CITY OF TURLOCK
STANISLAUS COUNTY, CALIFORNIA

ADDENDUM NO. 1

TO

CONTRACT DOCUMENTS FOR THE CONSTRUCTION OF THE

TURLOCK REGIONAL WATER QUALITY CONTROL FACILITY CHEMICAL SYSTEM UPGRADES PROJECT AT RWQCF

CITY PROJECT NO. 20-032

April 22, 2021

ADDENDUM NO. 1

Turlock Regional Water Quality Control Facility
CHEMICAL SYSTEM UPGRADES PROJECT AT RWQCF

Project No. 20-032

City of Turlock, California

THIS ADDENDUM IS NOW INCORPORATED AS A PART OF THE CONTRACT DOCUMENTS AND MODIFIES THE ORIGINAL PLANS AND SPECIFICATIONS AS NOTED HEREIN. BY SUBMISSION OF A BID FOR THIS PROJECT, THE BIDDER IS ACKNOWLEDGING THAT THE BIDDER HAS CONFIRMED THAT HE OR SHE HAS RECEIVED ALL ADDENDA ISSUED FOR THAT PROJECT AND HAS INCLUDED COSTS FOR SUCH IN THE BID SUBMITTED.

While we believe the plans and specifications to be accurate, they are disseminated in accordance with law and are to be relied upon only at user's risk. The user should be advised to contact the City for updates on any material they receive to ensure that they have the latest/most current information.

It shall be the responsibility of the prime bidder to inform any affected sub bidder of the content of this Addendum.

SPECIFICATIONS (VOLUME 1 OF 3 – DIVISIONS 0 THROUGH 9)

1. DOCUMENT 00100 - ADVERTISEMENT FOR BIDS

    A. Replace Document 00111 in its entirety with attached.

2. DOCUMENT 01612 – SEISMIC DESIGN CRITERIA

    A. Replace Appendix A Site-Specific Response Spectra report with the attached.

SPECIFICATIONS (VOLUME 2 OF 3 – DIVISIONS 09 THROUGH 17)

1. Document 17050 – COMMON WORK RESULTS FOR PROCESS CONTROL AND INSTRUMENTATION SYSTEMS

    A. Replace the HSQ Quote that follows this section with the attached updated HSQ Quote that matches the bid form.

DRAWINGS (VOLUME 3 OF 3)

1. Sheet Number 32 of 97, Drawing No. SHS01

   A. Add a General Note 2, to the drawing, it shall read "CONTRACTOR TO TOUCH UP ALL DAMAGED LATEX PAINT ON INTERIOR OF BUILDING. LATEX PAINT SHALL BE COLOR MATCHED TO EXISTING PAINT. THIS IS FOR ALL REPAIRS THAT NEED TO BE MADE TO THE CEILING AND WALLS OF THE STRUCTURE."

2. Sheet Number 34 of 97, Drawing No. DFM01

   A. Add to Keynote 15 on this drawing. "Add 14 gauge sheet metal that is coated with high solids epoxy/polyurethane per Section 09960 to close hole that is located at the top center of the doors where the existing monorail beam was located. Attach to both sides of the doors, and attach with screws @4-inches on center.

3. Sheet Number 48 of 97, Drawing No. SHSM01

   A. Delete Key Note 6 from this drawing.

4. Sheet Number 62 of 97, Drawing No. SHSE08

   A. Replace the drawing with the attached drawing.

5. Sheet Number 63 of 97, Drawing No. SHSE09

   A. Replace the drawing with the attached drawing.

6. Sheet Number 66 of 97, Drawing No. SHSE12

   A. Replace the drawing with the attached drawing.

7. Sheet Number 69 of 97, Drawing No. CSE03

   A. Replace the drawing with the attached drawing.

8. Sheet Number 72 of 97, Drawing No. DFE03

   A. Replace the drawing with the attached drawing.

ATTACHMENTS:

1. Document 00111 - Advertisement for Bids
2. Kleinfelder Site-Specific Response Spectra (Document 01612 Appendix A)
3. HSQ Quote No. 2103-0022-GJ_R.1 (Document 17050 attachment)
4. Sheet Number 62 of 97, Drawing No. SHSE08
5. Sheet Number 63 of 97, Drawing No. SHSE09
6. Sheet Number 66 of 97, Drawing No. SHSE12
7. Sheet Number 69 of 97, Drawing No. CSE03
8. Sheet Number 72 of 97, Drawing No. DFE03

This Addendum No. 1 shall become part of the Contract and all provisions of the Contract shall apply thereto. This addendum has been prepared by or under, the direction of the following Registered Engineers:

Digitally signed by Ryan M. Sellman
Contact Info: Carollo Engineers
Date: 2021.04.22 08:34:21-07'00'

REGISTERED PROFESSIONAL ENGINEER
RYAN M. SELLMAN
No. 76650
CIVIL
STATE OF CALIFORNIA

5/16/2017

Ryan Sellman, P.E. California Civil C-76650

CIVIL ENGINEERING
Carollo Engineers, Inc., 2795 Mitchell Drive
Walnut Creek, CA 94598, Telephone: 925-932-1710

DOCUMENT 00111

ADVERTISEMENT FOR BIDS

CITY OF TURLOCK
DEVELOPMENT SERVICES DEPARTMENT / ENGINEERING DIVISION
156 SOUTH BROADWAY, SUITE 150
TURLOCK, CA 95380-5454

TURLOCK REGIONAL WATER QUALITY CONTROL FACILITY
CHEMICAL SYSTEM UPGRADES PROJECT AT RWQCF
CITY PROJECT NO. 20-032

ADVERTISEMENT FOR BIDS

Sealed Bids for the construction of the Turlock Regional Water Quality Control Facility Chemical System Upgrades Project at RWQCF will be received by City of Turlock, at the office of the City Engineer, Engineering Division, 156 South Broadway, Suite 150, Turlock, CA 95380-5454, until 2:00 pm sharp (as determined by computer clock located at the Engineering Division Front Counter) on ~~MAY 05, 2021~~May 12, 2021[AD1] local time, at which time the Bids received will be publicly opened and read. The Project consists of constructing the following components:

1. Demolition of the existing Chlorine Gas disinfection system.
2. Installation of a new Sodium Hypochlorite disinfection system.
3. Demolition and installation of a new Coagulant chemical system.
4. Demolition and installation of a new Dechlorination system.
5. Additions and modifications to yard piping system.
6. Additions and modifications to electrical systems.
7. Additions and modifications to instrumentation systems.
8. Repair and reconstruction to existing facilities affected by the work and all work necessary to render the facility complete and operational.

BIDDING DOCUMENTS

The Issuing Office for the Bidding Documents is: City of Turlock, Development Services Department/Engineering Division, 156 South Broadway, Suite 150, Turlock, CA 95380-5454. The Bidding Documents in PDF format may be downloaded from the City of Turlock's website (www.cityofturlock.org/capitalprojects). Charges for all documents obtained will be made on the following basis: Checks to be made payable to the City of Turlock. Charges are not refundable.

Document Description	Non-Refundable Charges
Complete set of Contract Documents consisting of Volumes 1 through ~~2~~ 3[AD1] which includes full-size drawings (22-inch by 34-inch) and specifications.	$ 350
Complete set of Contract Documents consisting of Volumes 1 through 2 which includes reduced-size drawings (11-inch by 17-inch) and specifications.	$ 175
Mailing	Not included. Must provide UPS, FEDEX or other overnight mail service account number.
Information Available To Bidders, may be obtained by requesting a PDF copy by email to Stephen Fremming (sfremming@turlock.ca.us).	No fee.

Bidding Documents may also be examined at the following locations:

A full set of Bidding Documents is available for examination at the office of the City Engineer of the City of Turlock, Development Services Department/Engineering Division 156 South Broadway, Suite 150, Turlock, CA 95380-5454, and can be viewed at Carollo Engineers, 2795 Mitchell Drive, Walnut Creek, CA 94598.

List of plan holders can be viewed on the Internet at www.cityofturlock.org/capitalprojects. Click on “View Planholders List.”

For procedural questions contact:

Stephen Fremming
City of Turlock, Development Services, Engineering Division
(209) 668-5599 ext. 5417
sfremming@turlock.ca.us

Submit all technical questions during the bid period in writing (via email only) to both the primary and secondary contacts listed below:

Ryan Sellman, P.E. (primary contact)
Carollo Engineers, Inc. – Walnut Creek, California Office
209-518-6855
rsellman@carollo.com

Stephen Fremming, PE
City of Turlock, Development Services, Engineering Division
(209)668-5599 ext. 5417
sfremming@turlock.ca.us[AD1]

MANDATORY VIRTUAL PRE-BID CONFERENCE

A virtual pre-bid conference will be held at 1:00 p.m., local time on April 13, 2021. To obtain video-conference login information, email Ryan Sellman rsellman@carollo.com to request login information at least 24 hours prior to the pre-bid meeting date and time. Requests will be responded to confirming they have been received. If you do not receive a response call Ryan Sellman at 209-518-6855. Requests less than 24 hours prior to the pre-bid meeting date and time may not receive a response. Attendance at the pre-bid conference is mandatory and not attending the mandatory pre-bid meeting will result in a non-responsive bid.

A second Pre-Bid meeting will be provided for contractors that were unable to attend the first meeting. The meeting will be held on Wednesday 4/28 at 1:00 PM. If the general contractor attended the first meeting, attendance at the second meeting is not required. Please RSVP to Ryan Sellman at rsellman@carollo.com. The below information is to attend the meeting:

Join on your computer or mobile app
Click here to join the meeting
Or call in (audio only)
+1 602-935-0460,,681243753#   United States, Phoenix
(866) 840-7016,,681243753#   United States (Toll-free)
Phone Conference ID: 681 243 753#
Find a local number | Reset PIN[AD1]

MANDATORY INDIVIDUAL SITE WALKS

A Mandatory site-walk will be required by all responsive bidders. Due to COVID-19, the site walks will be set up by appointment only on April 15, 2021 and April 16, 2021. Each bidder will be given 1-1/2 hours onsite. Appointments will be schedule on 1-1/2 hour increments between 8:00 AM and 3:30. To request a your site walk appointment email Ryan Sellman rsellman@carollo.com. Masks will be required for the site walk.

A second Site Walk meeting will be provided for contractors that were unable to attend the first site walk. The site walk will be on Monday 5/03. Please RSVP to Ryan Sellman at rsellman@carollo.com to pick a time for the site walk. If the general contractor attended the first site walk, a second site walk is not required.[AD1]

BID SECURITY

Bid security shall be furnished in accordance with Document 00200 - Instructions to Bidders.

CONTRACTOR REGISTRATION

Contractor must provide proof of registration with the California Department of Industrial Relations (DIR) in the form of a PDF extract from DIR Public Works Registration website.

Pursuant to California SB854, Contractor and subcontractor must submit certified payroll records (CPRs) to the Labor Commissioner.

Project is subject to compliance monitoring and enforcement by the DIR.

PREVAILING WAGE RATES

Pursuant to Section 1770 et. seq., California Labor Code, the successful Bidder shall pay not less than the prevailing rate of per diem wages as determined by the Director of California Department of Industrial Relations. A copy of such prevailing rate is on file at the Owner's offices and will be made available for examination during business hours to any party on request. The project is subject to compliance monitoring and enforcement by the California Department of Industrial Relations.

CITY OF TURLOCK

By: ______________________________________

Nathan Bray, P.E.
Acting Director of Development Services/
City Engineer

Date: ____________________________________

Date of Initial Publication of Advertisement

END OF SECTION

[AD1] Addendum No. 1

APPENDIX A[AD1]

SITE-SPECIFIC RESPONSE SPECTRA

[AD1] Addendum No. 1

December 17, 2020
Kleinfelder Project No. 20212568.001A

Mr. Ryan Sellman
Carollo
2795 Mitchell Drive
Walnut Creek, CA 94598
Email: rsellman@carollo.com

SUBJECT: Site-Specific Ground Motion Hazard Analysis
Turlock Regional Water Quality Control Facility – Chlorine Building Tanks
901 S. Walnut Road
Turlock, California

Reference: Kleinfelder, "Geotechnical Services Report and Geologic/Seismic Hazards Assessment, Proposed Headworks and Secondary Treatment Expansion, Turlock Water Quality Control Plant, Turlock, California," dated December 21, 2007, File No. 87738.G01/MOD7R139

Kleinfelder, "Report Update, Geotechnical Services Report and Geologic/Seismic Hazards Assessment, Proposed Secondary Clarifier, Turlock Water Quality Control Plant, Turlock, California," dated July 24, 2014, File No. 128519.001A/MOD14R02505

Dear Mr. Sellman

This letter presents the results of Kleinfelder's site-specific ground motion hazard analysis (GMHA) for the Chlorine Building Tanks located at Turlock Regional Water Quality Control Facility in Turlock, California. The purpose of this GMHA is to develop site-specific ground motion parameters in terms of peak ground accelerations and response spectral accelerations. Site specific seismic design parameters are developed for the subject site in accordance with the requirements of the 2019 California Building Code (CBC) which adopts the procedures outlined in ASCE 7-16 (ASCE 7-16) and Supplement 1 of that standard. The scope of this analysis includes:

- Development of a site-specific earthquake source model for conformance with the current code requirements and current state of the practice.
- Performing site-specific ground motion hazard analyses per Section 21.2 of ASCE 7-16 consisting of probabilistic and deterministic seismic hazard analyses (PSHA and DSHA).
- Develop site-specific response spectra for the Risk-Targeted Maximum Considered Earthquake (MCE_R) and the Design Earthquake (DE) and to obtain seismic design parameters per Section 21.4 of ASCE 7-16.
- Preparation of this report presenting the results of the site-specific seismic hazard analyses.

This report is intended to support our current geotechnical study for the subject site and is subject to the same limitations as contained in the main report.

