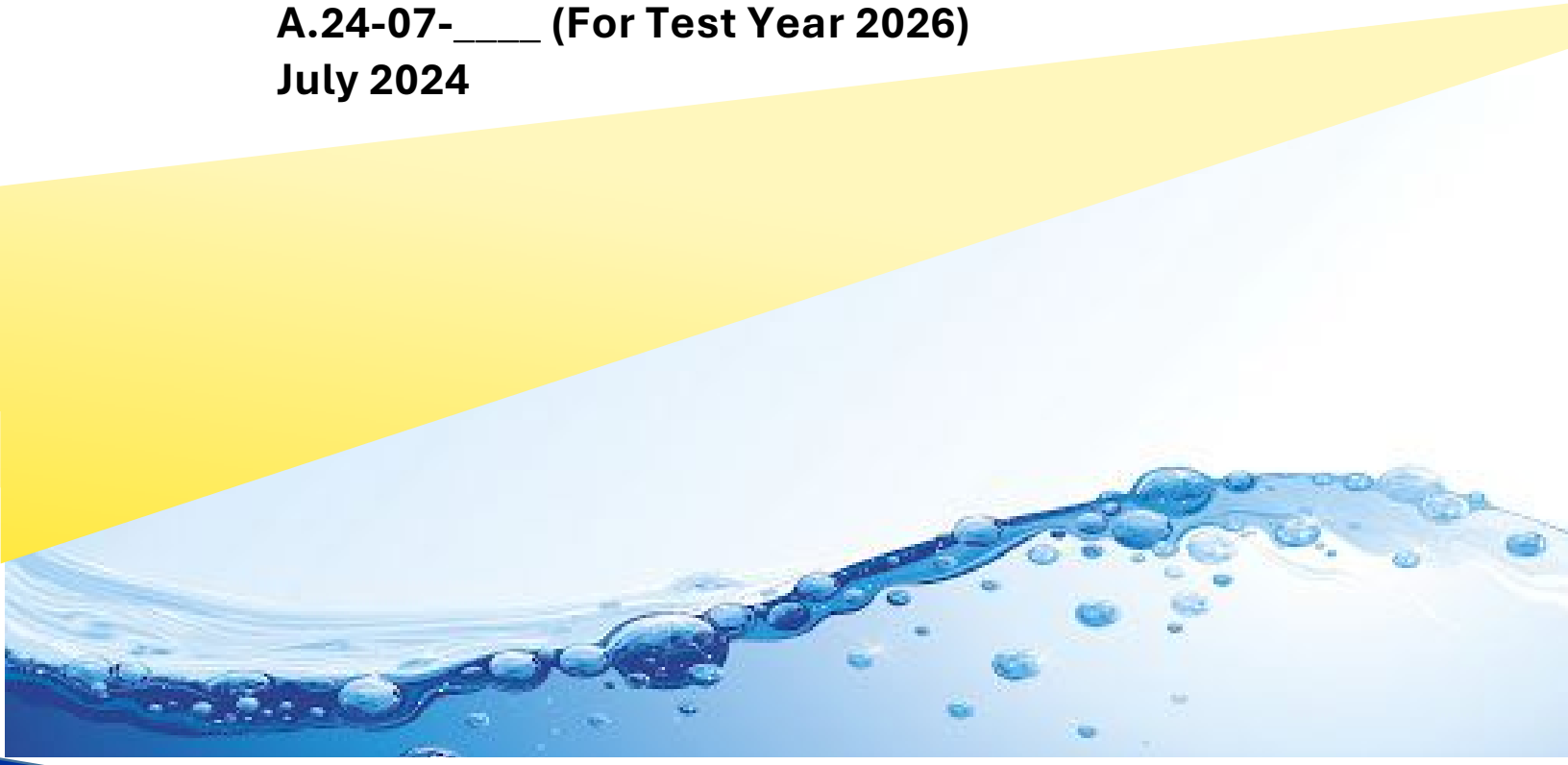
CAPITAL PROJECT JUSTIFICATION

Customer Support Services & Rancho Dominguez

2024 General Rate Case
A.24-07-____ (For Test Year 2026)
July 2024



California Water Service

Quality. Service. Value.

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Rancho Dominguez

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District & Project Justification Book Overview

District Background

Cal Water has functional departments, such as Accounting, Conservation, Communications, Customer Service, Engineering, Environmental Health, Facilities, Field Maintenance, Finance and Risk Management, Human Resources, Internal Audit, Information Technology, Legal, Operations, Procurement, Rates Safety and Water Quality, whose work supports all operating districts. This approach offers an economy of scale. The different departments have a pool of knowledge and experience in all aspects of utility operations, which allows for innovative solutions to be applied to all districts. This includes, but is not limited to:

- State-certified water quality laboratory capable of analyzing and testing the majority of required regulatory samples at lower cost than similar competing water quality laboratories.

- Fully staffed engineering department on par with national engineering firms. The department has expertise in all engineering disciplines related to water utilities. The engineers are equipped with tools and programs to facilitate designing and analyzing all aspects of water and wastewater systems.

- Rate-making staff to liaise with the California Public Utilities Commission (CPUC) to achieve fair rates for Cal Water customers and maintaining a high standard of compliance with the CPUC regulations.

- In-house legal expertise on defending and protecting water rights, including supply and quality, against competing interests and polluters.

- Management of comprehensive insurance policies, safeguarding customers, and company assets and employees.

- A conservation department that develops, implements, administers, monitors, and reports on conservation programs and activities, conservation strategic plans, compliance with 20% by 2020 water-use reductions, and California Urban Water Conservation Council's Best Management Practices.

- Finance and Accounting Departments who ensure compliance with all financial regulation.

- A technology platform, directed by the Information Technology Department, which allows Cal Water to meet its needs now and in the future.

These departments have employees based in Cal Water's corporate office (Customer Support Service office [CSS]) in San Jose, in the Rancho Dominguez office (RDOM) in Torrance and in various district offices throughout the State.

This justification book covers projects for these departments and facilities, which will be shared by all districts.

Project Justification Book Structure

The CSS/RDOM Project Justification (PJ) book presents individual specific project justifications. Specific project justifications are those unique projects for which an individual detailed project justification presents the necessity and supporting documents for the capital project. Generally, specific project justifications are projects which are not part of any ongoing companywide programs.

Justification Presentation Format

Specific justifications in this PJ book are presented in the following general format:

- **Introduction:** A brief introduction providing any background and/or summary of the needs for the project.
- **Deficiencies and Issues:** This section identifies the deficiencies and any supporting analysis or details supporting the need for an improvement project.
- **Alternative Analysis:** Description of approaches to address the current deficiencies, which always includes a "*Do Nothing*" alternative (i.e. maintain existing conditions).
- **Recommended Solution:** Identification and reasoning for the optimum solution to the current deficiencies.
- **Detailed Project Summary:** This section provides a more detailed project scope.
- **Attachments:** All supporting documents, figures, data, maps, reports, budgets, and cost information are presented at the end of the justification write up.

CSS/RDOM Project Justification Threshold

Detailed written justifications have been provided for all specific projects greater than $300,000 direct cost in order to demonstrate the necessity of the capital investment proposed for CSS & RDOM in the 2024 GRC. This threshold was selected as the most appropriate dollar amount to ensure that all major capital projects in the District are presented in sufficient detail to the CPUC and customers for review. Budgeting and cost details for all projects in the District are available for review in the relevant Results of Operation Report.

CAPITAL PROJECT JUSTIFICATION

Customer Support Services

2024 General Rate Case
A.24-07-____ (For Test Year 2026)
July 2024

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California Water Service

Quality. Service. Value.

Table 1. Capital Budget Summary – CSS

Project ID	Description	Direct Cost[a]	Inserted [b]
132210	MSPO Configuration/Upgrades	$936,320	X
132211	Workday Modification/Configuration	$181,500	X[e]
132318	CSS 2025 VEHICLE REPLACEMENT PROGRA	$21,681	X[d]
132446	CSS 2025 SUV	$43,916	X[e]
132448	CSS 2025 Sedan	$43,916	X[e]
132575	2025 PC & Device Replacement	$735,437	X
132579	Windows 11 Upgrade	$210,125	X[e]
132576	2026 PC & Device Replacement	$753,823	X
132577	2027 PC & Device Replacement	$772,651	X
132580	Replace Mitel Phone system	$315,187	X
132582	Service desk upgrade	$323,067	X
132791	2025 UPS Replacement	$160,000	X[e]
132809	Virtal Reality Safety / Ops Modules	$231,138	X[e]
132924	Workstations (4) for future staff	$38,099	X[e]
132925	Workstations (4) for future staff	$40,028	X[e]
132926	Office Furnishing for Manager	$11,550	X[e]
132927	Office Furnishings for Manager	$12,135	X[e]
132962	Demand Model Update	$125,762	X[e]
133317	Design Electrical Service Expansion	$279,539	X[e]
132626	Replace EOL MFP	$377,250	X
133319	CSS- DESIGN NEW 4TH ST ENTRY	$268,582	X[e]
133493	ROV for Asset Condition Assessment	$134,868	X[e]
132627	ZTA - Data Pillar	$992,365	X
133584	CSS- STUDY TO RELOCATE GAS LINE	$132,089	X[e]
133585	CSS-RDOM 2ND FL. REDESIGN	$97,858	X[e]
133596	CSS 2025 mobile water stations	$77,011	X[e]
133658	Upgrade Cal Water.com 2025	$105,062	X[e]
132628	ZTA - Identity Pillar	$1,479,074	X
133709	ICP-MS	$240,309	X[e]
330-NON-SP	330- General Office Non-specific	$1,200,700	X[d]
132319	CSS 2026 VEHICLE REPLACEMENT PROGRA	$396,589	X[d]
132630	ZTA - Network Pillar	$2,541,462	X
132631	Workday Ongoing Enhancements	$525,415	X
132668	PowerPlan Upgrade	$1,786,411	X
132673	Upgrade/ Redesign Cal Water.com 2026	$107,689	X[e]
132788	2025 Network Hardware Replacement	$320,843	X
132789	2025 SCADA Server & Network Repl.	$335,118	X
133491	CSS 2026 Asset Mgmt Large Tools	$106,790	X[e]
132790	2025 SAN Storage Upgrade	$367,719	X
132800	GIS Modernization	$807,826	X

Project ID	Description	Direct Cost[a]	Inserted [b]
133602	CSS 2026 RO Model Improvements	$266,530	X[e]
132801	EAM Decision support	$807,826	X
330-NON-SP	330- General Office Non-specific	$1,200,700	X[d]
132320	CSS 2027 VEHICLE REPLACEMENT PROGRA	$567,043	X[d]
132802	LIMS Upgrade	$430,840	X
132578	IT Equipment for new headcounts	$129,252	X[e]
132815	Digital Twin Ops Optimization	$1,137,370	X
132890	PowerPlan Tax Module Upgrade	$323,130	X
132957	2025 UWMP Development	$968,501	X
132963	CSS Climate Change Study - 2025	$445,252	X
132666	Audit and Compliance Management App	$134,638	X[e]
132667	ImageQuest Upgrade	$33,626	X[e]
133318	REPLACE BLDG ROOF SHINGLE AND CARPO	$304,117	X
133533	CSS Rooftop Solar	$2,919,517	X
133538	Halo Acetic Acids analytical tester	$455,328	X
133578	Network Hardware Replacement_2027	$345,505	X
132804	Integrate HIS with LIMS	$269,275	X[e]
133579	Network Hardware Replacement 2026	$337,086	X
133654	SCADA Server & Network Repl. 2026	$343,496	X
133492	CSS 2027 Asset Mgmt Large Tools	$112,740	X[e]
133544	High perf PC's + CSS monitors	$10,400	X[e]
133655	SCADA Server & Network Repl. 2027	$352,075	X
133661	30 Mobile Power Generators	$2,889,219	X
133659	Upgrade Cal Water.com 2027	$110,379	X[e]
133714	Workforce Mgt & Integration	$538,550	X
330-NON-SP	330- General Office Non-specific	$1,200,700	X[d]
134646	CSS - VEHICLES FOR NEW COMPLEMENTS	$118,107	X[e]
133490	CSS 2025 Asset Mgmt Large Tools	$101,150	X[e]
132445	CSS 2025 Midsize Pickup W/4WD	$40,095	X[e]
133646	CSS 2026 AMI INITIATIVE-IT INT/DEV	$1,537,615	X[d]
Total	**70**	**$36,066,964**	

Notes:

(a) Direct costs include escalation, but exclude construction overhead and AFUDC.

(b) Only projects above the District threshold of $300,000 direct cost are presented in this book with specific or programmatic justifications (see Section A for additional discussion).

(c) Due to confidentiality concerns, details for Physical Security projects are included separately within the Confidential justification book.

(d) Project presented in the Common Plant Justification Book.

(e) Projects presented in Section M. Under Threshold Projects

The following table presents a list of projects that are in progress for which justifications are provided in sub-section L1 of this book because the projects are over-budget and/or over-schedule. Other types of projects in progress are also presented in sub-sections L2 and L3.

Table 2. Projects In Progress – CSS District

PID	Description	Project Type
00119073	PowerPlan Budget Forecasting	Non-Specific
00124691	CSS EWWM-Buildout of Integration	Specific
00124693	CSS CC&B Cloud Upgrade	Specific
00124853	CSS Energy Efficiency - HVAC	Specific
00126076	Enterprise AMI Feasibility Study	Non-Specific
00128042	GRC 2021 Rev Rec Project	Non-Specific
00128946	Fiserv checkfree pay customer	Non-Specific
00129198	BLDG A - OFFICE UPDATES	Non-Specific
00131496	MSPO Roadmap	Non-Specific
00131989	TIME TRACKING IMPROVEMENT PHASE 2	Non-Specific

Section A.

Routine Replacements

CSS – Information Technology

PID # 00132575

PC & Device Replacement 2025

Introduction

Cal Water has over 4,000 technological devices such as desktops, laptops, monitors, and mobile devices to support our employees in completing their daily duties. These devices enable our employees to complete Engineering drawings, define the schedule for water quality sample collections, communicate with other employees and city agencies, and monitor the status of our water distribution and treatment systems. The equipment plays a critical role in daily operation and is expected to have 100% uptime. Failure of these devices can result in water quality violations, tank overflows, degradation of customer service, delays in emergency response, etc. It is imperative that Cal Water follows the standard hardware replacement cycle to provide safe drinking water. Computer equipment is not designed to be repaired beyond its useful life due to rapid technological improvements and the limited supplies of older parts. Additionally, older hardware does not work with current software versions due to compatibility issues. It is the industry's best practice to replace technology hardware on a routine basis to achieve Cal Water's mission of providing safe, reliable water and excellent service.

Deficiencies and Issues

This project replaces obsolete computer equipment and accessories such as desktops, laptops, monitors, tablets, and printers used by employees to perform critical tasks. These tasks include, but not limited to, billing customer accounts, producing customer water bills, processing customer payments and adjustments, starting/stopping service, meter reading, reporting, payroll, bookkeeping, backflow/cross connection processing, engineering design, monitoring the SCADA system, water quality sampling and testing, and providing essential human resource services. This project is part of the routine computer replacement program to maintain a stable computing environment and compatibility with software and security solutions.

Rapid technological advances led to PCs becoming functionally obsolete after an increasingly brief period, which causes the maintenance cost to exceed the replacement cost. Additionally, obsolete hardware is not supported by newer software, which increases security and operational risks. Investment in this type of technology is no longer a one-time expenditure; it is an ongoing capital investment that must be incorporated into periodic recurring budget planning.

Alternative Analysis

Alternative 1 - Do nothing

- Failure to take a holistic view of PC life cycle services can lead to inefficiencies, duplication, omissions, and unnecessary cost – raising total cost of ownership (TCO). PC life cycle services refer to all the processes, tasks and people required to keep PCs functional and maintain user productivity during the lifetime of PC hardware and

software. Failure to replace hardware in a timely manner can decrease user's productivity when hardware fails, and it is no longer supported by the vendors.

Alternative 2 - Replace the hardware routinely on a four-year basis – replacing 25% of the devices every year

- Standard manufacturer warranties normally range from one to three years. To obtain additional maintenance support beyond year three incurs significantly more cost and replacing a few failed components of a computer can become more expensive than replacing the whole computer. Cal Water strongly feels the option to replace the hardware routinely on a four-year basis is the best solution.

Recommended Solution

Alternative 2 is proposed by Cal Water

Department Homeland Security (DHS) considers computer equipment infrastructure to be critical. Cal Water's computer equipment is required to meet standards such as the National Institute of Standards and Technology (NIST), Control Objectives for Information and Related Technologies (COBIT) and Information Technology Infrastructure Library (ITIL). As a result, Cal Water needs to follow industry best practices.

To complete a replacement project in a timely manner, Cal Water has found it is most efficient to take a proactive approach and currently employs an annual replacement project to upgrade a quarter of the devices every year. Cal Water has maintained this schedule for more than ten years to consistently replace the devices according to a schedule, which avoids jeopardizing productivity and while keeping replacement costs down.

Cal Water customers depend on Cal Water to perform the following processes on schedule or upon request with no delays and with no computer related problems:

- Accurate water bills
- Correct meter reading
- Timely and accurate payment processing
- Account inquiries
- Cal Water website look ups
- Meter exchanges or replacements

All these activities require and rely on all of Cal Water's computer equipment to operate efficiently and to be replaced before any failures occur because of outdated hardware due to software incompatibilities or hardware failure. By Cal Water performing their exiting annual computer equipment replacement program ensures that Cal Water customers are served with excellent and professional customer service.

Project Summary

This is a recurring replacement program to replace 25% of the company owned devices as the assets are reaching the end of life.

The proposed minimum project cost is $700,000.00 per year.

****

Below is the full list of devices as of November 20, 2023.

The estimated yearly total cost for replacement is about $724,017.00 per year.

Device Type	Total Count	Yearly Replacement 25%	Unit Price	Yearly Total Cost
Laptop	468	117	$2,149.00	$251,433.00
Desktop	678	170	$1,560.00	$264,420.00
Toughbook	50	13	$2,400.00	$30,000.00
iPhone	1030	258	$30.00	$7,725.00
iPad	663	166	$812.00	$134,589.00
Monitor	1800	150	$239.00	$35,850.00
Total	**4,689**			**$724,017.00**

Project Attachments

- Attachment A –Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. : 132575
Description 2025 PC & Device Replacement
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2026
Prepared By: tyu
Date Initiated: 10/25/2023
Base Year: 2023
Sub-Total: $700,000
Direct Cost: $744,630

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
PC & DEVICE REPLACEMENT 2025	[EA]	1	$700,000.00	$700,000.00	Engineers Estimate

Sub-total = $700,000.00
Direct Cost = $744,630.40

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Quote for 1 Laptop and Docking Station - $2,149.00

DATA CENTER WAREHOUSE
23041 Avenida De La Carlota, Suite 325
Laguna Hills, CA 92653
Phone: 855-355-4329

Quotation
Number: **Q-49132**
Date: **07/27/2023**

Bill To:
Accounts Payable
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8290
Email: accountspayable@calwater.com

Ship To:
Tony Yu
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8204 x:x78204
Email: tyu@calwater.com

Item #	Mfr. Part	Description	Price	Qty.	Extended
1	21BR002TUS	Lenovo ThinkPad T14s Gen 3 21BR002TUS 14" Notebook - WUXGA - 1920 x 1200 - Intel Core i7 12th Gen i7-1260P Dodeca-core (12 Core) 2.10 GHz - 16 GB Total RAM - 16 GB On-board Memory - 512 GB SSD - Intel Chip - Windows 11 Pro - Iris Xe Graphics - IEEE 802.11ax Wireless LAN Standard - EPEAT Gold Compliance Mfr: LENOVO GROUP LIMITED	$ 1,766.48	1	**$ 1,766.48**
2	40AY0090US	Lenovo ThinkPad Universal USB-C Dock - for Notebook - 135 W - USB Type C - 3 Displays Supported - 3840 x 2160 - 6 x USB Ports - 2 x USB 2.0 - USB Type-C - 1 x RJ-45 Ports - Network (RJ-45) - 1 x HDMI Ports - HDMI - 2 x DisplayPorts - DisplayPort - Thunderbolt - Wired - Gigabit Ethernet - Windows Mfr: LENOVO GROUP LIMITED	$ 186.06	1	**$ 186.06**
2 item(s)				**Sub-Total**	**$ 1,952.54**
				Tax @ 9.375%	**$ 183.05**
				Freight	**$ 13.78**
				Total	**$ 2,149.37**

Quote Valid Until: 08/26/2023

Quote for 1 Desktop/Workstation - $1,560.00 (=$46,803.00 / 30)

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	HP Workstation Z2 G9 - Wolf Pro Security - mini - 5U - 1 x Core i7 13700 / 2.1 GHz - RAM 16 GB - SSD 512 GB - HP Z Turbo Drive, NVMe, TLC - T400 - GigE, 802.11ax (Wi-Fi 6E), Bluetooth Dual-Mode - WLAN: 802.11a/b/g/n/ac/ax (Wi-Fi 6E), Bluetooth 5.3 wirele HP, Inc. - Part#: 87C15UT#ABA	30	$1,423.02	$42,690.60

Subtotal	$42,690.60
Shipping	$100.81
*Tax	$4,011.69
Total	$46,803.10

*Tax is estimated. Invoice will include the full and final tax due.

Quote for 1 Toughbook/Rugged Laptop - $2,400

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	Mobile Precision 3580 / i7-1360P, / 64GB / 512SSD / NVIDIA RTX A500, 4GB / FHD NT / 3 years Pro / XCTO Dell - Part#: 3000161439032.1 **Note:** Lead time: 2 weeks	1	$2,193.31	$2,193.31

Subtotal	$2,193.31
Shipping	$0.00
*Tax	$205.62
Total	$2,398.93

*Tax is estimated. Invoice will include the full and final tax due.

Quote for 1 iPhone - $30.00

Apple
iPhone 13

Retail price
$629.99

Retail price: $629.99

★★★★★
(6155 Reviews)

As low as $29.99.
See details

Color and Storage

Starlight (PRODUCT)RED Blue Green

Midnight Pink

128GB 256GB

512GB

Payment options

$0.00
~~$17.49~~
36 monthly payments

$29.99
~~$179.99~~
2 Year Contract Required

$179.99
3 Year Contract Required

$629.99
Retail Price

Quote for 1 iPad – $812.00

DCW DATA CENTER WAREHOUSE

DATA CENTER WAREHOUSE
23041 Avenida De La Carlota, Suite 325
Laguna Hills, CA 92653
Phone: 855-355-4329

Quotation
Number: **Q-53228**
Date: **09/13/2023**

Bill To:
California Water Service Company
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8200
Email: accountspayable@calwater.com

Ship To:
AP AP
California Water Service Company
1720 North First Street
Tony Yu
San Jose, CA 95112
Phone: (408)367-8200
Email: accountspayable@calwater.com

Item #	Mfr. Part	Description	Price	Qty.	Extended
1	MQ6T3LL	Apple iPad (10th Generation) Tablet - 10.9 - Hexa-core (Firestorm Dual-core (2 Core) 3 GHz + Icestorm Quad-core (4 Core) 1.80 GHz) - 4 GB RAM - 256 GB Storage - 5G - Silver - Apple A14 Bionic SoC - 2360 x 1640 - Liquid Retina Display, In-plane Switching Mfr: APPLE, INC	$ 749.00	1	**$ 749.00**
2	77-89953	OtterBox iPad (10th Gen) Defender Series Case - For Apple iPad (10th Generation) Tablet, Apple Pencil - Black - Drop Resistant, Dirt Resistant, Debris Resistant, Dust Resistant, Scrape Resistant - Polycarbonate (PC), Polyester, Synthetic Rubber - Rugged Mfr: OTTERBOX	$ 50.10	1	**$ 50.10**
3	DFILLSIM5G-SA-A-D	VERIZON 5G SIM INDIVIDUAL SIMS Mfr: VERIZON WIRELESS	$ 0.00	1	**$ 0.00**
		3 item(s)		**Sub-Total**	**$ 799.10**
				Tax @ 0%	**$ 0.00**
				Freight	**$ 13.10**
				Total	**$ 812.20**

Quote for 1 Monitor - $239.00 (= $957 / 4)

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	HP E23 G4 - E-Series - LED monitor - 23" (23" viewable) - 1920 x 1080 Full HD (1080p) @ 60 Hz - IPS - 250 cd/m - 1000:1 - 5 ms - HDMI, VGA, DisplayPort - black, silver HP, Inc. - Part#: 9VF96AA#ABA	4	$218.75	$875.00

Subtotal	$875.00
Shipping	$0.00
*Tax	$82.03
Total	$957.03

*Tax is estimated. Invoice will include the full and final tax due.

CSS – Information Technology

PID # 00132576

PC & Device Replacement 2026

Introduction

Cal Water has over 4,000 technological devices such as desktops, laptops, monitors, and mobile devices to support our employees in completing their daily duties. These devices enable our employees to complete Engineering drawings, define the schedule for water quality sample collections, communicate with other employees and city agencies, and monitor the status of our water distribution and treatment systems. The equipment plays a critical role in daily operation and is expected to have 100% uptime. Failure of these devices can result in water quality violations, tank overflows, degradation of customer service, delays in emergency response, etc. It is imperative that Cal Water follows the standard hardware replacement cycle to provide safe drinking water. Computer equipment is not designed to be repaired beyond its useful life due to rapid technological improvements and the limited supplies of older parts. Additionally, older hardware does not work with current software versions due to compatibility issues. It is the industry's best practice to replace technology hardware on a routine basis to achieve Cal Water's mission of providing safe, reliable water and excellent service.

Deficiencies and Issues

This project replaces obsolete computer equipment and accessories such as desktops, laptops, monitors, tablets, and printers used by employees to perform critical tasks. These tasks include, but not limited to, billing customer accounts, producing customer water bills, processing customer payments and adjustments, starting/stopping service, meter reading, reporting, payroll, bookkeeping, backflow/cross connection processing, engineering design, monitoring the SCADA system, water quality sampling and testing, and providing essential human resource services. This project is part of the routine computer replacement program to maintain a stable computing environment and compatibility with software and security solutions.

Rapid technological advances led to PCs becoming functionally obsolete after an increasingly brief period, which causes the maintenance cost to exceed the replacement cost. Additionally, obsolete hardware is not supported by newer software, which increases security and operational risks. Investment in this type of technology is no longer a one-time expenditure; it is an ongoing capital investment that must be incorporated into periodic recurring budget planning.

Alternative Analysis

Alternative 1 - Do nothing

- Failure to take a holistic view of PC life cycle services can lead to inefficiencies, duplication, omissions, and unnecessary cost – raising total cost of ownership (TCO). PC life cycle services refer to all the processes, tasks and people required to keep PCs functional and maintain user productivity during the lifetime of PC hardware and

software. Failure to replace hardware in a timely manner can decrease user's productivity when hardware fails, and it is no longer supported by the vendors.

Alternative 2 - Replace the hardware routinely on a four-year basis – replacing 25% of the devices every year

- Standard manufacturer warranties normally range from one to three years. To obtain additional maintenance support beyond year three incurs significantly more cost and replacing a few failed components of a computer can become more expensive than replacing the whole computer. Cal Water strongly feels the option to replace the hardware routinely on a four-year basis is the best solution.

Recommended Solution

Department Homeland Security (DHS) considers computer equipment infrastructure to be critical. Cal Water's computer equipment is required to meet standards such as the National Institute of Standards and Technology (NIST), Control Objectives for Information and Related Technologies (COBIT) and Information Technology Infrastructure Library (ITIL). As a result, Cal Water needs to follow industry best practices.

To complete a replacement project in a timely manner, Cal Water has found it is most efficient to take a proactive approach and currently employs an annual replacement project to upgrade a quarter of the devices every year. Cal Water has maintained this schedule for more than ten years to consistently replace the devices according to a schedule, which avoids jeopardizing productivity and while keeping replacement costs down.

Cal Water customers depend on Cal Water to perform the following processes on schedule or upon request with no delays and with no computer related problems:

- Accurate water bills
- Correct meter reading
- Timely and accurate payment processing
- Account inquiries
- Cal Water website look ups
- Meter exchanges or replacements

All these activities require and rely on all of Cal Water's computer equipment to operate efficiently and to be replaced before any failures occur because of outdated hardware due to software incompatibilities or hardware failure. By Cal Water performing their exiting annual computer equipment replacement program ensures that Cal Water customers are served with excellent and professional customer service.

Project Summary

This is a recurring replacement program to replace 25% of the company owned devices as the assets are reaching the end of life.

The proposed minimum project cost is $700,000.00 per year.

****

Below is the full list of devices as of November 20, 2023.

The estimated yearly total cost for replacement is about $724,017.00 per year.

Device Type	Total Count	Yearly Replacement 25%	Unit Price	Yearly Total Cost
Laptop	468	117	$2,149.00	$251,433.00
Desktop	678	170	$1,560.00	$264,420.00
Toughbook	50	13	$2,400.00	$30,000.00
iPhone	1030	258	$30.00	$7,725.00
iPad	663	166	$812.00	$134,589.00
Monitor	1800	150	$239.00	$35,850.00
Total	**4,689**			**$724,017.00**

Project Attachments

- Attachment A – Cost Estimate
- Attachment B - Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132576
Description 2026 PC & Device Replacement
District / Department: CSS
Project Start Date: 01/01/2026
Project Completion Date: 12/31/2026
Prepared By: tyu
Date Initiated: 10/25/2023
Base Year: 2023
Sub-Total: $700,000
Direct Cost: $753,823

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
PC & DEVICE REPLACEMENTS	[EA]	1	$700,000.00	$700,000.00	Engineers Estimate

Sub-total = $700,000.00
Direct Cost = $753,823.48

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Quote for 1 Laptop and Docking Station - $2,149.00

DATA CENTER WAREHOUSE
23041 Avenida De La Carlota, Suite 325
Laguna Hills, CA 92653
Phone: 855-355-4329

Quotation
Number: **Q-49132**
Date: **07/27/2023**

Bill To:
Accounts Payable
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8290
Email: accountspayable@calwater.com

Ship To:
Tony Yu
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8204 x:x78204
Email: tyu@calwater.com

Item #	Mfr. Part	Description	Price	Qty.	Extended
1	21BR002TUS	Lenovo ThinkPad T14s Gen 3 21BR002TUS 14" Notebook - WUXGA - 1920 x 1200 - Intel Core i7 12th Gen i7-1260P Dodeca-core (12 Core) 2.10 GHz - 16 GB Total RAM - 16 GB On-board Memory - 512 GB SSD - Intel Chip - Windows 11 Pro - Iris Xe Graphics - IEEE 802.11ax Wireless LAN Standard - EPEAT Gold Compliance Mfr: LENOVO GROUP LIMITED	$ 1,766.48	1	**$ 1,766.48**
2	40AY0090US	Lenovo ThinkPad Universal USB-C Dock - for Notebook - 135 W - USB Type C - 3 Displays Supported - 3840 x 2160 - 6 x USB Ports - 2 x USB 2.0 - USB Type-C - 1 x RJ-45 Ports - Network (RJ-45) - 1 x HDMI Ports - HDMI - 2 x DisplayPorts - DisplayPort - Thunderbolt - Wired - Gigabit Ethernet - Windows Mfr: LENOVO GROUP LIMITED	$ 186.06	1	**$ 186.06**
2 item(s)				**Sub-Total**	**$ 1,952.54**
				Tax @ 9.375%	**$ 183.05**
				Freight	**$ 13.78**
				Total	**$ 2,149.37**

Quote Valid Until: 08/26/2023

Quote for 1 Desktop/Workstation - $1,560.00 (=$46,803.00 / 30)

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	HP Workstation Z2 G9 - Wolf Pro Security - mini - 5U - 1 x Core i7 13700 / 2.1 GHz - RAM 16 GB - SSD 512 GB - HP Z Turbo Drive, NVMe, TLC - T400 - GigE, 802.11ax (Wi-Fi 6E), Bluetooth Dual-Mode - WLAN: 802.11a/b/g/n/ac/ax (Wi-Fi 6E), Bluetooth 5.3 wirele HP, Inc. - Part#: 87C15UT#ABA	30	$1,423.02	$42,690.60

Subtotal	$42,690.60
Shipping	$100.81
*Tax	$4,011.69
Total	$46,803.10

*Tax is estimated. Invoice will include the full and final tax due.

Quote for 1 Toughbook/Rugged Laptop - $2,400

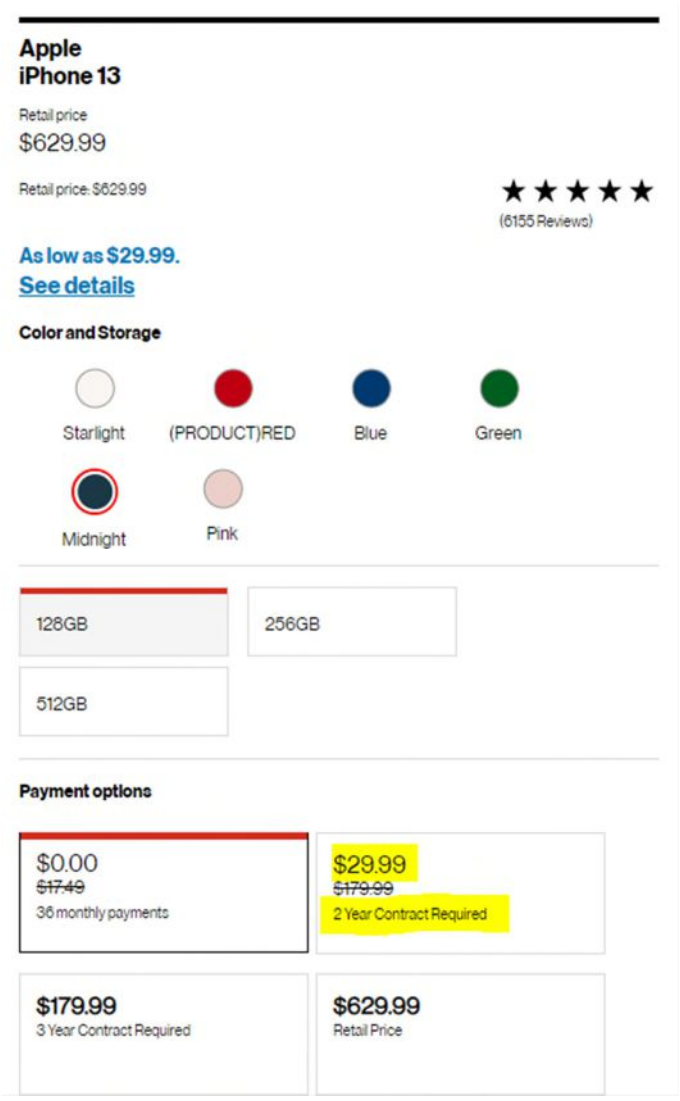
All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	Mobile Precision 3580 / i7-1360P, / 64GB / 512SSD / NVIDIA RTX A500, 4GB / FHD NT / 3 years Pro / XCTO Dell - Part#: 3000161439032.1 **Note:** Lead time: 2 weeks	1	$2,193.31	$2,193.31

Subtotal	$2,193.31
Shipping	$0.00
*Tax	$205.62
Total	$2,398.93

*Tax is estimated. Invoice will include the full and final tax due.

Quote for 1 iPhone - $30.00



Quote for 1 iPad – $812.00

DCW DATA CENTER WAREHOUSE

DATA CENTER WAREHOUSE
23041 Avenida De La Carlota, Suite 325
Laguna Hills, CA 92653
Phone: 855-355-4329

Quotation
Number: **Q-53228**
Date: **09/13/2023**

Bill To:
California Water Service Company
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8200
Email: accountspayable@calwater.com

Ship To:
AP AP
California Water Service Company
1720 North First Street
Tony Yu
San Jose, CA 95112
Phone: (408)367-8200
Email: accountspayable@calwater.com

Item #	Mfr. Part	Description	Price	Qty.	Extended
1	MQ6T3LL	Apple iPad (10th Generation) Tablet - 10.9 - Hexa-core (Firestorm Dual-core (2 Core) 3 GHz + Icestorm Quad-core (4 Core) 1.80 GHz) - 4 GB RAM - 256 GB Storage - 5G - Silver - Apple A14 Bionic SoC - 2360 x 1640 - Liquid Retina Display, In-plane Switching Mfr: APPLE, INC	$ 749.00	1	**$ 749.00**
2	77-89953	OtterBox iPad (10th Gen) Defender Series Case - For Apple iPad (10th Generation) Tablet, Apple Pencil - Black - Drop Resistant, Dirt Resistant, Debris Resistant, Dust Resistant, Scrape Resistant - Polycarbonate (PC), Polyester, Synthetic Rubber - Rugged Mfr: OTTERBOX	$ 50.10	1	**$ 50.10**
3	DFILLSIM5G-SA-A-D	VERIZON 5G SIM INDIVIDUAL SIMS Mfr: VERIZON WIRELESS	$ 0.00	1	**$ 0.00**
		3 item(s)		**Sub-Total**	**$ 799.10**
				Tax @ 0%	**$ 0.00**
				Freight	**$ 13.10**
				Total	**$ 812.20**

Quote for 1 Monitor - $239.00 (= $957 / 4)

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	HP E23 G4 - E-Series - LED monitor - 23" (23" viewable) - 1920 x 1080 Full HD (1080p) @ 60 Hz - IPS - 250 cd/m - 1000:1 - 5 ms - HDMI, VGA, DisplayPort - black, silver HP, Inc. - Part#: 9VF96AA#ABA	4	$218.75	$875.00

Subtotal	$875.00
Shipping	$0.00
*Tax	$82.03
Total	$957.03

*Tax is estimated. Invoice will include the full and final tax due.

CSS – Information Technology

PID # 00132577

PC & Device Replacement 2027

Introduction

Cal Water has over 4,000 technological devices such as desktops, laptops, monitors, and mobile devices to support our employees in completing their daily duties. These devices enable our employees to complete Engineering drawings, define the schedule for water quality sample collections, communicate with other employees and city agencies, and monitor the status of our water distribution and treatment systems. The equipment plays a critical role in daily operation and is expected to have 100% uptime. Failure of these devices can result in water quality violations, tank overflows, degradation of customer service, delays in emergency response, etc. It is imperative that Cal Water follows the standard hardware replacement cycle to provide safe drinking water. Computer equipment is not designed to be repaired beyond its useful life due to rapid technological improvements and the limited supplies of older parts. Additionally, older hardware does not work with current software versions due to compatibility issues. It is the industry's best practice to replace technology hardware on a routine basis to achieve Cal Water's mission of providing safe, reliable water and excellent service.

Deficiencies and Issues

This project replaces obsolete computer equipment and accessories such as desktops, laptops, monitors, tablets, and printers used by employees to perform critical tasks. These tasks include, but not limited to, billing customer accounts, producing customer water bills, processing customer payments and adjustments, starting/stopping service, meter reading, reporting, payroll, bookkeeping, backflow/cross connection processing, engineering design, monitoring the SCADA system, water quality sampling and testing, and providing essential human resource services. This project is part of the routine computer replacement program to maintain a stable computing environment and compatibility with software and security solutions.

Rapid technological advances led to PCs becoming functionally obsolete after an increasingly brief period, which causes the maintenance cost to exceed the replacement cost. Additionally, obsolete hardware is not supported by newer software, which increases security and operational risks. Investment in this type of technology is no longer a one-time expenditure; it is an ongoing capital investment that must be incorporated into periodic recurring budget planning.

Alternative Analysis

Alternative 1 - Do nothing

- Failure to take a holistic view of PC life cycle services can lead to inefficiencies, duplication, omissions, and unnecessary cost – raising total cost of ownership (TCO). PC life cycle services refer to all the processes, tasks and people required to keep PCs functional and maintain user productivity during the lifetime of PC hardware and

software. Failure to replace hardware in a timely manner can decrease user's productivity when hardware fails, and it is no longer supported by the vendors.

Alternative 2 - Replace the hardware routinely on a four-year basis – replacing 25% of the devices every year

- Standard manufacturer warranties normally range from one to three years. To obtain additional maintenance support beyond year three incurs significantly more cost and replacing a few failed components of a computer can become more expensive than replacing the whole computer. Cal Water strongly feels the option to replace the hardware routinely on a four-year basis is the best solution.

Recommended Solution

Department Homeland Security (DHS) considers computer equipment infrastructure to be critical. Cal Water's computer equipment is required to meet standards such as the National Institute of Standards and Technology (NIST), Control Objectives for Information and Related Technologies (COBIT) and Information Technology Infrastructure Library (ITIL). As a result, Cal Water needs to follow industry best practices.

To complete a replacement project in a timely manner, Cal Water has found it is most efficient to take a proactive approach and currently employs an annual replacement project to upgrade a quarter of the devices every year. Cal Water has maintained this schedule for more than ten years to consistently replace the devices according to a schedule, which avoids jeopardizing productivity and while keeping replacement costs down.

Cal Water customers depend on Cal Water to perform the following processes on schedule or upon request with no delays and with no computer related problems:

- Accurate water bills
- Correct meter reading
- Timely and accurate payment processing
- Account inquiries
- Cal Water website look ups
- Meter exchanges or replacements

All these activities require and rely on all of Cal Water's computer equipment to operate efficiently and to be replaced before any failures occur because of outdated hardware due to software incompatibilities or hardware failure. By Cal Water performing their exiting annual computer equipment replacement program ensures that Cal Water customers are served with excellent and professional customer service.

Project Summary

This is a recurring replacement program to replace 25% of the company owned devices as the assets are reaching the end of life.

The proposed minimum project cost is $700,000.00 per year.

****

Below is the full list of devices as of November 20, 2023.

The estimated yearly total cost for replacement is about $724,017.00 per year.

Device Type	Total Count	Yearly Replacement 25%	Unit Price	Yearly Total Cost
Laptop	468	117	$2,149.00	$251,433.00
Desktop	678	170	$1,560.00	$264,420.00
Toughbook	50	13	$2,400.00	$30,000.00
iPhone	1030	258	$30.00	$7,725.00
iPad	663	166	$812.00	$134,589.00
Monitor	1800	150	$239.00	$35,850.00
Total	**4,689**			**$724,017.00**

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132577
Description 2027 PC & Device Replacement
District / Department: CSS
Project Start Date: 01/01/2027
Project Completion Date: 12/31/2027
Prepared By: tyu
Date Initiated: 10/25/2023
Base Year: 2023
Sub-Total: $700,000
Direct Cost: $772,651

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
PC & DEVICE REPLACEMENTS	[EA]	1	$700,000.00	$700,000.00	Engineers Estimate

Sub-total = $700,000.00
Direct Cost = $772,650.64

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Quote for 1 Laptop and Docking Station - $2,149.00

DATA CENTER WAREHOUSE
23041 Avenida De La Carlota, Suite 325
Laguna Hills, CA 92653
Phone: 855-355-4329

Quotation
Number: **Q-49132**
Date: **07/27/2023**

Bill To:
Accounts Payable
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8290
Email: accountspayable@calwater.com

Ship To:
Tony Yu
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8204 x:x78204
Email: tyu@calwater.com

Item #	Mfr. Part	Description	Price	Qty.	Extended
1	21BR002TUS	Lenovo ThinkPad T14s Gen 3 21BR002TUS 14" Notebook - WUXGA - 1920 x 1200 - Intel Core i7 12th Gen i7-1260P Dodeca-core (12 Core) 2.10 GHz - 16 GB Total RAM - 16 GB On-board Memory - 512 GB SSD - Intel Chip - Windows 11 Pro - Iris Xe Graphics - IEEE 802.11ax Wireless LAN Standard - EPEAT Gold Compliance Mfr: LENOVO GROUP LIMITED	$ 1,766.48	1	**$ 1,766.48**
2	40AY0090US	Lenovo ThinkPad Universal USB-C Dock - for Notebook - 135 W - USB Type C - 3 Displays Supported - 3840 x 2160 - 6 x USB Ports - 2 x USB 2.0 - USB Type-C - 1 x RJ-45 Ports - Network (RJ-45) - 1 x HDMI Ports - HDMI - 2 x DisplayPorts - DisplayPort - Thunderbolt - Wired - Gigabit Ethernet - Windows Mfr: LENOVO GROUP LIMITED	$ 186.06	1	**$ 186.06**
		2 item(s)		**Sub-Total**	**$ 1,952.54**
				Tax @ 9.375%	**$ 183.05**
				Freight	**$ 13.78**
				Total	**$ 2,149.37**

Quote Valid Until: 08/26/2023

Quote for 1 Desktop/Workstation - $1,560.00 (=$46,803.00 / 30)

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	HP Workstation Z2 G9 - Wolf Pro Security - mini - 5U - 1 x Core i7 13700 / 2.1 GHz - RAM 16 GB - SSD 512 GB - HP Z Turbo Drive, NVMe, TLC - T400 - GigE, 802.11ax (Wi-Fi 6E), Bluetooth Dual-Mode - WLAN: 802.11a/b/g/n/ac/ax (Wi-Fi 6E), Bluetooth 5.3 wirele HP, Inc. - Part#: 87C15UT#ABA	30	$1,423.02	$42,690.60

Subtotal	$42,690.60
Shipping	$100.81
*Tax	$4,011.69
Total	$46,803.10

*Tax is estimated. Invoice will include the full and final tax due.

Quote for 1 Toughbook/Rugged Laptop - $2,400

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	Mobile Precision 3580 / i7-1360P, / 64GB / 512SSD / NVIDIA RTX A500, 4GB / FHD NT / 3 years Pro / XCTO Dell - Part#: 3000161439032.1 **Note:** Lead time: 2 weeks	1	$2,193.31	$2,193.31

Subtotal	$2,193.31
Shipping	$0.00
*Tax	$205.62
Total	$2,398.93

*Tax is estimated. Invoice will include the full and final tax due.

Quote for 1 iPhone - $30.00

Apple
iPhone 13

Retail price
$629.99

Retail price: $629.99

★★★★★
(6155 Reviews)

As low as $29.99.
See details

Color and Storage

Starlight (PRODUCT)RED Blue Green

Midnight Pink

128GB 256GB

512GB

Payment options

$0.00
~~$17.49~~
36 monthly payments

$29.99
~~$179.99~~
2 Year Contract Required

$179.99
3 Year Contract Required

$629.99
Retail Price

Quote for 1 iPad – $812.00

DCW DATA CENTER WAREHOUSE

DATA CENTER WAREHOUSE
23041 Avenida De La Carlota, Suite 325
Laguna Hills, CA 92653
Phone: 855-355-4329

Quotation
Number: **Q-53228**
Date: **09/13/2023**

Bill To:
California Water Service Company
California Water Service Company
1720 North First Street
San Jose, CA 95112
Phone: (408)367-8200
Email: accountspayable@calwater.com

Ship To:
AP AP
California Water Service Company
1720 North First Street
Tony Yu
San Jose, CA 95112
Phone: (408)367-8200
Email: accountspayable@calwater.com

Item #	Mfr. Part	Description	Price	Qty.	Extended
1	MQ6T3LL	Apple iPad (10th Generation) Tablet - 10.9 - Hexa-core (Firestorm Dual-core (2 Core) 3 GHz + Icestorm Quad-core (4 Core) 1.80 GHz) - 4 GB RAM - 256 GB Storage - 5G - Silver - Apple A14 Bionic SoC - 2360 x 1640 - Liquid Retina Display, In-plane Switching Mfr: APPLE, INC	$ 749.00	1	**$ 749.00**
2	77-89953	OtterBox iPad (10th Gen) Defender Series Case - For Apple iPad (10th Generation) Tablet, Apple Pencil - Black - Drop Resistant, Dirt Resistant, Debris Resistant, Dust Resistant, Scrape Resistant - Polycarbonate (PC), Polyester, Synthetic Rubber - Rugged Mfr: OTTERBOX	$ 50.10	1	**$ 50.10**
3	DFILLSIM5G-SA-A-D	VERIZON 5G SIM INDIVIDUAL SIMS Mfr: VERIZON WIRELESS	$ 0.00	1	**$ 0.00**
		3 item(s)		**Sub-Total**	**$ 799.10**
				Tax @ 0%	**$ 0.00**
				Freight	**$ 13.10**
				Total	**$ 812.20**

Quote for 1 Monitor - $239.00 (= $957 / 4)

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	HP E23 G4 - E-Series - LED monitor - 23" (23" viewable) - 1920 x 1080 Full HD (1080p) @ 60 Hz - IPS - 250 cd/m - 1000:1 - 5 ms - HDMI, VGA, DisplayPort - black, silver HP, Inc. - Part#: 9VF96AA#ABA	4	$218.75	$875.00

Subtotal	$875.00
Shipping	$0.00
*Tax	$82.03
Total	$957.03

*Tax is estimated. Invoice will include the full and final tax due.

CSS – Information Technology

PID # 00132626
Replace EOL MFP

Introduction

Employees use printers and scanners daily as that is an integral part of daily tasks at the office. We must ensure employees can print safely, securely, and promptly without disruptions or delays.

Even in today's business world, many documents still need to be printed. This includes contracts, proposals, reports, and more. We have approximately 20 Multi-Function Printers to support about 300 employees at CSS. The average monthly usage is 36,345 printouts. That translates to about 1211 printouts a day.

Deficiencies and Issues

Using End-of-Life (EOL) Multi-Function Printer (MFP) poses risks for the company because the support of the equipment will be more costly as the equipment ages and users will not be able to print or scan when the machine is down, leading to work delays while waiting for a technician to come and fix it. Additionally, confidential data can get exposed and may cause significant damage to the company if that data gets into the wrong hand.

Alternative Analysis

Alternative 1: Do Nothing

The Do Nothing will accept the risk of delayed processing of critical company functions, or it may cause security and data privacy leakage.

Alternative 2: Interim Repairs

The Interim Repairs alternative involves calling Ricoh to replace broken parts. The user cannot print or scan during this time that will cause undesired disruptions to the business.

Alternative 3: Replace aging multi-function printers

Replace aging hardware (i.e., disk drives failures) that are related to the outages.

Recommended Solution

Alternative 3 is recommended.

Cal Water recommends that we replace the aging multi-function printers with new ones to prevent imminent outages causing disruption and delays with critical business functions.

The cost for the final alternative is **$350,000**, which is presented in more detail in the Budget Estimate below.

Project Summary

The project is to replace approximately twenty multifunctional printers and plotters. The project will benefit customers by enhancing employee productivity, increased security, and data privacy.

• Upgrades often come with modern technology designed specifically to help employees better manage documents and improve the overall quality of printed materials.

• New security features designed to protect confidential and sensitive employee and customer data, which we must maintain to satisfy data privacy laws (i.e., California Consumer Privacy Act and California Privacy Rights Act). For example, the new method will only print if the owner is physically there to authenticate and pick it up.

Cost Avoidance:

• Aging technology not only means issues with device performance, security, and print quality, but also higher costs. As technology ages, machines become more expensive to run as supplies such as toners become more costly. And when maintenance is needed, parts will become scarce and harder to find for older machines. Upgrading will replace older, inefficient equipment with newer technology that will improve the system's overall functionality. This will translate to avoided calls to maintenance providers and the money it would cost to repair. Newer printer models are also designed to be more efficient, with toner yielding more pages per cartridge and maintenance kits built to last for more printed pages.

Budget Estimate

See the attached quote in Attachment B for $317,330.60. Approximately 10% is being added for potential unknowns which brings the current estimate to $350K.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B - Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132626
Description Replace EOL MFP
District / Department: CSS
Project Start Date: 02/15/2027
Project Completion Date: 12/30/2027
Prepared By: rchang
Date Initiated: 10/27/2023
Base Year: 2023
Sub-Total: $350,000
Direct Cost: $377,250

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
MULTI FUNCTIONAL PRINTERS	[EA]	21	$16,666.67	$350,000.00	Engineers Estimate

Sub-total = $350,000.00
Direct Cost = $377,250.11

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

RICOH
imagine. change.

