DESIGN REPORT

Main Garrison Wastewater Treatment Plant Modernization
Camp Roberts, California

April 16, 2026

PREPARED FOR

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Project No. 5890-300-01-67

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Design Report
Main Garrison Wastewater Treatment Plant Modernization
Camp Roberts, California

Dear MAJ Colendich:

This report documents the design for modernizing the wastewater treatment plant serving the Main Garrison at Camp Roberts, California. If you have any questions about the report or require additional information, please do not hesitate to contact the undersigned at (949) 296-0977 or at thunt@wcgrp.com. Weaver Consultants Group of California, LLC (WCG) appreciates the opportunity to be of service to the California Army National Guard.

Respectfully submitted,

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Signed and Sealed April 16, 2026

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Enclosure
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LIST OF ABBREVIATIONS AND ACRONYMS

BOD	biological oxygen demand
CA ARNG	California Army National Guard
CCRWQCB	Central Coast Regional Water Quality Control Board
DO	dissolved oxygen
gpd	gallons per day
gpm	gallons per minute
HDPE	high-density polyethylene
LFWW	low flow wet well
MBR	membrane bioreactor
mg/L	milligrams per liter
mL/L	milliliter per liter
M&RP	monitoring and reporting program
NH_3	ammonia
NO_2	nitrite
NO_3	nitrate
PFAS	polyfluoroalkyl substances
PLC	programmable logic controller
PRPPS	permeate retention pond pump station
PSI	pounds per square inch
sNdN	simultaneous nitrification and denitrification
TDS	total dissolved solids
TSS	total suspended solids
WCG	Weaver Consultants Group of California, LLC
WDR	waste discharge requirements
WSC	Water Systems Consulting, Inc.
WWTP	wastewater treatment plant

1.0 INTRODUCTION

Camp Roberts is an active military training facility located on the central coast of California. It is situated on U.S. Highway 101, about 12 miles north of Paso Robles and about 26 miles east of the Pacific Ocean. The camp occupies 42,784 acres, or approximately 60 square miles, the majority of which is located west of Highway 101. Nearly one-half of Camp Roberts lies within Monterey County, with the remainder lying within San Luis Obispo County (Figure 1). The training facility is currently operated and maintained by the California Army National Guard (CA ARNG).

Camp Roberts features two wastewater treatment facilities, the Main Garrison Wastewater Treatment Plant (WWTP) and the East Garrison WWTP. This *Design Report* is focused only on proposed upgrades of the Main Garrison WWTP (henceforth referred to as the WWTP). The WWTP was upgraded in 2016 via rehabilitation of existing (mothballed) treatment structures and the installation of a new denitrifying filter. These upgrades constituted the first phase of a three-phase plan intended to restore the functionality of aging infrastructure and to comply with new effluent limits.

1.1 BACKGROUND AND HISTORY

Camp Roberts was initially constructed in the 1940s as a training facility for troops preparing for combat in the pacific theater during World War II. Records show that the WWTP was designed and constructed in the 1950s to treat wastewater generated at the Main Garrison. The plant was designed to accommodate the wastewater flows expected during full occupancy of the garrison. At the time, the maximum expected flow was considered to be 2 million gallons per day (mgd). The original construction included a headworks, two clarifiers, two trickling filter beds, a chlorination chamber, and two sludge digesters.

In or around 1979, the Camp implemented significant modifications to the WWTP. The operation of the plant was scaled back both in overall capacity and in terms of treatment processes. As part of the modifications, one of the clarifiers (the Secondary Clarifier) and a trickling filter (Trickling Filter 2) were removed from service, eliminating system redundancy and effectively halving the hydraulic capacity of the plant. The chlorination chamber was filled with crushed rock and eliminated from the treatment process. One of the sludge digesters was abandoned in place and the other ended up being used as a sludge holding tank over time. Following the 1979 renovation and until a major permit revision in 2014, the WWTP was typically able to operate within the parameters prescribed by regulation and permit.

1.1.1 Plant Rehabilitation and Denitrifying Upgrades

The Central Coast Regional Quality Control Board (CCRWQCB) issued revised Waste Discharge Requirements (WDR) Order R3-2004-0106 in 2004 based on site-specific information provided by the CA ARNG. While the effluent nitrate discharge limit prior to this WDR is not known, the 2004 WDR included an effluent nitrate discharge limit of 7.7 milligrams per liter (mg/L).

Records indicate that while the WWTP was able to achieve the discharge limits for most parameters, there were some issues with effluent sodium, sulfate, and nitrate. While the historical exceedances of sodium and sulfate were less frequent and lower in magnitude, the effluent nitrate was consistently above the effluent limit of 7.7 mg/L. In response to this, the CA ARNG contracted Kennedy/Jenks Consultants (Kennedy/Jenks) in 2010 to assess the condition of the WWTP and propose any necessary upgrades to modernize the plant and address the nitrate issue. During a subsequent meeting, the CCRWQCB indicated to Camp Roberts personnel that preparations should be made for more restrictive future WDR conditions. Specifically, future requirements would have more stringent effluent controls, particularly with regard to total nitrogen.

After considering various treatment alternatives, Kennedy/Jenks proposed a series of facility upgrades to be implemented over three phases of construction (Kennedy/Jenks, March 1, 2012). The phased approach was recommended to allow continuous operation of the plant during construction. The principal elements of Phase 1 were:

- automation of the bar screening at the headworks,
- rehabilitation of the previously abandoned clarifier (the Secondary Clarifier) and Trickling Filter 2 (thus providing increased capacity and system redundancy), and
- installation of a fluidized bed nitrate reactor (denitrifying filter) to meet a total nitrogen limit of 10 mg/L.

The subsequent phases would include refurbishment of the Primary Clarifier and Trickling Filter 1, installation of additional denitrifying filters, and would address the antiquated sludge handling and digestion equipment.

1.1.2 2014 Permit Requirements

In 2014, in response to a *Report of Waste Discharge* prepared by Kennedy/Jenks, the CCRWQCB issued new WDR Order R3-2014-0046 for Camp Roberts (Appendix A). The 2014 WDR included new limits for three constituents: five-day biochemical oxygen demand (BOD), total suspended solids (TSS), and total nitrogen, as shown in the table below. Total nitrogen is considered to be the sum of organic nitrogen, ammonia (NH_3), nitrite (NO_2), and nitrate (NO_3). Additional effluent parameters are included but are not considered salient in the context of treatment design.

Parameter	**Value** (mg/L)
Biochemical Oxygen Demand (BOD)	**30**
Total Suspended Solids (TSS)	**30**
Total Dissolved Solids (TDS)	*1,250*
Sodium	*340*
Chloride	*240*
Sulfate	*250*

Boron	*3.5*
Total Nitrogen (as N)	**10**

The order also includes alternative effluent limits for potential emergency conditions at Camp Roberts. If the facility is required to temporarily (up to 90 days) shelter the public in times of emergency, the following effluent limits may be used in lieu of all those above:

Parameter	**Value** (mg/L)
Biochemical Oxygen Demand (BOD)	90
Total Suspended Solids (TSS)	90

The order also acknowledges the principal treatment processes as described in the *Report of Waste Discharge* prepared by Kennedy/Jenks (March 7, 2014). These are listed as "grit removal, comminution, primary clarification, trickle filtering, and secondary clarification." Although use of a continuous upflow denitrifying filter is not explicitly prescribed in the order, it is referenced via the *Report of Waste Discharge*. Furthermore, the annual average daily flows are limited under the conditions of the order in terms of how many denitrifying filters have been installed. The Phase 1 upgrades were designed for an annual average capacity of 40,000 gallons per day (gpd). Installation of additional denitrifying filters would increase the permitted annual average capacity to 150,000 and 300,000 gpd (for a total of two and three filters, respectively).

The 2014 WDR Order contains a Monitoring and Reporting Program (M&RP) intended to evaluate compliance with the order. The M&RP includes effectively continuous monitoring of the influent flowrate into the WWTP. Monthly grab samples of wastewater influent must also be collected and analyzed for BOD and TSS, although influent concentrations are not controlled under the WDR.

The M&RP requires that water quality parameters in the WWTP effluent are evaluated via periodic grab samples. Weekly samples must be collected and analyzed for settleable solids, pH, BOD, and TSS. The remaining general chemistry (including nitrogen) must be analyzed semiannually in March and September, with analysis for selected metals also required annually in September. Once every five years there is an additional requirement to test the effluent grab samples for volatile organic compounds, polychlorinated biphenyls, and certain pesticides. Based on the requirements of the M&RP described above, compliance with the prescribed total nitrogen limit for plant effluent would only be monitored on a semiannual basis. Regardless of the sampling frequency, it is the intent of both the CCRWQCB and the CA ARNG that the WWTP effluent be in compliance with the limits set forth in the WDR at all times.

1.2 EXISTING WASTEWATER TREATMENT INFRASTRUCTURE

Major construction associated with Phase 1 of the Kennedy/Jenks plan was completed in June 2016, although system leaks prevented operation of some secondary treatment equipment, specifically the rehabilitated Secondary Clarifier and Trickling Filter 2. A site plan showing the

current WWTP layout and flow regime is provided in Figure 2, with the major treatment components described below.

1.2.1 Headworks - Diversion Chamber.



Wastewater is transported to the WWTP headworks via the existing collection system serving the Main Garrison (located on the opposite side of Highway 101. The collection system crosses beneath the highway at two locations and approaches the WWTP from both the north and south. After passing through either the north or south grit chamber, influent wastewater combines and passes through the headworks. The headworks provides solids removal via a self-cleaning mechanical bar screen, with 3/8-inch bar spacing, installed during Phase 1 construction. A permanently installed flow meter measures influent flow rate at the headworks using a non-contacting ultrasonic sensor mounted over a 6-inch Parshall flume. After passing through the headworks, wastewater flow enters the Diversion Chamber, where it can be directed to either the Primary Clarifier, the Secondary Clarifier, or the Secondary Effluent Pump Station via manhole (MH-3) by operating slide gates that were installed as part of the Phase 1 upgrades.

1.2.2 Primary Clarifier

The Primary Clarifier remains in use following the completion of Phase 1 and was scheduled for refurbishment during Phase 2. The clarifier is approximately 85 feet in diameter and 12 feet deep, with a volume of approximately 500,000 gallons when full. As is typical for this type of clarifier, it is operated with a rotating skimmer blade to remove scum at the surface. Sludge is removed from the Primary Clarifier via subsurface piping and a sludge pump. Under most current flow conditions, nominal detention time in the Primary Clarifier is typically upwards of 50 days. The treated water flows over the peripheral weirs associated with the clarifier and into a launder collector trough prior to flowing (by gravity) into the primary effluent spillway channel that connects to the main wet well.



1.2.3 Trickling Filters

Trickling Filter 1 remains in use following the completion of Phase 1 and was scheduled for refurbishment during Phase 2. Trickling Filter 1 is approximately 90 feet in diameter and is filled with random pack plastic media to a depth of approximately 4 feet. Wastewater from the main wet well is pumped to a motorized rotary distributor arm of the trickling filter, continuously spraying over the filter surface, before percolating through the packing media. Biological treatment is achieved by a population of microorganisms attached to the filter media. The piping that connects the main well pump to Trickling Filter 1 is a dedicated line without any capability of routing water to Trickling Filter 2.



Trickling Filter 2 has similar dimensions to Trickling Filter 1 and was designed to operate in the same manner. Trickling Filter 2 was rehabilitated in 2015 after being out of service for approximately two decades. The interior was resurfaced and new packing media was installed along with a replacement rotary distributor. As of October 2017, Trickling Filter 2 remains out of service due to subsurface leaks in the associated piping. Similar to Trickling Filter 1, the piping that connects the main well pump to Trickling Filter 2 is a dedicated line without any capability of routing water to Trickling Filter 1.

1.2.4 Secondary Clarifier

The Secondary Clarifier has similar dimensions to the Primary Clarifier and was designed to operate in the same manner to provide secondary clarification. The Secondary Clarifier was rehabilitated in 2015 after approximately two decades out of service. The interior was resurfaced and new mechanical equipment was installed. As of October 2017, the Secondary Clarifier remains out of service due to subsurface leaks in the associated piping. When operational, the treated water flows over the peripheral weirs and into a launder collector trough prior to flowing into the Secondary Clarifier spillway channel and into the secondary effluent pump station by gravity.

1.2.5 Denitrifying Filter

Phase 1 improvements included the installation of a fluidized bed nitrate reactor, typically referred to as a denitrifying filter. The denitrifying filter uses a continuous backwash sand filter with suspended biofilm in the sand media. The biological microorganisms suspended in the filter are capable of removing nitrate from wastewater. The denitrifying filter was installed downstream of the existing clarifiers and trickling filters (Figure 2). By this point in the treatment process, the ammonia in the raw effluent will have undergone nitrification and converted to nitrate.



Partially treated water from the secondary effluent pump station is pumped to the denitrifying filter using pumps with variable frequency drives. The normal operating range for the denitrifying filter is between 20 and 70 gallons per minute (gpm) (28,800 and 100,800 gpd). At flows lower than 20 gpm, the sand media in the filter is prone to cementing (which requires cleaning and prevents efficient operation of the equipment). Given that flows of less than 20 gpm are not uncommon at the WWTP, denitrifying filter effluent is frequently recirculated to the headworks. This recirculation can be shut off once sufficient wastewater flows are entering the WWTP from the collection system, however this is a manual process and not automated. At flows greater than 70 gpm, the filter is unable to operate hydraulically (risk of blowout) and cannot reliably remove nitrogen to the required effluent limit.

The denitrifying filter can accommodate typical wastewater flows (with recirculation) but is unable to handle the high flows and rapid changes in flow associated with the erratic troop population at Camp Roberts (Section 2.2). The flows experienced during training periods exceed not only the capacity of the filter to treat for nitrate, but also the recommended hydraulic capacity of the filter.

Treated water from the denitrifying filter is continuously monitored for nitrate, nitrite, and ammonia using an online analyzer, and treated water that satisfies the required total nitrogen limit of 10 mg/L is discharged into percolation ponds via Manhole MH-1. Flows greater than the normal operating range of the denitrifying filter overflow from the secondary effluent pump station to the percolation ponds via Manhole MH-1, thus bypassing the denitrifying filter (Figure 2).

1.2.6 Sludge Digesters

Two existing sludge digester tanks are located at the WWTP, originally designed to accommodate the sludge generated from the primary and secondary clarifiers. Each digester is approximately 40 feet in diameter with a side water depth of 15 feet. They were originally sized to handle the sludge produced in treating up to 2 mgd of wastewater from the Main Garrison. As such, the current WWTP influent flow rates are too low to generate sufficient sludge for even a single digester to function without an external power source (Kennedy/Jenks, June 25, 2013).

Based on the available information, the two existing sludge digester tanks have not been used as originally intended for anaerobic digestion since after the rehabilitation in 1979. The vessel to the southeast has been effectively sealed and abandoned in place, and the vessel to the northwest is primarily used as a sludge holding tank. The structural integrity of the tanks and associated piping is questionable and not well understood.

The sludge accumulated in the active tank is periodically pumped to the sludge drying beds. Dried sludge is then disposed of at an approved facility.

1.2.7 Percolation Ponds

WWTP system effluent discharges to one of three existing percolation ponds (Figure 2). These ponds are not used for treatment as of the completion of Phase 1.

1.3 WWTP Upgrade Program Status

Avocet Environmental, Inc. (Avocet) and Water Systems Consulting, Inc. (WSC) were contracted by the CA ARNG during Phase 1 of construction to serve as commissioning agents. In this capacity, Avocet and WSC were required to verify that the upgrades were installed correctly and that the upgraded WWTP would be able to consistently meet the operational requirements of the new permit. During the construction and commissioning process, Avocet and WSC identified a series of design and operational issues. Several concerns were addressed and rectified during the Phase 1 construction project; however, there are several remaining issues impacting the operation of the WWTP, as discussed below.

1.3.1 Zero and Low Flows

As noted above, the WWTP was originally designed to operate with a hydraulic capacity of 2 mgd. This capacity provided for maximum occupancy of the Main Garrison at that time (on the order of 10,000 troops) and also for expansion of the facility or flows during an emergency condition. In practice, average daily flows between 2009 and 2016 were approximately 24,000 gpd. If training events are excluded from the data set, average daily flows were closer to 10,000 gpd. Furthermore, when considering losses (leaks and evaporation) at the plant, the net flow rate can easily be zero or negative. This is especially true at night during periods when no active training is taking place on post. At these times, there is unlikely to be any wastewater generated at the Main Garrison.

After reviewing the Phase 1 plans prior to construction, Avocet queried Kennedy/Jenks on its proposed denitrifying filter operation under these low flow conditions (i.e., flows lower than 20 gpm, the minimum required by the denitrifying filter). Kennedy/Jenks agreed that recirculation was necessary to maintain the function of the denitrifying filter and modified their design to include recirculation capability from the denitrifying wet well to the plant headworks.

It appears that this approach has been successful in terms of hydraulic operation of the denitrifying filter. However, the continual recirculation of treated water raises potential problems with the efficacy of the treatment equipment. The biological processes in the trickling filters and the

denitrifying filter are dependent on untreated influent wastewater as a food and nitrate source for the microorganisms contained therein. As recirculated (treated) water dilutes the plant influent, the microorganisms in the trickling filters and the denitrifying filter are effectively starved and, consequently, their populations tend to reduce significantly. Thus, when the Main Garrison does generate large wastewater flows, the biological processes are prone to an extended response time as bacteria populations are reestablished, possibly resulting in noncompliance for effluent total nitrogen and/or BOD.

Under these conditions, the likelihood of effluent BOD exceeding the discharge limit of 30 mg/L is higher because of the higher dosage of carbon source that may be added to the denitrifying filter to stimulate the microbial populations and provide the required carbon source in the carbon-depleted, recirculated water. The denitrifying filter monitors the total nitrogen and has the capability of recirculating noncompliant treated water to the Headworks if the total nitrogen in the effluent exceeds 10 mg/L. However, there is no real-time monitoring for effluent BOD (measurement requires five-day laboratory analysis).

1.3.2 Peak Flows

As described in greater detail in Section 2.2, the WWTP experiences a wide range of influent wastewater flow conditions. As a baseline condition, daily flows are generally very low (less than 10,000 gpd) when Camp Roberts is only occupied by permanent staff. Weekend training activities are frequent and typically generate average daily flows on the order of 40,000 gpd. Larger-scale annual training events (two or three times a year) represent Camp Roberts as fully occupied in terms of wastewater production and typically generate average daily flows of approximately 150,000 gpd. It is noted that there is also significant diurnal peaking under all of these flow scenarios.

Both diurnal and seasonal peaking pose a significant problem for consistent treatment at the WWTP, particularly with respect to the existing denitrifying filter. The average design flow for the denitrifying filter is approximately 28 gpm (40,000 gpd) and the maximum design flow is 70 gpm (100,000 gpd) (Kennedy/Jenks Contract Specifications, August 2013). When the flow rate exceeds this maximum capacity, the water flows through the denitrifying filter faster than it can be treated, reducing the filter's treatment efficiency. It is also noted that flows in excess of 70 gpm tend to cause blowout of the denitrifying filter, making it unfeasible from a hydraulic perspective.

High flows (in excess of 70 gpm) put the plant at risk of exceeding the total nitrogen limit prescribed under the WDR. In a technical paper published by the Water Environmental Federation (2010) focusing on modeling the effects of changing hydraulic and loading rates to an upflow continuous backwash denitrifying filter, modeling results show that as the flow rate increases toward the design maximum flow rate, the denitrification potential in the filter drops until the influent and effluent total nitrogen concentrations are the same. There is a concern at the Main Garrison WWTP that as the flows into the plant increase during annual training events and eventually exceed the maximum design flow rate of the filter, the denitrification potential of the

filter could drop significantly, resulting in effluent total nitrogen that could exceed the WDR limits. This supports the concept that as the flow rate at the Main Garrison WWTP increases toward, and exceeds, the maximum design flow rate, the denitrification potential drops significantly. In fact, based on observations made during the filter operation in 2017, it was noted that the filter has a consistently high treatment efficiency when a steady flow of about 30 gpm (close to the average design flow) is maintained. Flows above 30 gpm or frequently varying flows tend to cause a disruption in the filter performance, reduce the treatment efficiency, and increase the probability of exceeding the total nitrogen and/or BOD discharge limits.

Even assuming the overall filter capacity is not exceeded, the rapid increase of loading to the denitrifying filter during annual training events is still problematic. As a biological system, the denitrifying filter operates most efficiently with constant flows and loads. When the flows rapidly increase, the nitrate loading is higher than the filter can effectively treat, causing a shock loading. The filter can slowly adjust to the higher nitrate loading but it may take several days, and in that time, discharge from the WWTP is prone to exceed the total nitrogen effluent limit prescribed in the WDR. This problem is exacerbated by the long periods of very low flow (requiring recirculation) experienced at the WWTP.

WSC used the Hydromantis GPS-X wastewater treatment process modeling software to model the performance of the existing denitrifying filter using the anticipated flow rates and water quality. Based on the modeling results, it is evident that as the flow rate rapidly increases, the effluent total nitrogen would also spike. The effluent total nitrogen would slowly decrease after the initial shock as the denitrifying filter adjusts to the higher loading but could take up to 10 to 15 days to reduce total nitrogen below the effluent limit.

1.3.3 System Automation

The design intent for the new denitrifying filter was such that the influent flow rate through the filter would be automatically adjusted based on water level in the secondary effluent pump station (flow passing through the WWTP) and real-time measurements of nitrite, nitrate, and ammonia. In practice, the need for a near-constant recirculation flow of approximately 30 gpm and the lack of connectivity between the nitrogen analyzer and the filter controls means that automatic operation of the system is currently impractical.

1.3.4 Aging Infrastructure and System Leaks

Prior to implementation of Phase 1, the majority of the WWTP improvements dated back to the 1950s construction. The major features (clarifiers, trickling filters, the Main Wet Well, the Diversion Chamber) were constructed using reinforced concrete. System piping also appears to be reinforced concrete pipe below ground and typically steel above ground. Based on observations made during construction, most of the subsurface piping appears to be encased in concrete. Manholes are observed to be constructed using brick.

As construction was nearing completion for Phase 1, the contractor began hydraulic testing of the Secondary Clarifier and Trickling Filter 2. Unsurprisingly, subsurface elements that have been in place for over 60 years were found to be cracked and/or leaking in several locations. Cracks in the piping, dislocations at the ends of pipes, and improperly sealed joints were all observed during these inspections. The construction of Phase 1 was modified to include the resealing of joints and provide localized patches where cracks or damage were identified via video survey. The contract modification also included the rehabilitation of several valves and gates that had rusted or otherwise become locked in a fixed position. In spite of these fixes, it became apparent at the time of commissioning the WWTP Phase 1 rehabilitation that a significant quantity of water was still being lost beneath the Secondary Clarifier, either from the pipes connecting the clarifier to Trickling Filter 2 and/or the Diversion Chamber or along the joint between the Secondary Clarifier sidewall and base. Significant water loss was also observed in the subsurface piping between the main wet well pump and Trickling Filter 2. To date, it has not been possible to commission the rehabilitated secondary treatment equipment in accordance with Phase 1 objectives because of these continued leaks. It is noted that many of the subsurface lines were inspected via video logging during construction and no obvious major cracks or pipe dislocations were noted. This means that potential leaks were missed during the inspection or that the leaks were likely caused during or after construction, specifically the reloading of equipment left dormant for many years. A site plan with a summary of the video logging conducted by the contractor during the Phase 1 upgrades is provided in Appendix B. In 2024, WCG performed additional video logging and a hydrostatic test of the subsurface connection piping between the Secondary Clarifier and the Diversion Chamber and Trickling Filter 2. The results of the test indicated no apparent leaks within the Secondary Clarifier along the joint between the sidewall and base. However, significant water loss was observed from the influent pipes from the Diversion Chamber and Trickling Filter 2.

1.3.5 Lack of Equalization

In contrast to most modern wastewater treatment facilities, the Camp Roberts WWTP does not have system equalization anywhere in the treatment process. In this context, system equalization would constitute a storage tank or storage pond that could hold wastewater during peak flows and release it back at a rate suited to the treatment equipment. Given the relatively uncommon flow profile of the plant (diurnal and seasonal peaking), the lack of equalization is a fundamental flaw in the current wastewater treatment strategy that relies heavily on biological processes.

At any time that influent flows exceed the maximum hydraulic rate of the denitrifying filter, the plant effluent will be a mixture of partially treated wastewater (overflowing from the secondary effluent pump station) and fully treated wastewater (from the denitrifying filter). During these periods there is a high probability that the WWTP will discharge effluent out of compliance with the WDR limits for BOD, total nitrogen, or both.

1.4 REEVALUATION OF THREE-PHASE PLAN

Phase 1 of construction at the WWTP was substantially completed in June 2016. Prior to proceeding with a detailed design for Phase 2 per the Kennedy/Jenks plan, the CA ARNG decided to reevaluate treatment options for the WWTP. This decision was made in consideration of the issues described above, particularly the suitability of the denitrifying filter installed during Phase 1.

1.5 ENGINEERING FEASIBILITY STUDY REEVALUATION

Reevaluation of the treatment alternatives took the form of a feasibility study performed by Avocet and WSC and documented in a *Design Evaluation Report* (Avocet, December 2017). The objective of the feasibility study was to evaluate all available treatment alternatives for wastewater at Camp Roberts WWTP and select a preferred alternative. Prior to the feasibility study, Avocet and WSC identified seven potential treatment alternatives for consideration:

- Alternative 1 - Original Phase 2 Upgrades
- Alternative 1a - Original Phase 2 Upgrades and Blend with Groundwater to Accommodate Low Flows
- Alternative 2 - Smaller Additional Denitrifying Filter
- Alternative 3 - Downflow Denitrifying filter to Accommodate Low Flows
- Alternative 4 - Oxidation Ditch
- Alternative 5 - Membrane Bioreactor (MBR) Package Plant
- Alternative 6 - Sequencing Batch Reactor Field Constructed Plant

To thoroughly assess each of the alternatives, Avocet, WSC, and the CA ARNG established and developed a system of weighted screening criteria with which to rank the proposed technologies. The final criteria and weighting are summarized in the table below.

Screening Criteria	Weighting (1 = min, 5 = max)
Construction Cost	5
Life Cycle Costs	5
Ability to Consistently Produce Compliant Effluent	4
Incorporates Existing Facilities	4
Project Delivery	2
System Robustness	3
Permitting Uncertainty/Complexity	1
Ability to Handle Anticipated High and Low Flows	2
Ability to Meet Future Permit Revisions	1
Effluent Quality for Reuse	4

Avocet consulted informally with CA ARNG Facilities and Engineering personnel throughout the design evaluation and feasibility study for the WWTP. When development of the treatment alternatives was completed, Avocet held two design briefings with the CA ARNG to summarize the design challenges and refine the screening criteria and weighting. Avocet engineers met with SFC Herbert Kendall, LTC Craig Sandman, and MAJ Lorren Deakin in May 2017. The three preferred alternatives were presented to BG Frank Emanuel, the Director of Facilities and Engineering, in a briefing on June 28, 2017. The consensus of this briefing was that the highest ranked alternative, the MBR package plant, was the final preferred alternative and that conceptual design for this alternative should proceed as soon as practical.

Final selection of the MBR system was the recommendation of Avocet and WSC under the criteria and weighting outlined in the *Design Evaluation Report* (Avocet, December 2017).

1.6 PRELIMINARY DESIGN REPORT

Avocet prepared a Preliminary Design Report that outlined a conceptual design for the selected alternative described above (Avocet, March 23, 2018). In brief, the main components of the conceptual design were to include the following:

- An MBR wastewater treatment package plant configured to operate between zero and 250,000 gpd.
- A 60,000-gallon wastewater equalization tank regulating flow to the MBR.
- A (minimum) 840,000-gallon permeate retention pond (or ponds) to regulate noncompliant effluent.
- A sludge handling system with holding tank and solids press.

- Reconfiguration of the existing infrastructure to convey wastewater through the above-listed components.

To support the conceptual design, Avocet implemented engineering studies to verify existing influent wastewater volume and quality. Specifically, Avocet collected supplemental wastewater flow volume data and supplemental influent water quality data. In brief, the results of the flow study confirmed the extreme variability in wastewater flows, ranging from near-zero conditions to peak flows exceeding 200,000 gpd during training events. The results of the additional influent analytical data collection provided a set of comprehensive, recent, representative data to be used in the design of the MBR package plant. Further details regarding the results of these studies are included in the *Preliminary Design Report* (Avocet, March 23, 2018).

1.7 DESIGN EVALUATION

Following the preparation and submission of the *Preliminary Design Report* and accompanying design drawings in 2018, which detailed the 35 percent conceptual design, the continuation of the design of the proposed WWTP upgrades was put on hold due to an uncertainty in contracting mechanisms. The project was revived in 2023 and Avocet subsequently prepared a *Design Evaluation Report* to assess advancements in municipal wastewater treatment technologies, regulatory code and design guidance changes, and estimated construction cost changes since the development of the 35 percent conceptual design in 2018. The result of the evaluation generated a weighted score for each alternative based on costs, treatment effectiveness, existing infrastructure reuse, quickness of construction, permitting uncertainty, ability to accommodate anticipated flow range, and possibility of beneficial effluent reuse, with the MBR package plant alternative receiving the highest weighted score and remaining as the preferred alternative (Avocet, August 10, 2023).

1.8 REPORT ORGANIZATION

This section serves as an introduction to the report and provides relevant background information. Section 2.0 summarizes the basis of design and regulatory requirements. Section 3.0 describes the principal elements of the design.

2.0 BASIS OF DESIGN

The design of the WWTP upgrades has been performed using a set of criteria developed from permit requirements, historical wastewater information, and the engineering studies described in the Preliminary Design Report (Avocet, March 23, 2018). The design criteria can be summarized into three categories: influent wastewater quality, influent wastewater volume, and plant effluent limits.

2.1 INFLUENT WASTEWATER QUALITY

As discussed previously, the water quality parameters likely to cause effluent non-compliance are BOD, TSS and total nitrogen. Substantial WWTP influent analytical data exist for these parameters. The basis of design parameters were developed from historical average BOD, TSS, and total nitrogen influent concentrations and maximum observed concentrations. The design influent concentrations developed by Kennedy/Jenks in their *Preliminary Design Services for Main Garrison Wastewater Treatment* were confirmed as suitable design parameters for the proposed upgrades. This confirmation was based on the influent water quality monitoring and sampling conducted by Avocet between June and September 2017 as described in the *Preliminary Design Report*.

The following table summarizes the influent wastewater quality data used in the proposed design. The monthly maximum concentrations typically correspond to increased flow scenarios (Weekend Flow, Annual Training Flow).

Parameter	**Average Concentration** (mg/L)	**Monthly Maximum Concentration** (mg/L)
BOD_5	120	320
TSS	180	375
Total Nitrogen (as N)	45	80
Ammonia	25	65

2.2 EXPECTED WASTEWATER VOLUME

The variation of wastewater flows received at the Camp Roberts Main Garrison WWTP is greater than that experienced at a typical treatment facility. The camp population fluctuates substantially depending on the level of training activity taking place at a given time. Although the diurnal peak hour factor varies significantly, it has been modeled as up to 3.5 for the nonemergency flows at the WWTP. This peaking factor was determined through an analysis of flow data from June through August 2017 and through consideration of the unusual wastewater conditions at Camp Roberts. As a military training facility, concentrated demand of washing and cooking facilities at a specific time of day can cause an atypically high concentration of wastewater during these periods. Although it is not anticipated that the WWTP will experience a peak hour factor as high

as 3.5, this value has been used as a "stress-test" for the system to ensure that sufficient equalization capacity is provided. As such, it is considered extremely conservative for the design (Kennedy/Jenks typically used a factor of 2.5 in its *Evaluation Design Repair of Wastewater Treatment Plants at Camp Roberts, California*, March 1, 2012, a value which is itself already high).

The different potential flow scenarios that are considered in the proposed design are summarized in the table below. A brief explanation of each potential flow scenario is summarized in this section.

Flow Scenario	**Average Daily Flow** (gpd)	**Peak Hour Flow** (gpd)
Zero Flow	0	0
Baseline Flow	5,000	17,500
Weekend Flow	40,000[1]	105,000
Annual Training Flow	150,000	525,000
Maximum Design Flow	250,000	875,000
Emergency Flow[2]	*2,000,000*	*5,000,000*

2.2.1 Zero Flow

The proposed design considers how a period with no influent could be handled by the system. Although unlikely to be a frequent event, it may be advantageous to the CA ARNG to suspend all flow to the WWTP to complete repairs, maintenance, etc.

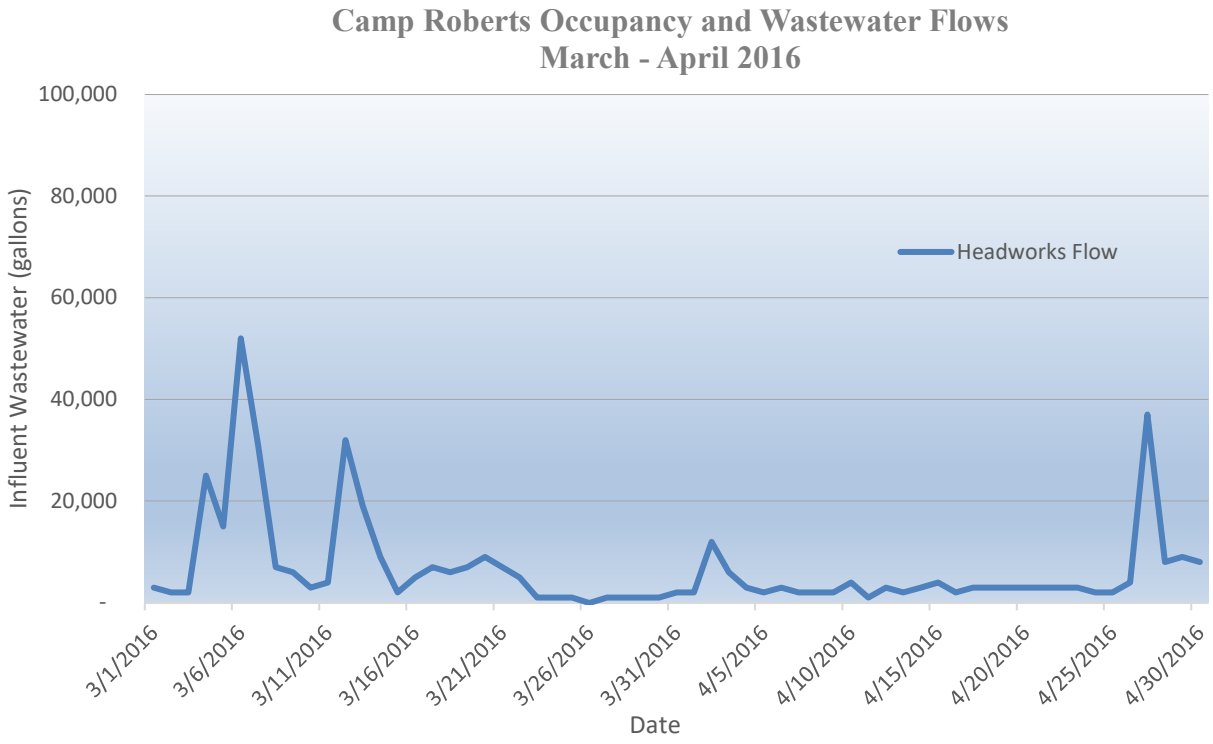
2.2.2 Baseline Flow

The typical weekday flow when no training event is in progress is considered as the Baseline Flow. It represents the wastewater volume generated by the Camp Roberts permanent staff and from the main dining facility, although it is noted that the baseline flow can vary depending on the time of year and staff levels at the facility. The baseline flow for the proposed design has been modeled with an average daily flow of 5,000 gpd and a peak hour flow of 17,500 gpd.

The chart on the following page shows the daily average flows during March and April of 2016 when no large-scale training was taking place at Camp Roberts. The flow was recorded using the dedicated headworks flow meter at the WWTP. It is noted that this flow meter has a tendency to underestimate flows at the lower end of its range. This should be considered a degree of

[1] Average daily flow was adjusted to 40,000 gpd while the corresponding peak hour flow was calculated based on an earlier estimate of 30,000 gpd. These values are not direct constraints on system design and will be adjusted for consistency in the detailed design phase.
[2] The Emergency Flow scenario assumes that existing traditional treatment equipment would be returned to service.

conservatism in the proposed design, as the baseline flow essentially defines the lowest expected flows to the plant.



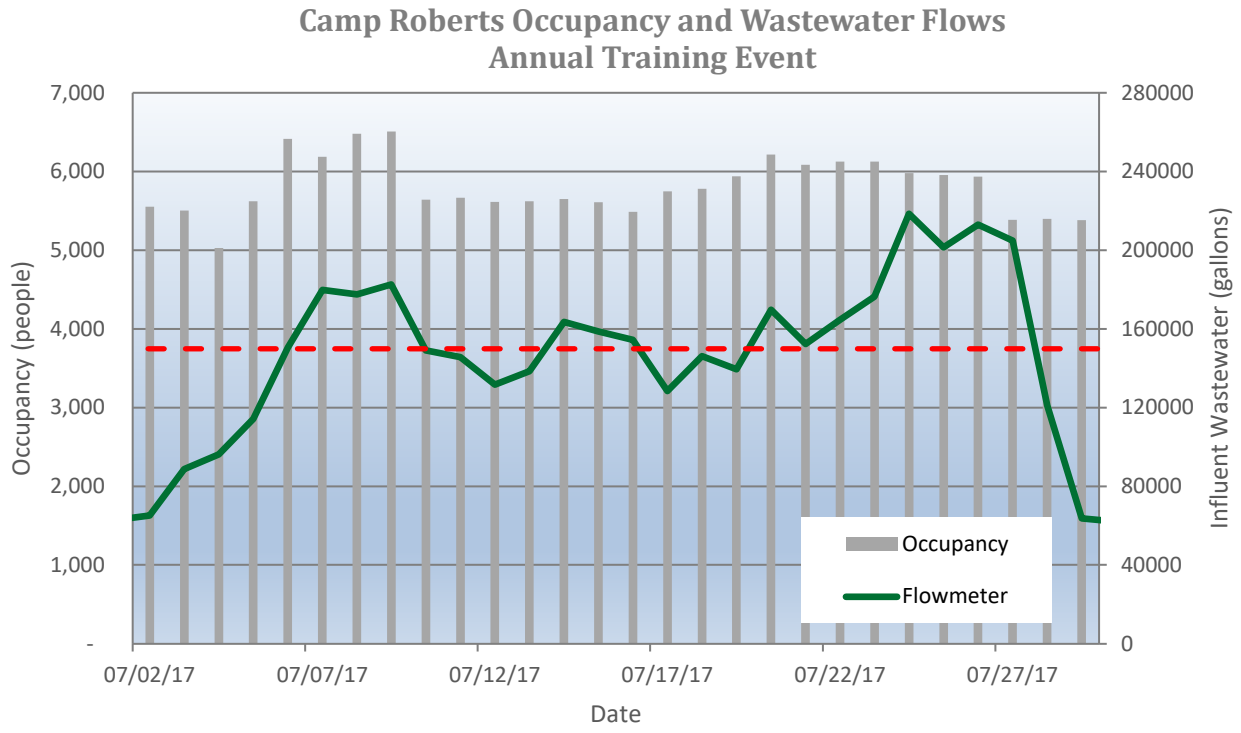
2.2.3 Weekend Flow

The flow generated during a normal weekend training event is considered as the Weekend Flow. It represents the wastewater flow generated by weekend training activities at the post. The weekend flow for the proposed design has been modeled with an average daily flow of 40,000 gpd and a peak hour flow of 105,000 gpd. The instances of increased flow in the chart above typically correspond to weekend training events. As can be seen from this example period, there remains significant variation in the volume of wastewater generated during any given weekend training event.

2.2.4 Annual Training Flow

At present, Camp Roberts accommodates up to three large-scale CA ARNG training events on post per year. During these training events, the camp population significantly increases and, consequently, wastewater flow from barracks and mess halls is also increased. The annual training flow for the proposed design has been modeled with an average daily flow of 150,000 gpd and a peak hour flow of 525,000 gpd. It was assumed that the maximum duration of increased flow associated with an annual training event was three weeks.

The chart shown below focuses on the 20-day period between July 7 and July 27, 2017, during which time Camp Roberts was accommodating the maximum allowable troop load (or close to it). As described in Section 2.1, the flow was recorded using a dedicated flow meter installed directly upstream of the plant. Calibration of the temporary meter was tested and verified by a flow meter technician prior to and following its use. The chart includes a trendline at 150,000 gallons, representing the median flow rate as recorded by the temporary flow meter throughout the annual training period.



2.2.5 Maximum Design Flow

The maximum design flow is the theoretical flow resulting from permanent maximum occupancy of the Camp Roberts training facility. Based on information provided by the CA ARNG, there are approximately 4,800 barracks spaces available at the camp. Sizing of treatment equipment at the WWTP assumes that permanent full occupancy of the 4,800 beds, along with a corresponding increase in mess hall facilities, represents the maximum sustained volume of wastewater the plant could expect in a nonemergency scenario. Using the data incorporated in the graphs above, Avocet observed that the maximum observed flows were at or around 200,000 gpd. The maximum design flow incorporates a 1.25 factor of safety and has been modeled with a sustained average daily flow of 250,000 gpd and a peak hour flow of 875,000 gpd.

2.2.6 Emergency Flow

Under the existing WDR, an allowance for emergency flow is made when Camp Roberts is "occupied by people displaced in response to natural disasters or other emergency conditions." The allowable average daily flow (when annualized) is 2,000,000 gpd for a period of 90 days. The emergency peak hour flow has been assumed to be 5,000,000 gpd.

The proposed upgrades to the WWTP have been designed to accommodate the zero flow, baseline flow, weekend flow, annual training flow, and the maximum design flow scenarios. In addition to operating under these flow scenarios, the proposed design also considers the time needed for the biological treatment processes to adjust from baseline flow to annual training flow. Wastewater and permeate equalization ponds have been sized accordingly to allow the treatment equipment to adjust to higher flow rates.

The design also provides hydraulic capacity for continuous operation under the emergency flow scenario. In this scenario the existing traditional treatment equipment (Primary Clarifier and Trickling Filter 1) could be utilized to handle the extreme flow.

2.3 REGULATORY REQUIREMENTS

In 2014, in response to a *Report of Waste Discharge* prepared by Kennedy/Jenks, the CCRWQCB issued new WDR Order No. R3-2014-0046 for Camp Roberts. The 2014 WDR included new limits for three constituents: BOD, TSS, and total nitrogen, as shown in the table below. Total nitrogen is considered to be the sum of organic nitrogen, ammonia, nitrite, and nitrate.

Parameter	**Value** (mg/L)
Biochemical Oxygen Demand (BOD)	30
Total Suspended Solids (TSS)	30
Total Nitrogen (as N)	10

WCG concurs with previous assessments that these parameters govern design of the system to achieve compliance. The complete list of effluent limits can be found in the WDR and is reproduced in Section 1.1.2.

The 2020 WDRs include the following effluent limitations, though more stringent, site-specific effluent limits may be imposed upon incorporation of the WWTP into the new WDRs and issuance of a new monitoring reporting program.

Parameter	Units	30-Day Average	7-Day Average	Sample Maximum
BOD	mg/L	30	45	N/A
TSS	mg/L	30	45	N/A
Settleable Solids	mL/L	0.1	0.3	0.5
pH	N/A	6.5 – 8.4	N/A	N/A

In addition to the effluent limitations above, the 2020 WDRs include effluent limits for total dissolved solids (TDS), chloride, sulfate, boron, sodium, and total nitrogen based on the discharger's groundwater basin and sub-basin. The WWTP is located within the Paso Robles Area sub-basin and is expected to have the following effluent limits under the new WDRs:

Parameter	Value (mg/L)
TDS	1,050
Chloride	270
Sulfate	200
Boron	2.0
Sodium	225
Total Nitrogen	10

In comparing the effluent limitations in the current WDRs for the facility to the effluent limitations likely to be included in new WDRs, the following modifications to effluent limit concentrations are anticipated:

- Settleable solids limited to 0.1, 0.3, and 0.5 milliliter per liter (mL/L) (30-day average, 7-day average, and sample maximum, respectively).
- pH limited to between 6.5 and 8.4.
- TDS limit decreased from 1,250 mg/L to 1,050 mg/L (25-month rolling median).
- Chloride limit increased from 240 mg/L to 270 mg/L (25-month rolling median).
- Sulfate limit decreased from 250 mg/L to 200 mg/L (25-month rolling median).
- Boron limit decreased from 3.5 mg/L to 2.0 mg/L (25-month rolling median).
- Sodium limit decreased from 340 mg/L to 225 mg/L (25-month rolling median).

In addition to the above anticipated effluent limit revisions, given the current focus on monitoring for per- and polyfluoroalkyl substances (PFAS) and preventing their discharge, it is expected that new WDRs for the WWTP will likely include limits on PFAS. Leachate collected from the Camp Roberts Class III Landfill, which may contain PFAS, is stored at the landfill in leachate storage

tanks and may be disposed of at the WWTP in accordance with the WWTP's current WDRs. Currently, Camp Roberts is preparing a design for an evaporation pond to be installed at the landfill for the local treatment and disposal of landfill leachate. The WWTP is not currently designed to treat wastewater containing PFAS and the proposed upgrades do not specifically treat for PFAS contaminated wastewater.

From a design standpoint, typically the only constituents that drive the complexity of wastewater treatment are BOD, TSS, and total nitrogen. These constituents remain unchanged between the 2014 WDRs and the 2020 WDRs, and the expected changes to the remaining effluent limit concentrations are not expected to have an effect on the planned MBR treatment system approach.

3.0 DESIGN

The Main Garrison WWTP Modernization design includes a proposed site plan and equipment layout (Figures 3 and 4), process flow diagrams for the proposed system (Figures 5 and 6), computer modeling of the proposed package plant, and miscellaneous upgrades to the WWTP at Camp Roberts.

3.1 MEMBRANE BIOREACTOR (MBR) PACKAGE PLANT MODELING

The MBR package plant is the principal element of the WWTP modernization design. Based on knowledge of similar systems, Avocet and WSC proposed an MBR package plant as the most reliable technology to treat the unusual flow profile for wastewater generated at Camp Roberts. To confirm the suitability of an MBR package plant in the conceptual design, Avocet contracted Cloacina of Arroyo Grande, California to develop a package plant specification customized for the Camp Roberts WWTP. The proposed MBR package plant is a MEMPAC-M system proposed by Cloacina and is intended to operate with a maximum capacity of 250,000 gpd.

To ensure its fitness for purpose, Cloacina developed a computer model of the proposed package system using the Hydromantis GPS-X™ software and tested it for the anticipated influent wastewater quality under the different potential flow scenarios described in Section 2.2. The results of the package plant modeling are included in the *MEMPAC-MTM Package Treatment System, Modeling and Simulation Report* prepared by Cloacina (October 2017) provided in Appendix C and are summarized below.

3.1.1 Plant Configuration

The MBR package plant was sized to operate with influent flow rates ranging from 5,000 to 250,000 gpd. To accommodate this flow range most efficiently the package plant operates under two distinct flow regimes, referred to henceforth as the "low flow" and "full plant" configurations. The plant consists of a train of process tanks that would be preferentially brought online depending on the flow regime.

The low flow configuration utilizes a single anoxic chamber followed by an aeration chamber and two membrane chambers within the main MBR tank. Flow equalization under the low flow configuration would be achieved by providing approximately 60,000-gallon influent storage capacity.

The full plant configuration utilizes a total of four anoxic tanks and three aeration tanks prior to the membrane chambers. Flow equalization under the full plant configuration requires the 60,000-gallon influent capacity and may require a maximum of 840,000 gallons of equalization capacity for partially treated permeate.

3.1.2 Simulation Results

The MBR plant system was modelled and tested using the influent concentrations as described in Section 2.1 and under all the non-emergency flow scenarios described in Section 2.2. Critically, the modeling software was also used to simulate the transitions between the flow scenarios, and thus the transitioning of the system from low flow to full plant configuration. Under all circumstances the MBR plant was able to reduce BOD and TSS to concentrations far below the effluent limits required in the WDR. It was found that the total nitrogen limit of 10 mg/L was exceeded in the MBR effluent during initial plant startup and during any initial transition between low flow and full plant configurations. During these periods, the MBR would automatically divert the partially treated permeate to the proposed equalization ponds or recirculate the partially treated permeate back to the start of the treatment train. As noted above, the greatest projected volume required for equalization of the permeate was 840,000 gallons when transitioning from Baseline Flow to Maximum Design Flow.

With sustained high flows and with influent wastewater parameters as described in Section 2.1, the MBR plant is capable of providing continuous treatment for BOD, TSS, and total nitrogen up to 250,000 gpd. Once steady state conditions are achieved during full plant operation, nitrate laden permeate can be recirculated to mix with the raw influent for completion of treatment.

3.2 PROPOSED DESIGN

The proposed treatment layout is presented in Figure 3. The main components of the upgraded system shall be:

- An MBR wastewater treatment package plant configured to operate between zero and 250,000 gpd.
- A minimum 60,000-gallon wastewater influent equalization tank regulating flow to the MBR.
- A minimum 840,000-gallon permeate equalization pond (or ponds) to regulate non-compliant effluent.
- A sludge handling system with holding tank and solids press.
- Reconfiguration of the existing infrastructure to convey wastewater through the above-listed components.

During non-emergency flows, the influent wastewater will flow through the grit chambers and mechanical screen into the Diversion Chamber. From here the water will flow into a low-flow lift station where wastewater flows up to the Baseline Flow will be pumped to the MBR package plant. Flows exceeding the Baseline Flow will overflow from the low-flow lift station to an equalization tank (formerly Secondary Clarifier). Based on the water level in the influent equalization tank, the untreated water shall be pumped to the MBR package plant. Water treated through the MBR that satisfies the WDR limits would be discharged, by gravity, into the existing discharge manhole MH-1 and gravity drain into the percolation ponds. Partially treated water from the MBR (above WDR limits) would be automatically recirculated through the MBR or diverted to a permeate

retention pond and reintroduced to the system (via recirculation back to the low-flow lift station) for further treatment as appropriate.

During emergency flows, wastewater treatment by the MBR may be supplemented by partially diverting sustained wastewater influent in excess of 250,000 gpd from the Diversion Chamber to the conventional treatment equipment. The wastewater would be treated using the existing treatment process that includes the Primary Clarifier and Trickling Filter 1. The wastewater would be treated through a recirculation loop between the clarifier, main wet well and trickling filter. Partially treated water would overflow from the main wet well and discharge to the percolation ponds. Since the WDR has less stringent limits during emergency flows, the partially treated water would be in compliance.

The proposed system components are discussed in detail in the following sections.

3.3 HEADWORKS MODIFICATIONS

Under the proposed design, the WWTP will retain the existing headworks and flow meter. Wastewater conveyed from the Main Garrison will flow from both the north and south, passing through the respective grit chambers, combining and then passing through the existing mechanical bar screen. The existing mechanical screen is a Headworks-manufactured self-cleaning bar screen with an opening size of 3/8-inch bar. To optimize screening collection, the headworks mechanical bar screen will be fitted with a compactor and wash configured to deliver screen material to an adjacent dumpster. To facilitate addition of the screen compactor and wash, a new control panel will be installed and locally controlled.

3.4 DIVERSION CHAMBER

The existing Diversion Chamber shall be retained and reconfigured to bypass the Primary Clarifier, trickling filter equipment, and the Main Wet Well. The Diversion Chamber gates will be positioned to direct influent wastewater directly to the low-flow lift station. The Diversion Chamber can be utilized to direct emergency flows to the conventional treatment equipment as necessary.

As such, the Diversion Chamber equipment (gate valves) should be included in the ongoing maintenance plan for the WWTP to ensure proper operation when necessary.

3.5 DIVERSION MANHOLE AND OVERFLOW MANHOLE MODIFICATIONS

Under the existing conditions at the WWTP, the Diversion Manhole receives partially treated water from the conventional treatment equipment and diverts it to the denitrification filter. The invert of the manhole is at approximately 11 feet below ground surface. Prior to Phase 1 plant modifications, this manhole directed wastewater to the chlorination tank (now abandoned) prior to plant discharge. The line connecting the Diversion Manhole with the former chlorination tank has been abandoned in place via plugging at the manhole. The Overflow Manhole, also referred to as the Secondary Effluent Pump Station, was installed as part of the Phase 1 plant modifications and

currently receives partially treated water from the Diversion Manhole. The Overflow Manhole is equipped with two submersible pumps that are used to pump the partially treated wastewater to the denitrification filter. As indicated previously, the denitrification filter has a limited hydraulic capacity of 70 gpm. As such, the Overflow Manhole features an 18-inch diameter concrete discharge pipe with a flanged riser that is connected to the existing percolation ponds to address wastewater flows that exceed the hydraulic capacity of the denitrifying filter.

As part of the proposed design, the diversion manhole will be utilized under the emergency flow scenario to receive overflow from the proposed influent equalization tank (Section 3.8) and partially treated wastewater from the Primary Clarifier and Trickling Filter 1 and direct wastewater to the percolation ponds. The existing manhole will be replaced with a new 5-foot diameter, precast manhole and the existing 24-inch diameter concrete pipe from the discharge chamber will be protected in place and connected to the new manhole. The existing 18-inch diameter concrete pipe to the existing Overflow Manhole will be protected in place and connected to the newly installed manhole. The Overflow Manhole will be protected in place and will receive emergency flows from the Diversion Manhole to discharge to the percolation ponds as part of the proposed design. The existing submersible pumps and associated piping to the denitrifying filter will be removed, as will the flanged overflow riser. The existing 18-inch concrete discharge pipe to the percolation ponds will be protected in place.

3.6 LOW FLOW WET WELL

The Low Flow Wet Well (LFWW) will be installed at the approximate location presented in Figure 3. The LFWW, which will consist of a 4-foot by 3-foot rectangular precast manhole with a total depth of 8 feet bgs and equipped with a 75 gallons per minute (gpm) capacity submersible pump (SP-1), will be used to divert influent wastewater and partially treated permeate that does not meet effluent standards to the MBR. Influent wastewater that exceeds the capacity of the LFWW will overflow into the proposed adjacent equalization tank (formerly Secondary Clarifier). Influent wastewater will be directed to the LFWW via the diversion chamber via a newly installed, 24-inch diameter subsurface conveyance line. The LFWW will also receive permeate from the Permeate Retention Pond Pump Station (PRPPS) via a new 6-inch diameter subsurface high-density polyethylene (HDPE) pipe. The PRPPS is discussed further in Section 3.11.5. In general, it is assumed that baseline and weekend flow volumes will be pumped directly to the MBR via the LFWW through a new 6-inch diameter HDPE pipe. Larger flows, including those above 108,000 gpd, will be diverted to the existing secondary clarifier, which will be repurposed to serve as an influent equalization tank (Section 3.8), via gravity feed through a newly installed 24-inch HDPE pipe.

3.7 INFLUENT EQUALIZATION

As described above, operation of the WWTP requires equalization of wastewater flows. With the installation of the MBR, equalization will be required for both raw influent wastewater and partially treated permeate. Under the low flow scenarios (Baseline and Weekend Flow) equalization may be required only for the influent wastewater. Based on the modeling performed

by Cloacina for an MBR configuration, a storage tank with a minimum of 60,000-gallon capacity is required for equalization under low flow conditions. This volume should be sufficient to accommodate diurnal peaking and the smaller (weekend) training events on post.

Avocet previously proposed using the former chlorination tank (Figure 2) for equalization to make use of existing equipment. During early 2019, Avocet conducted an investigation of the abandoned chlorination tank by removing the crushed rock debris and evaluating the discharge located at the bottom of the cone structure and the thickness of the walls. The findings of the investigation indicated the integrity of the tank was uncertain and it was estimated that the cost to rehabilitate the abandoned chlorination tank could equal or exceed the cost of constructing a new holding tank or repurposing the existing Secondary Clarifier.

3.7.1 Repurpose Existing Secondary Clarifier as Equalization Tank

Based on the results of the former chlorination tank investigation, WCG proposes to repurpose the existing secondary clarifier, which has a total hydraulic capacity of approximately 500,000 gallons, to provide the necessary influent equalization capacity. In brief, to repurpose the secondary clarifier, the clarifier rake arm, central feed-well, and spray wash water line will be removed along with the associated sludge pump station, wet well, and subsurface piping that is currently routed to the existing digester pumps. In addition, the existing piping from the Diversion Chamber to the secondary clarifier will be removed and the piping beneath the clarifier will be plugged with a minimum 18-inch concrete plug on each end. A new, 24-inch diameter HDPE overflow pipe will be installed from the proposed low flow pump station to the repurposed secondary clarifier.

3.7.2 MBR Feed Pumps and Piping

As indicated in Section 3.8.1, a new 24-inch diameter HDPE overflow pipe will be installed to connect the LFWW to the influent equalization tank. Two submersible pumps, Pumps SP-2 and SP-3, will be installed in the influent equalization tank along with associated control equipment to pump wastewater exceeding the capacity of the low flow pump station to the MBR. Wastewater will be pumped through 6-inch diameter, stainless steel discharge piping which will tie into the main 6-inch diameter MBR feed line from the LFWW as it passes over the equalization tank overflow to the existing main wet well. The two submersible pumps will each have a 250 gpm capacity and will be controlled by the MBR main control panel.

3.7.3 Electrical and Controls

Electronic level transmitters will be installed in the influent equalization tank to monitor the water level. The level in the tank will be used to control pump operation and as an input to the MBR control system. Power to the pumps and transmitters shall be provided as part of the plant upgrades.

3.8 MBR PACKAGE PLANT

The proposed location for the MBR plant is presented in Figure 3. An immersed[3] MBR performs a similar function to a conventional activated sludge plant in that it consumes BOD and can nitrify and denitrify. This process takes place within a bioreactor (a chamber with suspended biomass) which also contains microfiltration membranes (Figure 4). The membranes are used to extract the water out of the solids rather than settling solids in a clarifier. The membrane pore size is so small, typically 0.1 to 0.4 micrometers (µm), that the MBR consistently produces an effluent with less than 5 mg/L TSS, thereby typically making treated water suitable for reuse after disinfection. The proposed MBR package plant will use Fibracast-manufactured Fiberplate™ membranes with a nominal pore size of 0.04 micron, or equivalent.

To achieve simultaneous nitrification and denitrification (sNdN) both aerobic and anoxic conditions are required. The proposed system features a "Bardenpho" process consisting of an internal recycle from the aeration tank to the anoxic tank. This process returns a portion of the high nitrate wastewater to the front of the system to facilitate the consumption of influent BOD under anoxic conditions. Effective operation of an immersed MBR requires the addition of compressed air to the chamber. The air maintains TSS within the reactor and acts to scrub the membrane surface, ensuring the exterior remains clean. The introduction of air also provides the oxygen necessary for aerobic conditions. Intermittent aeration of the MBR chamber has been shown to be effective in controlling dissolved oxygen (DO) and thereby facilitating sNdN. Clear permeate drawn through the membranes by permeate pumps and thereby separated from the mixed liquid enters a clearwell chamber from which it will flow by gravity into the Discharge Manhole for discharge to the percolation ponds.

Inline analyzers will monitor the nitrate, nitrite and ammonia of the treated water. If the total nitrogen concentration of the treated water exceeds the discharge limit, the partially treated water will be automatically recirculated or diverted to the permeate equalization pond for storage (Section 3.11) until it can be reintroduced for treatment once the system has gained equilibrium.

3.8.1 Subgrade Preparation

In accordance with the soils report prepared in conjunction of the Phase 1 WWTP upgrade project (BSK Associates, March 13, 2013), subgrade preparation for the MBR equipment will include over-excavation of the concrete foundation slab footprints plus five feet on all sides to a depth of 5 feet bgs. The excavation shall be backfilled with structural fill and compacted to 95% relative maximum density to establish an appropriate subgrade. All grading and backfill operations will be continuously inspected by a licensed California Professional Geologist prior to acceptance for slab construction.

[3] MBR systems can also be configured with an external membrane separation unit.

3.8.2 Foundation

The MBR system will be installed on a 55-foot by 141-foot, 12-inch thick concrete mat foundation slab. The foundation slab will be constructed of 4,500 pounds per square inch (PSI) concrete with #5 reinforcing bar. The MBR foundation will feature a 6-inch secondary containment curb and collection sump.

3.8.3 MBR Unit and Installation

Design drawings for the proposed MBR package plant are attached to this report in Appendix D. The overall footprint of the proposed plant is 54 feet by 38 feet, with a nominal height of 10 feet over the pad. The components of the proposed MBR plant are as follows:

- Anoxic Tank A, a 4,500/8,000-gallon segregated chamber (12,500-gallon total);
- Anoxic Tank B, a 12,500-gallon chamber with fine bubble diffusers;
- Aeration Tank A, a 12,500-gallon chamber with fine bubble diffusers;
- Aeration Tank B, a 12,500-gallon chamber with fine bubble diffusers;
- Anoxic Tank C, a 12,500-gallon chamber with fine bubble diffusers;
- MBR Tank, a 12,500-gallon segregated chamber:
  - 8,400-gallon Anoxic Tank D with fine bubble diffusers;
  - 1,200-gallon Aeration Tank C with fine bubble diffusers;
  - (2x) 1,450-gallon membrane air sparging chambers.

By the nature of a package plant, the equipment shall be manufactured off-site and tested prior to installation. Once quality controls and operational tests are performed, the completed plant shall be disassembled and transported to Camp Roberts. It is expected that the system would be reconstructed on site by the manufacturer, with predetermined tie-in locations coordinated with the prime construction contractor.

3.8.4 Electrical and Controls

To provide the required power for the MBR, the existing 240 volt, 3-phase pole mounted transformer will be replaced with a 480 volt, 3-phase pad mounted transformer and 1200A service-rated switchboard. The switchboard will be fitted with a generator connector cabinet for the utilization of an emergency backup generator, where necessary.

The MBR will feature a primary control panel that will monitor influent wastewater flow at the headworks, wastewater levels within the LFWW, equalization tank, and permeate retention pond, and control influent pumping to the MBR as wastewater influent flow conditions change. Transitions between the low flow conditions and the full plant operation are to be automated by the control system of the MBR plant itself and will be primarily determined by influent wastewater flowrate and wastewater levels within the LFWW, equalization tank, and permeate retention pond.

3.9 SLUDGE HANDLING

Currently, sludge generated by the existing treatment train at the WWTP is conveyed via subsurface piping to a former digester now used as a sludge holding tank. Sludge is periodically removed from the tank and spread within the sludge drying beds adjacent to the WWTP before being disposed of off-site at an approved facility.

The proposed design involves demolition of the former digester equipment to provide space for the MBR and proposed sludge handling system.

The current sludge handling process will be replaced with a DryPac™ aerated sludge handling system installed adjacent to the MBR package plant. The sludge handling system will receive waste activated sludge (WAS) transferred to the liquid storage chamber by a Cloacina-supplied and integrated self-feeding pump. The sludge will be periodically aerated, utilizing medium bubble diffusers for freshening and odor mitigation. Once a preset level is reached, the automated sludge processing equipment will be fed with a self-priming sludge feed pump. The liquid pressate will be returned to the influent equalization tank and the pressed solids will be dumped into a bin, pending disposal at Camp Roberts Landfill.

3.9.1 Subgrade Preparation

The proposed location for the sludge handling system is presented in Figure 3. As with the MBR package plant itself, the subgrade preparation will include over-excavation of the concrete foundation slab footprint plus five feet on all sides to a depth of 5 feet bgs. The excavation shall be backfilled with structural fill and compacted to 95% relative maximum density. All grading and backfill operations will be continuously inspected by a licensed California Professional Geologist prior to acceptance for slab construction.

3.9.2 Foundation

The DryPac system will be installed on a 19-feet by 48- feet, 12-inch thick concrete mat foundation slab and the associated roll-off bin will be staged on a 16- feet by 51- feet, 12-inch thick concrete slab. The foundation slabs will be constructed of concrete with a design compressive strength of 4,500 PSI with #5 reinforcing bar. The DryPac system foundation will feature a 6-inch secondary containment curb and collection sump.

3.9.3 Sludge Handling Unit and Installation

Design drawings for the DryPac™ system are attached to this report in Appendix D. The overall footprint of the proposed sludge handling system is 42 feet by 11 feet, with a nominal height of 10 feet over the pad.

It is anticipated that the sludge handling system shall be manufactured off-site and tested prior to installation. It is anticipated that the sludge handling system tank and skids can be transported to Camp Roberts and assembled on-site.

3.9.4 Sludge Transfer Piping

Based on the proposed layouts in Figures 3 and 4, it is expected that only a very short run of sludge piping will be required. Sludge generated by the MBR system will be piped to the DryPac system via 2-inch diameter subsurface piping.

3.9.5 Electrical and Controls

Electrical service for the sludge handling system will be fed by the new 1200A service-rated switchboard. The sludge handling system will be provided with an integral control panel to control associated transfer pumps, presses, and other ancillary equipment that will communicate with the main panel at the MBR.

3.10 PERMEATE EQUALIZATION PONDS

As outlined in Section 3.1 above, economical operation of the WWTP using the MBR package plant may require a substantial volume of mid-treatment (permeate) equalization during large fluctuations in wastewater inflow to the WWTP. The subject design proposes to convert the existing sludge drying beds into an equalization pond. With the inclusion of a sludge press attached to the MBR package plant design, the sludge drying beds will be redundant and no longer needed for their current purpose. In brief, the ponds will be regraded and lined to provide a sufficient intermediate treatment retention capacity (approximately 850,000 gallons).

3.10.1 Grading and Subgrade Preparation

Earthwork for conversion of the sludge drying beds to a permeate retention pond and preparation of the subgrade for a suitable liner will include removal of existing sludge material, grading to adjust the drainage and overall volume, over-excavation of any unsuitable material, and compaction of the liner subgrade. The liner subgrade will consist of one foot of compacted native soil to 90% relative compaction and one foot of selective soil with cobble greater than three inches removed and compacted to 90% relative compaction.

3.10.2 Liner and Anchor Trenches

The permeate retention pond shall be lined to ensure partially treated wastewater doesn't seep into the ground. Other than a high total nitrogen concentration (greater than 10 mg/L), it is unlikely that a significant amount of solids will be present in permeate diverted to the retention pond. However, exposure to the elements may result in an accumulation of non-liquid material in the pond over time. Cleaning out solids which have settled can be hard on the liner, so it must be very abrasion, puncture and tear resistant. The proposed liner system will consist of a 40-mil HDPE geomembrane underlain by an 8-oz nonwoven geotextile. The geomembrane and geotextile will be held in place with a minimum 2-foot deep anchor trench installed along the entire perimeter of the pond and the liner will be weighted down with sand or gravel bags as appropriate.

3.10.3 Liner QA/QC

Integrity of a liner system is crucial to its effectiveness as even the smallest installation defect can result in a significant leak. The construction documents for the pond liner will include a construction quality assurance (QA) / quality control (QC) plan. Manufacturers QC data must be verified through direct testing of material samples prior to acceptance of the product. The installation of the liner shall be monitored by a third-party QA inspector to verify all materials, methods, and joint tests are acceptable under the standards required by the CCRWQCB.

3.10.4 Transfer Piping

Transfer piping will be required between the MBR package plant assembly and the proposed permeate equalization ponds and return piping between the ponds and the influent equalization tank. Permeate will be discharged to the permeate retention pond via a new aboveground, 6-inch diameter stainless steel pipe. A new, 6-inch diameter HDPE pipe will be installed to the new permeate pump station, discussed further below. The approximate locations of these piping runs are presented in Figure 3.

3.10.5 Permeate Retention Pond Pump Station (PRPPS)

The PRPPS will be located adjoining the permeate retention pond at the approximate location presented in Figure 3. The PRPPS will consist of a 5-foot diameter, precast concrete manhole with a total depth of 13 feet bgs. As discussed above, a 6-inch diameter HDPE subsurface pipe will connect the pond sump to the pump station. The permeate pump station will be equipped with two submersible pumps (SP-5 and SP-6), each with 75 gpm capacity. The pumps will be set to operate based on the water level in the influent equalization tank and, when operating, will move permeate from the equalization ponds to the LFWW via a 6-inch subsurface HDPE permeate return pipe.

3.10.6 Electrical and Controls

Electronic level transducers will be installed in the PRPPS to monitor the permeate level in the retention pond. The performance of the MBR and the level in the influent equalization tank will be used to control pump operation and as an input to the MBR control system. Power to the pumps and level transducers shall be provided as part of the plant upgrades and will consist of a local panel at the PRPPS.

3.11 DISCHARGE FROM THE MBR

Fully treated wastewater from the MBR package plant will be returned to the existing percolation ponds via the existing discharge manhole MH-1 (Figure 3). Treated wastewater will be piped from the MBR via a new 8-inch diameter, ductile iron (DI) discharge pipe. The new DI pipe will be tied into the existing DI pipe that is connected to MH-1 (Figure 3). Existing DI piping upstream of the tie-in point that is currently connected to the denitrifying filter will be abandoned or removed. To be considered fully treated, the effluent should consistently meet all the requirements described in the WDR Order. Based on the computer modeling of the treatment equipment described in this report, the proposed MBR plant and storage improvements are expected to be

sufficient to provide full treatment of influent wastewater at Camp Roberts main garrison under all expected flow conditions.

3.12 Overview of System Controls and Operating Conditions

The proposed MBR system will be provided with a new central control panel located at the MBR treatment system that will be tied into the basewide supervisory control and data acquisition (SCADA) system. A PLC in the new panel will control the operation of the entire WWTP with additional local hand control at each ancillary component. The control logic will be programmed to ensure proper plant operation, maintain equipment operating strategy, provide onsite and offsite notification to operators and other key personnel of critical alarms, and provide daily records and real-time monitoring capabilities.

3.13 System-Wide Electrical and Controls Upgrades

The existing WWTP electrical distribution system utilizes a 400-amp, 240-volt, three phase service with power being primarily distributed via two master control centers (MCC's), located in the lab building, and three 120/240V distribution panels (office building, lab building, and nitrate building). The system is equipped with a Manual Transfer Switch (MTS) to facilitate connection of a portable generator to provide standby power to the system.

As part of the plant upgrades, the existing 240-volt service, both MCC's and 120/240-volt panel in the nitrate building will either be removed or abandoned in place. These will be replaced with a new 1200-amp, 277/480-volt service to better accommodate the larger loads associated with the new MBR system. The new system will be fed from a 750kVA, 277/480-volt transformer (supplied by owner) and will leverage a new 1,200-amp service rated switchboard to distribute 480-volt power to all major site loads. The existing lighting/distribution panel in the office building will be re-utilized to feed power to the respective office building loads and will be re-fed from a new 25kVA, 480:120/240-volt, single phase transformer. The existing lighting/distribution panel in the lab building will be re-utilized to feed power to the respective lab building loads and will be re-fed from a new 37.5kVA, 480:120/240-volt, single phase transformer. The new system will be equipped with a 1,200-amp MTS with a respective Generator Termination Cabinet equipped with power distribution lugs to facilitate the connection of a portable standby generator to supply standby/backup power to the system. The existing 240-volt distribution system will remain in operation until the new 480-volt distribution system and plant treatment systems are fully operational.

The entire existing plant controls system will be removed or abandoned in place as part of this project and will be replaced by a new Allen Bradley-based PLC controls system. The MBR system master PLC will serve as the main/master plant PLC and will monitor and control all plant systems via Ethernet connections, as reflected on plant 'Communications Diagram' (Appendix D). This same PLC will also be utilized to communicate site data to existing base SCADA system via an existing multi-mode fiber connection. As part of this project, a new washer/compactor system will be added near the existing headworks bar screen system. With this, the existing bar screen system

control panel will be removed and replaced by a new PLC-based control panel that will be utilized to monitor and control both existing bar screen and new waster/compactor systems.