PROJECT LOCATION

The project site is located in Turlock, California. The approximate coordinates of the project site for the ground motion hazard analysis are:

Latitude: 37.4838° N
Longitude: 120.8708° W

SEISMOTECTONIC SETTING AND SEISMICITY

A brief discussion of the seismotectonic setting and historic seismicity is provided below. The regional seismotectonic setting and historic seismicity inform the selection of an appropriate seismic source model and provide context for the likely potential for future earthquakes to impact the site.

Seismotectonic Setting

The site is located in the Western United States (WUS) near the boundary between the Great Valley and Coast Range geomorphic provinces. Seismicity in this region is dominated by the northwest trending movement of the North American and Pacific Plate transform plate boundary. To the east, the Sierra Nevada-Great Valley block - an independent microplate - generally encompasses the entirety of the Sacramento Valley, beyond which as a zone of distributed shear known as the Walker Lane Belt (near California/Nevada border). Northward, in the pacific northwest, the Juan de Fuca plate is currently subducting below the North American plate in a region known as the Cascadia Subduction Zone (Humphreys and Coblentz, 2007; Unruh et al., 2003, Unruh and Humphrey, 2017).

Regionally, stress build up is associated with the northeast relative movement of the pacific plate and extensional relaxation of the Basin and Range. These stresses are accommodated primarily by displacements on faults within the San Andreas system, and to a much lesser extent by displacements on faults within the Walker Lane Belt (Unruh and Humphrey, 2017; Field et al., 2013).

Regional Faulting and Independent Seismogenic Sources

Figure 1 presents both active and inactive faults as mapped by Jennings and Bryant (2010). These faults were generally considered in development of independent seismogenic sources discussed in this report. Not all faults shown on the figure are considered independent seismogenic sources, with smaller or inactive faults generally excluded from consideration.

The nearest significant independent seismogenic fault to the site is the Great Valley 7 (Orestimba) fault with closest distance to surface projection of the fault (R_{jb}) of about 25 km. Other nearby significant fault sources include the Great Valley 8 (Quinto) fault at a distance of about 33 km, the Great Valley 9 (Laguna Seca) fault at a distance of about 44 km, the Ortigalita fault, at a distance of about 44 km, and the Greenville Connected fault at about 57 km. The Hayward fault system (75 km to the west) may also contribute significantly to seismic hazard at long periods. Table 1 lists these faults and their seismic parameters. The locations of the faults and associated parameters presented on Table 1 are based on data presented by Petersen et al. (2014), and Field et al. (2013). The maximum earthquake magnitudes presented in this table were estimated using Ellsworth (2003), Hanks and Bakun (2002, 2008), and Shaw (2009) and are based on the moment magnitude scale developed by Kanamori (1977), and Hanks and Kanamori (1979). Only the highest magnitude from these relationships are listed. Faults within a radius of 300 km from the site were used in the analyses. However, only faults within a radius of 100 km from the site are shown in Table 1.

TABLE 1: SIGNIFICANT INDEPENDENT SEISMOGENIC FAULTS

Fault Name	Closest Distance to Potential Rupture, R_{rup} (km)	Fault Length (km)	Magnitude of Maximum Earthquake *	Slip Rate (mm/yr)
Great Valley 7 (Orestimba)	26	66	7.0	0.6
Great Valley 8 (Quinto)	33	19	6.6	0.3
Great Valley 9 (Laguna Seca)	44	39	6.6	1.6
Ortigalita	44	102	7.3	1.5
Greenville Connected	57	79	7.3	2
Calaveras (CS + CC +CN)	73	126	7.0	6 – 15
Hayward (HS + HN + HSE)	75	131	7.4	9
Quien Sabe	76	25	6.6	1
Great Valley 10 (Panoche)	78	22	6.5	1.1
Great Valley 6 (Midland)	79	69	7.3	0.3
Sargent	83	57	7.0	1.7
Mount Diablo Thrust	85	30	7.0	1.5
Monte Vista–Shannon	85	45	6.7	0.4
N. San Andreas (SAS + SAP + SAN + SAO)	93	473	8.0	17 – 24
Great Valley 11	97	24	6.6	1.5
Zayante-Vergeles	98	58	7.5	0.1

* Moment Magnitude: The estimation of an earthquake magnitude by using the seismic moment which is a measure of an earthquake size utilizing rock rigidity, amount of slip, and area of rupture.

According to Petersen et al. (2014), characterizations of the Hayward, the N. San Andreas, the Calaveras, and the Greenville faults are based on the different fault rupture segments and fault rupture scenarios and we have used the same in our analysis

Historic Seismicity

Patterns of historic seismicity are used to identify potentially active sources, develop on- and off-fault recurrence rates, and understand the historic impacts from seismicity at a site. A catalog of events is typically used, such as those developed and used by the Uniform Earthquake Rupture Forecast version 3 (UCERF3, Field et al, 2013). For this study, we compiled and reviewed data from the USGS ANSS Comprehensive Earthquake catalog which contains data from multiple sources from 1808 to 2019 within 300 km of the site. We also reviewed the catalog of historic events developed and used by the UCERF3 project. Comparison of these two catalogs indicates generally good agreement.

The project site and vicinity are located in an area characterized by low to moderate seismicity. A number of earthquakes have occurred within the site vicinity during historic time (since 1800). Some of the significant regional earthquake events include: the 1866 (M6.0) West San Joaquin Valley earthquake, the 1881 (M6.0) West San Joaquin Valley earthquake, the 1911 (M6.5) Calaveras Fault earthquake, and the 1980 (M5.8) Livermore earthquake. Other significant regional earthquakes include: the 1858 (M6.3) San Jose earthquake, the 1889 (M6.3) Antioch earthquake, and the 1868 (M6.8) Hayward earthquake. Historic seismicity within 100 km of the site is depicted on Figure 1.

SUBSURFACE SITE CONDITIONS FOR SEISMIC STUDY

Site effects are typically modeled in GMHA based on the average shear wave velocity in the upper 100 feet (V_{S30}). For shear wave velocity estimates we relied on the data from the referenced earlier geotechnical reports. Based on the data from the borings, we utilized the empirical correlations developed by Caltrans (2012) to estimate the shear wave velocity profile for the site. We have estimated V_{S30} of about 886 feet/sec (270 m/s) for this project which is consistent with a Site Class D profile.

SITE SPECIFIC GROUND MOTION MODEL

A site-specific GMHA model is a useful tool in evaluation of potential ground motion hazard at a site. The model generally includes a representative seismic source model (geometry, style of faulting, magnitude, etc.), appropriate recurrence relationships, and appropriate ground motion models (aka. attenuation relationships). The model can be used to quantify the potential for strong ground shaking at a site including the mean peak ground acceleration (PGA_M) and spectral accelerations (S_a). For this work, the model used was developed consistent with the requirements of Section 21.2 of ASCE 7-16 and the 2019 CBC. Details of the model used in this study are described below.

Seismic Source Model

Based on our review of the seismotectonic setting and nearby active sources we have selected the Petersen et al. (2014) source model as the base model for our evaluations. The Petersen et al. (2014) source model has been used in developing the 2014 USGS National Seismic Hazard Maps and generally uses the sources developed by the UCERF3 project within California (which utilizes two alternative fault models, FM 3.1 and 3.2) to model on-fault seismicity. Off-fault seismicity (e.g. background seismicity) is modeled using gridded seismic sources.

Fault sources from the regional model within 300 km of the site have been included in the model, with intraslab subduction earthquake sources included out to 1000 km as recommended by the

USGS (Petersen et al., 2014). Based on review of the nearby and significant sources it was felt that the existing UCERF3 model generally adequately captured the seismicity in the region. The final source model used for this work is shown on Figure 2.

‘Grand Inversion’ and Recurrence Rates

The earthquake recurrence rates used within the source model used for this project were derived from work completed for UCERF3 as implemented by Petersen et al. (2014) using the branch averaged solutions of the ‘grand inversion’. The ‘grand inversion’ scheme used by the UCERF3 project team ‘solved’ the on-fault and off-fault recurrence rates at a system level using a set of defined constraints including the spatial probability density of off-fault seismicity, slip rate balancing, paleoseismic even rate matching, fault smoothness constraint, regional magnitude frequency distribution constraints, and fault section specific magnitude frequency distribution constraints. In simple terms the ‘grand inversion’ solves for three things: large on-fault (supra-seismogenic) event rates; small, near-fault (subseismogenic) event rates; and truly off-fault (unassociated) event rates. The supra-seismogenic ‘on-fault’ events are ultimately modeled using linear fault sources; while the later two categories (subseismogenic and off-fault) are considered ‘background seismicity’ and are modeled using spatially smoothed ‘grid’ of evenly spaced cells (aka. gridded seismicity). The combined on-fault and off-fault solution set (fault system solution) used the logic tree solution framework shown in a generalized form on Figure 3; and our model implemented the branch averaged solutions.

In the source model used for this work, the on-fault seismicity considers two potential alternative fault models, equally weighted, identified as fault model 3.1 (FM 3.1) and fault model 3.2 (FM 3.2). These fault models each contain a slightly different collection of fault traces that are broken into ‘segments’ for modeling purposes, with individual ‘segments strung together to create hundreds of thousands of potential fault-based ruptures or multi-rupture events. In our model, fault segments are modeled using a ‘characteristic’ magnitude frequency distribution (originally described by Schwartz and Coppersmith, 1984) with the recurrence rates constrained during the ‘grand inversion’ by the UCERF2 ‘characteristic’ inversion branch. Fault slip rates (deformations) are constrained by a combination of a ‘pure’ geologic deformation model and three other models that consider geologic and geodetic data including the average fault block model, NewKinema model, and Zeng-Shen model. The magnitude-area relationships used along with the associated slip-length models as well as other solution constraints applied are shown with weights on Figure 3 and discussed in detail in Field et al. (2013).

Background Seismicity

As discussed above, in addition to the individual seismogenic sources (major on-fault sources), our seismic analysis also includes background seismicity (off-fault seismicity). Background seismicity accounts for earthquakes, both on and off identified fault sources, with generally lower magnitudes. As discussed previously, consistent with the approach used by UCERF3 some of the smaller or less significant seismic sources in this area are not modeled as independent seismogenic sources, such as the Vernalis fault and the Corral Hollow-Carnegie fault. However, the seismicity of these faults was incorporated into our analysis by including background seismicity in our model.

Based on UCERF3, background seismicity is accounted for using a “grand inversion” solution. This solution applies regional constraints on the rate of background seismic sources which is balanced with the rate of already modeled major fault sources to generally limit overlap. Due to this solution, background seismicity in the UCERF3 model generally accounts for earthquakes on identified fault sources with magnitudes less than 6.5 (subseismogenic events) as well as earthquakes not on identified fault sources of all sizes (unassociated events).

GROUND MOTION MODELS

Site-specific ground motions can be influenced by the styles of faulting, magnitudes of the earthquakes, and local soil conditions. Other effects such as near source or basin effects can also influence the ground motions. The ground motion models (GMM's) used to estimate ground motion from an earthquake source need to directly or indirectly consider these effects. Many GMM's have been developed to estimate the variation of spectral acceleration with earthquake magnitude and distance from the site to the source of an earthquake.

We have used four of the Next Generation Attenuation (NGA) West 2 relationships including Abrahamson et al. (2014), Boore et al. (2014), Chiou and Youngs (2014), and Campbell and Bozorgnia (2014) with equal weights applied for all crustal faults (e.g. reverse, strike-slip, normal) included in the fault model. Idriss (2014) has not been used as the V_{S30} for our site is outside the range of their relationships.

Spectral acceleration values were obtained by averaging the individual hazard results. These GMM's provide 'mean' (RotD50) values of ground motions associated with magnitude, distance, site soil conditions, and mechanism of faulting.

GROUND MOTION HAZARD ANALYSIS

Preceding sections described the development of the source model used in this work. This section describes the use of the source models for the current study and the resulting application to development of design ground motion parameters.

According to ASCE 7-16, the Risk-Targeted Maximum Considered Earthquake (MCE_R) is the most severe earthquake load considered by that standard and is considered at the orientation that results in the largest maximum response to horizontal ground motions with adjustment for targeted risk as defined by that standard. The site-specific MCE_R is developed in accordance with Chapter 21 of ASCE 7-16 using a site-specific ground motion hazard analysis procedure and is the lesser of: (1) the probabilistic MCE_R ground motion taken as the five percent damped uniform hazard spectrum for a 2 percent probability of exceedance in 50 years (e.g. return period of about 2,475 years) adjusted for risk factors and for the maximum direction; and (2) the deterministic MCE_R ground motion taken as the 84^{th} percentile (median + 1 standard deviation) deterministic values (adjusted for the maximum direction) from the controlling fault(s) factored as required by Section 21.2.2 of ASCE 7-16. The design earthquake (DE) spectrum is defined as two-thirds of the MCE_R. The resulting site-specific DE spectrum may not be less than the 80 percent of the code spectrum developed in accordance with Chapter 11 of ASCE 7-16.

Both probabilistic and deterministic seismic hazard analyses should be used to estimate the spectral accelerations used to develop the site specific MCE_R unless the deterministic spectrum need not be calculated per section 21.2.2 of ASCE 7-16 as is the case for this analysis. Details of our evaluation are provided below.

PROBABILISTIC SEISMIC HAZARD ANALYSIS

For this work, a probabilistic seismic hazard analysis (PSHA) procedure was used to estimate the ground motion parameters (e.g. peak and spectral ground accelerations). The PSHA approach uses a logic tree approach to appropriately account for epistemic and aleatoric uncertainty in the model. The logic tree includes information about uncertainties in the source models, ground motion models, and other items impacting the results. Important source characteristics include such items as magnitude and recurrence interval of potential seismic events, distance from the site to the causative source, and other parameters. The effects of site soil conditions and other considerations such as basin effects can be accounted for using ground motion models (GMMs).

