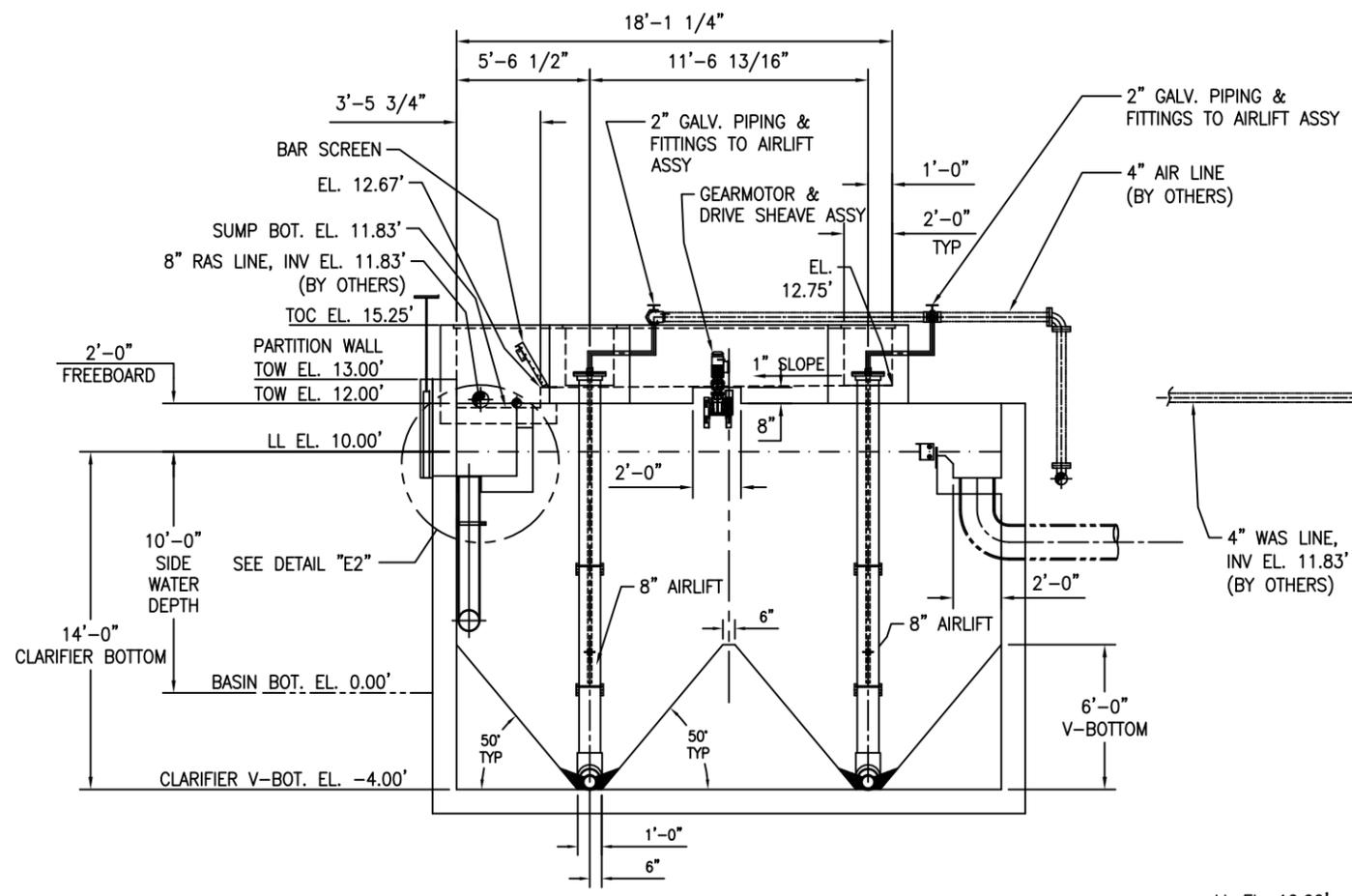
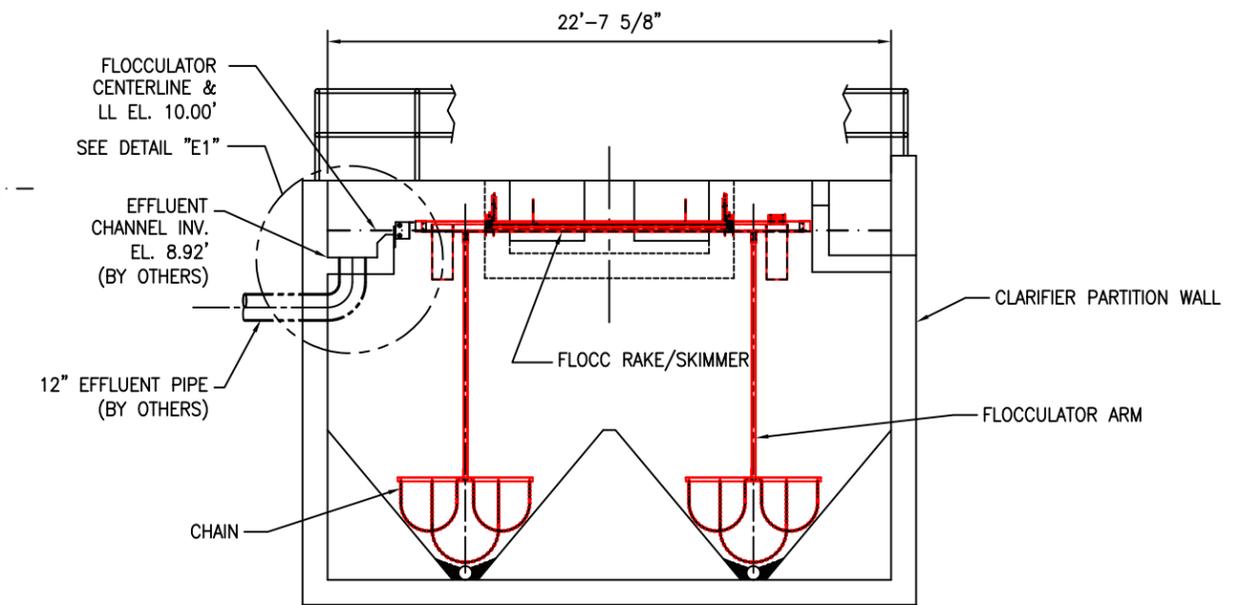
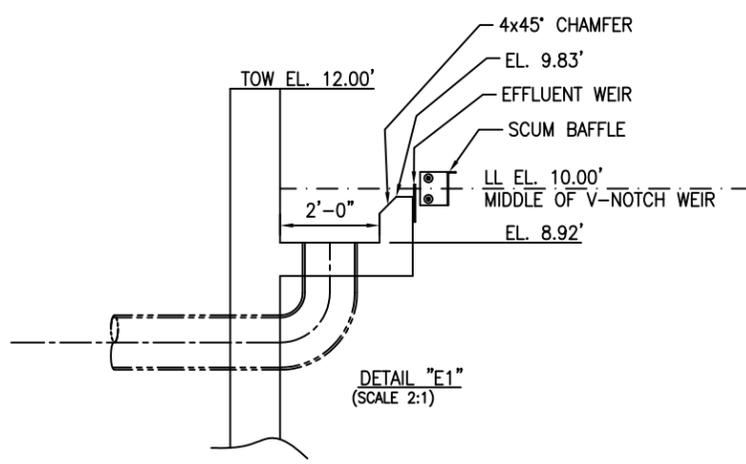
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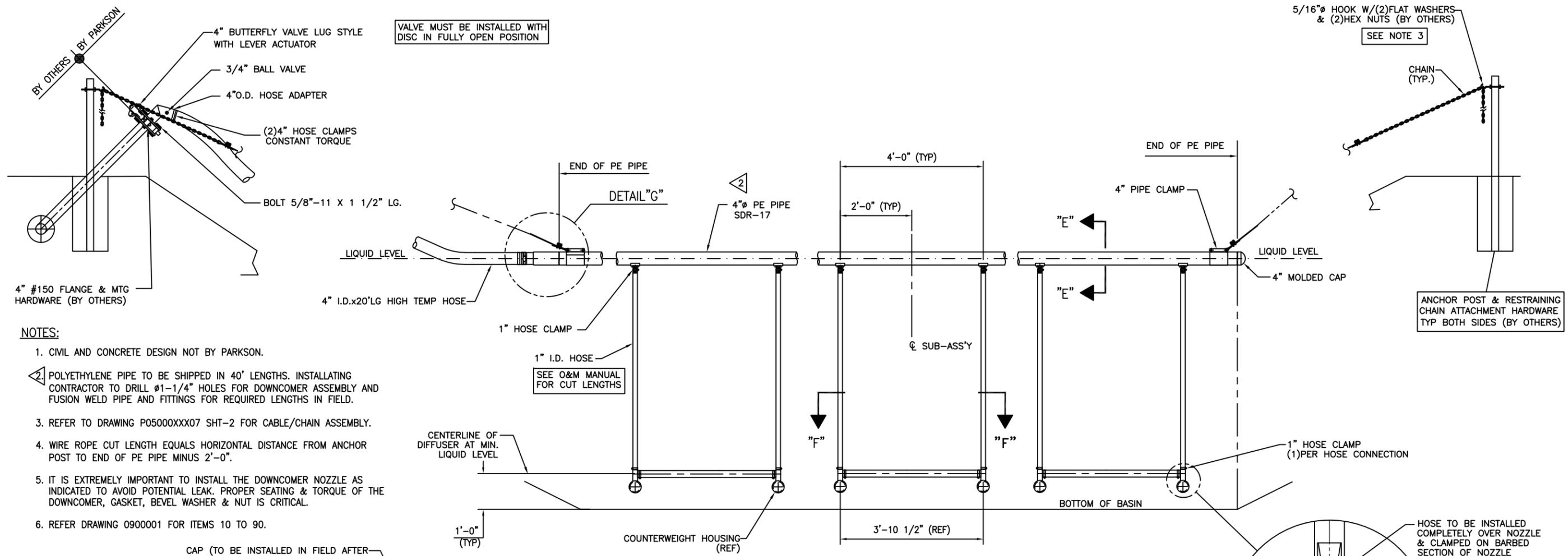
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PROJECT NUMBER P05000XXX OAK GROVE, LA	BIOLAC (R) SYSTEM CLARIFIER LAYOUT & VIEW "G-G"
REFERENCE INFORMATION	DRAWING NO
	P05000XXX01

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SHEET 3 OF 4	

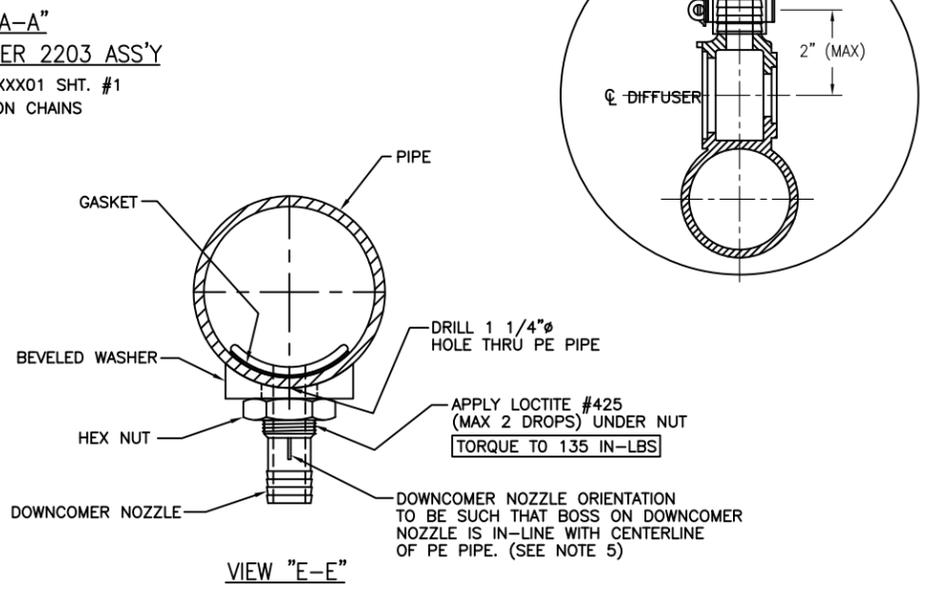
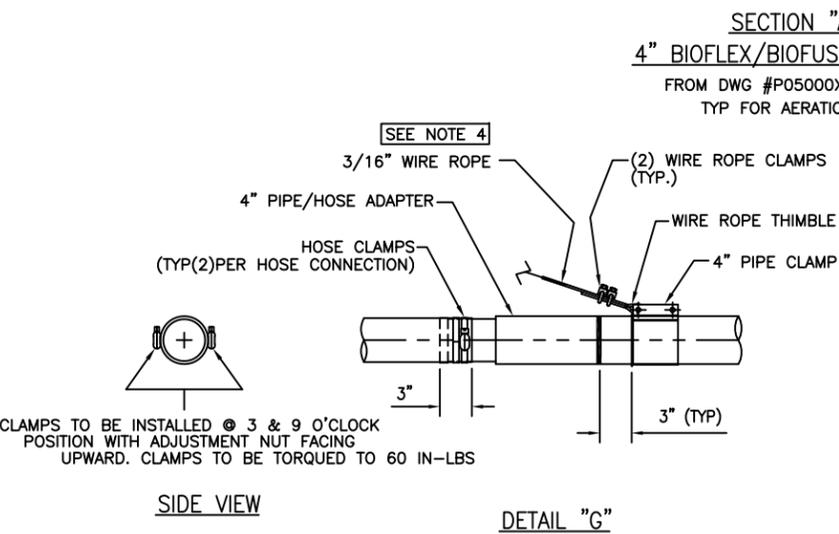
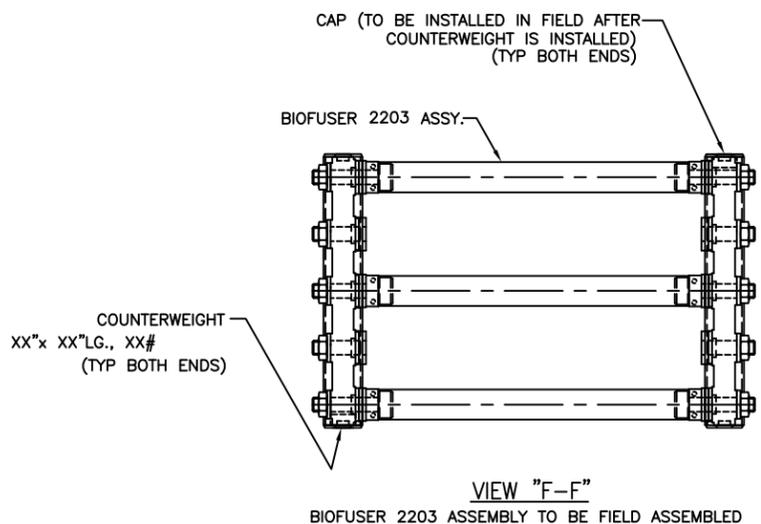


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1. CIVIL AND CONCRETE DESIGN NOT BY PARKSON.

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					CHECKED BY MR DATE 04/04/17	REFERENCE INFORMATION		DRAWING NO P05000XXX01	REV 0
	REV	DESCRIPTION	DATE	BY	THIS DRAWING IS LIMITED TO FUNCTIONAL DESIGN, GENERAL ARRANGEMENT AND CLEARANCE. NO RESPONSIBILITY IS ACCEPTED BY PARKSON CORPORATION FOR OTHER DIMENSIONS, QUANTITIES, OR COORDINATION WITH OTHER EQUIPMENT OR DRAWINGS EXCEPT AS STATED IN PURCHASE ORDER.	SCALE NTS SIZE B		SHEET 4 OF 4	



- NOTES:**
1. CIVIL AND CONCRETE DESIGN NOT BY PARKSON.
  2. POLYETHYLENE PIPE TO BE SHIPPED IN 40' LENGTHS. INSTALLING CONTRACTOR TO DRILL  $\phi 1-1/4$ " HOLES FOR DOWNCOMER ASSEMBLY AND FUSION WELD PIPE AND FITTINGS FOR REQUIRED LENGTHS IN FIELD.
  3. REFER TO DRAWING P05000XXX07 SHT-2 FOR CABLE/CHAIN ASSEMBLY.
  4. WIRE ROPE CUT LENGTH EQUALS HORIZONTAL DISTANCE FROM ANCHOR POST TO END OF PE PIPE MINUS 2'-0".
  5. IT IS EXTREMELY IMPORTANT TO INSTALL THE DOWNCOMER NOZZLE AS INDICATED TO AVOID POTENTIAL LEAK. PROPER SEATING & TORQUE OF THE DOWNCOMER, GASKET, BEVEL WASHER & NUT IS CRITICAL.
  6. REFER DRAWING 0900001 FOR ITEMS 10 TO 20.



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REV	DESCRIPTION	DATE	BY

PRELIMINARY — APPROVAL  
 INFORMATION — CERTIFIED

THIS DRAWING IS LIMITED TO FUNCTIONAL DESIGN, GENERAL ARRANGEMENT AND CLEARANCE. NO RESPONSIBILITY IS ACCEPTED BY PARKSON CORPORATION FOR OTHER DIMENSIONS, QUANTITIES, OR COORDINATION WITH OTHER EQUIPMENT OR DRAWINGS EXCEPT AS STATED IN PURCHASE ORDER.

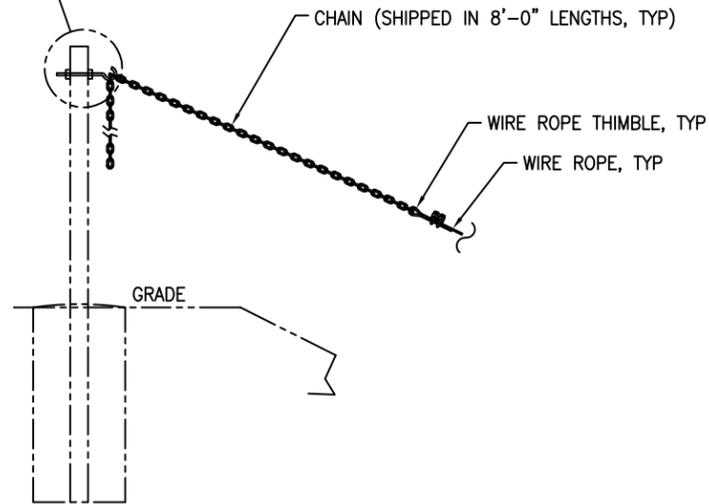
DRAWN BY	DATE
RAGHU	04/04/17
CHECKED BY	DATE
MR	04/04/17
SCALE	SIZE
NTS	B



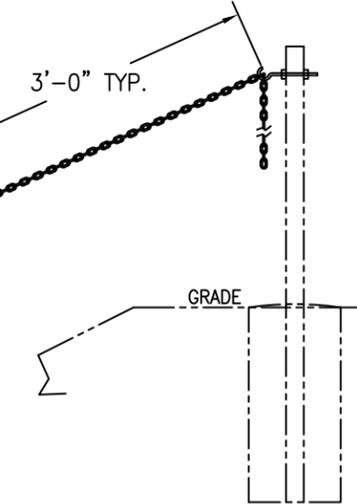
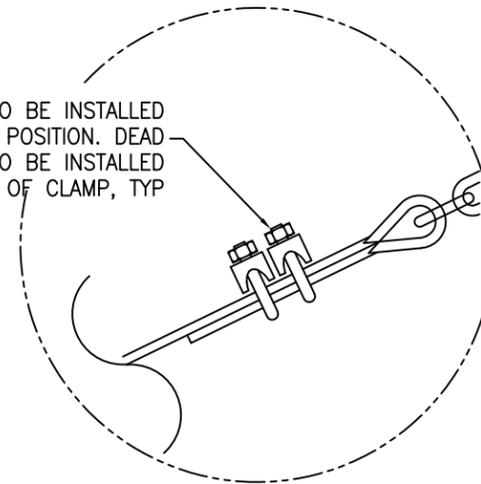
PROJECT NAME	TITLE
PROJECT NUMBER P05000XXX OAK GROVE, LA	BIOLAC (R) SYSTEM 4" BIOFLEX/BIOFUSER 2203 ASSY
REFERENCE INFORMATION	DRAWING NO
	P05000XXX07

	REV
	0
SHEET 1 OF 2	

SEE DETAIL "F"



TWO (2) WIRE ROPE CLAMPS TO BE INSTALLED WITH NUTS IN AN UPWARD POSITION. DEAD END SIDE OF WIRE ROPE TO BE INSTALLED UNDER U-BOLT PORTION OF CLAMP, TYP



INSTALL PE CLAMP BOLT THROUGH WIRE ROPE THIMBLE, TYP

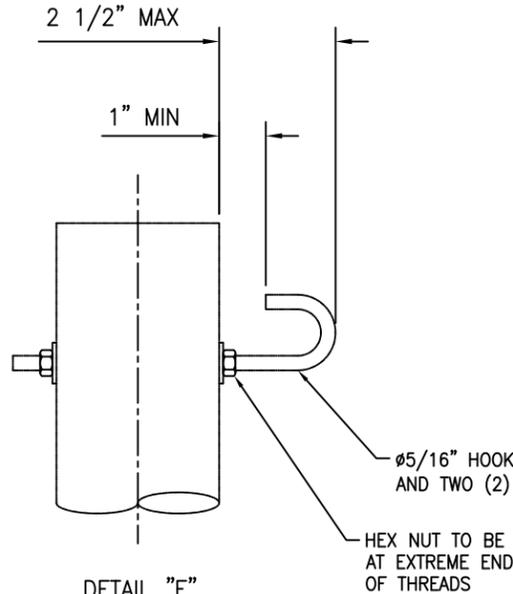
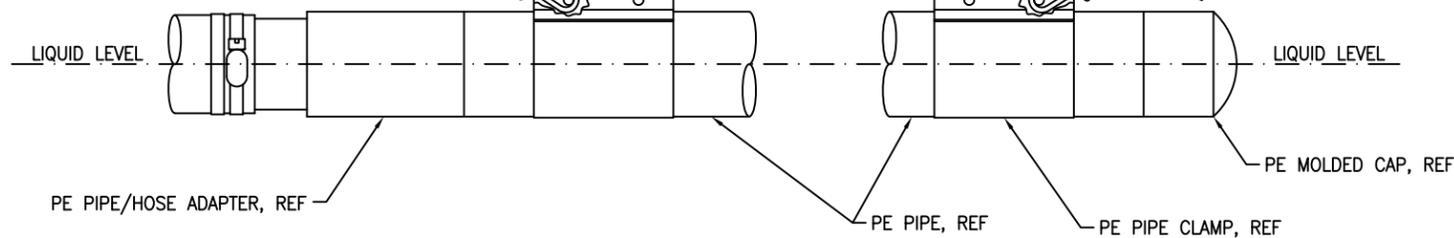
WIRE ROPE THIMBLE, REF

WIRE ROPE CLAMP, REF

INSTALL CLAMP AS CLOSE AS POSSIBLE TO THIMBLE, TYP

2" (TYP.)

1" MAX OVERLAP, TYP



DETAIL "F"

(RECOMMENDED HOOK DESIGN)  
(CHAIN OMITTED FOR CLARITY)

Ø5/16" HOOK WITH TWO (2) FLAT WASHERS AND TWO (2) HEX NUTS (BY OTHERS)

HEX NUT TO BE AT EXTREME END OF THREADS

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REV	DESCRIPTION	DATE	BY

PRELIMINARY  APPROVAL  
 INFORMATION  CERTIFIED

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DRAWN BY	DATE
RAGHU	04/04/17
CHECKED BY	DATE
MR	04/04/17
SCALE	SIZE
NTS	B



PROJECT NAME	TITLE
PROJECT NUMBER P05000XXX OAK GROVE, LA	BIOLAC SYSTEM CHAIN & CABLE ASSY
REFERENCE INFORMATION	DRAWING NO
	P05000XXX07

	REV
	0
SHEET 2 OF 2	

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**APPENDIX D**  
Calaveras County Water District  
Secondary Clarifier Design Calculations and Budgetary  
Proposal

Proposal

# La Contenta WWTF

Calaveras County, California

**Representative**

Dan Whittemore  
MISCOWater  
Pleasanton, California  
(925) 225-1900  
dwhittemore@miscowater.com

**Engineer**

HydroScience Engineers, Inc.  
Sacramento, California  
(916) 364-1490

**Contact**

Matthew Swaney  
mswaney@westechwater.com  
(801) 290-1910

Matt Pearson  
mpearson@westech-inc.com  
(801) 290-5772

Proposal: 2460412.B\_Rev0  
Wednesday, October 9, 2024

**WESTECH**<sup>®</sup>

 SWIRE WATER



# Table of Contents



## Technical Proposal



- Item A – One (1) 30' Diameter Clarifier Mechanism, Model COPS4G
- Item B – One (1) 40' Diameter Clarifier Mechanism, Model COPC1G



## Clarifications and Exceptions



## Commercial Proposal



- Bidder's Contact Information
- Pricing
- Payment Terms
- Schedule
- Freight



## Warranty



## Terms and Conditions





# Technical Proposal

## Item A – One (1) 30' Diameter Clarifier Mechanism, Model COPS4G

### General Scope of Supply

Item	Unit	Value/Description
Number of Mechanisms	Each	1
Application	-	Activated Sludge Secondary
Tank Diameter	ft	30
Tank Side Wall Depth	ft	14
Tank Side Water Depth	ft	12
Tank Bottom Slope	-	2.75:12
Average Flow Rate	MGD	0.237
Design Flow Rate	MGD	0.473
Max Flow Rate	MGD	0.7885
Peak Flow Rate	MGD	1.262
Influent MLSS Concentration	mg/L	3000
SVI	mL/g	130**

\*\*Assumed Values

see updated dimensions - separate file



# Technical Proposal

## Detailed Scope of Supply – Each Mechanism Includes the Following

Item	Qty	Size/Description	Material
Walkway Bridge	1	36" wide Full Diameter Beam Bridge	Steel
Walkway Handrail	-	2 Rail Component Handrail, Pop Rivet	Aluminum
Walkway Flooring	-	1.25" Grating	Aluminum
Drive Platform	1	24" Minimum Drive Clearance	Steel
Platform Handrail	-	2 Rail Component Handrail, Pop Rivet	Aluminum
Platform Flooring	-	0.25" Checker Plate	Aluminum
Influent Pipe	1	16" dia. sch. 40 pipe & supports	Steel
Drive Shaft	1	8" Dia.	Steel
Dual Gate EDI	1	4' dia. x 2.5' deep x 0.1875" plate	Steel
Feedwell	1	10' dia. x 5' deep x 0.1875" plate	Steel
Full Radius Rake Arms	2	Box Truss w/ Spiral Scrapers	Steel
Skimmer Blade & Supports	2	Extends from feedwell to hinged skimmer	Steel
Hinged Skimmer Assembly	2	With neoprene wipers	HDG/304 SS/Alum
Scum Box & Supports	1	3' Scum Box	Steel
Scum Flushing Valve	1	Skimmer Actuated	Polymer/SS
Effluent Weir	1	9" deep x 0.25" thick	FRP
Scum Baffle & Supports	1	12" deep x 0.25" thick	FRP
Electrical Control Panel	1	NEMA 4X	304 SS
Drive Unit	1	See Drive Unit Table for description	
Anchor Bolts & Fasteners	-	-	304 SS





# Technical Proposal

## Electrical Control Panel

The clarifier controls will be housed in a single NEMA 4X, wall-mount, stainless steel enclosure with painted steel back panel, and mounting feet. Hand/Off/Auto switch, run light, motor overload light, drive cutout light, alarm silence and reset pushbuttons are provided on the door. The panel will contain a magnetic combination motor starter with externally reset thermal overloads, a main circuit breaker with rotary disconnect handle, fuses, fuse blocks, relays, timer, and other supporting hardware. A control power transformer will provide 120VAC for internal controls. The transformer will have both primary legs fused, and one secondary leg on a circuit breaker.

A top mounted, amber strobing alarm light and horn shall provide indication of a high torque condition. A door mounted reset pushbutton clears all interlocks after the high torque conditions have been removed.

The control panel is wired to accept a single 480VAC, 3 phase, 60 Hertz power feed from the customer. A 3-pole molded case circuit breaker with pad-lockable disconnect handle is provided for short circuit protection. All wiring for field connections will be brought to a terminal strip. All interconnecting wiring is to be by others.

## Drive Unit

Description	Unit	Value/Description
Drive Type	D25	Shaft Drive w/ Precision Bearing
Housing Material	-	Fabricated Steel
Continuous Rated Torque	ft·lbs	4,100
Momentary Peak Torque	ft·lbs	8,200
Rake Tip Speed	ft/min	8.2
Motor Size	HP	1
Motor Voltage/Frequency/Phase	V / Hz / Phase	460 / 60 / 3
Torque Control Settings	Alarm: ft·lbs	100%: 4,100
	Motor Cutout: ft·lbs	120%: 4,920
Main Gear and Pinion Lubrication	-	Oil
Main Bearing and Reducer Lubrication	-	Grease

## Surface Preparation and Coating

Application Surfaces	Surface Preparation	Finish
Submerged	SSPC-SP10	One (1) Coat Tnemec N140-1255, 4-6 mils DFT, and One (1) Coat Tnemec N140-B5712, 4-6 mils DFT
Non-Submerged	SSPC-SP10	One (1) Coat Tnemec N140-1255, 4-6 mils DFT, and One (1) Coat Tnemec 1074U-B5712, 3-5 mils DFT
Drive Unit	SSPC-SP6	One (1) coat Tnemec N140F-1255 Epoxy, 4-6 mils DFT, and one (1) coat Tnemec 1074U-B5712 Polyurethane, 3-5 mils DFT



# Technical Proposal

## Approximate Weights

Item	Weight	Unit
Influent Pipe	1700	lbs
Drive Shaft, Rake Arms, Spiral Rake Blades	2350	lbs
Dual Gate EDI, Feedwell, Feedwell Supports	2550	lbs
Standard Skimmer, Scum Box & Supports	950	lbs
Bridge & Platform	2100	lbs
Drive Unit	1200	lbs
<b>Heaviest Single Item (Drive)</b>	<b>1200</b>	<b>lbs</b>

## Additional Services and Equipment

WesTech has included on-site technical assistance for inspection, observation of torque testing, startup, and instruction of plant personnel. Additional on-site services may be purchased at standard WesTech daily rates plus travel and living expenses.

## On-Site Technical Service

Item	Quantity
Total Number of Trips	1
Total Number of Days	1

## Items Not Included in WesTech's Base Scope of Supply (unless specifically noted)

- Access Stairs and Landings
- Concrete/Grout
- Concrete and Anchor Reinforcement
- Conduits and Wiring
- Erection or Assembly
- Lubricants
- Piping, Valves, or Fittings
- Unloading or Storage





# Technical Proposal

## Item B – One (1) 40' Diameter Clarifier Mechanism, Model COPC1G

### General Scope of Supply

Item	Unit	Value/Description
Number of Mechanisms	Each	1
Application	-	Activated Sludge Secondary
Tank Diameter	ft	40
Tank Side Wall Depth	ft	14
Tank Side Water Depth	ft	12
Tank Bottom Slope	-	1:12
Average Flow Rate	MGD	0.237
Design Flow Rate	MGD	0.473
Max Flow Rate	MGD	0.7885
Peak Flow Rate	MGD	1.262
Influent MLSS Concentration	mg/L	3000
SVI	mL/g	130**

\*\*Assumed Values





# Technical Proposal

## Detailed Scope of Supply – Each Mechanism Includes the Following

Item	Qty	Size/Description	Material
Walkway Bridge	1	36" wide Beam Bridge	Steel
Walkway Handrail	-	2 Rail Component Handrail, Pop Rivet	Aluminum
Walkway Flooring	-	1.25" Grating	Aluminum
Drive Platform	1	24" Minimum Drive Clearance	Steel
Platform Handrail	-	2 Rail Component Handrail, Pop Rivet	Aluminum
Platform Flooring	-	0.25" Checker Plate	Aluminum
Center Column	1	18" dia. x 0.25" thick	Steel
Center Cage	1	3' Square	Steel
Dual Gate EDI	1	6' dia. x 2.5' deep x 0.1875" plate	Steel
Feedwell	1	10' dia. x 5' deep x 0.1875" plate	Steel
Full Radius Rake Arms	2	Box Truss w/ Spiral Scrapers	Steel
Sludge Withdrawal Ring	1	20% Tank Diameter w/ Evenly Spaced Ports	Steel
Skimmer Blade & Supports	2	Extends from feedwell to hinged skimmer	Steel
Hinged Skimmer Assembly	2	With neoprene wipers	HDG/304 SS/Alum
Scum Box & Supports	1	3' Scum Box	Steel
Scum Flushing Valve	1	Skimmer Actuated	Polymer/SS
Effluent Weir	1	9" deep x 0.25" thick	FRP
Scum Baffle & Supports	1	12" deep x 0.25" thick	FRP
Electrical Control Panel	1	NEMA 4X	304 SS
Drive Unit	1	See Drive Unit Table for description	
Anchor Bolts & Fasteners	-	-	304 SS





# Technical Proposal

## Electrical Control Panel

The clarifier controls will be housed in a single NEMA 4X, wall-mount, stainless steel enclosure with painted steel back panel, and mounting feet. Hand/Off/Auto switch, run light, motor overload light, drive cutout light, alarm silence and reset pushbuttons are provided on the door. The panel will contain a magnetic combination motor starter with externally reset thermal overloads, a main circuit breaker with rotary disconnect handle, fuses, fuse blocks, relays, timer, and other supporting hardware. A control power transformer will provide 120VAC for internal controls. The transformer will have both primary legs fused, and one secondary leg on a circuit breaker.

A top mounted, amber strobing alarm light and horn shall provide indication of a high torque condition. A door mounted reset pushbutton clears all interlocks after the high torque conditions have been removed.

The control panel is wired to accept a single 480VAC, 3 phase, 60 Hertz power feed from the customer. A 3-pole molded case circuit breaker with pad-lockable disconnect handle is provided for short circuit protection. All wiring for field connections will be brought to a terminal strip. All interconnecting wiring is to be by others.

## Drive Unit

Description	Unit	Value/Description
Drive Type	C31	Cage Drive w/ Precision Bearing
Housing Material	-	Fabricated Steel
Continuous Rated Torque	ft·lbs	14,700
Momentary Peak Torque	ft·lbs	29,400
Rake Tip Speed	ft/min	8.0
Motor Size	HP	1
Motor Voltage/Frequency/Phase	V / Hz / Phase	460 / 60 / 3
Torque Control Settings	Alarm: ft·lbs	100%: 14,700
	Motor Cutout: ft·lbs	120%: 17,640
Main Gear and Pinion Lubrication	-	Oil
Main Bearing and Reducer Lubrication	-	Grease

## Surface Preparation and Coating

Application Surfaces	Surface Preparation	Finish
Submerged	SSPC-SP10	One (1) Coat Tnemec N140-1255, 4-6 mils DFT, and One (1) Coat Tnemec N140-B5712, 4-6 mils DFT
Non-Submerged	SSPC-SP10	One (1) Coat Tnemec N140-1255, 4-6 mils DFT, and One (1) Coat Tnemec 1074U-B5712, 3-5 mils DFT
Drive Unit	SSPC-SP6	One (1) coat Tnemec N140F-1255 Epoxy, 4-6 mils DFT, and one (1) coat Tnemec 1074U-B5712 Polyurethane, 3-5 mils DFT



# Technical Proposal

## Approximate Weights

Item	Weight	Unit
Center Column	1200	lbs
Center Cage, Rake Arms, Spiral Rake Blades, Sludge Withdrawal Ring	3550	lbs
Dual Gate EDI, Feedwell, Feedwell Supports	2800	lbs
Standard Skimmer, Scum Box & Supports	1200	lbs
Bridge & Platform	1100	lbs
Drive Unit	2200	lbs
<b>Heaviest Single Item (Drive Unit)</b>	<b>2200</b>	<b>lbs</b>

## Additional Services and Equipment

WesTech has included on-site technical assistance for inspection, observation of torque testing, startup, and instruction of plant personnel. Additional on-site services may be purchased at standard WesTech daily rates plus travel and living expenses.

## On-Site Technical Service

Item	Quantity
Total Number of Trips	1
Total Number of Days	1

## Items Not Included in WesTech’s Base Scope of Supply (unless specifically noted)

- Access Stairs and Landings
- Concrete/Grout
- Concrete and Anchor Reinforcement
- Conduits and Wiring
- Erection or Assembly
- Lubricants
- Piping, Valves, or Fittings
- Unloading or Storage



# Clarifications and Exceptions

## General Clarifications

**Terms & Conditions:** This proposal, including all terms and conditions contained herein, shall become part of any resulting contract or purchase order. Changes to any terms and conditions, including but not limited to submittal and shipment days, payment terms, and escalation clause shall be negotiated at order placement, otherwise the proposal terms and conditions contained herein shall apply.

**Escalation:** If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

**Build America, Buy America Act (BABAA) and Other Domestic Content Requirements:** WesTech is U.S. based and proudly manufacturers many products available to meet various domestic procurement requirements. Due to variability in legislation, products, and project-based specifications, WesTech is unable to guarantee compliance with domestic content requirements unless stated otherwise in our official project proposal. For products where domestic sourcing is not currently available, WesTech can provide documentation to support application for relevant waivers (Non-Availability, De Minimis, or others).

**Paint:** If your equipment has paint included in the price, please take note to the following. Primer paints are designed to provide only a minimal protection from the time of application (usually for a period not to exceed 30 days). Therefore, it is imperative that the finish coat be applied within 30 days of shipment on all shop primed surfaces. Without the protection of the final coatings, primer degradation may occur after this period, which in turn may require renewed surface preparation and coating. If it is impractical or impossible to coat primed surfaces within the suggested time frame, WesTech strongly recommends the supply of bare metal, with surface preparation and coating performed in the field. All field surface preparation, field paint, touch-up, and repair to shop painted surfaces are not by WesTech.

## Exceptions

Not applicable.



# Commercial Proposal

Proposal Name: La Contenta WWTF

Proposal Number: 2460412

Wednesday, October 09, 2024

## 1. Bidder's Contact Information

Company Name	WesTech Engineering, LLC
Primary Contact Name	Matthew Swaney
Phone	(801) 265-1000
Email	mswaney@westechwater.com
Address: Number/Street	3665 S West Temple
Address: City, State, Zip	Salt Lake City, UT 84115

## 2. Budget Pricing

Currency: USD

### Scope of Supply

<del>A</del>	<del>One (1) 30' Diameter Clarifier Mechanism, Model COPS4G</del>	<del>\$270,600</del>
B	One (1) 40' Diameter Clarifier Mechanism, Model COPC1G	\$282,000
	Taxes (sales, use, VAT, IVA, IGV, duties, import fees, etc.)	Not Included

Prices are valid for a period not to exceed 30 days from date of proposal.

### Additional Field Service

Daily Rate (Applicable Only to Field Service Not Included in Scope)	\$1,750
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Pricing does not include field service unless noted in scope of supply but is available at the daily rate plus expenses. The greater of a two week notice or visa procurement time is required prior to departure date. Our field service policy is subject to change and can be provided upon request.

## 3. Payment Terms

Purchase Order Acceptance and Contract Execution	10%
Submittals Provided by WesTech	15%
Release for Fabrication	35%
Notification of Ready to Ship	40%

All payments are net 30 days. Partial shipments are allowed. An approved Letter of Credit is required if Incoterms CIF, CFR, DAP, CIP, or CPT are applicable. Payment is required in full for all other Incoterms prior to international shipment. Other terms per WesTech proforma invoice. Please note that the advising bank must be named as: Wells Fargo Bank, International Department, 9000 Flair Drive, 3rd Floor, El Monte, California 91731, USA.

## 4. Schedule

Submittals, after Purchase Order Acceptance and Contract Execution	10 to 12 weeks
Ready to Ship, after Receipt of Final Submittal Approval	26 to 28 weeks

**Estimated Weeks to Ready to Ship 36 to 40 weeks\***

\*Customer submittal approval is typically required to proceed with equipment fabrication and is not accounted for in the schedule above. Project schedule will be extended to account for time associated with receipt of customer submittal approval. Due to supply chain disruptions and volatility, delivery schedule is a best estimate only and may be improved or hampered based on date of contract execution, scope selection, and materials availability.

## 5. Freight

Domestic	FOB Shipping Point (FSP)	
<b>From</b>	<b>Final Destination</b>	<b>Number of Trucks / Containers</b>
WesTech Shops	Calaveras County, California	Approximately 3





# One-Year Warranty

Equipment manufactured or sold by WesTech Engineering, LLC, once paid for in full, is backed by the following warranty:

Subject to the terms below, WesTech warrants all new equipment manufactured or sold by WesTech Engineering, LLC to be unencumbered and free from defects in material and workmanship, and WesTech will replace or repair, F.O.B. its factories or other location it chooses, any part or parts returned to WesTech which WesTech's examination and analysis determine have failed within the warranty period because of defects in material and workmanship. The warranty period is either, one calendar year immediately following start-up, or eighteen (18) months from when WesTech sent its ready-to-ship notification to the purchaser, whichever expires sooner. All repair or replacement parts qualifying under this warranty shall be free of charge. Purchaser will provide timely written notice to WesTech of any defects it believes should be repaired or replaced under this warranty. WesTech will reject as untimely any warranty defect claim that purchaser submits more than thirty (30) days after the possible warranty defect first occurred. Unless specifically stated otherwise, this warranty does not cover normal wear, consumables, or coatings. Purchasers are invited to inspect the equipment in the shop for proper surface preparation and coating application prior to shipment. This warranty is not transferable.

This warranty shall be void and shall not apply where the equipment or any part thereof

- has been dismantled, modified, repaired, or connected to other equipment, outside of a WesTech factory, or without WesTech's written approval, or
- has not been installed in complete adherence to all WesTech's or parts manufacturer's requirements, recommendations, and procedures, or
- has been subject to misuse, abuse, neglect, or accident, or has not at all times been operated and maintained in strict compliance with all of WesTech's requirements and recommendations therefor, including, but not limited to, the relevant WesTech Operations & Maintenance Manual and any other of WesTech's specified guidelines & procedures, or
- has been subject to force majeure events; use of chemicals not approved in writing by WesTech; electrical surges; overloading; significant power, water or feed supply fluctuations; or non-compliance with agreed feedwater or chemical volumes, specifications or procedures.