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Figures

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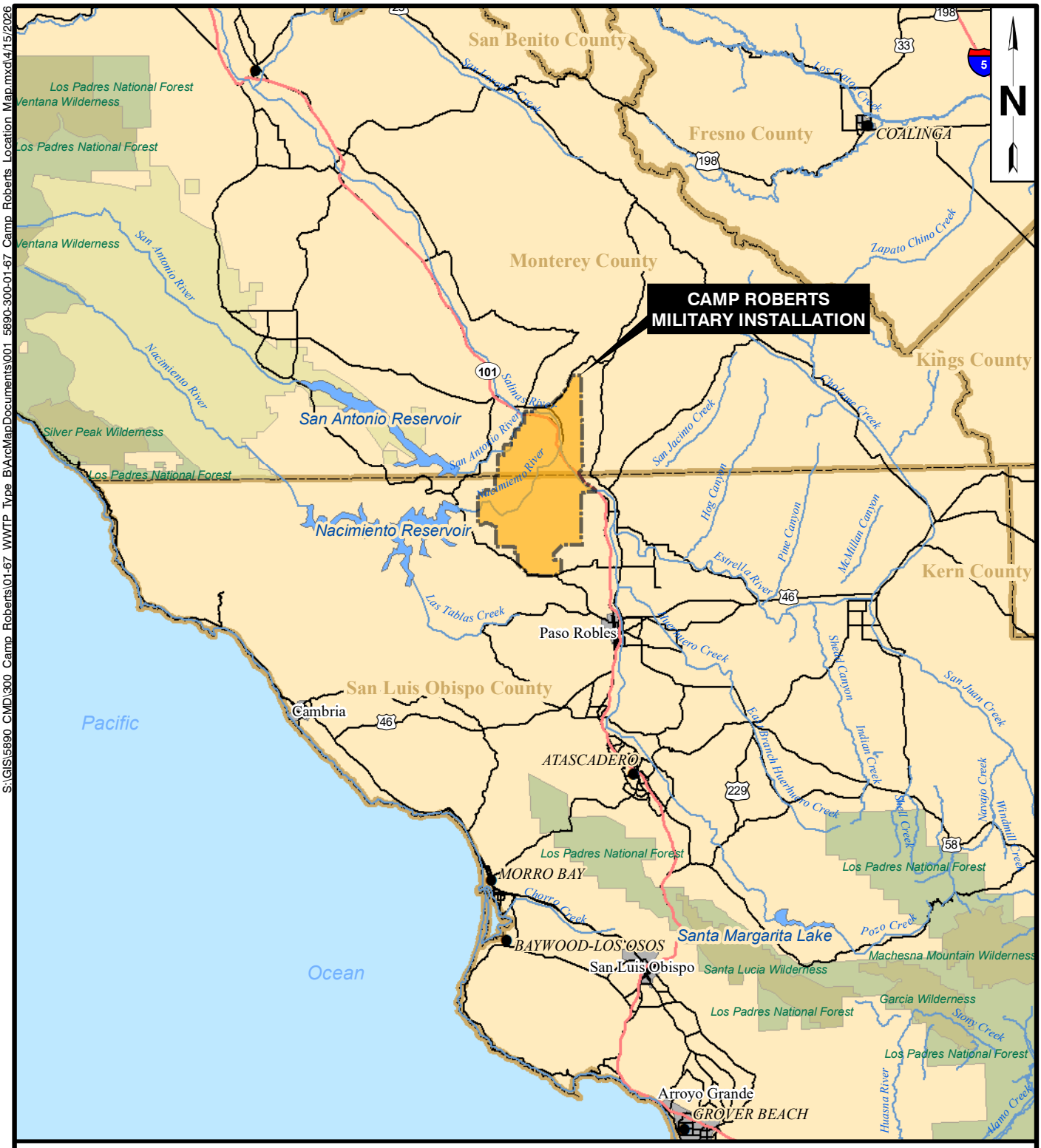


FIGURE 1

CAMP ROBERTS LOCATION MAP

WASTEWATER TREATMENT PLANT

PREPARED FOR

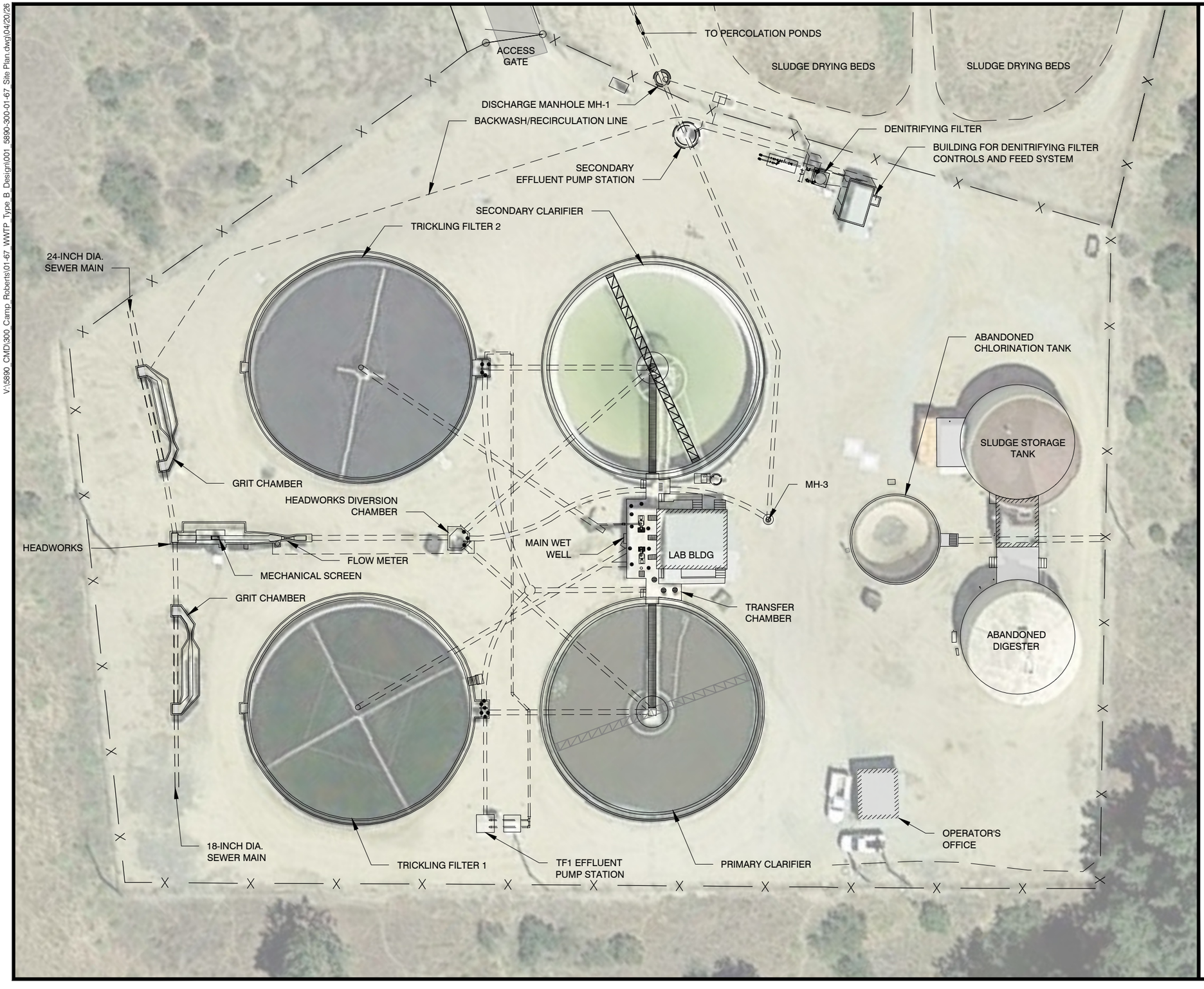
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REFERENCE:
ESRI USA DATA SET

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N

0 40 80 FEET

SCALE

FIGURE 2

SITE PLAN
CURRENT LAYOUT

WASTEWATER TREATMENT PLANT

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TO PERCOLATION POND

PERMEATE RETENTION POND PUMPING STATION

DISCHARGE MANHOLE (MH-1)

OVERFLOW MANHOLE

6" DIA. HDPE MBR AND PERMEATE RETURN PIPE

4" PERMEATE RETURN PIPE

PERMEATE RETENTION POND

8" DIA. DI TREATED WASTE WATER PIPE

DENITRIFYING SYSTEM

6" DIA. SS PERMEATE DISCHARGE

EQUALIZATION TANK (REPURPOSED SECONDARY CLARIFIER)

TRICKLING FILTER TF2

LOW FLOW WET WELL

SCREENING DUMPSTER

MECHANICAL SCREEN

SCREEN WASH AND COMPACTOR

MAIN WET WELL

LAB BUILDING

DIVERSION MANHOLE

TRICKLING FILTER TF1

PRIMARY CLARIFIER

SLUDGE HANDLING AND DEWATERING SYSTEM (BY CLOACINA)

2" DIA. SLUDGE INFLUENT FROM MBR

6" HDPE WW PIPE TO MBR

MBR PACKAGE TREATMENT SYSTEM (DESIGNED BY CLOACINA)

OFFICE BUILDING

N

EXPLANATION

- SUBJECT LINES (PROPOSED CONSTRUCTION)
- EXISTING CONDITIONS
- x FENCE LINE
- SUBSURFACE LINE
- PROPOSED GRADES (MAJOR - 5 FOOT)
- PROPOSED GRADES (MINOR - 1 FOOT)
- LIMIT OF GRADING
- ALL FLOWS UP TO 200,000 GPD
- EMERGENCY FLOWS UP TO 2 MGD
- SLUDGE HANDLING

0 40 80 FEET

SCALE

FIGURE 3

PROPOSED SITE PLAN

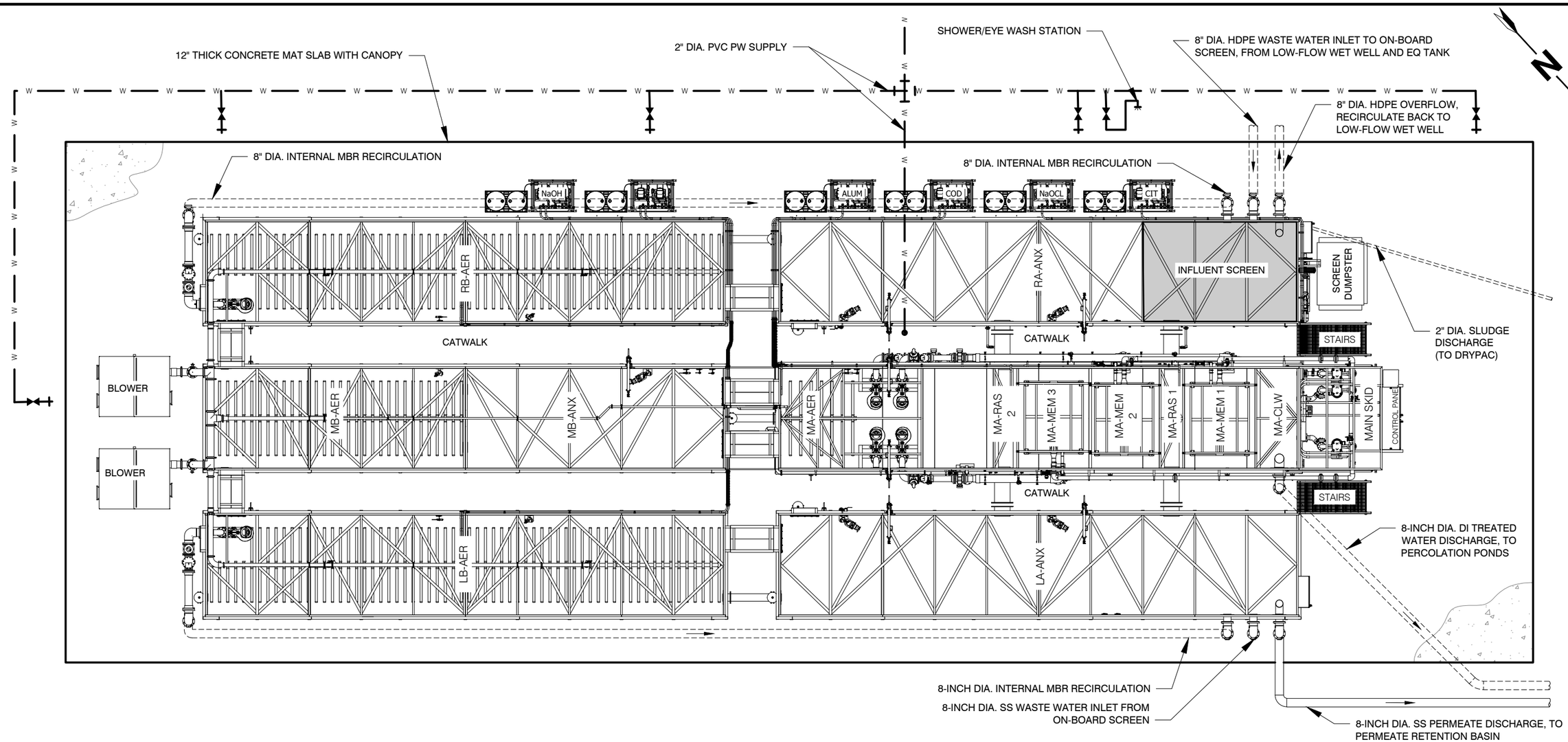
WASTE WATER TREATMENT PLANT

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ABBREVIATIONS

EQ	EQUALIZATION
HDPE	HIGH-DENSITY POLYETHYLENE
MBR	MEMBRANE BIOREACTOR
PVC	POLYVINYL CHLORIDE
SS	STAINLESS STEEL

FIGURE 4

PROPOSED MBR SYSTEM LAYOUT

WASTE WATER TREATMENT PLANT

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CLOACINA MEMPAC-M6 MBR

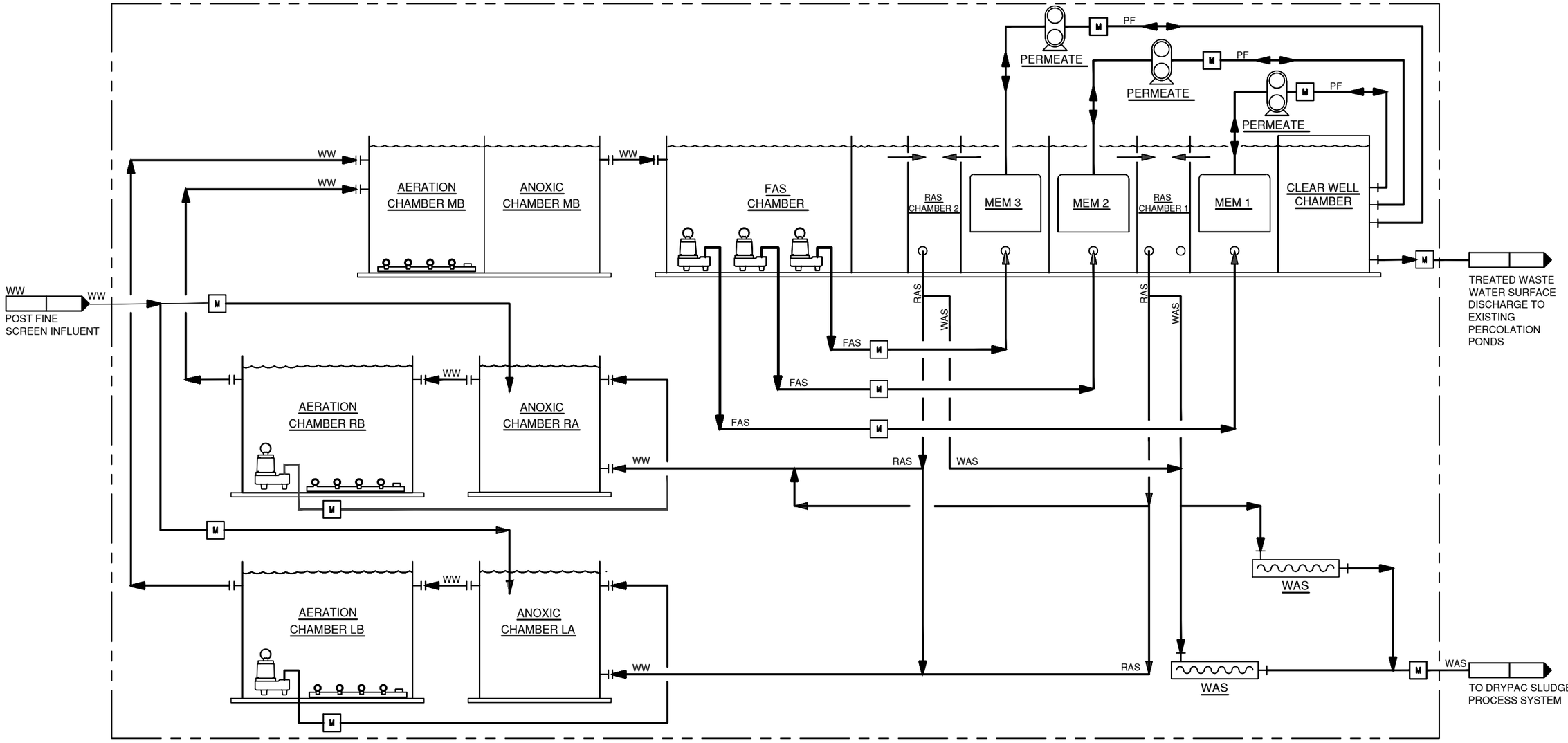


FIGURE 5

PROCESS FLOW DIAGRAM
PROPOSED MBR SYSTEM

WASTE WATER TREATMENT PLANT

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ABBREVIATIONS

FAS	FORWARD ACTIVATED SLUDGE
PF	PERMEATE FLOW
RAS	RETURN ACTIVATED SLUDGE
WAS	WASTE ACTIVATED SLUDGE
WW	WASTEWATER

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PROCESS ABBREVIATIONS

FAS	FORWARD ACTIVATED SLUDGE
ELEV	ELEVATION
GRA	GRAVITY
HHLS	HIGH-HIGH LEVEL SWITH
HLS	HIGH LEVEL SWITCH
LLS	LOW LEVEL SWITCH
LT	LEVEL TRANSMITTER
PF	PERMEATE FLOW
RAS	RETURN ACTIVATED SLUDGE
WAS	WASTE ACTIVATED SLUDGE
WW	WASTEWATER

PROCESS EQUIPMENT AND SYMBOLS

SOLENOID VALVE 2-WAY
SOLENOID VALVE 3-WAY
PUMP CONTROL VALVE
FLOW CONTROL VALVE
PRESSURE RELIEF VALVE
VACUUM RELIEF VALVE
PRESSURE REGULATOR WITH REMOTE PROCESS CONNECTION
PRESSURE REGULATOR SELF CONTAINED
CENTRIFUGAL PUMP
DRAIN
AIR RELIEF VALVE
PIPE REDUCER
GATE OR GENERIC VALVE
3-WAY VALVE
4-WAY VALVE
ANGLE VALVE
BUTTERFLY VALVE
PLUG VALVE
ECCENTRIC PLUG VALVE
BALL VALVE
CHECK VALVE
SWING CHECK VALVE
STOP CHECK VALVE
BALL CHECK VALVE
PINCH VALVE
DIAPHRAGM VALVE
DIAPHRAGM VALVE (ALTERNATE)
GLOBE VALVE
HAND VALVE
KNIFE VALVE
AIR RELEASE VALVE
SP-1 SUBMERSIBLE PUMP

PROCESS LINE SYMBOLS

PROCESS PIPING
EXISTING PROCESS PIPING AND EQUIPMENT
FUTURE PIPING AND EQUIPMENT
ELECTRICAL SIGNAL
ELECTRICAL DIRECTION ARROW
FLOW ARROW FOR PROCESS PIPING
P03 /A PROCESS LINE GOING TO ANOTHER SHEET (MATCH LETTERS)
P03 /A PROCESS LINE FROM ANOTHER SHEET (MATCH LETTERS)
PROCESS LINES CROSSING (NOT CONNECTED)

SCHEDULE OF VALVES

VALVE DESIGNATION	SIZE	TYPE	MATERIAL OF CONSTRUCTION	SERVICE
FGV 001	6-INCH	GATE	DI	BURIED/EXPOSED
FGV 002	4-INCH	GATE	DI	BURIED/EXPOSED
FGV 003	4-INCH	CHECK	DI	BURIED/EXPOSED
FGV 004	8-INCH	GATE	DI	BURIED/EXPOSED
FGV 005	6-INCH	BUTTERFLY	SS	EXPOSED

SCHEDULE OF PUMPS

PUMP DESIGNATION	FLOWRATE	POWER	DESCRIPTION	TYPE	POSSIBLE MANUFACTURER / MODEL
SP-1	75 GPM	1 HP	LOW-FLOW LIFT STATION	SUBMERSIBLE	GOULDS WS10BF
SP-2	250 GPM	3 HP	EQ LIFT STATION	SUBMERSIBLE	EBARA 100DLMFU63.7
SP-3	250 GPM	3 HP	EQ LIFT STATION	SUBMERSIBLE	EBARA 100DLMFU63.7
SP-5	75 GPM	0.5 HP	PERMEATE RECIRCULATION	SUBMERSIBLE	GOULDS WS05BF
SP-6	75 GPM	0.5 HP	PERMEATE RECIRCULATION	SUBMERSIBLE	GOULDS WS05BF

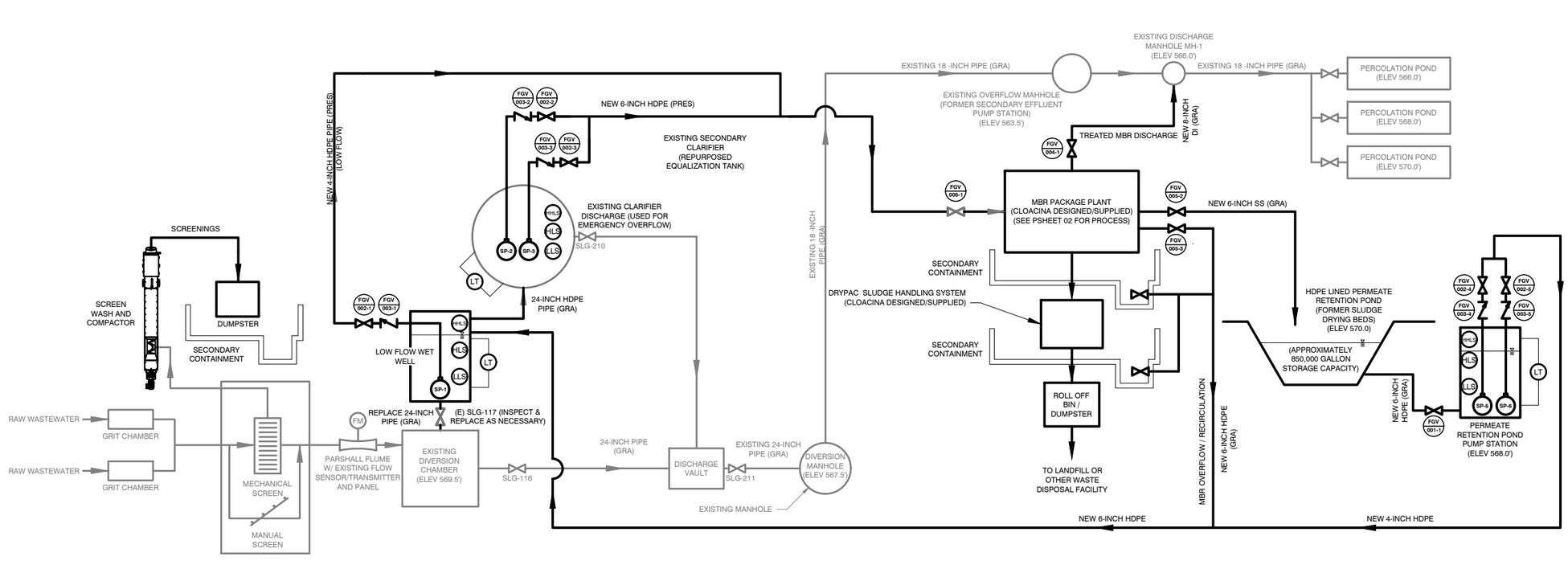


FIGURE 6

PROCESS FLOW DIAGRAM WWTP

WASTE WATER TREATMENT PLANT

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Appendix A

CCRWQCB WDR Order R3-2014-0046

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401

WASTE DISCHARGE REQUIREMENTS ORDER NO. R3-2014-0046

Waste Discharger Identification No. 3 270203002

For

CALIFORNIA ARMY NATIONAL GUARD
CAMP ROBERTS MILITARY RESERVATION
SAN LUIS OBISPO AND MONTEREY COUNTIES

The California Regional Water Quality Control Board, Central Coast Region (hereafter "Regional Board"), finds that:

FACILITY OWNER AND LOCATION

1. The California Army National Guard (hereafter "Discharger") owns and operates the Camp Roberts Military Reservation (hereafter "Camp Roberts").

2. Camp Roberts is located on US 101, about 12 miles north of Paso Robles. It is within the Salinas River sub-basin, in Township 24 South, Range 11 East, Sections 03 and 23 (Mount Diablo Base & Meridian), and spans the border between Monterey and San Luis Obispo Counties, as shown on Attachment "A".

3. The Salinas River bifurcates Camp Roberts into two garrisons. The Main Garrison and the East Garrison lie, respectively, west and east of the Salinas River.

4. Camp Roberts' sanitary wastewater is conveyed to two wastewater treatment plants; one wastewater treatment plant serves the Main Garrison (west of the Salinas River) and another wastewater treatment plant serves the East Garrison (east of the Salinas River), as shown in Attachment "B".

PURPOSE OF ORDER

5. On September 10, 2004, the Regional Water Quality Control Board adopted Waste Discharge Requirements Order No. R3-2004-0106 to regulate the Camp Roberts wastewater collection, treatment and disposal system.

6. This Order revises Order No. R3-2004-0106 based on the Discharger's request.

SITE/FACILITY DESCRIPTION

7. The 42,784-acre Camp Roberts serves as a military training center. Military training includes the use of tanks, personnel carriers, mobile howitzers, aircraft, and other equipment.

8. Camp Roberts collects, treats, and disposes of wastewater using two wastewater management systems; one for the Main Garrison on the west side of the Salinas River and one the East Garrison on the east side of the Salinas River.

9. The Camp Roberts Public Works Department has direct responsibility for an existing wastewater collection, treatment and disposal system.

Discharge Type

10. Influent flows to the existing treatment plants include sanitary wastewater and military equipment washwater.

11. Influent flow rates have typically been less than 50,000 gallons per day, but flows spike for two to three days at a time during summer training cycles.

12. As shown in Attachment "C," the Main Garrison processes all influent using grit removal, comminution, primary clarification, trickle filtering, and secondary clarification.

13. As shown in Attachment "D," the East Garrison processes wash rack wastewater through clarifiers and oil water separators and processes sanitary wastewater through a septic tank. After that primary treatment, the wash rack and sanitary wastewaters are combined in a lined treatment pond, and then disposed using percolation ponds.

14. Waste biosolids are discharged to drying beds. Dried biosolids are hauled to the on-site landfill as needed.

Design and Current Capacity

15. The Main Garrison wastewater treatment facility has a hydraulic design capacity of 2.0 MGD.

16. The East Garrison wastewater treatment facility is designed to process up to 134,000 gallons per day.

Wastewater Disposal

17. Wastewater is disposed of by percolation.

Solid Waste Disposal

18. At the Main Garrison, treatment system biosolids are treated in an unheated anaerobic digester. The sludge is withdrawn from the digester approximately once per year and dewatered on drying beds adjacent to the infiltration ponds, then hauled to the Camp Roberts landfill.

Geology

19. The ponds are located on relatively level topography consisting of sandy alluvial soils.

Hydrogeology

20. Below the disposal ponds, depth to first groundwater is approximately 30 feet through alluvial material. The shallow groundwater is likely underflow of the Salinas River. Potentiometric measurements suggest a northerly gradient.

Surface Water

21. The treatment and disposal facilities are located adjacent to the Salinas River, which flows in a northerly direction to Monterey Bay.

Land Uses

22. In the vicinity of the discharge, land is used for military training.

23. Other than those for military personnel, there are no residences in the vicinity of the discharge.

Regional Basin Plan

24. This Order implements the current Water Quality Control Plan for the Central Coast Basin. The Basin Plan incorporates statewide plans and policies by reference and contains a strategy for protecting beneficial uses of State Waters.

25. Historical beneficial uses of groundwater near the discharge include:
    a. Municipal and Domestic Water
    b. Agricultural Water Supply
    c. Industrial Water Supply

26. Present and anticipated beneficial uses of the Salinas River between Nacimiento River and the Santa Margarita reservoir include:

    a. Municipal and Domestic Supply
    b. Agricultural Supply
    c. Industrial Process Supply
    d. Groundwater Recharge
    e. Water Contact Recreation
    f. Non-Contact Water Recreation
    g. Wildlife Habitat
    h. Cold Freshwater Habitat
    i. Warm Freshwater Habitat
    j. Migration of Aquatic Organisms
    k. Spawning, Reproduction, and/or Early Development
    l. Rare, Threatened, or Endangered Species
    m. Commercial and Sport Fishing

RECYCLED WATER POLICY

27. The State Water Board adopted the Recycled Water Policy (Policy) via Resolution No. 2009-0011 (Resolution) on February 3, 2009.

28. It is the intent of the Recycled Water Policy that salts and nutrients from all sources be managed on a basin-wide or watershed-wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses. The State Water Board finds that the appropriate way to address salt and nutrient issues is through the development of regional or subregional salt and nutrient management plans rather than through imposing requirements solely on individual projects.

29. The Recycled Water Policy calls for the development of locally driven and controlled, collaborative processes open to all stakeholders that will prepare salt and nutrient management plans for each basin/sub-basin in California.

30. The CANG is an active participant involved in the development of the Salt and Nutrient Management Plan (SNMP) for the Paso Robles Groundwater Basin.

MONITORING PROGRAM

31. Monitoring and Reporting Program No. R3-2014-0046 is a part of the proposed Order. The Monitoring Program requires routine water supply, pond, influent, effluent, groundwater, solids/biosolids, facility, inflow/infiltration, and salt monitoring to verify compliance and protection of groundwater quality.

32. Monitoring reports are due quarterly, January, April, July, and October. An annual report summarizing the year's events and monitoring is due in January.

ANTIDEGRADATION

33. These waste discharge requirements allow discharges to a groundwater body where there is insufficient data to determine if the local receiving water has high quality. To the extent the discharges covered under this Order may be to high quality waters, this Order authorizes limited degradation consistent with the Antidegradation Policy.

34. Camp Roberts is upgrading the Main Garrison wastewater treatment plant to improve operations and conventional pollutant effluent quality.

35. Camp Roberts is upgrading the Main Garrison wastewater treatment plant to reduce nitrogen pollutants.

36. Camp Roberts is participating in the Paso Robles Groundwater Basin Salt and Nutrient Management Plan effort, which is an effort to better understand and manage the Paso Robles Groundwater Basin.

37. Camp Roberts is evaluating the strategic use of source water supply wells to further minimize potential salinity impacts on groundwater (the source water supply for Camp Roberts consists of a number of wells with differing water quality).

38. Limited degradation of groundwater by some pollutants associated with domestic wastewater effluent, after effective source control, treatment, and control measures are implemented, is consistent with the maximum benefit to the people of the state. The use of Camp Roberts as a military training facility contributes to the economic prosperity of the region, state, and country and is of maximum benefit to the people of the state. The use of Camp Roberts provides sufficient justification for allowing the limited groundwater degradation that may occur pursuant to this Order provided the terms of the Basin Plan and other applicable State Water Board and Regional Water Board policies are consistently met.

ENVIRONMENTAL ASSESSMENT

39. The CANG has provided a Notice of Exemption documenting that the Camp Roberts facility is categorically exempt from the California Environmental Compliance Act (Public Resources Code, Section 21000, et. seq.).

TOTAL MAXIMUM DAILY LOAD

40. Total maximum daily load (TMDL) allocations will be developed for impaired surface waters in the upper Salinas River Basin. TMDL documents will allocate responsibility for constituent loading throughout the watershed or applicable sub-watersheds. If TMDLs determine constituent contributions from waste discharged may adversely impact beneficial uses or exceed water quality objectives, changes in these waste discharge requirements may be required. Waste discharge requirements may be modified to implement applicable TMDL provisions and recommendations.

EXISTING ORDERS/GENERAL FINDINGS

41. The discharge was previously regulated by Waste Discharge Requirements Order No. R3-2004-0106, adopted by the Regional Board on September 10, 2004.

42. Discharge of waste is a privilege, not a right, and authorization to discharge is conditional upon the discharge complying with provisions of Division 7 of the California Water Code and any more stringent effluent limitations necessary to implement water quality control plans, to protect beneficial uses, and to prevent nuisance.

43. On September 8, 2014, the Regional Board notified the Discharger and interested parties of its intent to issue waste discharge requirements for the discharge and has provided them with a copy of the proposed Order and an opportunity to submit written views and comments.

44. After considering all comments pertaining to this discharge during a public hearing on November 13, 2014, this Order was found consistent with the above findings.

IT IS HEREBY ORDERED, pursuant to authority in Sections 13263 and 13267 of the California Water Code that the California Army National Guard, its agents, successors, and assigns, may discharge waste at the above-described facility providing compliance is maintained with the following:

Notes:

- Other prohibitions and conditions, definitions, and the method of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated January 1984. Superscripted terms are defined in Section, D. Definitions.
- All technical and monitoring reports submitted pursuant to this Order are required pursuant to Section 13267 of the California Water Code. Failure to submit reports in accordance with schedules established by this Order, or failure to submit a report of sufficient technical quality to be acceptable to the Executive Officer, may subject the Discharger to enforcement action pursuant to Section 13268 of the California Water Code. The Regional Board will base all enforcement actions on the date of Order adoption
- Any person affected by this action of the Regional Board may petition the State Water Resources Control Board (State Board) to review the action in accordance with section 13320 of the California Water Code and Title 23, California Code of Regulations, Section 2050. The State Board must receive the petition within 30 days of the date of this Order. Copies of the law and regulations applicable to filing petitions will be provided upon request.
- These requirements include the following footnotes, which indicate the requirement's source:

  [BP] Basin Plan [ROWD] Report of Waste Discharge
  [CWC] California Water Code

  Items without footnotes are based on Best Professional Judgment

A. PROHIBITIONS

1. Discharge of treated wastewater to areas other than disposal areas shown in Attachment "B" is prohibited unless approved by the Executive Officer. [ROWD]
2. Discharge of any wastes other than leachate from the Camp Roberts South Unit landfill, domestic wastewater, and equipment washwater is prohibited. [ROWD]
3. Discharge of any wastes including overflow, bypass, seepage, and overspray, from transport, treatment, storage, or disposal systems to adjacent drainageways or adjacent properties not listed in this Order is prohibited. [CWC]
4. Bypass of the treatment facility and discharge of untreated or partially treated wastes directly to the designated disposal area is prohibited.

5. Discharge of wastes to surface waters or surface water drainage courses is prohibited.[CWC]

6. Discharge of petroleum waste is prohibited.

B. SPECIFICATIONS

Flow

1. Annual average daily flow to the Main Garrison wastewater treatment plant shall not exceed: [ROWD]

   a. 0.04 MGD

   b. 0.15 MGD if a second denitrifying filter is installed and provides compliance with effluent nitrogen limits

   c. 0.3 MGD if a third denitrifying filter is installed and provides compliance with effluent nitrogen limits

   d. 2.0 MGD if Camp Roberts is occupied by people displaced in response to natural disasters or other emergency conditions

2. Annual average daily flow to the East Garrison wastewater treatment plant shall not exceed 0.134 MGD.[ROWD]

Effluent Limits

3. Under normal circumstances, when Camp Roberts is not used to temporarily (up to 90 days) shelter the public during disasters, effluent discharged to the Main Garrison disposal ponds shall not exceed the following limitations: [ROWD]

Parameter	Value
BOD_5	30 mg/L
Total Suspended Solids	30 mg/L
TDS	1250 mg/L
Sodium	340 mg/L
Chloride	240 mg/L
Sulfate	250 mg/L
Boron	3.5 mg/L
Nitrate (as N)	7.7 mg/L[1]
Total Nitrogen (as N)	10 mg/L[2]

[1] This Nitrate effluent limit serves as an interim limit and expires on June 30th, 2015

[2] This Total Nitrogen effluent limit shall take effect starting on July 1st, 2015

4. Under emergency circumstances, when Camp Roberts is used to temporarily (up to 90 days) shelter the public during disasters, effluent discharged to the disposal ponds shall not exceed the following limitations: [ROWD]

Parameter	Limit
BOD_5	90 mg/L
Total Suspended Solids	90 mg/L

System Protection

5. Extraneous surface drainage shall be excluded from the wastewater treatment and disposal facilities.

Groundwater Protection

6. The discharge shall not cause a significant increase of mineral constituent concentrations in underlying groundwater, as determined by comparison of samples collected from wells located upgradient and downgradient of disposal areas. [BP]

7. The discharge shall not cause radionuclides to be present in concentrations that are deleterious to human, plant, animal, or aquatic life; or result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life. [BP]

8. The discharge shall not cause groundwater to contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Article 5, Section 64443, Table 4. [BP]

9. The discharge shall not cause groundwater to contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Article 4, Section 64431, Table 64431-A. [BP]

10. The discharge shall not cause groundwater to contain concentrations of chemical constituents in amounts that adversely affect the agricultural supply beneficial use. [BP]

11. No controllable water quality factor shall significantly degrade the quality of any groundwater resource or adversely affect long-term soil productivity. The salinity control aspects of groundwater management will account for effects from all sources. [BP]

System Operation

12. Treatment and disposal areas shall be fenced and posted (English and Spanish) to advise the public that the facility contains domestic wastewater.

13. Wastewater shall be aerated as needed to ensure adequate treatment. Inadequate treatment, as evidenced by excessive surface scum and anaerobic gas production or creation of odor or nuisance conditions, shall not occur.

14. Treatment and disposal ponds shall have a freeboard greater than two feet at all times.

Wastewater Disposal

15. Effluent shall not be discharged within 100 feet of any existing water supply well.

16. Disposal ponds shall be alternated to permit emptying for maintenance purposes.

17. Disposal ponds shall be disked at least annually.

Solid Waste

18. All solids generated from the screening and treatment process must be reclaimed or disposed of in a manner acceptable to the Executive Officer.

Storm Water

19. All storm water contacting domestic wastewater shall be contained onsite.

Inflow/Infiltration

20. Best management practices shall be implemented to minimize the inflow and infiltration of storm water and/or unauthorized wastewater into the facility.

C. PROVISIONS

1. Order No. R3-2004-0106, "Waste Discharge Requirements for the California Army National Guard, Camp Roberts Military Reservation, San Luis Obispo And Monterey Counties," adopted by the Regional Board on September 10, 2004, is hereby rescinded, except for enforcement purposes.

2. The Discharger shall comply with "Monitoring and Reporting Program (MRP) No. R3-2014-0046, as specified by the Executive Officer.

3. The Discharger shall comply with all applicable items of the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated December 5, 2013.

4. All discharges from the facility shall comply with lawful requirements of the municipalities, counties, irrigation districts, drainage districts, and other local agencies regarding discharges of water to other watercourses under their jurisdiction.

5. The Discharger shall give advance notice to the Regional Board of any planned changes in the permitted facility or waste management activities that may result in noncompliance with this Order.

6. This Order may be reopened to address any changes in State or Federal plans, policies, or regulations that would affect the quality requirements for the discharges.

7. In the event of any change in control or ownership of land or facilities presently owned or utilized by the Discharger, the Discharger shall notify the succeeding owner(s) or operator(s) of the existence of this Order by letter, a copy of which shall be forwarded to the Regional Board.

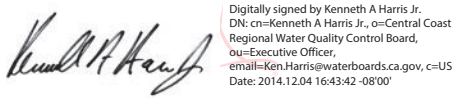
8. Pursuant to Title 23, Chapter 3, Subchapter 9, of the California Administrative Code, the Discharger must submit a written report to the Executive Officer, not later than May 13, 2024 addressing:

   a. Whether there will be changes in the continuity, character, location, or volume of the discharge;

   b. Whether, in their opinion, there is any portion of the Order that is incorrect, obsolete, or otherwise in need of revision; and

   c. A summary of all violations of Waste Discharge Requirements, Order No. R3-2004-0106, which occurred since adoption of the Order along with a description of the cause(s) and corrective action taken.

I, Kenneth A. Harris Jr., Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an order adopted by the California Regional Water Quality Control Board. Central Coast Region on November 13, 2014.



Kenneth A. Harris Jr., Executive Officer

TJK
126-01
CIWQS Place 212962
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STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION
895 Aerovista Place, Suite 101
San Luis Obispo, California 93401

MONITORING AND REPORTING PROGRAM NO. R3-2014-0046

Waste Discharger Identification No. 3 270203002

For

CALIFORNIA ARMY NATIONAL GUARD
CAMP ROBERTS MILITARY RESERVATION
SAN LUIS OBISPO AND MONTEREY COUNTIES

Reporting responsibilities are specified in Sections 13225(a), 13267(b), 13383, and 13387(b) of the California Water Code. This Discharge Monitoring Program is issued in accordance with Provision C.2 of Regional Board Order No. R3-2014-0046.

WATER SUPPLY MONITORING

Representative samples of domestic supply water shall be collected and analyzed as follows:

Parameter/Constituent	Units	Sample Type	Minimum Sampling and Analyzing Frequency
General Minerals [Calcium, Magnesium, Sodium, Sulfate, Carbonate, Bi-Carbonate, Chloride, Total Hardness, Total Alkalinity, Total Dissolved Solids, pH, Electrical Conductivity, Boron, Iron, and Nitrate (as N). Sampling results for the Department of Health Services may be submitted to satisfy this requirement]	mg/L	Grab	January and July

INFLUENT MONITORING

Representative samples of the influent to each wastewater treatment plant shall be collected and analyzed for the constituents and at the frequencies specified below:

Parameter/Constituent	Units	Sample Type	Minimum Sampling and Analyzing Frequency
Flow Volume	MGD	Metered	Daily
Maximum Daily Flow	MGD	Metered	Monthly
Mean Daily Flow	MGD	Calculated	Monthly
BOD_5	mg/L	Grab	Monthly
Total Suspended Solids	mg/L	Grab	Monthly

FACILITY MONITORING

The Discharger shall make at least bi-weekly inspections of the treatment and disposal systems. During the inspections, the Discharger shall note compliance status with this Order. A log of these inspections

shall be maintained and a summary of observations made during the inspections shall be submitted with each quarterly monitoring report.

The East Garrison treatment ponds shall be monitored as follows:

Constituent	Units	Sample Type	Minimum Sampling and Analyzing Frequency
pH	-	Grab*	Weekly
Dissolved Oxygen	mg/l	Grab*	Weekly
Freeboard	Feet	Visual	Weekly

* Grab sample to be taken at one-foot depth.

Each disposal pond shall be monitored as follows:

Constituent	Units	Sample Type	Minimum Sampling and Analyzing Frequency
Freeboard	Feet	Visual	Weekly
Presence of weeds	-	Visual	Quarterly (Dec., March, June, Sept.)
Presence of burrows	-	Visual	Quarterly (Dec., March, June, Sept.)

* Grab sample to be taken at one-foot depth.

LEACHATE MONITORING

Prior to discharge of leachate to the Main Garrison WWTP, the CANG must demonstrate that the leachate from the Solid Waste Cell does not contain any chemicals of concern that could degrade state waters. Sampling should analyze for the following constituents/parameters:

Constituents/Parameters	Method[1]	Units[2]
Volatile Organic Compounds[3]	8260B	µg/L
pH	Field	pH Units
Electrical Conductivity (EC)	Field	µmhos/ cm
Chloride	300.0	mg/L
Nitrate (as Nitrogen)	300.0	mg/L
Total Dissolved Solids	160.1	mg/L
Sulfate	300.0	mg/L
Manganese	6010B	mg/L
Sodium	6010B	mg/L
Barium	6010B	mg/L
Lead	6010B	mg/L
Perchlorate	314.0	µg/L
Total Petroleum Hydrocarbons – crude oil standard	8015M	mg/L
Total Organic Carbon	9060/5310B	mg/L
Dissolved Oxygen	Field	mg/L
Temperature	Field	ºF/C
Turbidity	Field	NTU
Constituents of Concern		
Antimony	6010B	mg/L
Arsenic	6010B	mg/L

Constituents/Parameters	Method[1]	Units[2]
Beryllium	6010B	mg/L
Cadmium	6010B	mg/L
Chromium	6010B	mg/L
Cobalt	6010B	mg/L
Copper	6010B	mg/L
Cyanide	335.4	mg/L
Mercury	7470	mg/L
Nickel	6010B	mg/L
Selenium	6010B	mg/L
Silver	6010B	mg/L
Sulfide	376.2	mg/L
Thallium	6010B	mg/L
Tin	6010B	mg/L
Vanadium	6010B	mg/L
Zinc	6010B	mg/L
Chlorophenoxy Herbicides	8151A	µg/L
Organochlorine Pesticides	8081A	µg/L
PCBs	8082	µg/L
Organophosphorus Pesticides	8141	µg/L
Semi-Volatile Organic Compounds[4]	8270C	µg/L
Volatile Organic Compounds, Appendix II[5]	8260B	µg/L

1. Or most recently approved United States Environmental Protection Agency (US EPA) method that provides the lowest practicable detection limits. All metals must be field filtered before laboratory analysis.
2. mg/L – milligrams per liter; µmhos/cm – micromillimhos per centimeter; ^{o}F/C – degrees Fahrenheit/Centigrade; NTU – nephelometric turbidity units; µg/L – micrograms per liter
3. Volatile Organic Compounds (VOCs) include all VOCs detectable using US EPA Method 8260B, including at least all 47 organic constituents listed in Appendix I to 40 CFR, 258 (Subtitle D), oxygenates (MTBE, TAME, DIPE, EDB, and 1,2 DCA), 1,4 Dioxane, and all unidentified peaks. The detection limit for individual VOCs in undiluted samples shall not exceed 0.5 micrograms per liter (µg/L).
4. Semi-Volatile Organic Compounds must include pentachloroethane, 2-picoline, and pyridine.
5. Includes Fuel Oxygenates. The detection limit for individual VOCs in undiluted samples shall not exceed 0.5 micrograms per liter (µg/L).

EFFLUENT MONITORING

Representative samples of wastewater being discharged to percolation areas shall be collected and analyzed for the constituents and at the frequencies specified below:

Constituent	Units	Sample Type	Minimum Sampling and Analyzing Frequency	
			Main Garrison	East Garrison
Settleable Solids	ml/l	Grab	Weekly	Monthly
pH	-	Grab	Weekly	Monthly
BOD5	mg/l	Grab	Weekly	Monthly
Total Suspended Solids	mg/l	Grab	Weekly	Monthly
Total Dissolved Solids	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Volatile Solids	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)

Constituent	Units	Sample Type	Minimum Sampling and Analyzing Frequency	
			Main Garrison	East Garrison
Sodium	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Chloride	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Boron	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Sulfate	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Nitrite (as N)	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Nitrate (as N)	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Total Kjeldahl Nitrogen (as N)	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Ammonia (as N)	mg/l	Grab	Semiannually (March and September)	Semiannually (March and September)
Total Nitrogen (as N)	mg/l	Calculated	Semiannually (March and September)	Semiannually (March and September)
Aluminum	mg/l	Grab	Annually (September)	Annually (September)
Antimony	mg/l	Grab	Annually (September)	Annually (September)
Arsenic	mg/l	Grab	Annually (September)	Annually (September)
Barium	mg/l	Grab	Annually (September)	Annually (September)
Berylium	mg/l	Grab	Annually (September)	Annually (September)
Cadmium	mg/l	Grab	Annually (September)	Annually (September)
Chromium	mg/l	Grab	Annually (September)	Annually (September)
Copper	mg/l	Grab	Annually (September)	Annually (September)
Cyanide	mg/l	Grab	Annually (September)	Annually (September)
Flouride	mg/l	Grab	Annually (September)	Annually (September)
Lead	mg/l	Grab	Annually (September)	Annually (September)
Mercury	mg/l	Grab	Annually (September)	Annually (September)
Nickel	mg/l	Grab	Annually (September)	Annually (September)
Selenium	mg/l	Grab	Annually (September)	Annually (September)
Thalium	mg/l	Grab	Annually (September)	Annually (September)
Zinc	mg/l	Grab	Annually (September)	Annually (September)
VOCs	mg/l	Grab	Once/5 years (September)	Once/5 years (September)
PCBs	mg/l	Grab	Once/5 years (September)	Once/5 years (September)
Pesticides	mg/l	Grab	Once/5 years (September)	Once/5 years (September)

SOLIDS/BIOSOLIDS MONITORING

The Discharger shall submit a summary of activities regarding solids handling with each quarterly monitoring report. Prior to biosolid removal or change in disposal practices (location, process,

frequency), the Discharger shall submit all disposal information to the Executive Officer for approval. Representative samples of the biosolids to be disposed of shall be collected and analyzed for the constituents and at the frequencies specified below:

Parameter/Constituent*	Units	Sample Type	Minimum Sampling and Analyzing Frequency **
Quantity	Tons or yds^3	Measured during removal	Each load
Moisture Content	%	Grab	Prior to transport/disposal
Nitrate (as N)	mg/kg	Grab	Prior to transport/disposal
Total Phosphorus	mg/kg	Grab	Prior to transport/disposal
pH	pH units	Grab	Prior to transport/disposal
Grease & Oil	mg/kg	Grab	Prior to transport/disposal
Arsenic	mg/kg	Grab	Prior to transport/disposal
Antimony	mg/kg	Grab	Prior to transport/disposal
Barium	mg/kg	Grab	Prior to transport/disposal
Beryllium	mg/kg	Grab	Prior to transport/disposal
Boron	mg/kg	Grab	Prior to transport/disposal
Cadmium	mg/kg	Grab	Prior to transport/disposal
Cobalt	mg/kg	Grab	Prior to transport/disposal
Copper	mg/kg	Grab	Prior to transport/disposal
Chromium, VI & Total	mg/kg	Grab	Prior to transport/disposal
Lead	mg/kg	Grab	Prior to transport/disposal
Mercury	mg/kg	Grab	Prior to transport/disposal
Molybdenum	mg/kg	Grab	Prior to transport/disposal
Nickel	mg/kg	Grab	Prior to transport/disposal
Selenium	mg/kg	Grab	Prior to transport/disposal
Silver	mg/kg	Grab	Prior to transport/disposal
Thallium	mg/kg	Grab	Prior to transport/disposal
Tin	mg/kg	Grab	Prior to transport/disposal
Vanadium	mg/kg	Grab	Prior to transport/disposal
Zinc	mg/kg	Grab	Prior to transport/disposal
Pesticides	mg/kg	Grab	Prior to transport/disposal***
Organic Lead	mg/kg	Grab	Prior to transport/disposal***
PCBs	mg/kg	Grab	Prior to transport/disposal***

*Characterization required by disposal facility may be submitted in place of this list.

** If no need for sludge/biosolids removal occurs during a given year, the Discharger will have no obligation for biosolids monitoring. Reporting in this case shall explain the absence of this monitoring.

*** At least once every 5 years prior to transport or disposal.

RECEIVING WATER MONITORING

Representative samples of groundwater shall be collected from shallow wells upgradient and downgradient of disposal areas and analyzed for the constituents and at the frequencies specified below:

Parameter/Constituent	Units	Sample Type	Minimum Sampling and Analyzing Frequency
Depth to Groundwater	feet	Measured	Semiannually (March and September)
pH	-	Grab	Semiannually (March and September)
Total Dissolved Solids	mg/l	Grab	Semiannually (March and September)
Sodium	mg/l	Grab	Semiannually (March and September)
Chloride	mg/l	Grab	Semiannually (March and September)
Boron	mg/l	Grab	Semiannually (March and September)
Sulfate	mg/l	Grab	Semiannually (March and September)
Nitrite (as N)	mg/l	Grab	Semiannually (March and September)
Nitrate (as N)	mg/l	Grab	Semiannually (March and September)
Total Kjeldahl Nitrogen (as N)	mg/l	Grab	Semiannually (March and September)
Total Nitrogen (as N)	mg/l	Grab	Semiannually (March and September)

REPORTING

Monitoring reports are required quarterly, by the 30th of January, April, July, and October, and shall contain all data collected or calculated over the previous three months. Pursuant to Standard Provisions and Reporting Requirements, General Reporting Requirement C.16, an annual report is required by the 30th of January along with the 4th quarter monitoring report.

IMPLEMENTATION

This monitoring and reporting program shall be implemented immediately.

Digitally signed by Kenneth A Harris Jr.
DN: cn=Kenneth A Harris Jr., o=Central Coast Regional Water Quality Control Board, ou=Executive Officer, email=Ken.Harris@waterboards.ca.gov, c=US
Date: 2014.12.04 16:40:24 -08'00'

ORDERED BY _____
Kenneth A. Harris Jr., Executive Officer

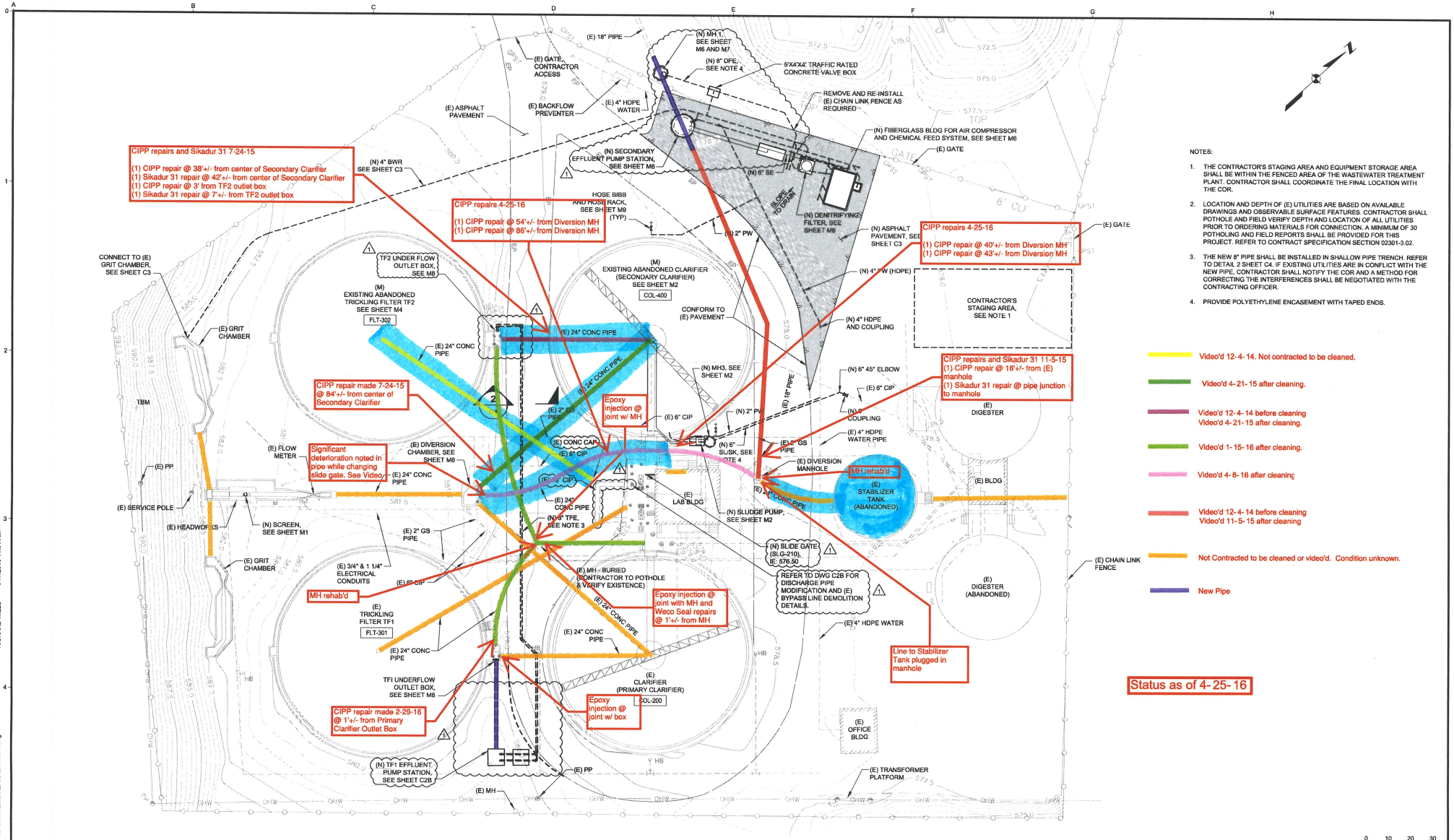
December 4, 2014
Date

TJK
126-01
CIWQS Place 212962
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Appendix B

Site Plan with pipeline Video Logging summary

Weaver Consultants Group



USE OF DOCUMENTS

THIS DOCUMENT, INCLUDING THE INCORPORATED DESIGNS, IS AN INSTRUMENT OF SERVICE FOR THIS PROJECT AND SHALL NOT BE USED FOR ANY OTHER PROJECT WITHOUT THE WRITTEN AUTHORIZATION OF KENNEDY/JENKS CONSULTANTS ©.

NO.	REVISION	DATE	BY
1	DESIGN MODIFICATIONS		

SCALES

0 1"
0 25mm

IF THIS BAR IS NOT DIMENSION SHOWN, ADJUST SCALES ACCORDINGLY.

REGISTERED PROFESSIONAL ENGINEER KENNETH M. RUHL No.41255 Exp.03/31/17 CIVIL STATE OF CALIFORNIA

DESIGNED	RLO
DRAWN	CCE
CHECKED	RFY

CALIFORNIA ARMY NATIONAL GUARD
CAMP ROBERTS, CALIFORNIA

SUSTAINMENT AND COMPLIANCE PROJECT
MAIN GARRISON WASTEWATER TREATMENT PLANT IMPROVEMENTS

Kennedy/Jenks Consultants
10850 Gold Center Drive, Ste 350, Rancho Cordova, California 95670

ALTERNATE SITE PLAN

FILE NAME	127001201c02a.dwg
JOB NO.	1270012.01
DATE	AUGUST 14, 2013
SHEET	C2A
OF	

RICHARD HILLS 4/17/2015 11:54 AM

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Appendix C

MEMPAC-MTM Package Treatment System, Modeling and Simulation Report

Weaver Consultants Group

MEMPAC-M™ Package Treatment System Modeling and Simulation Report

Camp Roberts Phase II
Wastewater Treatment Plant

Prepared for
Avocet Environmental, Inc.
1 Technology Dr, Suite C-515
Irvine, CA 92618

October 2017

2385 Precision Drive
Arroyo Grande, CA 93420
(888) 483-8469

www.cloacina.com



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PART 1 – Overview

The goal of this modeling and simulation report is to determine the effectiveness of the MBR-based wastewater treatment process of the proposed Camp Roberts MEMPAC-M Package Treatment System (Plant). Modeling and simulation of the Plant will show that it meets all waste discharge criteria under the expected plant loading conditions and under all flow conditions.

PART 2 – Plant Design

The Plant is designed to treat municipal wastewater across an average daily flow (ADF) range of 0.005 to 0.250 MGD. The plant is an immersed membrane bioreactor (MBR) plant that includes an activated sludge treatment process and immersed membranes for separation of clear effluent from wastewater process solids. The process flow diagram (PFD) presented in Figure 2.1 represents the “low flow” configuration designed to process flows in the range 5,000 to 40,000 gallons per day (gpd) ADF. The PFD presented in Figure 2.2 represents the “full plant” configuration designed to process flows in the range 40,000 to 250,000 gpd ADF. Transitions between low flow and full plant configurations are automatic, governed by the Plant Control Panel.

The plant consists of a train of process tanks, each having a hydraulic volume of 12,500 gallons. In full plant configuration, wastewater flows through the plant per Table 2.1.

STEP	STATION	DESCRIPTION
1	Equalization Tank "EQ 1"	60,000 gallons, pumped
2	Fine Screen	
3	Anoxic Tank "A"	Compartments "A1" 4,500 gallons & "A2" 8,000 gallons
4	Anoxic Tank "B"	12,500 gallons; Fine bubble diffusers
5	Aeration Tank "A"	12,500 gallons; Fine bubble diffusers
6	Aeration Tank "B"	12,500 gallons; Fine bubble diffusers
7	Anoxic Tank "C"	12,500 gallons; Fine bubble diffusers
8	MBR Tank	12,500 gallons; 3 Compartments
	Anoxic "D"	8,400 gallons; Fine bubble diffusers
	Aeration "C"	1,200 gallons; Fine bubble diffusers
	Membrane Chambers (2)	2,900 gallons total; Membrane sparging air
9	Dewatering	Screw Press
*	Retention "EQ 2"	500,000 gallons; Returns non-compliant effluent to "EQ 1"
*	Retention "EQ 3"	500,000 gallons; Returns non-compliant effluent to "EQ 1"

Table 2.1: Full Plant Configuration Flow Sequence

In low flow configuration, wastewater flows directly from Anoxic “A1” to Aeration “C,” bypassing Anoxic “A2,” Steps 4 through 7, and Anoxic “D.” In low flow configuration, the bypassed tanks are usually empty. During the transition from low flow to full plant configuration, the incoming wastewater high in

ammonia must be nitrified as a batch while the empty tanks fill. All anoxic tanks except for Anoxic “A” therefore contain fine bubble diffusers for transient batch nitrification. The membrane cassettes provide coarse bubble air continuously during operation for scrubbing of the membranes. This air provides a credit toward the total dissolved oxygen (DO) introduced to the process flow by the aeration system.

Flow exiting the membranes chambers enters a recycled activated sludge (RAS) collection chamber from which it is circulated at a rate that is four times the influent flow rate (4Q) up to a maximum rate of 1.00 MGD. The system features a “Bardenpho” process consisting of an internal recycle from Aeration Tank “B” to Anoxic Tank “A.” This process returns a portion of the high nitrate wastewater to the front of the system to facilitate the consumption of influent BOD under anoxic conditions.

Sodium hypochlorite “caustic” is injected into Aeration Tank C as required to maintain a total alkalinity set point.

Clear permeate drawn through the membranes by permeate pumps and thereby separated from the mixed liquor enters a Clearwell Chamber from which it flows by gravity to outfall. Among the effluent quality metrics Biological Oxygen Demand (BOD5), Total Suspended Solids (TSS) and Total Nitrogen (TN), TN is the first to violate discharge requirements. This tends to occur during transitions between low flow and full plant configurations. When TN exceeds its discharge limit, permeate effluent is diverted automatically and immediately to retention basins “EQ 2” and “EQ 3” to be stored until it can be reprocessed when the system has regained equilibrium.

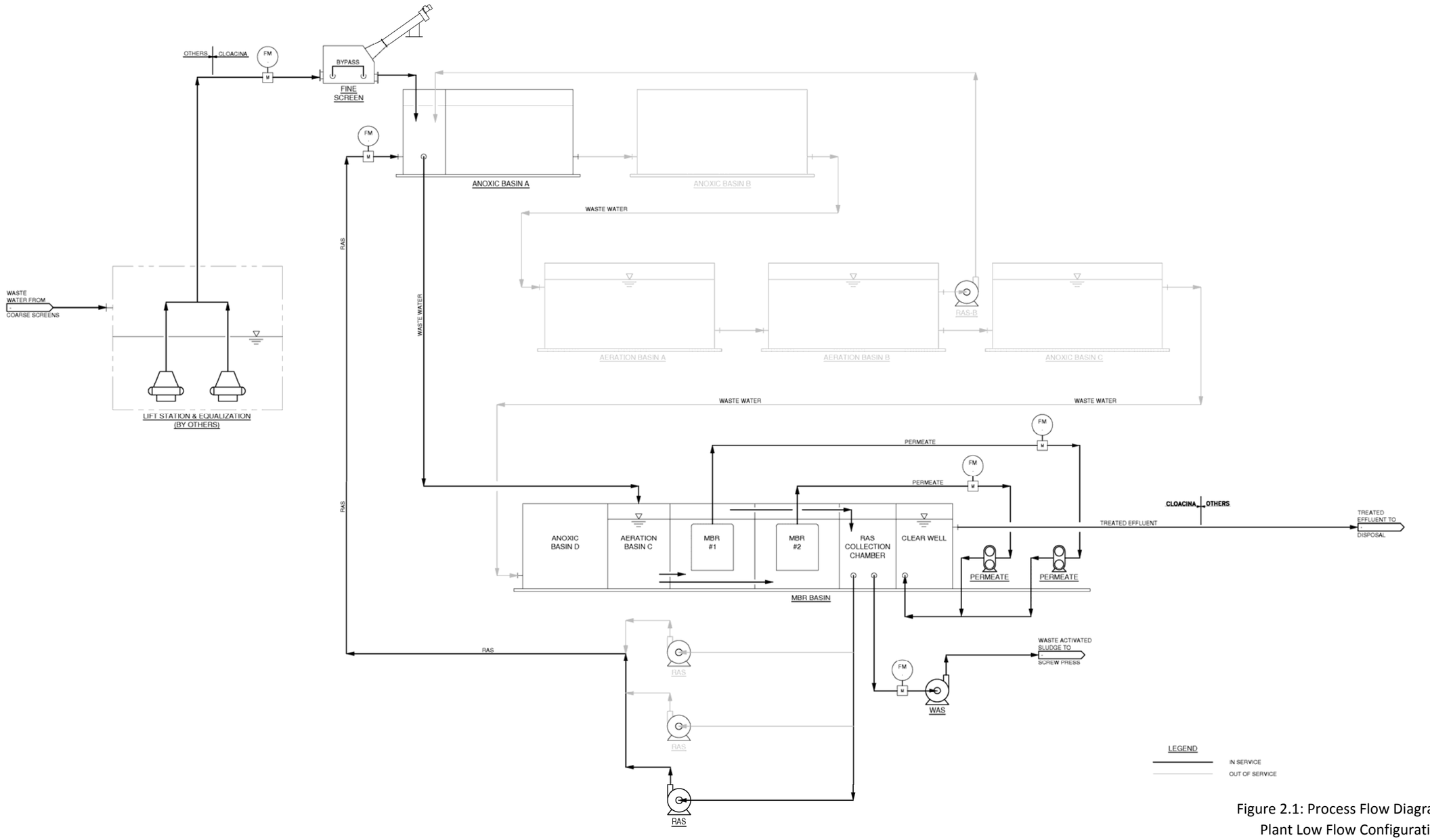


Figure 2.1: Process Flow Diagram
Plant Low Flow Configuration
CL17-004 Camp Roberts MEMPAC-M

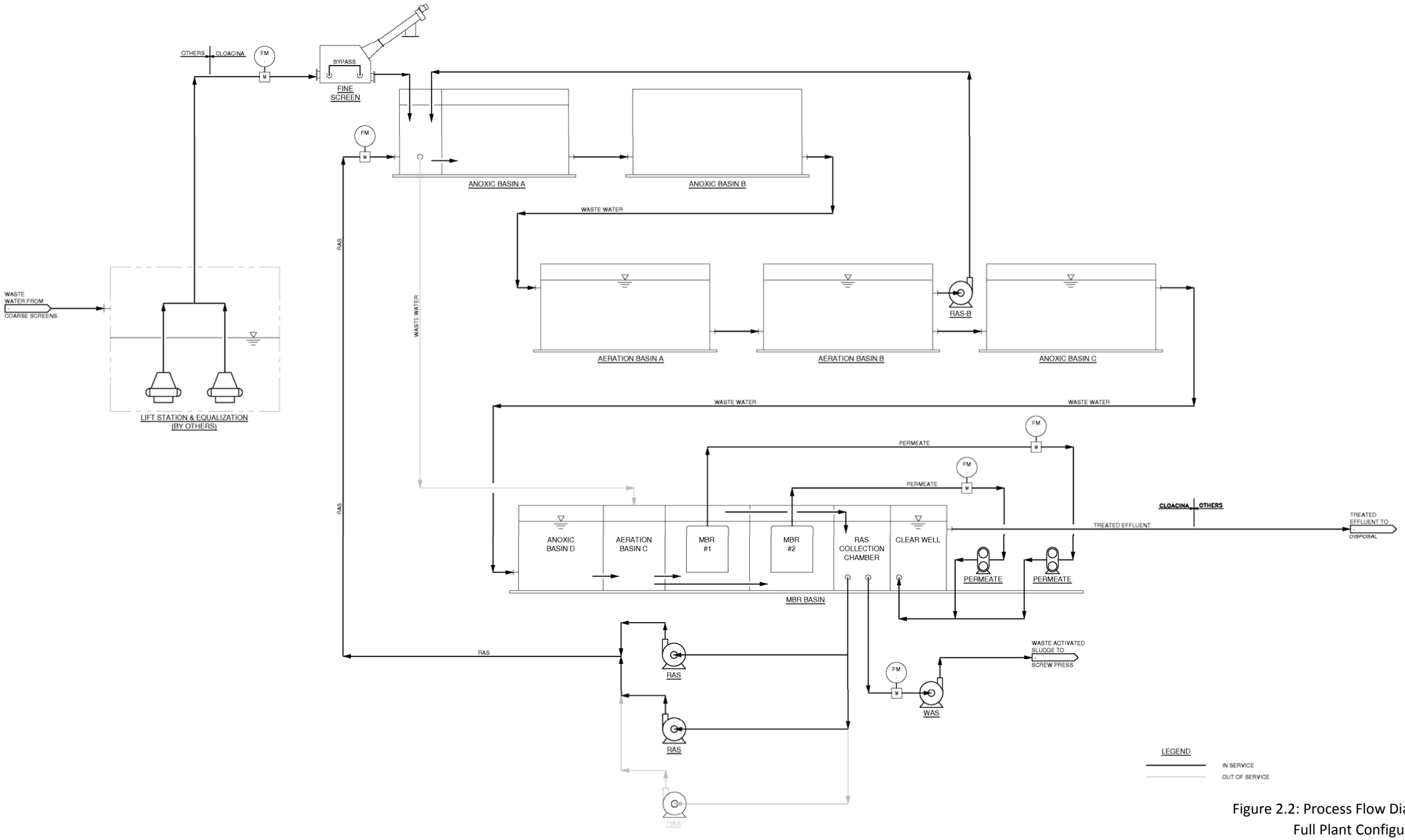


Figure 2.2: Process Flow Diagram
Full Plant Configuration
CL17-004 Camp Roberts MEMPAC-M

PART 3 – System Modeling

A detailed process model was developed using the Hydromantis GPS-X™ process modeling platform. The GPS-X™ Mantis 2 model library that allows for comprehensive analysis of COD, N, P and pH was selected. The BOD based influent model was utilized since the organic carbon loading information in the influent data provided by Avocet Environmental was stated in BOD terms.

3.01 Model Layout and Configuration

The layout of the plant in GPS-X™ is shown in Figure 3.1. The Influent object corresponds to the Lift Station, and the Permeate object corresponds to the effluent stream from the plant to outfall. The influent is initially screened using a 2-mm perforation size microscreen. The screening performance metrics are assumed to approximate those of the default Belt Microscreen process object in GPS-X™. These metrics are that about 0.5% of the influent flow is retained be the screens, and about 60% of organic inert particulate materials and inorganic compounds are removed. Also, 30% of organic particulate materials and biological solids are removed.

Transitions from low flow to full plant configurations are prompted by a level set point in "EQ 1." Transitions from full plant to low flow configuration are prompted by a moving average of the raw influent flow rate with an adjustable dwell time that is set initially to 5 days.

Virtual blowers feeding fine bubble diffusers are PID-controlled to maintain DO set points. The standard oxygen transfer efficiency (SOTE) for all fine bubble diffusers was set, per their manufacturer's literature (OTT Group, 2008), to 0.20 as a function of 8 feet of submergence and a maximum specific flow rate of 17.5 SCFM per 1,000 gallons of tank volume. An actual oxygen transfer rate to standard oxygen transfer rate (OTR/SOTR) ratio of approximately 0.40 applies, varying slightly with aeration rate.

The twin parallel membrane cassettes are modeled as a single Membrane Tank object complete with membrane sparging air. The membrane modules are assumed to have a solids capture rate of 0.9999 and colloidal substrate and soluble inert capture rates of 0.1. These are typical performance metrics for microfiltration membrane systems, and are default values in GPS-X™. Similarly to the Aeration Basins, the Membrane Tank contains a virtual blower, the flow rate of which is proportional, per the membranes manufacturer, to the permeate flux rate through the membranes.

The pump included in the Membrane Tank object serves as the Return Activated Sludge (RAS) pump, and it is controlled to pump at a rate that is four times the moving average Influent flow rate (4Q) up to a maximum rate of 1.00 MGD. Similarly, the Bardenpho internal recycle pump is controlled to pump at a rate of 4Q. The RAS pump impels flow to a flow splitter that contains the Waste Activated Sludge (WAS) pump. The WAS pump is activated by a PID controller to waste flow to the Dewatering screen at a rate that maintains a mixed liquor suspended solids (MLSS) set point. Sludge that is not wasted by the WAS pump return through the flow splitter to Anoxic Tank "A."

Process flow is assumed to be at an average temperature of 64 °F due to warming by the hot air diffused into the process flow by the blowers. A maximum ambient temperature of 115 °F is the most conservative input for the blowers' inlet temperature in terms of solubility of air in water and also in terms of SCFM delivered per ACFM conveyed.

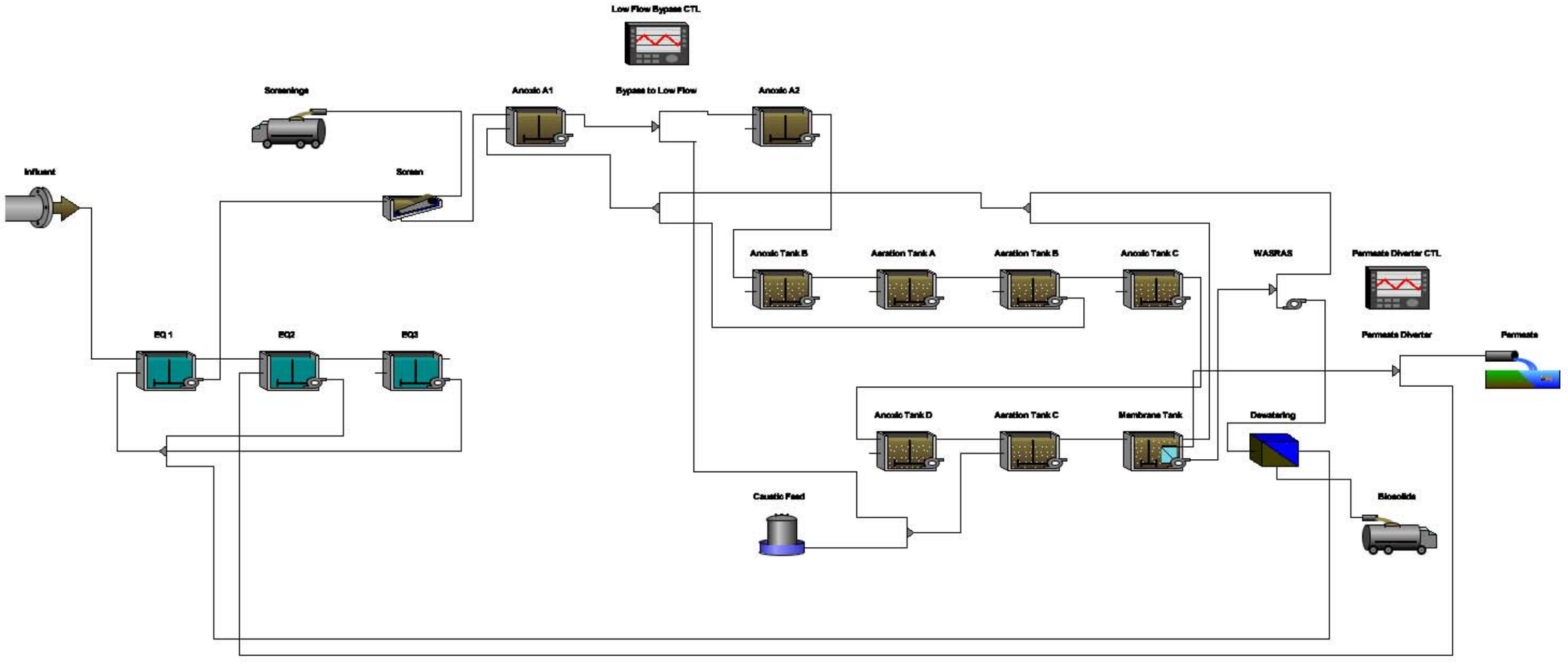


Figure 3.1: Plant Layout Model
Plant Modeling & Simulation Report
CL17-004 Camp Roberts MEMPAC-M

3.02 Influent Characterization

Key influent constituent concentrations provided by Avocet are shown in Table 3.1.

Parameter	Average Concentration (mg/L)	Monthly Maximum Concentration (mg/L)
BOD_5	120	320
TSS	180	375
Total Nitrogen (as N)	45	80
Ammonia	25	65

Table 3.1: Influent Constituents Concentrations

Four flow rate scenarios were specified by Avocet for consideration as shown in Table 3.2. The peak-hour factor (Peak Hour / ADF) for the Weekend Flow scenario is 2.625. The peak-hour factor for the other scenarios is 3.500.