Quote Document for

CALIFORNIA WATER SERVICE CO
Date: November 03,2023

Quantity	Item Description	Ext Selling Price
11	RICOH IMC3000 CONFIGURABLE PTO MODEL RICOH IMC3000 BRANDING SET BRIDGE UNIT BU3090 PAPER FEED UNIT PB3280 FINISHER SR3260 PUNCH UNIT PU3080 NA [NP]POSTSCRIPT3 UNIT TYPE M37 [NP]MEMORY UNIT TYPE M37 4GB [NP]FAX MEMORY UNIT TYPE M19 64MB FAX OPTION TYPE M37 ESP XG-PCS-15D 1 BIN TRAY BN3130	
11	TS NETWORK & SCAN CONNECT - SEG BC2	
5	RICOH IMC3500 CONFIGURABLE PTO MODEL RICOH IMC3500 BRANDING SET 1 BIN TRAY BN3130 BRIDGE UNIT BU3090 PAPER FEED UNIT PB3280 FINISHER SR3260 PUNCH UNIT PU3080 NA [NP]POSTSCRIPT3 UNIT TYPE M37 [NP]MEMORY UNIT TYPE M37 4GB [NP]FAX MEMORY UNIT TYPE M19 64MB FAX OPTION TYPE M37 ESP XG-PCS-15D	
5	TS NETWORK & SCAN CONNECT - SEG BC3	
10	RICOH IMC4500 CONFIGURABLE PTO MODEL RICOH IMC4500 BRANDING SET 1 BIN TRAY BN3130	

	BRIDGE UNIT BU3090
	PAPER FEED UNIT PB3280
	FINISHER SR3280
	PUNCH UNIT PU3090 NA
	[NP]POSTSCRIPT3 UNIT TYPE M37
	[NP]MEMORY UNIT TYPE M37 4GB
	[NP]FAX MEMORY UNIT TYPE M19 64MB
	FAX OPTION TYPE M37
	ESP XG-PCS-15D
10	TS NETWORK & SCAN - SEG BC4
8	RICOH IMC6000 CONFIGURABLE PTO MODEL
	RICOH IMC6000 BRANDING SET
	1 BIN TRAY BN3130
	BRIDGE UNIT BU3090
	PAPER FEED UNIT PB3280
	FINISHER SR3280
	PUNCH UNIT PU3090 NA
	[NP]POSTSCRIPT3 UNIT TYPE M37
	[NP]MEMORY UNIT TYPE M37 4GB
	[NP]FAX MEMORY UNIT TYPE M19 64MB
	FAX OPTION TYPE M37
	ESP XG-PCS-15D
8	TS NETWORK & SCAN - SEG BC4
4	[NP]RICOH MPC6503 CONFIGURABLE PTO MODEL
	RICOH MPC6503 BRANDING SET
	[XXXX]FINISHER SR4120
	PUNCH UNIT PU3060 NA
	[NP]POSTSCRIPT3 UNIT TYPE M26
	[NP]FAX OPTION TYPE M26
	FAX MEMORY UNIT TYPE M26 64MB
	XG-PCS 120/20D RIC AMP SURGE PROTECTOR
4	TS NETWORK & SCAN - SEG BC4
11	[OA][OOD]SMART INTEGRATION ESSENTIALS SUBSCRIPTION FOR NEW A3 DEVICES INC1YR
6	[OA][OOD]SMART INTEGRATION ESSENTIALS SUBSCRIPTION FOR NEW A3 DEVICES INC1YR
10	[OA][OOD]SMART INTEGRATION

8		**ESSENTIALS SUBSCRIPTION FOR NEW A3 DEVICES INC1YR [OA][OOD]SMART INTEGRATION**	
4		**ESSENTIALS SUBSCRIPTION FOR NEW A3 DEVICES INC1YR [OA][OOD]SMART INTEGRATION**	
		ESSENTIALS SUBSCRIPTION FOR NEW A3 DEVICES INC1YR	
		Sub Total:	**$317,330.60**

Technology Service

Quantity		Description	Ext Rate
11		**RICOH IMC3000 CONFIGURABLE PTO MODEL**	
	Includes	0 B&W copies per Quarter per unit overages at $0.0059 per page 0 color copies per Quarter per unit overages at $ 0.0412 per page GOLD - includes Parts, Labor, Toner and Staples, excludes Paper	
5		**RICOH IMC3500 CONFIGURABLE PTO MODEL**	
	Includes	0 B&W copies per Quarter per unit overages at $0.0059 per page 0 color copies per Quarter per unit overages at $ 0.0412 per page GOLD - includes Parts, Labor, Toner and Staples, excludes Paper	
10		**RICOH IMC4500 CONFIGURABLE PTO MODEL**	
	Includes	0 B&W copies per Quarter per unit overages at $0.0059 per page 0 color copies per Quarter per unit overages at $ 0.0412 per page GOLD - includes Parts, Labor, Toner and Staples, excludes Paper	
8		**RICOH IMC6000 CONFIGURABLE PTO MODEL**	
	Includes	0 B&W copies per Quarter per unit overages at $0.0059 per page 0 color copies per Quarter per unit	

		overages at $ 0.0412 per page GOLD - includes Parts, Labor, Toner and Staples, excludes Paper
4		**[NP]RICOH MPC6503 CONFIGURABLE PTO MODEL**
	Includes	0 B&W copies per Quarter per unit overages at $0.0059 per page 0 color copies per Quarter per unit overages at $ 0.0412 per page GOLD - includes Parts, Labor, Toner and Staples, excludes Paper

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Rev. 04/13	**Quote Number**	28762454	**Expires on**	November 30,2023

CSS – Information Technology

PID # 00132788

Network Hardware Replacement 2025

Introduction

Replacing and upgrading to a modern network infrastructure will dramatically simplify network deployments, operations, and management for our IT staff. All California districts and general office have one hundred fifty-nine Cisco Catalyst 2960 series network switches at forty-three locations. They are outdated and old. We must replace all one hundred and fifty-nine outdated network switches in three years' time. This means that we must replace fifty-three network switches starting in 2025, 2026, and 2027 respectively.

Deficiencies and issues

- Older networks were not built to support the technological demands of today's workforce.

- One of the main risks of using outdated hardware is that it might not be compatible with the latest software, operating systems, or security updates. This can lead to errors, crashes, slowdowns, or even data loss.

- Mobile solutions and cloud-based business applications can overwhelm an older network infrastructure. Upgrading to a modernized network can make a real difference to productivity. For example, if the Company's LIMS system goes off-line, water quality samples cannot be recorded and reported in a timely manner.

- Threats to the network are more sophisticated and targeted than ever before. The older the infrastructure, the more vulnerable it becomes.

- Introducing new technology puts an increased strain on older network infrastructure that then requires more and more attention. Some common reasons for upgrading network switches include outdated hardware, increasing network traffic, expanding network requirements, and improved security needs. If the hardware is not upgraded, the IT staff will spend its time fixing downtime rather than supporting IT daily operations.
  .

Alternative Analysis

Alternative 1 – Do Nothing

- Cal Water could choose to leave network hardware as is. However, older hardware is more likely to develop problems over time due to wear and tear. Even if the hardware is fine for the tasks, it will likely become less reliable and more expensive to maintain over time.

- Beyond replacement costs is the fact that many manufacturers and software developers have stopped supporting older hardware. This means that should an error occur; Cal Water will not necessarily be able to get support from the manufacturers. This can lead to repair delays, operational outages, and lost productivity. Ultimately impacting business operations and customers.

- Crashes, cyber-attacks, and system downtime will lead to decreased productivity.

Alternative 2

- Apply the latest updates – Only if network hardware is not End of Life (EOL)

- Quality of service – To ensure that the most important applications get priority.

- Traffic Shaping – IT staff do not always understand the impact of packet shaping, which can be negative if not done correctly.

Alternative 3

- It's very critical that we replace legacy network switches because they run slower in alternatives number one and number two. The vendor does not provide technical support and software updates for these old network devices. It means that we're putting the company at risk for security and information breaches.

- Establishing and maintaining reliable connections is critical to the success of the Cal Water business. Cal Water has forty-three locations and by using the most current technology ensures users can do their jobs more efficiently, with fewer interruptions.

Recommended Solution

Alternative 3

Replace and upgrade the outdated network switches per the refresh rate and scheduled timeline to keep Cal Water's network infrastructure up-to-date and stay current when it comes to preventing the latest threats.

Better Security – It's getting much harder to secure older networks, so investing in a new one or upgrading an existing one is the way forward because security is important to Cal Water. Upgrading network hardware will give users/customers access to much better features that can help protect network connections on various devices. Hackers and other criminals are always finding ways to steal data and personal information via enterprise networks that are not secure. Increase network performance – Good network performance equals more efficiency and productivity. Bandwidth limitations are avoidable with new hardware.

Project Summary

Maintaining a reliable network assists Cal Water employees provide high-quality, reliable water service, supports security efforts, and deliver exceptional customer service.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132788
Description 2025 Network Hardware Replacement
District / Department: CSS
Project Start Date: 01/02/2025
Project Completion Date: 12/31/2025
Prepared By: trnguyen
Date Initiated: 11/03/2023
Base Year: 2023
Sub-Total: $313,018
Direct Cost: $320,843

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
EQUIPMENT (NO AFUDC)	[EA]	1	$28,509.00	$28,509.00	Engineers Estimate
EQUIPMENT (NO AFUDC)	[EA]	1	$284,509.00	$284,509.00	Engineers Estimate

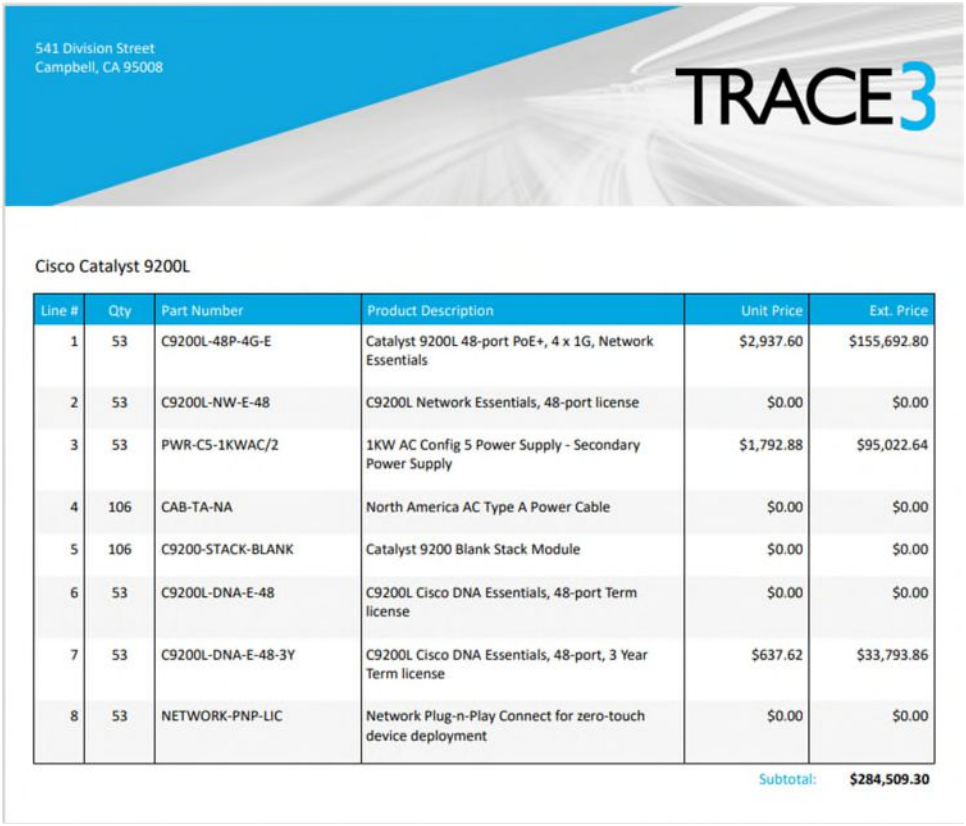
Sub-total = $313,018.00
Direct Cost = $320,843.44

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

PID 00132788 Cost Estimate

Device	Amount	Year to Replace/Add
53 Cisco network switches Replacement in 2025 (see quote)	$284,509.30	**2025**
10% Contingency	$28,509.00	Contingency
Total	**$312,959.30**	

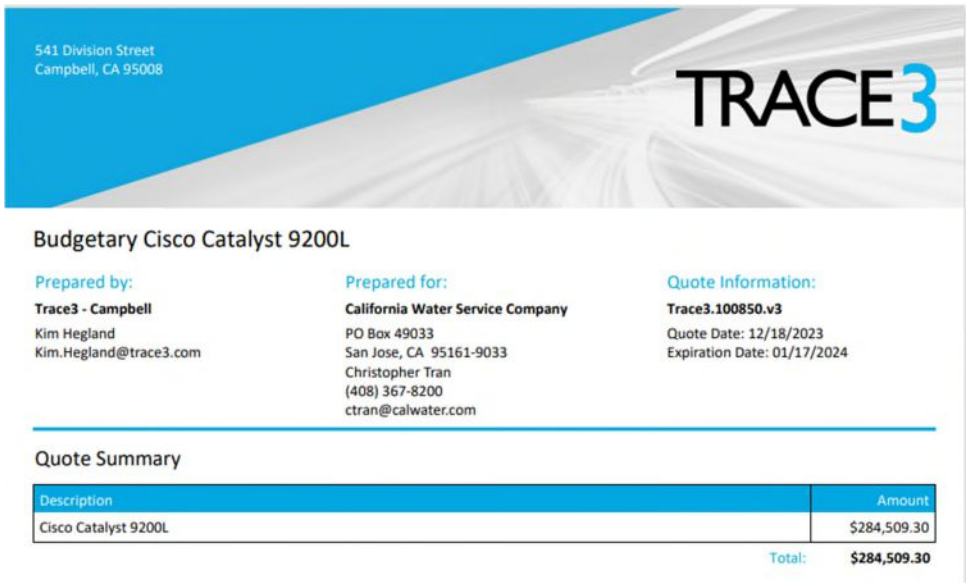


541 Division Street
Campbell, CA 95008

TRACE3

Cisco Catalyst 9200L

Line #	Qty	Part Number	Product Description	Unit Price	Ext. Price
1	53	C9200L-48P-4G-E	Catalyst 9200L 48-port PoE+, 4 x 1G, Network Essentials	$2,937.60	$155,692.80
2	53	C9200L-NW-E-48	C9200L Network Essentials, 48-port license	$0.00	$0.00
3	53	PWR-C5-1KWAC/2	1KW AC Config 5 Power Supply - Secondary Power Supply	$1,792.88	$95,022.64
4	106	CAB-TA-NA	North America AC Type A Power Cable	$0.00	$0.00
5	106	C9200-STACK-BLANK	Catalyst 9200 Blank Stack Module	$0.00	$0.00
6	53	C9200L-DNA-E-48	C9200L Cisco DNA Essentials, 48-port Term license	$0.00	$0.00
7	53	C9200L-DNA-E-48-3Y	C9200L Cisco DNA Essentials, 48-port, 3 Year Term license	$637.62	$33,793.86
8	53	NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	$0.00	$0.00
				Subtotal:	**$284,509.30**



541 Division Street
Campbell, CA 95008

TRACE3

Budgetary Cisco Catalyst 9200L

Prepared by:

Trace3 - Campbell

Kim Hegland
Kim.Hegland@trace3.com

Prepared for:

California Water Service Company

PO Box 49033
San Jose, CA 95161-9033
Christopher Tran
(408) 367-8200
ctran@calwater.com

Quote Information:

Trace3.100850.v3

Quote Date: 12/18/2023
Expiration Date: 01/17/2024

Quote Summary

Description	Amount
Cisco Catalyst 9200L	$284,509.30
Total:	**$284,509.30**

CSS – Information Technology

PID # 00132789

SCADA Server & Network Replacement 2025

Introduction

Cal Water's business depends on SCADA systems to operate and distribute safe water to the customers. The hardware needed to support this process must be kept current using the latest technology so that continuous support is maintained.

Ensuring operational support is challenging with outdated/antiquated hardware or systems. Network devices must be refreshed every four to five years to maintain optimum operational support for integrity, reliability, and availability. Currently, all California districts and customer service support (CSS) have a total of twenty-six Cisco Catalyst 3600 series network switches, forty-four Moxa network switches, one hundred thirty-five network devices, and eighty-six Gen10 HP servers.

We must replace fifteen HP servers, forty-five network devices, and ten Moxa network switches in 2025 simply because they are outdated.

Deficiencies and issues

- Older networks and network hardware were not built to support the technological demands of today's workforce. One of the main risks of using outdated hardware is that it might not be compatible with the latest software, operating systems, or security updates. This can lead to errors, crashes, slowdowns, or even data loss Mobile solutions and cloud-based business applications can overwhelm an older network infrastructure. Upgrading to a modernized network can make a real difference to productivity.

- Threats to the network are more sophisticated and targeted than ever before. The older the infrastructure, the more vulnerable it becomes.

- Introducing modern technology puts an increased strain on older network infrastructure that then requires more attention.

Alternative Analysis

Alternative 1 – Do Nothing

We could choose to leave equipment as is, however, it will not be able to sustain operations into the future due to the degradation of hardware components and software technology changes that obsolete the original design. This could cause serious operational outages. Ultimately impacting business operations and customers.

Alternative 2

Choosing alternative equipment was considered. However, equipment alternatives are not feasible due to the current environment and the need to maintain operations as is, maintaining standardization and knowledge expertise. Also, equipment lifespans are based on the original installation date making it difficult, and less cost-efficient, to replace all similar hardware, using another manufacturer, at the same time. The exception would be if the manufacturer is no longer making the hardware or is no longer supporting the technology needed in the network environment. Using dissimilar hardware will introduce unknown operational issues and further complicate administration. Ultimately increasing the cost of maintenance and support.

Crashes, cyber-attacks, and system downtime will lead to decreased productivity.

Alternative 3

It is extremely critical that we replace legacy hardware because they run slower in alternatives one and two. The vendor does not provide technical support and software updates for these old network devices. It means that we are putting the company at risk for security and information breaches.

Establishing and maintaining reliable connections is critical to the success of the Cal Water business. Cal Water has forty-three locations and by using the most current technology ensures users can do their jobs more efficiently, with fewer interruptions.

Recommended Solution

Alternative 3

Replace and upgrade the outdated network hardware per the refresh rate and scheduled timeline to keep Cal Water's network infrastructure up-to-date and stay current when it comes to preventing the latest threats.

Better Security – It is getting much harder to secure older networks, so investing in a new one or upgrading an existing one is the way forward because security is important. Upgrading network hardware will give users/customers access to much better features that can help protect network connections on various devices. Hackers and other criminals are always finding ways to steal data and personal information via enterprise networks that are not secure.

Increase network performance – Good network performance equals more efficiency and productivity. Bandwidth limitations are avoidable with new hardware.

Project Summary

SCADA system is a critical infrastructure that is required to manage our water systems. Cal Water follows best practices as per ISO 55001- Asset Management hardware lifecycle recommendations to ensure the availability, confidentiality, integrity, and reliability of the hardware that supports this system. The following devices must be continually updated and refreshed to provide foundational support for SCADA applications: servers, network switches, network firewalls, network storage, and network blade servers.

Network switches provide data packet flow for SCADA systems between the districts and headquarters. These devices must be updated continuously with new firmware and refreshed

every four years to ensure access availability and reliability to SCADA applications. The Information Technology Information Library (ITIL) best practice is to replace hardware as needed to provide confidentiality, integrity, and availability to our customers.

Network firewalls provide security protection that segregates and isolates SCADA networks from corporate network and district network segments. Firewalls must be continuously updated with new firmware and refreshed every four years to ensure that adequate protection is provided within the SCADA network. The Department of Homeland Security suggests companies be vigilant and combat Cyber threats for SCADA systems as hackers have demonstrated an ability to disrupt water service in cities and communities by attacking older operating systems, software and hardware. In addition, a company system supports the security logging needed, and access information, for PII, PCI, SOX and HIPPA information within the network. The ITIL best practice is to replace hardware as needed to provide confidentiality, integrity, and availability.

Similar to the Cal Water's corporate network, this project's network hardware is scheduled to be refreshed every four years. Servers provide the environment for SCADA applications. The company has over 70 physical SCADA servers that support all of the company's water operations. The ITIL best practice is to replace hardware to provide confidentiality, integrity, and availability .

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132789
Description 2025 SCADA Server & Network Repl.
District / Department: CSS
Project Start Date: 01/02/2025
Project Completion Date: 12/31/2025
Prepared By: trnguyen
Date Initiated: 11/03/2023
Base Year: 2023
Sub-Total: $318,970
Direct Cost: $335,118

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
EQUIPMENT (NO AFUDC)	[EA]	1	$28,997.00	$28,997.00	Engineers Estimate
EQUIPMENT (NO AFUDC)	[EA]	1	$289,973.00	$289,973.00	Engineers Estimate

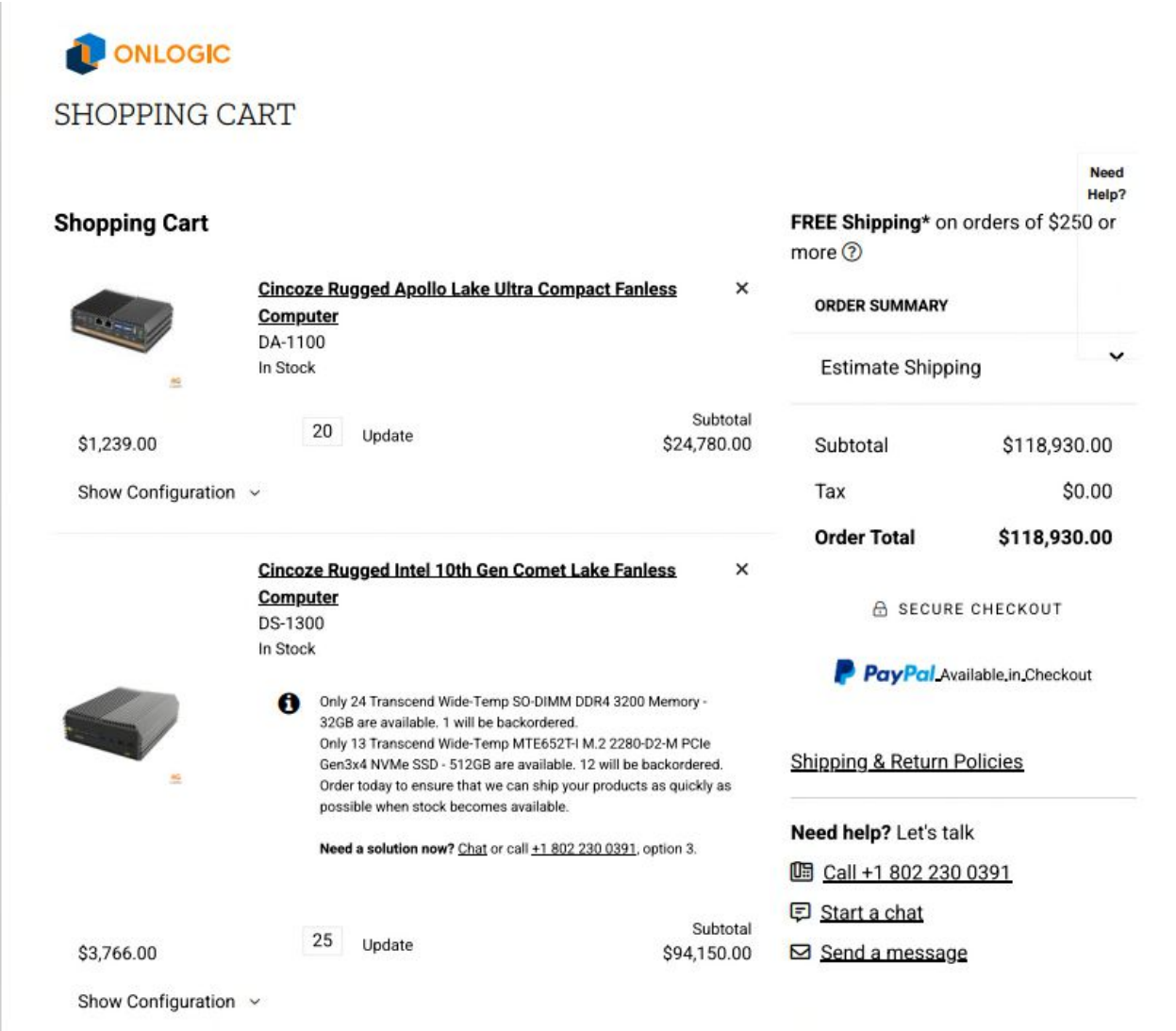
Sub-total = $318,970.00
Direct Cost = $335,117.80

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

PID 00132789 Cost Estimate in 2025

Device	Amount	Year to Replace/Add
10 Moxa network switches	$19,970.00	2025
20 Cincoze Rugged Apollo Ultra Compact fanless Computer	$24,780.00	2025
25 Cincore Rugged Intel 10th Gen Comet Lake Fanless Computer	$94,150.00	2025
15 Gen11 HP servers	$151,073.75	2025
10% Contingency	$28,997.00	Contingency
Total	**$318,970.75**	



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Cincoze Rugged Apollo Lake Ultra Compact Fanless Computer
DA-1100
In Stock

$1,239.00 | 20 Update | Subtotal $24,780.00

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Cincoze Rugged Intel 10th Gen Comet Lake Fanless Computer
DS-1300
In Stock

Only 24 Transcend Wide-Temp SO-DIMM DDR4 3200 Memory - 32GB are available. 1 will be backordered.
Only 13 Transcend Wide-Temp MTE652T-I M.2 2280-D2-M PCIe Gen3x4 NVMe SSD - 512GB are available. 12 will be backordered.
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$3,766.00 | 25 Update | Subtotal $94,150.00

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Estimate Shipping

Subtotal	$118,930.00
Tax	$0.00
Order Total	**$118,930.00**

SECURE CHECKOUT

PayPal Available in Checkout

Shipping & Return Policies

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10

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MOXA

EDS-G4012-4GC-LV

Price	Quantity:	Total
$1,997.00	− 10 +	**$19,970.00**

Subtotal:	$19,970.00
Shipping:	$0.00
Tax:	$1,547.68
Coupon Code:	Add Coupon
Grand total:	$21,517.68

CHECK OUT

Quotation

Applied Computer Solutions
110 Progress
Irvine, CA 92618
www.acsacs.com

Shawn Donovan
shawnd@acsacs.com
916-804-4923

Quote Number: ACSQ19807
Quote Date: 10/24/2023

Company: California Water Service Co.
Contact: Loan Nguyen
Address: 1720 North First St
City:
State: San Jose
Phone: CA
E-mail: (408) 3678366 x78366
lnguyen@calwater.com

Terms: NET 30
Expires: 30 days from quote date

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price
1	5	P52499-B21	HPE DL360 Gen11 8SFF CTO Server	$4,387.00	$21,935.00	60.00%	$1,754.80	$8,774.00
2	5	P52499-B21#ABA	HPE DL360 G11 SFF CTO Server	$0.00	$0.00	0.00%	$0.00	$0.00
3	5	P49610-B21	INT Xeon-S 4410Y CPU for HPE	$1,393.00	$6,965.00	60.00%	$557.20	$2,786.00
4	5	P49610-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
5	5	P43322-B21	HPE 16GB 1Rx8 PC5-4800B-R Smart Kit	$1,065.00	$5,325.00	60.00%	$426.00	$2,130.00
6	5	P43322-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
7	5	P48895-B21	HPE DL360 G11 8SFF x1 U.3 TM BP Kit	$414.00	$2,070.00	60.00%	$165.60	$828.00
8	5	P48895-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
9	10	P40502-B21	HPE 480GB SATA MU SFF BC MV SSD	$1,114.00	$11,140.00	60.00%	$445.60	$4,456.00
10	10	P40502-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
11	5	P01366-B21	HPE 96W Smart Stg Li-ion Batt 145mm Kit	$202.00	$1,010.00	60.00%	$80.80	$404.00
12	5	P01366-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
13	5	P48918-B21	HPE DL360 Gen11 Stg Cntrl Enable Cbl Kit	$38.00	$190.00	60.00%	$15.20	$76.00
14	5	P48918-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
15	5	P58335-B21	HPE MR408i-o Gen11 SPDM Storage Cntlr	$2,619.00	$13,095.00	60.00%	$1,047.60	$5,238.00
16	5	P58335-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
17	5	P51181-B21	BCM 5719 1Gb 4p BASE-T OCP Adptr	$485.00	$2,425.00	60.00%	$194.00	$970.00
18	5	P51181-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
19	5	P48907-B21	HPE DL3X0 Gen11 1U Stnd Fan Kit	$487.00	$2,435.00	60.00%	$194.80	$974.00
20	5	P48907-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
21	10	P38995-B21	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	$524.00	$5,240.00	60.00%	$209.60	$2,096.00
22	10	P38995-B21#0D1	HPE 800W II FS Plat HtPlg Pwr Supply Kit	$0.00	$0.00	0.00%	$0.00	$0.00
23	5	P51911-B21	HPE DL360 Gen11 CPU1/OCP2 x8 Enable Kit	$120.00	$600.00	60.00%	$48.00	$240.00
24	5	P51911-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price
25	5	P52416-B21	HPE DL360 Gen11 OROC TM Cbl Kit	$701.00	$3,505.00	60.00%	$280.40	$1,402.00
26	5	P52416-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
27	5	P48904-B21	HPE DL3X0 Gen11 1U Stnd Heat Sink Kit	$129.00	$645.00	60.00%	$51.60	$258.00
28	5	P48904-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
29	5	P52341-B21	HPE DL3XX Gen11 Easy Install Rail 3 Kit	$164.00	$820.00	60.00%	$65.60	$328.00
30	5	P52341-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
31	10	P52499-B21	HPE DL360 Gen11 8SFF CTO Server	$4,387.00	$43,870.00	60.00%	$1,754.80	$17,548.00
32	10	P52499-B21#ABA	HPE DL360 G11 SFF CTO Server	$0.00	$0.00	0.00%	$0.00	$0.00
33	10	P49598-B21	INT Xeon-G 6426Y CPU for HPE	$3,067.00	$30,670.00	60.00%	$1,226.80	$12,268.00
34	10	P49598-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
35	20	P43328-B21	HPE 32GB 2Rx8 PC5-4800B-R Smart Kit	$1,981.00	$39,620.00	60.00%	$792.40	$15,848.00
36	20	P43328-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
37	10	P48895-B21	HPE DL360 G11 8SFF x1 U.3 TM BP Kit	$414.00	$4,140.00	60.00%	$165.60	$1,656.00
38	10	P48895-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
39	20	P40504-B21	HPE 1.92TB SATA MU SFF BC MV SSD	$3,623.00	$72,460.00	60.00%	$1,449.20	$28,984.00
40	20	P40504-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
41	10	P26253-B21	BCM 57416 10GbE 2p BASE-T Adptr	$1,105.00	$11,050.00	60.00%	$442.00	$4,420.00
42	10	P26253-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
43	10	P01366-B21	HPE 96W Smart Stg Li-ion Batt 145mm Kit	$202.00	$2,020.00	60.00%	$80.80	$808.00
44	10	P01366-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
45	10	P48918-B21	HPE DL360 Gen11 Stg Cntrl Enable Cbl Kit	$38.00	$380.00	60.00%	$15.20	$152.00
46	10	P48918-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
47	10	P58335-B21	HPE MR408i-o Gen11 SPDM Storage Cntlr	$2,619.00	$26,190.00	60.00%	$1,047.60	$10,476.00
48	10	P58335-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
49	10	P51181-B21	BCM 5719 1Gb 4p BASE-T OCP Adptr	$485.00	$4,850.00	60.00%	$194.00	$1,940.00
50	10	P51181-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
51	10	P48907-B21	HPE DL3X0 Gen11 1U Stnd Fan Kit	$487.00	$4,870.00	60.00%	$194.80	$1,948.00
52	10	P48907-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
53	20	P38995-B21	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	$524.00	$10,480.00	60.00%	$209.60	$4,192.00
54	20	P38995-B21#0D1	HPE 800W II FS Plat HtPlg Pwr Supply Kit	$0.00	$0.00	0.00%	$0.00	$0.00
55	10	P51911-B21	HPE DL360 Gen11 CPU1/OCP2 x8 Enable Kit	$120.00	$1,200.00	60.00%	$48.00	$480.00
56	10	P51911-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
57	10	P52416-B21	HPE DL360 Gen11 OROC TM Cbl Kit	$701.00	$7,010.00	60.00%	$280.40	$2,804.00
58	10	P52416-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
59	10	P48904-B21	HPE DL3X0 Gen11 1U Stnd Heat Sink Kit	$129.00	$1,290.00	60.00%	$51.60	$516.00
60	10	P48904-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
61	10	P52341-B21	HPE DL3XX Gen11 Easy Install Rail 3 Kit	$164.00	$1,640.00	60.00%	$65.60	$656.00
62	10	P52341-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
63	15	R7A11AAE	HPE GreenLake COM En 3y Up ProLiant aaS	$450.00	$6,750.00	60.00%	$180.00	$2,700.00

All orders for products and/or services are governed by the current, executed purchase and/or services agreement between the parties. If no such agreement has been executed, then by authorizing an order for products and/or services, you agree to be bound by the Master Products and Services

Subtotal	$138,356.00
Sales Tax	$12,717.75

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price

Terms and Conditions located at: Microsoft Word - MASTER PRODUCTS AND SERVICES TERMS AND CONDITIONS_Applied website.docx (acsacs.com)

Freight	$0.00
TOTAL	**$151,073.75**

If you object to these terms, you must notify us within ten (10) days of receipt of this form.

NOTE: Freight and Tax are estimates only. Final charges will be added to the invoice.

For more information : Shawn Donovan, shawnd@acsacs.com (916-804-4923)
Leticia Hernandez, leticia.hernandez@acsacs.com (925-251-4405)

Accepted By : _____ Date : _____

Title : _____ PO #: _____

CSS – Information Technology

PID # 00132790

Storage Area Network (SAN) Array Replacement

Introduction

Currently, all California districts and general office utilize the storage Area (SAN) for electronic storage of company-wide data, including databases and data that support the various enterprise resource planning system. A SAN storage enables Cal Water to treat storage as a single collective resource that can also be centrally replicated and protected.

This project will allow for getting access to the data and applications that are necessary for our organization, implementing disaster recovery as we will be able to get back all the lost data via Disaster Recovery feature and adding additional storage shelves (SAN Arrays) as projected. This SAN system is critical to the company because it houses all the company's electronic data and customer data.

Deficiencies and issues

- Data storage is required for mission critical systems because it is built to have extremely high degrees of resiliency. Using an old SAN storage inevitably becomes a job for an entire team due to administrative loads growing even more strenuous.

- End users complain about storage response time and performance. A performance bottleneck in our old SAN storage environment is a root cause of this issue.

- Hard drive crashes account for the highest percentage of data loss and data loss from hard drive can be catastrophic. Therefore, knowing and avoiding these scenarios can drastically improve both performance and customer experience.

Alternative Analysis

Alternative 1 – Do Nothing

Cal Water could choose to leave equipment as is. However, as hardware ages, performance issues affect productivity. Older hardware is more likely to develop mechanical problems over time due to wear and tear. Even if the hardware is fine for the tasks, it will become less reliable and more expensive to maintain over time.

Beyond replacement costs is the fact that many manufacturers and software developers have stopped supporting older systems. This means that should an error occur; Cal Water will not necessarily be able to get support from the manufacturers. This can lead to repair delays, operational outages, and lost productivity. Ultimately impacting business operations and customers.

Alternative 2

Replacing our old SAN with a new SAN has many advantages. It improves our organization's data availability, better application performance, protection, responsive backup, and recovery capabilities.

Firmware hardens the environment making it less vulnerable to cyber-attack.

Disaster recovery – Cal Water can replicate data from our main site to a disaster recovery site giving us a backup if the main site is down.

Recommended Solution

Alternative 2

Cal Water needs high availability for its applications, faster backups, rapid data migration, increased data security, and fault tolerance. Storage network needs to keep pace with the demands of applications and the ability to support bottleneck detection to identify and alert administrators. Refreshing our storage network provides a wonderful opportunity to clean up our old configuration data and makes our storage network more secure. SAN offers high availability through redundancy mechanisms.

Data is often replicated across multiple storage devices, ensuring that if one device fails, the data remains accessible from other devices, contributing to business continuity. Features such as transparent file system replication allow disaster recovery solutions to be deployed with negligible to zero impact on normal business activities.

Project Summary

Improved customer experience in many areas such as:

- Data accessibility - SAN enhances data accessibility by providing centralized storage that is accessible to multiple servers simultaneously. This ensures that data can be retrieved quickly and efficiently, contributing to the ongoing streamlining of business operations.

- Enhanced performance - SAN improves network efficiency by offloading storage traffic from the local network, reducing congestion, and enhancing overall system performance. This is particularly beneficial in data-intensive environments where rapid data access is critical.

- Scalability - SAN is designed to scale easily as data volumes grow. Cal Water can seamlessly add storage devices to the SAN without disrupting operations, making it an ideal solution for businesses experiencing rapid data expansion.

- High availability and Redundancy - SAN offers high availability through redundancy mechanisms. Data is often replicated across multiple storage devices, ensuring that if one device fails, the data remains accessible from other devices, contributing to business continuity. No service outages.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132790
Description 2025 SAN Storage Upgrade
District / Department: CSS
Project Start Date: 01/02/2025
Project Completion Date: 12/31/2025
Prepared By: trnguyen
Date Initiated: 11/03/2023
Base Year: 2023
Sub-Total: $350,000
Direct Cost: $367,719

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
EQUIPMENT (NO AFUDC)	[EA]	1	$350,000.00	$350,000.00	Engineers Estimate

Sub-total = $350,000.00
Direct Cost = $367,718.72

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

PID 00132790

Device	Amount	Year to Replace/Add
NetApp SAN Storage Replacement (see quote)	$310,070.21	2024
10% Contingency	$31,000.00	Contingency
Total	**$341,070.21**	

NetApp C250 30x15.3 TB SSD Drives

Line #	Qty	Part Number	Product Description	Unit Price	Ext. Price
1	2	AFF-C250A-001	AFF C250 HA SYSTEM	$3,420.11	$6,840.22
2	1	AFF-C250	AFF-C250,MODEL	$0.00	$0.00
3	1	AFF-C250-001-C	AFF C250,24X15.3TB,NVME,SED,CF,NO PSU,-C	$76,818.11	$76,818.11
4	1	NS224-CF-15.3-4-C	NVME SHLF,4X15.3TB,CF,-C	$14,661.56	$14,661.56
5	1	X4020B-CF-2-C	DRIVE PACK,NVME,SED,CF,2X15.3TB,-C	$6,215.56	$6,215.56
6	4590	SW-ONTAPO-CF-C02-C	SW,ONTAP ONE PACKAGE,PER-0.1TB,CF,C02,-C	$21.99	$100,934.10
7	1	SW-SMIRROR-CLD-ONTAP-ONE	SOFTWARE,SNAPMIRROR CLOUD,ONTAP ONE	$0.00	$0.00
8	2	X66240A-05-N-C	CABLE,25GBE,SFP28-SFP28,CU,0.5M,-C	$0.00	$0.00
9	2	X1152-N-C	MEZZANINE 4-PORT 25GBE,-C	$2,196.43	$4,392.86
10	2	X5532A-N-C	RAIL,4-POST,THIN,RND/SQ-HOLE,SM,ADJ,24-3	$0.00	$0.00
11	1	DOC-AFF-C250-C	DOCUMENTS,AFF-C250,-C	$0.00	$0.00
12	2	DATA-AT-REST-ENCRYPTION	DATA AT REST ENCRYPTION CAPABLE OPERATIN	$0.00	$0.00
13	2	X737A-C	POWER SUPPLY,1600W,-C	$0.00	$0.00
14	4	X800-42U-R6-C	JUMPER CRD,IN-CAB,C13-C14,-C	$0.00	$0.00
15	4	X66250-2-N-C	CABLE,LC-LC,OM4,2M,-C	$0.00	$0.00
16	4	X66211B-1-N-C	CABLE,100GBE,QSFP28-QSFP28,CU,1M,-C	$0.00	$0.00
17	2	X1153-N-C	MEZZANINE 2-PORT 100GBE,-C	$2,180.28	$4,360.56
18	1	SW-S3-SM-ONTAP-ONE	SOFTWARE,ONTAP ONE	$0.00	$0.00
19	4	X6589-R6	SFP+OPTICAL 10GB SHORTWAVE	$213.47	$853.88

NetApp C250 30x15.3 TB SSD Drives

Line #	Qty	Part Number	Product Description	Unit Price	Ext. Price
20	4	X65404	SFP28,25GBE,SR	$660.67	$2,642.68
21	**1**	**Services**	3 Years of NetApp SupportEdge Advisor with 4 Hour Parts Replace and Standard Install	**$92,350.68**	**$92,350.68**
21.001	1	CS-4HR-REPLACEMENT-C	3 Years of NetApp 4 Hour Parts Replacement		
21.002	1	CS-G1C-SE-ADVISOR	3 Years of NetApp SupportEdge Advisor		
21.003	1	QS-PS-ADVANCED SERVICES	Trace3 Professional Services for Install		
				Subtotal:	**$310,070.21**

CSS – Information Technology

PID # 00133578

Network Hardware Replacement 2027

Introduction

Replacing and upgrading it to a modern network infrastructure will dramatically simplify network deployments, operations, and management for our IT staff. All California districts and general office have one hundred fifty-nine Cisco Catalyst 2960 series network switches at forty-three locations. They are outdated and old. We must replace all one hundred and fifty-nine outdated network switches in three years' time. This means that we must replace fifty-three network switches starting in 2025, 2026, and 2027 respectively.

Deficiencies and issues

- Older networks were not built to support the technological demands of today's workforce.

- One of the main risks of using outdated hardware is that it might not be compatible with the latest software, operating systems, or security updates. This can lead to errors, crashes, slowdowns, or even data loss.

- Mobile solutions and cloud-based business applications can overwhelm an older network infrastructure. Upgrading to a modernized network can make a real difference to productivity. For example, if the Company's LIMS system goes off-line, water quality samples cannot be recorded and reported in a timely manner.

- Threats to the network are more sophisticated and targeted than ever before. The older the infrastructure, the more vulnerable it becomes.

- Introducing new technology puts an increased strain on older network infrastructure that then requires more and more attention. Some common reasons for upgrading network switches include outdated hardware, increasing network traffic, expanding network requirements, and improved security needs. If the hardware is not upgraded, the IT staff will spend its time fixing downtime rather than supporting IT daily operations.

Alternative Analysis

Alternative 1 – Do Nothing

- Cal Water could choose to leave network hardware as is. However, older hardware is more likely to develop problems over time due to wear and tear. Even if the hardware is fine for the tasks, it will likely become less reliable and more expensive to maintain over time.

- Beyond replacement costs is the fact that many manufacturers and software developers have stopped supporting older hardware. This means that should an error occur; Cal Water will not necessarily be able to get support from the manufacturers. This can lead to repair delays, operational outages, and lost productivity. Ultimately impacting business operations and customers.

- Crashes, cyber-attacks, and system downtime will lead to decreased productivity.

Alternative 2

- Apply the latest updates – Only if network hardware is not End of Life (EOL)

- Quality of service – To ensure that the most important applications get priority.

- Traffic Shaping – IT staff do not always understand the impact of packet shaping, which can be negative if not done correctly.

Alternative 3

- It's very critical that we replace legacy network switches because they run slower in alternatives one and two. The vendor does not provide technical support and software updates for these old network devices. It means that we're putting the company at risk for security and information breaches.

- Establishing and maintaining reliable connections is critical to the success of the Cal Water business. Cal Water has forty-three locations and by using the most current technology ensures users can do their jobs more efficiently, with fewer interruptions.

Recommended Solution

Alternative 3

Replace and upgrade the outdated network switches per the refresh rate and scheduled timeline to keep Cal Water's network infrastructure up-to-date and stay current when it comes to preventing the latest threats.

Better Security – It's getting much harder to secure older networks, so investing in a new one or upgrading an existing one is the way forward because security is important. Upgrading network hardware will give users/customers access to much better features that can help protect network connections on various devices. Hackers and other criminals are always finding ways to steal data and personal information via enterprise networks that are not secure.

Increase network performance – Good network performance equals more efficiency and productivity. Bandwidth limitations are avoidable with new hardware.

Project Summary

Maintaining a reliable network assists Cal Water employees provide high-quality, reliable water service, supports security efforts, and deliver exceptional customer service.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 133578
Description Netw ork Hardw are Replacement_2027
District / Department: CSS
Project Start Date: 01/01/2027
Project Completion Date: 12/30/2027
Prepared By: ctran
Date Initiated: 12/21/2023
Base Year: 2023
Sub-Total: $313,018
Direct Cost: $345,505

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
EQUIPMENT (NO AFUDC)	[EA]	1	$284,509.00	$284,509.00	Engineers Estimate
EQUIPMENT (NO AFUDC)	[EA]	1	$28,509.00	$28,509.00	Engineers Estimate

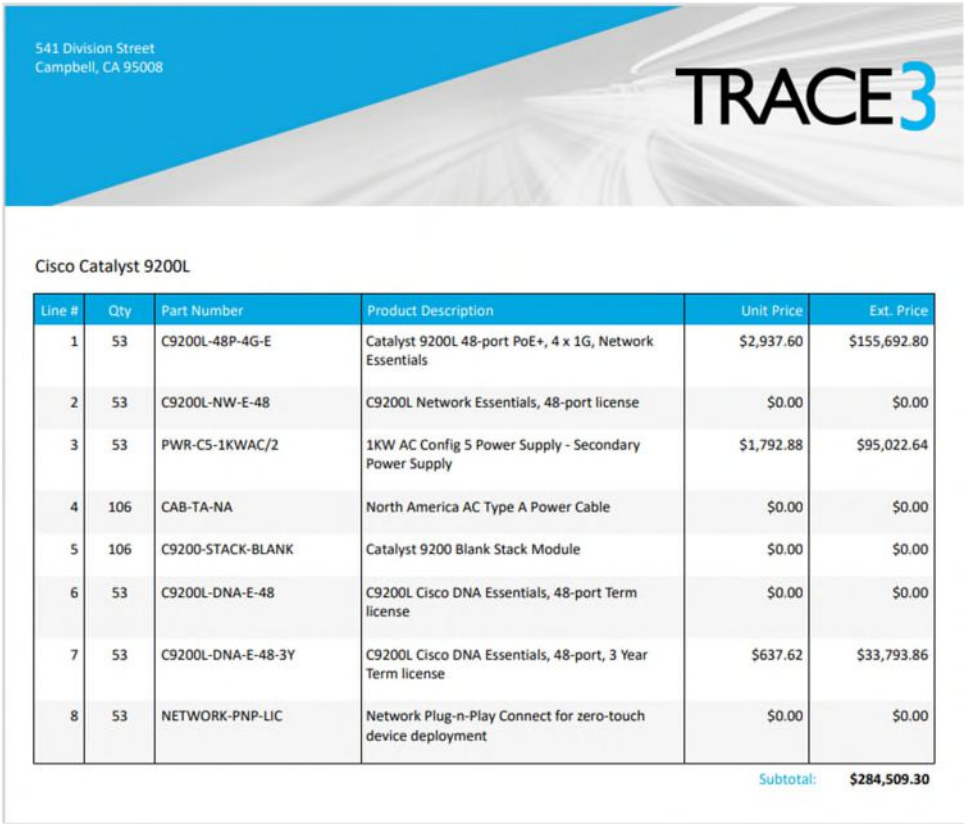
Sub-total = $313,018.00
Direct Cost = $345,505.12

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

PID 00133578

Device	Amount	Year to Replace/Add
53 Cisco network switches Replacement in 2027 (see quote)	$284,509.30	**2027**
10% Contingency	$28,509.00	Contingency
Total	**$313,018.30**	

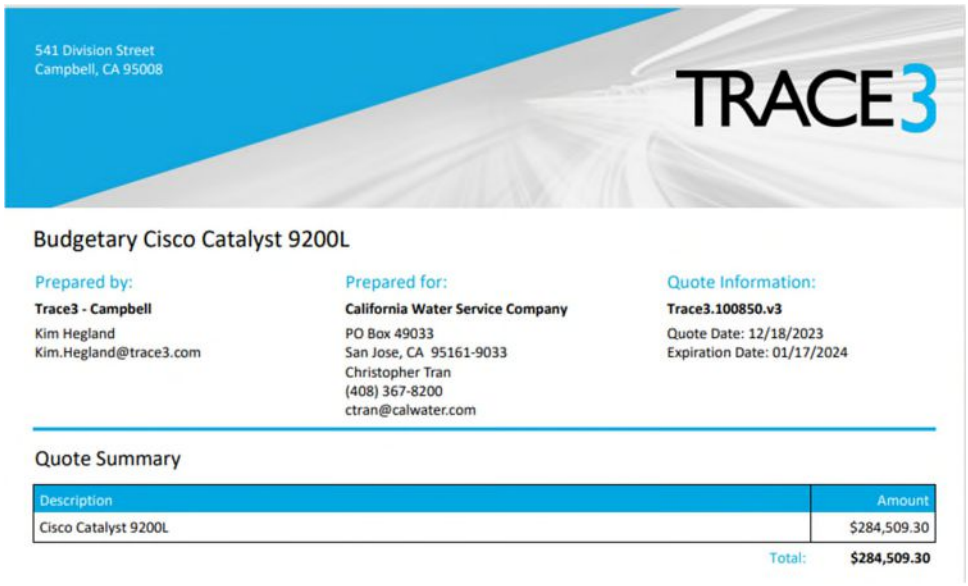


541 Division Street
Campbell, CA 95008

TRACE3

Cisco Catalyst 9200L

Line #	Qty	Part Number	Product Description	Unit Price	Ext. Price
1	53	C9200L-48P-4G-E	Catalyst 9200L 48-port PoE+, 4 x 1G, Network Essentials	$2,937.60	$155,692.80
2	53	C9200L-NW-E-48	C9200L Network Essentials, 48-port license	$0.00	$0.00
3	53	PWR-C5-1KWAC/2	1KW AC Config 5 Power Supply - Secondary Power Supply	$1,792.88	$95,022.64
4	106	CAB-TA-NA	North America AC Type A Power Cable	$0.00	$0.00
5	106	C9200-STACK-BLANK	Catalyst 9200 Blank Stack Module	$0.00	$0.00
6	53	C9200L-DNA-E-48	C9200L Cisco DNA Essentials, 48-port Term license	$0.00	$0.00
7	53	C9200L-DNA-E-48-3Y	C9200L Cisco DNA Essentials, 48-port, 3 Year Term license	$637.62	$33,793.86
8	53	NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	$0.00	$0.00
				Subtotal:	**$284,509.30**



541 Division Street
Campbell, CA 95008

TRACE3

Budgetary Cisco Catalyst 9200L

Prepared by:

Trace3 - Campbell
Kim Hegland
Kim.Hegland@trace3.com

Prepared for:

California Water Service Company
PO Box 49033
San Jose, CA 95161-9033
Christopher Tran
(408) 367-8200
ctran@calwater.com

Quote Information:

Trace3.100850.v3
Quote Date: 12/18/2023
Expiration Date: 01/17/2024

Quote Summary

Description	Amount
Cisco Catalyst 9200L	$284,509.30
Total:	**$284,509.30**

District - CSS

PID # 00133579

Network Hardware Replacement 2026

Introduction

Replacing and upgrading it to a modern network infrastructure will dramatically simplify network deployments, operations, and management for our IT staff. All California districts and general office have one hundred fifty-nine Cisco Catalyst 2960 series network switches at forty-three locations. They are outdated and old. We must replace all one hundred and fifty-nine outdated network switches in three years' time. This means that we must replace fifty-three network switches starting in 2025, 2026, and 2027 respectively.

Deficiencies and issues

- Older networks were not built to support the technological demands of today's workforce.

- One of the main risks of using outdated hardware is that it might not be compatible with the latest software, operating systems, or security updates. This can lead to errors, crashes, slowdowns, or even data loss.

- Mobile solutions and cloud-based business applications can overwhelm an older network infrastructure. Upgrading to a modernized network can make a real difference to productivity. For example, if the Company's LIMS system goes off-line, water quality samples cannot be recorded and reported in a timely manner.

- Threats to the network are more sophisticated and targeted than ever before. The older the infrastructure, the more vulnerable it becomes.

- Introducing new technology puts an increased strain on older network infrastructure that then requires more and more attention. Some common reasons for upgrading network switches include outdated hardware, increasing network traffic, expanding network requirements, and improved security needs. If the hardware is not upgraded, the IT staff will spend its time fixing downtime rather than supporting IT daily operations.

Alternative Analysis

Alternative 1 – Do Nothing

- Cal Water could choose to leave network hardware as is. However, older hardware is more likely to develop problems over time due to wear and tear. Even if the hardware is fine for the tasks, it will likely become less reliable and more expensive to maintain over time.

- Beyond replacement costs is the fact that many manufacturers and software developers have stopped supporting older hardware. This means that should an error occur; Cal Water will not necessarily be able to get support from the manufacturers. This can lead to repair delays, operational outages, and lost productivity. Ultimately impacting business operations and customers.

- Crashes, cyber-attacks, and system downtime will lead to decreased productivity.

Alternative 2

- Apply the latest updates – Only if network hardware is not End of Life (EOL)

- Quality of service – To ensure that the most important applications get priority.

- Traffic Shaping – IT staff do not always understand the impact of packet shaping, which can be negative if not done correctly.

Alternative 3

- It's very critical that we replace legacy network switches because they run slower in alternatives one and two. The vendor does not provide technical support and software updates for these old network devices. It means that we're putting the company at risk for security and information breaches.

- Establishing and maintaining reliable connections is critical to the success of the Cal Water business. Cal Water has forty-three locations and by using the most current technology ensures users can do their jobs more efficiently, with fewer interruptions.

Recommended Solution

Alternative 3

Replace and upgrade the outdated network switches per the refresh rate and scheduled timeline to keep Cal Water's network infrastructure up-to-date and stay current when it comes to preventing the latest threats.

Better Security – It's getting much harder to secure older networks, so investing in a new one or upgrading an existing one is the way forward because security is important. Upgrading network hardware will give users/customers access to much better features that can help protect network connections on various devices. Hackers and other criminals are always finding ways to steal data and personal information via enterprise networks that are not secure.Increase network performance – Good network performance equals more efficiency and productivity. Bandwidth limitations are avoidable with new hardware.