In any case where a part or component of equipment under this warranty is or may be faulty and the component or part is also covered under the warranty of a third party then the purchaser shall provide reasonable assistance to first pursue a claim under the third-party warranty before making a claim under this warranty from WesTech. WesTech Engineering, LLC gives no warranty with respect to parts, accessories, or components purchased other than through WesTech. The warranties which apply to such items are those offered by the respective manufacturers.

This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory, or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.





# Terms and Conditions

Terms and Conditions appearing in any order based on this proposal which are inconsistent herewith shall not be binding on WesTech Engineering, LLC. The sale and purchase of equipment described herein shall be governed exclusively by the foregoing proposal and the following provisions:

**1. SPECIFICATIONS:** WesTech Engineering, LLC is furnishing its standard equipment as outlined in the proposal and as will be covered by final approved drawings. The equipment may not be in strict compliance with the Engineer's/Owner's plans, specifications, or addenda as there may be deviations. The equipment will, however, meet the general intention of the mechanical specifications of these documents.

**2. ITEMS INCLUDED:** This proposal includes only the equipment specified herein and does not include erection, installation, accessories, nor associated materials such as controls, piping, etc., unless specifically listed.

**3. PARTIES TO CONTRACT:** WesTech Engineering, LLC is not a party to or bound by the terms of any contract between WesTech Engineering, LLC's customer and any other party. WesTech Engineering, LLC's undertakings are limited to those defined in the contract between WesTech Engineering, LLC and its direct customers.

**4. PRICE AND DELIVERY:** All selling prices quoted are subject to change without notice after 30 days from the date of this proposal unless specified otherwise. Unless otherwise stated, all prices are F.O.B. WesTech Engineering, LLC or its supplier's shipping points. All claims for damage, delay or shortage arising from such equipment shall be made by Purchaser directly against the carrier. When shipments are quoted F.O.B. job site or other designation, Purchaser shall inspect the equipment shipped, notifying WesTech Engineering, LLC of any damage or shortage within forty-eight hours of receipt, and failure to so notify WesTech Engineering, LLC shall constitute acceptance by Purchaser, relieving WesTech Engineering, LLC of any liability for shipping damages or shortages.

**5. PAYMENTS:** All invoices are net 30 days. Delinquencies are subject to a 1.5 percent service charge per month or the maximum permitted by law, whichever is less on all past due accounts. Pro rata payments are due as shipments are made. If shipments are delayed by the Purchaser, invoices shall be sent on the date when WesTech Engineering, LLC is prepared to make shipment and payment shall become due under standard invoicing terms. If the work to be performed hereunder is delayed by the Purchaser, payments shall be based on the purchase price and percentage of completion. Products held for the Purchaser shall be at the risk and expense of the Purchaser. Unless specifically stated otherwise, prices quoted are for equipment only. These terms are independent of and not contingent upon the time and manner in which the Purchaser receives payment from the owner.

**6. PAYMENT TERMS:** Credit is subject to acceptance by WesTech Engineering, LLC's Credit Department. If the financial condition of the Purchaser at any time is such as to give WesTech Engineering, LLC, in its judgment, doubt concerning the Purchaser's ability to pay, WesTech Engineering, LLC may require full or partial payment in advance or may suspend any further deliveries or continuance of the work to be performed by the WesTech Engineering, LLC until such payment has been received.

**7. ESCALATION:** If between the proposal date and actual procurement and through no fault of the Seller, the relevant cost of labor, material, freight, tariffs, and other Seller costs combined relating to the contract, increase by greater than 2.5% of the overall contract price, then the contract price shall be subject to escalation and increased. Such increase shall be verified by documentation and the amount of contract price escalation shall be calculated as either the actual increased cost to the Seller or, if agreed by the Parties, the equivalent increase of a relevant industry recognized third-party index, and in both cases without any additional profit or margin being added.

**8. APPROVAL:** If approval of equipment submittals by Purchaser or others is required, a condition precedent to WesTech Engineering, LLC supplying any equipment shall be such complete approval.

**9. INSTALLATION SUPERVISION:** Prices quoted for equipment do not include installation supervision. WesTech Engineering, LLC recommends and will, upon request, make available, at WesTech Engineering, LLC's then current rate, an experienced installation supervisor to act as the Purchaser's employee and agent to supervise installation of the equipment. Purchaser shall at its sole expense furnish all necessary labor equipment, and materials needed for installation.

Responsibility for proper operation of equipment, if not installed by WesTech Engineering, LLC or installed in accordance with WesTech Engineering, LLC's instructions, and inspected and accepted in writing by WesTech Engineering, LLC, rests entirely with Purchaser; and any work performed by WesTech Engineering, LLC personnel in making adjustment or changes must be paid for at WesTech Engineering, LLC's then current per diem rates plus living and traveling expenses.

WesTech Engineering, LLC will supply the safety devices described in this proposal or shown in WesTech Engineering, LLC's drawings furnished as part of this order but excepting these, WesTech Engineering, LLC shall not be required to supply or install any safety devices whether required by law or otherwise. The Purchaser hereby agrees to indemnify and hold harmless WesTech Engineering, LLC from any claims or losses arising due to alleged or actual insufficiency or inadequacy of the safety devices offered or supplied hereunder, whether specified by WesTech Engineering, LLC or Purchaser, and from any damage resulting from the use of the equipment supplied hereunder.

**10. ACCEPTANCE OF PRODUCTS:** Products will be deemed accepted without any claim by Purchaser unless written notice of non-acceptance is received by WesTech Engineering, LLC within 30 days of delivery if shipped F.O.B. point of shipment, or 48 hours of delivery if shipped F.O.B. point of destination. Such written notice shall not be considered received by WesTech Engineering, LLC unless it is accompanied by all freight bills for said shipment, with Purchaser's notations as to damages, shortages and conditions of equipment, containers, and seals. Non-accepted products are subject to the return policy stated below.

**11. TAXES:** Any federal, state, or local sales, use or other taxes applicable to this transaction, unless specifically included in the price, shall be for Purchaser's account.





# Terms and Conditions

**12. TITLE:** The equipment specified herein, and any replacements or substitutes therefore shall, regardless of the manner in which affixed to or used in connection with realty, remain the sole and personal property of WesTech Engineering, LLC until the full purchase price has been paid. Purchaser agrees to do all things necessary to protect and maintain WesTech Engineering, LLC's title and interest in and to such equipment; and upon Purchaser's default, WesTech Engineering, LLC may retain as liquidated damages any and all partial payments made and shall be free to enter the premises where such equipment is located and remove the same as its property without prejudice to any further claims on account of damages or loss which WesTech Engineering, LLC may suffer from any cause.

**13. INSURANCE:** From date of shipment until the invoice is paid in full, Purchaser agrees to provide and maintain at its expense, but for WesTech Engineering, LLC's benefit, adequate insurance including, but not limited to, builders risk insurance on the equipment against any loss of any nature whatsoever.

**14. SHIPMENTS:** Any shipment of delivery dates recited represent WesTech Engineering, LLC's best estimate but no liability, direct or indirect, is assumed by WesTech Engineering, LLC for failure to ship or deliver on such dates.

WesTech Engineering, LLC shall have the right to make partial shipments; and invoices covering the same shall be due and payable by Purchaser in accordance with the payment terms thereof. If Purchaser defaults in any payment when due hereunder, WesTech Engineering, LLC may, without incurring any liability therefore to Purchaser or Purchaser's customers, declare all payments immediately due and payable with maximum legal interest thereon from due date of said payment, and at its option, stop all further work and shipments until all past due payments have been made, and/or require that any further deliveries be paid for prior to shipment.

If Purchaser requests postponements of shipments, the purchase price shall be due and payable upon notice from WesTech Engineering, LLC that the equipment is ready for shipment; and thereafter any storage or other charge WesTech Engineering, LLC incurs on account of the equipment shall be for the Purchaser's account.

If delivery is specified at a point other than WesTech Engineering, LLC or its supplier's shipping points, and delivery is postponed or prevented by strike, accident, embargo, or other cause beyond WesTech Engineering, LLC's reasonable control and occurring at a location other than WesTech Engineering, LLC or its supplier's shipping points, WesTech Engineering, LLC assumes no liability in delivery delay. If Purchaser refuses such delivery, WesTech Engineering, LLC may store the equipment at Purchaser's expense. For all purposes of this agreement such tender of delivery or storage shall constitute delivery.

**15. WARRANTY:** WesTech Engineering, LLC warrants equipment it supplies only in accordance with the attached WesTech Warranty. This warranty is expressly given by WesTech and accepted by purchaser in lieu of all other warranties whether written, oral, express, implied, statutory or otherwise, including without limitation, warranties of merchantability and fitness for particular purpose. WesTech neither accepts nor authorizes any other person to assume for it any other liability with respect to its equipment. WesTech shall not be liable for normal wear and tear, corrosion, or any contingent, incidental, or consequential damage or expense due to partial or complete inoperability of its equipment for any reason whatsoever. The purchaser's exclusive and only remedy for breach of this warranty shall be the repair and or replacement of the defective part or parts within a reasonable time of WesTech's accepting the validity of a warranty claim made by the purchaser.

**16. PATENTS:** WesTech Engineering, LLC agrees that it will, at its own expense, defend all suits or proceedings instituted against Purchaser and pay any award of damages assessed against it in such suits or proceedings, so far as the same are based on any claim that the said equipment or any part thereof constitutes an infringement of any apparatus patent of the United States issued at the date of this Agreement, provided WesTech Engineering, LLC is given prompt notice in writing of the institution or threatened institution of any suit or proceeding and is given full control of the defense, settlement, or compromise of any such action; and Purchaser agrees to give WesTech Engineering, LLC needed information, assistance, and authority to enable WesTech Engineering, LLC so to do. In the event said equipment is held or conceded to infringe such a patent, WesTech Engineering, LLC shall have the right at its sole option and expense to a) modify the equipment to be non-infringing, b) obtain for Purchaser the license to continue using said equipment, or c) accept return of the equipment and refund to the Purchaser the purchase price thereof less a reasonable charge for the use thereof. WesTech Engineering, LLC will reimburse Purchaser for actual out-of-pocket expenses, exclusive of legal fees, incurred in preparing such information and rendering such assistance at WesTech Engineering, LLC's request. The foregoing states the entire liability of WesTech Engineering, LLC, with respect to patent infringement; and except as otherwise agreed to in writing, WesTech Engineering, LLC assumes no responsibility for process patent infringement.

**17. SURFACE PREPARATION AND PAINTING:** If furnished, shop primer paint is intended to serve only as minimal protective finish. WesTech Engineering, LLC will not be responsible for the condition of primed or finish painted surfaces after equipment leaves its shops. Purchasers are invited to inspect paint in shops for proper preparation and application prior to shipment. WesTech Engineering, LLC assumes no responsibility for field surface preparation or touch-up of shipping damage to paint. Painting of fasteners and other touch-up to painted surfaces will be by Purchaser's painting contractor after mechanism installation.

Motors, gear motors, and other components not manufactured by WesTech Engineering, LLC will be painted with that manufacturer's standard paint system. It is WesTech Engineering, LLC's intention to ship major steel components as soon as fabricated, often before drive, motors, and other manufactured components. Unless Purchaser can ensure that shop primed steel shall be field painted within thirty (30) days after arrival at the job site, WesTech Engineering, LLC encourages the Purchaser to order these components without primer.

WesTech Engineering, LLC's prices are based on paints and surface preparations as outlined in the main body of this proposal. In the event that an alternate paint system is selected, WesTech Engineering, LLC requests that Purchaser's order advise of the paint





# Terms and Conditions

selection. WesTech Engineering, LLC will then either adjust the price as may be necessary to comply or ship the material unpainted if compliance is not possible due to application problems or environmental controls.

**18. CANCELLATION, SUSPENSION, OR DELAY:** After acceptance by WesTech Engineering, LLC, this proposal, or Purchaser's order based on this proposal, shall be a firm agreement and is not subject to cancellation, suspension, or delay except upon payment by Purchaser of appropriate charges which shall include all costs incurred by WesTech Engineering, LLC to date of cancellation, suspension, or delay plus a reasonable profit. Additionally, all charges related to storage and/or resumption of work, at WesTech Engineering, LLC's plant or elsewhere, shall be for Purchaser's sole account; and all risks incidental to storage shall be assumed by Purchaser.

**19. FORCE MAJEURE:** Neither party hereto shall be liable to the other for default or delay in delivery caused by extreme weather or other act of God, strike or other labor shortage or disturbance, fire, accident, war or civil disturbance, act of government, pandemic, delay of carriers, failure of normal sources of supply, complete or partial shutdown of plant by reason of inability to attain sufficient raw materials or power, and/or other similar contingency beyond the reasonable control of the respective parties. The time for delivery specified herein shall be extended during the continuance of such conditions, or any other cause beyond such party's reasonable control. Escalation resulting from a Force Majeure event shall be equitably adjusted per the escalation policy stated above.

**20. RETURN OF PRODUCTS:** No products may be returned to WesTech Engineering, LLC without WesTech Engineering, LLC's prior written permission. Said permission may be withheld by WesTech Engineering, LLC at its sole discretion.

**21. BACKCHARGES:** WesTech Engineering, LLC will not approve or accept backcharges for labor, materials, or other costs incurred by Purchaser or others in modification, adjustment, service, or repair of WesTech Engineering, LLC furnished materials unless such back charge has been authorized in advance in writing by a WesTech Engineering, LLC purchase order, or work requisition signed by WesTech Engineering, LLC.

**22. INDEMNIFICATION:** Purchaser agrees to indemnify WesTech Engineering, LLC from all costs incurred, including but not limited to court costs and reasonable attorney fees, from enforcing any provisions of this contract, including but not limited to breach of contract or costs incurred in collecting monies owed on this contract.

**23. ENTIRE AGREEMENT:** This proposal expresses the entire agreement between the parties hereto superseding any prior understandings, and is not subject to modification except by a writing signed by an authorized officer of each party.

**24. MOTORS AND MOTOR DRIVES:** In order to avoid shipment delays of WesTech Engineering, LLC equipment, motors and drives may be sent directly to the job site for installation by the equipment installer. Minor fit-up may be required.

**25. EXTENDED STORAGE:** Extended storage instructions will be part of information provided to shipment. If equipment installation and start-up is delayed more than 30 days, the provisions of the storage instructions must be followed to keep WARRANTY in force.

**26. LIABILITY:** Professional liability insurance, including but not limited to, errors and omissions insurance, is not included. In any event, liability for errors and omissions shall be limited to the lesser of \$100,000 USD or the value of the particular piece of equipment (not the value of the entire order) supplied by WesTech Engineering, LLC against which a claim is sought.

**27. ARBITRATION NEGOTIATION:** Any controversy or claim arising out of or relating to the performance of any contract resulting from this proposal or contract issued, or the breach thereof, shall be settled by arbitration in accordance with the Construction Industry Arbitration Rules of the American Arbitration Association, and judgment upon the award rendered by the arbitrator(s) may be entered to any court having jurisdiction.

## ACCEPTED BY PURCHASER

Customer Name: \_\_\_\_\_

Customer Address: \_\_\_\_\_

Contact Name: \_\_\_\_\_

Contact Phone: \_\_\_\_\_ Contact Email: \_\_\_\_\_

Signature: \_\_\_\_\_ Printed Name: \_\_\_\_\_

Date: \_\_\_\_\_ Title: \_\_\_\_\_



ATTACHMENT D - Clarifier Loading

Buildout Clarifier Loading with Equal Flow Split

						Detention Time, DT (Hours)		Surface Overflow Rate, SOR (gal/d/ft <sup>2</sup> )		Weir Overflow Rate, WOR (gal/d/ft)		Solids Loading Rate, SLR (lbs/d/ft <sup>2</sup> )	
		Flow (MGD)	Number of Clarifiers Running	MLSS (mg/L)	RAS SS (mg/L)	Clarifier 1	Clarifier 2	Clarifier 1	Clarifier 2	Clarifier 1	Clarifier 2	Clarifier 1	Clarifier 2
<i>ADF</i>		0.338	2	3,000	7,000	7.1	17.6	318	149	6,760	1,416	13.9	6.5
<i>MMF</i>		0.675	2	3,000	7,000	3.6	8.8	293	298	13,500	2,827	12.8	13.0
<i>MDF</i>		1.125	2	3,000	7,000	2.1	5.3	489	496	22,500	4,712	21.4	21.7
<i>PHF</i>		1.8	2	3,000	7,000	1.3	3.3	783	794	36,000	7,539	23.1	23.4

Phase 3 Clarifier Loading with only New Clarifier Running

						Detention Time, DT (Hours)		Surface Overflow Rate, SOR (gal/d/ft <sup>2</sup> )		Weir Overflow Rate, WOR (gal/d/ft)		Solids Loading Rate, SLR (lbs/d/ft <sup>2</sup> )	
		Flow (MGD)	Number of Clarifiers Running	MLSS (mg/L)	RAS SS (mg/L)	Clarifier 1	Clarifier 2	Clarifier 1	Clarifier 2	Clarifier 1	Clarifier 2	Clarifier 1	Clarifier 2
<i>ADF</i>													
<i>MMF</i>		0.473	1	3,000	7,000	0.0	6.3	0	417	0	3,962	0.0	16.5
<i>MDF</i>		0.7885	1	3,000	7,000	0.0	3.8	0	695	0	6,605	0.0	27.5
<i>PHF</i>		1.262	1	3,000	7,000	0.0	2.4	0	1113	0	10,571	0.0	44.0

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**APPENDIX E**  
Calaveras County Water District  
RAS/WAS Pump Data Sheets and Budgetary Proposal



[www.esscopumps.com](http://www.esscopumps.com)  
sales@esscopumps.com

**ESSCO Pumps & Controls**  
4935 Telegraph Rd.  
Los Angeles, Ca 90022

(323) 261-2181  
Fax (323) 261-1523

---

**10/30/2024**

**Customer: La Contenta WWTF**

**REF: RAS/WAS PS**

**Conditions of service: 250 GPM @ 25 FT TDH**

**ESSCO is pleased to provide you with the following Engineering BUDGET proposal for your review.**

ESSCO model 4x12-7.5-6 torque fluid submersible sized for 250 GPM @ 25 ft. TDH vortex pump with a 100% recessed vortex style impeller **capable of passing 4 inch diameter and long length solids**. Each unit shall be constructed of heavy duty engineered Cast Iron with High Chrome Iron "Shredder" impeller, cast iron volute, cast iron wear plate, assembled with Stainless Steel hardware. The pump shall be painted with standard factory paint.

Each pump shall be equipped with a **Cool Agivent device which shall vent the pump case, cool the motor and agitate the wet well. The Cool Agivent shall provide enough cooling to dissipate any excess heat generated by the motor in the event of prolonged operation with the motor exposed.** EIM, FM Approved 7.5 HP, 1150 RPM, VFD rated, inverter duty, 460/3/60hz. submersible motor with Buna-N O-rings, Carbon/Ceramic upper mechanical seal with Buna-N elastomers and Silicon Carbide lower mechanical seal with Buna-N elastomers, 416 Stainless Steel shaft, Class F insulation, oil buffer zone, moisture sensing probes, built-in thermal overload protection, 50 ft motor leads. The exterior of the motor shall be coated with standard factory paint.

Also include will be 4". Design 3 slide rail assy. With 90 degree discharge elbow

**Net Each \$15,880.00**

**Shipping to jobsite TBD**

Estimated lead time after engineering approval 20-22 weeks

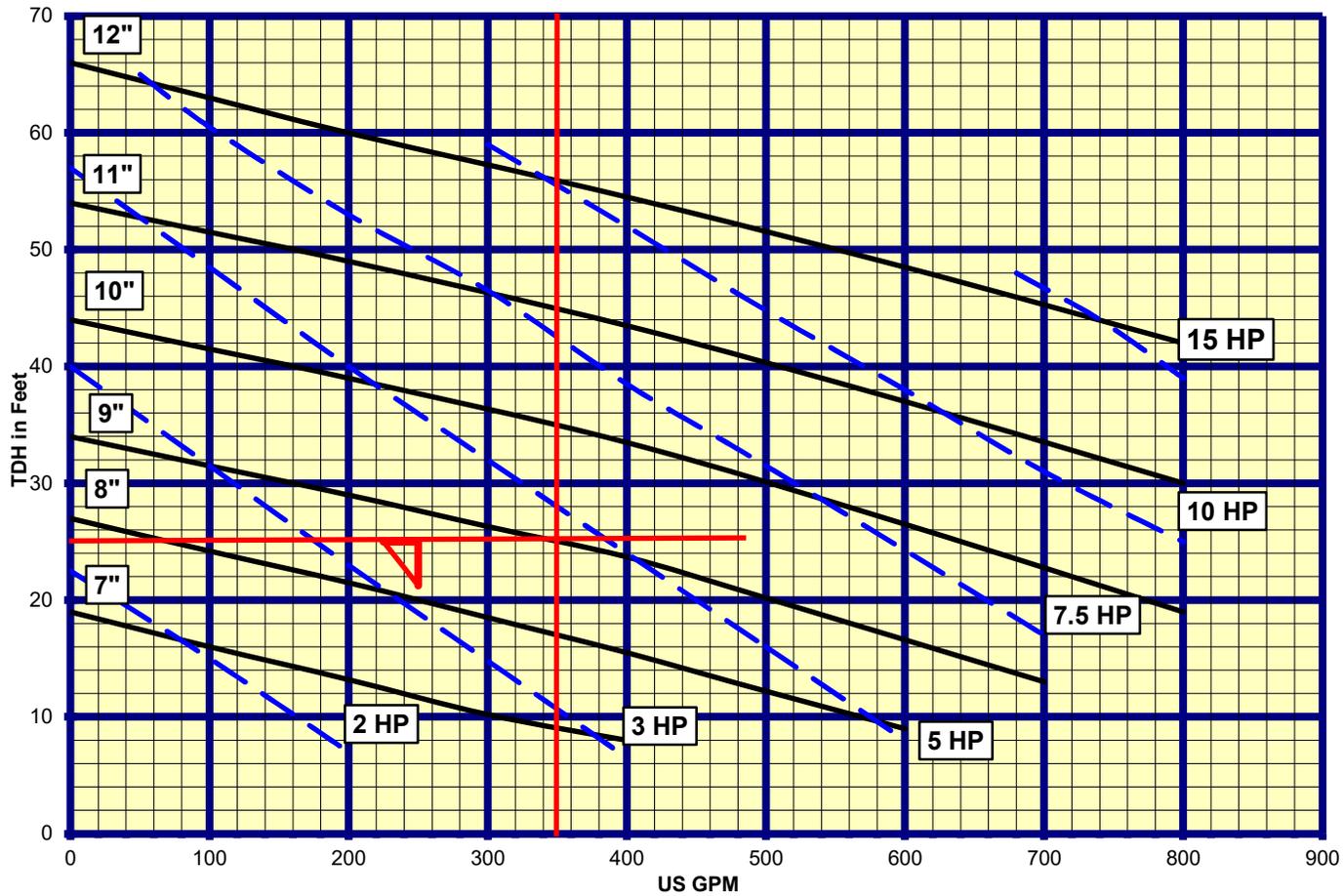
Let me know if you have any questions



**Pumps**  
4935 Telegraph Rd  
L.A., Ca. 90022  
323-261-2181  
323-261-1523 FAX  
Website: www.esscopumps.com



Pump Model:	4X12	Impeller No.:	1012
RPM:	1150	Sphere Size:	4"
Type:	Submersible, Horizontal, Vertical		
Impeller Type:	Vortex 7 Vane	Revised Date	Nov-98
Impeller Dia:	Various		
Condition Point:	250 GPM		25 TDH
Condition Point:	0 GPM		0 TDH
Condition Point:	0 GPM		0 TDH



# The World Leader in Free-Disc™ Pumping Technology



## Model: 8DDDX214

Flow Range:	0 - 1100 GPM
Displacement:	2.14 gal/rev
Operating Speeds:	0 - 400 RPM
Max Discharge Pressure:	60psi operating
Max Suction Lift:	25 ft
Connection:	8" 150# Flanged

### Lower Wear = Longer Life

With a non-close tolerance design and no rubbing action to generate flow the Double Disc Pump offers the lowest life cycle cost of any positive displacement pump on the market.

### Features and Benefits:



"Maintain-In-Place"  
Design



Self-priming



Passes up to 2" solids



Two (2) year warranty



Made in the USA



Runs dry without damage



Low friction design



No check valves



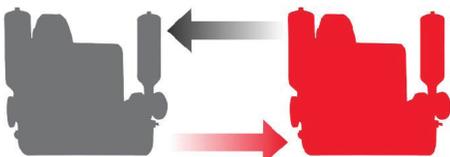
No routine maintenance



Seal-less design

## THE ULTIMATE IN SLUDGE PUMPS™

### Swap-Your-Pump



A unique trial program that lets you try before you buy.  
Contact us today to swap-your-pump.

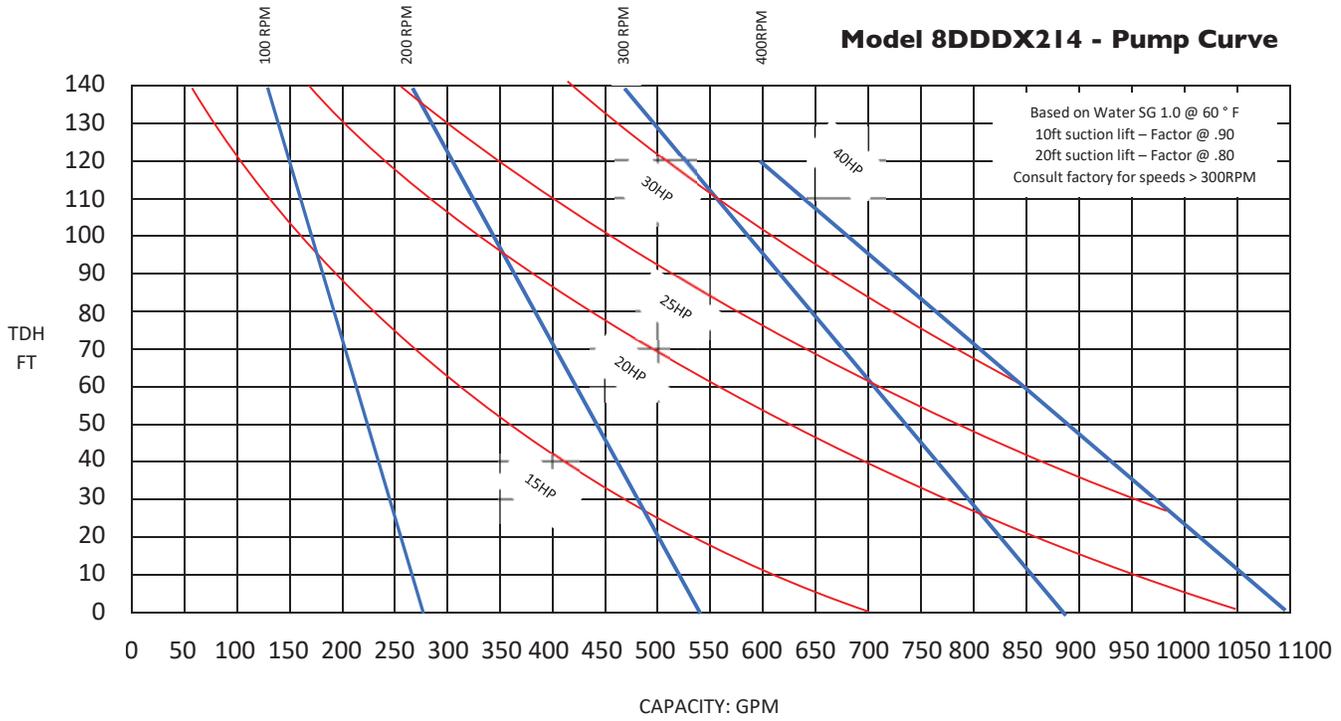
✉ info@pennvalleypump.com

☎ 215-343-8750

📍 Warrington, PA 18976

🌐 www.pennvalleypump.com



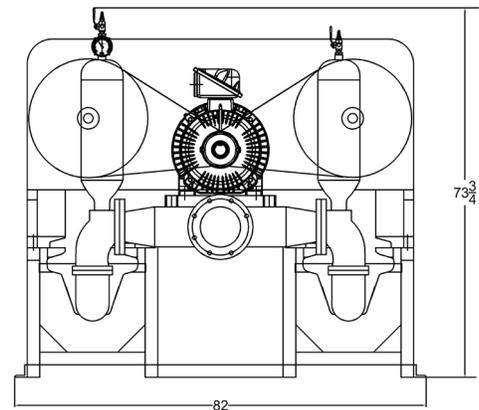
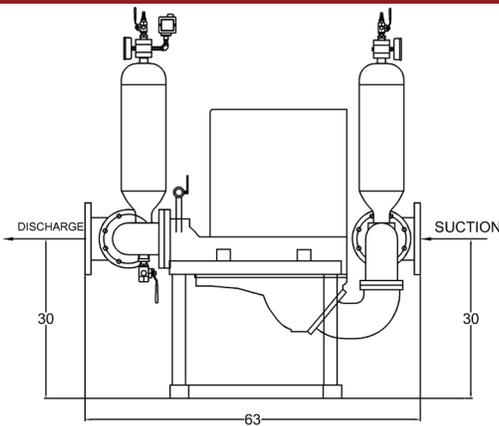


**Materials of Construction:**

	Standard	Optional:
Housings:	Cast Iron	Linings: Porcelain Glass, Neoprene, Powder Coat, Soft PVC, Tungsten Carbide
Discs & Trunnions:	Neoprene -10° to +200°F	Buna-N +10° to +180° F, EPDM +10° to +200°F, HNBR +10° to +220° F, Viton -40° to +350° F
Connecting Rods:	Aluminum	
Drive Shaft:	High-Tensile 416 Stainless Steel	
Eccentric Cams:	High-Tensile Bronze Alloy	
Bearing Pedestals:	Aluminum	
Frame & Covers:	304 Stainless Steel	316 Stainless Steel

**Drive System Options:**

	Standard	Optional:
Static:	Electric motor, belt and pulley	Gearmotor, air or hydraulic motor
Portable:	Electric, Gas or Diesel Engine	





# SPARK PROOF STAINLESS STEEL AND HARD METAL SLIDE RAIL SYSTEM

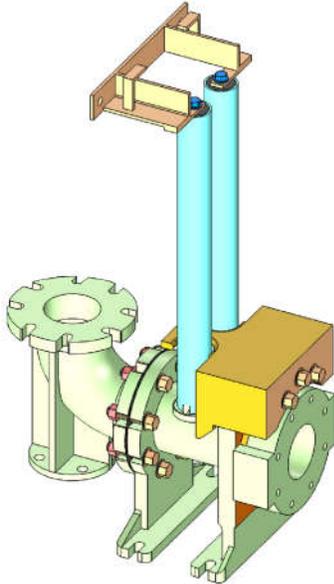


Figure 1 at left:  
Rendering of  
ESSCO Design 3  
Slide Rail System

ESSCO offers a series of Slide Rail Systems are designed to meet light duty, normal duty and severe duty requirements. Each system is available for non hazardous and hazardous installations. Applications include storm water, sewage wet well, waste water treatment plants, industrial waste pits, power plants, solid waste management run off tanks and many more. The ESSCO slide rail adaptor is available in all Cast Iron construction, Spark Proof Bronze, 316 Stainless Steel and Hard Metal Construction such as High Chrome Iron (BRN 550 min), CD4MCu and many other materials. Contact your local distributor or the factory for specific materials requirements.

All slide rail systems are available in spark proof design. Spark Proof systems have a Bronze rail guide "claw" and a Bronze insert on the sliding face. The Sliding Face has an embedded O-ring to provide a superior sealing method between the

stationary base face and the sliding face. An optional metal to metal face seal is available.

ESSCO endeavors to provide the user with the most reliable system on the market. Our many years of experience and thousands of successful installations are key factors in solving tough application problems.

Contact ESSCO 's application team and draw upon our knowledge base to help solve your next difficult pump problem.

Materials of Construction				
Design 3	All Iron	Spark Proof	Hard Metal	316 SS
Base	Cast Iron	Cast Iron	Hard Metal	316 SS
Sliding Face	Cast Iron	Cast Iron	Cast Iron	316 SS
Face Insert	Cast Iron	Bronze	Bronze	316 SS
Sliding Face T Sleeve	---	---	Hard Metal	316 SS
Rail Guide	Cast Iron	Bronze	Bronze	316 SS
Discharge Elbow	Cast Iron	Cast Iron	Hard Metal	316 SS
Alternate Material				
Top Guide Bracket	304 SS	316 SS		
Intermediate Guide Bracket	304 SS	316 SS		
Spacer Kit for Intermediate Guide Bracket	304 SS	316 SS		

## ESSCO Pumps & Controls

4935 Telegraph Rd.  
Los Angeles, Ca 90022  
(323) 261-2181  
Fax (323) 261-1523  
www.esscopumps.com  
Email sales@esscopumps.com

Distributed By:



# EIM Electric Co. FM Approved XP Motors And Non-XP Motors



## SUBMERSIBLE MOTORS

- HP 1-250\* HP
- 1750 RPM, 1150 RPM, 870 RPM
- STANDARD POWER AND CONTROL CABLE LENGTH 50 FT



Single Channel



Dual Channel

SEAL LEAKAGE  
Single & Dual Channel | SFP Series



\*- Consult Factory for XP Motors 150 HP and above.

## ESSCO Pumps & Controls

4935 Telegraph Rd.  
Los Angeles, Ca 90022

(323) 261-2181  
Fax (323) 261-1523

Website: [www.esscopumps.com](http://www.esscopumps.com)  
Email: [sales@esscopumps.com](mailto:sales@esscopumps.com)

Member of the Hydraulic Institute

Form EIM1





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**APPENDIX F**  
Calaveras County Water District  
UESP Pump Station Calculation and Budgetary Proposal

10/25/2024

G3 ENGINEERING INC.  
 5905 GRANITE LAKE DRIVE STE 120  
 Granite Bay, CA 95746

Quotation number: 2376380  
 Revision: 0

Attn: Jory Benitez  
 E-mail: HydroScience Engineers

Project: La Contenta WWTF Phase 3 Improvements Project  
 Your reference:

With reference to your project noted above, we are pleased to submit our proposal covering the equipment described herein.

The following is a price summary for this project. See itemized quote for details.

Tag Number	Service	Model	Unit Price	Qty	Extended Price
001		SL1.30.A30.55	\$ 18,540.00	2	\$ 37,080.00
Grand Total					\$ 37,080.00

**COMMENTS:** - Pricing for budgetary purposes only.  
 - Submittal lead time is 4 weeks after receipt of order.  
 - Shipment lead time is 12 weeks after submittal approval.

**SCOPE OF SUPPLY:** Only the material detailed in the following quote is being offered. No assumptions should be made that anything not specifically defined is included.

**VALIDITY:** This offer is valid for 30 days from date issued. Quoted prices will be held firm thru shipment if order is released for manufacture within 60 days from Grundfos CBS receipt of purchase order. Otherwise, a price adjustment may be applied.

**PAYMENT TERMS:** Net 30 days.

**FREIGHT:** Prices are FOB our plant and include freight to the jobsite, but does NOT include unloading or taxes.

**PACKAGING:** Items will be palletized for domestic shipment.

**SHIPMENT:** Approximately 10-12 weeks after our acceptance of your written purchase order and your written release for manufacture.

**START-UP:** Included.

**EXPORT CONTROL:** Country of Final Destination is The United States of America

**SPECIFICATION:** Written specifications were not received at time of quotation. Exception is taken to all sections not received.

**TERMS AND CONDITIONS:** Our standard terms and conditions are attached.  
 G3 Engineering, Inc. · 5905 Granite Lake Drive · Ste 120 · Granite Bay, CA 95746  
 phone: 916-797-1880 · fax: 916-797-1881 · <http://g3engineering.com/>

**TAXES:** Prices do not include taxes, tariffs, or duties.

We hope you find our quotation in line with your requirements. However, if you have any questions, please do not hesitate to contact us.

Sincerely,

Christopher Davidson  
G3 Engineering, Inc.

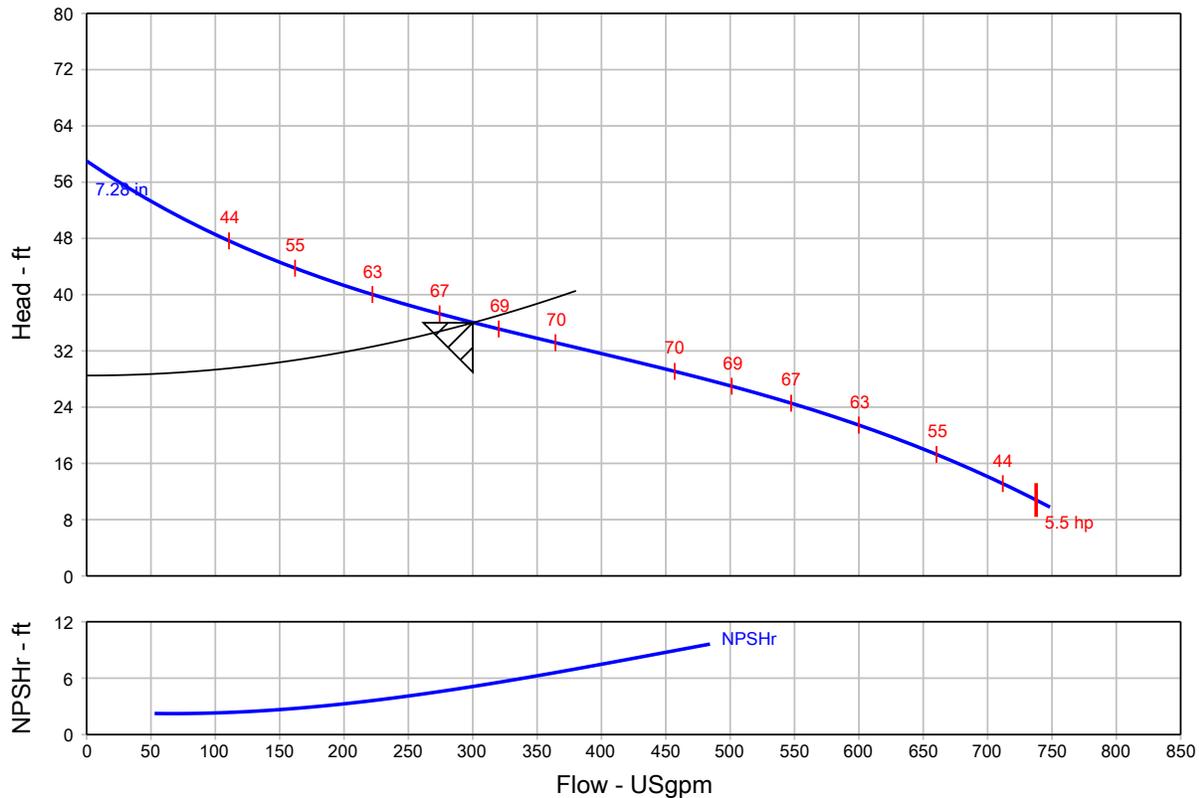
## Pump Performance Datasheet

Customer :	Quote Number / ID :	2376380
Customer ref. / PO :	Model :	SL1.30.A30.55
Tag Number : 001	Stages :	1
Service :	Based on curve number :	RC10599
Quantity : 2	Date last saved :	10/25/2024 2:15 PM

Operating Conditions		Liquid	
Flow, rated	: 300.0 USgpm	Liquid type	: Cold Water
Differential head / pressure, rated (requested)	: 36.00 ft	Additional liquid description	:
Differential head / pressure, rated (actual)	: 36.05 ft	Solids diameter, max	: 0.00 in
Suction pressure, rated / max	: 0.00 / 0.00 psi.g	Temperature, max	: 68.00 deg F
NPSH available, rated	: Ample	Fluid density, rated / max	: 1.000 / 1.000 SG
Site Supply Frequency	: 60 Hz		

Performance		Pressure Data	
Speed, rated	: 1762 rpm	Maximum working pressure	: 25.54 psi.g
Efficiency	: 68.26 %		
NPSH required / margin required	: 5.11 / 0.00 ft		
Ns (imp. eye flow) / Nss (imp. eye flow)	: 2,705 / 7,695 US Units		
MCSF	: -		
Head, maximum, rated diameter	: 59.01 ft		
Head rise to shutoff	: 63.71 %		
Flow, best eff. point	: 410.5 USgpm		
Flow ratio, rated / BEP	: 73.08 %		
Diameter ratio (rated / max)	: 100.00 %		
Head ratio (rated dia / max dia)	: 100.00 %		
Solids diameter limit	: 3.15 in		
Cq/Ch/Ce/Cn [ANSI/HI 9.6.7-2010]	: 1.00 / 1.00 / 1.00 / 1.00		
Selection status	: Acceptable		
Curve Tolerance	: ANSI/HI11.6:2017 3B2		
Consult Factory for a different Tolerance			

Driver & Power Data (@Max density)	
Motor sizing specification	: Max power (non-overloading)
Service factor	: 1.15 (used)
Power, hydraulic	: 2.73 hp
Rated power (based on duty point)	: 4.00 hp
Max power (non-overloading)	: 5.60 hp
Motor rating	: 5.50 hp / 4.10 kW (Fixed)
Efficiency at 100%	: 87.8
Efficiency at 75%	: 87.8
Efficiency at 50%	: 86.2
Power Factor at 100%	: 0.78
Power Factor at 75%	: 0.7
Power Factor at 50%	: 0.59
Full Load Amps	: 9.05
Locked Rotor Amps	: 80
Nema Code Ltr	: K



### Construction Datasheet

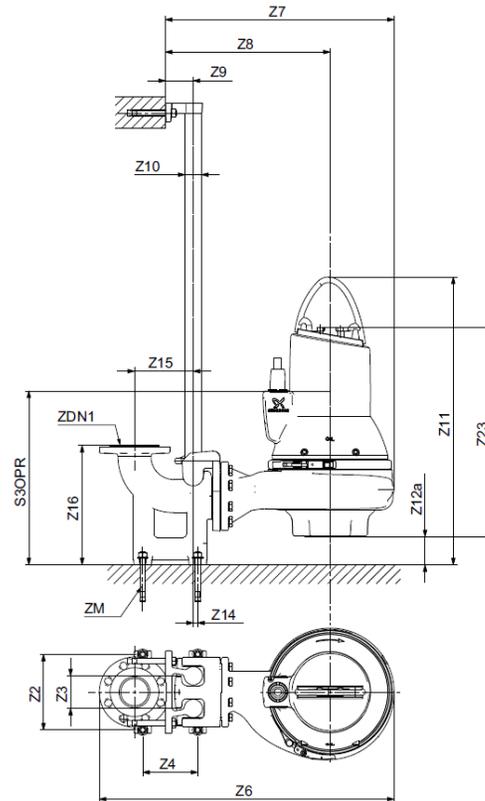
Project name	La Contenta WWTF Phase 3 Improvements Project	Tag Number	001
Consulting engineer		Service	
Customer		Model	SL1.30.A30.55
Customer ref. / PO		Quantity	2
Quote Number / ID	2376380	Grundfos Partner	G3 ENGINEERING INC.
Date last saved	10/25/2024 2:15 PM	Quoted By (Sales Engineer)	Christopher Davidson

**Construction Code : SL1.30.A30.55.EX.4.61R.C**

Construction		Motor Information	
Product Family	SL	Horsepower	5.50 hp
Product Type	SL1	Enclosure Class	IP68
Pump Housing Type	Cast iron	Explosion proof	YES
Pump Housing Material	ASTM A48 35B	Explosion Proof Class	Class I, Division 1, Groups C and D, T4,T3C
Impeller Type	S-TUBE	Frame Range	C
Impeller Material	ASTM A48 35B	Rated Voltage	230/460 V
Primary Shaft Seal Material	SIC/SIC	Rated Speed	1760 rpm
Secondary Shaft Seal Material	CARBON/CERAMICS	Phase	3
Max Flow	748.5 USgpm	Frequency	60 Hz
Max Head	56.76 ft	Number of Poles	4
Suction	4" / DN100	Insulation Class	H
Discharge	3" / DN80	Motor Thermal Protection	THERMAL SWITCH
Connection	ANSI	Rated Current	16.2/9.05 A
Cooling Jacket	NO	FLA	16.2/9.05A
Pressure Stage	PN 10	LRA	120/80A
Moisture Sensor	YES	Efficiency at 100%	87.8
Water in Oil Sensor	NO	Efficiency at 75%	87.8
Nameplate Approval	CSA, FM	Efficiency at 50%	86.2
Installation	SUBMERGED	Power Factor at 100%	0.78
Orientation	Vertical	Power Factor at 75%	0.7
Max Installation Depth	65.62 ft	Power Factor at 50%	0.59
		Start Method	Direct-on-line
		Max Starts per hour	20
		Cable Length	49.21 ft
		<b>Weights Approx.</b>	
		Net Weight (lb)	324.1 lb

## General Arrangement

Project name	: La Contenta WWTF Phase 3 Improvements Project	Tag Number	: 001
Consulting engineer	:	Service	:
Customer	:	Model	:
Customer ref. / PO	:	Quantity of pumps	: 2
Quote Number / ID	: 2376380	Grundfos Partner	: G3 ENGINEERING INC.
Date last saved	: 10/25/2024 2:15 PM	Quoted By (Sales Engineer)	: Christopher Davidson



**NOT FOR CONSTRUCTION, UNLESS CERTIFIED AND REFERENCED ON ORDER**

Units	Z2	Z3	Z4	Z6	Z7	Z8	Z9	Z10	Z11	Z12a	Z15	Z16	ZDN1	ZM	Z23 EX	S3OPR EX
inches	9.10	4.30	8.70	37.30	28.40	21.10	4.30	1.50	34.30	4.80	8.70	16.30	ANSI 4"	4 X M16	24.50	21.90

Conditions of Service				Motor Data			
Flow: 300.0 USgpm	Fluid: Cold Water	HP: 5.5	Encl: IP68	Phase: 3	Efficiency: 87.8		
TDH: 36.00 ft	Temp.: 20.00 deg F	RPM: 1762 rpm	Hz: 60	Voltage: 230/460	S.F.: 1.15		

# Wiring Diagrams for Small (1.5-15 HP) SL/SLV pumps

61R-3 phase, 230/460V, 60Hz without WIO (Water-in-Oil) Sensor:

- Connect 230V pumps using the low-voltage (delta) connection.
- Connect 460V pumps using the high-voltage (star) connection.