Flow Scenario	Average Daily Flow (gpd)	Peak Hour Flow (gpd)
Baseline Flow	5,000	17,500
Weekend Flow	40,000	105,000
Annual Training Flow	150,000	525,000
Maximum Design Flow	250,000	875,000

Table 3.2: Flow Rate Scenarios

Flow rate data, sampled continuously at two-minute intervals at the existing influent lift station from 6/7/17 to 8/22/17, was provided by Avocet. From this data set were taken representative Baseline weekday and Annual Training Flow (ATF) diurnal curves. ATF events are typically three weeks in duration, and the ATF diurnal curve applies to both ATF weekdays and ATF weekends. These diurnal curves were normalized to generate diurnal flow factor curves whereby each hour of a 24-hour day is assigned its ratio of the ADF. ADF itself has a factor of 1, and the average of the 24 hourly factors in any diurnal flow factor curve is 1. The ATF flow factor curve was conformed to a peak-hour factor of 2.625 to generate a Weekend Flow diurnal flow factor curve. The ATF flow factor curve was conformed to a peak-hour factor of 3.500 to generate the diurnal flow factor curve that applies to both ATF and Maximum Design Flow scenarios. Finally, the Baseline diurnal flow factor curve was conformed to a peak-hour factor of 3.500.

The sets of 24 diurnal flow factors (Figure 3.2) are input into GPS-X™ on a day-to-day basis by way of an "Input File" that governs the values of 24 flow factor parameters in GPS-X™ for each day of the simulation period. This enables the simulation to change from one flow scenario to another while in

progress. Influent constituent concentrations are also assigned to each day in the Input File as follows: the Average Concentration data set (BOD5, TSS and TN) is assigned to Baseline and Weekend flows, and the Maximum Monthly Concentrations data set is assigned to ATF and Maximum Design Flows.

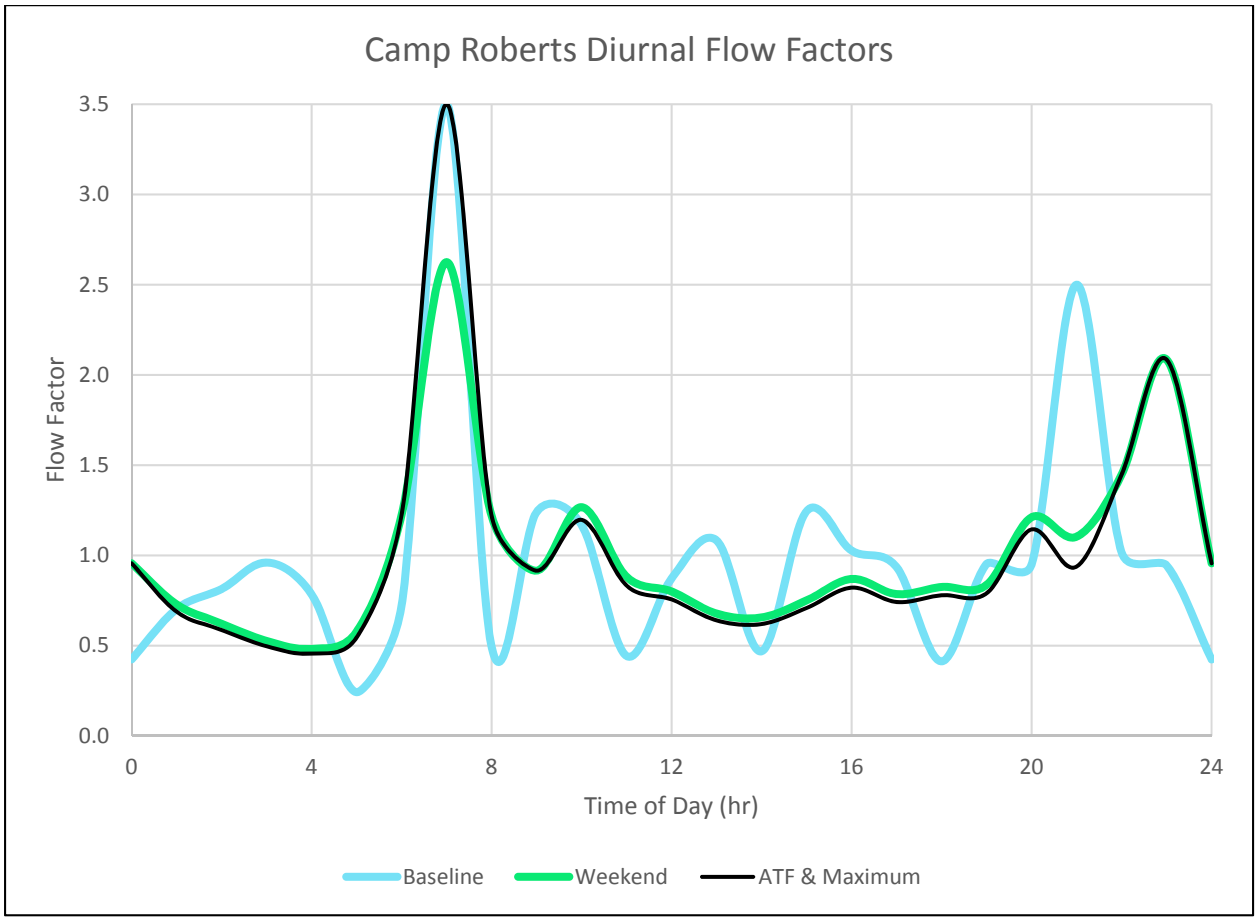


Figure 3.2: Diurnal Flow Factor Curves

3.03 Discharge Limits

Average daily effluent limits, applicable to all flow scenarios, were specified by Avocet as indicated in Table 3.3.

Parameter	Value (mg/L)
Biochemical Oxygen Demand (BOD_5)	**30**
Total Suspended Solids (TSS)	**30**
Total Nitrogen (as N)	**10**

Table 3.3: Key Discharge Limits

PART 4 – Simulation

To prove the efficacy of the proposed MEMPAC-M Package Treatment Plant across all flow scenarios and their respective influent constituent concentrations, three simulations were conducted:

- Baseline and Weekend flows, alternating
- ATF and Maximum Design Flow
- Transitions: Baseline/Weekend to ATF/Maximum Design Flow and back

4.01 Baseline and Weekend Flows

An input file for Baseline and Weekend flows was loaded to govern ADFs, hourly flow factors, and influent constituent concentrations on a daily basis for a period of 30 days. The MLSS set point for control of the WAS pump was set to 12,000 mg/L for maximum effect should there be a low-flow to full-plant transition during which the MLSS would be diluted. A total alkalinity set point of 300 mg/L CaCO3 applies to Baseline and Weekend flows. The influent flows and loading are shown across the 30-day period in Figure 4.11. Figure 4.12 shows that permeate TSS and BOD5 levels remained well under their limits (30 mg/L and 30 mg/L, respectively) for the duration of the simulation. TN exceeded its limit of 10 mg/L during the first two days after start-up. Flow to outfall was zero while permeate was diverted to "EQ 2" until TN should fall below its limit. Figure 4.13 shows that approximately 10,000 gallons of permeate were stored then returned to the system for reprocessing. Figure 4.13 also shows a weekly maximum equalization volume in "EQ 1" of approximately 50,000 gallons of raw influent. Finally, Figure 4.14 shows that the system remained in Low Flow Configuration for the duration of the 30-day simulation. That is, Anoxic Basins "B," "C" and "D," and Aeration Basins "A" and "B" remained off-line.

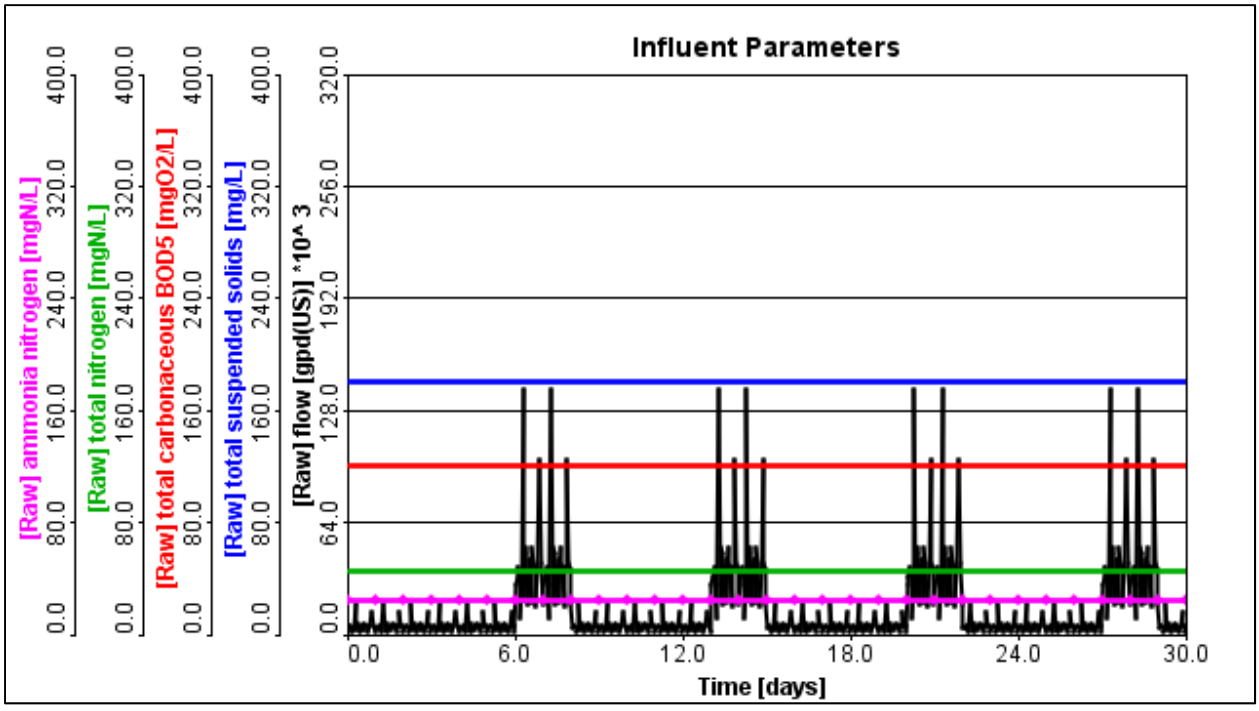


Figure 4.11: Influent Parameters

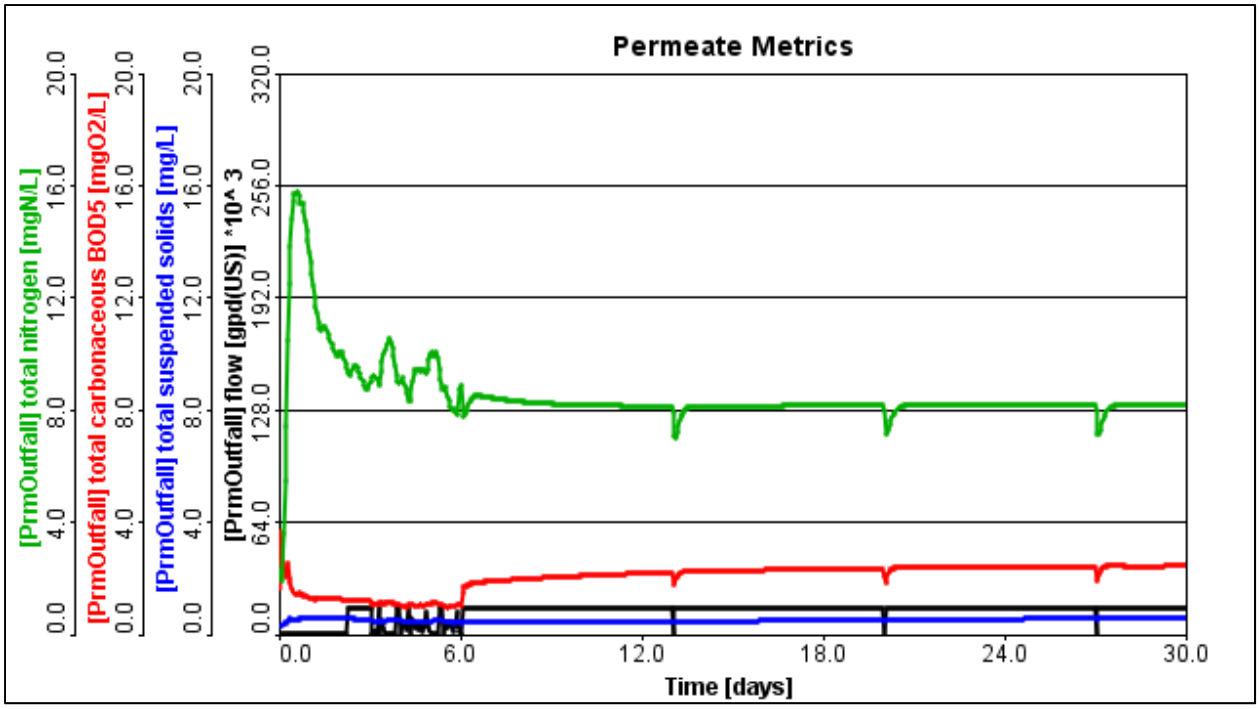


Figure 4.12: Effluent Metrics

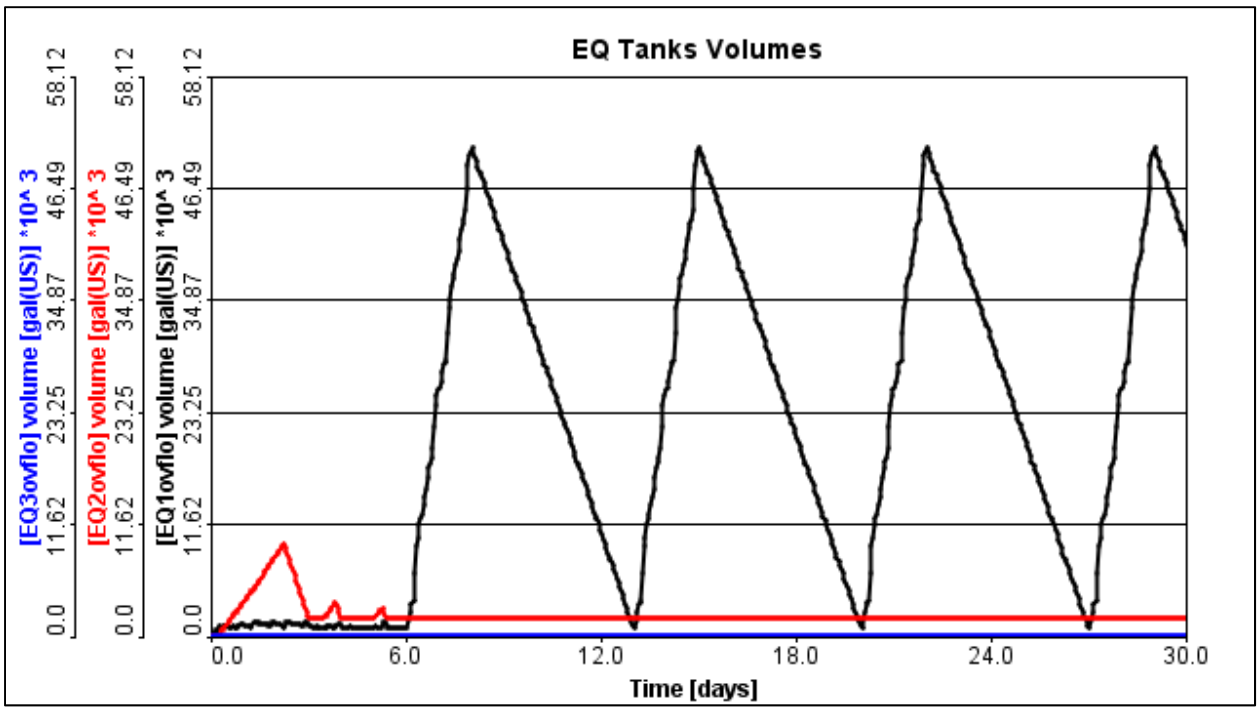


Figure 4.13: Equalization Tanks Volumes

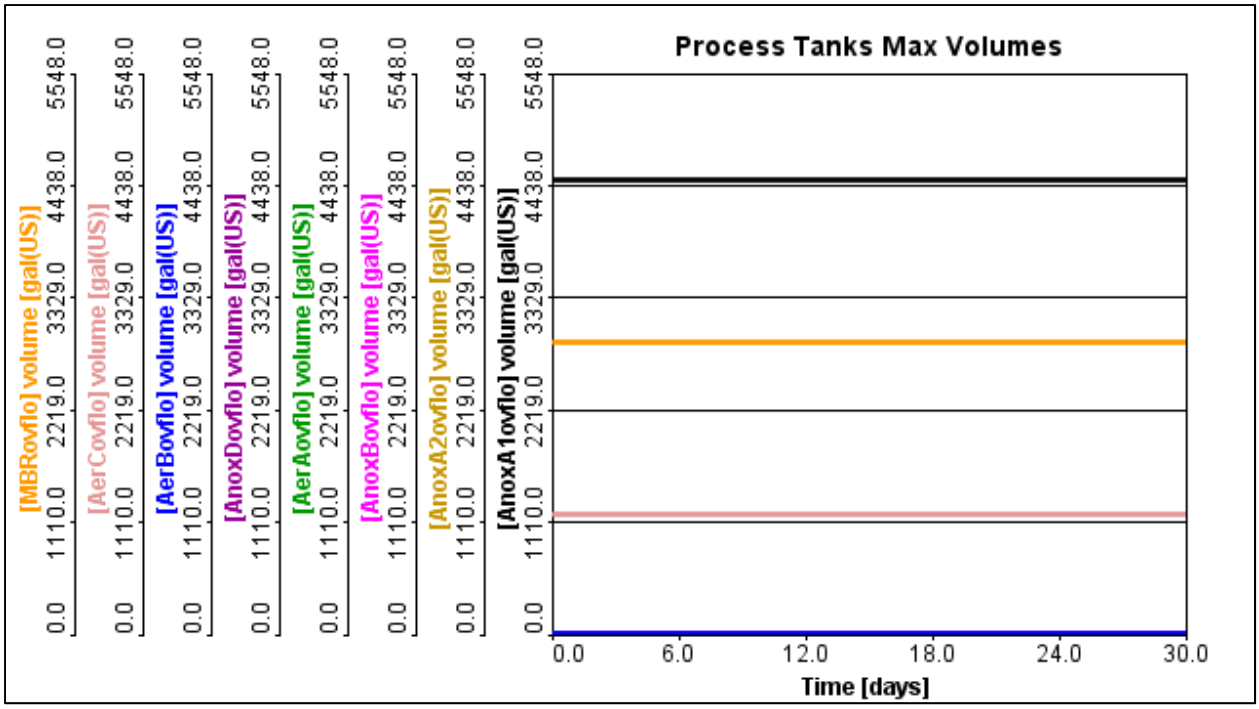


Figure 4.14: Process Tanks Online

4.02 Annual Training Flow (ATF) and Maximum Design Flow

An input file was loaded that governs both ATF and Weekend flows for a period of 60 days. The DO set points for blowers control was governed to 2.0 mg/L, and the total alkalinity set point was governed to 450 mg/L CaCO3. MLSS set points for ATF and Maximum Design Flow were 8,000 mg/L and 12,000 mg/L, respectively. The influent flows and loading across the 60-day period are shown in Figure 4.21. Figure 4.22 shows that permeate TSS and BOD5 levels remained well under their limits for the duration of the simulation, but TN exceeded its limit for nearly 6 days after start-up. It was at the beginning of this 6-day period that Anoxic Tanks "B," "C" and D," and Aeration Tanks "A" and "B" filled up, the system having started in its default low flow configuration. During this full system start-up period, all fine bubble diffusers are summoned to aerate the filling tanks until TN, driven by a spike in ammonia, is brought to below its limit. Flow to outfall was zero for these 6 days while permeate was diverted to "EQ 2" and "EQ 3" in succession. Figure 4.23 shows that "EQ 2" filled with permeate to its maximum capacity of 500,000 gallons then overflowed approximately 340,000 gallons more to "EQ 3." Finally, Figure 4.24 shows that the system transitioned to full system configuration immediately at commencement of simulation and remained there for the duration of the 60-day period. During ATF and Maximum Design Flow, the system is capable of reprocessing stored non-compliant permeate at the rate of 50,000 gpd.

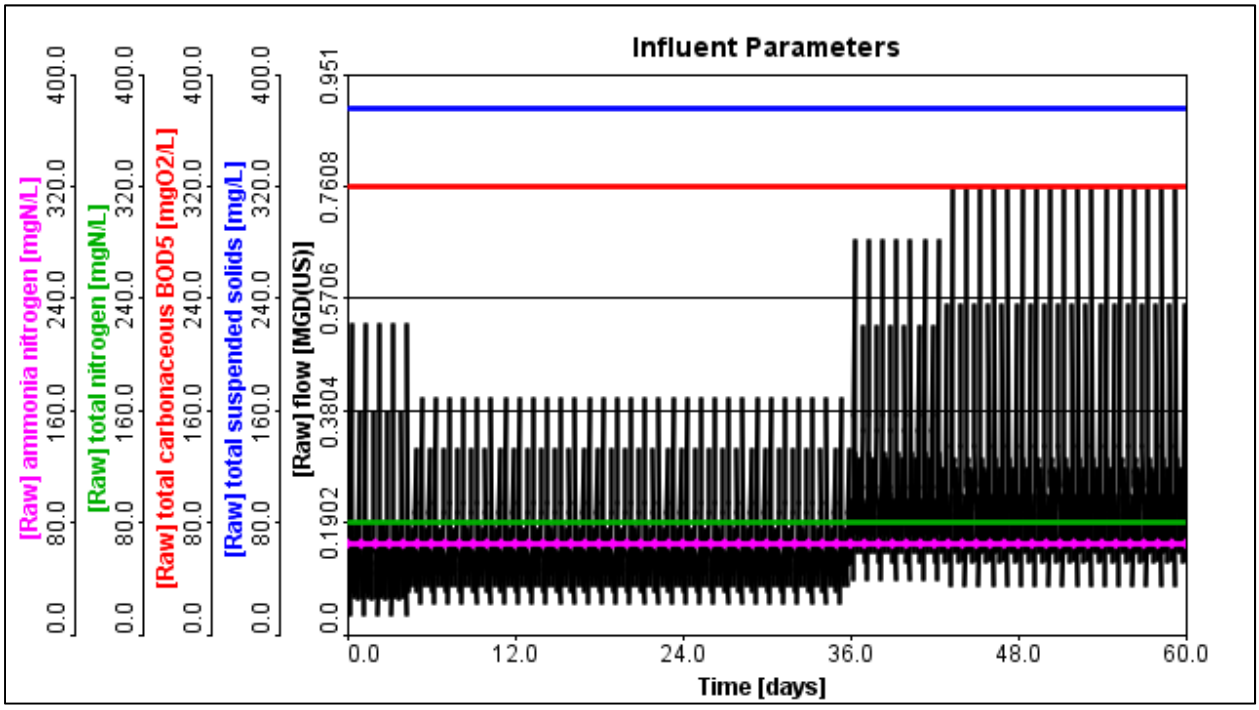


Figure 4.21: Influent Parameters

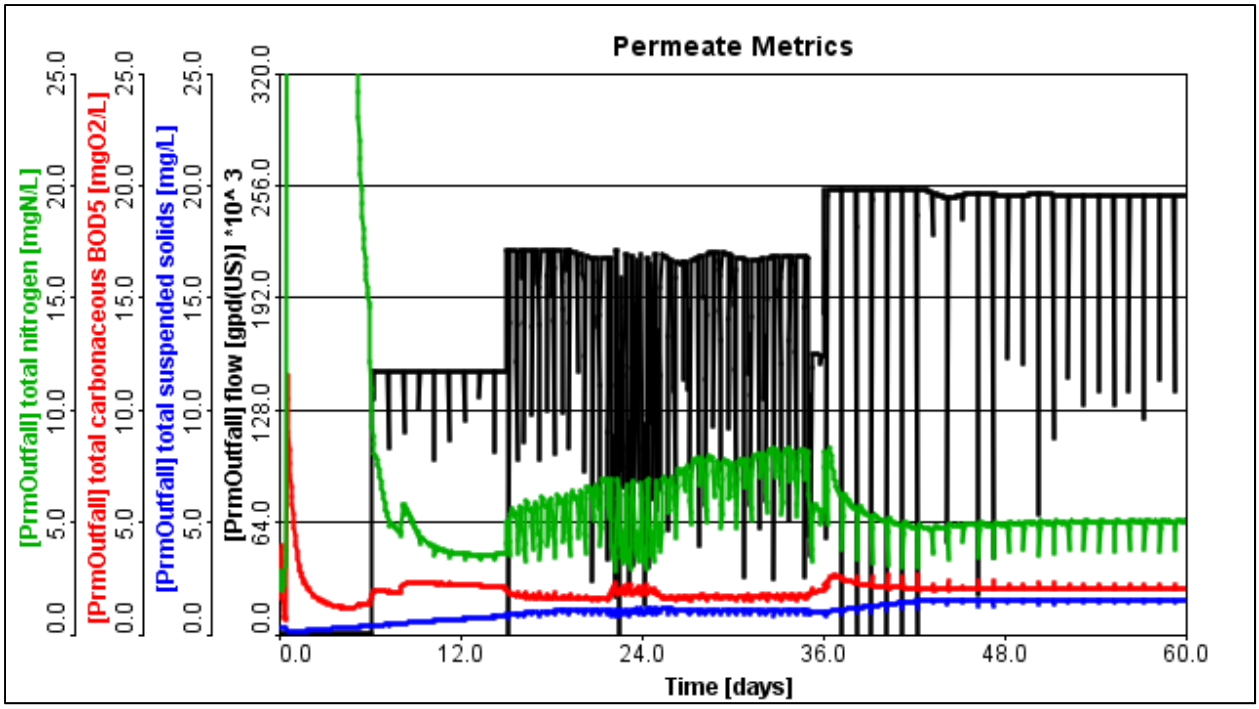


Figure 4.22: Effluent Metrics

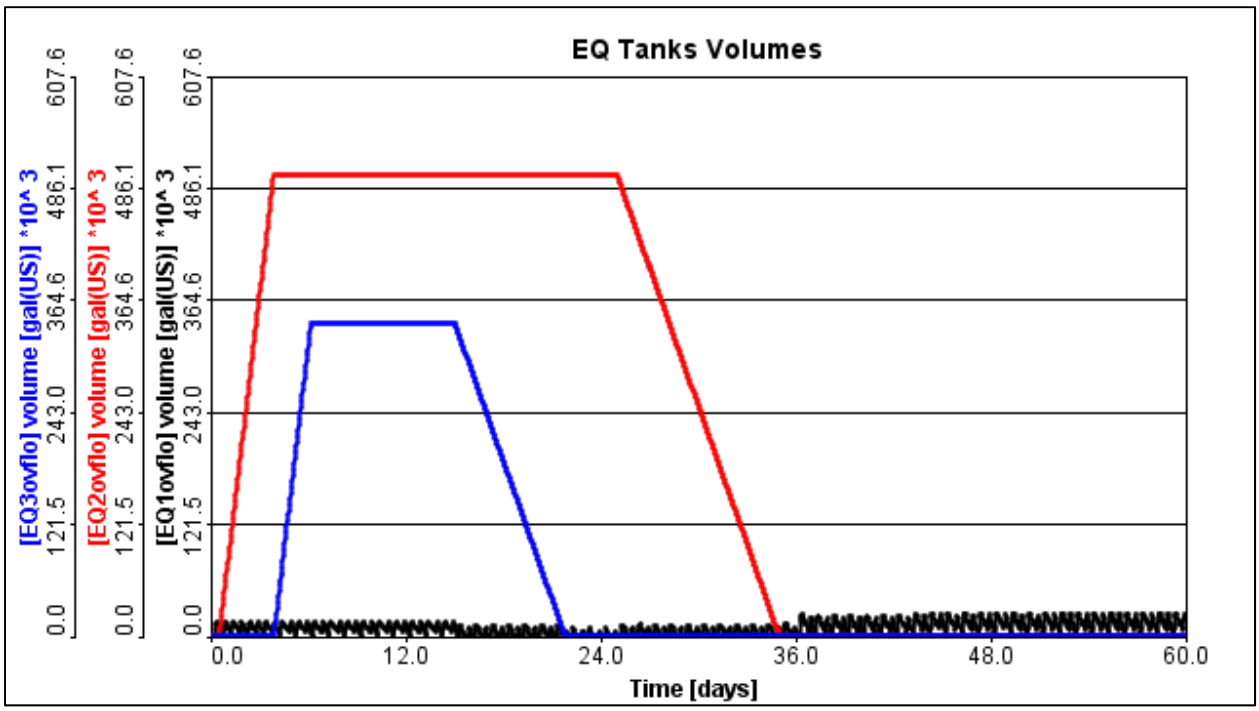


Figure 4.23: Equalization Tanks Volumes

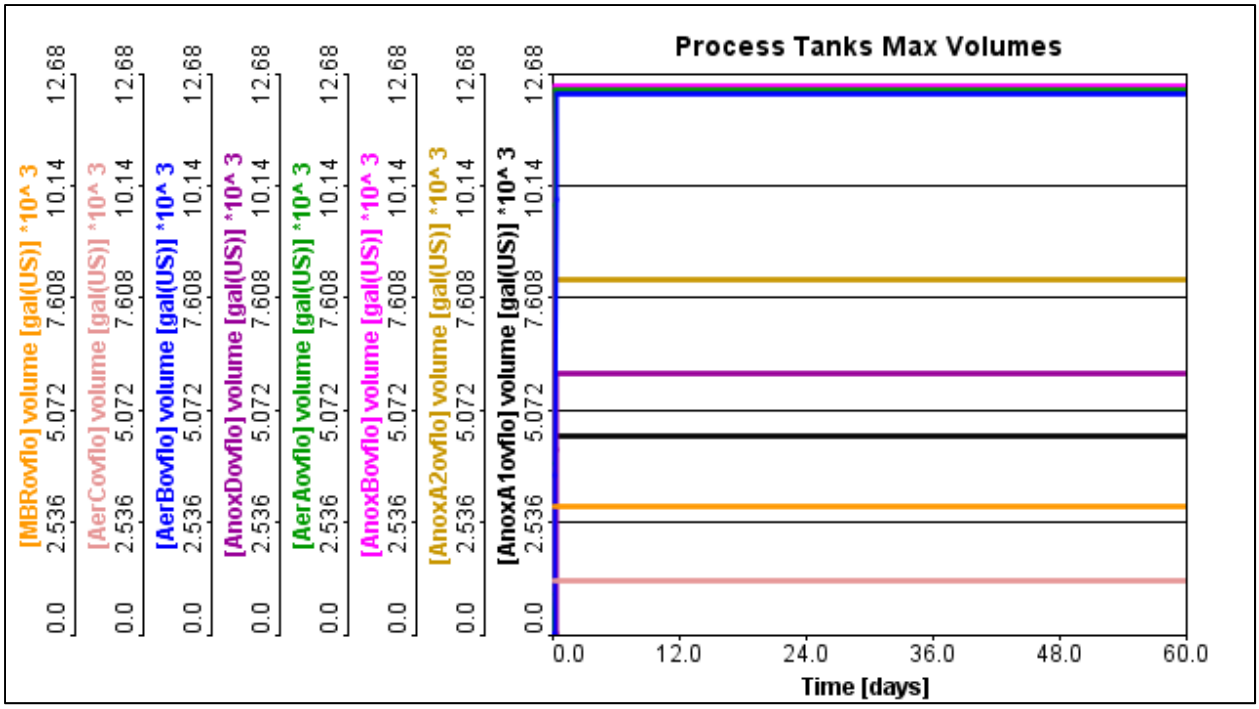


Figure 4.24: Process Tanks Online

4.03 Transitions

An input file was loaded that varies the flow scenarios across a period of 82 days as shown in Table 3.4.

Day	Flow Scenario
1	Baseline/Weekend
18	(ramp up)
20	ATF
39	(ramp down)
41	Baseline/Weekend
46	(ramp up)
50	Maximum Design
69	(ramp down)
71	Baseline/Weekend

Table 3.4: Flow Scenarios Transitions

The DO, MLSS and total alkalinity set points determined for the separate flow scenarios in the two previous simulations apply also to their respective flow scenarios in this simulation. The influent flows and loading across the 82-day period are shown in Figure 4.31. Figure 4.32 shows that the permeate TSS level remained well under its limit for the duration of the simulation, but TN exceeded its limit during the system configuration transitions initiated on Days 18, 39 and 69. Also of note is that the permeate BOD5 concentration very nearly exceeded its limit briefly at the commencement of the first transition

period. During each period of discharge non-compliance, permeate was diverted to “EQ 2” and “EQ 3” so that flow to outfall was zero as indicated in Figure 4.32. Figure 4.33 shows that over a 5-day period commencing at Day 18 (transition from Baseline/Weekend to ATF), “EQ 2” filled with permeate to its maximum capacity of 500,000 gallons then overflowed approximately 100,000 gallons more to “EQ 3.” Over an approximately 3-day period commencing at Day 46 (transition from Baseline/Weekend to Maximum Design), “EQ 2” filled with approximately 380,000 gallons of permeate, and “EQ 3” was not needed. Figure 4.34 shows that the system transitioned from low-flow to full system configuration promptly upon the ramp-up commencing on Day 18. Note that even though influent flow returned to the Baseline/Weekend scenario for the 5 weekdays starting on Day 39, the dwell period combined with the moving influent flow average controlled the system to remain in full plant configuration in case of a ramp-up during the coming week (which it did). Starting from full plant configuration (as long as sufficient biomass remains alive) is preferable to starting again from low-flow configuration (i.e. empty process tanks). Finally, the influent flow scenario began on Day 69 to ramp back down to Baseline/Weekend flows. The simulation ended before the system could pass sufficient time to transition back to low flow configuration. Figure 4.33 shows that after each period of effluent non-compliance, permeate was successfully returned from “EQ 2” and “EQ 3” to the system for reprocessing.

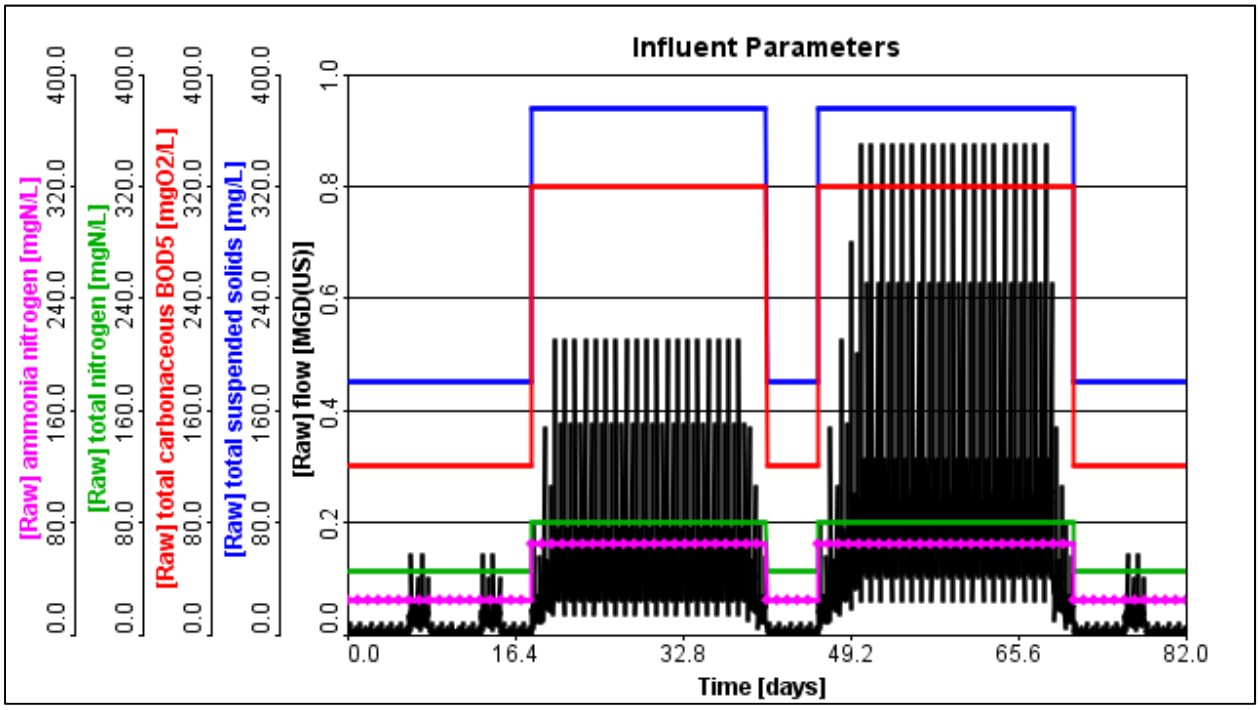


Figure 4.31: Influent Parameters

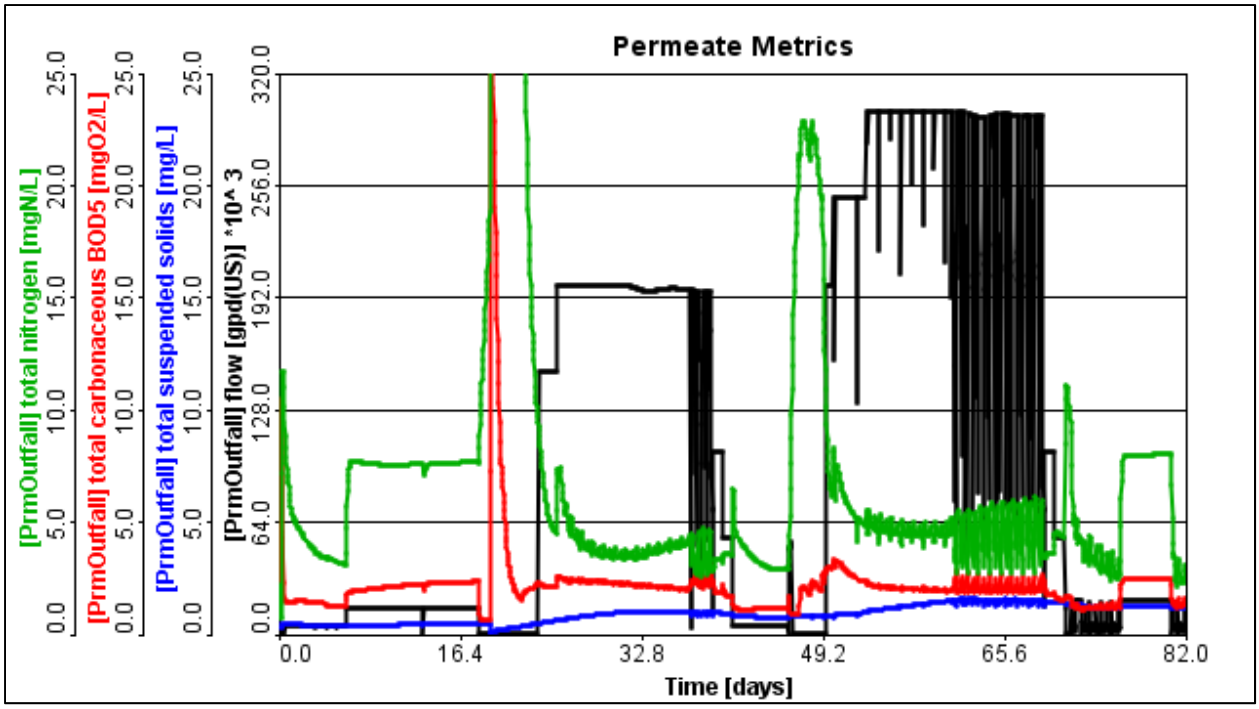


Figure 4.32: Effluent Metrics

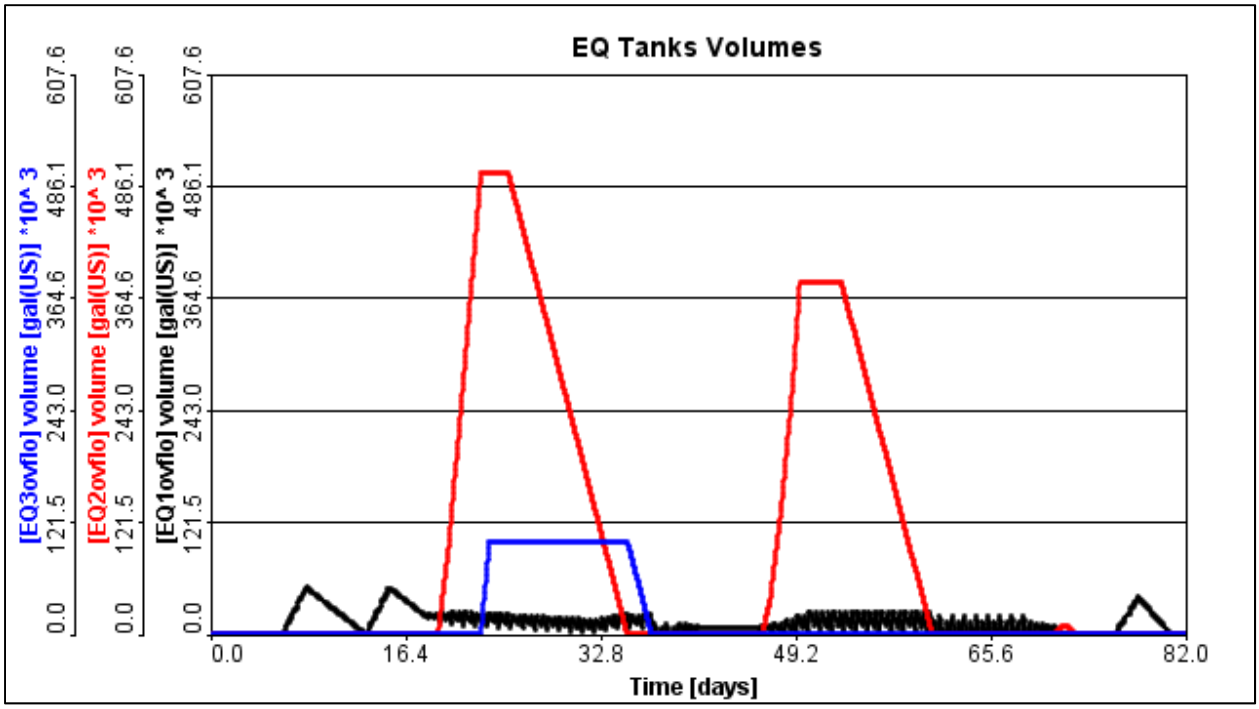


Figure 4.33: Equalization Tanks Volumes

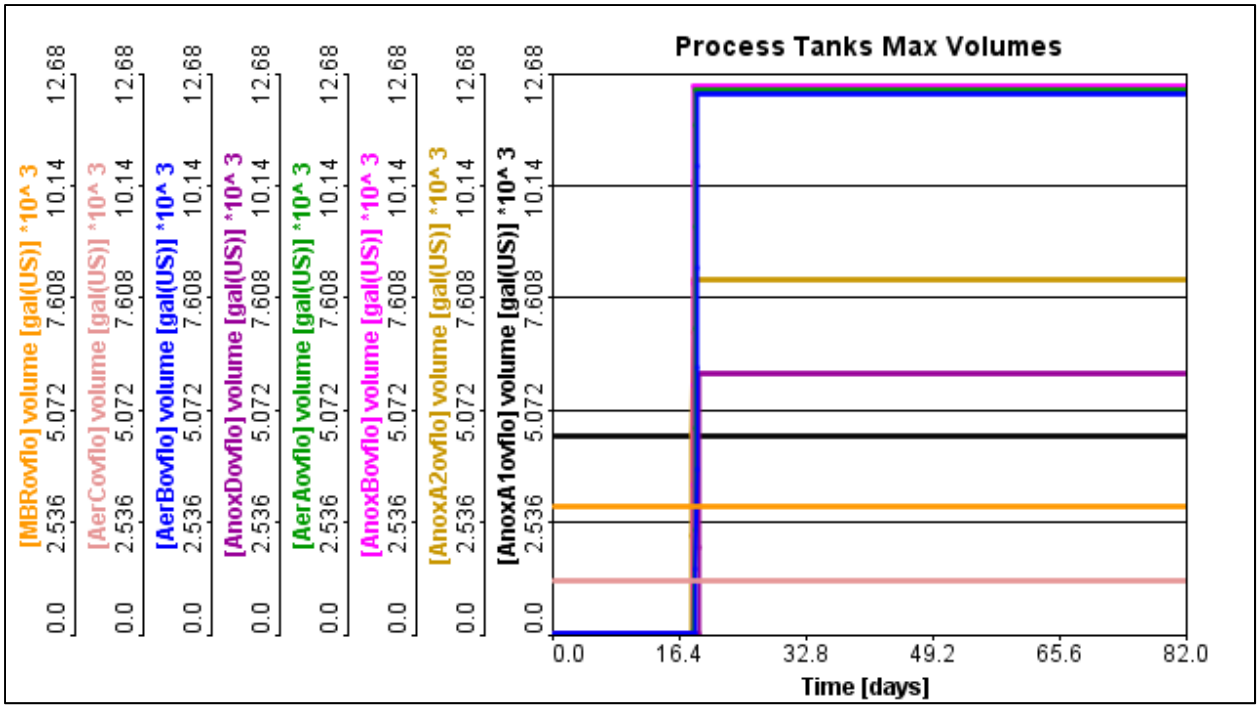


Figure 4.34: Process Tanks Online

PART 5 – Summary

This modeling and simulation exercise for the proposed design of the Camp Roberts MEMPAC-M Package Treatment Plant demonstrates that the plant is capable of treating municipal wastewater across all flow scenarios and their respective influent loadings specified by Avocet. The plant transitions seamlessly between its two configurations to accommodate the wide range of flows. The plant meets all specified effluent limits by refraining from discharging to outfall during transient periods when permeate is not in compliance with discharge criteria.

Appendix D

Design Drawings

Weaver Consultants Group

PREPARED FOR

CALIFORNIA MILITARY DEPARTMENT

PROJECT TITLE

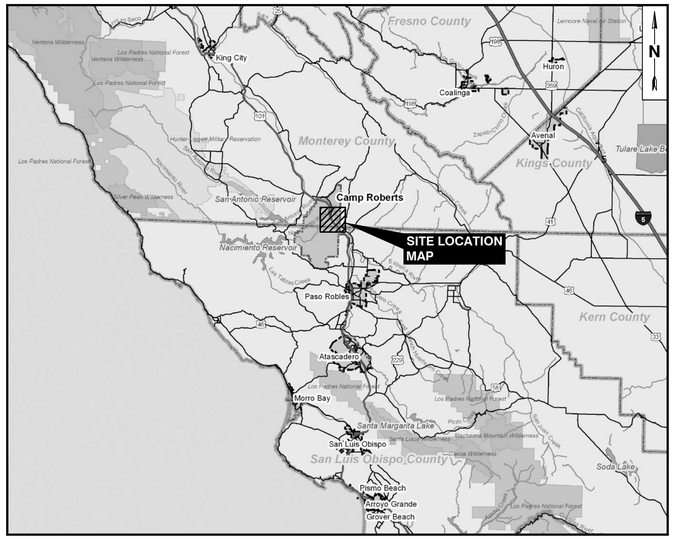
MAIN GARRISON WASTEWATER TREATMENT PLANT PHASE 2 UPGRADES

CAMP ROBERTS, CALIFORNIA

INDEX OF DRAWINGS

G01	INDEX OF DRAWINGS, SITE VICINITY MAP, AND SITE LOCATION MAP
G02	GENERAL NOTES, ABBREVIATIONS, AND LEGEND
G03	WASTEWATER TREATMENT PLANT SITE PLAN
G04	FLOW PROFILE - LOW FLOW AND PERMEATE RECIRCULATION
G05	FLOW PROFILE - EQUALIZATION TANK
P01	WWTP SITE PROCESS FLOW DIAGRAM
P02	MBR PROCESS FLOW DIAGRAM
C01	EXISTING SITE AND DEMOLITION PLAN (1 OF 2)
C02	EXISTING SITE AND DEMOLITION PLAN (2 OF 2)
C03	SITE PLAN
C04	MEMBRANE BIOREACTOR (MBR) PLAN AND PROFILE
C05	DRYPAC PLAN AND PROFILE
C06	PERMEATE RETENTION POND PLAN
C07	DETAILS AND SECTIONS (1 OF 3)
C08	DETAILS AND SECTIONS (2 OF 3)
C09	DETAILS AND SECTIONS (3 OF 3)
C10	DETAILS AND SECTIONS (4 OF 4)
C11	HARDSCAPE PLAN
S01	STRUCTURAL TITLE SHEET
S02	STRUCTURAL SPECIFICATIONS
S03	STRUCTURAL SPECIFICATIONS
S04	MBR FOUNDATION PLAN
S05	MBR MAT SLAB REBAR PLAN
S06	MBR CANOPY FRAMING PLAN
S07	SLUDGE TANK FOUNDATION PLAN
S08	SLUDGE TANK MAT SLAB REBAR PLAN
S09	SLUDGE TANK CANOPY FRAMING PLAN
S10	STRUCTURAL DETAILS
S11	STRUCTURAL DETAILS
S12	STRUCTURAL DETAILS
E01	ELECTRICAL SYMBOLS, NOTES, AND LEGEND
E02	SINGLE LINE DIAGRAM
E03	ELECTRICAL SCHEDULES
E04	OVERALL ELECTRICAL SITE PLAN
E05	SCHEMATIC & CONNECTION DIAGRAMS - SHEET 1
E06	SCHEMATIC & CONNECTION DIAGRAMS - SHEET 2
E07	COMMUNICATION DIAGRAM
E08	CONDUIT BLOCK DIAGRAM
E09	ELECTRICAL DETAILS
I01	P&ID SYMBOLS AND LEGEND
I02	P&ID - SHEET 1
I03	P&ID - SHEET 2
I04	P&ID - SHEET 3

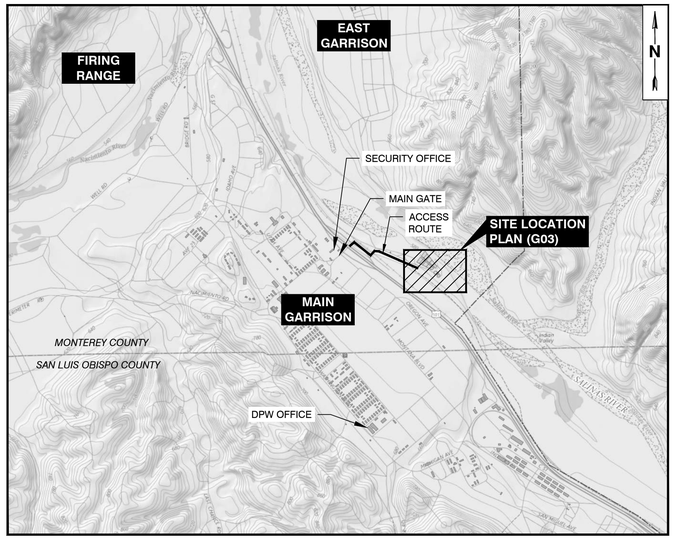
SITE VICINITY MAP



REFERENCE: ESRI ArcGIS USA DATA, 2005

0 12 24 MILES
APPROXIMATE SCALE

SITE LOCATION MAP



REFERENCE: ESRI ArcGIS USGS THE NATIONAL MAP, 2018

0 2,000 4,000 FEET
APPROXIMATE SCALE

SHEET No. DESIGNATION

C03
- INDIVIDUAL DRAWING NUMBER
- DISCIPLINE

LETTER	DISCIPLINE
C	CIVIL
E	ELECTRICAL
G	GENERAL
I	INSTRUMENTATION / CONTROLS
P	PROCESS
S	STRUCTURAL

PROJECT INFORMATION

OWNER/OPERATOR:	CALIFORNIA MILITARY DEPARTMENT 10601 BEAR HOLLOW DRIVE RANCHO CORDOVA, CALIFORNIA 95670
SITE ADDRESS:	WASTEWATER TREATMENT PLANT CAMP ROBERTS, CALIFORNIA
CIVIL ENGINEER:	WEAVER CONSULTANTS GROUP OF CALIFORNIA, LLC. 1 TECHNOLOGY DRIVE, SUITE C515 IRVINE, CALIFORNIA 92618
STRUCTURAL ENGINEER:	T&S STRUCTURAL 684 CLARION COURT SAN LUIS OBISPO, CALIFORNIA 93401
ELECTRICAL ENGINEER:	NCS ENGINEERS 202 E. EARLL DRIVE, SUITE 110 PHOENIX, ARIZONA 85012
MBR ENGINEER/VENDOR:	CLOACINA, LLC 2385 PRECISION DRIVE ARROYO GRANDE, CALIFORNIA 93420
GEOTECHNICAL ENGINEER:	KLING CONSULTING GROUP, INC. 18008 SKY PARK CIRCLE, SUITE 250 IRVINE, CALIFORNIA 92618

C:\WORK\DRAFTING\GRWWTP\G01 - TITLE.DWG

PREPARED BY:
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-3502

PREPARED FOR:
CAL GUARD
CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10601 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
D	08/08/25	RESPECIFIED DESIGN SUBMITTAL	TMH	TMH
C	04/17/24	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	TMH	TMH
A	02/28/18	35% DESIGN	BB	JP

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER TIMOTHY M. HUNT C 68637 CIVIL STATE OF CALIFORNIA

DESIGNER:	TMH
DRAWN BY:	TMH
CHECKED BY:	PM
APPROVED BY:	TMH
DATE:	03/31/2026

INDEX OF DRAWINGS, SITE VICINITY MAP AND SITE LOCATION MAP

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No: 5980-300-01-67
FILE NAME: G01 - TITLE.DWG

SHEET No. G01
SHEET 1 OF 42
REVISION 0

ABBREVIATIONS

℄	PLATE
&	AND
L	ANGLE
±	APPROXIMATELY
>	GREATER THAN
<	LESS THAN
Ø	DIAMETER
%	PERCENT
@	AT
AB	AGGREGATE BASE, ANCHOR BOLT
AC	ASPHALT CONCRETE
A.C.	ALTERNATING CURRENT
ACP	ASBESTOS CEMENT PIPE
ALUM	ALUMINUM
APPROX	APPROXIMATE
ARV	AIR RELEASE VALVE
AVE	AVENUE
AVG	AVERAGE
ADD	ADDITIONAL
AWG	AMERICAN WIRE GAUGE
AWWA	AMERICAN WATER WORKS ASSOCIATION
B	BURIED
BF	BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BLDG	BUILDING
BLKG	BLOCKING
BOTT	BOTTOM
BM	BENCH MARK
BP	BEGINNING POINT
BS	BLACK STEEL
B&S	BELL & SPIGOT
BV	BALL VALVE
BWR	BACKWASH RETURN WATER
C	CONCRETE ENCASED
℄, C/L	CENTERLINE
CA	COMPRESSED AIR
CAV	COMBINATION AIR-VACUUM RELEASE VALVE
CB	CATCH BASIN
CC	CENTER TO CENTER
CDF	CONTROLLED DENSITY FILL
CF	CUBIC FEET
CFS	CUBIC FEET PER SECOND
CI	CAST IRON
CIP	CAST IRON PIPE
CIPP	CURED-IN-PLACE PIPE LINING
CL2	CHLORINE
CLG	CHLORINE GAS
CLR	CLEAR, CLEARANCE
CLS	CHLORINE SOLUTION
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CLW	CLEARWELL
CML&C	CEMENT LINED & COATED
CML	CEMENT MORTAR LINING
CO	CLEANOUT
COMB	COMBINED
COMM	COMMUNICATIONS
COMP	COMPACTION
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
COORD	COORDINATE
CMD PM	CALIFORNIA MILITARY DEPARTMENT PROJECT MANAGER
CPLG	COUPLING
CSK	COUNTERSINK
CTR	CENTER
CTS	CATHODIC PROTECTION TEST STATION
CU	COPPER
D	DIAMETER, DRAIN
(D)	DEMOLISH
DF	DITCH FLOW LINE
DFE	DENITRIFYING FILTER EFFLUENT
DG	DECOMPOSED GRANITE
DI	DUCTILE IRON
DIA	DIAMETER
DIM	DIMENSION
DIP	DUCTILE IRON PIPE
DN	DOWN
DoD	DEPARTMENT OF DEFENSE
DPW	DEPARTMENT OF PUBLIC WORKS
DR	DRIVE
DS	DIGESTED SLUDGE
DWG	DRAWING
E	EAST, EXPOSED
(E)	EXISTING
EA	EACH
ECC	ECCENTRIC
ED	EQUIPMENT DRAIN
EF	EACH FACE
EFF	PLANT EFFLUENT
EL, ELEV	ELEVATION
ELL	ELBOW
ELEC	ELECTRICAL
EP	EDGE OF PAVEMENT
EQ	EQUAL, EQUATION
EXP	EXPANSION
EW	EACH WAY
(F)	FUTURE
FB	FLAT BAR
FC	FLEX COUPLING
FCA	FLANGE COUPLING ADAPTER
FD	FLOOR DRAIN
FES	FILTER EFFLUENT SAMPLE
FF	FINISHED FLOOR
FG	FINISHED GRADE
FH	FIRE HYDRANT
FIG	FIGURE
FIN	FINISHED
FLEX	FLEXIBLE
FLG	FLANGE
FLGD	FLANGED
FM	FLOW METER
FO	FIBER OPTIC
FRP	FIBERGLASS REINFORCED PLASTIC
FT	FEET
FTGS	FITTINGS
FURN	FURNISH
GA	GAUGE OR GUY ANCHOR
GALV	GALVANIZED
GAL	GALLON
GFI	GROUND FAULT INTERRUPTER
GND	GROUND
GP	GUARD POST
GPM	GALLON PER MINUTE
GS	GALVANIZED STEEL
GSP	GALVANIZED STEEL PIPE
GV	GATE VALVE
H	HEIGHT
HB	HOSE BIBB
HDPE	HIGH DENSITY POLYETHYLENE
HGL	HYDRAULIC GRADE LINE
HORIZ	HORIZONTAL
HP	HORSEPOWER
ID	INSIDE DIAMETER OR IDENTIFICATION
IE	INVERT ELEVATION
IN	INCH
INT	INTERIOR
INV	INVERT
JT	JOINT
JB, J-BOX	JUNCTION BOX
KW	KILOWATT
LB	POUND
LONGIT	LONGITUDINAL
LP	LOW POINT
LTG	LIGHTING
(M)	MODIFIED
MAX	MAXIMUM
MC	MICRO
MCC	MOTOR CONTROL CENTER
MB	MACHINE BOLT
MBR	MEMBRANE BIOREACTOR
MECH	MECHANICAL
MEM	MEMBRANE
MFR	MANUFACTURER
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MTR	MOTOR
(N)	NEW
N	NORTH
NaOH	SODIUM HYDROXIDE
NC	NORMALLY CLOSED
NG	NATURAL GAS
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NO.	NUMBER
NPT	NATIONAL PIPE THREAD
NTS	NOT TO SCALE
N/A	NOT APPLICABLE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED - CONTRACTOR INSTALLED
OG	ORIGINAL GRADE
OPNG	OPENING
PC	"PIECE, POINT OF CURVE"
PCC	POINT OF CURVE TO CURVE
PE	PLAIN END, PERMANENT EASEMENT, PRIMARY EFFLUENT
PI	POINT OF INTERSECTION
PL	"PLATE, PROPERTY LINE"
PLCS	PLACES
POLY	POLYMER
PP	POWER POLE
PPD	POUNDS PER DAY
PRESS	PRESSURE
PRV	PRESSURE REDUCING VALVE
PSI	POUNDS PER SQUARE INCH
PSF	POUNDS PER SQUARE FOOT
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PW	PLANT WATER
R	RADIUS
(R)	RELOCATE
RAS	RETURN ACTIVATED SLUDGE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD
RECT	RECTANGULAR
RED	REDUCER
REG	REGULATOR
REINF	REINFORCING
REQ'D	REQUIRED
R/W	RIGHT OF WAY
RW	RAW WASTEWATER
S	SOUTH, SLOPE
SA	SAMPLE
SD	STORM DRAIN
SE	SECONDARY EFFLUENT
SED	SEDIMENTATION
SES	SEDIMENTATION EFFLUENT SAMPLE
SDMH	STORM DRAIN MANHOLE
SK	SCUM
SS	SANITARY SEWER, STAINLESS STEEL
SSMH	SANITARY SEWER MANHOLE
SCH, SCHED	SCHEDULE
SECT	SECTION
SF	SQUARE FEET
SHT,SH	SHEET
SIM	SIMILAR
SL	SLUDGE
SPECS	SPECIFICATIONS
SQ	SQUARE
STA	STATION
STL	STEEL
STD	STANDARD
t	THICKNESS
T & B	TOP & BOTTOM
T & G	TONGUE & GROOVE
TB	THRUST BLOCK
TBC	TOP BACK OF CURB
TBM	TEMPORARY BENCH MARK
TCE	TEMPORARY CONSTRUCTION EASEMENT
TFE	TRICKLING FILTER EFFLEUNT
TFR	TRICKLING FILTER RECYCLE
TDH	TOTAL DISCHARGE HEAD
TEL	TELEPHONE
TEMP	TEMPORARY
THK	THICK
TOC	TOP OF CONCRETE
TOS	TOP OF SLAB
TV	TOP OF VAULT
TYP	TYPE or TYPICAL
UG	UNDERGROUND
V	VENT
VARS	VARIES
VCP	VITRIFIED CLAY PIPE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VTR	VENT TO ROOF
W	WEST, WATER, WIDE
W/	WITH
W/O	WITHOUT
WAB	WORK AREA BOUNDARY
WP	WATERPROOF
WS	WELDED STEEL, WATER SURFACE
WSEL	WATER SURFACE ELEVATION
WSP	WELDED STEEL PIPE
WWTP	WASTE WATER TREATMENT PLANT
WW	WASTE WATER
WWF	WELDED WIRE FABRIC

GENERAL NOTES

1. THESE DRAWINGS, TOGETHER WITH THE PROJECT-SPECIFIC SPECIFICATIONS, AND THE THE UNIFIED FACILITIES GUIDE SPECIFICATIONS (UFGS) CONSTITUTE THE CONSTRUCTION DOCUMENTS FOR THIS PROJECT. THE CONTRACTOR SHALL KEEP AT LEAST ONE COPY OF THE LATEST APPROVED VERSION OF THESE DOCUMENTS ON-SITE AT ALL TIMES. THE ENGINEER SHALL HAVE ACCESS TO THE CONTRACTOR'S DOCUMENTS AT ALL TIMES.
2. ON FINDING A DISCREPANCY BETWEEN THE CONTRACT DOCUMENTS INTERNALLY, OR BETWEEN THE CONTRACT DOCUMENTS AND ACTUAL FIELD CONDITIONS, THE CONTRACTOR SHALL IMMEDIATELY BRING SAID DISCREPANCY TO THE ATTENTION OF THE CMD PM. SPECIFICATIONS SHALL TAKE PRECEDENCE OVER DRAWINGS.
3. DURING CONSTRUCTION, CONTRACTOR SHALL TAKE FIELD NOTES OF ACTUAL LOCATIONS OF ALL INSTALLED EQUIPMENT, SLABS, PIPING, CONDUIT, AND ALL OTHER CONSTRUCTION RELATED MATERIAL ON A DAILY BASIS TO REFLECT WORK COMPLETED. CONTRACTOR SHALL PREPARE AND MAINTAIN A REDLINE "AS-BUILT" SET OF PLANS THROUGHOUT THE PROJECT. THE CONTRACTOR SHALL PERIODICALLY REVIEW THE "AS-BUILT" SET WITH THE CMD PM TO ENSURE CHANGES ARE KEPT UP TO DATE. THE CONTRACTOR SHALL SUBMIT "AS-BUILT" PLANS TO THE CMD PM FOR REVIEW AND APPROVAL PRIOR TO PREPARATION OF FINAL "AS-BUILT" SET.
4. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL ENVIRONMENTAL LAWS AND ORDINANCES.
5. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING THE ENVIRONMENT DURING CONSTRUCTION BY PROTECTING TREES AND SHRUBS, CONTAINING ANY RUNON OR RUNOFF. CONTROLLING DUST AND CONTAMINATION CAUSED BY THE CONTRACTOR. THE CONTRACTOR SHALL DISPOSE OF ALL CONSTRUCTION DEBRIS OFFSITE INCLUDING PAVEMENT, CONCRETE, PIPELINES, SOIL, OR OTHER CONSTRUCTION RELATED MATERIAL REMOVED DURING CONSTRUCTION. IF EXCAVATED MATERIALS CANNOT BE USED AS BACKFILL, THEY SHALL BE DISPOSED OF AT AN AUTHORIZED FACILITY AND WITH THE PROPER DOCUMENTATION. THE CONTRACTOR SHALL PROVIDE THE CMD PM WITH THE APPROPRIATE MANIFESTS AND CERTIFICATES TO DEMONSTRATE THAT THE MATERIALS HAVE BEEN PROPERLY DISPOSED OF. THE CONTRACTOR SHALL BE RESPONSIBLE FOR WASTE PROFILING OF MATERIAL FOR DISPOSAL. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO RECYCLE CONSTRUCTION MATERIAL IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS.
6. THE CONTRACTOR SHALL CLEARLY MARK PROPOSED EXCAVATIONS PRIOR TO ANY INTRUSIVE WORK. EXCAVATION AREAS SHALL BE CLEARED BY UNDERGROUND SERVICE ALERT, GEOPHYSICAL SURVEY, AND THE OWNER'S REPRESENTATIVE PRIOR TO ANY INTRUSIVE WORK. SUBSURFACE WORK SHALL NOT COMMENCE UNTIL AN AREA HAS BEEN CLEARED.
7. THE CONTRACTOR SHALL EXERCISE CAUTION IN PERFORMING SUBSURFACE WORK. IF AN UNMARKED UTILITY IS ENCOUNTERED THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE CMD PM, WHO WILL BE RESPONSIBLE FOR DETERMINING HOW TO PROCEED RELATIVE TO THE UNMARKED UTILITY.
8. THE CONTRACTOR SHALL PERFORM ALL THE NECESSARY WORK TO COMPLETE THE PROJECT IN A SATISFACTORY MANNER. UNLESS OTHERWISE PROVIDED, THE CONTRACTOR SHALL FURNISH ALL MATERIALS, EQUIPMENT, TOOLS, LABOR, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
9. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY ALL DIMENSIONS AND CONDITIONS BEFORE STARTING WORK. ALL WORK SHALL CONFORM TO THE LINE, GRADE AND ELEVATIONS SHOWN ON THESE PLANS. ANY DISCREPANCY, ERROR, OR OMISSION DISCOVERED BY THE CONTRACTOR SHALL BE BROUGHT TO THE ATTENTION OF THE CMD PM.
10. CONSTRUCTION AND TRENCHING AREAS SHALL BE CLEARLY MARKED WITH CONES, BARRICADES, OR OTHER APPROVED SAFETY MARKERS AS REQUIRED BY LOCAL CODES TO RESTRICT ACCESS AND PROVIDE A SAFE WORK AREA FOR THE CONTRACTOR, ENGINEER, AND ANYONE ELSE PERMITTED TO ENTER THE WORK AREA (E.G. INSPECTORS, OWNERS, ETC.).
11. ALL MATERIALS, PARTS, AND EQUIPMENT FURNISHED BY THE CONTRACTOR FOR THIS PROJECT SHALL BE NEW, HIGH GRADE AND FREE FROM DEFECTS. QUALITY OF WORK SHALL BE TO GENERALLY ACCEPTED STANDARDS. MATERIALS AND WORK QUALITY ARE SUBJECT TO THE ENGINEER'S APPROVAL. MATERIALS AND WORK NOT CONFORMING TO THE CONSTRUCTION DOCUMENTS SHALL BE CONSIDERED DEFECTIVE AND SUBJECT TO REJECTION. DEFECTIVE WORK OR MATERIAL, WHETHER IN PLACE OR NOT, SHALL BE REMOVED IMMEDIATELY FROM THE SITE BY THE CONTRACTOR, AT ITS EXPENSE, WHEN SO DIRECTED BY THE CONTRACTING OFFICER. IF THE CONTRACTOR FAILS TO REPLACE ANY DEFECTIVE OR DAMAGED WORK OR MATERIAL AFTER REASONABLE NOTICE, THE CONTRACTING OFFICER MAY CAUSE SUCH WORK OR MATERIALS TO BE REPLACED, THE COST OF WHICH WILL BE DEDUCTED FROM PAYMENTS DUE TO THE CONTRACTOR.
12. THE CONTRACTOR SHALL WARRANT ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF TWO YEARS FOLLOWING ACCEPTANCE OF THE FINAL WALKTHROUGH INSPECTION BY THE CMD PM. DEFECTS SHALL BE CMD PMRECTED AT NO COST TO THE OWNER.
13. THE CONTRACTOR SHALL COMMISSION ALL EQUIPMENT IN ACCORDANCE WITH THE CONTRACT SPECIFICATIONS AND SHALL PROVIDE FOR THE TRAINING OF ALL OPERATIONAL STAFF THROUGHOUT THE WARRANTY PERIOD.
14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF SLUDGE GENERATED BY THE MBR SYSTEM THROUGHOUT THE WARRANTY PERIOD.
15. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PROTECT IN PLACE EXISTING FEATURES NOT INCLUDED FOR DEMOLITION IN THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING FEATURES DURING CONSTRUCTION ACTIVITIES AND SHALL REPAIR OR REPLACE DAMAGED FEATURES AT ITS OWN EXPENSE.
16. THE WORK AREA IS AN OPERATING TRAINING FACILITY FOR THE CALIFORNIA ARMY NATIONAL GUARD. IT IS LIKELY THAT TRAINING MAY BE IN PROGRESS DURING EXECUTION OF THIS WORK. THE CONTRACTOR SHALL COORDINATE HIS WORK AND THE WORK OF HIS SUBCONTRACTORS TO ENSURE A MINIMAL IMPACT TO THE OPERATIONS AT CAMP ROBERTS.
17. UNLESS SPECIFIED OTHERWISE, SUBMITTALS WILL BE REQUIRED FOR ALL MATERIALS TO BE USED FOR CONSTRUCTION. SHOP DRAWINGS WILL BE REQUIRED FOR ALL ITEMS THAT WILL BE FABRICATED FOR THE WORK. THE CONTRACTOR SHALL HANDLE SUBMITTALS AS DESCRIBED IN SECTION 01 22 00 OF THE UFGS. THE CMD PM CAN WAIVE THIS REQUIREMENT FOR MINOR ITEMS AT HIS DISCRETION.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ESTABLISHING LOCAL SURVEYING CONTROL. SUCH CONTROL SHALL USE THE CALIFORNIA STATE PLANE COORDINATE SYSTEM (ZONE 4), THE HORIZONTAL DATUM FOR THE PROJECT SHALL BE THE NORTH AMERICAN DATUM OF 1983 (NAD 83). THE VERTICAL DATUM SHALL BE THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
19. THE CA ARNG WILL OPERATE ITS FACILITIES IN AND AROUND THE WORK AREA. THE CONTRACTOR SHALL MAKE EVERY REASONABLE EFFORT TO ENSURE THAT WATER (AND OTHER UTILITY) SERVICE IS DISRUPTED AS LITTLE AS POSSIBLE DURING THE WORK. THE CONTRACTOR SHALL COORDINATE WITH THE CAMP ROBERTS DEPARTMENT OF PUBLIC WORKS TO IDENTIFY UTILITY SHUT-OFFS IN THE EVENT THE WORK AREA MUST BE ISOLATED.
20. THE EXISTING TREATMENT FACILITIES SHALL REMAIN IN OPERATION AT ALL TIMES DURING THE CONSTRUCTION OF THE PROJECT TO THE EXTENT POSSIBLE. PORTABLE OR TEMPORARY TREATMENT FACILITIES AND EQUIPMENT SHALL BE UTILIZED IF PORTIONS OF THE EXISTING TREATMENT SYSTEM NEED TO BE BROUGHT OFFLINE DUE TO DEMOLITION OR NEW COMPONENT TIE-INS PRIOR TO MBR COMMISSIONING.
21. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING FACILITIES THAT ARE TO REMAIN IN PLACE. ALL FACILITIES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE EXPEDITIOUSLY REPAIRED OR RECONSTRUCTED AT THE CONTRACTOR'S EXPENSE WITHOUT ADDITIONAL COMPENSATION.
22. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL SURPLUS EXCAVATION MATERIAL AND DEBRIS PROMPTLY FROM THE SITE AND SHALL MAINTAIN THE SITE IN A NEAT AND ORDERLY CONDITION.
23. FOR WORK SEQUENCE, REFER TO SPECIFICATION SECTION 01 11 00 PART 1.2.1.
24. EXISTING FENCE AND GATES SHALL BE PROTECTED IN PLACE UNLESS NOTED OTHERWISE.
25. LOCATION AND DEPTH OF (E) UTILITIES SHOWN ARE BASED ON AVAILABLE DRAWINGS AND OBSERVABLE SURFACE FEATURES. CONTRACTOR SHALL POTHOLE AND FIELD VERIFY DEPTH AND LOCATION OF ALL UTILITIES, (IN PARTICULAR AT CONNECTION AND PIPE CROSSING POINTS).
26. CONTRACTOR SHALL GRADE SITE TO PRE-CONSTRUCTION CONDITIONS AND RESTORE EXISTING ACCESS ROADS TO PRE-CONSTRUCTION CONDITIONS UNLESS OTHERWISE NOTED ON THE DRAWINGS.
27. SPECIAL INSPECTIONS SHALL BE AS DESCRIBED ON SHEET S01.
28. PRIOR TO EXISTING INFRASTRUCTURE DEMOLITION, CONTRACTOR SHALL HAVE PERFORMED A HAZARDOUS MATERIALS INSPECTION AND ASSESSMENT OF INFRASTRUCTURE TO BE REMOVED FOR LEAD AND ASBESTOS. REMOVAL AND DISPOSAL OF SUCH MATERIAL SHALL BE IN ACCORDANCE WITH ALL LOCAL, STATE, AND DoD PROCEDURES.
29. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITIES WITH CMD ENVIRONMENTAL PRIOR TO ANY GROUND DISTURBANCE.\
30. THE CONTRACTOR SHALL LOCATE ALL STAGING AND EQUIPMENT STORAGE WITHIN THE FENCED AREAS OF THE WWTP. CONTRACTOR SHALL COORDINATE FINAL LOCATION WITH CMD PM.