Project Summary

Maintaining a reliable network assists Cal Water employees provide high-quality, reliable water service, supports security efforts, and deliver exceptional customer service.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 133579
Description Netw ork Hardw are Replacement 2026
District / Department: CSS
Project Start Date: 01/01/2026
Project Completion Date: 12/30/2026
Prepared By: ctran
Date Initiated: 12/21/2023
Base Year: 2023
Sub-Total: $313,018
Direct Cost: $337,086

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
EQUIPMENT (NO AFUDC)	[EA]	1	$284,509.00	$284,509.00	Engineers Estimate
EQUIPMENT (NO AFUDC)	[EA]	1	$28,509.00	$28,509.00	Engineers Estimate

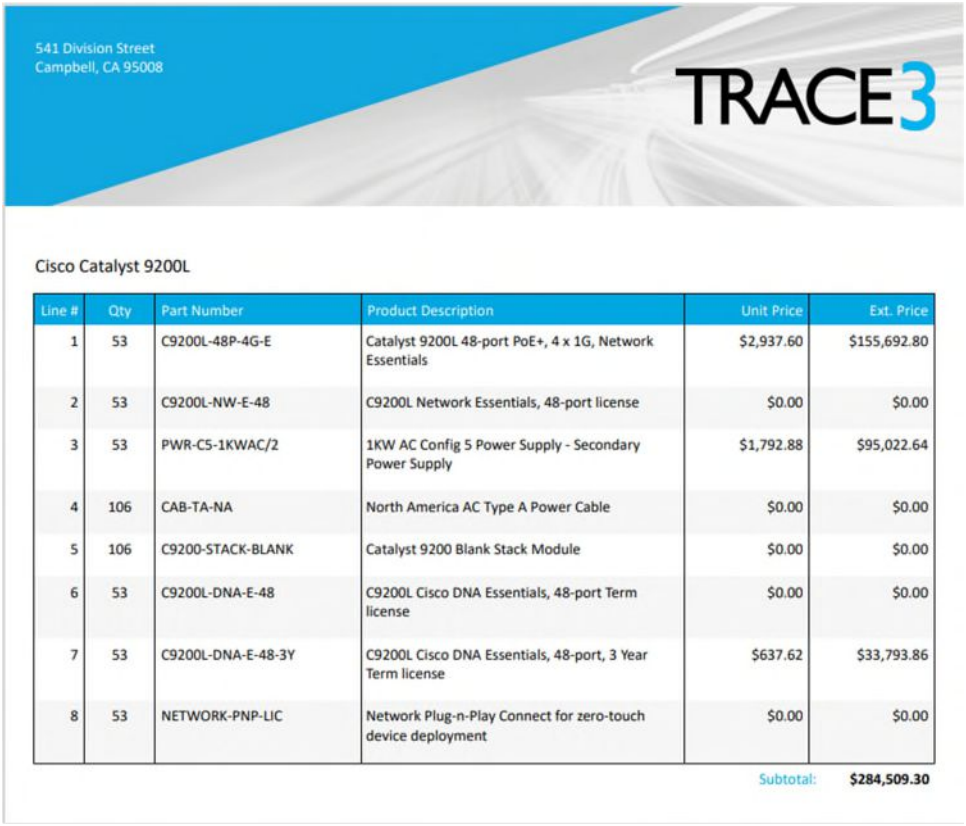
Sub-total = $313,018.00
Direct Cost = $337,086.16

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

PID 00133579

Device	Amount	Year to Replace/Add
53 Cisco network switches Replacement in 2026 (see quote)	$284,509.30	**2026**
10% Contingency	$28,509.00	Contingency
Total	**$313,038.30**	

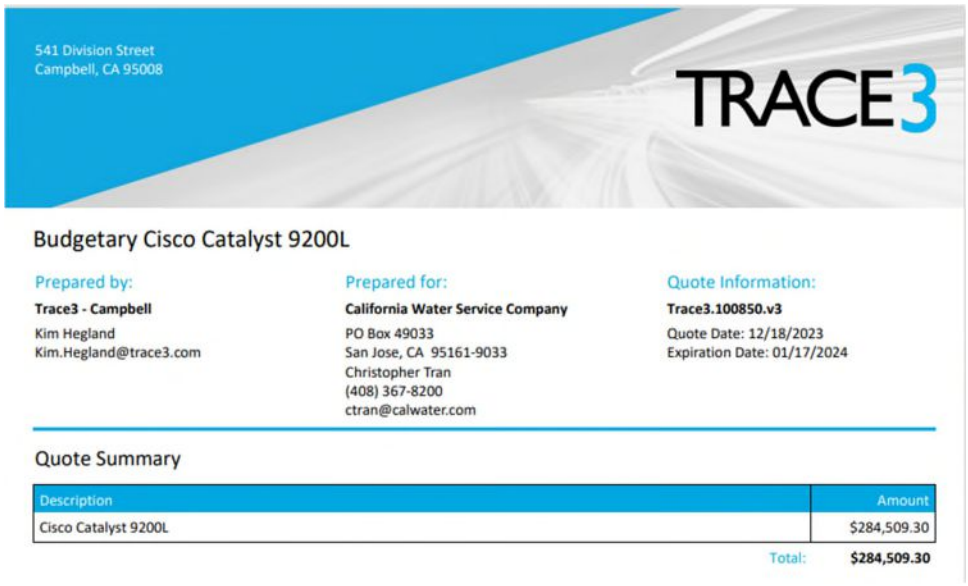


541 Division Street
Campbell, CA 95008

TRACE3

Cisco Catalyst 9200L

Line #	Qty	Part Number	Product Description	Unit Price	Ext. Price
1	53	C9200L-48P-4G-E	Catalyst 9200L 48-port PoE+, 4 x 1G, Network Essentials	$2,937.60	$155,692.80
2	53	C9200L-NW-E-48	C9200L Network Essentials, 48-port license	$0.00	$0.00
3	53	PWR-C5-1KWAC/2	1KW AC Config 5 Power Supply - Secondary Power Supply	$1,792.88	$95,022.64
4	106	CAB-TA-NA	North America AC Type A Power Cable	$0.00	$0.00
5	106	C9200-STACK-BLANK	Catalyst 9200 Blank Stack Module	$0.00	$0.00
6	53	C9200L-DNA-E-48	C9200L Cisco DNA Essentials, 48-port Term license	$0.00	$0.00
7	53	C9200L-DNA-E-48-3Y	C9200L Cisco DNA Essentials, 48-port, 3 Year Term license	$637.62	$33,793.86
8	53	NETWORK-PNP-LIC	Network Plug-n-Play Connect for zero-touch device deployment	$0.00	$0.00
				Subtotal:	**$284,509.30**


541 Division Street
Campbell, CA 95008
TRACE3
Budgetary Cisco Catalyst 9200L
Prepared by:
Trace3 - Campbell
Kim Hegland
Kim.Hegland@trace3.com
Prepared for:
California Water Service Company
PO Box 49033
San Jose, CA 95161-9033
Christopher Tran
(408) 367-8200
ctran@calwater.com
Quote Information:
Trace3.100850.v3
Quote Date: 12/18/2023
Expiration Date: 01/17/2024
Quote Summary
Description
Amount
Cisco Catalyst 9200L
$284,509.30
Total:
$284,509.30

District - CSS

PID # 00133654

SCADA Server & Network Replacement 2026

Introduction

Cal Water's business depends on SCADA systems to operate and distribute safe water to the customers. The hardware needed to support this process must be kept current using the latest technology so that continuous support is maintained.

Ensuring operational support is challenging with outdated/antiquated hardware or systems. Network devices must be refreshed every four to five years to maintain optimum operational support for integrity, reliability, and availability. Currently, all California districts and customer service support (CSS) have a total of twenty-six Cisco Catalyst 3600 series network switches, forty-four Moxa network switches, forty-five network devices, and eighty-six Gen10 HP servers.

We must replace fifteen HP servers, forty-five network devices, and ten Moxa network switches in 2026 simply because they are outdated.

Deficiencies and issues

- Older networks and network hardware were not built to support the technological demands of today's workforce. One of the main risks of using outdated hardware is that it might not be compatible with the latest software, operating systems, or security updates. This can lead to errors, crashes, slowdowns, or even data loss. Mobile solutions and cloud-based business applications can overwhelm an older network infrastructure. Upgrading to a modernized network can make a real difference to productivity.

- Threats to the network are more sophisticated and targeted than ever before. The older the infrastructure, the more vulnerable it becomes.

Introducing modern technology puts an increased strain on older network infrastructure that then requires more attention.

Alternative Analysis

Alternative 1 – Do Nothing

- We could choose to leave equipment as is, however, it will not be able to sustain operations into the future due to the degradation of hardware components and software technology changes that obsolete the original design. This could cause serious operational outages. Ultimately impacting business operations and customers.

Alternative 2

- Choosing alternative equipment was considered. However, equipment alternatives are not feasible due to the current environment and the need to maintain operations as is, maintaining standardization and knowledge expertise. Also, equipment lifespans are based on the original installation date making it difficult, and less cost-efficient, to replace all similar hardware, using another manufacturer, at the same time. The exception would be if the manufacturer is no longer making the hardware or is no longer supporting the technology needed in the network environment. Using dissimilar hardware will introduce unknown operational issues and further complicate administration. Ultimately increasing the cost of maintenance and support.

- Crashes, cyber-attacks, and system downtime will lead to decreased productivity.

Alternative 3

- It is extremely critical that we replace legacy hardware because they run slower in alternatives one and two. The vendor does not provide technical support and software updates for these old network devices. It means that we are putting the company at risk for security and information breaches.

- Establishing and maintaining reliable connections is critical to the success of the Cal Water business. Cal Water has forty-three locations and by using the most current technology ensures users can do their jobs more efficiently, with fewer interruptions.

Recommended Solution

Alternative 3

Replace and upgrade the outdated network hardware per the refresh rate and scheduled timeline to keep Cal Water's network infrastructure up-to-date and stay current when it comes to preventing the latest threats.

Better Security – It is getting much harder to secure older networks, so investing in a new one or upgrading an existing one is the way forward because security is important. Upgrading network hardware will give users/customers access to much better features that can help protect network connections on various devices. Hackers and other criminals are always finding ways to steal data and personal information via enterprise networks that are not secure.

This is the biggest reason to upgrade to prevent the worst from happening.

Increase network performance – Good network performance equals more efficiency and productivity. Bandwidth limitations are avoidable with new hardware.

Project Summary

SCADA system is a critical infrastructure that is required to manage our water systems. Cal Water follows best practices as per ISO 55001- Asset Management hardware lifecycle recommendations to ensure the availability, confidentiality, integrity, and reliability of the hardware that supports this system. The following devices must be continually updated and refreshed to provide foundational support for SCADA applications: servers, network switches,

network firewalls, network storage, and network blade servers.

Network switches provide data packet flow for SCADA systems between the districts and headquarters. These devices must be updated continuously with new firmware and refreshed every four years to ensure access availability and reliability to SCADA applications. The Information Technology Information Library (ITIL) best practice is to replace hardware as needed to provide confidentiality, integrity, and availability to our customers.

Network firewalls provide security protection that segregates and isolates SCADA networks from corporate network and district network segments. Firewalls must be continuously updated with new firmware and refreshed every four years to ensure that adequate protection is provided within the SCADA network. The Department of Homeland Security suggests companies be vigilant and combat Cyber threats for SCADA systems as hackers have demonstrated an ability to disrupt water service in cities and communities by attacking older operating systems, software and hardware. In addition, a company system supports the security logging needed, and access information, for PII, PCI, SOX and HIPPA information within the network. The ITIL best practice is to replace hardware as needed to provide confidentiality, integrity, and availability.

Similar to the Cal Water's corporate network, this project's network hardware is scheduled to be refreshed every four years. Servers provide the environment for SCADA applications. The company has over 70 physical SCADA servers that support all of the company's water operations. The ITIL best practice is to replace hardware to provide confidentiality, integrity, and availability.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. : 133654
Description SCADA Server & Network Repl. 2026
District / Department: CSS
Project Start Date: 01/01/2026
Project Completion Date: 12/31/2026
Prepared By: ctran
Date Initiated: 01/02/2024
Base Year: 2024
Sub-Total: $318,970
Direct Cost: $343,496

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
EQUIPMENT (NO AFUDC)	[EA]	1	$28,997.00	$28,997.00	Engineers Estimate
EQUIPMENT (NO AFUDC)	[EA]	1	$289,973.00	$289,973.00	Engineers Estimate

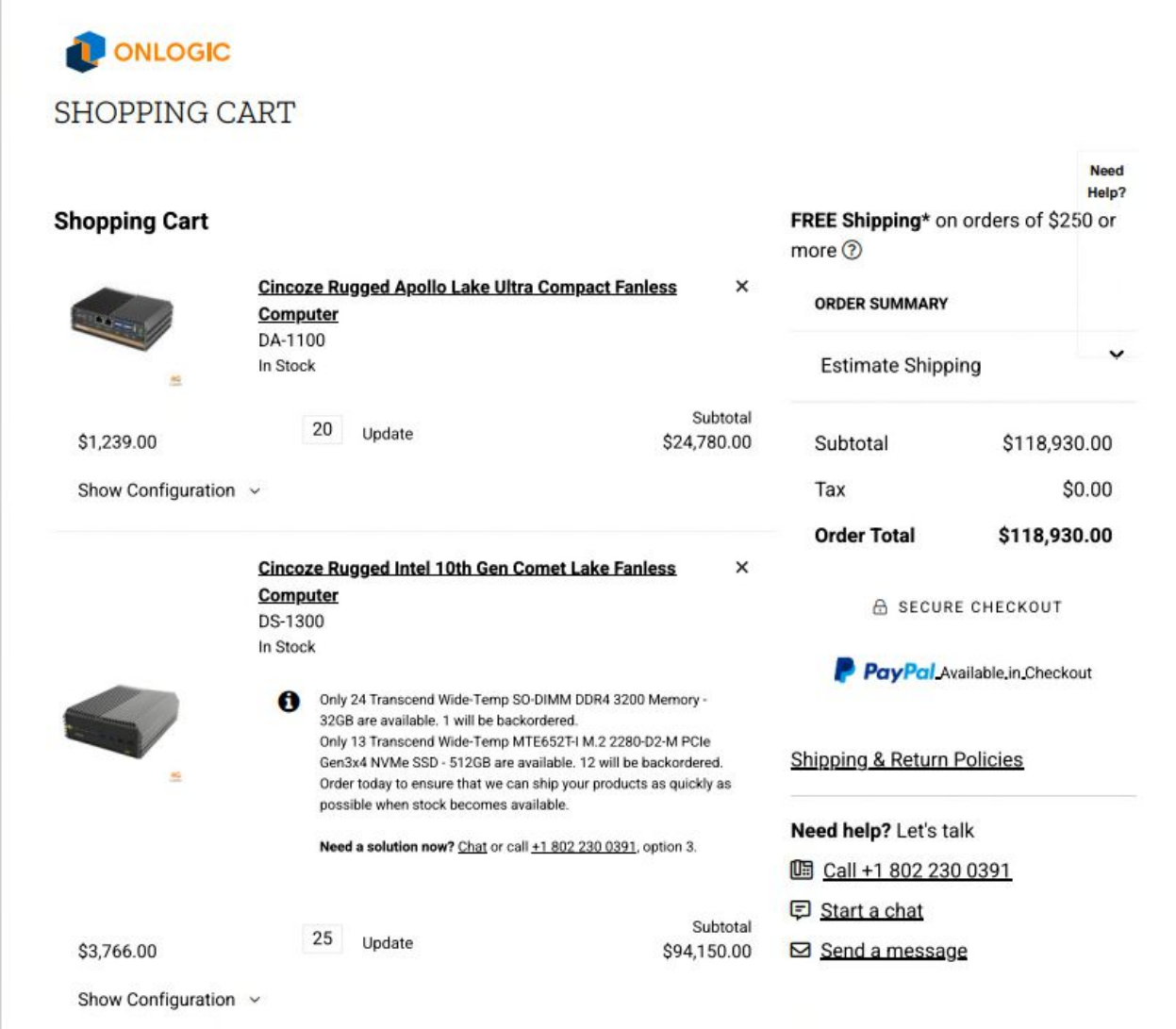
Sub-total = $318,970.00
Direct Cost = $343,495.83

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

PID 00133654 Cost Estimate in 2026

Device	Amount	Year to Replace/Add
10 Moxa network switches	$19,970.00	2026
20 Cincoze Rugged Apollo Ultra Compact fanless Computer	$24,780.00	2026
25 Cincore Rugged Intel 10th Gen Comet Lake Fanless Computer	$94,150.00	2026
15 Gen11 HP servers	$151,073.75	2026
10% Contingency	$28,997.00	Contingency
Total	**$318,970.75**	



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SHOPPING CART

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Shopping Cart

FREE Shipping* on orders of $250 or more

Cincoze Rugged Apollo Lake Ultra Compact Fanless Computer
DA-1100
In Stock

$1,239.00 | 20 Update | Subtotal $24,780.00

Show Configuration

ORDER SUMMARY

Estimate Shipping

Subtotal	$118,930.00
Tax	$0.00
Order Total	**$118,930.00**

SECURE CHECKOUT

PayPal Available in Checkout

Cincoze Rugged Intel 10th Gen Comet Lake Fanless Computer
DS-1300
In Stock

Only 24 Transcend Wide-Temp SO-DIMM DDR4 3200 Memory - 32GB are available. 1 will be backordered.
Only 13 Transcend Wide-Temp MTE652T-I M.2 2280-D2-M PCIe Gen3x4 NVMe SSD - 512GB are available. 12 will be backordered.
Order today to ensure that we can ship your products as quickly as possible when stock becomes available.

Need a solution now? Chat or call +1 802 230 0391, option 3.

$3,766.00 | 25 Update | Subtotal $94,150.00

Show Configuration

Shipping & Return Policies

Need help? Let's talk

Call +1 802 230 0391

Start a chat

Send a message

Free Ground Shipping on U.S. Orders over $99

NETEON

10

Home › Your Cart

Your Cart (10 items)

MOXA

EDS-G4012-4GC-LV

Price	Quantity:	Total
$1,997.00	− 10 +	**$19,970.00**

Subtotal:	$19,970.00
Shipping:	$0.00
Tax:	$1,547.68
Coupon Code:	Add Coupon
Grand total:	$21,517.68

CHECK OUT

Quotation

Applied Computer Solutions
110 Progress
Irvine, CA 92618
www.acsacs.com

Shawn Donovan
shawnd@acsacs.com
916-804-4923

Quote Number: ACSQ19807
Quote Date: 10/24/2023

Company: California Water Service Co.
Contact: Loan Nguyen
Address: 1720 North First St
City:
State: San Jose
Phone: CA
E-mail: (408) 3678366 x78366
lnguyen@calwater.com

Terms: NET 30
Expires: 30 days from quote date

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price
1	5	P52499-B21	HPE DL360 Gen11 8SFF CTO Server	$4,387.00	$21,935.00	60.00%	$1,754.80	$8,774.00
2	5	P52499-B21#ABA	HPE DL360 G11 SFF CTO Server	$0.00	$0.00	0.00%	$0.00	$0.00
3	5	P49610-B21	INT Xeon-S 4410Y CPU for HPE	$1,393.00	$6,965.00	60.00%	$557.20	$2,786.00
4	5	P49610-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
5	5	P43322-B21	HPE 16GB 1Rx8 PC5-4800B-R Smart Kit	$1,065.00	$5,325.00	60.00%	$426.00	$2,130.00
6	5	P43322-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
7	5	P48895-B21	HPE DL360 G11 8SFF x1 U.3 TM BP Kit	$414.00	$2,070.00	60.00%	$165.60	$828.00
8	5	P48895-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
9	10	P40502-B21	HPE 480GB SATA MU SFF BC MV SSD	$1,114.00	$11,140.00	60.00%	$445.60	$4,456.00
10	10	P40502-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
11	5	P01366-B21	HPE 96W Smart Stg Li-ion Batt 145mm Kit	$202.00	$1,010.00	60.00%	$80.80	$404.00
12	5	P01366-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
13	5	P48918-B21	HPE DL360 Gen11 Stg Cntrl Enable Cbl Kit	$38.00	$190.00	60.00%	$15.20	$76.00
14	5	P48918-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
15	5	P58335-B21	HPE MR408i-o Gen11 SPDM Storage Cntlr	$2,619.00	$13,095.00	60.00%	$1,047.60	$5,238.00
16	5	P58335-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
17	5	P51181-B21	BCM 5719 1Gb 4p BASE-T OCP Adptr	$485.00	$2,425.00	60.00%	$194.00	$970.00
18	5	P51181-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
19	5	P48907-B21	HPE DL3X0 Gen11 1U Stnd Fan Kit	$487.00	$2,435.00	60.00%	$194.80	$974.00
20	5	P48907-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
21	10	P38995-B21	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	$524.00	$5,240.00	60.00%	$209.60	$2,096.00
22	10	P38995-B21#0D1	HPE 800W II FS Plat HtPlg Pwr Supply Kit	$0.00	$0.00	0.00%	$0.00	$0.00
23	5	P51911-B21	HPE DL360 Gen11 CPU1/OCP2 x8 Enable Kit	$120.00	$600.00	60.00%	$48.00	$240.00
24	5	P51911-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price
25	5	P52416-B21	HPE DL360 Gen11 OROC TM Cbl Kit	$701.00	$3,505.00	60.00%	$280.40	$1,402.00
26	5	P52416-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
27	5	P48904-B21	HPE DL3X0 Gen11 1U Stnd Heat Sink Kit	$129.00	$645.00	60.00%	$51.60	$258.00
28	5	P48904-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
29	5	P52341-B21	HPE DL3XX Gen11 Easy Install Rail 3 Kit	$164.00	$820.00	60.00%	$65.60	$328.00
30	5	P52341-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
31	10	P52499-B21	HPE DL360 Gen11 8SFF CTO Server	$4,387.00	$43,870.00	60.00%	$1,754.80	$17,548.00
32	10	P52499-B21#ABA	HPE DL360 G11 SFF CTO Server	$0.00	$0.00	0.00%	$0.00	$0.00
33	10	P49598-B21	INT Xeon-G 6426Y CPU for HPE	$3,067.00	$30,670.00	60.00%	$1,226.80	$12,268.00
34	10	P49598-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
35	20	P43328-B21	HPE 32GB 2Rx8 PC5-4800B-R Smart Kit	$1,981.00	$39,620.00	60.00%	$792.40	$15,848.00
36	20	P43328-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
37	10	P48895-B21	HPE DL360 G11 8SFF x1 U.3 TM BP Kit	$414.00	$4,140.00	60.00%	$165.60	$1,656.00
38	10	P48895-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
39	20	P40504-B21	HPE 1.92TB SATA MU SFF BC MV SSD	$3,623.00	$72,460.00	60.00%	$1,449.20	$28,984.00
40	20	P40504-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
41	10	P26253-B21	BCM 57416 10GbE 2p BASE-T Adptr	$1,105.00	$11,050.00	60.00%	$442.00	$4,420.00
42	10	P26253-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
43	10	P01366-B21	HPE 96W Smart Stg Li-ion Batt 145mm Kit	$202.00	$2,020.00	60.00%	$80.80	$808.00
44	10	P01366-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
45	10	P48918-B21	HPE DL360 Gen11 Stg Cntrl Enable Cbl Kit	$38.00	$380.00	60.00%	$15.20	$152.00
46	10	P48918-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
47	10	P58335-B21	HPE MR408i-o Gen11 SPDM Storage Cntlr	$2,619.00	$26,190.00	60.00%	$1,047.60	$10,476.00
48	10	P58335-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
49	10	P51181-B21	BCM 5719 1Gb 4p BASE-T OCP Adptr	$485.00	$4,850.00	60.00%	$194.00	$1,940.00
50	10	P51181-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
51	10	P48907-B21	HPE DL3X0 Gen11 1U Stnd Fan Kit	$487.00	$4,870.00	60.00%	$194.80	$1,948.00
52	10	P48907-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
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56	10	P51911-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
57	10	P52416-B21	HPE DL360 Gen11 OROC TM Cbl Kit	$701.00	$7,010.00	60.00%	$280.40	$2,804.00
58	10	P52416-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
59	10	P48904-B21	HPE DL3X0 Gen11 1U Stnd Heat Sink Kit	$129.00	$1,290.00	60.00%	$51.60	$516.00
60	10	P48904-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
61	10	P52341-B21	HPE DL3XX Gen11 Easy Install Rail 3 Kit	$164.00	$1,640.00	60.00%	$65.60	$656.00
62	10	P52341-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
63	15	R7A11AAE	HPE GreenLake COM En 3y Up ProLiant aaS	$450.00	$6,750.00	60.00%	$180.00	$2,700.00

All orders for products and/or services are governed by the current, executed purchase and/or services agreement between the parties. If no such agreement has been executed, then by authorizing an order for products and/or services, you agree to be bound by the Master Products and Services

Subtotal	$138,356.00
Sales Tax	$12,717.75

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price

Terms and Conditions located at: Microsoft Word - MASTER PRODUCTS AND SERVICES TERMS AND CONDITIONS_Applied website.docx (acsacs.com)

Freight	$0.00
TOTAL	**$151,073.75**

If you object to these terms, you must notify us within ten (10) days of receipt of this form.

NOTE: Freight and Tax are estimates only. Final charges will be added to the invoice.

For more information : Shawn Donovan, shawnd@acsacs.com (916-804-4923)
Leticia Hernandez, leticia.hernandez@acsacs.com (925-251-4405)

Accepted By : _____ Date : _____

Title : _____ PO #: _____

District - CSS

PID # 00133655

SCADA Server & Network Replacement 2027

Introduction

Cal Water's business depends on SCADA systems to operate and distribute safe water to the customers. The hardware needed to support this process must be kept current using the latest technology so that continuous support is maintained.

Ensuring operational support is challenging with outdated/antiquated hardware or systems. Network devices must be refreshed every four to five years to maintain optimum operational support for integrity, reliability, and availability. Currently, all California districts and customer service support (CSS) have a total of twenty-six Cisco Catalyst 3600 series network switches, forty-four Moxa network switches, one hundred thirty-five network devices, and eighty-six Gen10 HP servers.

We must replace fifteen HP servers, forty-five network devices, and ten Moxa network switches in 2027 simply because they are outdated.

Deficiencies and issues

- Older networks and network hardware were not built to support the technological demands of today's workforce. One of the main risks of using outdated hardware is that it might not be compatible with the latest software, operating systems, or security updates. This can lead to errors, crashes, slowdowns, or even data loss. Mobile solutions and cloud-based business applications can overwhelm an older network infrastructure. Upgrading to a modernized network can make a real difference to productivity.

- Threats to the network are more sophisticated and targeted than ever before. The older the infrastructure, the more vulnerable it becomes.

- Introducing modern technology puts an increased strain on older network infrastructure that then requires more attention.

Alternative Analysis

Alternative 1 – Do Nothing

- We could choose to leave equipment as is, however, it will not be able to sustain operations into the future due to the degradation of hardware components and software technology changes that obsolete the original design. This could cause serious operational outages. Ultimately impacting business operations and customers.

Alternative 2 -

- Choosing alternative equipment was considered. However, equipment alternatives are not feasible due to the current environment and the need to maintain operations as is, maintaining standardization and knowledge expertise. Also, equipment lifespans are based on the original installation date making it difficult, and less cost-efficient, to replace all similar hardware, using another manufacturer, at the same time. The exception would be if the manufacturer is no longer making the hardware or is no longer supporting the technology needed in the network environment. Using dissimilar hardware will introduce unknown operational issues and further complicate administration. Ultimately increasing the cost of maintenance and support.

- Crashes, cyber-attacks, and system downtime will lead to decreased productivity.

Alternative 3

- It is extremely critical that we replace legacy hardware because they run slower in alternatives one and two. The vendor does not provide technical support and software updates for these old network devices. It means that we are putting the company at risk for security and information breaches.

- Establishing and maintaining reliable connections is critical to the success of the Cal Water business. Cal Water has forty-three locations and by using the most current technology ensures users can do their jobs more efficiently, with fewer interruptions.

Recommended Solution

Alternative 3

Replace and upgrade the outdated network hardware per the refresh rate and scheduled timeline to keep Cal Water's network infrastructure up-to-date and stay current when it comes to preventing the latest threats.

Better Security – It is getting much harder to secure older networks, so investing in a new one or upgrading an existing one is the way forward because security is important. Upgrading network hardware will give users/customers access to much better features that can help protect network connections on various devices. Hackers and other criminals are always finding ways to steal data and personal information via enterprise networks that are not secure.Increase network performance – Good network performance equals more efficiency and productivity. Bandwidth limitations are avoidable with new hardware.

Project Summary

SCADA system is a critical infrastructure that is required to manage our water systems. Cal Water follows best practices as per ISO 55001- Asset Management hardware lifecycle recommendations to ensure the availability, confidentiality, integrity, and reliability of the hardware that supports this system. The following devices must be continually updated and refreshed to provide foundational support for SCADA applications: servers, network switches, network firewalls, network storage, and network blade servers.

Network switches provide data packet flow for SCADA systems between the districts and headquarters. These devices must be updated continuously with new firmware and refreshed every four years to ensure access availability and reliability to SCADA applications. The Information Technology Information Library (ITIL) best practice is to replace hardware as needed to provide confidentiality, integrity, and availability to our customers.

Network firewalls provide security protection that segregates and isolates SCADA networks from corporate network and district network segments. Firewalls must be continuously updated with new firmware and refreshed every four years to ensure that adequate protection is provided within the SCADA network. The Department of Homeland Security suggests companies be vigilant and combat Cyber threats for SCADA systems as hackers have demonstrated an ability to disrupt water service in cities and communities by attacking older operating systems, software and hardware. In addition, a company system supports the security logging needed, and access information, for PII, PCI, SOX and HIPPA information within the network. The ITIL best practice is to replace hardware as needed to provide confidentiality, integrity, and availability.

Similar to the Cal Water's corporate network, this project's network hardware is scheduled to be refreshed every four years. Servers provide the environment for SCADA applications. The company has over 70 physical SCADA servers that support all of the company's water operations. The ITIL best practice is to replace hardware to provide confidentiality, integrity, and availability to our customers.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Quote

Attachment A

Capital Project Cost Estimate

Project No. : 133655
Description SCADA Server & Network Repl. 2027
District / Department: CSS
Project Start Date: 01/01/2027
Project Completion Date: 12/31/2027
Prepared By: ctran
Date Initiated: 01/02/2024
Base Year: 2024
Sub-Total: $318,970
Direct Cost: $352,075

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
EQUIPMENT (NO AFUDC)	[EA]	1	$28,997.00	$28,997.00	Engineers Estimate
EQUIPMENT (NO AFUDC)	[EA]	1	$289,973.00	$289,973.00	Engineers Estimate

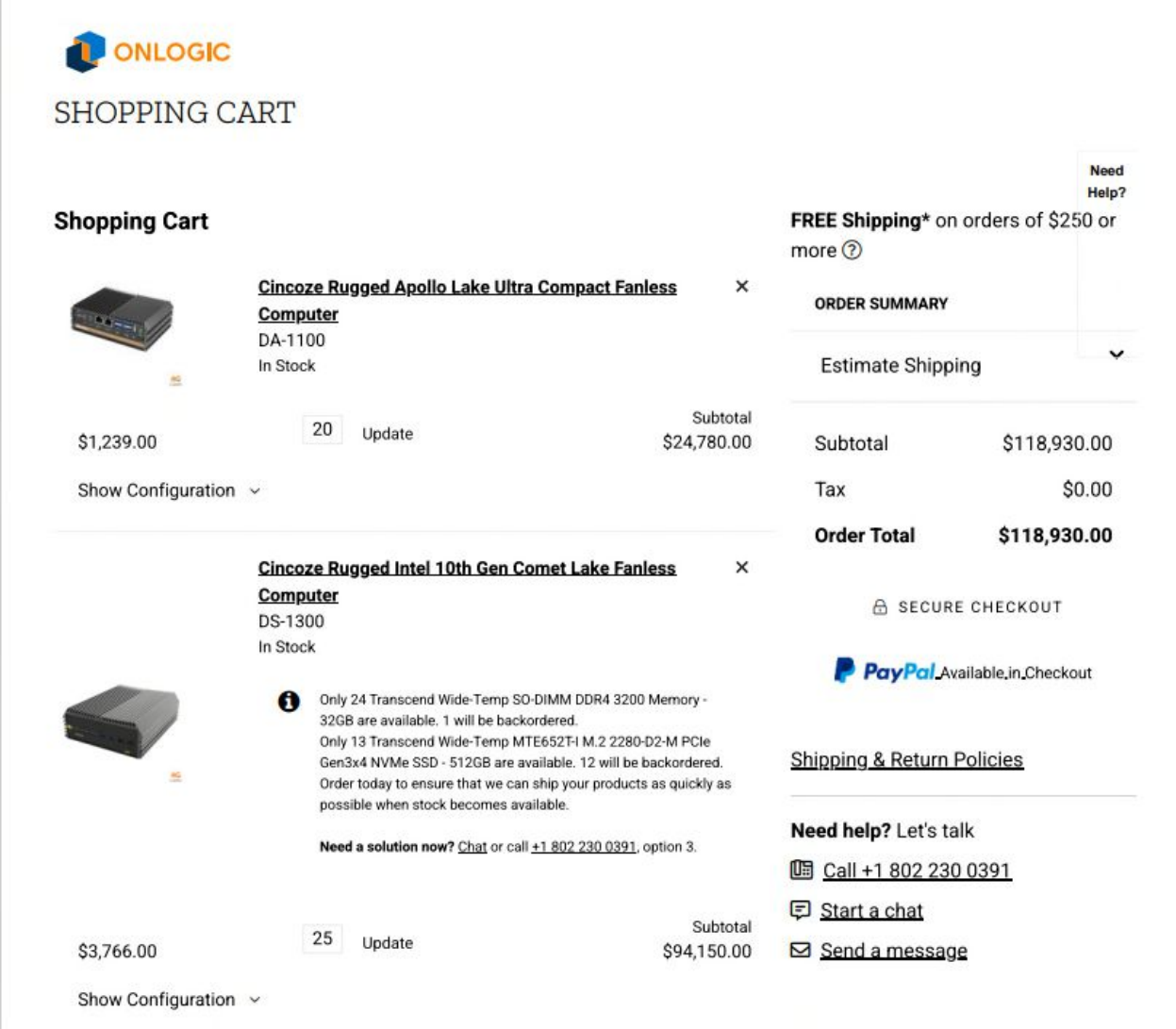
Sub-total = $318,970.00
Direct Cost = $352,074.76

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

PID 00133655 Cost Estimate in 2027

Device	Amount	Year to Replace/Add
10 Moxa network switches	$19,970.00	2027
20 Cincoze Rugged Apollo Ultra Compact fanless Computer	$24,780.00	2027
25 Cincore Rugged Intel 10th Gen Comet Lake Fanless Computer	$94,150.00	2027
15 Gen11 HP servers	$151,073.75	2027
10% Contingency	$28,997.00	Contingency
Total	**$318,970.75**	



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SHOPPING CART

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FREE Shipping* on orders of $250 or more

Cincoze Rugged Apollo Lake Ultra Compact Fanless Computer
DA-1100
In Stock

$1,239.00 | 20 Update | Subtotal $24,780.00

Show Configuration

ORDER SUMMARY

Estimate Shipping

Subtotal	$118,930.00
Tax	$0.00
Order Total	**$118,930.00**

SECURE CHECKOUT

PayPal Available in Checkout

Cincoze Rugged Intel 10th Gen Comet Lake Fanless Computer
DS-1300
In Stock

Only 24 Transcend Wide-Temp SO-DIMM DDR4 3200 Memory - 32GB are available. 1 will be backordered.
Only 13 Transcend Wide-Temp MTE652T-I M.2 2280-D2-M PCIe Gen3x4 NVMe SSD - 512GB are available. 12 will be backordered.
Order today to ensure that we can ship your products as quickly as possible when stock becomes available.

Need a solution now? Chat or call +1 802 230 0391, option 3.

$3,766.00 | 25 Update | Subtotal $94,150.00

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Shipping & Return Policies

Need help? Let's talk

Call +1 802 230 0391

Start a chat

Send a message

Free Ground Shipping on U.S. Orders over $99

NETEON

10

Home › Your Cart

Your Cart (10 items)

MOXA

EDS-G4012-4GC-LV

Price	Quantity:	Total
$1,997.00	− 10 +	**$19,970.00**

Subtotal:	$19,970.00
Shipping:	$0.00
Tax:	$1,547.68
Coupon Code:	Add Coupon
Grand total:	$21,517.68

CHECK OUT

Quotation

Applied Computer Solutions
110 Progress
Irvine, CA 92618
www.acsacs.com

Shawn Donovan
shawnd@acsacs.com
916-804-4923

Quote Number: ACSQ19807
Quote Date: 10/24/2023

Company: California Water Service Co.
Contact: Loan Nguyen
Address: 1720 North First St
City:
State: San Jose
Phone: CA
E-mail: (408) 3678366 x78366
lnguyen@calwater.com

Terms: NET 30
Expires: 30 days from quote date

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price
1	5	P52499-B21	HPE DL360 Gen11 8SFF CTO Server	$4,387.00	$21,935.00	60.00%	$1,754.80	$8,774.00
2	5	P52499-B21#ABA	HPE DL360 G11 SFF CTO Server	$0.00	$0.00	0.00%	$0.00	$0.00
3	5	P49610-B21	INT Xeon-S 4410Y CPU for HPE	$1,393.00	$6,965.00	60.00%	$557.20	$2,786.00
4	5	P49610-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
5	5	P43322-B21	HPE 16GB 1Rx8 PC5-4800B-R Smart Kit	$1,065.00	$5,325.00	60.00%	$426.00	$2,130.00
6	5	P43322-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
7	5	P48895-B21	HPE DL360 G11 8SFF x1 U.3 TM BP Kit	$414.00	$2,070.00	60.00%	$165.60	$828.00
8	5	P48895-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
9	10	P40502-B21	HPE 480GB SATA MU SFF BC MV SSD	$1,114.00	$11,140.00	60.00%	$445.60	$4,456.00
10	10	P40502-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
11	5	P01366-B21	HPE 96W Smart Stg Li-ion Batt 145mm Kit	$202.00	$1,010.00	60.00%	$80.80	$404.00
12	5	P01366-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
13	5	P48918-B21	HPE DL360 Gen11 Stg Cntrl Enable Cbl Kit	$38.00	$190.00	60.00%	$15.20	$76.00
14	5	P48918-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
15	5	P58335-B21	HPE MR408i-o Gen11 SPDM Storage Cntlr	$2,619.00	$13,095.00	60.00%	$1,047.60	$5,238.00
16	5	P58335-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
17	5	P51181-B21	BCM 5719 1Gb 4p BASE-T OCP Adptr	$485.00	$2,425.00	60.00%	$194.00	$970.00
18	5	P51181-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
19	5	P48907-B21	HPE DL3X0 Gen11 1U Stnd Fan Kit	$487.00	$2,435.00	60.00%	$194.80	$974.00
20	5	P48907-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
21	10	P38995-B21	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	$524.00	$5,240.00	60.00%	$209.60	$2,096.00
22	10	P38995-B21#0D1	HPE 800W II FS Plat HtPlg Pwr Supply Kit	$0.00	$0.00	0.00%	$0.00	$0.00
23	5	P51911-B21	HPE DL360 Gen11 CPU1/OCP2 x8 Enable Kit	$120.00	$600.00	60.00%	$48.00	$240.00
24	5	P51911-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price
25	5	P52416-B21	HPE DL360 Gen11 OROC TM Cbl Kit	$701.00	$3,505.00	60.00%	$280.40	$1,402.00
26	5	P52416-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
27	5	P48904-B21	HPE DL3X0 Gen11 1U Stnd Heat Sink Kit	$129.00	$645.00	60.00%	$51.60	$258.00
28	5	P48904-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
29	5	P52341-B21	HPE DL3XX Gen11 Easy Install Rail 3 Kit	$164.00	$820.00	60.00%	$65.60	$328.00
30	5	P52341-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
31	10	P52499-B21	HPE DL360 Gen11 8SFF CTO Server	$4,387.00	$43,870.00	60.00%	$1,754.80	$17,548.00
32	10	P52499-B21#ABA	HPE DL360 G11 SFF CTO Server	$0.00	$0.00	0.00%	$0.00	$0.00
33	10	P49598-B21	INT Xeon-G 6426Y CPU for HPE	$3,067.00	$30,670.00	60.00%	$1,226.80	$12,268.00
34	10	P49598-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
35	20	P43328-B21	HPE 32GB 2Rx8 PC5-4800B-R Smart Kit	$1,981.00	$39,620.00	60.00%	$792.40	$15,848.00
36	20	P43328-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
37	10	P48895-B21	HPE DL360 G11 8SFF x1 U.3 TM BP Kit	$414.00	$4,140.00	60.00%	$165.60	$1,656.00
38	10	P48895-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
39	20	P40504-B21	HPE 1.92TB SATA MU SFF BC MV SSD	$3,623.00	$72,460.00	60.00%	$1,449.20	$28,984.00
40	20	P40504-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
41	10	P26253-B21	BCM 57416 10GbE 2p BASE-T Adptr	$1,105.00	$11,050.00	60.00%	$442.00	$4,420.00
42	10	P26253-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
43	10	P01366-B21	HPE 96W Smart Stg Li-ion Batt 145mm Kit	$202.00	$2,020.00	60.00%	$80.80	$808.00
44	10	P01366-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
45	10	P48918-B21	HPE DL360 Gen11 Stg Cntrl Enable Cbl Kit	$38.00	$380.00	60.00%	$15.20	$152.00
46	10	P48918-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
47	10	P58335-B21	HPE MR408i-o Gen11 SPDM Storage Cntlr	$2,619.00	$26,190.00	60.00%	$1,047.60	$10,476.00
48	10	P58335-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
49	10	P51181-B21	BCM 5719 1Gb 4p BASE-T OCP Adptr	$485.00	$4,850.00	60.00%	$194.00	$1,940.00
50	10	P51181-B21#0D1	Factory Integrated	$0.00	$0.00	0.00%	$0.00	$0.00
51	10	P48907-B21	HPE DL3X0 Gen11 1U Stnd Fan Kit	$487.00	$4,870.00	60.00%	$194.80	$1,948.00
52	10	P48907-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
53	20	P38995-B21	HPE 800W FS Plat Ht Plg LH Pwr Sply Kit	$524.00	$10,480.00	60.00%	$209.60	$4,192.00
54	20	P38995-B21#0D1	HPE 800W II FS Plat HtPlg Pwr Supply Kit	$0.00	$0.00	0.00%	$0.00	$0.00
55	10	P51911-B21	HPE DL360 Gen11 CPU1/OCP2 x8 Enable Kit	$120.00	$1,200.00	60.00%	$48.00	$480.00
56	10	P51911-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
57	10	P52416-B21	HPE DL360 Gen11 OROC TM Cbl Kit	$701.00	$7,010.00	60.00%	$280.40	$2,804.00
58	10	P52416-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
59	10	P48904-B21	HPE DL3X0 Gen11 1U Stnd Heat Sink Kit	$129.00	$1,290.00	60.00%	$51.60	$516.00
60	10	P48904-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
61	10	P52341-B21	HPE DL3XX Gen11 Easy Install Rail 3 Kit	$164.00	$1,640.00	60.00%	$65.60	$656.00
62	10	P52341-B21#0D1	Factory integrated	$0.00	$0.00	0.00%	$0.00	$0.00
63	15	R7A11AAE	HPE GreenLake COM En 3y Up ProLiant aaS	$450.00	$6,750.00	60.00%	$180.00	$2,700.00

All orders for products and/or services are governed by the current, executed purchase and/or services agreement between the parties. If no such agreement has been executed, then by authorizing an order for products and/or services, you agree to be bound by the Master Products and Services

Subtotal	$138,356.00
Sales Tax	$12,717.75

Line#	Qty	Manufacturer Part #	Description	Unit List	Ext. List	Customer Discount	Customer Unit Price	Customer Ext. Price

Terms and Conditions located at: Microsoft Word - MASTER PRODUCTS AND SERVICES TERMS AND CONDITIONS_Applied website.docx (acsacs.com)

Freight	$0.00
TOTAL	**$151,073.75**

If you object to these terms, you must notify us within ten (10) days of receipt of this form.

NOTE: Freight and Tax are estimates only. Final charges will be added to the invoice.

For more information : Shawn Donovan, shawnd@acsacs.com (916-804-4923)
Leticia Hernandez, leticia.hernandez@acsacs.com (925-251-4405)

Accepted By : _____ Date : _____

Title : _____ PO #: _____

Section **B.**

Security Projects (Physical and Cyber)

District - CSS

PID # 00132627

ZTA – Data Pillar

Introduction

The protection of data is the key driver behind the implementation of a Zero Trust Architecture (ZTA). As such, the protection and handling of data crosses several pillars in the Department of Homeland Security (DHS) Cybersecurity and Infrastructure Security Agency (CISA) maturity model. The model emphasizes this crossover stating, “Agency data should be protected on devices, in applications, and networks. While data protection must happen at rest and when data is in motion, the data pillar deals mainly with data at rest. Data in motion activity is covered in the network & environment pillar. Key to the effort to protect data is the inventory, categorization, and labeling – you can only protect what you know you have.

Security is aimed at preventing the loss or disclosure of data while sustaining authorized access. The possibility that something could happen to damage, destroy, or disclose data or other resources is known as a risk. The primary goal of risk management is to reduce risk to an acceptable level. That level depends on the organization, the value of its assets, and many other factors. Risks to an IT infrastructure are not all computer-based. Many risks come from non-computer sources. Failing to properly evaluate and respond to all forms of risk will leave a company vulnerable. Risk management requires evaluation, assessment, and the assignment of value for all assets within the organization. Without proper asset valuations, it is not possible to prioritize and compare risks with possible losses.

Deficiencies and Issues

Anything used in a business process or task that should be protected is an asset. It can be a network service, a process, a program, an IT infrastructure, a hardware device, facilities, data, and so on. The loss or disclosure of an asset could result in an overall security compromise, loss of productivity, reduction in profit, additional expenditures, and intangible consequences such as public confidence, and industry support.

An essential part of risk analysis is identifying and examining threats. And the first step is to identify and then appraise the value of assets. Improperly assigning value to assets can result in failing to properly protect an asset or implementing financially infeasible safeguards. Assigning or determining the value of assets to an organization can fulfill numerous requirements. It serves as the foundation for performing a cost-effective analysis of asset protection. It serves as a means for selecting or evaluating safeguards and countermeasures. It provides values for insurance purposes and establishes an overall net worth or net value for the organization. It helps senior management understand exactly what is at risk within the organization. Understanding the value of assets also helps to prevent negligence of due care and encourages compliance with legal requirements, industry regulations, and internal security policies.

Alternative Analysis

To address the deficiencies identified, the following alternatives were analyzed:

Alternative 1: Do Nothing

The Do Nothing alternative was deemed imprudent and thus not considered further.

Alternative 2: Fix the problem as it occurs

The solution will not be sustainable because the team has other daily operational tasks and projects. Suppose we don't put in the proper control to protect an asset that contains sensitive data that was breached. In that case, the company must deal with breach notification and reputational and financial damage.

Alternative 3: Implement Zero Trust – Data Pillar

This zero-trust pillar revolves around the categorization of corporate data. Once categorized, the data can be isolated from everyone except those who need access. This pillar also includes the process of determining where data should be stored, as well as the use of encryption mechanisms while data is in transit and at rest.

Recommended Solution

Cal Water recommends Alternative 3 because it will enable the Company to implement the right security controls to protect the data based on classification level. We can protect sensitive data at rest and in transit and that will reduce the impact of a cybersecurity incident involving data exfiltration.

Project Summary

To protect the data, we must first understand what data classification we have and where it resides. Once we have the data inventory, we will need to classify the data and assign a data custodian for each data we own. We then need to implement the proper security controls to protect access to that data based on the classification level of the data. We then need to perform the following actions:

- Create a federal zero trust data security guide that provides a comprehensive, accurate approach to categorizing and tagging data to meet the needs of zero trust.
- Automate this categorization and security responses.
- Audit access to any data encrypted at rest on-premise and in the cloud.
- Implement comprehensive logging and information-sharing capabilities for better detection and remediation.
- Implement auto-remediation of data found to be out of compliance with our zero trust model.

Project Attachments

- Attachment A – Cost Estimate

- Attachment B - Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132627
Description ZTA - Data Pillar
District / Department: CSS
Project Start Date: 03/30/2025
Project Completion Date: 12/30/2027
Prepared By: rchang
Date Initiated: 10/27/2023
Base Year: 2023
Sub-Total: $920,000
Direct Cost: $992,365

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
DATA CLASSIFICATION FOR ZERO TRUST EFFORT	[EA]	1	$920,000.00	$920,000.00	Engineers Estimate

Sub-total = $920,000.00
Direct Cost = $992,365.44

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Below is an estimate quote to implement ZTA for the data pillar. Varonis is the de facto tool that a lot of companies use to classify and protect data.

OPTIV

Quote#: 2511047-33
Payment Terms: Net 30
Tax ID: 43-1806449
Internal Reference#: Q-2054989

Date: 5/31/2023
Expiration: 6/9/2023

From:
Andrew Lee
(408) 3558000
andrew.lee@optiv.com

Client Operations Specialist:
Matt Shorum
(858) 2280045
matt.shorum@optiv.com

To:
Cal Water
Richard Chang
Info Sec Director
1720 N 1ST ST
SAN JOSE, CA 95112-4508
US
(408) 367-8290
rchang@calwater.com

Remit Payment:
PO Box 28216 Network Place
Chicago, IL 60673-1282

All classification of sensitive data is done on a VM built and hosted in the California Water environment within their network and behind the firewall. Scanning is done in memory and sensitive data is purged once scanning is completed. Pointers to the sensitive data (just metadata) are then brought up to the Varonis SaaS tenant.
Optiv will install the in-scope Varonis products in Client's environment (Calwater SQL server, Calwater VM, Calwater SOLR server). Additionally, Optiv will integrate directories and monitored resources specified in the sizing documentation as time allows. Following installation completion, Optiv will perform a health check to confirm all jobs are running correctly and as scheduled.

(May 31, 2023 to May 30, 2026)

Product Description	Product Code	Customer Extended Price
• Varonis Systems: 1501 DatAdvantage Cloud framework SaaS • Varonis Systems: 1501 DatAdvantage Cloud for Okta SaaS • Varonis Systems: 2 Collector License • Varonis Systems: 1501 Varonis for Windows/NAS + M365 SaaS • Varonis Systems: 1501 Varonis for Active Directory SaaS "3 years implementation and support"	DACF-1501-2000CS	USD 845,113.83
(May 31, 2023 to May 30, 2026) TOTAL:		USD 845,113.83

Subtotal :	USD 845,113.83
Estimated Tax:	USD 0.00
Estimated Shipping:	USD 0.00
Grand Total:	**USD 845,113.83**

"Upon receipt of a fully funded PO for $845,113.83, Optiv will invoice in full year 1"

CSS – Information Technology

PID # 00132628

ZTA – Identity Pillar

Introduction

Identity is core to the implementation of zero trust. The Department of Homeland Security (DHS) Cybersecurity and Infrastructure Security Agency (CISA) Zero Trust maturity model defines "identity" as "an attribute or set of attributes that uniquely describe an agency user or entity." Being able to do this means being able to ensure and ensure that the right users and entities have the right access to the right resources at the right time.

Deficiencies and Issues

We don't have a way to look deep into a user before granting the user access. We are relying on least-privilege access based solely on authentication. Another problem is users now have identities among a variety of cloud providers because we are moving more applications to the cloud. These cloud identities need to be integrated with on-premise identities in a way that does not increase the attack surface.

Alternative Analysis

To address the deficiencies identified, the following alternatives were analyzed:

Alternative 1: Do Nothing

The Do Nothing alternative involves not making any changes. Our security model today is no longer effective in the modern world where data breaches continue to become more rampant due to the increasing sophistication of hackers' attacks on users' accounts.

Doing nothing repeatedly gives us an Achilles heel when it comes to phishing attacks and credential theft by the exploitation of the human element. Not only are employees able to connect into the network from anywhere and anytime in the nation, but they're also able to access major sections of data that they might not necessarily need.

Unregulated identity and access management and thus unchecked data access creates an immeasurable number of blind spots where attackers who breach the user can and will have unimpeded entry to other systems by elevating their user privileges in order to do more damage to the company, all without a chance of being detected.

The Do Nothing alternative was deemed imprudent and thus not considered further.

Alternative 2: Implement Zero Trust – Identity Pillar

We need to apply context to the credentials trying to access an application or system. These questions will need to be answered before access is granted.

- Role – What does this person need to see based on their title and position?

- Device – Are they using a device that is associated with them? Managed? Compliant?

- Location – Is this person logging on from a plausible location? Are they logging on from Washington DC one minute and China the next?

- Time – Is this person logging on at irregular times that they never log on from?

The Zero Trust – Identity Pillar is designed to use this contextual identity information to optimize access policies and enforce the least privilege principle. As such, this pillar grants access to the right person, for the right amount of time, and for the right reason.

Recommended Solution

Cal Water recommends [Alternative 2] because it will take a broad look at the user before granting that user access to the right data they are entitled to access. Having this context allows Zero Trust to mitigate risk by limiting a successful attack to only that singular user or system. The access may even be completely denied if the context matches attack patterns. By assuming that no user should be fully trusted, Zero Trust is able to limit the risk of insider threats where employees exfiltrate data that does not even belong to their team. Below are the core capabilities required to successfully implement this solution.

- For Authentication, we must continuously validate identity with phishing-resistant Multi-Factor-Authentication (MFA), not just when access is initially granted.

- For Identity Stores (locations where users and roles are managed), we must securely integrate the identity store across all partners and environments.

- For Identity Risk Assessments (the likelihood that identity is compromised), we must determine identity risks in real-time based on continuous analysis and dynamic rules to deliver ongoing protection.

- For Access Management, we must use automation to authorize just-in-time and just-enough access tailored to individual actions and individual resource needs.

Project Summary

The identity pillar considers how accounts are created and how users log into systems. The ability to identify every user and device requesting system access is foundational to the concept of zero trust.

Identify a solution that will achieve the four core requirements from the recommended solution section.

Project Attachments

- Attachment A – Cost Estimate

- Attachment B - Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132628
Description ZTA - Identity Pillar
District / Department: CSS
Project Start Date: 03/20/2027
Project Completion Date: 12/30/2027
Prepared By: rchang
Date Initiated: 10/27/2023
Base Year: 2023
Sub-Total: $1,340,000
Direct Cost: $1,479,074

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
ZTA - IDENTITY PROTECTION	[EA]	1	$1,340,000.00	$1,340,000.00	Engineers Estimate

Sub-total = $1,340,000.00
Direct Cost = $1,479,074.10

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Below is an estimate for implementing Zero Trust for Identity and Access Management.

$1,340,000

slalom

ZTA Solution Deployment

Cal Water Zero Trust Cost Estimate

The cost estimate factors

- A common standard cost range for software and hardware components of a ZTA solution(s) across 5 main pillars of ZeroTrust principles
- The maturity/readiness level of the client's capabilities across 5 pillars

ZeroTrust Implemenation Cost Estimate						
	Components	Zero Trust Pillar	3-YR Calibrated Cost	Year 1	Year 2	Year 3
Hardware	Firewall and network segmentation equipment	Network, Infrastructure	$670,000	$223,333	$223,333	$223,333
	Multi-factor authentication tokens and readers	Device	$134,000	$44,667	$44,667	$44,667
	Endpoint protection software and hardware	Device	$1,340,000	$446,667	$446,667	$446,667
	Network access control equipment	Network, Infrastructure	$670,000	$223,333	$223,333	$223,333
	Intrusion detection and prevention systems	Network, Infrastructure	$1,340,000	$446,667	$446,667	$446,667
			$4,154,000	**$1,384,667**	**$1,384,667**	**$1,384,667**
Software	Identity and access management software	Identity	$1,340,000	$446,667	$446,667	$446,667
	Privileged access management software	Identity	$670,000	$223,333	$223,333	$223,333
	Security information and event management (SIEM) softwar	Infrastructure	$1,340,000	$446,667	$446,667	$446,667
	Endpoint detection and response software	Application	$670,000	$223,333	$223,333	$223,333
	Data loss prevention software	Data, Application	$670,000	$223,333	$223,333	$223,333
			$4,690,000	**$1,563,333**	**$1,563,333**	**$1,563,333**

CSS – Information Technology

PID # 00132630

ZTA – Network Pillar

Introduction

As attackers become more sophisticated, ransomware groups proliferate, and advances in technology introduce new vulnerabilities, traditional security approaches that rely on trusting the network are no longer sufficient to defend organizations from cyber threats. The Cybersecurity and Infrastructure Security Agency (CISA), an operational component of the Department of Homeland Security (DHS), leads the nation's effort to understand, manage, and reduce cybersecurity risk. CISA's Zero Trust Maturity Model (ZTMM) provides a framework for organizations to strengthen their efforts to prevent unauthorized access to their technology infrastructures and information resources via zero trust.