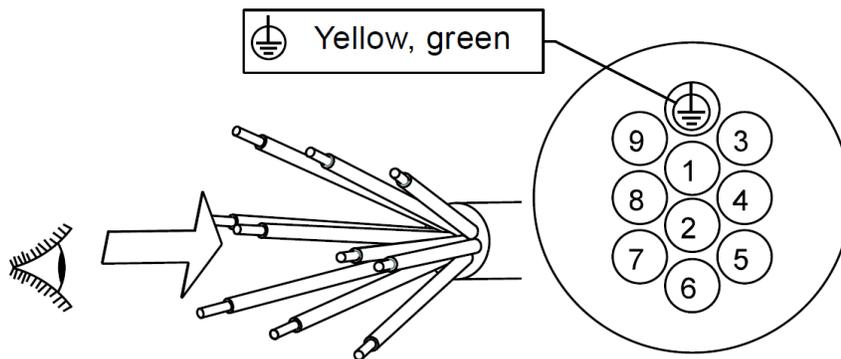


Fig. 1 Wiring Diagram, 10 core cable.

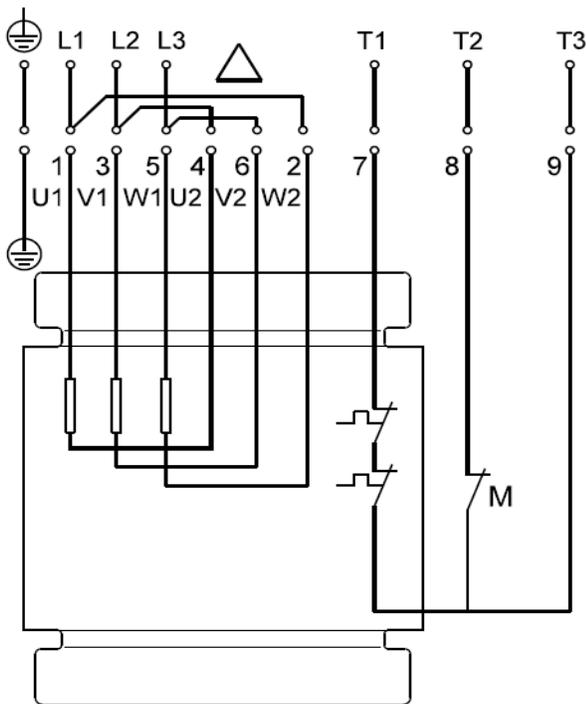


Fig. 2 Standard version with Thermal Switches and Moisture Switch wired in low-voltage (delta) connection.

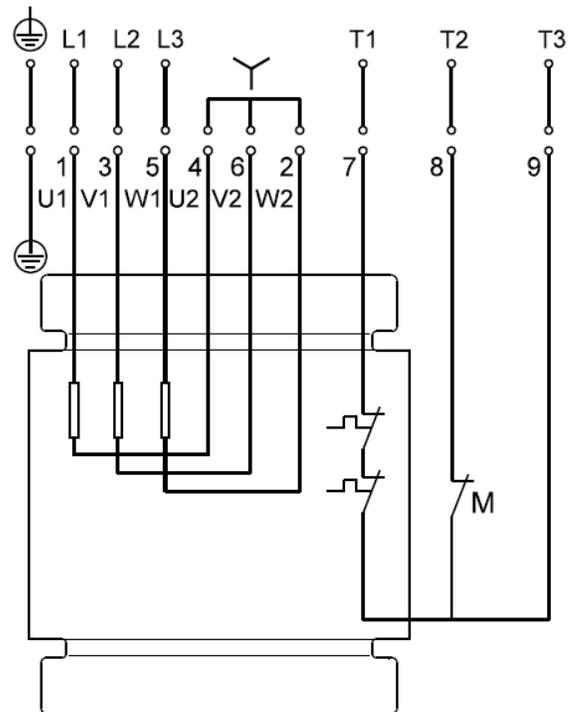


Fig. 3 Standard version with Thermal Switches and Moisture Switch wired in high-voltage (star) connection.

Calc Name: La Contenta - Upper Effluent Storage Pond PS  
 Scenario: Jory Benitez  
 Date: Existing Return Lift Station Calcs  
 Date: 9/18/2024

Fill Field
Notes
Verify
Calculated

Demand and Assumptions

Description	Value	Notes
<b>SCENARIO 1 - SINGLE PUMP CAPACITY, LEAD/LAG</b>		
Influent Flow	71 gpm	adjusted to meet pump cycling time
QTY of Duty Pumps	1	
Design Flow	305 gpm	
Est. Pipe Diameter	6 in	
Flow Velocity Check	3 fps	<7 fps
Max Pump Starts/Hr	6.0	Recommended
Min Sump Volume	458 gal	= T <sub>min</sub> *Q/4
Max Sump Volume	634 gal	
ft^3	84.8 cf	
Wet well Dia	6.0 ft	
Operational depth	3.0 ft	for lead pump
Operational Volume	634 gal	
Time to Fill	8.9 min	
Time to Drain	1.0 min	critical flow
Total Cycle Time	10.0 min	
Pump cycles/hr	6.0	
Pump cycles/hr/pump	6.0	<6 cycles per pump ok

Elevations

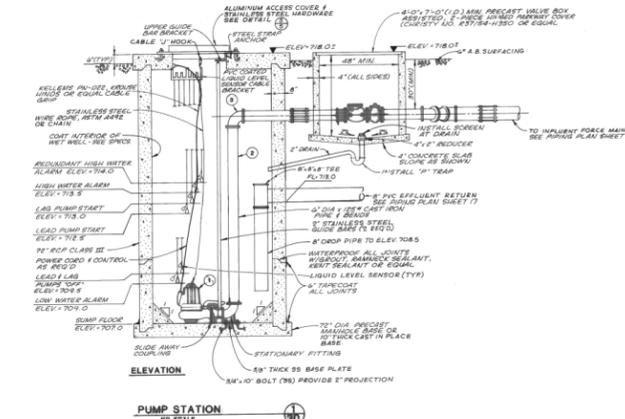
Description	Value	Notes
Lid Elevation	718.00 ft	per as-built
Min Inlet Invert EI	713.00 ft	per as-built
HWL Alarm EI	713.50 ft	per as-built
Pump On	712.50 ft	per as-built
Pump Off	709.50 ft	per as-built
Wet Well Base	707.00 ft	per as-built
Total Wet Well Depth	11.0 ft	

Static

Delivery Elevation	750 ft	assumed 0.5' below top of grate elev
Design Static Head Required	38 ft	
Max Static Head	41 ft	from pump low level elev to delivery elev
Min Static Head	36 ft	

Pressure

Pressure Required at Discharge	0 ft	
Additional Flow	0 gpm	



Straight Piping Losses

Code	C	Type of Pipe	Dia., d	Length, L	Flow, Q	Velocity, V	Headloss, H <sub>p</sub>		
wsd	100	Welded Steel	6.00 in	12.0 ft	305 gpm	4.0906E-06	3.46 ft/sec	0.16 ft	
dip	130	Ductile Iron Pipe	6.00 in	10.0 ft	305 gpm	2.09802E-06	3.46 ft/sec	0.08 ft	
pd	130	Plastic (PVC or ABS)	8.00 in	60.0 ft	305 gpm	3.10508E-06	1.95 ft/sec	0.12 ft	
PD	130	Plastic (PVC or ABS)	12.00 in	460.0 ft	305 gpm	3.3106E-06	0.87 ft/sec	0.13 ft	
Subtotals:								$\sum \frac{10.44(L)}{C^{1.85} d^{4.8655}} = 1.26043E-05 = K1'$	Piping losses (at Q <sub>des</sub> ): 0.50 ft

all pipe lengths assumed

Fittings and Valving

Code	K	Description	Dia., d	Number	Flow, Q	Velocity, V	Headloss, H <sub>f</sub>		
sfb	0.3	45 deg. Bend - Std	12.00 in	4	305 gpm	0.030207558	0.87 ft/sec	0.01 ft	
rft	0.3	90 deg. Elbow - Reg, flg	6.00 in	2	305 gpm	0.241660463	3.46 ft/sec	0.11 ft	
sc	1.5	Swing Check	6.00 in	1	305 gpm	0.604151157	3.46 ft/sec	0.28 ft	
GV	0.2	Gate Valve	6.00 in	1	305 gpm	0.080553488	3.46 ft/sec	0.04 ft	
SFB	0.3	45 deg. Bend - Std	6.00 in	1	305 gpm	0.120830231	3.46 ft/sec	0.06 ft	
D_2	0.2	Reducer	6.00 in	1	305 gpm	0.080553488	3.46 ft/sec	0.04 ft	
WBL	0.75	Wye - Branch to Line	8.00 in	1	305 gpm	0.095578601	1.95 ft/sec	0.04 ft	
blt	1	Tee - Branch to Line	8.00 in	1	305 gpm	0.127438135	1.95 ft/sec	0.06 ft	
e	1	Exits	12.00 in	1	305 gpm	0.025172965	0.87 ft/sec	0.01 ft	
Subtotals:								$\sum \frac{K}{2g * (A)^2} = 1.40614608510 = K2'$	Fitting losses (at Q <sub>max</sub> ): 0.65 ft

Results

Velocity: $V = \frac{Q[gpm]}{448.832 * D[in]^2 / 4}$	Total frictional losses	1.15 ft
Piping Losses (Hazen Williams Formula): $H_p = K1'(Q)^{1.85}$	Design TDH:	39.40 ft
Fitting Losses (Darcy Weisbach Equation): $H_f = \frac{KV^2}{2g} = K2'(Q)^2$	Max TDH:	41.65 ft
Total Dynamic Head (TDH): $TDH = StaticHead[H_s] + H_p + H_f$	Min TDH:	37.15 ft
		Matches design TDH

Q, gpm	Q, mgd	Pipe Losses, H <sub>p</sub>	Minor Losses, H <sub>f</sub>	Total Losses	Max TDH	Min TDH	Design TDH
0	0.00	0.00 ft	0.00 ft	0.00 ft	40.50 ft	36.00 ft	38.25 ft
100	0.14	0.06 ft	0.07 ft	0.13 ft	40.63 ft	36.13 ft	38.38 ft
200	0.29	0.23 ft	0.28 ft	0.51 ft	41.01 ft	36.51 ft	38.76 ft
305	0.44	0.50 ft	0.65 ft	1.15 ft	41.65 ft	37.15 ft	39.40 ft
400	0.58	0.82 ft	1.12 ft	1.94 ft	42.44 ft	37.94 ft	40.19 ft
500	0.72	1.24 ft	1.75 ft	2.99 ft	43.49 ft	38.99 ft	41.24 ft
600	0.86	1.74 ft	2.52 ft	4.26 ft	44.76 ft	40.26 ft	42.51 ft
700	1.01	2.31 ft	3.43 ft	5.74 ft	46.24 ft	41.74 ft	43.99 ft
800	1.15	2.96 ft	4.48 ft	7.44 ft	47.94 ft	43.44 ft	45.69 ft
900	1.30	3.68 ft	5.67 ft	9.36 ft	49.86 ft	45.36 ft	47.61 ft
1000	1.44	4.47 ft	7.01 ft	11.48 ft	51.98 ft	47.48 ft	49.73 ft



Calc Name: La Contenta - Upper Effluent Storage Pond PS  
 Scenario: Jory Benitez  
 Date: Existing Return Lift Station Calcs  
 Date: 9/18/2024

Legend
Fill Field
Notes
Verify
Calculated

Demand and Assumptions

Description	Value	Notes
<b>SCENARIO 3 - SINGLE PUMP CAPACITY, ALTERNATING SINGLE PUMPS, 740 GAL OP. CAP.</b>		
Influent Flow	195 gpm	adjusted to meet pump cycling time
QTY of Duty Pumps	2	
Design Flow	305 gpm	
Est. Pipe Diameter	6 in	
Flow Velocity Check	3 fps	<7 fps
Max Pump Starts/Hr	6.0	Recommended
Min Sump Volume	458 gal	= T <sub>min</sub> *Q/4
Max Sump Volume	740 gal	
ft^3	99.0 cf	
Wet well Dia	6.0 ft	
Operational depth	3.5 ft	for lag pump
Operational Volume	740 gal	
Time to Fill	3.8 min	
Time to Drain	1.2 min	critical flow
Total Cycle Time	5.0 min	
Pump cycles/hr	12.0	
Pump cycles/hr/pump	6.0	<6 cycles per pump ok

Elevations

Description	Value	Notes
Lid Elevation	718.00 ft	per as-built
Min Inlet Invert EI	713.00 ft	per as-built
HWL Alarm EI	713.50 ft	per as-built
Pump On	712.50 ft	per as-built lag on at 713.0
Pump Off	709.50 ft	per as-built
Wet Well Base	707.00 ft	per as-built
Total Wet Well Depth	11.0 ft	

Static

Delivery Elevation	750 ft	assumed 0.5' below top of grate elev
Design Static Head Required	38 ft	
Max Static Head	41 ft	from pump low level elev to delivery elev
Min Static Head	36 ft	

Pressure

Pressure Required at Discharge	0 ft	
Additional Flow	0 gpm	

Straight Piping Losses

Code	C	Type of Pipe	Dia., d	Length, L	Flow, Q	Velocity, V	Headloss, H <sub>p</sub>
wsd	100	Welded Steel	6.00 in	12.0 ft	305 gpm	4.0906E-06	3.46 ft/sec 0.16 ft
dip	130	Ductile Iron Pipe	6.00 in	10.0 ft	305 gpm	2.09802E-06	3.46 ft/sec 0.08 ft
pd	130	Plastic (PVC or ABS)	8.00 in	60.0 ft	305 gpm	3.10508E-06	1.95 ft/sec 0.12 ft
PD	130	Plastic (PVC or ABS)	12.00 in	460.0 ft	305 gpm	3.3106E-06	0.87 ft/sec 0.13 ft
Subtotals:							
				$\sum \frac{10.44(L)}{C^{1.85} d^{4.8655}} =$	1.26043E-05 = K1'	Piping losses (at Q <sub>des</sub> ):	0.50 ft

all pipe lengths assumed

Fittings and Valving

Code	K	Description	Dia., d	Number	Flow, Q	Velocity, V	Headloss, H <sub>f</sub>
sfb	0.3	45 deg. Bend - Std	12.00 in	4	305 gpm	0.030207558	0.87 ft/sec 0.01 ft
rft	0.3	90 deg. Elbow - Reg. flg	6.00 in	2	305 gpm	0.241660463	3.46 ft/sec 0.11 ft
sc	1.5	Swing Check	6.00 in	1	305 gpm	0.604151157	3.46 ft/sec 0.28 ft
GV	0.2	Gate Valve	6.00 in	1	305 gpm	0.080553488	3.46 ft/sec 0.04 ft
SFB	0.3	45 deg. Bend - Std	6.00 in	1	305 gpm	0.120830231	3.46 ft/sec 0.06 ft
D_2	0.2	Increaser	6.00 in	1	305 gpm	0.080553488	3.46 ft/sec 0.04 ft
WBL	0.75	Wye -Branch to Line	8.00 in	1	305 gpm	0.095578601	1.95 ft/sec 0.04 ft
blt	1	Tee - Branch to Line	8.00 in	1	305 gpm	0.127438135	1.95 ft/sec 0.06 ft
e	1	Exits	12.00 in	1	305 gpm	0.025172965	0.87 ft/sec 0.01 ft
Subtotals:							
				$\sum \frac{K}{2g(A)^2} =$	1.40614608510 = K2'	Fitting losses (at Q <sub>max</sub> ):	0.65 ft

Results

Velocity: $V = \frac{Q[gpm]}{448.8 \times \pi \times D[in]^2 / 4}$		Total frictional losses	1.15 ft				
Piping Losses (Hazen Williams Formula): $H_p = (10.44)(L[ft]) \frac{Q[gpm]^{1.85}}{(C)^{1.85} (d[inches])^{4.8655}}$		Design TDH:	39.40 ft				
Fitting Losses (Darcy Weisbach Equation): $H_f = \frac{KV^2}{2g} = K2'(Q)^2$		Max TDH:	41.65 ft				
Total Dynamic Head (TDH): $TDH = StaticHead[H_s] + H_p + H_f$		Min TDH:	37.15 ft				
<i>Matches design TDH</i>							
Q, gpm	Q, mgd	Pipe Losses, H <sub>p</sub>	Minor Losses, H <sub>f</sub>	Total Losses	Max TDH	Min TDH	Design TDH
0	0.00	0.00 ft	0.00 ft	0.00 ft	40.50 ft	36.00 ft	38.25 ft
100	0.14	0.06 ft	0.07 ft	0.13 ft	40.63 ft	36.13 ft	38.38 ft
200	0.29	0.23 ft	0.28 ft	0.51 ft	41.01 ft	36.51 ft	38.76 ft
305	0.44	0.50 ft	0.65 ft	1.15 ft	41.65 ft	37.15 ft	39.40 ft
400	0.58	0.82 ft	1.12 ft	1.94 ft	42.44 ft	37.94 ft	40.19 ft
500	0.72	1.24 ft	1.75 ft	2.99 ft	43.49 ft	38.99 ft	41.24 ft
600	0.86	1.74 ft	2.52 ft	4.26 ft	44.76 ft	40.26 ft	42.51 ft
700	1.01	2.31 ft	3.43 ft	5.74 ft	46.24 ft	41.74 ft	43.99 ft
800	1.15	2.96 ft	4.48 ft	7.44 ft	47.94 ft	43.44 ft	45.69 ft
900	1.30	3.68 ft	5.67 ft	9.36 ft	49.86 ft	45.36 ft	47.61 ft
1000	1.44	4.47 ft	7.01 ft	11.48 ft	51.98 ft	47.48 ft	49.73 ft

Calc Name: La Contenta - Upper Effluent Storage Pond PS  
 Scenario: Jory Benitez  
 Date: Existing Return Lift Station Calcs  
 Date: 9/18/2024

Legend  
 Fill Field  
 Notes  
 Verify  
 Calculated

Demand and Assumptions

Description	Value	Notes
<b>SCENARIO 4 - TWO DUTY PUMPS, 740 GAL OP. CAP.</b>		
Influent Flow	78 gpm	adjusted to meet pump cycling time
QTY of Duty Pumps	1	
Design Flow	700 gpm	
Est. Pipe Diameter	6 in	
Flow Velocity Check	8 fps	<7 fps
Max Pump Starts/Hr	6.0	Recommended
Min Sump Volume	1,050 gal	= T <sub>min</sub> *Q/4
Max Sump Volume	740 gal	
ft^3	99.0 cf	
Wet well Dia	6.0 ft	
Operational depth	3.5 ft	for lag pump
Operational Volume	740 gal	
Time to Fill	9.5 min	
Time to Drain	0.5 min	critical flow
Total Cycle Time	10.0 min	
Pump cycles/hr	6.0	
Pump cycles/hr/pump	6.0	<6 cycles per pump ok

Elevations

Description	Value	Notes
Lid Elevation	718.00 ft	per as-built
Min Inlet Invert EI	713.00 ft	per as-built
HWL Alarm EI	713.50 ft	per as-built
Pump On	712.50 ft	per as-built lag on at 713.0
Pump Off	709.50 ft	per as-built
Wet Well Base	707.00 ft	per as-built
Total Wet Well Depth	11.0 ft	

Static

Delivery Elevation	750 ft	assumed 0.5' below top of grate elev
Design Static Head Required	38 ft	
Max Static Head	41 ft	from pump low level elev to delivery elev
Min Static Head	36 ft	

Pressure

Pressure Required at Discharge	0 ft	
Additional Flow	0 gpm	

Straight Piping Losses

Code	C	Type of Pipe	Dia., d	Length, L	Flow, Q	Velocity, V	Headloss, H <sub>p</sub>
wsd	100	Welded Steel	6.00 in	12.0 ft	700 gpm	4.0906E-06	7.94 ft/sec 0.75 ft
dip	130	Ductile Iron Pipe	6.00 in	10.0 ft	700 gpm	2.09802E-06	7.94 ft/sec 0.38 ft
pd	130	Plastic (PVC or ABS)	8.00 in	60.0 ft	700 gpm	3.10508E-06	4.47 ft/sec 0.57 ft
PD	130	Plastic (PVC or ABS)	12.00 in	460.0 ft	700 gpm	3.3106E-06	1.99 ft/sec 0.61 ft

all pipe lengths assumed

Subtotals:

$$\sum \frac{10.44(L)}{C^{1.85} d^{4.8655}} = 1.26043E-05 = K1'$$

Piping losses (at Q<sub>des</sub>): 2.31 ft

Fittings and Valving

Code	K	Description	Dia., d	Number	Flow, Q	Velocity, V	Headloss, H <sub>f</sub>
sfb	0.3	45 deg. Bend - Std	12.00 in	4	700 gpm	0.030207558	1.99 ft/sec 0.07 ft
rfl	0.3	90 deg. Elbow - Reg. flg	6.00 in	2	700 gpm	0.241660463	7.94 ft/sec 0.59 ft
sc	1.5	Swing Check	6.00 in	1	700 gpm	0.604151157	7.94 ft/sec 1.47 ft
GV	0.2	Gate Valve	6.00 in	1	700 gpm	0.080553488	7.94 ft/sec 0.20 ft
SFB	0.3	45 deg. Bend - Std	6.00 in	1	700 gpm	0.120830231	7.94 ft/sec 0.29 ft
D_2	0.2	Increaser	6.00 in	1	700 gpm	0.080553488	7.94 ft/sec 0.20 ft
WBL	0.75	Wye -Branch to Line	8.00 in	1	700 gpm	0.095578601	4.47 ft/sec 0.23 ft
blt	1	Tee - Branch to Line	8.00 in	1	700 gpm	0.127438135	4.47 ft/sec 0.31 ft
e	1	Exits	12.00 in	1	700 gpm	0.025172965	1.99 ft/sec 0.06 ft

Subtotals:

$$\sum \frac{K}{2g * (A)^2} = 1.40614608510 = K2'$$

Fitting losses (at Q<sub>max</sub>): 3.42 ft

Results

Velocity:  $V = \frac{Q[gpm]}{448.8 * \pi * D[in]^2 / 4}$

Piping Losses (Hazen Williams Formula):  $H_p = (10.44)(L[ft]) \frac{Q[gpm]^{1.85}}{(C)^{1.85} (d[inches])^{4.8655}} = K1'(Q)^{1.85}$

Fitting Losses (Darcy Weisbach Equation):  $H_f = \frac{KV^2}{2g} = K2'(Q)^2$

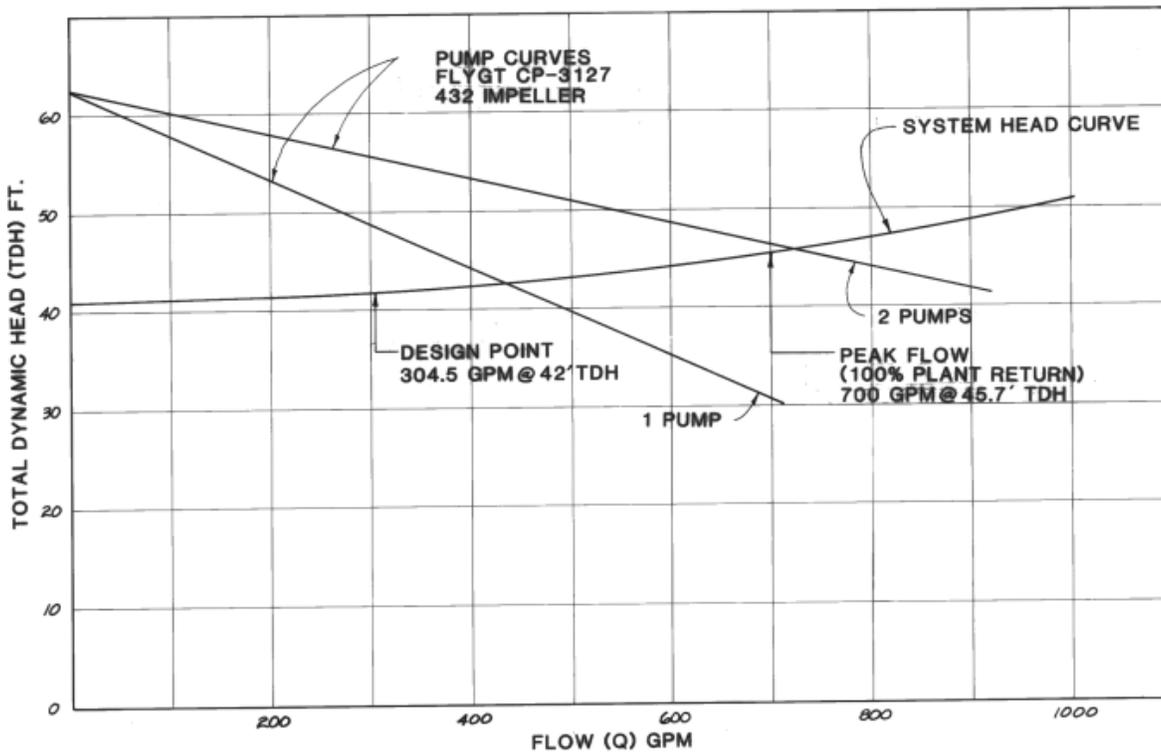
Total Dynamic Head (TDH):  $TDH = StaticHead[H_s] + H_p + H_f$

Total frictional losses: 5.73 ft  
 Design TDH: 43.98 ft  
 Max TDH: 46.23 ft  
 Min TDH: 41.73 ft

Q, gpm	Q, mgd	Pipe Losses, H <sub>p</sub>	Minor Losses, H <sub>f</sub>	Total Losses	Max TDH	Min TDH	Design TDH
0	0.00	0.00 ft	0.00 ft	0.00 ft	40.50 ft	36.00 ft	38.25 ft
100	0.14	0.06 ft	0.07 ft	0.13 ft	40.63 ft	36.13 ft	38.38 ft
200	0.29	0.23 ft	0.28 ft	0.51 ft	41.01 ft	36.51 ft	38.76 ft
305	0.44	0.50 ft	0.65 ft	1.15 ft	41.65 ft	37.15 ft	39.40 ft
400	0.58	0.82 ft	1.12 ft	1.94 ft	42.44 ft	37.94 ft	40.19 ft
500	0.72	1.24 ft	1.75 ft	2.99 ft	43.49 ft	38.99 ft	41.24 ft
600	0.86	1.74 ft	2.52 ft	4.26 ft	44.76 ft	40.26 ft	42.51 ft
700	1.01	2.31 ft	3.43 ft	5.74 ft	46.24 ft	41.74 ft	43.99 ft
800	1.15	2.96 ft	4.48 ft	7.44 ft	47.94 ft	43.44 ft	45.69 ft
900	1.30	3.68 ft	5.67 ft	9.36 ft	49.86 ft	45.36 ft	47.61 ft
1000	1.44	4.47 ft	7.01 ft	11.48 ft	51.98 ft	47.48 ft	49.73 ft

Pump Manufacturer: **FLYGT**  
 Model: **CP-3127**  
 Speed: -  
 Stages: -  
 Impeller Dia: -  
 Horsepower: -

1 Pump			2 Pumps	
Flow (gpm)	TDH (ft)	TDH (ft) (inc. station loss)	Flow (gpm)	TDH (ft)
0	64.0	64.0	0	64.00
100	59.0	59.0	200	59.00
200	54.0	54.0	400	54.00
300	49.0	49.0	600	49.00
400	44.0	44.0	800	44.00
500	40.0	40.0	1000	40.00
600	36.0	36.0		
700	32.0	32.0		



RETURN LIFT STATION  
 SYSTEMS HEAD CURVE AND PUMP CURVES

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**APPENDIX G**  
Calaveras County Water District  
Treated Effluent Pipeline Calculations

## Flow Scenario 1: 8-inch and 10-inch Pipelines, Evaluation of 2MGD Flow to LESP

Input AutoCalc  
**Hazen William's Calculator (For Full Flow Circular Pipe)**

This calculation is based on the full capacity of the pipe (full flow), not under partial flow conditions

$$v = 1.318 C_{HW} R_H^{0.63} S^{0.54}$$

**Step 1: Calculate existing flow capacity & required flow for proposed pipe**

Description	Units	Gravity (Mannings)	Pressurized (Hazen)	Existing Pipe (Hazen)	Proposed Pipe (Hazen)
Calculation Condition		Resulting Flow	Resulting Flow	Resulting Head Losses (If Resulting Head Losses (Input Q)	
Begin STA or Point		12"x8" DI Cross after Parshall Flume	12"x8" DI Cross after Parshall Flume	12"x8" DI Cross after Parshall Flume	12"x10" DI Tee after Parshall Flume
End STA or Point		STA 0+80	STA 0+80	STA 0+80	STA 5+95
Begin WS EL		736.33	736.33	736.33	736.33
End WS EL		702.3	702.3	702.3	702.3
Flow Rate, Q = CFS		1.09	1.22	0.92	2.17
Flow Rate, Q = GPM		490.79	548.51	414.97	973.92
<b>Flow Rate, Q = MGD</b>		<b>0.71</b>	<b>0.79</b>	<b>0.60</b>	<b>1.40</b>
velocity = ft/s		3.13	3.50	2.65	3.98
Pipe Diameter = inch		8	8.00	8.00	10.00
Pipe Diameter = ft		0.67			
Theta =		6.28			
Height of Water  y = ft		0.67	0.67	0.67	0.83
Mutiplier =		1			
Hydraulic Radius  R = ft		0.17	0.17	0.17	0.21
Cross-Sectional Area of Flow  A = ft <sup>2</sup>		0.35	0.35	0.35	0.55
Wetted Perimeter  P = ft		2.09	2.09	2.09	2.62
Slope of Hydraulic Surface  S = ft/ft		0.0082	0.0082	0.0082	0.0097
Slope of Hydraulic Surface  S = % Slope		0.8189			
Vertical Delta = ft		34.0	34.0	34.0	34.0
Horizontal Pipe Run = ft		4,155	4,155	4,155	3,498
Manning's Roughness Coefficient  n = DI, CCWD		0.013			
Energy Gradient Sf =		0.0082			
H-Williams Roughness Coefficient, C =		110	110	110	145
H-Williams Major Head Losses hL1= ft		27.93	34.30	20.47	16.90
H-Williams Minor Head Losses hL2= ft		3.940	4.404	3.332	6.901
Total Head Losses hLtot = ft		31.87	38.71	23.80	23.80
Sum of K =		9			10.57

0.00 Balance check

Fittings	K Value	Quantity	Individual Losses (ft)
90 DEG BEND	0.3	1	0.06
45 DEG BEND	0.2	17	0.65
TEE, STRAIGHT THRU	0.2		
TEE, BRANCH TO LINE	1	2	0.38
TEE, LINE TO BRANCH	1		
ENTR, INWARD PROJECT'G	0.8		
ENTR., SHARP CRNR	0.5	1	0.10
ENTR. BELL MOUTH	0.1		
SLUICE GATE	2.7		
GATE VALVE (FULLY OPEN)	0.2	3	0.11
WATER METER	0.5	1	0.10
BUTTERFLY VALVE (FULLY OPEN)	0.7	1	
SWING CHECK VALVE (FULLY OPEN)	2.5	0	-
PLUG VALVE, ECCENTRIC (FULLY OPEN)	1		
FLAP GATE	1.5		
EXIT LOSS	1	1	0.19

**Step 2: Proposed hydraulic grade line (piping profile)**

Description	Units	Hazen Williams Design Calculations (Full Flow Conditions)									TOTALS	
Segment No.		1	2	3	4	5	6	7	8	9		
Begin STA or Point		Parshall Flume	STA 100+00	STA 110+92	STA 114+50	STA 118+00	STA 118+00	STA 122+50	STA 130+21	STA 132+80	STA 133+40	STA 133+40
End STA or Point		STA 100+00	STA 110+92	STA 114+50	STA 118+00	STA 122+50	STA 130+21	STA 132+80	STA 133+40	STA 135+15		
Begin WS EL		736.64	733.48	731.33	727.20	725.77	722.00	706.00	706.00	703.00	736.64	
End WS EL		733.48	731.33	727.20	725.77	722.00	706.00	706.00	703.00	702.30	702.30	
Flow Rate, Q = CFS		3.09	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17		
Flow Rate, Q = GPM		1,388.89	973.92	973.92	973.92	973.92	973.92	973.92	973.92	973.92		
<b>Flow Rate, Q = MGD</b>		<b>2.00</b>	<b>1.40</b>	1.40	1.40	1.40	1.40	1.40	1.40	1.40		
velocity = ft/s		3.94	2.76	3.98	3.98	3.98	3.98	3.98	3.98	3.98		
Pipe Diameter = inch		12.00	12.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00		
Height of Water  y = ft		1.00	1.00	0.83	0.83	0.83	0.83	0.83	0.83	0.83		
Hydraulic Radius  R = ft		0.25	0.25	0.21	0.21	0.21	0.21	0.21	0.21	0.21		
Cross-Sectional Area of Flow  A = ft <sup>2</sup>		0.79	0.79	0.55	0.55	0.55	0.55	0.55	0.55	0.55		
Wetted Perimeter  P = ft		3.14	3.14	2.62	2.62	2.62	2.62	2.62	2.62	2.62		
Vertical Delta = ft		3.16	2.15	4.13	1.43	3.77	16.00	0.00	3.00	0.70	34.34	
Horizontal Pipe Run = ft		30	1,075	358	350	450	771	259	60	175		
Total Pipe Run = ft		30	1,105	1,463	1,813	2,263	3,034	3,293	3,353	3,528		
H-Williams Roughness Coefficient, C =		145	145	145	145	145	145	145	145	145		
H-Williams Major Head Losses hL1= ft		0.12	2.14	1.73	1.69	2.17	3.73	1.25	0.29	0.85	13.96	
Sum of K =		1.80	2.80	0.57	0.13	0.20	0.67	0.00	0.60	3.80		
H-Williams Minor Head Losses hL2= ft		0.20	0.34	0.02	0.00	0.00	0.03	0.00	0.02	0.89	1.50	
<b>Total Head Losses hLtot = ft</b>		<b>0.31</b>	<b>2.47</b>	<b>1.75</b>	<b>1.69</b>	<b>2.18</b>	<b>3.75</b>	<b>1.25</b>	<b>0.31</b>	<b>1.74</b>	<b>15.46</b>	
Accumulated Head Losses = ft		0.31	2.79	4.54	6.23	8.41	12.16	13.41	13.72	15.46		
Hydraulic Grade Line at Endpoint = ft EL		736.33	733.85	732.10	730.41	728.23	724.48	723.23	722.92	721.18	721.18	
Max. Invert Elevation at Endpoint = ft EL		735.33	732.85	731.27	729.58	727.40	723.65	722.40	722.08	720.35		
Total Head = ft		3.16	5.31	9.44	10.87	14.64	30.64	30.64	33.64	34.34		
Net Static Head Available = ft		2.85	2.52	4.91	4.64	6.23	18.48	17.23	19.92	18.88	18.88	
Velocity Head = ft		0.24	0.12	0.25	0.25	0.25	0.25	0.25	0.25	0.25		
Net Total Head = ft		3.09	2.64	5.15	4.89	6.48	18.73	17.47	20.16	19.12		

Fittings	K Value	Quantity									
90 DEG BEND	0.3	1	1								
45 DEG BEND	0.2		10	2	1	1	1		3	3	
TEE, STRAIGHT THRU	0.2		1				1				
TEE, BRANCH TO LINE	1										
TEE, LINE TO BRANCH	1		1								
ENTR, INWARD PROJECT'G	0.8										
ENTR., SHARP CRNR	0.5		1								
ENTR. BELL MOUTH	0.1										
SLUICE GATE	2.7										
GATE VALVE (FULLY OPEN)	0.2		1	1			1			1	
WATER METER	0.5									1	
BUTTERFLY VALVE (FULLY OPEN)	0.7										
SWING CHECK VALVE (FULLY OPEN)	2.5										
PLUG VALVE, ECCENTRIC (FULLY OPEN)	1										
FLAP GATE	1.5									1	
EXIT LOSS	1									1	
REDUCER	0.04		1	1							

## Flow Scenario 2: 8-inch and 10-inch Pipelines, Evaluation of Maximum Flow to LESP

Input AutoCalc

### Hazen William's Calculator (For Full Flow Circular Pipe)

This calculation is based on the full capacity of the pipe (full flow), not under partial flow conditions

$$v = 1.318 C_{HW} R_H^{0.63} S^{0.54}$$

#### Step 1: Calculate existing flow capacity & required flow for proposed pipe

Description	Units	Gravity (Mannings)	Pressurized (Hazen)	Existing Pipe (Hazen)	Proposed Pipe (Hazen)
Calculation Condition		Resulting Flow	Resulting Flow	Resulting Head Losses (I)	Resulting Head Losses (Input Q)
Begin STA or Point		16" DI Cross after Parshall Flume			
End STA or Point		STA 0+80	STA 0+80	STA 0+80	STA 5+95
Begin WS EL		736.22	736.22	736.22	736.22
End WS EL		702.3	702.3	702.3	702.3
Flow Rate, Q = CFS		1.09	1.22	1.13	2.70
Flow Rate, Q = GPM		490.04	547.61	508.56	1,212.07
<b>Flow Rate, Q = MGD</b>		<b>0.71</b>	<b>0.79</b>	<b>0.73</b>	<b>1.75</b>
velocity = ft/s		3.13	3.50	3.25	4.95
Pipe Diameter = inch		8	8.00	8.00	10.00
Pipe Diameter = ft		0.67			
Theta =		6.28			
Height of Water  y = ft		0.67	0.67	0.67	0.83
Mutiplier =		1			
Hydraulic Radius  R = ft		0.17	0.17	0.17	0.21
Cross-Sectional Area of Flow  A = ft <sup>2</sup>		0.35	0.35	0.35	0.55
Wetted Perimeter  P = ft		2.09	2.09	2.09	2.62
Slope of Hydraulic Surface  S = ft/ft		0.0082	0.0082	0.0082	0.0097
Slope of Hydraulic Surface  S = % Slope		0.8164			
Vertical Delta = ft		33.9	33.9	33.9	33.9
Horizontal Pipe Run = ft		4,155	4,155	4,155	3,498
Manning's Roughness Coefficient   n = DI, CCWD		0.013			
Energy Gradient Sf =		0.0082			
H-Williams Roughness Coefficient, C =		110	110	110	145
H-Williams Major Head Losses hL1= ft		27.85	34.20	29.83	25.33
H-Williams Minor Head Losses hL2= ft		3.934	4.397	4.083	8.589
Total Head Losses hLtot = ft		31.78	38.60	33.91	33.92
Sum of K =		9			10.57
					0.00 Balance check