SURVEY CONTROL NOTES

HORIZONTAL DATUM:
CALIFORNIA STATE PLANE COORDINATE SYSTEM ZONE IV
NAD83(2010.0) CA HPGN

MEAN COMBINATION FACTOR (CF):
1.000021895063327O
DISTANCES SHOWN HEREON ARE GRID DISTANCES
TO CONVERT GRID DISTANCE TO GROUND DISTANCE ... DIVIDE BY THE CF
TO CONVERT GROUND DISTANCE TO GRID DISTANCE ... MULTIPLY BY THE CF

VERTICAL DATUM:
NAVD88 BASED ON BENCH MARK

PIPING SYMBOLS

JOINTS	SINGLE LINE	DOUBLE LINE
FLANGED OR GROOVED PIPE COUPLING		
BELL AND SPIGOT OR MECHANICAL		
SCREWED OR SOCKETWELD		
FITTINGS		
BLIND FLANGE		
REDUCER		
UNION		
FLEXIBLE COUPLING		
FLANGED COUPLING ADAPTER		
MALE CAM COUPLER		
PIPE CLEANOUT		

LEGEND

- UNDISTURBED EARTH
- UNCLASSIFIED BACKFILL (SOIL [NATIVE OR IMPORT] USED IN NON-STRUCTURAL APPLICATIONS AND PLACED IN ACCORDANCE WITH SECTION 300-4 OF THE SSPWC). UNCLASSIFIED FILL WILL BE COMPACTED TO 90% OF ITS RELATIVE MAXIMUM DENSITY PER ASTM D1557, UNLESS OTHERWISE SPECIFIED IN THE CONSTRUCTION DOCUMENTS.
- PREPARED SUBGRADE/STRUCTURAL FILL (NATIVE OR IMPORTED SOIL PLACED IN ACCORDANCE WITH SECTION 301-1 OF THE SSPWC). PREPARED SUBGRADE/STRUCTURAL FILL WILL BE COMPACTED TO 95% OF ITS RELATIVE MAXIMUM DENSITY PER ASTM D1557, UNLESS OTHERWISE SPECIFIED IN THE CONSTRUCTION DOCUMENTS.
- SAND BEDDING (IMPORTED MATERIAL, UNLESS OTHERWISE AUTHORIZED, MEETING THE REQUIREMENTS OF SECTION 200-1.5 OF THE SSPWC AND THE SCHEDULE OF MATERIALS).
- CONCRETE (AS GENERALLY SPECIFIED IN SECTION 201-1.1.2 OF THE SSPWC UNLESS SPECIFICALLY DESCRIBED IN THE DRAWINGS)
- ASPHALT (UNLESS SPECIFIED OTHERWISE ASPHALT SHALL CONSIST OF 4-INCHES OF ASPHALT PER SECTION 203-6 OF THE SSPWC).
- AGGREGATE BASE (UNLESS SPECIFIED OTHERWISE AGGREGATE BASE SHALL CONSIST OF CRUSHED AGGREGATE BASE AS SPECIFIED IN SECTION 200-2.2 OF THE SSPWC).

4 / C03 C04 — DETAIL PLAN, DETAIL, OR SECTION LABEL. DETAIL PLANS AND DETAILS ARE IDENTIFIED WITH NUMBERS (e.g., 1, 2, 3) . SECTIONS ARE IDENTIFIED WITH LETTERS (e.g., A, B, C)

SHEET ON WHICH THE DETAIL PLAN, DETAIL, OR SECTION IS SHOWN

SHEET ON WHICH THE DETAIL PLAN, DETAIL, OR SECTION IS CALLED OUT

GENERAL LINE TYPES AND SYMBOLS

SUBJECT LINE (PROPOSED CONSTRUCTION)	WATER VALVE
EXISTING CONDITIONS	UNDERGROUND ELECTRIC VAULT
X — FENCE LINE	FIRE HYDRANT
CENTER LINE	STORM DRAIN MANHOLE
SUBSURFACE LINE	SANITARY SEWER MANHOLE
G — GAS	NEW SANITARY SEWER MANHOLE
W — WATER	SANITARY SEWER CLEAN OUT
S — SANITARY SEWER	NEW SANITARY SEWER CLEAN OUT
SD — STORM DRAIN	ELECTRICAL MANHOLE
E — ELECTRICAL (UNDERGROUND)	LIGHT POLE
C — COMMUNICATION/OPTICAL	GAS VALVE
UKN — UNKNOWN UTILITY	CONTROL POINT
ABANDON	DIRECTION OF SURFACE FLOW
DEMOLISH/REMOVE	

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PREPARED FOR
CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
1 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	90% DESIGN SUBMITTAL	TMH	TMH
D	08/06/25	RECHECK 65% DESIGN SUBMITTAL	TMH	TMH
C	05/05/25	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	TMH	TMH
A	02/28/18	35% DESIGN	BB	JP

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER — TIMOTHY M. HUNT — C 68637 — CIVIL — STATE OF CALIFORNIA

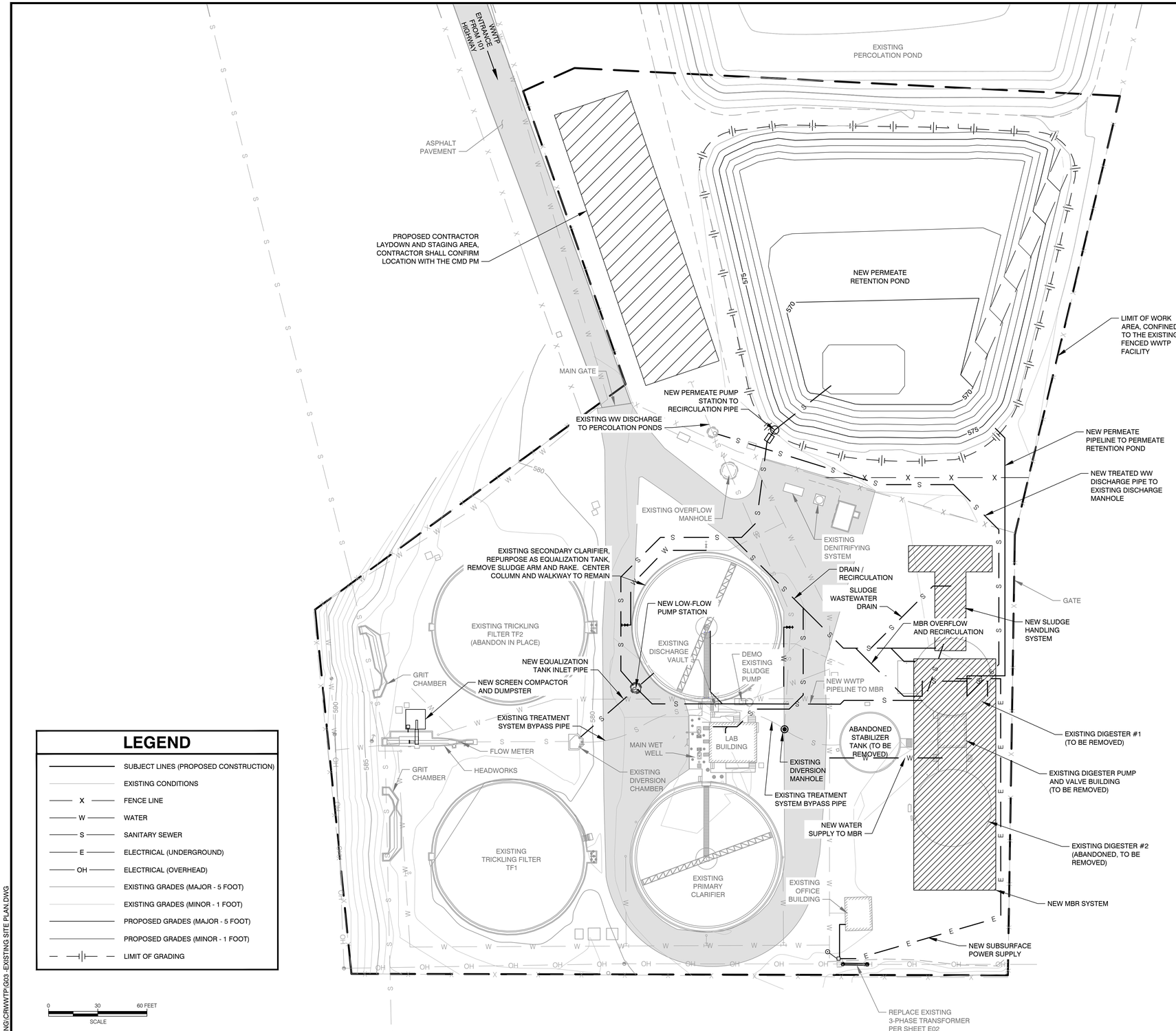
DESIGNER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
TMH	TMH	PM	TMH	03/31/2026

GENERAL NOTES, ABBREVIATIONS AND LEGEND
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME: G02 - ABBREVIATIONS AND LEGEND.DWG

SHEET No. **G02**
SHEET 2 OF 42
REVISION 0

C:\WORK\DRAFTING\CRWWTP\G02 - ABBREVIATIONS AND LEGEND.DWG - PLOTTED BY HUNT, TIM ON 04/24/26



LEGEND

- SUBJECT LINES (PROPOSED CONSTRUCTION)
- EXISTING CONDITIONS
- X — FENCE LINE
- W — WATER
- S — SANITARY SEWER
- E — ELECTRICAL (UNDERGROUND)
- OH — ELECTRICAL (OVERHEAD)
- EXISTING GRADES (MAJOR - 5 FOOT)
- EXISTING GRADES (MINOR - 1 FOOT)
- PROPOSED GRADES (MAJOR - 5 FOOT)
- PROPOSED GRADES (MINOR - 1 FOOT)
- LIMIT OF GRADING

0 30 60 FEET
SCALE

REFERENCE: EXISTING ELEVATIONS AND TOPOGRAPHIC CONTOURS ARE APPROXIMATE AND ARE BASED ON TOPOGRAPHIC INFORMATION PROVIDED BY ANDREGG GEOMATICS, DATED FEBRUARY 13, 2013. CONTRACTOR SHALL FIELD VERIFY ELEVATIONS.

SCOPE OF WORK

1. CLEARING, GRUBBING, SITE PREPARATION AND INSTALLATION OF SITE CONTROLS.
2. REPLACE EXISTING HEADWORKS MECHANICAL SCREEN HMI.
3. INSTALL NEW HEADWORKS MECHANICAL SCREEN SPRAY WASH, COMPACTOR, AND DISPOSAL DUMPSTER.
4. REMOVE ACCUMULATED SLUDGE FROM THE EXISTING SLUDGE DRYING BEDS AND EXISTING SLUDGE DIGESTERS (STORAGE TANKS) AND DISPOSE OF AT AN APPROVED FACILITY. PROVIDE FOR SLUDGE HANDLING OF EXISTING WWTP PRIMARY CLARIFIER DURING CONSTRUCTION AND UP TO COMMISSIONING OF MBR.
5. ABANDON, RELOCATE, AND/OR DEMOLISH EXISTING WASTE WATER TREATMENT PLANT (WWTP) COMPONENTS TO ALLOW FOR INSTALLATION OF MEMBRANE BIOREACTOR SYSTEM(S), SLUDGE HANDLING SYSTEM, AND ASSOCIATED COMPONENTS. REMOVE ALL ABANDONED SUBSURFACE PIPING AND CONDUITS ENCOUNTERED DURING CONSTRUCTION.
6. ABANDON AND REMOVE EXISTING 24-INCH DIA. RCP FROM DIVERSION CHAMBER TO SECONDARY CLARIFIER.
7. REPURPOSE EXISTING SECONDARY CLARIFIER AS MBR EQUALIZATION TANK WITH UPSTREAM LOW-FLOW EQUALIZATION TANK BY-PASS PUMP STATION.
8. INSTALL NEW 24-INCH DIA. HDPE GRAVITY LINE FROM DIVERSION CHAMBER TO LOW-FLOW PUMP STATION AND FROM LOW-FLOW PUMP STATION TO EQUALIZATION TANK.
9. INSTALL NEW EQUALIZATION TANK SUBMERSIBLE TRANSFER PUMPS WITH ASSOCIATED CONTROLS.
10. TRENCH EXCAVATION AND INSTALLATION OF NEW PIPELINE(S).
11. SURFACE RESTORATION IN AREAS OF TRENCHING (MATCH EXISTING CONDITIONS WHERE APPROPRIATE).
12. INSTALL NEW MBR SYSTEM, SLUDGE HANDLING SYSTEM, AND ASSOCIATED PIPING AND CONCRETE PADS.
13. INSTALL NEW ELECTRICAL SERVICE AND SUBSURFACE ELECTRICAL LINE(S) PROVIDING POWER TO THE NEW MBR SYSTEM AND ASSOCIATED COMPONENTS.
14. GRADE PERMEATE RETENTION POND AND INSTALL HDPE LINER SYSTEM. EXCESS CUT THAT MEETS SPECIFICAITONS MAY BE UTILIZED AS BACKFILL, STOCKPILED AT THE CAMP ROBERTS LANDFILL BORROW AREA UPON APPROVAL BY CAMP ROBERTS ENVIRONMENTAL, OR AS DIRECTED BY THE CMD PM.
15. INSTALL NEW PERMEATE RETENTION POND PUMP STATION WITH ASSOCIATED CONTROLS.
16. PROVIDE CONTROLS AS REQUIRED FOR IMPLEMENTATION OF ALL WWTP COMPONENTS WITH THE NEW MBR SYSTEM.
17. UPGRADE THE ELECTRICAL UTILITY SERVICE TO ACCOMMODATE NEW SYSTEM LOAD(S).
18. PROVIDE FOR REMOTE MONITORING OF WWTP COMPONENTS WITHIN EXISTING BASEWIDE SCADA SYSTEM.
19. PERFORM STARTUP TESTING AND COMMISSIONING REQUIREMENTS AS SPECIFIED IN THE CONTRACT DOCUMENTS.

ESTIMATED SLUDGE VOLUME FOR REMOVAL AND DISPOSAL
APPROXIMATE VOLUME OF SLUDGE WITHIN DRYING BEDS: ~2,500 CY (SEE NOTE 3)
APPROXIMATE VOLUME OF SLUDGE IN DIGESTER #1: VARIES (SEE NOTE 2)
APPROXIMATE VOLUME OF SLUDGE IN DIGESTER #2: EMPTY

ESTIMATED DEMOLITION AND BACKFILL IMPORT EARTHWORK VOLUMES
APPROXIMATE VOLUME OF NON-STRUCTURAL IMPORT BACKFILL: ~500 CY
APPROXIMATE VOLUME OF STRUCTURAL IMPORT BACKFILL: ~2,500 CY

PERMEATE RETENTION POND GRADING
APPROXIMATE GRADED AREA: 38,100 SQ. FT.
APPROXIMATE CUT: 1,265 CUBIC YD
APPROXIMATE FILL: 37 CUBIC YD.
APPROXIMATE NET (CUT): 1,228 CUBIC YD. (SEE NOTE 3)

NOTES:

1. SEE SHEETS C01 AND C02 FOR EXISTING BELOWGROUND WASTEWATER TREATMENT PLANT PIPING AND DEMOLITION PLAN. SEE SHEET C03 FOR SITE LAYOUT AND IMPROVEMENT PLAN. SEE SHEET C11 FOR HARDSCAPE IMPROVEMENT PLAN.
2. THE EXISTING SLUDGE DIGESTER #1 IS CURRENTLY IN USE. VOLUME OF SLUDGE CONTAINED WITHIN THE DIGESTER AT TIME OF PROJECT CONSTRUCTION MAY VARY AND IS DEPENDANT ON CAMP ROBERTS OCCUPANCY AND TIMING OF LAST DISPOSAL EVENT. CONTRACTOR IS RESPONSIBLE FOR EVALUATING AND DETERMINING AMOUNT OF SLUDGE CONTAINED WITHIN THE DIGESTER FOR REMOVAL AND DISPOSAL AT TIME OF PROJECT CONSTRUCTION. TEMPORARY SLUDGE STORAGE AND REMOVAL SHALL BE PROVIDED BY CONTRACTOR DURING CONSTRUCTION OF MBR AND ASSOCIATED SLUDGE HANDLING SYSTEM.
3. PERMEATE RETENTION POND CUT MATERIAL IS ASSUMED TO BE COMPRISED OF SLUDGE MATERIAL FROM THE EXISTING DIGESTER(S). CONTRACTOR IS RESPONSIBLE FOR EVALUATING THE THICKNESS AND DETERMINING AMOUNT OF SLUDGE MATERIAL CONTAINED WITHIN THE EXISTING SLUDGE DRYING BEDS TO BE REMOVED. MATERIAL SHALL BE CHARACTERIZED AND DISPOSED OF AT AN APPROVED FACILITY.

C:\WORK\DRAFTING\CRWWTP\G03 - EXISTING SITE PLAN.DWG

PREPARED BY
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR
CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	90% DESIGN SUBMITTAL	TMH	TMH
D	06/06/25	REVISED 90% DESIGN SUBMITTAL	TMH	TMH
C	12/05/24	60% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	TMH	TMH
A	02/28/18	35% DESIGN	BB	JP

SCALE: AS NOTED
B4R SHOULD BE EXACTLY 1 INCH LONG
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REGISTERED PROFESSIONAL ENGINEER — TIMOTHY M. HUNT — C 68637 — CIVIL — STATE OF CALIFORNIA

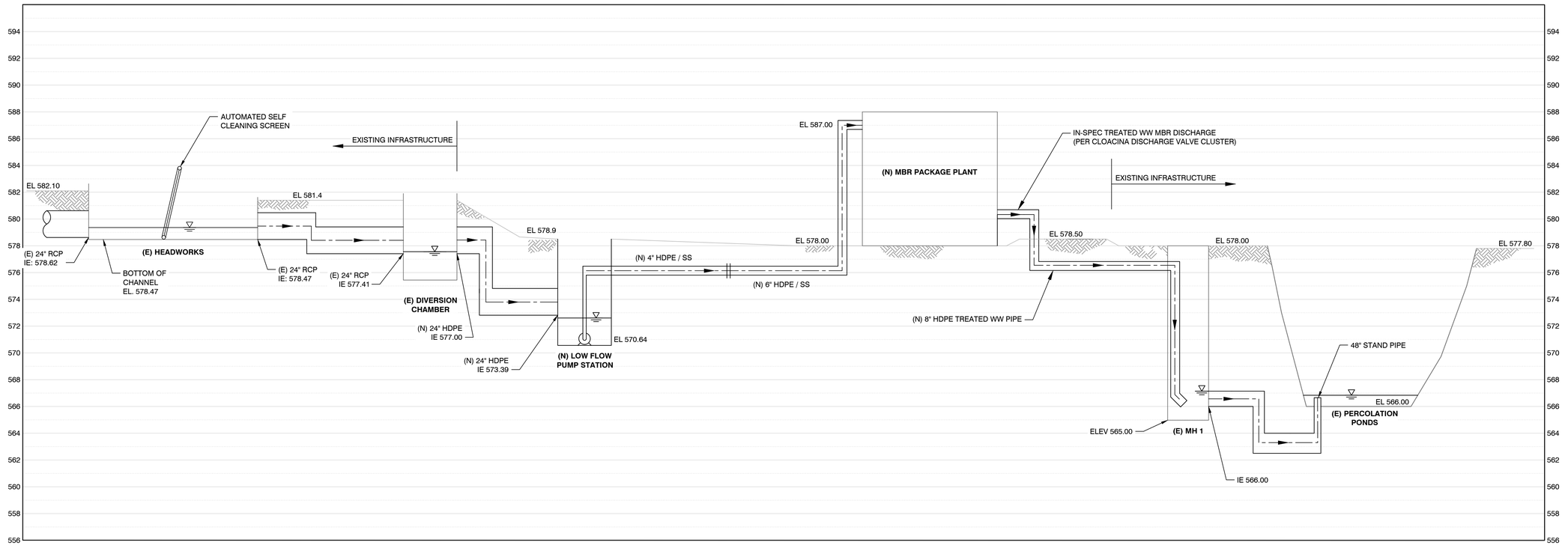
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DATE: 03/31/2026

WASTEWATER TREATMENT PLANT SITE PLAN

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

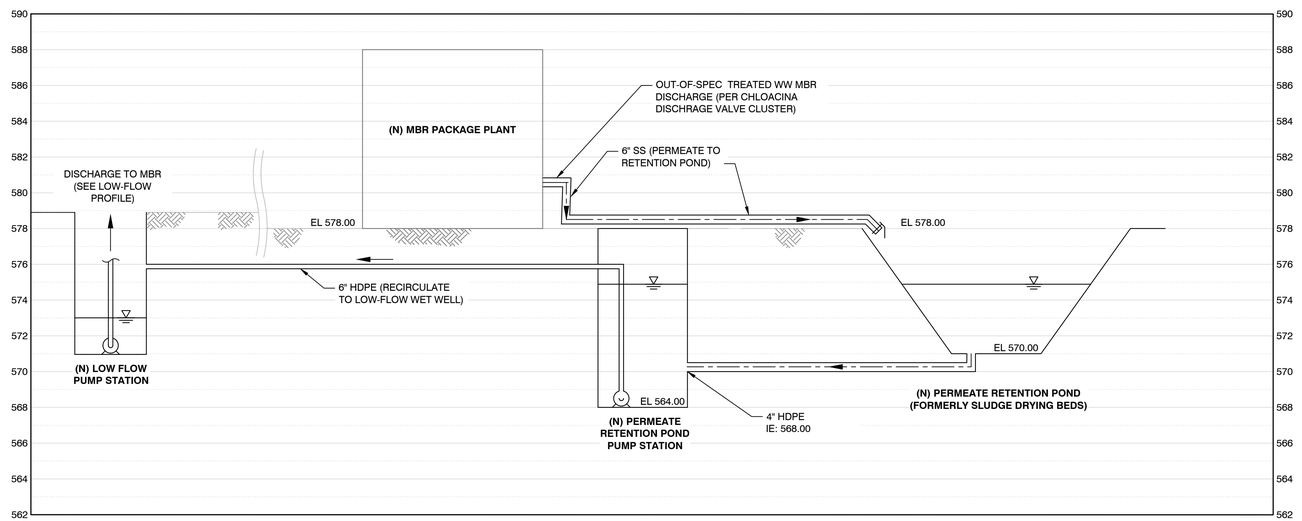
FILE NAME: G03 - EXISTING SITE PLAN.DWG
PROJECT No. 5890-300-01-67

SHEET No. G03
SHEET 3 OF 42
REVISION 0



FLOW PROFILE - LOW FLOW SCENARIO

HORZ: NTS
VERT: 1" = 4'



FLOW PROFILE - PERMEATE RECIRCULATION

HORZ: NTS
VERT: 1" = 4'

NOTES:

1. THE WATER SURFACE DOWNSTREAM OF THE EQUALIZATION TANK IS A CONSTANT AND IS DEFINED BY THE PUMPING RATE OF THE PUMPING UNITS THAT SUPPLY THE MBR SYSTEM.
2. THE WATER SURFACE IN THE PERCOLATION PONDS WILL BE SUBJECT TO TWO FACTORS --- THE ACTUAL PERCOLATION CAPACITY AND THE BYPASS FLOW (WHEN IT OCCURS).

C:\WORK\DRAFTING\CRWWTP\G04 - HYDRAULIC PROFILE.DWG

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REGISTERED PROFESSIONAL ENGINEER
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C 68637
CIVIL
STATE OF CALIFORNIA

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APPROVED BY:	TMH
DATE:	03/31/2026

FLOW PROFILE - LOW FLOW AND PERMEATE RECIRCULATION

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

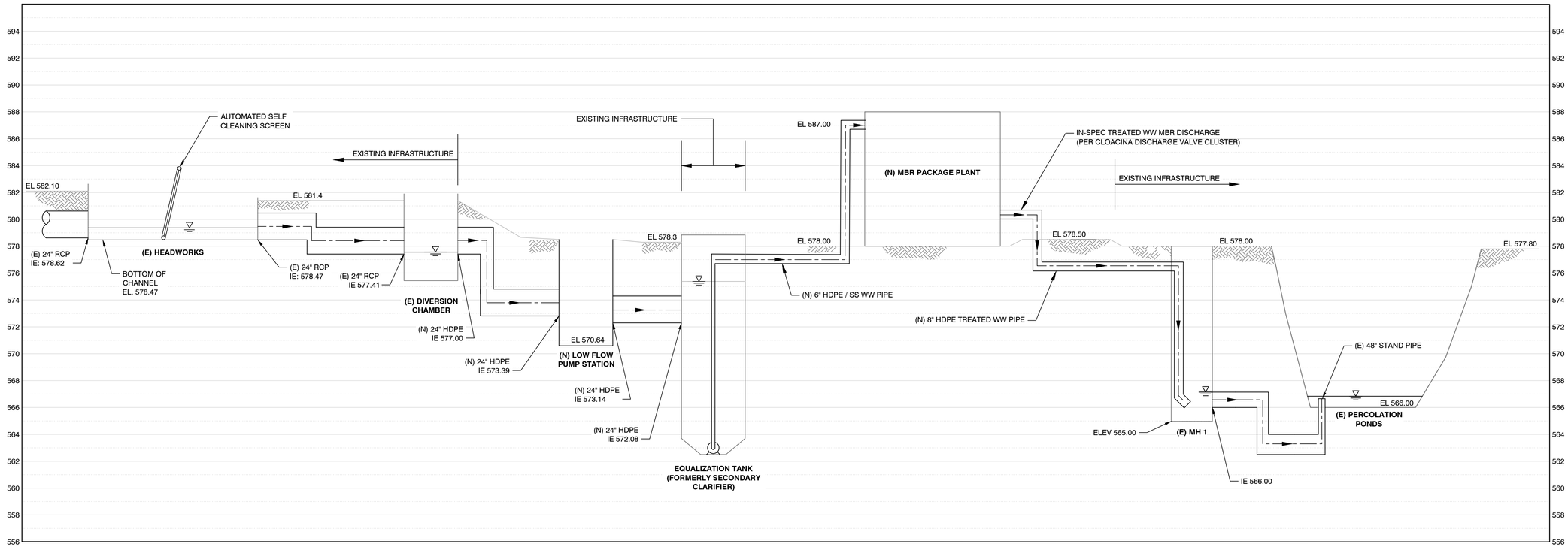
PROJECT No.: 5990-300-01-67

FILE NAME: G04 - HYDRAULIC PROFILE.DWG

SHEET No.: **G04**

SHEET 4 OF 42

REVISION 0



FLOW PROFILE - EQUALIZATION TANK

HORZ: NTS
VERT: 1" = 4'

NOTES:

1. THE WATER SURFACE DOWNSTREAM OF THE EQUALIZATION TANK IS A CONSTANT AND IS DEFINED BY THE PUMPING RATE OF THE PUMPING UNITS THAT SUPPLY THE MBR SYSTEM.
2. THE WATER SURFACE IN THE PERCOLATION PONDS WILL BE SUBJECT TO TWO FACTORS --- THE ACTUAL PERCOLATION CAPACITY AND THE BYPASS FLOW (WHEN IT OCCURS).

C:\WORK\DRAFTING\CRWWTP\G04 - HYDRAULIC PROFILE.DWG

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FLOW PROFILE - EQUALIZATION TANK

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67

FILE NAME: G04 - HYDRAULIC PROFILE.DWG

SHEET No. **G05**

SHEET 5 OF 42

REVISION 0

PROCESS ABBREVIATIONS

A	AMPERE
AFD	ADJUSTABLE FREQUENCY DRIVE
AI	ANALOG INPUT
AIC	AMPS INTERRUPTING CAPACITY
ARV	AIR RELIEF VALVE
AO	ANALOG OUTPUT
AS	AIR SUPPLY
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
CB	CIRCUIT BREAKER
CL2	CHLORINE
CON	CONTACTOR
CU	COPPER
CV	CONTROL VALVE
DCS	DISTRIBUTED CONTROL SYSTEM
DI	DISCRETE INPUT
DO	DISSOLVED OXYGEN, DISCRETE OUTPUT
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
EGO	EMERGENCY GAS OFF
ETM	ELAPSED TIME METER
ETMf	ELAPSED TIME METER (FAST SPEED)
ETMs	ELAPSED TIME METER (SLOW SPEED)
EOL	ELECTRONIC OVERLOAD
ELEV	MEAN SEA LEVEL ELEVATION
EXIST	EXISTING
FA	FOUL AIR
FC	FAIL CLOSED
FE	FINAL EFFLUENT
FIT	FLOW INDICATING TRANSMITTER
FR	FORWARD-REVERSE
FS	FLOAT SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
FW	FINISHED WATER
GND	GROUND
GAL	GALLONS
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRA	GRAVITY
H, HI	HIGH
H2S	HYDROGEN SULFIDE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND-OFF-AUTO
I	CURRENT
IO	INPUT/OUTPUT
IOE	INTERNAL-OFF-EXTERNAL
JB	JUNCTION BOX
L, LO	LOW
LAN	LOCAL AREA NETWORK
LC	LOOP CONTROLLER
LCP	LOCAL CONTROL PANEL
LIT	LEVEL INDICATING TRANSMITTER
LOS	LOCK-OFF-STOP
LR	LOCAL/REMOTE
LS	LEVEL (i.e.. FLOAT) SWITCH
M	METER
MA	MANUAL/AUTO
mA	MILLIAMP
MC	MANUFACTURE CABLE
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR(S)	MANUFACTURER(S)
MGD	MILLION GALLONS PER DAY
MG/L	MILLIGRAMS PER LITER
MH	MANHOLE
MLR	MIXED LIQUOR RETURN
MO	MOISTURE
MOD	MODULATED
MTU	MASTER TELEMETRY UNIT
NPW	NON-POTABLE WATER
NS	NITROGEN SUPPLY
NTU	TURBIDITY
O/C	OPEN / CLOSE
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD
OO	ON/OFF (MAINTAINED)
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OSC	OPEN-STOP-CLOSE
PAH	PRESSURE ALARM HIGH
PDT	PRESSURE DIFFERENTIAL INDICATING TRANSMITTER
PDS	PRESSURE DIFFERENTIAL SWITCH
PER	PERMISSIVE
PIT	PRESSURE INDICATING TRANSMITTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
PO	PULSE OUTPUT
POS	POSITION
POT	POTENTIOMETER
PPG	POUNDS PER GALLON
PPH	POUNDS PER HOUR
PPM	PARTS PER MILLION
PR	PAIR
PRES	PRESSURE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PV	PROCESS VARIABLE
RAS	RETURN ACTIVATED SLUDGE
RAW	RAW WATER
REM	REMOTE
RF	RADIO FREQUENCY
RIO	REMOTE INPUT OUTPUT
RS	RAW SEWAGE
RSP	RAW SEWAGE PUMP
RST	RESET
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TELEMETRY UNIT
RUNf	RUN (FAST SPEED)
RUNs	RUN (SLOW SPEED)
SB	SLUDGE BLANKET
SEQ	SERVICE ENTRANCE EQUIPMENT
SES	SERVICE ENTRANCE SECTION
SLC	SINGLE LOOP CONTROLLER
SLOS	START-LOCK-OFF-STOP
SO2	SULFUR DIOXIDE
SOV	SOLENOID OPERATED VALVE
SP	SET POINT
SPD	SPEED
SPR	SPARE
SS	START/STOP (MAINTAINED)
SSS	SOLID STATE STARTER (SOFT START)
STR	MOTOR STARTER
TAH	TEMPERATURE ALARM HIGH
T/M	TEMPERATURE AND/OR MOISTURE
TEMP	TEMPERATURE
TS	TEMPERATURE SWITCH
TSS	TOTAL SUSPENDED SOLIDS
UG	UNDERGROUND
USD	UP/STOP/DOWN
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATER
WAS	WASTE ACTIVATED SLUDGE
WW	WASTEWATER
XMTR	TRANSMITTER
ZS	POSITION (i.e. LIMIT) SWITCH

PROCESS EQUIPMENT AND SYMBOLS

- SOLENOID VALVE 2-WAY
- SOLENOID VALVE 3-WAY
- PUMP CONTROL VALVE
- FLOW CONTROL VALVE
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE
- PRESSURE REGULATOR WITH REMOTE PROCESS CONNECTION
- PRESSURE REGULATOR SELF CONTAINED
- CENTRIFUGAL PUMP
- DRAIN
- AIR RELIEF VALVE
- PIPE REDUCER
- GATE OR GENERIC VALVE
- 3-WAY VALVE
- 4-WAY VALVE
- ANGLE VALVE
- BUTTERFLY VALVE
- PLUG VALVE
- ECCENTRIC PLUG VALVE
- BALL VALVE
- CHECK VALVE
- SWING CHECK VALVE
- STOP CHECK VALVE
- BALL CHECK VALVE
- PINCH VALVE
- DIAPHRAGM VALVE
- DIAPHRAGM VALVE (ALTERNATE)
- GLOBE VALVE
- HAND VALVE
- KNIFE VALVE
- AIR RELEASE VALVE
- SP-1 SUBMERSIBLE PUMP

PROCESS LINE SYMBOLS

- PROCESS PIPING
- EXISTING PROCESS PIPING AND EQUIPMENT
- FUTURE PIPING AND EQUIPMENT
- ELECTRICAL SIGNAL
- ELECTRICAL DIRECTION ARROW
- FLOW ARROW FOR PROCESS PIPING
- P03 /A — PROCESS LINE GOING TO ANOTHER SHEET (MATCH LETTERS)
- P03 /A — PROCESS LINE FROM ANOTHER SHEET (MATCH LETTERS)
- PROCESS LINES CROSSING (NOT CONNECTED)

SCHEDULE OF VALVES

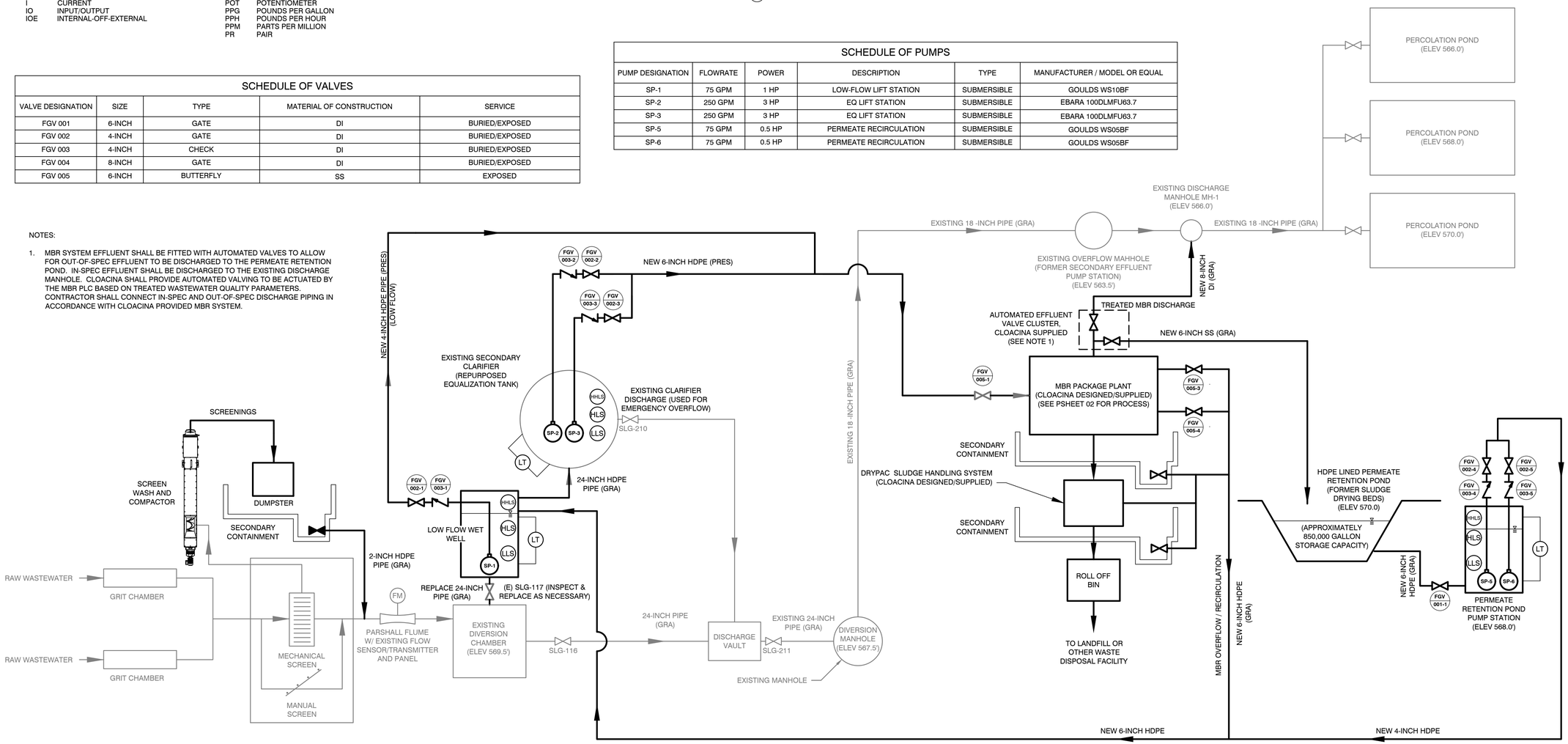
VALVE DESIGNATION	SIZE	TYPE	MATERIAL OF CONSTRUCTION	SERVICE
FGV 001	6-INCH	GATE	DI	BURIED/EXPOSED
FGV 002	4-INCH	GATE	DI	BURIED/EXPOSED
FGV 003	4-INCH	CHECK	DI	BURIED/EXPOSED
FGV 004	8-INCH	GATE	DI	BURIED/EXPOSED
FGV 005	6-INCH	BUTTERFLY	SS	EXPOSED

SCHEDULE OF PUMPS

PUMP DESIGNATION	FLOWRATE	POWER	DESCRIPTION	TYPE	MANUFACTURER / MODEL OR EQUAL
SP-1	75 GPM	1 HP	LOW-FLOW LIFT STATION	SUBMERSIBLE	GOULDS WS10BF
SP-2	250 GPM	3 HP	EQ LIFT STATION	SUBMERSIBLE	EBARA 100DLMFU63.7
SP-3	250 GPM	3 HP	EQ LIFT STATION	SUBMERSIBLE	EBARA 100DLMFU63.7
SP-5	75 GPM	0.5 HP	PERMEATE RECIRCULATION	SUBMERSIBLE	GOULDS WS05BF
SP-6	75 GPM	0.5 HP	PERMEATE RECIRCULATION	SUBMERSIBLE	GOULDS WS05BF

NOTES:

1. MBR SYSTEM EFFLUENT SHALL BE FITTED WITH AUTOMATED VALVES TO ALLOW FOR OUT-OF-SPEC EFFLUENT TO BE DISCHARGED TO THE PERMEATE RETENTION POND. IN-SPEC EFFLUENT SHALL BE DISCHARGED TO THE EXISTING DISCHARGE MANHOLE. CLOACINA SHALL PROVIDE AUTOMATED VALVING TO BE ACTUATED BY THE MBR PLC BASED ON TREATED WASTEWATER QUALITY PARAMETERS. CONTRACTOR SHALL CONNECT IN-SPEC AND OUT-OF-SPEC DISCHARGE PIPING IN ACCORDANCE WITH CLOACINA PROVIDED MBR SYSTEM.



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WWTP SITE PROCESS FLOW DIAGRAM

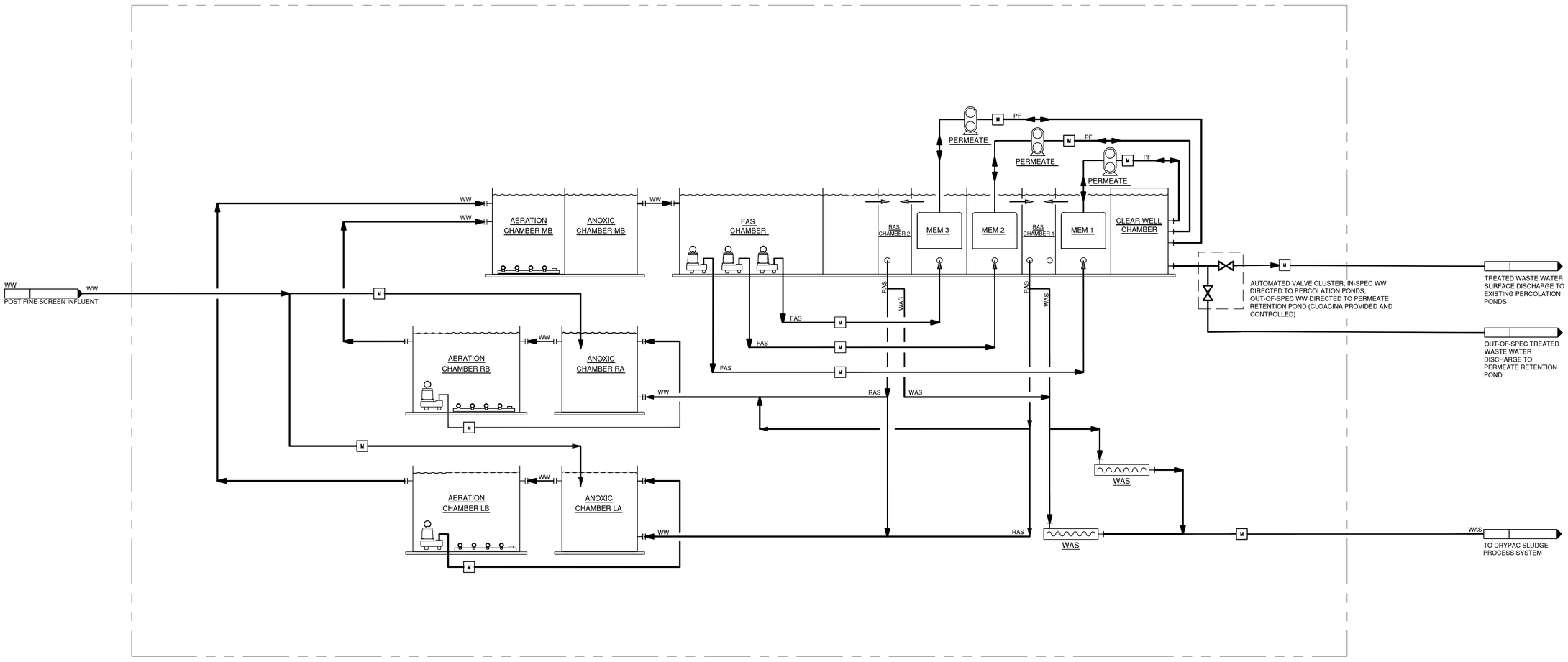
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

FILE NAME: P01 - P&ID.DWG
PROJECT No. 5890-300-01-67

SHEET No. P01
SHEET 6 OF 42
REVISION 0

CLOACINA

CLOACINA MEMPAC-M6 MBR



REFERENCE: MBR PROCESS FLOW DIAGRAM PROVIDED BY CLOACINA DRAWING, STANDARD MEMPAC-M6 BARDENPHO WASTE WATER TREATMENT PLANT, SHEET NUMBER P-001, REVISION A

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C 68637
CIVIL
STATE OF CALIFORNIA

DESIGNER:	TMH
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MBR PROCESS FLOW DIAGRAM

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67

FILE NAME: P01 - P&ID.DWG

SHEET No. **P02**

SHEET 7 OF 42

REVISION **0**

SHEET C02

SHEET C01

1 ABANDON EXISTING 4" DENITRIFICATION RECIRCULATION LINE

2 REMOVE EXISTING RAKE ARM (SEE NOTE 5)

3 DEMO/ABANDON 24" RCP

4 REMOVE WATER LINE

5 DEMO AND REMOVE EXISTING PUMP STATION AND WET WELL (SEE NOTE 1)

6 DEMO EXISTING DIGESTERS, STRUCTURES, AND HOLDING TANKS, ABANDON IN PLACE ALL ASSOCIATED BELOWGROUND PIPING AND CONDUITS

7 DEMO EXISTING TANK

8 REMOVE OVERFLOW MANHOLE PUMP EQUIPMENT

9 REMOVE ASSOCIATED SLUDGE DRYING POND EQUIPMENT AND PIPELINES

10 EXISTING SLUDGE DRYING POND

11 DENITRIFYING FILTER AND ASSOCIATED EQUIPMENT (DECOMMISSION AND REMOVE AFTER MBR STARTUP IN ACCORDANCE WITH CMD PM DIRECTION)

EXISTING FENCING SHALL BE MOVED TO ACCOMMODATE NEW EQUIPMENT FOOTPRINT, REPLACE TO MATCH EXISTING

REPURPOSE EXISTING DENITRIFICATION BLDG FOR STORAGE, OR IN ACCORDANCE WITH CMD PM DIRECTION

REMOVE AND REPLACE EXISTING DIVERSION MANHOLE

ITEM No.	DESCRIPTION
1	CUT AND PLUG EXISTING PIPE WITH MINIMUM 18-INCHES CONCRETE PLUG ON EACH END
2	REMOVE EXISTING CLARIFIER RAKE ARM AND FEEDWELL
3	REMOVE EXISTING 24" DIA. RCP FROM DIVERSION CHAMBER TO EXISTING CLARIFIER. PLUG PIPING BENEATH CLARIFIER WITH MINIMUM 18-INCHES CONCRETE PLUG ON EACH END
4	REMOVE EXISTING WATER LINE, CAP AT HOSE BIB
5	DEMO AND REMOVE EXISTING SLUDGE PUMP STATION, WET WELL, AND SUBSURFACE PIPING TO DIGESTER PUMP(S)
6	DISPOSE OF EXISTING DIGESTER SLUDGE, DEMO EXISTING DIGESTERS, PIPING, AND PUMP STATION. BACKFILL WITH STRUCTURAL FILL
7	DEMO AND REMOVE EXISTING CONE BOTTOM, IN-GROUND, CONCRETE TANK. PLUG INLET/OUTLET PIPING WITH MINIMUM 18-INCH CONCRETE PLUG ON EACH END. BACKFILL WITH STRUCTURAL FILL
8	REMOVE EXISTING SUBMERSIBLE PUMPS, ASSOCIATED CONTROLS, AND POWER. REMOVE VERTICAL DISCHARGE RISER. REMOVE PUMP DISCHARGE PIPES AND PLUG MANHOLE PIPE PENETRATIONS
9	DEMO AND REMOVE EXISTING SLUDGE DRYING BED INFRASTRUCTURE. CUT AND PLUG SUBSURFACE PIPING WITH MINIMUM 18-INCHES CONCRETE PLUG
10	REMOVE ACCUMULATED SLUDGE TO NATIVE SOIL. GRADE PER GRADING PLAN
11	UPON COMMISSIONING OF MBR AND SLUDGE HANDLING EQUIPMENT, DEMO AND REMOVE EXISTING DENITRIFICATION EQUIPMENT, CHEMICAL FEED EQUIPMENT, PIPING, AND APPURTENANCES

LEGEND

- SUBJECT LINES (PROPOSED CONSTRUCTION)
- EXISTING CONDITIONS
- X — FENCE LINE
- E — ELECTRICAL (UNDERGROUND)
- OH — ELECTRICAL (OVERHEAD)
- EXISTING GRADES (MAJOR - 5 FOOT)
- EXISTING GRADES (MINOR - 1 FOOT)
- SUBSURFACE LINE
- DEMO/ABANDON
- DEMOLISH/REMOVE

0 20 40 FEET
SCALE

NOTES:

1. THE CONTRACTOR SHALL REMOVE, RELOCATE, OR REPLACE EXISTING EQUIPMENT TO ALLOW FOR THE INSTALLATION OF NEW EQUIPMENT. REMOVAL, RELOCATION OR REPLACEMENT ACTIVITIES WILL BE CONDUCTED IN COORDINATION WITH THE CMD PM.
2. THE CONTRACTOR SHALL PROVIDE FOR SLUDGE HANDLING PRIOR TO DEMOLITION OF THE EXISTING SLUDGE DIGESTERS UNTIL PROJECT CONSTRUCTION IS COMPLETED AND WASTEWATER TREATMENT PROCESSES ARE MIGRATED TO THE NEW MBR AND SLUDGE HANDLING FACILITIES. THE CONTRACTOR MAY UTILIZE MOBILE SLUDGE HANDLING PROCESS UNITS PROVIDED BY CLOACINA, OR OTHERS, AS APPROPRIATE.
3. THE CONTRACTOR SHALL RE-ESTABLISH EXISTING GRADE AFTER DEMOLITION AND SUBSURFACE STRUCTURE/PIPELINE REMOVAL. BACKFILL MATERIAL SHALL BE CLEAN IMPORT, NON-STRUCTURAL BACKFILL, COMPACTED TO A MINIMUM 90% RELATIVE MAXIMUM DENSITY, UNLESS OTHERWISE SPECIFIED. BACKFILL BENEATH THE PROPOSED MBR AND DRYPACK SYSTEMS SHALL BE STRUCTURAL BACKFILL, COMPACTED TO A MINIMUM 95% RELATIVE MAXIMUM DENSITY IN ACCORDANCE WITH GEOTECHNICAL REQUIREMENTS PROVIDED ON SHEET S01.
4. PIPE LINES 6 INCH DIA. OR SMALLER ARE DISPLAYED AS SINGLE LINE.
5. CONTRACTOR TO REMOVE AND DISPOSE OF EXISTING RAKE ARM AND FEEDWELL. CENTER COLUMN, COLUMN FRAME, AND BRIDGE PLATFORM TO REMAIN IN PLACE.

C:\WORK\DRAFTING\GRWWTP\C01 - EXISTING SITE PLAN AND DEMO.DWG

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IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER TIMOTHY M. HUNT C 68637 CIVIL STATE OF CALIFORNIA

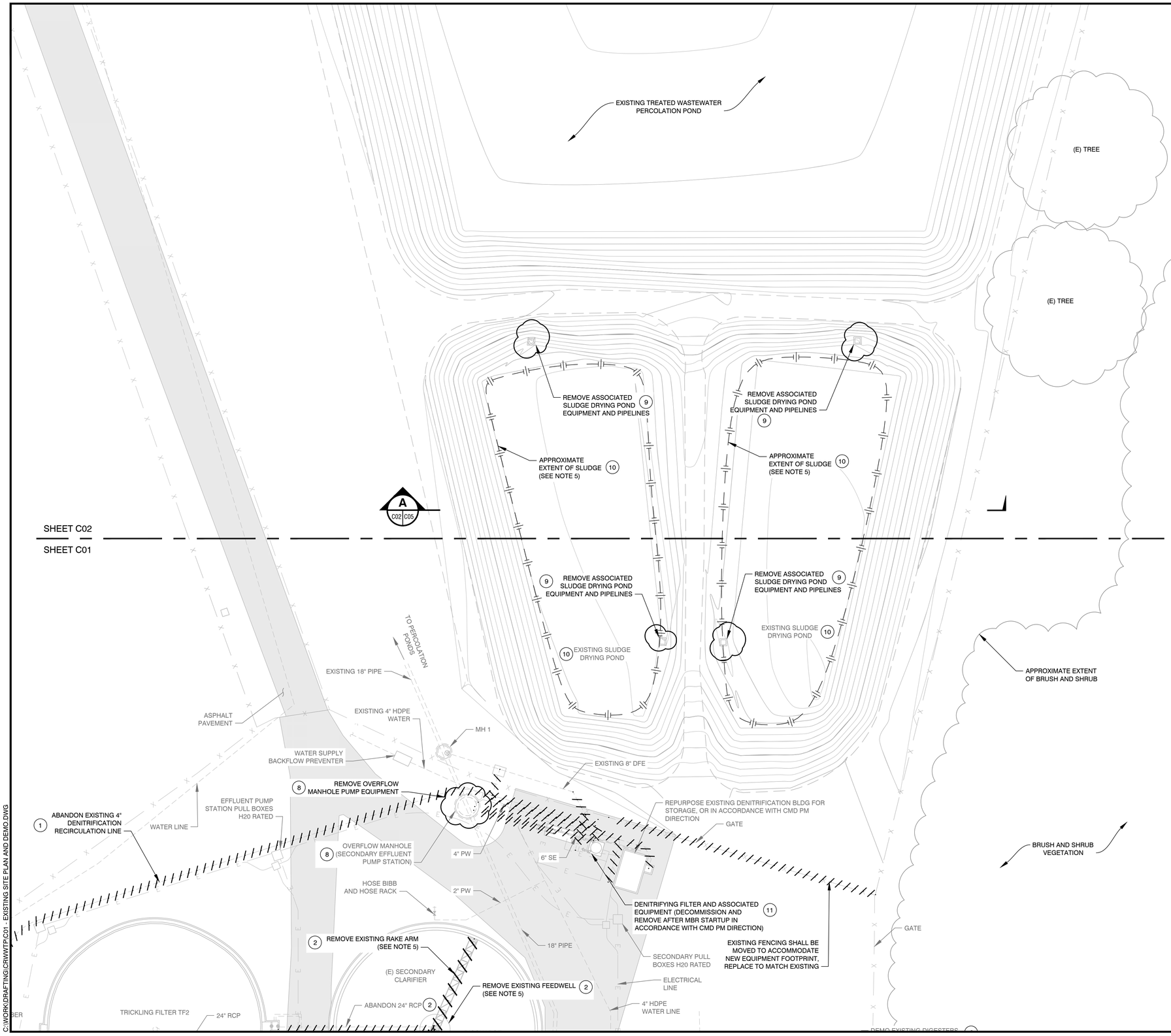
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DRAWN BY: TMH
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DATE: 03/31/2026

EXISTING SITE AND DEMOLITION PLAN (1 OF 2)

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No.: 5880-300-01-67
FILE NAME: C01 - EXISTING SITE PLAN AND DEMO.DWG

SHEET No. C01
SHEET 8 OF 42
REVISION 0



ITEM No.	DESCRIPTION
1	CUT AND PLUG EXISTING PIPE WITH MINIMUM 18-INCHES CONCRETE PLUG ON EACH END
2	REMOVE EXISTING CLARIFIER RAKE ARM AND FEEDWELL
8	REMOVE EXISTING SUBMERSIBLE PUMPS, ASSOCIATED CONTROLS, AND POWER. REMOVE VERTICAL DISCHARGE RISER. REMOVE PUMP DISCHARGE PIPES AND PLUG MANHOLE PIPE PENETRATIONS
9	DEMO AND REMOVE EXISTING SLUDGE DRYING BED INFRASTRUCTURE. CUT AND PLUG SUBSURFACE PIPING WITH MINIMUM 18-INCHES CONCRETE PLUG
10	REMOVE ACCUMULATED SLUDGE TO NATIVE SOIL. GRADE PER PLAN
11	UPON COMMISSIONING OF MBR AND SLUDGE HANDLING EQUIPMENT, DEMO AND REMOVE EXISTING DENITRIFICATION EQUIPMENT, CHEMICAL FEED EQUIPMENT, PIPING, AND APPURTENANCES

LEGEND

- SUBJECT LINES (PROPOSED CONSTRUCTION)
- EXISTING CONDITIONS
- X — FENCE LINE
- E — ELECTRICAL (UNDERGROUND)
- OH — ELECTRICAL (OVERHEAD)
- EXISTING GRADES (MAJOR - 5 FOOT)
- EXISTING GRADES (MINOR - 1 FOOT)
- SUBSURFACE LINE
- DEMO/ABANDON
- DEMOLISH/REMOVE

0 20 40 FEET
SCALE

NOTES:

1. THE CONTRACTOR SHALL REMOVE, RELOCATE, OR REPLACE EXISTING EQUIPMENT TO ALLOW FOR THE INSTALLATION OF NEW EQUIPMENT. REMOVAL, RELOCATION OR REPLACEMENT ACTIVITIES WILL BE CONDUCTED IN COORDINATION WITH THE CMD PM.
2. THE CONTRACTOR SHALL PROVIDE FOR SLUDGE HANDLING AFTER THE EXISTING SLUDGE DIGESTERS HAVE BEEN DEMOLISHED AND REMOVED UNTIL PROJECT CONSTRUCTION IS COMPLETED AND WASTEWATER TREATMENT PROCESSES ARE MIGRATED TO THE NEW MBR AND SLUDGE HANDLING FACILITIES. THE CONTRACTOR MAY UTILIZE MOBILE SLUDGE HANDLING PROCESS UNITS PROVIDED BY CLOACINA, OR OTHERS, AS APPROPRIATE.
3. THE CONTRACTOR SHALL RE-ESTABLISH EXISTING GRADE AFTER DEMOLITION AND SUBSURFACE STRUCTURE/PIPELINE REMOVAL. BACKFILL MATERIAL SHALL BE CLEAN IMPORT, NON-STRUCTURAL BACKFILL, COMPACTED TO A MINIMUM 90% RELATIVE MAXIMUM DENSITY, UNLESS OTHERWISE SPECIFIED.
4. PIPE LINES 6 INCH DIA. OR SMALLER ARE DISPLAYED AS SINGLE LINE.
5. CONTRACTOR SHALL FIELD VERIFY EXTENT AND DEPTH OF EXISTING SLUDGE TO BE REMOVED AND DISPOSED.

PREPARED BY
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR
CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
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C	12/04/24	60% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	TMH	JP
A	02/28/18	35% DESIGN	BB	APPD

REVISION SUMMARY

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER — TIMOTHY M. HUNT — C 68637 — CIVIL — STATE OF CALIFORNIA

DESIGNED:	TMH
DRAWN BY:	TMH
CHECKED BY:	PM
APPROVED BY:	TMH
DATE:	03/31/2026

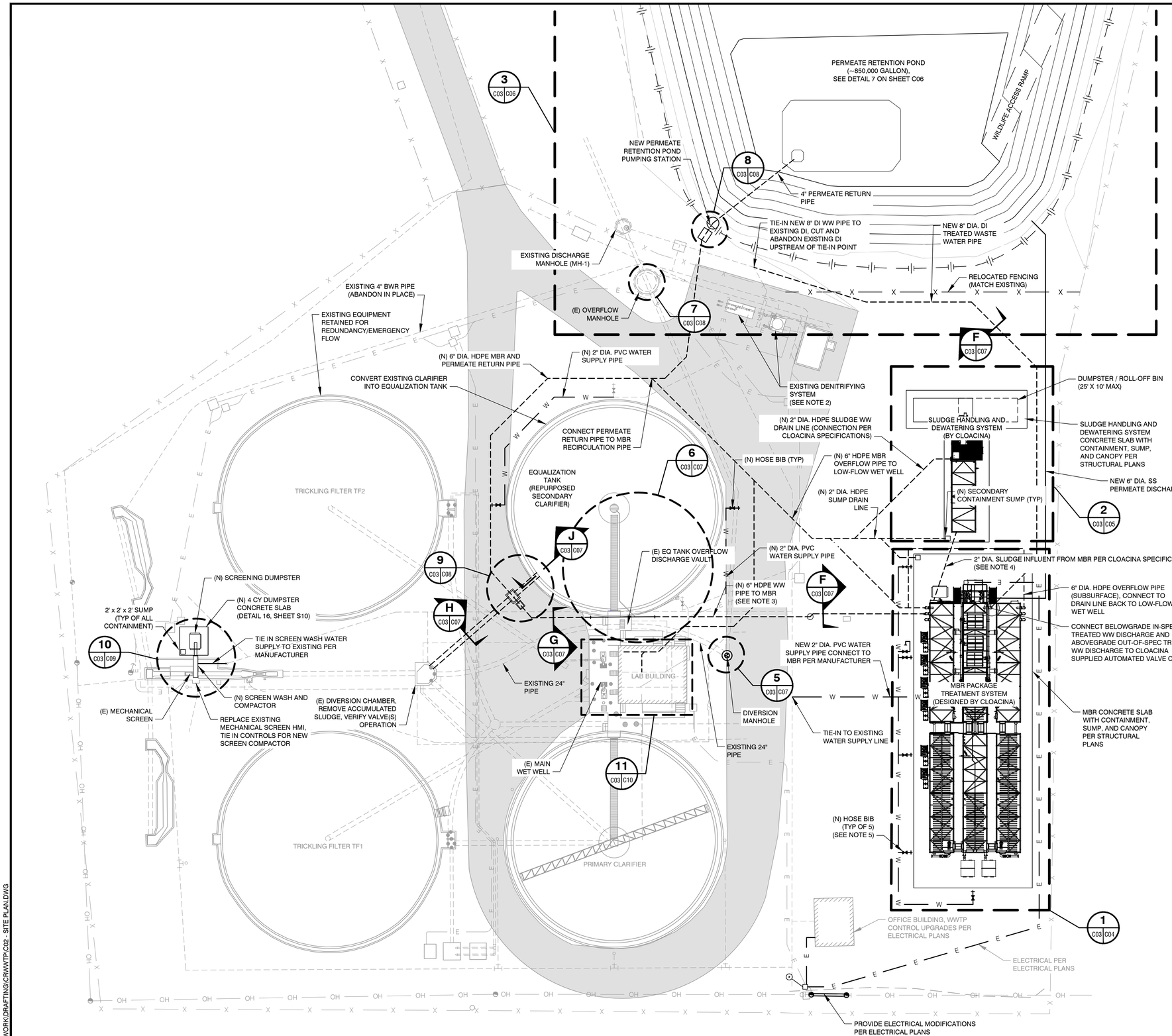
EXISTING SITE AND DEMOLITION PLAN (2 OF 2)

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME: C01 - EXISTING SITE PLAN AND DEMO.DWG

SHEET No. C02
SHEET 9 OF 40
REVISION 0

C:\WORK\DRAFTING\CRWWTP\C01 - EXISTING SITE PLAN AND DEMO.DWG



LEGEND

- SUBJECT LINES (PROPOSED CONSTRUCTION)
- EXISTING CONDITIONS
- X — FENCE LINE
- E — ELECTRICAL (UNDERGROUND)
- OH — ELECTRICAL (OVERHEAD)
- W — WATER
- SUBSURFACE LINE
- PROPOSED GRADES (MAJOR - 5 FOOT)
- PROPOSED GRADES (MINOR - 1 FOOT)
- LIMIT OF GRADING

0 20 40 FEET
SCALE

NOTES:

1. PIPELINES 6-INCH DIA. OR SMALLER ARE DISPLAYED AS SINGLE LINE.
2. EXISTING DENITRIFICATION FILTER SYSTEM SHALL REMAIN OPERATIONAL DURING CONSTRUCTION OF THE MBR AND ASSOCIATED INFRASTRUCTURE. UPON MBR COMMISSIONING, CONTRACTOR SHALL DECOMMISSION, DEMO, AND REMOVE ALL DENITRIFICATION EQUIPMENT, CHEMICAL FEED SYSTEMS, PIPING, AND ASSOCIATED INFRASTRUCTURE.
3. ALL HDPE PIPING DOWNSTREAM OF THE LOW-FLOW PUMP STATION SHALL BE MECHANICALLY RESTRAINED.
4. SLUDGE PIPING SHALL CONSIST OF LONG SWEEPING BENDS AND ELBOWS.
5. LOCATE HOSE BIBS AND EYE WASH STATIONS AT CANOPY VERTICAL SUPPORT BEAMS SO AS TO NOT INTERFERE WITH ACCESS TO MBR COMPONENTS.
6. HARDSCAPE IMPROVEMENTS PER SHEET C11 - HARDSCAPE PLAN.

C:\WORK\DRAFTING\CRWWTP\C02 - SITE PLAN.DWG

PREPARED BY
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR
CAL GUARD
CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA NATIONAL GUARD
CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

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REGISTERED PROFESSIONAL ENGINEER
TIMOTHY M. HUNT
C 69637
CIVIL
STATE OF CALIFORNIA

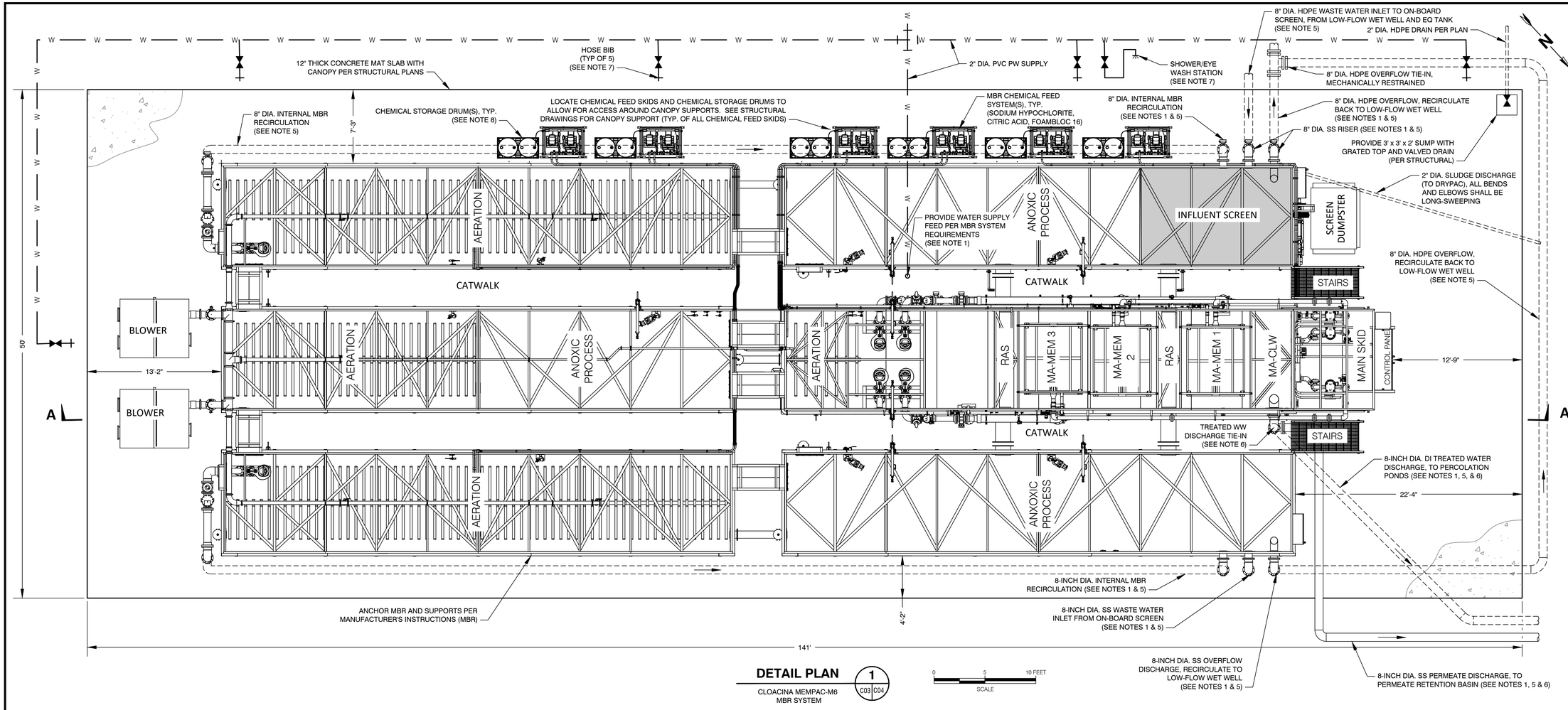
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DRAWN BY:	TMH
CHECKED BY:	PM
APPROVED BY:	TMH
DATE:	03/31/2026

SITE PLAN

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-47
FILE NAME: C02 - SITE PLAN.DWG

SHEET No. C03
SHEET 10 OF 42
REVISION 0

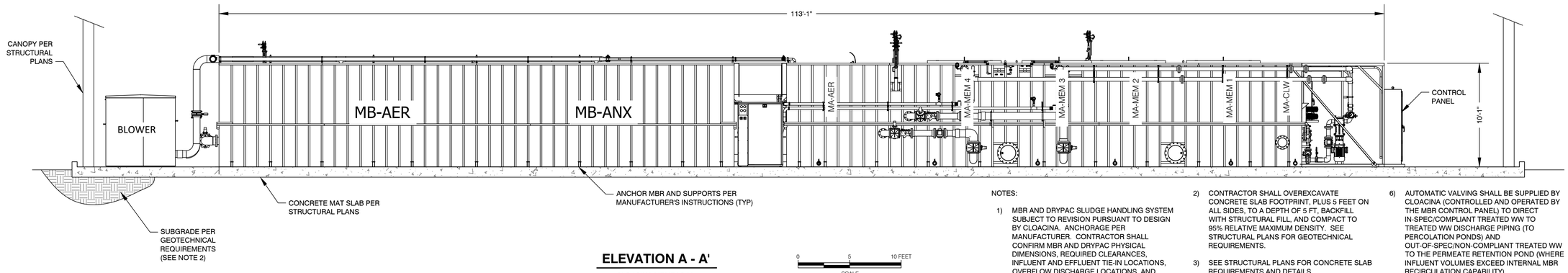


DETAIL PLAN

CLOACINA MEMPAC-M6 MBR SYSTEM

1 (C03 | C04)

0 5 10 FEET
SCALE



ELEVATION A - A'

CLOACINA MEMPAC-M6 MBR SYSTEM

0 5 10 FEET
SCALE

NOTES:

1) MBR AND DRYPAC SLUDGE HANDLING SYSTEM SUBJECT TO REVISION PURSUANT TO DESIGN BY CLOACINA. ANCHORAGE PER MANUFACTURER. CONTRACTOR SHALL CONFIRM MBR AND DRYPAC PHYSICAL DIMENSIONS, REQUIRED CLEARANCES, INFLUENT AND EFFLUENT TIE-IN LOCATIONS, OVERFLOW DISCHARGE LOCATIONS, AND WATER SUPPLY LOCATIONS WITH CLOACINA PRIOR TO SLAB AND CANOPY CONSTRUCTION. CONTRACTOR SHALL BRING ANY DIMENSION DISCREPANCIES OR CONFLICTS TO THE ATTENTION OF THE CMD PM AND ENGINEER.
2) CONTRACTOR SHALL OVEREXCAVATE CONCRETE SLAB FOOTPRINT, PLUS 5 FEET ON ALL SIDES, TO A DEPTH OF 5 FT, BACKFILL WITH STRUCTURAL FILL, AND COMPACT TO 95% RELATIVE MAXIMUM DENSITY. SEE STRUCTURAL PLANS FOR GEOTECHNICAL REQUIREMENTS.
3) SEE STRUCTURAL PLANS FOR CONCRETE SLAB REQUIREMENTS AND DETAILS.
4) SEE ELECTRICAL PLANS FOR CONDUIT SCHEMATICS.
5) PROVIDE HDPE OR DI TO SS RESTRAINT FLANGE ADAPTER WHERE APPLICABLE.
6) AUTOMATIC VALVING SHALL BE SUPPLIED BY CLOACINA (CONTROLLED AND OPERATED BY THE MBR CONTROL PANEL) TO DIRECT IN-SPEC/COMPLIANT TREATED WW TO TREATED WW DISCHARGE PIPING (TO PERCOLATION PONDS) AND OUT-OF-SPEC/NON-COMPLIANT TREATED WW TO THE PERMEATE RETENTION POND (WHERE INFLUENT VOLUMES EXCEED INTERNAL MBR RECIRCULATION CAPABILITY).
7) LOCATE HOSE BIBS AND EYE WASH STATIONS AT CANOPY VERTICAL BEAM LOCATIONS.
8) PROVIDE SECONDARY CONTAINMENT FOR ALL CHEMICAL FEED STORAGE DRUMS.

C:\WORK\DRAFTING\CRW\TP.C - MBR.DWG

PREPARED BY: Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR: CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

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REGISTERED PROFESSIONAL ENGINEER — TIMOTHY M. HUNT — C 68637 — MECHANICAL — STATE OF CALIFORNIA

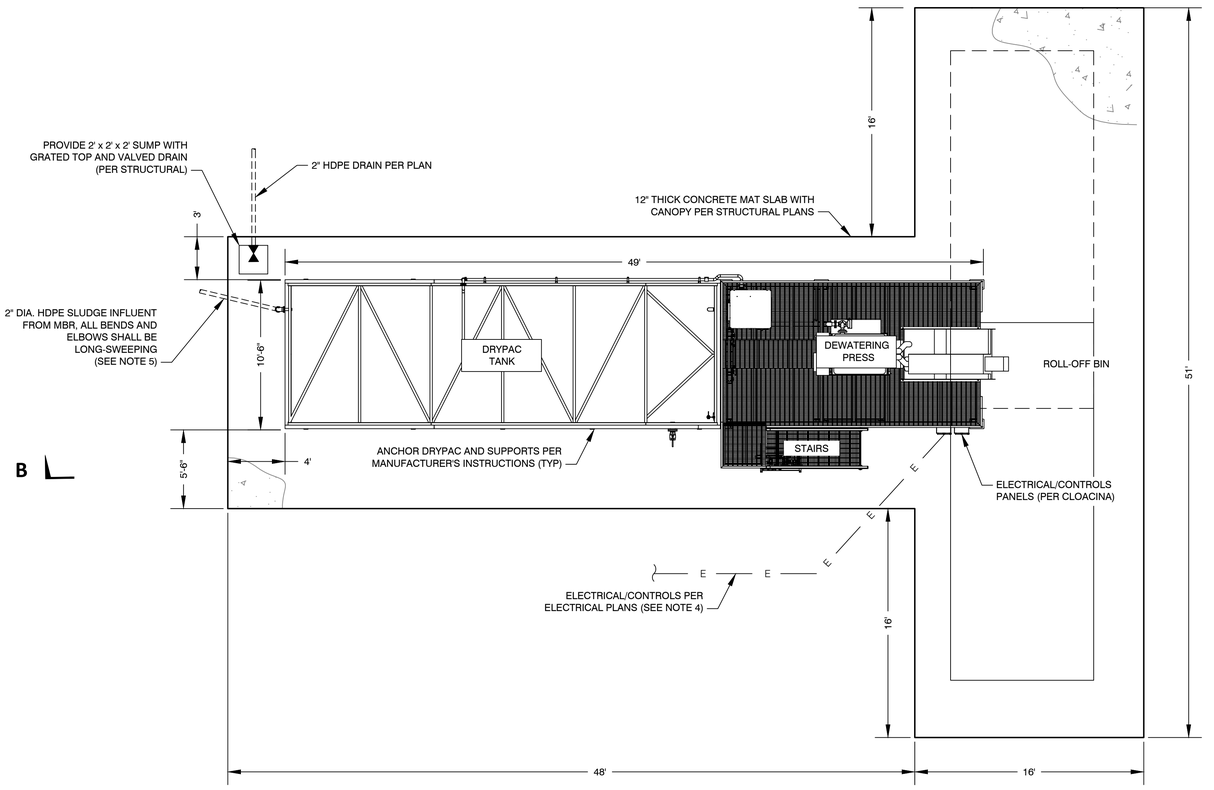
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TMH	TMH	PM	TMH	03/31/2026

MEMBRANE BIOREACTOR (MBR) PLAN AND PROFILE

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No.: 5880-300-01-67
FILE NAME: c-mbr.dwg

SHEET No. C04
SHEET 11 OF 42
REVISION 0

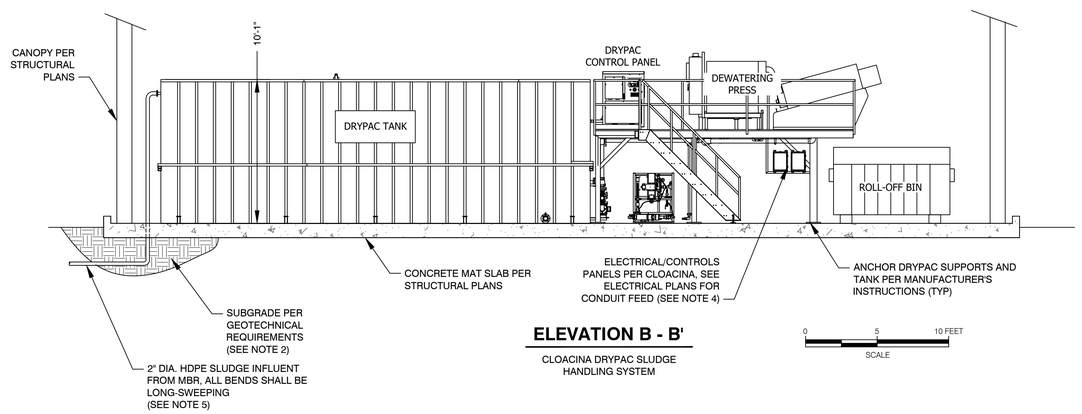


DETAIL PLAN

CLOACINA DRYPAC SLUDGE HANDLING SYSTEM

2 (C03 | C05)

0 5 10 FEET
SCALE



ELEVATION B - B'

CLOACINA DRYPAC SLUDGE HANDLING SYSTEM

0 5 10 FEET
SCALE

NOTES:

1) MBR AND DRYPAC SLUDGE HANDLING SYSTEM SUBJECT TO REVISION PURSUANT TO DESIGN BY CLOACINA. ANCHORAGE PER MANUFACTURER. CONTRACTOR SHALL CONFIRM MBR AND DRYPAC PHYSICAL DIMENSIONS, REQUIRED CLEARANCES, INFLUENT AND EFFLUENT TIE-IN LOCATIONS, OVERFLOW DISCHARGE LOCATIONS, AND WATER SUPPLY LOCATIONS WITH CLOACINA PRIOR TO SLAB AND CANOPY CONSTRUCTION. CONTRACTOR SHALL BRING ANY DIMENSION DISCREPANCIES OR CONFLICTS TO THE ATTENTION OF THE CMD PM AND ENGINEER.
2) CONTRACTOR SHALL OVEREXCAVATE CONCRETE SLAB FOOTPRINT, PLUS 5 FEET ON ALL SIDES, TO A DEPTH OF 5 FT, BACKFILL WITH STRUCTURAL FILL, AND COMPACT TO 95% RELATIVE MAXIMUM DENSITY. SEE STRUCTURAL PLANS FOR GEOTECHNICAL REQUIREMENTS.
3) SEE STRUCTURAL PLANS FOR CONCRETE SLAB REQUIREMENTS AND DETAILS.
4) SEE ELECTRICAL PLANS FOR CONDUIT SCHEMATICS.
5) PROVIDE HDPE TO SS RESTRAINT FLANGE ADAPTER WHERE APPLICABLE.