The theory behind the empirical probabilistic approach to seismic risk analysis has been developed over many years (Cornell, 1968, 1971; Merz and Cornell, 1973; SSHAC, 1997), and is based on the "total probability theorem". Generally, this work uses an assumption that earthquakes events are independent of time and space from one another (e.g. time-independent models). According to this approach, the probability of exceedance $P_E(z)$ at a given level of ground motion, z, at the site within a specified time period, t, is related to the annual frequency of exceedance v(z) by:

$$P_E(z) = 1 - \exp(-v(z) * t)$$

Different probabilities of exceedance may be selected, depending on the level of performance required. The return period is essentially equivalent to the reciprocal of v(z).

The PSHA is conducted using three generalized steps: 1) development of an appropriate seismic source model including source characterization, development of recurrence relationships, and appropriately capturing uncertainty, 2) selection of appropriate ground motion models (and site amplification models if appropriate), and 3) conducting the calculation and processing the results. The annual frequency of exceedance of a certain ground motion level can be found by summing the rates for all sources, N, with the rate for each source determined by summing over all magnitudes and source to site distances, and so forth. The annual frequency of occurrence of earthquakes of magnitude, m_i, on seismic source, n, is $\lambda(m_i)$. The probability of an earthquake of magnitude m_i on source n occurring at a certain distance, r_j, from the site is $P(R = r_j \mid m_i)$ while the probability that the ground motion level, z, will be exceeded is given as $P(Z>z \mid m_i,r_j)$. Thus, mathematically the basic formulation for the annual frequency of exceedance, v(z), is given by:

$$v(z) = \sum_N \left[\sum_M \lambda(m_i) * \sum_R P\left(R = r_j \middle| m_i\right) * P\left(Z > z \middle| m_i, r_j\right) \right]$$

where $\nu(Sa>z)$ is the mean annual rate of a spectral acceleration (Sa) exceeding a test value (z); N_{source} is the number of seismic sources; $N_i(M_{min})$ is the rate of earthquakes with magnitude greater than M_{min} on the i^{th} seismic source; $f_{m,i}(M)$ is the probability distribution of earthquake magnitude (M) of the i^{th} source; $f_{r,i}(r)$ is the probability distribution of the fault rupture location (r); and $P(Sa>z|M,r)$ is the probability that Sa is greater than the test value (z) given the magnitude, M, and distance to rupture, r.

Modern computers make the above calculation, while computationally expensive, easily implementable. We have used the computer program OpenSHA (Field et al., 2003) for our probabilistic analysis which implements the above general equation and evaluations of the probability of exceedance. Uncertainties are accounted for within the source model using the logic tree approach and source model discussed previously.

DETERMINISTIC SEISMIC HAZARD ANALYSIS

The deterministic seismic hazard analysis (DSHA) approach is also based on the characteristics of the earthquake and the causative fault associated with the earthquake. These characteristics include such items as magnitude of the earthquake and distance from the site to the causative fault. The effects of site soil conditions and mechanism of faulting are also accounted for in the GMM's for this site. Per ASCE 7-16, the 84th percentile deterministic site-specific spectral acceleration values should be used for DSHA with the exception that the deterministic spectrum need not be calculated when the largest spectral acceleration from the probabilistic spectrum is less than 1.2*Fa. If the largest spectral acceleration from the resulting 84^{th} percentile maximum horizontal spectrum is les than 1.5*F_a then the spectrum is scaled by a single factor such that the maximum spectral value equals 1.5*F_a. The value of F_a is taken from either table 11.4.1 (Site Class A to D) with a value of S_s equal to 1.5 for purposes of these comparisons, or set equal to 1.0 (Site Class E).

For the deterministic evaluations, we used the NGA West 2 spreadsheet (PEER 2018). The Great Valley 7 (Orestimba) fault system at a R_{rup} distance of 26 km and with a magnitude 7.0 generally controlled the deterministic events over the period range presented in this report.

SITE-SPECIFIC MCE_R AND DESIGN RESPONSE SPECTRA

To develop the site-specific spectral response accelerations, we first obtained the general seismic design parameters based on the site class, site coordinates, and the risk category based on Chapter 11 of ASCE 7-16 using online tools which access the USGS database (Table 2).

TABLE 2: GENERAL GROUND MOTION PARAMETERS BASED ON ASCE 7-16

Parameter	Value[1]	ASCE 7-16 Reference
S_S	0.699g	Fig 22-1
S_1	0.273g	Fig 22-2
Site Class	D	Table 20.3-1
F_a	1.241	Table 11.4-1
F_v	N/A	Table 11.4-2
S_{MS}	0.867	Eq. 11.4-1
S_{M1}	N/A	Eq. 11.4-2
S_{DS}	0.578	Eq. 11.4-3
S_{D1}	N/A	Eq. 11.4-4
C_{RS}	0.951	Fig 22-3
C_{R1}	0.951	Fig 22-4
PGA	0.291g	Fig 22-7
F_{pga}	1.309	Table 11.8-1
PGA_M	0.381g	Eq. 11-8-1
T	12 seconds	

[1]N/A = Not Applicable; Section 11.4.8 of ASCE 7-16 requires a site-specific ground motion hazard analysis be performed for Site Class D sites with S_1 values greater than or equal to 0.2g. However, if exceptions are taken, then a F_v value of 2.05 could be used only to calculate the Ts value.

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The MCE_R response spectrum is generally developed by comparing probabilistic, deterministic, and 80% of the general procedure code spectrum. The NGA West 2 GMMs present the spectral accelerations in terms of 'mean' (RotD50) values of the rotated two horizontal components of ground motion. To estimate spectral accelerations in the direction of the maximum horizontal response (e.g. RotD100) at each period from geometric mean values, we have used the scaling factors of Shahi and Baker (2014). These values were used as they more accurately represent the appropriate factors to apply using the NGA West 2 relationships, as was done in this report. These factors are shown in Table 3. In addition, the probabilistic spectrum was adjusted for targeted risk using risk coefficients C_{RS} and C_{R1} (e.g. method 1 of section 21.2.1 of ASCE 7-16). C_{RS} and C_{R1} were estimated from Figures 22-3 and 22-4 of ASCE 7-16 and are shown in Table 2. C_{RS} is applied on periods of 0.2s or less and C_{R1} is applied on periods of 1.0s or greater and linear interpolation in between.

TABLE 3: RISK COEFFICIENTS AND MAXIMUM ROTATION FACTORS

Period	Risk Coefficients (ASCE 7-16)	Shahi and Baker (2014) Max Rotation Factor
0.010	0.951	1.19
0.020	0.951	1.19
0.030	0.951	1.19
0.050	0.951	1.19
0.075	0.951	1.19
0.100	0.951	1.19
0.150	0.951	1.20
0.200	0.951	1.21
0.250	0.951	1.22
0.300	0.951	1.22
0.400	0.951	1.22
0.500	0.951	1.23
0.750	0.951	1.23
1.000	0.951	1.24
1.500	0.951	1.24
2.000	0.951	1.24
3.000	0.951	1.24
4.000	0.951	1.25
5.000	0.951	1.26

As mentioned earlier geometric mean deterministic values were estimated for the Great Valley 7 (Orestimba) fault and were then adjusted for the maximum direction. Since the maximum deterministic spectral acceleration is less than 1.5, the deterministic spectrum was scaled up to $1.5F_a$ where value of F_a is taken from Table 11.4-1 of ASCE 7-16 for S_s value of 1.5 per ASCE 7-16 Supplement 1. The scaled-up spectrum is the governing deterministic spectrum.

Spectral acceleration values for scaled-up deterministic and probabilistic are compared in Table 4 and the graphical comparison is shown on Figure 4. Table 4 and Figure 4 shows that probabilistic spectrum is lower than the controlling deterministic spectrum for periods up to 3 seconds and the controlling deterministic is higher beyond that. Therefore, the preliminary site-specific spectrum is an enveloping spectrum. Spectral acceleration values for the preliminary site-specific DE and 80% of the code DE are compared in Table 5 with the graphical comparison is shown on Figure 5. Table 5 and Figure 5 shows that the preliminary DE spectrum is higher than the 80% of the code DE spectrum for all periods except for the period of 5 sec. Therefore, the final site-specific DE spectrum is an enveloping spectrum. The final site-specific MCE_R spectrum is taken as 1.5 times the final site-specific DE spectrum. The recommended site-specific MCE_R and DE spectra are shown on Figure 6. Spectral acceleration values for the MCE_R and DE spectra are listed in Table 6.

TABLE 4: COMPARISON OF DETERMINISTIC AND PROBABILISTIC SPECTRAL ACCELERATIONS (g)

Period	84th-Percentile Deterministic (Sa, g)	Probabilistic RotD50 (Sa, g)	84th-Percentile Max Dir Deterministic (Sa, g)	Risk-Targeted Probabilistic Max Dir (Sa, g)	Scaled-Up Deterministic (Sa, g)
0.010	0.336	0.424	0.400	0.480	0.593
0.020	0.321	0.426	0.382	0.482	0.567
0.030	0.328	0.440	0.390	0.498	0.579
0.050	0.372	0.514	0.443	0.582	0.657
0.075	0.461	0.660	0.549	0.747	0.814
0.100	0.553	0.800	0.658	0.905	0.976
0.150	0.688	0.971	0.826	1.108	1.225
0.200	0.768	1.055	0.929	1.214	1.379
0.250	0.813	1.091	0.992	1.266	1.472
0.300	0.829	1.097	1.011	1.273	1.500
0.400	0.796	1.035	0.979	1.211	1.453
0.500	0.734	0.959	0.903	1.122	1.340
0.750	0.553	0.732	0.686	0.863	1.017
1.000	0.434	0.570	0.538	0.672	0.798
1.500	0.289	0.388	0.358	0.458	0.532
2.000	0.206	0.282	0.255	0.333	0.379
3.000	0.119	0.179	0.149	0.213	0.221
4.000	0.077	0.127	0.097	0.152	0.144
5.000	0.053	0.097	0.067	0.116	0.099

TABLE 5: COMPARISON OF SITE-SPECIFIC AND CODE SPECTRA

Period	Site-Specific MCE_R (Sa, g)	Site-Specific Design (Sa, g)	80% Code (Sa, g)
0.010	0.480	0.320	0.185
0.020	0.482	0.321	0.341
0.030	0.498	0.332	0.366
0.050	0.582	0.388	0.416
0.075	0.747	0.498	0.480
0.100	0.905	0.604	0.543
0.150	1.108	0.739	0.669
0.200	1.214	0.809	0.462
0.250	1.266	0.844	0.462
0.300	1.273	0.849	0.462
0.400	1.211	0.807	0.462
0.500	1.122	0.748	0.462
0.750	0.863	0.575	0.462
1.000	0.672	0.448	0.364
1.500	0.458	0.305	0.243
2.000	0.333	0.222	0.182
3.000	0.213	0.142	0.121
4.000	0.144	0.096	0.091
5.000	0.099	0.066	0.073

TABLE 6: FINAL SITE-SPECIFIC HORIZONTAL SPECTRAL ACCELERATIONS (g)

Period (sec)	Design Spectrum (DE)	MCE_R Spectrum (MCE_R)
	5% Damping	
0.010	0.320	0.480
0.020	0.321	0.482
0.030	0.332	0.498
0.050	0.388	0.582
0.075	0.498	0.747
0.100	0.604	0.905
0.150	0.739	1.108
0.200	0.809	1.214
0.250	0.844	1.266
0.300	0.849	1.273
0.400	0.807	1.211
0.500	0.748	1.122
0.750	0.575	0.863
1.000	0.448	0.672
1.500	0.305	0.458
2.000	0.222	0.333
3.000	0.142	0.213
4.000	0.096	0.144
5.000	0.073	0.109

SITE-SPECIFIC GROUND MOTION PARAMETERS

Site-specific ground motion parameters were estimated using the site-specific design response spectrum presented above. According to Section 21.4 of ASCE 7-16, the S_{DS} value should be taken as 90 percent of the maximum spectral acceleration at any period between 0.2 and 5 seconds. For this site, S_{DS} value is governed by the spectral acceleration value at 0.3 sec. Since the site's V_{S30} value is less than 1,200 ft/s, the S_{D1} value is taken as the maximum value of T*Sa between periods of 1 and 5 seconds, where T is the period and Sa is the corresponding spectral acceleration. For this site, the S_{D1} value is governed by the spectral acceleration value at 1.5 sec. The parameters S_{MS} and S_{M1} are taken as 1.5 times S_{DS} and S_{D1}. Site-specific values of S_{DS}, S_{D1}, S_{MS}, and S_{M1} are presented below in Table 7.

TABLE 7: SITE-SPECIFIC DESIGN ACCELERATION PARAMETERS (g)

Parameter	Value (5% Damping)
S_{DS}	0.764g
S_{D1}	0.458g
S_{MS}	1.146g
S_{M1}	0.687g

Site-specific maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA_M) was estimated based on Section 21.5 of ASCE 7-16. According to Section 21.5 of ASCE 7-16, the site-specific PGA_M shall be taken as the lesser of the site-specific probabilistic geometric mean peak ground acceleration of Section 21.5.1 and the site-specific deterministic geometric mean peak ground acceleration of Section 21.5.2. Additionally, the site-specific PGA_M shall not be taken as less than one-half the F_{PGA} value determined from Table 11.8-1 using a PGA value of 0.5g or 80 percent of the PGA_M value determined from Eq. 11.8-1 (code-based). Based on this procedure, the site-specific PGA_M value is 0.424g and is controlled by the probabilistic geometric mean peak ground acceleration. Since the PGA_M is controlled by the probabilistic spectrum, the associated earthquake modal magnitude is M6.5 based on United States Geological Survey (USGS) Unified Hazard Tool deaggregation results.

SEISMIC DESIGN CATEGORY

The Seismic Design Category is determined as specified in the 2019 California Building Code Section 1613.2.5. We understand that the structure is classified as a Risk Category II structure. Based on this and the site-specific seismic design parameters developed above the structure is classified as a Seismic Design Category D.

CLOSURE

We have prepared this letter for the exclusive use of Carollo for specific application to the subject project. The findings and conclusions presented in this letter were prepared in accordance with generally accepted geotechnical engineering practice.

We appreciate this opportunity to be of service and look forward to continuing to work with you in the future. If you have any questions about this letter, please contact us at 916-366-2382.