Fittings	K Value	Quantity	Individual Losses (ft)
90 DEG BEND	0.3	1	0.06
45 DEG BEND	0.2	17	0.65
TEE, STRAIGHT THRU	0.2		
TEE, BRANCH TO LINE	1	2	0.38
TEE, LINE TO BRANCH	1		
ENTR, INWARD PROJECT'G	0.8		
ENTR., SHARP CRNR	0.5	1	0.09
ENTR. BELL MOUTH	0.1		
SLUICE GATE	2.7		
GATE VALVE (FULLY OPEN)	0.2	3	0.11
WATER METER	0.5	1	0.09
BUTTERFLY VALVE (FULLY OPEN)	0.7	1	
SWING CHECK VALVE (FULLY OPEN)	2.5	0	-
PLUG VALVE, ECCENTRIC (FULLY OPEN)	1		
FLAP GATE	1.5		
EXIT LOSS	1	1	0.19

#### Step 2: Proposed hydraulic grade line (piping profile)

Description	Units	Hazen Williams Design Calculations (Full Flow Conditions)									TOTALS	
Segment No.		1	2	3	4	5	6	7	8	9		
Begin STA or Point		Parshall Flume	STA 100+00	STA 110+92	STA 114+50	STA 118+00	STA 122+50	STA 130+21	STA 132+80	STA 133+40	STA 133+40	
End STA or Point		STA 100+00	STA 110+92	STA 114+50	STA 118+00	STA 122+50	STA 130+21	STA 132+80	STA 133+40	STA 135+15		
Begin WS EL		736.64	733.48	731.33	727.20	724.92	722.00	706.00	706.00	703.00	736.64	
End WS EL		733.48	731.33	727.20	724.92	722.00	706.00	706.00	703.00	702.30	702.30	
Flow Rate, Q = CFS		3.83	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	2.70	
Flow Rate, Q = GPM		1,720.63	1,212.07	1,212.07	1,212.07	1,212.07	1,212.07	1,212.07	1,212.07	1,212.07	1,212.07	
<b>Flow Rate, Q = MGD</b>		<b>2.48</b>	<b>1.75</b>	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	
velocity = ft/s		4.88	3.44	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	
Pipe Diameter = inch		12.00	12.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	
Height of Water  y = ft		1.00	1.00	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	
Hydraulic Radius  R = ft		0.25	0.25	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	
Cross-Sectional Area of Flow  A = ft <sup>2</sup>		0.79	0.79	0.55	0.55	0.55	0.55	0.55	0.55	0.55	0.55	
Wetted Perimeter  P = ft		3.14	3.14	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	
Vertical Delta = ft		3.16	2.15	4.13	2.27	2.92	16.00	0.00	3.00	0.70	34.34	
Horizontal Pipe Run = ft		30	1,075	358	350	450	771	259	60	175		
Total Pipe Run = ft		30	1,105	1,463	1,813	2,263	3,034	3,293	3,353	3,528		
H-Williams Roughness Coefficient, C =		145	145	145	145	145	145	145	145	145		
H-Williams Major Head Losses hL1= ft		0.17	3.20	2.59	2.53	3.26	5.58	1.88	0.43	1.27	20.92	
Sum of K =		1.80	2.80	0.57	0.13	0.20	0.67	0.00	0.60	3.80		
H-Williams Minor Head Losses hL2= ft		0.25	0.42	0.03	0.00	0.00	0.03	0.00	0.03	1.11	1.87	
<b>Total Head Losses hLtot = ft</b>		<b>0.42</b>	<b>3.62</b>	<b>2.62</b>	<b>2.54</b>	<b>3.26</b>	<b>5.62</b>	<b>1.88</b>	<b>0.46</b>	<b>2.38</b>	<b>22.79</b>	
Accumulated Head Losses = ft		0.42	4.04	6.66	9.19	12.46	18.07	19.95	20.41	22.79		
Hydraulic Grade Line at Endpoint = ft EL		736.22	732.60	729.98	727.45	724.18	718.57	716.69	716.23	713.85	713.85	
Max. Invert Elevation at Endpoint = ft EL		735.22	731.60	729.15	726.61	723.35	717.73	715.86	715.40	713.02		
Total Head = ft		3.16	5.31	9.44	11.72	14.64	30.64	30.64	33.64	34.34		
Net Static Head Available = ft		2.74	1.27	2.79	2.52	2.18	12.57	10.69	13.23	11.55	11.55	
Velocity Head = ft		0.37	0.18	0.38	0.38	0.38	0.38	0.38	0.38	0.38	0.38	
Net Total Head = ft		3.11	1.45	3.17	2.91	2.57	12.95	11.07	13.61	11.93		

Fittings	K Value	Quantity
90 DEG BEND	0.3	1
45 DEG BEND	0.2	10
TEE, STRAIGHT THRU	0.2	1
TEE, BRANCH TO LINE	1	
TEE, LINE TO BRANCH	1	
ENTR, INWARD PROJECT'G	0.8	
ENTR., SHARP CRNR	0.5	1
ENTR. BELL MOUTH	0.1	
SLUICE GATE	2.7	
GATE VALVE (FULLY OPEN)	0.2	1
WATER METER	0.5	
BUTTERFLY VALVE (FULLY OPEN)	0.7	
SWING CHECK VALVE (FULLY OPEN)	2.5	
PLUG VALVE, ECCENTRIC (FULLY OPEN)	1	
FLAP GATE	1.5	
EXIT LOSS	1	
REDUCER	0.04	1

## Flow Scenario 3: One 12-inch Proposed Pipeline, Abandon (E) 8-inch Pipeline

Input AutoCalc

### Hazen William's Calculator (For Full Flow Circular Pipe)

This calculation is based on the full capacity of the pipe (full flow), not under partial flow conditions

$$v = 1.318 C_{HW} R_H^{0.63} S^{0.54}$$

#### Step 1: Calculate existing flow capacity & required flow for proposed pipe

Description	Units	Proposed Pipe (Hazen)
Calculation Condition		Resulting Head Losses (Input Q)
Begin STA or Point		16" DI Cross after Parshall Flume
End STA or Point		STA 5+95
Begin WS EL		736.33
End WS EL		702.3
Flow Rate, Q = CFS		3.09
Flow Rate, Q = GPM		1,388.89
<b>Flow Rate, Q = MGD</b>		<b>2.00</b>
velocity = ft/s		3.94
Pipe Diameter = inch		12.00
Pipe Diameter = ft		
Theta =		
Height of Water  y = ft		1.00
Mutiplier =		
Hydraulic Radius  R = ft		0.25
Cross-Sectional Area of Flow  A = ft <sup>2</sup>		0.79
Wetted Perimeter  P = ft		3.14
Slope of Hydraulic Surface  S = ft/ft		0.0097
Slope of Hydraulic Surface  S = % Slope		
Vertical Delta = ft		34.0
Horizontal Pipe Run = ft		3,515
Manning's Roughness Coefficient  n = DI, CCWD		
Energy Gradient Sf =		
H-Williams Roughness Coefficient, C =		145
H-Williams Major Head Losses hL1= ft		13.48
H-Williams Minor Head Losses hL2= ft		6.835
Total Head Losses hLtot = ft		20.31
Sum of K =		10.57

#### Step 2: Proposed hydraulic grade line (piping profile)

Description	Units	Hazen Williams Design Calculations (Full Flow Conditions)									TOTALS
		1	2	3	4	5	6	7	8	9	
Segment No.		1	2	3	4	5	6	7	8	9	
Begin STA or Point		Parshall Flume	STA 100+00	STA 110+92	STA 114+50	STA 118+00	STA 122+50	STA 130+21	STA 132+80	STA 133+40	
End STA or Point		STA 100+00	STA 110+92	STA 114+50	STA 118+00	STA 122+50	STA 130+21	STA 132+80	STA 133+40	STA 135+15	
Begin WS EL		736.64	733.48	731.30	727.16	725.77	722.00	706.00	706.00	703.00	736.64
End WS EL		733.48	731.30	727.16	725.77	722.00	706.00	706.00	703.00	702.30	702.30
Flow Rate, Q = CFS		3.09	3.09	3.09	3.09	3.09	3.09	3.09	3.09	3.09	
Flow Rate, Q = GPM		1,388.89	1,388.89	1,388.89	1,388.89	1,388.89	1,388.89	1,388.89	1,388.89	1,388.89	
<b>Flow Rate, Q = MGD</b>		<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	<b>2.00</b>	
velocity = ft/s		3.94	2.89	3.94	3.94	3.94	3.94	3.94	3.94	3.94	
Pipe Diameter = inch		12.00	14.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
Height of Water  y = ft		1.00	1.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Hydraulic Radius  R = ft		0.25	0.29	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
Cross-Sectional Area of Flow  A = ft <sup>2</sup>		0.79	1.07	0.79	0.79	0.79	0.79	0.79	0.79	0.79	
Wetted Perimeter  P = ft		3.14	3.67	3.14	3.14	3.14	3.14	3.14	3.14	3.14	
Vertical Delta = ft		3.16	2.18	4.13	1.39	3.77	16.00	0.00	3.00	0.70	34.34
Horizontal Pipe Run = ft		30	1,092	358	350	450	771	259	60	175	
Total Pipe Run = ft		30	1,122	1,480	1,830	2,280	3,051	3,310	3,370	3,545	
H-Williams Roughness Coefficient, C =		145	145	145	145	145	145	145	145	145	
H-Williams Major Head Losses hL1= ft		0.12	1.98	1.37	1.34	1.73	2.96	0.99	0.23	0.67	11.38
Sum of K =		1.80	2.80	0.57	0.13	0.20	0.67	0.00	0.60	3.80	
H-Williams Minor Head Losses hL2= ft		0.20	0.35	0.02	0.00	0.00	0.03	0.00	0.02	0.88	1.51
<b>Total Head Losses hLtot = ft</b>		<b>0.31</b>	<b>2.33</b>	<b>1.39</b>	<b>1.34</b>	<b>1.73</b>	<b>2.98</b>	<b>0.99</b>	<b>0.25</b>	<b>1.55</b>	<b>12.89</b>
Accumulated Head Losses = ft		<b>0.31</b>	<b>2.64</b>	<b>4.03</b>	<b>5.38</b>	<b>7.11</b>	<b>10.09</b>	<b>11.08</b>	<b>11.33</b>	<b>12.89</b>	
Hydraulic Grade Line at Endpoint = ft EL		736.33	734.00	732.61	731.26	729.53	726.55	725.56	725.31	723.75	723.75
Max. Invert Elevation at Endpoint = ft EL		735.33	732.83	731.61	730.26	728.53	725.55	724.56	724.31	722.75	
Total Head = ft		3.16	5.34	9.48	10.87	14.64	30.64	30.64	33.64	34.34	
Net Static Head Available = ft		2.85	2.70	5.44	5.49	7.53	20.55	19.56	22.31	21.45	21.45
Velocity Head = ft		0.24	0.13	0.24	0.24	0.24	0.24	0.24	0.24	0.24	
Net Total Head = ft		3.09	2.83	5.69	5.73	7.78	20.79	19.80	22.55	21.69	

Fittings	K Value	Quantity									
90 DEG BEND	0.3	1	1								
45 DEG BEND	0.2		10	2	1	1	1		3	3	
TEE, STRAIGHT THRU	0.2		1				1				
TEE, BRANCH TO LINE	1										
TEE, LINE TO BRANCH	1	1									
ENTR, INWARD PROJECT'G	0.8										
ENTR., SHARP CRNR	0.5	1									
ENTR. BELL MOUTH	0.1										
SLUICE GATE	2.7										
GATE VALVE (FULLY OPEN)	0.2		1	1			1			1	
WATER METER	0.5									1	
BUTTERFLY VALVE (FULLY OPEN)	0.7										
SWING CHECK VALVE (FULLY OPEN)	2.5										
PLUG VALVE, ECCENTRIC (FULLY OPEN)	1										
FLAP GATE	1.5									1	
EXIT LOSS	1									1	
REDUCER	0.04		1	1							

## Flow Scenario 4: 8-inch and 10-inch Pipelines, Max Flow to LESP Bottom Inlet

Input AutoCalc

### Hazen William's Calculator (For Full Flow Circular Pipe)

This calculation is based on the full capacity of the pipe (full flow), not under partial flow conditions

$$v = 1.318 C_{HW} R_H^{0.63} S^{0.54}$$

#### Step 1: Calculate existing flow capacity & required flow for proposed pipe

Description	Units	Gravity (Mannings)	Pressurized (Hazen)	Existing Pipe (Hazen)	Proposed Pipe (Hazen)
Calculation Condition		Resulting Flow	Resulting Flow	Resulting Head Losses (In	Resulting Head Losses (Input Q)
Begin STA or Point		16" DI Cross after Parshall	16" DI Cross after	16" DI Cross after	16" DI Cross after
End STA or Point		Flume	Parshall Flume	Parshall Flume	Parshall Flume
Begin WS EL		STA 0+80	STA 0+80	STA 5+95	STA 5+95 (bottom outlet)
End WS EL					
		736.41	736.41	736.41	736.41
		702.3	702.3	702.3	702.3
Flow Rate, Q = CFS		1.14	1.28	0.73	1.71
Flow Rate, Q = GPM		511.27	573.28	327.97	767.86
<b>Flow Rate, Q = MGD</b>		<b>0.74</b>	<b>0.83</b>	<b>0.47</b>	<b>1.11</b>
velocity = ft/s		3.26	3.66	2.09	3.14
Pipe Diameter = inch		8	8.00	8.00	10.00
Pipe Diameter = ft		0.67			
Theta =		6.28			
Height of Water  y = ft		0.67	0.67	0.67	0.83
Mutiplier =		1			
Hydraulic Radius  R = ft		0.17	0.17	0.17	0.21
Cross-Sectional Area of Flow  A = ft <sup>2</sup>		0.35	0.35	0.35	0.55
Wetted Perimeter  P = ft		2.09	2.09	2.09	2.62
Slope of Hydraulic Surface  S = ft/ft		0.0089	0.0089	0.0093	0.0097
Slope of Hydraulic Surface  S = % Slope		0.8887			
Vertical Delta = ft		34.1	34.1	34.1	34.1
Horizontal Pipe Run = ft		3,838	3,838	3,670	3,508
Manning's Roughness Coefficient  n = DI, CCWD		0.013			
Energy Gradient Sf =		0.0089			
H-Williams Roughness Coefficient, C =		110	110	110	145
H-Williams Major Head Losses hL1= ft		27.82	34.38	11.70	10.92
H-Williams Minor Head Losses hL2= ft		4.105	4.603	2.633	3.412
Total Head Losses hLtot = ft		31.93	38.99	14.33	14.33
Sum of K =		9			8.37
					0.00
					Balance check
	<u>Fittings</u>	<u>K Value</u>	<u>Quantity</u>	<u>Individual Losses (ft)</u>	
90 DEG BEND		0.3	1	0.06	
45 DEG BEND		0.2	17	0.71	
TEE, STRAIGHT THRU		0.2			
TEE, BRANCH TO LINE		1	2	0.42	
TEE, LINE TO BRANCH		1			
ENTR, INWARD PROJECT'G		0.8			
ENTR., SHARP CRNR		0.5	1	0.10	
ENTR. BELL MOUTH		0.1			
SLUICE GATE		2.7			
GATE VALVE (FULLY OPEN)		0.2	3	0.12	
WATER METER		0.5	1	0.10	
BUTTERFLY VALVE (FULLY OPEN)		0.7	1		
SWING CHECK VALVE (FULLY OPEN)		2.5	0	-	
PLUG VALVE, ECCENTRIC (FULLY OPEN)		1			
FLAP GATE		1.5			
EXIT LOSS		1	1	0.21	

Description	Units	Existing Pipe (Hazen)
Calculation Condition		Resulting Head Losses (Input Q)
Begin STA or Point		STA 5+95
End STA or Point		STA 0+00
Begin WS EL		702.30
End WS EL		702.3
Flow Rate, Q = CFS		2.44
Flow Rate, Q = GPM		1,095.84
<b>Flow Rate, Q = MGD</b>		<b>1.58</b>
velocity = ft/s		6.99
Pipe Diameter = inch		8.00
Pipe Diameter = ft		
Theta =		
Height of Water  y = ft		0.67
Mutiplier =		
Hydraulic Radius  R = ft		0.17
Cross-Sectional Area of Flow  A = ft <sup>2</sup>		0.35
Wetted Perimeter  P = ft		2.09
Slope of Hydraulic Surface  S = ft/ft		0.0000
Slope of Hydraulic Surface  S = % Slope		
Vertical Delta = ft		0.0
Horizontal Pipe Run = ft		595
Manning's Roughness Coefficient  n = DI, CCWD		0.013
Energy Gradient Sf =		0.0408
H-Williams Roughness Coefficient, C =		110
H-Williams Major Head Losses hL1= ft		17.67
H-Williams Minor Head Losses hL2= ft		2.103
Total Head Losses hLtot = ft		19.78
Max Allowable Headloss = ft		19.78
Headloss Balance = ft		0.00
Sum of K =		4.4
		Iterate until = 0
	<u>Fittings</u>	<u>K Value</u>
		<u>Quantity</u>
		<u>Individual Losses (ft)</u>
90 DEG BEND		0.3
45 DEG BEND		0.2
TEE, STRAIGHT THRU		0.2
TEE, BRANCH TO LINE		1
TEE, LINE TO BRANCH		1
ENTR, INWARD PROJECT'G		0.8
ENTR., SHARP CRNR		0.5
ENTR. BELL MOUTH		0.1
SLUICE GATE		2.7
GATE VALVE (FULLY OPEN)		0.2
WATER METER		0.5
BUTTERFLY VALVE (FULLY OPEN)		0.7
SWING CHECK VALVE (FULLY OPEN)		2.5
PLUG VALVE, ECCENTRIC (FULLY OPEN)		1
FLAP GATE		1.5
EXIT LOSS		1

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**APPENDIX H**  
Calaveras County Water District  
Preliminary Cost Estimate

# || PRE-CONSTRUCTION SERVICES GROUP

## LA CONTENTA WWTF PHASE 3 – 30% OPCC

### REPORT SUMMARY

The following summary report prepared on 11/11/2024 is based on the HydroScience 30% SUBMITTAL LA CONTENTA WASTEWATER TREATMENT FACILITY PHASE 3 IMPROVEMENTS dated November 2024. The following comments, questions and recommendations are not intended to be direction. Ultimate design, engineering, and use of the information provided is at the discretion of the recipient.

#### Notes and Comments:

- This estimate is commensurate with the design level and is based on the drawings and documents provided. Material and quantities were taken off and were used by PCSG in the completion of the estimate.
- NOTE ABOUT MATERIAL PRICING: Material pricing is volatile. Pricing is often guaranteed for as little as 10 or 15 days. Material costs are based on material pricing at the time of this report.
- A 30% contingency factor has been included in the overall project value to account for design development and scope of work evolution. Contractor risk contingency is included in the overall contingency value.
- Direct costs are based on takeoff quantities with labor and equipment typical of the scope of work and regional productivity to prosecute the work as shown. Direct cost also includes typical small tools, non-permanent materials consumed during construction, and support subcontractors typical of the scope of work. Temporary and construction materials have been included at current pricing levels.
- California and Calaveras County Prevailing Wage Rates for 2024/2025 have been used in pricing craft labor costs.
- Construction equipment costs are based on available rental pricing data in Washoe County and include fuel, oil, grease, and wear parts as well as Blue Book Equipment Rates from Equipment Watch.
- Overhead and project management have been included to represent the overall project costs.
- A contractor fee of 12% has been included to represent assumed contractor profit.
- 2 years of escalation at 5% per year has been included to represent assumed inflation over the next two years
- This opinion of probable construction costs (OPCC) is provided as a specific value; however, contractor means and methods, actual wage and equipment rates, advantages, and risk assumptions will vary. Bids received from contractors are likely to vary by as much as +/- 25% depending on the number of bidders, market conditions, and regional factors if the project bids are received within the assumed 2 year period.

## La Contenta WWTF Phase 3 Improvements - 30%

### OPINION OF PROBABLE CONSTRUCTION COSTS

ACTIVITY	BASELINE	ALTERNATE	ALTERNATE OPTIONS
Sitework	\$ 634,277	\$ 634,277	
Splitter Box	\$ 105,722	\$ 105,722	
Flow Meter Vaults	\$ 178,438	\$ 178,438	
Aeration Basin w/ Integral Clarifier	\$ 3,833,045		
Aeration Basin w/o Integral Clarifier		\$ 2,310,797	
Independent Clarifier		\$ 1,729,700	
Baseline Integral Clarifier Yard Piping	\$ 740,301		
Independent Clarifier Yard Piping		\$ 750,917	
Electrical Building	\$ 371,471	\$ 371,471	
RAS/WAS Pump Station (Submersible Option)		\$ 332,930	
<i>RAS/WAS Pump Station (Split Case Pump Option)</i>			\$ 190,882
Influent Junction Box	\$ 203,579	\$ 203,579	
Effluent Pump Station (Baseline)	\$ 586,243	\$ 586,243	
<i>Effluent Pump Station (Barge Option)</i>			\$ 426,341
<i>Effluent Pump Station (Plant Drain Combination)</i>			\$ 993,607
Effluent Pipeline	\$ 1,303,800	\$ 1,303,800	
<i>Effluent Pipeline (Increased Pipeline Size Option)</i>			\$ 1,450,000
Electrical Work (New MCC/PLC/Generator)	\$ 3,112,638	\$ 3,250,000	
<b>TOTAL DIRECT COSTS</b>	<b>\$ 11,069,514</b>	<b>\$ 11,757,874</b>	
<b>CONTINGENCY (30%)</b>	<b>\$ 3,320,854</b>	<b>\$ 3,527,362</b>	
<b>ESCALATION (2 YEARS @ 5% YOY)</b>	<b>\$ 1,162,299</b>	<b>\$ 1,234,577</b>	
<b>TOTAL OPCC</b>	<b>\$ 15,552,667</b>	<b>\$ 16,519,813</b>	

# Cost Report

## Biditem

# 10

## Sitework

Takeoff Qty: 1.000 LS  
 Bid Qty: 1.000 LS

Client #: 1

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	116,724.00	40,468.43	157,192.43	117,209.32	84,443.29	6,198.75	149,980.00	515,023.79
Total	116,724.00	40,468.43	157,192.43	117,209.32	84,443.29	6,198.75	149,980.00	515,023.79

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
1,476.0000	0.0007	1,476.0000	348.9321	79.0813	106.4989	0.0028

Activity: 020150.01 Site Demo - Remove Comp Surface Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	5,296.00	1,821.30	7,117.30	6,576.62	0.00	1,848.75	6,480.00	22,022.67
Total	5,296.00	1,821.30	7,117.30	6,576.62	0.00	1,848.75	6,480.00	22,022.67

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
13,693.9200	16.0000	0.0625	855.8700	2.0000	0.5000	2.0000	11,011.3350

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	0.0156	64.0000	111.2078	5,296.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 4 man Exc Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3DUMPFEEES	Dump Fees	1.00	68.00	TON	25.00	108.750	27.19	1,848.75
4HAUL	Hauling - Sub	1.00	48.00	HR	135.00	100.000	135.00	6,480.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	16.00	HR	111.02	108.750	120.73	1,931.75
8279	EXCAVATOR SMALL-MED	1.00	16.00	HR	221.08	108.750	240.42	3,846.79
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 311000.02 Dewater Pond Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	19,008.00	6,536.85	25,544.85	14,983.21	0.00	0.00	68,980.00	109,508.06
Total	19,008.00	6,536.85	25,544.85	14,983.21	0.00	0.00	68,980.00	109,508.06

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
40,528.0600	48.0000	0.0208	844.3346	6.0000	0.1667	6.0000	18,251.3433

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	0.0042	240.0000	106.4369	19,008.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE Small Pipe Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 5.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	48.00	HR	135.00	100.000	135.00	6,480.00
4SLUDGEDEH20	Sludge Dewatering Sub	1.00	2,500.00	GAL	25.00	100.000	25.00	62,500.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	48.00	HR	111.02	108.750	120.73	5,795.24
8276	EXCAVATOR SMALL	1.00	48.00	HR	130.15	108.750	141.54	6,793.73
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	2.00	96.00	MH	65.00	100.000	87.35	8,385.94

OPER4	Operator Foreman	1.00	48.00	MH	92.00	100.000	123.64	5,934.66
OPERATOR	Operator	2.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 015556.01 Temporary Controls/Protection/SWPPP Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	8,680.00	2,985.05	11,665.05	3,195.25	0.00	4,350.00	0.00	19,210.30
Total	8,680.00	2,985.05	11,665.05	3,195.25	0.00	4,350.00	0.00	19,210.30

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
14,860.3000	40.0000	0.0250	371.5075	5.0000	0.2000	5.0000	3,842.0600

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
120.0000	0.0083	120.0000	97.2088	8,680.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MINIP Mini Pipe Crew Prod: CH 40 Eff: 100.00 Crew Hrs: 40.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3SWPPMTL	SWPPP Materials	1.00	1.00	LS	4,000.00	108.750	4,350.00	4,350.00
8243	BACKHOE/LOADER 60-90HP 4WD	1.00	40.00	HR	73.45	108.750	79.88	3,195.25
LABORER	Laborer	2.00	80.00	MH	65.00	100.000	87.35	6,988.28
OPERATOR	Operator	1.00	40.00	MH	87.00	100.000	116.92	4,676.77

Activity: 312000.09 Earth Moving - Cut & Offhaul Quantity: 4000.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	6.62	2.28	8.90	8.22	0.00	0.00	13.50	30.62
Total	26,480.00	9,106.47	35,586.47	32,883.10	0.00	0.00	54,000.00	122,469.57

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
17.1174	0.0200	50.0000	855.8696	10.0000	400.0000	0.0025	12,246.9570

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
320.0000	12.5000	0.0800	111.2077	6.6200

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 4 man Exc Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	400.00	HR	135.00	100.000	135.00	54,000.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	80.00	HR	111.02	108.750	120.73	9,658.74
8279	EXCAVATOR SMALL-MED	1.00	80.00	HR	221.08	108.750	240.42	19,233.96
8UTLPU	Utility Pickup	1.00	80.00	HR	49.88	100.000	49.88	3,990.40
LABORER	Laborer	1.00	80.00	MH	65.00	100.000	87.35	6,988.28
OPER4	Operator Foreman	1.00	80.00	MH	92.00	100.000	123.64	9,891.10
OPERATOR	Operator	2.00	160.00	MH	87.00	100.000	116.92	18,707.09

Activity: 311000.01 Earthwork-Clearing Quantity: 50000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	0.05	0.02	0.07	0.11	0.00	0.00	0.04	0.23
Total	2,648.00	910.65	3,558.65	5,730.73	0.00	0.00	2,160.00	11,449.38

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
0.1858	0.0002	6,250.0000	1,161.1725	1.0000	50,000.0000	0.0000	11,449.3800

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
32.0000	1,562.5000	0.0006	111.2078	0.0530

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGGRD (Mod) Large Grading Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 4.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	16.00	HR	135.00	100.000	135.00	2,160.00
8239	MOTORGRADER/BLADE	1.00	8.00	HR	182.58	108.750	198.56	1,588.45
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.00	HR	111.02	108.750	120.73	965.87
8287	DOZER STANDARD TRACK SMALL	1.00	8.00	HR	192.87	108.750	209.75	1,677.97
8326	4000 GAL WATER TRUCK	1.00	8.00	HR	126.37	108.750	137.43	1,099.40
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71

Activity: 311000.03 Remove Saturated Materials (Unreviewed) Quantity: 600.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	8.83	3.04	11.86	10.96	0.00	0.00	7.20	30.02
Total	5,296.00	1,821.30	7,117.30	6,576.62	0.00	0.00	4,320.00	18,013.92

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
22.8232	0.0267	37.5000	855.8700	2.0000	300.0000	0.0033	9,006.9600

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	9.3750	0.1067	111.2078	8.8267

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 4 man Exc Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	32.00	HR	135.00	100.000	135.00	4,320.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	16.00	HR	111.02	108.750	120.73	1,931.75
8279	EXCAVATOR SMALL-MED	1.00	16.00	HR	221.08	108.750	240.42	3,846.79
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 323100.02 Bollards Quantity: 12.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	651.00	223.88	874.88	239.64	937.97	0.00	0.00	2,052.49
Total	7,812.00	2,686.54	10,498.54	2,875.72	11,255.63	0.00	0.00	24,629.89

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,114.5217	3.0000	0.3333	371.5072	4.5000	2.6667	0.3750	5,473.3089

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
108.0000	0.1111	9.0000	97.2087	651.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MINIP Mini Pipe Crew Prod: HU 3 Eff: 100.00 Crew Hrs: 36.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BOLLARD	Bollard Steel	1.00	12.00	EA	750.00	108.750	815.63	9,787.50
2CONC	Ready-Mix Concrete	1.00	6.00	CY	225.00	108.750	244.69	1,468.13
8243	BACKHOE/LOADER 60-90HP 4WD	1.00	36.00	HR	73.45	108.750	79.88	2,875.72
LABORER	Laborer	2.00	72.00	MH	65.00	100.000	87.35	6,289.45
OPERATOR	Operator	1.00	36.00	MH	87.00	100.000	116.92	4,209.09

Activity: 339900.99 Raise/Collar (Unreviewed) Quantity: 8.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
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U. Cost	868.00	298.51	1,166.51	835.40	122.34	0.00	0.00	2,124.25
Total	6,944.00	2,388.04	9,332.04	6,683.23	978.75	0.00	0.00	16,994.02

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,001.9088	4.0000	0.2500	500.4772	4.0000	2.0000	0.5000	4,248.5050

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.0833	12.0000	97.2088	868.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: RAISE Utility Raise/Collar Prod: HU 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	4.00	CY	225.00	108.750	244.69	978.75
8002	COMPRESSOR 175-195 CFM	1.00	32.00	HR	28.37	108.750	30.85	987.28
8016	BREAKER PAVEMENT AIR 90#	1.00	32.00	HR	18.00	108.750	19.58	626.40
8245	BACKHOE/LOADER 91-104HP 4WD	1.00	32.00	HR	99.81	108.750	108.54	3,473.39
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	2.00	64.00	MH	65.00	100.000	87.35	5,590.62
OPERATOR	Operator	1.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 312000.01 Site Grading Quantity: 50000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.15	0.05	0.21	0.19	0.00	0.00	0.00	0.40
Total	7,648.00	2,630.15	10,278.15	9,562.27	0.00	0.00	0.00	19,840.42

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
0.3968	0.0006	1,562.5000	620.0131	4.0000	12,500.0000	0.0001	4,960.1050

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	520.8333	0.0019	107.0641	0.1530

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMGRD (Mod) Small Grading Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8272	LOADER LANDSCAPER 4WD	1.00	32.00	HR	41.69	108.750	45.34	1,450.92
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	1.00	32.00	MH	65.00	100.000	87.35	2,795.31
OPERATOR	Operator	2.00	64.00	MH	87.00	100.000	116.92	7,482.84

Activity: 312000.02 Agg Base Quantity: 21000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.64	0.22	0.86	0.69	0.66	0.00	0.00	2.20
Total	13,376.00	4,600.00	17,976.00	14,465.13	13,859.10	0.00	0.00	46,300.23

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1.5448	0.0015	656.2500	1,013.7853	4.0000	5,250.0000	0.0002	11,575.0575

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
160.0000	131.2500	0.0076	112.3500	0.6370

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGGRD (Mod) Large Grading Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 5.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BASE	Base Rock	1.00	708.00	TON	18.00	108.750	19.58	13,859.10
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8239	MOTORGRADER/BLADE	1.00	32.00	HR	182.58	108.750	198.56	6,353.78

8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	1.00	32.00	MH	65.00	100.000	87.35	2,795.31
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	3.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 321216.01 AC Paving Quantity: 20000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.68	0.25	0.93	0.68	2.92	0.00	0.70	5.23
Total	13,536.00	4,982.08	18,518.08	13,677.44	58,349.81	0.00	14,040.00	104,585.33

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1.6098	0.0008	1,250.0000	2,012.2200	2.0000	10,000.0000	0.0001	52,292.6650

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
176.0000	113.6364	0.0088	105.2164	0.6768

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: PAVE Asphalt Paving Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 11.00 Equipment Pcs: 8.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ACPAVEMENT	Asphalt	1.00	511.00	TON	105.00	108.750	114.19	58,349.81
4HAUL	Hauling - Sub	1.00	104.00	HR	135.00	100.000	135.00	14,040.00
8042	ROLLER MD DOUBLE DRUM	1.00	16.00	HR	62.64	108.750	68.12	1,089.94
8043	ROLLER LG DOUBLE DRUM	2.00	32.00	HR	75.10	108.750	81.67	2,613.48
8272	LOADER LANDSCAPER 4WD	1.00	16.00	HR	41.69	108.750	45.34	725.46
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8998	AC PAVER	1.00	16.00	HR	325.00	100.000	325.00	5,200.00
8MECHTRK	Mechanics Truck	1.00	16.00	HR	65.73	100.000	65.73	1,051.68
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
MECH	Mechanic	1.00	16.00	MH	44.00	100.000	79.57	1,273.15
OPER4	Operator Foreman	2.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	4.00	64.00	MH	87.00	100.000	116.92	7,482.84
TRUCK	Truck Driver (On Site)	1.00	16.00	MH	75.00	100.000	100.79	1,612.68

Biditem

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Splitter Box

Takeoff Qty: 1.000 LS  
 Bid Qty: 1.000 LS

Client #: 2

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	29,700.00	10,213.83	39,913.83	9,653.13	18,772.97	3,806.25	13,440.00	85,586.18
Total	29,700.00	10,213.83	39,913.83	9,653.13	18,772.97	3,806.25	13,440.00	85,586.18

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
333.6000	0.0030	333.6000	256.5533	89.0288	119.6458	0.0137

Activity: 033001.01 Invert Quantity: 9.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	986.67	339.31	1,325.98	133.01	269.16	36.25	420.00	2,184.40
Total	8,880.00	3,053.83	11,933.83	1,197.12	2,422.41	326.25	3,780.00	19,659.61

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,458.9944	2.6667	0.3750	547.1229	3.0000	3.0000	0.3333	6,553.2033

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.0938	10.6667	124.3107	986.6667

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 3 Eff: 100.00 Crew Hrs: 24.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	9.90	CY	225.00	108.750	244.69	2,422.41
3FORMMTL	Form Materials	1.00	60.00	SF	5.00	108.750	5.44	326.25
4REBAR	Rebar - Sub	1.00	2,700.00	LB	1.40	100.000	1.40	3,780.00
8UTLPU	Utility Pickup	1.00	24.00	HR	49.88	100.000	49.88	1,197.12
CARP	Carpenter - Journeyman	2.00	48.00	MH	100.00	100.000	134.39	6,450.72
CARP4	Carpenter Foreman	1.00	24.00	MH	105.00	100.000	141.11	3,386.63
LABORER	Laborer	1.00	24.00	MH	65.00	100.000	87.35	2,096.48

Activity: 033001.02 Concrete Walls Quantity: 10.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	812.80	279.52	1,092.32	63.85	269.16	348.00	534.00	2,307.32
Total	8,128.00	2,795.22	10,923.22	638.46	2,691.56	3,480.00	5,340.00	23,073.24

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,156.1680	1.2800	0.7813	903.2563	1.6000	6.2500	0.1600	14,420.7750

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
89.6000	0.1116	8.9600	121.9109	812.8000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL 6 Man Wall Crew Prod: S 1.6 Eff: 100.00 Crew Hrs: 12.80 Labor Pcs: 7.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	11.00	CY	225.00	108.750	244.69	2,691.56
3FORMMTL	Form Materials	1.00	640.00	SF	5.00	108.750	5.44	3,480.00
4PUMP	Concrete Pump	1.00	4.00	HR	285.00	100.000	285.00	1,140.00
4REBAR	Rebar - Sub	1.00	3,000.00	LB	1.40	100.000	1.40	4,200.00
8UTLPU	Utility Pickup	1.00	12.80	HR	49.88	100.000	49.88	638.46
CARP	Carpenter - Journeyman	4.00	51.20	MH	100.00	100.000	134.39	6,880.77
CARP4	Carpenter Foreman	1.00	12.80	MH	105.00	100.000	141.11	1,806.20
LABORER	Laborer	2.00	25.60	MH	65.00	100.000	87.35	2,236.25

Activity: 055001.01 Misc Metals Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	5,920.00	2,035.89	7,955.89	798.08	13,267.50	0.00	0.00	22,021.47
Total	5,920.00	2,035.89	7,955.89	798.08	13,267.50	0.00	0.00	22,021.47

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
8,753.9700	16.0000	0.0625	547.1231	2.0000	0.5000	2.0000	11,010.7350

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	0.0156	64.0000	124.3108	5,920.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2FRAMEGRATE	Frame and Grate	1.00	100.00	SF	100.00	108.750	108.75	10,875.00
2WEIR	Weir	1.00	2.00	EA	1,100.00	108.750	1,196.25	2,392.50
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
CARP	Carpenter - Journeyman	2.00	32.00	MH	100.00	100.000	134.39	4,300.48
CARP4	Carpenter Foreman	1.00	16.00	MH	105.00	100.000	141.11	2,257.75
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66

Activity: 32001.01 Structure Exc Quantity: 1.00 Unit: LS

Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
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U. Cost	2,648.00	910.65	3,558.65	3,288.31	0.00	0.00	2,160.00	9,006.96
Total	2,648.00	910.65	3,558.65	3,288.31	0.00	0.00	2,160.00	9,006.96

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
6,846.9600	8.0000	0.1250	855.8700	1.0000	1.0000	1.0000	9,006.9600

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
32.0000	0.0313	32.0000	111.2078	2,648.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 4 man Exc Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	16.00	HR	135.00	100.000	135.00	2,160.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.00	HR	111.02	108.750	120.73	965.87
8279	EXCAVATOR SMALL-MED	1.00	8.00	HR	221.08	108.750	240.43	1,923.40
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71

Activity: 32001.02 Invert Grading Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	956.00	328.76	1,284.76	1,195.28	391.50	0.00	0.00	2,871.54
Total	956.00	328.76	1,284.76	1,195.28	391.50	0.00	0.00	2,871.54

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,480.0400	4.0000	0.2500	620.0100	0.5000	2.0000	0.5000	5,743.0800

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
12.0000	0.0833	12.0000	107.0633	956.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMGRD (Mod) Small Grading Crew Prod: S 0.5 Eff: 100.00 Crew Hrs: 4.00 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BASE	Base Rock	1.00	20.00	TON	18.00	108.750	19.58	391.50
8040	SINGLE DRUM COMPACTOR	1.00	4.00	HR	60.85	108.750	66.18	264.70
8272	LOADER LANDSCAPER 4WD	1.00	4.00	HR	41.69	108.750	45.34	181.36
8326	4000 GAL WATER TRUCK	1.00	4.00	HR	126.37	108.750	137.43	549.70
8UTLPU	Utility Pickup	1.00	4.00	HR	49.88	100.000	49.88	199.52
LABORER	Laborer	1.00	4.00	MH	65.00	100.000	87.35	349.41
OPERATOR	Operator	2.00	8.00	MH	87.00	100.000	116.92	935.35

Activity: 32001.03 Structure BF Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	3,168.00	1,089.48	4,257.48	2,535.88	0.00	0.00	2,160.00	8,953.36
Total	3,168.00	1,089.48	4,257.48	2,535.88	0.00	0.00	2,160.00	8,953.36

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
6,793.3600	8.0000	0.1250	849.1700	1.0000	1.0000	1.0000	8,953.3600

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
40.0000	0.0250	40.0000	106.4370	3,168.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: BKFL (Mod) Backfill Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 5.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	16.00	HR	135.00	100.000	135.00	2,160.00
8040	SINGLE DRUM COMPACTOR	1.00	8.00	HR	60.85	108.750	66.18	529.40

8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.00	HR	111.02	108.750	120.73	965.87
8324	2000 GAL WATER TRUCK	1.00	8.00	HR	73.74	108.750	80.20	641.57
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71

**Biditem**  
**30**

**Flow Meter Vaults**

Takeoff Qty: 1.000 LS  
Bid Qty: 1.000 LS

**Client #: 3**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	20,744.00	7,133.86	27,877.86	16,654.02	100,131.57	0.00	0.00	144,663.45
Total	20,744.00	7,133.86	27,877.86	16,654.02	100,131.57	0.00	0.00	144,663.45

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
264.0000	0.0038	264.0000	547.9676	78.5758	105.5980	0.0179

Activity: 03600.01 Valve/Vault Materials Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	99,886.88	0.00	0.00	99,886.88
Total	0.00	0.00	0.00	0.00	99,886.88	0.00	0.00	99,886.88

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2FLOWMETER	Flow Meter	1.00	2.00	EA	16,800.00	108.750	18,270.00	36,540.00
2MISCMTL	Misc Materials	1.00	1.00	LS	2,500.00	108.750	2,718.75	2,718.75
2PCVAULT	Precast Vault	1.00	2.00	EA	22,000.00	108.750	23,925.00	47,850.00
2PIPEMTL	Pipe Materials	1.00	1.00	LS	11,750.00	108.750	12,778.13	12,778.13

Activity: 03600.02 Valve Vault - Install Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	19,008.00	6,536.85	25,544.85	14,983.21	0.00	0.00	0.00	40,528.06
Total	19,008.00	6,536.85	25,544.85	14,983.21	0.00	0.00	0.00	40,528.06