C:\WORK\DRAFTING\CRW\WTP\C - MBR.DWG

PREPARED BY:
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR:
CAL GUARD
CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

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REGISTERED PROFESSIONAL ENGINEER TIMOTHY M. HUNT C 68637 CIVIL STATE OF CALIFORNIA

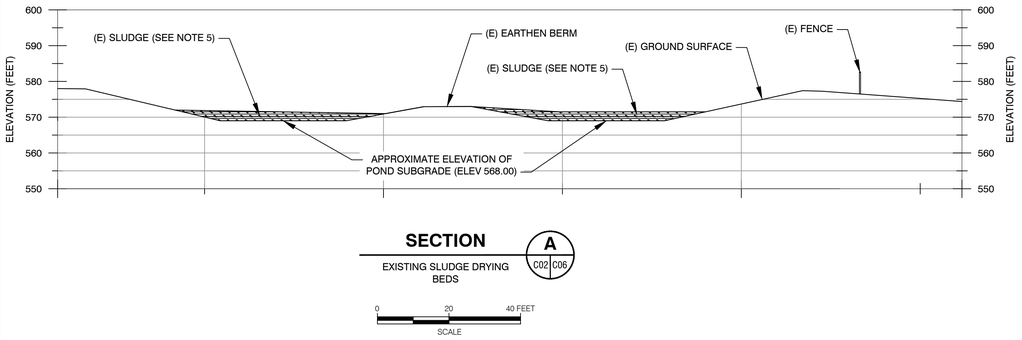
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CHECKED BY: PM
APPROVED BY: TMH
DATE: 03/31/2026

DRYPAC PLAN AND PROFILE

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME: C - MBR.DWG

SHEET No. C05
SHEET 12 OF 42
REVISION 0

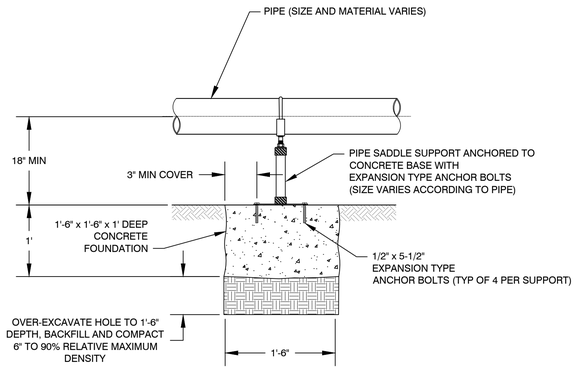


SECTION A (C02 | C06)

EXISTING SLUDGE DRYING BEDS

0 20 40 FEET
SCALE

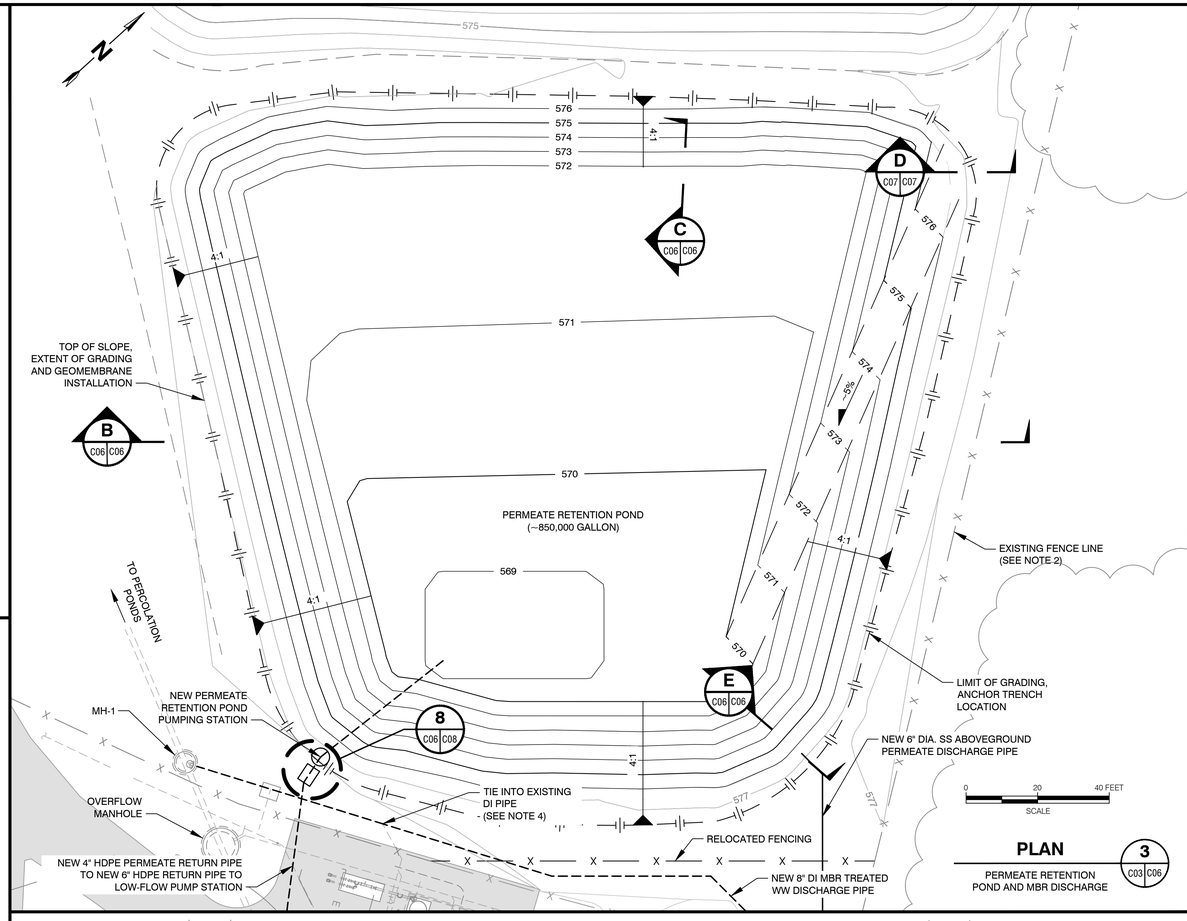
REFERENCE: EXISTING ELEVATIONS AND TOPOGRAPHIC CONTOURS ARE APPROXIMATE AND ARE BASED ON TOPOGRAPHIC INFORMATION PROVIDED BY ANDREGG GEOMATICS, DATED FEBRUARY 13, 2013. CONTRACTOR SHALL FIELD VERIFY ELEVATIONS.



DETAIL 4 (C06 | C06)

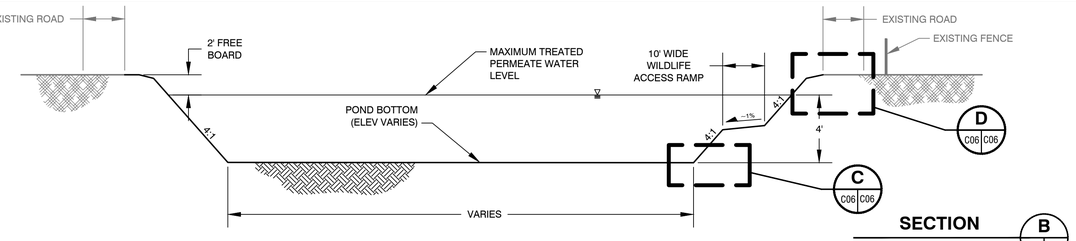
TYPICAL ABOVEGROUND PIPE SUPPORT

0 1 2 FEET
SCALE



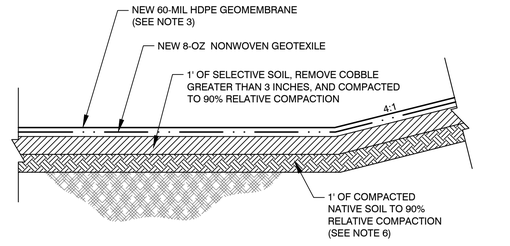
PLAN 3 (C03 | C06)

PERMEATE RETENTION POND AND MBR DISCHARGE



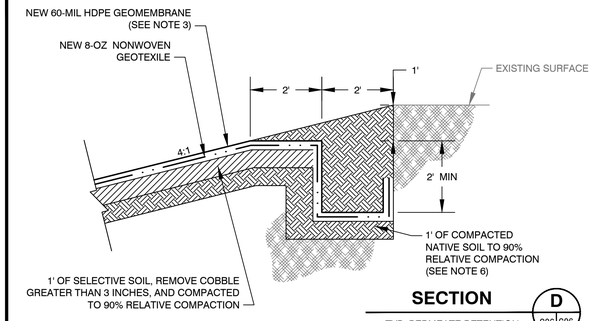
SECTION B (C05 | C05)

TYP. PERMEATE RETENTION POND CROSS SECTION (NTS)



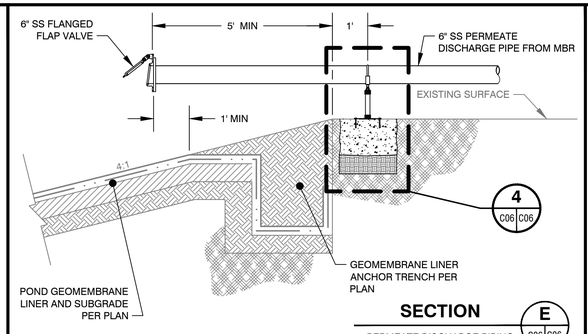
SECTION C (C06 | C06)

TYP. PERMEATE RETETION POND LINER CROSS SECTION (NTS)



SECTION D (C06 | C06)

TYP. PERMEATE RETENTION POND ANCHOR TRENCH (NTS)



SECTION E (C06 | C06)

PERMEATE DISCHARGE PIPING (NTS)

NOTES:

1. PIPE LINES 6 INCH DIA. OR SMALLER ARE DISPLAYED AS SINGLE LINE.
2. CONTRACTOR SHALL LIMIT CONSTRUCTION ACTIVITIES TO WITHIN THE EXISTING FENCE LINE OF THE WASTEWATER TREATMENT PLANT AND ASSOCIATED DRYING BEDS AND PERCOLATION PONDS. ALL VEGETATION AND SITE IMPROVEMENTS OUTSIDE OF THE EXISTING FENCE LINE SHALL BE PROTECTED IN PLACE.
3. HDPE GEOMEMBRANE LINER SHALL BE 60-MIL (1.5 mm) THICKNESS AND SHALL BE TEXTURED (BOTH SIDES) WITH A MINIMUM TEAR RESISTANCE OF 42 LBS AND A PUNCTURE RESISTANCE OF 90 LBS. HDPE GEOMEMBRANE LINER SHALL BE ANCHORED AT THE PERIMETER WITHIN AN ANCHOR TRENCH AS SHOWN OR AS REQUIRED BY THE MANUFACTURER AND SHALL BE ANCHORED USING SANDBAGS OR OTHER APPROVED WEIGHT DEVICES TO PREVENT THE LINER FROM LIFTING FROM THE POND SURFACE IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
4. ALL BELOW GROUND DI PIPE SHALL BE POLYETHYLENE ENCASED WITH TAPED ENDS.
5. CONTRACTOR SHALL FIELD VERIFY THICKNESS OF SLUDGE AT TIME AND BIDDING AND CONSTRUCTION. CONTRACTOR SHALL REMOVE ACCUMULATED SLUDGE UNTIL NATIVE SUBGRADE IS ESTABLISHED AND DISPOSE OF AS DIRECTED BY THE COR.
6. UPON COMPLETION OF SLUDGE REMOVAL AND GRADING FOR THE PERMEATE RETENTION POND, CONTRACTOR SHALL SCARIFY SUBGRADE TO A DEPTH OF 1' AND COMPACT TO 90% RELATIVE MAXIMUM DENSITY. COMPACTION INSPECTIONS SHALL BE IN ACCORDANCE WITH GEOTECHNICAL REQUIREMENTS SHOWN ON SHEET S01.

PREPARED BY
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR
CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
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REGISTERED PROFESSIONAL ENGINEER — TIMOTHY M. HUNTER — C 68637 — CIVIL — STATE OF CALIFORNIA

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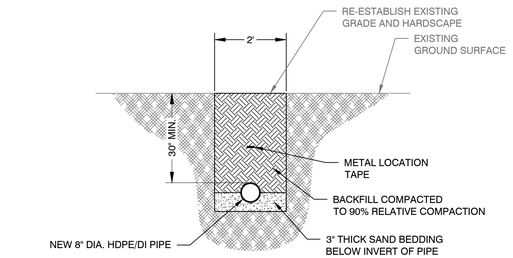
PERMEATE RETENTION POND PLAN

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME: C:\HOLDING POND.DWG

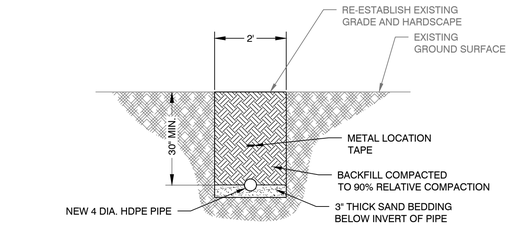
SHEET No. C06
SHEET 13 OF 42
REVISION 0

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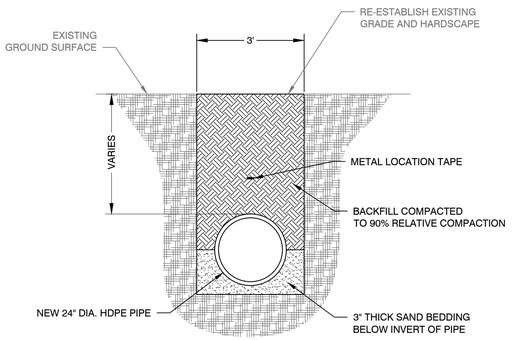
0 2 4 FEET
SCALE

SECTION F
TYPICAL TRENCH CROSS-SECTION
C03 | C07



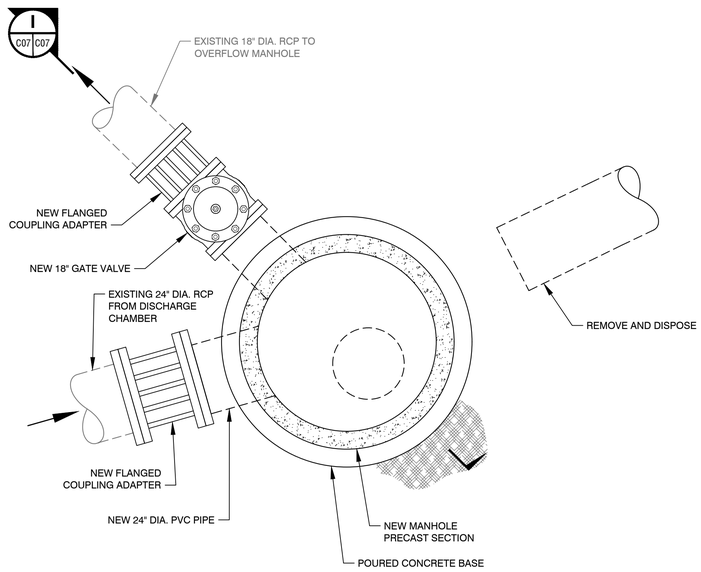
0 2 4 FEET
SCALE

SECTION G
TYPICAL TRENCH CROSS-SECTION
C03 | C07



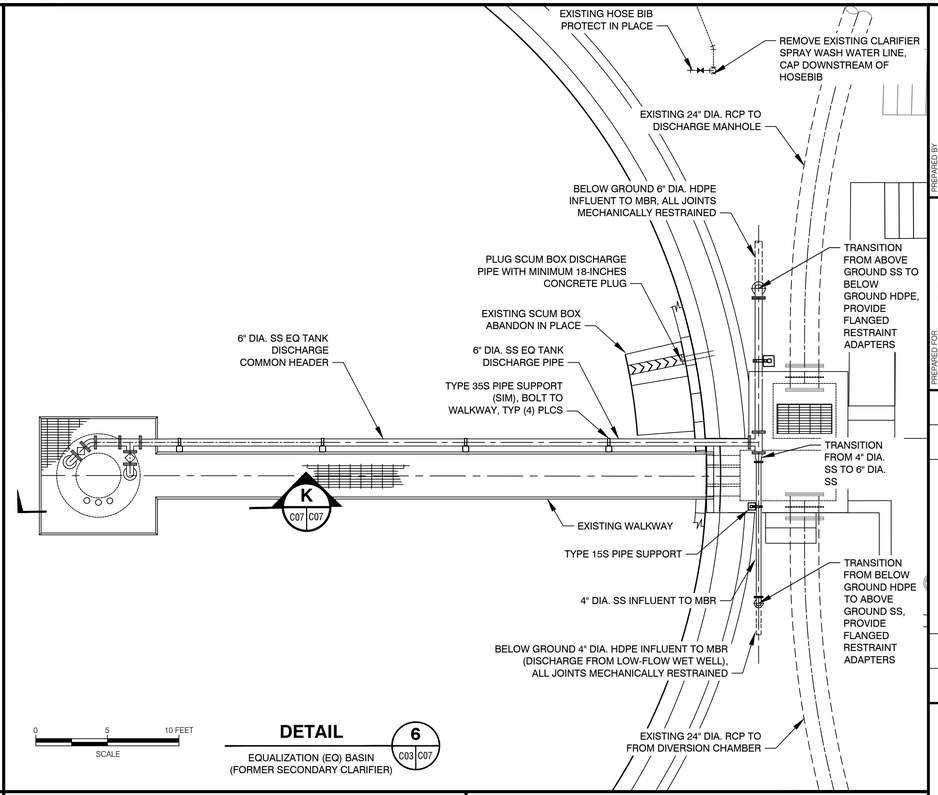
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SECTION H
TYPICAL TRENCH CROSS-SECTION
C03 | C07



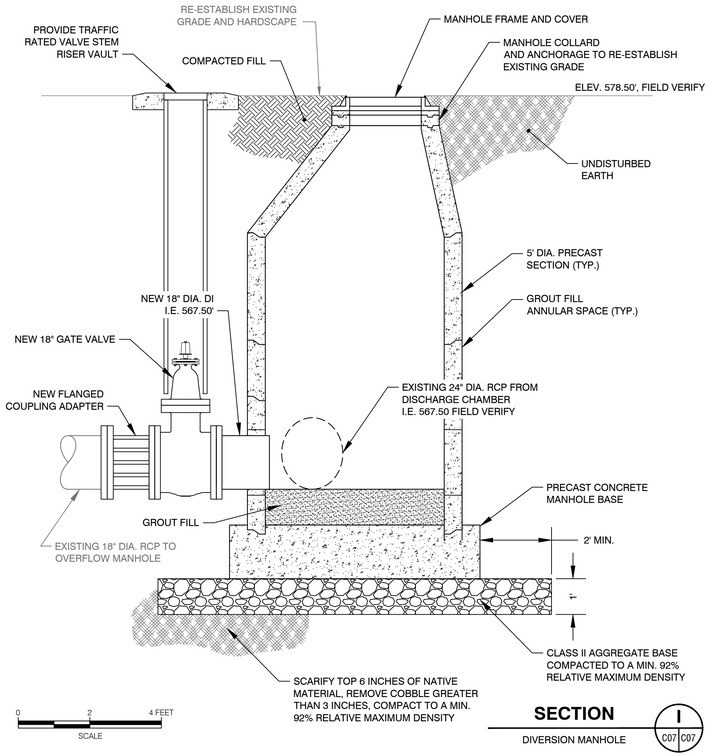
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DETAIL 5
DIVERSION MANHOLE
C03 | C07



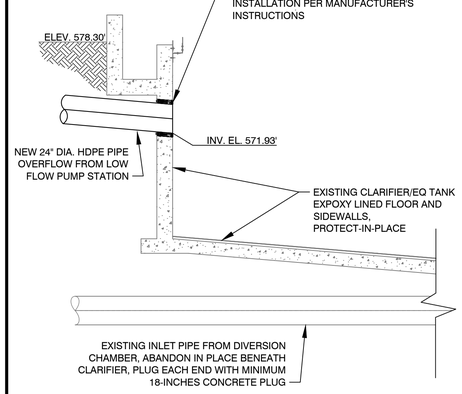
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DETAIL 6
EQUALIZATION (EQ) BASIN (FORMER SECONDARY CLARIFIER)
C03 | C07



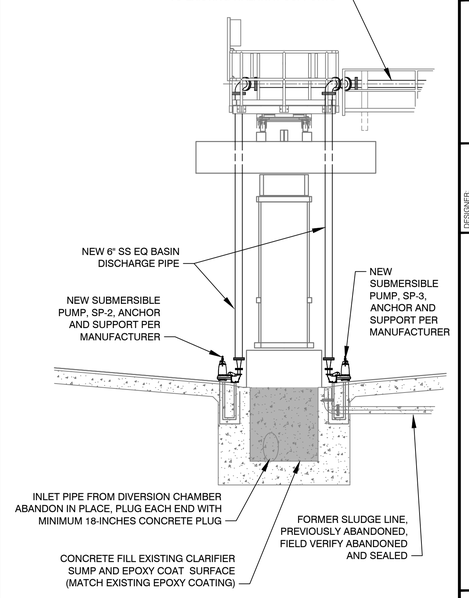
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SECTION I
DIVERSION MANHOLE
C07 | C07



0 5 10 FEET
SCALE

SECTION J
EQUALIZATION (EQ) BASIN (FORMER SECONDARY CLARIFIER)
C03 | C07



0 5 10 FEET
SCALE

SECTION K
EQUALIZATION (EQ) BASIN PUMPS (FORMER SECONDARY CLARIFIER)
C07 | C07

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Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED BY

PREPARED FOR
CAL GUARD CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
1060 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	90% DESIGN SUBMITTAL	TMH	TMH
D	08/06/25	RECISED 60% DESIGN SUBMITTAL	TMH	TMH
C	12/05/24	60% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 30% DESIGN	TMH	TMH
A	02/28/18	30% DESIGN	BB	JP

SCALE:
AS NOTED
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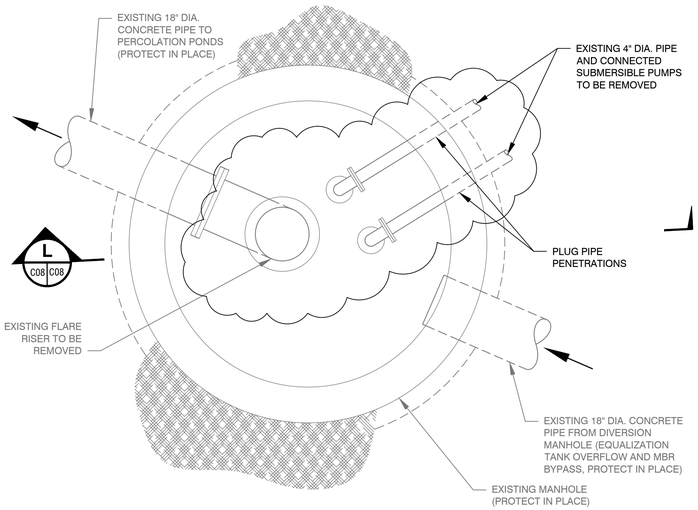
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DRAWN BY: TMH
CHECKED BY: PM
APPROVED BY: TMH
DATE: 03/31/2026

DETAILS AND SECTIONS (1 OF 4)

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

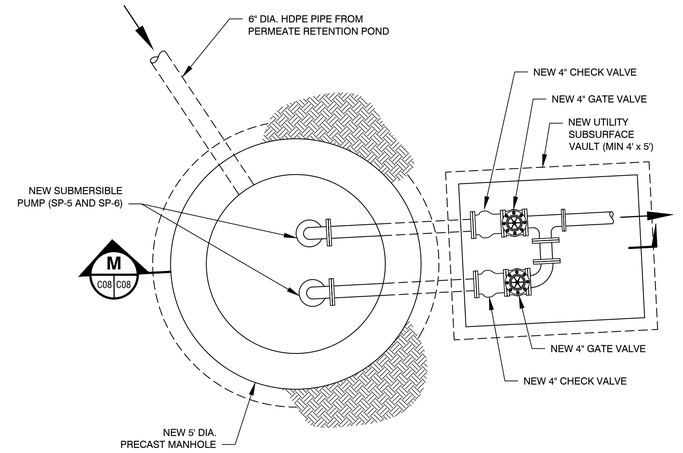
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PROJECT No. 5890-300-01-67

SHEET No. **C07**
SHEET 14 OF 42
REVISION 0



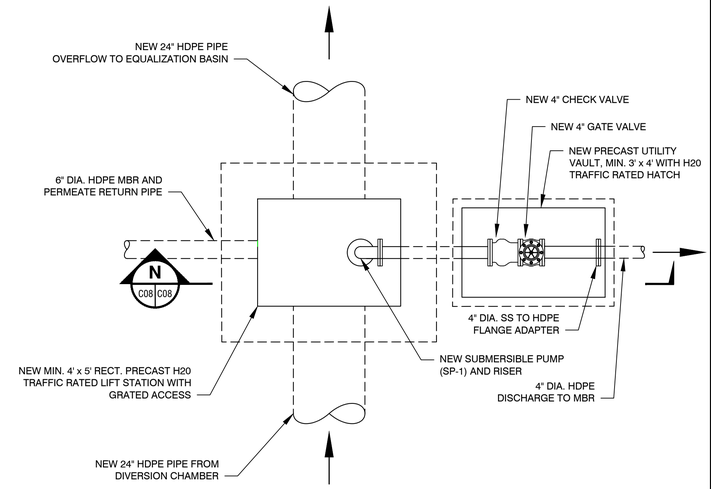
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DETAIL 7 C03 C08
EXISTING OVERFLOW MANHOLE MODIFICATIONS



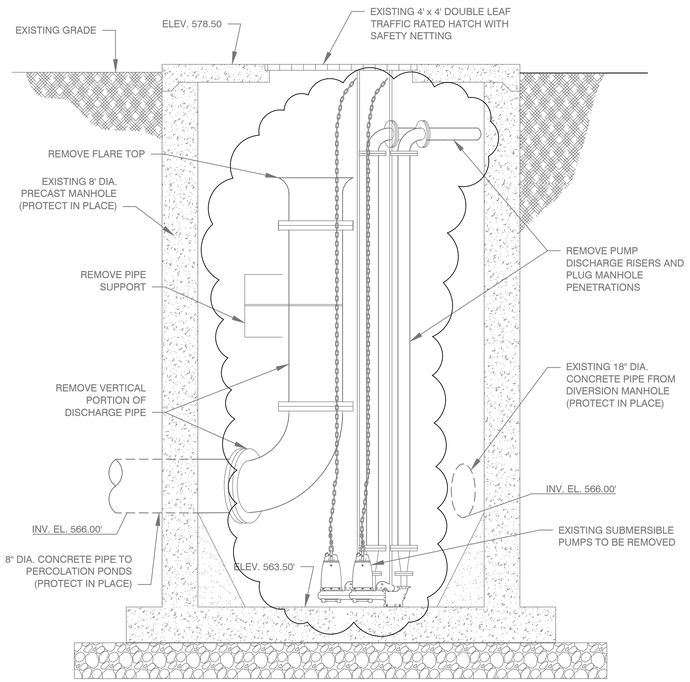
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DETAIL 8 C03 C08
PERMEATE RETENTION POND PUMP STATION



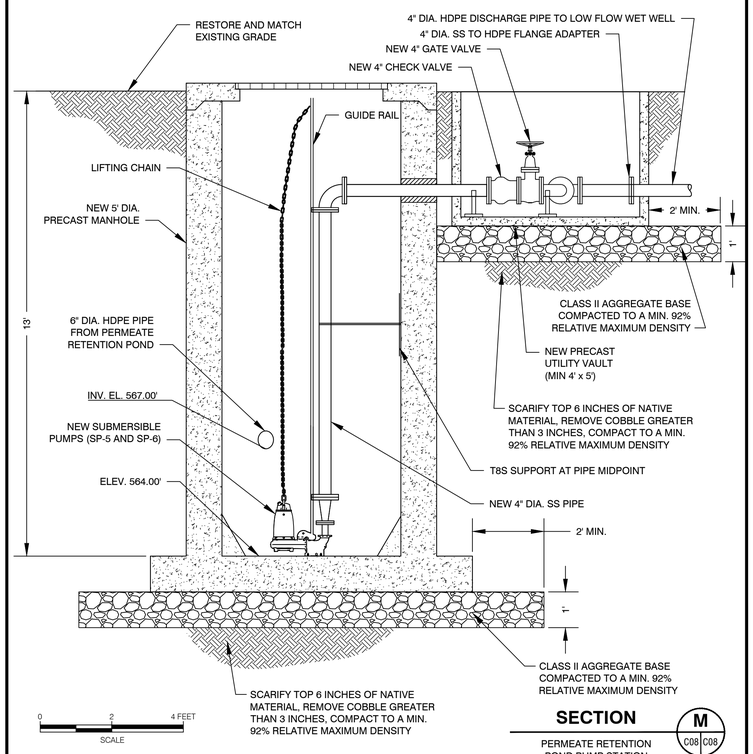
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DETAIL 9 C03 C08
LOW FLOW PUMP STATION



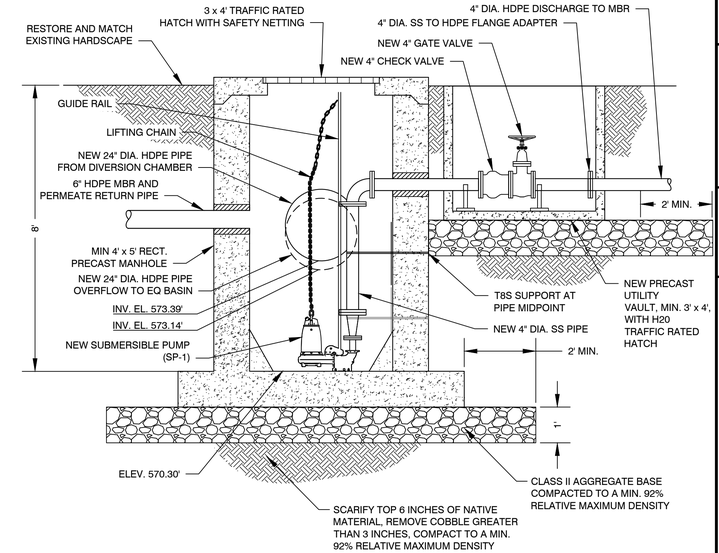
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SECTION L C08 C08
EXISTING OVERFLOW MANHOLE MODIFICATIONS



0 2 4 FEET
SCALE

SECTION M C08 C08
PERMEATE RETENTION POND PUMP STATION



0 2 4 FEET
SCALE

SECTION N C08 C08
LOW FLOW PUMP STATION

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1 TECHNOLOGY DRIVE, SUITE C515
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PREPARED FOR
CAL GUARD
CALIFORNIA MILITARY DEPARTMENT
11801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
D	08/08/25	REVISED 95% DESIGN SUBMITTAL	TMH	TMH
C	12/04/24	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	TMH	TMH
A	02/28/18	35% DESIGN	BB	JP

SCALE: AS NOTED
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REGISTERED PROFESSIONAL ENGINEER TIMOTHY M. HUNT C 68637 CIVIL STATE OF CALIFORNIA

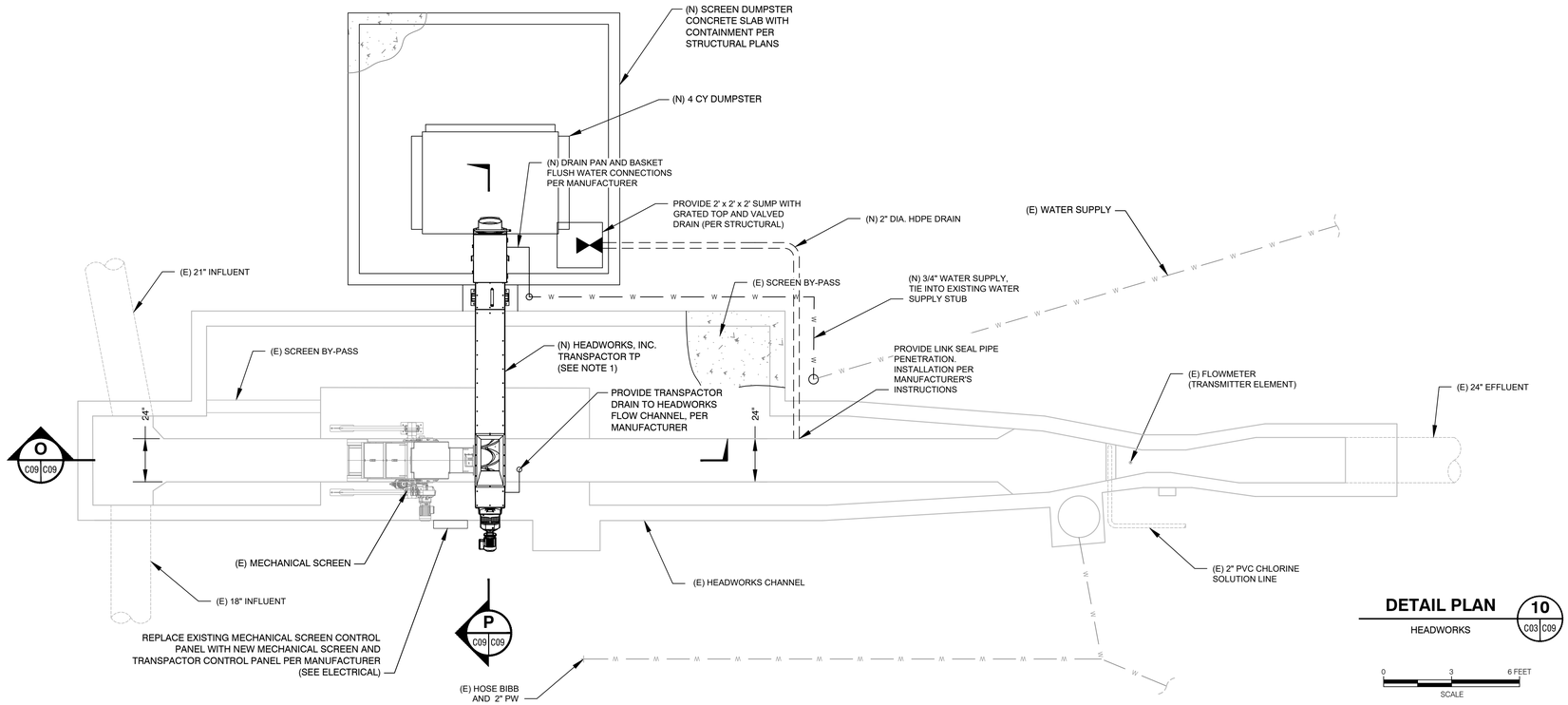
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DRAWN BY:	TMH
CHECKED BY:	PM
APPROVED BY:	TMH
DATE:	03/31/2026

DETAILS AND SECTIONS (2 OF 4)

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME: C - DETAILS.DWG

SHEET No. **C08**
SHEET 15 OF 42
REVISION 0



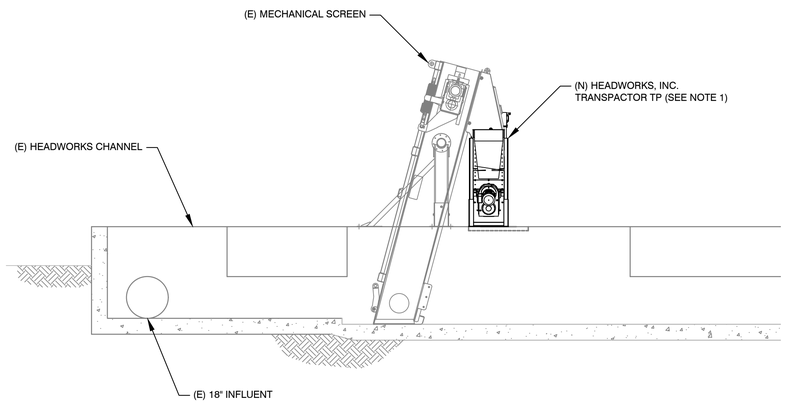
DETAIL PLAN

HEADWORKS

10 C03 C09

0 3 6 FEET

SCALE



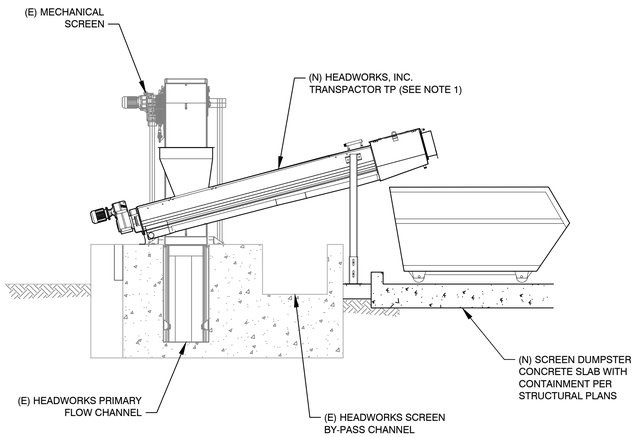
0 3 6 FEET

SCALE

SECTION

HEADWORKS COMPACTOR

O C09 C09



0 3 6 FEET

SCALE

SECTION

HEADWORKS COMPACTOR

P C09 C09

NOTES:

1) SCREEN COMPACTOR UNIT SHALL BE HEADWORKS, INC. MODEL TRANSPACTOR TP (OR EQUAL) WITH SPRAY WASH ATTACHMENT. SUPPORT AND ANCHORING PER MANUFACTURER'S INSTRUCTIONS. POWER AND CONTROLS SHALL BE PER ELECTRICAL AND CONTROL PLANS. PROVIDE WASH WATER SUPPLY FROM NEARBY EXISTING WATER SUPPLY.

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1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR

CAL GUARD — CALIFORNIA MILITARY DEPARTMENT

CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	90% DESIGN SUBMITTAL	TMH	TMH
D	08/08/25	RESPECTIVE DESIGN SUBMITTAL	TMH	TMH
C	12/05/24	60% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	TMH	JP
A	02/28/18	35% DESIGN	BB	JP

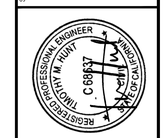
REVISION SUMMARY

SCALE:

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DESIGNER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
TMH	TMH	PM	TMH	03/31/2026

DETAILS AND SECTIONS (3 OF 4)

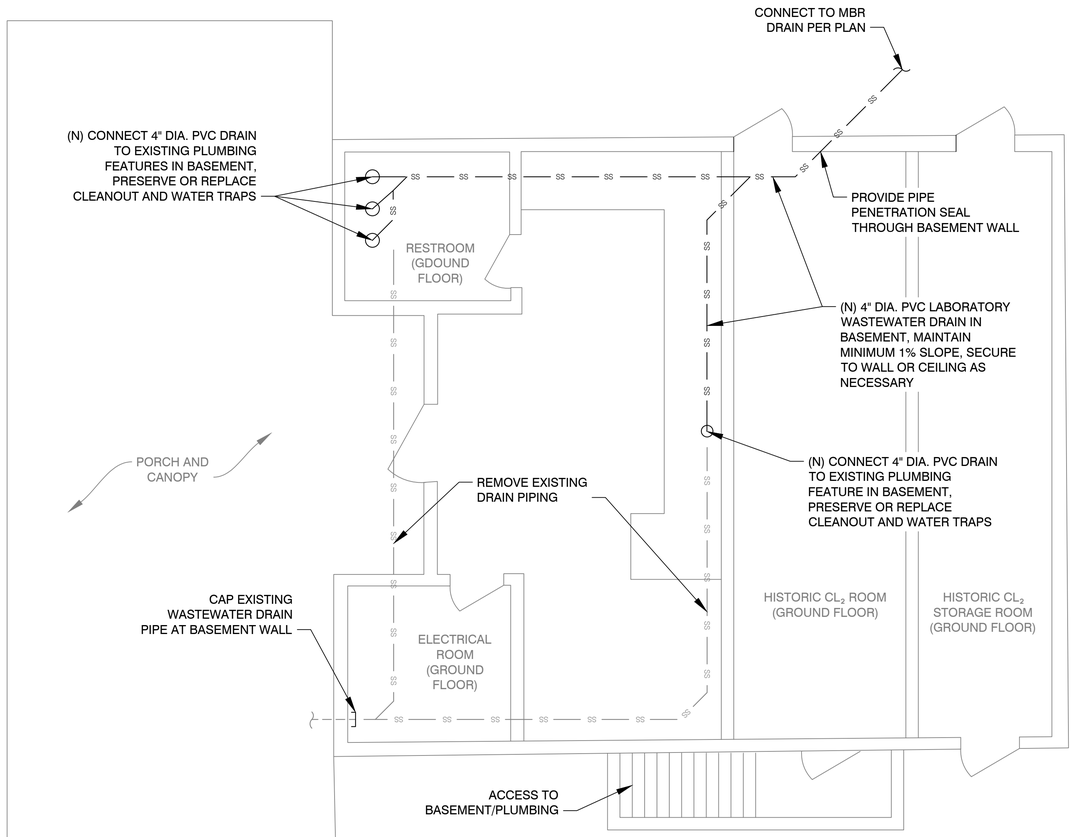
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5990-300-01-67 | FILE NAME: C - DETAILS.DWG

SHEET No. **C09**

SHEET 16 OF 42

REVISION 0



DETAIL PLAN

LABORATORY WASTEWATER DRAIN

11 (C03 | C10)

0 4 8 FEET
SCALE

NOTES:

1) LABORATORY PLUMBING LOCATED IN BASEMENT. GROUND FLOOR PLAN SHOWN FOR REFERENCE.

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CAL GUARD
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CALIFORNIA CIVILIAN MILITARY VETERANS HISTORY
CALIFORNIA MILITARY DEPARTMENT
1600 I BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV.	DATE	DESCRIPTION	BY	APP'D
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C	12/05/24	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CAL 35% DESIGN	TMH	TMH
A	02/28/18	35% DESIGN	BB	JP

REVISION SUMMARY

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REGISTERED PROFESSIONAL ENGINEER
TIMOTHY M. HUNT
C 68637
EXP. 12/31/2026
STATE OF CALIFORNIA

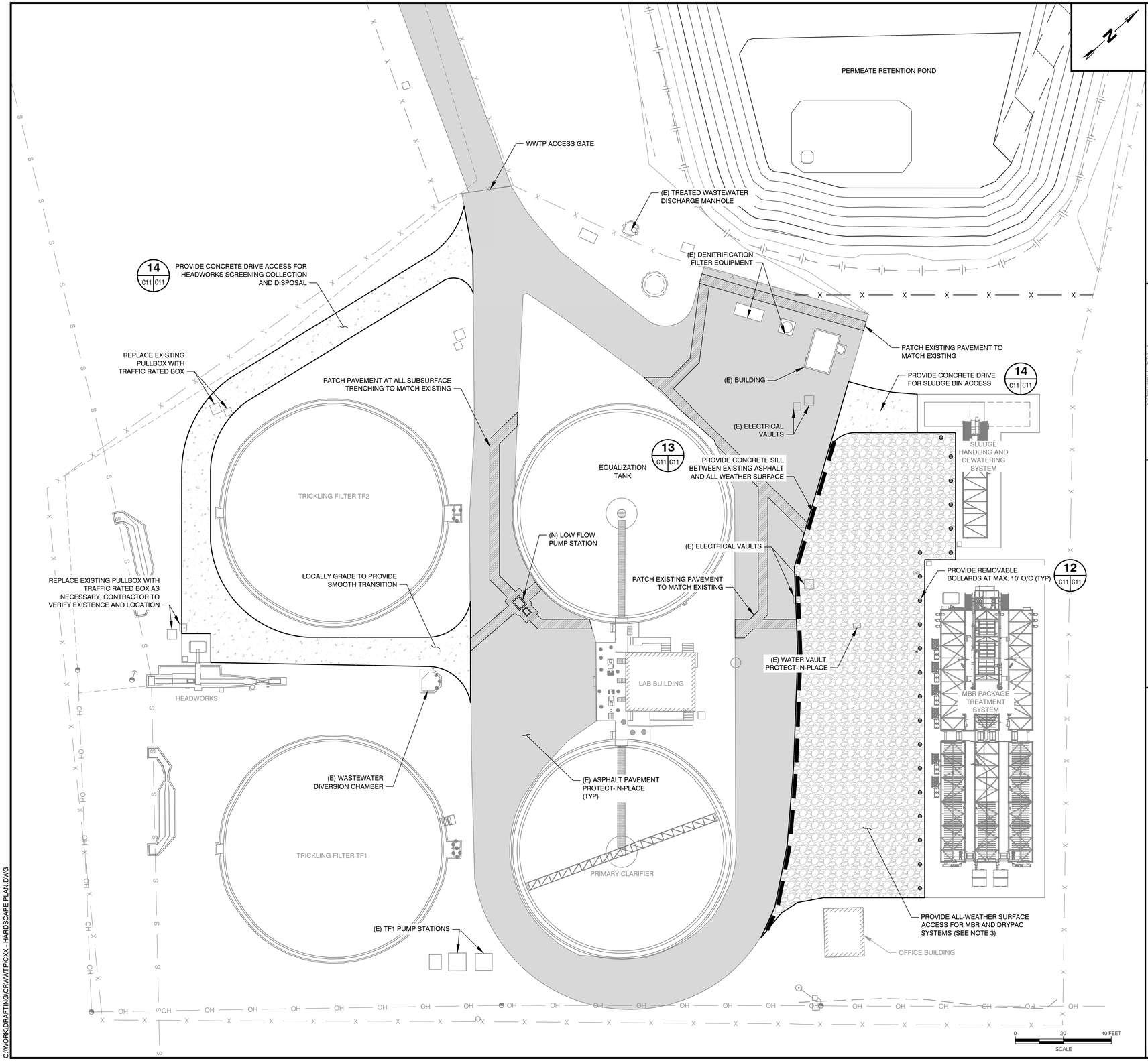
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APPROVED BY:	TMH
DATE:	03/31/2026

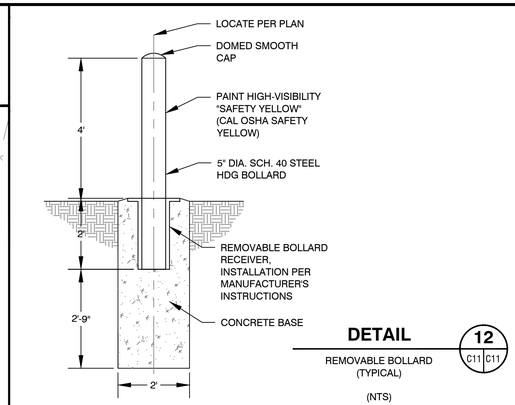
DETAILS AND SECTIONS (4 OF 4)

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

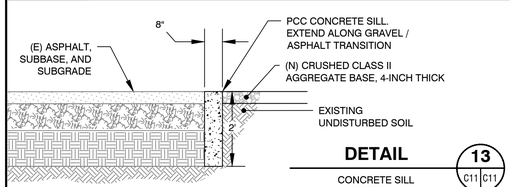
PROJECT No. 5890-300-01-67
FILE NAME: C - DETAILS.DWG

SHEET No. **C10**
SHEET 17 OF 42
REVISION **0**

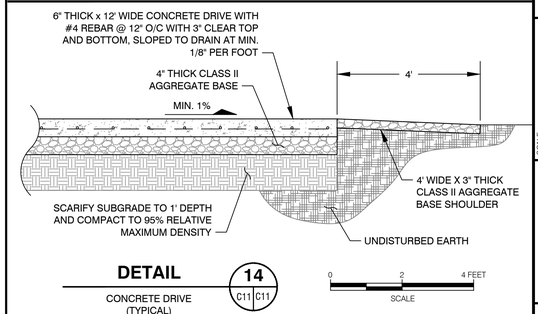




DETAIL 12 (C11 | C11)
REMOVABLE BOLLARD (TYPICAL)
(NTS)



DETAIL 13 (C11 | C11)
CONCRETE SILL (TYPICAL)



DETAIL 14 (C11 | C11)
CONCRETE DRIVE (TYPICAL)

LEGEND

- SUBJECT LINES (PROPOSED CONSTRUCTION)
- EXISTING CONDITIONS
- X — FENCE LINE
- OH — ELECTRICAL (OVERHEAD)
- SUBSURFACE LINE
- PROPOSED GRADES (MAJOR - 5 FOOT)
- PROPOSED GRADES (MINOR - 1 FOOT)
- LIMIT OF GRADING
- EXISTING PAVEMENT
- AGGREGATE BASE ALL-WEATHER SURFACE

NOTES:

1. SUBSURFACE INFRASTRUCTURE NOT SHOWN FOR CLARITY.
2. CONTRACTOR SHALL PROTECT EXISTING PAVEMENT THROUGHOUT CONSTRUCTION. DAMAGE TO EXISTING PAVEMENT SHALL BE REPAIRED TO MATCH EXISTING.
3. CONTRACTOR SHALL MAINTAIN EXISTING GRADE AND PROVIDE 4-INCH THICK CLASS II AGGREGATE BASE ALL-WEATHER SURFACE.

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1 TECHNOLOGY DRIVE, SUITE C515
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PREPARED FOR
CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APPD
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A	02/28/18	35% DESIGN	BB	JP

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REGISTERED PROFESSIONAL ENGINEER — TIMOTHY M. HUNT — C 68637 — CIVIL — STATE OF CALIFORNIA

DESIGNER: TMH
DRAWN BY: TMH
CHECKED BY: PM
APPROVED BY: TMH
DATE: 03/31/2026

HARDSCAPE PLAN

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No.: 5890-300-01-47
FILE NAME: CDX - HARDSCAPE PLAN.DWG

SHEET No. C11
SHEET 18 OF 42
REVISION 0

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WASTE WATER TREATMENT PLANT (WWTP) UPGRADES

CAMP ROBERTS, CA

STATEMENT OF SPECIAL INSPECTIONS

REQUIRED VERIFICATION AND INSPECTION OF
STEEL CONSTRUCTION
(per IBC Section 1705.2.1 and AISC 360)

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REF. STANDARD	IBC REF.
1. Material verification of high-strength bolts, nuts, and washers:				
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	–	X	AISC 360, Section A3.3 and applicable ASTM material standards	–
b. Manufacturer's certificate of compliance required.	–	X	–	–
2. Inspection of high-strength bolting:				
a. Snug-tight joints.	–	X	AISC 360, Section N5.6	–
b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation.	–	X		
c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation.	X	–		
3. Material verification of weld filler materials:				
a. Identification markings to conform to AWS specification in the approved construction documents.	–	X	AISC 360, Section A3.5 and applicable AWS A5 documents	–
b. Procedures of quality control prior to welding per AISC table N5.4.2	–	X	AISC table N5.4-1	
c. Manufacturer's certificate of compliance required	–	X	–	–
4. Inspection of welding: Quality Assurance of the following to be performed in accordance with AISC table N5.4-2 and 3				
a. Structural steel and cold-formed steel deck:				
1) Complete and partial joint penetration groove welds.	X	–	AWS D1.1	–
2) Multipass fillet welds.	X	–		
3) Single-pass fillet welds > 5/16”	X	–		
4) Plug and slot welds.	X	–		
5) Single-pass fillet welds ≤ 5/16”	–	X		
6) Floor and roof deck welds.	–	X	AWS D1.3	–
b. Reinforcing steel:				
1) Verification of weldability of reinforcing steel other than ASTM A706.	–	X	AWS D1.4; ACI 318: 26.6.4	–
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	–		
3) Shear reinforcement.	X	–		
4) Other reinforcing steel.	–	X		

REQUIRED VERIFICATION AND INSPECTION OF
SOILS
(per IBC Section 1705.6 and Table 1705.6)

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
1. Verify materials below footings are adequate to achieve the design bearing capacity.	–	X
2. Verify excavations are extended to proper depth and have reached proper material.	–	X
3. Perform classification and testing of compacted fill materials.	–	X
4. During fill placement, verify use of proper materials and procedures in accordance with the provisions of the approved geotechnical report. Verify densities and lift thicknesses during placement and compaction of the compacted full.	X	–
5. Prior to placement of compacted fill, observe subgrade and verify that site has been prepared properly.	–	X

REQUIRED VERIFICATION AND INSPECTION OF
CONCRETE CONSTRUCTION
(per IBC Section 1705.3 and Table 1705.3)

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REF. STANDARD	IBC REFERENCE
1. Inspection of reinforcing steel, and placement.	–	X	ACI 318: Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	–
2. Inspection of reinforcing steel welding in accordance with IBC Table 1705.3, Item 2 (see Steel Inspections Table).	–	–	AWS D1.4; ACI 318: 26.6.4	–
3. Inspect anchors cast in concrete where allowable loads have been increased or where strength design is used.	X	–	ACI 318: 17.8.2	-
4. Inspection of anchors installed in hardened concrete (*i.e. post-installed anchors*).	–	X	ACI 318: 17.8.2	-
5. Verifying use of required design mix.	–	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2
6. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.	X	–	ASTM C172, C31 ACI 318: 26.5, 26.12	-
7. Inspection of concrete placement for proper application techniques.	X	–	ACI 318: 26.5	-
8. Inspection for maintenance of specified curing temperature and techniques.	–	X	ACI 318: 26.5.3–26.5.5	-
9. Verification of in-situ concrete strength, prior to removal of shores and forms from beams and structural slabs.	–	X	ACI 318: 26.11.2	–
10. Inspect formwork for shape, location, and dimensions of the concrete member being formed.	–	X	ACI 318: 26.11.2(b)	–
11. Inspection of adhesive/epoxied anchors and their installation	X	–	*ICC Evaluation Report*	–

ADDITIONAL SPECIAL INSPECTIONS: SEISMIC RESISTANCE*
(per IBC 1705, 1707, 1705.13)

VERIFICATION AND INSPECTION TASK	CONTINUOUS	PERIODIC
THESE INSPECTIONS APPLY TO DESIGNATED SEISMIC SYSTEMS AND OTHER ELEMENTS AS LISTED BELOW:		
1. Mechanical and electrical components: Special inspection for mechanical and electrical components shall be as follows. 1. Periodic special inspection is required during the anchorage of electrical equipment for emergency or standby power systems in structures assigned to Seismic Design Category C, D, E or F; 2. Periodic special inspection is required during the anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F; 3. Periodic special inspection is required during the installation and anchorage of piping systems designed to carry hazardous materials and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F; 4. Periodic special inspection is required during the installation and anchorage of ductwork designed to carry hazardous materials in structures assigned to Seismic Design Category C, D, E or F; and 5. Periodic special inspection is required during the installation and anchorage of vibration isolation systems in structures assigned to Seismic Design Category C, D, E or F where the construction documents require a nominal clearance of 1/4 inch (6.4 mm) or less between the equipment support frame and restraint.	–	X

ADDITIONAL NOTES

See Architectural, Mechanical, Electrical, and other plans for additional required non-structural special inspections.

IBC 1704.2.1: The special inspector shall be a qualified person who shall demonstrate competence, to the satisfaction of the building official, for inspection of the particular type of construction or operation requiring inspection. The special inspector shall provide written documentation to the building official demonstrating his or her competence and relevant experience or training. Experience or training shall be considered relevant when the documented experience or training is related in complexity to the same type of special inspection activities for projects of similar complexity and material qualities. These qualifications are in addition to qualifications specified in other sections of this code.

IBC 1705.1.1: Special inspections shall be required for proposed work that is, in the opinion of the building official, unusual in its nature, such as, but not limited to, the following examples:

1. *Construction materials and systems that are alternatives to materials and systems prescribed by the IBC.*
2. *Unusual design applications of materials described in the IBC.*
3. *Materials and systems required to be installed in accordance with additional manufacturer's instructions that prescribe requirements not contained in this code or in standards referenced by the IBC.*

The special inspector shall observe the work assigned for conformance with the approved design drawings, approved specifications, and the applicable workmanship provisions of the IBC. The special inspector shall furnish inspection reports to the building official, the engineer or architect of record, and other designated persons as directed in Chapter 17 of the IBC. All discrepancies shall be brought to the immediate attention of the contractor for correction and then, if uncorrected, to the appropriate design authority and to the building official.

IBC 1704.4 and 1704.2.3: Each contractor responsible for the construction of a main wind or seismic force resisting system, designated seismic system or a wind- or seismic-resisting component listed in the statement of special inspections shall submit a written statement of responsibility to the building official and the owner prior to the commencement of work on the system or component. The contractor's statement of responsibility shall contain acknowledgment of awareness of the special requirements contained in the statement of special inspection.

STRUCTURAL OBSERVATION SCHEDULE AND NOTES

STRUCTURAL OBSERVATION
(CHECKED ITEMS ARE REQUIRED)

FOUNDATION	WALL	FRAME	DIAPHRAGM
☐ FOOTING, STEM WALLS, PIERS	☐ CONCRETE	☒ STEEL MOMENT FRAME	☐ CONCRETE
☒ MAT FOUNDATION	☐ MASONRY	☐ STEEL BRACED FRAME	☒ STEEL DECK
☐ CAISSONS, PILES, GRADE BEAMS	☐ WOOD	☐ CONCRETE MOMENT FRAME	☐ WOOD
☐ HILLSIDE, RETAINING	☐ OTHER: (LIST)	☐ MASONRY WALL FRAME	☐ OTHER: (LIST)
☐ SPECIAL ANCHORS		☒ OTHER: (LIST) STEEL CANTILEVER COLUMN MOMENT FRAME	
☐ OTHER: (LIST)			

CONSTRUCTION STAGE	ELEMENTS/CONNECTIONS TO BE OBSERVED
A. PRIOR TO FOUNDATION POUR	REBAR, ANCHORAGES, HOLDOWNS
B. FLOOR FRAMING & DIAPHRAGM PRIOR TO PLATING FOR SECOND-STORY WALLS	FLOOR FRAMING, DIAPHRAGM NAILING
C. ROOF FRAMING & DIAPHRAGM PRIOR TO COVERING ROOF DIAPHRAGM	ROOF FRAMING, DIAPHRAGM NAILING, SHEAR TRANSFERS, AND SHEARWALLS

THE CONTRACTOR SHALL REQUEST STRUCTURAL OBSERVATION SITE VISITS TO BE PERFORMED AT THOSE STEPS IN THE PROGRESS OF THE WORK THAT ALLOW FOR CORRECTION OF DEFICIENCIES WITHOUT SUBSTANTIAL EFFORT OR UNCOVERING OF THE WORK INVOLVED. AT A MINIMUM, THE CONSTRUCTION STAGES LISTED ABOVE REQUIRE A SITE VISIT AND AN OBSERVATION REPORT FROM THE STRUCTURAL OBSERVER.

STRUCTURAL DESIGN PARAMETERS

GENERAL PARAMETERS

BUILDING CODE	2021 IBC
RISK CATEGORY	IV
VEHICULAR LOAD (PSF)	250
EQUIPMENT OPERATIONAL WEIGHT (LBS)	
TANK RA	300,000
TANK RB	300,000
TANK MA	340,000
TANK MB	300,000
TANK LA	300,000
TANK LB	300,000
DRYPACK UNIT	30,000
SLUDGE TANK	187,200

SOILS VALUES**

BEARING PRESSURE	6,000 PSF
LATERAL PASSIVE	200 PCF
FRICTION COEFFICIENT	0.50
MODULUS OF SUBGRADE REACTION	220 PCI

** SOILS VALUES PER HENRY KLING, PE/GE
OF KLING CONSULTING GROUP, INC.

SEISMIC DESIGN DATA (PER IBC 1603.1.5):

SEISMIC IMPORTANCE FACTOR, I	1.5
SITE CLASS	D, DEFAULT
SPECTRAL RESPONSE ACCELERATIONS	$S_S = 1.277$
	$S_1 = 0.452$
SPECTRAL RESPONSE COEFFICIENTS	$S_{DS} = 1.022$
	$S_{D1} = 0.557$
SEISMIC DESIGN CATEGORY	D
SEISMIC FORCE RESISTING SYSTEM:	
1. INVERTED PENDULUM TYPE STRUCTURES*	
2. FLAT-BOTTOM GROUND SUPPORTED TANKS*	
RESPONSE MODIFICATION FACTOR, R	2 & 3
SEISMIC RESPONSE COEFFICIENT, C_S	0.766, & 0.511

* SEE ASCE 7-16 TABLE 15.4-2

WIND DESIGN DATA (PER IBC 1603.1.4):

BASIC WIND SPEED, V	103 MPH
EXPOSURE CATEGORY	C

GENERAL NOTES

1. THE NOTES ON THIS TITLE SHEET APPLY TO AND ARE IN EFFECT FOR ALL PARTS OF THE PROJECT, UNLESS NOTED OTHERWISE. REFER TO THE STRUCTURAL SPECIFICATIONS ON SHEET S0.2 FOR ADDITIONAL STRUCTURAL REQUIREMENTS. REFER TO THE DRAWINGS, NOTES, AND SPECIFICATIONS OF THE ARCHITECT, MECHANICAL ExxxNGINEER, ELECTRICAL ENGINEER, CIVIL ENGINEER, AND OTHER CONSULTANTS FOR ADDITIONAL REQUIREMENTS.
2. DO NOT SCALE THESE DRAWINGS. REFER TO WRITTEN DIMENSIONS. DRAWINGS ARE NOT NECESSARILY TO SCALE. THE CONTRACTOR IS TO USE ARCHITECTURAL DIMENSIONS TO LAY OUT WALLS, FRAMING, FOUNDATIONS, AND OTHER ELEMENTS. THE CONTRACTOR IS TO VERIFY ALL DIMENSIONS AND CONDITIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO COMMENCING WITH ANY DIRECTLY OR INDIRECTLY RELATED WORK.
3. T&S STRUCTURAL'S DETAILS ARE PREPARED TO CONVEY ONLY STRUCTURAL ASPECTS OF EACH ELEMENT SHOWN. NON-STRUCTURAL INFORMATION, INCLUDING BUT NOT LIMITED TO FENESTRATIONS, FIRE-RESISTANCE, INSULATION, FINISHES, WATERPROOFING, DRAINAGE, AND FLASHING MAY NOT BE INCLUDED ON THE STRUCTURAL PLANS. THE CONTRACTOR MUST OBTAIN NON-STRUCTURAL INFORMATION RELATED TO EACH DETAIL FROM THE ARCHITECT, ARCHITECTURAL PLANS, AND PLANS PROVIDED BY OTHER CONSULTANTS. BRACE EQUIPMENT PER THE MANUFACTURER'S SPECIFICATIONS.
4. NO DEVIATIONS FROM THESE STRUCTURAL PLANS, DETAILS, AND SPECIFICATIONS ARE ALLOWED WITHOUT WRITTEN APPROVAL FROM T&S STRUCTURAL. APPROVAL BY AN INSPECTOR OR ANY OTHER PARTY DOES NOT CONSTITUTE AUTHORITY TO DEVIATE FROM THESE PLANS. PLAN CHANGES AND ADDENDA ARE SUBJECT TO APPROVAL BY THE BUILDING ENFORCEMENT AGENCY. THE CONTRACTOR IS RESPONSIBLE FOR PROCESSING CHANGES, ASSEMBLING PERMIT DOCUMENTS, ACQUIRING PERMITS, AND OBTAINING OWNER APPROVAL FOR COSTS RELATED TO CHANGE ORDERS.
5. SUBSTITUTIONS OF SPECIFIED PRODUCTS (I.E. SIMPSON STRONG-TIE) FOR EQUIVALENT PRODUCTS ARE NOT RECOMMENDED. SUBSTITUTIONS WILL BE CONSIDERED IF THE CONTRACTOR AGREES TO THIS PROCEDURE PRIOR TO SUBSTITUTIONS BEING MADE: (A) CONTRACTOR PROVIDES T&S STRUCTURAL WITH SATISFACTORY EVIDENCE OF PRODUCT EQUIVALENCE; (B) IF SATISFACTORY, CONTRACTOR AGREES TO REIMBURSE T&S STRUCTURAL FOR TIME AND EXPENSES TO REVISE PLANS; AND (C) CONTRACTOR AGREES TO RESUBMIT PLANS TO THE BUILDING ENFORCEMENT AGENCY FOR APPROVAL.
6. CONSTRUCTION AND MATERIALS MUST COMPLY WITH AND BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF ALL LEGALLY-CONSTITUTED PUBLIC AUTHORITIES HAVING JURISDICTION, INCLUDING ALL COUNTY, CITY, AND LOCAL ORDINANCES, AS WELL AS THE SAFETY ORDERS OF THE STATE INDUSTRIAL ACCIDENT COMMISSION, OSHA. RECEIVE ALL REQUIRED APPROVALS PRIOR TO COMMENCEMENT OF CONSTRUCTION.
7. THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR AND DOES NOT HAVE CONTROL OR CHARGE OF CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES, OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE CONSTRUCTION DELINEATED BY THESE PLANS. THE CONTRACTOR OR HIS/HER AGENT(S) ARE RESPONSIBLE TO SUPERVISE AND DIRECT ALL WORK AND ARE SOLELY AND COMPLETELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND CONDITIONS ON THE JOB SITE, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY DURING THE ENTIRE PERIOD OF CONSTRUCTION. PERIODIC OBSERVATIONS BY T&S STRUCTURAL PERSONNEL OR REPRESENTATIVES ARE NOT INTENDED TO INCLUDE VERIFICATION OF DIMENSIONS OR REVIEW THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES ON OR NEAR THE CONSTRUCTION SITE.
8. THE CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL SHORING AND BRACING DURING CONSTRUCTION TO SUPPORT ALL LOADS TO WHICH THE STRUCTURE AND SITE MAY BE SUBJECTED. PROVIDE SHORING FOR VERTICAL CUTS IN EXCESS OF 5 FEET PER OSHA AND THE BUILDING OFFICIAL AND AS DIRECTED BY THE SOILS ENGINEER.
9. WHERE INSPECTION IS REQUIRED, THE SPECIAL INSPECTOR IS TO OBTAIN BUILDING ENFORCEMENT AGENCY APPROVAL PRIOR TO WORK COMMENCEMENT. COPIES OF THE INSPECTION REPORT(S) TO BE FILED BY THE SPECIAL INSPECTOR(S) MUST BE GIVEN TO THE ARCHITECT, STRUCTURAL ENGINEER, OWNER, AND BUILDING OFFICIAL. THE CONTRACTOR IS RESPONSIBLE FOR SCHEDULING, COORDINATION, AND EXPENSES INVOLVED IN ANY AND ALL INSPECTIONS.
10. THE CONTRACTOR IS RESPONSIBLE TO INITIATE A RESOLUTION TO ANY CONFLICTS WITHIN OR BETWEEN DRAWINGS, SPECIFICATIONS, AND/OR MANUFACTURER INSTRUCTIONS BY ISSUING AN RFI. THE MOST STRENUOUS AND/OR COSTLY OPTION GOVERNS UNLESS OTHERWISE STATED IN RESPONSE TO AN RFI. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IDENTIFY AND PROVIDE FOR ANY 'SCOPE GAPS' THAT MAY EXIST AND BE RECOGNIZABLE TO A PROFESSIONAL BUILDING CONTRACTOR.
11. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A WIND- OR SEISMIC-FORCE-RESISTING SYSTEM OR COMPONENT LISTED IN THE "STATEMENT OF SPECIAL INSPECTIONS" MUST SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. (SEE IBC SECTION 1704.4 FOR SPECIFIC REQUIREMENTS.)
12. "CLOUDING" SHOWN ON THE CONSTRUCTION DOCUMENTS IS ONLY FOR CONVENIENCE FOR GENERAL MAJOR REVISIONS AND IS NOT NECESSARILY INCLUSIVE OF ALL REVISIONS TO THE DRAWINGS. THE CONTRACTOR AND OTHERS MUST REVIEW THE CONSTRUCTION DOCUMENTS COMPLETELY AND THOROUGHLY AND ARE NOT TO DEPEND UPON THE CLOUDING BEING AN INDICATION OF THE FULL LIMIT OR EXTENT OF REVISIONS.
13. ALL CONSTRUCTION PROJECTS REQUIRE INSPECTION AND MAINTENANCE FOLLOWING COMPLETION. OPERATION, INSPECTION, AND MAINTENANCE ARE THE SOLE RESPONSIBILITY OF THE OWNER. T&S STRUCTURAL HAS NO RESPONSIBILITY FOR ANY FAILURES BY THE OWNER OR OTHERS TO PROPERLY OPERATE, INSPECT, OR MAINTAIN THE PROJECT(S) SHOWN IN THESE PLANS.
15. WHERE PLANS, DETAILS, NOTES, AND/OR SPECIFICATIONS (CONSTRUCTION DOCUMENTS) ARE NOTED AS BEING IN A PRELIMINARY/PROGRESS STATE (E.G. "NOT FOR CONSTRUCTION"), THE CONTRACTOR MUST TAKE THIS INTO CONSIDERATION IF CHOOSING TO USE THESE PROGRESS DOCUMENTS FOR COST ESTIMATING, BIDDING, OR ANY OTHER PURPOSE.
16. THE PLANS, CALCULATIONS, AND SPECIFICATIONS CONTAINED HEREIN AND PROVIDED HEREWITH ARE THE EXCLUSIVE PROPERTY OF T&S STRUCTURAL, © 2026. THE USE OF THESE PLANS AND SPECIFICATIONS IS RESTRICTED TO THE ORIGINAL SITE FOR WHICH THEY WERE PREPARED AND PUBLICATION THEREOF IS EXPRESSLY LIMITED TO SUCH USE. REPRODUCTION OR PUBLICATION BY ANY METHOD, IN WHOLE OR IN PART, IS PROHIBITED. TITLE TO THESE PLANS AND SPECIFICATIONS REMAINS WITH T&S STRUCTURAL WITHOUT PREJUDICE. VISUAL CONTACT WITH THESE PLANS AND SPECIFICATIONS CONSTITUTES PRIMA FACIE EVIDENCE OF THE ACCEPTANCE OF THESE RESTRICTIONS.
17. ROOF CANOPY METAL DECK IS INTENDED FOR SUN SHADING AND GENERAL RAIN PROTECTION AND IS NOT A WATERTIGHT ROOFING SYSTEM; A SEPARATE ROOFING/WATERPROOFING SYSTEM IS REQUIRED FOR COMPLETE WATERTIGHTNESS.