Sincerely,

KLEINFELDER

Zia Zafir, PhD, PE, GE
Senior Technical Manager

Alexander D. Wright, PE
Project Manager

Attachments:
Figure 1 – Regional Seismicity
Figure 2 – Seismic Source Model
Figure 3 – UCERF3 Source Model Logic Tree
Figure 4 – Comparison of Probabilistic and Deterministic Spectra
Figure 5 – Comparison of DE and 80% of Code Spectra
Figure 6 – Final Design Earthquake and MCE_R Spectra

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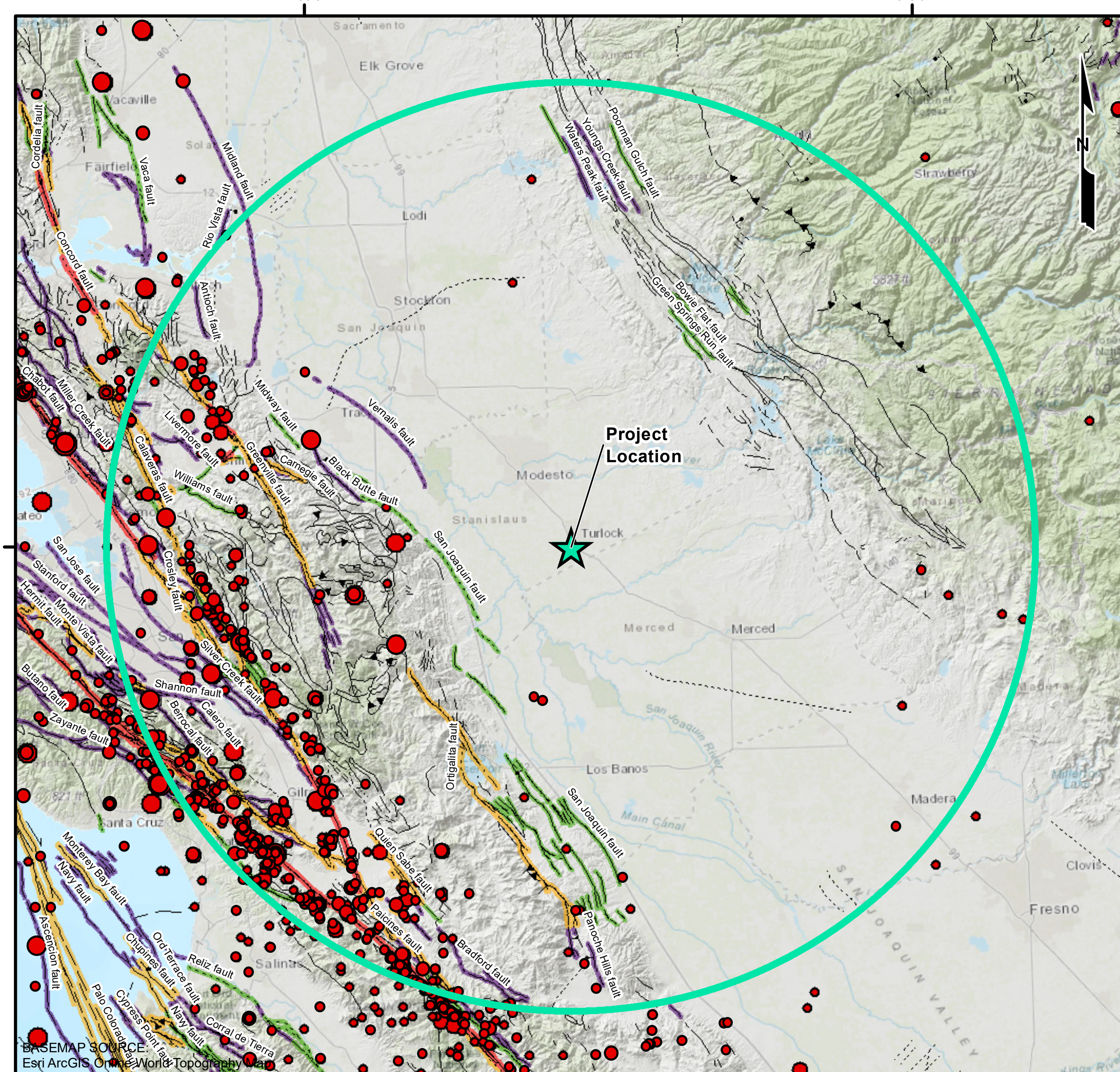

Quaternary Faults (Jennings and Bryant, 2010)

Historic displacement (< 150 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Holocene displacement (< 15,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Late Quaternary displacement (< 750,000 years)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

Quaternary & unspecified displacement (< 1,600,000 years)
- undifferentiated Quaternary Well Constrained
- undifferentiated Quaternary Moderately Constrained
- undifferentiated Quaternary Inferred

Pre-Quaternary geologic structures (CGS, 2010)
- Mapped Fault Location
- Dashed were Approximated
- Concealed

ANSS Earthquakes

Magnitude
- 4.0 - 4.9
- 4.9 - 5.9
- 5.9 - 6.9
- 6.9 - 7.9
- 7.9 - 8.9

0 17 34 68
Kilometers

Date: 12/17/2020 User: ALeonard Path: \\azrgisstorp01\GIS_Projects\Client\TurlockChlorine\MXD\Turlock_EQ_FaultMap_FAM_100km.mxd

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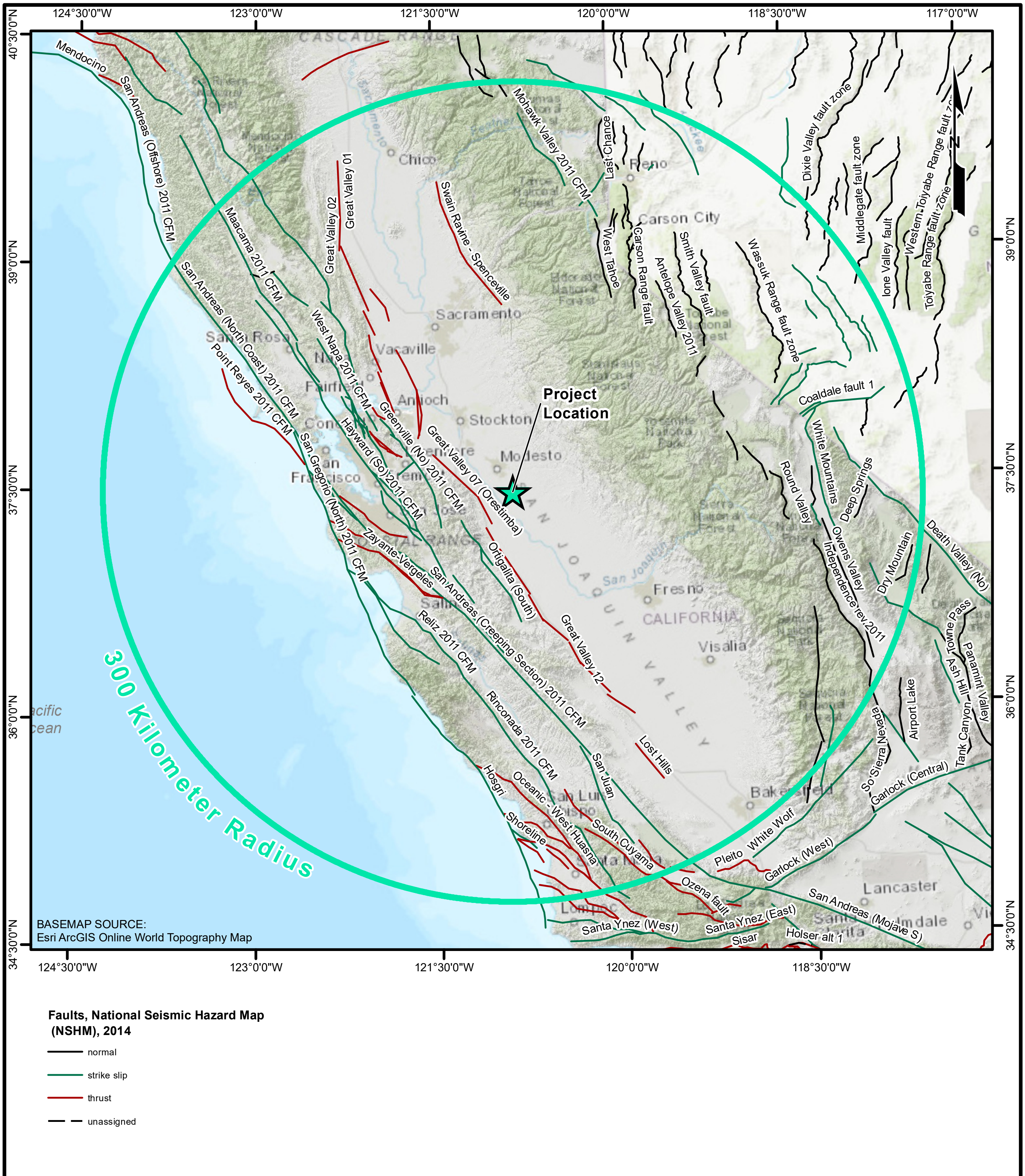
Regional Seismicity

Proposed Chlorine Building Tanks
Turlock Water Quality Control Plant
Turlock, California

FIGURE
1



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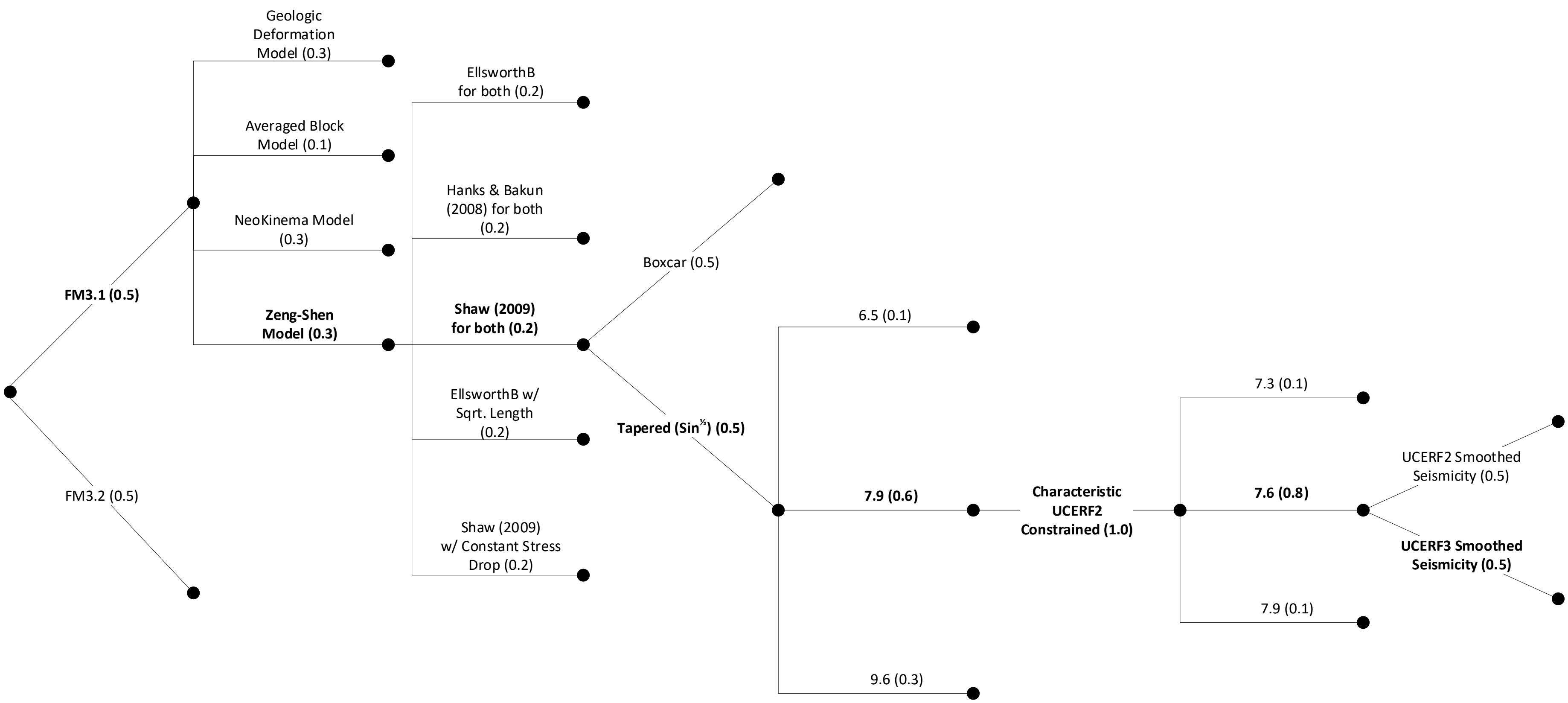
Seismic Source Model

Proposed Chlorine Building Tanks
Turlock Water Quality Control Plant
Turlock, California

FIGURE
2

Fault Models	Deformation Models	Scaling Relationships (mag-area & slip-length relationships)	Slip Along Rupture (Dsr)	Total M ≥5 Event Rate (yr^{-1})	Inversion Model	$M^{off-fault}_{max}$	Off-Fault Spatial Seismicity PDF (aka SpatialPDF)