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
40,528.0600	48.0000	0.0208	844.3346	6.0000	0.1667	6.0000	6,754.6767

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	0.0042	240.0000	106.4369	19,008.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE Small Pipe Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 5.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	48.00	HR	111.02	108.750	120.73	5,795.24
8276	EXCAVATOR SMALL	1.00	48.00	HR	130.15	108.750	141.54	6,793.73
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	2.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	48.00	MH	92.00	100.000	123.64	5,934.66
OPERATOR	Operator	2.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 32009.01 Raise & Collar Quantity: 2.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	868.00	298.51	1,166.51	835.41	122.35	0.00	0.00	2,124.26
Total	1,736.00	597.01	2,333.01	1,670.81	244.69	0.00	0.00	4,248.51

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,001.9100	4.0000	0.2500	500.4775	1.0000	2.0000	0.5000	4,248.5100
Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit			
24.0000	0.0833	12.0000	97.2088	868.0000			

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: RAISE Utility Raise/Collar Prod: HU 4 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	1.00	CY	225.00	108.750	244.69	244.69
8002	COMPRESSOR 175-195 CFM	1.00	8.00	HR	28.37	108.750	30.85	246.82
8016	BREAKER PAVEMENT AIR 90#	1.00	8.00	HR	18.00	108.750	19.58	156.60
8245	BACKHOE/LOADER 91-104HP 4WD	1.00	8.00	HR	99.81	108.750	108.54	868.35
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPERATOR	Operator	1.00	8.00	MH	87.00	100.000	116.92	935.35

**Biditem**  
**40**

**Aeration Basin w/ Integral Clarifier**

Takeoff Qty: 1.000 LS  
 Bid Qty: 1.000 LS

Client #: 4a

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	559,032.64	192,251.30	751,283.94	147,078.66	1,617,677.59	28,035.76	565,450.00	3,109,525.95
Total	559,032.64	192,251.30	751,283.94	147,078.66	1,617,677.59	28,035.76	565,450.00	3,109,525.95

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
6,552.0000	0.0002	6,552.0000	474.5919	85.3224	114.6648	0.0007

Activity: 02001.01 Blower Building Mods Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	29,600.00	10,179.44	39,779.44	3,990.40	3,208.13	543.75	0.00	47,521.72
Total	29,600.00	10,179.44	39,779.44	3,990.40	3,208.13	543.75	0.00	47,521.72

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
43,769.8400	80.0000	0.0125	547.1230	10.0000	0.1000	10.0000	4,752.1720

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
320.0000	0.0031	320.0000	124.3108	29,600.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: 4CARP 4 Man Carp Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	2.00	CY	225.00	108.750	244.69	489.38
2MISCMTL	Misc Materials	1.00	1.00	LS	2,500.00	108.750	2,718.75	2,718.75
3MISCMTL	Misc Materials	1.00	1.00	LS	500.00	108.750	543.75	543.75
8UTLPU	Utility Pickup	1.00	80.00	HR	49.88	100.000	49.88	3,990.40
CARP	Carpenter - Journeyman	2.00	160.00	MH	100.00	100.000	134.39	21,502.40
CARP4	Carpenter Foreman	1.00	80.00	MH	105.00	100.000	141.11	11,288.76
LABORER	Laborer	1.00	80.00	MH	65.00	100.000	87.35	6,988.28

Activity: 03300.01 Clarifier - Invert Concrete (Unreviewed) Quantity: 97.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	529.48	182.09	711.57	49.37	269.16	24.44	727.01	1,781.55
Total	51,360.00	17,662.70	69,022.70	4,788.48	26,108.16	2,370.75	70,520.00	172,810.09

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
760.9400	0.9897	1.0104	768.8665	12.0000	8.0833	0.1237	14,400.8408

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
576.0000	0.1684	5.9381	119.8311	529.4845

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL 6 Man Wall Crew Prod: S 12 Eff: 100.00 Crew Hrs: 96.00 Labor Pcs: 6.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	106.70	CY	225.00	108.750	244.69	26,108.16
3FORMMTL	Form Materials	1.00	436.00	SF	5.00	108.750	5.44	2,370.75
4CRANE	Crane - Subcontractor	1.00	0.50	MO	55,000.00	100.000	55,000.00	27,500.00
4PUMP	Concrete Pump	1.00	8.00	HR	285.00	100.000	285.00	2,280.00
4REBAR	Rebar - Sub	1.00	29,100.00	LB	1.40	100.000	1.40	40,740.00
8UTLPU	Utility Pickup	1.00	96.00	HR	49.88	100.000	49.88	4,788.48
CARP	Carpenter - Journeyman	3.00	288.00	MH	100.00	100.000	134.39	38,704.32
CARP4	Carpenter Foreman	1.00	96.00	MH	105.00	100.000	141.11	13,546.51
LABORER	Laborer	2.00	192.00	MH	65.00	100.000	87.35	16,771.87

Activity: 03300.02 Clarifier - Wall Concrete Quantity: 78.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	2,214.36	761.52	2,975.88	173.94	682.52	242.60	1,976.41	6,051.34
Total	172,720.00	59,398.40	232,118.40	13,567.36	53,236.39	18,922.50	154,160.00	472,004.65

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
3,149.8174	3.4872	0.2868	903.2565	34.0000	2.2941	0.4359	13,882.4897

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
1,904.0000	0.0410	24.4103	121.9109	2,214.3590

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL (Mod) 6 Man Wall Crew Prod: S 34 Eff: 100.00 Crew Hrs: 272.00 Labor Pcs: 7.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	85.80	CY	225.00	108.750	244.69	20,994.19
2FORMSAVER	Form Savers	1.00	436.00	EA	68.00	108.750	73.95	32,242.20
3FORMMTL	Form Materials	1.00	3,480.00	SF	5.00	108.750	5.44	18,922.50
4CRANE	Crane - Subcontractor	1.00	2.00	MO	55,000.00	100.000	55,000.00	110,000.00
4PUMP	Concrete Pump	1.00	40.00	HR	285.00	100.000	285.00	11,400.00
4REBAR	Rebar - Sub	1.00	23,400.00	LB	1.40	100.000	1.40	32,760.00
8UTLPU	Utility Pickup	1.00	272.00	HR	49.88	100.000	49.88	13,567.36
CARP	Carpenter - Journeyman	4.00	1,088.00	MH	100.00	100.000	134.39	146,216.32
CARP4	Carpenter Foreman	1.00	272.00	MH	105.00	100.000	141.11	38,381.78
LABORER	Laborer	2.00	544.00	MH	65.00	100.000	87.35	47,520.30

Activity: 03300.03 Clarifier - Launderer Invert Concrete Quantity: 11.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	3,112.73	1,070.47	4,183.19	290.21	269.16	103.81	3,023.64	7,870.01
Total	34,240.00	11,775.14	46,015.14	3,192.32	2,960.72	1,141.88	33,260.00	86,570.06

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
4,473.4055	5.8182	0.1719	768.8666	8.0000	1.3750	0.7273	10,821.2575

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
384.0000	0.0286	34.9091	119.8311	3,112.7273

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL 6 Man Wall Crew Prod: S 8 Eff: 100.00 Crew Hrs: 64.00 Labor Pcs: 6.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	12.10	CY	225.00	108.750	244.69	2,960.72
3FORMMTL	Form Materials	1.00	210.00	SF	5.00	108.750	5.44	1,141.88

4CRANE	Crane - Subcontractor	1.00	0.50	MO	55,000.00	100.000	55,000.00	27,500.00
4PUMP	Concrete Pump	1.00	4.00	HR	285.00	100.000	285.00	1,140.00
4REBAR	Rebar - Sub	1.00	3,300.00	LB	1.40	100.000	1.40	4,620.00
8UTLPU	Utility Pickup	1.00	64.00	HR	49.88	100.000	49.88	3,192.32
CARP	Carpenter - Journeyman	3.00	192.00	MH	100.00	100.000	134.39	25,802.88
CARP4	Carpenter Foreman	1.00	64.00	MH	105.00	100.000	141.11	9,031.01
LABORER	Laborer	2.00	128.00	MH	65.00	100.000	87.35	11,181.25

Activity: 03300.04 Clarifier - Launderer Wall Concrete Quantity: 11.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	2,723.64	936.66	3,660.29	253.93	269.16	187.84	3,023.64	7,394.86
Total	29,960.00	10,303.24	40,263.24	2,793.28	2,960.72	2,066.25	33,260.00	81,343.49

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
3,914.2291	5.0909	0.1964	768.8664	7.0000	1.5714	0.6364	11,620.4986

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
336.0000	0.0327	30.5455	119.8311	2,723.6364

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL 6 Man Wall Crew Prod: S 7 Eff: 100.00 Crew Hrs: 56.00 Labor Pcs: 6.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	12.10	CY	225.00	108.750	244.69	2,960.72
3FORMMTL	Form Materials	1.00	380.00	SF	5.00	108.750	5.44	2,066.25
4CRANE	Crane - Subcontractor	1.00	0.50	MO	55,000.00	100.000	55,000.00	27,500.00
4PUMP	Concrete Pump	1.00	4.00	HR	285.00	100.000	285.00	1,140.00
4REBAR	Rebar - Sub	1.00	3,300.00	LB	1.40	100.000	1.40	4,620.00
8UTLPU	Utility Pickup	1.00	56.00	HR	49.88	100.000	49.88	2,793.28
CARP	Carpenter - Journeyman	3.00	168.00	MH	100.00	100.000	134.39	22,577.52
CARP4	Carpenter Foreman	1.00	56.00	MH	105.00	100.000	141.11	7,902.13
LABORER	Laborer	2.00	112.00	MH	65.00	100.000	87.35	9,783.59

Activity: 03300.05 Clarifier Grout Quantity: 1736.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	16.95	5.83	22.78	1.38	1.73	0.47	2.63	28.99
Total	29,424.00	10,118.92	39,542.92	2,394.24	3,009.66	815.63	4,560.00	50,322.45

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
24.1574	0.0276	36.1667	873.6908	6.0000	289.3333	0.0035	8,387.0750

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
336.0000	5.1667	0.1935	117.6873	16.9493

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL (Mod) 6 Man Wall Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 7.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	12.30	CY	225.00	108.750	244.69	3,009.66
3FORMMTL	Form Materials	1.00	1.00	LS	750.00	108.750	815.63	815.63
4PUMP	Concrete Pump	1.00	16.00	HR	285.00	100.000	285.00	4,560.00
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
CARP	Carpenter - Journeyman	3.00	144.00	MH	100.00	100.000	134.39	19,352.16
CARP4	Carpenter Foreman	1.00	48.00	MH	105.00	100.000	141.11	6,773.26
LABORER	Laborer	2.00	96.00	MH	65.00	100.000	87.35	8,385.94
MASON	Cement Mason	1.00	48.00	MH	78.00	100.000	104.82	5,031.56

Activity: 05500.01 Install Misc Metals (Unreviewed) Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
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U. Cost	13,941.12	4,794.35	18,735.47	4,788.48	14,137.50	0.00	0.00	37,661.45
Total	13,941.12	4,794.35	18,735.47	4,788.48	14,137.50	0.00	0.00	37,661.45

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
23,523.9500	96.0000	0.0104	245.0411	12.0000	0.0833	12.0000	3,138.4542

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
192.0000	0.0052	192.0000	97.5806	13,941.1200

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 12 Eff: 100.00 Crew Hrs: 96.00 Labor Pcs: 2.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2HANDRAIL	Handrail	1.00	100.00	LF	80.00	108.750	87.00	8,700.00
2MISCMETAL	Misc Metal	1.00	1.00	LS	5,000.00	108.750	5,437.50	5,437.50
8UTLPU	Utility Pickup	1.00	96.00	HR	49.88	100.000	49.88	4,788.48
LABORER	Laborer	1.00	96.00	MH	65.00	100.000	87.35	8,385.94
MILLWR	Millwright	1.00	96.00	MH	80.22	100.000	107.81	10,349.53

Activity: 09900.01 Performance Coatings (Unreviewed) Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4COAT	High Performance Coating	1.00	584.00	SF	80.00	100.000	80.00	46,720.00

Activity: 10000.01 Signage (Unreviewed) Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4SIGN	Signage	1.00	1.00	LS	5,000.00	100.000	5,000.00	5,000.00

Activity: 32000.01 Clarifier Structure Exc (Unreviewed) Quantity: 1018.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	13.01	4.47	17.48	16.15	0.00	0.00	21.22	54.85
Total	13,240.00	4,553.23	17,793.23	16,441.55	0.00	0.00	21,600.00	55,834.78

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
33.6294	0.0393	25.4500	855.8695	5.0000	203.6000	0.0049	11,166.9560

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
160.0000	6.3625	0.1572	111.2077	13.0059

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 (Mod) 4 man Exc Crew Prod: S 5 Eff: 100.00 Crew Hrs: 40.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	160.00	HR	135.00	100.000	135.00	21,600.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	40.00	HR	111.02	108.750	120.73	4,829.37
8279	EXCAVATOR SMALL-MED	1.00	40.00	HR	221.08	108.750	240.42	9,616.98
8UTLPU	Utility Pickup	1.00	40.00	HR	49.88	100.000	49.88	1,995.20
LABORER	Laborer	1.00	40.00	MH	65.00	100.000	87.35	3,494.14
OPER4	Operator Foreman	1.00	40.00	MH	92.00	100.000	123.64	4,945.55
OPERATOR	Operator	2.00	80.00	MH	87.00	100.000	116.92	9,353.54

Activity: 32000.02 Clarifier Subgrade (Unreviewed) Quantity: 2628.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1.46	0.50	1.96	1.82	2.93	0.00	0.00	6.71
Total	3,824.00	1,315.08	5,139.08	4,781.13	7,706.68	0.00	0.00	17,626.89

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
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3.7748	0.0061	164.2500	620.0131	2.0000	1,314.0000	0.0008	8,813.4450
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Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
48.0000	54.7500	0.0183	107.0642	1.4551

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMGRD (Mod) Small Grading Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BASE	Base Rock	1.00	328.00	TON	18.00	108.750	19.58	6,420.60
2FABRIC	Filter Fabric	1.00	2,628.00	SF	0.45	108.750	0.49	1,286.08
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8272	LOADER LANDSCAPER 4WD	1.00	16.00	HR	41.69	108.750	45.34	725.46
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 32004.01 Structure Backfill (Unreviewed) Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	11,472.00	3,945.22	15,417.22	14,343.39	0.00	0.00	0.00	29,760.61
Total	11,472.00	3,945.22	15,417.22	14,343.39	0.00	0.00	0.00	29,760.61

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
29,760.6100	48.0000	0.0208	620.0127	6.0000	0.1667	6.0000	4,960.1017

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
144.0000	0.0069	144.0000	107.0640	11,472.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMGRD (Mod) Small Grading Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8040	SINGLE DRUM COMPACTOR	1.00	48.00	HR	60.85	108.750	66.17	3,176.37
8272	LOADER LANDSCAPER 4WD	1.00	48.00	HR	41.69	108.750	45.34	2,176.37
8326	4000 GAL WATER TRUCK	1.00	48.00	HR	126.37	108.750	137.43	6,596.41
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	1.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPERATOR	Operator	2.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 402319.01 Pipe & Fittings - Blower Piping/Air Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	17,058.96	5,866.57	22,925.53	3,591.36	496,117.50	0.00	0.00	522,634.39
Total	17,058.96	5,866.57	22,925.53	3,591.36	496,117.50	0.00	0.00	522,634.39

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
26,516.8900	72.0000	0.0139	368.2901	9.0000	0.1111	9.0000	58,070.4878

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
216.0000	0.0046	216.0000	106.1367	17,058.9600

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 9 Eff: 100.00 Crew Hrs: 72.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEACC	Pipe Accessories	1.00	1.00	LS	6,200.00	108.750	6,742.50	6,742.50
2PIPEMTL	Pipe Materials	1.00	1.00	LS	450,000.00	108.750	489,375.00	489,375.00
8UTLPU	Utility Pickup	1.00	72.00	HR	49.88	100.000	49.88	3,591.36
LABORER	Laborer	1.00	72.00	MH	65.00	100.000	87.35	6,289.45
MILLWR	Millwright	1.00	72.00	MH	80.22	100.000	107.81	7,762.15
PLUMB	Plumber - Journeyman	1.00	72.00	MH	91.71	100.000	123.25	8,873.93

Activity: 402319.02 Pipe & Fittings - Aeration Basin & Clarifier Quantity: 1.00 Unit: LS

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for crew cost breakdown.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for manhour and labor metrics.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECH5M (Mod) Small Mechanical Crew Prod: S 13 Eff: 100.00 Crew Hrs: 104.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Lists resources like 2PIPEACC, 2PIPEMTL, 8UTLPU, LABORER, MILLWR, PLUMB.

Activity: 46000.00 Aeration Equipment - Buy out Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Row for 2AERATION.

Activity: 46000.01 Install Aeration Equipment Quantity: 1.00 Unit: LS

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for crew cost breakdown.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for manhour and labor metrics.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD (Mod) Medium Mechanical Crew Prod: S 12 Eff: 100.00 Crew Hrs: 96.00 Labor Pcs: 5.00 Equipment Pcs: 2.00

Resource table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Lists resources like 4CRANE, 8MECHTRK, 8UTLPU, LABORER, MILLWR, PLUMB.

Activity: 46000.02 Install Blower Equipment Quantity: 1.00 Unit: LS

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for crew cost breakdown.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for manhour and labor metrics.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD Medium Mechanical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 4.00 Equipment Pcs: 2.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 4CRANE, 8MECHTRK, 8UTLPU, LABORER, MILLWR, PLUMB.

Activity: 46000.03 Install Clarifier (Unreviewed) Quantity: 1.00 Unit: EA

Summary table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for Total values.

Summary table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for Total values.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 4CRANE, 8UTLPU, LABORER, MECHHLP, MILLWR.

Activity: 46000.04 Install Clarifier Weir (Unreviewed) Quantity: 1.00 Unit: EA

Summary table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for Total values.

Summary table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for Total values.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2MISCMTL, 8UTLPU, CARP, LABORER, MILLWR.

Activity: 312000.02 Earth Moving - Cut Quantity: 3000.00 Unit: CY

Summary table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for Total values.

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
256.0000	11.7188	0.0853	111.2077	7.0613

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 4 man Exc Crew Prod: S 8 Eff: 100.00 Crew Hrs: 64.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	300.00	HR	135.00	100.000	135.00	40,500.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	64.00	HR	111.02	108.750	120.73	7,726.99
8279	EXCAVATOR SMALL-MED	1.00	64.00	HR	221.08	108.750	240.42	15,387.17
8UTLPU	Utility Pickup	1.00	64.00	HR	49.88	100.000	49.88	3,192.32
LABORER	Laborer	1.00	64.00	MH	65.00	100.000	87.35	5,590.62
OPER4	Operator Foreman	1.00	64.00	MH	92.00	100.000	123.64	7,912.88
OPERATOR	Operator	2.00	128.00	MH	87.00	100.000	116.92	14,965.67

Activity: 312000.03 Pond Grading Quantity: 16000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.33	0.11	0.44	0.45	0.00	0.00	0.00	0.90
Total	5,296.00	1,821.30	7,117.30	7,232.56	0.00	0.00	0.00	14,349.86

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
0.8969	0.0010	1,000.0000	896.8663	2.0000	8,000.0000	0.0001	7,174.9300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	250.0000	0.0040	111.2078	0.3310

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGGRD (Mod) Large Grading Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8239	MOTORGRADER/BLADE	1.00	16.00	HR	182.58	108.750	198.56	3,176.89
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 312000.04 Conc Pond Liner Quantity: 16000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.89	0.31	1.20	0.05	4.98	0.14	2.74	9.11
Total	14,288.00	4,913.64	19,201.64	798.08	79,670.25	2,175.00	43,870.00	145,714.97

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1.2500	0.0010	1,000.0000	1,249.9825	2.0000	8,000.0000	0.0001	72,857.4850

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
176.0000	90.9091	0.0110	109.1002	0.8930

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: POURF Pour Crew - Flatwork/Slab Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 11.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	325.60	CY	225.00	108.750	244.69	79,670.25
3FORMMTL	Form Materials	1.00	400.00	SF	5.00	108.750	5.44	2,175.00
4PUMP	Concrete Pump	1.00	10.00	HR	285.00	100.000	285.00	2,850.00
4REBAR	Rebar - Sub	1.00	29,300.00	LB	1.40	100.000	1.40	41,020.00
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
CARP	Carpenter - Journeyman	2.00	32.00	MH	100.00	100.000	134.39	4,300.48
CARP4	Carpenter Foreman	1.00	16.00	MH	105.00	100.000	141.11	2,257.75

LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
MASON	Cement Mason	4.00	64.00	MH	78.00	100.000	104.82	6,708.75
MASON4	Mason Foreman	1.00	16.00	MH	81.00	100.000	108.86	1,741.69

Activity: 312000.05 Drain Intake Structure Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	6,336.00	2,178.95	8,514.95	11,858.34	23,925.00	0.00	0.00	44,298.29
Total	6,336.00	2,178.95	8,514.95	11,858.34	23,925.00	0.00	0.00	44,298.29

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
20,373.2900	16.0000	0.0625	1,273.3306	2.0000	0.5000	2.0000	22,149.1450

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
80.0000	0.0125	80.0000	106.4369	6,336.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 5.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PRECASTINLE	Precast Inlet	1.00	1.00	EA	22,000.00	108.750	23,925.00	23,925.00
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	2.00	32.00	MH	65.00	100.000	87.35	2,795.31
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 323100.02 Pond Accessories Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,736.00	597.01	2,333.01	639.05	2,990.63	0.00	0.00	5,962.69
Total	1,736.00	597.01	2,333.01	639.05	2,990.63	0.00	0.00	5,962.69

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,972.0600	8.0000	0.1250	371.5075	1.0000	1.0000	1.0000	5,962.6900

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	97.2088	1,736.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MINIP Mini Pipe Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	2.00	CY	225.00	108.750	244.69	489.38
2RESQRING	Rescue Ring	1.00	4.00	EA	575.00	108.750	625.31	2,501.25
8243	BACKHOE/LOADER 60-90HP 4WD	1.00	8.00	HR	73.45	108.750	79.88	639.05
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPERATOR	Operator	1.00	8.00	MH	87.00	100.000	116.92	935.35

**Biditem**

**45**

**(Non Additive) Aeration Basin w/o Integral Clarifier**

Takeoff Qty: 1.000 LS

Bid Qty: 1.000 LS

Client #: 4b

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	172,203.92	59,220.91	231,424.83	100,009.52	1,503,699.85	3,099.38	128,720.00	1,966,953.58
Total	172,203.92	59,220.91	231,424.83	100,009.52	1,503,699.85	3,099.38	128,720.00	1,966,953.58

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
2,104.0000	0.0005	2,104.0000	934.8639	81.8460	109.9928	0.0021

**Activity: 02001.01 (Non Additive) Blower Building Mods (Unreviewed) Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	29,600.00	10,179.44	39,779.44	3,990.40	3,208.13	543.75	0.00	47,521.72
Total	29,600.00	10,179.44	39,779.44	3,990.40	3,208.13	543.75	0.00	47,521.72

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
43,769.8400	80.0000	0.0125	547.1230	10.0000	0.1000	10.0000	4,752.1720

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
320.0000	0.0031	320.0000	124.3108	29,600.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	2.00	CY	225.00	108.750	244.69	489.38
2MISCMTL	Misc Materials	1.00	1.00	LS	2,500.00	108.750	2,718.75	2,718.75
3MISCMTL	Misc Materials	1.00	1.00	LS	500.00	108.750	543.75	543.75
8UTLPU	Utility Pickup	1.00	80.00	HR	49.88	100.000	49.88	3,990.40
CARP	Carpenter - Journeyman	2.00	160.00	MH	100.00	100.000	134.39	21,502.40
CARP4	Carpenter Foreman	1.00	80.00	MH	105.00	100.000	141.11	11,288.76
LABORER	Laborer	1.00	80.00	MH	65.00	100.000	87.35	6,988.28

**Activity: 402319.01 (Non Additive) Pipe & Fittings - Blower Piping/Air (Unreviewed) Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	17,058.96	5,866.57	22,925.53	3,591.36	496,117.50	0.00	0.00	522,634.39
Total	17,058.96	5,866.57	22,925.53	3,591.36	496,117.50	0.00	0.00	522,634.39

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
26,516.8900	72.0000	0.0139	368.2901	9.0000	0.1111	9.0000	58,070.4878

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
216.0000	0.0046	216.0000	106.1367	17,058.9600

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 9 Eff: 100.00 Crew Hrs: 72.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEACC	Pipe Accessories	1.00	1.00	LS	6,200.00	108.750	6,742.50	6,742.50
2PIPEMTL	Pipe Materials	1.00	1.00	LS	450,000.00	108.750	489,375.00	489,375.00
8UTLPU	Utility Pickup	1.00	72.00	HR	49.88	100.000	49.88	3,591.36
LABORER	Laborer	1.00	72.00	MH	65.00	100.000	87.35	6,289.45
MILLWR	Millwright	1.00	72.00	MH	80.22	100.000	107.81	7,762.15
PLUMB	Plumber - Journeyman	1.00	72.00	MH	91.71	100.000	123.25	8,873.93

**Activity: 402319.02 (Non Additive) Pipe & Fittings - Aeration Basin & Clarifier (Unreviewed) Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	7,581.76	2,607.36	10,189.12	1,596.16	13,050.00	0.00	0.00	24,835.28
Total	7,581.76	2,607.36	10,189.12	1,596.16	13,050.00	0.00	0.00	24,835.28

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
11,785.2800	32.0000	0.0313	368.2900	4.0000	0.2500	4.0000	6,208.8200

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.0104	96.0000	106.1367	7,581.7600

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2PIPEACC, 2PIPEMTL, 8UTLPU, LABORER, MILLWR, PLUMB.

Activity: 46000.00 (Non Additive) Aeration Equipment - Buy out Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Row: 2AERATION Aeration Basin & Integral Clarifier.

Activity: 46000.01 (Non Additive) Install Aeration Equipment Quantity: 1.00 Unit: LS

Summary table with 9 columns: U. Cost, Total, Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift.

Summary table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD (Mod) Medium Mechanical Crew Prod: S 12 Eff: 100.00 Crew Hrs: 96.00 Labor Pcs: 5.00 Equipment Pcs: 2.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 4CRANE, 8MECHTRK, 8UTLPU, LABORER, MILLWR, PLUMB.

Activity: 46000.02 (Non Additive) Install Blower Equipment Quantity: 1.00 Unit: LS

Summary table with 9 columns: U. Cost, Total, Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift.

Summary table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD Medium Mechanical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 4.00 Equipment Pcs: 2.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 4CRANE, 8MECHTRK, 8UTLPU, LABORER, MILLWR, PLUMB.

**Activity: 312000.02 (Non Additive) Earth Moving - Fill Quantity: 3400.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	12.79	4.40	17.18	16.33	27.39	0.00	0.00	60.90
Total	43,472.00	14,950.02	58,422.02	55,505.49	93,130.78	0.00	0.00	207,058.29

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
33.5081	0.0306	32.6923	1,095.4568	13.0000	261.5385	0.0038	15,927.5608

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
520.0000	6.5385	0.1529	112.3500	12.7859

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGGRD (Mod) Large Grading Crew Prod: S 13 Eff: 100.00 Crew Hrs: 104.00 Labor Pcs: 5.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2FILL	Fill Dirt	1.00	5,525.00	TON	15.50	108.750	16.86	93,130.78
8040	SINGLE DRUM COMPACTOR	1.00	104.00	HR	60.85	108.750	66.17	6,882.14
8043	ROLLER LG DOUBLE DRUM	1.00	104.00	HR	75.10	108.750	81.67	8,493.81
8239	MOTORGRADER/BLADE	1.00	104.00	HR	182.58	108.750	198.56	20,649.80
8326	4000 GAL WATER TRUCK	1.00	104.00	HR	126.37	108.750	137.43	14,292.22
8UTLPU	Utility Pickup	1.00	104.00	HR	49.88	100.000	49.88	5,187.52
LABORER	Laborer	1.00	104.00	MH	65.00	100.000	87.35	9,084.76
OPER4	Operator Foreman	1.00	104.00	MH	92.00	100.000	123.64	12,858.44
OPERATOR	Operator	3.00	312.00	MH	87.00	100.000	116.92	36,478.82

**Activity: 312000.03 (Non Additive) Pond Grading Quantity: 18800.00 Unit: SF**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.28	0.10	0.38	0.38	0.00	0.00	0.00	0.76
Total	5,296.00	1,821.30	7,117.30	7,232.56	0.00	0.00	0.00	14,349.86

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
0.7633	0.0009	1,175.0000	896.8663	2.0000	9,400.0000	0.0001	7,174.9300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	293.7500	0.0034	111.2078	0.2817

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGGRD (Mod) Large Grading Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8239	MOTORGRADER/BLADE	1.00	16.00	HR	182.58	108.750	198.56	3,176.89
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

**Activity: 312000.04 (Non Additive) Conc Pond Liner Quantity: 18800.00 Unit: SF**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.76	0.26	1.02	0.04	4.98	0.14	2.75	8.94
Total	14,288.00	4,913.64	19,201.64	798.08	93,715.31	2,555.63	51,720.00	167,990.66

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1.0638	0.0009	1,175.0000	1,249.9825	2.0000	9,400.0000	0.0001	83,995.3300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
176.0000	106.8182	0.0094	109.1002	0.7600

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: POURF Pour Crew - Flatwork/Slab Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 11.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	383.00	CY	225.00	108.750	244.69	93,715.31
3FORMMTL	Form Materials	1.00	470.00	SF	5.00	108.750	5.44	2,555.63
4PUMP	Concrete Pump	1.00	12.00	HR	285.00	100.000	285.00	3,420.00
4REBAR	Rebar - Sub	1.00	34,500.00	LB	1.40	100.000	1.40	48,300.00
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
CARP	Carpenter - Journeyman	2.00	32.00	MH	100.00	100.000	134.39	4,300.48
CARP4	Carpenter Foreman	1.00	16.00	MH	105.00	100.000	141.11	2,257.75
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
MASON	Cement Mason	4.00	64.00	MH	78.00	100.000	104.82	6,708.75
MASON4	Mason Foreman	1.00	16.00	MH	81.00	100.000	108.86	1,741.69

Activity: 312000.05 (Non Additive) Drain Intake Structure Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	6,336.00	2,178.95	8,514.95	11,858.34	23,925.00	0.00	0.00	44,298.29
Total	6,336.00	2,178.95	8,514.95	11,858.34	23,925.00	0.00	0.00	44,298.29

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
20,373.2900	16.0000	0.0625	1,273.3306	2.0000	0.5000	2.0000	22,149.1450

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
80.0000	0.0125	80.0000	106.4369	6,336.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 5.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PRECASTINLE	Precast Inlet	1.00	1.00	EA	22,000.00	108.750	23,925.00	23,925.00
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	2.00	32.00	MH	65.00	100.000	87.35	2,795.31
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 323100.02 (Non Additive) Pond Accessories Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,736.00	597.01	2,333.01	639.05	2,990.63	0.00	0.00	5,962.69
Total	1,736.00	597.01	2,333.01	639.05	2,990.63	0.00	0.00	5,962.69

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,972.0600	8.0000	0.1250	371.5075	1.0000	1.0000	1.0000	5,962.6900

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	97.2088	1,736.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MINIP Mini Pipe Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	2.00	CY	225.00	108.750	244.69	489.38
2RESQRING	Rescue Ring	1.00	4.00	EA	575.00	108.750	625.31	2,501.25
8243	BACKHOE/LOADER 60-90HP 4WD	1.00	8.00	HR	73.45	108.750	79.88	639.05
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPERATOR	Operator	1.00	8.00	MH	87.00	100.000	116.92	935.35

**Biditem**

**(Non Additive) Independent Clarifier**

**55**

Takeoff Qty: 1.000 LS

Client #: 5b

Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	367,828.07	126,496.06	494,324.13	86,345.76	414,441.26	25,338.75	381,850.00	1,402,299.90
Total	367,828.07	126,496.06	494,324.13	86,345.76	414,441.26	25,338.75	381,850.00	1,402,299.90

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
4,287.0900	0.0002	4,287.0900	327.0983	85.7990	115.3053	0.0011

**Activity: 03300.01 (Non Additive) Clarifier - Invert Concrete Quantity: 93.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	460.22	158.27	618.48	42.91	268.37	14.73	516.34	1,460.84
Total	42,800.00	14,718.92	57,518.92	3,990.40	24,958.13	1,370.25	48,020.00	135,857.70

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
661.3905	0.8602	1.1625	768.8665	10.0000	9.3000	0.1075	13,585.7700

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
480.0000	0.1938	5.1613	119.8311	460.2151

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: 6WALL 6 Man Wall Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 6.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	102.00	CY	225.00	108.750	244.69	24,958.13
3FORMMTL	Form Materials	1.00	252.00	SF	5.00	108.750	5.44	1,370.25
4CRANE	Crane - Subcontractor	1.00	0.50	MO	55,000.00	100.000	55,000.00	27,500.00
4PUMP	Concrete Pump	1.00	16.00	HR	285.00	100.000	285.00	4,560.00
4REBAR	Rebar - Sub	1.00	11,400.00	LB	1.40	100.000	1.40	15,960.00
8UTLPU	Utility Pickup	1.00	80.00	HR	49.88	100.000	49.88	3,990.40
CARP	Carpenter - Journeyman	3.00	240.00	MH	100.00	100.000	134.39	32,253.60
CARP4	Carpenter Foreman	1.00	80.00	MH	105.00	100.000	141.11	11,288.76
LABORER	Laborer	2.00	160.00	MH	65.00	100.000	87.35	13,976.56

**Activity: 03300.02 (Non Additive) Clarifier - Wall Concrete Quantity: 62.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	1,474.84	507.20	1,982.04	115.85	610.23	286.61	1,557.90	4,552.63
Total	91,440.00	31,446.22	122,886.22	7,182.72	37,834.13	17,769.75	96,590.00	282,262.82

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,097.8861	2.3226	0.4306	903.2565	18.0000	3.4444	0.2903	15,681.2678

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
1,008.0000	0.0615	16.2581	121.9109	1,474.8387

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: 6WALL (Mod) 6 Man Wall Crew Prod: S 18 Eff: 100.00 Crew Hrs: 144.00 Labor Pcs: 7.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	70.00	CY	225.00	108.750	244.69	17,128.13
2FORMSAVER	Form Savers	1.00	280.00	EA	68.00	108.750	73.95	20,706.00
3FORMMTL	Form Materials	1.00	3,268.00	SF	5.00	108.750	5.44	17,769.75
4CRANE	Crane - Subcontractor	1.00	1.25	MO	55,000.00	100.000	55,000.00	68,750.00
4PUMP	Concrete Pump	1.00	24.00	HR	285.00	100.000	285.00	6,840.00
4REBAR	Rebar - Sub	1.00	15,000.00	LB	1.40	100.000	1.40	21,000.00
8UTLPU	Utility Pickup	1.00	144.00	HR	49.88	100.000	49.88	7,182.72
CARP	Carpenter - Journeyman	4.00	576.00	MH	100.00	100.000	134.39	77,408.64
CARP4	Carpenter Foreman	1.00	144.00	MH	105.00	100.000	141.11	20,319.77

LABORER	Laborer	2.00	288.00	MH	65.00	100.000	87.35	25,157.81
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**Activity: 03300.03 (Non Additive) Clarifier - Launderer Invert Concrete** **Quantity: 9.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	3,804.44	1,308.35	5,112.79	354.70	271.88	77.33	3,898.89	9,715.59
Total	34,240.00	11,775.14	46,015.14	3,192.32	2,446.88	696.00	35,090.00	87,440.34

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
5,467.4956	7.1111	0.1406	768.8666	8.0000	1.1250	0.8889	10,930.0425

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
384.0000	0.0234	42.6667	119.8311	3,804.4444

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL 6 Man Wall Crew Prod: S 8 Eff: 100.00 Crew Hrs: 64.00 Labor Pcs: 6.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	10.00	CY	225.00	108.750	244.69	2,446.88
3FORMMTL	Form Materials	1.00	128.00	SF	5.00	108.750	5.44	696.00
4CRANE	Crane - Subcontractor	1.00	0.50	MO	55,000.00	100.000	55,000.00	27,500.00
4PUMP	Concrete Pump	1.00	6.00	HR	285.00	100.000	285.00	1,710.00
4REBAR	Rebar - Sub	1.00	4,200.00	LB	1.40	100.000	1.40	5,880.00
8UTLPU	Utility Pickup	1.00	64.00	HR	49.88	100.000	49.88	3,192.32
CARP	Carpenter - Journeyman	3.00	192.00	MH	100.00	100.000	134.39	25,802.88
CARP4	Carpenter Foreman	1.00	64.00	MH	105.00	100.000	141.11	9,031.01
LABORER	Laborer	2.00	128.00	MH	65.00	100.000	87.35	11,181.25

**Activity: 03300.04 (Non Additive) Clarifier - Launderer Wall Concrete** **Quantity: 26.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	2,469.23	849.17	3,318.40	230.22	269.16	190.73	2,138.08	6,146.58
Total	64,200.00	22,078.38	86,278.38	5,985.60	6,998.06	4,959.00	55,590.00	159,811.04

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
3,548.6146	4.6154	0.2167	768.8665	15.0000	1.7333	0.5769	10,654.0693

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
720.0000	0.0361	27.6923	119.8311	2,469.2308

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL 6 Man Wall Crew Prod: S 15 Eff: 100.00 Crew Hrs: 120.00 Labor Pcs: 6.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	28.60	CY	225.00	108.750	244.69	6,998.06
3FORMMTL	Form Materials	1.00	912.00	SF	5.00	108.750	5.44	4,959.00
4CRANE	Crane - Subcontractor	1.00	0.75	MO	55,000.00	100.000	55,000.00	41,250.00
4PUMP	Concrete Pump	1.00	12.00	HR	285.00	100.000	285.00	3,420.00
4REBAR	Rebar - Sub	1.00	7,800.00	LB	1.40	100.000	1.40	10,920.00
8UTLPU	Utility Pickup	1.00	120.00	HR	49.88	100.000	49.88	5,985.60
CARP	Carpenter - Journeyman	3.00	360.00	MH	100.00	100.000	134.39	48,380.40
CARP4	Carpenter Foreman	1.00	120.00	MH	105.00	100.000	141.11	16,933.14
LABORER	Laborer	2.00	240.00	MH	65.00	100.000	87.35	20,964.84

**Activity: 03300.05 (Non Additive) Clarifier Grout** **Quantity: 1256.00 Unit: SF**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	23.43	8.06	31.48	1.91	1.73	0.43	3.63	39.19
Total	29,424.00	10,118.92	39,542.92	2,394.24	2,177.72	543.75	4,560.00	49,218.63

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
33.3895	0.0382	26.1667	873.6908	6.0000	209.3333	0.0048	8,203.1050

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
336.0000	3.7381	0.2675	117.6873	23.4268

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL (Mod) 6 Man Wall Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 7.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	8.90	CY	225.00	108.750	244.69	2,177.72
3FORMMTL	Form Materials	1.00	1.00	LS	500.00	108.750	543.75	543.75
4PUMP	Concrete Pump	1.00	16.00	HR	285.00	100.000	285.00	4,560.00
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
CARP	Carpenter - Journeyman	3.00	144.00	MH	100.00	100.000	134.39	19,352.16
CARP4	Carpenter Foreman	1.00	48.00	MH	105.00	100.000	141.11	6,773.26
LABORER	Laborer	2.00	96.00	MH	65.00	100.000	87.35	8,385.94
MASON	Cement Mason	1.00	48.00	MH	78.00	100.000	104.82	5,031.56

Activity: 05500.01 (Non Additive) Install Misc Metals Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	13,941.12	4,794.35	18,735.47	4,788.48	19,031.25	0.00	0.00	42,555.20
Total	13,941.12	4,794.35	18,735.47	4,788.48	19,031.25	0.00	0.00	42,555.20

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
23,523.9500	96.0000	0.0104	245.0411	12.0000	0.0833	12.0000	3,546.2667

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
192.0000	0.0052	192.0000	97.5806	13,941.1200

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 12 Eff: 100.00 Crew Hrs: 96.00 Labor Pcs: 2.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2HANDRAIL	Handrail	1.00	125.00	LF	80.00	108.750	87.00	10,875.00
2MISCMETAL	Misc Metal	1.00	1.00	LS	7,500.00	108.750	8,156.25	8,156.25
8UTLPU	Utility Pickup	1.00	96.00	HR	49.88	100.000	49.88	4,788.48
LABORER	Laborer	1.00	96.00	MH	65.00	100.000	87.35	8,385.94
MILLWR	Millwright	1.00	96.00	MH	80.22	100.000	107.81	10,349.53

Activity: 09900.01 (Non Additive) Performance Coatings Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4COAT	High Performance Coating	1.00	1,005.00	SF	80.00	100.000	80.00	80,400.00

Activity: 10000.01 (Non Additive) Signage Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4SIGN	Signage	1.00	1.00	LS	5,000.00	100.000	5,000.00	5,000.00

Activity: 32000.01 (Non Additive) Clarifier Structure Exc Quantity: 1018.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	13.01	4.47	17.48	16.15	0.00	0.00	21.22	54.85
Total	13,240.00	4,553.23	17,793.23	16,441.55	0.00	0.00	21,600.00	55,834.78

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
33.6294	0.0393	25.4500	855.8695	5.0000	203.6000	0.0049	11,166.9560

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
160.0000	6.3625	0.1572	111.2077	13.0059

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 (Mod) 4 man Exc Crew Prod: S 5 Eff: 100.00 Crew Hrs: 40.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	160.00	HR	135.00	100.000	135.00	21,600.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	40.00	HR	111.02	108.750	120.73	4,829.37
8279	EXCAVATOR SMALL-MED	1.00	40.00	HR	221.08	108.750	240.42	9,616.98
8UTLPU	Utility Pickup	1.00	40.00	HR	49.88	100.000	49.88	1,995.20
LABORER	Laborer	1.00	40.00	MH	65.00	100.000	87.35	3,494.14
OPER4	Operator Foreman	1.00	40.00	MH	92.00	100.000	123.64	4,945.55
OPERATOR	Operator	2.00	80.00	MH	87.00	100.000	116.92	9,353.54

Activity: 32000.02 (Non Additive) Clarifier Subgrade Quantity: 1962.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1.91	0.66	2.57	2.39	2.93	0.00	0.00	7.89
Total	3,751.43	1,290.11	5,041.54	4,691.50	5,756.03	0.00	0.00	15,489.07

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
4.9608	0.0080	125.0000	620.0968	1.9620	1,000.0000	0.0010	7,894.5311

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
47.0900	41.6649	0.0240	107.0618	1.9120

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMGRD (Mod) Small Grading Crew Prod: S 1.962 Eff: 100.00 Crew Hrs: 15.70 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BASE	Base Rock	1.00	245.00	TON	18.00	108.750	19.58	4,795.88
2FABRIC	Filter Fabric	1.00	1,962.00	SF	0.45	108.750	0.49	960.15
8040	SINGLE DRUM COMPACTOR	1.00	15.70	HR	60.85	108.750	66.17	1,038.94
8272	LOADER LANDSCAPER 4WD	1.00	15.70	HR	41.69	108.750	45.34	711.86
8326	4000 GAL WATER TRUCK	1.00	15.70	HR	126.37	108.750	137.43	2,157.58
8UTLPU	Utility Pickup	1.00	15.70	HR	49.88	100.000	49.88	783.12
LABORER	Laborer	1.00	15.70	MH	65.00	100.000	87.35	1,371.45
OPERATOR	Operator	2.00	31.39	MH	87.00	100.000	116.92	3,670.09

Activity: 32000.03 (Non Additive) Underslab Piping Quantity: 28.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	226.29	77.82	304.11	178.37	169.92	0.00	0.00	652.40
Total	6,336.00	2,178.95	8,514.95	4,994.41	4,757.81	0.00	0.00	18,267.17

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
482.4771	0.5714	1.7500	844.3350	2.0000	14.0000	0.0714	9,133.5850

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
80.0000	0.3500	2.8571	106.4369	226.2857

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPE Small Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 5.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	7.00	CY	225.00	108.750	244.69	1,712.81
2PIPEMTL	Pipe Materials	1.00	28.00	LF	100.00	108.750	108.75	3,045.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	16.00	HR	111.02	108.750	120.73	1,931.75
8276	EXCAVATOR SMALL	1.00	16.00	HR	130.15	108.750	141.54	2,264.58
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	2.00	32.00	MH	65.00	100.000	87.35	2,795.31
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 32004.01 (Non Additive) Structure Backfill Quantity: 1.00 Unit: LS

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Mats, Const Mats, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values for 49,601.0300 crew cost.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row includes values for 240.0000 manhours.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMGRD (Mod) Small Grading Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Lists items like SINGLE DRUM COMPACTOR and LOADER LANDSCAPER 4WD.