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STANDARD ABBREVIATIONS

AB	ANCHOR BOLT
ABV.	ABOVE
ADD'L	ADDITIONAL
ADD'M	ADDENDUM
ADJ.	ADJACENT, ADJUSTABLE
AFF	ABOVE FINISHED FLOOR
ALT.	ALTERNATE
APPROX.	APPROXIMATE
ASTM	AMERICAN SOCIETY OF TESTING & MATERIALS
AVG.	AVERAGE
AWS	AMERICAN WELDING SOCIETY
BD.	BOARD
BLDG.	BUILDING
BLK(G).	BLOCK (ING)
BLW.	BELOW
BM.	BEAM
BN	BOUNDARY NAILING
BOT.	BOTTOM
BP	BASE PLATE
BRG.	BEARING
BTWN.	BETWEEN
BW	BOTH WAYS
CANT.	CANTILEVER (ED)
CBC	CALIFORNIA BUILDING CODE
CDX	GRADE C-D PLYWOOD
CEM.	CEMENT
CIP	CAST-IN-PLACE
CJP	COMPLETE JOINT PENETRATION
CL	CENTER LINE
CLR.	CLEAR (ANCE)
CM	CENTIMETER (S)
CMU	CONCRETE MASONRY UNIT
COEFF.	COEFFICIENT
COL.	COLUMN
COM.	COMMON
CONC.	CONCRETE
CONN.	CONNECT (ION)
CONST.	CONSTRUCTION
CONT.	CONTINUOUS, CONTINUE
CONTR.	CONTRACTOR
CORR.	CORRUGATED
CTR.	CENTER
CTRSK.	COUNTERSINK
CU.	CUBIC
D	PENNY (NAILS)
DBL.	DOUBLE
DEG.	DEGREE
DEMO	DEMOLISH, DEMOLITION
DEP.	DEPRESSED
DF	DOUGLAS FIR
DIA(M).	DIAMETER
DIAG.	DIAGONAL
DIM.	DIMENSION (S)
DIST.	DISTANCE
DIV.	DIVISION, DIVIDER
DJ	DECK JOIST (S)
DL	DEAD LOAD
DN.	DOWN
DWG.	DRAWING
(E)	EXISTING
EA.	EACH
EF	EACH FACE
EFP	EFFECTIVE FLUID PRESSURE
EL.	ELEVATION (GRADE)
ELEC.	ELECTRIC (AL)
ELEV.	ELEVATOR, ELEVATION
EMBED.	EMBEDDED, EMBEDMENT
EN	EDGE NAIL (ING)
ENCL.	ENCLOSE (D), (URE)
ENG(R).	ENGINEER (ED)
EQ	EQUAL
EQUIP.	EQUIPMENT
EQUIV.	EQUIVALENT
ES	EACH SIDE
EST.	ESTIMATE (D)
ETC.	ETCETERA
EW	EACH WAY
EF	EACH FACE
EXIST.	EXISTING
EXP.	EXPAND, EXPANSION
EXT.	EXTERIOR,
FDN.	EXTENDED
FF	FOUNDATION
FG	FINISHED FLOOR
FIN.	FINISHED GRADE
FL.	FINISH (ED)
FLR(G).	FLANGE
FN	FLOOR (ING)
	FIELD NAIL (ING)
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOP	FACE OF PANEL
FOS	FACE OF STEEL
FR	FIRE RATE (D)
FRMG.	FRAMING
FS	FAR SIDE
FT.	FOOT, FEET
FTG.	FOOTING
FUT.	FUTURE
GA.	GAGE, GAUGE
GALV.	GALVANIZED
GB	GRADE BEAM
GC	GENERAL CONTRACTOR
GEN.	GENERAL
GR.	GRADE, GRADING
HD	HOLDOWN
HDG	HOT-DIP GALVANIZED
HDR.	HEADER
HEX	HEXAGONAL
HGR.	HANGER
HOR (IZ).	HORIZONTAL
HS	HIGH STRENGTH
HSS	HOLLOW STRUCTURAL SECTION
HT.	HEIGHT
IBC	INTERNATIONAL BUILDING CODE
ICC-ES	ICC EVALUATION SERVICE
ID	INSIDE DIAMETER
IN.	INCH (ES)
INCL.	INCLUDE (D), (S), (ING)
INFO	INFORMATION
INSP.	INSPECT (ION), (OR)
INSUL.	INSULATE (D), (ION)
INSTL.	INSTALLATION, INSTALL
INT.	INTERIOR
INV.	INVERT (ED)
JST.	JOIST
K	KIP (1000 POUNDS)
KLF	KIPS PER LINEAR FOOT
KP	KING POST
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
LAM.	LAMINATE (D), (TION)
LB(S).	POUND (S)
LG.	LARGE
LF	LINEAR (L) FOOT
LIN.	LINEAR, LINEAL
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG.	LONGITUDINAL
LTWT.	LIGHTWEIGHT
MAT'L	MATERIAL
MAX.	MAXIMUM
MBR.	MEMBER
MECH.	MECHANIC (AL)
MED.	MEDIUM
MEP	MECH./ELEC./PLUMBING
MF	MOMENT FRAME
MFR.	MANUFACTURE (R)
MIN.	MINIMUM, MINUTE (S)
MISC.	MISCELLANEOUS
MM	MILLIMETER (S)
MOD.	MODIFY, MODIFIED
MS	MACHINE SCREW
MTL.	METAL
(N)	NEW
N	NORTH
N/A	NOT APPLICABLE
NAT.('L)	NATURAL, NATIONAL
NEG.	NEGATIVE
NIC	NOT IN CONTRACT
NO.	NUMBER
NOM.	NOMINAL
NS	NEAR SIDE
NSA	NELSON STUD ANCHOR
NSG	NON-SHRINK GROUT
NTS	NOT TO SCALE
OC OR O.C.	ON CENTER (S)
OD	OUTSIDE DIAMETER
OPP.	OPPOSITE
OSB	ORIENTED STRAND BOARD
OT	OVERTURNING
PAR.	PARALLEL
PCF	POUNDS PER CUBIC FOOT
PEN.	PENETRATE (ION)
PERF.	PERFORATE (D), (TION)
PERIM.	PERIMETER
PERP.	PERPENDICULAR
PJP	PARTIAL JOINT PENETRATION
PL.	PLATE
PL	PROPERTY LINE
PLF	POUNDS PER LINEAR FOOT
PLY(WD).	PLYWOOD
PREFAB.	PREFABRICATED (ION)
PRELIM.	PRELIMINARY
PROJ.	PROJECT
PROP.	PROPERY
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE-TREATED,
PT.	POINT
PV	PHOTOVOLTAIC
QTR.	QUARTER
QTY.	QUANTITY
R(AD).	RADIUS
RD.	ROAD
REBAR	REINFORCING BAR (S)
REC('D).	RECEIVE (D)
RECT.	RECTANGULAR
REF.	REFERENCE
REINF.	REINFORCE (D), (ING), (MENT)
REQ('D).	REQUIRE (D), (MENT)
RET.	RETAIN (ING)
REV.	REVISION (S), REVISED
RM.	ROOM
RO	ROUGH OPENING
SCHED.	SCHEDULE
SE	STRUCTURAL ENGINEER
SHTG.	SHEATHING
SIM.	SIMILAR
SMS	SHEET METAL SCREW
SOG	SLAB ON GRADE
SPEC(S)	SPECIFICATIONS (S)
SQ.	SQUARE
SS	STAINLESS STEEL
ST	SELF-TAPPING
STD(S).	STANDARD (S)
ST(L).	STEEL
STR(UCT).	STRUCTURAL, STRUCTURE
SURF.	SURFACE
SUSP.	SUSPENDED
SYM.	SYMMETRY (ICAL),
SYN.	SYMBOL
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TEMP.	TEMPORARY, TEMPERED
TH(K).	THICK, THICKNESS
THRU	THROUGH
T.O.	TOP OF
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOG	TOP OF GRADE
TOL.	TOLERANCE
TOP	TOP OF PLATE
TOS	TOP OF SLAB, TOP OF STEEL
TOW	TOP OF WALL
TRANS.	TRANSVERSE
TRIM.	TRIMMER STUD (S)
TYP.	TYPICAL
UBC	UNIFORM BUILDING CODE
UNO	UNLESS NOTE OTHERWISE
UTIL.	UTILITY (IES)
VAR.	VARIES, VARNISH
VENT.	VENTILATE (ION)
VERT.	VERTICAL
VIF	VERIFY IN FIELD
VOL.	VOLUME
W	WIDTH, WIDE
W/	WITH
WD.	WOOD
WF	WIDE FLANGE
W/IN.	WITHIN
W/O	WITHOUT
WP	WATERPROOFING
WS	WOOD SCREW
WT.	WEIGHT
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
YD.	YARD
∠	ANGLE
@	AT
∇	DELTA
Ø	DIAMETER
#	NUMBER, POUND (S)
/	PER
+/-	PLUS OR MINUS

STRUCTURAL ENGINEER:
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PREPARED BY
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1 TECHNOLOGY DRIVE, SUITE C515
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PREPARED FOR
CALIFORNIA MILITARY DEPARTMENT
10601 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APP'D
0	03/31/26	100% DESIGN SUBMITTAL		
E	11/06/25	95% DESIGN SUBMITTAL	MAM	NBW
D	08/08/25	REVISED 65% DESIGN SUBMITTAL	MAM	NBW
C	12/16/24	65% DESIGN SUBMITTAL	MAM	NBW
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN		
A	02/28/18	35% DESIGN		

REVISION SUMMARY

SCALE: NTS

S 4818

DESIGNER: MAM
DRAWN BY: MAM
CHECKED BY: NBW
APPROVED BY: NBW
DATE: 03/31/2026

STRUCTURAL TITLE SHEET

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457
FILE NAME: 230457 - CAMP ROBERTS WWTP

SHEET NO. **S01**
SHEET 19 OF
REVISION **0**

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.1 SUMMARY

A. THIS SECTION SPECIFIES CAST-IN-PLACE CONCRETE, INCLUDING FORMWORK, REINFORCEMENT, CONCRETE MATERIALS, MIXTURE DESIGN, PLACEMENT PROCEDURES, AND FINISHES, FOR THE FOLLOWING CONCRETE ELEMENTS: FOOTINGS, GRADE BEAMS, WALLS, STRUCTURAL SLABS, INTERIOR SLABS-ON-GRADE, COLUMNS, BEAMS, AND LINTELS.
B. THIS SECTION DOES NOT INCLUDE UTILITY TRENCH BACKFILL, CURB & GUTTERS, SIDEWALKS, TOPPING SLABS, WALKWAYS, DRIVEWAYS, ROADWAYS, PARKING LOTS, LANDINGS, PAVEMENT, OR FLATWORK.

1.2 SUBMITTALS

A. COMPLY WITH DIVISION 1 SPECIFICATIONS AND THE CIVIL ENGINEER'S ADDITIONAL INSTRUCTIONS.
B. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
C. DESIGN MIXTURES: FOR EACH CONCRETE MIXTURE.
D. SHOP DRAWINGS: FOR STEEL REINFORCEMENT. MATERIAL CERTIFICATES.
E. PROPOSED FINISHES: SUBMIT TO CIVIL ENGINEER AND OWNER FOR APPROVAL.

1.3 QUALITY ASSURANCE

A. USE ADEQUATE NUMBERS OF SKILLED WORKERS WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHODS NEEDED FOR PROPER PERFORMANCE OF THE WORK OF THIS SECTION.
B. MANUFACTURER QUALIFICATIONS: A FIRM EXPERIENCED IN MANUFACTURING READY-MIXED CONCRETE PRODUCTS AND THAT COMPLIES WITH ASTM C94 REQUIREMENTS FOR PRODUCTION FACILITIES AND EQUIPMENT.
C. SPECIAL INSPECTION: INSPECTION AND TESTING OF THE BUILDING SUBGRADE AND OF THE CONCRETE CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH 2021 IBC CHAPTER 17 AND AS DELINEATED IN THE STATEMENT OF SPECIAL INSPECTIONS.
D. COMPLY WITH THE REFERENCES LISTED BELOW; WHEN AN EDITION (YEAR) IS NOT LISTED, COMPLY WITH THE MOST CURRENT EDITION.

1.4 REFERENCES

A. ACI 301: *SPECIFICATION FOR STRUCTURAL CONCRETE*
B. ACI 302.1R: *GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION*
C. ACI 117: *SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS*
D. ACI 318: *BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE*, 2019 EDITION.
E. ACI *FIELD REFERENCE MANUAL*, PUBLICATION SP-15 (05).
F. CONCRETE REINFORCING STEEL INSTITUTE (CRSI): *MANUAL OF STANDARD PRACTICE*
G. PORTLAND CEMENT ASSOCIATION (PCA): CEMENT AND CONCRETE STANDARDS.
H. 2021 *INTERNATIONAL BUILDING CODE* (IBC).
I. APPLICABLE OR REFERENCED MATERIALS AND TESTING STANDARDS BY THE AMERICAN SOCIETY OF TESTING MATERIALS (ASTM).
J. SOILS REPORT (GEOTECHNICAL REPORT) OR SIMILAR DOCUMENTATION FROM THE GEOTECHNICAL ENGINEER, HENRY F. KLING, PE, GE OF KLING CONSULTING GROUP, INC.

PART 2 – PRODUCTS

2.1 FORM-FACING MATERIALS

A. SMOOTH-FORMED FINISHED CONCRETE: FORM-FACING PANELS THAT WILL PROVIDE CONTINUOUS, TRUE, AND SMOOTH CONCRETE SURFACES. FURNISH IN LARGEST PRACTICABLE SIZES TO MINIMIZE NUMBER OF JOINTS.
B. ROUGH-FORMED FINISHED CONCRETE: PLYWOOD, LUMBER, METAL, OR ANOTHER APPROVED MATERIAL. PROVIDE LUMBER DRESSED ON AT LEAST TWO EDGES AND ONE SIDE FOR TIGHT FIT.

2.2 STEEL REINFORCEMENT

A. REINFORCING BARS THAT WILL NOT BE WELDED: ASTM A615 GRADE 60, DEFORMED, CLEAN, AND FREE OF RUST.
B. REINFORCING BARS THAT ARE TO BE WELDED: ASTM A706 GRADE 60, DEFORMED, CLEAN, AND FREE OF RUST.
C. EPOXY-COATED REINFORCING BARS: SHALL ALSO CONFORM TO ASTM A775.
D. PLAIN-STEEL WELDED WIRE REINFORCEMENT: ASTM A185, PLAIN, FABRICATED FROM AS-DRAWN STEEL WIRE INTO FLAT SHEETS. (WWR)
E. DEFORMED-STEEL WELDED WIRE REINFORCEMENT: ASTM A497, FLAT SHEET.
F. BAR SUPPORTS: BOLSTERS, CHAIRS, SPACERS, AND OTHER DEVICES FOR SPACING, SUPPORTING, AND FASTENING REINFORCING BARS AND WELDED WIRE REINFORCEMENT IN PLACE. MANUFACTURE BAR SUPPORTS FROM STEEL WIRE, PLASTIC, OR PRECAST CONCRETE ACCORDING TO CRSI'S "MANUAL OF STANDARD PRACTICE."
G. FABRICATE STEEL REINFORCEMENT ACCORDING TO CRSI'S "MANUAL OF STANDARD PRACTICE."

2.3 CONCRETE MATERIALS

A. CEMENTITIOUS MATERIAL:
1. PORTLAND CEMENT, ASTM C150, TYPE II, LOW-ALKALI
2. FLY ASH: ASTM C618, CLASS F. 15% MAX. BY WEIGHT MAY BE SUBSTITUTED FOR PORTLAND CEMENT, IF MIX DESIGN IS PROPORTIONED PER ACI 318 SECTION 5.3.
3. ASTM C595 TYPE IL (MS) CEMENT WITH PRE-APPROVAL.

B. AGGREGATES:
1. ASTM C33, GRADED. COURSE AGGREGATE SHALL BE CRUSHED ROCK.
2. NORMAL-WEIGHT, EXCEPT WHERE LIGHTWEIGHT CONCRETE IS SPECIFIED.
3. FOUNDATIONS (FOOTINGS): 1 1/2 INCH MAX. NOMINAL SIZE
4. WALLS, COLUMNS, BEAMS, AND LINTELS: 3/4 INCH MAX. NOMINAL SIZE
5. SLABS AND OTHER CONCRETE WORK: 1 INCH MAX. NOMINAL SIZE
6. LARGEST AGGREGATE SIZE SHALL BE REDUCED DEPENDING UPON LOCATION AND USE OF THE CONCRETE, SO THAT AGGREGATE DOES NOT EXCEED ANY OF THE FOLLOWING:
A) 1/5 THE NARROWEST DIMENSION BETWEEN SIDES OF FORMS
B) 1/3 THE LEAST DEPTH (THICKNESS) OF SLAB
C) 3/4 THE MINIMUM CLEAR SPACING BETWEEN INDIVIDUAL REINFORCING STEEL, DUCTS AND/OR CONDUITS.
D) 3/4 THE CLEAR SPACE BETWEEN REINFORCEMENT AND FORMS

C. WATER: ASTM C94, AND CLEAN AND FREE FROM DELETERIOUS AMOUNTS OF ACIDS, SALTS, ALKALI, AND ORGANIC MATERIALS.
D. CHEMICAL ADMIXTURES: PROVIDE ADMIXTURES CERTIFIED BY MANUFACTURER TO BE COMPATIBLE WITH OTHER ADMIXTURES AND THAT WILL NOT CONTRIBUTE WATER-SOLUBLE CHLORIDE IONS EXCEEDING THOSE PERMITTED IN HARDENED CONCRETE. DO NOT USE CALCIUM CHLORIDE OR ADMIXTURES CONTAINING CALCIUM CHLORIDE. ADMIXTURES, WHEN USED, SHALL CONFORM TO:

1. WATER-REDUCING ADMIXTURE:	ASTM C494, TYPE A
2. RETARDING ADMIXTURE:	ASTM C494, TYPE B
3. WATER-REDUCING AND RETARDING ADMIXTURE:	ASTM C494/, TYPE D
4. PLASTICIZING AND RETARDING ADMIXTURE:	ASTM C1017/, TYPE II
5. AIR-ENTRAINING ADMIXTURE:	ASTM C260

6. SHRINKAGE-REDUCING ADMIXTURE (SRA): "ECLIPSE" BY GRACE CONSTRUCTION PRODUCTS, "TETRAGUARD AS20" BY BASF ADMIXTURES, OR APPROVED EQUAL.

2.4 CURING MATERIALS

A. EVAPORATION RETARDER: WATERBORNE, MONOMOLECULAR FILM FORMING, MANUFACTURED FOR APPLICATION TO FRESH CONCRETE.
B. ABSORPTIVE COVER: AASHTO M182, CLASS 2, BURLAP CLOTH MADE FROM JUTE OR KENAF, WEIGHING APPROXIMATELY 9 OZ./SQ. YD. WHEN DRY.
C. MOISTURE-RETAINING COVER: ASTM C171, POLYETHYLENE FILM OR WHITE BURLAP-POLYETHYLENE SHEET.
D. WATER: POTABLE.

2.5 RELATED MATERIALS

A. ANCHOR BOLTS AND ANCHOR RODS: HEAVY HEX-HEADED ASTM A36, A307, OR F1554 GRADE 36, UNLESS NOTED OTHERWISE.
B. THREADED RODS: CARBON STEEL CONFORMING TO ASTM A307 GRADE C OR ASTM A193 GRADE B7; OR STAINLESS STEEL CONFORMING TO ASTM F593 ALLOY GROUP 1 TYPE 304 CONDITION CW.
C. BOLTS OR RODS EXPOSED TO WEATHER, SOIL, OR MOISTURE SHALL BE HOT DIP GALVANIZED PER ASTM A153 OR SHALL BE STAINLESS STEEL.
D. MECHANICAL BAR SPLICE COUPLERS:
1. BAR-LOCK L-SERIES COUPLERS, OR APPROVED EQUAL.
2. WITH LOCKSHEAR BOLTS AND INTERNAL SERRATED GRIP RAILS WITHIN THE COUPLING SLEEVE.
3. COUPLERS SHALL EXCEED THE SPECIFICATION REQUIREMENTS FOR BOTH TENSION AND COMPRESSION SPECIFIED BY ACI 318 AND THE IBC AND SHALL BE RECOGNIZED AND APPROVED BY ICC.

E. EXPANSION- AND ISOLATION-JOINT-FILLER STRIPS: ASTM D1751, ASPHALT-SATURATED CELLULOSIC FIBER OR ASTM D1752, CORK OR SELF-EXPANDING CORK.
F. CONTRACTION JOINT FILLER: TWO-COMPONENT SEMI-RIGID EPOXY RESIN / POLYMER, 100% SOLIDS, MINIMUM "SHORE A" HARDNESS OF 80 WHEN MEASURED IN ACCORDANCE WITH ASTM D2240.
G. EPOXY/ADHESIVE ANCHORS: INSTALL ONLY WHERE SPECIFICALLY DETAILED. TYPE SHALL BE APPROVED FOR CRACKED CONCRETE PER 2021 IBC.
H. EXPANSION ANCHORS: INSTALL ONLY WHERE SPECIFICALLY DETAILED. TYPE SHALL BE APPROVED FOR CRACKED CONCRETE PER 2021 IBC.

2.6 CONCRETE MIXTURES

A. PREPARE DESIGN MIXTURES FOR EACH TYPE AND STRENGTH OF CONCRETE, PROPORTIONED ON THE BASIS OF LABORATORY TRIAL MIXTURE OR FIELD TEST DATA, OR BOTH, ACCORDING TO ACI 301 AND 318
B. PROPORTION NORMAL-WEIGHT CONCRETE MIXTURE AS FOLLOWS:

1. COMPRESSIVE STRENGTH (28 DAYS), f'c:	4500 PSI
2. SLUMP:	2 INCHES MIN. – 5 INCHES MAX.
3. W/C MATERIALS RATIO:	0.45, MAX.
4. AIR CONTENT, MAX.:	3%

C. SLUMP MAY BE INCREASED UPON REVIEW AND APPROVAL BY THE ENGINEER, IN CONSIDERATION OF UTILIZATION OF WATER-REDUCERS AND/OR PLASTICIZERS IN THE CONCRETE MIX(ES).
D. SHRINKAGE-REDUCING ADMIXTURE: INCLUDE IN SLAB MIXTURES SO AS TO LIMIT TOTAL CONCRETE SHRINKAGE TO A MAXIMUM OF 0.040% AT 28 DAYS. (IN ORDER TO ASSIST IN DRYING SHRINKAGE REDUCTION, THE W/C RATIO MAY BE LOWERED AND A WATER-REDUCER ADDED.) THE ADDITION RATE SHALL BE WITHIN THE MANUFACTURER'S "TYPICAL" OR "RECOMMENDED" RANGE AT A MINIMUM, REGARDLESS OF THE DESIGN SHRINKAGE PERCENTAGE. NOTE THAT IF SEPARATE FOOTING, SLAB, COLUMN, OR OTHER CONCRETE MIXES ARE SUPPLIED, ONLY THE SLAB MIX NEEDS TO CONTAIN SRA.
E. READY-MIXED CONCRETE: MEASURE, BATCH, MIX, AND DELIVER CONCRETE ACCORDING TO ASTM C94, AND FURNISH BATCH TICKET INFORMATION. WHEN AIR TEMPERATURE IS BETWEEN 85°F AND 90°F, REDUCE MIXING AND DELIVERY TIME FROM 90 MINUTES TO 75 MINUTES; WHEN AIR TEMPERATURE IS ABOVE 90°F, REDUCE MIXING AND DELIVERY TIME TO 60 MINUTES.
F. DRYPACK/GROUT: NON-SHRINK GROUT BY FIVE STAR PRODUCTS INC., QUIKRETE, OR APPROVED EQUAL, FOR THE INTENDED USE, INSTALLED AT A "PLASTIC" CONSISTENCY, IN ACCORDANCE WITH APPROVED METHODS AND TECHNIQUES AND PER THE MANUFACTURER'S REQUIREMENTS.
G. MANUFACTURED CONCRETE MIX: IN LIEU OF READY-MIXED CONCRETE PROPORTIONED AS SPECIFIED ABOVE, "STRUCTURAL CONCRETE" BY FIVE STAR PRODUCTS INC. EXTENDED WITH AGGREGATE MAY BE USED IN ACCORDANCE WITH APPROVED METHODS AND TECHNIQUES AND PER THE MANUFACTURER'S REQUIREMENTS.

PART 3 – EXECUTION

3.1 SUBGRADE PREPARATION

A. GRADING, EXCAVATIONS, COMPACTION AND OTHER SUBGRADE PREPARATION SHALL BE IN UNDER THE SUPERVISION OF A GEOTECHNICAL ENGINEER.
B. NATIVE SOIL SHALL BE OVEREXCAVATED TO 1 FT. MIN. BELOW BOTTOM OF FOOTINGS/FOUNDATIONS, ONSITE SOIL PROCESSED AND RE-COMPACTED TO 95% RELATIVE COMPACTION, WITH GREATER THAN 3/4-INCH AGGREGATE REMOVED.
C. OPTIONALLY, IN LIEU OF ONSITE PROCESSING, THE CONTRACTOR MAY REMOVE NATIVE SOIL TO ONE FOOT BELOW BOTTOM OF FOOTINGS/FOUNDATIONS, AND REPLACE WITH CLASS 2 AGGREGATE BASE OR SIMILAR, COMPACTED TO 95% RELATIVE COMPACTION.

3.2 FORMWORK

A. DESIGN, ERECT, SHORE, BRACE, AND MAINTAIN FORMWORK ACCORDING TO ACI 301 TO SUPPORT VERTICAL, LATERAL, STATIC, AND DYNAMIC LOADS, AND CONSTRUCTION LOADS THAT MIGHT BE APPLIED, UNTIL STRUCTURE CAN SUPPORT SUCH LOADS. "BIRD MOUTHS" MAY BE REQUIRED.
B. CONSTRUCT FORMWORK SO CONCRETE MEMBERS AND STRUCTURES ARE OF SIZE, SHAPE, ALIGNMENT, ELEVATION, AND POSITION INDICATED, WITHIN TOLERANCE LIMITS OF ACI 117.
C. CHAMFER EXTERIOR CORNERS AND EDGES OF PERMANENTLY EXPOSED CONCRETE WHEN REQUIRED BY THE OWNER OR CIVIL ENGINEER.
D. PROVIDE AIR RELIEF HOLES AS NECESSARY.
E. REMOVAL OF FORMWORK: COMPLY WITH ACI 301 AND ACI 318.

3.3 EMBEDDED ITEMS

A. PLACE AND SECURE ANCHORAGE DEVICES AND OTHER EMBEDDED ITEMS REQUIRED FOR ADJOINING WORK THAT IS ATTACHED TO OR SUPPORTED BY CAST-IN-PLACE CONCRETE. USE SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS, AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.
B. EMBEDDED ITEMS SHALL BE SECURED IN PLACE PRIOR TO FOUNDATION INSPECTION AND PRIOR TO POURING CONCRETE.
C. EPOXY/ADHESIVE: USE ONLY WHERE SPECIFICALLY DETAILED BY THE ENGINEER OR CIVIL ENGINEER. INSTALL PER THE MANUFACTURER'S ICC EVALUATION REPORT.
D. EXPANSION ANCHORS: USE ONLY WHERE SPECIFICALLY DETAILED BY THE ENGINEER OR CIVIL ENGINEER. INSTALL PER THE MANUFACTURER'S ICC EVALUATION REPORT.

3.4 STEEL REINFORCEMENT

A. GENERAL: COMPLY WITH CRSI'S "MANUAL OF STANDARD PRACTICE" FOR PLACING REINFORCEMENT. DO NOT CUT OR PUNCTURE VAPOR RETARDER. REPAIR DAMAGE AND RESEAL VAPOR RETARDER BEFORE PLACING CONCRETE.
B. MECHANICAL BAR SPLICE COUPLERS:
1. MAY BE USED IN LIEU OF LAP SPLICES.
2. USE WHERE INDICATED ON THE DRAWINGS.
3. STAGGER ADJACENT SPLICES 2 FEET MINIMUM.
4. INSTALL PER THE ICC EVALUATION REPORT.

C. LAP SPLICES: STAGGER 2 FT. MIN., WITH MIN. BAR LAP LENGTHS PER PLAN.
D. HOOKS: REFER TO STRUCTURAL DRAWINGS.
E. DOWELS: SHALL BE PROVIDED FOR VERTICAL AND HORIZONTAL REINFORCING BARS IN WALLS, COLUMNS, CURBS, ETC., AND SHALL BE OF THE SAME SIZE AND SPACING AS THE SUPPORTING FOOTING, SLAB, WALL, COLUMN, ETC. UNLESS NOTED OTHERWISE ON THE DRAWINGS.
F. REINFORCING CLEARANCES (COVER) FOR FOOTINGS:
1. 3 INCHES WHEN POURED AGAINST EARTH
2. 2 INCHES WHEN POURED AGAINST FORMED SURFACES (INCLUDING FORMWORK, EMBEDDED PIPES OR CONDUIT) OR TOP OF CONCRETE.
3. WHERE REQUIRED CLEARANCE CANNOT BE ACHIEVED, REINFORCING SHALL BE EPOXY OR ZINC PAINTED OR SPRAYED. CLEARANCE REDUCTION REQUIRES SPECIFIC APPROVAL FROM THE ENGINEER.

3.5 JOINTS

A. GENERAL: CONSTRUCT JOINTS TRUE TO LINE WITH FACES PERPENDICULAR TO SURFACE PLANE OF CONCRETE.
B. CONSTRUCTION JOINTS:
1. INSTALL SO STRENGTH AND APPEARANCE OF CONCRETE ARE NOT IMPAIRED, AT LOCATIONS INDICATED AND AS APPROVED BY CIVIL ENGINEER.
2. CONSTRUCTION JOINTS SHALL BE ROUGHENED TO AN AMPLITUDE OF APPROXIMATELY 1/4" PER ACI 318 SECTION 11.7.9.
3. WIRE BRUSH, CLEAN AND DAMPEN IMMEDIATELY PRIOR TO POURING.
4. LOCATION OF FOUNDATION CONSTRUCTION JOINTS SHALL BE APPROVED BY THE ENGINEER.

C. ISOLATION JOINTS IN SLABS: AFTER REMOVING FORMWORK, INSTALL JOINT-FILLER STRIPS AT SLAB JUNCTIONS WITH VERTICAL SURFACES, AS INDICATED.

3.6 CONCRETE PLACEMENT

A. BEFORE PLACING CONCRETE, VERIFY THAT INSTALLATION OF FORMWORK, REINFORCEMENT, AND EMBEDDED ITEMS IS COMPLETE AND THAT REQUIRED INSPECTIONS HAVE BEEN PERFORMED. "BIRD MOUTHS" MAY BE REQUIRED.
B. CHUTES, TREMIES, BUGGIES, BUCKETS OR SIMILAR EQUIPMENT MAY BE REQUIRED.
C. PROVIDE ADEQUATE ACCESS TO ALLOW A VIBRATOR TO BE INSERTED INTO REPAIR MATERIAL FOR CONSOLIDATION. WHERE THIS IS NOT POSSIBLE, VIBRATE FORMWORK. USE VIBRATOR IN A MANNER TO AVOID MATERIAL SEGREGATION – DO NOT OVER-VIBRATE. VIBRATORS SHALL NOT BE USED TO MOVE REPAIR MATERIAL LATERALLY.
D. LEAVE A SMALL OPENING OR SLOT AT THE TOP OF THE FORM TO PERMIT THE MATERIAL TO BE POURED INTO PLACE. MATERIAL SHALL BE POURED IN FORMWORK IN A MANNER TO AVOID SEGREGATION. DO NOT ALLOW MATERIAL TO FALL FREELY OVER REINFORCEMENT OR OTHER EMBEDDED MATERIALS
E. DEPOSIT CONCRETE CONTINUOUSLY IN ONE LAYER OR IN HORIZONTAL LAYERS OF SUCH THICKNESS THAT NO NEW CONCRETE WILL BE PLACED ON CONCRETE THAT HAS HARDENED ENOUGH TO CAUSE SEAMS OR PLANES OF WEAKNESS. IF A SECTION CANNOT BE PLACED CONTINUOUSLY, PROVIDE CONSTRUCTION JOINTS AS INDICATED. DEPOSIT CONCRETE TO AVOID SEGREGATION. CONSOLIDATE PLACED CONCRETE WITH MECHANICAL VIBRATING EQUIPMENT ACCORDING TO ACI 301.
F. FLOOR SLABS: COMPLY WITH ACI 302.1R. WHEN CONCRETE IS PLACED DIRECTLY ON TOP OF THE VAPOR RETARDER, THE CONCRETE CONTRACTOR SHALL MAKE THE NECESSARY CHANGES IN THE CONCRETE PLACEMENT.
G. COLD-WEATHER PLACEMENT: COMPLY WITH ACI 306.1.
H. HOT-WEATHER PLACEMENT: COMPLY WITH ACI 301.

3.7 FINISHING FORMED SURFACES

A. FOLLOWING CURING AND REMOVAL OF FORMS, REMOVE "BIRDS MOUTHS" AND OTHER PROJECTIONS TO PROVIDE THE REQUIRED FINISH SURFACE.
B. CONCRETE THAT MAY REMAIN EXPOSED TO PUBLIC VIEW SHALL BE "SMOOTH-FORMED FINISHED CONCRETE." CONCRETE THAT WILL NOT BE EXPOSED TO PUBLIC VIEW SHALL BE "ROUGH-FORMED FINISHED CONCRETE" OR "SMOOTH-FORMED FINISHED CONCRETE."
C. ROUGH-FORMED FINISH: AS-CAST CONCRETE TEXTURE IMPARTED BY FORM-FACING MATERIAL WITH TIE HOLES AND DEFECTS REPAIRED AND PATCHED. REMOVE FINS AND OTHER PROJECTIONS THAT EXCEED SPECIFIED LIMITS ON FORMED-SURFACE IRREGULARITIES.
D. SMOOTH-FORMED FINISH: AS-CAST CONCRETE TEXTURE IMPARTED BY FORM-FACING MATERIAL, ARRANGED IN AN ORDERLY AND SYMMETRICAL MANNER WITH A MINIMUM OF SEAMS. REPAIR AND PATCH TIE HOLES, VOIDS, AND DEFECTS. REMOVE FINS AND OTHER PROJECTIONS THAT EXCEED SPECIFIED LIMITS ON FORMED-SURFACE IRREGULARITIES.
E. RELATED UNFORMED SURFACES: AT TOPS OF WALLS, HORIZONTAL OFFSETS, AND SIMILAR UNFORMED SURFACES ADJACENT TO FORMED SURFACES, STRIKE OFF SMOOTH AND FINISH WITH A TEXTURE MATCHING ADJACENT FORMED SURFACES. CONTINUE FINAL SURFACE TREATMENT OF FORMED SURFACES UNIFORMLY ACROSS ADJACENT UNFORMED SURFACES, UNLESS OTHERWISE INDICATED.
F. OWNER OR CIVIL ENGINEER'S SPECIFICATIONS OR REQUIREMENTS FOR FINISHING FORMED SURFACES SHALL TAKE PRECEDENCE OVER THESE SPECIFICATIONS.

3.8 FINISHING FLOORS AND SLABS

A. COMPLY WITH ACI 302.1R RECOMMENDATIONS FOR SCREEDING, RESTRAIGHTENING, AND FINISHING OPERATIONS FOR CONCRETE SURFACES.
B. FINISH AS INDICATED ON THE DRAWINGS, OR AS APPROVED BY THE CIVIL ENGINEER AND OWNER PRIOR TO CONSTRUCTION.

3.9 CONCRETE PROTECTING AND CURING

A. GENERAL: PROTECT FRESHLY PLACED CONCRETE FROM PREMATURE DRYING AND EXCESSIVE COLD OR HOT TEMPERATURES. COMPLY WITH ACI 306.1 FOR COLD-WEATHER PROTECTION AND ACI 301 FOR HOT-WEATHER PROTECTION DURING CURING. CONCRETE SHALL BE MAINTAINED ABOVE 50°F AND IN A MOIST CONDITION FOR AT LEAST THE FIRST SEVEN DAYS AFTER PLACEMENT. WHEN CONCRETE IS PLACED DIRECTLY ON TOP OF THE VAPOR RETARDER, THE CONCRETE CONTRACTOR SHALL MAKE THE NECESSARY CHANGES IN THE CONCRETE CURING.
B. EVAPORATION RETARDER: APPLY EVAPORATION RETARDER TO UNFORMED CONCRETE SURFACES IF HOT, DRY, OR WINDY CONDITIONS CAUSE MOISTURE LOSS APPROACHING 0.2 LB/SQ. FT. X H BEFORE AND DURING FINISHING OPERATIONS. APPLY ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AFTER PLACING, SCREEDING, AND BULL FLOATING OR DARBYING CONCRETE, BUT BEFORE FLOAT FINISHING.
C. CURE CONCRETE ACCORDING TO ACI 308.1, BY ONE OR A COMBINATION OF THE FOLLOWING METHODS:
1. MOISTURE CURING: KEEP SURFACES CONTINUOUSLY MOIST FOR NOT LESS THAN SEVEN DAYS.
2. MOISTURE-RETAINING-COVER CURING: COVER CONCRETE SURFACES WITH MOISTURE-RETAINING COVER FOR CURING CONCRETE, PLACED IN WIDEST PRACTICABLE WIDTH, WITH SIDES AND ENDS LAPPED, AND SEALED BY WATERPROOF TAPE OR ADHESIVE. CURE FOR NOT LESS THAN SEVEN DAYS. IMMEDIATELY REPAIR ANY HOLES OR TEARS DURING CURING PERIOD USING COVER MATERIAL AND WATERPROOF TAPE.
3. CURING COMPOUND: APPLY UNIFORMLY IN CONTINUOUS OPERATION BY POWER SPRAY OR ROLLER ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS. RECOAT AREAS SUBJECTED TO HEAVY RAINFALL WITHIN THREE HOURS AFTER INITIAL APPLICATION. MAINTAIN CONTINUITY OF COATING AND REPAIR DAMAGE DURING CURING PERIOD. AFTER CURING PERIOD HAS ELAPSED, REMOVE CURING COMPOUND WITHOUT DAMAGING CONCRETE SURFACES BY METHOD RECOMMENDED BY CURING COMPOUND MANUFACTURER UNLESS MANUFACTURER CERTIFIES CURING COMPOUND WILL NOT INTERFERE WITH BONDING OF FLOOR COVERING USED ON PROJECT.

3.10 FIELD QUALITY CONTROL

A. THE CONTRACTOR SHALL SUITABLY PROTECT THE WORK IN ORDER TO MAINTAIN FINISHES IN PERFECT CONDITION UNTIL FINAL COMPLETION AND ACCEPTANCE.
B. REPAIR AND PATCH DEFECTIVE AREAS WHERE REQUIRED BY THE OWNER OR ENGINEER. REMOVE AND REPLACE CONCRETE THAT CANNOT BE REPAIRED AND PATCHED TO OWNER OR ENGINEER'S APPROVAL. ANY REPAIR OR REPLACEMENT SHALL BE AT NO ADDITIONAL COST TO THE OWNER.
C. TESTING AND INSPECTING: CONTRACTOR SHALL ENGAGE A QUALIFIED INDEPENDENT TESTING AND INSPECTING AGENCY TO PERFORM FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS.
D. TESTING SERVICES: TESTS SHALL BE PERFORMED ACCORDING TO ACI 301 AND IBC CHAPTER 17 FOR CONCRETE CONSTRUCTION, EXCEPT WHERE SPECIFICALLY EXCLUDED.
E. SPECIAL INSPECTIONS: REFER TO THE "STATEMENT OF SPECIAL INSPECTIONS" ON THE STRUCTURAL DRAWINGS.
F. A CIVIL OR GEOTECHNICAL ENGINEER SHALL INSPECT, TEST, AND SIGN-OFF ALL GRADING AND EXCAVATIONS PRIOR TO PLACEMENT OF FORMS, REINFORCING STEEL OR CONCRETE.

END OF SECTION

STRUCTURAL ENGINEER:
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REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	MAM	NBW
E	11/06/25	95% DESIGN SUBMITTAL	MAM	NBW
D	08/06/25	REVISED 65% DESIGN SUBMITTAL	MAM	NBW
C	06/13/24	65% DESIGN SUBMITTAL	MAM	NBW
B	04/17/24	REVISIONS TO DWL 35% DESIGN		
A	02/28/18	35% DESIGN		

REVISION SUMMARY

SCALE: NTS

DESIGNER: MAM
DRAWN BY: MAM
CHECKED BY: NBW
APPROVED BY: NBW
DATE: 03/31/2026

STRUCTURAL SPECIFICATIONS

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457 | FILE NAME 230457 - CAMP ROBERTS WWTP

SHEET NO. S02
SHEET 20 OF
REVISION 0

SECTION 05 12 00
STRUCTURAL STEEL

PART 1 – GENERAL

1.1 SUMMARY

A. THIS SECTION INCLUDES: STRUCTURAL STEEL, INCLUDING STEEL FRAMING, BRACES, WELDING, BOLTING, AND MISCELLANEOUS CONNECTIONS AND FABRICATIONS.

1.2 SUBMITTALS

A. COMPLY WITH DIVISION 1 SPECIFICATIONS AND THE CIVIL ENGINEER'S ADDITIONAL INSTRUCTIONS.
B. PRODUCT DATA: FOR EACH TYPE OF PRODUCT INDICATED.
C. SHOP DRAWINGS: SHOW FABRICATION OF STRUCTURAL-STEEL COMPONENTS.
D. WELDING CERTIFICATES.
E. MILL TEST REPORTS.
F. SOURCE QUALITY-CONTROL TEST REPORTS

1.3 QUALITY ASSURANCE

A. FABRICATOR QUALIFICATIONS: A QUALIFIED FABRICATOR, APPROVED BY THE BUILDING DEPARTMENT AND THE OWNER, WHO HAS HAD REVIEW AND APPROVAL BY A CERTIFIED SPECIAL INSPECTOR. APPROVAL SHALL BE BASED UPON REVIEW OF THE FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND PERIODIC AUDITING OF FABRICATION PRACTICES BY AN APPROVED SPECIAL INSPECTION AGENCY.
B. WELDING: QUALIFY PROCEDURES AND PERSONNEL ACCORDING TO AWS D1.1, "STRUCTURAL WELDING CODE – STEEL." WELDING SHALL BE PERFORMED BY APPROVED CERTIFIED WELDERS.
C. USE ADEQUATE NUMBERS OF SKILLED WORKERS WHO ARE THOROUGHLY TRAINED AND EXPERIENCED IN THE NECESSARY CRAFTS AND WHO ARE COMPLETELY FAMILIAR WITH THE SPECIFIED REQUIREMENTS AND THE METHODS NEEDED FOR PROPER PERFORMANCE OF THE WORK OF THIS SECTION.
D. SPECIAL INSPECTION: INSPECTION AND TESTING SHALL BE PERFORMED IN ACCORDANCE WITH IBC CHAPTER 17 AND AS DELINEATED IN THE STATEMENT OF SPECIAL INSPECTIONS.
E. COMPLY WITH THE REFERENCES LISTED BELOW; WHEN AN EDITION (YEAR) IS NOT LISTED, COMPLY WITH THE MOST CURRENT EDITION.

1.4 REFERENCES

A. AISC 303 – *CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES*
B. AISC 360-16 – *SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS*
C. AISC 341-16 – *SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS*
D. RCSC – *SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS*
E. AWS D1.1 – *STRUCTURAL WELDING CODE – STEEL*
F. AWS D1.3 – *STRUCTURAL WELDING CODE – SHEET STEEL*
G. AWS D1.4 – *STRUCTURAL WELDING CODE – REINFORCING STEEL*
H. AWS D1.8 – *STRUCTURAL WELDING CODE – SEISMIC SUPPLEMENT*
I. AWS QC1 – *STANDARD FOR AWS CERTIFICATION OF WELDING INSPECTORS*
J. 2021 *INTERNATIONAL BUILDING CODE* (IBC).
K. APPLICABLE OR REFERENCED MATERIALS AND TESTING STANDARDS BY THE AMERICAN SOCIETY OF TESTING MATERIALS (ASTM).

PART 2 – PRODUCTS

2.1 MATERIALS

A. W-SHAPES: ASTM A992 OR ASTM A572 GRADE 50
B. HSS (HOLLOW STRUCTURAL SECTIONS): ASTM A500 GRADE C (Fy = 50 KSI)
C. ROUND HSS: ASTM A500 GRADE C (Fy = 46 KSI)
D. STEEL PIPE: ASTM A53 GRADE B OR ASTM A501
E. OTHER SHAPES (E.G. ANGLES, CHANNELS): ASTM A36 OR ASTM A572 GR.50
F. PLATES: ASTM A572 GRADE 50
G. STAINLESS STEEL:
   1. PLATES, SHEETS, AND STRIPS: ASTM A240 AND GRADE TYPE 304 (OR 316 IF WELDED).
   2. BARS AND SHAPES: ASTM A276 AND TYPE 304 (OR 316 IF WELDED).
H. WELDING ELECTRODES: COMPLY WITH AWS REQUIREMENTS.
I. STEEL REINFORCING BARS (REBAR): SEE SECTION 03 30 00 – CAST-IN-PLACE CONCRETE.
J. DRYPACK/GROUT: SEE SECTION 03 30 00 – CAST-IN-PLACE CONCRETE.
K. ALL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION, OR SHALL BE STAINLESS STEEL.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. STANDARD BOLTED CONNECTIONS:
   1. ASTM A3125 GRADE A325
   2. COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATORS OR TWIST-OFF-TYPE TENSION-CONTROL BOLTS CONFORMING TO RCSC *SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS* SHALL BE PROVIDED AT ALL BOLTED CONNECTIONS
B. SHEAR CONNECTORS: ASTM A108, GRADES 1010 – 1020, THREADED OR HEADED-STUD TYPE, AS DETAILED OR OTHERWISE REQUIRED FOR THE APPLICATION.
C. ANCHOR RODS (OR ANCHOR BOLTS): ASTM F1554 GRADE 36, UNLESS NOTED OTHERWISE.
D. THREADED RODS: CARBON STEEL CONFORMING TO ASTM A307 GRADE C OR ASTM A193 GRADE B7; OR STAINLESS STEEL CONFORMING TO ASTM F593 ALLOY GROUP 1 TYPE 304 CONDITION CW.
E. ALL BOLTS, RODS, ANCHOR BOLTS, AND OTHER CONNECTORS SHALL BE HOT DIP GALVANIZED PER ASTM A153 OR SHALL BE STAINLESS STEEL.

2.3 STEEL DECK

A. SHALL BE MANUFACTURED BY VERCO OR APPROVED EQUAL.
B. USE TYPES, DEPTHS, AND GAGES SHOWN ON THE STRUCTURAL PLANS.
C. DECK AND ACCESSORIES SHALL BE FORMED OF G90 GALVANIZED SHEET STEEL CONFORMING TO ASTM A446, FY = 50 KSI WITH A GALVANIZED COATING PER ASTM A525.
D. ATTACHMENTS SHALL COMPLY WITH REQUIREMENTS SHOWN ON THE STRUCTURAL PLANS AND IN ACCORDANCE WITH THE RESPECTIVE MANUFACTURER'S PRODUCT ICC EVALUATION REPORT.
E. LENGTHS TO HAVE TWO OR THREE CONTINUOUS SPANS, WITH DECK ENDS LAPPED 2-INCHES MINIMUM.
F. FABRICATE ACCESSORIES, INCLUDING CLOSURES AND EDGE ANGLES, FROM THE SAME GAGE (OR THICKER) AND MATERIALS AS ADJACENT STEEL DECK.
G. PRIMER: WHITE PRIMER PAINT ON TOP SIDE OF DECK, AFTER GALVANIZING.

2.4 DRYPACK/GROUT

A. SEE SECTION 03 30 00 – CAST-IN-PLACE CONCRETE.

2.5 FABRICATION

A. STRUCTURAL STEEL: FABRICATE AND ASSEMBLE IN SHOP TO GREATEST EXTENT POSSIBLE. FABRICATE ACCORDING TO REFERENCED STANDARDS AND SPECIFICATIONS.
B. WELD CONNECTIONS: COMPLY WITH AWS D1.1 FOR WELDING PROCEDURE SPECIFICATIONS, TOLERANCES, APPEARANCE, AND QUALITY OF WELDS AND FOR METHODS USED IN CORRECTING WELDING WORK, SUPPLEMENTED WITH AWS D1.8 AS REQUIRED.
C. GENERAL:
   1. USE MATERIALS OF SIZE AND THICKNESS SHOWN. IF NOT SHOWN, USE REQUIRED SIZE AND THICKNESS TO PRODUCE STRENGTH AND DURABILITY IN THE FINISHED PRODUCT.
   2. WORK TO DIMENSIONS SHOWN ON THE CIVIL ENGINEER'S DRAWINGS. PLAN AND ELEVATION DIMENSIONS SHOWN ON STRUCTURAL DRAWINGS ARE SHOWN FOR CLARIFICATION.
   3. FORM EXPOSED WORK TRUE TO LINE AND LEVEL, WITH ACCURATE ANGLES AND SURFACES AND WITH STRAIGHT SHAPE EDGES. FORM BENT-METAL CORNERS TO SMALLEST RADIUS POSSIBLE WITHOUT CAUSING GRAIN SEPARATION OR OTHERWISE IMPAIRING WORK.
   4. EASE EXPOSED EDGES TO A RADIUS OF APPROXIMATELY 1/32" UNLESS OTHERWISE SHOWN. WELD CORNERS AND SEAMS CONTINUOUSLY, COMPLYING WITH AWS RECOMMENDATIONS.
   5. AT EXPOSED CONNECTIONS, GRIND EXPOSED WELDS SMOOTH, UNLESS REASONABLY SMOOTH AND UNIFORM WELDS HAVE BEEN PROVIDED. ADDITIONAL FINISH REQUIREMENTS ARE PER THE CIVIL ENGINEER AND OWNER.
   6. FORM EXPOSED CONNECTIONS WITH HAIRLINE JOINTS, FLUSH AND SMOOTH, USING CONCEALED FASTENERS WHEREVER POSSIBLE. USE EXPOSED FASTENERS OF TYPE SHOWN OR, IF NOT SHOWN, USE PHILLIPS FLATHEAD (COUNTERSUNK) SCREWS OR BOLTS.
   7. PROVIDE FOR ANCHORAGE OF THE TYPE SHOWN OR REQUIRED. COORDINATE WITH SUPPORTING STRUCTURE. FABRICATE AND SPACE THE ANCHORING DEVICES TO PROVIDE ADEQUATE SUPPORT FOR INTENDED USE.
   8. CUT, REINFORCE, DRILL, AND TAP MISCELLANEOUS METAL WORK AS INDICATED TO RECEIVE FINISH HARDWARE AND SIMILAR ITEMS.
   9. INSTALL DRAIN HOLES IN HOLLOW ASSEMBLIES TO BE HOT DIP GALVANIZED, WITHOUT COMPROMISING THE REQUIRED STRENGTH OF THE ASSEMBLY.
   10. SECTIONS, PLATES AND BARS SHALL NOT BE SHEARED GAS-CUT OR SAW-CUT.
   11. BOLT HOLES:
      A) HOLES IN BASEPLATES: AISC "STANDARD" OR "OVERSIZE" HOLES.
      B) ALL OTHER HOLES: AISC "STANDARD" HOLES, DRILLED A MAXIMUM OF 1/16" LARGER THAN THE BOLT DIAMETER.
   12. WELDING SHALL BE PERFORMED USING SMAW, SAW, GMAW, OR FCAW PROCESSES WITH APPROVED ELECTRODES CONFORMING TO ASTM A-233 AND APPLICABLE AWS SPECIFICATIONS. WELDS SHALL USE E70XX ELECTRODES, UNLESS NOTED OTHERWISE. WITH A MINIMUM CVN TOUGHNESS OF 20 FT-LB AT -20°F, USING AWS A5 CLASSIFICATION TEST METHODS.
   13. MINIMUM PREHEAT AND INTERPASS TEMPERATURES SHALL BE PROVIDED FOR ALL WELDS, INCLUDING TACK WELDS, IN ACCORDANCE WITH AWS D1.1, TABLE 3.2. THE MAXIMUM PREHEAT AND MAXIMUM INTERPASS TEMPERATURE PERMITTED IS 550°F, MEASURED AT A DISTANCE OF 1 IN. FROM THE POINT OF ARC INITIATION.
   14. WELDING SHALL BE PERFORMED BY WELDERS CERTIFIED IN ACCORDANCE WITH AWS D1.1 AND D1.8.
   15. USE WELD TABS (BACKING BARS) AS REQUIRED. AFTER WELDING, REMOVE WELD TABS AND FINISH TO A SMOOTH CONTOUR. BACKGOUGE THE WELD ROOT TO SOUND METAL AND WELD BACKGOUGED REGION.

2.6 SHOP PRIMING

A. ALL STEEL SHALL BE HOT DIP GALVANIZED AFTER FABRICATION, OR SHALL BE STAINLESS STEEL.
B. SHOP PRIME STEEL SURFACES WHERE REQUESTED BY THE OWNER OR WHERE STEEL IS TO BE PAINTED, BUT AFTER GALVANIZING IS COMPLETE.

PART 3 – EXECUTION

3.1 ERECTION

A. EXAMINATION: VERIFY ELEVATIONS OF BEARING SURFACES AND LOCATIONS OF ANCHOR RODS, BEARING PLATES, AND OTHER EMBEDMENTS, WITH STEEL ERECTOR PRESENT, FOR COMPLIANCE WITH REQUIREMENTS. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.
B. SET STRUCTURAL STEEL ACCURATELY IN LOCATIONS AND TO ELEVATIONS INDICATED.
C. MAINTAIN ERECTION TOLERANCES OF STRUCTURAL STEEL WITHIN AISC'S "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES."
A. NO HOLES OTHER THAN THOSE SPECIFICALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS. NO CUTTING OR BURNING OF STRUCTURAL STEEL WILL BE PERMITTED WITHOUT PRIOR CONSENT OF THE ENGINEER AND COR.

3.2 FIELD CONNECTIONS

A. BOLTS: INSTALL BOLTS ACCORDING TO RCSC'S *SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH STRENGTH BOLTS* FOR TYPE OF BOLT SPECIFIED. COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATORS OR TWIST-OFF-TYPE TENSION-CONTROL BOLTS SHALL BE PROVIDED AT ALL BOLTED CONNECTIONS.
B. WELD CONNECTIONS: COMPLY WITH AWS STANDARDS FOR WELDING PROCEDURE SPECIFICATIONS, TOLERANCES, APPEARANCE, AND QUALITY OF WELDS AND FOR METHODS USED IN CORRECTING WELDING WORK. COMPLY WITH AISC AND AWS STANDARDS FOR BEARING, ADEQUACY OF TEMPORARY CONNECTIONS, ALIGNMENT, AND REMOVAL OF PAINT ON SURFACES ADJACENT TO FIELD WELDS.

3.3 STEEL DECK

A. COMPLY WITH MANUFACTURER'S WRITTEN SPECIFICATIONS, RECOMMENDATIONS, AND THE APPROVED SHOP DRAWINGS.
B. PROVIDE SHORING PRIOR TO SECURING DECK WHEN REQUIRED PER THE MANUFACTURER.
C. POSITION DECK UNITS ON SUPPORTING STEEL FRAMEWORK AND ADJUST TO FINAL POSITIONS WITH DECK ENDS BEARING MINIMUM OF 2-INCHES ON SUPPORTING MEMBERS.
D. PLACE UNITS WITH DECK ENDS LAPPED 2-INCHES MINIMUM BEFORE PERMANENTLY FASTENING. ALIGN RIBS OVER ENTIRE LENGTH OF RUN.
E. SECURE TO END, INTERMEDIATE AND SIDE SUPPORTING MEMBERS.
F. PROVIDE CLOSURES AND END ANGLES PER THE MANUFACTURER'S RECOMMENDATIONS.
G. DO NOT USE DECK UNITS FOR STORAGE OR WORKING PLATFORMS UNTIL PERMANENTLY SECURED IN POSITION.
H. STORE AND PROTECT FROM WEATHER.

3.4 POWER-ACTUATED OR POWER-DRIVEN FASTENERS (OR "SHOT PINS"):

A. SHALL BE BY HILTI INC. OR APPROVED EQUAL. PRODUCT AND INSTALLATION TO COMPLY WITH MANUFACTURER'S WRITTEN SPECIFICATIONS, RECOMMENDATIONS, AND ICC REPORT.
B. PROVIDE AND INSTALL SEALING WASHERS WITH FASTENERS PER MANUFACTURER'S WRITTEN SPECIFCATIONS, RECOMMENDATIONS, AND ICC REPORT.

3.5 TOUCH-UP OF GALVANIZED COATING AND FIELD WELDS
A. WHEREVER FIELD WELDING, CUTTING, GRINDING, OR HANDLING DAMAGES HOT-DIP GALVANIZED COATING, REPAIR THE AFFECTED AREAS.
B. CLEAN AND PREPARE SURFACES PER ASTM A780.
C. APPLY ZINC-RICH COLD GALVANIZING COMPOUND EQUAL TO "LPS COLD GALVANIZE" SPRAY, MEETING ASTM A780 AND CONTAINING ≥65% ZINC BY WEIGHT.
D. APPLY MINIMUM THREE (3) LIGHT COATS IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS, ACHIEVING MINIMUM 2.0-MIL DFT. FINAL APPEARANCE SHALL CLOSELY RESEMBLE ADJACENT GALVANIZING.
E. TOPCOAT IF INDICATED ELSEWHERE AND COMPATIBLE WITH ZINC-RICH COATING.
F. TOUCH-UP AREAS SHALL BE VISUALLY CONTINUOUS AND FREE OF PINHOLES; NOTIFY ENGINEER OF LOCATIONS.

3.6 FIELD QUALITY CONTROL

A. THE CONTRACTOR SHALL SUITABLY PROTECT THE WORK IN ORDER TO MAINTAIN FINISHES IN PERFECT CONDITION UNTIL FINAL COMPLETION AND ACCEPTANCE.
B. FINISHES OF EXPOSED MATERIALS ARE PER THE OWNER OR ENGINEER.

C. WELDED CONNECTIONS: FIELD WELDS SHALL BE INSPECTED ACCORDING TO AWS D1.1, D1.8, AND THE CONSTRUCTION DOCUMENTS.
D. TESTING AND INSPECTING: CONTRACTOR SHALL ENGAGE A QUALIFIED INDEPENDENT TESTING AND INSPECTING AGENCY TO PERFORM FIELD TESTS AND INSPECTIONS AND PREPARE TEST REPORTS.
E. TESTING SERVICES: TESTS SHALL BE PERFORMED ACCORDING TO ACI 301 AND IBC CHAPTER 17 FOR CONCRETE CONSTRUCTION, EXCEPT WHERE SPECIFICALLY EXCLUDED.
F. SPECIAL INSPECTIONS: REFER TO THE STRUCTURAL TITLE SHEET.
G. CORRECT DEFICIENCIES IN WORK THAT TEST REPORTS AND INSPECTIONS INDICATE DOES NOT COMPLY WITH THE CONTRACT DOCUMENTS.
H. REPAIR DEFECTIVE ELEMENTS WHERE REQUIRED BY THE OWNER OR ENGINEER. REMOVE AND REPLACE ELEMENTS THAT CANNOT BE REPAIRED TO OWNER OR ENGINEER'S APPROVAL. ANY REPAIR OR REPLACEMENT SHALL BE AT NO ADDITIONAL COST TO THE OWNER.

END OF SECTION

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RANCHO CORDOVA, CA 95670

REVISION SUMMARY

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A	02/28/18	35% DESIGN	NBW	
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D	08/06/25	REVISED 65% DESIGN SUBMITTAL	MAM	NBW
E	11/06/25	95% DESIGN SUBMITTAL	MAM	NBW
0	03/31/26	100% DESIGN SUBMITTAL		

SCALE: NTS

REGISTERED PROFESSIONAL ENGINEER
MICHAEL B. WHITE
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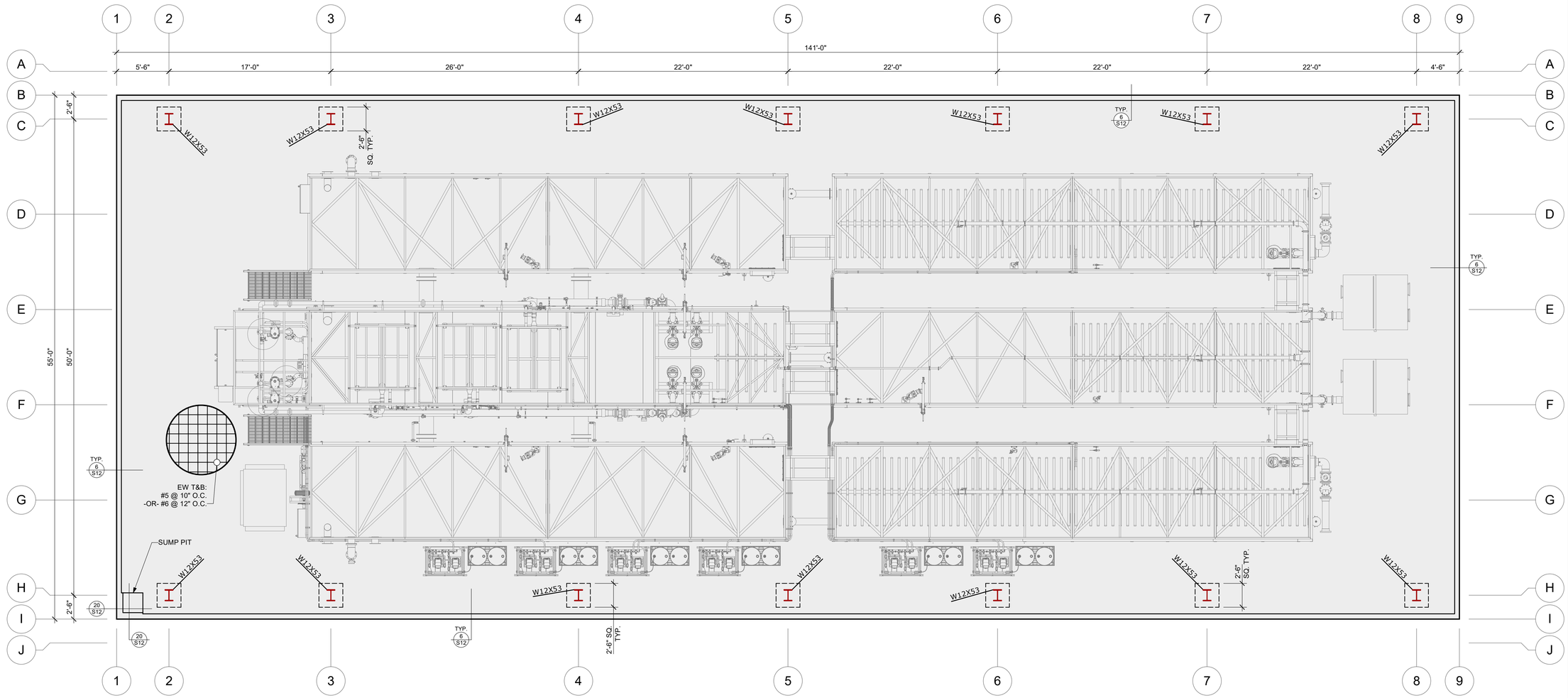
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APPROVED BY: NBW
DATE: 03/31/2026

STRUCTURAL SPECIFICATIONS

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457
FILE NAME: 230457 - CAMP ROBERTS WWTP

SHEET NO. **S03**
SHEET 21 OF
REVISION **0**



TYPICAL DETAILS

DETAIL DESCRIPTION	LOCATION
REBAR LAP SPLICES & DEV. LENGTHS	3/S12
TYPICAL REINFORCEMENT BAR BENDS	4/S12
TYPICAL MAT SLAB SECTION W/O CURB DETAIL	5/S12
TYPICAL MAT SLAB SECTION W/ CURB DETAIL	6/S12
TYPICAL MAT SLAB W/ INTERIOR CURB DETAIL	7/S12
TYPICAL MAT SLAB CONSTRUCTION JOINT DETAIL	8/S12
TYPICAL PIPE THROUGH SLAB DETAIL	9/S12
TYPICAL OPENING IN CONCRETE SLAB DETAIL	10/S12
TYPICAL ISOLATED PAD DETAIL	13/S12
TYPICAL SLAB CORNER DETAIL	14/S12
-	-
-	-

DETAILS LISTED ABOVE ARE TYPICAL THROUGHOUT THIS PLAN UNO. ALSO SEE TYP. DEAILS SCHED. WHERE PROVIDED ON OTHER PLAN SHEETS.

GENERAL FOUNDATION NOTES

SYMBOL KEY:

= 12" THICK MAT SLAB PER PLAN

= STEEL COLUMN ABOVE PER PLAN SEE DETAIL 17/S12 COLUMN FDN.

= CONTAINMENT CURB PER PLAN

= COLUMN LEVELING PAD PER PLAN

1. CONCRETE STRENGTH, F'C = 4500 PSI, UNO. SEE SOILS REPORT, GENERAL NOTES, AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND MATERIAL SPECIFICATIONS.
2. VERIFY ALL DIMENSIONS WITH CIVIL DRAWINGS AND COORDINATE INSTALLATION OF EQUIPMENT WITH THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS. DIMENSIONS SHOWN ARE FOR CONVENIENCE ONLY AND ARE GOVERNED BY THE CIVIL DRAWINGS. DO NOT RELY UPON THE DIMENSIONS SHOWN ON THIS PLAN FOR BIDDING OR CONSTRUCTION.
3. LOCATION OF FOUNDATIONS ON-SITE IS PER THE CIVIL ENGINEER. TANKS AND THEIR ANCHORAGE ARE PER THE CIVIL ENGINEER AND THE MANUFACTURER. SLOPE SLAB FOR DRAINAGE PER CIVIL ENGINEER.
4. SOIL PREPARATION, SUBGRADE, EMBEDMENT INTO APPROVED COMPETENT SOIL, AND MOISTURE PROTECTION PER THE SOILS REPORT.
5. ANCHORAGE OF ALL EQUIPMENT IS PER THE MANUFACTURER, UNO. ALL ANCHORAGE AND FASTENING HARDWARE SHALL BE STAINLESS STEEL, EXCEPT WHERE HOT DIP GALVANIZED IS SPECIFIED.

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C	12/6/24	65% DESIGN SUBMITTAL	MAM	NBW
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN		
A	02/28/18	35% DESIGN		

REVISION SUMMARY

SCALE: 3/16" = 1'-0"
BARS SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
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APPROVED BY: NBW
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MBR FOUNDATION PLAN

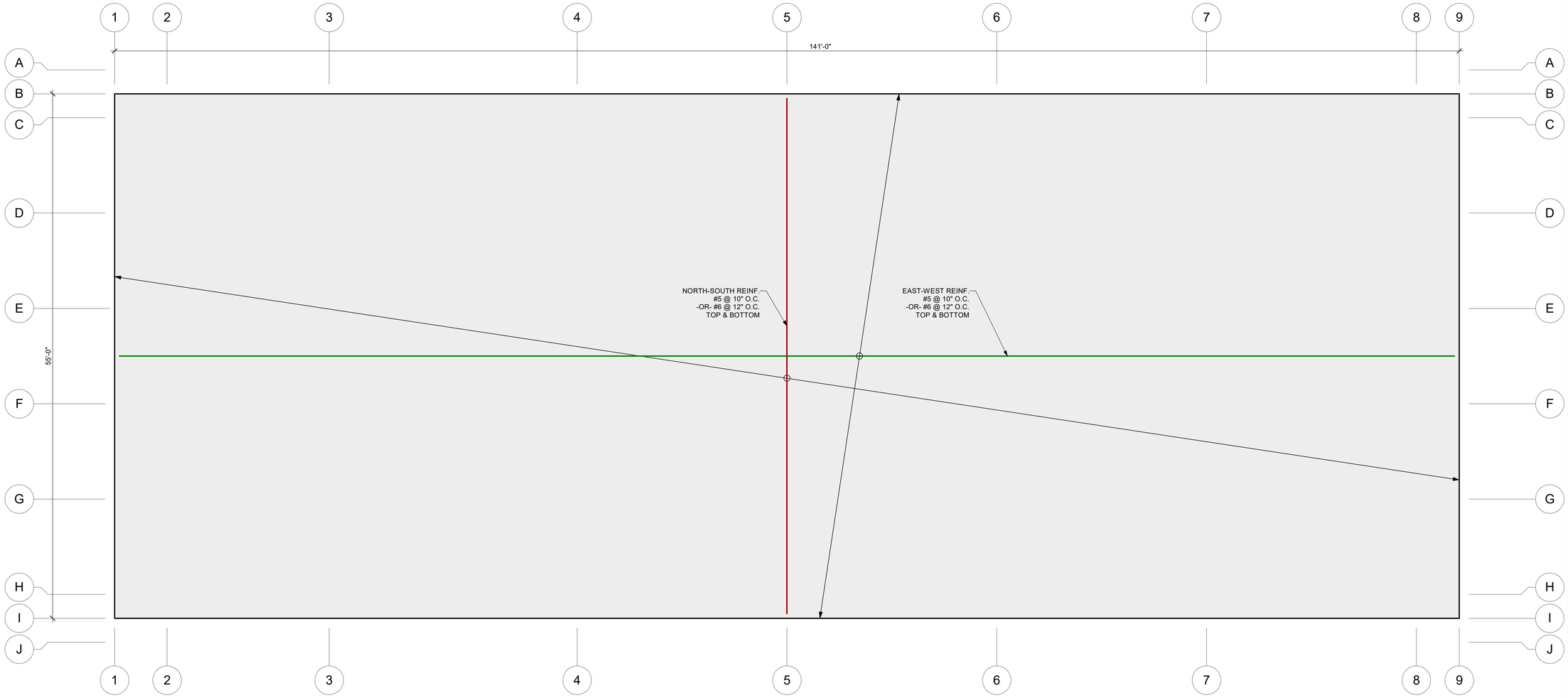
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457 | FILE NAME: 230457 - CAMP ROBERTS WWTP

SHEET NO. **S04**
SHEET 22 OF
REVISION 0

PLAN NORTH

N



REBAR PLAN NOTES

SYMBOL KEY:

= NORTH-SOUTH REBAR PER PLAN

= EAST-WEST REBAR PER PLAN

= REBAR EXTENTS PER PLAN

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S 4618
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DESIGNER:	MAM
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MBR MAT SLAB REBAR PLAN

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

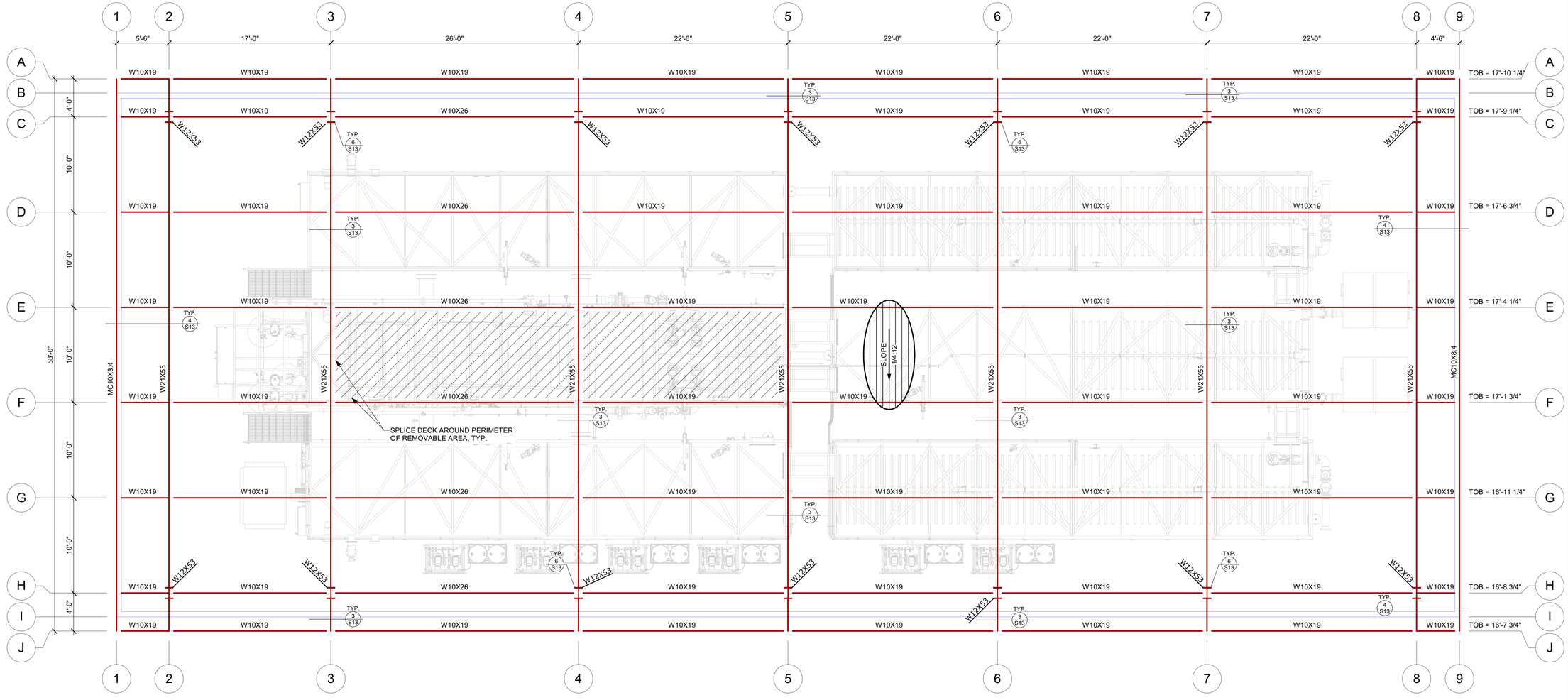
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SHEET NO. **S05**

SHEET 23 OF

REVISION **0**

PLAN NORTH



GENERAL FRAMING NOTES

SYMBOL KEY:

- = ROOF DECK SEE DETAIL 2/S13
- = STEEL BEAM PER PLAN
- = STEEL BEAM CONTINUOUS OVER COLUMN PER PLAN
- = STEEL WIDE FLANGE COLUMN BELOW PER PLAN
- = EXTENT REMOVEABLE ROOF

1. SEE GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND MATERIAL SPECIFICATIONS.
2. VERIFY ALL DIMENSIONS WITH CIVIL DRAWINGS AND COORDINATE INSTALLATION OF EQUIPMENT WITH THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS. DIMENSIONS SHOWN ARE FOR CONVENIENCE ONLY AND ARE GOVERNED BY THE CIVIL DRAWINGS. DO NOT RELY UPON THE DIMENSIONS SHOWN ON THIS PLAN FOR BIDDING OR CONSTRUCTION.
3. USE VERCO HSB-36 18GA, GRADE 50 W/ G90 GALVANIZED COATING & WHITE PRIMER OVER THE GALVANIZATION ON TOPSIDE OF DECK. SLOPE ROOF 1/4:12 FOR DRAINAGE. 2 SPANS MIN. EXCEPT IN REMOVABLE AREA. SEE DETAIL 2/S13.
4. SEE SHEET S07 FOR MBR CANOPY ELEVATION VIEWS
5. ROOF DECK IS INTENDED TO PROVIDE SUN SHADING AND GENERAL RAIN PROTECTION.