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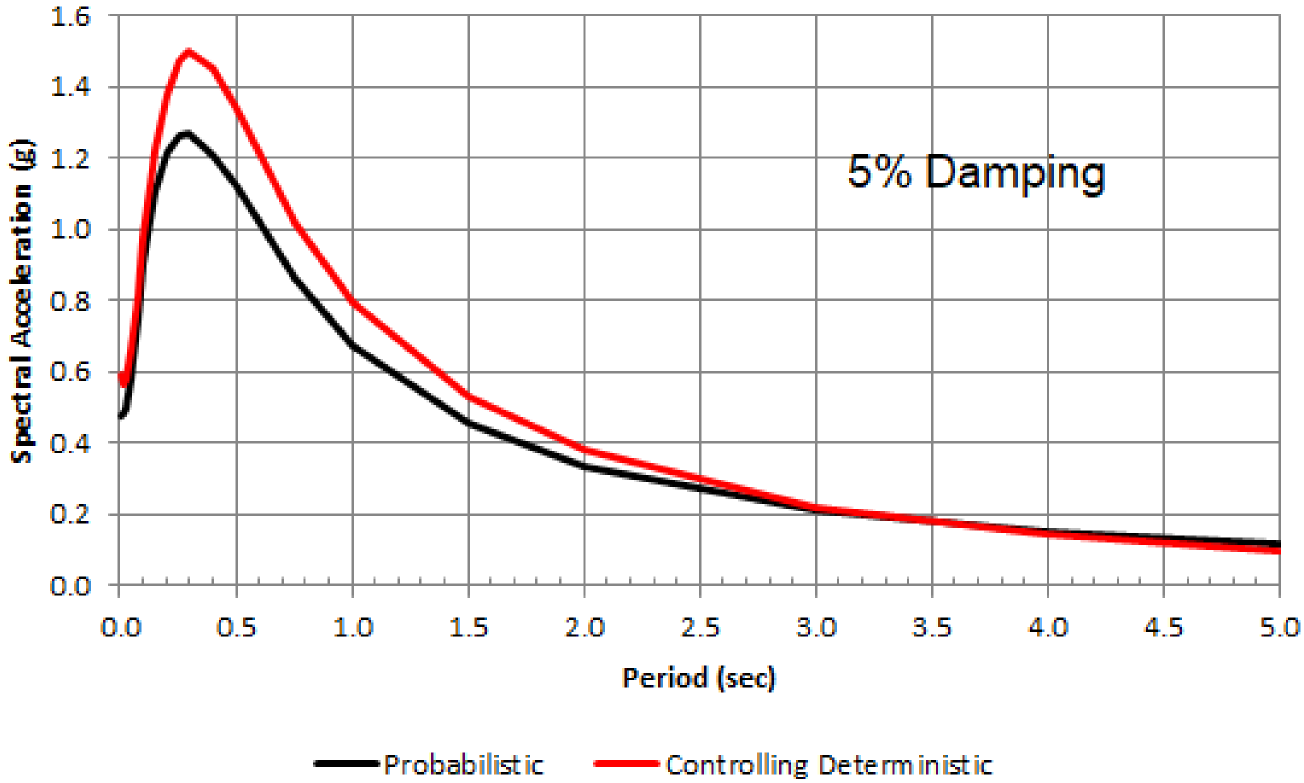
UCERF3 SOURCE MODEL LOGIC TREE

Proposed Chlorine Building Tanks
Turlock Water Quality Control Plant
Turlock, California

FIGURE: **3**



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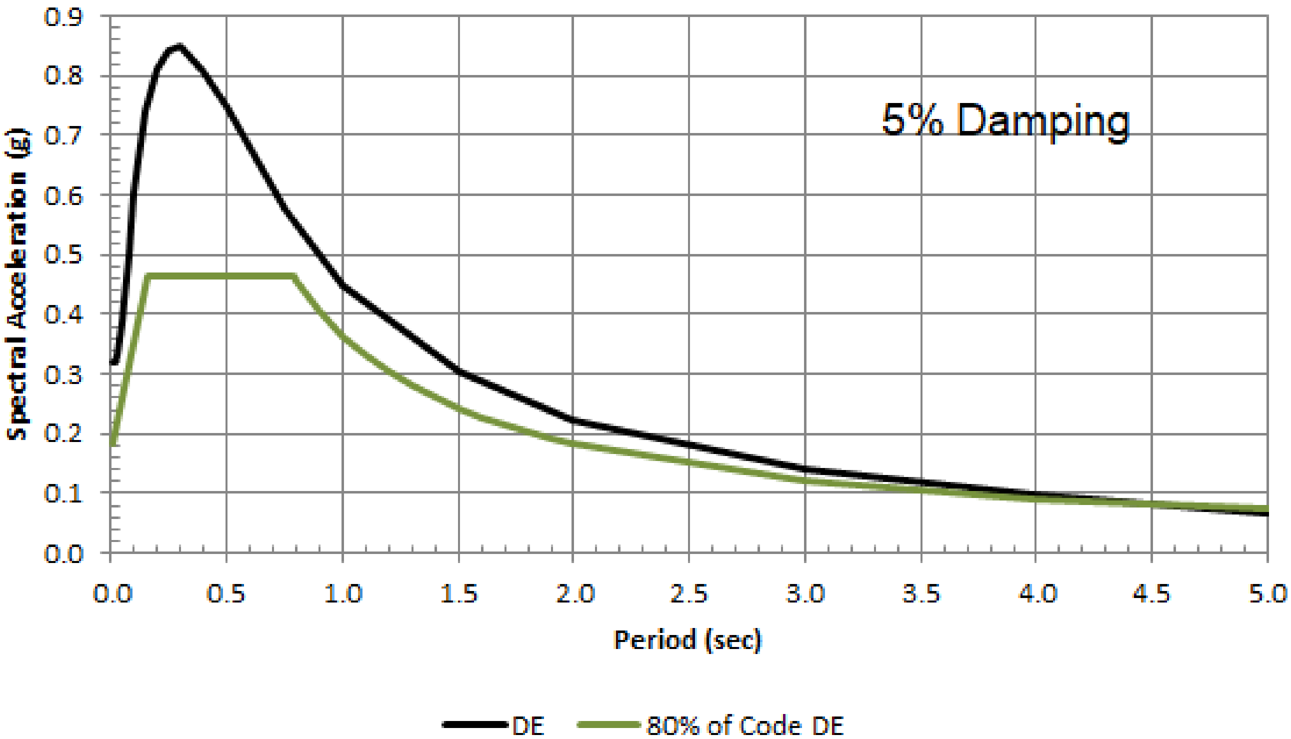
COMPARISON OF SITE-SPECIFIC PROBABILISTIC AND DETERMINISTIC SPECTRA

Proposed Chlorine Building Tanks
Turlock Water Quality Control Plant
Turlock, California

FIGURE:

4



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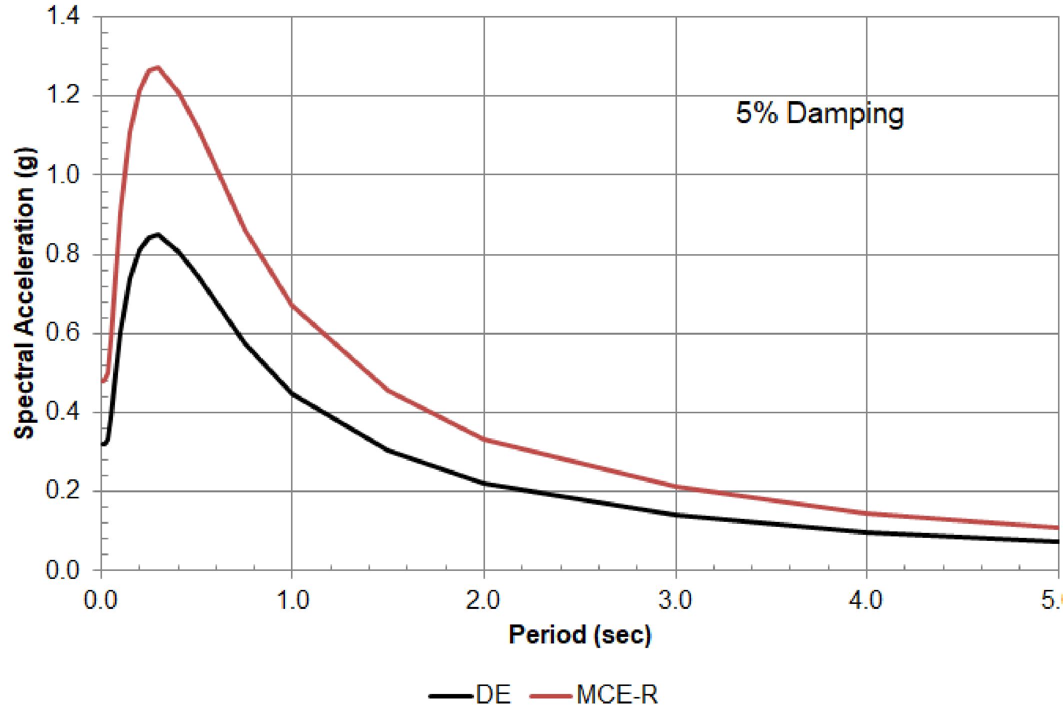
COMPARISON OF SITE-SPECIFIC DESIGN AND 80% OF THE CODE SPECTRA

Proposed Chlorine Building Tanks
Turlock Water Quality Control Plant
Turlock, California

FIGURE:

5



S_{DS}	0.764
S_{D1}	0.458
S_{MS}	1.146
S_{M1}	0.687
PGA_M	0.424

Site-Specific Horizontal Spectra		
Period (sec)	DE SA (g)	MCE_R SA (g)
0.010	0.320	0.480
0.020	0.321	0.482
0.030	0.332	0.498
0.050	0.388	0.582
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1.500	0.305	0.458
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3.000	0.142	0.213
4.000	0.096	0.144
5.000	0.073	0.109

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FILE NAME:	

RECOMMENDED SITE-SPECIFIC HORIZONTAL DESIGN AND MCE_R SPECTRA

Proposed Chlorine Building Tank
Turlock Regional Water Quality Control Plant
Turlock, California

FIGURE: **6**

26227 Research Road
Hayward, California 94545-3725
Phone: (510) 259-1334
Fax: (510) 259-1392
www.hsq.com

By Email: Justin Robar; jrobar@carollo.com
Ryan Sellman; RSellman@carollo.com

March 30, 2021

City of Turlock
C/o Carollo Engineers
2795 Mitchell Drive,
Walnut Creek, California 94598-1601

Attention: Justin Robar
Senior Instrumentation and Controls Engineer

Reference: **City of Turlock**
Turlock Chemical Systems Improvements
HSQ Quote No. 2103-0022-GJ_R.1

Dear Mr. Robar:

HSQ Technology is pleased to offer you a budgetary quotation for Carollo project number 12002A.10 titled "Chemical Systems Improvement", which is for the City of Turlock, known as CoT, Regional Water Quality Control Facility, known as RWQCF, located in the State of California. This is for integrating the new chemical system for Sodium Hypochlorite which will replace the existing Chlorine Gas System. The Existing HSQ Miser SCADA system shall be developed and modified to add this system as part of the SCADA Controls.

The new SHS system will be located in the same building as the Chlorine gas system. The SHS system will consist of:

- 3 safety showers
- 1 sump pump
- 4 SHS storage tanks with 2 future tanks, each with a discharge motorized open/closed valve
- 1 SHS Truck Unloading station
- 1 SHS pump skid with ? Seepex progressive cavity pumps, model IMP, each with its own variable speed controller
- 2 Pump skid discharge flow meters

The New PLC-DS for the Sodium Hypochlorite System shall communicate over Modbus utilizing a Pro-Soft Modbus card in the Allen-Bradley Control Logix PLC rack. HSQ shall poll all necessary information over the Network via CAT-6 Cable from the suppliers provided Modbus registers over City of Turlock's Network.

Reference Documents;
DWG # 12002A10SHSN01.PDF
DWG # 12002A10SHSN02.PDF
DWG # 12002A10SHSN03.PDF
DWG # 12002A10SHSN04.PDF
DWG # 12002A1000GN01.PDF
DWG # 12002A1000GN02.PDF
DWG # 12002A1000GN03.PDF
DWG # 12002A1000GN06.PDF
DWG # 12002A1000N01.PDF
DWG # 12002A1002N02.PDF
DWG # 12002A1004N04.PDF
HMI Table.PDF
Carollo Specification 17901 – Field Instrument Schedule.pdf
Carollo Specification 17903 – I/O List Schedule.pdf

Included:

- Develop the necessary SCADA Operator graphics in Miser for the new SHS system per the listed project P&IDs and HMI table for the SHS metering pumps
  - Display all the SHS storage tank levels
  - Display the SHS safety shower flow status
  - Display the status and provide control of all the SHS storage tank discharge valves
  - Display the status and provide control of each of the three SHS metering pumps
  - Display the flow value of the pump skid flow
  - Provide the existing chlorine residual information from the chlorine meters in the Chlorine contact tank on the new slides
  - Provide the status on the existing mixer (EVOQUA Water Champ) that is located in the chlorine contact basin on the new slides

- New and modified graphics will comply with the style, look and functionality of existing graphics
- Develop alarming, historization, and trending for new I/O from PLC-DS and each of the 3 SHS metering pumps
- Establish communications between the existing HSQ system with the new PLC-DS in order to transfer status and command information
- Two design review meetings, each at a minimum of 2 hour duration, with CoT and Carollo project team to discuss the SoW, graphics, alarming, historization, functionality, and other HSQ features to finalize design details
- Develop and submit a Factory Acceptance Test, known as FAT (Witnessed) in conjunction with Vendor Provided PLC-DS RACK / CPU.
- Perform a Factory Acceptance Test at a HSQ facility for the new/modify portion of the HSQ system that is integrated into a HSQ system that emulates the RWQCF current HSQ system
- Develop and submit a Site Acceptance Test, known as SAT (Witnessed)

- Develop and submit a Commissioning plan Related to Miser SCADA Upgrade
- Perform a Site Acceptance Test at RWQCF which will require the new/modified portion of the HSQ system to be integrated into the existing RWQCF HSQ system without disputing RWQCF's ability to operate via the existing HSQ system
- Commission the new/modified graphics portion of the HSQ system
- Develop Training Plan Submittal
- Develop an Operations Manual for the new/modified portion of the HSQ system.
- Provide digital copies of the manual on flash drives
- Provide 2, 1-day, on-site training sessions for operations for the new/modified HSQ system

Excluded:

- Field Installation, Termination or localized testing of PLC-DS SHS Panel
- Loop and Interconnection Diagrams provided by SHS Vendor Supplier
- Network Equipment
- Sales Tax (Not Applicable)
- Bonding

Design Criteria Required;

- SHS PLC-DS Modbus Registers
- Any analytical calculations or formulas
- SHS PLC-DS approved submittal design and data
- Network Protocols, IP Addresses
- SHS PLC-DS rack for FAT at HSQ (Hayward CA.)