Zero Trust Micro Segmentation is a network security architecture that divides a network into granular zones and requires verification for all users and devices. It is a way to implement a zero-trust model, which believes that no one can be trusted until authenticated and grants access according to the principle of least privilege. It reduces the attack surface and prevents the spread of lateral threats creating secure micro-perimeters around specific applications and workloads.

Deficiencies and Issues

There is no perimeter. With the rapid adoption of cloud applications, the legacy "perimeter" has dramatically eroded. Applications, data, and users dynamically exist anywhere and everywhere. For example, when you load Gmail in your browser, the user interface you see is composed of a complex web of microservices and data stores hosted across a vast cloud architecture, each of which changes and scales multiple times a day to meet the needs of users.

Alternative Analysis

To address the deficiencies identified, the following alternatives were analyzed:

Alternative 1: Do Nothing

The Do Nothing alternative involves not making any changes. For these reasons, the Do Nothing alternative was deemed imprudent and thus not considered further.

Alternative 2: Fix the problem as it occurs.

The solution will fail because we wouldn't have an opportunity to complete thorough planning and testing before making the changes. It may well cause unnecessary downtime and disruption to critical services. We open ourselves to a potential company-damaging cyber incident if the breach occurs due to a lack of network micro-segmentation. The adversary can readily pivot to other sensitive network parts to steal confidential information.

Alternative 3: Implement Zero Trust – Network Pillar

The current IT network has limited network segmentation. Cal Water needs to perform micro-segmentation and establish trust-based access control on networks within an organization's management. This will help to isolate sensitive data from being accessed by unauthorized people or things.

Recommended Solution

Cal Water recommends [Alternative 3] for these reasons:

- Designed to support old-fashioned business models where employees primarily work in offices, legacy solutions can't meet today's distributed workforce needs for cybersecurity, scalability, and performance. ZTA's modern approach to cybersecurity protects your infrastructure and improves the productivity of your employees by enabling them to securely and reliably work from anywhere.

- Conventional approach to security assumes that everything inside an organization's network can be trusted. The ZTA approach provides conditional access to resources within the corporate network to reduce the size of the attack surface and enforce least privilege access controls to provide users with secure access to only the resources they require and avoid oversharing with third parties.

- Malicious actors can move across or within a network after gaining access to that network. ZTA mitigates the impact of attacks involving compromised devices and stolen user credentials by preventing access to other networks and restricting lateral movement.

Project Summary

Zero Trust Micro-segmentation will require these core capabilities:

- Have a comprehensive asset discovery and inventory that can be automated and not a task to be performed by humans.

- Determine which assets will require micro-segmentation based on how this might impact the flow of business operations.

- We can now execute network micro-segmentation based on data classification and flow of the data.

Project Attachments

- Attachment A – Cost Estimate

- Attachment B - Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132630
Description ZTA - Netw ork Pillar
District / Department: CSS
Project Start Date: 02/15/2026
Project Completion Date: 12/30/2026
Prepared By: rchang
Date Initiated: 10/27/2023
Base Year: 2023
Sub-Total: $2,360,000
Direct Cost: $2,541,462

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
ZTA - NETWORK PILLAR	[EA]	1	$2,360,000.00	$2,360,000.00	Engineers Estimate

Sub-total = $2,360,000.00
Direct Cost = $2,541,461.84

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Below, highlighted, is an estimate for hardware cost to implement ZTA for the Network Pillar.

slalom

ZTA Solution Deployment

Cal Water Zero Trust Cost Estimate

The cost estimate factors

- A common standard cost range for software and hardware components of a ZTA solution(s) across 5 main pillars of ZeroTrust principles

ZeroTrust Implemenation Cost Estimate						
	Components	Zero Trust Pillar	3-YR Calibrated Cost	Year 1	Year 2	Year 3
Hardware	Firewall and network segmentation equipment	Network, Infrastructure	$670,000	$223,333	$223,333	$223,333
	Multi-factor authentication tokens and readers	Device	$134,000	$44,667	$44,667	$44,667
	Endpoint protection software and hardware	Device	$1,340,000	$446,667	$446,667	$446,667
	Network access control equipment	Network, Infrastructure	$670,000	$223,333	$223,333	$223,333
	Intrusion detection and prevention systems	Network, Infrastructure	$1,340,000	$446,667	$446,667	$446,667
			$4,154,000	**$1,384,667**	**$1,384,667**	**$1,384,667**
	Identity and access management software	Identity	$1,340,000	$446,667	$446,667	$446,667
	Privileged access management software	Identity	$670,000	$223,333	$223,333	$223,333

Section C.

Software/Hardware Upgrades

CSS – Information Technology

PID # 00132580

TM-Replace Mitel Phone System

Introduction

The current legacy Mitel phone system was implemented in 2017. It is due for replacement because of high maintenance costs and lack of modern functionalities to meet our customer service requirements.

Deficiencies and Issues

The legacy Mitel phone system has limited features with high maintenance on the network and PBX equipment. The threat of failure increases as the system ages.

The business impact of phone system failures:

- Disrupted customer service
- Loss of Customer Faith
- Loss of Reputation
- Loss of Employee Production

Alternative Analysis

To address deficiencies identified with the Mitel phone system, the following alternatives were analyzed:

Alternative 1: Do Nothing

- The Do Nothing alternative involves renewing the current maintenance contract with the software and hardware vendors, paying high maintenance and customization costs, using the limited features and functionalities for customer services, and enduring difficulties on maintaining the network and phone equipment. For these reasons, the Do Nothing alternative was deemed imprudent and thus not considered further.

Alternative 2: Replace the legacy on-premises Mitel phone system

- Cloud Phone System benefits our business by taking our system into the cloud for increased flexibility and efficiency. Some of the benefits include:
    - Compliance – Improved reporting capabilities
    - Water quality - Timely communication and updates
    - Efficiency –
        - Ability to scale up or down as needed

        - Disaster recovery with no downtime
        - Do not have to incur upfront hardware costs
        - Boosted productivity anywhere employees go
        - Free up IT resources
    - Safety –
        - Increased security
        - Automatic upgrades at no additional charge
    - Customer experience –
        - Feature-rich for boosted productivity
        - Customization
        - Increased Agility

Recommended Solution

Alternative 2 is the choice of Cal Water.

Implementing phone service in the cloud for better scalability, better customer services, and less maintenance. We will replace Mitel's legal phone system and all desk phones.

Project Summary

Replace the legacy on-premises Mitel Phone system with the phone service in the cloud.

The proposed project cost is $300,000.00 including:

- Costs for Professional Services and Hardware - $244,000.00
- Costs for Internal Labor - $56,000.00

Project Attachments

- Attachment A – Cost Estimate
- Attachment B - Quotes

Capital Project Cost Estimate

Project No. : 132580
Description Replace Mitel Phone system
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2025
Prepared By: tyu
Date Initiated: 10/25/2023
Base Year: 2023
Sub-Total: $300,000
Direct Cost: $315,187

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
REPLACE MITEL PHONE SYSTEM	[EA]	1	$300,000.00	$300,000.00	Engineers Estimate

Sub-total = $300,000.00
Direct Cost = $315,187.44

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Quote for Cisco Phone Services - $1,242,000.00 less **CapEx project estimate $244K** with remaining $998,000 related to OpEx software licensing fee costs for 3 years

Below is the list of implementation costs for Professional Services and Hardware in the quote. This will be considered as Capital Investment.

Professional Services and Hardware	Cost
Cloud Calling Setup Assist	$14,640.00
Solution Support for Collaboration	$59,081.00
Webex Contact Center Setup Assist Core Extra Small	$39,270.00
Cisco IP Phone 7840 with Multiplatform Phone firmware	$60,300.00
Cisco IP Phone 7841 with Multiplatform Phone firmwareSNTC-8X	$10,010.00
Cisco IP Phone 8851 with Multiplatform Phone firmware	$42,308.70
Cisco IP Phone 8851 with Multiplatform Phone firmwareSNTC-8X	$9,216.90
Cisco IP Phone 7821 with Multiplatform Phone firmware	$7,661.70
Cisco IP Phone 7821 with Multiplatform Phone firmwareSNTC-8X	$1,663.20
Total	**$244,151.50**

The rest of the quote is for software licensing costs (about $998,000 for 36 months). This will be considered as Operating Expenses.

All Prices are in US Dollar (USD)

	Product	Qty	Your Price	Total
1	EntW Webex Calling Cisco Systems - Part#: A-FLEX-EACL **Note:** Duration: 36 months	800	$290.97	$232,776.00
2	AU Meetings (1) Cisco Systems - Part#: A-FLEX-AUM **Note:** Duration: 36 months	100	$483.12	$48,312.00
3	Outbound Calling Plan - Committed Enterprise Agreement User Cisco Systems - Part#: A-AUD-OCP1-EA **Note:** Duration: 36 months	800	$90.00	$72,000.00
4	AU Meetings Bridge Country Call Me / Call Back Audio (1) Cisco Systems - Part#: A-AUD-AU-BCCB **Note:** Duration: 36 months	100	$219.60	$21,960.00
5	Cloud Calling Setup Assist Cisco Systems - Part#: A-FLEX-CALL-ASSIST **Note:** Duration: 36 months	800	$18.30	$14,640.00
6	Solution Support for Collaboration Cisco Systems - Part#: SVS-CSS-SUPT-SSPT **Note:** Duration: 36 months	1	$59,081.40	$59,081.40
7	Webex Contact Center Premium Concurrent Agent Cisco Systems - Part#: A-FLEX-WCC-P-C **Note:** Duration: 36 months	10	$3,733.20	$37,332.00
8	Webex Contact Center Standard Concurrent Agent Cisco Systems - Part#: A-FLEX-WCC-S-C **Note:** Duration: 36 months	90	$2,525.40	$227,286.00
9	WFO Bundle Named Agent Cisco Systems - Part#: A-FLEX-WFO-NWFB **Note:** Duration: 36 months	100	$3,150.00	$315,000.00

10	Webex Contact Center PSTN Audio Toll Inbound Cisco Systems - Part#: A-FLEX-WXCC-DID **Note:** Duration: 36 months	100	$432.00	$43,200.00
11	Webex Contact Center Setup Assist Core Extra Small Cisco Systems - Part#: SVS-CCSA-XS **Note:** Duration: 3 months	1	$39,270.00	$39,270.00
12	Cisco IP Phone 7841 with Multiplatform Phone firmware Cisco Systems - Part#: CP-7841-3PCC-K9=	500	$120.60	$60,300.00
13	Cisco IP Phone 7841 with Multiplatform Phone firmwareSNTC-8X Cisco Systems - Part#: CON-SNT-P7JK94J1 **Note:** Duration: 12 months	500	$20.02	$10,010.00
14	Cisco IP Phone 8851 with Multiplatform Phone firmware Cisco Systems - Part#: CP-8851-3PCC-K9=	210	$201.47	$42,308.70
15	Cisco IP Phone 8851 with Multiplatform Phone firmwareSNTC-8X Cisco Systems - Part#: CON-SNT-P8JK95J9 **Note:** Duration: 12 months	210	$43.89	$9,216.90
16	Cisco IP Phone 7821 with Multiplatform Phone firmware Cisco Systems - Part#: CP-7821-3PCC-K9=	90	$85.13	$7,661.70
17	Cisco IP Phone 7821 with Multiplatform Phone firmwareSNTC-8X Cisco Systems - Part#: CON-SNT-P7BK92B3 **Note:** Duration: 12 months	90	$18.48	$1,663.20
			Total	$1,242,017.90

CSS – Information Technology

PID # 00132582
TM-Service Desk Upgrade

Introduction

IT (Information Technology) Service Desk / Help Desk software allows the company to accept, track, and respond to support requests in an organized fashion. It also provides knowledge bases, self-service portals, Service Level Agreement (SLA) and Service Level Objective (SLO) Management, and reporting. This is critical to support our 1300+ employees daily to provide essential customer service to the customers.

It is required to upgrade the end-of-life IT Service Desk tool to align with the overall IT Technology master plan in modernizing and driving successful digital transformation.

Deficiencies and Issues

The current IT Service Desk software reaches the end of life in 2026.

Here are the top risks without an effective IT Service Desk software:

- User requests may be misplaced, forgotten, not properly prioritized, responded in delay
- Employees / requestors may not be able to use self-service through a Frequently Asked Questions (FAQ) or knowledge base
- Important tickets / requests may not be properly prioritized, tracked, routed, approved, completed
- There is no method to track metrics like ticket volume, resolution time, customer satisfaction, individual performance, SOX audit, compliance, Service Level Agreement (SLA) and Service Level Objective (SLO)

Alternative Analysis

Alternative 1: Do Nothing

- Leaving the current IT Service Desk software in place is not a viable alternative as business requirements have changed and are always evolving. Cal Water needs to update and enhance its IT Service Desk tool to enable optimum productivity and efficiency. A catastrophic failure will result in extended downtime, lost productivity, and service degradation to internal and external customers including the various city and state agencies that we partner with.

Alternative 2: Reassess the current IT Service Desk and upgrade the application as required

- Upgrading and improving Cal Water's existing IT Service Desk application will benefit Cal Water in the following ways:
    - Avoid catastrophic failure, which will be costly to recover since the software is no longer supported by the vendor.
    - Single point of contact to report issues efficiently. Cal Water employees do not have to worry who they should be calling for incident response.
    - Generate tickets to capture and document all incidents and change requests. Provide status updates to meet customer's expectations
    - Provide systematic approach to support Cal Water employees on a common set of procedures
    - Provide historical logs of all different issues and problems that can be used as a reference point and enable the company to have better visibility into common issues or recurring problems
    - Provide better self-service portal for the Cal Water employees
- The Cal Water customers will directly benefit from the upgrades and improvements of its IT Service Desk application because Cal Water employees will be able to report, log, track and report on all incidents and problems more efficiently. Cal Water employees will have more visibility to identify common issues and take immediate action to resolve them in a timely manner. This will assist Cal Water employees manage issues efficiently.

Recommended Solution

Alternative 2

Reassess the current IT Service Desk and upgrade the application as required to ensure application meets the following:

1. Refine technology organization to support adoption and effective utilization of best practices and standards.
2. Continue to improve alignment with industry standards to support benefits realization.
3. Address all current and new company's business processes and requirements.
4. Incorporate other departments to utilize the system.
5. Enhance and create more complex workflows to automate business processes.
6. Expand other modules such as Problems management, Knowledge management, and Self-Service processes

Project Summary

This project is to replace the current IT Service Desk.

The project cost is $300,000.00 including:

- Costs for implementation services - $250,000.00
- Costs for internal labor - $50,000.00

Project Attachments

- Attachment A – Cost Estimate
- Attachment B - Quotes

Attachment A

Capital Project Cost Estimate

Project No. : 132582
Description Service desk upgrade
District / Department: CSS
Project Start Date: 01/01/2026
Project Completion Date: 12/31/2026
Prepared By: tyu
Date Initiated: 10/25/2023
Base Year: 2023
Sub-Total: $300,000
Direct Cost: $323,067

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
SERVICE DESK UPGRADE	[EA]	1	$300,000.00	$300,000.00	Engineers Estimate

Sub-total = $300,000.00
Direct Cost = $323,067.24

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

You are receiving this message because you or your company have been identified as a customer of Ivanti, to which this information is pertinent. To ensure you receive this information, general marketing opt-out preferences have been overridden.

Cherwell Service Management End of Life Notification

Dear valued Ivanti customer,

Ivanti is contacting you today to notify you that we will End of Life the Cherwell Service Management solution, on **December 31, 2026**. Below you can find the key milestone dates as it relates to your service. You can purchase additional licenses as needed at any stage before the End of Life. Please note that contract end dates will not go past December 31, 2026.

Milestone	Date
Renewal May Not Extend Beyond	December 31, 2026
End of Support and Life	December 31, 2026

Quote for Implementation Services - $356,750.00

Solution Investment

Solution	Investment	Duration	Total Investment
ITSM Foundations w/Training ITAM Foundations	$155,000 $51,750	16 weeks 9 weeks	$206,750
Flex Ad-Hoc Support	$25,000 per month	24 weeks	$150,000
		Total	**$356,750**

Please Note: The pricing provided herein reflects 2023 services pricing along with the FY23Q2 application stack provided by ServiceNow. There will be several release changes scheduled for ServiceNow prior to purchase. There may be changes to implementation services costs as well.

CSS – Information Technology

PID # 00132631

Workday Ongoing Enhancements

Introduction

Cal Water is using the following Workday Human Resource modules to support the core functions of the Company - Human Capital Management, Talent, Recruiting, Performance, Learning, Advanced Compensation, Benefits and Absence, compliance, and Payroll and Time Tracking. These modules support the essential operations of employee recruiting, administering compensation and benefits plans, managing the Union contracts, compliance, and developing employees.

The project funding request is to comply with legislation mandates and add new features to enhance employee usability and experience. Almost every year, there are new labor related legislations introduced that we are required to comply with, which requires configurations in Workday. For example, in 2023 Governor Newsom signed into law Senate Bill (SB) 616 Paid Sick Leave to expand mandatory sick leave from three days to five days in California. Another example was the Roth Catch up provision announced earlier this year under Secure 2.0 Act which required 401(k) plans to implement mandatory Roth (post-tax) for all catch up contributions. Cal Water needs to implement these changes before the deadline set in the legislation.

As with all software applications, Workday will release software patches multiple times a year, to provide tax or regulatory updates, fix system issues or add new functionalities. These releases will require extensive testing before applying them to the production environment.

Deficiencies and Issues

1. Release Management: Workday has two releases each year – as part of each release, there are mandatory, regulatory and optional feature enhancements. Mandatory and regulatory changes must be adopted. In addition, it is recommended that customers adopt new functionality that enhances productivity and improves business processes. As part of this Release Management process, the following activities need to be completed:

    a. Review the functional and technical features (what's new) with each release.

    b. Take action on upcoming changes (including configuration) that are mandatory or regulatory in nature for each module that Cal Water has implemented.

    c. Modify and test Workday integrations with other systems. Currently Cal Water has 50+ integrations, each of which needs to be retrofitted and tested for each of the mandatory changes within the new release.

d. Complete regression testing of all functionalities across the different modules to ensure that there is no adverse impact of the new release.

2. New Integrations need to be built for several ongoing and planned initiatives at Cal Water to add new functionalities to Workday. Some currently planned integrations are:

    a. Centralized bidding process

    b. Roth 401K

    c. MSPO to Workday

    d. Workday to PBCS/Hyperion

    e. KloudGin to Workday Time Capture

3. In addition, as internal and outside vendor applications are enhanced and move towards the cloud, new integrations are expected to be built and existing integrations need to be re-worked to continue connectivity and minimize business risk.

4. Continued enhancements to the Workday application to provide operational redundancy and improve security including but not limited to segregation of duties, adoption of encryption & reducing external security risks.

5. Leverage Workday Extend PAAS to eliminate existing business processes maintained on paper and use the Workday application to begin automating those business processes.

6. Build new Workday reports and configurations as per new business requirements.

Alternative Analysis

Alternative 1: Do Nothing

- This will leave the Organization out of compliance to new regulations and legislations, this is not a viable option.

- Not applying mandatory changes released twice a year will lead to security vulnerabilities, breakage of integrations and system functionalities.

- Not implementing the mandated legislation can lead to monetary penalties such as fins, back taxes, financial penalties, and levied of the company.

- Problems with Payroll could lead to inaccurate payments to employees and incorrect withholding and reporting of taxes, financial penalties, and interest.

- Redundant manual work will need to be done if integrations are not built for systems to communicate with each other.

- The benefits of moving forward with this planned effort far outweigh the risks of doing nothing.

Alternative 2: Implement Changes to Comply with Regulations and Improve Business Processes

- Follow Workdays' release schedule and apply necessary changes to Workday to be in full compliance with new regulations, continue implementing new functionalities and enhancements to fully leverage Workday system functionalities and improve business processes. The costs to implement new functionalities for regulation compliance and business improvements are capitalizable based on GAAP and SAP-98-01. Recommended Solution

Recommended Solution

Alternative 2 – Implement Changes to Comply with Regulations and Improve Business Processes and move forward with the tasks and Projects outlined below.

Project Summary

1. Release Management – Complete all tasks to fully adopt Workday's two releases each year.

2. Build new integrations as and when internal and external vendor applications are enhanced and move towards the cloud.

3. Build planned integrations outlined in the Deficiencies and Issues

    a. Centralized bidding process

    b. MSPO to Workday

    c. Workday to PBCS/Hyperion

    d. KloudGin to Workday Time Capture

4. Apply continued enhancements to the Workday Application and leverage Workday PAAS (WCP) to digitize business processes that are currently paper based.

5. Design and build new legislation to be in compliance with State and Federal laws.

Project Attachments

- Attachment A – Cost Estimate

- Attachment B - Proposal

Attachment A

Capital Project Cost Estimate

Project No. : 132631
Description Workday Ongoing Enhancements
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2027
Prepared By: vpadisala
Date Initiated: 10/27/2023
Base Year: 2023
Sub-Total: $500,000
Direct Cost: $525,415

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
WORKDAY ENHANCEMENTS	[EA]	1	$500,000.00	$500,000.00	Engineers Estimate

Sub-total = $500,000.00
Direct Cost = $525,415.04

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Gefira
Bridging the Gap between Business and Technology

Nov 29th, 2023
Tammy Nguyen
California Water Service Group

Re: Proposal for Release Management and Feature adoption for Calwater's Workday HCM application for a three-year period from 2025 through 2027.

Dear Tammy,

Gefira Business Solutions is pleased to present this proposal for Release Management and Feature adoption for Calwater's Workday HCM application for a three-year period from 2025 through 2027. Here is a high level list of deliverables covered under this Proposal:

1. Manage two releases each year from 2025 through 2027. The following activities would be covered under release management:
    a. Support End to end functional testing of all Calwater modules in the Preview tenant. Review mandatory changes with the team and rebuild configurations as needed.
    b. Rework integrations impacted by mandatory changes and test all integrations in the Preview tenant.
    c. Rework reports impacted by mandatory changes.
2. Configure the system to ensure that features related to regulatory compliance are designed and implemented in a timely manner. This would cover any changes at the Federal level as well as those for the states that Calwater operates within.
3. Digitize paper-based processes each year from 2025 through 2027.
4. Implement up to 10 new features included in the semiannual Workday Releases.
5. Build the following integrations within the three-year period from 2025 through 2027:
    a. Roth 401K
    b. Centralized bidding process
    c. KloudGin to Workday Time Tracking

To meet the deliverables in a timely manner, we propose the following resources to be used for this Project each year:

1. Gefira Workday Studio Developer for integrations
2. Gefira Workday functional resources by module and as needed
3. Gefira Business Analyst
4. Calwater Functional Lead/Project Manager
5. Individual SME's for HCM, Benefits, Payroll, Time Tracking, Learning, Performance and Compensation

Time Estimate:
We estimate a period of 4 months each year to complete the deliverables outlined above.

Anoushka, Inc. DBA Gefira Business Solutions
http://www.gefira.co

Cost Estimate:

We propose a fixed cost estimate of $110,000 per year; the total amount for 3 years being $330,000 to complete the deliverables outlined above. Consultant Travel expenses incurred during this Project will be billed on actuals. If the timeline of the project extends beyond the projected 4 months due to factors outside of our control, the resources will be converted to Time and Material and will be billed as such.

Signed:

Nov 29th, 2023
Amit Khatri
President & CEO
Anoushka, Inc. DBA Gefira Business Solutions
amit.khatri@gefira.co
1.408-242-5677

CSS – Information Technology

PID # 00132668
PowerPlan Upgrade

Introduction

PowerPlan is the dominant Project, Asset, Construction Job Order, Asset Retirement Obligation (ARO), Capital Lease and Tax systems, Tax Repairs in use for asset intensive companies regardless of the Financial Management system they use. The PowerPlan system allows the Company to do depreciation studies, tax depreciation or deferred tax, leased asset accounting, land and real estate tracking, etc. while providing analysis tools such as on-line net book valuations. Upgrading the Power Plan systems enables Cal Water to perform complex calculations necessary for compliance to the IRS regulations and CPUC rulings.

PowerPlan will continually evolve to address our complex financial reporting needs. In the latest 2023.1 release,it incorporates best practices across our modules, including import enhancements, usability improvements, new security features, and more. The most recent version of PowerPlan allows the company to receive essential products and security patches along with other maintenance releases.

- This project allows Cal Water to comply with the changes in accounting standards and corporate federal income tax regulations that result in SEC financial reporting regulations. The company also relies on support for monthly and yearly reports. Please see some examples below:

- Support the budget module where the details for the funding projects in the rate case are stored.

- The need to incorporate a larger scale of annual capital investment.

- On December 22, 2017, federal tax reform (Tax Cut and Jobs Act) was enacted. Federal Tax Reform is complex, has multiple effective dates, and requires additional guidance from the U. S. Treasury Department (expected before the end of 2018) to finalize all impacts ratepayers. Tax Reform Compliance work was required, and we utilized PowerPlan resources to help with the work.

- PowerPlan support is required for any interfaces to the new Tax Fixed Assets cloud software for Tax Depreciation, Deferred Taxes, and Book Depreciation Allocation.

- The Tax Provision modules streamline the monthly tax provisions computation and provide tax journal entries. The Tax Provision module is not part of Tax Fixed Assets cloud software.

Deficiencies and Issues

On December 31, 2024, all versions of PowerPlan 2021, Cal Water's current version, will reach the end of defective support. This is in line with PowerPlan commitment to provide defective

support for the two most recent versions of the software, which is no less than 36 months from the initial general release of the applicable version.

PowerPlan support is required to maintain accurate regulatory, tax, and financial transactions using the supported modules from PowerPlan:

- Capital Budgeting & Project & Budget Users modules
    - Funding project data for the Rate Case
    - Required for Rate Case approval.
    - Inaccurate or late reporting could result in delays of the rate case.
- Project Cost Management, Charge Repository, Project Accounting & Allocations modules
    - Project Costing, including Direct Charges, Benefit Allocations, and AFUDC
    - These values are used to create the total asset value for Rate Base
    - Inaccurate or late reporting could result in financial and regulatory deficiencies.
- Project Unitization & Asset Accounting modules
    - Fixed Asset, Depreciation, AFUDC, Job Order, and Lease financial transactions.
    - Yearly PUC reporting requirement
    - Inaccurate or late reporting can result in audit and regulatory deficiencies.
- Project Reimbursables
    - Job Order billings to customers
- Lessee Accounting
    - Used to the new GAP accounting requirement for leases.
- PowerTax US Tax Depreciation, PowerTax Deferred Tax Accounting, and PowerTax Monthly Tax Provision
    - State and Federal tax filings
    - Inaccurate or late reporting can result in fines.
- Tax Repairs
    - Cal Water's annual tax repairs deduction is more than $100M, which is approximately 8% of the effective tax rate and Tax Repairs also provide huge cash tax benefits annually.

- The Tax Repairs module is not part of Tax Fixed Assets cloud software.

Alternative Analysis

To address deficiencies identified], the following alternatives were analyzed:

Alternative 1: Hire an outside consulting company.

Hiring an outside company to support PowerPlan is an option. This option comes with the following risks:

- Product security and system defect updates from PowerPlan would be excluded
- Any updates made by the consultant would not be supported by PowerPlan in any future updates.
- Before completing any upgrades to the software, Cal Water would be required to bring the system up to date at an additional cost from PowerPlan.
- PowerPlan support is required for any interfaces to the new Tax Fixed Assets cloud software for Tax Depreciation, Deferred Taxes, and Book Depreciation Allocation.

Alternative 2: Do Nothing

The Do Nothing alternative involves putting the company at great risk for the following reasons:

- Security updates on the software and servers
- There have been system items preventing the fiscal close and PowerPlan support was able to resolve the issues. This is essential for the Fixed Asset, Depreciation, AFUDC, Job Order, and Lease financial transactions.
- Without the tax repairs module, it will be impossible to analyze the data in a timely manner, and it will substantially increase the accounting risk and create burden to the tax department if we have to manually calculate the tax deductions.

Recommended Solution

Upgrade the PowerPlan software to a supported version. The project work is required for compliance reporting to the Tax, SEC, and Regulatory filings. Most of the project costs are capital investment costs.

The Company is required to comply with all corporate federal income tax regulations and state regulatory commission changes. The compliance matter for this capital project is driven by changes to federal income tax (U. S. Treasury) regulations. The result of this change will significantly lower the Company's federal income tax costs which must be passed to all customers.

All these federal tax transactions are managed in the Company's Power Plant system; there are no other alternatives that would satisfy the federal and state compliance requirements safely.

Project Summary

"The PowerPlan upgrade is required to stay current with the compliance of the tax laws that impact regulated operations.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – PowerPlan Support Letter

Attachment A

Capital Project Cost Estimate

Project No. : 132668
Description PowerPlan Upgrade
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2027
Prepared By: vpadisala
Date Initiated: 10/30/2023
Base Year: 2023
Sub-Total: $1,700,000
Direct Cost: $1,786,411

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
POWERPLAN UPGRADE	[EA]	1	$1,700,000.00	$1,700,000.00	Engineers Estimate

Sub-total = $1,700,000.00
Direct Cost = $1,786,411.04

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

From: Jim Dahlby <jim.dahlby@powerplan.com>
Sent: Tuesday, August 29, 2023 8:05 AM
To: McIntire, Lana <lmcintire@calwater.com>
Subject: IMPORTANT UPDATE ABOUT YOUR POWERPLAN SOLUTION

This is an EXTERNAL EMAIL. Stop and think before clicking a link or opening attachments.

POWERPLAN®

Dear Lana,

Thank you for being a valued PowerPlan client. I am reaching out because our records indicate your organization is on PowerPlan version 2021 or earlier. It's important to note that on December 31, 2024, all versions of PowerPlan 2021 will reach end of defect support. This is in line with our commitment to provide defect support for the two most recent versions of the software, which is no less than 36 months from the initial general release of the applicable version.

What this means for your organization

Below are critical end-of-defect dates you should be aware of as you consider your technology implementation and maintenance strategy:

PowerPlan version End of defect date
2020 | December 31, 2023
2021 | December 31, 2024

Version 2018 reached end of defect on 12/1/22

These dates are in line with our routine end-of-defect cycle to provide defect support for the two most recent versions of the software, which is no less than 36 months from the initial general release of the applicable version. If you are or were on version 2020, you should have received prior communications about end of defect. If you are on version 2021 this is the first official notice we have sent to your account contacts.

Action you should take:
At PowerPlan, we continually evolve our offerings to address your most complex financial reporting needs, recently introducing our latest release, 2023.1. It incorporates best practices across our suites, including import enhancements, usability improvements, new security features, and more. We believe it is in your organization's best interest to transition to the most recent version of PowerPlan. This allows you to receive essential product and security patches and maintenance releases, as well as the benefits of new features. We urge you to talk with your stakeholders about the implications and opportunities this presents for your business.

We're here to help.
Your account team will reach out to you in coming weeks to review our development roadmap, answer upgrade questions and discuss an approach that works best for your business. In the meantime, please do not hesitate to contact your PowerPlan representative or contact me at jim.dahlby@powerplan.com.

Thank you for your continued support and for the trust you place in our team.

Best regards,

Jim Dahlby
SVP, Customer Support and Success

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update subscription preferences

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CSS – Information Technology

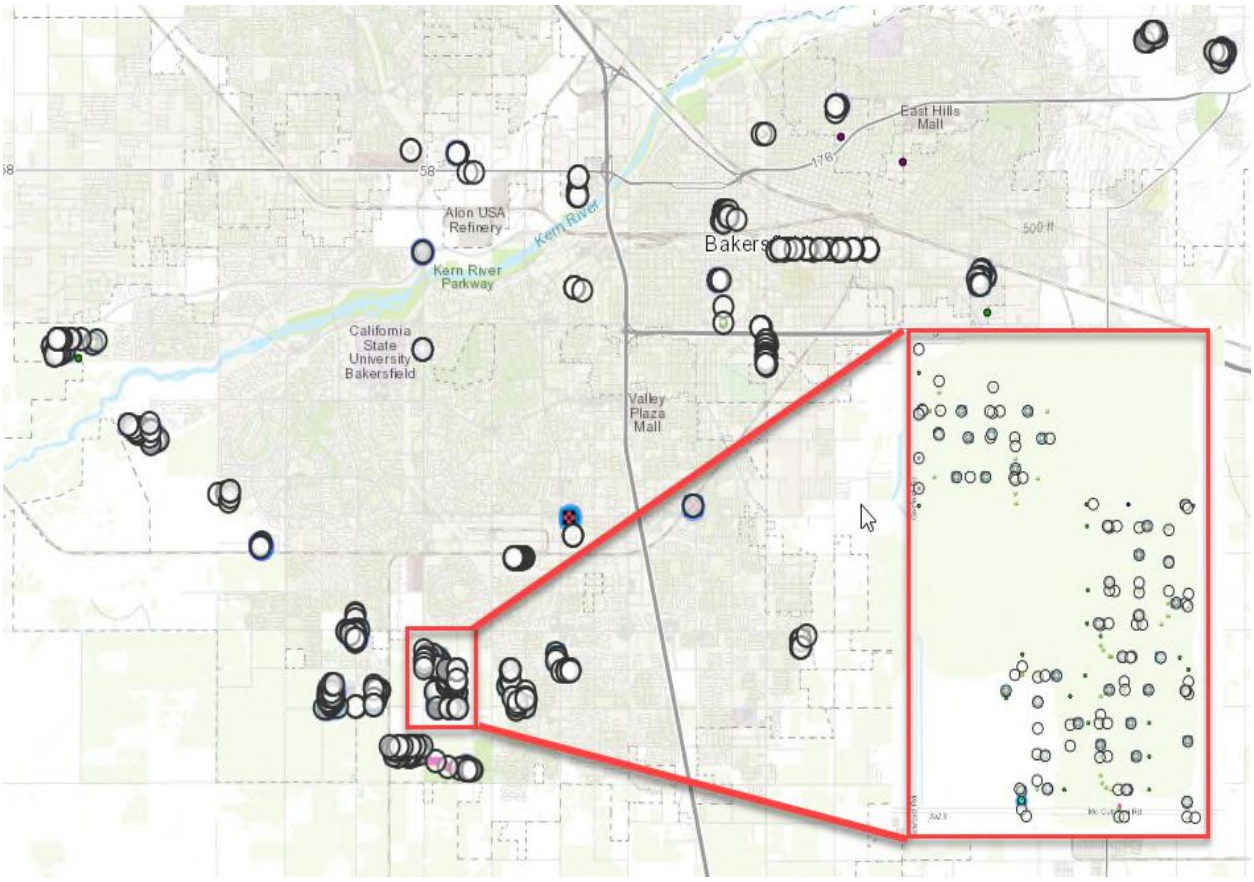
PID # 00132800
GIS Modernization

Introduction

Cal Water maintains a Geographic Information System that utilizes ESRI's ArcGIS products. There are tools available from ESRI to build custom applications, such as Experience Builder, that allows organizations to build applications that use GIS data. Cal Water has several of these applications that are built for a single purpose. There are internal customer requests for specific applications that are currently only piloted but require additional development. There are new technologies that will have significant benefits in data; however, some development is required in order to realize all of the benefits that data has to offer. Cal Water is proposing to modernize its applications to develop multi-purpose applications that take advantage of new tools offered by ESRI as well as new data that is available.

Deficiencies and Issues

Cal Water has developed a network of GPS base stations for capturing accurate GPS data of its assets. We have developed simple tools to capture the data in the field and then provide that information to the GIS team who can then convert those data points into the appropriate asset (pipeline, valve, property boundary, etc.) within its GIS data. The challenge is that once the data is converted from field collected data points to the appropriate asset, the GPS data is not readily available and clearly marked on the asset. As Cal Water collects more and more GPS data for its buried assets, accessing the GPS data for the exact asset becomes extremely valuable for activities such as locating and design. Below is an example of the point data that is collected using GPS data capture.



The data points represent a variety of assets and as Cal Water collects more GPS data, it will become extremely cluttered and confusing on what assets are being captured by what data points. But that GPS data is extremely important to track back to the actual asset.

Cal Water manages a large amount of capital work across multiple communities within California. We are partners with these communities in serving water to the residents and as such the communities expect us to communicate with them on the water system investments we plan to make. This can be quite complicated when trying to plan hundreds of projects over multiple years. Cal Water's Government and Community Relations team has requested maps for the proposed projects. While this may seem like a simple request, developing those maps is a significant manual task that requires a lot of back and forth with the groups proposing the projects and the GIS staff that is putting together the maps. And for activities that happen consistently and frequently, creating manual maps is not efficient as it leads to significant amounts of rework. In order to develop a communication plan for so many projects across multiple districts and multiple years, a GIS based application that maintains location information for proposed capital projects would help create a tool that could be used to communicate to other communities and agencies on proposed capital projects. Cal Water has developed a few draft versions of that proposed application but significant development is still needed to make a consolidate application that has all of the information needed to effectively communicate planned projects within a community. There are also opportunities to provide this same level of information to customers.

One proposed solution is a Capital Project Dashboard application that maps the proposed projects along with their proposed budgets. A draft of this is shown below; however, one missing component of this is the spatial location of the projects and the integration with project information from Powerplan and MSPO.

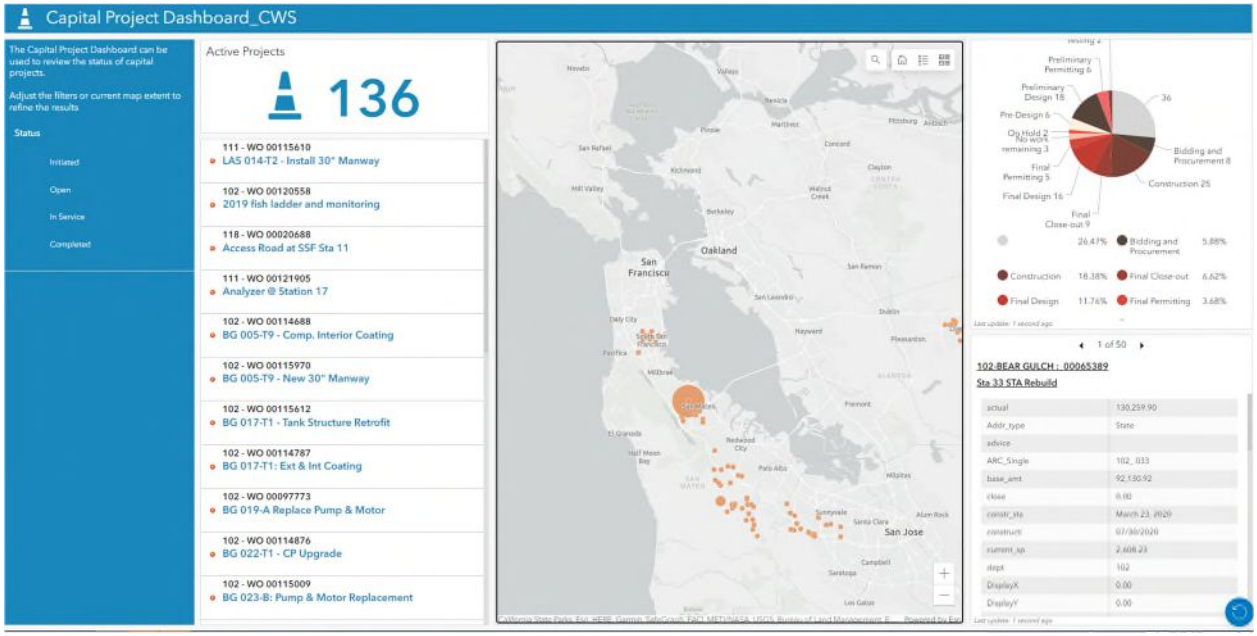


Figure 1 - Capital Project Dashboard

A draft Capital Planning application was developed to show how multiple types of projects may be performed in the same area. The intent was to identify project conflicts and synergies. However, this application did not have the integration to project data from Powerplan or MSPO and required manual updating to provide the location information.

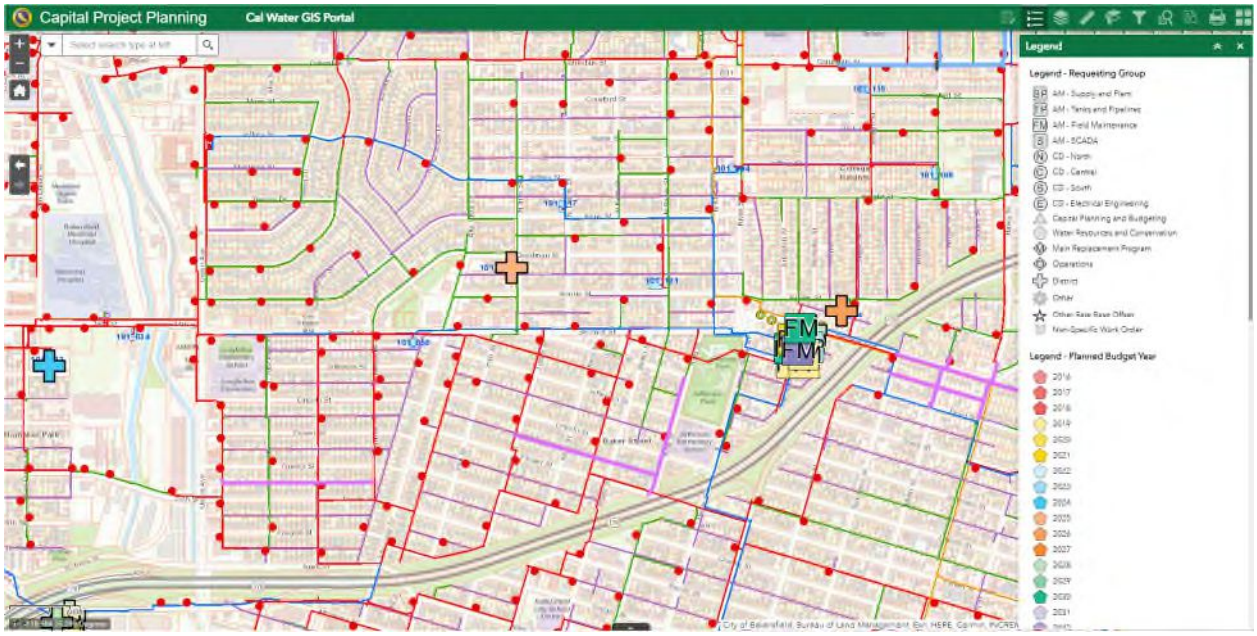


Figure 2 - Capital Project Planning Draft Application

Below is the Main Replacement Program Project Redlining tool. This application identifies high risk mains that should be replaced and allows for users to map proposed projects and assign them to a future budget year. However, this application does not integrate with Powerplan or MSPO.

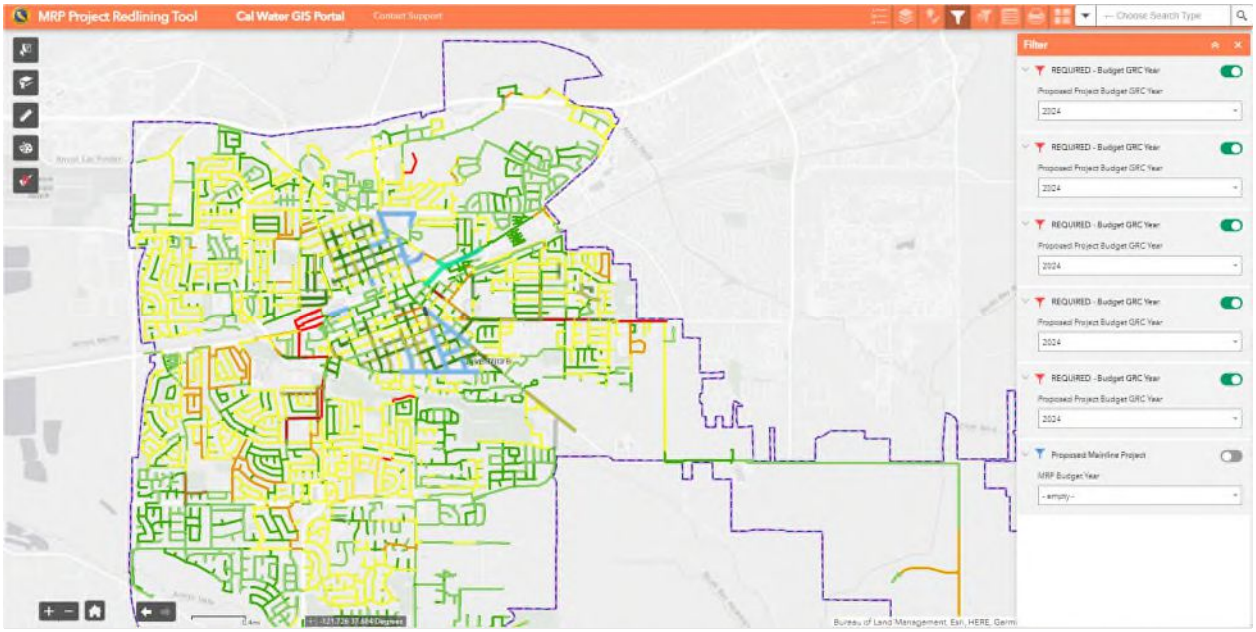


Figure 3 - Main Replacement Redlining Tool

Below is Cal Water's Water Quality Dashboard. This was not developed to provide maps of proposed Capital Projects but rather a method for identifying future capital needs based on treatment requirements or pending water quality regulations. This application did integrate data from the Laboratory Information Management System (LIMS) with the GIS data demonstrating the value of the combined data in one common application.

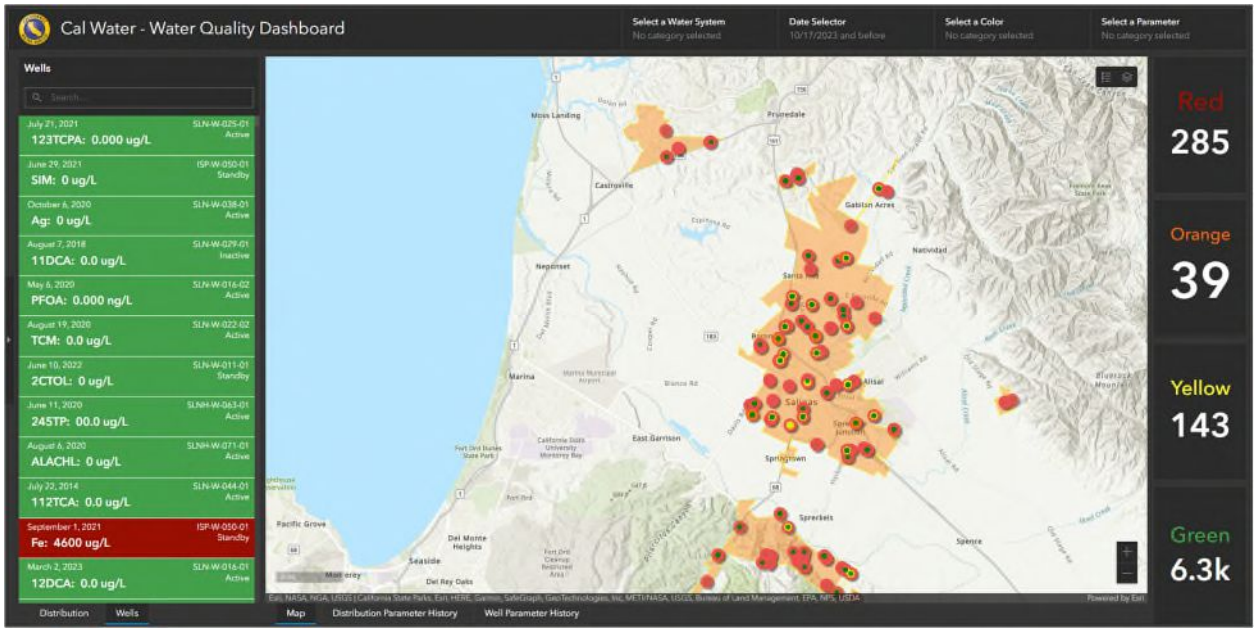


Figure 4 - Water Quality Dashboard Application

Cal Water will frequently have to deal with emergency situations. These include wildfires, power outages, floods, storms, and even civil unrest. Cal Water has built different mapping tools that allow for intelligence gathering during some of these events; however, they are focused only on wildfires or floods and gathering that data from external sources. What is lacking is the ability for users to add information to the mapping application including locating portable resources, personnel, operational data, issues, and tasks.

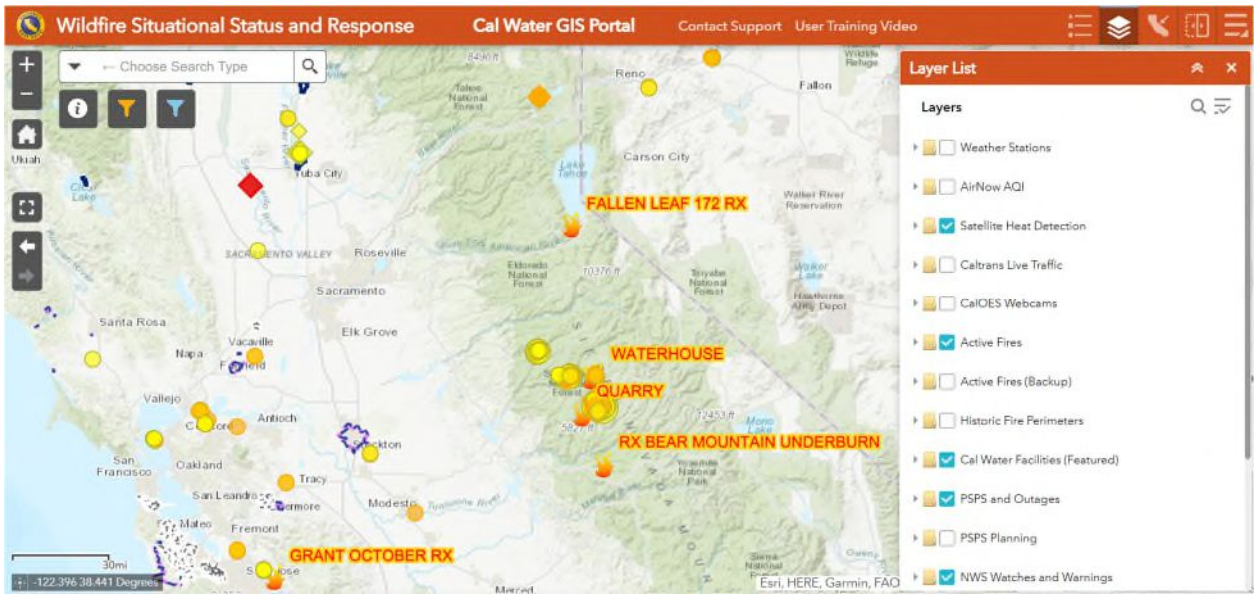


Figure 5 - Wildfire Situational Status Application

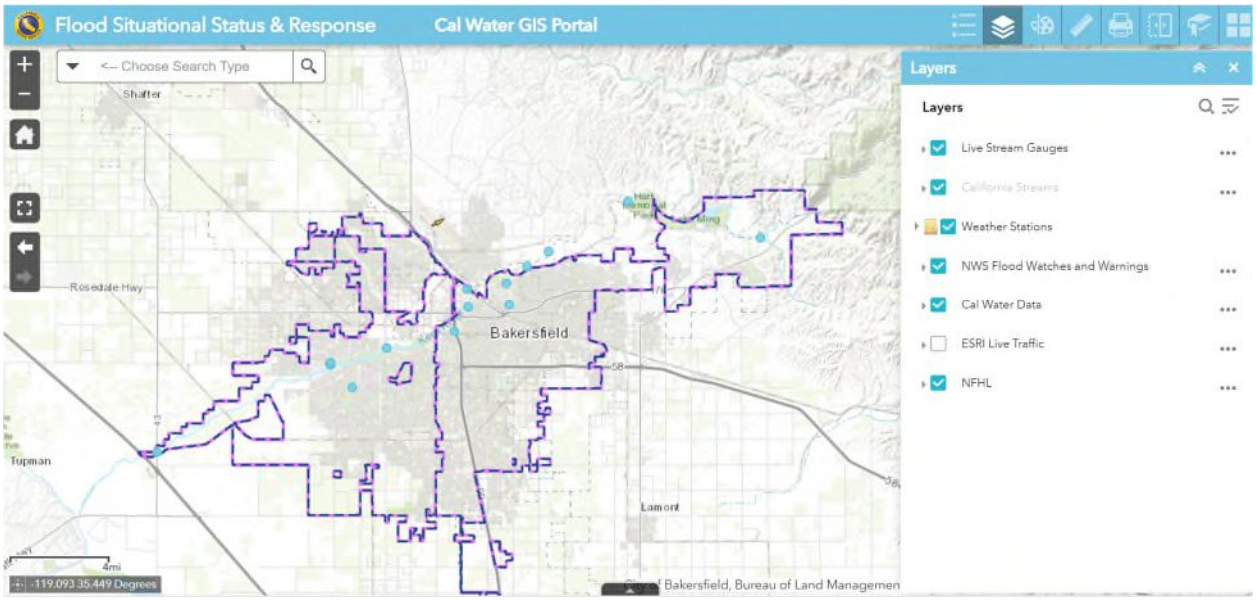


Figure 6 - Flood Situational Status Application

Alternative Analysis

Alternative 1: Application to leverage data sourced from multiple sources

Cal Water recommends building a series of applications using its GIS data, integrating that data with specific data sources, and presenting that data to the entire organization as well as external partners and customers. These applications include:

- GPS data portal application where internal users who are performing data capture can upload their data, assign it to the appropriate asset, and then extract that data tied to the asset in the future for tasks such as underground utility locating and design work.

- Capital planning application where internal users can map future capital projects, identify opportunities to consolidate projects into larger but more efficient projects, and communicate those projects to external partners and customers.

- Emergency event management application where we can consolidate external data (such as wildfire boundaries and weather) with internal data (such as operational data from the SCADA system, asset data, and LIMS) to better manage operations during emergencies. This application may integrate with the proposed EOC application or be enhancements to that application.

Alternative 2: Do Nothing

Cal Water can continue to manage its operations with the single purpose applications that it has developed; however, there are requests from our internal customers and goals that we have to do better in communicating with outside agencies that are not going to be fulfilled. There is a significant opportunity to enhance the management of our GPS data in order for it to provide better business value in the future for tasks such as locating of underground facilities and designing new systems.

Recommended Solution –

Alternate 1: Application to leverage data sourced from multiple sources

Build a series of applications integrating data with specific data sources that can be used across the entire organization to make strategic operational decisions, improve communications to internally and externally to customers and organizations.