Activity: 32011.01 (Non Additive) Dewatering Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Notes: None Anticipated

Activity: 46000.01 (Non Additive) Install Clarifier Quantity: 1.00 Unit: EA

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Mats, Const Mats, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values for 50,797.2800 crew cost.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row includes values for 448.0000 manhours.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 14 Eff: 100.00 Crew Hrs: 112.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Lists items like 2CLARIFIER Round Tank Clarifier and 4CRANE Crane - Subcontractor.

Activity: 46000.02 (Non Additive) Install Clarifier Weir Quantity: 1.00 Unit: EA

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Mats, Const Mats, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values for 24,283.5900 crew cost.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row includes values for 192.0000 manhours.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 8 Eff: 100.00 Crew Hrs: 64.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2MISCMTL, 8UTLPU, CARP, LABORER, MILLWR.

Biditem

Baseline Inegral Clarifier Yard Piping

60

Takeoff Qty: 1.000 LS Bid Qty: 1.000 LS

Client #: 6a

Summary table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Summary table with 9 columns: Manhours, Unit/MH, MH/Unit, \$/MH, Base Labor/MH, Total Labor/MH, Unit/CH. Row for Manhours.

Activity: 339901.01 12" SS Quantity: 156.00 Unit: LF

Summary table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for Crew \$/Unit.

Summary table with 5 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for Manhours.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2PIPEMTL, 8040, 8268, 8283, 8326, 8UTLPU, LABORER, OPER4, OPERATOR.

Activity: 339901.02 8" RAS Quantity: 296.00 Unit: LF

Summary table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for Crew \$/Unit.

Summary table with 5 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for Manhours.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total.

2PIPEMTL	Pipe Materials	1.00	296.00	LF	105.00	108.750	114.19	33,799.50
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	3.00	48.00	MH	87.00	100.000	116.92	5,612.13

Activity: 339901.03 6" WAS Quantity: 428.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	40.97	14.09	55.06	55.41	100.05	0.00	0.00	210.53
Total	17,536.00	6,030.63	23,566.63	23,716.68	42,821.40	0.00	0.00	90,104.71

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
110.4750	0.0748	13.3750	1,477.6034	4.0000	107.0000	0.0093	22,526.1775

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
224.0000	1.9107	0.5234	105.2082	40.9720

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	428.00	LF	92.00	108.750	100.05	42,821.40
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	32.00	HR	153.44	108.750	166.87	5,339.68
8283	EXCAVATOR LARGE	1.00	32.00	HR	294.99	108.750	320.80	10,265.65
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	3.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	3.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 339901.04 6" SFM Quantity: 675.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	25.98	8.93	34.91	35.14	97.88	0.00	0.00	167.92
Total	17,536.00	6,030.63	23,566.63	23,716.68	66,065.63	0.00	0.00	113,348.94

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
70.0493	0.0474	21.0938	1,477.6034	4.0000	168.7500	0.0059	28,337.2350

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
224.0000	3.0134	0.3319	105.2082	25.9793

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	675.00	LF	90.00	108.750	97.88	66,065.63
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	32.00	HR	153.44	108.750	166.87	5,339.68
8283	EXCAVATOR LARGE	1.00	32.00	HR	294.99	108.750	320.80	10,265.65
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	3.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44

OPERATOR	Operator	3.00	96.00	MH	87.00	100.000	116.92	11,224.25
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Activity: 339901.05	12" SE	Quantity: 361.00					Unit: LF
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	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	28.03	9.64	37.67	37.92	135.94	0.00	0.00	211.53
Total	10,120.04	3,480.28	13,600.32	13,688.96	49,073.44	0.00	0.00	76,362.72

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
75.5936	0.0512	19.5500	1,477.8522	2.3082	156.3998	0.0064	33,083.4129

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
129.2700	2.7926	0.3581	105.2086	28.0334

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2.3082 Eff: 100.00 Crew Hrs: 18.47 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	361.00	LF	125.00	108.750	135.94	49,073.44
8040	SINGLE DRUM COMPACTOR	1.00	18.47	HR	60.85	108.750	66.17	1,222.24
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	18.47	HR	153.44	108.750	166.86	3,081.99
8283	EXCAVATOR LARGE	1.00	18.47	HR	294.99	108.750	320.80	5,925.21
8326	4000 GAL WATER TRUCK	1.00	18.47	HR	126.37	108.750	137.43	2,538.24
8UTLPU	Utility Pickup	1.00	18.47	HR	49.88	100.000	49.88	921.28
LABORER	Laborer	3.00	55.40	MH	65.00	100.000	87.35	4,839.38
OPER4	Operator Foreman	1.00	18.47	MH	92.00	100.000	123.64	2,283.61
OPERATOR	Operator	3.00	55.40	MH	87.00	100.000	116.92	6,477.33

Activity: 339901.06	Tie Ins	Quantity: 2.00					Unit: EA
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	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	8,768.00	3,015.32	11,783.32	11,858.34	3,806.25	0.00	0.00	27,447.91
Total	17,536.00	6,030.63	23,566.63	23,716.68	7,612.50	0.00	0.00	54,895.81

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
23,641.6550	16.0000	0.0625	1,477.6034	4.0000	0.5000	2.0000	13,723.9525

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
224.0000	0.0089	112.0000	105.2082	8,768.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	2.00	EA	3,500.00	108.750	3,806.25	7,612.50
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	32.00	HR	153.44	108.750	166.87	5,339.68
8283	EXCAVATOR LARGE	1.00	32.00	HR	294.99	108.750	320.80	10,265.65
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	3.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	3.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 339901.09	Blower Air	Quantity: 100.00					Unit: LF
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	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	87.68	30.15	117.83	118.58	163.13	0.00	0.00	399.54
Total	8,768.00	3,015.32	11,783.32	11,858.34	16,312.50	0.00	0.00	39,954.16

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
236.4166	0.1600	6.2500	1,477.6038	2.0000	50.0000	0.0200	19,977.0800

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
112.0000	0.8929	1.1200	105.2082	87.6800

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	100.00	LF	150.00	108.750	163.13	16,312.50
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	3.00	48.00	MH	87.00	100.000	116.92	5,612.13

Activity: 339901.99 Bypass Allowance Quantity: 2.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	9,504.00	3,268.43	12,772.43	10,496.53	0.00	2,175.00	0.00	25,443.95
Total	19,008.00	6,536.85	25,544.85	20,993.05	0.00	4,350.00	0.00	50,887.90

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
23,268.9500	24.0000	0.0417	969.5396	6.0000	0.3333	3.0000	8,481.3167

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	0.0083	120.0000	106.4369	9,504.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE (Mod) Small Pipe Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 5.00 Equipment Pcs: 6.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3PIPEMTL	Temp Pipe Materials	1.00	200.00	LF	20.00	108.750	21.75	4,350.00
8092	GENERATOR 50-59 KVA	1.00	48.00	HR	52.03	108.750	56.58	2,716.02
8165	PUMP 6" SELF PRIME - ELECTRI	2.00	96.00	HR	31.55	108.750	34.31	3,293.82
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	48.00	HR	111.02	108.750	120.73	5,795.24
8276	EXCAVATOR SMALL	1.00	48.00	HR	130.15	108.750	141.54	6,793.73
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	2.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	48.00	MH	92.00	100.000	123.64	5,934.66
OPERATOR	Operator	2.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 320001.01 AC Patch Paving Quantity: 10000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	1.84	0.63	2.48	1.20	2.92	0.00	0.70	7.30
Total	18,440.00	6,341.51	24,781.51	12,030.70	29,174.91	0.00	7,020.00	73,007.12

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
3.6812	0.0040	250.0000	920.3053	5.0000	2,000.0000	0.0005	14,601.4240

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	41.6667	0.0240	103.2563	1.8440

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: PAVE (Mod) Asphalt Paving Prod: S 5 Eff: 100.00 Crew Hrs: 40.00 Labor Pcs: 6.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ACPAVEMENT	Asphalt	1.00	255.50	TON	105.00	108.750	114.19	29,174.91
4HAUL	Hauling - Sub	1.00	52.00	HR	135.00	100.000	135.00	7,020.00

8042	ROLLER MD DOUBLE DRUM	1.00	40.00	HR	62.64	108.750	68.12	2,724.84
8272	LOADER LANDSCAPER 4WD	1.00	40.00	HR	41.69	108.750	45.34	1,813.65
8326	4000 GAL WATER TRUCK	1.00	40.00	HR	126.37	108.750	137.43	5,497.01
8UTLPU	Utility Pickup	1.00	40.00	HR	49.88	100.000	49.88	1,995.20
LABORER	Laborer	3.00	120.00	MH	65.00	100.000	87.35	10,482.42
OPER4	Operator Foreman	1.00	40.00	MH	92.00	100.000	123.64	4,945.55
OPERATOR	Operator	2.00	80.00	MH	87.00	100.000	116.92	9,353.54

**Biditem**  
**65**

**(Non Additive) Independent Clarifier Yard Piping**

Takeoff Qty: 1.000 LS

Client #: 6b

Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	129,512.00	44,539.18	174,051.18	157,536.32	266,447.84	4,350.00	7,020.00	609,405.34
Total	129,512.00	44,539.18	174,051.18	157,536.32	266,447.84	4,350.00	7,020.00	609,405.34

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
1,656.0000	0.0006	1,656.0000	367.9984	78.2077	105.1034	0.0039

Activity: 339901.01 (Non Additive) 12" SS (Unreviewed) Quantity: 156.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	56.21	19.33	75.53	76.02	135.94	0.00	0.00	287.49
Total	8,768.00	3,015.32	11,783.32	11,858.34	21,206.25	0.00	0.00	44,847.91

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
151.5491	0.1026	9.7500	1,477.6038	2.0000	78.0000	0.0128	22,423.9550

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
112.0000	1.3929	0.7179	105.2082	56.2051

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	156.00	LF	125.00	108.750	135.94	21,206.25
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	3.00	48.00	MH	87.00	100.000	116.92	5,612.13

Activity: 339901.02 (Non Additive) 8" RAS Quantity: 300.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	29.23	10.05	39.28	39.53	114.19	0.00	0.00	192.99
Total	8,768.00	3,015.32	11,783.32	11,858.34	34,256.25	0.00	0.00	57,897.91

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
78.8055	0.0533	18.7500	1,477.6038	2.0000	150.0000	0.0067	28,948.9550

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
112.0000	2.6786	0.3733	105.2082	29.2267

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
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2PIPEMTL	Pipe Materials	1.00	300.00	LF	105.00	108.750	114.19	34,256.25
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	3.00	48.00	MH	87.00	100.000	116.92	5,612.13

Activity: 339901.03 (Non Additive) 6" WAS Quantity: 396.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	44.28	15.23	59.51	59.89	100.05	0.00	0.00	219.45
Total	17,536.00	6,030.63	23,566.63	23,716.68	39,619.80	0.00	0.00	86,903.11

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
119.4023	0.0808	12.3750	1,477.6034	4.0000	99.0000	0.0101	21,725.7775

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
224.0000	1.7679	0.5657	105.2082	44.2828

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	396.00	LF	92.00	108.750	100.05	39,619.80
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	32.00	HR	153.44	108.750	166.87	5,339.68
8283	EXCAVATOR LARGE	1.00	32.00	HR	294.99	108.750	320.80	10,265.65
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	3.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	3.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 339901.04 (Non Additive) 6" SFM (Unreviewed) Quantity: 675.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	25.98	8.93	34.91	35.14	97.88	0.00	0.00	167.92
Total	17,536.00	6,030.63	23,566.63	23,716.68	66,065.63	0.00	0.00	113,348.94

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
70.0493	0.0474	21.0938	1,477.6034	4.0000	168.7500	0.0059	28,337.2350

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
224.0000	3.0134	0.3319	105.2082	25.9793

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	675.00	LF	90.00	108.750	97.88	66,065.63
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	32.00	HR	153.44	108.750	166.87	5,339.68
8283	EXCAVATOR LARGE	1.00	32.00	HR	294.99	108.750	320.80	10,265.65
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	3.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44

OPERATOR	Operator	3.00	96.00	MH	87.00	100.000	116.92	11,224.25
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Activity: 339901.05 (Non Additive) 12" ML Quantity: 88.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	49.82	17.13	66.95	67.38	135.94	0.00	0.00	270.27
Total	4,384.00	1,507.65	5,891.65	5,929.17	11,962.50	0.00	0.00	23,783.32

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
134.3275	0.0909	11.0000	1,477.6025	1.0000	88.0000	0.0114	23,783.3200

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
56.0000	1.5714	0.6364	105.2080	49.8182

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	88.00	LF	125.00	108.750	135.94	11,962.50
8040	SINGLE DRUM COMPACTOR	1.00	8.00	HR	60.85	108.750	66.18	529.40
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	8.00	HR	153.44	108.750	166.87	1,334.92
8283	EXCAVATOR LARGE	1.00	8.00	HR	294.99	108.750	320.80	2,566.41
8326	4000 GAL WATER TRUCK	1.00	8.00	HR	126.37	108.750	137.43	1,099.40
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	3.00	24.00	MH	65.00	100.000	87.35	2,096.48
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	3.00	24.00	MH	87.00	100.000	116.92	2,806.06

Activity: 339901.06 (Non Additive) Tie Ins Quantity: 2.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	8,768.00	3,015.32	11,783.32	11,858.34	3,806.25	0.00	0.00	27,447.91
Total	17,536.00	6,030.63	23,566.63	23,716.68	7,612.50	0.00	0.00	54,895.81

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
23,641.6550	16.0000	0.0625	1,477.6034	4.0000	0.5000	2.0000	13,723.9525

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
224.0000	0.0089	112.0000	105.2082	8,768.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	2.00	EA	3,500.00	108.750	3,806.25	7,612.50
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	32.00	HR	153.44	108.750	166.87	5,339.68
8283	EXCAVATOR LARGE	1.00	32.00	HR	294.99	108.750	320.80	10,265.65
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	3.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	3.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 339901.07 (Non Additive) 12" SE Quantity: 296.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	29.62	10.19	39.81	40.06	135.94	0.00	0.00	215.81
Total	8,768.00	3,015.32	11,783.32	11,858.34	40,237.50	0.00	0.00	63,879.16

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
79.8705	0.0541	18.5000	1,477.6038	2.0000	148.0000	0.0068	31,939.5800

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
112.0000	2.6429	0.3784	105.2082	29.6216

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	296.00	LF	125.00	108.750	135.94	40,237.50
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	3.00	48.00	MH	87.00	100.000	116.92	5,612.13

Activity: 339901.09 (Non Additive) Blower Air Quantity: 100.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	87.68	30.15	117.83	118.58	163.13	0.00	0.00	399.54
Total	8,768.00	3,015.32	11,783.32	11,858.34	16,312.50	0.00	0.00	39,954.16

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
236.4166	0.1600	6.2500	1,477.6038	2.0000	50.0000	0.0200	19,977.0800

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
112.0000	0.8929	1.1200	105.2082	87.6800

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 7.00 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	100.00	LF	150.00	108.750	163.13	16,312.50
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	3.00	48.00	MH	87.00	100.000	116.92	5,612.13

Activity: 339901.99 (Non Additive) Bypass Allowance Quantity: 2.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	9,504.00	3,268.43	12,772.43	10,496.53	0.00	2,175.00	0.00	25,443.95
Total	19,008.00	6,536.85	25,544.85	20,993.05	0.00	4,350.00	0.00	50,887.90

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
23,268.9500	24.0000	0.0417	969.5396	6.0000	0.3333	3.0000	8,481.3167

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	0.0083	120.0000	106.4369	9,504.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE (Mod) Small Pipe Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 5.00 Equipment Pcs: 6.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3PIPEMTL	Temp Pipe Materials	1.00	200.00	LF	20.00	108.750	21.75	4,350.00
8092	GENERATOR 50-59 KVA	1.00	48.00	HR	52.03	108.750	56.58	2,716.02

8165	PUMP 6" SELF PRIME - ELECTRI	2.00	96.00	HR	31.55	108.750	34.31	3,293.82
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	48.00	HR	111.02	108.750	120.73	5,795.24
8276	EXCAVATOR SMALL	1.00	48.00	HR	130.15	108.750	141.54	6,793.73
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	2.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	48.00	MH	92.00	100.000	123.64	5,934.66
OPERATOR	Operator	2.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 320001.01 (Non Additive) AC Patch Paving Quantity: 10000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	1.84	0.63	2.48	1.20	2.92	0.00	0.70	7.30
Total	18,440.00	6,341.51	24,781.51	12,030.70	29,174.91	0.00	7,020.00	73,007.12

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
3.6812	0.0040	250.0000	920.3053	5.0000	2,000.0000	0.0005	14,601.4240

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	41.6667	0.0240	103.2563	1.8440

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: PAVE (Mod) Asphalt Paving Prod: S 5 Eff: 100.00 Crew Hrs: 40.00 Labor Pcs: 6.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ACPAVEMENT	Asphalt	1.00	255.50	TON	105.00	108.750	114.19	29,174.91
4HAUL	Hauling - Sub	1.00	52.00	HR	135.00	100.000	135.00	7,020.00
8042	ROLLER MD DOUBLE DRUM	1.00	40.00	HR	62.64	108.750	68.12	2,724.84
8272	LOADER LANDSCAPER 4WD	1.00	40.00	HR	41.69	108.750	45.34	1,813.65
8326	4000 GAL WATER TRUCK	1.00	40.00	HR	126.37	108.750	137.43	5,497.01
8UTLPU	Utility Pickup	1.00	40.00	HR	49.88	100.000	49.88	1,995.20
LABORER	Laborer	3.00	120.00	MH	65.00	100.000	87.35	10,482.42
OPER4	Operator Foreman	1.00	40.00	MH	92.00	100.000	123.64	4,945.55
OPERATOR	Operator	2.00	80.00	MH	87.00	100.000	116.92	9,353.54

Biditem

Electrical Building

70

Takeoff Qty: 1.000 LS

Client #: 7

Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	83,977.52	28,879.87	112,857.39	14,587.07	58,424.32	2,234.81	113,055.00	301,158.59
Total	83,977.52	28,879.87	112,857.39	14,587.07	58,424.32	2,234.81	113,055.00	301,158.59

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
976.0000	0.0010	976.0000	308.5641	86.0425	115.6326	0.0042

Activity: 031100.01 Concrete Footings Quantity: 14.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	1,480.00	508.97	1,988.97	199.52	269.16	144.09	420.00	3,021.74
Total	20,720.00	7,125.61	27,845.61	2,793.28	3,768.19	2,017.31	5,880.00	42,304.39

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,188.4921	4.0000	0.2500	547.1230	7.0000	2.0000	0.5000	6,043.4843

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
224.0000	0.0625	16.0000	124.3108	1,480.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 7 Eff: 100.00 Crew Hrs: 56.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
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2CONC	Ready-Mix Concrete	1.10	15.40	CY	225.00	108.750	244.69	3,768.19
3FORMMTL	Form Materials	1.00	371.00	SF	5.00	108.750	5.44	2,017.31
4REBAR	Rebar - Sub	1.00	4,200.00	LB	1.40	100.000	1.40	5,880.00
8UTLPU	Utility Pickup	1.00	56.00	HR	49.88	100.000	49.88	2,793.28
CARP	Carpenter - Journeyman	2.00	112.00	MH	100.00	100.000	134.39	15,051.68
CARP4	Carpenter Foreman	1.00	56.00	MH	105.00	100.000	141.11	7,902.13
LABORER	Laborer	1.00	56.00	MH	65.00	100.000	87.35	4,891.80

**Activity: 031100.02 Concrete Slab Quantity: 16.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	893.00	307.10	1,200.10	49.88	269.16	0.00	529.00	2,048.14
Total	14,288.00	4,913.64	19,201.64	798.08	4,306.50	0.00	8,464.00	32,770.22

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,249.9825	1.0000	1.0000	1,249.9825	2.0000	8.0000	0.1250	16,385.1100

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
176.0000	0.0909	11.0000	109.1002	893.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: POURF Pour Crew - Flatwork/Slab Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 11.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	17.60	CY	225.00	108.750	244.69	4,306.50
4PUMPCY	Concrete Pump - CY	1.00	16.00	CY	3.00	100.000	3.00	48.00
4PUMPHR	Concrete Pump - Hrly	1.00	6.40	HR	265.00	100.000	265.00	1,696.00
4REBAR	Rebar - Sub	1.00	4,800.00	LB	1.40	100.000	1.40	6,720.00
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
CARP	Carpenter - Journeyman	2.00	32.00	MH	100.00	100.000	134.39	4,300.48
CARP4	Carpenter Foreman	1.00	16.00	MH	105.00	100.000	141.11	2,257.75
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
MASON	Cement Mason	4.00	64.00	MH	78.00	100.000	104.82	6,708.75
MASON4	Mason Foreman	1.00	16.00	MH	81.00	100.000	108.86	1,741.69

**Activity: 042200.01 CMU Masonry Quantity: 1.00 Unit: LS**

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4MASON	Masonry - Sub	1.00	1,100.00	SF	42.00	100.000	42.00	46,200.00

**Activity: 042200.02 CMU Masonry Support Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	5,920.00	2,035.89	7,955.89	798.08	0.00	217.50	0.00	8,971.47
Total	5,920.00	2,035.89	7,955.89	798.08	0.00	217.50	0.00	8,971.47

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
8,753.9700	16.0000	0.0625	547.1231	2.0000	0.5000	2.0000	4,485.7350

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	0.0156	64.0000	124.3108	5,920.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3TEMPLATE	Template Materials	1.00	1.00	LS	200.00	108.750	217.50	217.50
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
CARP	Carpenter - Journeyman	2.00	32.00	MH	100.00	100.000	134.39	4,300.48
CARP4	Carpenter Foreman	1.00	16.00	MH	105.00	100.000	141.11	2,257.75
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66

Activity: 054000.01 Framing Quantity: 1.00 Unit: LS

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values like 13,130.9500, 24.0000, 0.0417, 547.1229, 3.0000, 0.3333, 3.0000, 9,832.6100.

Table with 5 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row includes values like 96.0000, 0.0104, 96.0000, 124.3107, 8,880.0000.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 3 Eff: 100.00 Crew Hrs: 24.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2FRAMING, 2TRUSS, 8UTLPU, CARP, CARP4, LABORER.

Activity: 075419.01 Roofing Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Row includes 4MTLSHINGROO Metal Shingle Roofing.

Activity: 076200.01 Sheet Metal Flashing Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Row includes 4ROOFFLASH Roof Flashing.

Activity: 076200.02 Nailer (Unreviewed) Quantity: 1.00 Unit: LS

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values like 6,450.7200, 24.0000, 0.0417, 268.7800, 3.0000, 0.3333, 3.0000, 2,150.2400.

Table with 5 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row includes values like 48.0000, 0.0208, 48.0000, 134.3900, 4,800.0000.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: TEMP (Mod) Template Prod: S 3 Eff: 100.00 Crew Hrs: 24.00 Labor Pcs: 2.00 Equipment Pcs: 0.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2NAILER, CARP.

Activity: 081113.01 Hollow Metal Doors Quantity: 2.00 Unit: EA

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values like 3,282.7350, 6.0000, 0.1667, 547.1225, 1.5000, 1.3333, 0.7500, 11,518.2333.

Table with 5 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit.

48.0000	0.0417	24.0000	124.3106	2,220.0000
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Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: HU 6 Eff: 100.00 Crew Hrs: 12.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2DRHDWRSNGL	Single Door Hardware	1.00	2.00	EA	1,200.00	108.750	1,305.00	2,610.00
2HMDOOR	Hollow Metal Door	1.00	1.00	EA	3,240.00	108.750	3,523.50	3,523.50
2HMDOORDBL	Double Hollow Metal Door	1.00	1.00	EA	4,210.00	108.750	4,578.38	4,578.38
8UTLPU	Utility Pickup	1.00	12.00	HR	49.88	100.000	49.88	598.56
CARP	Carpenter - Journeyman	2.00	24.00	MH	100.00	100.000	134.39	3,225.36
CARP4	Carpenter Foreman	1.00	12.00	MH	105.00	100.000	141.11	1,693.31
LABORER	Laborer	1.00	12.00	MH	65.00	100.000	87.35	1,048.24

Activity: 092900.01 Drywall Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	6,334.08	2,178.29	8,512.37	798.08	1,239.75	0.00	0.00	10,550.20
Total	6,334.08	2,178.29	8,512.37	798.08	1,239.75	0.00	0.00	10,550.20

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
9,310.4500	16.0000	0.0625	581.9031	2.0000	0.5000	2.0000	5,275.1000

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	0.0156	64.0000	133.0058	6,334.0800

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP (Mod) 4 Man Carp Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2DRYWALLMTL	Drywall Materials	1.00	570.00	SF	2.00	108.750	2.18	1,239.75
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
CARP	Carpenter - Journeyman	1.00	16.00	MH	100.00	100.000	134.39	2,150.24
CARP4	Carpenter Foreman	1.00	16.00	MH	105.00	100.000	141.11	2,257.75
DRYWALL	Drywall Taper/Texture	2.00	32.00	MH	95.44	100.000	128.26	4,104.38

Activity: 099000.01 Painting/Coatings Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	0.00	0.00	7,920.00	7,920.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	7,920.00	7,920.00

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4EXTPAINT	Exterior Paint - Sub	1.00	1.00	EA	2,500.00	100.000	2,500.00	2,500.00
4FLOORSEAL	Floor Sealer	1.00	570.00	SF	6.00	100.000	6.00	3,420.00
4INTPAINT	Interior Paint	1.00	1.00	EA	2,000.00	100.000	2,000.00	2,000.00

Activity: 101410.01 Signage Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	532.00	182.95	714.95	199.52	489.38	0.00	0.00	1,403.85
Total	532.00	182.95	714.95	199.52	489.38	0.00	0.00	1,403.85

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
914.4700	4.0000	0.2500	228.6175	0.5000	2.0000	0.5000	2,807.7000

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
8.0000	0.1250	8.0000	89.3688	532.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LAB4 (Mod) 4 Man Labor Crew Prod: S 0.5 Eff: 100.00 Crew Hrs: 4.00 Labor Pcs: 2.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2SIGNMTL	Signage Materials	1.00	3.00	EA	150.00	108.750	163.13	489.38
8UTLPU	Utility Pickup	1.00	4.00	HR	49.88	100.000	49.88	199.52
LAB4	Labor Foreman	1.00	4.00	MH	68.00	100.000	91.39	365.54
LABORER	Laborer	1.00	4.00	MH	65.00	100.000	87.35	349.41

Activity: 233400.01 Exhaust/Vent Fans Quantity: 1.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,616.48	555.91	2,172.39	399.04	4,023.75	0.00	1,648.75	8,243.93
Total	1,616.48	555.91	2,172.39	399.04	4,023.75	0.00	1,648.75	8,243.93

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,571.4300	8.0000	0.1250	321.4288	1.0000	1.0000	1.0000	8,243.9300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	90.5163	1,616.4800

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: HVAC HVAC Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2FAN	HVAC Exhaust/Vent Fan	1.00	1.00	EA	2,800.00	108.750	3,045.00	3,045.00
2LOUVER	Louver	1.00	1.00	EA	900.00	108.750	978.75	978.75
4HVAC	HVAC - Sub	1.00	6,595.00	LS	0.25	100.000	0.25	1,648.75
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
HVAC	HVAC Tech	2.00	16.00	MH	68.53	100.000	92.10	1,473.56
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83

Activity: 235523.01 Unit Heater Quantity: 1.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	808.24	277.95	1,086.19	199.52	1,957.50	0.00	810.75	4,053.96
Total	808.24	277.95	1,086.19	199.52	1,957.50	0.00	810.75	4,053.96

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,285.7100	4.0000	0.2500	321.4275	0.5000	2.0000	0.5000	8,107.9200

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
12.0000	0.0833	12.0000	90.5158	808.2400

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: HVAC HVAC Crew Prod: HU 4 Eff: 100.00 Crew Hrs: 4.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2UNITHEATER	Unit Heater	1.00	1.00	EA	1,800.00	108.750	1,957.50	1,957.50
4HVAC	HVAC - Sub	1.00	3,243.00	LS	0.25	100.000	0.25	810.75
8UTLPU	Utility Pickup	1.00	4.00	HR	49.88	100.000	49.88	199.52
HVAC	HVAC Tech	2.00	8.00	MH	68.53	100.000	92.10	736.78
LABORER	Laborer	1.00	4.00	MH	65.00	100.000	87.35	349.41

Activity: 265000.01 Lighting/Power Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	9,366.72	3,221.22	12,587.94	1,596.16	13,702.50	0.00	6,971.50	34,858.10
Total	9,366.72	3,221.22	12,587.94	1,596.16	13,702.50	0.00	6,971.50	34,858.10

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
14,184.1000	32.0000	0.0313	443.2531	4.0000	0.2500	4.0000	8,714.5250

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
128.0000	0.0078	128.0000	98.3433	9,366.7200

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC Electrical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ELECMTL	Electrical Materials	1.00	1.00	LS	5,700.00	108.750	6,198.75	6,198.75
2LIGHTING	Lighting - LED	1.00	12.00	EA	575.00	108.750	625.31	7,503.75
4ELEC	Electric - Sub	1.00	27,886.00	LS	0.25	100.000	0.25	6,971.50
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
ELEC	Electrician	2.00	64.00	MH	73.88	100.000	99.29	6,354.39
ELEC4	Electrician Foreman	1.00	32.00	MH	79.95	100.000	107.45	3,438.24
LABORER	Laborer	1.00	32.00	MH	65.00	100.000	87.35	2,795.31

Activity: 311000.02 Footing Excavation Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,736.00	597.01	2,333.01	639.05	0.00	0.00	0.00	2,972.06
Total	1,736.00	597.01	2,333.01	639.05	0.00	0.00	0.00	2,972.06

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,972.0600	8.0000	0.1250	371.5075	1.0000	1.0000	1.0000	2,972.0600

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	97.2088	1,736.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MINIP Mini Pipe Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8243	BACKHOE/LOADER 60-90HP 4WD	1.00	8.00	HR	73.45	108.750	79.88	639.05
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPERATOR	Operator	1.00	8.00	MH	87.00	100.000	116.92	935.35

Activity: 311000.03 Backfill Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	2,104.00	723.57	2,827.57	2,180.01	0.00	0.00	0.00	5,007.58
Total	2,104.00	723.57	2,827.57	2,180.01	0.00	0.00	0.00	5,007.58

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
5,007.5800	8.0000	0.1250	625.9475	1.0000	1.0000	1.0000	5,007.5800

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
28.0000	0.0357	28.0000	100.9846	2,104.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMBF Small Backfill Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.50 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8031	WALKBEHIND ROLLER (AUTO)	1.00	8.00	HR	93.69	108.750	101.89	815.10
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.00	HR	111.02	108.750	120.73	965.87
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	0.50	4.00	MH	92.00	100.000	123.64	494.56
OPERATOR	Operator	1.00	8.00	MH	87.00	100.000	116.92	935.35

Activity: 311000.05 Pad Grading Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	2,432.00	836.37	3,268.37	2,390.57	1,857.99	0.00	0.00	7,516.93
Total	2,432.00	836.37	3,268.37	2,390.57	1,857.99	0.00	0.00	7,516.93

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
5,658.9400	8.0000	0.1250	707.3675	1.0000	1.0000	1.0000	7,516.9300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
32.0000	0.0313	32.0000	102.1366	2,432.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMGRD (Mod) Small Grading Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 4.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BASE	Base Rock	1.00	68.00	TON	18.00	108.750	19.58	1,331.10
2VAPOR	Vapor Barrier	1.00	570.00	SF	0.85	108.750	0.92	526.89
8040	SINGLE DRUM COMPACTOR	1.00	8.00	HR	60.85	108.750	66.18	529.40
8272	LOADER LANDSCAPER 4WD	1.00	8.00	HR	41.69	108.750	45.34	362.73
8326	4000 GAL WATER TRUCK	1.00	8.00	HR	126.37	108.750	137.43	1,099.40
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71

**Biditem**

**(Non Additive) RAS/WAS Pump Station (Submersible Option)**

**80**

Takeoff Qty: 1.000 LS

Client #: 8a

Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	65,522.96	22,533.36	88,056.32	18,763.81	82,894.69	6,851.25	73,346.50	269,912.57
Total	65,522.96	22,533.36	88,056.32	18,763.81	82,894.69	6,851.25	73,346.50	269,912.57

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
776.0000	0.0013	776.0000	347.8255	84.4368	113.4746	0.0047

Activity: 031100.01 (Non Additive) Invert Quantity: 8.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,110.00	381.73	1,491.73	149.64	269.16	67.97	562.50	2,540.99
Total	8,880.00	3,053.83	11,933.83	1,197.12	2,153.25	543.75	4,500.00	20,327.95

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,641.3688	3.0000	0.3333	547.1229	3.0000	2.6667	0.3750	6,775.9833

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.0833	12.0000	124.3107	1,110.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 3 Eff: 100.00 Crew Hrs: 24.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	8.80	CY	225.00	108.750	244.69	2,153.25
3FORMMTL	Form Materials	1.00	60.00	SF	5.00	108.750	5.44	326.25
3TEMPLATE	Template Materials	1.00	1.00	LS	200.00	108.750	217.50	217.50
4PUMP	Concrete Pump	1.00	4.00	HR	285.00	100.000	285.00	1,140.00
4REBAR	Rebar - Sub	1.00	2,400.00	LB	1.40	100.000	1.40	3,360.00
8UTLPU	Utility Pickup	1.00	24.00	HR	49.88	100.000	49.88	1,197.12
CARP	Carpenter - Journeyman	2.00	48.00	MH	100.00	100.000	134.39	6,450.72
CARP4	Carpenter Foreman	1.00	24.00	MH	105.00	100.000	141.11	3,386.63
LABORER	Laborer	1.00	24.00	MH	65.00	100.000	87.35	2,096.48

Activity: 031100.02 (Non Additive) PS Walls Quantity: 22.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,076.36	370.16	1,446.53	145.11	269.16	286.70	471.82	2,619.31
Total	23,680.00	8,143.55	31,823.55	3,192.32	5,921.44	6,307.50	10,380.00	57,624.81

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,591.6305	2.9091	0.3438	547.1230	8.0000	2.7500	0.3636	7,203.1013

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
256.0000	0.0859	11.6364	124.3107	1,076.3636

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 8 Eff: 100.00 Crew Hrs: 64.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	24.20	CY	225.00	108.750	244.69	5,921.44
3FORMMTL	Form Materials	1.00	1,160.00	SF	5.00	108.750	5.44	6,307.50
4PUMP	Concrete Pump	1.00	4.00	HR	285.00	100.000	285.00	1,140.00
4REBAR	Rebar - Sub	1.00	6,600.00	LB	1.40	100.000	1.40	9,240.00
8UTLPU	Utility Pickup	1.00	64.00	HR	49.88	100.000	49.88	3,192.32
CARP	Carpenter - Journeyman	2.00	128.00	MH	100.00	100.000	134.39	17,201.92
CARP4	Carpenter Foreman	1.00	64.00	MH	105.00	100.000	141.11	9,031.01
LABORER	Laborer	1.00	64.00	MH	65.00	100.000	87.35	5,590.62

Activity: 055001.01 (Non Additive) Misc Metals/Hatch Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,761.20	605.68	2,366.88	399.04	5,981.25	0.00	0.00	8,747.17
Total	1,761.20	605.68	2,366.88	399.04	5,981.25	0.00	0.00	8,747.17

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,765.9200	8.0000	0.1250	345.7400	1.0000	1.0000	1.0000	8,747.1700

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	98.6200	1,761.2000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM Small Mechanical Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2HATCH	Access Hatch	1.00	1.00	EA	5,500.00	108.750	5,981.25	5,981.25
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83
MECHHLP	Mech Helper/Oiler	1.00	8.00	MH	74.93	100.000	100.70	805.59
MILLWR	Millwright	1.00	8.00	MH	80.22	100.000	107.81	862.46

Activity: 099000.01 (Non Additive) Painting/Coatings Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	0.00	0.00	52,100.00	52,100.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	52,100.00	52,100.00

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4COATING	High Performance Coating	1.00	620.00	SF	80.00	100.000	80.00	49,600.00
4MECHPAINT	Mechanical/Pipe Painting	1.00	1.00	EA	2,500.00	100.000	2,500.00	2,500.00

Activity: 101410.01 (Non Additive) Signage Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	532.00	182.95	714.95	199.52	543.75	0.00	0.00	1,458.22
Total	532.00	182.95	714.95	199.52	543.75	0.00	0.00	1,458.22

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
914.4700	4.0000	0.2500	228.6175	0.5000	2.0000	0.5000	2,916.4400

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
8.0000	0.1250	8.0000	89.3688	532.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LAB4 (Mod) 4 Man Labor Crew Prod: S 0.5 Eff: 100.00 Crew Hrs: 4.00 Labor Pcs: 2.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2SIGNMTL	Signage Materials	1.00	1.00	LS	500.00	108.750	543.75	543.75
8UTLPU	Utility Pickup	1.00	4.00	HR	49.88	100.000	49.88	199.52
LAB4	Labor Foreman	1.00	4.00	MH	68.00	100.000	91.39	365.54
LABORER	Laborer	1.00	4.00	MH	65.00	100.000	87.35	349.41

**Activity: 262X00.01 (Non Additive) Electrical Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	7,286.72	2,505.91	9,792.63	1,596.16	5,437.50	0.00	4,206.50	21,032.79
Total	7,286.72	2,505.91	9,792.63	1,596.16	5,437.50	0.00	4,206.50	21,032.79

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
11,388.7900	32.0000	0.0313	355.8997	4.0000	0.2500	4.0000	5,258.1975

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.0104	96.0000	102.0066	7,286.7200

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC (Mod) Electrical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ELECMTL	Electrical Materials	1.00	1.00	LS	5,000.00	108.750	5,437.50	5,437.50
4ELEC	Electric - Sub	1.00	16,826.00	LS	0.25	100.000	0.25	4,206.50
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
ELEC	Electrician	2.00	64.00	MH	73.88	100.000	99.29	6,354.39
ELEC4	Electrician Foreman	1.00	32.00	MH	79.95	100.000	107.45	3,438.24

**Activity: 311000.06 (Non Additive) Wet Well Excavation Quantity: 114.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	27.79	9.56	37.35	47.37	0.00	0.00	18.95	103.66
Total	3,168.00	1,089.48	4,257.48	5,399.77	0.00	0.00	2,160.00	11,817.25

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
84.7127	0.0702	14.2500	1,207.1563	1.0000	114.0000	0.0088	11,817.2500

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
40.0000	2.8500	0.3509	106.4370	27.7895

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 5.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	16.00	HR	135.00	100.000	135.00	2,160.00
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	8.00	HR	153.44	108.750	166.87	1,334.92
8283	EXCAVATOR LARGE	1.00	8.00	HR	294.99	108.750	320.80	2,566.41
8326	4000 GAL WATER TRUCK	1.00	8.00	HR	126.37	108.750	137.43	1,099.40
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71

**Activity: 311000.07 (Non Additive) Wet Well Backfill Quantity: 82.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	45.95	15.80	61.75	30.93	0.00	0.00	0.00	92.68
Total	3,768.00	1,295.82	5,063.82	2,535.88	0.00	0.00	0.00	7,599.70

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
92.6793	0.0976	10.2500	949.9625	1.0000	82.0000	0.0122	7,599.7000

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
48.0000	1.7083	0.5854	105.4963	45.9512