Project Specification Listing Required;

Integrating the new chemical system for Sodium Hypochlorite (SHS) which will replace the existing Chlorine Gas System. The Existing HSQ Miser SCADA system shall be developed and modified to add this system as part of the existing SCADA controls.

The new SHS system will be located in the same building as the Chlorine gas system. The SHS system will consist of:

- 3 safety showers
- 1 sump pump
- 4 SHS storage tanks with 2 future tanks, each with a discharge motorized open/closed valve
- 1 SHS Truck Unloading Station
- 1 SHS pump skid with Seepex progressive cavity pumps, model IMP, each with it's own variable speed controller
- 2 Pump skid discharge flow meters

The New PLC-DS for the Sodium Hypochlorite System Shall communicate over Modbus utilizing a Pro-Soft Modbus card in the Allen-Bradley Control Logix PLC rack. HSQ shall poll all necessary information over the Network via CAT-6 Cable from the suppliers provided Modbus registers.

- ➢ Develop the necessary SCADA Operator graphics in Miser for the new SHS system per the listed project P&IDs and HMI table for the SHS metering pumps
  - Display all the SHS storage tank levels
  - Display the SHS safety shower flow status
  - Display the status and provide control of all the SHS storage tank discharge valves
  - Display the status and provide control of each of the three SHS metering pumps
  - Display the flow value of the pump skid flow
  - Provide the existing chlorine residual information from the chlorine meters in the Chlorine contact tank on the new slides
  - Provide the status on the existing mixer (EVOQUA Water Champ) that is located in the chlorine contact basin on the new slides.
- ➢ Develop alarming, historization, and trending for new I/O from PLC-DS and each of the 3 SHS metering pumps.
- ➢ Two Design review meetings, each at a minimum of 2 hour duration, with CoT and Carollo project team to discuss the SoW, graphics, alarming, historization, functionality, and other HSQ features to finalize design details.
- ➢ Develop and submit a Factory Acceptance Test, known as FAT (Witnessed)
- ➢ Perform a Factory Acceptance Test at a HSQ facility for the new/modify portion of the HSQ system that is integrated into a HSQ system that emulates the RWQCF current HSQ system and PLC-DS PLC Rack/CPU.
- ➢ Develop and submit a Site Acceptance Test, known as SAT (Witnessed)
- ➢ Develop and submit a Commissioning plan Related to Miser SCADA Upgrade.
- ➢ Perform a Site Acceptance Test at RWQCF which will require the new/modified portion of the HSQ system to be integrated into the existing RWQCF HSQ system without disputing RWQCF's ability to operate via the existing HSQ system.
- ➢ Commission the new/modified graphics portion of the HSQ system
- ➢ Develop Training Plan Submittal.
- ➢ Develop an Operations Manual for the new/modified portion of the HSQ system. Provide a digital copies of the manual on flash drives
- ➢ Provide 2, 1-day, on-site training sessions for operations for the new/modified HSQ system.

Contact;
HSQ Technology
26227 Research Road
Hayward CA. 94545
Attention: Gus Jimenez
Phone: 510-259-3713 (Direct)
Phone: 510-259-1334
Email: jimenez@hsq.com & est@hsq.com
http://www.hsq.com

Pricing:

The following budgetary pricing is based on the scope indicated above in HSQ's preliminary scope of work. Pricing subject to change based on finalized project bid specification .The total lump sum budget price is **$277,710.00** (excluding sale tax). This pricing is valid for a period of Ninety (90) days and subject to change based on published conformed Specifications and Drawing for this listed project. Please call the undersigned at 800/486-6684 or est@hsq.com if you have any questions.

Sincerely yours,

HSQ TECHNOLOGY, A CORPORATION

Gus Jimenez
Director of Projects and Operations

GJ/jm

cc: Est@hsq.com

EX LP-5B

3/22/2021 (1)

LOCATION:	SODIUM HYPOCHLORITE BUILDING (MCC-5B)	NEMA:	4X	PH A WEIGHTED VA	8233
VOLTS:	208/120	FEED:	BOTTOM	PH B WEIGHTED VA	10933
PHASE & WIRE:	3 PH 4W	MTG.	MCC	PH C WEIGHTED VA	11925
INTERRUPT:	65 KAIC	BUS RATING:	225		
OPTIONS:	SPD	MAIN:	CB	EQUIP SIZING VA	35775
		MAIN RATING:	125 AF 125 AT	PANEL AMPS	99.3

Note	I/C/S	DESCRIPTION	LOAD (VA)	BKR	CIR	Ø	CIR	BKR	LOAD (VA)	DESCRIPTION	I/C/S	Note
		AIT-1621, AIT-1623, CHLORINE CONTACT TANK	200	20A-1P	1	A	2	20A-1P	400	LIT-1521, LIT-1522 COAGULANT FACILITY		
		LIT-1101, LIT-1104 SEC EFFLUENT PUMPING STATION	400	20A-1P	3	B	4	20A-1P	540	LIT-1501, LIT-1502 COAGULANT FACILITY		
		FIT-1110 SECONDARY EFFLUENT PUMPING STATION	200	20A-1P	5	C	6	20A-1P	200	LIT-0311-JJUNCTION BOX 2B		
3		PLC-DS SODIUM HYPOCHLORITE BUILDING (1 of 2)	500	20A-1P	7	A	8	30A-2P	840	HPU-1 CONTROL ROOM		
		LIT-1801, LIT-1802 DECHLORINATION FACILITY	400	20A-1P	9	B	10		840			
3		SUMP PUMP VCP-1541 COAGULANT FACILITY	1920	20A-1P	11	C	12	20A-1P	500	LEAK DETECTION PANEL SODIUM HYPOCHLORITE BUILDING		6
		FIT-1241, FIT-1242 HIGH RATE FLOCCULATION	400	20A-1P	13	A	14	20A-1P		SPARE		4
3		SUMP PUMP VCP-1542 COAGULANT FACILITY	1920	20A-1P	15	B	16	20A-1P		SPARE		4
		FIT-1231, FIT-1232 HIGH RATE FLOCCULATION	400	20A-1P	17	C	18	20A-1P	1920	SUMP PUMP VCP-1431 SODIUM HYPOCHLORITE BUILDING		3
		AITA-1211, AITB-1212 HIGH RATE FLOCCULATION	400	20A-1P	19	A	20	20A-1P	500	PLC-DS SODIUM HYPOCHLORITE BUILDING (2 of 2)		3
		AITA-1221, AITB-1222 HIGH RATE FLOCCULATION	400	20A-1P	21	B	22	20A-1P	400	TIT-1401, LSH-1401 - CHLORINE STORAGE ROOM		
		AITC-1213, AITB-1214 HIGH RATE FLOCCULATION	400	20A-1P	23	C	24	20A-1P	1000	VCP-1400 CONTROL ROOM		
		AITC-1223, AITB-1224 HIGH RATE FLOCCULATION	400	20A-1P	25	A	26	20A-1P	200	FIT-1421 SODIUM HYPOCHLORITE BUILDING		3
		LIT-1211, LIT-1221 HIGH RATE FLOCCULATION	400	20A-1P	27	B	28	20A-1P	200	FIT-1422 SODIUM HYPOCHLORITE BUILDING		3
4		SPARE		20A-1P	29	C	30	20A-1P		SPARE		4
		HEAT TRACING PANEL (DECHLORINATION)	2000	30A-3P	31	A	32	20A-1P		SPARE		4
			2000		33	B	34	20A-1P		SPARE		4
			2000		35	C	36	20A-1P		SPARE		4
3		EDR-1401 (VAL-1401), EDR-1402 (VAL-1402) SODIUM HYPOCHLORITE BUILDING	746	20A-1P	37	A	38	20A-1P		SPARE		4
3		EDR-1403 (VAL-1403), EDR-1404 (VAL-1404) SODIUM HYPOCHLORITE BUILDING	746	20A-1P	39	B	40	20A-1P	500	VCP-1411 SODIUM HYPOCHLORITE BUILDING		3
3		VCP-1410 SODIUM HYPOCHLORITE BUILDING	500	20A-1P	41	C	42	20A-1P	500	VCP-1412 SODIUM HYPOCHLORITE BUILDING		3

EX LP-5A

3/22/2021 (1)

LOCATION:	SODIUM HYPOCHLORITE BUILDING - MCC-5A	NEMA:	4X	PH A WEIGHTED VA	10993
VOLTS:	208/120	FEED:	BOTTOM	PH B WEIGHTED VA	13845
PHASE & WIRE:	3 PH 4W	MTG.	MCC	PH C WEIGHTED VA	8816
INTERRUPT:	65 KAIC	BUS RATING:	225		
OPTIONS:	SPD	MAIN:	CB	EQUIP SIZING VA	41535
		MAIN RATING:	125 AF 125 AT	PANEL AMPS	115.3

Note	I/C/S	DESCRIPTION	LOAD (VA)	BKR	CIR	Ø	CIR	BKR	LOAD (VA)	DESCRIPTION	I/C/S
	C	LIGHTING-TERTIARY FILTERS	400	20A-1P	1	A	2	20A-1P	900	RECEPTACLES-TERTIARY FILTER	I
	C	LIGHTING-TERTIARY FILTERS	1600	20A-1P	3	B	4	20A-1P	900	RECEPTACLES-TERTIARY FILTER	I
			720	20A-1P	5	C	6	20A-1P	720		
		SPARE	600	20A-1P	7	A	8	20A-1P	720	RECEPTACLES-COAGULANT FACILITY	I
5	C	LIGHTING-COAGULANT FACILITY	(1) 276 564	20A-1P	9	B	10	20A-1P	540	RECEPTACLES-COAGULANT FACILITY	I
5	C	LIGHTING-COAGULANT FACILITY	568	20A-1P	11	C	12	20A-1P	540	RECEPTACLES-DECHLORINATION FACILITY	I
5	C	LIGHTING-DECHLORINATION FACILITY	(1) 493 637	20A-1P	13	A	14	20A-1P		SPARE	
	C	LIGHTING-HIGH RATE FLOCCULATION BUILDING	1620	20A-1P	15	B	16	20A-1P	540	RECEPTACLES-HIGH RATE FLOCCULATION BUILDING	I
	C	LIGHTING-HIGH RATE FLOCCULATION BUILDING	1480	20A-1P	17	C	18	20A-1P	540	RECEPTACLES-HIGH RATE FLOCCULATION BUILDING	I
	C	LIGHTING-SECONDARY EFFLUENT PUMPING STATION	800	20A-1P	19	A	20	20A-1P	720	RECEPTACLES-SECONDARY EFFLUENT PUMPING STATION	I
	C	LIGHTING-SECONDARY EFFLUENT PUMPING STATION	800	20A-1P	21	B	22	20A-1P	900	RECEPTACLES-SODIUM HYPOCHLORITE BUILDING	I
	C	LIGHTING-SODIUM HYPOCHLORITE BUILDING	570	20A-1P	23	C	24	20A-1P	900	RECEPTACLES-SODIUM HYPOCHLORITE BUILDING	I
5	C	LIGHTING-SODIUM HYPOCHLORITE BUILDING	585	20A-1P	25	A	26	20A-1P	720	RECEPTACLES-SODIUM HYPOCHLORITE BUILDING	I
5	C	LIGHTING-SODIUM HYPOCHLORITE BUILDING	500	20A-1P	27	B	28	20A-1P	720	RECEPTACLES-SODIUM HYPOCHLORITE BUILDING	I
5	C	LIGHTING-SODIUM HYPOCHLORITE BUILDING	923	20A-1P	29	C	30	20A-1P	360	RECEPTACLES-SCRUBBER FACILITY	I
5	C	LIGHTING-SODIUM HYPOCHLORITE BUILDING	468	20A-1P	31	A	32	60A-2P	3000	BATTERY CHARGER	C
5	C	LIGHTING-SCRUBBER FACILITY	400	20A-1P	33	B	34		3000		C
5	C	LIGHTING-JUNCTION BOX 2B	200	20A-1P	35	C	36	20A-1P		SPARE	
	I	CONTACT BASIN RECEPTACLES		20A-1P	37	A	38	20A-1P		GENERATORS HEATERS	C
	I	CONTACT BASIN RECEPTACLES		20A-1P	39	B	40	20A-1P		SPARE	
	C	CONTACT BASIN LIGHTS		20A-1P	41	C	42	20A-1P		SPARE	

PNL-1820

3/22/2021 (2)

LOCATION:	DECHLORINATION FACILITY	NEMA:	4X	PH A WEIGHTED VA	4356
VOLTS:	240/120	FEED:	BOTTOM	PH B WEIGHTED VA	4816
PHASE & WIRE:	1 PH 3W	MTG.	SURFACE		
INTERRUPT:	18 KAIC	BUS RATING:	100		
OPTIONS:	SPD	MAIN:	CB	EQUIP SIZING VA	9633
		MAIN RATING:	100 AF 70 AT	PANEL AMPS	40.1

I/C/S	DESCRIPTION	LOAD (VA)	BKR	CIR	Ø	CIR	BKR	LOAD (VA)	DESCRIPTION	I/C/S
C	WEST TANK HEAT TRACE (HTU-1800B)	1440	20A-1P -GFE	1	A	2	20A-1P		SPARE	
C	EAST TANK HEAT TRACE (HTU-1800A)	1440	20A-1P -GFE	3	B	4	20A-1P		SPARE	
C	PIPING HEAT TRACE (HTU-1800C)	1104	20A-1P -GFE	5	A	6	20A-1P		SPARE	
C	LIGHTING DECHLORINATION FACILITY	493	20A-1P	7	B	8	20A-1P		SPARE	
I	RECEPTACLES DECHLORINATION FACILITY	1176	20A-1P	9	A	10	20A-1P		SPARE	
C	SUMP PUMP VCP-1831 DECHLORINATION FACILITY	1920	20A-1P	11	B	12	20A-1P		SPARE	

KEY NOTES:

1. EXISTING PANELBOARD IN SODIUM HYPOCHLORITE BUILDING ELECTRICAL ROOM. UPDATE LOAD DESCRIPTION IN NEW REPRINTED PANEL SCHEDULE.
2. NEW 15KVA PANELBOARD IN DECHLORINATION FACILITY.
3. EXISTING SPARE BREAKERS SHALL BE UTILIZED TO FEED NEW LOADS. WIRE NEW LOAD TO EXISTING CIRCUIT BREAKER.
4. CIRCUIT BREAKERS SHALL REMAIN INTACT AND RETAGGED AS SPARE AFTER DEMOLISHING EXISTING LOADS POWERED FROM PANEL LP-5B.
5. NEW LIGHTING FIXTURES SHOWN ON LIGHTING PLAN DRAWINGS SHALL BE POWERED FROM SAME EXISTING CIRCUIT BREAKERS IN PANEL LP-5A. EXISTING WIRES SHALL BE UTILIZED TO POWER NEW LIGHTS IF POSSIBLE.
6. EXISTING LOAD (VCP-1401) FED FROM THIS CIRCUIT BREAKER SHALL BE DEMOLISHED. REUSE CIRCUIT BREAKER TO POWER NEW LOAD AS SHOWN HERE.