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REGISTERED PROFESSIONAL ENGINEER DANIEL B. WHITAKER S-4816 STRUCTURAL STATE OF CALIFORNIA

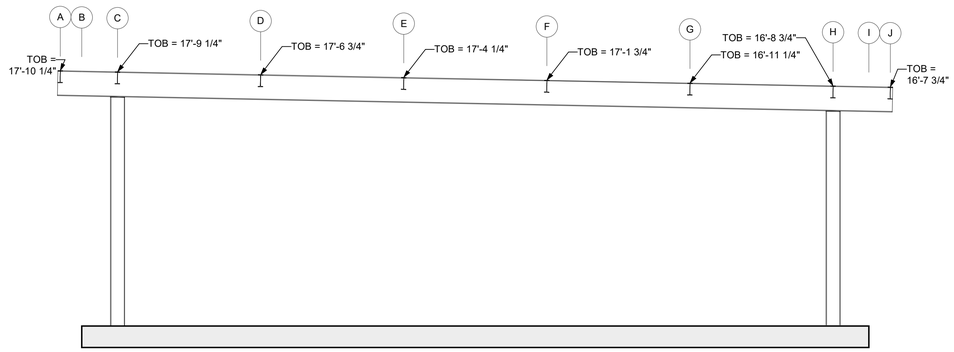
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MBR CANOPY FRAMING PLAN

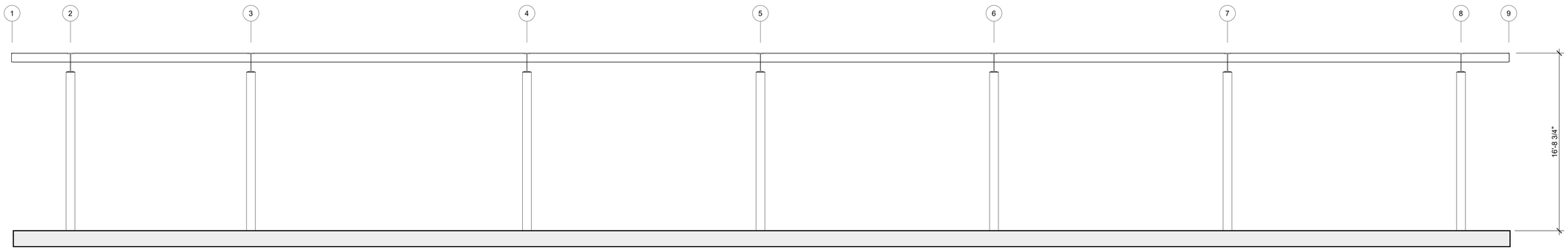
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457
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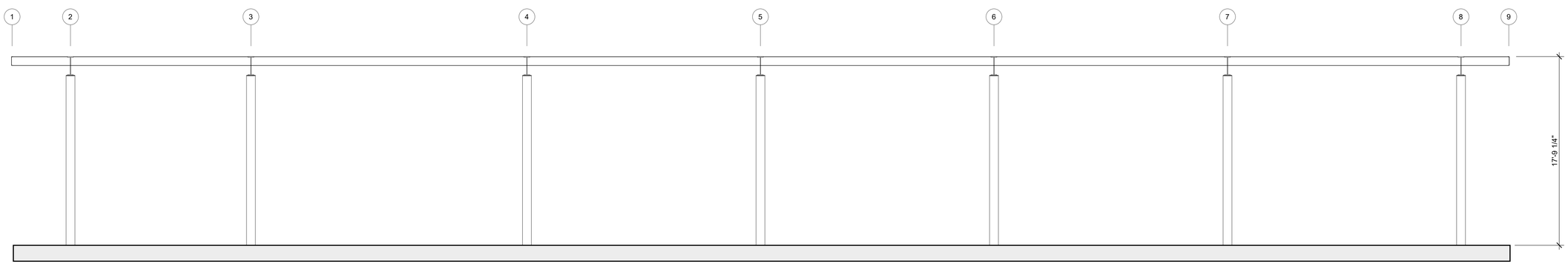
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SHEET 24 OF
REVISION 0



GRIDLINES 2 THROUGH 8 ELEVATION - LOOKING PLAN EAST (A)



GRIDLINE H ELEVATION - LOOKING PLAN NORTH (B)



GRIDLINE C ELEVATION - LOOKING PLAN NORTH (C)

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STRUCTURAL

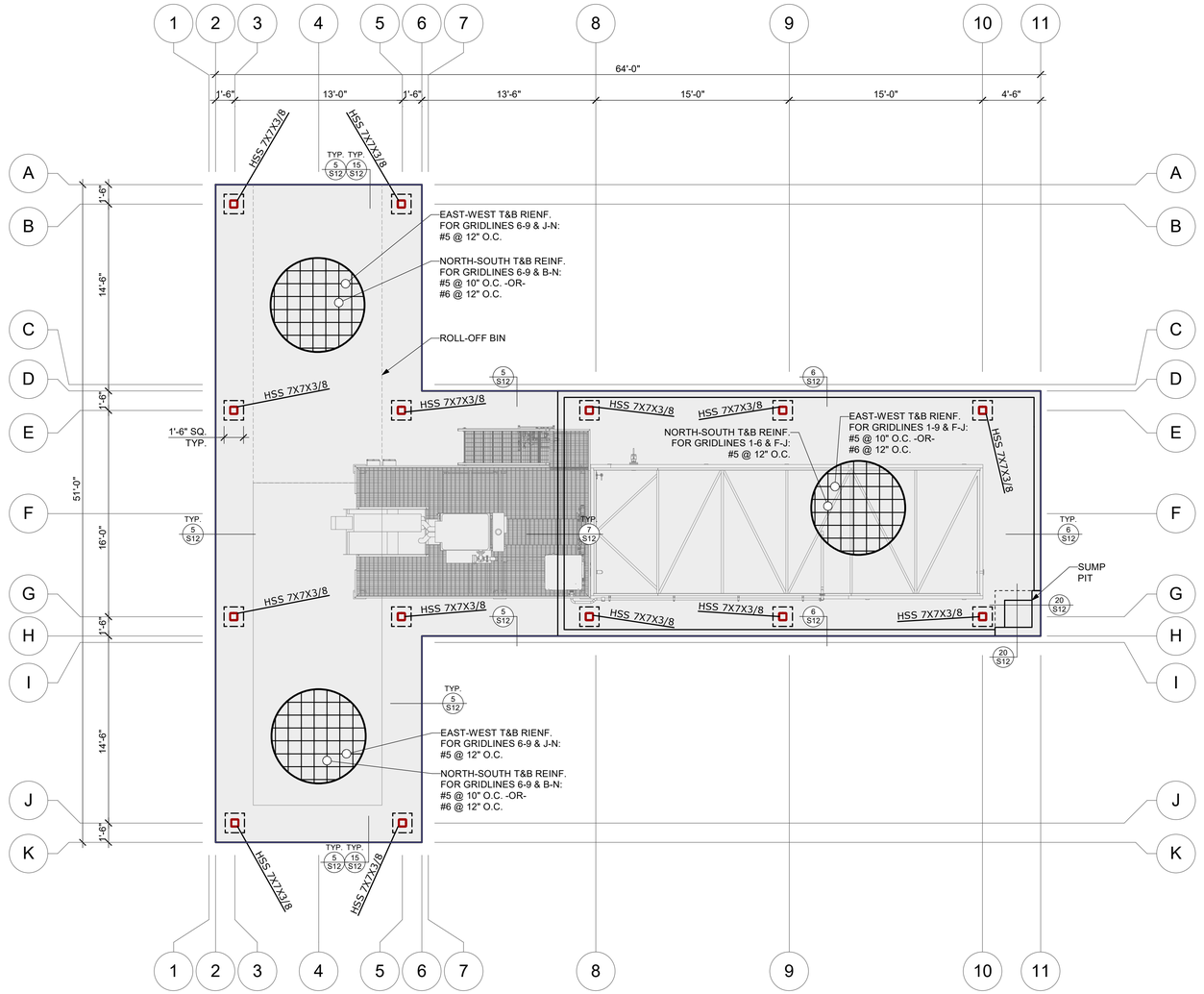
DESIGNER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
MAM	MAM	NBW	NBW	03/31/2026

MBR CANOPY ELEVATION VIEW

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457 | FILE NAME: 230457 - CAMP ROBERTS WWTP

SHEET NO. **S07**
SHEET 25 OF
REVISION **0**



TYPICAL DETAILS	
DETAIL DESCRIPTION	**LOCATION**
REBAR LAP SPLICES & DEV. LENGTHS	3/S12
TYPICAL REINFORCEMENT BAR BENDS	4/S12
TYPICAL MAT SLAB SECTION W/O CURB DETAIL	5/S12
TYPICAL MAT SLAB SECTION W/ CURB DETAIL	6/S12
TYPICAL MAT SLAB W/ INTERIOR CURB DETAIL	7/S12
TYPICAL MAT SLAB CONSTRUCTION JOINT DETAIL	8/S12
TYPICAL PIPE THROUGH SLAB DETAIL	9/S12
TYPICAL OPENING IN CONCRETE SLAB DETAIL	10/S12
TYPICAL ISOLATED PAD DETAIL	13/S12
TYPICAL SLAB CORNER DETAIL	14/S12
-	-
-	-
DETAILS LISTED ABOVE ARE TYPICAL THROUGHOUT THIS PLAN UNO. ALSO SEE TYP. DEAILS SCHED. WHERE PROVIDED ON OTHER PLAN SHEETS.	

GENERAL FOUNDATION NOTES

SYMBOL KEY:

- = 12" THICK MAT SLAB PER PLAN
- = STEEL COLUMN ABOVE PER PLAN SEE DETAIL 18/S12 COLUMN FDN.
- = CONTAINMENT CURB PER PLAN
- = COLUMN LEVELING PAD PER PLAN

1. CONCRETE STRENGTH, F'C = 4000 PSI, UNO. SEE SOILS REPORT, GENERAL NOTES, AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND MATERIAL SPECIFICATIONS.
2. VERIFY ALL DIMENSIONS WITH CIVIL DRAWINGS AND COORDINATE INSTALLATION OF EQUIPMENT WITH THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS. DIMENSIONS SHOWN ARE FOR CONVENIENCE ONLY AND ARE GOVERNED BY THE CIVIL DRAWINGS. DO NOT RELY UPON THE DIMENSIONS SHOWN ON THIS PLAN FOR BIDDING OR CONSTRUCTION.
3. LOCATION OF FOUNDATIONS ON-SITE IS PER THE CIVIL ENGINEER. TANKS AND THEIR ANCHORAGE ARE PER THE CIVIL ENGINEER AND THE MANUFACTURER. SLOPE SLAB FOR DRAINAGE PER CIVIL ENGINEER.
4. SOIL PREPARATION, SUBGRADE, EMBEDMENT INTO APPROVED COMPETENT SOIL, AND MOISTURE PROTECTION PER THE SOILS REPORT.
5. ANCHORAGE OF ALL EQUIPMENT IS PER THE MANUFACTURER, UNO. ALL ANCHORAGE AND FASTENING HARDWARE SHALL BE STAINLESS STEEL, EXCEPT WHERE HOT DIP GALVANIZED IS SPECIFIED.

STRUCTURAL ENGINEER:
T&S STRUCTURAL
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WWW.TSSTRUCTURAL.COM
SAN LUIS OBISPO
PASADENA
SANTA BARBARA
SANTA CLARA
HEADQUARTERS:
684 CLARION COURT
SAN LUIS OBISPO, CA 93401

PREPARED BY
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR
CALIFORNIA MILITARY DEPARTMENT
10601 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APP'D
0	03/31/26	100% DESIGN SUBMITTAL	MAM	NBW
E	11/06/25	95% DESIGN SUBMITTAL	MAM	NBW
D	08/06/25	REVISED 65% DESIGN SUBMITTAL	MAM	NBW
C	12/04/24	65% DESIGN SUBMITTAL	MAM	NBW
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN		
A	02/28/18	35% DESIGN		

SCALE: 3/16" = 1'-0"
BARS SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
MICHAEL B. WITHERS
S 4816
STRUCTURAL
STATE OF CALIFORNIA

DESIGNER: MAM
DRAWN BY: MAM
CHECKED BY: NBW
APPROVED BY: NBW
DATE: 03/31/2026

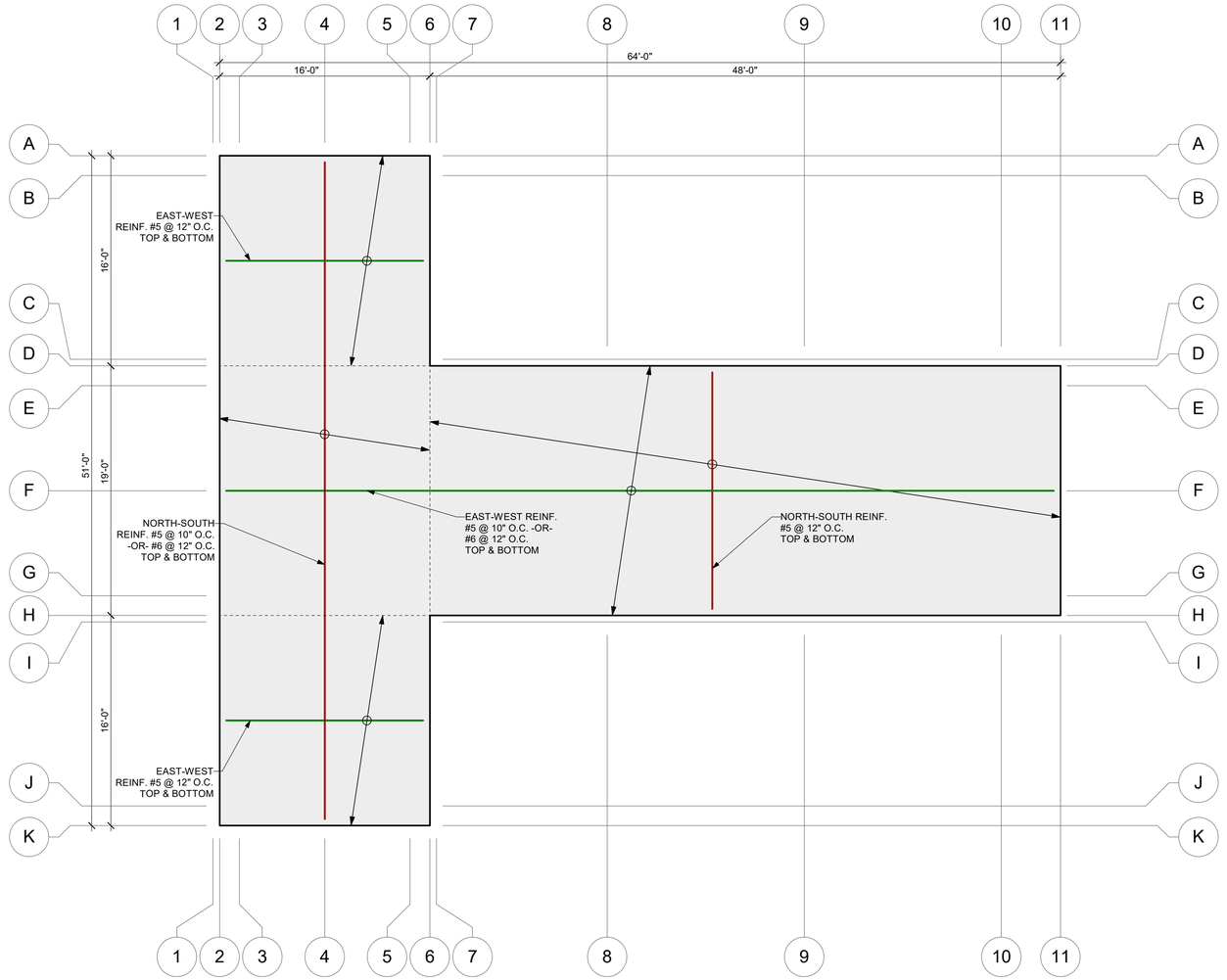
SLUDGE TANK FOUNDATION PLAN

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

FILE NAME: 230457 - CAMP ROBERTS WWTP
PROJECT No. 230457

SHEET NO. **S08**
SHEET 26 OF
REVISION **0**

PLAN NORTH



REBAR PLAN NOTES

SYMBOL KEY:

= NORTH-SOUTH REBAR PER PLAN

= EAST-WEST REBAR PER PLAN

= REBAR EXTENTS PER PLAN

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SAN LUIS OBISPO, CA 93401

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Weaver Consultants Group
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PREPARED FOR
CALIFORNIA MILITARY DEPARTMENT
10601 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

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0	03/31/26	100% DESIGN SUBMITTAL	MAM	NBW
E	11/06/25	95% DESIGN SUBMITTAL	MAM	NBW
D	08/06/25	REVISED 65% DESIGN SUBMITTAL	MAM	NBW
C	12/05/24	65% DESIGN SUBMITTAL	MAM	NBW
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN		
A	02/28/18	35% DESIGN		

SCALE: 3/16" = 1'-0"
BARS SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
NATHANIEL B. WHITAKER
S 5616
STRUCTURAL
STATE OF CALIFORNIA

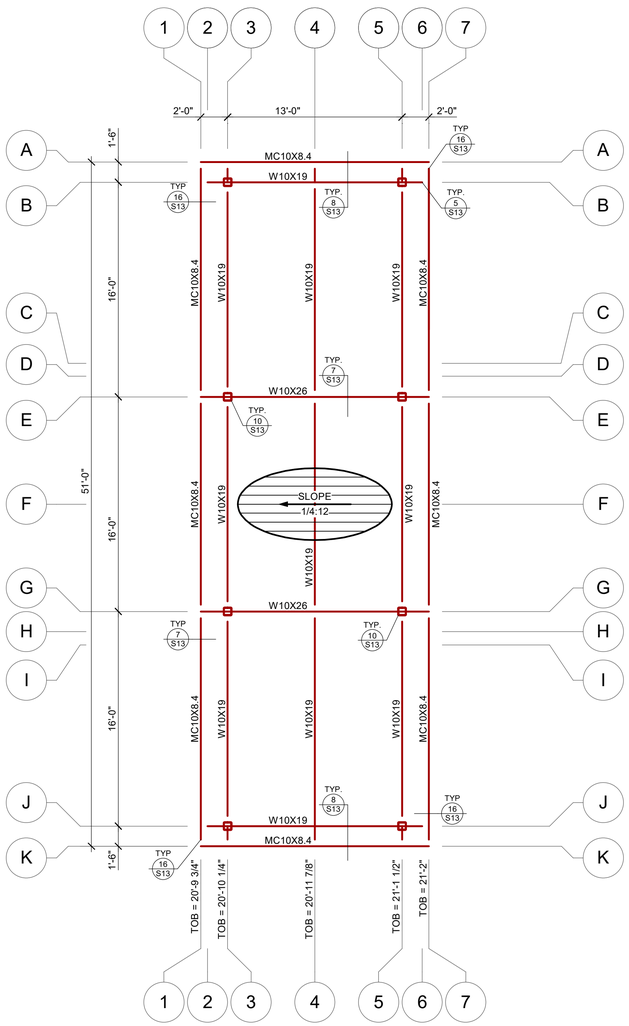
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DRAWN BY: MAM
CHECKED BY: NBW
APPROVED BY: NBW
DATE: 03/31/2026

SLUDGE TANK MAT SLAB REBAR PLAN

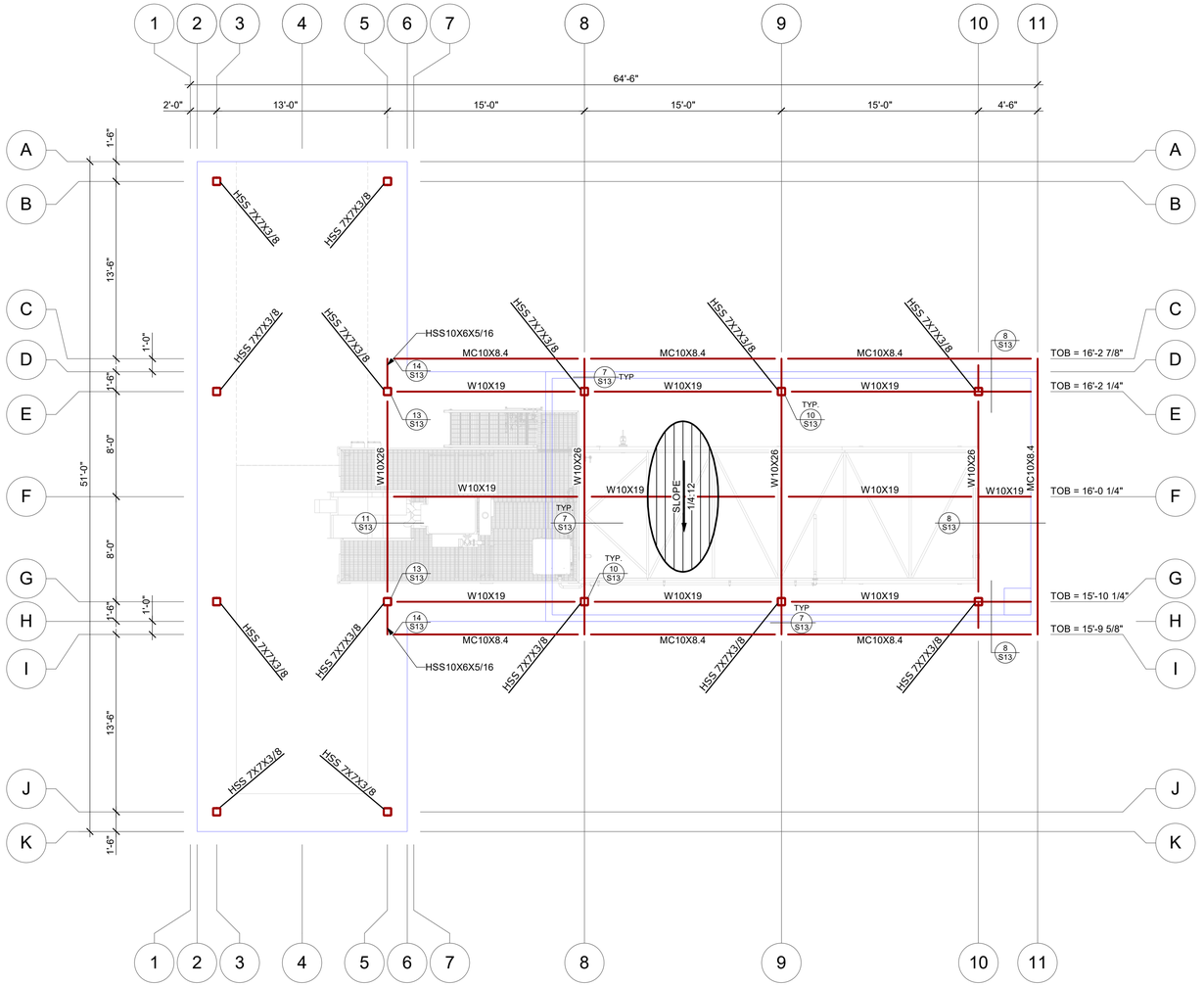
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457 | FILE NAME: 230457 - CAMP ROBERTS WWTP

SHEET NO. **S09**
SHEET 27 OF
REVISION **0**



HIGH ROOF FRAMING PLAN



LOW ROOF FRAMING PLAN

GENERAL FRAMING NOTES

SYMBOL KEY:

- = ROOF DECK SEE DETAIL 2/S13
- = STEEL BEAM PER PLAN
- = STEEL HSS COLUMN BELOW PER PLAN
- = STEEL BEAM CONTINUOUS OVER COLUMN PER PLAN
- = PERIMETER OF ROOF DECK

1. SEE GENERAL NOTES AND SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND MATERIAL SPECIFICATIONS.
2. VERIFY ALL DIMENSIONS WITH CIVIL DRAWINGS AND COORDINATE INSTALLATION OF EQUIPMENT WITH THE MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS. DIMENSIONS SHOWN ARE FOR CONVENIENCE ONLY AND ARE GOVERNED BY THE CIVIL DRAWINGS. DO NOT RELY UPON THE DIMENSIONS SHOWN ON THIS PLAN FOR BIDDING OR CONSTRUCTION.
3. USE VERCO HSB-36 18GA, GRADE 50 W/ G90 GALVANIZED COATING & WHITE PRIMER OVER THE GALVANIZATION ON TOPSIDE OF DECK. SLOPE ROOF 1/4:12 FOR DRAINAGE. 2 SPANS MIN. SEE DETAIL 2/S13.
4. SEE SHEET S11 FOR SLUDGE TANK CANOPY ELEVATION VIEWS
5. ROOF DECK IS INTENDED TO PROVIDE SUN SHADING AND GENERAL RAIN PROTECTION.

PLAN NORTH

STRUCTURAL ENGINEER:
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684 CLARION COURT
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PREPARED FOR:
CALIFORNIA MILITARY DEPARTMENT
1060T BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APPD
A	02/28/18	35% DESIGN		
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	MAM	NBW
C	11/07/24	65% DESIGN SUBMITTAL	MAM	NBW
D	06/06/25	REVISED 65% DESIGN SUBMITTAL	MAM	NBW
E	11/06/25	95% DESIGN SUBMITTAL	MAM	NBW
0	03/31/26	100% DESIGN SUBMITTAL		

SCALE:
BARS SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
MICHAEL B. WHITE
S 4818
STRUCTURAL
STATE OF CALIFORNIA

DESIGNER: MAM
DRAWN BY: MAM
CHECKED BY: NBW
APPROVED BY: NBW
DATE: 03/31/2026

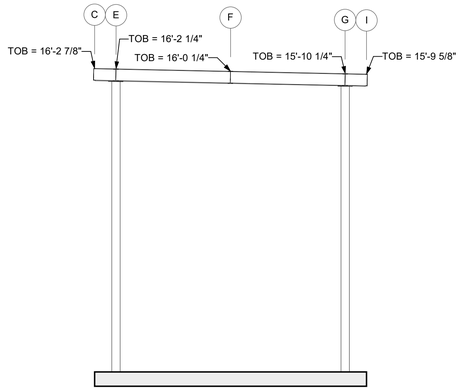
SLUDGE TANK CANOPY FRAMING PLAN

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

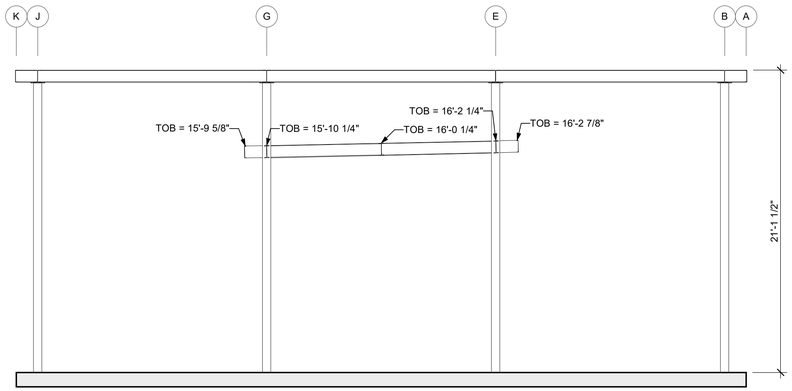
PROJECT No. 230457
FILE NAME: 230457 - CAMP ROBERTS WWTP

SHEET NO.
S10

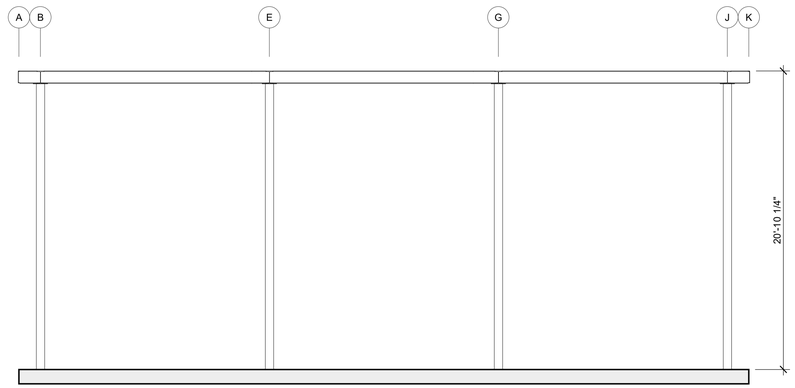
SHEET 28 OF
REVISION **0**



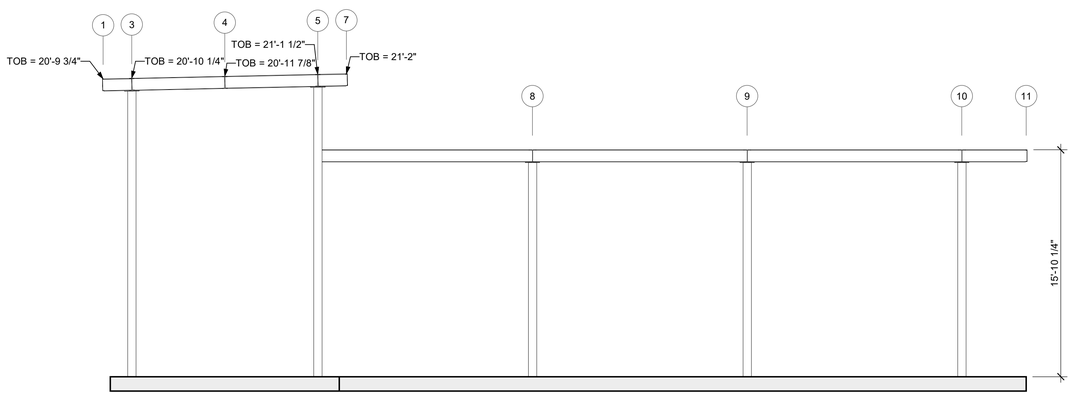
GRIDLINE 7 & 8 & 9 ELEVATION - LOOKING PLAN EAST (A)



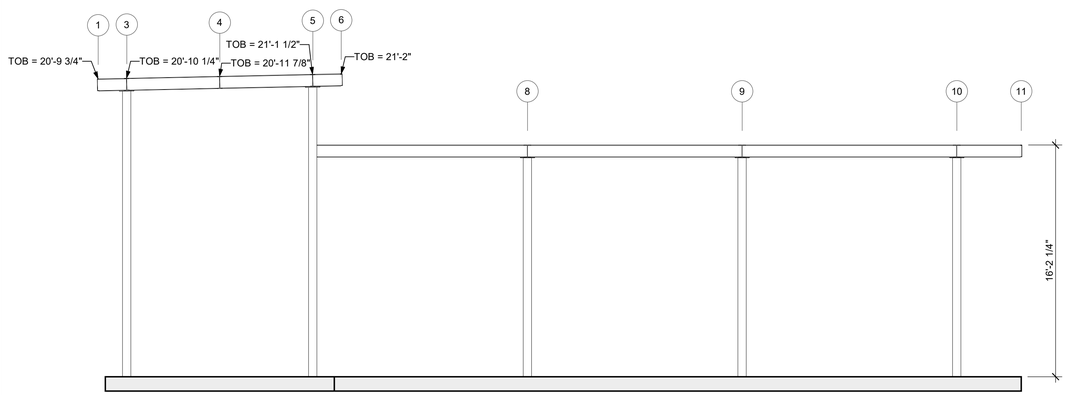
GRIDLINE 5 ELEVATION - LOOKING PLAN WEST (B)



GRIDLINE 3 ELEVATION - LOOKING PLAN EAST (C)



GRIDLINE G ELEVATION - LOOKING PLAN NORTH (E)



GRIDLINE E ELEVATION - LOOKING PLAN NORTH (D)

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684 CLARION COURT
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PREPARED BY:
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR:
CALIFORNIA MILITARY DEPARTMENT
10601 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

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D	08/06/25	REVISED 65% DESIGN SUBMITTAL	MAM	NBW
C	12/16/24	65% DESIGN SUBMITTAL	MAM	NBW
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN		
A	02/28/18	35% DESIGN		

SCALE: 1" = 5'-4"
BARS SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
Nathaniel B. Whitaker
S 4616
STATE OF CALIFORNIA
STRUCTURAL

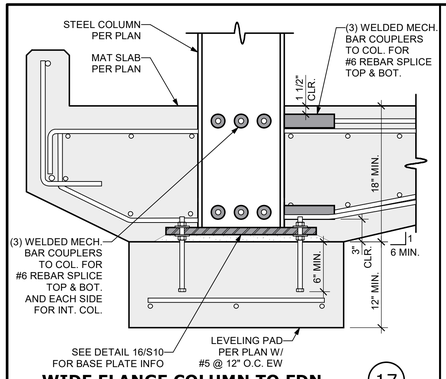
DESIGNER: MAM
DRAWN BY: MAM
CHECKED BY: NBW
APPROVED BY: NBW
DATE: 03/31/2026

SLUDGE TANK CANOPY ELEVATION VIEW

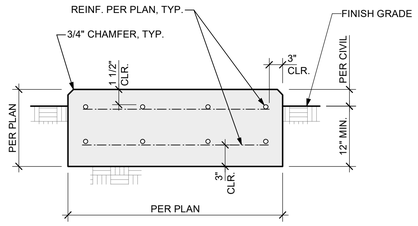
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457 | FILE NAME: 230457 - CAMP ROBERTS WWTP

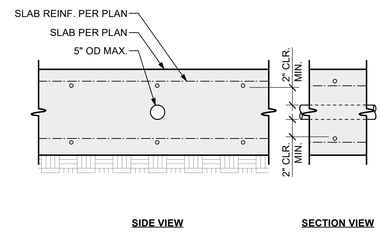
SHEET NO. **S11**
SHEET 29 OF
REVISION **0**



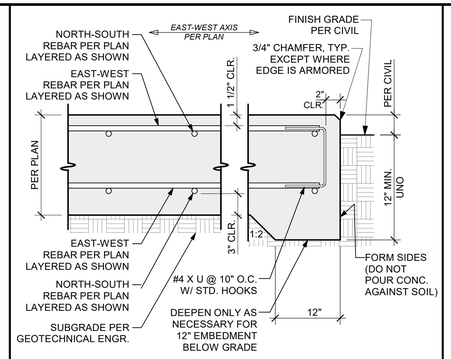
WIDE FLANGE COLUMN TO FDN. 17



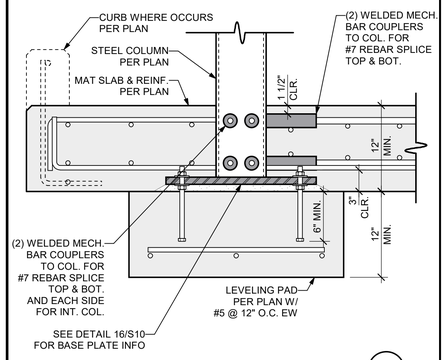
TYPICAL ISOLATED PAD 13



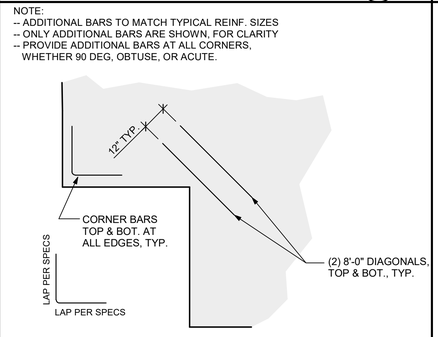
TYPICAL PIPE THROUGH SLAB 9



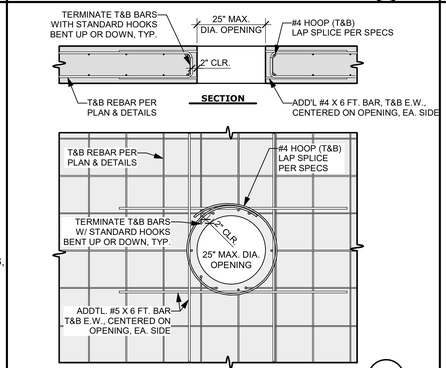
TYP. MAT SLAB SECTION W/O CURB 5



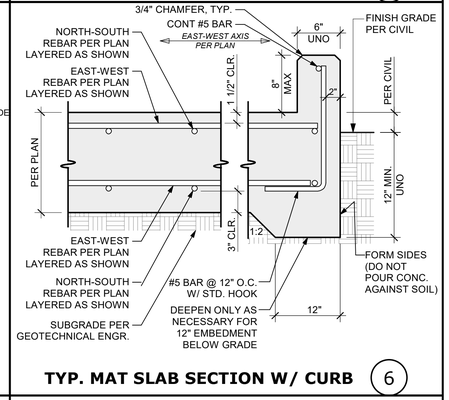
HSS COLUMN TO FOUNDATION 18



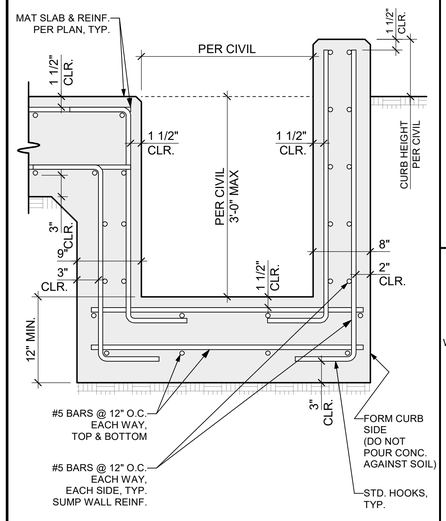
TYPICAL SLAB CORNER DETAIL 14



TYP. OPENING IN CONCRETE SLAB 10

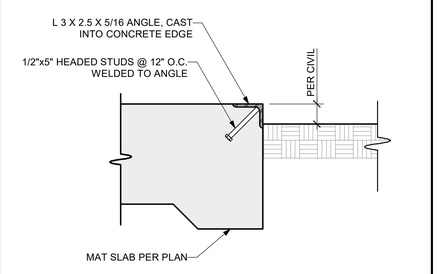


TYP. MAT SLAB SECTION W/ CURB 6

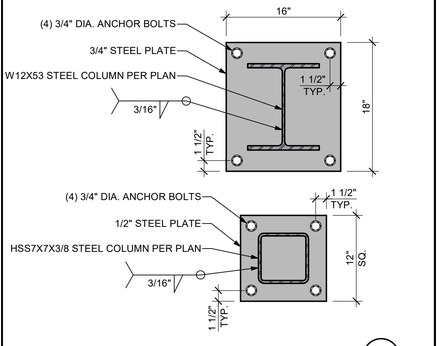


SUMP PIT IN CONC. MAT SLAB 20

NOTE: STEEL ANGLE & BOLTS ASSEMBLY SHALL BE HDG AFTER FABRICATION

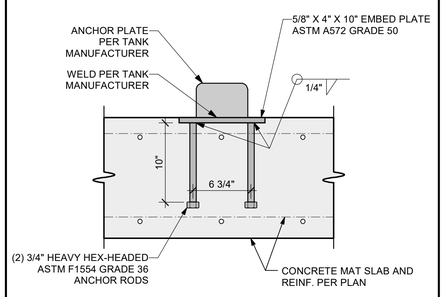


ARMORED CONCRETE SLAB EDGE 15

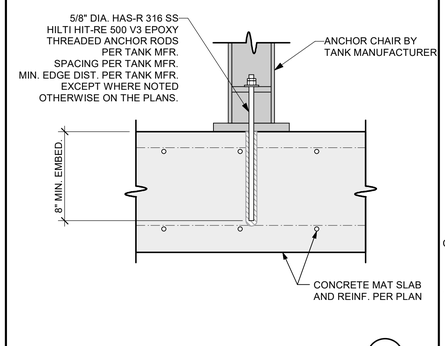


STEEL COLUMN BASE PLATE 16

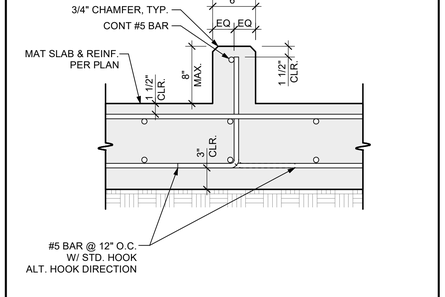
NOTE:
-- HOT DIP GALVANIZE EMBED PLATE & ROD ASSEMBLY.
-- COLD GALVANIZE AFTER WELDING ANCHOR PLATE WHERE HOT DIP GALVANIZING IS AFFECTED BY WELDING.



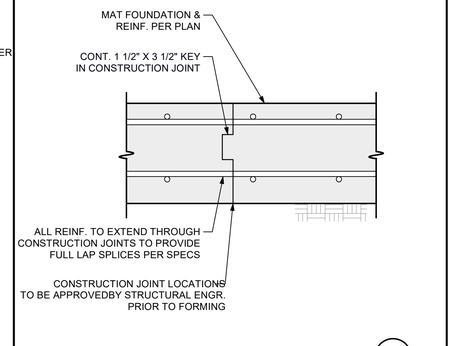
SLUDGE TANK ANCHORAGE 11



EPOXIED TANK ANCHORAGE 12



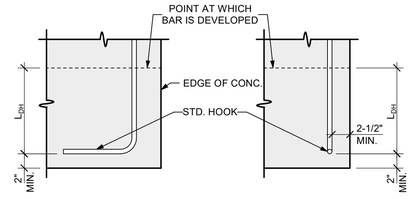
TYP. MAT SLAB W/ INTERIOR CURB 7



TYP. MAT CONSTRUCTION JOINT 8

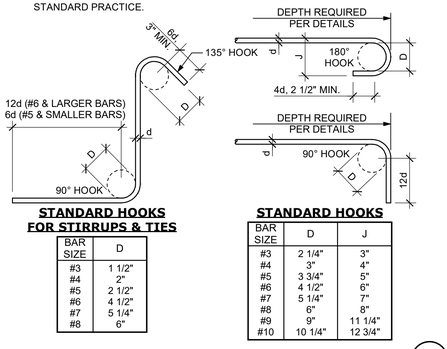
BAR SIZE	TENSION LAP SPLICE LENGTH, CLASS B (IN.)[5] TOP	TENSION LAP SPLICE LENGTH, CLASS B (IN.)[5] OTHER	DEVELOPMENT LENGTH, L_D (IN.)[5] TOP	DEVELOPMENT LENGTH, L_D (IN.)[5] OTHER	HOOK DEVELOPMENT LENGTH, L_{DH} (IN.)[6] CASE 1	HOOK DEVELOPMENT LENGTH, L_{DH} (IN.)[6] CASE 2
#3	16	16	12	12	8	6
#4	20	16	15	12	10	7
#5	29	23	23	18	12	9
#6	40	31	31	24	15	11
#7	65	50	50	39	17	13
#8	81	62	62	48	19	14
#9	98	76	75	59	22	16
#10	119	92	91	71	25	18
#11	141	108	109	83	27	20

NOTES:
1. ALL SPLICES SHALL BE TENSION LAP SPLICES UNO.
2. LENGTHS SHOWN ASSUME 1" MINIMUM CLEAR COVER AND 2" MINIMUM CLEAR SPACING BETWEEN BARS. CONTACT T&S WHERE TIGHTER BAR SPACINGS ARE REQUIRED.
3. LENGTHS SHOWN ARE FOR GRADE 60 UNCOATED BARS. WHERE 40 KSI #3 BARS ARE ALLOWED, 16" LAP SPLICES, 12" DEVELOPMENT LENGTHS, & 6" HOOK DEVELOPMENT LENGTHS MAY BE USED.
4. LENGTHS SHOWN ARE FOR NORMAL WEIGHT CONCRETE. INCREASE LENGTHS 30% FOR LIGHT WEIGHT CONCRETE.
5. TOP BARS ARE HORIZONTAL BARS PLACED WITH MORE THAN 12" OF FRESH CONCRETE CAST BELOW THEM.
6. CASE 1 HOOK DEVELOPMENT LENGTHS MUST BE USED UNLESS CASE 2 MINIMUM SIDE COVER AND HOOK COVER REQUIREMENTS ARE MET AS SHOWN BELOW.



REBAR LAP SPLICE & DEV. LENGTHS 3

NOTE: ALL BAR BEND DIAMETERS AND END LENGTHS MUST CONFORM TO THE CRSI MANUAL OF STANDARD PRACTICE.



STANDARD HOOKS FOR STIRRUPS & TIES

BAR SIZE	D
#3	1 1/2"
#4	2"
#5	2 1/2"
#6	4 1/2"
#7	5 1/4"
#8	6"

STANDARD HOOKS

BAR SIZE	D	J
#3	2 1/4"	3"
#4	3"	4"
#5	3 3/4"	5"
#6	4 1/2"	6"
#7	5 1/4"	7"
#8	6"	8"
#9	9"	11 1/4"
#10	10 1/4"	12 3/4"

TYP. REINFORCEMENT BAR BENDS 4

STRUCTURAL ENGINEER: T&S STRUCTURAL
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PASADENA
SANTA BARBARA
SANTA CLARA
HEADQUARTERS:
684 CLARION COURT
SAN LUIS OBISPO, CA 93401

PREPARED BY: Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR: CALIFORNIA MILITARY DEPARTMENT
10601 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	MAM	NBW
E	11/06/25	95% DESIGN SUBMITTAL	MAM	NBW
D	08/06/25	REVISED 65% DESIGN SUBMITTAL	MAM	NBW
C	05/01/25	65% DESIGN SUBMITTAL	MAM	NBW
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN		
A	02/28/18	35% DESIGN		

REVISION SUMMARY

SCALE: NTS



DESIGNER:	MAM
DRAWN BY:	MAM
CHECKED BY:	NBW
APPROVED BY:	NBW
DATE:	03/31/2026

STRUCTURAL DETAILS

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457 | FILE NAME: 230457 - CAMP ROBERTS WWTP

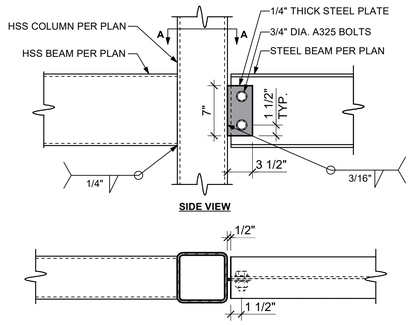
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SHEET 30 OF

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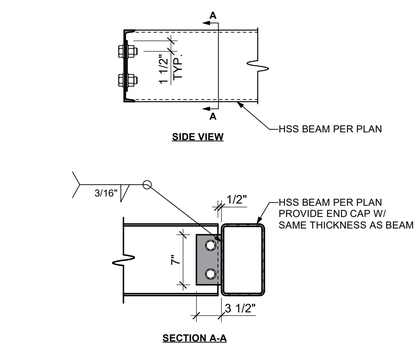
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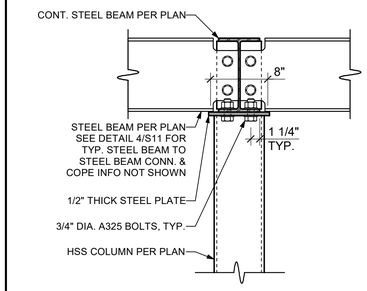
BEAMS TO CONT. HSS COLUMN 13

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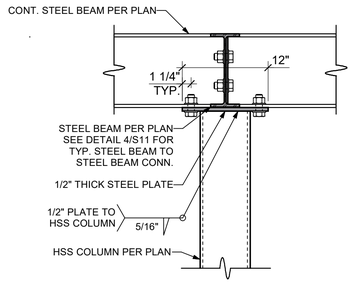
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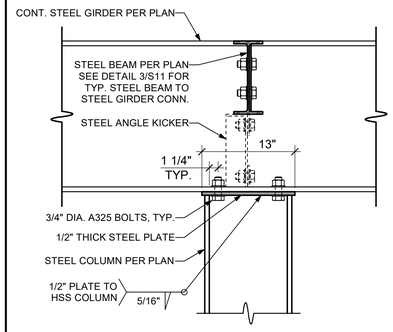
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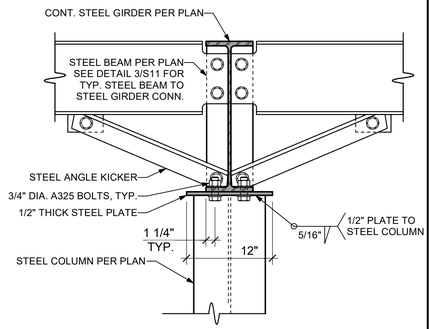


STEEL BEAM TO HSS COLUMN 10

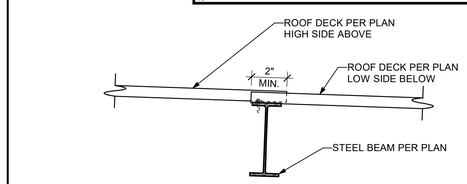


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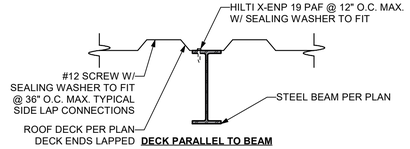




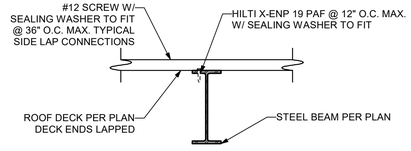
STEEL BEAM TO WIDE FLANGE COL. 6



DECK LAP - LOW SIDE DOWN FIRST



DECK PARALLEL TO BEAM

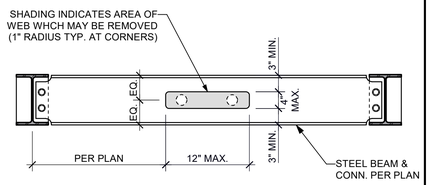


DECK PERPENDICULAR TO BEAM

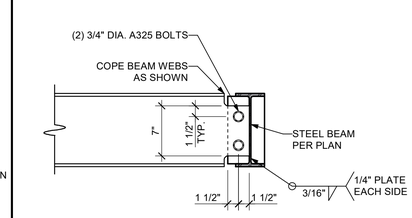
ROOF DECK TO STEEL FRAMING 2

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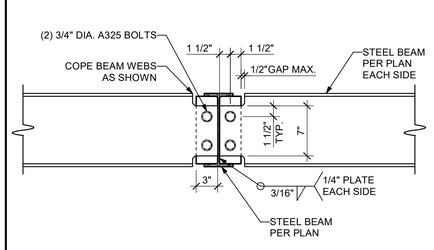
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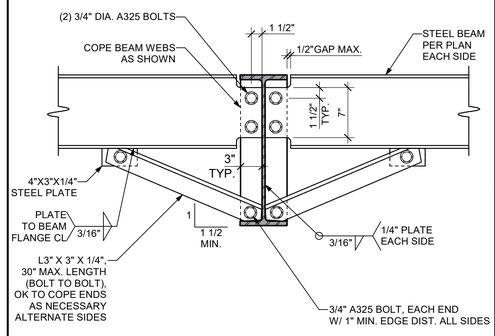
TYP. SMALL BEAM PENETRATIONS 15



STEEL BEAM TO STEEL BEAM 11



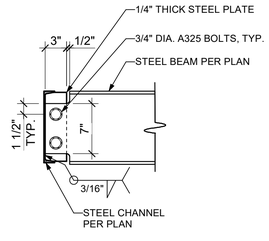
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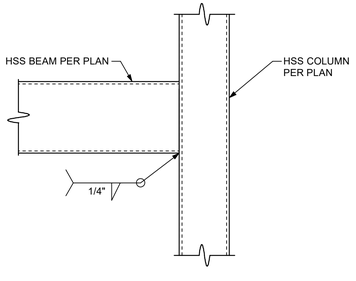
STEEL BEAM TO STEEL GIRDER 3

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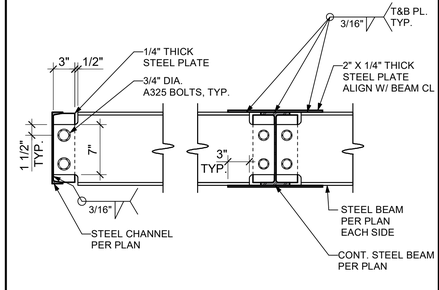
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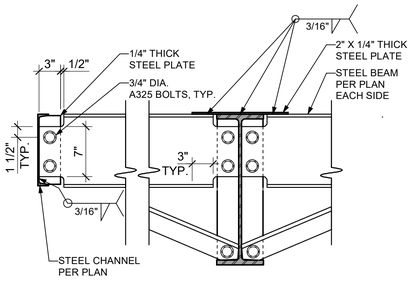
STEEL BEAM TO STEEL CHANNEL 16



HSS BEAM TO HSS COLUMN 12



ROOF OVERHANG STEEL FRAMING 8



ROOF OVERHANG STEEL FRAMING 4

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SAN LUIS OBISPO, CA 93401

PREPARED BY
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1 TECHNOLOGY DRIVE, SUITE C515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR
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10601 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

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B	04/17/24	REVISIONS TO CIVIL 35% DESIGN		
A	02/28/18	35% DESIGN		

REVISION SUMMARY

SCALE: NTS

REGISTERED PROFESSIONAL ENGINEER
DANIEL B. WITHERS
S 4618
STRUCTURAL
STATE OF CALIFORNIA

DESIGNER: MAM
DRAWN BY: MAM
CHECKED BY: NBW
APPROVED BY: NBW
DATE: 03/31/2026

STRUCTURAL DETAILS

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457 | FILE NAME: 230457 - CAMP ROBERTS WWTP

SHEET NO. **S13**

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REVISION **0**

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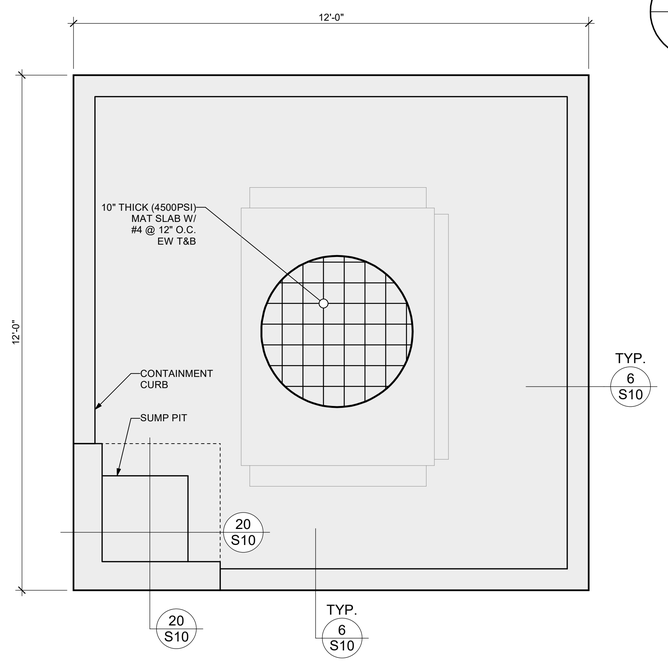
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DUMPSTER FOUNDATION PLAN 3

PLAN NORTH

N

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PREPARED BY
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A	02/28/18	35% DESIGN		

REVISION SUMMARY

SCALE: NTS

REGISTERED PROFESSIONAL ENGINEER — MICHAEL B. WHITTAKER — No. S 4818 — STATE OF CALIFORNIA — STRUCTURAL

DESIGNER:	MAM
DRAWN BY:	MAM
CHECKED BY:	NBW
APPROVED BY:	NBW
DATE:	03/31/2026

STRUCTURAL DETAILS

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 230457 | FILE NAME: 230457 - CAMP ROBERTS WWTP

SHEET NO. **S14**

SHEET 32 OF

REVISION **0**

SCHEMATIC DIAGRAM SYMBOLS

- CR — CONTROL RELAY
- TD — TIME DELAY RELAY
- AR — ALARM RELAY
- ETM — ELAPSED TIME METER
- M — MOTOR STARTER OR CONTACTOR COIL
- PC — PHOTO CELL
- R — BEACON ALARM LIGHT, LETTER INDICATES COLOR, R=RED, A=AMBER, B=BLUE, G=GREEN
- R — PILOT LIGHT, LETTER INDICATES COLOR, R=RED, A=AMBER, B=BLUE, G=GREEN
- OUTPUT DV/DT FILTER
- HEATING ELEMENT
- TRANSFORMER
- CT — CURRENT TRANSFORMER
- GROUND CONNECTION
- GENERATOR
- HORN — HORN
- 5 — FULL VOLTAGE NON-REVERSING (FVNR) MOTOR STARTER OR CONTACTOR NUMBER DESIGNATES NEMA SIZE
- NORMALLY OPEN CONTACT
- NORMALLY CLOSED CONTACT
- DI — RTU OR PLC CONTACT
- HAND / AUTO, XO — 2 POSITION SELECTOR SWITCH, POSITION LEGEND: X=CLOSED O=OPEN
- OFF / HAND / AUTO, XOO — 3 POSITION SELECTOR SWITCH HAND – OFF – AUTO POSITION LEGEND: X=CLOSED O=OPEN
- NORMALLY CLOSED PUSH BUTTON
- LOCKOUT STOP PUSH BUTTON
- NORMALLY OPEN PUSH BUTTON
- EMERGENCY STOP PUSH BUTTON (MAINTAINED)
- AMPS — DISCONNECT SWITCH SHOWN WITH RATING AND NUMBER OF POLES
- LIMIT OR POSITION SWITCH
- PSH — PRESSURE SWITCH HIGH
- PSL — PRESSURE SWITCH LOW
- FLOW SWITCH
- LEVEL FLOAT SWITCH
- T / ICTO — TIMER RELAY CONTACT INSTANTANEOUS CLOSE TIME DELAY OPEN
- T / NOTC — TIMER RELAY CONTACT NORMALLY OPEN TIME DELAY CLOSE
- TEMPERATURE SWITCH
- FUSE
- AMPS — FUSEHOLDER OR FUSEBLOCK
- THERMAL OVERLOAD RELAY
- TERMINAL BLOCK
- DEVICE LOCATED AT REMOTE LOCATION
- CONDUIT SEALOFF

POWER SINGLE LINE DIAGRAM SYMBOLS

- JUNCTION BOX WITH POWER DISTRIBUTION BLOCK OR LUGS
- CONDUIT SEALOFF
- LTC CONNECTION
- MC CONNECTION
- BOND TO METALLIC WATER PIPE
- UM — UTILITY METER
- HP — MOTOR, NUMBER DESIGNATES NEMA HORSEPOWER SIZE
- FUSE
- AMPS — FUSEHOLDER OR FUSEBLOCK
- AMPS / POLES — CIRCUIT BREAKER, SHOWN WITH TRIP RATING AND NUMBER OF POLES
- AMPS MCP / POLES — MOTOR CIRCUIT PROTECTOR WITH TRIP RATING AND NUMBER OF POLES
- AMPS / POLES — DISCONNECT SWITCH SHOWN WITH RATING AND NUMBER OF POLES
- MMR — MOTOR MANAGEMENT RELAY
- SSS — SOLID STATE STARTER
- VFD — VARIABLE FREQUENCY DRIVE
- HF — HARMONIC FILTER
- EOL — ELECTRONIC OVERLOAD RELAY
- GROUND CONNECTION

SITE PLAN SYMBOLS

- TELEPHONE OUTLET
- $ — SINGLE POLE SWITCH
- $3 — 3 WAY SWITCH
- $4 — 4-WAY SWITCH
- $M — MANUAL MOTOR STARTER
- SPECIAL PURPOSE OR WELDING OUTLET
- S — SMOKE DETECTOR
- T — THERMOSTAT
- FIELD DEVICE
- P — PHOTOCELL
- GROUND ROD
- DUPLEX RECEPTACLE
- SIMPLEX RECEPTACLE
- ANTENNA/MAST
- CONDUIT SEALOFF
- DISCONNECT SWITCH
- M — MOTOR
- CONDUIT TURN UP
- CONDUIT TURN DOWN

CIRCUIT SCHEDULE LEGEND

AAA-BC
- AAA — SEQUENCE NUMBER
- B — TYPE C=CONTROL P=POWER
- C — DEVICE SERVED

ELECTRICAL ABBREVIATIONS

A	AMPERE
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AI	ANALOG INPUT
AIC	AMPS INTERRUPTING CAPACITY
AO	ANALOG OUTPUT
AS	AIR SUPPLY
ATS	AUTOMATIC TRANSFER SWITCH
BC	BYPASS CONTACTOR
C	CONDUIT
CB	CIRCUIT BREAKER
CCW	COUNTER CLOCKWISE
CL2	CHLORINE
CON	CONTACTOR
CPB	CONTROL PULLBOX
CU	COPPER, BARE
CV	CONTROL VALVE
CW	CLOCKWISE
DCS	DISTRIBUTED CONTROL SYSTEM
DI	DISCRETE INPUT
DO	DISCRETE OUTPUT
DP	DISTRIBUTION PANEL
DV/DT	DIFFERENTIAL VOLTAGE/TIME
DWG	DRAWING
ETM	ELAPSED TIME METER
EOL	ELECTRONIC OVERLOAD
EXIST	EXISTING
FA	FOUL AIR
FC	FAIL CLOSED
FE	FLOW ELEMENT
FLA	FULL LOAD AMPS
FS	FLOW SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
FW	FINISHED WATER
GEC	GROUNDING ELECTRODE CONDUCTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GRS	GALVANIZED RIGID STEEL
H, HI	HIGH
H2S	HYDROGEN SULFIDE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
I	CURRENT
IC	INSTRUMENTATION CABLE
ICR	INTERMITTENT CYCLE REACTOR
IO	INPUT/OUTPUT
ISC	SHORT CIRCUIT CURRENT
JB	JUNCTION BOX
L, LO	LOW
LAN	LOCAL AREA NETWORK
LC	LOOP CONTROLLER
LCL	LEVEL CONTROL, LOW
LCP	LOCAL CONTROL PANEL
LOS	LOCK-OUT-STOP
LOR	LOCAL/OFF/REMOTE
LS	LEVEL (i.e., FLOAT) SWITCH
LTC	LIQUIDTIGHT FLEXIBLE METAL CONDUIT
M	MOTOR
MA	MANUAL/AUTO
mA	MILLIAMP
MAX	MAXIMUM
MC	MANUFACTURER'S CABLE
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR(S)	MANUFACTURER(S)
MGD	MILLION GALLONS PER DAY
MGL	MILLIGRAMS PER LITER
MH	MANHOLE
MIN	MINIMUM
MOV	MOTOR OPERATED VALVE
MMR	MOTOR MANAGEMENT RELAY
MTU	MASTER TELEMETRY UNIT
NEC	NATIONAL ELECTRICAL CODE
NECA	NATIONAL ELECTRICAL CONTRACTOR ASSOCIATION
N.C.	NORMALLY CLOSED
N.O.	NORMALLY OPEN
NIC	NOT IN CONTRACT
NOTC	NORMALLY OPEN TIMED CLOSED
NPW	NON-POTABLE WATER
NS	NITROGEN SUPPLY
NTS	NOT TO SCALE
NTU	TURBIDITY
OF	OVERFLOW
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD
OLR	OVERLOAD RELAY
OO	ON/OFF (MAINTAINED)
OR	OFF-REMOTE
OSC	OPEN/STOP/CLOSE
P	PHASE
PB	PULL BOX
PCP	PROCESS CONTROL PANEL
PCV	PRESSURE CONTROL VALVE
PFR	PHASE/POWER FAILURE RELAY
PI	PULSE INPUT
PLC	PROGRAMMABLE LOGIC CONTROLLER
PLI	PLANT INFLUENT
PMP	PUMP
PNL	PANEL
PO	PULSE OUTPUT
PPB	POWER PULLBOX
PPG	POUNDS PER GALLON
PPH	POUNDS PER HOUR
PPM	PARTS PER MILLION
PR	PAIR
PRES	PRESSURE
PS	PRESSURE SWITCH
PSH	PRESSURE SWITCH, HIGH
PSI	POUNDS PER SQUARE INCH
PV	PROCESS VARIABLE
RAS	RETURN ACTIVATED SLUDGE
RW	RAW WATER
RF	RADIO FREQUENCY
RIO	REMOTE INPUT OUTPUT
RS	RAW SEWAGE
RSP	RAW SEWAGE PUMP
RST	RESET
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TELEMETRY UNIT
RWT	REFLECTED WAVE TRAP
SCA	SHORT CIRCUIT AMPS
SEQ	SERVICE ENTRANCE EQUIPMENT
SES	SERVICE ENTRANCE SECTION
SLC	SINGLE LOOP CONTROLLER
SLOS	START-LOCK-OUT-STOP
SMC	SUBMERSIBLE MANUFACTURER CABLE
SO2	SULFUR DIOXIDE
SP	SET POINT
SPC	SPARE CONDUIT
SPD	SURGE PROTECTIVE DEVICE
SPR	SPARE
SS	START/STOP
SSS	SOLID STATE STARTER (SOFT START)
ST	SHUNT TRIP
TC	TELEPHONE CABLE
TS	TEMPERATURE SWITCH
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TYP	TYPICAL
UG	UNDERGROUND
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATT, WIRE
WAS	WASTE ACTIVATED SLUDGE
WP	WEATHERPROOF
XFMR	TRANSFORMER
XMR	TRANSFORMER
XMTR	TRANSMITTER
ZS	POSITION (i.e.. LIMIT) SWITCH

ELECTRICAL LINETYPES

- EXPOSED CONDUIT
- EXISTING EXPOSED CONDUIT
- UNDERGROUND CONDUIT
- EXISTING UNDERGROUND CONDUIT
- BARE COPPER GROUND CONDUCTOR
- EXISTING
- FUTURE
- NEW ELECTRICAL EQUIPMENT
- DEMOLITION
- DETAIL VIEW OR MATCHING
- CAPPED CONDUIT STUB OUT

PXXX / CXXX — GROUPED CONDUIT AND CIRCUIT IDENTIFICATION TAGS. REFER TO THE POWER SINGLE-LINE, SCHEMATIC CONNECTION DIAGRAMS AND CIRCUIT SCHEDULE FOR CONDUIT SIZES AND CONTENTS.

P=POWER
C=CONTROL

GENERAL NOTES

1. THE COMPLETED INSTALLATION SHALL COMPLY WITH LATEST REVISION OF APPLICABLE FEDERAL, STATE, AND LOCAL CODES, ORDINANCES, AND REGULATIONS. THE CONTRACTOR SHALL OBTAIN NECESSARY PERMITS AND INSPECTIONS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. ALL WORK SHALL BE COMPLETED IN A NEAT, WORKMANLIKE MANNER IN ACCORDANCE WITH THE LATEST NECA STANDARDS OF INSTALLATION UNDER COMPETENT SUPERVISION. INSTALL GROUNDING PER NEC.
2. VISIT THE SITE PRIOR TO BIDDING TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND OTHER FACTORS, WHICH MAY AFFECT THE EXECUTION OF THE WORK. INCLUDE ALL RELATED COSTS IN THE INITIAL BID PROPOSAL.
3. THE CONTRACTOR SHALL COORDINATE WORK WITH THE UTILITIES PROVIDING SERVICES ON THIS PROJECT, AND SHALL COMPLY WITH ALL THEIR INSTALLATION REQUIREMENTS.
4. ALL MATERIALS SHALL BE NEW AND OF THE BEST QUALITY, MANUFACTURED IN ACCORDANCE WITH THE LATEST REVISION OF NEMA, ANSI, UL, OR OTHER APPLICABLE STANDARDS. THE USE OF MANUFACTURERS' NAMES, MODELS, AND NUMBERS IS INTENDED TO ESTABLISH STYLE, QUALITY, APPEARANCE, USEFULNESS, AND BID PRICE.
5. PROTECT ALL ELECTRICAL MATERIAL AND EQUIPMENT INSTALLED AGAINST DAMAGE BY OTHER TRADES, WEATHER CONDITIONS, OR ANY OTHER PREVENTABLE CAUSES. EQUIPMENT DAMAGED DURING SHIPPING OR CONSTRUCTION, PRIOR TO ACCEPTANCE BY THE ENGINEER OR THE OWNER, WILL BE REJECTED AS DEFECTIVE.
6. LEAVE THE SITE CLEAN. REMOVE ALL DEBRIS, EMPTY CARTONS, TOOLS, CONDUIT, WIRE SCRAPS AND ALL MISCELLANEOUS SPARE EQUIPMENT AND MATERIALS USED IN THE WORK DURING CONSTRUCTION. ALL COMPONENTS SHALL BE FREE OF DUST, GRIT AND FOREIGN MATERIALS, LEFT AS NEW BEFORE FINAL ACCEPTANCE OF WORK. DAMAGED PAINT AND FINISHES SHALL BE TOUCHED UP OR REPAINTED WITH MATCHING COLOR PAINT AND FINISH.
7. CIRCUIT CONDUCTORS #6 AWG OR SMALLER SHALL BE THWN STRANDED COPPER. #4 AWG THROUGH #2 AWG SHALL BE XHHW STRANDED COPPER. #1 AWG OR LARGER SHALL BE XHHW-2 STRANDED COPPER. MINIMUM POWER CONDUCTOR SIZE SHALL BE #12 AWG WITH #12 AWG GROUND.
8. UNDERGROUND CONDUITS SHALL BE SCHEDULE 40 PVC. MINIMUM CONDUIT DEPTH SHALL BE 24 INCHES. MINIMUM UNDERGROUND CONDUIT SIZE SHALL BE 1 INCH.
9. CONDUITS SHALL BE MARKED AT EACH END WITH MATCHING NUMBERED BRASS TAGS. SPARE CONDUITS SHALL HAVE A PULL STRING INSTALLED, SECURED, AND CAPPED.
10. EXPOSED CONDUITS SHALL BE GALVANIZED RIGID STEEL (GRS). MINIMUM SIZE 3/4 INCH, UNLESS OTHERWISE NOTED ON THE PLANS. CONDUITS INSTALLED IN WET OR CORROSIVE LOCATIONS SHALL BE PVC COATED GRS.
11. SAFETY SWITCHES, ELECTRICAL DISTRIBUTION EQUIPMENT, CONTROL PANELS, AND OTHER ELECTRICAL DEVICES SHALL BE UL LISTED, AND RATED FOR HEAVY DUTY SERVICE.
12. WIRING DEVICES SHALL BE SPECIFICATION GRADE.
13. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING, SCHEDULING, DOCUMENTING, AND PERFORMING THE WORK SO THAT A COMPLETE ELECTRICAL, INSTRUMENTATION AND CONTROL SYSTEM FOR THE FACILITY IS PROVIDED. ACCURATE SHOP AND RECORD DRAWINGS, AND O&M MANUALS SHALL BE SUBMITTED PRIOR TO FINAL ACCEPTANCE OF THE WORK.
14. TYPICAL DETAILS SHALL APPLY IN ALL CASES, WHETHER SPECIFICALLY REFERRED TO OR NOT.

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PREPARED BY: Weaver Consultants Group

PREPARED FOR: CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
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D	09/08/25	RE-REVIEW 90% DESIGN SUBMITTAL	TMH	TMH
C	06/04/25	90% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO 60%, 35% DESIGN	TMH	TMH
A	02/29/18	30% DESIGN	BB	JP

REVISION SUMMARY

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER — BRIAN A. PRATT — No. 17607 — Exp. 06/30/27 — ELECTRICAL — STATE OF CALIFORNIA — 924196

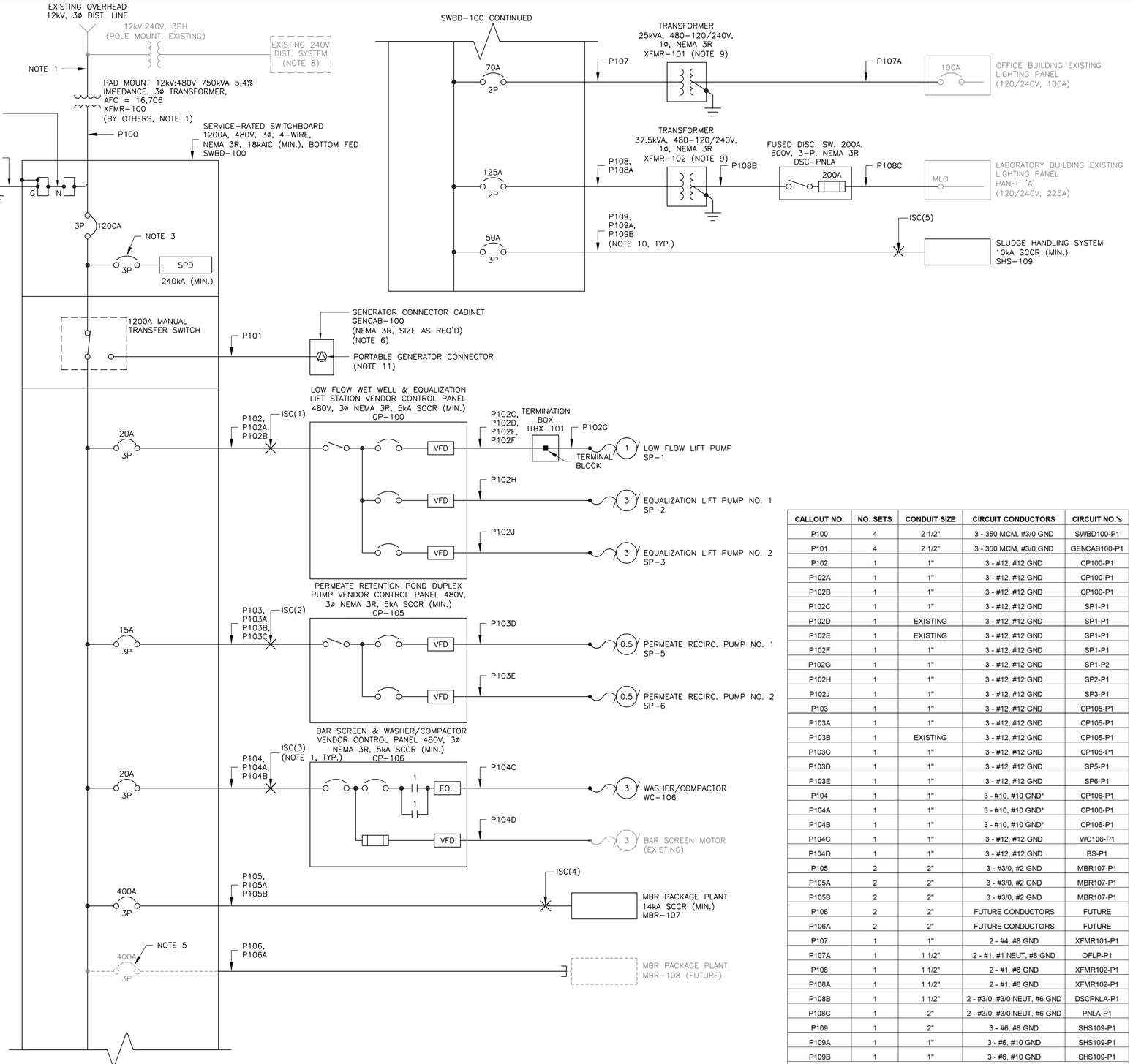
DESIGNER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
JA/DN	JA	DN	AGA	03/31/2026

ELECTRICAL SYMBOLS, NOTES, AND LEGEND

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME:

SHEET No. E01
30
REVISION 0



A SINGLE LINE DIAGRAM

NOTES:

1. PAD MOUNTED TRANSFORMER WILL BE PROVIDED BY OWNER AND INSTALLED BY CONTRACTOR. ASSOCIATED CONCRETE PAD SHALL BE PROVIDED AND INSTALLED BY CONTRACTOR. FEED FROM EXISTING OVERHEAD 12KV LINE TO TRANSFORMER PRIMARY WILL BE BY OWNER.
2. ALL SHORT CIRCUIT INTERRUPTING AND PROTECTING DEVICES SHALL HAVE A SHORT CIRCUIT INTERRUPTING RATING EQUAL TO OR GREATER THAN THE AVAILABLE SHORT CIRCUIT CURRENT ON ON RESPECTIVE BUS.
3. UNSIZED OVERCURRENT PROTECTIVE DEVICES SHALL BE SIZED PER ASSOCIATED EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
4. ALL OVERCURRENT PROTECTIVE DEVICES SHALL BE PROPERLY COORDINATED SO AS TO ENSURE LOCALIZATION OF OVERCURRENT CONDITIONS TO THE CIRCUIT OR EQUIPMENT AFFECTED.
5. WITHIN PANEL DP-100, ENSURE THERE IS SUFFICIENT PROVISIONAL SPACE TO ACCOMMODATE A FUTURE 400A, 3-POLE CIRCUIT BREAKER FOR (POTENTIAL) FUTURE MBR PACKAGED PLANT ALONG WITH SPACE FOR A MINIMUM OF THREE ADDITIONAL 100A, 3-POLE CIRCUIT BREAKERS.
6. INSTALL SIGN ON GENERATOR TERMINATION CABINET INDICATING THE FOLLOWING: 1) ENSURE PORTABLE GENERATOR BONDING JUMPER IS INSTALLED AS GENERATOR WILL BE CONSIDERED TO BE A SEPARATELY DERIVED SOURCE. 2) ENSURE GENERATOR MAIN CIRCUIT BREAKER RATING/SETTING DOES NOT EXCEED 1200A.
7. REFERENCE E03 FOR SHORT CIRCUIT CALCULATIONS.
8. EXISTING 240V, 3PH DISTRIBUTION SYSTEM SHALL REMAIN IN OPERATION UNTIL NEW 480V, 3PH DISTRIBUTION SYSTEM AND NEW PLANT TREATMENT SYSTEM ARE FULLY OPERATIONAL.
9. ENSURE LOCATION OF TRANSFORMER PRIMARY DISCONNECTING MEANS IS CLEARLY MARKED ON TRANSFORMERS 'XFMR-101' AND 'XFMR-102'.
10. GROUPED CALLOUTS REPRESENT CONDUIT RUNS BETWEEN PULL BOXES WHICH HAVE NOT BEEN SHOWN ON SINGLE LINE IN ORDER TO REDUCE DRAWING CONGESTION. REFER TO CONDUIT BLOCK DIAGRAM ON E08 FOR FURTHER CLARIFICATION.
11. GENERATOR TERMINATION CABINET SHALL BE EQUIPPED WITH POWER DISTRIBUTION LUGS CAPABLE OF ACCOMMODATING (4) PARALLEL SETS OF (3) 500MCM CONDUCTORS. IN ADDITION, (1) ADDITIONAL LUG SHALL BE PROVIDED TO ACCOMMODATE UP TO A 500MCM GROUND CONDUCTOR.