Project Summary

Cal Water will work with an outside developer that is familiar with GIS and ESRI's products to build these three applications. There may be some hardware purchase as well to roll out the GPS data capture to any remaining districts that do not have the correct hardware.

Project Attachments

- Attachment A – Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. : 132800
Description GIS Modernization
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2027
Prepared By: vpadisala
Date Initiated: 11/07/2023
Base Year: 2023
Sub-Total: $750,000
Direct Cost: $807,826

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
GIS UPGRADES	[EA]	1	$750,000.00	$750,000.00	Engineers Estimate

Sub-total = $750,000.00
Direct Cost = $807,825.61

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

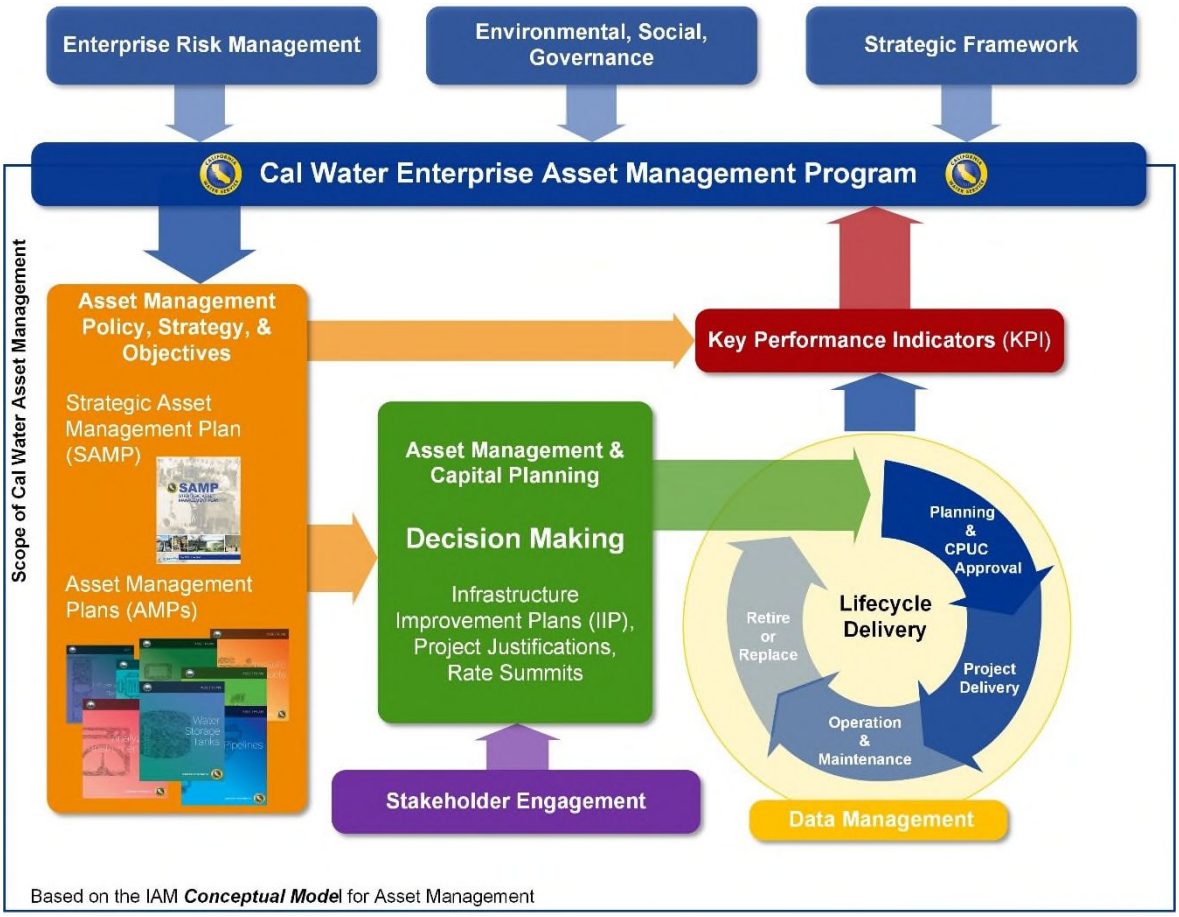
CSS – Information Technology

PID # 00132801
EAM Decision Support

Introduction

Cal Water manages over 700 different pumping stations, 6000 miles of water main, 2000 control valves, 400 backup generators, and 1200 pumps. Each of these assets have a different life expectancy and every asset has been installed at a different time. As such it is difficult to manage proposed replacement and reinvestment projects to maintain these assets to the lowest lifecycle cost while maintaining a minimum level of service and within risk tolerance. Cal Water is proposing to build a software system that helps track the age of assets and prioritize reinvestment at the right time to maintain levels of service, minimizing risk without over-investment, and trying to manage total lifecycle costs to the customers.

Cal Water's strategic vision for asset management is shown graphically below.



Key performance indicators will be used to guide asset replacement and reinvestment. Out of those indicators, Cal Water will need to prioritize what reinvestment is required in order to improve on any KPI that is outside of the target range. Not everything within a water system can

be boiled down to a simple KPI and as such there is some oversight and input from stakeholders that is required in order to manage the operation of each water system. This process requires keeping track of all of the assets and their function within the water system, the criticality of those assets, the condition of every asset, and the age of the assets to manage the necessary replacements and reinvestments in the water system.

Deficiencies and Issues

The current process of planning for asset replacement and reinvestment in the water system involves hundreds of people within the organization who spend a significant amount of time preparing a list of projects based on the best information available to them at the time. The process to collect information is time consuming so often the information is limited to what is readily available. This can lead to decision making on project priorities based on personal opinion of a few knowledgeable people. While there needs to be a method for gathering input from stakeholders as no system can address every aspect of operating a water system, having consistent data on all assets will lead to better decision making on priorities. Project priorities should be based on the likelihood of failure for an asset, the consequence of failure of that asset, the long-term plan for the facility, and the investment required to maintain the level of service required for that system.

Alternative Analysis

Alternative 1: Implement software to establish a decision support system

Cal Water will purchase and implement software tailored towards Decision Support functionality that will meet the desired business requirements. Also the application selected should be able to integrate with current applications and data sources.

Alternative 2: Develop decision support system using existing office tools

There are no existing internal tools that exactly match the requirements of a decision support system. One could theoretically develop this using Excel; however, when managing multiple systems, tens of thousands of assets, thousands of miles of pipeline, and thousands of stations, a single spreadsheet application is unwieldy. This then tends to breakdown into spreadsheets getting passed from one user to another which ultimately leads to errors as documents are passed and worked on by multiple people. There are online tools to help manage multiple users but there is not a good system for bringing all of the different asset types of data from different systems into one single spreadsheet. This would then result in a lot of custom data extraction to bring the data into a spreadsheet that would still lead to errors as data is passed from one person to another. This process will eventually devolve into the same approach that Cal Water is currently working through and would lead to no efficiency gains.

Alternative 3: Develop custom application using ArcGIS and Maximo

Any decision support system should help Cal Water prioritize reinvestment projects across the major asset groups. This should at a minimum include the largest asset classes including pipelines, wells, tanks, pumps and motors, MCCs, and control valves. Currently the asset data for these assets is housed in two separate systems, ArcGIS and Maximo. Some integration between the two systems would be required in order to use either one as the primary tool in the decision support system or custom applications for both ArcGIS and Maximo would be needed

in order to duplicate the decision support functionality in both systems. Rather than duplicate development effort in both environments and the heavy integration between the two systems, Cal Water proposes to use an off the shelf product that already integrates with both environments.

Alternative 4: Do Nothing

Cal Water could continue to manage its capital program using the same methods it currently employs; however, that continues to grow in terms of the level of time and effort from internal resources and leads to delays in completing other work, including capital investment in the water system. This still requires a significant effort from internal resources and an extensive amount of outside resources to help with writing and managing project justifications and cost estimates. Cal Water anticipates spending more than $4 million on outside consultant resources to help develop the 2024 capital program and justifications and that does not include the internal labor.

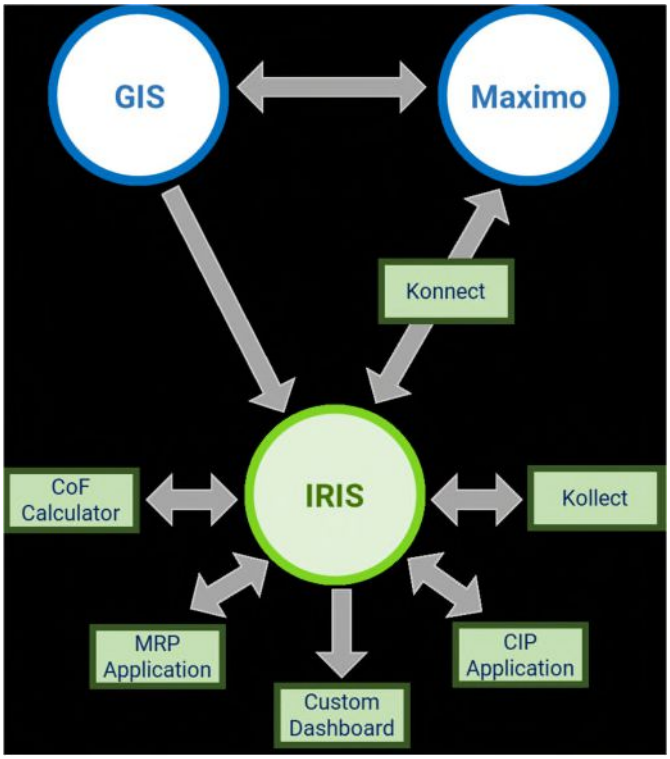
Recommended Solution–

Alternative 1: Implement software to establish a decision support system

Cal Water recommends purchasing IRIS from Kayuga Solutions. The IRIS product integrates with ArcGIS and Maximo. Additionally, Kayuga Solutions has helped Cal Water develop its Strategic Asset Management Plan as well as its asset plans for its major asset groups. Kayuga has already begun the process of working with Cal Water on the decision support system design as part of our planning effort on the 2024 GRC; however, due to timing and turnover, Cal Water elected to defer the implementation of the DSS to the 2027 rate case cycle and to put into the capital plan for the 2024 GRC cycle the necessary tools.

Kayuga has assessed the design of the system that would work best for Cal Water. To greatly simplify and improve the data collection and recording efficiency, Kayuga is proposing the development of a custom application (Kollect) in iOS that specifically meets Cal Water's business processes and to fully integrate with IRIS and other information management systems.

In order for Cal Water asset management to be dynamic and sustainable, the asset management information system must be integrated to allow data to be shared across the different information systems. The proposed Cal Water Asset Management Information System (AMIS) architecture is illustrated below. GIS provides locational information about the linear assets (e.g., pipes, valves, hydrants) while Maximo captures vertical assets (e.g., motors, pumps, generators, MCCs) and records work activities performed on both linear and vertical assets. Both GIS and Maximo will need to link with IRIS to predictively plan for future asset replacements. GIS provides an Application Program Interface (API) IRIS can use to communicate with GIS. IRIS will need to utilize Konnect, Kayuga's middleware, to connect with Maximo and other data sources. The Kollect handheld application will provide continuous condition data updates from field investigations. Using the latest condition data from Kollect, replacement and rehabilitation data from Maximo, and geographic and asset attribute information from GIS, IRIS will be able to help plan for and optimize Cal Water's future CIP needs. The dynamic nature of the proposed Cal Water AMIS architecture will continuously provide the latest MRP analysis and CIPs



IRIS Overview

IRIS is primarily a dashboarding tool that allows the capital planning recommendations to be visually identified. IRIS has a dedicated database configured within the Microsoft Azure environment. During the initial configuration, each of the database tables, lookups, and graphic themes are customized to suit Cal Water data. These initial configurations include catalog setup (asset classification, types, size, etc.), asset statuses, measurement, alias (connection to system of records), and map interface. Major component configuration includes asset register, replacement cost, management strategy, BRE, and long-range R&R projection. IRIS obtains data from other databases including maximo, excel, GIS, and other databases that are used to collect information in the field.

Figure 4.4 Cal Water IRIS Homepage

The asset register establishes the data foundation of the asset management program by consolidating and documenting all assets owned and managed by Cal Water.

Each asset in the asset register is assigned a replacement cost which estimates the budget required to replace the asset with a like, in-kind asset. This replacement cost includes only the direct cost consisting of design, permitting, material, labor, and contingency. Overhead and other additional cost factors (AFUDC) are not included with the estimated replacement costs.

Every asset in the asset registry is assigned a management strategy that characterizes the life-cycle behavior of an asset (e.g., how it will decay, how long it will last, necessary rehabilitation during the life of the asset, when rehabilitation is needed, how much rehabilitation will cost).

Figure 4-4 illustrates the relationship between asset condition, management activities, and lifecycle cost. After the installation, asset condition will decrease with time. To raise the condition to an acceptable level, an investment in the form of maintenance or rehabilitation is required. Eventually, at the end of its useful life, the asset will need to be replaced and the cycle will repeat.

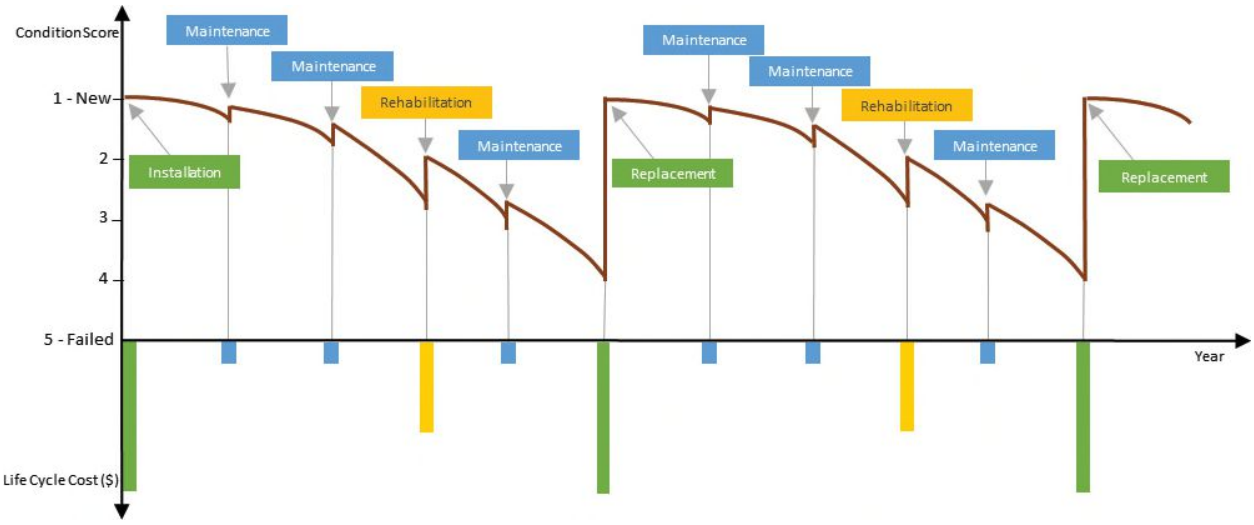
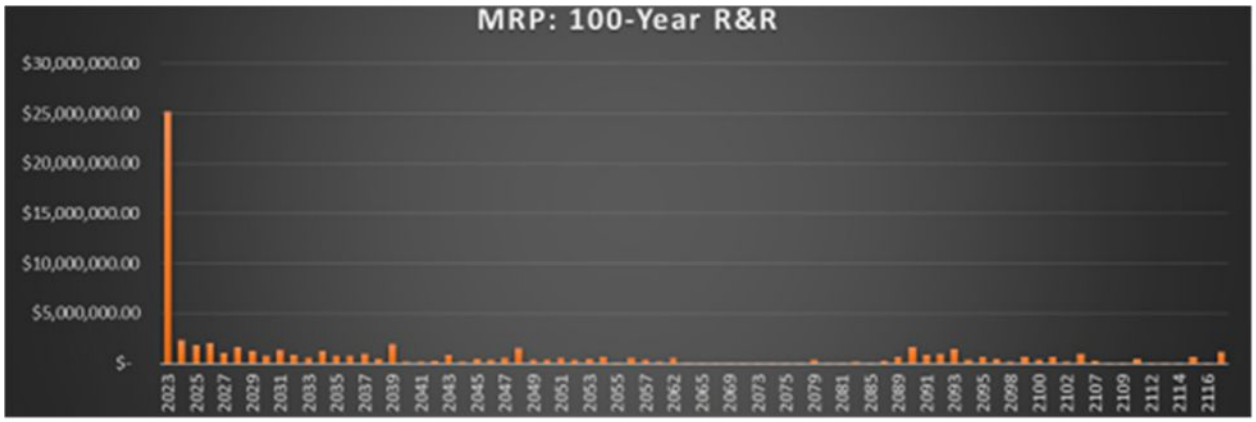


Figure 4.5 Management Strategy for Assets

IRIS generates the long-range replacement profile for estimated future R&R financial needs based on the life cycle cost analysis. Every year, those assets requiring investment are identified and summed to generate the replacement profile. The timing of asset replacement is calculated based on asset probability of failure which will depend on asset attributes (e.g., asset class, size, material). The probability of failure is calculated using an assumed decay curve recommended by consultant engineers. Figure 4-5 is a graphic that illustrates an initial 100-year planning horizon R&R projection for water main replacement.



Project Summary

IRIS Enterprise Implementation

IRIS implementation tasks include the following one-time activities:

- Set up Cal Water IRIS database with capacity to house assets from all districts
- Set up asset catalog based on standard asset classifications provided by Cal Water
- Set up management strategies utilizing standard management strategy provided by Cal Water (i.e., Asset Plans)
- Set up cost database using standard unit cost provided by Cal Water
- Set up map interface. Cal Water will provide one GIS layer per feature type (i.e., point, polyline, polygon) for all districts. Coordinate with Cal Water IT on security policy
- Set up standard user roles, user groups, and access level. The minimum access roles include the following:
    - Admin: full access to all IRIS modules with read, write, and delete privileges
    - General User: access to some of IRIS modules with read and write privileges
    - Read Only: access to some of IRIS modules with read only privilege

The following IRIS implementation tasks will be repeated for each district:

- Set up asset hierarchy utilizing Cal Water standard asset hierarchy.
- Upload asset data. Cal Water will provide Maximo and GIS data in excel format.
- Assign standard management strategy to all assets
- Assign standard cost for all assets
- Upload BRE data (PoF & CoF). Cal Water will provide raw PoF and CoF score data.
- Set up user login and roles
- Perform user access test
- Perform functionality test to ensure all IRIS features working as designed

IRIS - Maximo Integration with Konnect

Tasks associated with setting up Konnect include the following:

- Functionality workshop with Cal Water Maximo team to discuss interface tables, touch points, validation rules, etc.
- Customize Konnect based on functionality requirements
- Design user interface (GUI)
- Set up user roles, user groups, and access levels
- Perform user access test
- Perform functionality test (connection with Maximo)
- Deploy Konnect into IRIS production

- Troubleshooting support
- Develop user guide

IRIS Field Application (Kollect)

Tasks associated with setting up Kollect include the following:

- Review current condition data collection processes and technology and understand gaps
- Identify data fields to be utilized during the data collection process
- Develop data collection framework
- Create database tables
- Design user interface (GUI)
- Develop application in iOS (Apple mobile operating system)
- Develop API to connect application with IRIS
- Set up user roles, user groups, and access levels
- Perform user access test
- Perform functionality test
- Deploy Kollect into IRIS production
- Troubleshooting support
- Develop user guide

IRIS Business Risk Exposure (BRE) Calculator

Tasks associated with development of BRE Calculator are provided below:

- Review Cal Water SAMP and Asset Plans
- Create BRE database tables
- Design user interface (GUI)
- Set up PoF and CoF criteria
- Set up user roles, user groups, and access levels
- Perform user access test
- Perform functionality test
- Deploy BRE Calculator in IRIS
- Troubleshooting support
- Develop user guide

IRIS Custom Dashboard

Tasks associated with development of Custom Dashboard are provided below:

- Identify standard metrics to display in Dashboard
- Create database tables
- Design user interface (GUI)
- Design custom tables and figures
- Set up user roles, user groups, and access levels
- Perform user access test
- Perform functionality test
- Deploy Dashboard into IRIS production
- Troubleshooting support

IRIS Main Replacement Program (MRP) Application

Tasks associated with development of MRP Application are provided below:

- Design database schema
- Design user interface (GUI)
- Develop MRP Application API
- Program API connectivity with IRIS
- Develop query and data filters
- Develop simulation model utilizing main break formula, pipe age, pipe material, pipe replacement cost, annual budget, and LOS target
- Design output tables and figures
- Set up user roles, user groups, and access levels
- Perform user access test
- Perform functionality test
- Deploy MRP application into IRIS production
- Troubleshooting support
- Develop user guide

IRIS CIP Planning Application

Tasks associated with development of CIP Application are provided below:

- Design database schema
- Design user interface (GUI)

- Develop CIP Planning Application API
- Program API connectivity with IRIS
- Develop query and data filters
- Develop automated management strategy activity update based on new project time line
- Design output tables and figures
- Set up user roles, user groups, and access levels
- Perform user access test
- Perform functionality test
- Deploy CIP Planning application into IRIS production
- Troubleshooting support
- Developer user guide

IRIS User Training

Tasks associated with user training are provided below:

- General training: IRIS overview, how to access, navigate, and extract data and modelling results from IRIS database
- Role-based training:
    - Field staff: IRIS refresher, IRIS Manage module (navigation, filters, download and upload, record condition assessment, etc.)
    - CIP planning group: IRIS refresher, IRIS Plan module (navigation, filters, output tables and graphs, download results)
- Application specific training: focuses on one custom application (e.g., BRE Calculator, Custom Dashboard, or MRP Application).

Project Attachments

- Attachment A – Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. : 132801
Description EAM Decision support
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2027
Prepared By: vpadisala
Date Initiated: 11/07/2023
Base Year: 2023
Sub-Total: $750,000
Direct Cost: $807,826

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
EAM DECISON SUPPORT SYSTEM	[EA]	1	$750,000.00	$750,000.00	Engineers Estimate

Sub-total = $750,000.00
Direct Cost = $807,825.61

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

CSS – Information Technology

PID # 00132802
LIMS Upgrade

Introduction

Cal Water uses the Laboratory Information Management System (LIMS) from LabVantage version 8.3, with the latest version available from LabVantage being 8.6. This application assists in the management of sample schedules, results, and quality control data for drinking water samples in all our districts in California. It also generates work orders for each sample needing collection and maintains an audit trail of the life cycle of the sample within the lab, while the chain of custody documents the transfer of custody of the sample in the field. When the sample is received by the lab, it is analyzed, and results are recorded within LIMS. All data within the LIMS application is used to generate reports that are submitted to various state departments to comply with water testing regulations.

Deficiencies and Issues

When LabVantage's LIMS 8.3 was released, it was built to provide direct support for the Business Objects reporting tool. The current version we are using is now on a reduced support model as of March 2022.

The reporting software supported by LIMS 8.3 uses Business Objects, which has since been acquired by SAP. In order to stay up to date with support and security patches, it would require an upgrade of the business object software and reports server. Cal Water would like to move away from the dependency of Business Objects and use other reporting tools supported by LabVantage such as Jaspersoft and/or Cal Water's enterprise-wide reporting tools such as Power BI.

In addition, there are new features that would benefit the Water Quality department, such as a mobile application, improved notifications and monitoring, a SaaS subscription model, and built- in dashboard reporting.

Alternative Analysis

To address the deficiencies identified, the following alternatives were analyzed:

Alternative 1: Upgrade LabVantage LIMS application

Cal Water recommends keeping the LIMS application up to date with future versions to allow for the intake of new features, improved performance and up to date security controls provided. LabVantage is now offering a Software as a Service (SaaS) platform, which has inherent benefits in terms of maintaining the application, such as regular patches/updates and decreased server maintenance.

Migrate reports from current reporting tool to new reporting tool supported by the upgraded version of LIMS.

Alternative 2: Replace LabVantage LIMS Application

Initiate a Response For Proposal (RFP), identifying desired functionality for a new LIMS application. Select desired application and vendor, and implement application.

Alternative 3: Do Nothing

Cal Water will not upgrade their LIMS application and retain the current version and wait to upgrade our LIMS application until the 2027 General Rate Case

Recommended Solution

Alternative 1: Upgrade LabVantage LIMS application

Cal Water recommends keeping the LIMS application up to date with the current version to allow for the intake of new features, improved performance and up to date security controls provided.

In addition, Cal Water recommends migrating reports from the current reporting tool to new reporting tool supported by the upgraded version of LIMS

Project Attachments

- Attachment A – Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. :	132802
Description	LIMS Upgrade
District / Department:	CSS
Project Start Date:	01/01/2025
Project Completion Date:	12/31/2027
Prepared By:	vpadisala
Date Initiated:	11/07/2023
Base Year:	2023
Sub-Total:	$400,000
Direct Cost:	$430,840

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
LIMS UPGRADE	[EA]	1	$400,000.00	$400,000.00	Engineers Estimate

Sub-total =	$400,000.00
Direct Cost =	$430,840.25

Notes:

1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs

2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate

3. See Common Plant Book for additional details on cost estimating methodology and justification

Description	Source	Hourly Rate	Total Hours [Hrs]	2024	2025	2026	Total
Professional Consulting Services – Implementation	LabVantage Solutions, Inc	$237.50	304		$66,500		$66,500
Professional Consulting Services – Reports Migration (70 Reports / $3500 per report)	Winwire				$245,000		$245,000
Internal labor effort		$135.00	350		$47,250		$47,250
			Sub-totals				**$358,750.00**
Contingency	Contingency (10%)						$35,875.00
Grand Totals							**$394,625.00**

CSS – Information Technology

PID # 00132815
Digital Twin Ops Optimization

Introduction

Efficiently treating water in California is not an easy task, as plants are required to handle variable supply and demand driven by rapidly changing source water events. This situation is complicated by numerous manual processes and lack of instrumentation, meaning operators must perform strongly based on their training and experience. Cal Water personnel perform effectively but there is an opportunity to augment their efforts through investments in technology, resulting in stronger knowledge management and operations optimization.

A Digital Twin can provide a high-fidelity virtual replica of existing operations, allowing management to model unique scenarios, run simulations, create data visualizations and refine the accuracy of calculations. It enables humans to 'see inside' the physical systems that run their production lines, pump stations, facilities and can be a powerful enabler for decision making. Digital Twins enable use cases ranging from operation optimizations, remote management, augmented management (remote SME, onsite worker), and – potentially – high fidelity simulations of plausible future scenarios. The opportunity will be for Cal Water to strengthen the trust among the public, as it would demonstrate the company's commitment to innovation, sustainability, and environmental stewardship. As an organization that handles one of the scarcest resources in the state, this is imperative to long-term success.

The value that the creation of a Digital Twin brings to Cal Water can be categorized by improved water quality due to optimization of operation, stronger operator performance via a shared platform that enables collaboration, knowledge redundancy, and remote control and standardization. This results in improved internal compliance, efficiency, and retention, more effective compliance with regulations and greater alignment with ESG goals, greater satisfaction among customers due to improved quality and lower frequency & potential impact of public health incidents. Reference Attachment C for more extensive Digital Twin value propositions.

Deficiencies and Issues

Cal Water is currently using a combination of manual and automated instrumentation within the larger scale water treatment systems to measure turbidity levels to provide appropriate levels of clean water to its service connections, and data is tracked through the AVEVA PI platform. Areas configured with instrumentation can be tracked at a granular level (down to every 15 seconds) and allow for trend analysis and modification. However, each district has levels of variability and manual or limited tracking that do not allow for forecasting or predictive modelling. Lack of information and analysis results in delays in decision making, potential for increased cost across operations, and loss of water within the treatment process:

- Training the Trainees - While a T2 Operator Trainee is acting as an apprentice primarily during the 12-month training period, regulators require a certified shift operator or chief operator for oversight.

- Preparing for Weather Events - When extreme weather leads to spiking and/or elevated turbidity levels, operators may be required to change chemical drawdowns more frequently, in a more urgent time setting (the norm being ~30 minutes), and with less reliable data from past scenarios to rely upon.

- Setting operating parameters at static settings are effective for most of the treatment plant time online, but may not be optimized for changing conditions, leading to either" false" (preemptive) alarms or shutdowns occurring after water quality has been compromised (extremely rare but theoretically possible).

- Finding (the time to find) Efficiencies - Operators are required via regulations to manually conduct hours of testing on critical equipment each day, which, while critical, take them away from proactively considering process improvements and upcoming maintenance.

- Maintenance (Expected & Unexpected) - maintenance may require scheduled downtime, but unexpected failures mean contingency plans being put into place, which may take hours to launch.

- Documentation & Integration - Many reports are filled out manually and some are handwritten, meaning that information may not be added to data systems (which can be used for future operational planning).

Alternative Analysis

To address deficiencies identified, the following alternatives were analyzed:

Alternative 1: Do Nothing

The Do Nothing alternative would result in Cal Water continuing with the current chemical coagulant operations for the large-scale treatment plants, such as the plants in the Bakersfield, Oroville and Lucerne districts. The operators would continue adding the manually estimated amounts of chemical to incoming raw water with higher risk of a plant shut-down due to incorrect dosage level and until the chemical mix can be optimized or turbidity levels decrease. This plant shutdown risk also increases when the correct coagulant introduction must take place in a narrow window (usually 30 minutes) when turbidity spikes. Plant shutdown reduces full utilization and constrains the use of treated water for customer supply.

Alternative 2: Implement Digital Twin for Operations Optimization

Implement a Digital Twin in the larger scale treatment plants, such as in the Bakersfield, Lucerne and Oroville districts, for improving operational processes and decision making for the operators at those water treatment plants that would result in reduced plant shut down time (i.e. increased plant utilization) and operational efficiency.

The estimated direct cost without factors to implement this Digital Twin project is $972,000.

Recommended Solution

Alternative 2

The value that the creation of a Digital Twin brings to Cal Water can be categorized by:

- Improved water quality due to optimization of operations.
- Stronger operator performance via shared platform that enables collaboration, knowledge redundancy, remote control, and standardization, resulting in improved compliance, efficiency, and retention.
- More effective compliance with regulations and greater alignment with ESG goals.
- Greater satisfaction among customers due to improved quality and lower frequency & potential impact of public health incidents.

We believe Cal Water will benefit from building a Digital Twin for Bakersfield and other major water treatment plants within the Cal Water portfolio. Our recommendation is to implement a Digital Twin and build it out using both AVEVA tools / systems with custom integrations and visualizations with selected communication service providers (e.g., AWS) to automate network management and provisioning for maximum efficiency, leverage cloud-hosted custom reporting and data analytics for executive / observer use, and add cloud-hosted virtual reality capabilities to facilitate advanced user training and remote operational observations.

Project Summary

A Digital Twin will enable Cal Water to realize five types of value: improved water quality (measured by turbidity & chemical contact time ratios), operator spatial awareness & improved performance, compliance with state regulations, and higher satisfaction among customers. Reference Attachment D for more extensive Digital Twin path forward details.

The Digital Twin will most immediately improve coagulant operations. Today, adding the appropriate types and amounts of chemical to incoming water is a mix of art and science, often requiring the presence of a T5 Operator to oversee plant operators execute the process. Furthermore, the treatment must take place in a narrow window (usually 30 minutes) when turbidity spikes; if coagulant is not added correctly, the plant must shut down until the chemical mix can be optimized or turbidity levels decrease.

Other benefits would be higher quality water, less water lost, less water purchased from other sources, freed up personnel hours to concentrate on more strategic issues, and less danger to operators (as sampling often requires operators to traverse outside the plant to draw water manually).

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Digital Twin Projected Value and Impact Matrix
- Attachment C – Digital Twin Path Forward for Cal Water

Attachment A

Capital Project Cost Estimate

Project No. : 132815
Description Digital Twin Ops Optimization
District / Department: CSS
Project Start Date: 01/06/2025
Project Completion Date: 12/11/2026
Prepared By: jcollazo
Date Initiated: 11/07/2023
Base Year: 2023
Sub-Total: $1,069,200
Direct Cost: $1,137,370

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
CONTINGENCY - 10%	[EA]	1	$97,200.00	$97,200.00	Engineers Estimate
DIGITAL TWIN SYSTEM IMPLEMENTATION	[EA]	1	$972,000.00	$972,000.00	Engineers Estimate

Sub-total = $1,069,200.00
Direct Cost = $1,137,369.84

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Water Treatment Plant Digital Twin Proof-of-Value (PoV)

DEC '23 / California Water Service Group

Quality. Service. Value.®

BUSINESS NEED

Cal Water is looking to build a next-generation Digital Twin to help manage their water treatment process. They are embarking on an ambitious path to bring existing instrumentation capabilities, along with new measurement functionality, into a common, live data set visualized in a spatially relevant 3D model of - initially - a single use case within a single water treatment plant. This capability will serve as the basis for future expansion into other use cases and additional water treatment plants managed by Cal Water. This new platform is initially expected to assist Cal Water with more effectively leveraging their T-5 operator expertise and delivering more tangible value to their operational teams, with the potential for future use cases to support virtual training, deeper operational insights, and potential cost savings (out of scope for this PoV).

To address these needs, Slalom proposes a milestone-oriented value-creation approach to create an initial, non-production Digital Twin Proof-of-Value (PoV) of one or two relevant use cases for a single water treatment plant in partnership with AVEVA (for instrumentation / edge integration) and Microsoft's Azure / GEMS team (for data management / visualization).

HOW

- Two distinct, yet coordinated, teams will collaborate to define one or two relevant use cases for the Digital Twin PoV and create the initial capability.
- Path A [AVEVA]: Collaborate with Path B team on instrumentation and edge integration requirements for selected use case(s). EXCLUDED FROM COSTS SHOWN.
- Path B [Slalom]: Lead the overall program, define use case(s), PoV Reference Architecture, and PoV visualizations.

WHAT

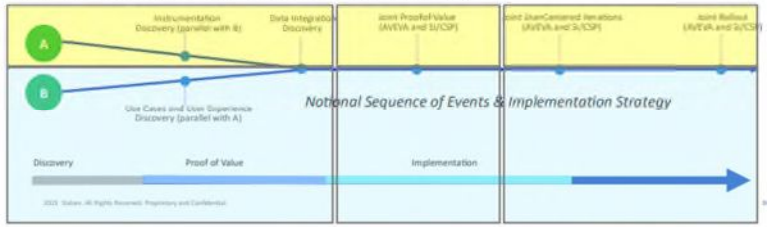
- Path A [AVEVA]: Instrumentation discovery and edge platform integration within the existing IPC / AVEVA infrastructure.
- Path B [Slalom + MSFT / GEMS]: Use case, data and visualization discovery in partnership with Path A team and CalWater program team.
- Path B team is expected to provide program-level coordination of milestone scheduling, requirements gathering, etc. in support of the non-production PoV.

OUTCOME

- Implementation of a, executable, non-production digital twin PoV showcasing data ingest and spatially-relevant visualizations for a selected use case(s) related to one water treatment plant.
- Documented baseline Reference Architecture (RA) for current state and planned future state.
- Documented roadmap for scaling the use case(s) to more water treatment plants.

APPROACH

- Build upon **existing AVEVA platform** (including SCADA / historian data), expand systems integration capabilities where appropriate, and incorporate additional instrumentation for operational use
- Supplement AVEVA with **cloud-hosted custom reporting and spatially relevant data analytics** to assist operators with decision making, and support future-state simulations
- Potential to **add cloud-hosted virtual reality capabilities** to help capture experienced operator know-how, support remote operational collaboration, and facilitate advanced user training



Represents the notional milestone and roadmap focus of this non-production PoV and exclude scale-up.

IMPORTANT NOTE: Path A estimates / costs are expected to be separately managed / contracted.

ASSUMPTIONS

- Slalom will have access to all needed documentation representing current and planned requirements
- Client resources and subject matter experts will be available as needed
- Activities will be based on to-be identified high priority items and are subject to change. Path A / AVEVA work is NOT included in any staffing / pricing estimates and is provided as a notional placeholder for TBD work.
- This estimate only addresses the initial PoV, and not a scaled-up and production-ready MVP or beyond

SLALOM TEAM ROLES (1 - 3 FTE's for technical roles)

- Program Manager (PT)
- Solution Owner / BA (FTE)
- Exp. Design Lead (FTE -> PT)
- Software Engineering Lead (FTE)
- Data Engineering / ML Lead (FTE)
- Viz / Game Engine Lead (FTE)
- Data / Analytics / ML Engineer (FTE)
- Software Engineer (FTE)
- IoT SME's (PT)
- DevOps SME's (PT)
- Executive Team SME's (PT)

INVESTMENT

Connect Workshops
- Team size: Small Team
- Timeframe: ~1 week
- Investment: $30K

Roadmap/ Implementation Alignment
- Team size: Mid-Sized Team
- Timeframe: ~ 3 weeks
- Investment: ~$102K

PoV Co-Create
- Team Size: Mid-Sized / Larger Team
- Timeframe: ~4 Months(*)
- Investment: ~$840K (*)

slalom

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Andy King
Technical Director
Andy.King@slalom.com

(*) = Pricing estimates are approximate and represent Rough Orders of Magnitude costing for this engagement.

Collaboration Opportunity. Digital Twin

We view the following steps as a plausible path forward in building out a Digital Twins ecosystem for Cal Water. Here's are DRAFT Suggestion for a Plausible Path Forward.

Milestone A - CONNECT

(~1 Week)

- Workshop on further use case definition to partner with Slalom and potentially other collaborators
- Choose 1 use case to move forward to design next phase (Phase 1)
- *Approx. $30K**

Milestone B - ALIGN

(~3 Weeks)

- Alignment on approach and design for roadmap and implementation
- Pre - work reference architecture and potential light weight POC
- Feasibility of use cases
- Understanding data points, integration needs, etc.
- *Approx. $102K**

Phase 2 - PoV

(~4 Months)

- Phase 0+1 (required)
- Proof of Value (non-production)
- Spin up capabilities within Azure and/or other COTS platform environment
- Show 1 example of art of the possible for 1 use case
- *Approx. $840K**

Phase 3 - BUILD

(6 Months - 2 Years)

- *Not included in this estimate - but called out as a placeholder for future collaboration and potential productionalization*

**** Pricing estimates are approximate and represent Rough Orders of Magnitude costing for this engagement.***

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Attachment B

Projected Value & Impact

A DT will enable Cal Water to realize **five types of value**: improved water quality (measured by turbidity & chemical contact time ratios), operator spatial awareness & improved performance, tangible financial savings, compliance with state regulations, and higher satisfaction among customers. These are all aligned with Cal Water's corporate goals of **Quality, Service, Value**

Identified Use Case	Water Quality	Operator Spatial Awareness	Financial Savings / Efficiency	Compliance	Customer Experience
Improving Chemical Operations	• Reduce turbidity and chemical contact time of treated water at Bakersfield and another 9 plants throughout the state resulting in [illegible]	• Optimize jar testing in timing and calibration of chemical mix • Reduced operator error during drawdowns • Increased notice time for chemical vendors	• Fewer alarms -> less overtime • More efficient use of chemicals (i.e., less waste) • Analog -> Digital reporting enables capture of historical data	• Lower risk of compromised water quality requiring public notification	• Improved water quality • Lower the risk of delivering "bad" water to customers, resulting in boiling notices or litigation
Reducing Water Loss			• Minimize water lost to discharge, sludge, and sewage, increasing treated yield • Drive efficiencies in repair & maintenance	• Establish more effective compliance with state regulations on tracking water volumes	• Mitigation of need for rationing during drought scenarios • Increase in brand equity as ESG goals succeed
Strengthening Training & Integration	• Operators will be better prepared to react properly & more quickly to challenging scenarios while meeting quality parameters	• Remove barriers to advancement • Eliminate tedious textbook study • Create standardization that improves compliance, knowledge management, retention	• Shorten apprenticeship & subsequent supervisor overtime • Improve employee retention	• Allows operators to stay up to date and in compliance on training over time	
Building Plant Resiliency	• Mitigate water quality risk during extreme events (i.e., massive rainfall, temp swings, etc.)	• Better & more highly trained operators minimize frequency of plants going offline • Upskilling & standardization reduces time from bid to fill operator positions	• Reduce need for purchased water • Gain greater leverage & confidence in negotiating "take or pay" contracts		• Lower risk of plants going offline and creating water scarcity
Optimizing Power Generated *(This will complement existing Cal Water initiatives)*		• Refine maintenance schedules so equipment operates at top performance, minimize controlled downtime	• More accurately anticipate power required, reducing waste & overall cost		

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Major Impact Likely | **Significant Impact** | **Medium Impact** | **Small to No Impact**

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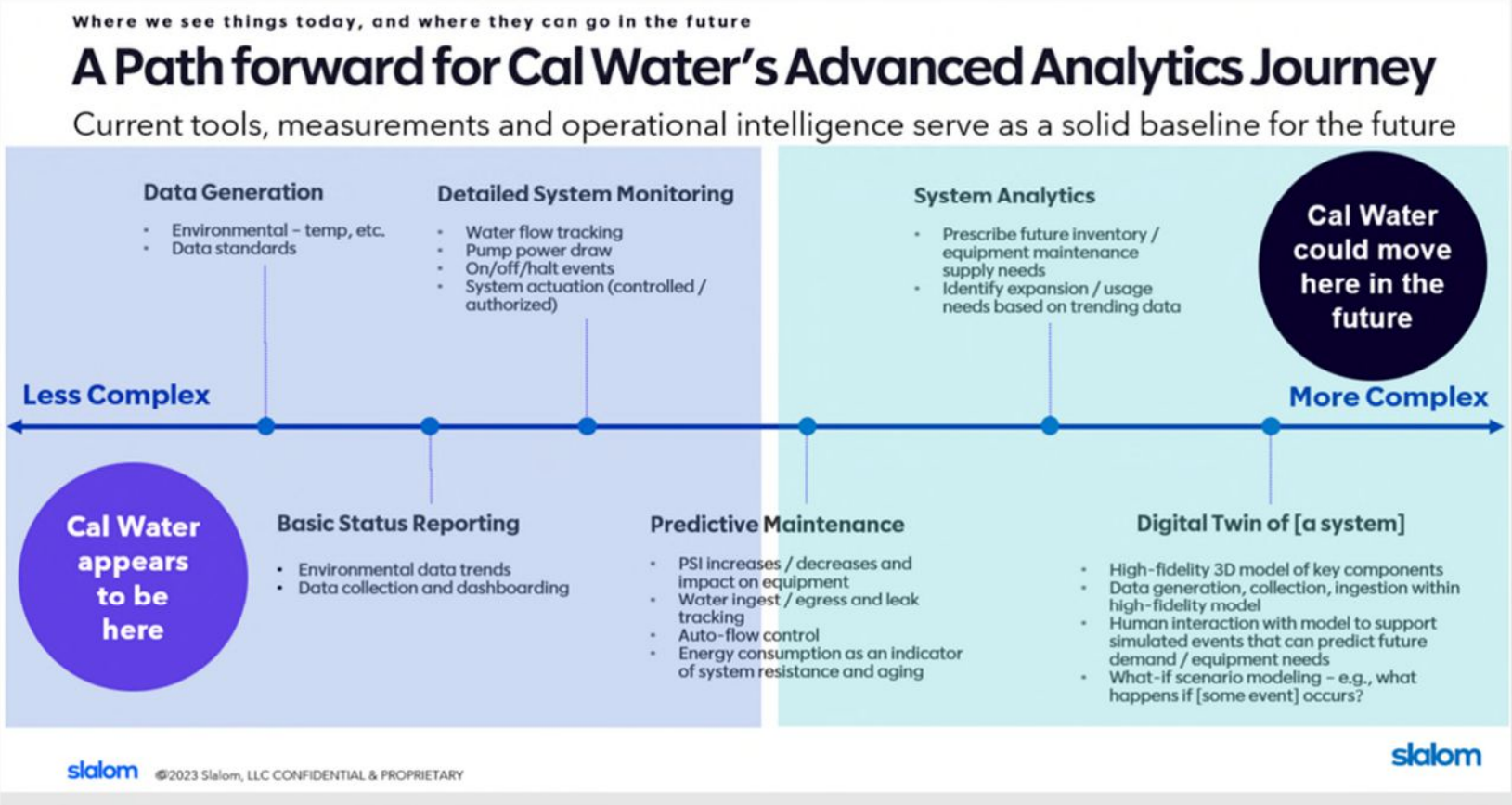
Attachment C



CSS – Information Technology

PID # 00132890

BT – Power Tax Upgrade

Introduction

PowerPlan is the dominant system used by utilities that allows the Company to do depreciation studies, tax depreciation and deferred tax, while providing analysis tools.

PowerPlan is releasing Tax Fixed Assets cloud subscription software. This module will include Tax Depreciation, Deferred Taxes, and Book Depreciation Allocation. The current Power Tax Version 2022.2 is the last version being offered on premise as part of Cal waters current PowerPlan software package. The end of defect and standard maintenance support ends Q4 2025.

The Tax Fixed Assets cloud user interface will improve the user experience with increased functionality, validation, and reporting.

- User-first design to improve the process of getting expert results.
- Built-in controls help you spot and address issues early.
- Scenario modeling enables spot-on tax planning and forecasting.

Cal Water relies on Power Plan's tax features to stay compliant for storing and calculating accurate tax depreciation. Cal Water relies on the data housed in PowerPlan for Tax and GAAP (Generally Accepted Accounting Principles) reporting to the IRS and SEC. This project also allows Cal Water to comply with the changes in corporate federal income tax regulations and resulting SEC financial reporting regulations.

Deficiencies and Issues

Cal Water has over $3B in plant assets. Tax Fixed Assets helps to track the book-to-tax reconciliation, tax depreciation and asset-related deferred taxes. With continuous business acquisitions, PowerTax integrates directly from PowerPlan's fixed asset data and can transfer the newly acquired fixed assets from PowerPlan to PowerTax seamlessly. It has a module with the ability to set up the net tax value and vintage years for tax purposes which are different from the normal plant records. The deferred tax not only tracks the deferred tax assets for all plant assets but also the TCJA tax benefits. The tax team can easily pull the deferred tax assets data that are needed for financial and IRS tax audits. We also use PowerTax for tax depreciation Form 4562 on the federal tax return. The benefits described above are not currently available with Cal Water's existing platforms.

Alternative Analysis

Alternative 1: Hire an outside consulting company.

Hiring an outside company to support PowerPlan is an option. This option comes with the following risks:

- Product security and system defect updates from PowerPlan would be excluded.
- Tax regulations updates from PowerPlan would be excluded.
- Any updates made by the consultant would not be supported by PowerPlan in any future updates tax regulation updates.
- Before completing any upgrades to the software Cal Water would be required to bring the system up to date at an additional cost from PowerPlan.
- PowerPlan support is required for any interfaces to the new Tax Fixed Assets cloud software for Tax Depreciation, Deferred Taxes, and Book Depreciation Allocation.

Alternative 2: Do Nothing

The Do Nothing alternative involves putting the company at great risk for the following reasons:

- Security updates on the software and servers
- Federal and state tax reporting would be at risk.
    - This could result in increased audit costs.
    - This could also result in fines.

Recommended Solution

Implement the Tax Fixed Assets cloud user interface. The work would include Accounting Dept resources, IT Dept resources, Power Plan Consultants, and E&Y consultants.

Project start date is January 1, 2025, and the project will be completed in August 2025.

Description	GRC Estimate	Expense
Subscription	-	191,160.00
Training		10,000.00
PowerPlan Consulting	198,000	
PowerPlan Consulting Travel	21,600	
Internal Resource	80,400	

Total	300,000	201,160

Project Summary

The PowerPlan upgrade is required to stay current with tax law compliance that can impact regulated operations. Cal Water risks being out of compliance and the current version will not be supported if it doesn't start an upgrade to complete in 2025. The classic version of the PowerTax module will be supported through 2024, and then Cal Water will need to use the improved cloud version Tax Fixed Assets.

This project is for the implementation of "Tax Fixed Assets" PowerPlan recommended package including the following:

- TFA migration planning
- Data migration
- TFA functional configuration
- Calculation benchmarking with results documentation
- Integration to Classic Fixed Assets
- Validation Support
- Go-live support
- Walking Tour
- TFA Instructor-led end user class

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – PowerPlan TFA Intro and PowerTax EOL presentation

Attachment A

Capital Project Cost Estimate

Project No. : 132890
Description PowerPlan Tax Module Upgrade
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2027
Prepared By: vpadisala
Date Initiated: 11/14/2023
Base Year: 2023
Sub-Total: $300,000
Direct Cost: $323,130

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
POWERTAX UPGRADE	[EA]	1	$300,000.00	$300,000.00	Engineers Estimate

Sub-total = $300,000.00
Direct Cost = $323,130.13

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

SafeHarbor

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The information contained in this document is intended for general informational purposes only and is not a commitment to deliver any material, code or functionality. The information, including but not limited to any statements regarding PowerPlan's strategies, plans, roadmaps, or objectives as they relate to PowerPlan's software or services, is subject to change at any time for any reason at PowerPlan's sole discretion without notice, and PowerPlan disclaims all warranties, express or implied, with respect to the information, including but not limited to any warranties relating to accuracy or completeness. As a result, readers are advised to avoid relying upon the information contained within this document when making any purchasing decisions.

Agenda

- PowerPlan Product Focus Areas
- TFA Product Overview
- PowerTax End of Life Conversation

Industry-leading functionality in a single platform

The depreciation and deferred tax functions teams tell us they need most

Core functionality:	Tax Depreciation	Deferred Taxes	Book Depreciation Allocation
Future planning:	Multi-Scenario Tracking	Forecasted Tax Rates	Flexible Data Import
Tools for tax reform:	ADIT True Up/Reverse South Georgia (RSG) Record Creation	Excess Deferred Tax Tracking by Tax Event	

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Beyond features and functions

Thoughtful, innovative design supports both users and business outcomes

User-first design means you don't have to be a tax expert to get expert results

- Clean, intuitive interface eases adoption and appeals to all generations of users
- In-platform "First Use" guides and Knowledgebase articles make it easy to onboard users

Built-in controls help you spot and address issues early

- Embedded data validations find and flag reconciliation and data quality issues before processing
- Embedded calculations remove guesswork, surface essential information quickly and give you complete confidence in your results

Scenario modeling enables spot-on tax planning and forecasting

- Advanced case functionality helps you maximize deductions
- Help you better manage cash flow and optimize income statement

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SaaS delivery puts innovation in your hands

Cloud-based hosting and deployment keeps you on the leading edge

- Centrally hosted by PowerPlan
- Regular release cadence eliminates the need for costly, time-consuming upgrades
- Has best practices built right in, eliminating costly, time-consuming customizations
- Designed to the highest security standards and audited semiannually for SOC (Security Operations Center) compliance
- Vastly simplifies the migration process

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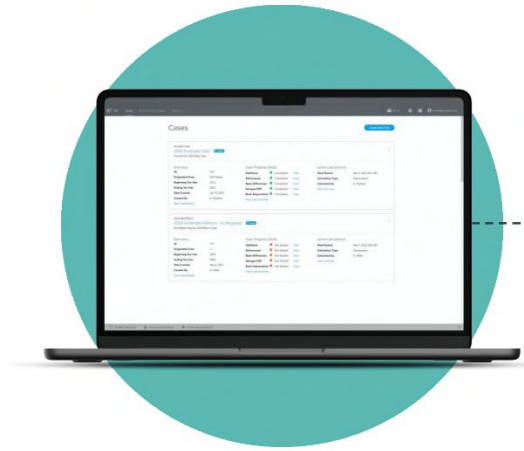
Key Features and Functions



- **Built-in reporting** unlocks the power of your data
- **First-use explanations** orient new users immediately
- **Built-in Knowledgebase** saves users time and steps
- **See key information** on your most important cases
- **View the exact status** of activities within a case
- **Grid view** lets you see, filter, and sort all your assets
- **Quickly get confident** in your deferred tax data
- **Get a clear snapshot** of your calculation results
- **Data validations** identify problems early

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How Tax Fixed Assets was created

Builds on 20+ years of tax innovation, with users involved at each step

50+	4	30+	25+
Discovery calls	Beta clients	User testing sessions	Clients contributing to product development

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PowerTax End of Life Milestones

POWERPLAN

PowerTax End of Life

Sunset Milestones and Timelines

Date	Milestone	Description
Q4 2022	**PowerTax Version 2022.2*** is the last version of PowerTax.	From the general availability of this version, we will uphold a 36 months maintenance support window.
Q4 2025	**PowerTax 2022.2 is End of Defect. Standard Maintenance Support Ends** for PowerTax 2022.2.	This date represents the end of fixes/defect resolution via release or patch for 2022.2.
Q4 2025 To Q4 2027	**PowerTax Sustaining Support** will be offered for PowerTax v2021 or greater.	For a fee, reasonable efforts will be made to resolve issues and provide work arounds.
Dec 31, 2027	**PowerTax 2022.2 is End of Life.** Sustaining Support Ends.	On this date, we cease to support the module in-full, including any sustaining support offered as the last phase of software deprecation.

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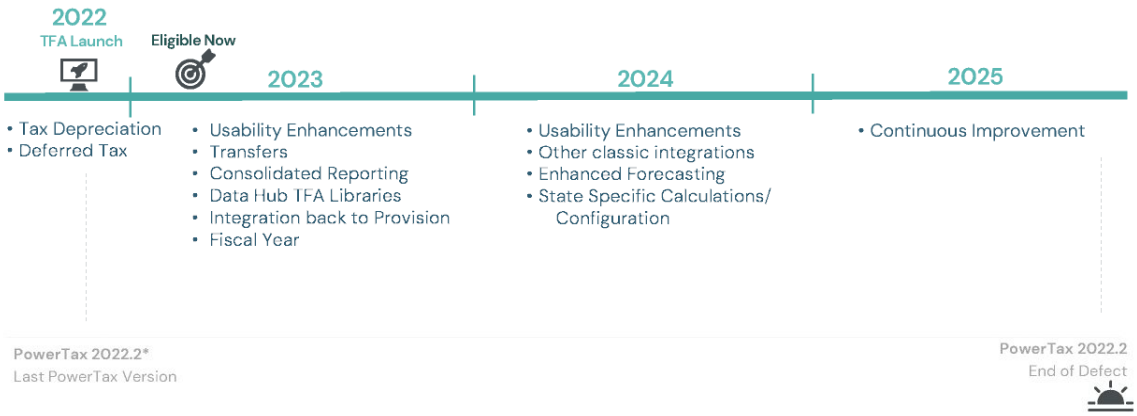
What does this mean for you…?