REV	DATE	BY	DESCRIPTION
1	4/21/2021	RD	ADDENDUM 1 - LIGHTING LOAD REVISION

DESIGNED RD | DRAWN SMF | CHECKED EB | DATE MARCH 2021

REGISTERED PROFESSIONAL ENGINEER ERIK M. BAHNEMAN No. E19683 ELECTRICAL STATE OF CALIFORNIA

carollo®

CITY OF TURLOCK INC. 1908 — STANISLAUS COUNTY, CALIFORNIA

CITY OF TURLOCK PROJECT NO. 20-032

CHEMICAL SYSTEM UPGRADES PROJECT AT RWQCF

ELECTRICAL

SODIUM HYPOCHLORITE BUILDING PANELBOARD SCHEDULES

VERIFY SCALES — BAR IS ONE INCH ON ORIGINAL DRAWING — 0 1" — IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 12002A.10 | DRAWING NO. SHSE08 | SHEET NO. 62 OF 97

LUMINAIRE SCHEDULE

3/23/2021

ITEM	DESCRIPTION	MOUNTING METHOD	LAMP		LUMINAIRE SPECIFICATIONS			
			QUANTITY	TYPE	MANUFACTURER	CATALOG	VOLTS	VA
A	SEALED, AND GASKETED LED LUMINAIRE, CLEAR POLYCARBONATE LENS 80 CRI, SUITABLE FOR WET LOCATIONS, w/ HIGH EFFICIENCY LEDs FOR AMBIENT TEMPERATURES -29 TO 40 DEG C, L80 AT 75,000 HOURS 0-10V DIMMING	CEILING MOUNT OR SUSPENDED AS NEEDED	N/A	LED 4000K CCT 6,643 LUMENS	HOLOPHANE	EVT4 6000LM PCL WD MVOLT GZ10 40K 80 CRI	120	71
B	SLIM, LOW PROFILE CAST ALUMINUM LED FIXTURE. INTEGRAL WEATHER-TIGHT LED DRIVER COMPARTMENTS AND HIGH PERFORMANCE ALUMINUM HEAT SINKS	WALL MOUNT		LED 4000K CCT 5,003 LUMENS	CREE OR EQUAL	E ARE-EDG-4M-DA-E-UL-BZ-350-40K WM - DM EZ	120	46
C	SLIM, LOW PROFILE CAST ALUMINUM LED FIXTURE. INTEGRAL WEATHER-TIGHT LED DRIVER COMPARTMENTS AND HIGH PERFORMANCE ALUMINUM HEAT SINKS SUITABLE FOR WET LOCATIONS 10' OR 12' STRAIGHT ROUND ALUMINUM ARM POLE, COLOR OF POLE SHALL MATCH COLOR OF FIXTURE INCLUDE POLE MOUNTED WEATHER PROOF RECEPTACLE	POLE MOUNT		LED 4000K CCT 7,311 LUMENS	CREE OR EQUAL COOPER	ARE-EDG-2M-DA-04-E-UL-BZ-700-40K RTA4T10AF41E OR RTA4T12AF41E	120	94
D	SLIM, LOW PROFILE CAST ALUMINUM LED FIXTURE. INTEGRAL WEATHER-TIGHT LED DRIVER COMPARTMENTS AND HIGH PERFORMANCE ALUMINUM HEAT SINKS SUITABLE FOR WET LOCATIONS 10' OR 12' STRAIGHT ROUND ALUMINUM ARM POLE, COLOR OF POLE SHALL MATCH COLOR OF FIXTURE	POLE MOUNT		LED 4000K CCT 7,311 LUMENS	CREE OR EQUAL COOPER	ARE-EDG-2M-DA-04-E-UL-BZ-700-40K RTA4T10AF41 OR RTA4T12AF41	120	94

1

DISCONNECT SCHEDULE

3/15/2021

TAG	VOLTAGE	POLES	AMPS	NEMA TYPE	TYPE	HORSEPOWER
A	120 VAC	1P	30A	4X-SS	NON-FUSED	0.5

REV	DATE	BY	DESCRIPTION
1	4/21/2021	RD	ADDENDUM 1 - LIGHT FIXTURE ADDITION

DESIGNED RD
DRAWN SMF
CHECKED EB
DATE MARCH 2021

REGISTERED PROFESSIONAL ENGINEER ERIK M. BAHNEMAN No. E19683 ELECTRICAL STATE OF CALIFORNIA

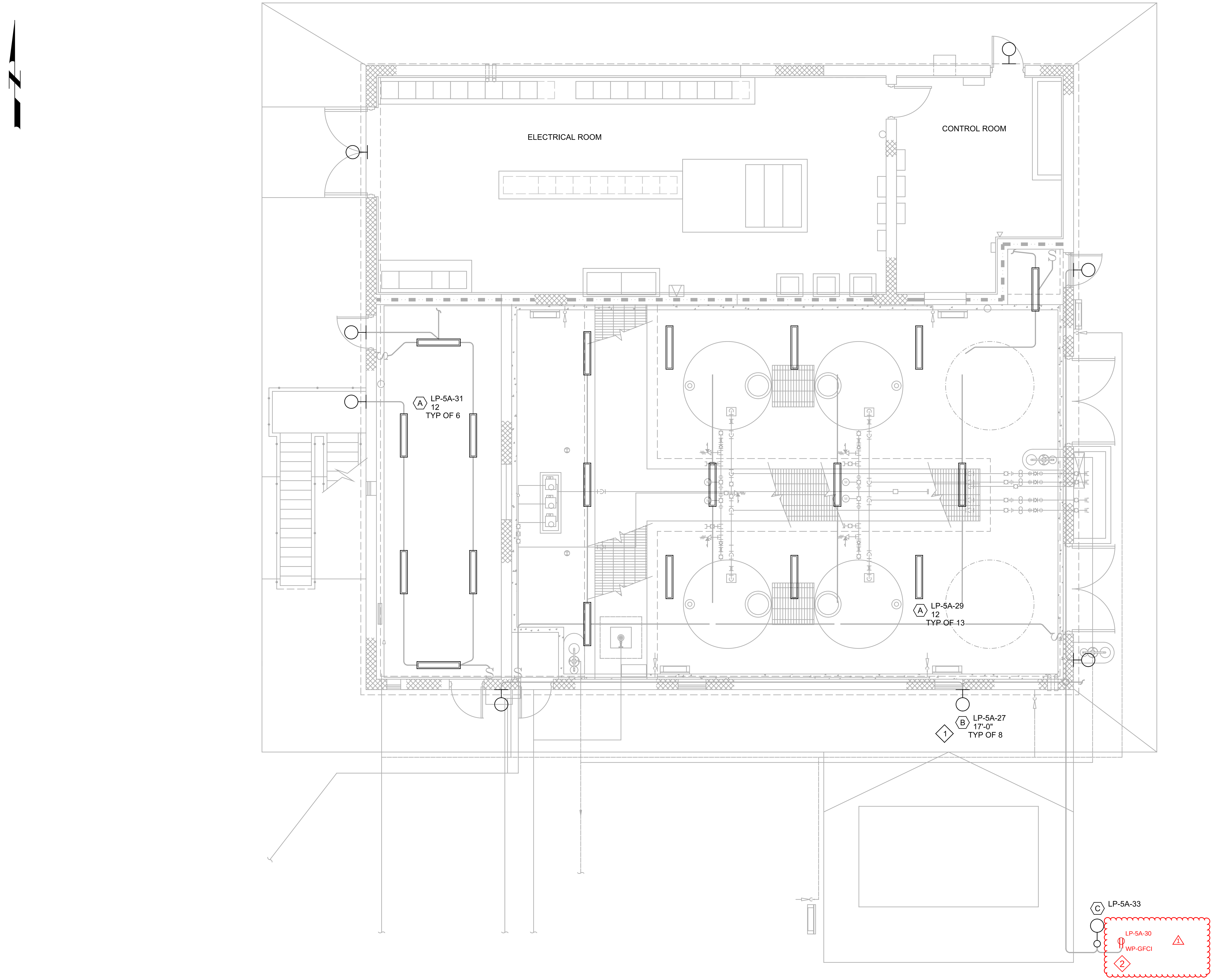
carollo®

CITY OF TURLOCK INC. 1908
STANISLAUS COUNTY, CALIFORNIA

CITY OF TURLOCK PROJECT NO. 20-032
CHEMICAL SYSTEM UPGRADES PROJECT AT RWQCF
ELECTRICAL
SODIUM HYPOCHLORITE BUILDING
LUMINAIRE & DISCONNECT SCHEDULES

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 12002A.10
DRAWING NO. SHSE09
SHEET NO. 63 OF 97



C PLAN

00GE03

SCALE: 3/16" = 1'-0"

FILE: 12002A1001SHE103

GENERAL NOTES:

1. DEMOLISH EXISTING LIGHT FIXTURES IN PLACE. PROVIDE NEW LIGHT FIXTURES TO REPLACE EXISTING LIGHT FIXTURES. REFER TO LUMINAIRE SCHEDULE FOR NEW LIGHT FIXTURES.
2. DEMOLISH ALL EXPOSED CONDUITS THAT ARE NO LONGER NEEDED AND CAP ALL OF THEM WITHIN 6- INCHES OF WALL OR GRADE. REMOVE ALL CONDUCTORS FROM CONDUITS THAT ARE NO LONGER BEING USED. PROVIDE NEW CABLE AND CONUCTOR AS NEEDED.
3. WHERE TYPICAL DETAILS INCLUDE A (TYP) NOTE, IT IS INTENDED THAT THE DETAIL SHOULD BE APPLIED TO ALL TYPICAL EQUIPMENT ON THE DRAWING.

KEY NOTES:

1. MOUNT LIGHT FIXTURE 17 FEET HIGH ABOVE FINISH GRADE ON THE BUILDING WALL.
2. RECEPTACLE SHALL BE POLE-MOUNTED. REUSE EXISTING CABLE AND CONDUIT.

REV	DATE	BY	DESCRIPTION
1	4/21/2021	RD	ADDENDUM 1 - NEW RECEPTACLE ADDITION

DESIGNED RD
DRAWN CLH
CHECKED EB
DATE MARCH 2021

REGISTERED PROFESSIONAL ENGINEER — ERIK M. BAHNEMAN — No. E19683 — ELECTRICAL — STATE OF CALIFORNIA

CITY OF TURLOCK INC. 1908
STANISLAUS COUNTY, CALIFORNIA

CITY OF TURLOCK PROJECT NO. 20-032
CHEMICAL SYSTEM UPGRADES PROJECT AT RWQCF
ELECTRICAL
SODIUM HYPOCHLORITE BUILDING - ELECTRICAL LIGHTING PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 12002A.10
DRAWING NO. SHSE12
SHEET NO. 66 OF 97