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: BKFL (Mod) Backfill Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 6.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8040	SINGLE DRUM COMPACTOR	1.00	8.00	HR	60.85	108.750	66.18	529.40
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.00	HR	111.02	108.750	120.73	965.87
8324	2000 GAL WATER TRUCK	1.00	8.00	HR	73.74	108.750	80.20	641.57
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71
TRUCK	Truck Driver (On Site)	1.00	8.00	MH	75.00	100.000	100.79	806.34

Activity: 402319.03 (Non Additive) Pipe & Fittings Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	11,372.64	3,911.06	15,283.70	2,394.24	22,402.50	0.00	0.00	40,080.44
Total	11,372.64	3,911.06	15,283.70	2,394.24	22,402.50	0.00	0.00	40,080.44

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
17,677.9400	48.0000	0.0208	368.2904	6.0000	0.1667	6.0000	6,680.0733

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
144.0000	0.0069	144.0000	106.1368	11,372.6400

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEACC	Pipe Accessories	1.00	1.00	LS	2,000.00	108.750	2,175.00	2,175.00
2PIPEMTL	Pipe Materials	1.00	1.00	LS	18,600.00	108.750	20,227.50	20,227.50
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	1.00	48.00	MH	65.00	100.000	87.35	4,192.97
MILLWR	Millwright	1.00	48.00	MH	80.22	100.000	107.81	5,174.77
PLUMB	Plumber - Journeyman	1.00	48.00	MH	91.71	100.000	123.25	5,915.96

Activity: 432113.01 (Non Additive) Pumps Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	5,074.40	1,745.08	6,819.48	1,849.76	40,455.00	0.00	0.00	49,124.24
Total	5,074.40	1,745.08	6,819.48	1,849.76	40,455.00	0.00	0.00	49,124.24

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
8,669.2400	16.0000	0.0625	541.8275	2.0000	0.5000	2.0000	24,562.1200

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	0.0156	64.0000	106.5544	5,074.4000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD Medium Mechanical Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PUMP	Submersible Pump	1.00	2.00	EA	18,600.00	108.750	20,227.50	40,455.00
8MECHTRK	Mechanics Truck	1.00	16.00	HR	65.73	100.000	65.73	1,051.68
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
MILLWR	Millwright	2.00	32.00	MH	80.22	100.000	107.81	3,449.84
PLUMB	Plumber - Journeyman	1.00	16.00	MH	91.71	100.000	123.25	1,971.98

# 82

Takeoff Qty: 1.000 LS  
 Bid Qty: 1.000 LS

Client #: 8b

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	19,781.84	6,802.99	26,584.83	3,790.88	54,301.60	0.00	70,180.00	154,857.31
Total	19,781.84	6,802.99	26,584.83	3,790.88	54,301.60	0.00	70,180.00	154,857.31

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
244.0000	0.0041	244.0000	634.6611	81.0731	108.9542	0.0132

**Activity: 031100.01 Concrete Pad Quantity: 6.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	928.00	319.14	1,247.14	133.01	269.16	0.00	233.33	1,882.64
Total	5,568.00	1,914.84	7,482.84	798.08	1,614.94	0.00	1,400.00	11,295.86

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,380.1533	2.6667	0.3750	517.5575	2.0000	3.0000	0.3333	5,647.9300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	0.0938	10.6667	116.9194	928.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: POURF (Mod) Pour Crew - Flatwork/Slab Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	6.60	CY	225.00	108.750	244.69	1,614.94
4REBAR	Rebar - Sub	1.00	1,000.00	LB	1.40	100.000	1.40	1,400.00
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
CARP	Carpenter - Journeyman	1.00	16.00	MH	100.00	100.000	134.39	2,150.24
CARP4	Carpenter Foreman	1.00	16.00	MH	105.00	100.000	141.11	2,257.75
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
MASON	Cement Mason	1.00	16.00	MH	78.00	100.000	104.82	1,677.19

**Activity: 031100.02 Pump Pedistals Quantity: 1.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	1,080.00	371.41	1,451.41	199.52	269.16	0.00	280.00	2,200.09
Total	1,080.00	371.41	1,451.41	199.52	269.16	0.00	280.00	2,200.09

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,650.9300	4.0000	0.2500	412.7325	0.5000	2.0000	0.5000	4,400.1800

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
12.0000	0.0833	12.0000	120.9508	1,080.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: POURF (Mod) Pour Crew - Flatwork/Slab Prod: CH 4 Eff: 100.00 Crew Hrs: 4.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	1.10	CY	225.00	108.750	244.69	269.16
4REBAR	Rebar - Sub	1.00	200.00	LB	1.40	100.000	1.40	280.00
8UTLPU	Utility Pickup	1.00	4.00	HR	49.88	100.000	49.88	199.52
CARP	Carpenter - Journeyman	1.00	4.00	MH	100.00	100.000	134.39	537.56
CARP4	Carpenter Foreman	1.00	4.00	MH	105.00	100.000	141.11	564.44
LABORER	Laborer	1.00	4.00	MH	65.00	100.000	87.35	349.41

**Activity: 099000.01 Painting/Coatings Quantity: 1.00 Unit: LS**

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4MECHPAINT	Mechanical/Pipe Painting	1.00	1.00	EA	2,500.00	100.000	2,500.00	2,500.00

**Activity: 402319.03 Pipe & Fittings Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	11,372.64	3,911.06	15,283.70	2,394.24	23,055.00	0.00	0.00	40,732.94
Total	11,372.64	3,911.06	15,283.70	2,394.24	23,055.00	0.00	0.00	40,732.94

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
17,677.9400	48.0000	0.0208	368.2904	6.0000	0.1667	6.0000	6,788.8233

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
144.0000	0.0069	144.0000	106.1368	11,372.6400

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEACC	Pipe Accessories	1.00	1.00	LS	4,500.00	108.750	4,893.75	4,893.75
2PIPEMTL	Pipe Materials	1.00	1.00	LS	16,700.00	108.750	18,161.25	18,161.25
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	1.00	48.00	MH	65.00	100.000	87.35	4,192.97
MILLWR	Millwright	1.00	48.00	MH	80.22	100.000	107.81	5,174.77
PLUMB	Plumber - Journeyman	1.00	48.00	MH	91.71	100.000	123.25	5,915.96

**Activity: 432113.01 Pumps Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,761.20	605.68	2,366.88	399.04	29,362.50	0.00	0.00	32,128.42
Total	1,761.20	605.68	2,366.88	399.04	29,362.50	0.00	0.00	32,128.42

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,765.9200	8.0000	0.1250	345.7400	1.0000	1.0000	1.0000	32,128.4200

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	98.6200	1,761.2000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM Small Mechanical Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2SCPUMP	Split Case Pump	1.00	2.00	EA	13,500.00	108.750	14,681.25	29,362.50
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83
MECHHLP	Mech Helper/Oiler	1.00	8.00	MH	74.93	100.000	100.70	805.59
MILLWR	Millwright	1.00	8.00	MH	80.22	100.000	107.81	862.46

**Activity: 82.1 Enclosure Quantity: 1.00 Unit: LS**

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4ENCLOSURE	Pump Enclosure	1.00	120.00	SF	550.00	100.000	550.00	66,000.00

**Biditem**  
**90**

**Influent Junction Box**

Takeoff Qty: 1.000 LS  
Bid Qty: 1.000 LS

**Client #: 9**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	76,571.44	26,332.93	102,904.37	23,501.59	17,370.10	7,373.25	13,896.00	165,045.31
Total	76,571.44	26,332.93	102,904.37	23,501.59	17,370.10	7,373.25	13,896.00	165,045.31

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
868.0000	0.0012	868.0000	190.1444	88.2159	118.5534	0.0061

Activity: 033001.01 Invert Quantity: 5.00 Unit: CY

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values for crew and unit costs.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row includes values for manhours and unit costs.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Lists resources like 2CONC, 3FORMMTL, 4REBAR, etc.

Activity: 033001.02 Concrete Walls Quantity: 14.00 Unit: CY

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values for crew and unit costs.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row includes values for manhours and unit costs.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 6WALL 6 Man Wall Crew Prod: S 8 Eff: 100.00 Crew Hrs: 64.00 Labor Pcs: 7.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Lists resources like 2CONC, 3FORMMTL, 4PUMP, etc.

Activity: 055001.01 Misc Metals Quantity: 1.00 Unit: LS

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows include U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row includes values for crew and unit costs.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row includes values for manhours and unit costs.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2FRAMEGRATE	Frame and Grate	1.00	100.00	SF	100.00	108.750	108.75	10,875.00
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
CARP	Carpenter - Journeyman	2.00	64.00	MH	100.00	100.000	134.39	8,600.96
CARP4	Carpenter Foreman	1.00	32.00	MH	105.00	100.000	141.11	4,515.50
LABORER	Laborer	1.00	32.00	MH	65.00	100.000	87.35	2,795.31

Activity: 32001.01 Structure Exc Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	2,648.00	910.65	3,558.65	3,288.31	0.00	0.00	2,160.00	9,006.96
Total	2,648.00	910.65	3,558.65	3,288.31	0.00	0.00	2,160.00	9,006.96

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
6,846.9600	8.0000	0.1250	855.8700	1.0000	1.0000	1.0000	9,006.9600

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
32.0000	0.0313	32.0000	111.2078	2,648.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: EXC4 4 man Exc Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	16.00	HR	135.00	100.000	135.00	2,160.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.00	HR	111.02	108.750	120.73	965.87
8279	EXCAVATOR SMALL-MED	1.00	8.00	HR	221.08	108.750	240.43	1,923.40
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71

Activity: 32001.02 Invert Grading Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	956.00	328.76	1,284.76	1,195.28	293.63	0.00	0.00	2,773.67
Total	956.00	328.76	1,284.76	1,195.28	293.63	0.00	0.00	2,773.67

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,480.0400	4.0000	0.2500	620.0100	0.5000	2.0000	0.5000	5,547.3400

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
12.0000	0.0833	12.0000	107.0633	956.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: SMGRD (Mod) Small Grading Crew Prod: S 0.5 Eff: 100.00 Crew Hrs: 4.00 Labor Pcs: 3.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BASE	Base Rock	1.00	15.00	TON	18.00	108.750	19.58	293.63
8040	SINGLE DRUM COMPACTOR	1.00	4.00	HR	60.85	108.750	66.18	264.70
8272	LOADER LANDSCAPER 4WD	1.00	4.00	HR	41.69	108.750	45.34	181.36
8326	4000 GAL WATER TRUCK	1.00	4.00	HR	126.37	108.750	137.43	549.70
8UTLPU	Utility Pickup	1.00	4.00	HR	49.88	100.000	49.88	199.52
LABORER	Laborer	1.00	4.00	MH	65.00	100.000	87.35	349.41
OPERATOR	Operator	2.00	8.00	MH	87.00	100.000	116.92	935.35

Activity: 32001.03 Structure BF Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	3,168.00	1,089.48	4,257.48	2,535.88	0.00	0.00	2,160.00	8,953.36
Total	3,168.00	1,089.48	4,257.48	2,535.88	0.00	0.00	2,160.00	8,953.36

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
6,793.3600	8.0000	0.1250	849.1700	1.0000	1.0000	1.0000	8,953.3600

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
40.0000	0.0250	40.0000	106.4370	3,168.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: BKFL (Mod) Backfill Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 5.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	16.00	HR	135.00	100.000	135.00	2,160.00
8040	SINGLE DRUM COMPACTOR	1.00	8.00	HR	60.85	108.750	66.18	529.40
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.00	HR	111.02	108.750	120.73	965.87
8324	2000 GAL WATER TRUCK	1.00	8.00	HR	73.74	108.750	80.20	641.57
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71

Activity: 402319.03 Cut Out Existing Pipe Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,895.44	651.85	2,547.29	399.04	1,087.50	0.00	0.00	4,033.83
Total	1,895.44	651.85	2,547.29	399.04	1,087.50	0.00	0.00	4,033.83

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
2,946.3300	8.0000	0.1250	368.2913	1.0000	1.0000	1.0000	4,033.8300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	106.1371	1,895.4400

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEACC	Pipe Accessories	1.00	1.00	LS	1,000.00	108.750	1,087.50	1,087.50
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83
MILLWR	Millwright	1.00	8.00	MH	80.22	100.000	107.81	862.46
PLUMB	Plumber - Journeyman	1.00	8.00	MH	91.71	100.000	123.25	986.00

Activity: 339901.99 Bypass Allowance Quantity: 1.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	9,504.00	3,268.43	12,772.43	10,496.52	0.00	2,175.00	0.00	25,443.95
Total	9,504.00	3,268.43	12,772.43	10,496.52	0.00	2,175.00	0.00	25,443.95

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
23,268.9500	24.0000	0.0417	969.5396	3.0000	0.3333	3.0000	8,481.3167

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
120.0000	0.0083	120.0000	106.4369	9,504.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPICE (Mod) Small Pipe Crew Prod: S 3 Eff: 100.00 Crew Hrs: 24.00 Labor Pcs: 5.00 Equipment Pcs: 6.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3PIPEMTL	Temp Pipe Materials	1.00	100.00	LF	20.00	108.750	21.75	2,175.00
8092	GENERATOR 50-59 KVA	1.00	24.00	HR	52.03	108.750	56.58	1,358.01
8165	PUMP 6" SELF PRIME - ELECTRI	2.00	48.00	HR	31.55	108.750	34.31	1,646.91
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	24.00	HR	111.02	108.750	120.73	2,897.62
8276	EXCAVATOR SMALL	1.00	24.00	HR	130.15	108.750	141.54	3,396.86
8UTLPU	Utility Pickup	1.00	24.00	HR	49.88	100.000	49.88	1,197.12
LABORER	Laborer	2.00	48.00	MH	65.00	100.000	87.35	4,192.97

OPER4	Operator Foreman	1.00	24.00	MH	92.00	100.000	123.64	2,967.33
OPERATOR	Operator	2.00	48.00	MH	87.00	100.000	116.92	5,612.13

**Biditem**

**(Non Additive) Effluent Return Pump Station**

**100**

Takeoff Qty: 1.000 LS

Client #: 10a

Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	103,659.76	35,648.60	139,308.36	54,527.84	162,654.66	10,200.75	108,586.50	475,278.11
Total	103,659.76	35,648.60	139,308.36	54,527.84	162,654.66	10,200.75	108,586.50	475,278.11

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
1,232.0000	0.0008	1,232.0000	385.7777	84.1394	113.0750	0.0034

**Activity: 031100.01 (Non Additive) Invert Quantity: 10.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	888.00	305.38	1,193.38	119.71	269.16	63.08	114.00	1,759.33
Total	8,880.00	3,053.83	11,933.83	1,197.12	2,691.56	630.75	1,140.00	17,593.26

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,313.0950	2.4000	0.4167	547.1229	3.0000	3.3333	0.3000	5,864.4200

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.1042	9.6000	124.3107	888.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 3 Eff: 100.00 Crew Hrs: 24.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	11.00	CY	225.00	108.750	244.69	2,691.56
3FORMMTL	Form Materials	1.00	76.00	SF	5.00	108.750	5.44	413.25
3TEMPLATE	Template Materials	1.00	1.00	LS	200.00	108.750	217.50	217.50
4PUMP	Concrete Pump	1.00	4.00	HR	285.00	100.000	285.00	1,140.00
8UTLPU	Utility Pickup	1.00	24.00	HR	49.88	100.000	49.88	1,197.12
CARP	Carpenter - Journeyman	2.00	48.00	MH	100.00	100.000	134.39	6,450.72
CARP4	Carpenter Foreman	1.00	24.00	MH	105.00	100.000	141.11	3,386.63
LABORER	Laborer	1.00	24.00	MH	65.00	100.000	87.35	2,096.48

**Activity: 031100.02 (Non Additive) PS Walls Quantity: 33.00 Unit: CY**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,076.36	370.16	1,446.53	145.11	269.16	290.00	34.55	2,185.33
Total	35,520.00	12,215.33	47,735.33	4,788.48	8,882.16	9,570.00	1,140.00	72,115.97

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,591.6306	2.9091	0.3438	547.1230	12.0000	2.7500	0.3636	6,009.6642

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
384.0000	0.0859	11.6364	124.3108	1,076.3636

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 12 Eff: 100.00 Crew Hrs: 96.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	36.30	CY	225.00	108.750	244.69	8,882.16
3FORMMTL	Form Materials	1.00	1,760.00	SF	5.00	108.750	5.44	9,570.00
4PUMP	Concrete Pump	1.00	4.00	HR	285.00	100.000	285.00	1,140.00
8UTLPU	Utility Pickup	1.00	96.00	HR	49.88	100.000	49.88	4,788.48
CARP	Carpenter - Journeyman	2.00	192.00	MH	100.00	100.000	134.39	25,802.88
CARP4	Carpenter Foreman	1.00	96.00	MH	105.00	100.000	141.11	13,546.51
LABORER	Laborer	1.00	96.00	MH	65.00	100.000	87.35	8,385.94

**Activity: 031500.01 (Non Additive) Concrete Accessories Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	6,215.06	0.00	0.00	6,215.06
Total	0.00	0.00	0.00	0.00	6,215.06	0.00	0.00	6,215.06

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONCACCESS	Concrete Accessories	1.00	43.00	CY	5.00	108.750	5.44	233.81
2HATCH2	Access Hatch - 2	1.00	1.00	EA	5,500.00	108.750	5,981.25	5,981.25

**Activity: 032000.01 (Non Additive) Concrete Reinforcing Quantity: 1.00 Unit: LS**

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4REBAR	Rebar - Sub	1.00	12,900.00	LB	1.40	100.000	1.40	18,060.00

**Activity: 099000.01 (Non Additive) Painting/Coatings Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	0.00	0.00	72,300.00	72,300.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	72,300.00	72,300.00

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4COATING	High Performance Coating	1.00	860.00	SF	80.00	100.000	80.00	68,800.00
4MECHPAINT	Mechanical/Pipe Painting	1.00	1.00	EA	3,500.00	100.000	3,500.00	3,500.00

**Activity: 101410.01 (Non Additive) Signage Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	532.00	182.95	714.95	199.52	543.75	0.00	0.00	1,458.22
Total	532.00	182.95	714.95	199.52	543.75	0.00	0.00	1,458.22

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
914.4700	4.0000	0.2500	228.6175	0.5000	2.0000	0.5000	2,916.4400

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
8.0000	0.1250	8.0000	89.3688	532.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LAB4 (Mod) 4 Man Labor Crew Prod: S 0.5 Eff: 100.00 Crew Hrs: 4.00 Labor Pcs: 2.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2SIGNMTL	Signage Materials	1.00	1.00	LS	500.00	108.750	543.75	543.75
8UTLPU	Utility Pickup	1.00	4.00	HR	49.88	100.000	49.88	199.52
LAB4	Labor Foreman	1.00	4.00	MH	68.00	100.000	91.39	365.54
LABORER	Laborer	1.00	4.00	MH	65.00	100.000	87.35	349.41

**Activity: 262X00.01 (Non Additive) Electrical Quantity: 1.00 Unit: LS**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	7,286.72	2,505.91	9,792.63	1,596.16	5,437.50	0.00	4,206.50	21,032.79
Total	7,286.72	2,505.91	9,792.63	1,596.16	5,437.50	0.00	4,206.50	21,032.79

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
11,388.7900	32.0000	0.0313	355.8997	4.0000	0.2500	4.0000	5,258.1975

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.0104	96.0000	102.0066	7,286.7200

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC (Mod) Electrical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ELECMTL	Electrical Materials	1.00	1.00	LS	5,000.00	108.750	5,437.50	5,437.50
4ELEC	Electric - Sub	1.00	16,826.00	LS	0.25	100.000	0.25	4,206.50
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
ELEC	Electrician	2.00	64.00	MH	73.88	100.000	99.29	6,354.39
ELEC4	Electrician Foreman	1.00	32.00	MH	79.95	100.000	107.45	3,438.24

**Activity:** 311000.06 (Non Additive) Wet Well Excavation **Quantity:** 280.00 **Unit:** CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	22.63	7.78	30.41	38.57	0.00	0.00	11.57	80.55
Total	6,336.00	2,178.95	8,514.95	10,799.55	0.00	0.00	3,240.00	22,554.50

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
68.9804	0.0571	17.5000	1,207.1563	2.0000	140.0000	0.0071	11,277.2500

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
80.0000	3.5000	0.2857	106.4369	22.6286

**Calendar:** STD Standard **Hrs/Shift:** 8 **WC:** 5221 **Concrete Construction**

**Crew:** LGPIPE (Mod) Large Pipe Crew **Prod:** S 2 **Eff:** 100.00 **Crew Hrs:** 16.00 **Labor Pcs:** 5.00 **Equipment Pcs:** 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	24.00	HR	135.00	100.000	135.00	3,240.00
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	2.00	32.00	MH	65.00	100.000	87.35	2,795.31
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

**Activity:** 311000.07 (Non Additive) Wet Well Backfill **Quantity:** 240.00 **Unit:** CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	31.40	10.80	42.20	21.13	0.00	0.00	0.00	63.33
Total	7,536.00	2,591.63	10,127.63	5,071.77	0.00	0.00	0.00	15,199.40

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
63.3308	0.0667	15.0000	949.9625	2.0000	120.0000	0.0083	7,599.7000

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	2.5000	0.4000	105.4961	31.4000

**Calendar:** STD Standard **Hrs/Shift:** 8 **WC:** 5221 **Concrete Construction**

**Crew:** BKFL (Mod) Backfill Crew **Prod:** S 2 **Eff:** 100.00 **Crew Hrs:** 16.00 **Labor Pcs:** 6.00 **Equipment Pcs:** 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	16.00	HR	111.02	108.750	120.73	1,931.75
8324	2000 GAL WATER TRUCK	1.00	16.00	HR	73.74	108.750	80.20	1,283.15
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	2.00	32.00	MH	65.00	100.000	87.35	2,795.31
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42
TRUCK	Truck Driver (On Site)	1.00	16.00	MH	75.00	100.000	100.79	1,612.68

**Activity:** 312319.01 (Non Additive) Dewatering **Quantity:** 1.00 **Unit:** LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,986.00	682.99	2,668.99	2,914.56	0.00	0.00	0.00	5,583.55
Total	1,986.00	682.99	2,668.99	2,914.56	0.00	0.00	0.00	5,583.55

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
5,583.5500	6.0000	0.1667	930.5917	0.7500	1.3333	0.7500	7,444.7333

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	111.2079	1,986.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 (Mod) 4 man Exc Crew Prod: CH 6 Eff: 100.00 Crew Hrs: 6.00 Labor Pcs: 4.00 Equipment Pcs: 6.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8092	GENERATOR 50-59 KVA	1.00	6.00	HR	52.03	108.750	56.58	339.50
8205	PUMP 2" ELECTRIC SUBMERSIBLE	2.00	12.00	HR	8.34	108.750	9.07	108.82
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	6.00	HR	111.02	108.750	120.74	724.41
8279	EXCAVATOR SMALL-MED	1.00	6.00	HR	221.08	108.750	240.43	1,442.55
8UTLPU	Utility Pickup	1.00	6.00	HR	49.88	100.000	49.88	299.28
LABORER	Laborer	1.00	6.00	MH	65.00	100.000	87.36	524.13
OPER4	Operator Foreman	1.00	6.00	MH	92.00	100.000	123.64	741.83
OPERATOR	Operator	2.00	12.00	MH	87.00	100.000	116.92	1,403.03

Activity: 402319.02 (Non Additive) Intake Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	19,136.00	6,580.87	25,716.87	23,716.68	24,936.38	0.00	8,500.00	82,869.93
Total	19,136.00	6,580.87	25,716.87	23,716.68	24,936.38	0.00	8,500.00	82,869.93

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
49,433.5500	32.0000	0.0313	1,544.7984	4.0000	0.2500	4.0000	20,717.4825

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	0.0042	240.0000	107.1536	19,136.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 7.50 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	2.00	CY	225.00	108.750	244.69	489.38
2PIPEMTL	Pipe Materials	1.00	1.00	LS	22,480.00	108.750	24,447.00	24,447.00
4LINER	Liner Sub	1.00	1.00	LS	8,500.00	100.000	8,500.00	8,500.00
8040	SINGLE DRUM COMPACTOR	1.00	32.00	HR	60.85	108.750	66.17	2,117.58
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	32.00	HR	153.44	108.750	166.87	5,339.68
8283	EXCAVATOR LARGE	1.00	32.00	HR	294.99	108.750	320.80	10,265.65
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
CARP	Carpenter - Journeyman	0.50	16.00	MH	100.00	100.000	134.39	2,150.24
LABORER	Laborer	3.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	3.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 402319.03 (Non Additive) Pipe & Fittings Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	11,372.64	3,911.06	15,283.70	2,394.24	22,598.25	0.00	0.00	40,276.19
Total	11,372.64	3,911.06	15,283.70	2,394.24	22,598.25	0.00	0.00	40,276.19

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
17,677.9400	48.0000	0.0208	368.2904	6.0000	0.1667	6.0000	6,712.6983

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
144.0000	0.0069	144.0000	106.1368	11,372.6400

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2PIPEACC, 2PIPEMTL, 8UTLPU, LABORER, MILLWR, PLUMB.

Activity: 432113.01 (Non Additive) Pumps Quantity: 1.00 Unit: LS

Summary table with 9 columns: U. Cost, Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Values range from 5,074.40 to 100,019.24.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Values range from 8,669.2400 to 50,009.6200.

Summary table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Values range from 64.0000 to 5,074.4000.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD Medium Mechanical Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 2.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2PUMP, 8MECHTRK, 8UTLPU, LABORER, MILLWR, PLUMB.

Biditem

(Non Additive) Effluent Return Pump Station (Barge Option)

102

Takeoff Qty: 1.000 LS Bid Qty: 1.000 LS

Client #: 10b

Summary table with 9 columns: U. Cost, Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Values range from 54,643.92 to 345,691.42.

Summary table with 8 columns: Manhours, Unit/MH, MH/Unit, \$/MH, Base Labor/MH, Total Labor/MH, Unit/CH. Values range from 688.0000 to 0.0050.

Activity: 031100.01 (Non Additive) Concrete Pad Quantity: 4.00 Unit: CY

Summary table with 9 columns: U. Cost, Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Values range from 1,392.00 to 10,302.55.

Summary table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Values range from 2,070.2300 to 5,151.2750.

Summary table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Values range from 64.0000 to 1,392.0000.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: POURF (Mod) Pour Crew - Flatwork/Slab Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows include 2CONC, 4REBAR.

8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
CARP	Carpenter - Journeyman	1.00	16.00	MH	100.00	100.000	134.39	2,150.24
CARP4	Carpenter Foreman	1.00	16.00	MH	105.00	100.000	141.11	2,257.75
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
MASON	Cement Mason	1.00	16.00	MH	78.00	100.000	104.82	1,677.19

Activity: 099000.01 (Non Additive) Painting/Coatings (Unreviewed) Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4MECHPAINT	Mechanical/Pipe Painting	1.00	1.00	EA	5,000.00	100.000	5,000.00	5,000.00

Activity: 262X00.01 (Non Additive) Electrical (Unreviewed) Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	7,286.72	2,505.91	9,792.63	1,596.16	5,437.50	0.00	4,206.50	21,032.79
Total	7,286.72	2,505.91	9,792.63	1,596.16	5,437.50	0.00	4,206.50	21,032.79

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
11,388.7900	32.0000	0.0313	355.8997	4.0000	0.2500	4.0000	5,258.1975

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.0104	96.0000	102.0066	7,286.7200

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC (Mod) Electrical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ELECMTL	Electrical Materials	1.00	1.00	LS	5,000.00	108.750	5,437.50	5,437.50
4ELEC	Electric - Sub	1.00	16,826.00	LS	0.25	100.000	0.25	4,206.50
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
ELEC	Electrician	2.00	64.00	MH	73.88	100.000	99.29	6,354.39
ELEC4	Electrician Foreman	1.00	32.00	MH	79.95	100.000	107.45	3,438.24

Activity: 402319.01 (Non Additive) Barge & Gangway Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	20,297.60	6,980.34	27,277.94	7,399.04	76,125.00	0.00	0.00	110,801.98
Total	20,297.60	6,980.34	27,277.94	7,399.04	76,125.00	0.00	0.00	110,801.98

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
34,676.9800	64.0000	0.0156	541.8278	8.0000	0.1250	8.0000	13,850.2475

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
256.0000	0.0039	256.0000	106.5545	20,297.6000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD Medium Mechanical Crew Prod: S 8 Eff: 100.00 Crew Hrs: 64.00 Labor Pcs: 4.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2FLOATBARGE	Floating Barge	1.00	1.00	LS	50,000.00	108.750	54,375.00	54,375.00
2GANGWAY	Gangway	1.00	80.00	LF	250.00	108.750	271.88	21,750.00
8MECHTRK	Mechanics Truck	1.00	64.00	HR	65.73	100.000	65.73	4,206.72
8UTLPU	Utility Pickup	1.00	64.00	HR	49.88	100.000	49.88	3,192.32
LABORER	Laborer	1.00	64.00	MH	65.00	100.000	87.35	5,590.62
MILLWR	Millwright	2.00	128.00	MH	80.22	100.000	107.81	13,799.38
PLUMB	Plumber - Journeyman	1.00	64.00	MH	91.71	100.000	123.25	7,887.94

Activity: 402319.03 (Non Additive) Pipe & Fittings Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	18,954.40	6,518.42	25,472.82	3,990.40	73,406.25	0.00	0.00	102,869.47
Total	18,954.40	6,518.42	25,472.82	3,990.40	73,406.25	0.00	0.00	102,869.47

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
29,463.2200	80.0000	0.0125	368.2903	10.0000	0.1000	10.0000	10,286.9470

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	0.0042	240.0000	106.1368	18,954.4000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEACC	Pipe Accessories	1.00	1.00	LS	2,500.00	108.750	2,718.75	2,718.75
2PIPEMTL	Pipe Materials	1.00	1.00	LS	65,000.00	108.750	70,687.50	70,687.50
8UTLPU	Utility Pickup	1.00	80.00	HR	49.88	100.000	49.88	3,990.40
LABORER	Laborer	1.00	80.00	MH	65.00	100.000	87.35	6,988.28
MILLWR	Millwright	1.00	80.00	MH	80.22	100.000	107.81	8,624.61
PLUMB	Plumber - Journeyman	1.00	80.00	MH	91.71	100.000	123.25	9,859.93

Activity: 432113.01 (Non Additive) Pumps Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	2,537.20	872.55	3,409.75	924.88	91,350.00	0.00	0.00	95,684.63
Total	2,537.20	872.55	3,409.75	924.88	91,350.00	0.00	0.00	95,684.63

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
4,334.6300	8.0000	0.1250	541.8288	1.0000	1.0000	1.0000	95,684.6300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
32.0000	0.0313	32.0000	106.5547	2,537.2000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD Medium Mechanical Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 4.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PUMP	Submersible Pump	1.00	2.00	EA	42,000.00	108.750	45,675.00	91,350.00
8MECHTRK	Mechanics Truck	1.00	8.00	HR	65.73	100.000	65.73	525.84
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83
MILLWR	Millwright	2.00	16.00	MH	80.22	100.000	107.81	1,724.92
PLUMB	Plumber - Journeyman	1.00	8.00	MH	91.71	100.000	123.25	986.00

**Biditem**

**Effluent Return Pump Station (Plant Drain Combo)**

**104**

Takeoff Qty: 1.000 LS

Client #: 10c

Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	160,525.04	55,204.56	215,729.60	140,245.16	339,397.89	2,936.25	109,339.95	807,648.85
Total	160,525.04	55,204.56	215,729.60	140,245.16	339,397.89	2,936.25	109,339.95	807,648.85

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
1,984.0000	0.0005	1,984.0000	407.0811	80.9098	108.7347	0.0026

Activity: 031100.01 Invert Quantity: 12.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	986.67	339.31	1,325.98	133.01	269.16	63.44	95.00	1,886.59
Total	11,840.00	4,071.77	15,911.77	1,596.16	3,229.88	761.25	1,140.00	22,639.06

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,458.9942	2.6667	0.3750	547.1228	4.0000	3.0000	0.3333	5,659.7650

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
128.0000	0.0938	10.6667	124.3107	986.6667

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.10	13.20	CY	225.00	108.750	244.69	3,229.88
3FORMMTL	Form Materials	1.00	100.00	SF	5.00	108.750	5.44	543.75
3TEMPLATE	Template Materials	1.00	1.00	LS	200.00	108.750	217.50	217.50
4PUMP	Concrete Pump	1.00	4.00	HR	285.00	100.000	285.00	1,140.00
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
CARP	Carpenter - Journeyman	2.00	64.00	MH	100.00	100.000	134.39	8,600.96
CARP4	Carpenter Foreman	1.00	32.00	MH	105.00	100.000	141.11	4,515.50
LABORER	Laborer	1.00	32.00	MH	65.00	100.000	87.35	2,795.31

Activity: 031100.02 PS Walls Quantity: 36.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	608.89	209.40	818.29	749.97	2,265.63	0.00	0.00	3,833.88
Total	21,920.00	7,538.29	29,458.29	26,998.88	81,562.50	0.00	0.00	138,019.67

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,568.2547	1.1111	0.9000	1,411.4293	5.0000	7.2000	0.1389	27,603.9340

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
280.0000	0.1286	7.7778	105.2082	608.8889

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE Large Pipe Crew Prod: S 5 Eff: 100.00 Crew Hrs: 40.00 Labor Pcs: 7.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2WETWELL	Precast Wet Well	1.00	1.00	LS	75,000.00	108.750	81,562.50	81,562.50
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	40.00	HR	153.44	108.750	166.87	6,674.60
8283	EXCAVATOR LARGE	1.00	40.00	HR	294.99	108.750	320.80	12,832.07
8326	4000 GAL WATER TRUCK	1.00	40.00	HR	126.37	108.750	137.43	5,497.01
8UTLPU	Utility Pickup	1.00	40.00	HR	49.88	100.000	49.88	1,995.20
LABORER	Laborer	3.00	120.00	MH	65.00	100.000	87.35	10,482.42
OPER4	Operator Foreman	1.00	40.00	MH	92.00	100.000	123.64	4,945.55
OPERATOR	Operator	3.00	120.00	MH	87.00	100.000	116.92	14,030.32

Activity: 031500.01 Concrete Accessories Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	12,223.50	0.00	0.00	12,223.50
Total	0.00	0.00	0.00	0.00	12,223.50	0.00	0.00	12,223.50

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONCACCESS	Concrete Accessories	1.00	48.00	CY	5.00	108.750	5.44	261.00
2HATCH2	Access Hatch - 2	1.00	2.00	EA	5,500.00	108.750	5,981.25	11,962.50

Activity: 032000.01 Concrete Reinforcing Quantity: 1.00 Unit: LS

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4REBAR	Rebar - Sub	1.00	14,000.00	LB	1.40	100.000	1.40	19,600.00

Activity: 03600.02 Valve Vault Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	19,008.00	6,536.85	25,544.85	14,983.21	36,975.00	0.00	0.00	77,503.06
Total	19,008.00	6,536.85	25,544.85	14,983.21	36,975.00	0.00	0.00	77,503.06

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
40,528.0600	48.0000	0.0208	844.3346	6.0000	0.1667	6.0000	12,917.1767

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
240.0000	0.0042	240.0000	106.4369	19,008.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE Small Pipe Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 5.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2VAULT	Precast Vault	1.00	1.00	EA	34,000.00	108.750	36,975.00	36,975.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	48.00	HR	111.02	108.750	120.73	5,795.24
8276	EXCAVATOR SMALL	1.00	48.00	HR	130.15	108.750	141.54	6,793.73
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	2.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	48.00	MH	92.00	100.000	123.64	5,934.66
OPERATOR	Operator	2.00	96.00	MH	87.00	100.000	116.92	11,224.25

Activity: 055001.01 Misc Metals Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	11,840.00	4,071.77	15,911.77	1,596.16	30,015.00	0.00	0.00	47,522.93
Total	11,840.00	4,071.77	15,911.77	1,596.16	30,015.00	0.00	0.00	47,522.93

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
17,507.9300	32.0000	0.0313	547.1228	4.0000	0.2500	4.0000	11,880.7325

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
128.0000	0.0078	128.0000	124.3107	11,840.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP 4 Man Carp Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2FRAMEGRATE	Frame and Grate	1.00	120.00	SF	100.00	108.750	108.75	13,050.00
2SLIDEGATE	Slide Gate	1.00	2.00	EA	7,800.00	108.750	8,482.50	16,965.00
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
CARP	Carpenter - Journeyman	2.00	64.00	MH	100.00	100.000	134.39	8,600.96
CARP4	Carpenter Foreman	1.00	32.00	MH	105.00	100.000	141.11	4,515.50
LABORER	Laborer	1.00	32.00	MH	65.00	100.000	87.35	2,795.31

Activity: 099000.01 Painting/Coatings Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	0.00	0.00	78,700.00	78,700.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	78,700.00	78,700.00

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4COATING	High Performance Coating	1.00	940.00	SF	80.00	100.000	80.00	75,200.00
4MECHPAINT	Mechanical/Pipe Painting	1.00	1.00	EA	3,500.00	100.000	3,500.00	3,500.00

Activity: 101410.01 Signage Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	532.00	182.95	714.95	199.52	543.75	0.00	0.00	1,458.22
Total	532.00	182.95	714.95	199.52	543.75	0.00	0.00	1,458.22

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
914.4700	4.0000	0.2500	228.6175	0.5000	2.0000	0.5000	2,916.4400

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
8.0000	0.1250	8.0000	89.3688	532.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LAB4 (Mod) 4 Man Labor Crew Prod: S 0.5 Eff: 100.00 Crew Hrs: 4.00 Labor Pcs: 2.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2SIGNMTL	Signage Materials	1.00	1.00	LS	500.00	108.750	543.75	543.75
8UTLPU	Utility Pickup	1.00	4.00	HR	49.88	100.000	49.88	199.52
LAB4	Labor Foreman	1.00	4.00	MH	68.00	100.000	91.39	365.54
LABORER	Laborer	1.00	4.00	MH	65.00	100.000	87.35	349.41

Activity: 311000.06 Wet Well Excavation Quantity: 121.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	26.18	9.00	35.19	44.63	0.00	0.00	11.57	91.38
Total	3,168.00	1,089.48	4,257.48	5,399.77	0.00	0.00	1,399.95	11,057.20

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
79.8120	0.0661	15.1250	1,207.1563	1.0000	121.0000	0.0083	11,057.2000

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
40.0000	3.0250	0.3306	106.4370	26.1818

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 5.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4HAUL	Hauling - Sub	1.00	10.37	HR	135.00	100.000	135.00	1,399.95
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	8.00	HR	153.44	108.750	166.87	1,334.92
8283	EXCAVATOR LARGE	1.00	8.00	HR	294.99	108.750	320.80	2,566.41
8326	4000 GAL WATER TRUCK	1.00	8.00	HR	126.37	108.750	137.43	1,099.40
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71

Activity: 311000.07 Wet Well Backfill Quantity: 92.00 Unit: CY

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	40.96	14.09	55.04	27.56	0.00	0.00	0.00	82.61
Total	3,768.00	1,295.82	5,063.82	2,535.88	0.00	0.00	0.00	7,599.70

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
82.6054	0.0870	11.5000	949.9625	1.0000	92.0000	0.0109	7,599.7000

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
48.0000	1.9167	0.5217	105.4963	40.9565

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: BKFL (Mod) Backfill Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 6.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8040	SINGLE DRUM COMPACTOR	1.00	8.00	HR	60.85	108.750	66.18	529.40
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.00	HR	111.02	108.750	120.73	965.87
8324	2000 GAL WATER TRUCK	1.00	8.00	HR	73.74	108.750	80.20	641.57
8UTLPU	Utility Pickup	1.00	8.00	HR	49.88	100.000	49.88	399.04
LABORER	Laborer	2.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	8.00	MH	92.00	100.000	123.64	989.11
OPERATOR	Operator	2.00	16.00	MH	87.00	100.000	116.92	1,870.71
TRUCK	Truck Driver (On Site)	1.00	8.00	MH	75.00	100.000	100.79	806.34

Activity: 312319.01 Dewatering Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	1,986.00	682.99	2,668.99	2,914.56	0.00	0.00	0.00	5,583.55
Total	1,986.00	682.99	2,668.99	2,914.56	0.00	0.00	0.00	5,583.55

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
5,583.5500	6.0000	0.1667	930.5917	0.7500	1.3333	0.7500	7,444.7333

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.0417	24.0000	111.2079	1,986.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: EXC4 (Mod) 4 man Exc Crew Prod: CH 6 Eff: 100.00 Crew Hrs: 6.00 Labor Pcs: 4.00 Equipment Pcs: 6.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8092	GENERATOR 50-59 KVA	1.00	6.00	HR	52.03	108.750	56.58	339.50
8205	PUMP 2" ELECTRIC SUBMERSIBLE	2.00	12.00	HR	8.34	108.750	9.07	108.82
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	6.00	HR	111.02	108.750	120.74	724.41
8279	EXCAVATOR SMALL-MED	1.00	6.00	HR	221.08	108.750	240.43	1,442.55
8UTLPU	Utility Pickup	1.00	6.00	HR	49.88	100.000	49.88	299.28
LABORER	Laborer	1.00	6.00	MH	65.00	100.000	87.36	524.13
OPER4	Operator Foreman	1.00	6.00	MH	92.00	100.000	123.64	741.83
OPERATOR	Operator	2.00	12.00	MH	87.00	100.000	116.92	1,403.03

Activity: 402319.01 Buried Piping Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	12,672.00	4,357.90	17,029.90	9,988.81	7,395.00	0.00	0.00	34,413.71
Total	12,672.00	4,357.90	17,029.90	9,988.81	7,395.00	0.00	0.00	34,413.71

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
27,018.7100	32.0000	0.0313	844.3347	4.0000	0.2500	4.0000	8,603.4275

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
160.0000	0.0063	160.0000	106.4369	12,672.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE Small Pipe Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 5.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	1.00	LS	6,800.00	108.750	7,395.00	7,395.00
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	32.00	HR	111.02	108.750	120.73	3,863.50
8276	EXCAVATOR SMALL	1.00	32.00	HR	130.15	108.750	141.54	4,529.15
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	2.00	64.00	MH	65.00	100.000	87.35	5,590.62
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	2.00	64.00	MH	87.00	100.000	116.92	7,482.84