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Information Technology Dept 376

PID # 00133714

Workforce Mgt & Integrations

Introduction

As a water service provider, California Water Service is part of the 16 critical infrastructure sectors identified by the federal Cybersecurity and Infrastructure Security Agency (Department of Homeland Security). The Agency has classified the assets, systems and networks of these sectors as vital to the United States.

Cal Water manages over $3.3 billion of Utility Depreciable Plant and Equipment to provide clean and safe water to our customers located in 26 districts throughout the State of California. The assets include pipes, valves, tanks, pumps, wells, hydrants, treatment facilities, instrumentation, electrical panel boards, meters, etc. They are the physical components of a modern water system that allow the Company to provide reliable and safe water and wastewater services covered under the Critical Infrastructure Sectors.

In 2023, the Company spent approximately $29.8 million to maintain these assets and this amount is expected to increase into the year 2027.

Cal Water has been developing their Asset Management Program for several years and needs to build upon its previous years completed Asset Management projects. The Company and its customers gain incremental value of the overall program after each project completion.

An effective Asset Management Program with good data is important to ensure proper operation of these assets at lowest cost while meeting the required level of service at an acceptable risk. To build and effective program, the utility needs to be able to address the following five core questions based on US EPA and American Water Works Association (AWWA) guidelines:

1. What is the current state of assets?
2. What is the required level of service for the assets?
3. What assets are the most critical and what is the business risk of failure?
4. What is the minimum life-cycle costs of the assets?
5. What is the most effective long-term funding strategy?

Also, the life of an asset and related operating maintenance costs are impacted by the design, selected materials, build, ground/ location conditions, cost and management for a new asset installation or replacement. For the 2024 GRC, Cal Water plans to focus on implementing the mobile work order system to track, monitor and measure the effectiveness of the Main Replacement Program's individual projects from "cradle to grave".

This project will implement solutions based on automation, integration, and digitization of manual processes to further address the ability to track, monitor, measure, and support efforts in particular to the Company's Mainline Replacement Program and Cross Connection Control programs (AB1671) to help advance our Asset Management Program maturity level.

KloudGin is Cal Water's mobile workforce management system and will be the application most impacted by this project in terms of application design, build, test and deploy.

Historically, using the KloudGin workforce management system results in improved field work operations, improves reporting and compliance, reduces paper that ends up in a drawer, and moves data from one application to another, avoiding manual entry a second or third time.

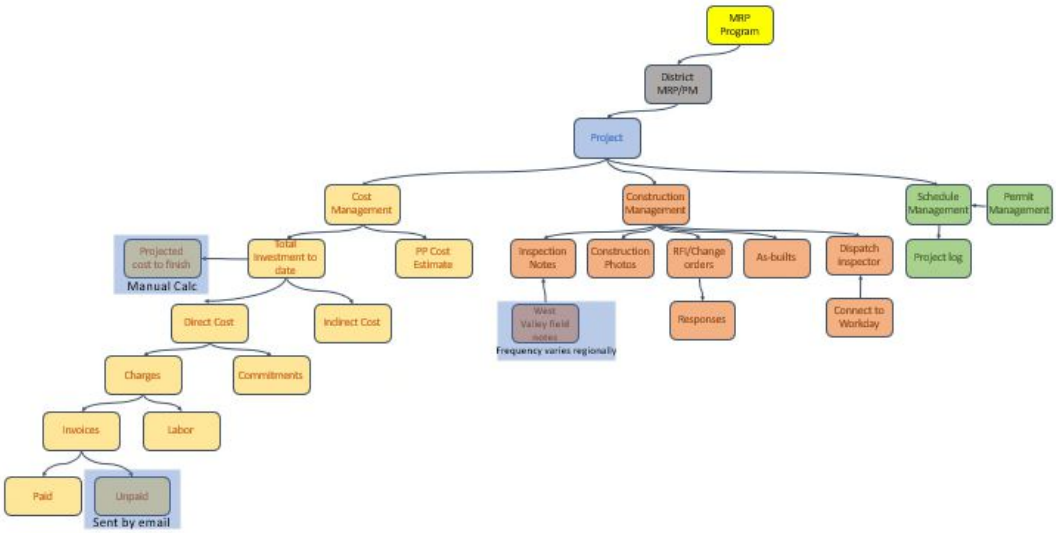
Deficiencies and Issues

For the 2024 GRC, the Company has proposed 225 Main Replacement Program (MRP) projects of approximately $400M to replace 122 miles of mains, laterals, etc. in the years 2025 through 2027. This will be a recurring effort which will continue for the 2027 GRC and beyond.

Currently the Company has no formal work order system in place to track individual or a group of MRP projects from "beginning to end", easily provide activity or milestone status, dispatch MRP work to field crews, list all MRP work order related activities, enter data, pictures, capture costs and activity progress by work order activity. The Company wants to have an MRP work-order system in place for its MRP work in 2027.

Using the Company's existing reporting tools, a combination of PowerPlan, Microsoft Project, PeopleSoft FS, excel, word, PowerPoint, GIS, WorkDay, and manual manipulation and compilation of data, it is difficult for the MRP tools to easily track, monitor, measure, an MRP's project status. The several tools and manual workarounds mentioned above are involved to support MRP with less than desired results.

Please see the below mind map of objectives the MRP leadership team has concerns with and would like to see under one umbrella which a workorder system can provide.



A workorder system can be designed to have tiers that provide the ability to track a main replacement project from its initial inception, inclusion in a Rate Case, master contract initiation, permitting management, construction management, schedule management, estimation and cost management, and activity management for one or more projects via dashboards and reports.

A work-order system will be mobile for field workers and a desktop version for the back office and engineering staff to leverage. Field workers will be able to get the project information they need to successfully complete their activities from other source systems, enter data, and trigger next step activities. Back office and Engineering staff can enter data and or record their time against their activities associated with the project, trigger next steps activities, have the project's data sent to target applications for those application data consumption via integrations.

An example would be a field employee inspects good and services from a third-party construction vendor, enters the approval into the work order and then that approval is sent to PSoft FS accounts payable for a three match so the 3rd party construction vendor can be paid (matching the PO, Receipt and invoice)

This would allow the Company to have an appropriate tool to support the MRP.

For AB1671:

On October 6, 2017, Assembly Bill 1671 was approved and filed. AB 1671 established the following:

- The State Water Resources Control Board (SWRCB) must adopt standards for backflow protection and cross connection control.

- The SWRCB may establish standards for backflow protection and cross-connection control through the adoption of a Cross-Connection Control Policy Handbook (CCCPH),

with the CCCPH not being subject to the requirements of the CA Administrative Procedure Act.

- A public water system (PWS) must implement a cross-connection control program that complies with the standards adopted by the SWRCB.

The SWRCB is scheduled to adopt the CCCPH on December 19, 2023, at the board meeting and the new regulations will go into effect on July 1, 2024. A new requirement with the regulations is that a PWS must submit a cross-connection control plan to the SWRCB for approval. This plan must include how we will meet every requirement in the CCCPH. The biggest change in the CCCPH is that it makes clear that the PWS must perform initial and recurring hazard assessments on all our service connections. The CCCPH also outlines specific information that must be captured in our hazard assessments. Currently, the information we're capturing in KloudGin doesn't meet the AB1671 requirements, and we'll need to make changes to satisfy them. We'll also need a better way to track our progress on the assessments. The CCCPH also requires that failed backflow assemblies be repaired within 30 days, so we'll need a better way to track and report this data in KloudGin.

There are a handful of other changes that will require updates to KloudGin, such as:

- Updating all letter templates to reflect the new regulations.
- We'll need to update what certifications we can accept, which will be dependent on what the SWRCB will accept.
- Currently, we only accept USC-approved backflow assemblies, but the CCCPH will allow other agencies to be accepted.
- User supervisors for recycle water properties should be moved into KloudGin.

Alternative Analysis

To address deficiencies identified above, the following alternatives were analyzed:

Alternative 1: Do Nothing

The Do Nothing alternative is deemed imprudent, does not support the Company's digital transformation effort, nor improve operations and thus not consider further.

Alternative 2: Design, build, test and deploy workorder management system and make cross connection AB1671 upgrades.

This alternative allows Cal Water to continue with its digital transformation efforts, improve operations, and helps support AB1671.

Alternative 3: Design, build, test and deploy workorder management system.

This alternative is a viable solution but addresses only a portion of the deficiencies.

Alternative 4: Make cross connection AB1671 upgrades.

This alternative is a viable solution but addresses only a portion of the deficiencies.

Recommended Solution

Cal Water recommends Alternative 2 as it addresses and removes all deficiencies noted above.

Project Summary

Design, build, test and deploy MRP long run work orders in KloudGin including the entire end to end process and integrations between KloudGin, GIS, PSoft FS, WorkDay, PowerPlan, and Operational Data Management System (ODMS). Create 3rd party vendor portal to exchange information such as dailys, invoices, crewing, good and services provided, etc.

Design, build, test and deploy Cross Connection AB1671 upgrade solution.

Cost Estimates

In support of California Water Service's main replacement program, we propose the implementation of the KloudGin application for the tracking and management of the field work related to the mains and their assets. It is assumed that the planning, budgeting, and estimation aspects of the main replacement program will take place in an existing or non-KloudGin CWS system and the KloudGin application will be leveraged for the management of crews, the scheduling, dispatching, integration (up to two external systems) and mobile completion of related field work for the assets included in this program.

This implementation will take approximately 6 months, plus 4 weeks of hypercare/stabilization post go-live. The estimated budget for this implementation effort is $400,000. The timeline and budget proposed are dependent upon further discussions between CWS and KloudGin to define the requirements, scope, integrations, etc.

As part of regulatory updates and changes for 2024 backflow and cross connection program, changes will be required in the KloudGin application. To support these changes, we would estimate an approximate 2-month implementation timeline with a proposed budget of $50,000. The timeline and budget are subject to change based on final requirements.

Workforce Management Implementation	$400,000
Cross Connection AB1671 upgrade	$50,000
Internal Labor	$50,000
Total:	**$500,000**

Project Attachments

- Attachment A – Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. : 133714
Description Workforce Mgt & Integration
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2027
Prepared By: rstuart
Date Initiated: 01/08/2024
Base Year: 2024
Sub-Total: $500,000
Direct Cost: $538,550

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
KLOUDGIN MOBILE WORKORDERS FOR MRP & CCC	[EA]	1	$500,000.00	$500,000.00	Engineers Estimate

Sub-total = $500,000.00
Direct Cost = $538,550.36

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Section D.

Water Supply and Reliability

District – CSS

PID # 00132957

2025 Urban Water Management Plans

Introduction

Since 1983, the Urban Water Management Plan Act (Act) has required specified California urban water suppliers – those who deliver over 3,000 acre-feet of water annually, or serve more than 3,000 urban connections – to update their UWMPs consistent with Water Code, Sections §10608– 10656. The Urban Water Management Plans (UWMPs) are then submitted to the Department of Water Resources (DWR) where they are reviewed for compliance by DWR staff.

Private water companies with multiple districts, often each with their own unique water supplies, can be particularly challenged to meet the growing requirements within the short timeframe allowed for fulfilling the Act's requirements. The necessary information to update the UWMPs will not be available until the end of January 2026 and the plans are due June 30, 2026, leaving less than 6 months to finalize 24 district plans. Some preparation and public outreach will also be required prior to the data being available. The project will have a start date of January 1, 2025, to allow preparatory work to be accomplished and an end date of September 30, 2026, to send the documents to outside organizations, post documents on the internet, and document lessons learned.

UWMPs have become a primary source that local land use authorities turn to in order to demonstrate long-term water supply availability before approving new, large development projects. UWMP's provide the long term demand forecasts, supply availability, and water shortage contingency plans to help ensure that new developments can be properly evaluated to have enough water supply and to meet the requirements of Senate Bills (SB) 221 and 610. UWMP's also provide direction on changes to water use during periods of drought.

Deficiencies and Issues

California water law requires urban water suppliers of defined size to update their urban water management plans (UWMP) every 5 years. The Water Resources Group requires assistance to update 24 UWMPs within such a short period after the requirements are announced. These plans provide the basis for short term capital planning along with water availability justifications for Will Serve letters, Water Supply Assessments, and future capital projects.

Alternative Analysis

The following alternatives were analyzed:

Alternative 1: Do Nothing

The Do-Nothing option would constrain Cal Water to rely on the existing outdated plans in violation of the California Water Code Division 6 Part 2.6. Urban Water Management Planning, Section 10610, cited as the "Urban Water Management Planning Act."

Additionally, without the updated UWMPs, cities and counties may not be able to secure government grants.

Finally, without updated plans with new water demand forecasts and supply capability, local cities and counties would not be able to evaluate if new developments have enough water supply per the requirements of Senate Bills (SB) 221 and 610.

Alternative 2: In-House Development

Though the plans could theoretically be completed in-house, given the quantity of plans, the available in-house staff, and the late release of the new UWMP requirements, completing all 24 plans in the allotted time would likely result in reduced information or quality in each plan, and may not meet State reporting requirements for every district.

Alternative 3: Outside Consultant

The utilization of outside consultants can provide a range of benefits, including:

- Access to Specialized Expertise
- Objectivity and Unbiased Perspective
- Efficient Use of Resources
- Accelerated Project Completion for 24 unique plans
- Impartial Guidance and Decision Support
- Access to Best Practices and Industry Trends
- Implementation Support and Change Management
- Cost-Effectiveness

Recommended Solution

Cal Water proposes to use an outside consultant to review, update, coordinate public hearings in the Districts, provide customer outreach, document public comments, and publish the final plans for all Cal Water districts.

Project Summary

The scope of work includes the following tasks:

- Document design and formatting
- Development of plan content and data for 24 different water service areas
- Data quality control and assurance

- Preparation of draft plans
- Communication and coordination with Cal Water staff, DWR, and other third-parties
- Public outreach and corporate communications
- Preparation of final plans
- Plan submittal.

Project Attachments

- Attachment A – Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. : 132957
Description 2025 UWMP Development
District / Department: CSS
Project Start Date: 07/01/2025
Project Completion Date: 08/01/2026
Prepared By: mbolzow ski
Date Initiated: 11/21/2023
Base Year: 2023
Sub-Total: $908,850
Direct Cost: $968,501

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
CONSULTANT REPORT	[EA]	1	$776,227.20	$776,227.20	Cost Catalog
CONTIGENCY	[EA]	1	$82,622.72	$82,622.72	Additional Factors
CWS ENG LABOR	[EA]	1	$50,000.00	$50,000.00	Labor SKU

Sub-total = $908,849.92
Direct Cost = $968,501.32

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

District – CSS

PID# 00132963

Climate Change Action Plan

Introduction

In January 2016, Gary Fiske and Associates and Balance Hydrologics developed a report for Cal Water entitled "Potential Climate Change Impacts on the Water Supplies of California Water Service". This document reported the results of an initial study of how future climate change could affect supplies available to Cal Water to serve customer demands. The study (1) estimated potential climate change impacts for 14 Cal Water Districts, (2) projected temperature and precipitation for early, mid, and late 21st century, and (3) used these projections to analyze impacts for local surface water and groundwater supplies. While the study broke new methodological ground and several innovative approaches were developed, the project's resource constraints together with data limitations constrained the level of analysis.

Along with outside consultants (ICF, Pathways Climate Institute and Carollo Engineers), Cal Water developed its "Climate Change Water Resource Monitoring and Adaptation Plan" in December 2020. This document provided a baseline understanding of changes to climate and included three primary areas of review: (1) Literature and tools related to adaptation planning by water suppliers and other relevant organizations, (2) Methods and data in "Potential Climate Change Impacts on the Water Supplies of California Water Service", and (3) Climate change impact assessments and adaptation plans beyond Cal Water (wholesalers, state agencies) that could affect Cal Water's vulnerability or adaptive capacity.

The "Potential Climate Impacts on the Water Supplies of California Water Service" and "Climate Change Water Resource Monitoring and Adaption Plan" formed the foundation for the subsequent work, "Climate Change Risk Assessment and Adaptation Framework" (Framework) which was completed in December 2021 and considered climate-related risks and opportunities over three distinct time horizons:

- The early century horizon (2020-2049) includes near-term vulnerabilities and adaptation measures to consider for immediate implementation.
- The mid-century horizon (2035-2064) covers longer-term capital investments, such as new facilities constructed after the lifespan of the current infrastructure.
- The late-century horizon (2070-2099) evaluates long-term adaptation pathways.

Climate projections for each time horizon were averaged to account for natural climate variability across shorter periods. We also followed guidance from the Intergovernmental Panel on Climate Change (IPCC) to leverage Representative Concentration Pathways for a range of possible climate futures.

The Framework identifies and prioritizes climate-driven risks to Cal Water facilities, operations, and water supply portfolio while also projecting and assessing changes to water supply and

demand. This analysis will allow us to more effectively develop adaptation strategies that reduce the impact of climate change on our operations, prioritize infrastructure investments that increase resiliency, and monitor and address risks to disadvantaged and vulnerable communities.

The Framework developed the following steps for future work: (1) Prioritize top risks, (2) Evaluate how adaptation strategies apply to various climate scenarios, (3) Assess the viability of proposed opportunities to reduce risk, (4) Coordinate recommended actions with other planned capital or maintenance work, and (5) Develop project implementation plans for the short-, medium-, and long-term time horizons.

Deficiencies and Issues

“California’s Fourth Climate Change Assessment” recognizes the current and future impacts of climate change and states:

”California is one of the most ‘climate-challenged’ regions of North America; it’s historical climate is extremely variable, and climate change is making extreme conditions more frequent and severe. California’s temperatures are already warming, heat waves are more frequent, and precipitation continues to be highly variable. Since its Third Climate Change Assessment in 2012, California has experienced several of the most extreme natural events in its recorded history: a severe drought from 2012-2016, an almost non-existent Sierra Nevada winter snowpack in 2014-2015, increasingly large and severe wildfires, and back-to-back years of the warmest average temperatures.”

It goes on to say “We must…prepare for the continued acceleration of climate impacts in the future.”Cal Water mustaddress vulnerabilities exacerbated by climate change to continue to provide a reliable water supply and meet demands .

Alternative Analysis

The following alternatives were analyzed:

Alternative 1: Do Nothing

Cal Water could wait for additional requirements for climate change analysis to be detailed in regulations or official guidance materials, such as the Commission’s Order Instituting Rulemaking to Consider Strategies and Guidance for Climate Change Adaptation (R.18-04-019). R.18-04-019 recognizes that “Robust climate adaptation planning in a time of worsening climate impacts is a prudent next step to ensure the safety and reliability of all investor-owned public utilities.” but, unfortunately, has not provided guidance for water utilities. Given this lack of guidance, and the identified climate impacts, it is necessary to complete focused assessments and site-specific evaluations that can be efficiently and effectively implemented in order to continue providing a reliable water supply.

Alternative 2: In-House Development

Cal Water could rely solely on its limited in-house technical expertise. However, these resources are (1) not sufficient or appropriate to perform the comprehensive analysis necessary to evaluate climate-driven impacts and (2) already dedicated to other critical

activities within Cal Water. . It would also be inefficient for Cal Water to hire additional specialized resources necessary to support this effort.

Recommended Solution

Cal Water proposes to use outside consultants to provide technical support to conduct focused site-specific evaluations and develop adaptation responses as they relate to identified climate change impacts.

Project Summary

In order to develop a robust climate change adaptation response, the consultant is anticipated to perform the below, and related, tasks to evaluate adaptation options for effective and efficient implementation):

1. Initiate robust adaptation planning using the developed framework.

2. Refine asset vulnerabilities by cataloging local asset characteristics through site specific evaluations. This can support adaptation strategy development for individual assets.

3. Re-evaluate climate vulnerability and risk as new climate projections or datasets become available to identify additional system stressors and adaptation needs.

4. Conduct focused assessment (e.g., stress testing) of top risks from this assessment and their respective adaptation strategies. We recommend developing a pilot study for specific hazards in a single district.

5. In conjunction with the above, define metrics for conducting performance evaluation under climate change for key risks and refine metrics for exposure based on asset design and attributes.

6. Consider approaches to integrating downscaled climate projections into resource reliability planning.

7. Prepare a plan for engagement with disadvantaged vulnerable communities identified in this assessment to prioritize and address vulnerabilities within Cal Water's locus of control.

Project Attachments

- Attachment A – Cost Estimate

- Attachment B – "California Water Service Climate Change Risk Assessment & Adaptation Framework" - Executive Summary

Attachment A

Capital Project Cost Estimate

Project No. : 132963
Description CSS Climate Change Study - 2025
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2027
Prepared By: jlam
Date Initiated: 11/21/2023
Base Year: 2023
Sub-Total: $413,380
Direct Cost: $445,252

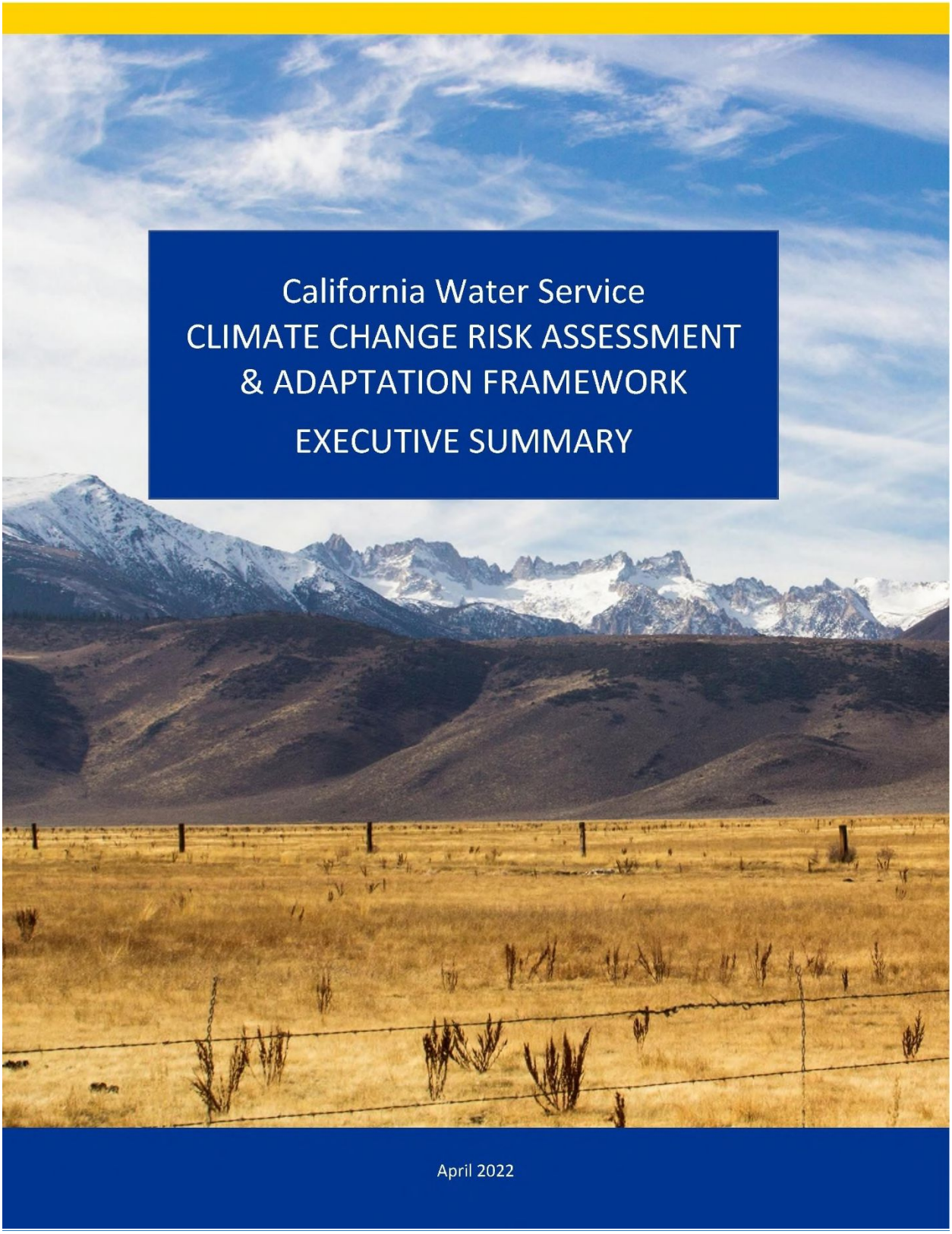
Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
ENG CONSULTANT	[EA]	1	$325,800.00	$325,800.00	Cost Catalog
LABOR	[EA]	1	$50,000.00	$50,000.00	Labor SKU
OTHER	[EA]	1	$37,580.00	$37,580.00	Engineer's Estimate

Sub-total = $413,380.00
Direct Cost = $445,251.99

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B



Background and Purpose

Climate change poses a risk to the reliability and resilience of essential services, such as the provision of safe and affordable water. California Water Service already faces climate risks — wildfire, increasing temperatures, sea level rise, flooding, and drought — and seeks to address these risks by identifying them and taking action.

This current Study is an expansion of Cal Water's 2016 Study *Potential Climate Change Impacts on the Water Supplies of California Water Service.* In December 2020, Cal Water completed Phase 1 of this project. The resulting *Climate Change-Water Resource Monitoring and Adaptation Plan* provides a baseline understanding of changes to climate in areas relevant to Cal Water's system. In Phase 2 of this project, *Climate Change Risk Assessment & Adaptation Framework,* Cal Water conducted a Study to (1) identify and prioritize climate-driven risks to Cal Water's supply reliability, operations, and assets, and (2) project and assess changes to the supply of and demand for Cal Water resources.

This Study is intended to assist in understanding climate change risk across all Cal Water's districts, spanning its future supply availability as well as its key operations and assets. The Study identifies primary risks to Cal Water across all districts as well as the top risks to individual districts.

Using this Study and the Adaptation Framework, Cal Water can continuously monitor and address the following:

- Immediate risks given near-term threat and low risk tolerance
- Actions to take when a trigger is reached (e.g., when information becomes available or there is external opportunity for an adaptation strategy)
- District-specific risks requiring targeted management attention
- Risks to disadvantaged and vulnerable communities

Policy Context

Various state agencies have, and are expected to, develop requirements for water utilities to incorporate climate change adaptation into their planning and operations, including conducting vulnerability assessments as a starting point. This Study is designed to address requirements of these policies. These policy frameworks and requirements include:

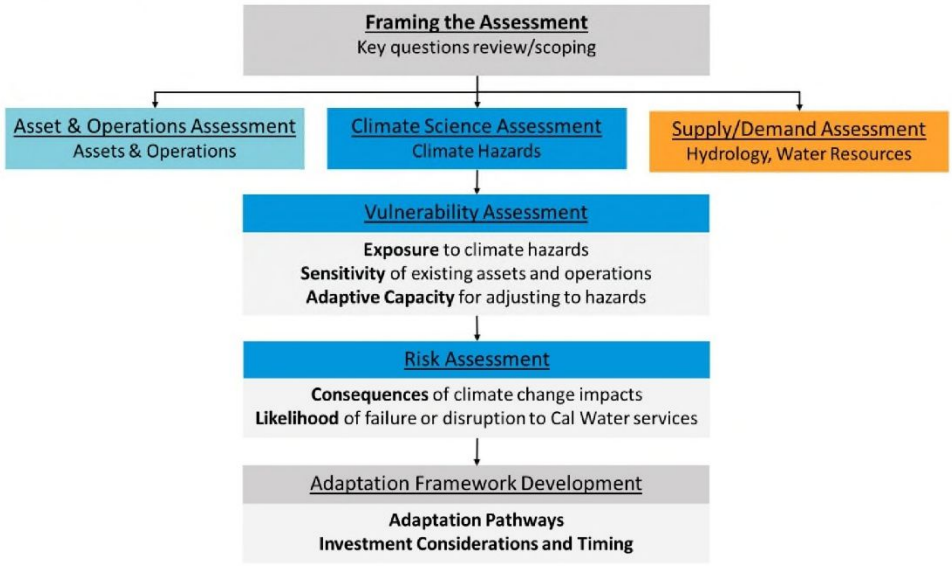
1. The California Public Utilities Commission (CPUC) Order Instituting Rulemaking (OIR) R.18-04-019 to Consider Strategies and Guidance for Climate Change Adaptation (2020). The deadline for finalizing requirements for Phase II, expected to apply to water utilities, has been extended to December 2022.
2. The California Coastal Commission (CCC) Critical Infrastructure at Risk: Sea Level Rise Planning Guidance for California's Coastal Zone (Draft, November 2021).

3. The California Natural Resources Agency (CNRA) 2021 Climate Adaptation Strategy (Draft, October 2021).
4. The 2020 Water Resilience Portfolio in response to Governor's Executive Order N-10-19.
5. The State Water Resources Control Board's 2017 Comprehensive Response to Climate Change.
6. The Task Force on Climate-Related Financial Disclosures (TCFD) from the Financial Stability Board recommend that organizations describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term. Furthermore, it recommends that asset managers describe how climate-related risks and opportunities are factored into relevant products or investment strategies.

Methodology

The Study follows three steps that are common in the risk assessment stages of adaptation planning: framing the assessment, conducting the vulnerability assessment, and carrying out the risk evaluation (Figure 1). Finally, the Study team developed an adaptation framework to identify the structure for Cal Water's order of operations for addressing key risks.

Figure 1: Vulnerability assessment methodology



Framing the Assessment

To determine how Cal Water may be impacted by climate change, the Study team reviewed literature, conducted a workshop with subject matter experts within Cal Water to identify

potential effects on critical system components, and developed a sensitivity inventory with potential risks highlighted by literature or Cal Water experts.

Vulnerability Assessment

The Study team sought to understand the relationships between climate hazards, climate indicators available in climate science, and Cal Water's system and key functions. To do this, the Study team carried out a science-based vulnerability assessment looking at climate change impacts under two different scenarios (Representative Concentration Pathway [RCP] 4.5 and 8.5[1]) that span over the early, mid, and late century.

The assets and operations vulnerability assessment draws from the framework put forth in the 2020 California Adaptation Planning Guide, which includes three key elements of vulnerability: exposure, sensitivity, and adaptive capacity. Exposure refers to systems, populations, or assets in areas that make them subject to direct harm; sensitivity is the degree to which a system may be impacted; and adaptive capacity is the ability to prepare for and respond to potential consequences or opportunities.

The supply vulnerability assessment focused on incorporating existing supply studies, where available, along with watershed-level climate projections developed for this assessment, which consider the exposure and sensitivity of district supplies to climate change.

Risk Assessment

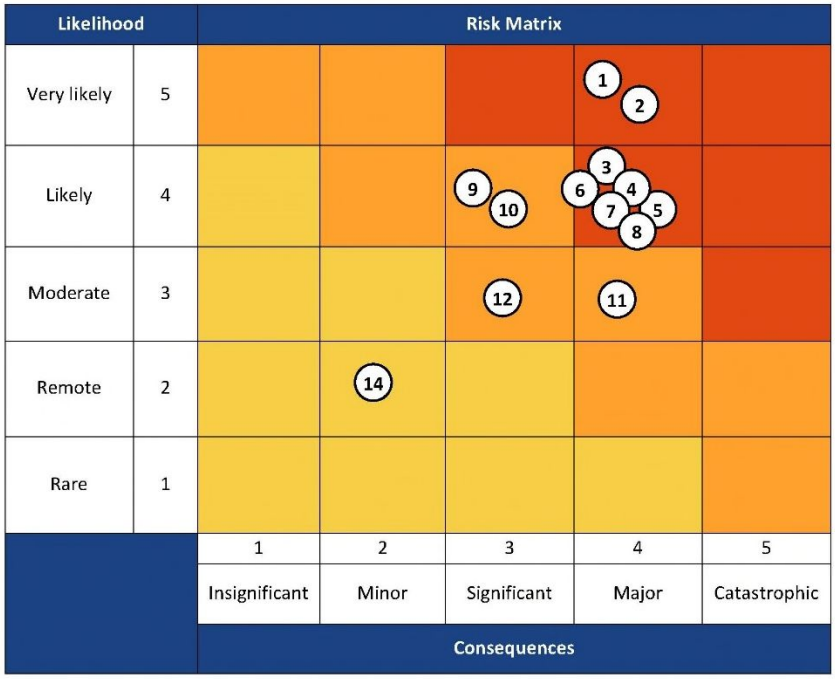
Based on vulnerabilities to supply and demand, operations, and assets, the Study team developed a collection of risk statements that describe the potential damage or disruption to Cal Water's system. The Study team ranked each risk statement based on the scenario's likelihood and consequences to Cal Water's system. Likelihood refers to the chance, absent any intervention, that the risk will result in asset/operational failure or disruption to services, while consequence refers to the magnitude of the effect on Cal Water's system.

Findings

The Study team developed fourteen risk statements based on the highest-scoring supply reliability, assets, and operations vulnerabilities, which are compared to each other based on likelihood and consequence ratings as shown in the risk matrix (Figure 2).

[1] Representative Concentration Pathway (RCP) scenarios are greenhouse gas concentration trajectories adopted by the IPCC for its Fifth Assessment Report in 2014. RCP 4.5 represents an intermediate scenario that considers global greenhouse gas mitigation measures, while RCP 8.5 represents a higher-emissions scenario in which emissions continue to rise throughout the 21st century.

Figure 2: Risk matrix

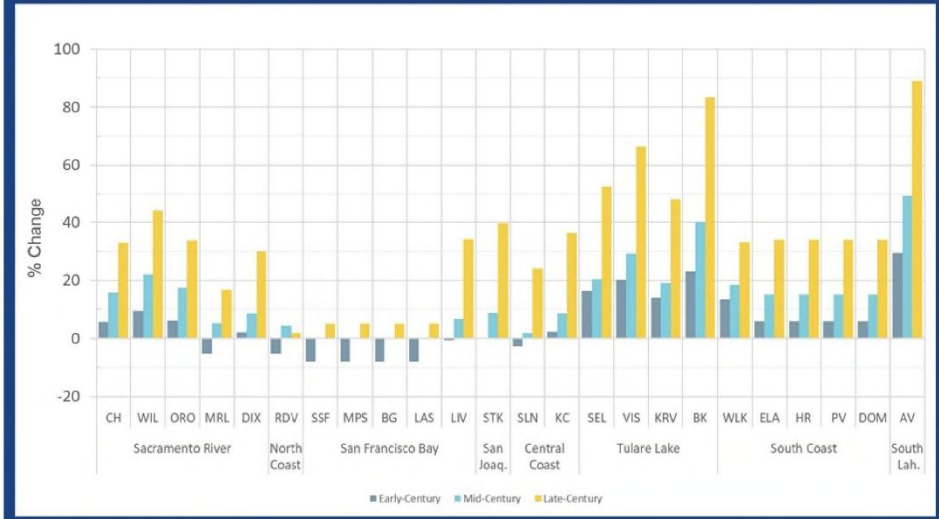


These risks, ranked with the most likely and consequential statements near the top, include (as numbered in Figure 2):

1. **Operations:** Water quality will decrease due to high temperatures and low rainfall, which could increase algal blooms, cyanotoxins, sediments, and eutrophication, increasing water treatment costs and potentially impacting supply availability.
2. **Operations:** Water quality will be impacted by increased wildfire risk and frequency of intense rainfall, resulting in greater quantities of debris and pollutants that enter waterways after fire events. This may disrupt operations, increase water treatment costs, and reduce water available for distribution.
3. **Supply Reliability:** Annual State Water Project (SWP) deliveries are likely to decrease in average years and be eliminated in the driest years.
4. **Supply Reliability:** Groundwater recharge is expected to decrease in some basins, which could limit sustainable yield from groundwater basins and lead to supply shortages.

5. **Supply Reliability:** Decreased surface water supply availability is expected due to longer, more severe, and more frequent droughts, leading to potential supply shortages.

Figure 3: Percent change in average drought duration months (using 12-month SPEI).

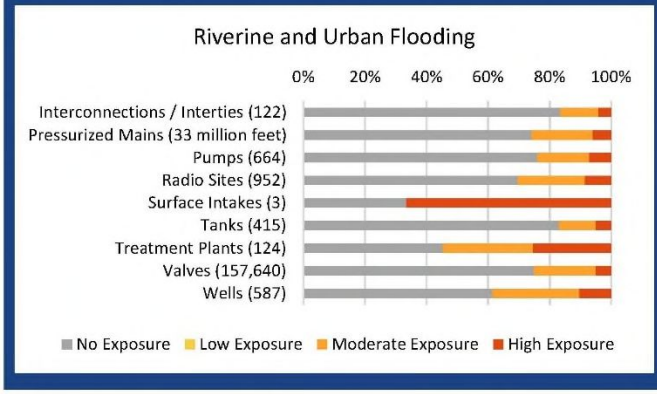


Highlight: Risk Statement #5

Increased drought duration and intensity could lead to supply shortages. The SPEI (a drought index) for each district shows that while drought duration is generally expected to increase throughout the state, the Tulare Lake region is likely to experience the greatest increases in drought duration while the San Francisco Bay region is likely to experience the least increase in drought duration (Figure 3).

6. **Operations:** Worker health and safety will be endangered due to wildfire.
7. **Assets:** More frequent and severe riverine and urban flooding can result in service disruption and infrastructure damage due to loss of access to assets, damage to electrical components, long recovery time from disruption, and difficulty in moving or replacing fixed assets.

Figure 4: Percentage of assets exposed to riverine and urban flooding.



Highlight: Risk Statement #7

Riverine and urban flooding poses a high risk to assets. Flooding could result in loss of access to assets, damage to electrical components, long recovery time from disruption, and difficulty in moving or replacing fixed assets that are damaged or at-risk to flooding.

8. **Assets:** Increased wildfire risk could affect all of Cal Water's asset types.
9. **Supply Reliability:** Outdoor demands will increase due to increased evapotranspiration (ET) and longer, more frequent, and more severe droughts, leading to potential shortages and/or challenges to operations.
10. **Operations:** Natural snowpack storage may decrease due to declining snowpack due to temperature increases, leading to overall reduced supply and forcing Cal Water (or reservoir managers) to adjust reservoir storage facilities and operations to adapt to decreased surface flows.
11. **Assets:** Sea level rise can result in permanent inundation of several asset types, especially pressurized mains.
12. **Assets:** Rising groundwater due to sea level rise may affect wells and treatment facilities through flooding or causing saltwater intrusion in wells, affecting operations, water quality, or preventing access to facilities.
13. **Assets:** Subsidence may damage wells, valves, and treatment plants and increase leakage at joints.
14. **Operations:** High temperatures may impact safety and productivity of workers.

Disadvantaged Vulnerable Communities (DVCs)

Disadvantaged Vulnerable Communities (DVCs) are communities that have been identified as being the most vulnerable to climate change under the Phase 1 decision of the California Public Utilities Commission's (CPUC) 2020 Order Instituting Rulemaking (OIR) to Consider Strategies and Guidance for Climate Change Adaptation. DVCs often face disproportionate levels of

exposure to climate hazards and have a lower capacity to adapt to these hazards. The CPUC's 2020 OIR requires that California utilities companies devote special attention to DVCs in climate adaptation and resilience planning.

DVC criteria, as defined by the CPUC, are as follows:

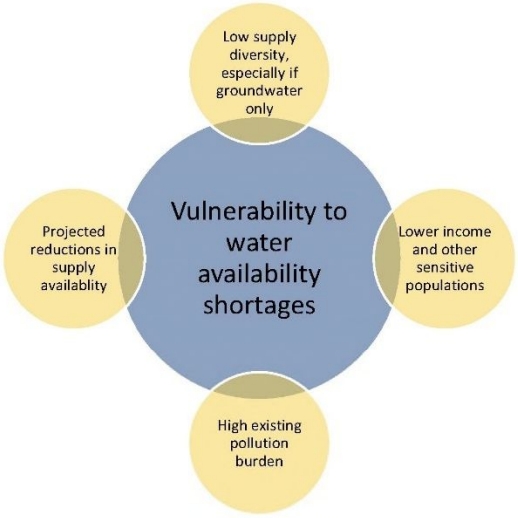
- 25% highest scoring census tracts according to CalEnviroScreen;
- All tribal lands;
- Census tracts with median household incomes less than 60% of state median income;
- Census tracts that score in the highest 5% of Pollution Burden[2] within CalEnviroScreen, but do not receive an overall CalEnviroScreen score due to unreliable public health and socioeconomic data.

DVCs may experience disproportionate impacts from climate-driven changes to water resources and face challenges in preparing for and recovering from events that affect water supplies, such as water contamination and water shortages. Districts that serve vulnerable communities and rely on only one supply of water are particularly vulnerable to the impacts of climate change.

In total, approximately 732,000 residents from 16 Cal Water districts live in disadvantaged and vulnerable communities. The Study team identified the districts with the highest number of customers living in DVCs and lowest supply diversity to determine which DVCs are most at risk. Figure 5 shows the social and physical factors contributing to that risk.

[2] Pollution Burden compiles the potential exposure to pollutants and adverse effects caused by pollution, which includes but is not limited to water pollution (California Office of Environmental Health Hazard Assessment (OEHHA), 2021).

Figure 5: Factors contributing to community vulnerability to water availability shortages



Addressing Climate Risks

Existing Efforts

Cal Water is currently carrying out programs that address some of the climate risks identified in this Study. These existing efforts include:

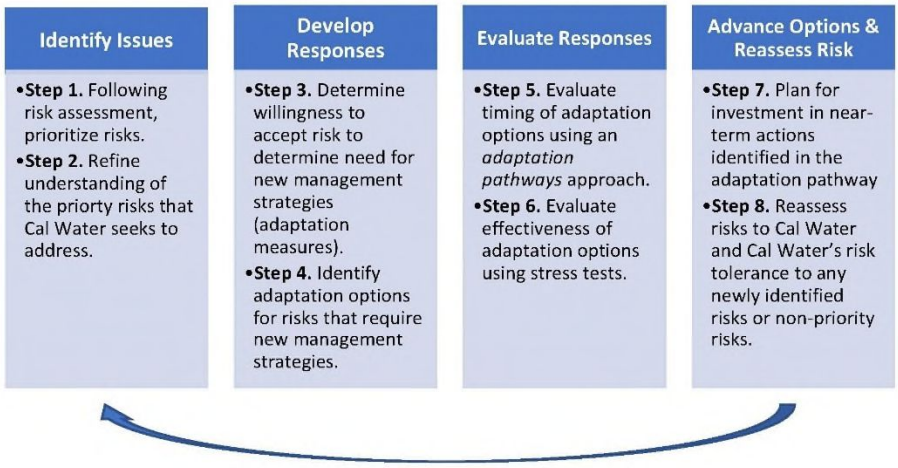
- Wildfire preparation and Wildfire Risk Assessment – Infrastructure projects and upgrades to increase reliability in the event of a wildfire and prevent loss of power at key facilities, along with protections for worker safety.
- Treatment plant analysis – Systematic review of climate change risks driven by wildfires, droughts, intense rainstorms, or excessive agricultural nutrient loads.
- Long-term demand model update – Improvements in modeling for more effective management of water resources, including the addition of evapotranspiration, and updating climate projection inputs.

Adaptation Framework

An adaptation framework is provided to assist Cal Water in incorporating the outcomes of this study into further analysis of investment decision making over time.

The primary steps of the adaptation framework are summarized below in Figure 6.

Figure 6: The Adaptation Framework follows 8 steps and is an iterative process for adaptation planning



The departments primarily affected by climate risks include Water Resource Sustainability; Water Quality; Operations; and Engineering. District Management will be affected by specific vulnerabilities in each individual district.

Cal Water will need to address vulnerabilities exacerbated by climate change to prepare its systems for continued operation and to continue to meet established level-of-service goals. Worsening climate conditions may change the historical balance between supply and demand and increase management requirements of assets and operations. Adaptation investments should be developed and evaluated for major identified risks and resiliency potential. Given that supply availability is dictated by many factors outside of Cal Water's control, it may be important for Cal Water to seek adaptation measures in collaboration with wholesalers and state and federal water management agencies.

Next Steps

The Study team recommends these seven next steps toward the development of adaptation responses:

1. Initiate robust adaptation planning using the framework described in Section 6, *Framework to Identify and Prioritize Adaptation Strategies*.
2. Refine asset vulnerabilities by cataloging local asset characteristics through site specific evaluations. This can support adaptation strategy development for individual assets.
3. Re-evaluate climate vulnerability and risk as new climate projections or datasets become available to identify additional system stressors and adaptation needs.

4. Conduct focused assessment (e.g., stress testing) of top risks from this assessment and their respective adaptation strategies. The study team recommended developing a pilot study for specific hazards in a single district.
5. In conjunction with the above, define metrics for conducting performance evaluation under climate change for key risks and refine metrics for exposure based on asset design and attributes.
6. Consider approaches to integrating downscaled climate projections into local resource reliability planning.
7. Prepare a plan for engagement with disadvantaged vulnerable communities identified in this assessment to prioritize and address vulnerabilities within Cal Water's locus of control.

Conclusion

Cal Water faces climate change risks that, if not addressed, may damage its assets and disrupt its operations and services. Highly likely and consequential risks include decreased water quality, reduced supply reliability from decreased groundwater and surface water availability, endangered worker health and safety due to wildfire, and damage to assets from riverine and urban flooding and wildfire. Disadvantaged vulnerable communities, particularly those with low supply diversity, are especially vulnerable to climate risks that threaten Cal Water's system.

While it is already carrying out efforts to address climate change risks, Cal Water will need to invest in additional climate adaptation efforts to continue reliable operations and meet its service goals. As climate impacts continue to affect the water sector, Cal Water will proactively incorporate climate change considerations into its planning and decision-making processes.

Section E.

Facilities Projects

CSS – District 392

PID # 133318
Roof Shingle Replacement

Introduction

Two structures on the San Jose campus have roofs that have exceeded their useful life, are leaking, and should be replaced to maintain other company assets within.

Building D has two roof areas, a flat roof system with a membrane finish and a sloped roofline with wood shingles. The wood shingles have exceeded their expected useful life and need to be replaced. The carport roof has surpassed its useful life and is suitable for resurfacing

Deficiencies and Issues

Building D

The wood shake roof area is original to the building constructed in 1993. The wood shingles are beyond their useful expected life, present a safety hazard and should be replaced with composition shingles. There have been multiple leaks stemming from these areas of roofing. The affected spaces within the building primarily affect private offices, some of which were recently renovated and the water quality lab. The deteriorating shingles are now prone to growing moss during the winter months and pose a hazard for contractors needing to access these areas as the moss creates a slippery surface.

Carport/Storage Structure

The current roof is original to the parking structure constructed in 1992. The roof has been patched multiple times to extend its use, however the roof has now exceeded its useful life. Continued leaks during inclement weather have damaged contents in the enclosed storage areas at both ends of the structure.

Photo 1. Bldg D Roof

Photo 2. Bldg D Roof

Photo 3. Bldg D Roof

Photo 4. Carport Roof

Photo 5. Carport Patches

Recommended Solution

Cal Water recommends replacing the deteriorating wood shingles with standard composite shingles on building D and applying a new weather resistant silicone coating to the carport roof.

Project Summary

Improvements to address aging infrastructure.

- Replace wood shingles on Bldg D with composite shingles. Composite shingles are designed to mimic the appearance of wood shingles with improved durability and longevity. These shingles are lightweight, made from recycled materials and can last up to 50 years.

- Apply silicone coating to the Carport roof. Silicone roof coatings are ideal for a flat roof, can be applied over our existing roof material, are durable and long-lasting.

Customer Benefits

Proposed improvements will better protect and increase the longevity of company assets and reduce safety risk to employees and contractors

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Site Assessment Report
- Attachment C – Cost Proposal

Attachment A

Capital Project Cost Estimate

Project No. : 133318
Description REPLACE BLDG ROOF SHINGLE AND CARPO
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2025
Prepared By: rybarra
Date Initiated: 11/28/2023
Base Year: 2023
Sub-Total: $289,463
Direct Cost: $304,117

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
CONTINGENCY	[EA]	1	$26,314.80	$26,314.80	Contingency Estimate
REPLACE WOOD SHINGLE ROOF AND SILICONE CAR PORT ROOF	[EA]	1	$263,148.00	$263,148.00	Engineers Estimate

Sub-total = $289,462.80
Direct Cost = $304,116.96

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

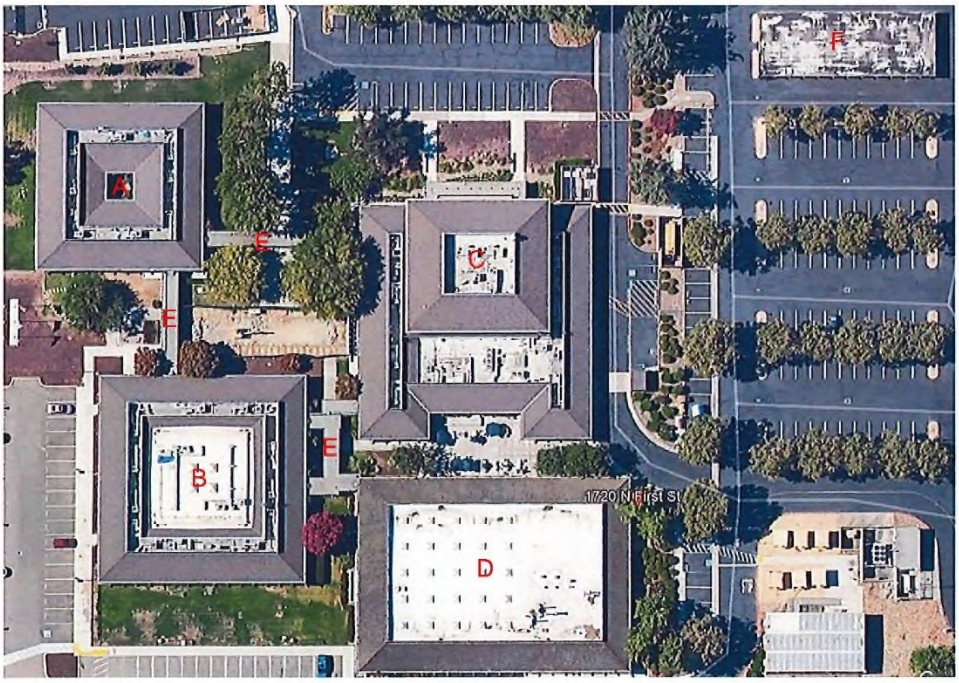
Attachment B

Enterprise Roofing Service, Inc.

P.O. BOX 5130 • CONCORD, CA 94524-0130 • PHONE (925) 689-8100 • FAX (925) 825-5027
CALIFORNIA CONTRACTOR'S LICENSE 221274 • NEVADA CONTRACTOR'S LICENSE 12052
DIR#1000000444 www.enterpriseroofing.com

Visual Roof Inspection Report

Site: San Jose Water Service – 1720 N. 1st St., San Jose, CA 95112
Inspected and Report: ENTERPRISE ROOFING SERVICE, INC.
Alex Sarmiento – Assistant Service Manager



ENTERPRISE ROOFING SERVICE, INC. is providing this complimentary visual roof inspection report of the general roof conditions at 1720 North 1st St., San Jose. This report is not to be used or relied upon by anyone as a substitute for professional engineering design and documentation required by building code. By accepting this report, you agree that it does not constitute a guarantee or warranty nor is it an endorsement to buy or sell said property. No test cuts, destructive nor water test were performed.

COMMERCIAL • INDUSTRIAL • INSTITUTIONAL

Enterprise Roofing Service, Inc.

Buildings A, B,& C

These three buildings basically have the same characteristics. Compositions asphalt shingles on a sloped mansard with a built-up roof on the flat (mechanical equipment) deck.
The shingles appear to be approximately 7 years old with typical granule loss. The hip ridges have a worn surface, and some are cracked apart. Replacement is recommended as needed. Debris on the equipment well deck should be removed. Pipe, skylights, and other penetrations in the equipment wells need to be checked and resealed as needed. The parapet walls need
to be cleaned and resealed in the future.
There is a metal gutter system at the bottom of the composition shingles. The gutters need to be cleaned. Several drains are clogged and there is standing water in these gutters. Rust is starting to compromise the gutter system. Laps need to be cleaned, dried and resealed. A coating is recommended to help alleviate metal deterioration.

Building D

This building has the same design as the other three, but the original wood shake roof has not been replaced with composition shingles. The wood shingles are beyond their useful expected life and should be replaced. The flat roof system is a newer single ply material. Maintenance is recommended. The gutter system is the is in the same condition as the other three buildings.

Walkways E

The walkway canopies are in fair condition, but cleaning and sealing are recommended.

Carport F

The carport appears to be at the end of it useful life. Replacement or Coating is recommended at this time.

Enterprise Roofing Service, Inc.

BUDGET PRICING –

Building A, B, and C – Recommended roof maintenance – TWENTY-FIVE THOUSAND FIVE HUNDRED DOLLARS $25,500.00
This would include removing debris, sealing pipe and other penetrations (as needed).
This excludes coating parapet walls.
This excludes coating the metal gutter systems. Alternate #1 – Coat gutter systems on A, B, and C – add to base bid: FIFTEEN THOUSAND DOLLARS $15,000.00

Building D – Recommended roof maintenance – SIX THOUSAND DOLLARS $6,000.00
This includes removing debris and sealing pipes as needed. Replacing missing wood shingles with metal inserts.
This excludes coating the metal gutter system. Alternate #2 – Coat gutter system on BLD D - add to base bid: FIVE THOUSAND DOLLARS $5,000.00

Walkways E – Cleaning and resealing as needed- FIVE THOUSAND DOLLARS $5,000.00

Carport F – Cleaning and resealing as needed – TWO THOUSAND FIVE HUNDRDE DOLLARS $2,500.00
Recommended coating with Silicone: ELEVEN THOUSAND FIVE HUNDRED DOLLARS $11,500.00

Alexander Sarmiento
Digitally signed by Alexander Sarmiento
DN: C=US, E=asarmiento@enterpriseroofing.com, O="Enterprise Roofing Service, Inc.", CN=Alexander Sarmiento
Date: 2023.12.18 09:49:47-08'00'

Attachment C

Enterprise Roofing Service, Inc.