CALLOUT NO.	NO. SETS	CONDUIT SIZE	CIRCUIT CONDUCTORS	CIRCUIT NO.'s
P100	4	2 1/2"	3 - 350 MCM, #3/0 GND	SWBD100-P1
P101	4	2 1/2"	3 - 350 MCM, #3/0 GND	GENCAB100-P1
P102	1	1"	3 - #12, #12 GND	CP100-P1
P102A	1	1"	3 - #12, #12 GND	CP100-P1
P102B	1	1"	3 - #12, #12 GND	CP100-P1
P102C	1	1"	3 - #12, #12 GND	SP1-P1
P102D	1	EXISTING	3 - #12, #12 GND	SP1-P1
P102E	1	EXISTING	3 - #12, #12 GND	SP1-P1
P102F	1	1"	3 - #12, #12 GND	SP1-P1
P102G	1	1"	3 - #12, #12 GND	SP1-P2
P102H	1	1"	3 - #12, #12 GND	SP2-P1
P102J	1	1"	3 - #12, #12 GND	SP3-P1
P103	1	1"	3 - #12, #12 GND	CP105-P1
P103A	1	1"	3 - #12, #12 GND	CP105-P1
P103B	1	EXISTING	3 - #12, #12 GND	CP105-P1
P103C	1	1"	3 - #12, #12 GND	CP105-P1
P103D	1	1"	3 - #12, #12 GND	SP5-P1
P103E	1	1"	3 - #12, #12 GND	SP6-P1
P104	1	1"	3 - #10, #10 GND*	CP106-P1
P104A	1	1"	3 - #10, #10 GND*	CP106-P1
P104B	1	1"	3 - #10, #10 GND*	CP106-P1
P104C	1	1"	3 - #12, #12 GND	WC106-P1
P104D	1	1"	3 - #12, #12 GND	BS-P1
P105	2	2"	3 - #3/0, #2 GND	MBR107-P1
P105A	2	2"	3 - #3/0, #2 GND	MBR107-P1
P105B	2	2"	3 - #3/0, #2 GND	MBR107-P1
P106	2	2"	FUTURE CONDUCTORS	FUTURE
P106A	2	2"	FUTURE CONDUCTORS	FUTURE
P107	1	1"	2 - #4, #8 GND	XFMR101-P1
P107A	1	1 1/2"	2 - #1, #1 NEUT, #8 GND	OFLP-P1
P108	1	1 1/2"	2 - #1, #6 GND	XFMR102-P1
P108A	1	1 1/2"	2 - #1, #6 GND	XFMR102-P1
P108B	1	1 1/2"	2 - #3/0, #3/0 NEUT, #6 GND	DSCPNLA-P1
P108C	1	2"	2 - #3/0, #3/0 NEUT, #6 GND	PNLA-P1
P109	1	2"	3 - #6, #6 GND	SHS109-P1
P109A	1	1"	3 - #6, #10 GND	SHS109-P1
P109B	1	1"	3 - #6, #10 GND	SHS109-P1

* DENOTES CONDUCTORS THAT HAVE BEEN UPSIZED TO OFFSET VOLTAGE DROP

B CALLOUT SCHEDULE

CIRCUIT/DESCRIPTION	KVA	HP	FLA
MOTOR LOADS			
LOW FLOW LIFT PUMP SP-1		1.0	2.1
EQUALIZATION LIFT PUMP SP-2		3.0	4.8
EQUALIZATION LIFT PUMP SP-3		3.0	4.8
PERMEATE RECIRCULATION PUMP SP-5		0.5	1.1
PERMEATE RECIRCULATION PUMP SP-6		0.5	1.1
WASHER/COMPACTOR		3.0	4.8
BAR SCREEN (EXISTING)		3.0	4.8
MBR PACKAGE PLANT MBR-107			320.0
MBR PACKAGE PLANT MBR-108 (FUTURE)			320.0
SLUDGE HANDLING SYSTEM			40.0
NON-MOTOR LOADS			
OFFICE BUILDING TRANSFORMER XFMR-101	25.0		52.1
LABORATORY BUILDING TRANSFORMER XFMR-102	37.5		78.1
SUBTOTAL			833.7
+ 25% OF LARGEST MOTOR*			13.0
TOTAL AMPS @ 480V/3PHASE			846.7
TRANSFORMER CAPACITY (AMPS)			904.0

* +25% OF LARGEST MOTOR VALUE IS BASED ON LARGEST MBR SYSTEM MOTOR (40HP)

C LOAD CALCULATIONS

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PREPARED BY: Weaver Consultants Group

PREPARED FOR: CAL GUARD CALIFORNIA MILITARY DEPARTMENT

CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
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REVISION SUMMARY

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REGISTERED PROFESSIONAL ENGINEER — BRIAN D. BOWLING — No. 17507 — Exp. 06/30/27 — ELECTRICAL — STATE OF CALIFORNIA

DESIGNER: JA/DN
DRAWN BY: JA
CHECKED BY: DN
APPROVED BY: AGA
DATE: 03/31/2026

SINGLE LINE DIAGRAM

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No.: 5890-300-01-67
FILE NAME:

SHEET No.: E02
31
REVISION: 0

NOTES:

1. MULTI-MODE FIBER OPTIC CABLE SHALL BE RUGGEDIZED INDOOR/OUTDOOR RATED, TYPE OM2, OM3 OR OM4, 6-STRAND MINIMUM.

SHORT CIRCUIT CALCULATIONS			
DEFINITIONS		**FORMULAS**	
ISC =	SHORT CIRCUIT CURRENT (AMPS)	3 PH: f =	1.732 x L x Isc / N x C x V L-L
N =	NUMBER OF CONDUCTORS/PHASE		
L =	LENGTH OF CONDUCTOR (FEET)	1 PH: f =	2 x L x Isc / N x C xV L-L
C =	CONSTANT FROM TABLE OF "C"		
Isc =	AVAILABLE SHORT-CIRCUIT AMPS		
V L-L =	LINE TO LINE VOLTAGE (VOLTS)		
V P =	PRIMARY VOLTAGE	1 PH XFMR: f =	Iscx Vp x % Z / 100,000 x KVA
V s =	SECONDARY VOLTAGE		
% Z =	TRANSFORMER % IMPEDANCE		

ISC(1)

$$f1 = \frac{1.732 \times 230 \times 16{,}706}{1 \times 617 \times 480} = 22.471$$

$$M = \frac{1}{1 + 22.471} = 0.0426$$

ISC(1) = 16,706 x 0.0426 = 712 A

ISC(2)

$$f1 = \frac{1.732 \times 360 \times 16{,}706}{1 \times 617 \times 480} = 35.172$$

$$M = \frac{1}{1 + 35.172} = 0.0276$$

ISC(2) = 16,706 x 0.0276 = 461 A

ISC(3)

$$f1 = \frac{1.732 \times 670 \times 16{,}706}{1 \times 617 \times 480} = 65.4589$$

$$M = \frac{1}{1 + 65.4589} = 0.015$$

ISC(3) = 16,706 x 0.015 = 251 A

ISC(4)

$$f1 = \frac{1.732 \times 270 \times 16{,}706}{2 \times 13923 \times 480} = 0.5845$$

$$M = \frac{1}{1 + 0.5845} = 0.6311$$

ISC(4) = 16,706 x 0.6311 = 10,543 A

ISC(5)

$$f5 = \frac{1.732 \times 290 \times 16{,}706}{1 \times 2430 \times 480} = 7.194$$

$$M = \frac{1}{1 + 7.194} = 0.122$$

ISC(5) = 16,706 x 0.122 = 2,038 A

A SHORT CIRCUIT CALCULATIONS

SHEET NO.	CIRCUIT	CONDUCTORS
E05	LCS110-C1	7 - #14, #14 GND
E05	LCS106-C1	7 - #14, #14 GND
E05	LE1A-C1	1 - IC, #14 GND
E05	LE1B-C	1 - IC, #14 GND
E05	14SSOL-C1	2 - #14, #14 GND
E05	15SSOL-C1	2 - #14, #14 GND
E05	ZS110-C1	2 - #14, #14 GND
E05	CP106-C1	1 - MULTI MODE FIBER OPTIC CABLE (NOTE 1)
E05	FIT-C1	1 - IC, #14 GND
E05	CP100-C1	1 - CAT6 CABLE
E05	MBR107-C1	1 - CAT6 CABLE
E05	SHS109-C1	1 - CAT6 CABLE
E05	CP105-C1	1 - MULTI MODE FIBER OPTIC CABLE (NOTE 1)
E05	LSLL102-C1	1 - MANUF. CABLE
E05	LSH102-C1	1 - MANUF. CABLE
E05	LSHH102-C1	1 - MANUF. CABLE
E05	LT102-C1	1 - MANUF. CABLE
E05	LSLL105-C1	1 - MANUF. CABLE
E05	LSH105-C1	1 - MANUF. CABLE
E05	LSHH105-C1	1 - MANUF. CABLE
E05	LT105-C1	1 - MANUF. CABLE
E05	SP1-C1	4 - #14, #14 GND
E05	LSLL101-C2	2 - #14, #14 GND
E05	LSH101-C2	2 - #14, #14 GND
E05	LSHH101-C2	2 - #14, #14 GND
E05	LT101-C2	1 - MANUF. CABLE
E05	LSLL101-C1	1 - MANUF. CABLE
E05	LSH101-C1	1 - MANUF. CABLE
E05	LSHH101-C1	1 - MANUF. CABLE
E05	LT101-C1	1 - IC, #14 GND
E06	LCP107-P1	2 - #12, #12 GND
E06	LCP107-P2	2 - #12, #12 GND
E06	LCP107-P3	2 - #12, #12 GND
E06	LCP107-P4	2 - #12, #12 GND
E06	LCP107-C1	4 - #12, #12 GND
E06	LIGHT-P1	2 - #12, #12 GND
E06	RECEPT-P1	2 - #12, #12 GND

B MASTER CIRCUIT SCHEDULE

LIGHTING FIXTURE SCHEDULE					
SYMBOL	DESCRIPTION	MOUNTING	MANUFACTURER	LAMPS	REMARKS
▯	120V, 4' LED STRIP, NEMA 4X RATED WITH CORROSION RESISTANT FINISH, STAINLESS STEEL MOUNTING HARDWARE AND BRACKETS WITH SILICONE GASKETS.	SURFACE	LITHONIA LIGHTING FEX LED SERIES OR EQUAL	6-8k LUMEN OUTPUT, 4000K	
□	DIE CAST HOUSING, HORIZONTAL ARM MOUNT, 120V, 60 LED FIXTURE, FULL CUTOFF. UL LISTED FOR WET LOCATIONS, BRONZE COLOR WITH INTEGRAL PHOTOCELL.	POLE	SPAULDING LIGHTING CIMARRON LED, OR EQUAL	12-15K LUMEN OUTPUT, 3000K LED	SHALL COMPLY WITH CITY, COUNTY, AND STATE DARK SKY ORDINANCES

C LIGHTING FIXTURE SCHEDULE

PREPARED BY: Weaver Consultants Group

PREPARED FOR: CAL GUARD — CALIFORNIA MILITARY DEPARTMENT

CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
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REVISION SUMMARY

SCALE: AS NOTED
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DESIGNER: JA/DN
DRAWN BY: JA
CHECKED BY: DN
APPROVED BY: AGA
DATE: 03/31/2026

ELECTRICAL SCHEDULES

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME:

SHEET No. E03
32
REVISION 0

NCS ENGINEERING PE

NOTES:

1. REFER TO CONDUIT BLOCK DIAGRAM ON E08 FOR CONDUIT INFORMATION/REQUIREMENTS (I.E. TO/FROM ROUTING, TAG #'S, SIZES, CONTENTS ETC.)
2. CONDUIT ROUTING SHOWN IS APPROXIMATE AND SCHEMATIC IN NATURE. ACTUAL ROUTING SHALL BE FIELD DETERMINED.
3. ENSURE ALL DUCTBANK GROUND CONDUCTORS ARE BONDED TOGETHER.
4. UTILIZE FOUR EXISTING SPARE 20A CIRCUIT BREAKERS IN EXISTING PANEL WITHIN THE OFFICE BUILDING TO FEED NEW LIGHTING CONTROL PANEL, SITE RECEPTACLES, AND NEW POLE LIGHT.
5. TAG NUMBERS SHOWN FOR EXISTING PULL BOXES DO NOT REFLECT DESIGNATIONS IN THE FIELD. THEY ARE LABELED FOR ASSOCIATION PURPOSES WITHIN THIS DESIGN SET.
6. REFERENCE E03 FOR LIGHT FIXTURE SCHEDULE.
7. EXISTING SCREENINGS CONTROL PANEL SHALL BE REMOVED AND RETURNED TO OWNER AFTER NEW SYSTEM IS PUT INTO OPERATION.
8. ENSURE CABLES IN EQUALIZATION BASIN UTILIZE STRAIN RELIEFS (I.E. KELLUMS GRIP).
9. EXISTING CLARIFIER CONTROL PANEL SHALL BE REMOVED AND RETURNED TO OWNER AFTER NEW EQUALIZATION LIFT STATION CONTROL PANEL IS IN OPERATION.
10. REFERENCE VENDOR DRAWINGS FOR LOCATION OF VENDOR-PROVIDED EQUIPMENT ASSOCIATED WITH THE BAR SCREEN PACKAGE.
11. ALL ELECTRICAL INSTALLATIONS AND EQUIPMENT WITHIN 5'-0" OF EQ. LIFT STATION, LOW FLOW WETWELL AND HEADWORKS INFLUENT CHANNEL SHALL BE COMPLIANT WITH NEC ARTICLE 500 REQUIREMENTS FOR CLASS 1 DIVISION 2 HAZARDOUS AREAS.
12. ALL ELECTRICAL INSTALLATIONS AND EQUIPMENT WITHIN EQ. LIFT STATION, LOW FLOW WETWELL AND HEADWORKS INFLUENT CHANNEL SHALL BE COMPLIANT WITH NEC ARTICLE 500 REQUIREMENTS FOR CLASS 1 DIVISION 1 RATED HAZARDOUS AREAS.

REFERENCE DETAIL B FOR PERMEATE RETENTION POND PUMP STATION DETAILS
PULL BOX PB-103P (EXISTING, NOTE 6 TYP.)
PULL BOX PB-103C (EXISTING)
PULL BOX PB-104P (EXISTING)
PULL BOX PB-104C (EXISTING)
SLUDGE HANDLING SKID TERMINATION PANELS
SLUDGE HANDLING AND DEWATERING SYSTEM (VENDOR PROVIDED) SHS-109
PULL BOX PB-102P (EXISTING)
PULL BOX PB-102C (EXISTING)
GFCI WP
SKID BOND (TYP.)
LEVEL TRANSMITTER LT-102
EQUALIZATION LIFT PUMP NO. 1 SP-2 (YS-102, TSH-102)
EQUALIZATION LIFT PUMP NO. 2 SP-3 (YS-103, TSH-103)
FLOAT SWITCHES LSHH-102, LSH-102, LSLL-102
(NOTES 11 & 12)
REFERENCE DETAIL C FOR LOW FLOW WET WELL DETAILS
PULL BOX PB-101P (EXISTING)
PULL BOX PB-101C (EXISTING)
MBR SKID CONTROL PANEL
GFCI WP
LOW FLOW WET WELL & EQUALIZATION LIFT STATION VENDOR CONTROL PANEL CP-100 (NOTES 8 & 9)
105 / E09 DUCTBANK - CONCRETE ENCASED (TYP.)
SCREEN WASH & COMPACTOR WC-106
(NOTES 11 & 12)
EXISTING FLOWMETER
EXISTING BAR SCREEN CONTROL PANEL
BAR SCREEN & WASHER/COMPACTOR VENDOR CONTROL PANEL CP-106 (NOTES 7 & 10)
EXISTING PANEL 'A'
DISCONNECT DSC-PNLA
TRANSFORMER XFMR-102
LIGHT FIXTURE (MOUNTED TO STRUCTURAL BEAM, NOTE 6, TYP.)
MBR PACKAGE TREATMENT SYSTEM (VENDOR PROVIDED) MBR-107
GFCI WP
#4/0 BARE CU (TYP.)
EXOTHERMIC BOND TO DUCTBANK GROUNDING CONDUCTOR (TYP.)
LIGHTING CONTROL PANEL LCP-107 (MOUNTED TO STRUCTURAL I-BEAM) OFFICE BUILDING
GFCI WP
EXISTING LIGHTING PANEL (NOTE 4)
SITE PLC CABINET PLC-100
SERVICE-RATED SWITCHBOARD SWBD-100
TRANSFORMER XFMR-101
OFFICE BLDG.
315 / E09 UNDERGROUND CONCRETE JUNCTION BOX (TYP.)
PULL BOX PB-100C
PULL BOX PB-100P
NETWORK PBOX (EXISTING)
GROUND ROD WITH TEST ACCESS WELL 406 / E09
GENERATOR CONNECTOR CABINET GENCAB-100
LIGHT FIXTURE (MOUNTED TO EXISTING POLE, NOTE 6)
TRANSFORMER XFMR-100
SKID BOND (TYP.)
MOUNT PHOTOCELL TO TOP OF SHADE STRUCTURE
BOND TO STRUCTURAL I-BEAM (TYP.)
402 / E09 "UFER" GROUNDING DETAIL (TYP.)
POLE WITH EXISTING 12KV:240V STEP-DOWN TRANSFORMERS
POLE WITH EXISTING 240V SYSTEM MAIN DISC. & ATS

A ~ OVERALL ELECTRICAL PLAN
16 12 8 4 0 8 16
SCALE: 1/16" = 1'-0"

LEVEL TRANSMITTER LT-105
PERMEATE RECIRCULATION PUMP NO. 1 SP-5 (YS-105, TSH-105)
FLOAT SWITCHES LSHH-105, LSH-105, LSLL-105
PERMEATE RECIRCULATION PUMP NO. 2 SP-6 (YS-106, TSH-106)
PERMEATE RETENTION POND DUPLEX CONTROL PANEL CP-105
207 / E09 EQUIPMENT RACK DETAIL (TYP.)

B ~ PERMEATE RETENTION POND PUMP STATION PLAN
2 1.5 1 0.5 0 1 2
SCALE: 1/2" = 1'-0"

213 / E09 WET WELL JUNCTION BOX
TERMINATION BOX ITBX-101
LOW FLOW LIFT PUMP SP-1 (YS-101, TSH-101)
FLOAT SWITCHES LSHH-101, LSH-101, LSLL-101
LEVEL TRANSMITTER LT-101

C ~ LOW FLOW WET WELL PLAN
(NOTES 11 & 12)
2 1.5 1 0.5 0 1 2
SCALE: 1/2" = 1'-0"

N

PREPARED BY
Weaver Consultants Group
1 TECHNOLOGY DRIVE, SUITE G515
IRVINE, CALIFORNIA 92618-5302

PREPARED FOR
CAL GUARD
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

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OVERALL ELECTRICAL SITE PLAN

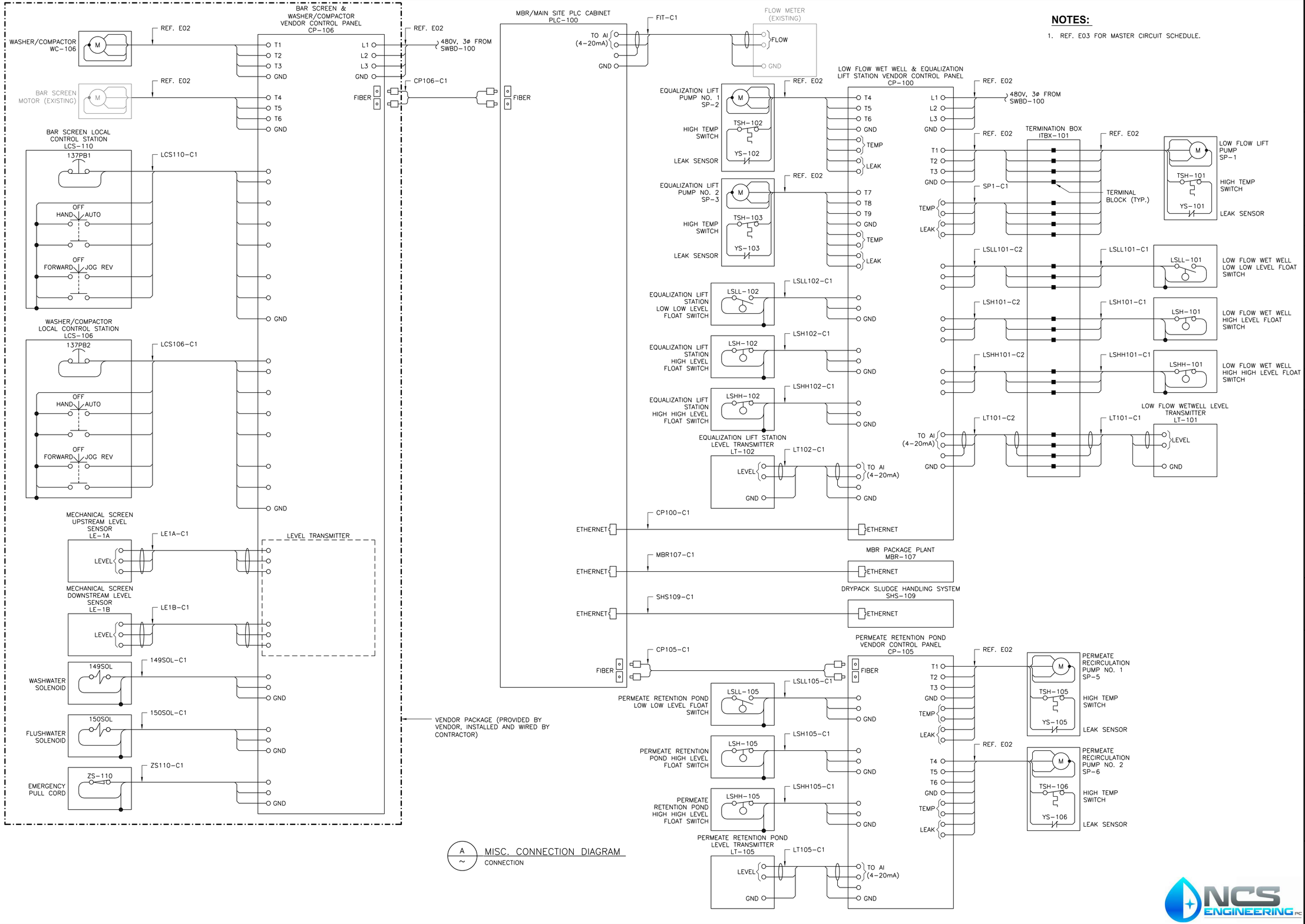
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5690-300-01-67
FILE NAME: 1924VS_E04.DWG

SHEET No. E04
33
REVISION 0

NCS ENGINEERING PC

X:\2400'S\N2419.24 CAMP ROBERTS WASTEWATER TREATMENT PLANT - PROJECT COMPLETION\100 - E&I DESIGN_CAD FILES\N2419_E04.DWG



NOTES:

1. REF. E03 FOR MASTER CIRCUIT SCHEDULE.

A ~ MISC. CONNECTION DIAGRAM
CONNECTION

PREPARED BY: Weaver Consultants Group

PREPARED FOR: CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
D	09/08/25	RESPECTFORK DESIGN SUBMITTAL	TMH	TMH
C	07/07/25	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO 65% DESIGN	TMH	TMH
A	02/28/18	30% DESIGN	BB	JP

REVISION SUMMARY

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED ELECTRICAL ENGINEER — BRIAN K. DINGTHER — No. 17607 — Exp. 06/30/27 — STATE OF CALIFORNIA

DESIGNED: JA/DN
DRAWN BY: JA
CHECKED BY: DN
APPROVED BY: AGA
DATE: 03/31/2026

SCHEMATIC & CONNECTION DIAGRAMS - SHEET 1

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

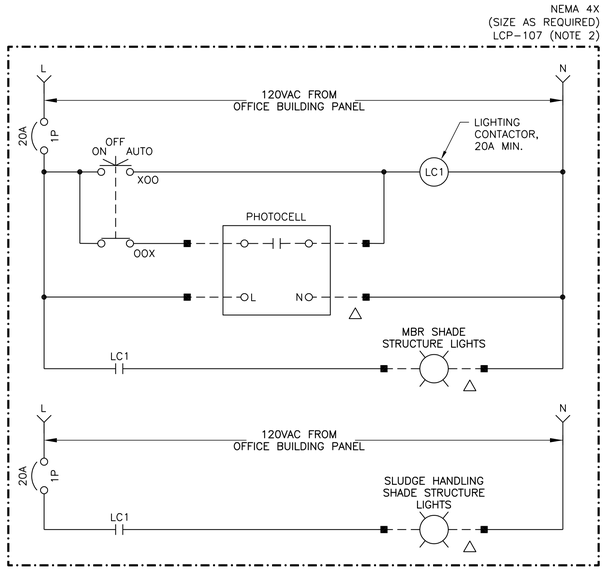
PROJECT No. 5890-300-01-67
FILE NAME:

SHEET No. E05
34
REVISION 0

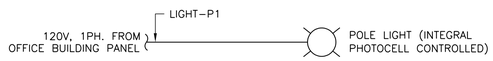
NCS ENGINEERING PE

NOTES:

1. REF. E03 FOR MASTER CIRCUIT SCHEDULE.
2. INSTALL SIGN ON LIGHTING CONTROL CABINET INDICATING THAT LIGHTING CONTROL PANEL IS FED BY TWO 120V CIRCUITS FROM OFFICE BUILDING LIGHTING PANEL.



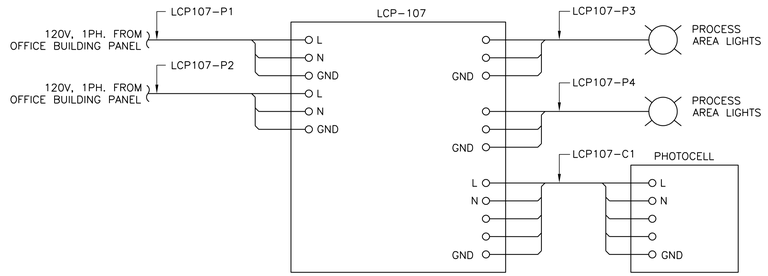
A ~ LIGHTING CONTROL PANEL SCHEMATIC (LCP-107)
SCHEMATIC



B ~ POLE LIGHT CONNECTION DIAGRAM
CONNECTION



C ~ RECEPTACLE CONNECTION DIAGRAM
CONNECTION



D ~ LIGHTING CONTROL PANEL CONNECTION (LCP-107)
CONNECTION

PREPARED BY
Weaver Consultants Group

PREPARED FOR
CAL GUARD
CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
D	08/08/25	RESPECTFORL DESIGN SUBMITTAL	TMH	TMH
C	05/05/25	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO 60% DESIGN	TMH	TMH
A	02/28/18	30% DESIGN	BB	JP

REVISION SUMMARY

SCALE:
AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
SHAWN D. DOWNING
No. 17507
Exp. 06/30/27
ELECTRICAL
STATE OF CALIFORNIA

DESIGNER: JA/DN
DRAWN BY: JA
CHECKED BY: DN
APPROVED BY: AGA
DATE: 03/31/2026

SCHEMATIC & CONNECTION DIAGRAMS - SHEET 2

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME:

SHEET No. E06
35
REVISION 0

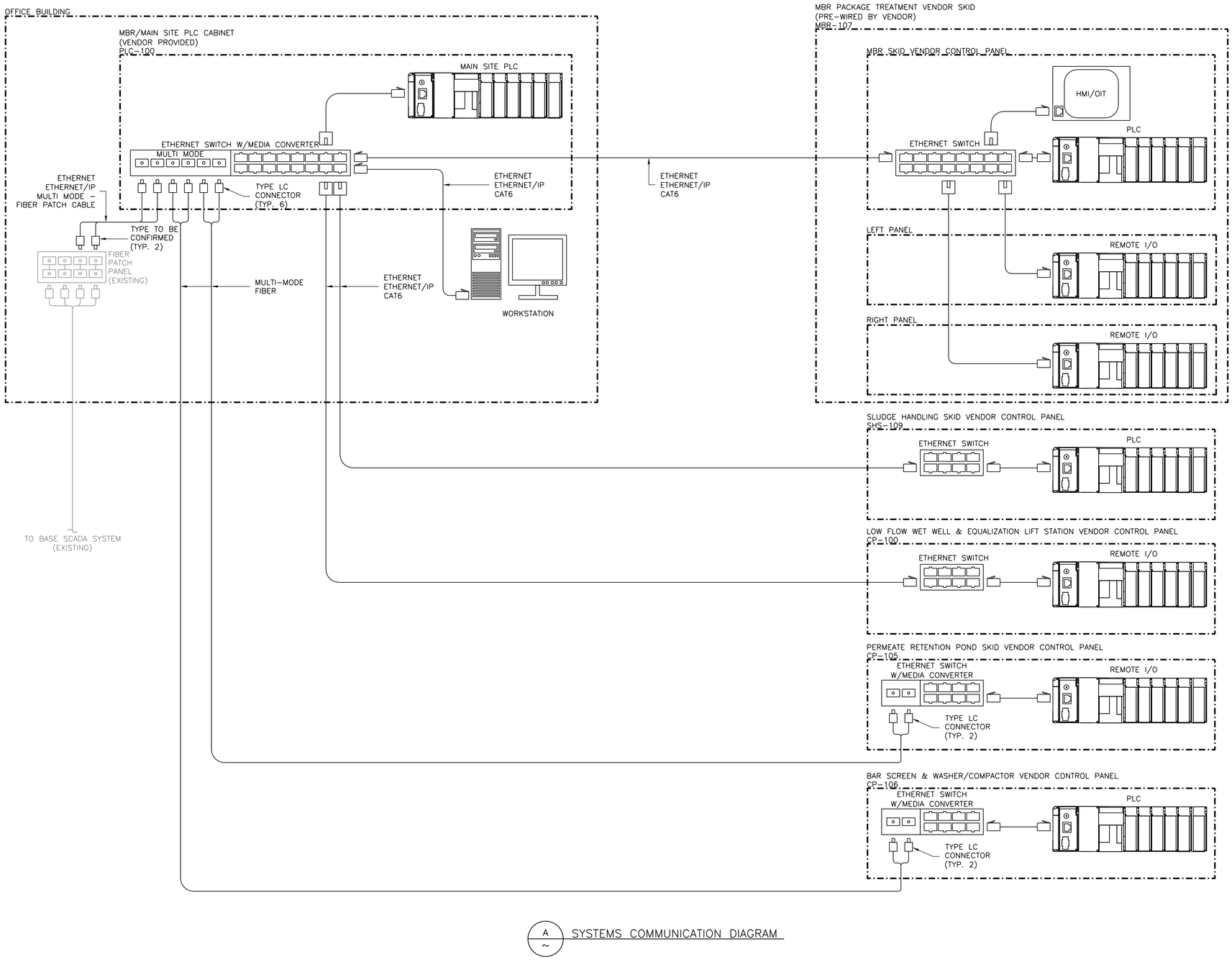
NCS ENGINEERING PE

NOTES:

1. REFER TO VENDOR DRAWINGS FOR ADDITIONAL DETAILS PERTAINING TO NETWORKING SYSTEMS PROVIDED IN EACH RESPECTIVE VENDOR BASED CONTROL PANEL.

LEGEND:

ETHERNET ← COMM. STANDARD
ETHERNET/IP ← PROTOCOL
CAT 6 ← MEDIA TYPE



A SYSTEMS COMMUNICATION DIAGRAM

PREPARED BY: Weaver Consultants Group

PREPARED FOR: CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
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D	08/08/25	RESPECTIVE DESIGN SUBMITTAL	TMH	TMH
C	05/05/24	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CWL 35% DESIGN	TMH	TMH
A	02/29/18	35% DESIGN	BB	JP

REVISION SUMMARY

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER — BRIAN A. HOMMING — No. 17607 — Exp. 06/30/27 — ELECTRICAL — STATE OF CALIFORNIA — 92196

DESIGNER:	JA/DN
DRAWN BY:	JA
CHECKED BY:	DN
APPROVED BY:	AGA
DATE:	03/31/2026

COMMUNICATION DIAGRAM

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67 | FILE NAME:

SHEET No. **E07** | 36 | REVISION 0

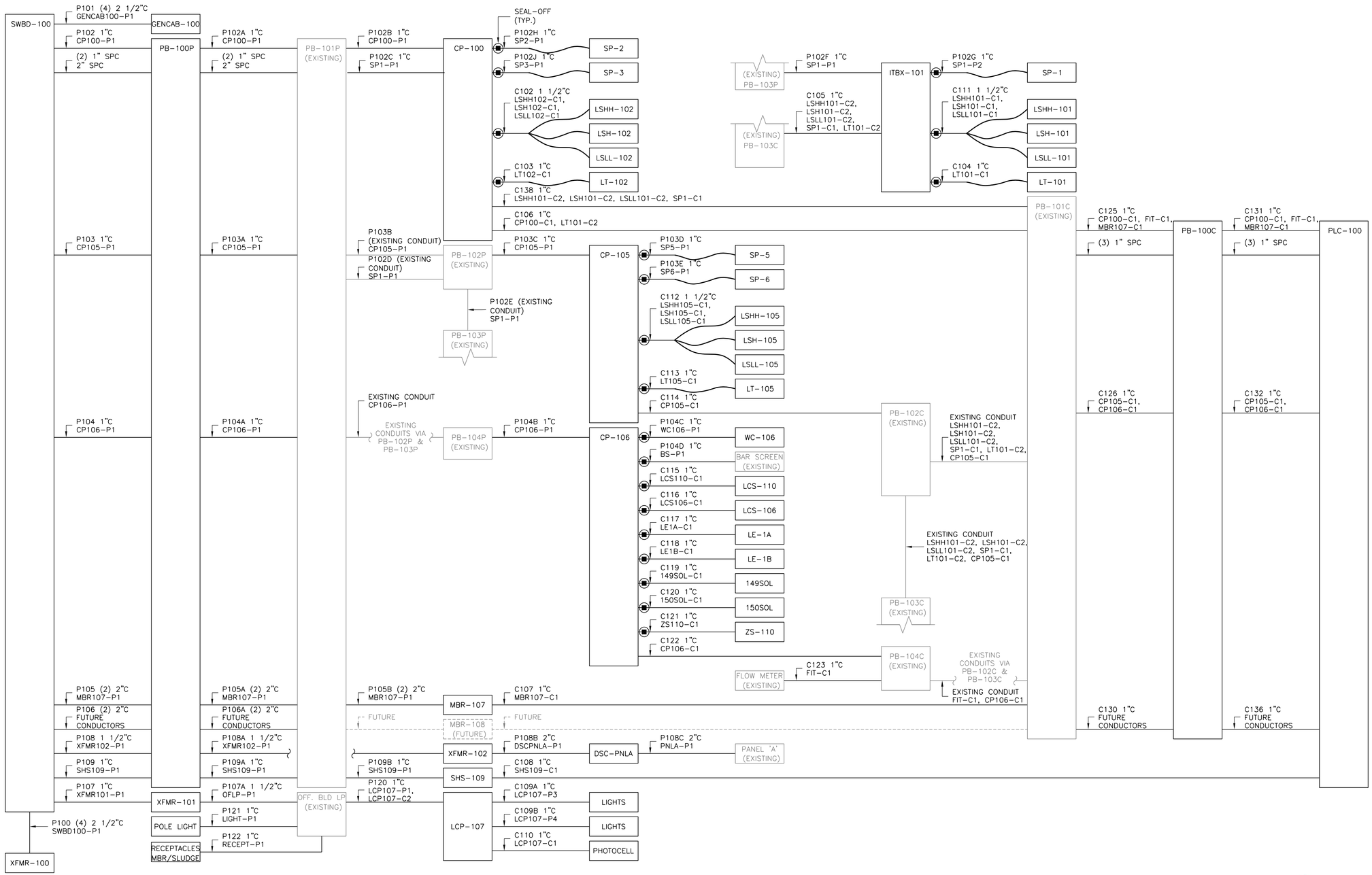
NCS ENGINEERING PE

NOTES:

1. ALL OUTDOOR EXPOSED CONDUITS SHALL BE PVC-COATED GRS.

LEGEND:

C100 1"C — CONDUIT NUMBER & SIZE
RTU100-1 — CIRCUIT NUMBER(S)



A CONDUIT BLOCK DIAGRAM

PREPARED BY: Weaver Consultants Group

PREPARED FOR: CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
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D	09/08/25	RESPECTIVE DESIGN SUBMITTAL	TMH	TMH
C	06/06/25	REVISIONS TO 65% DESIGN	TMH	TMH
B	04/17/24	REVISIONS TO 65% DESIGN	TMH	TMH
A	02/28/18	30% DESIGN	BB	JP

REVISION SUMMARY

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED ELECTRICAL ENGINEER — BRIAN A. DOMINGO — No. 17607 — Exp. 06/30/27 — ELECTRICAL — STATE OF CALIFORNIA — 92196

DESIGNER:	JA/DN
DRAWN BY:	JA
CHECKED BY:	DN
APPROVED BY:	AGA
DATE:	03/31/2026

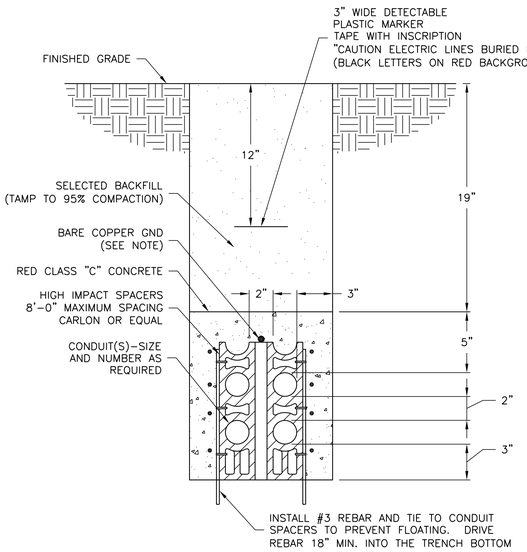
CONDUIT BLOCK DIAGRAM

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME:

SHEET No. E08
37
REVISION 0

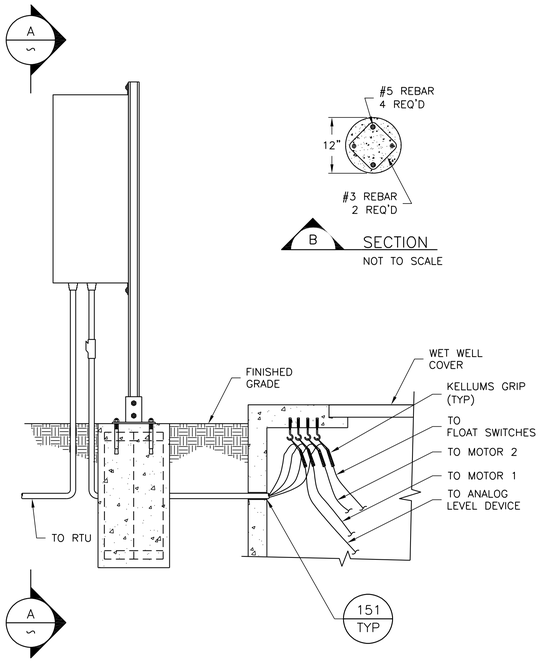
NCS ENGINEERING PE



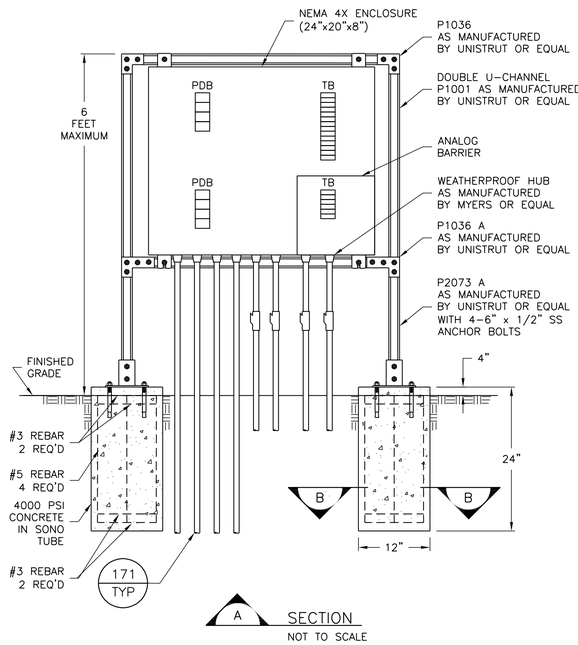
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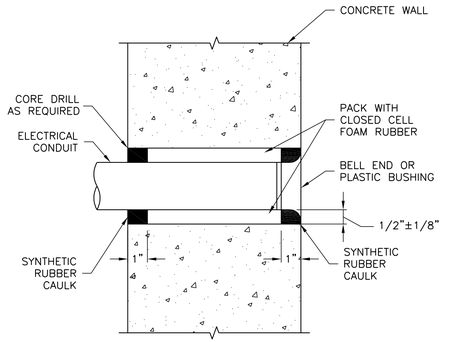
1. GROUND CONDUCTOR SHALL RUN CONTINUOUSLY THROUGH MANHOLES AND SHALL CONTINUE FROM DUCTBANK INTO SWITCHGEAR OR BUILDING GROUNDING SYSTEM AND SHALL BE BONDED TO EACH RIGID METAL CONDUIT. SIZE TO BE #4/0 UNLESS OTHERWISE INDICATED ON PLANS.
2. ALL DIMENSIONS ARE MINIMUM.

105 TYP — DUCTBANK – CONCRETE ENCASED
NOT TO SCALE

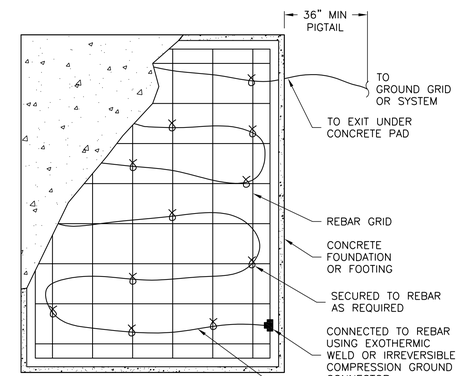


213 TYP — WET WELL JUNCTION BOX
NOT TO SCALE

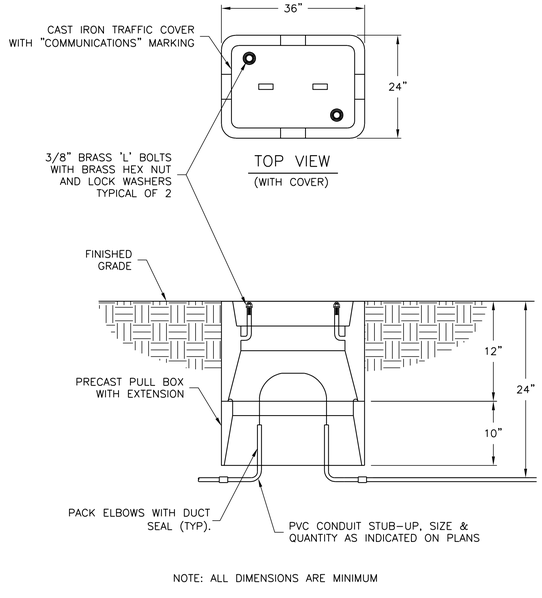




151 TYP — MANHOLE PENETRATION
NOT TO SCALE

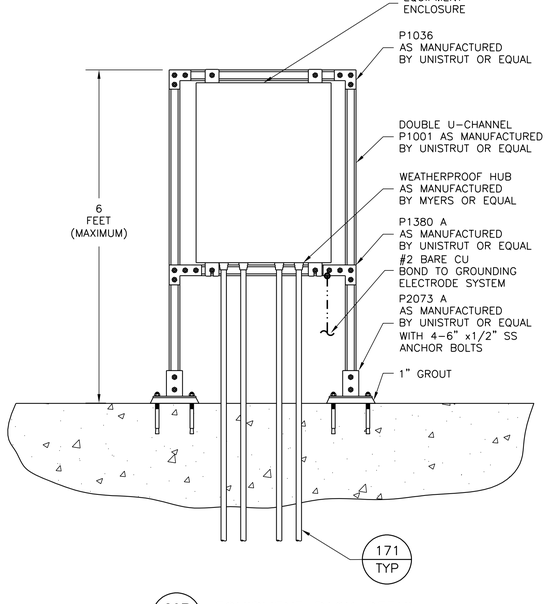


402 TYP — "UFER" GROUNDING DETAIL
NOT TO SCALE

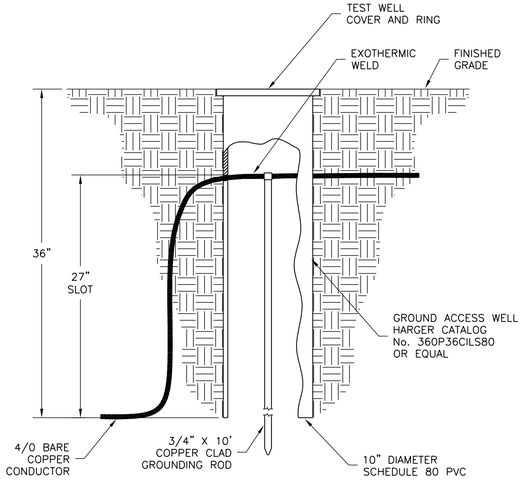


NOTE: ALL DIMENSIONS ARE MINIMUM

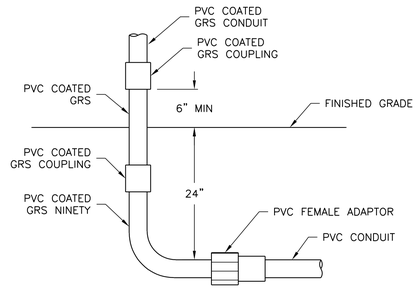
315 TYP — UNDERGROUND CONCRETE JUNCTION BOX
NOT TO SCALE



207 TYP — EQUIPMENT RACK DETAIL
NOT TO SCALE



406 TYP — GROUND ROD WITH TEST ACCESS WELL
NOT TO SCALE



NOTES:

1. WHERE CONDUITS ARE INSTALLED IN A CONCRETE SLAB, THE 24" DIMENSION DOES NOT APPLY. CONDUITS SHALL BE INSTALLED BETWEEN REBAR MATS OR UNDER A SINGLE REBAR MAT.
2. IN CORROSIVE AREAS, PVC COATED GRS SHALL BE USED.

171 TYP — PVC COATED GRS STUB UP DETAIL
NOT TO SCALE

PREPARED BY
Weaver Consultants Group

PREPARED FOR
CAL GUARD CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
D	08/08/25	RESPECTFORL DESIGN SUBMITTAL	TMH	TMH
C	04/30/25	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL, 95% DESIGN	TMH	TMH
A	02/28/18	30% DESIGN	BB	JP

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

BRIAN K. DOHNING REGISTERED ELECTRICAL ENGINEER No. 17607 Exp. 06/30/27 STATE OF CALIFORNIA

DESIGNER: JA/DN
DRAWN BY: JA
CHECKED BY: DN
APPROVED BY: AGA
DATE: 03/31/2026

ELECTRICAL DETAILS

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME:

SHEET No. E09
38
REVISION 0

NCS ENGINEERING PC

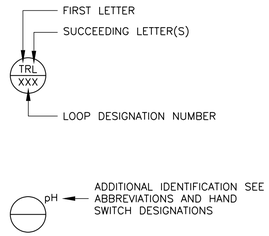
ISA INSTRUMENT IDENTIFICATION TABLE

FIRST LETTERS			SUCCEEDING LETTERS		
MEASURED OR INITIATING VARIABLE		MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYZER		ALARM		AUTO
B	BURNER, COMBUSTION				
C	CONDUCTIVITY			CONTROL	CLOSED
D	DENSITY	DIFFERENTIAL			
E	VOLTAGE		ELEMENT		
F	FLOW	RATIO			
G	GAUGE		GLASS, VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHED.	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	MOTION				MIDDLE
N	INTRUSION				NORMAL
O	TORQUE		ORIFICE, RESTRICTION		OPEN
P	PRESSURE		POINT CONNECTION		STOP
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD, OR PRINT		RUN OR REMOTE
S	SPEED, FREQUENCY	SAFETY		SWITCH	START
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION			VALVE, LOUVER	
W	WEIGHT		WELL		
X	MOTOR	X-AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE, OR PRESENCE	Y-AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION	Z-AXIS		DRIVER, ACTUATOR, FINAL CONTROL ELEMENT	

P&ID ABBREVIATIONS

A	AMPERE
AFD	ADJUSTABLE FREQUENCY DRIVE
AI	ANALOG INPUT
AIC	AMPS INTERRUPTING CAPACITY
ARV	AIR RELIEF VALVE
AO	ANALOG OUTPUT
AS	AIR SUPPLY
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
CB	CIRCUIT BREAKER
CL2	CHLORINE
CON	CONTACTOR
CU	COPPER
CV	CONTROL VALVE
DCS	DISTRIBUTED CONTROL SYSTEM
DI	DISCRETE INPUT
DO	DISSOLVED OXYGEN, DISCRETE OUTPUT
DP	DIFFERENTIAL PRESSURE
DWG	DRAWING
EGO	EMERGENCY GAS OFF
ETM	ELAPSED TIME METER
ETMf	ELAPSED TIME METER (FAST SPEED)
ETMs	ELAPSED TIME METER (SLOW SPEED)
EOL	ELECTRONIC OVERLOAD
EXIST	EXISTING
FA	FOUL AIR
FC	FAIL CLOSED
FE	FINAL EFFLUENT
FR	FORWARD-REVERSE
FS	FLOAT SWITCH
FVNR	FULL VOLTAGE NON-REVERSING
FW	FINISHED WATER
GND	GROUND
GAL	GALLONS
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
H, HI	HIGH
H2S	HYDROGEN SULFIDE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND-OFF-AUTO
I	CURRENT
IO	INPUT/OUTPUT
IOE	INTERNAL-OFF-EXTERNAL
JB	JUNCTION BOX
L, LO	LOW
LAN	LOCAL AREA NETWORK
LC	LOOP CONTROLLER
LCP	LOCAL CONTROL PANEL
LOS	LOCK-OFF-STOP
LR	LOCAL/REMOTE
LS	LEVEL (i.e., FLOAT) SWITCH
M	MOTOR
MA	MANUAL/AUTO
mA	MILLIAMP
MC	MANUFACTURE CABLE
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MFR(S)	MANUFACTURER(S)
MGD	MILLION GALLONS PER DAY
MGL	MILLIGRAMS PER LITER
MH	MANHOLE
MLR	MIXED LIQUOR RETURN
MO	MOISTURE
MOD	MODULATED
MTU	MASTER TELEMETRY UNIT
NPW	NON-POTABLE WATER
NS	NITROGEN SUPPLY
NTU	TURBIDITY
O/C	OPEN / CLOSE
OCA	OPEN-CLOSE-AUTO
OCR	OPEN-CLOSE-REMOTE
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD
OO	ON/OFF (MAINTAINED)
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OSC	OPEN-STOP-CLOSE
PAH	PRESSURE ALARM HIGH
PER	PERMISSIVE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
PO	PULSE OUTPUT
POS	POSITION
POT	POTENTIOMETER
PPG	POUNDS PER GALLON
PPH	POUNDS PER HOUR
PPM	PARTS PER MILLION
PR	PAIR
PRES	PRESSURE
PS	PRESSURE SWITCH
PSI	POUNDS PER SQUARE INCH
PV	PROCESS VARIABLE
RAS	RETURN ACTIVATED SLUDGE
RAW	RAW WATER
REM	REMOTE
RF	RADIO FREQUENCY
RIO	REMOTE INPUT OUTPUT
RS	RAW SEWAGE
RSP	RAW SEWAGE PUMP
RST	RESET
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TELEMETRY UNIT
RUNf	RUN (FAST SPEED)
RUNs	RUN (SLOW SPEED)
SB	SLUDGE BLANKET
SEQ	SERVICE ENTRANCE EQUIPMENT
SES	SERVICE ENTRANCE SECTION
SLC	SINGLE LOOP CONTROLLER
SLOS	START-LOCK-OFF-STOP
SO2	SULFUR DIOXIDE
SOV	SOLENOID OPERATED VALVE
SP	SET POINT
SPD	SPEED
SPR	SPARE
SS	START/STOP (MAINTAINED)
SSS	SOLID STATE STARTER (SOFT START)
STR	MOTOR STARTER
TAH	TEMPERATURE ALARM HIGH
T/M	TEMPERATURE AND/OR MOISTURE
TEMP	TEMPERATURE
TS	TEMPERATURE SWITCH
TSS	TOTAL SUSPENDED SOLIDS
UG	UNDERGROUND
USD	UP/STOP/DOWN
V	VOLT
VFD	VARIABLE FREQUENCY DRIVE
W	WATER
WAS	WASTE ACTIVATED SLUDGE
WW	WASTEWATER
XMTR	TRANSMITTER
ZS	POSITION (i.e. LIMIT) SWITCH

TAG NUMBERS AND DESIGNATIONS



HAND SWITCH DESIGNATIONS

ES	EMERGENCY STOP
HOA	HAND-OFF-AUTO
HOR	HAND-OFF-REMOTE
HORA	HAND-OFF-REMOTE-AUTO
JOA	JOG-OFF-AUTO
LOR	LOCAL-OFF-REMOTE
LR	LOCAL-REMOTE
OC	OPEN-CLOSE
OO	ON-OFF
S/S	START STOP PUSH BUTTONS

LINE SYMBOLS

- MAJOR PROCESS PIPING OR FLOW CHANNEL
- EXISTING PROCESS PIPING
- SECONDARY PROCESS PIPING
- EXISTING SECONDARY PROCESS PIPING
- FUTURE PIPING AND EQUIPMENT
- ELECTRICAL SIGNAL
- HYDRAULIC SIGNAL
- PNEUMATIC SIGNAL
- ELECTRICAL DIRECTION ARROW
- SIGNAL CONNECTION POINT
- FLOW ARROW FOR PROCESS PIPING
- PROCESS OR SIGNAL LINE GOING TO ANOTHER SHEET (MATCH LETTERS) — I-3 /A
- PROCESS OR SIGNAL LINE FROM ANOTHER SHEET (MATCH LETTERS) — I-2 /A
- PROCESS LINES CROSSING (NOT CONNECTED)
- INTERNAL SYSTEM SIGNAL LINK (SOFTWARE OR DATA LINK)

P&ID VALVE SYMBOLS

- GATE OR GENERIC VALVE
- 3-WAY VALVE
- 4-WAY VALVE
- ANGLE VALVE
- BUTTERFLY VALVE
- PLUG VALVE
- ECCENTRIC PLUG VALVE
- BALL VALVE
- CHECK VALVE
- SWING CHECK VALVE
- STOP CHECK VALVE
- BALL CHECK VALVE
- PINCH VALVE
- DIAPHRAGM VALVE
- DIAPHRAGM VALVE (ALTERNATE)
- GLOBE VALVE
- HAND VALVE
- KNIFE VALVE
- MOTORIZED VALVE ACTUATOR
- SOLENOID VALVE 2-WAY
- SOLENOID VALVE 3-WAY
- PUMP CONTROL VALVE
- FLOW CONTROL VALVE
- PRESSURE RELIEF VALVE
- VACUUM RELIEF VALVE
- PRESSURE REGULATOR WITH REMOTE PROCESS CONNECTION
- PRESSURE REGULATOR SELF CONTAINED
- AIR RELEASE VALVE

P&ID EQUIPMENT AND PROCESS SYMBOLS

- METERING PUMP WITH MANUAL STROKE CONTROL
- ROTARY LUBE PUMP
- SUBMERSIBLE MIXER
- AERATOR
- SUBMERSIBLE PUMP
- DIESEL GENERATOR
- CENTRIFUGAL PUMP
- BLOWER
- LIFT PUMP
- MOTOR OR MOTOR ACTUATOR
- PNEUMATIC ACTUATOR
- SOLENOID
- VERTICAL TURBINE PUMP
- PARSHALL FLUME
- WEIGHT SCALE
- AIR COMPRESSOR
- SLUICE GATE
- SAMPLER
- PROPELLER FLOWMETER ELEMENT
- MAGNETIC FLOWMETER ELEMENT
- CL2 FLOWMETER
- MASS FIT 6 — INSERTION TYPE MASS FLOW METER
- MASS FIT 6 — MASS FLOW METER ANNUBAR TYPE
- DRAIN
- OUTLET SILENCER
- INLET SILENCER
- ROTAMETER
- AIR RELIEF VALVE
- EJECTOR
- DIAPHRAGM SEAL
- DIFFUSER
- DIAPHRAGM
- Y-TYPE STRAINER
- IPS CORPORATION STOP
- PVC DIFFUSER WITH IPS CORPORATION STOP

SENSING, INDICATION, AND CONTROL SYMBOLS

- LE — ULTRASONIC LEVEL TRANSDUCER
- LS — FLOAT SWITCH
- BEACON R — BEACON R=RED, A=AMBER, B=BLUE, G=GREEN
- STOP YL G — INDICATING LIGHT
- HOA HS — HAND SWITCH
- ORP AIT — ORP ANALYZER
- pH AIT — pH ANALYZER
- AE — ANALYZER ELEMENT
- DO AE — DO SENSOR
- ORP AE — ORP SENSOR
- pH AE — pH SENSOR
- DO AIT — DO ANALYZER
- CL2 AE — RESIDUAL CL2 CHLORINE SENSOR
- CL2 AIT — RESIDUAL CL2 CHLORINE ANALYZER

P&ID INTERFACE SYMBOLS

- AAA BBB X — PILOT LIGHT X= LENS COLOR, R=RED, G=GREEN, A=AMBER B=BLUE
- AAA BBB CCC — FIELD DEVICE
- AAA BBB CCC — PANEL DEVICE
- AAA BBB CCC — DEVICE MOUNTED IN SUBPANEL
- BBB CCC — I/O TERMINAL
- BBB CCC — HMI OR OIT FUNCTION
- I X — INTERLOCK DEVICE OR RELAY X=NOTE REF.
- I/I — DUAL CHANNEL CURRENT ISOLATOR
- DISCRETE INPUT
- DISCRETE OUTPUT
- ANALOG INPUT
- ANALOG OUTPUT
- PULSE INPUT

NOTE:

REFER TO ISA INSTRUMENT IDENTIFICATION TABLE FOR DEFINITION OF LETTERS BBB INSIDE THE BUBBLES. CCC REPRESENTS LOOP ID (IF USED). SEE ABBREVIATIONS LIST FOR SUPERSCRIPT AAA.

NCS ENGINEERING PE

PREPARED BY: Weaver Consultants Group

PREPARED FOR: CAL GUARD — CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REV	DATE	DESCRIPTION	BY	APPD
0	03/31/28	100% DESIGN SUBMITTAL	TMH	
E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
D	08/08/25	RESPECTFORL DESIGN SUBMITTAL	TMH	TMH
C	07/07/25	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO 65%, 35% DESIGN	TMH	TMH
A	02/28/18	35% DESIGN	BB	JP

REVISION SUMMARY

SCALE: AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER — BRIAN A. HOINTING — No. 17607 — Exp. 06/30/27 — CIVIL — ELECTRICAL — STATE OF CALIFORNIA — 92196

DESIGNER: JA/DN
DRAWN BY: JA
CHECKED BY: DN
APPROVED BY: AGA
DATE: 03/31/2028

P&ID SYMBOLS AND LEGEND

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME:

SHEET No. 101
39
REVISION 0

SCADA (EXISTING)

SPECIFIC I/O POINTS TO BE COMMUNICATED SHALL BE AS REQUIRED BY OWNER AND/OR AS RECOMMENDED BY CLOACINA

ETHERNET (MULTI-MODE FIBER)

MBR/MAIN SITE PLC CABINET

SPECIFIC I/O POINTS TO BE COMMUNICATED TO BE PER CLOACINA

PLANT INFLUENT FLOW INDICATION
FI

VENDOR PACKAGE (PROVIDED BY VENDOR, INSTALLED AND WIRED BY CONTRACTOR)

MULTI MODE FIBER

BAR SCREEN & WASHER/COMPACTOR VENDOR CONTROL PANEL 480V, 3ø NEMA 3R, 5kA SCCR (MIN.) CP-106

LIT

480VAC

ESTOP HOA
HS 137PB1 HS 110
FOJ
HS 110A
BAR SCREEN LOCAL CONTROL STATION LCS-110

ESTOP HOA
HS 137PB2 HS 106
FOJ
HS 106A
WASHER/COMPACTOR LOCAL CONTROL STATION LCS-106

FIELD

DEWATERING ZONE SUPPLY WATER

S
FLUSHWATER SOLENOID 150SOL

S
WASHWATER SOLENOID 149SOL

SCREENINGS

WASTE CONTAINER

SECONDARY CONTAINMENT

M
WASHER/ COMPACTOR WC-106

LE 1A

LE 1B

ZS 110

PULL CORD ESTOP
HS 137PB2

M

120VAC (EXISTING)

FIT

FE

DIVERSION CHAMBER (EXISTING)

A/I-03
TO LOW FLOW WET WELL

B/I-04
TO DISCHARGE VAULT

RAW WASTEWATER

GRIT CHAMBER

RAW WASTEWATER

GRIT CHAMBER

BAR SCREEN SCR-110

MANUAL SCREEN

NCS ENGINEERING PE

PREPARED BY
Weaver Consultants Group

PREPARED FOR
CAL GUARD
CALIFORNIA MILITARY DEPARTMENT

CALIFORNIA MILITARY DEPARTMENT
10801 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

REVISION SUMMARY

REV	DATE	DESCRIPTION	BY	APPD
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E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
D	08/08/25	RESPECTFORL DESIGN SUBMITTAL	TMH	TMH
C	06/04/25	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO 60% DESIGN	TMH	TMH
A	02/28/18	30% DESIGN	BB	JP

SCALE:
AS NOTED
BAR SHOULD BE EXACTLY 1 INCH LONG
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REGISTERED PROFESSIONAL ENGINEER
BRIAN A. KNOTTS
No. 17607
Exp. 06/30/27
ELECTRICAL
STATE OF CALIFORNIA

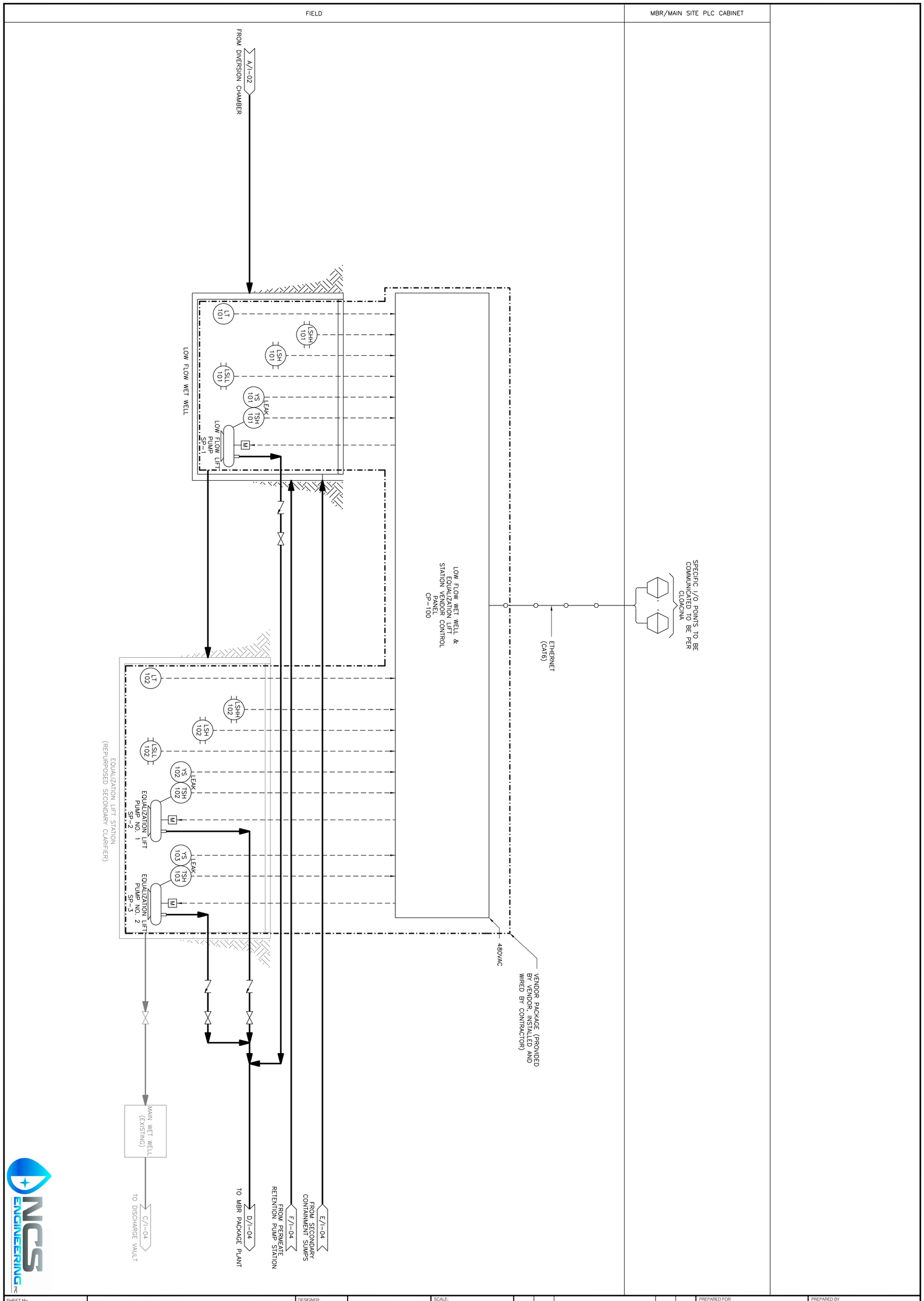
DESIGNED: JA/DN
DRAWN BY: JA
CHECKED BY: DN
APPROVED BY: AGA
DATE: 03/31/2026

P&ID - SHEET 1

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67
FILE NAME:

SHEET No. I02
40
REVISION 0



SHEET No. **103**

41

REVISION **0**

P&ID - SHEET 2

WASTE WATER TREATMENT PLANT UPGRADES PHASE 2
CAMP ROBERTS, CA

PROJECT No. 5890-300-01-67 | FILE NAME:

DESIGNER: JA/DN
DRAWN BY: JA
CHECKED BY: DN
APPROVED BY: AGA
DATE: 03/31/2026

REGISTERED PROFESSIONAL ENGINEER
BRIAN D. DOWNING
No. 17607
Exp. 06/30/27
ELECTRICAL
STATE OF CALIFORNIA

SCALE: AS NOTED

BAR SHOULD BE EXACTLY 1 INCH LONG

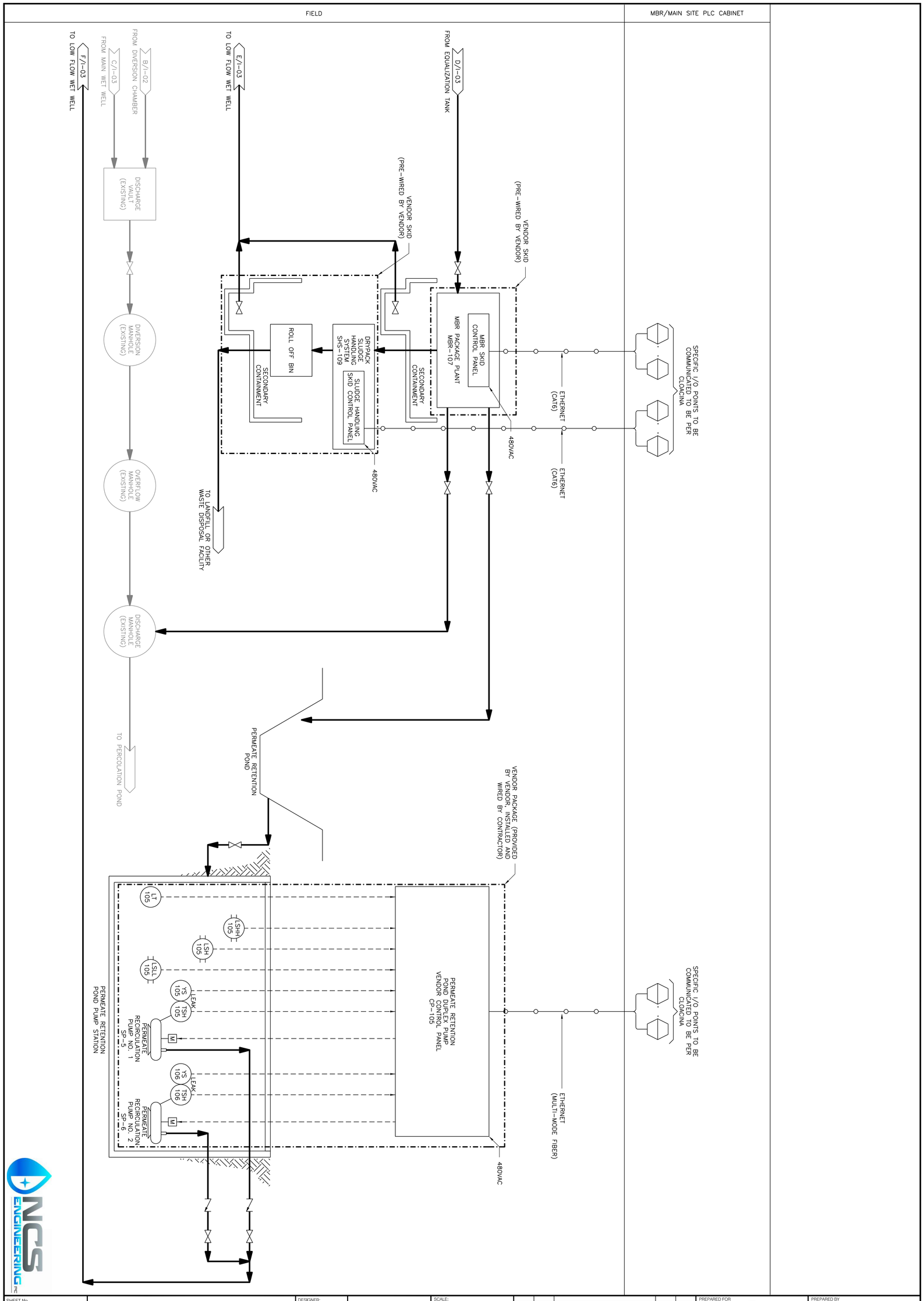
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY

REV	DATE	DESCRIPTION	BY	APPD
D	03/31/26	100% DESIGN SUBMITTAL	TMH	TMH
E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
D	08/08/25	REVISED 65% DESIGN SUBMITTAL	TMH	TMH
C	12/16/24	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	TMH	TMH
A	02/28/18	35% DESIGN	BB	JP

REVISION SUMMARY

PREPARED FOR
CAL GUARD
CALIFORNIA MILITARY DEPARTMENT
CALIFORNIA MILITARY DEPARTMENT
10601 BEAR HOLLOW DRIVE
RANCHO CORDOVA, CA 95670

PREPARED BY
Weaver Consultants Group



SHEET No.	104	
42		
REVISION	0	
P&ID - SHEET 3		
WASTE WATER TREATMENT PLANT UPGRADES PHASE 2 CAMP ROBERTS, CA		
PROJECT No.	5890-300-01-67	
FILE NAME:		
DESIGNER:	JA/DN	
DRAWN BY:	JA	
CHECKED BY:	DN	
APPROVED BY:	AGA	
DATE:	03/31/2026	
SCALE:	AS NOTED	
BAR SHOULD BE EXACTLY 1 INCH LONG		
IF NOT 1 INCH, ADJUST SCALE ACCORDINGLY		

REGISTERED PROFESSIONAL ENGINEER
BRIAN A. DOWNING
No. 17607
Exp. 06/30/27
ELECTRICAL
STATE OF CALIFORNIA

REV	DATE	DESCRIPTION	BY	APPD
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E	11/07/25	95% DESIGN SUBMITTAL	TMH	TMH
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C	12/16/24	65% DESIGN SUBMITTAL	TMH	TMH
B	04/17/24	REVISIONS TO CIVIL 35% DESIGN	TMH	TMH
A	02/28/18	35% DESIGN	DEN	DJR

REVISION SUMMARY

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