Activity: 402319.02 Intake Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	47,840.00	16,452.17	64,292.17	59,291.69	53,505.01	0.00	8,500.00	185,588.87
Total	47,840.00	16,452.17	64,292.17	59,291.69	53,505.01	0.00	8,500.00	185,588.87

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
123,583.8600	80.0000	0.0125	1,544.7983	10.0000	0.1000	10.0000	18,558.8870

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
600.0000	0.0017	600.0000	107.1536	47,840.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 7.50 Equipment Pcs: 5.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	2.00	CY	225.00	108.750	244.69	489.38
2PIPEMTL	Pipe Materials	1.00	1.00	LS	48,750.00	108.750	53,015.63	53,015.63
4LINER	Liner Sub	1.00	1.00	LS	8,500.00	100.000	8,500.00	8,500.00
8040	SINGLE DRUM COMPACTOR	1.00	80.00	HR	60.85	108.750	66.17	5,293.95
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	80.00	HR	153.44	108.750	166.86	13,349.19
8283	EXCAVATOR LARGE	1.00	80.00	HR	294.99	108.750	320.80	25,664.13
8326	4000 GAL WATER TRUCK	1.00	80.00	HR	126.37	108.750	137.43	10,994.02
8UTLPU	Utility Pickup	1.00	80.00	HR	49.88	100.000	49.88	3,990.40
CARP	Carpenter - Journeyman	0.50	40.00	MH	100.00	100.000	134.39	5,375.60
LABORER	Laborer	3.00	240.00	MH	65.00	100.000	87.35	20,964.84
OPER4	Operator Foreman	1.00	80.00	MH	92.00	100.000	123.64	9,891.10
OPERATOR	Operator	3.00	240.00	MH	87.00	100.000	116.92	28,060.63

Activity: 402319.03 Pipe & Fittings Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	11,372.64	3,911.06	15,283.70	2,394.24	22,598.25	0.00	0.00	40,276.19
Total	11,372.64	3,911.06	15,283.70	2,394.24	22,598.25	0.00	0.00	40,276.19

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
17,677.9400	48.0000	0.0208	368.2904	6.0000	0.1667	6.0000	6,712.6983

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
144.0000	0.0069	144.0000	106.1368	11,372.6400

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHSM (Mod) Small Mechanical Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEACC	Pipe Accessories	1.00	1.00	LS	1,180.00	108.750	1,283.25	1,283.25
2PIPEMTL	Pipe Materials	1.00	1.00	LS	19,600.00	108.750	21,315.00	21,315.00
8UTLPU	Utility Pickup	1.00	48.00	HR	49.88	100.000	49.88	2,394.24
LABORER	Laborer	1.00	48.00	MH	65.00	100.000	87.35	4,192.97
MILLWR	Millwright	1.00	48.00	MH	80.22	100.000	107.81	5,174.77
PLUMB	Plumber - Journeyman	1.00	48.00	MH	91.71	100.000	123.25	5,915.96

Activity: 432113.01 Pumps Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	5,074.40	1,745.08	6,819.48	1,849.76	91,350.00	0.00	0.00	100,019.24
Total	5,074.40	1,745.08	6,819.48	1,849.76	91,350.00	0.00	0.00	100,019.24

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
8,669.2400	16.0000	0.0625	541.8275	2.0000	0.5000	2.0000	50,009.6200

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	0.0156	64.0000	106.5544	5,074.4000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MECHMD Medium Mechanical Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PUMP	Submersible Pump	1.00	2.00	EA	42,000.00	108.750	45,675.00	91,350.00
8MECHTRK	Mechanics Truck	1.00	16.00	HR	65.73	100.000	65.73	1,051.68
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
MILLWR	Millwright	2.00	32.00	MH	80.22	100.000	107.81	3,449.84
PLUMB	Plumber - Journeyman	1.00	16.00	MH	91.71	100.000	123.25	1,971.98

Activity: 339901.99 Bypass Allowance Quantity: 1.00 Unit: EA

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	9,504.00	3,268.43	12,772.43	10,496.52	0.00	2,175.00	0.00	25,443.95
Total	9,504.00	3,268.43	12,772.43	10,496.52	0.00	2,175.00	0.00	25,443.95

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
23,268.9500	24.0000	0.0417	969.5396	3.0000	0.3333	3.0000	8,481.3167

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
120.0000	0.0083	120.0000	106.4369	9,504.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE (Mod) Small Pipe Crew Prod: S 3 Eff: 100.00 Crew Hrs: 24.00 Labor Pcs: 5.00 Equipment Pcs: 6.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3PIPEMTL	Temp Pipe Materials	1.00	100.00	LF	20.00	108.750	21.75	2,175.00
8092	GENERATOR 50-59 KVA	1.00	24.00	HR	52.03	108.750	56.58	1,358.01
8165	PUMP 6" SELF PRIME - ELECTRI	2.00	48.00	HR	31.55	108.750	34.31	1,646.91
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	24.00	HR	111.02	108.750	120.73	2,897.62
8276	EXCAVATOR SMALL	1.00	24.00	HR	130.15	108.750	141.54	3,396.86
8UTLPU	Utility Pickup	1.00	24.00	HR	49.88	100.000	49.88	1,197.12
LABORER	Laborer	2.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPER4	Operator Foreman	1.00	24.00	MH	92.00	100.000	123.64	2,967.33
OPERATOR	Operator	2.00	48.00	MH	87.00	100.000	116.92	5,612.13

Biditem

110

Effluent Pipeline

Takeoff Qty: 3,975.000 LF  
 Bid Qty: 3,975.000 LF

Client #: 11

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	40.91	14.07	54.98	71.28	113.50	7.96	18.27	265.99
Total	162,607.60	55,920.77	218,528.37	283,335.91	451,163.90	31,651.69	72,630.00	1,057,309.87

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
2,099.0000	1.8938	0.5281	503.7208	77.4691	104.1107	8.2366

Activity: 339900.07 Unload/Stage Pipe Quantity: 1.07 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1,943.93	668.51	2,612.44	4,184.46	0.00	0.00	0.00	6,796.90
Total	2,080.00	715.31	2,795.31	4,477.37	0.00	0.00	0.00	7,272.68

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
6,796.8972	29.9065	0.0334	227.2713	4.0000	0.2675	3.7383	1,818.1700

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
32.0000	0.0334	29.9065	87.3534	1,943.9252

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LAB4 (Mod) 4 Man Labor Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 1.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8*FORK10	Reach Forklift - 10000 lb	1.00	32.00	HR	128.66	108.750	139.92	4,477.37
LABORER	Laborer	1.00	32.00	MH	65.00	100.000	87.35	2,795.31

Activity: 015526.02 Traffic Control - Unpaved Sections Quantity: 1.07 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	4,067.29	1,398.74	5,466.03	2,983.48	0.00	5,188.50	0.00	13,638.00
Total	4,352.00	1,496.65	5,848.65	3,192.32	0.00	5,551.69	0.00	14,592.66

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
8,449.5047	119.6262	0.0084	70.6326	16.0000	0.0669	14.9533	912.0413

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	0.0167	59.8131	91.3852	4,067.2897

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: TRAFIC (Mod) Traffic Control Prod: S 16 Eff: 100.00 Crew Hrs: 128.00 Labor Pcs: 0.50 Equipment Pcs: 0.50

Notes: Assumed Traffic Control for paved road alignment.

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3TCARROW	Traffic Control Arrow Board	1.00	0.00	EAD	40.00	108.750	0.00	0.00
3TCBARRELS	Traffic Control Barrels	1.00	0.00	EAD	2.25	108.750	0.00	0.00
3TCBARRIER	Traffic Control Conc Barrier	1.00	0.00	FT/D	1.00	108.750	0.00	0.00
3TCCONES	Traffic Control Cones	1.00	810.00	EAD	1.50	108.750	1.63	1,321.31
3TCMSGBD	Traffic Control Message Board	1.00	0.00	MO	3,800.00	108.750	0.00	0.00
3TCPLATE	Traffic Control Traffic Plate	1.00	162.00	EAD	20.00	108.750	21.75	3,523.50
3TCSIGNS	Traffic Control Signs	1.00	130.00	EAD	5.00	108.750	5.44	706.88
3TCWTRBARR	Traffic Control Water Barrier	1.00	0.00	FT/D	3.25	108.750	0.00	0.00
8UTLPU	Utility Pickup	0.50	64.00	HR	49.88	100.000	49.88	3,192.32
FLAG	Flagger	0.00	0.00	MH	48.91	100.000	0.00	0.00
LAB4	Labor Foreman	0.50	64.00	MH	68.00	100.000	91.39	5,848.65

Activity: 311000.01 Earthwork - Clearing Quantity: 59625.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.03	0.01	0.04	0.08	0.00	0.00	0.00	0.12
Total	1,816.00	624.52	2,440.52	4,658.05	0.00	0.00	0.00	7,098.57

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
0.1191	0.0001	7,453.1250	887.3213	1.0000	59,625.0000	0.0000	7,098.5700

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	2,484.3750	0.0004	101.6883	0.0305

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: PIONR (Mod) Pioneering Crew Prod: S 1 Eff: 100.00 Crew Hrs: 8.00 Labor Pcs: 3.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8290	DOZER STANDARD TRACK MED	1.00	8.00	HR	409.04	108.750	444.83	3,558.65
8326	4000 GAL WATER TRUCK	1.00	8.00	HR	126.37	108.750	137.43	1,099.40
LABORER	Laborer	1.00	8.00	MH	65.00	100.000	87.35	698.83
OPERATOR	Operator	1.00	8.00	MH	87.00	100.000	116.92	935.35
TRUCK	Truck Driver (On Site)	1.00	8.00	MH	75.00	100.000	100.79	806.34

Activity: 312000.02 Gravel Road Quantity: 25000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.21	0.07	0.28	0.29	0.43	0.00	0.00	1.00
Total	5,296.00	1,821.30	7,117.30	7,232.56	10,766.25	0.00	0.00	25,116.11

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
0.5740	0.0006	1,562.5000	896.8663	2.0000	12,500.0000	0.0001	12,558.0550

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
64.0000	390.6250	0.0026	111.2078	0.2118

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: LGGRD (Mod) Large Grading Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 4.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BASE	Base Rock	1.00	550.00	TON	18.00	108.750	19.58	10,766.25
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8239	MOTORGRADER/BLADE	1.00	16.00	HR	182.58	108.750	198.56	3,176.89
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80

8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	1.00	16.00	MH	65.00	100.000	87.35	1,397.66
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22
OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42

Activity: 339900.01 Install Pipeline - Dig/Lay/Backfill Quantity: 3975.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	26.47	9.10	35.57	57.61	0.00	6.57	15.62	115.37
Total	105,216.00	36,183.79	141,399.79	228,985.46	0.00	26,100.00	62,100.00	458,585.25

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
93.1787	0.0483	20.7031	1,929.0898	24.0000	165.6250	0.0060	19,107.7188

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
1,344.0000	2.9576	0.3381	105.2082	26.4694

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 24 Eff: 100.00 Crew Hrs: 192.00 Labor Pcs: 7.00 Equipment Pcs: 8.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
3FUSIONRENT	Rental HDPE Fusion Machine	1.00	5.00	WEEK	4,800.00	108.750	5,220.00	26,100.00
4HAUL	Hauling - Sub	1.00	460.00	HR	135.00	100.000	135.00	62,100.00
8027	VIB PLATE	1.00	192.00	HR	18.51	108.750	20.13	3,864.89
8040	SINGLE DRUM COMPACTOR	1.00	192.00	HR	60.85	108.750	66.17	12,705.48
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	192.00	HR	153.44	108.750	166.86	32,038.06
8282	EXCAVATOR MED	1.00	192.00	HR	246.65	108.750	268.23	51,500.52
8283	EXCAVATOR LARGE	1.00	192.00	HR	294.99	108.750	320.80	61,593.91
8285	EXCAVATOR BREAKER	1.00	192.00	HR	150.00	108.750	163.13	31,320.00
8326	4000 GAL WATER TRUCK	1.00	192.00	HR	126.37	108.750	137.43	26,385.64
8UTLPU	Utility Pickup	1.00	192.00	HR	49.88	100.000	49.88	9,576.96
LABORER	Laborer	3.00	576.00	MH	65.00	100.000	87.35	50,315.62
OPER4	Operator Foreman	1.00	192.00	MH	92.00	100.000	123.64	23,738.65
OPERATOR	Operator	3.00	576.00	MH	87.00	100.000	116.92	67,345.52

Activity: 339900.99 Abandon Existing Pipeline Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	7,376.00	2,536.61	9,912.61	12,180.41	1,223.44	0.00	0.00	23,316.46
Total	7,376.00	2,536.61	9,912.61	12,180.41	1,223.44	0.00	0.00	23,316.46

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
22,093.0200	16.0000	0.0625	1,380.8138	2.0000	0.5000	2.0000	11,658.2300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	0.0104	96.0000	103.2564	7,376.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction  
 Crew: LGPIPE (Mod) Large Pipe Crew Prod: S 2 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 6.00 Equipment Pcs: 6.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	5.00	CY	225.00	108.750	244.69	1,223.44
8027	VIB PLATE	1.00	16.00	HR	18.51	108.750	20.13	322.07
8040	SINGLE DRUM COMPACTOR	1.00	16.00	HR	60.85	108.750	66.17	1,058.79
8268	LOADER WHEEL 3.0-3.4 CUBIC Y	1.00	16.00	HR	153.44	108.750	166.87	2,669.84
8283	EXCAVATOR LARGE	1.00	16.00	HR	294.99	108.750	320.80	5,132.83
8326	4000 GAL WATER TRUCK	1.00	16.00	HR	126.37	108.750	137.43	2,198.80
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	3.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22

OPERATOR	Operator	2.00	32.00	MH	87.00	100.000	116.92	3,741.42
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**Activity: 339900.02 Materials Quantity: 3975.00 Unit: LF**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	99.27	0.00	0.00	99.27
Total	0.00	0.00	0.00	0.00	394,579.37	0.00	0.00	394,579.37

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2BASE	Base Rock	1.00	1,552.40	TON	18.00	108.750	19.58	30,388.23
2PIPEACC	Pipe Accessories	1.00	3,975.00	LF	3.00	108.750	3.26	12,968.44
2PIPEMTL	Pipe Materials	1.00	3,975.00	LF	75.00	108.750	81.56	324,210.94
2SAND	Bedding Sand - FOB Plant	1.00	1,552.40	TON	16.00	108.750	17.40	27,011.76

**Activity: 339900.05 Potholing Quantity: 4.30 Unit: EA**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	792.00	272.37	1,064.37	624.30	0.00	0.00	0.00	1,688.67
Total	3,405.60	1,171.19	4,576.79	2,684.49	0.00	0.00	0.00	7,261.28

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,688.6698	2.0000	0.5000	844.3349	1.0750	4.0000	0.2500	6,754.6791

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
43.0000	0.1000	10.0000	106.4370	792.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE Small Pipe Crew Prod: HU 2 Eff: 100.00 Crew Hrs: 8.60 Labor Pcs: 5.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
8267	LOADER WHEEL 2.5-2.9 CUBIC Y	1.00	8.60	HR	111.02	108.750	120.73	1,038.31
8276	EXCAVATOR SMALL	1.00	8.60	HR	130.15	108.750	141.54	1,217.21
8UTLPU	Utility Pickup	1.00	8.60	HR	49.88	100.000	49.88	428.97
LABORER	Laborer	2.00	17.20	MH	65.00	100.000	87.35	1,502.49
OPER4	Operator Foreman	1.00	8.60	MH	92.00	100.000	123.64	1,063.29
OPERATOR	Operator	2.00	17.20	MH	87.00	100.000	116.92	2,011.01

**Activity: 339900.06 Raise/Collar Quantity: 3.00 Unit: EA**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	618.00	212.53	830.53	360.38	122.34	0.00	0.00	1,313.25
Total	1,854.00	637.59	2,491.59	1,081.13	367.03	0.00	0.00	3,939.75

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
1,190.9067	2.0000	0.5000	595.4533	0.7500	4.0000	0.2500	5,253.0000

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
24.0000	0.1250	8.0000	103.8163	618.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: MINIP (Mod) Mini Pipe Crew Prod: HU 2 Eff: 100.00 Crew Hrs: 6.00 Labor Pcs: 4.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONC	Ready-Mix Concrete	1.00	1.50	CY	225.00	108.750	244.69	367.03
8002	COMPRESSOR 175-195 CFM	1.00	6.00	HR	28.37	108.750	30.85	185.11
8016	BREAKER PAVEMENT AIR 90#	1.00	6.00	HR	18.00	108.750	19.58	117.45
8243	BACKHOE/LOADER 60-90HP 4WD	1.00	6.00	HR	73.45	108.750	79.88	479.29
8UTLPU	Utility Pickup	1.00	6.00	HR	49.88	100.000	49.88	299.28
LABORER	Laborer	2.00	12.00	MH	65.00	100.000	87.35	1,048.24
OPER4	Operator Foreman	1.00	6.00	MH	92.00	100.000	123.64	741.83

OPERATOR	Operator	1.00	6.00	MH	87.00	100.000	116.92	701.52
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Activity: 320001.01	AC Patch Paving	Quantity: 15000.00	Unit: SF
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	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	1.84	0.63	2.48	1.20	2.92	0.00	0.70	7.30
Total	27,660.00	9,512.28	37,172.28	18,046.04	43,762.36	0.00	10,530.00	109,510.68

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
3.6812	0.0040	250.0000	920.3053	7.5000	2,000.0000	0.0005	14,601.4240

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
360.0000	41.6667	0.0240	103.2563	1.8440

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: PAVE (Mod) Asphalt Paving Prod: S 7.5 Eff: 100.00 Crew Hrs: 60.00 Labor Pcs: 6.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ACPAVEMENT	Asphalt	1.00	383.25	TON	105.00	108.750	114.19	43,762.36
4HAUL	Hauling - Sub	1.00	78.00	HR	135.00	100.000	135.00	10,530.00
8042	ROLLER MD DOUBLE DRUM	1.00	60.00	HR	62.64	108.750	68.12	4,087.26
8272	LOADER LANDSCAPER 4WD	1.00	60.00	HR	41.69	108.750	45.34	2,720.47
8326	4000 GAL WATER TRUCK	1.00	60.00	HR	126.37	108.750	137.43	8,245.51
8UTLPU	Utility Pickup	1.00	60.00	HR	49.88	100.000	49.88	2,992.80
LABORER	Laborer	3.00	180.00	MH	65.00	100.000	87.35	15,723.63
OPER4	Operator Foreman	1.00	60.00	MH	92.00	100.000	123.64	7,418.33
OPERATOR	Operator	2.00	120.00	MH	87.00	100.000	116.92	14,030.32

Activity: 402319.01	Pipe Testing/Cleaning	Quantity: 1.07	Unit: LS
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	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	3,319.63	1,141.62	4,461.24	745.87	435.00	0.00	0.00	5,642.11
Total	3,552.00	1,221.53	4,773.53	798.08	465.45	0.00	0.00	6,037.06

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
5,207.1121	14.9533	0.0669	348.2256	2.0000	0.5350	1.8692	3,018.5300

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
48.0000	0.0223	44.8598	99.4485	3,319.6262

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: SMPPIPE (Mod) Small Pipe Crew Prod: CH 16 Eff: 100.00 Crew Hrs: 16.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2PIPEMTL	Pipe Materials	1.00	1.07	LS	400.00	108.750	435.00	465.45
8UTLPU	Utility Pickup	1.00	16.00	HR	49.88	100.000	49.88	798.08
LABORER	Laborer	2.00	32.00	MH	65.00	100.000	87.35	2,795.31
OPER4	Operator Foreman	1.00	16.00	MH	92.00	100.000	123.64	1,978.22

**Biditem**

**120**

**Electrical Work**

Takeoff Qty: 1.000 LS  
 Bid Qty: 1.000 LS

**Client #: 12**

	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
U. Cost	335,529.04	115,388.45	450,917.49	128,526.85	1,715,116.92	25,848.25	209,684.50	2,530,094.01
Total	335,529.04	115,388.45	450,917.49	128,526.85	1,715,116.92	25,848.25	209,684.50	2,530,094.01

Manhours	Unit/MH	MH/Unit	\$/MH	Base Labor/MH	Total Labor/MH	Unit/CH
4,432.0000	0.0002	4,432.0000	570.8696	75.7060	101.7413	0.0008

Activity: 260001.01	Electrical Gear	Quantity: 1.00	Unit: LS
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	Base Labor	Burden	Total Labor	Equipment	Perm Mats	Const Mats	Sub	Total
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U. Cost	70,250.40	24,159.11	94,409.51	11,971.20	494,812.50	0.00	0.00	601,193.21
Total	70,250.40	24,159.11	94,409.51	11,971.20	494,812.50	0.00	0.00	601,193.21

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
106,380.7100	240.0000	0.0042	443.2530	30.0000	0.0333	30.0000	20,039.7737

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
960.0000	0.0010	960.0000	98.3432	70,250.4000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC Electrical Crew Prod: S 30 Eff: 100.00 Crew Hrs: 240.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2MCC02	MCC 2	1.00	1.00	EA	267,000.00	108.750	290,362.50	290,362.50
2SWB	Main Switchgear	1.00	1.00	LS	188,000.00	108.750	204,450.00	204,450.00
8UTLPU	Utility Pickup	1.00	240.00	HR	49.88	100.000	49.88	11,971.20
ELEC	Electrician	2.00	480.00	MH	73.88	100.000	99.29	47,657.92
ELEC4	Electrician Foreman	1.00	240.00	MH	79.95	100.000	107.44	25,786.75
LABORER	Laborer	1.00	240.00	MH	65.00	100.000	87.35	20,964.84

Activity: 260001.02 Electrical Work Quantity: 1.00 Unit: LS

U. Cost	109,300.80	37,588.55	146,889.35	23,942.40	130,500.00	0.00	75,332.75	376,664.50
Total	109,300.80	37,588.55	146,889.35	23,942.40	130,500.00	0.00	75,332.75	376,664.50

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
170,831.7500	480.0000	0.0021	355.8995	60.0000	0.0167	60.0000	6,277.7417

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
1,440.0000	0.0007	1,440.0000	102.0065	109,300.8000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC (Mod) Electrical Crew Prod: S 60 Eff: 100.00 Crew Hrs: 480.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ELECMTL	Electrical Materials	1.00	1.00	LS	120,000.00	108.750	130,500.00	130,500.00
4ELEC	Electric - Sub	1.00	301,331.00	LS	0.25	100.000	0.25	75,332.75
8UTLPU	Utility Pickup	1.00	480.00	HR	49.88	100.000	49.88	23,942.40
ELEC	Electrician	2.00	960.00	MH	73.88	100.000	99.29	95,315.84
ELEC4	Electrician Foreman	1.00	480.00	MH	79.95	100.000	107.44	51,573.51

Activity: 260001.03 Electrical Transfers Quantity: 1.00 Unit: LS

U. Cost	36,433.60	12,529.51	48,963.11	47,358.74	21,750.00	0.00	29,517.75	147,589.60
Total	36,433.60	12,529.51	48,963.11	47,358.74	21,750.00	0.00	29,517.75	147,589.60

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
96,321.8500	160.0000	0.0063	602.0116	20.0000	0.0500	20.0000	7,379.4800

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
480.0000	0.0021	480.0000	102.0065	36,433.6000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC (Mod) Electrical Crew Prod: S 20 Eff: 100.00 Crew Hrs: 160.00 Labor Pcs: 3.00 Equipment Pcs: 2.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ELECMTL	Electrical Materials	1.00	1.00	LS	20,000.00	108.750	21,750.00	21,750.00
4ELEC	Electric - Sub	1.00	118,071.00	LS	0.25	100.000	0.25	29,517.75
8104	GENERATOR 600-699 KVA	1.00	160.00	HR	226.31	108.750	246.11	39,377.94
8UTLPU	Utility Pickup	1.00	160.00	HR	49.88	100.000	49.88	7,980.80
ELEC	Electrician	2.00	320.00	MH	73.88	100.000	99.29	31,771.94
ELEC4	Electrician Foreman	1.00	160.00	MH	79.95	100.000	107.44	17,191.17

Activity: 260001.04 New Generator Quantity: 1.00 Unit: LS

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for 14,184.1000.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for 128.0000.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC Electrical Crew Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 4.00 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows for 2ELECMTL, 2GENSET, 4CRANE, 8UTLPU, ELEC, ELEC4, LABORER.

Activity: 260001.04.1 Generator Pad Quantity: 27.00 Unit: CY

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for 1,065.8404.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for 216.0000.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: 4CARP (Mod) 4 Man Carp Crew Prod: S 6 Eff: 100.00 Crew Hrs: 48.00 Labor Pcs: 4.50 Equipment Pcs: 1.00

Table with 9 columns: Resource, Description, Pcs/Wste, Quantity, Unit, Unit Cost, Tax/OT %, Actual UC, Total. Rows for 2AB, 2CONC, 3FORMMTL, 4PUMP, 4REBAR, 8UTLPU, CARP, CARP4, LABORER, MASON.

Activity: 260040.01 Duct Banks Quantity: 1930.00 Unit: LF

Table with 9 columns: Base Labor, Burden, Total Labor, Equipment, Perm Matls, Const Matls, Sub, Total. Rows for U. Cost and Total.

Table with 9 columns: Crew \$/Unit, Crew Hrs/Unit, Units/Crew Hr, \$/Crew Hour, Shifts, Units/Shift, Shifts/Unit, \$/Shift. Row for 24.8380.

Table with 6 columns: Manhours, Unit/MH, MH/Unit, Total Labor/MH, Base Labor/Unit. Row for 320.0000.

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: DUCT Duct Bank Crew Prod: S 10 Eff: 100.00 Crew Hrs: 80.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2DUCTMTL	Duct Bank Conduit Materials	1.00	1,930.00	LF	45.00	108.750	48.94	94,449.38
2SAND	Bedding Sand - FOB Plant	1.00	510.00	TON	16.00	108.750	17.40	8,874.00
8245	BACKHOE/LOADER 91-104HP 4WD	1.00	80.00	HR	99.81	108.750	108.54	8,683.47
8UTLPU	Utility Pickup	2.00	160.00	HR	49.88	100.000	49.88	7,980.80
ELEC	Electrician	1.00	80.00	MH	73.88	100.000	99.29	7,942.99
LABORER	Laborer	2.00	160.00	MH	65.00	100.000	87.35	13,976.56
OPERATOR	Operator	1.00	80.00	MH	87.00	100.000	116.92	9,353.54

Activity: 260040.02 Primary Service Quantity: 300.00 Unit: LF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	23.27	8.00	31.27	16.66	103.39	83.33	0.00	234.66
Total	6,981.12	2,400.80	9,381.92	4,999.28	31,015.50	25,000.00	0.00	70,396.70

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
47.9373	0.0800	12.5000	599.2167	3.0000	100.0000	0.0100	23,465.5667

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
96.0000	3.1250	0.3200	97.7283	23.2704

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: DUCT Duct Bank Crew Prod: S 3 Eff: 100.00 Crew Hrs: 24.00 Labor Pcs: 4.00 Equipment Pcs: 3.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
1UTILITYFEE	Utility Fee	1.00	1.00	LS	25,000.00	100.000	25,000.00	25,000.00
2DUCTMTL	Duct Bank Conduit Materials	1.00	300.00	LF	75.00	108.750	81.56	24,468.75
2PULLBOX	Pull Box	1.00	2.00	EA	1,250.00	108.750	1,359.38	2,718.75
2SAND	Bedding Sand - FOB Plant	1.00	80.00	TON	16.00	108.750	17.40	1,392.00
2TPAD	Precast T-Pad	1.00	1.00	EA	2,240.00	108.750	2,436.00	2,436.00
8245	BACKHOE/LOADER 91-104HP 4WD	1.00	24.00	HR	99.81	108.750	108.54	2,605.04
8UTLPU	Utility Pickup	2.00	48.00	HR	49.88	100.000	49.88	2,394.24
ELEC	Electrician	1.00	24.00	MH	73.88	100.000	99.29	2,382.89
LABORER	Laborer	2.00	48.00	MH	65.00	100.000	87.35	4,192.97
OPERATOR	Operator	1.00	24.00	MH	87.00	100.000	116.92	2,806.06

Activity: 260099.01 PLC/Controls Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	45,542.00	15,661.90	61,203.90	9,976.00	94,748.44	0.00	82,964.00	248,892.34
Total	45,542.00	15,661.90	61,203.90	9,976.00	94,748.44	0.00	82,964.00	248,892.34

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
71,179.9000	200.0000	0.0050	355.8995	25.0000	0.0400	25.0000	9,955.6936

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
600.0000	0.0017	600.0000	102.0065	45,542.0000

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: ELEC (Mod) Electrical Crew Prod: S 25 Eff: 100.00 Crew Hrs: 200.00 Labor Pcs: 3.00 Equipment Pcs: 1.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2CONTROLWIRE	Control Wire	1.00	2,500.00	LF	0.85	108.750	0.92	2,310.94
2PLC	PLC	1.00	1.00	LS	85,000.00	108.750	92,437.50	92,437.50
4CONTROLS	Controls Integration Sub	1.00	165,928.00	LS	0.50	100.000	0.50	82,964.00
8UTLPU	Utility Pickup	1.00	200.00	HR	49.88	100.000	49.88	9,976.00
ELEC	Electrician	2.00	400.00	MH	73.88	100.000	99.29	39,714.93
ELEC4	Electrician Foreman	1.00	200.00	MH	79.95	100.000	107.44	21,488.97

Activity: 320001.01 AC Patch Paving Quantity: 8000.00 Unit: SF

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	1.84	0.63	2.48	1.20	2.93	0.00	0.71	7.32
Total	14,752.00	5,073.22	19,825.22	9,624.56	23,408.44	0.00	5,670.00	58,528.22

Crew \$/Unit	Crew Hrs/Unit	Units/Crew Hr	\$/Crew Hour	Shifts	Units/Shift	Shifts/Unit	\$/Shift
3.6812	0.0040	250.0000	920.3056	4.0000	2,000.0000	0.0005	14,632.0550

Manhours	Unit/MH	MH/Unit	Total Labor/MH	Base Labor/Unit
192.0000	41.6667	0.0240	103.2564	1.8440

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Crew: PAVE (Mod) Asphalt Paving Prod: S 4 Eff: 100.00 Crew Hrs: 32.00 Labor Pcs: 6.00 Equipment Pcs: 4.00

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
2ACPAVEMENT	Asphalt	1.00	205.00	TON	105.00	108.750	114.19	23,408.44
4HAUL	Hauling - Sub	1.00	42.00	HR	135.00	100.000	135.00	5,670.00
8042	ROLLER MD DOUBLE DRUM	1.00	32.00	HR	62.64	108.750	68.12	2,179.87
8272	LOADER LANDSCAPER 4WD	1.00	32.00	HR	41.69	108.750	45.34	1,450.92
8326	4000 GAL WATER TRUCK	1.00	32.00	HR	126.37	108.750	137.43	4,397.61
8UTLPU	Utility Pickup	1.00	32.00	HR	49.88	100.000	49.88	1,596.16
LABORER	Laborer	3.00	96.00	MH	65.00	100.000	87.35	8,385.94
OPER4	Operator Foreman	1.00	32.00	MH	92.00	100.000	123.64	3,956.44
OPERATOR	Operator	2.00	64.00	MH	87.00	100.000	116.92	7,482.84

**Biditem**

**2000**

**Escalation (5% YOYx 2 Yrs)**

Takeoff Qty: 1.000 LS  
Bid Qty: 1.000 LS

Client #: ESC

**Biditem**

**2500**

**Contingency (30%)**

Takeoff Qty: 1.000 LS  
Bid Qty: 1.000 LS

Client #: CONT

**Biditem**

**990001**

**General Account**

Takeoff Qty: 1.000 LS  
Bid Qty: 1.000 LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	31,102.50	0.00	682,594.80	51,620.00	765,317.30
Total	0.00	0.00	0.00	31,102.50	0.00	682,594.80	51,620.00	765,317.30

Activity: 999 PROJECT SUPPORT Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	0.00	0.00	34,400.00	34,400.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	34,400.00	34,400.00

Calendar: Code not found. Hrs/Shift: 8 WC: Code not found.

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4*CRANESUB	Crane Subcontractor	1.00	0.00	HR	500.00	100.000	0.00	0.00
4*QAQC	QA/QC Testing	1.00	0.00	LS	0.00	100.000	0.00	0.00
4*SURVEY	Land Surveyor	1.00	160.00	HR	215.00	100.000	215.00	34,400.00
5*CRANE-CRAW	Crawler Crane	1.00	0.00	HR	400.00	100.000	0.00	0.00
5*CRANE-HYDR	Hydrolic Crane	1.00	0.00	HR	200.00	100.000	0.00	0.00

8*BOOM45	→ 45' Boomlift	1.00	0.00	HR	38.00	108.750	0.00	0.00
8*FORK10	→ Reach Forklift - 10000 lb	1.00	0.00	HR	128.66	108.750	0.00	0.00
8*FORK8	→ Reach Forklift - 8000 lb	1.00	0.00	HR	145.75	108.750	0.00	0.00
8*SHOPLIFT	→ Shop Forklift	1.00	0.00	HR	30.56	108.750	0.00	0.00
OPERATOR	→ Operator	1.00	0.00	MH	87.00	100.000	0.00	0.00
RIGGER	→ Crane Rigger	1.00	0.00	MH	78.00	100.000	0.00	0.00

Activity: 9999 MOB/DEMOB EQUIPMENT Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	0.00	0.00	0.00	17,220.00	17,220.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	17,220.00	17,220.00

Calendar: STD Standard Hrs/Shift: 8 WC: 5221 Concrete Construction

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
4*9AXL	9 axel Heavy Equipment Trans	1.00	28.00	HR	225.00	100.000	225.00	6,300.00
4*TRUCKING	Flat bed material transport	1.00	84.00	HR	130.00	100.000	130.00	10,920.00

Activity: 9 GENERAL CONDITIONS Quantity: 1.00 Unit: LS

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
U. Cost	0.00	0.00	0.00	31,102.50	0.00	682,594.80	0.00	713,697.30
Total	0.00	0.00	0.00	31,102.50	0.00	682,594.80	0.00	713,697.30

Calendar: Code not found. Hrs/Shift: 8 WC: Code not found.

Resource	Description	Pcs/Wste	Quantity	Unit	Unit Cost	Tax/OT %	Actual UC	Total
1*ADMIN	Project Admin	1.00	0.00	MO	6,000.00	110.000	0.00	0.00
1*APM	Assistant PM	1.00	0.00	MO	12,000.00	110.000	0.00	0.00
1*PE	Project Engineer	1.00	9.00	MO	8,000.00	110.000	8,800.00	79,200.00
1*PM	Project Manager	1.00	4.00	MO	14,000.00	110.000	15,400.00	61,600.00
1*SAFETY	Safety Professional	1.00	2.00	MO	8,000.00	110.000	8,800.00	17,600.00
1*SUPT	Project Superintendent	1.00	9.00	MO	13,000.00	110.000	14,300.00	128,700.00
1*TRADESUPT	Trade Superintendent	1.00	2.00	MO	10,000.00	110.000	11,000.00	22,000.00
3*AIRPHOTO	Aerial Photography	1.00	0.00	EA	2,000.00	108.750	0.00	0.00
3*COMPUTER	Computer Cost	1.00	1.00	EA	3,500.00	108.750	3,806.25	3,806.25
3*CONEX	Conex storage box	1.00	27.00	MO	150.00	108.750	163.13	4,404.38
3*COPIER	Office Copier	1.00	9.00	MO	250.00	108.750	271.88	2,446.88
3*DH	SMALL TOOLS & SAFETY SUPPLIE	1.00	20,845.87	LBHR	5.00	108.750	5.44	113,349.42
3*DUMPSTER	Dumpster	1.00	9.00	EAM	550.00	108.750	598.13	5,383.13
3*MAIL/FEDEX	Mail/Fedex/Postage	1.00	9.00	MO	250.00	108.750	271.88	2,446.88
3*OFFICE	Project Office - Per Single	1.00	9.00	MO	800.00	108.750	870.00	7,830.00
3*OFFICESUP	Office Supplies	1.00	9.00	MO	500.00	108.750	543.75	4,893.75
3*PHOTOS	Jobsite Photos	1.00	9.00	MO	100.00	108.750	108.75	978.75
3*PRINT	Printing & Copying Service	1.00	9.00	MO	400.00	108.750	435.00	3,915.00
3*SNOWREMOVE	Snow Removal	1.00	0.00	MO	350.00	108.750	0.00	0.00
3*TD	Builders Risk Insurance	1.00	9,471,763.74	TDC\$	0.02	108.750	0.02	206,010.86
3*TEMPELESET	Temp Electrical Setup	1.00	1.00	LS	2,500.00	108.750	2,718.75	2,718.75
3*TEMPELEUSE	Temp Electric Use	1.00	9.00	MO	200.00	108.750	217.50	1,957.50
3*TEMPFENCE	Temp Fence	1.00	400.00	LF	3.00	108.750	3.26	1,305.00
3*TEMPH20SET	Temp Water Setup	1.00	1.00	LS	2,000.00	108.750	2,175.00	2,175.00
3*TEMPH20USE	Temp Water Usage	1.00	600.00	KGAL	5.50	108.750	5.98	3,588.75
3*TEMPHEAT	Temp Heat	1.00	0.00	GAL	7.00	108.750	0.00	0.00
3*TEMPTOILET	Temp Toilets	1.00	24.00	MO	145.00	108.750	157.69	3,784.50
3*WINTERPRO	Winter Protection	1.00	0.00	CY	3.00	108.750	0.00	0.00
8*PICKUP	→ Admin Pickup	1.00	26.00	MO	1,100.00	108.750	1,196.25	31,102.50
9*PERMITS	Permit Fees	1.00	1.00	LS	2,500.00	100.000	2,500.00	2,500.00

**Report Summary**

	Base Labor	Burden	Total Labor	Equipment	Perm Matls	Const Matls	Sub	Total
Total	1,691,673	582,093	2,273,767	1,069,123	4,722,866	795,030	1,376,295	10,237,081

**Calendars Used In Estimate**

STD

Standard

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Timeline											
								Dec	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter	
									Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
1		<b>La Contenta WWTF</b>	<b>193 days</b>	<b>Mon 1/5/26</b>	<b>Wed 9/30/26</b>			[Summary Bar]											
2		<b>Milestones</b>	<b>193 days</b>	<b>Mon 1/5/26</b>	<b>Wed 9/30/26</b>			[Summary Bar]											
3		NTP	0 days	Mon 1/5/26	Mon 1/5/26			1/5											
4		Substantial Completion	0 days	Wed 9/9/26	Wed 9/9/26	6		9/9											
5		Final Completion	0 days	Wed 9/30/26	Wed 9/30/26	4FS+15 days		9/30											
6		<b>Construction</b>	<b>178 days</b>	<b>Mon 1/5/26</b>	<b>Wed 9/9/26</b>			[Summary Bar]											
7		Mobilization	5 days	Mon 1/5/26	Fri 1/9/26	3		[Task Bar]											
8		Site Clearing	3 days	Mon 1/12/26	Wed 1/14/26	7		[Task Bar]											
9		Remove Existing Surfacing	2 days	Thu 1/15/26	Fri 1/16/26	8		[Task Bar]											
10		Cut/Fill Aeration Pond	7 days	Thu 1/15/26	Fri 1/23/26	8		[Task Bar]											
11		Excavate for Clarifier	3 days	Mon 1/26/26	Wed 1/28/26	10		[Task Bar]											
12		Clarifier Invert	10 days	Thu 1/29/26	Wed 2/11/26	11		[Task Bar]											
13		Clarifier Walls	25 days	Thu 2/12/26	Wed 3/18/26	12		[Task Bar]											
14		Backfill Clarifier	5 days	Thu 4/9/26	Wed 4/15/26	13FS+15 days		[Task Bar]											
15		Aeration Pond Grading	3 days	Thu 4/16/26	Mon 4/20/26	14		[Task Bar]											
16		Aeration Pond Concrete Liner	3 days	Tue 4/21/26	Thu 4/23/26	15		[Task Bar]											
17		Yard Piping	30 days	Thu 1/29/26	Wed 3/11/26	11		[Task Bar]											
18		Duct Banks	10 days	Thu 3/12/26	Wed 3/25/26	17		[Task Bar]											
19		New Primary Electrical	5 days	Thu 3/26/26	Wed 4/1/26	18		[Task Bar]											

Project: Draft Construction Schedule Date: Tue 11/5/24	Task		Project Summary		Manual Task		Start-only		Deadline	
	Split		Inactive Task		Duration-only		Finish-only		Progress	
	Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
	Summary		Inactive Summary		Manual Summary		External Milestone			

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Timeline											
								Dec	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter	
									Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
20		New Electrical Building	80 days	Thu 2/12/26	Wed 6/3/26	12													
21		Install New Switchgear	20 days	Thu 6/4/26	Wed 7/1/26	20													
22		Equipment Power Transfer to New MCC	15 days	Thu 7/2/26	Wed 7/22/26	21													
23		Install Aeration	8 days	Fri 5/8/26	Tue 5/19/26	16FS+10 days													
24		Install Clarifier Mechanism	12 days	Wed 5/20/26	Thu 6/4/26	23													
25		Install Splitter Box & Flow Meter Vaults	24 days	Thu 4/2/26	Tue 5/5/26	19													
26		Tie In SS line to New Flow Meter/Splitter	2 days	Wed 5/6/26	Thu 5/7/26	25													
27		Install Effluent Return Pump Station	40 days	Thu 3/19/26	Wed 5/13/26	13													
28		Off-site Pipeline	25 days	Thu 5/14/26	Wed 6/17/26	27													
29		Site Electrical/Pull Wire/Aeration & Clarifier	30 days	Thu 7/2/26	Wed 8/12/26	18,24,21													
30		Install New PLC and Controls	15 days	Thu 6/4/26	Wed 6/24/26	20													
31		Startup	10 days	Thu 8/13/26	Wed 8/26/26	29,30													
32		Commissioning	10 days	Thu 8/27/26	Wed 9/9/26	31													

Project: Draft Construction Schedule  
Date: Tue 11/5/24

Task		Project Summary		Manual Task		Start-only		Deadline	
Split		Inactive Task		Duration-only		Finish-only		Progress	
Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
Summary		Inactive Summary		Manual Summary		External Milestone			

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