CALIFORNIA CONTRACTORS LICENSE 221274 • NEVADA CONTRACTORS LICENSE 12052
MEMBER: NATIONAL ROOFING CONTRACTORS ASSOCIATION
MEMBER: ASSOCIATED ROOFING CONTRACTORS OF THE BAY AREA COUNTIES, INC.
MEMBER: ASSOCIATED GENERAL CONTRACTORS OF AMERICA
MBE CERTIFICATION #: 15060364 (SUPPLIER CLEARING HOUSE) DIR# 1000000444
www.enterpriseroofing.com

PLEASE RESPOND TO:
P.O. BOX 5130 • CONCORD, CA 94524
PHONE (925) 689-8100 • FAX (925) 285-5027

PROPOSAL AND CONTRACT

Name: CALIFORNIA WATER SERVICE – ATTN: RODNEY FERGUSON Date 10.6.2023

Address: 2710 N.1st Street, San Jose, CA 95112

Job Name and Address: Wood Shake Removal and Replacement – 2710 N.1st Street, San Jose, CA 94112
Attachment "A" is part of this contract. The undersigned agrees to furnish and provide necessary labor, materials, tools, implements, and appliances to do, perform and complete in good workmanlike manner the following:

SCOPE OF WORK:

- Secure job site perimeter. Caution tape and delineators on the ground for pedestrian warning. Temporary safety fall protection equipment on the roof as needed.
- Remove existing wood shakes from deck and mansard wall, sheet metal flashings, and sheet metal gutter system. Properly dispose of it from site.
- Provide and install CertainTeed WinterGuard Roofing Granulated underlayment (or equal).
- Provide and install CertainTeed Roofing Presidential Shake TL Shingles . Color to be determined.
- Install new metal flashings, sheet metal parapet wall coping, gutter system and downspouts.
- Install hip and ridge shingles as needed.

EXCLUSIONS:

- Design, specifications, structural modifications, dry rot repair, carpentry, protection of property inside the facility, painting, wood repair/replacement, noise/dust control, city or county code enforcement, weekend labor rates, escalated material or labor cost.

CLARIFICATIONS:

- Bid based upon a visual site inspection, existing plywood deck minimum ½' thick, normal weekday work hours 7:00am -3:30pm

All of the above work to be completed for the sum of : **TWO HUNDRED FORTY-SIX THOUSAND SIX HUNDRED FORY-EIGHT Dollars ($246,648.00)**

Terms of Payment shall be as follows: PROGRESSIVE MONTHLY PAYMENTS in accordance with the attached Terms and Conditions.

This proposal is void after 90 days.

Respectfully submitted,

By Alexander Sarmiento

All California, Nevada and Oregon Contractors must be licensed and are regulated by the Contractors License Board. Any questions concerning a contractor may be referred to the Registrar of Contractors at this office.

ACCEPTANCE

You are hereby authorized to furnish all materials and labor required to complete the work mentioned in the above proposal for which I agree to pay the amount mentioned in said proposal and in accordance with the terms stated on the reverse side.

Date _____ Signed _____

Title _____

District - CSS

PID # 133533

Rooftop Solar

Introduction

Cal Water proposes the development, interconnection, and maintenance of a two hundred and fifty (250) to four hundred (400) kilowatt (kW) Cal Water-owned onsite solar energy generation facility at the Customer Support Services Headquarters to be constructed by 2026. Cal Water has engaged an expert consultancy, Edison Energy, to identify this project as one of two sites that present a viable opportunity to pursue onsite solar generation within the company's operations.

Deficiencies and Issues

According to The Intergovernmental Panel on Climate Change (IPCC) Climate Change 2023 Synthesis Report Summary for Policymakers:

Human-caused climate change is already affecting many weather and climate extremes in every region across the globe. This has led to widespread adverse impacts and related losses and damages to nature and people (high confidence). Vulnerable communities who have historically contributed the least to current climate change are disproportionately affected (high confidence) (p.5)[1].

To address anthropogenic climate change, California has set a target to reach carbon neutrality by 2045 through Executive Order (EO) B-55-18 and signaled the importance of corporate climate action through recent passage of Senate Bill (SB) 253, Climate Corporate Data Accountability Act and SB 261, The Climate-Related Financial Risk Act. While Cal Water is not currently subject to SB 253 due to the bill's revenue threshold, Cal Water reports a greenhouse gas emissions inventory publicly and has leveraged guidance from the Taskforce on Climate-related Financial Disclosures (TCFD) in its annual Environmental, Social, and Governance (ESG) Report to proactively report on its climate risks and opportunities.

Additionally, as demonstrated by the Securities and Exchange Commission Proposed Rule (The Enhancement and Standardization of Climate-Related Disclosures for Investors), climate mitigation and adaptation remain top-of-mind for the public and investors. The proposed onsite solar project responds proactively to both policy pressures in California and stakeholder interest in climate mitigation efforts driven by global recognition of the need to address climate change, including the 2015 Paris Agreement to limit warming to well-below two degrees Celsius above pre-industrial levels.

Climate change increases the risks associated with rising temperatures, drought, and extreme weather events that may affect the reliability of Cal Water's systems and the availability of its water supply. The energy Cal Water consumes to provide water and wastewater services to its

[1] https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf

customers contributes, in part, to climate change. Cal Water recognizes the importance of doing its part to reduce greenhouse gas emissions; the company works to reduce the carbon footprint of its operations by lowering energy demand through customer conservation measures and by increasing system efficiency and transitioning to carbon-free energy sources in its operations. The Customer Support Service campus has the highest energy consumption among all California offices due to the data center and water quality lab that reside on this campus. Therefore, this site has been identified as a top candidate for onsite solar installation. It will reduce the operational footprint by an estimated 283 metric tons of carbon dioxide equivalent based on current electricity consumption patterns and emission factors, which represents approximately two percent of Cal Water's Scope 2 greenhouse gas emissions in California. Cal Water recognizes the importance of doing its part to reduce greenhouse gas emissions.

While this project would contribute to climate mitigation, it would also support Cal Water's existing climate adaptation efforts by providing energy resilience to power outages through a distributed energy resource. This further supports Cal Water's ability to provide reliable, resilient service to its customers.

Finally, by providing a mechanism for Cal Water to generate its own electricity rather than purchasing it from electric utility providers, this investment would generate long-term cost savings that would directly benefit customers.

Alternatives Analysis

Upon extensive analysis of Cal Water's facilities based on policies, economics, available incentives, energy demand, load profile, land availability, and roof availability and condition, the Customer Support Services Headquarters in San Jose has been identified as one of two sites with the greatest onsite solar potential.

The following alternatives to the proposed project were also analyzed:

Alternative 1: Do Nothing

The Do Nothing alternative involves continuing to rely on grid-supplied energy. With grid-supplied energy, Cal Water would have reduced its ability to realize greenhouse gas emissions reductions, long-term cost savings, and climate resilience. For these reasons, the Do Nothing alternative was not considered further.

Alternative 2: Offsite Renewable Energy Procurement

Rather than developing an onsite solar project, Cal Water also investigated the potential for purchasing offsite renewable energy to address climate mitigation and stakeholder expectations. Cal Water found that market conditions for purchasing offsite renewable energy, in the form of unbundled renewable energy credits (RECs) and virtual Power Purchase Agreements (vPPAs), would be cost-additive and present financial risks to the company and its ratepayers. In addition, Cal Water researched community solar and found that it is not currently eligible for any of these types of programs. As such, this alternative was not considered further.

Recommended Solution

Cal Water recommends the San Jose Customer Support Service campus onsite solar project as the Recommended Solution. The upfront investment for the final alternative has been

estimated at $2,919,517. This recommended solution would achieve the objectives of increasing energy resilience as a climate adaptation measure, contributing to climate mitigation efforts, and providing customers with long-term cost savings.

Project Summary

Install a Cal Water-owned two hundred and fifty (250) to four hundred (400) kilowatt (kW) ground-mount onsite solar photovoltaic energy generation facility at the Customer Support Service campus in San Jose with an interconnection to improve energy resilience and reduce long-term energy costs for customers.

Project Attachments

- Attachment A – Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. :	133533
Description	Rooftop Solar
District / Department:	CSS
Project Start Date:	01/01/25
Project Completion Date:	12/21/26
Prepared By:	jagraham
Date Initiated:	12/13/2023
Base Year:	2023
Sub-Total:	$3,503,420
Direct Cost:	$3,726,791

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
20% CONTINGENCY	LS	1	$583,903.40	$583,903.40	Additional Factors
Rooftop Solar	LS	1	$2,919,517.00	$2,919,517.00	Attachment B

Sub-total =	$3,503,420.40
Direct Cost =	$3,726,790.82

Notes:

1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs

2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate

3. See Common Plant Book for additional details on cost estimating methodology and justification

Section F.

Operational Enhancement Projects

District - CSS

PID # 133661

Portable Emergency Power Generators

Introduction

Cal Water operates approximately 866 active pumping stations across the state. Of these stations, approximately 284 sites currently have fixed emergency power generators, ready to operate upon loss of electric power. Fixed generators are usually considered the best emergency power supply as they typically include automatic transfer switches and automatic starting capabilities, so they are ideal in an emergency. However, they can be costly to design and install, so are primarily located at larger and more important sites. This leaves approximately 582 sites across the state without fixed emergency power.

To combat this lack of fixed emergency power, Cal Water uses portable towable boosters and portable towable diesel power generators. As emergencies develop, these units are either utilized as a response effort or they are prepositioned when conditions warrant. Cal Water currently has approximately 30 portable boosters, and 40 portable power generators to serve the 582 sites without fixed emergency power. To supplement this number during fire season and PSPS season, Cal Water has rented an average of 49 additional portable power generators each year over the last 3 years, at a 3 year total cost of $4.6 million dollars or an average of $1.52 million dollars per year.

Deficiencies and Issues

In an emergency or during a series of emergencies, having additional emergency portable power generation allows more flexibility and helps Cal Water maintain normal and emergency service levels.

Adding an additional 30 Cal Water-owned generators was identified for inclusion in the 2024 General Rate Case (GRC) application based on having enough generators; the high cost and limited availability of rentals; and the need to have additional generators for prolonged outages to allow for fixed generators to be taken off-line for maintenance and repair of generators.

Lack of Cal Water owned emergency power generators

The state of California has experienced an increase in wildfires and extreme weather events. When these events occur, electric grid power interruption is often a result. Having these additional power generators will allow expedited response to various weather related events.

High cost of rental

Cal Water has been renting power generation equipment during wildfire season in various districts. The purchase of these additional generators will offset most of this expense. The following table reflects the amount Cal Water has spent on generator rental each year by district.

Sum of Received	Year			
Dist/Sys	2020	2021	2022	Grand Total
AV	78,866.96	110,085.92	78,433.66	267,386.54
BAY	325,390.81	162,756.00	156,809.62	644,956.43
BG	196,264.23	175,962.80	184,422.88	556,649.91
CH	13,116.63	14,705.10	22,990.00	50,811.73
HR	26,836.49			26,836.49
KC	2,055.00			2,055.00
KRV	529,225.30	189,419.15	200,801.00	919,445.45
LAS	14,369.25	26,141.74	14,664.00	55,174.99
MRL	12,600.00	17,881.00	19,673.20	50,154.20
ORO	53,774.35	51,462.80		105,237.15
PV	345,402.74	420,916.00	595,386.00	1,361,704.74
RDV	36,215.15	34,181.57	42,432.40	112,829.12
SLN	90,492.35	112,827.76	78,881.20	282,201.31
WLK	46,660.30	61,992.00	53,023.70	161,676.00
Grand Total	**1,771,270**	**1,378,332**	**1,447,518**	**4,597,119.06**

The following table reflects the number of units Cal Water has rented in each district over a three-year period.

Number of Rental Generators	Year		
Dist/Sys	2020	2021	2022
AV	4	4	4
BAY	7	4	4
BG	12	8	7
CH	1	1	1
HR	1		
KC	1		
KRV	27	13	10
LAS	1	1	1
MRL	1	1	1
ORO	2	1	
PV	3	2	2
RDV	4	3	3
SLN	3	2	2
WLK	2	2	2
Grand Total	**69**	**42**	**37**

Purchasing and paying a one-time charge will be a much better expenditure and when reviewing the annual cost, is a more cost effective overall expenditure.

Additional backup for fixed power generators in extended outage

One of the problems associated with emergency usage of generators for a prolonged period of time is that they start to break down and required various types of maintenance. Having portable power generators will allow Cal Water to service duty generators, thereby potentially avoiding issues that were experienced in water systems in events such as Hurricane and Super Storm Sandy in 2012. According to FEMA, water systems in the northeast United States performed relatively well in the first few days of power outage, but once electricity outages extended to multiple days, generators began to fail, and without additional generators, the load on the systems became unmanageable and led to numerous boil water and no water conditions.

Photo 1. Typical Portable Power Generators

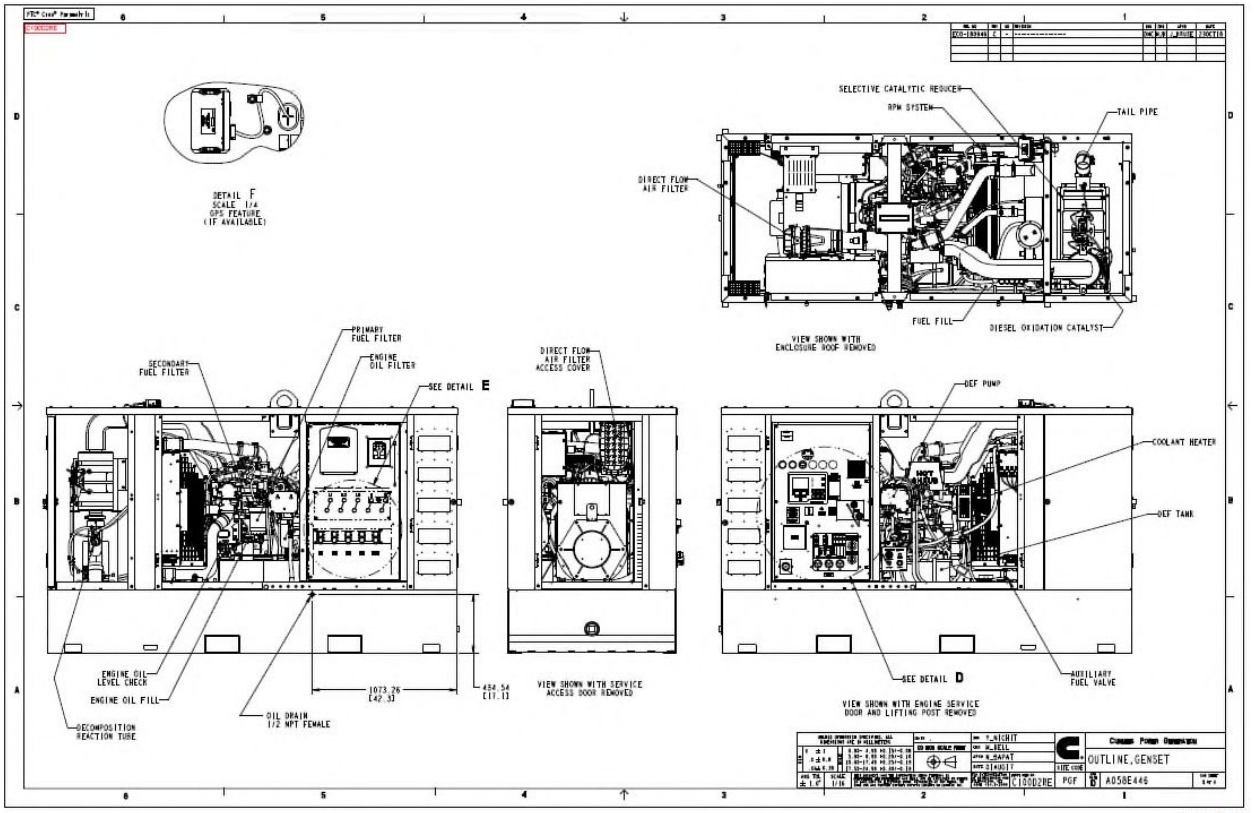


Figure 2. Typical cut sheet of power generator – see attached files for reference.

Alternative Analysis

To address emergency power deficiencies identified across the Company, the following alternatives were analyzed:

Alternative 1: Do Nothing

The Do Nothing alternative involves simply not renting or purchasing additional emergency power generation equipment. This option does not provide enough resilience during wildfire season.

Alternative 2: Continue to rent

The next alternative is to continue renting mobile power generation units. However, as this can be seen from the above data, this is an expensive option and should only be used for very short term and planned emergencies.

Recommended Solution

Cal Water recommends purchasing 30 mobile power generators. 20 of these will be the larger 150 kw generators capable of powering most Cal Water sites. 10 of these will be smaller 36 kw generators to allow for optimization at small sites and not tie up the larger generators. This is a reasonable solution to offset high rental expenses while providing more reliability across the State.

The cost for the final alternative is $3,273,407, which is presented in more detail in the attached Budget Estimate and supporting documentation.

Project Summary

Purchase and outfit 30 portable power generation trailers.

- Purchase trailer mounted units.
- Install tow equipment, license and registration, battery chargers and outfit.

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – Specifications for 150 wk gen sets
- Attachment C – Specifications for 45 kw gen sets

Attachment A

Capital Project Cost Estimate

Project No. : 133661
Description 30 Mobile Pow er Generators
District / Department: CSS
Project Start Date: 02/15/2025
Project Completion Date: 10/01/2025
Prepared By: dduncan
Date Initiated: 01/02/2024
Base Year: 2024
Sub-Total: $2,750,000
Direct Cost: $2,889,219

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
150 KW GENERATORS	[EA]	20	$125,000.00	$2,500,000.00	Engineers Estimate
45 KW GENERATORS	[EA]	10	$25,000.00	$250,000.00	Engineers Estimate

Sub-total = $2,750,000.00
Direct Cost = $2,889,218.75

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Sales and Service

CUMMINS INC
14775 Wicks Blvd
San Leandro CA 94577
(323) 513-4051

May 5, 2020

Submittal for:
CWS Portable Generators

Cummins Inc. Project No.
PO No.: CWSCO 0000133191

Customer Requested Delivery Date:______________________________

Customer Requested Equipment Delivery Address:____________________

____

Contact Person & Phone # for Deliveries:__________________________

Transfer switch(es) require a withstand and closing rating (WCR) capable of meeting the available upstream fault current (kAIC). The WCR may be based on a specific breaker rating or a time-based rating, and it is the responsibility of the facility designer or engineer to verify compatibility. A full listing of the WCR is included as a part of this submittal.

Prepared for:
Gurkiran Kaur
California Water Service CO.
1720 North First St
San Jose CA, 95112
Phone No.: 408-367-8200
Fax No. : 408-392-9797
Email : gkaur@calwater.com

Prepared by: James Feng
Office Number: 510-347-1528
Mobile Number: 323-513-4051
Fax Number: -
Email address: james.feng@cummins.com

Customer Approval

Revise and Resubmit

Approved with corrections

Approved

Released for Production

By: Dated:

[illegible]

1. [illegible]
2. [illegible]
3. Our Company policy states that "We can NOT order any materials or proceed with production without an approved and release submittal that includes a required ship date".

Sales and Service

May 5, 2020
Project Name: **CWS Portable Generators**
Project Number: **0**

Dear: Gurkiran Kaur

Thank you for your order. The next step in the process is the submittals phase.
Attached please find the submittal, prepared by James Feng the Project Engineer assigned to your Project. Please review the submittal and return it to him as soon as possible along with your approval and/or changes clearly indicated so we can continue to process your order.

Our company policy states we cannot order any materials or proceed with any production without an approved Submittal returned from you along with requested delivery date, and data for the circuit breaker being used upstream of our transfer switch(s).

Current lead time is approximately **6-7 weeks** Split shipments and drop shipments on equipment that do not need local upfit are possible, but requirements must be advised at the time of release.

Note: Requested delivery date is not a guarantee of delivery date. Leadtimes at time of release can vary due to market conditions and manufacturing production capacities. We will advise you of our closest delivery target to match your request within 1-2 weeks.

A Cummins Project Team has now been assigned to your project. Their names and contacts are listed below. For all technical issues, your Project Engineer, James Feng, will best be able to assist you at this stage of the project. Feel free to contact anyone on your Project Team directly.

Name	Title	Function	Phone	email
Max Montero	Territory Manager	Sales	949 275 6302	max.montero@cummins.com
James Feng	Project Manager San Leandro	Prepares Submittals, handles all Technical issues	510-347-1528	james.feng@cummins.com
#N/A	ISR	#N/A	#N/A	#N/A
Denise Wauke-Stover	PC	Project Coordinator	808-682-6209	denis.wauke-stover.com
John McWilliams	Senior Application Engineer	Technical Resource for all projects	510 347 6673	john.l.mcwilliams@cummins.com
Dennis Long	Start and Test Specialist	Schedules pre-inspect and S&T	510-347-6651	Dennis.d.long@cummins.com
Tom S Golnick	GM - PowerGen Sales South	Sales Management	619-219-5044	tom.g.golnick@cummins.com

Best regards,

Max Montero
Cummins Inc.

Sales and Service

May 5, 2020

Notice to End User or Contractor

***

Please be advised that without a permit to construct or operate from AQMD, we will not be able to start and commission this generator, it is therefore suggested that an AQMD permit be filed at the same time you issue an approval for this submittal.

***

Please make sure you've reviewed our Automatic Transfer Switch Withstand and Closing Rating Chart for compliance with our list of acceptable breakers being used upstream of the ATS.

***

This order is provided with one set of owners and installation manual meant for the installing contractor. Additional copies may require a change order while electronic copies can be provided free of charge.

***

Approval Drawings

This Approval Drawing Package is submitted as our interpretation of the contract drawings and/or the specifications for this job.

It is the obligation of the electrical contractor and reviewing engineer to determine that the item quantities and accuracy of this submittal is correct as required for the job. Any inccuracies or deviations must be addressed with Cummins Inc. before release to manufacturing. Any releases of material to manufacturing by the above parties constitute an acceptance of the accuracy of the submittal. Any changes after release will be viewed as a change order, subject to pricing changes.

Please take the time to review this package for accuracy to prevent any after-shipment problems. This will allow the job to be shipped correctly and prevent any delay in energization.

***

Cummins Power Generation provides a large amount of technical information on it's products, as well as specific technical topics aimed at clarifying our position on topical issues. Below you'll find links to valuable information that would help you with our recommendations for installation on different topics.

Technical Manuals

T-011 Application Manual - Transfer Switches

T-016 Application Manual - Paralleling

T-030 Application Manual - Liquid Cooled Generator Sets

T-034 Application Manual - Networking

Sales and Service

May 5, 2020
Project Name: **CWS Portable Generators**
Project Number: **0**
PO Number: **CWSCO 0000133191**

C100D2RE Summary Sheet

(Not for Construction, please refer to specific materials within submittal or call Cummins Inc. to double check values.)

Project Engineer James Feng 510-347-1528

Major Equipment Shipping Weights and Dimensions

	Length (in)	Width (in)	Height (in)	Weight (lbs)		Sources Drawing Number
Diesel Fuel Gallonage						
141				1,041		
Total Genset Package	**181**	**83**	**91**	**8,100**		A058E446

Generator Set

Max. Breaker Amps		
400A		

*For genset 250kW and below refer to drawing 0333-0588 for reconnectable heater.

General Wiring Guidelines

Interconnection Wiring To Be # 14 AWG Stranded Wire Minimum. Ac and Dc Control Wires to Be Run In Separate Conduits

Battery Charger to Battery to Be Sized For Charger Output And length of run.

For AC Connections Use # 14 AWG or larger for lengths up to 40 Feet.

Use # 12 AWG or larger for lengths up to 50 Feet.

Use # 10 AWG or larger for lengths up to 100 Feet.

For DC Connections Use # 14 AWG or larger for lengths up to 100 Feet.

Paralleling load share cable to be 18 AWG 4 - conductor twisted shielded cable.
Modbus and PCCnet cable to be Belden model 9729 twisted shielded pair.
Echelon Lontalk network cable to be stranded CAT5.
We recommend running additional 20% spare wires for each circuit.
****REFER TO WIRING DIAGRAMS SUPPLIED WITH SUBMITTAL FOR SPECIFIC INFORMATION****

Special Requirements / Submittal Review Notes

Sales and Service

May 5, 2020
Project Name: **CWS Portable Generators**
Project Number: **0**
PO Number: **CWSCO 0000133191**

C150D2RE Summary Sheet

(Not for Construction, please refer to specific materials within submittal or call Cummins Inc. to double check values.)

Project Engineer James Feng 510-347-1528

Major Equipment Shipping Weights and Dimensions

	Length (in)	Width (in)	Height (in)	Weight (lbs)		Sources Drawing Number
Diesel Fuel Gallonage						
255				1,882		
Total Genset Package	**213**	**84**	**89**	**10,000**		A054F941

Generator Set

Max. Breaker Amps		
600A		

*For genset 250kW and below refer to drawing 0333-0588 for reconnectable heater.

General Wiring Guidelines

Interconnection Wiring To Be # 14 AWG Stranded Wire Minimum. Ac and Dc Control Wires to Be Run In Separate Conduits

Battery Charger to Battery to Be Sized For Charger Output And length of run.

For AC Connections Use # 14 AWG or larger for lengths up to 40 Feet.

Use # 12 AWG or larger for lengths up to 50 Feet.

Use # 10 AWG or larger for lengths up to 100 Feet.

For DC Connections Use # 14 AWG or larger for lengths up to 100 Feet.

Paralleling load share cable to be 18 AWG 4 - conductor twisted shielded cable.
Modbus and PCCnet cable to be Belden model 9729 twisted shielded pair.
Echelon Lontalk network cable to be stranded CAT5.
We recommend running additional 20% spare wires for each circuit.
****REFER TO WIRING DIAGRAMS SUPPLIED WITH SUBMITTAL FOR SPECIFIC INFORMATION****

Special Requirements / Submittal Review Notes

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Cummins

1939 Deere Ave
Irvine, California, 92606

Project: CWS - Portable Generators BILL OF MATERIALS

California Water Service Company (Bakersfield)
3725 South H Street
Bakersfield, California, 93304

Ms. Gurkiran Kaur,

Item	Notes	ID	Description	Qty
1	**a**		**Rental Genset: 50/60Hz-100kW with Trailer**	**5**
		Install-US-Nonroad	U.S. EPA, Nonroad (Portable) Application	
		C100D2RE	Genset-Diesel,50/60 Hz,100 kW,Standby-Rental	
		A122-2	Duty Rating-Prime Power	
		L230-2	Emissions-Compliance EPA Tier 4 Final Certified	
		R175-2	Voltage 208-480 Variable	
		B975-2	Alt-60Hz, 208/416-240/480 Volt, 125/80C (S/P)	
		C281-2	UN31A (Canada) Certified Fuel Tank	
		KX21-2	Generator Set Control-PowerCommand 3.3, Paralleling with MLD	
		KX06-2	Distribution Panel-Rental Bus Bar Connection	
		E153-2	Coolant Heater, Cold Ambient	
		F239-2	Electric Brake Trailer	
		F244-2	HITCH, PINTLE	
		A452-2	Packaging - Cummins Power Generation	
		J061-2	Quick Fit Kit	
		L231-2	Auxiliary Fuel and DEF Connections	
		A456-2	Battery Charger-Rental	
		E152-2	Engine Coolant - 60% Antifreeze, 40% Water Mixture	
		F248-2	Cam Lock Distribution Panel-U.S. Rental	
		L175-2	Genset Warranty - Industrial Mobile Extended, Prime 5 years / 5000 hours	
		CP01-2	Common Parts Listing	
		SPEC-D	Product Revision - D	
2	**a**		**Rental Genset: 50/60Hz-150kW with Trailer**	**5**
		Install-US-Nonroad	U.S. EPA, Nonroad (Portable) Application	
		C150D2RE	Genset-Diesel,50/60 Hz,150 kW,Standby-Rental	
		A122-2	Duty Rating-Prime Power	
		L230-2	Emissions-Compliance EPA Tier 4 Final Certified	
		R175-2	Voltage 208-480 Variable	
		B975-2	Alt-60Hz, 208/416-240/480 Volt, 125/80C (S/P)	
		C281-2	UN31A (Canada) Certified Fuel Tank	
		KX21-2	Generator Set Control-PowerCommand 3.3, Paralleling with MLD	
		KX06-2	Distribution Panel-Rental Bus Bar Connection	
		F239-2	Electric Brake Trailer	
		F244-2	HITCH, PINTLE	
		A452-2	Packaging - Cummins Power Generation	
		J061-2	Quick Fit Kit	
		F248-2	Cam Lock Distribution Panel-U.S. Rental	
		L231-2	Auxiliary Fuel and DEF Connections	
		E152-2	Engine Coolant - 60% Antifreeze, 40% Water Mixture	
		A456-2	Battery Charger-Rental	
		L175-2	Genset Warranty - Industrial Mobile Extended, Prime 5 years / 5000 hours	
		CP01-2	Common Parts Listing	

Item	Notes	ID	Description	Qty
		SPEC-F	Product Revision - F	
3	**d**	**AC23300MMB1**	**A050Y686 Paralleling Wiring Harness**	**10**
4	**e**		**Start & Test** C150D2RE (Tier 4F) Trailer:4-Hour O&M Training, Install Batteries (grp 31 down) (10), Start & Test (10), 1 Hour Load Bank Test (10)	**1** 10

Cummins Terms & Conditions

NOTES

Please use this as a reference for the "note" column in the quote.

a. Factory Assembled.

b. Assemble at Cummins facility.

c. Shipped loose items. Assemble/Install by Cummins at Job Site.

d. Shipped loose items. Assemble/Install by customer at Job Site.

e. Start and Test performed by Cummins.

f. Start and Test performed by customer.

- Price is FOB Cummins Sales & Service Facility, CA.

- Installation, wiring, power cables, diesel fuel, CARB Registration, DMV Registration, Permits and Sales Tax are not included.

- Quoted Start & Test as optional. These generator were factory tested prior to shipment. Certified Tests Report will be provided.

Specification sheet

Rental Power

100 kW

U.S EPA Tier IV emissions

Description

This Cummins® Rental package is a fully integrated mobile power generation system, providing optimum performance, reliability, and versatility for Standby and Prime Power applications.

Features

Cummins diesel engines

- U.S. Tier IV Final and EU SIIIa certified Cummins QSB5-G11 engines which meet emissions limits without the use of a Diesel Particulate Filter (DPF)
- Dual speed engine for operation at 50 or 60 Hz
- Advanced electronic engine controls with integrated after-treatment system provide superior fuel efficiency while reducing emissions
- High-pressure common rail fuel system reduces engine noise and smoke
- Cummins Direct Flow™ air filtration offering improved air management, longer service life, and easier serviceability
- 2-stage fuel filtration with optimum particle and water separation

Control features

- The most advanced, reliable and capable generator set control system on the market today
- PowerCommand 3.3© with Masterless Load Demand (MLD) technology enables smartly adapting power to match varying load demand. MLD capable generators allow sharing of information among paralleled generator sets
- Controls provide precise frequency and voltage regulation, alarm and status message display in one easy to operate customer interface

Engine controls

- Oil pressure and coolant temperature gauge
- Fuel level gauge, Diesel Exhaust Fluid (DEF) level gauge and battery voltage gauge
- Digital Hour meter (5-digit read out)
- Engine control module includes remote start capability

Stamford alternators

- 12-lead reconnectable alternators fitted with voltage selection switch
- Permanent magnet excitation for improved performance in non-linear load applications

Rental package enclosure

- Camlock, barrel lugs & bus bar distribution panel
- Sound attenuated, white powder coated lockable enclosure
- 24-hour fuel tank (75% prime) with leak detection sensor
- Single wall fuel tank with 110% fluid containment basin
- Transport Canada Tank
- Roof mounted, single point lift
- Cooling system rated for 120 °F (49 °C) at 100% Standby ambient
- Complete engine fluid containment reservoir
- 4 position voltage selector switch (277/480 or 139/240 or 120/208 VAC 3 phase or 120/240 VAC 1 phase)
- 2 position voltage selector switch (60Hz: 277/480 or 347/600 VAC 3 phase).
- Shore power (15A/120 V) – for coolant heater, battery charger, oil heater and battery warmer
- Conveniently located analog gauges and heated Human Machine Interface (HMI) display

Rental package options

- Optional Auxiliary Fuel and DEF connections
- DOT approved electric brake trailer with heavy duty center mounted jack, ball or pintle hitch
- DOT approved hydraulic brake trailer with heavy duty center mounted jack, ball or pintle hitch

		Standby Rating		Prime Rating			
Model	Voltages (V)	60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz kW (kVA)	50 Hz kW (kVA)	Sound Level Full load @7m	Alternator Model
C100D2RE	480-600 Switchable	100 (125)	-	90 (113)	-	68 dB(A)	UCI27E
	208/240/480	100 (125)	90 (113)	90 (113)	81 (101)	68 dB(A)	UCI274D

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Engine specifications

Engine model	QSB5-G11
Alternator data sheet	UCI
Tier rating	Tier IV
Design	4 cycle, In-Line, turbocharged and after-cooled
Bore	107 mm (4.21 in.)
Stroke	124.0 mm (4.88 in.)
Displacement	4.5 liters (274.6 in^3)
Cylinder block	Cast iron, In-Line 4 cylinder
Battery capacity	2 x 760 cca
Battery charging alternator	70 amps
Starting voltage	24 volt, negative ground
Fuel system	Direct injection HPCR system
Fuel filter	Dual Spin on fuel filter with water separator
Air cleaner type	2-stage, dry replaceable element with dust ejector
Lube oil filter type(s)	Single spin-on, full flow
Standard cooling system	120 °F (49 °C) ambient radiator

Alternator specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	Double layer concentric, 2/3 winding pitch
Rotor	Singe bearing, flexible disc
Insulation system	Class H per NEMA MG1-1.65
Standard temperature rise	125/40 ºC Prime
Exciter type	Permanent Magnet Generator (PMG)
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower fan
AC waveform Total Harmonic Distortion (THDV)	< 1.5% no load, < 5% non-distorting balance linear load
Telephone Influence Factor (TIF)	< 50 per NEMA MG1-22.43
Telephone Harmonic Factor (THF)	< 2%

Power capability specifications

(Assume power factor = 0.80 for 3 phase amps)

	Standby rating					
	240 V, 1 phase Amps 60 Hz	**208 V, 3 phase Amps 60 Hz**	**480 V, 3 phase Amps 60 Hz**	**240 V, 3 phase Amps 60 Hz**	**400 V, 3 phase Amps 50 Hz**	**600 V, 3 Phase Amps 60Hz**
C100D2RE	280	347	150	301	162	120

Electrical power panel specifications

Model voltage	120 V duplex receptacles	240 V twist	Load lug connection (stud diameter)	Load lug circuit breakers
120/480 Volt	2 - 20 Amp GFCI	3 - 50 Amp	1/2 inch	400 Amp
480-600 Volt			1/2 inch	150 Amp

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PowerCommand 3.3 control system

An integrated microprocessor based generator set control system providing voltage regulation, engine protection, alternator protection, operator interface and isochronous governing. Refer to document S-1570 for more detailed information on the control.

Simplified display for Rental operators - simplified display tailored for Rental equipment operations for ease of use.

Masterless Load Demand (MLD) - The controller is capable of smartly managing power from paralleled generators to match varying load patterns.

Power management - Control function provides battery monitoring and testing features and smart starting control system.

Advanced control methodology - Three phase sensing, full wave rectified voltage regulation, with a PWM output for stable operation with all load types.

Regulation compliant - Prototype tested: UL, CSA and CE compliant.

Service - InPower™ PC-based service tool available for detailed diagnostics, setup, data logging and fault simulation.

Easily upgradeable - PowerCommand controls are designed with common control interfaces.

Reliable design - The control system is designed for reliable operation in harsh environment.

Operator panel features

Operator/display functions

- Displays paralleling breaker status
- Provides direct control of the paralleling breaker
- 320 x 240 pixels graphic LED backlight LCD
- Auto, manual, start, stop, fault reset and lamp test/panel lamp switches
- Alpha-numeric display with pushbuttons
- Heated HMI
- LED lamps indicating genset running, remote start, not in auto, common shutdown, common warning, manual run mode, auto mode and stop

Paralleling control functions

- First Start Sensor™ system selects first genset to close to bus
- Phase lock loop synchronizer with voltage matching
- Sync check relay
- Isochronous kW and kVar load sharing
- Enhanced safety features for paralleling generators

Alternator data

- Line-to-Neutral and Line-to-Line AC volts
- 3-phase AC current
- Frequency
- kW, kVar, power factor kVA (three phase and total)

Engine data

- DC voltage
- Lube oil pressure
- Coolant temperature
- Comprehensive FAE data (where applicable)

Other data

- Fault history
- Data logging and fault simulation (requires InPower)

Standard control functions

Digital governing

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

- Integrated digital electronic voltage regulator
- 3-phase, 4-wire Line-to-Line sensing
- Configurable torque matching

AmpSentry™ AC protection

- AmpSentry protective relay
- Over current and short circuit shutdown
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shutdown
- Over and under frequency shutdown
- Overload warning with alarm contact
- Reverse power and reverse Var shutdown
- Field overload shutdown

Engine protection

- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking lockout
- Sensor failure indication
- Full authority electronic engine protection

Control functions

- Time delay start and cool down
- Real time clock for fault and event time stamping
- Cycle cranking
- Load shed
- Remote emergency stop

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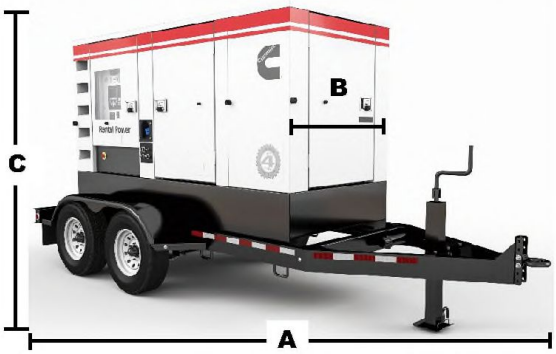
Ratings definitions

Standby:

Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating. (Equivalent to Fuel Stop Power in accordance with ISO3046, AS2789, DIN6271 and BS5514). Nominally rated.

Prime (unlimited running time):

Applicable for supplying power in lieu of commercially purchased power. Prime power is the maximum power available at a variable load for an unlimited number of hours. A 10% overload capability is available for limited time. (Equivalent to Prime Power in accordance with ISO8528 and Overload Power in accordance with ISO3046, AS2789, DIN6271, and BS5514).



Dimensions

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Weight w/o fuel kg (lbs)	Weight with fuel kg (lbs)	Fuel capacity liters (gal)*
C100D2RE	3063 (121)	1262 (50)	1953 (77)	2522 (5560)	2976 (6560)	495 (131)
With trailer	4798 (189)	2106 (83)	2444 (96)	3221 (7100)	3674 (8100)	495 (131)

* Onboard DEF capacity is sized for 24 hours of operation at 10 gallons.

Fuel consumption

	Standby				Prime				
60 Hz Ratings, kW (kVA)	100 (125)				90 (113)				Hours of operation
Load	**1/4**	**1/2**	**3/4**	**Full**	**1/4**	**1/2**	**3/4**	**Full**	**75% load**
US Gal/hr	2.3	3.8	5.3	7.1	2.2	3.5	4.8	6.3	27
L/hr	8.7	14.2	19.9	26.9	8.2	13.1	18.3	24.0	27

Note: DEF consumption less than 4% of fuel consumption.

Trailer information

Model	Tire size	Tire type	Load range	Number of tires per trailer	Lug pattern
C100D2RE	225/75-R15	Radial	2535 lbs - each	4	6 hole

Certifications

These generator sets are certified to following standards:

CAN/CSA STD C22.2 NO. 100
CAN/CSA STD C22.2 NO. 14

For more information contact your local Cummins distributor or visit power.cummins.com

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PDA062H283 NAS-6299-EN (11/19)

UCI274D

STAMFORD

WINDING 311

CONTROL SYSTEM	SEPARATELY EXCITED BY P.M.G.		
A.V.R.	MX321	MX341	
VOLTAGE REGULATION	± 0.5 %	± 1.0 %	With 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	REFER TO SHORT CIRCUIT DECREMENT CURVES (page 7)		

CONTROL SYSTEM	SELF EXCITED		
A.V.R.	SX460	AS440	
VOLTAGE REGULATION	± 1.0 %	± 1.0 %	With 4% ENGINE GOVERNING
SUSTAINED SHORT CIRCUIT	SERIES 4 CONTROL DOES NOT SUSTAIN A SHORT CIRCUIT CURRENT		

INSULATION SYSTEM	CLASS H							
PROTECTION	IP23							
RATED POWER FACTOR	0.8							
STATOR WINDING	DOUBLE LAYER CONCENTRIC							
WINDING PITCH	TWO THIRDS							
WINDING LEADS	12							
STATOR WDG. RESISTANCE	0.044 Ohms PER PHASE AT 22°C SERIES STAR CONNECTED							
ROTOR WDG. RESISTANCE	1.26 Ohms at 22°C							
EXCITER STATOR RESISTANCE	20 Ohms at 22°C							
EXCITER ROTOR RESISTANCE	0.091 Ohms PER PHASE AT 22°C							
R.F.I. SUPPRESSION	BS EN 61000-6-2 & BS EN 61000-6-4,VDE 0875G, VDE 0875N. refer to factory for others							
WAVEFORM DISTORTION	NO LOAD < 1.5% NON-DISTORTING BALANCED LINEAR LOAD < 5.0%							
MAXIMUM OVERSPEED	2250 Rev/Min							
BEARING DRIVE END	BALL. 6315-2RS (ISO)							
BEARING NON-DRIVE END	BALL. 6310-2RS (ISO)							
	1 BEARING				2 BEARING			
WEIGHT COMP. GENERATOR	431 kg				450 kg			
WEIGHT WOUND STATOR	141 kg				141 kg			
WEIGHT WOUND ROTOR	149.37 kg				138.41 kg			
WR² INERTIA	1.1962 kgm^2				1.1455 kgm^2			
SHIPPING WEIGHTS in a crate	458 kg				476 kg			
PACKING CRATE SIZE	105 x 67 x 103(cm)				105 x 67 x 103(cm)			
	50 Hz				60 Hz			
TELEPHONE INTERFERENCE	THF<2%				TIF<50			
COOLING AIR	0.514 m³/sec 1090 cfm				0.617 m³/sec 1308 cfm			
VOLTAGE SERIES STAR	380/220	400/231	415/240	440/254	416/240	440/254	460/266	480/277
VOLTAGE PARALLEL STAR	190/110	200/115	208/120	220/127	208/120	220/127	230/133	240/138
VOLTAGE SERIES DELTA	220/110	230/115	240/120	254/127	240/120	254/127	266/133	277/138
kVA BASE RATING FOR REACTANCE VALUES	114	120	114	N/A	131.3	137.5	137.5	146.3
Xd DIR. AXIS SYNCHRONOUS	2.17	2.06	1.82	-	2.52	2.36	2.16	2.11
X'd DIR. AXIS TRANSIENT	0.18	0.18	0.16	-	0.21	0.20	0.18	0.17
X"d DIR. AXIS SUBTRANSIENT	0.12	0.11	0.10	-	0.15	0.14	0.13	0.12
Xq QUAD. AXIS REACTANCE	1.39	1.32	1.17	-	1.49	1.39	1.28	1.25
X"q QUAD. AXIS SUBTRANSIENT	0.16	0.16	0.14	-	0.21	0.20	0.18	0.17
X_L LEAKAGE REACTANCE	0.07	0.06	0.06	-	0.07	0.07	0.06	0.06
X_2 NEGATIVE SEQUENCE	0.14	0.13	0.12	-	0.17	0.16	0.15	0.14
X_0 ZERO SEQUENCE	0.09	0.08	0.07	-	0.10	0.09	0.09	0.08
REACTANCES ARE SATURATED	VALUES ARE PER UNIT AT RATING AND VOLTAGE INDICATED							
T'd TRANSIENT TIME CONST.	0.031 s							
T"d SUB-TRANSTIME CONST.	0.01 s							
T'do O.C. FIELD TIME CONST.	0.85 s							
Ta ARMATURE TIME CONST.	0.0073 s							
SHORT CIRCUIT RATIO	1/Xd							

APPROVED DOCUMENT

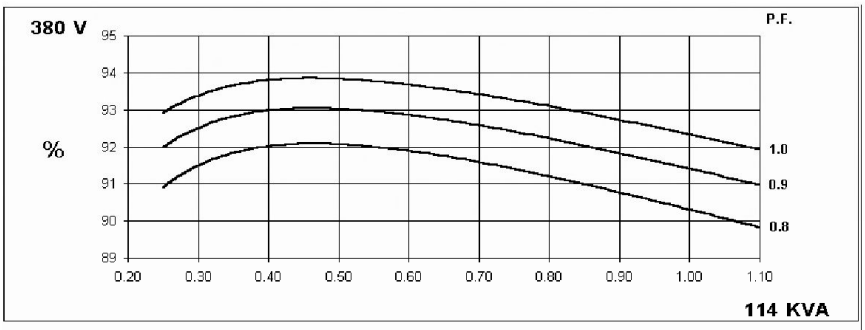
50 Hz

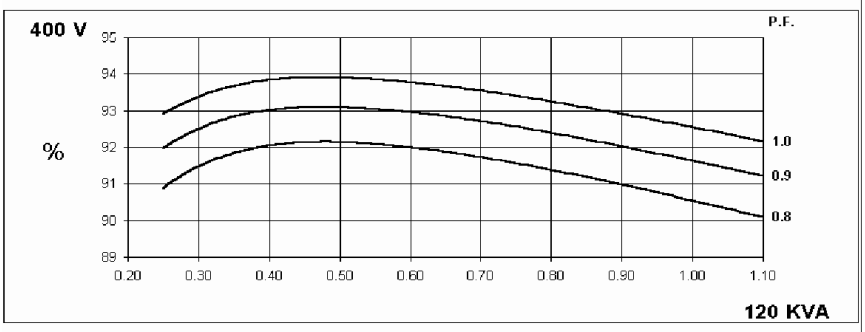
UCI274D

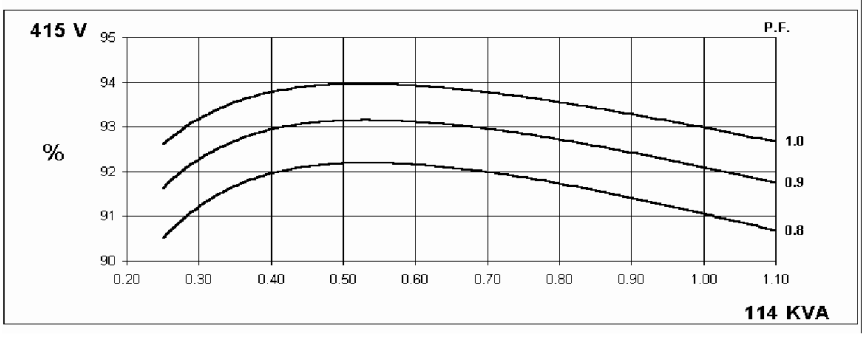
Winding 311

STAMFORD

THREE PHASE EFFICIENCY CURVES







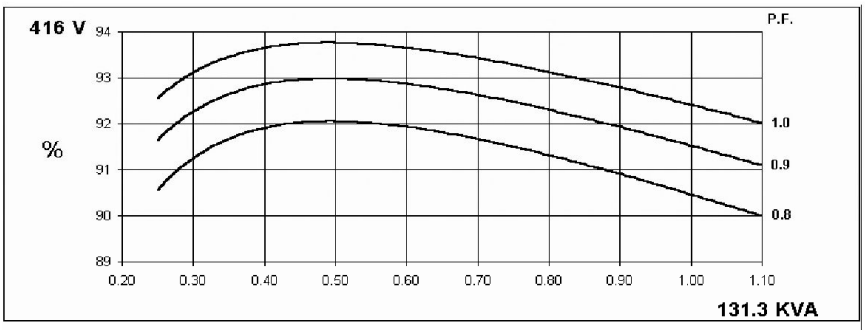
60 Hz

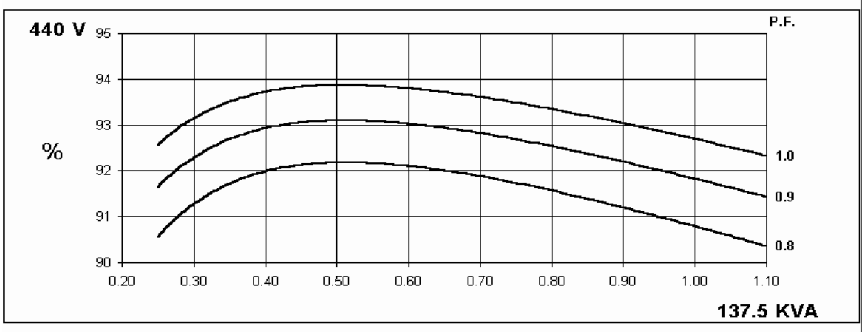
UCI274D

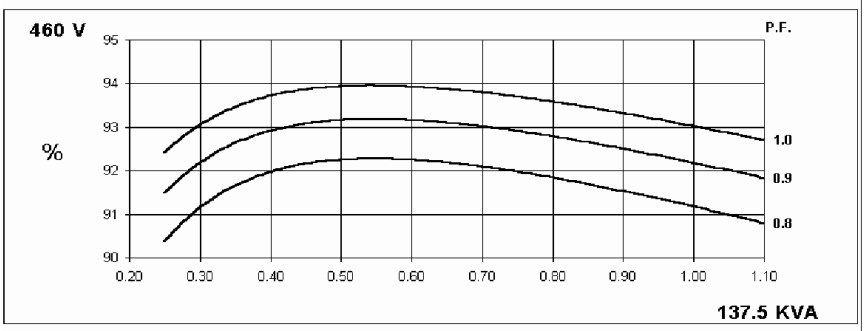
Winding 311

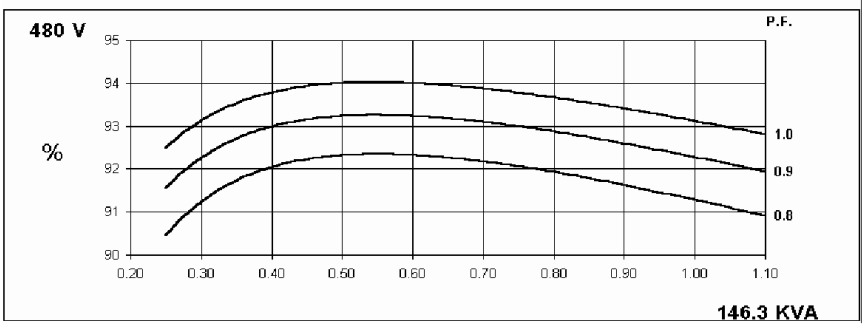
STAMFORD

THREE PHASE EFFICIENCY CURVES









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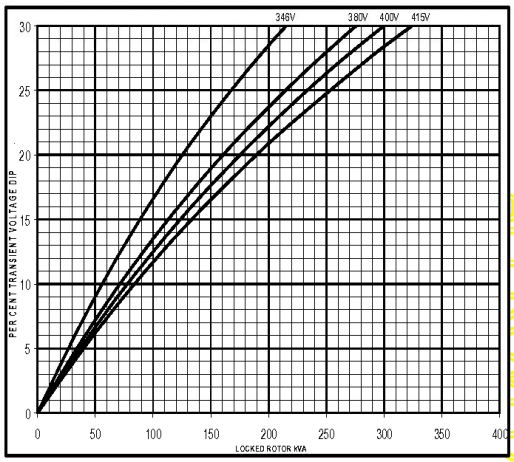
Winding 311

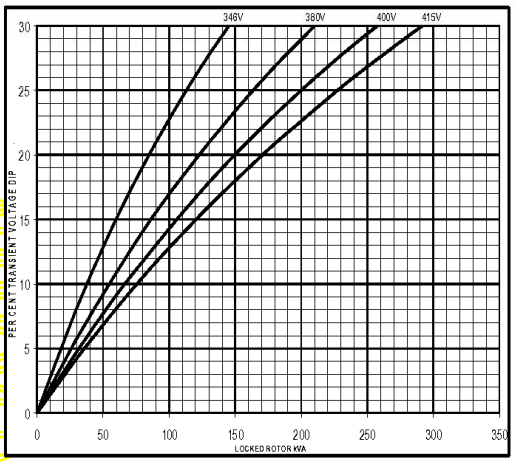
Locked Rotor Motor Starting Curve

50 Hz

MX



SX



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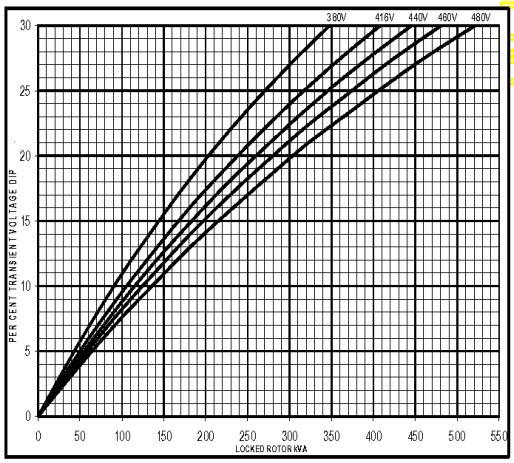
60 Hz

MX



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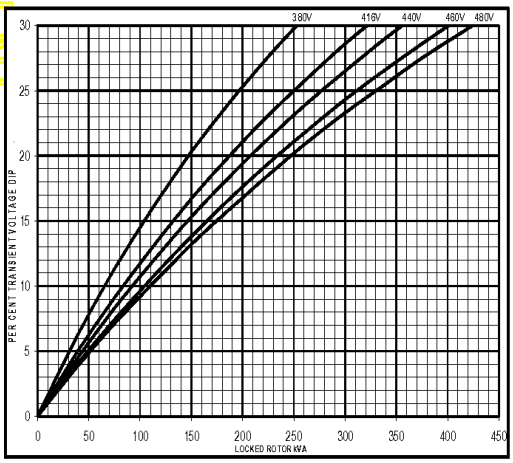
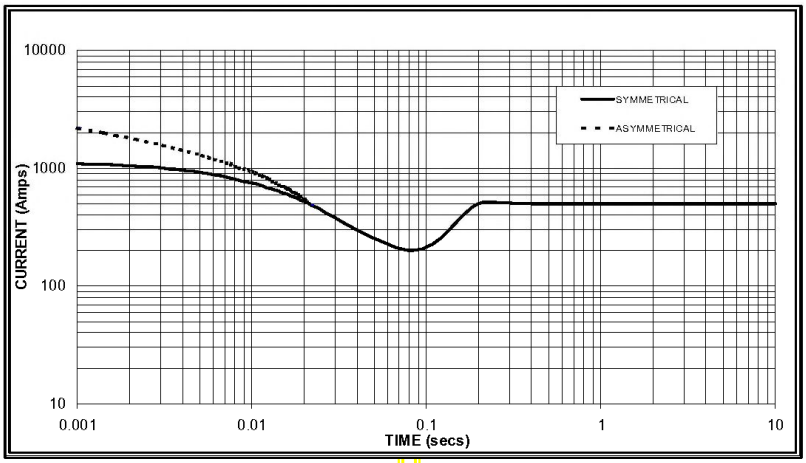


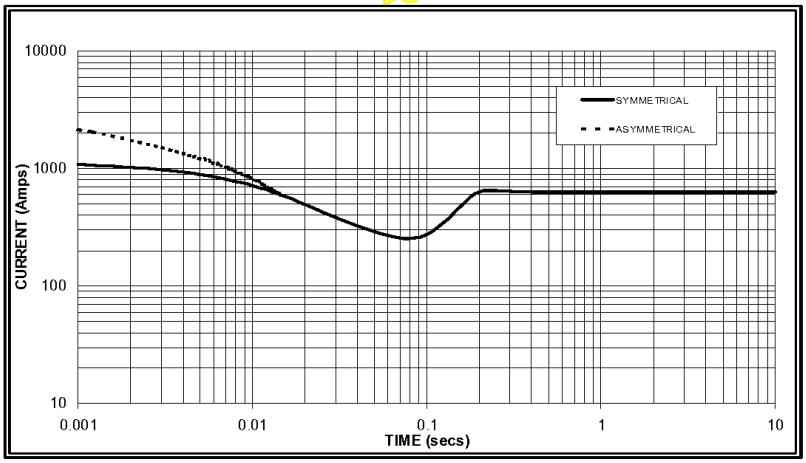
Three-phase Short Circuit Decrement Curve. No-load Excitation at Rated Speed
Based on star (wye) connection.