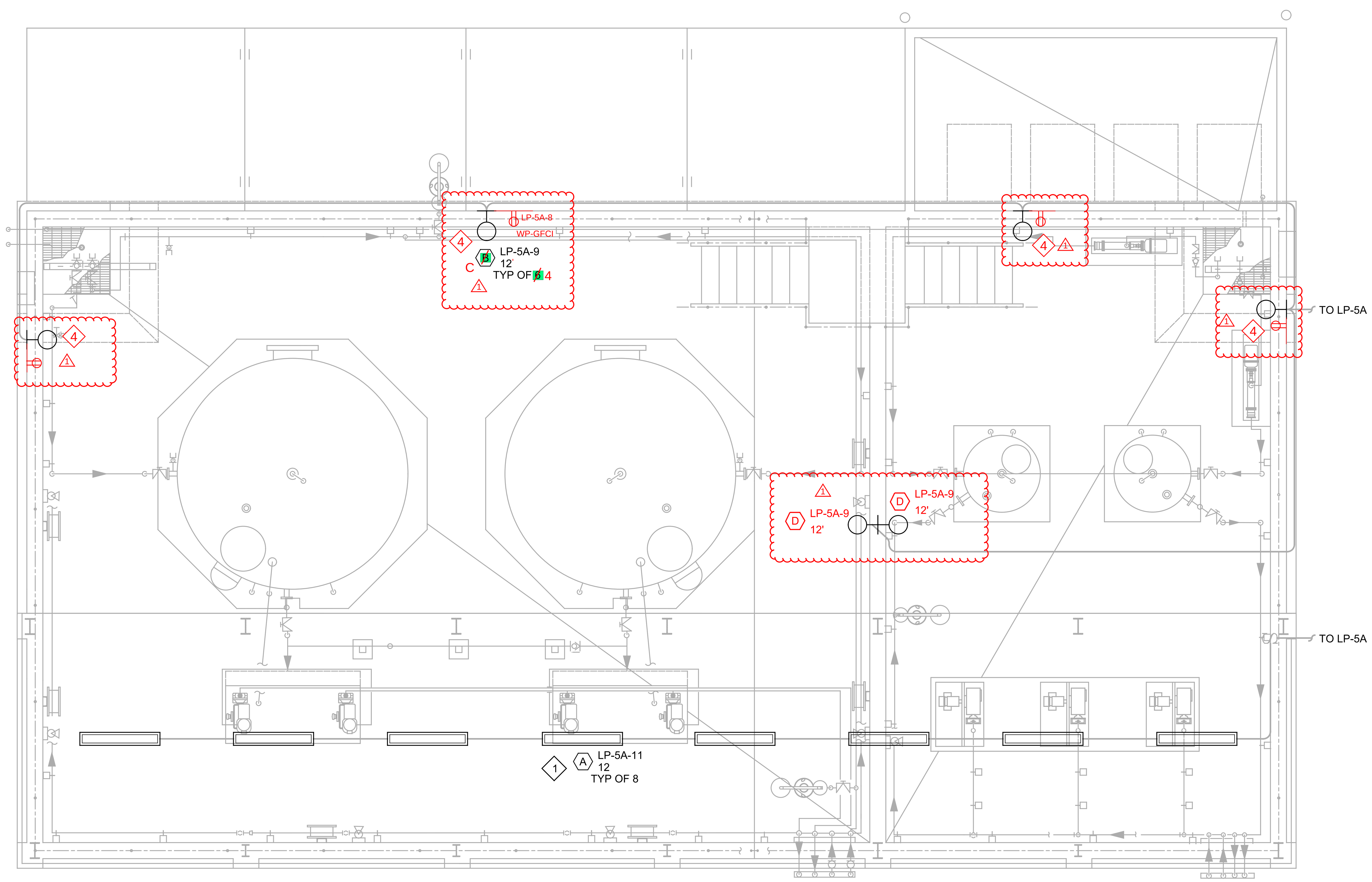
PROJECT NO. 12002A10 FILE NAME: 12002A10SHSE12.dgn

Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 1:1 User: svcPW Plot Date: 23-MAR-2021 8:45:08 AM

LAST SAVED BY: sfunckes

GENERAL NOTES:

1. DEMOLISH EXISTING LIGHT FIXTURES. PROVIDE NEW LIGHT FIXTURES TO REPLACE EXISTING LIGHT FIXTURES. REFER TO LUMINAIRE SCHEDULE FOR NEW LIGHT FIXTURES.
2. REUSE EXISTING CABLE AND CONDUCTOR IF THEY ARE IN USEABLE CONDITION. DEMOLISH ALL EXPOSED CONDUITS THAT ARE NO LONGER NEEDED AND CAP THEM WITHIN 6-INCHES OF WALL OR GRADE. REMOVE ALL CONDUCTORS FROM CONDUITS THAT ARE NO LONGER BEING USED. PROVIDE NEW CABLE AND CONDUCTORS AS NEEDED.
3. WHERE TYPICAL DETAILS INCLUSE A (TYP) NOTE, IT IS INTENDED THAT THE DETAIL SHOULD BE APPLIED TO ALL TYPICAL EQUIPMENT ON THE DRAWING.
4. RECEPTACLE SHALL BE POLE-MOUNTED. REUSE EXISTING CABLE AND CONDUIT. ⚠1



C EXISTING LIGHTING PLAN
00GE03
SCALE: 1/4" = 1'-0"
FILE: 12002A1001CSE103.2dm

REV	DATE	BY	DESCRIPTION
1	4/21/2021	RD	ADDENDUM 1 - LIGHT FIXTURE TYPE UPDATE

DESIGNED RD
DRAWN CLH
CHECKED EB
DATE MARCH 2021

REGISTERED PROFESSIONAL ENGINEER ERIK M. BAHNEMAN No. E19683 ELECTRICAL STATE OF CALIFORNIA

carollo®

CITY OF TURLOCK INC. 1908
STANISLAUS COUNTY, CALIFORNIA

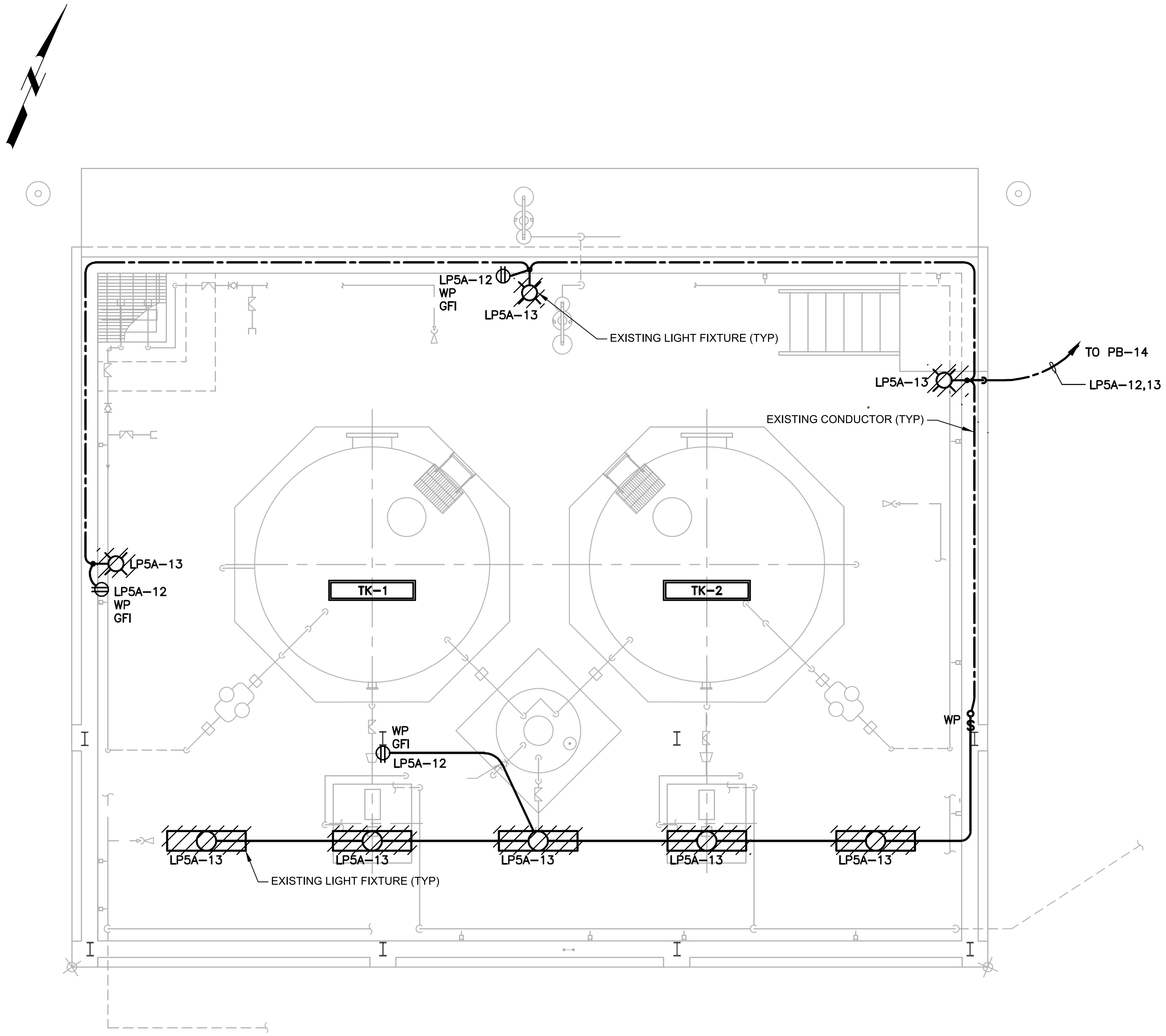
CITY OF TURLOCK PROJECT NO. 20-032
CHEMICAL SYSTEM UPGRADES PROJECT AT RWQCF
ELECTRICAL
COAGULANT FACILITY - ELECTRICAL LIGHTING PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 12002A.10
DRAWING NO. CSE03
SHEET NO. 69 OF 97

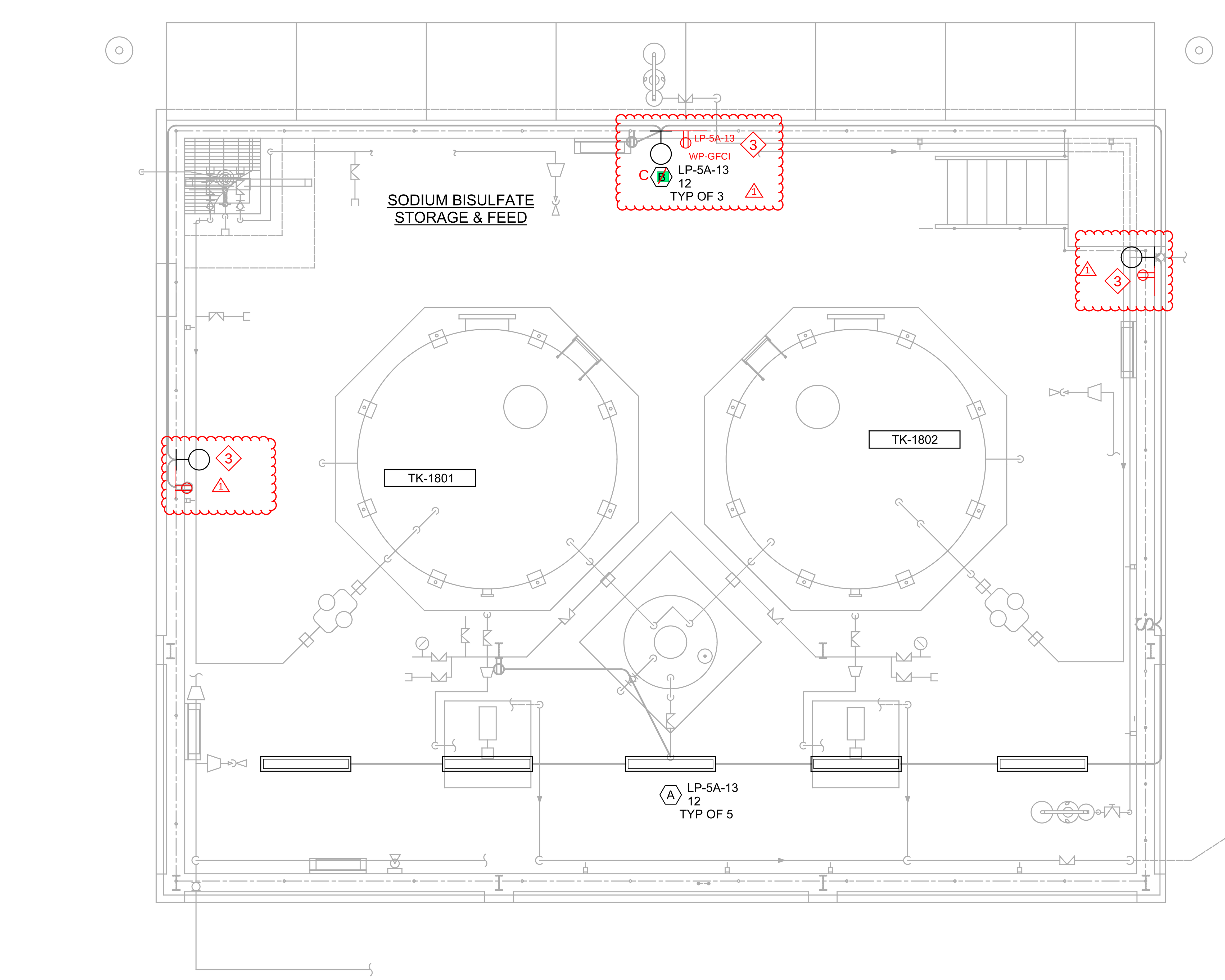
GENERAL NOTES:

1. DEMOLISH EXISTING LIGHT FIXTURES AS SHOWN ON EXISTING LIGHTING PLAN. PRESERVE CONDUITS AND CABLES IN PLACE FOR REUSE.
2. PROVIDE NEW LIGHT FIXTURES TO REPLACE EXISTING LIGHT FIXTURES IN SAME LOCATION. REFER TO LUMINAIRE SCHEDULE FOR NEW LIGHT FIXTURES.
3. RECEPTACLE SHALL BE POLE-MOUNTED. REUSE EXISTING CABLE AND CONDUIT. ⚠1



EXISTING LIGHTING PLAN

SCALE: 1/4" = 1'-0"
FILE: 12002A1001DFE103



C PLAN

00GE03

SCALE: 1/4" = 1'-0"
FILE: 12002A10DFE103

REV	DATE	BY	DESCRIPTION
⚠1	4/21/2021	RD	ADDENDUM 1 - LIGHT FIXTURE TYPE UPDATE

DESIGNED RD
DRAWN SMF
CHECKED EB
DATE MARCH 2021

REGISTERED PROFESSIONAL ENGINEER ERIK M. BAHNEMAN No. E19683 ELECTRICAL STATE OF CALIFORNIA

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CITY OF TURLOCK INC. 1908
STANISLAUS COUNTY, CALIFORNIA

CITY OF TURLOCK PROJECT NO. 20-032
CHEMICAL SYSTEM UPGRADES PROJECT AT RWQCF
ELECTRICAL
DECHLORINATION FACILITY
LIGHTING PLAN

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY

JOB NO. 12002A.10
DRAWING NO. DFE03
SHEET NO. 72 OF

PROJECT NO. 12002A10 FILE NAME: 12002A10DFE03.dgn

LAST SAVED BY: sfunckes Model: Layout1 ColorTable: gshade.ctb DesignScript: Carollo_Std_Pen_v0905.pen PlotScale: 1:1 User: svcPW Plot Date: 22-MAR-2021 1:04:33 PM