50 Hz



Sustained Short Circuit = 500 Amps

60 Hz



Sustained Short Circuit = 630 Amps

Note 1
The following multiplication factors should be used to adjust the values from curve between time 0.001 seconds and the minimum current point in respect of nominal operating voltage :

50Hz		60Hz	
Voltage	Factor	Voltage	Factor
380v	X 1.00	416v	X 1.00
400v	X 1.07	440v	X 1.06
415v	X 1.12	460v	X 1.12
		480v	X 1.17

The sustained current value is constant irrespective of voltage level

Note 2
The following multiplication factor should be used to convert the values calculated in accordance with NOTE 1 to those applicable to the various types of short circuit :

	3-phase	2-phase L-L	1-phase L-N
Instantaneous	x 1.00	x 0.87	x 1.30
Minimum	x 1.00	x 1.80	x 3.20
Sustained	x 1.00	x 1.50	x 2.50
Max. sustained duration	10 sec.	5 sec.	2 sec.

All other times are unchanged

Note 3
Curves are drawn for Star (Wye) connected machines. For other connection the following multipliers should be applied to current values as shown :
Parallel Star = Curve current value X 2
Series Delta = Curve current value X 1.732

UCI274D

STAMFORD

Winding 311 / 0.8 Power Factor

RATINGS

	Class - Temp Rise	Cont. F - 105/40°C				Cont. H - 125/40°C				Standby - 150/40°C				Standby - 163/27°C			
50 Hz	Series Star (V)	380	400	415	440	380	400	415	440	380	400	415	440	380	400	415	440
	Parallel Star (V)	190	200	208	220	190	200	208	220	190	200	208	220	190	200	208	220
	Series Delta (V)	220	230	240	254	220	230	240	254	220	230	240	254	220	230	240	254
	kVA	100.0	100.0	100.0	N/A	114.0	120.0	114.0	N/A	121.0	127.0	121.0	N/A	125.0	130.0	125.0	N/A
	kW	80.0	80.0	80.0	N/A	91.2	96.0	91.2	N/A	96.8	101.6	96.8	N/A	100.0	104.0	100.0	N/A
	Efficiency (%)	90.9	91.3	91.5	N/A	90.3	90.6	91.1	N/A	90.0	90.3	90.8	N/A	89.8	90.2	90.7	N/A
	kW Input	88.0	87.6	87.4	N/A	101.0	106.0	100.1	N/A	107.6	112.5	106.6	N/A	111.4	115.3	110.3	N/A
60 Hz	Series Star (V)	416	440	460	480	416	440	460	480	416	440	460	480	416	440	460	480
	Parallel Star (V)	208	220	230	240	208	220	230	240	208	220	230	240	208	220	230	240
	Series Delta (V)	240	254	266	277	240	254	266	277	240	254	266	277	240	254	266	277
	kVA	120.0	125.0	125.0	131.3	131.3	137.5	137.5	146.3	137.5	145.0	145.0	156.3	142.5	150.0	150.0	158.8
	kW	96.0	100.0	100.0	105.0	105.0	110.0	110.0	117.0	110.0	116.0	116.0	125.0	114.0	120.0	120.0	127.0
	Efficiency (%)	90.9	91.2	91.5	91.6	90.5	90.8	91.2	91.3	90.2	90.6	91.0	91.0	90.1	90.4	90.8	91.0
	kW Input	105.6	109.6	109.3	114.7	116.1	121.1	120.6	128.2	122.0	128.0	127.5	137.4	126.5	132.7	132.2	139.6

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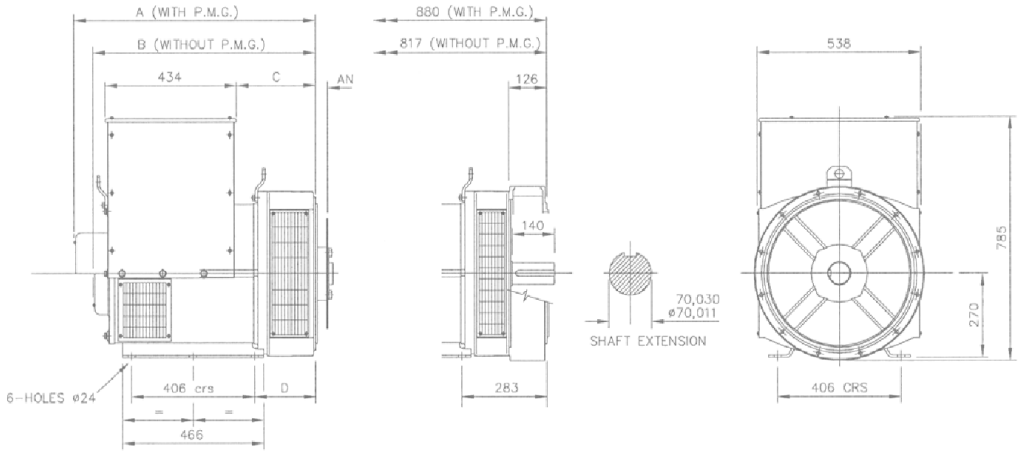
DIMENSIONS



SINGLE BEARING ADAPTORS				
ADAPTOR	A	B	C	D
SAE 1	813,3	750,3	274,3	216,3
SAE 2	799	736	260	202
SAE 3	799	736	260	202

COUPLING DISCS	
DISC	AN
SAE 10	53,98
SAE 11,5	39,68
SAE 14	25,40

Sound Data
C100D2RE
QSB5-G11 60Hz
Diesel Generator Set

A-weighted Sound Pressure Level @ 7 meters, dB(A)

See notes 2, 5 and 7-11 listed below

Configuration	Exhaust	Applied Load	Position (Note 2)								8 Position Average
			1	2	3	4	5	6	7	8	
Housed with SCR and Trailer	Open	0 % Prime	67.8	67.0	62.6	63.2	64.2	68.0	65.0	68.1	66.2
		75% Standby	69.6	68.0	64.9	65.0	65.4	68.6	66.6	69.7	67.6
		100 % Prime	70.1	68.5	65.3	65.7	65.9	68.9	66.9	70.0	68.1
		110 % Prime	70.1	68.7	65.2	65.6	66.1	68.9	66.9	70.0	68.1

Average A-weighted Sound Pressure Level @ 1 meter, dB(A)

See notes 1, 5 and 7-14 listed below

Configuration	Exhaust	Applied Load	Octave Band Center Frequency (Hz)										Overall Sound Pressure Level
			16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
Housed with SCR and Trailer	Open	0 % Prime	N/A	33.8	58.8	66.9	71.3	70.2	69.5	69.2	63.2	55.9	40.4	76.9
		75% Standby	N/A	36.8	62.2	69.0	71.2	71.0	70.0	69.7	64.5	56.5	47.2	77.6
		100 % Prime	N/A	37.3	63.2	69.8	71.6	71.1	69.9	69.7	64.1	56.8	47.4	77.9
		110 % Prime	N/A	37.8	63.3	69.9	71.6	71.2	69.9	69.7	64.2	56.9	47.5	77.9

A-weighted Sound Pressure Level @ Operator Location, dB(A)

See notes 1, 3, 5 and 7-14 listed below

Configuration	Exhaust	Applied Load	Octave Band Center Frequency (Hz)										Overall Sound Pressure Level
			16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
Housed with SCR and Trailer	Open	100 % Prime	N/A	38.4	64.6	73.4	77.3	69.6	68.3	66.7	61.0	55.2	49.5	80.0
		110 % Prime	N/A	38.7	64.7	73.8	77.7	69.7	67.5	66.5	61.1	55.2	49.1	80.3

Sound Data
C100D2RE
QSB5-G11 60Hz
Diesel Generator Set

A-weighted Sound Power Level, dB(A)

See notes 1, 3 and 6-14 listed below

Configuration	Exhaust	Applied Load	Octave Band Center Frequency (Hz)											Overall Sound Power Level
			16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
Housed with SCR and Trailer	Open	0 % Prime	N/A	52.8	78.4	84.9	86.6	86.5	86.8	86.1	79.1	73.0	56.0	93.5
		75% Standby	N/A	55.3	81.8	87.1	87.0	87.3	87.2	86.6	80.4	73.8	61.7	94.5
		100 % Prime	N/A	55.7	82.9	87.9	87.4	87.5	87.1	86.8	80.1	74.1	61.9	94.8
		110 % Prime	N/A	56.2	83.0	88.1	87.4	87.5	87.1	86.7	80.2	74.1	62.2	94.9

Exhaust Sound Power Level, dB(A)

See notes 4 and 6-14 listed below

Configuration	Exhaust	Applied Load	Octave Band Center Frequency (Hz)											Overall Sound Power Level
			16	31.5	63	125	250	500	1000	2000	4000	8000	16000	
Housed with SCR and Trailer	Open	0 % Prime	N/A	51.6	71.7	79.1	86.9	85.3	83.5	83.9	76.7	68.4	54.3	91.6
		75% Standby	N/A	55.2	77.3	81.3	88.1	85.3	83.4	84.5	78.4	69.1	59.6	92.4
		100 % Prime	N/A	55.7	77.8	82.2	88.7	85.3	83.5	84.6	78.1	69.4	57.6	92.8
		110 % Prime	N/A	56.3	76.5	82.2	88.8	85.3	83.5	84.5	78.2	69.5	58.3	92.8

Notes:

1. Sound pressure levels at 1 meter are measured per the requirements of ISO 3744, ISO 8528-10, ANSI S1.13, ANSI S12.1 and European Communities Directive 2000/14/EC as applicable. The microphone measurement locations are 1 meter from a reference parallelepiped just enclosing the generator set (enclosed or unenclosed).
2. Seven-meter measurement location 1 is 7 meters (23 feet) from the generator (alternator) end of the generator set, and the locations proceed counter-clockwise around the generator set at 45° angles at a height of 1.2 meters (48 inches) above the ground surface.
3. Sound Power Levels are calculated according to ISO 3744, ISO 8528-10, and or CE (European Union) requirements.
4. Exhaust Sound Levels are measured and calculated per ISO 6798, Annex A.
5. Reference Sound Pressure Level is 20 µPa.
6. Reference Sound Power Level is 1 pW (10^{-12} Watt).
7. Sound data for remote-cooled generator sets are based on rated loads without cooling fan noise.
8. Sound data for the generator set with infinite exhaust do not include the exhaust noise contribution.
9. Published sound levels are measured at CE certified test site and are subject to instrumentation, measurement, installation and manufacturing variability.
10. Unhoused/Open configuration generator sets refers to generator sets with no sound enclosures of any kind.
11. Housed/Enclosed/Closed/Canopy configuration generator sets refer to generator sets that have noise reduction sound enclosures installed over the generator set and usually integrally attached to the skid base/base frame/fuel container base of the generator set.
12. Published sound levels meet the requirements India's Central Pollution Control Board (Ministry of Environment & Forests),vide GSR 371 (E), which states the A-weighted sound level at1meter from any diesel generator set up to a power output rating of 1000kVA shall not exceed 75dB(A)
13. For updated noise pollution information for India see website: http://www.envfor.nic.in/legis/legis.html
14. Sound levels must meet India's Ambient Air Noise Quality Standards detailed for Daytime/Night-time operation in Noise Pollution (Regulation and Control) Rules, 2000

2020 EPA Tier4 Certified Exhaust Emission Compliance Statement
C100D2RE
EPA Tier 4/EU Stage IIIA
60Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with Tier 4 emissions limit of U.S. EPA Non-Road Engines under the provisions of 40 CFR part 1039 when tested per ISO8178 D2.

Engine Manufacturer:	Cummins Inc.
EPA Certificate Number:	LCEXL04.5AAJ-010
Effective Date:	5/14/2019
Date Issued:	5/14/2019
EPA Engine Family (Cummins Emissions Family):	LCEXL04.5AAJ

Engine Information:

Model:	QSB5-G11	Bore:	4.21 in. (107 mm)
Engine Nameplate HP:	169	Stroke:	4.88 in. (124 mm)
Type:	4 Cycle, Inline, 4 Cylinder Diesel	Displacement:	275 cu. in. (4.5 liters)
Aspiration:	Turbocharged, CAC and EGR	Compression Ratio:	17.2:1
Emission Control Device:	DOC and SCR	Exhaust Stack Diameter:	4 in.

Diesel Fuel Emissions Limits

D2 Cycle Exhaust Emissions	Grams per BHP-hr				Grams per kW_m-hr			
	NO_X	NMHC	CO	PM	NO_X	NMHC	CO	PM
Test Results	0.13	0.01	0.0	0.01	0.18	0.01	0.0	0.01
EPA Emissions Limit	0.30	0.14	2.6	0.01	0.40	0.19	3.5	0.02

Test methods: EPA emissions recorded per 40 CFR Part 60, 89, 1039, 1065 and weighted at load points prescribed in the regulations for constant speed engines.

Diesel fuel specifications: Cetane number: 40-50. Reference: ASTM D975 No. 2-D, 7-15 ppm sulfur.

Reference conditions: Air inlet temperature: 25°C (77°F), Fuel inlet temperature: 40°C (104°F). Barometric pressure: 100 kPa (29.53 in Hg), Humidity: 10.7 g/kg (75 grains H2O/lb) of dry air; required for NOx correction, Restrictions: Intake restriction set to a maximum allowable limit for clean filter; Exhaust back pressure set to a maximum allowable limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

Specification sheet

Rental Power

150 kW

U.S EPA Tier IV emissions

Description

This Cummins® Rental package is a fully integrated mobile power generation system, providing optimum performance, reliability, and versatility for Standby and Prime Power applications.

Features

Cummins diesel engines

- U.S. Tier IV Final and EU SIIIa certified Cummins QSB7-G9 engines which meet emissions limits without the use of a Diesel Particulate Filter (DPF)
- Dual speed engine for operation at 50 or 60 Hz
- Advanced electronic engine controls with integrated after-treatment system provide superior fuel efficiency while reducing emissions
- High-pressure common rail fuel system reduces engine noise and smoke
- Cummins Direct Flow™ air filtration offering improved air management, longer service life, and easier serviceability
- 2-stage fuel filtration with optimum particle and water separation

Control features

- The most advanced, reliable and capable generator set control system on the market today
- PowerCommand 3.3© with Masterless Load Demand (MLD) technology enables smartly adapting power to match varying load demand. MLD capable generators allow sharing of information among paralleled generator sets
- Controls provide precise frequency and voltage regulation, alarm and status message display in one easy to operate customer interface

Engine controls

- Oil pressure and coolant temperature gauge
- Fuel level gauge, Diesel Exhaust Fluid (DEF) level gauge and battery voltage gauge
- Hour meter
- Engine control module includes remote start capability

Stamford alternators

- 12-lead reconnectable alternators fitted with voltage selection switch
- Permanent magnet excitation for improved performance in non-linear load applications

Rental package enclosure

- Camlock distribution panel
- Sound attenuated, white powder coated lockable enclosure
- 24-hour fuel tank (75% prime) with leak detection sensor
- Single wall fuel tank with 110% fluid containment basin
- Transport Canada Tank
- Roof mounted, single point lift
- Cooling system rated for 122 °F (50 °C) at 100% Standby ambient
- Complete engine fluid containment reservoir
- 4 position voltage selector switch (277/480 or 139/240 or 120/208 VAC 3 phase or 120/240 VAC 1 phase)
- Shore power (15 A/120 V) – for coolant heater and battery charger
- Conveniently located analog gauges and heated Human Machine Interface (HMI) display

Rental package options

- Optional Auxiliary Fuel and DEF connections
- DOT approved electric brake trailer with heavy duty center mounted jack, ball or pintle hitch
- DOT approved hydraulic brake trailer with heavy duty center mounted jack, ball or pintle hitch

Model	Voltages (V)	Standby rating		Prime rating		Sound level Full load @ 7 m	Alternator model
		60 Hz kW (kVA)	50 Hz kW (kVA)	60 Hz kW (kVA)	50 Hz kW (kVA)		
C150D2RE	208/240/480	150 (188)	128 (160)	135 (169)	116 (145)	73 dBA	UCI274F

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Engine specifications

Engine model	QSB7-G9
Alternator data sheet	UCI274F (208/240/480)
Tier rating	Tier IV
Design	4 cycle, in-line, turbocharged and after-cooled
Bore	107 mm (4.21 in.)
Stroke	124.0 mm (4.88 in.)
Displacement	6.69 liters (408 in^3)
Cylinder block	Cast iron, in-line 6 cylinder
Battery capacity	2 x 760 cca
Battery charging alternator	70 amps
Starting voltage	24 volt, negative ground
Fuel system	Direct injection HPCR system
Fuel filter	Dual Spin on fuel filter with water separator
Air cleaner type	2-stage, dry replaceable element with dust ejector
Lube oil filter type(s)	Single spin-on, full flow
Standard cooling system	122 °F (50 °C) ambient radiator

Alternator specifications

Design	Brushless, 4 pole, drip proof, revolving field
Stator	Double layer concentric, 2/3 winding pitch
Rotor	Singe bearing, flexible disc
Insulation system	Class H per NEMA MG1-1.65 (208/240/480 VAC)
Standard temperature rise	125/40 ºC Prime (208/480 VAC)
Exciter type	Permanent Magnet Generator (PMG)
Phase rotation	A (U), B (V), C (W)
Alternator cooling	Direct drive centrifugal blower fan
AC waveform Total Harmonic Distortion (THDV)	< 1.5% no load, < 5% non-distorting balance linear load
Telephone Influence Factor (TIF)	< 50 per NEMA MG1-22.43
Telephone Harmonic Factor (THF)	< 2%

Power capability specifications

(Assume power factor = 0.80 for 3 phase amps)

	Standby rating				
	240 V, 1 phase Amps 60 Hz	**208 V, 3 phase Amps 60 Hz**	**480 V, 3 phase Amps 60 Hz**	**240 V, 3 phase Amps 60 Hz**	**400 V, 3 phase Amps 50 Hz**
C150D2RE	419	520	226	451	233

Electrical power panel specifications

Model voltage	120 V duplex receptacles	240 V twist	Load lug connection (stud diameter)	Load lug circuit breakers
120/480 Volt	2 - 20 Amp GFCI	3 - 50 Amp	1/2 inch	600 Amp

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PowerCommand 3.3 control system

An integrated microprocessor based generator set control system providing voltage regulation, engine protection, alternator protection, operator interface and isochronous governing. Refer to document S-1570 for more detailed information on the control.

Simplified display for Rental operators - simplified display tailored for Rental equipment operations for ease of use.

Masterless Load Demand (MLD) - The controller is capable of smartly managing power from paralleled generators to match varying load patterns.

Power management - Control function provides battery monitoring and testing features and smart starting control system.

Advanced control methodology - Three phase sensing, full wave rectified voltage regulation, with a PWM output for stable operation with all load types.

Regulation compliant - Prototype tested: UL, CSA and CE compliant.

Service - InPower™ PC-based service tool available for detailed diagnostics, setup, data logging and fault simulation.

Easily upgradeable - PowerCommand controls are designed with common control interfaces.

Reliable design - The control system is designed for reliable operation in harsh environment.

Operator panel features

Operator/display functions

- Displays paralleling breaker status
- Provides direct control of the paralleling breaker
- 320 x 240 pixels graphic LED backlight LCD
- Auto, manual, start, stop, fault reset and lamp test/panel lamp switches
- Alpha-numeric display with pushbuttons
- Heated HMI
- LED lamps indicating genset running, remote start, not in auto, common shutdown, common warning, manual run mode, auto mode and stop

Paralleling control functions

- First Start Sensor™ system selects first genset to close to bus
- Phase lock loop synchronizer with voltage matching
- Sync check relay
- Isochronous kW and kVar load sharing
- Enhanced safety features for paralleling generators

Alternator data

- Line-to-Neutral and Line-to-Line AC volts
- 3-phase AC current
- Frequency
- kW, kVar, power factor kVA (three phase and total)

Engine data

- DC voltage
- Lube oil pressure
- Coolant temperature
- Comprehensive FAE data (where applicable)

Other data

- Fault history
- Data logging and fault simulation (requires InPower)

Standard control functions

Digital governing

- Integrated digital electronic isochronous governor
- Temperature dynamic governing

Digital voltage regulation

- Integrated digital electronic voltage regulator
- 3-phase, 4-wire Line-to-Line sensing
- Configurable torque matching

AmpSentry™ AC protection

- AmpSentry protective relay
- Over current and short circuit shutdown
- Over current warning
- Single and three phase fault regulation
- Over and under voltage shutdown
- Over and under frequency shutdown
- Overload warning with alarm contact
- Reverse power and reverse Var shutdown
- Field overload shutdown

Engine protection

- Battery voltage monitoring, protection and testing
- Overspeed shutdown
- Low oil pressure warning and shutdown
- High coolant temperature warning and shutdown
- Low coolant level warning or shutdown
- Low coolant temperature warning
- Fail to start (overcrank) shutdown
- Fail to crank shutdown
- Cranking lockout
- Sensor failure indication
- Full authority electronic engine protection

Control functions

- Time delay start and cool down
- Real time clock for fault and event time stamping
- Cycle cranking
- Load shed
- Remote emergency stop

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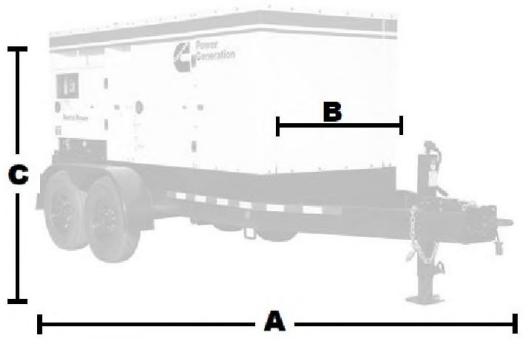
Ratings definitions

Standby:

Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating. (Equivalent to Fuel Stop Power in accordance with ISO3046, AS2789, DIN6271 and BS5514). Nominally rated.

Prime (unlimited running time):

Applicable for supplying power in lieu of commercially purchased power. Prime Power is the maximum power available at a variable load for an unlimited number of hours. A 10% overload capability is available for limited time. (Equivalent to Prime Power in accordance with ISO8528 and Overload Power in accordance with ISO3046, AS2789, DIN6271, and BS5514).



Dimensions

Model	Dim "A" mm (in.)	Dim "B" mm (in.)	Dim "C" mm (in.)	Weight w/o fuel kg (lbs)	Weight with fuel kg (lbs)	Fuel capacity liters (gal)*
C150D2RE	3700 (146)	1450 (57)	1700 (67)	3020 (6600)	3800 (8390)	965 (255)
With trailer	5740 (226)	2140 (84)	2309 (91)	3750 (8270)	4530 (10000)	965 (255)

* Onboard DEF capacity is sized for 24 hours of operation at 15 gallons.

Fuel consumption

	Standby				Prime				
60 Hz Ratings, kW (kVA)	150 (187)				135 (168)				Hours of operation
Load	**1/4**	**1/2**	**3/4**	**Full**	**1/4**	**1/2**	**3/4**	**Full**	**75% load**
US Gal/hr	4.2	6.6	8.9	11.3	4.1	6.2	8.4	10.6	24
L/hr	15.9	25.0	33.7	42.8	15.5	23.5	31.8	40.1	24

Note: DEF consumption less than 4% of fuel consumption.

Trailer information

Model	Tire size	Tire type	Load range	Number of tires per trailer	Lug pattern
C150D2RE	235/85-R16	Radial	2755 lbs - each	4	8 hole

Certifications

These generator sets are certified to following standards:

CAN/CSA STD C22.2 NO. 100
CAN/CSA STD C22.2 NO. 14

For more information contact your local Cummins distributor or visit power.cummins.com

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Alternator data sheet

Frame size: UC3F

Characteristics

Weights:	Wound stator assembly:	337 lb	153 kg
	Rotor assembly:	419 lb	190 kg
	Complete alternator:	1175 lb	533 kg
Maximum speed:		2250 rpm	
Excitation current:	Full load:	2 Amps	
	No load:	0.5 Amps	
Insulation system:	Class H throughout		

1 Ø Ratings (1.0 power factor)		**60 Hz**			**50 Hz**	
(Based on specific temperature rise at 40 °C ambient temperature)		Double delta	4 lead		Double delta	
		120/240	120/240		110-120 220-240	
125 °C rise ratings	kW/kVA	109/109	135/135		96/96	
105 °C rise ratings	kW/kVA	98/98	125/125		87/87	

3 Ø Ratings (0.8 power factor)		Upper broad range		LBR*	347/600	Broad range		
(Based on specified temperature rise at 40 °C ambient temperature)		120/208 240/416	139/240 277/480	190-208 380-416	347/600	110/190 220/380	120/208 240/415	127/220 254/440
150 °C Rise ratings	kW	150	170	148	170	136	136	128
	kVA	188	213	185	213	170	170	160
125 °C Rise ratings	kW	145	165	144	165	128	128	120
	kVA	181	206	180	206	160	160	150
105 °C Rise ratings	kW	130	150	128	150	116	116	108
	kVA	163	188	160	188	145	145	135
80 °C Rise ratings	kW	112	128	110	128	101	101	94
	kVA	140	160	138	160	126	126	118

3 Ø Reactances (per unit, ±10%)							
(Based on full load at 105 °C rise rating)							
Synchronous	2.21	1.92	1.68	1.97	2.04	1.71	1.42
Transient	0.18	0.15	0.14	0.16	0.17	0.15	0.12
Subtransient	0.13	0.11	0.09	0.10	0.12	0.10	0.09
Negative sequence	0.14	0.12	0.10	0.11	0.13	0.11	0.09
Zero sequence	0.08	0.07	0.07	0.07	0.08	0.07	0.06

3 Ø Motor starting						
Maximum kVA	(Shunt)	516	516	516	367	
(90% sustained voltage)	(PMG)	607	607	607	458	

Time constants (Sec)					
Transient	0.035	0.035	0.035	0.035	
Subtransient	0.011	0.011	0.011	0.011	
Open circuit	0.900	0.900	0.900	0.900	
DC	0.009	0.009	0.009	0.009	

Alternator data sheet

Frame size: UC3F

Windings	(@ 20° C)				
Stator resistance	(Line to Line, Ohms)	0.0480	0.0400	0.0700	0.0480
Rotor resistance	(Ohms)	0.0480	0.0400	0.0700	0.0480
Number of leads		12	12	6	12

* Lower broad range 110/190 thru 120/208, 220/380 thru 240/416.

Sound data
C150D2RE 60 Hz

Sound pressure level @ 7 meters, dB(A)

See notes 1-8 listed below

Configuration		Measurement Location Number								Average
		1	2	3	4	5	6	7	8	
Standard container	Mounted muffler	73.5	73.7	72.0	72.0	71.7	73.0	71.6	73.9	72.8

Note:

1. Position 1 faces the engine front. The positions proceed around the generator set in a counter-clockwise direction in 45° increments. All positions are at 7m (23 ft) from the surface of the generator set and 1.2m (48") from floor level.
2. Sound levels are subject to instrumentation, measurement, installation and manufacturing variability.
3. Sound data with remote-cooled generator sets are based on rated loads without cooling fan noise.
4. Sound levels for aluminum enclosures are approximately 2 dB(A)s higher than listed sound levels for steel enclosures.
5. Sound data for generator set with infinite exhaust do not include exhaust noise.
6. Data is based on full rated load with standard radiator-cooling fan package
7. Sound Pressure Levels are measured per ANSI S1.13 and ANSI S12.18, as applicable.
8. Reference sound pressure is 20 µPa.

2020 EPA Tier4 Certified Exhaust Emission Compliance Statement
C150D2RE
EPA Tier 4/EU Stage IIIA
60 Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with Tier 4 emissions limit of U.S. EPA Non-Road Engines under the provisions of 40 CFR part 1039 when tested per ISO8178 D2.

Engine Manufacturer:	Cummins Inc.
EPA Certificate Number:	LCEXL06.7AAL-047
Effective Date:	7/23/2019
Date Issued:	7/23/2019
EPA Engine Family (Cummins Emissions Family):	LCEXL06.7AAL

Engine Information:

Model:	QSB7-G9	Bore:	4.21 in. (107 mm)
Engine Nameplate HP:	314	Stroke:	4.88 in. (124 mm)
Type:	4 Cycle, Inline, 6 Cylinder Diesel	Displacement:	409 cu. in. (7 liters)
Aspiration:	Turbocharged and CAC	Compression Ratio:	17.3:1
Emission Control Device:	Turbocharge with CAC and T4F After-treatment system		

Diesel Fuel Emissions Limits

D2 Cycle Exhaust Emissions

	Grams per BHP-hr				Grams per kW_m-hr			
	NO_x	NMHC	CO	PM	NO_x	NMHC	CO	PM
Test Results	0.10	0.02	0.0	0.01	0.13	0.03	0.0	0.01
EPA Emissions Limit	0.30	0.14	2.6	0.01	0.40	0.19	3.5	0.02

Test methods: EPA emissions recorded per 40 CFR Part 60, 89, 1039, 1065 and weighted at load points prescribed in the regulations for constant speed engines.

Diesel fuel specifications: Cetane number: 40-50. Reference: ASTM D975 No. 2-D, 7-15 ppm sulfur.

Reference conditions: Air inlet temperature: 25°C (77°F), Fuel inlet temperature: 40°C (104°F). Barometric pressure: 100 kPa (29.53 in Hg), Humidity: 10.7 g/kg (75 grains H2O/lb) of dry air; required for NOx correction, Restrictions: Intake restriction set to a maximum allowable limit for clean filter; Exhaust back pressure set to a maximum allowable limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results.

Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

SAME CONTROLS ON ALL UNITS

Specification sheet

PowerCommand®
3.3 control system

Control system description

The PowerCommand control system is a microprocessor-based genset monitoring, metering and control system designed to meet the demands of today's engine driven gensets. The integration of all control functions into a single control system provides enhanced reliability and performance, compared to conventional genset control systems. These control systems have been designed and tested to meet the harsh environment in which gensets are typically applied.

Features

- 320 x 240 pixels graphic LED backlight LCD.
- Multiple language support.
- AmpSentry™ protection - for true alternator overcurrent protection.
- Digital power transfer control (AMF) provides load transfer operation in open transition, closed transition, or soft (ramping) transfer modes.
- Extended paralleling (peak shave/base load) regulates the genset real and reactive power output while paralleled to the utility. Power can be regulated at either the genset or utility Bus monitoring point.
- Digital frequency synchronization and voltage matching.
- Isochronous load share
- Droop kW and kVAr control
- Real time clock for fault and event time stamping.
- Exerciser clock and time of day start/stop initiate a test with or without load, or a base load or peak shave session.
- Digital voltage regulation. Three phase full wave FET type regulator compatible with either shunt or PMG systems.
- Digital engine speed governing (where applicable)
- Generator set monitoring and protection.
- Utility/AC Bus metering and protection
- 12 and 24 V DC battery operation.
- ModBus® interface for interconnecting to customer equipment.
- Warranty and service. Backed by a comprehensive warranty and worldwide distributor service network.
- Certifications - Suitable for use on gensets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std. and CE standards.

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PowerCommand digital genset control PCC 3300

Description

The PowerCommand genset control is suitable for use on a wide range of diesel and lean burn natural gas gensets in paralleling applications. The PowerCommand control is compatible with shunt or PMG excitation style. It is suitable for use with reconnectable or non-reconnectable generators, and it can be configured for any frequency, voltage and power connection from 120-600 VAC line-toline, 601-45,000 VAC with external PT.

Power for this control system is derived from the genset starting batteries. The control functions over a voltage range from 8 VDC to 30 VDC.

Features

- 12 and 24 VDC battery operation.
- Digital voltage regulation - Three phase full wave FET type regulator compatible with either shunt or PMG systems. Sensing is three phase.
- Digital engine speed governing (where applicable) - Provides isochronous frequency regulation.
- Full authority engine communications (where applicable) - Provides communication and control with the Engine Control Module (ECM).
- AmpSentry protection - for true alternator overcurrent protection.
- Genset monitoring - Monitors status of all critical engine and alternator functions.
- Digital genset metering (AC and DC).
- Genset battery monitoring system to sense and warn against a weak battery condition.
- Configurable for single or three phase AC metering.
- Engine starting - Includes relay drivers for starter, Fuel Shut Off (FSO), glow plug/spark ignition power and switch B+ applications.
- Genset protection – Protects engine and alternator.
- Real time clock for fault and event time stamping.
- Exerciser clock and time of day start/stop initiate a test with or without load, or a base load or peak shave session.
- Digital power transfer control (AMF) provides load transfer operation in open transition, closed transition, or soft (ramping) transfer modes.
- Extended paralleling (peak shave/base load) regulates the genset real and reactive power output while paralleled to the utility. Power can be regulated at either the genset or utility bus monitoring point.
- Digital frequency synchronization and voltage matching.
- Isochronous load share
- Droop kW and KVAr control
- Sync cCheck – The sync check function has adjustments for phase angle window, voltage window, frequency window and time delay.
- Utility/AC Bus metering and protection
- Advanced serviceability – using InPower™, a PC-based software service tool.
- Environmental protection – The control system is designed for reliable operation in harsh environments.
- The main control board is a fully encapsulated module that is protected from the elements.
- ModBus interface for interconnecting to customer equipment.
- Configurable inputs and outputs – Four discrete inputs and four dry contact relay outputs.
- Warranty and service – Backed by a comprehensive warranty and worldwide distributor service network.
- Certifications – Suitable for use on gensets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std. and CE standards.

Base control functions

HMI capability

Options – Local and remote HMI options.

Operator adjustments – The HMI includes provisions for many set up and adjustment functions.

Genset hardware data – Access to the control and software part number, genset rating in kVA and genset model number is provided from the HMI or InPower.

Data logs – Includes engine run time, controller on time, number of start attempts, total kilowatt hours, and load profile. (Control logs data indicating the operating hours at percent of rated kW load, in 5% increments. The data is presented on the operation panel based on total operating hours on the generator).

Fault history – Provides a record of the most recent fault conditions with control date and time stamp. Up to 32 events are stored in the control non-volatile memory.

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Alternator data

- Voltage (single or three phase line-to-line and line-to-neutral)
- Current (single or three phase)
- kW, kVAr, power factor, kVA (three phase and total)
- Frequency

For Lean burn natural gas engine applications:

- Alternator heater status
- Alternator winding temperature (per phase)
- Alternator drive end bearing temperature
- Alternator non-drive end bearing temperature

Utility/AC Bus data

- Voltage (three phase line-to-line and line-to-neutral)
- Current (three phase and total)
- kW, kVAr, power factor, kVA (three phase and total)
- Frequency

Engine data

- Starting battery voltage
- Engine speed
- Engine temperature
- Engine oil pressure
- Engine oil temperature
- Intake manifold temperature
- Coolant temperature
- Comprehensive Full Authority Engine (FAE) data (where applicable)

For lean burn natural gas engine applications:

- Safety shutoff valve status
- Valve proving status
- Downstream gas pressure
- Gas inlet pressure
- Gas mass flow rate
- Control valve position
- Gas outlet pressure
- Manifold pressure
- Manifold temperature
- Throttle position
- Compressor outlet pressure
- Turbo speed
- Compressor bypass position
- Cylinder configuration (e.g., drive end and non-drive end configurations
- Coolant pressure 1 and 2 (e.g., HT and LT)
- Coolant temperature 1 and 2 (e.g., HT and LT)
- Exhaust port temperature (up to 18 cylinders)
- Pre-filter oil pressure
- Exhaust back pressure
- CM700 internal temperature
- CM700 isolated battery voltage
- Speed bias
- CM558 internal temperature
- CM558 isolated battery voltage
- Knock level (up to 18 cylinders)
- Spark advance (up to 18 cylinders)
- Knock count (up to 18 cylinders)
- Auxiliary supply disconnector status
- Engine heater status
- Coolant circulating pump status
- Lube oil priming pump status
- Lube oil status
- Oil heater status
- Derate authorization status
- Start system status
- Ventilator fan status
- Ventilation louvre status
- Radiator fan status
- DC PSU status
- Start inhibit/enable status and setup

Service adjustments – The HMI includes provisions for adjustment and calibration of genset control functions. Adjustments are protected by a password. Functions include:

- Engine speed governor adjustments
- Voltage regulation adjustments
- Cycle cranking
- Configurable fault set up
- Configurable input and output set up
- Meter calibration
- Paralleling setup
- Display language and units of measurement

Engine control

SAE-J1939 CAN interface to full authority ECMs (where applicable). Provides data transfer between genset and engine controller for control, metering and diagnostics. 12 VDC/24 VDC battery operations - PowerCommand will operate either on 12 VDC or 24 VDC batteries.

Temperature dependent governing dynamics (with electronic governing) - modifies the engine governing control parameters as a function of engine temperature. This allows the engine to be more responsive when warm and more stable when operating at lower temperature levels.

Isochronous governing - (where applicable) Capable of controlling engine speed within +/-0.25% for any steady state load from no load to full load. Frequency drift will not exceed +/-0.5% for a 33 °C (60 °F) change in ambient temperature over an 8 hour period.

Droop electronic speed governing - Control can be adjusted to droop from 0 to 10% from no load to full load.

Remote start mode - It accepts a ground signal from remote devices to automatically start the genset and immediately accelerates to rated speed and voltage or run at idle until engine temperature is adequate. The remote start signal will also wake up the control from sleep mode. The control can incorporate a time delay start and stop.

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Remote and local emergency stop - The control accepts a ground signal from a local (genset mounted) or remote (facility mounted) emergency stop switch to cause the genset to immediately shut down. The genset is prevented from running or cranking with the switch engaged. If in sleep mode, activation of either emergency stop switch will wake up the control.

Sleep mode - The control includes a configurable low current draw state to minimize starting battery current draw when the genset is not operating. The control can also be configured to go into a low current state while in auto for prime applications or applications without a battery charger.

Engine starting - The control system supports automatic engine starting. Primary and backup start disconnects are achieved by one of two methods: magnetic pickup or main alternator output frequency. The control also supports configurable glow plug control when applicable.

Cycle cranking - Is configurable for the number of starting cycles (1 to 7) and duration of crank and rest periods. Control includes starter protection algorithms to prevent the operator from specifying a starting sequence that might be damaging.

Time delay start and stop (cooldown) - Configurable for time delay of 0-300 seconds prior to starting after receiving a remote start signal and for time delay of 0-600 seconds prior to shut down after signal to stop in normal operation modes. Default for both time delay periods is 0 seconds.

For lean burn natural gas engine applications:

Engine start inhibit/enable – The function will allow application-specific processes to be started prior to the genset/engine start (e.g., pumps, boosters, etc.).

Alternator control

The control includes an integrated three phase line-to-line sensing voltage regulation system that is compatible with shunt or PMG excitation systems. The voltage regulation system is a three phase full wave rectified and has an FET output for good motor starting capability. Major system features include:

Digital output voltage regulation - Capable of regulating output voltage to within +/-1.0% for any loads between no load and full load. Voltage drift will not exceed +/-1.5% for a 40 ºC
(104 ºF) change in temperature in an eight hour period. On engine starting or sudden load acceptance, voltage is controlled to a maximum of 5% overshoot over nominal level.

The automatic voltage regulator feature can be disabled to allow the use of an external voltage regulator.

Droop voltage regulation - Control can be adjusted to droop from 0-10% from no load to full load.

Torque-matched V/Hz overload control - The voltage roll-off set point and rate of decay (i.e. the slope of the V/Hz curve) is adjustable in the control.

Fault current regulation - PowerCommand will regulate the output current on any phase to a maximum of three times rated current under fault conditions for both single phase and three phase faults. In conjunction with a permanent magnet generator, it will provide three times rated current on all phases for motor starting and short circuit coordination purpose.

Paralleling functions

First Start Sensor™ system – PowerCommand provides a unique control function that positively prevents multiple gensets from simultaneously closing to an isolated bus under black start conditions. The First Start Sensor system is a communication system between the gensets that allows the gensets to work together to determine which genset is a system should be the first to close to the bus. The system includes an independent backup function, so that if the primary system is disabled the required functions are still performed.

Synchronizing – Control incorporates a digital synchronizing function to force the genset to match the frequency, phase and voltage of another source such as a utility grid. The synchronizer includes provisions to provide proper operation even with highly distorted bus voltage waveforms. The synchronizer can match other sources over a range of 60-110% of nominal voltage and -24 to +6 Hz. The synchronizer function is configurable for slip frequency synchronizing for applications requiring a known direction of power flow at instant of breaker closure or for applications where phase synchronization performance is otherwise inadequate.

Load sharing control – The genset control includes an integrated load sharing control system for both real (kW) and reactive (kVar) loads when the genset(s) are operating on an isolated bus. The control system determines kW load on the engine and kVar load on the alternator as a percent of genset capacity, and then regulates fuel and excitation systems to maintain system and genset at the same percent of load without impacting voltage or frequency regulation. The control can also be configured for operation in droop mode for kW or Kvar load sharing.

Load govern control – When PowerCommand receives a signal indicating that the genset is paralleled with an infinite source such as a utility (mains) service, the genset will operate in load govern mode. In this mode the genset will synchronize and close to the bus, ramp to a pre-programmed kW and kVar load level, and then operate at that point. Control is adjustable for kW values from 0- 100% of Standby rating, and 0.7-1.0 power factor (lagging). Default setting is 80% of Standby and 1.0 power factor. The control includes inputs to allow independent control of kW and kVar load level by a remote device while in the load govern mode. The rate of load increase and decrease is also adjustable in the control. In addition, the control can be configured for operation in kW or kVAr load govern droop.

Load demand control – The control system includes the ability to respond to an external signal to initiate load demand operation. On command, the genset will ramp to no load, open its paralleling breaker, cool down, and shut down. On removal of the command, the genset will immediately start, synchronize, connect, and ramp to its share of the total load on the system.

Sync check – The sync check function decides when permissive conditions have been met to allow breaker closure. Adjustable criteria are: phase difference from 0.1-20 deg, frequency difference from 0.001-1.0 Hz, voltage difference from 0.5-10%, and a dwell time from 0.5-5.0 sec. Internally the sync check is used to perform closed transition operations. An external sync check output is also available.

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Genset and utility/AC Bus source AC metering – The control provides comprehensive three phase AC metering functions for both monitored sources, including:

3-phase voltage (L-L and L-N) and current, frequency, phase rotation, individual phase and totalized values of kW, kVAr, kVA and Power Factor; totalized positive and negative kW-hours, kVAr-hours, and kVA-hours. Three wire or four wire voltage connection with direct sensing of voltages to 600V, and up to 45kV with external transformers. Current sensing is accomplished with either 5 amp or 1 CT secondaries and with up to 10,000 amp primary. Maximum power readings are 32,000kW/kVAR/kVA.

Power transfer control – provides integrated automatic power transfer functions including source availability sensing, genset start/stop and transfer pair monitoring and control. The transfer/retransfer is configurable for open transition, fast closed transition (less than 100msec interconnect time), or soft closed transition (load ramping) sequences of operation. Utility source failure will automatically start genset and transfer load, retransferring when utility source returns. Test will start gensets and transfer load if test with load is enabled. Sensors and timers include:

Under voltage sensor: 3-phase L-N or L-L under voltage sensing adjustable for pickup from 85-100% of nominal. Dropout adjustable from 75-98% of pickup. Dropout delay adjustable from 0.1-30 sec.

Over voltage sensor: 3-phase L-N or L-L over voltage sensing adjustable for pickup from 95-99% of dropout. Dropout adjustable from 105-135% of nominal. Dropout delay adjustable from 0.5-120 sec. Standard configuration is disabled, and is configurable to enabled in the field using the HMI or InPower service tools.

Over/Under frequency sensor: Center frequency adjustable from 45-65 Hz. Dropout bandwidth adjustable from 0.3-5% of center frequency beyond pickup bandwidth. Pickup bandwidth adjustable from 0.3-20% of center frequency. Field configurable to enable.

Loss of phase sensor: Detects out of range voltage phase angle relationship. Field configurable to enable.

Phase rotation sensor: Checks for valid phase rotation of source. Field configurable to enable.

Breaker tripped: If the breaker tripped input is active, the associated source will be considered as unavailable.

Timers: Control provides adjustable start delay from 0- 300 sec, stop delay from 0-800 sec, transfer delay from
0- 120 sec, retransfer delay from 0-1800 sec, programmed transition delay from 0-60sec, and maximum parallel time from 0-1800 sec.

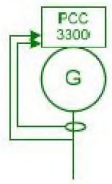
Breaker control – Utility and genset breaker interfaces include separate relays for opening and closing breaker, as well as inputs for both 'a' and 'b' breaker position contacts and tripped status. Breaker diagnostics include contact failure, fail to close, fail to open, fail to disconnect, and tripped. Upon breaker failure, appropriate control action is taken to maintain system integrity.

Extended paralleling – In extended paralleling mode (when enabled) the controller will start the genset and parallel to a utility source and then govern the real and reactive power output of the genset based on the desired control point. The control point for the real power (kW) can be configured for either the genset metering point ("base load") or the utility metering point ("peak shave"). The control point for the reactive power (kVAr or Power Factor) can also be independently configured for either the genset metering point or the utility metering point. This flexibility would allow base kW load from the genset while maintaining the utility power factor at a reasonable value to avoid penalties due to low power factor. The System always operates within genset ratings. The control point can be changed while the system is in operation. Set points can be adjusted via hardwired analog input or adjusted through an operator panel display or service tool.

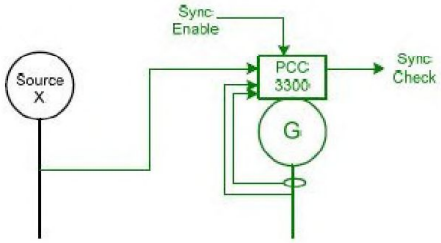
Exerciser clock –The exerciser clock (when enabled) allows the system to be operated at preset times in either test without load, test with load, or extended parallel mode. A real time clock is built in. Up to 12 different programs can be set for day of week, time of day, duration, repeat interval, and mode. For example, a test with load for 1 hour every Tuesday at 2AM can be programmed. Up to 6 different exceptions can also be set up to block a program from running during a specific date and time period.

Application types – Controller is configured to operating in one of six possible application types. These topologies are often used in combinations in larger systems, with coordination of the controllers in the system either by external device or by interlocks provided in the control. Topologies that may be selected in the control include:

Standalone: Control provides monitoring, protection and control in a non-paralleling application.



Synchronizer only: control will synchronize the genset to other source when commanded to either via a hardwired or Modbus driven input.



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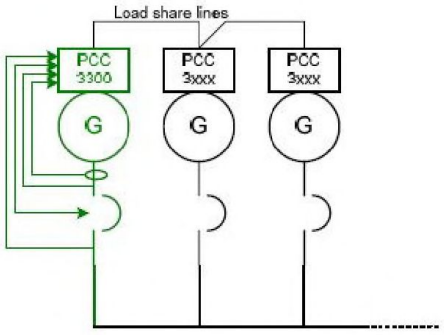
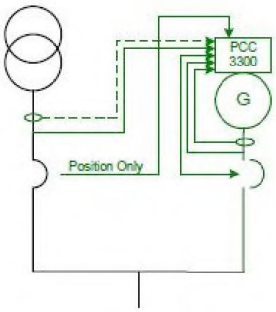
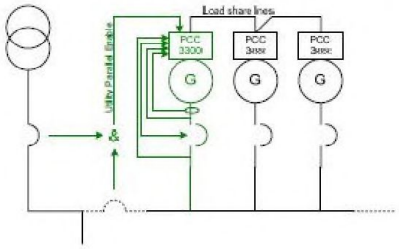
Isolated Bus: allows the genset to perform a dead bus closure or synchronize to the bus and isochronously share kW and kVAR loads with other gensets.



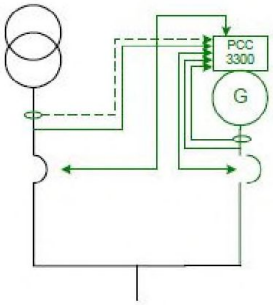
Utility single: Control monitors one genset and utility. The control will automatically start and provide power to a load if the utility fails. The control will also resynchronize the genset back to the utility and provides extended paralleling capabilities.



Utility multiple: Supports all functionality of Isolated Bus and provides extended paralleling to the utility. Extended paralleling load set points follow a constant setting; dynamically follow an analog input, ModBus register or HMI.



Power transfer control: control operates a single genset/single utility transfer pair in open transition, fast closed transition, or soft closed transition. Extended paralleling functionality also provides base load and peak shave options.



Protective functions

On operation of a protective function the control will indicate a fault by illuminating the appropriate status LED on the HMI, as well as display the fault code and fault description on the LCD. The nature of the fault and time of occurrence are logged in the control. The service manual and InPower service tool provide service keys and procedures based on the service codes provided.

Protective functions include:

Battle short mode

When enabled and the battle short switch is active, the control will allow some shutdown faults to be bypassed. If a bypassed shutdown fault occurs, the fault code and description will still be annunciated, but the genset will not shutdown. This will be followed by a fail to shutdown fault. Emergency stop shutdowns and others that are critical for proper operation (or are handled by the engine ECM) are not bypassed. Please refer to the control application guide or manual for list of these faults.

Derate

The derate function reduces output power of the genset in response to a fault condition. If a derate command occurs while operating on an isolated bus, the control will issue commands to reduce the load on the genset via contact closures or ModBus. If a derate command occurs while in utility parallel mode, the control will actively reduce power by lowering the base load kW to the derated target kW.

Configurable alarm and status inputs

The control accepts up to four alarm or status inputs (configurable contact closed to ground or open) to indicate a configurable (customer-specified) condition. The control is programmable for warning, derate, shutdown, shutdown with cooldown or status indication and for labeling the input.

Emergency stop

Annunciated whenever either emergency stop signal is received from external switch.

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General engine protection

Low and high battery voltage warning - Indicates status of battery charging system (failure) by continuously monitoring battery voltage.

Weak battery warning - The control system will test the battery each time the genset is signaled to start and indicate a warning if the battery indicates impending failure.

Fail to start (overcrank) shutdown - The control system will indicate a fault if the genset fails to start by the completion of the engine crack sequence.

Fail to crank shutdown - Control has signaled starter to crank engine but engine does not rotate.

Cranking lockout - The control will not allow the starter to attempt to engage or to crank the engine when the engine is rotating.

Fault simulation –The control in conjunction with InPower software, will accept commands to allow a technician to verify the proper operation of the control and its interface by simulating failure modes or by forcing the control to operate outside of its normal operating ranges. InPower also provides a complete list of faults and settings for the protective functions provided by the controller.

For lean burn natural gas engine applications:

Off load running (protection) – This feature protects the engine in the event the genset is being called to go off load for too long.

Hydro mechanical fuel system engine protection

Overspeed shutdown – Default setting is 115% of nominal Low lube oil pressure warning/shutdown – Level is preset (configurable with InPower or HMI) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

High lube oil temperature warning/shutdown – Level is preset (configurable with InPower or HMI) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

High engine temperature warning/shutdown – Level is preset (configurable with InPower or HMI) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

Low coolant temperature warning – Indicates that engine temperature may not be high enough for a 10 second start or proper load acceptance.

Low coolant temperature warning – Can be set up to be a warning or shutdown.

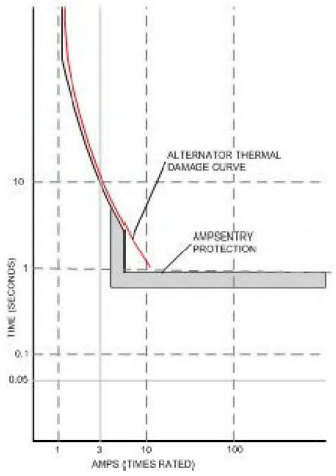
High intake manifold temperature shutdown – Level is preset (configurable with InPower or HMI) to match the capabilities of the engine used. Control includes time delays to prevent nuisance alarms.

Full authority electronic engine protection

Engine fault detection is handled inside the engine ECM. Fault information is communicated via the SAE-J1939 data link for annunciation in the HMI.

Alternator protection

AmpSentry protective relay - A comprehensive monitoring and control system integral to the PowerCommand Control System that guards the electrical integrity of the alternator and power system by providing protection against a wide array of fault conditions in the genset or in the load. It also provides single and three phase fault current regulation so that downstream protective devices have the maximum current available to quickly clear fault conditions without subjecting the alternator to potentially catastrophic failure conditions. See document R1053 for a full size time over current curve. The control does not included protection required for interconnection to a utility (mains) service.



High AC voltage shutdown (59) - Output voltage on any phase exceeds preset values. Time to trip is inversely proportional to amount above threshold. Values adjustable from 105-125% of nominal voltage, with time delay adjustable from 0.1-10 seconds. Default value is 110% for 10 seconds.

Low AC voltage shutdown (27) - Voltage on any phase has dropped below a preset value. Adjustable over a range of 50-95% of reference voltage, time delay 2-20 seconds. Default value is 85% for 10 seconds. Function tracks reference voltage. Control does not nuisance trip when voltage varies due to the control directing voltage to drop, such as during a V/Hz roll-off or synchronizing.

Under frequency shutdown (81 u) - Genset output frequency cannot be maintained. Settings are adjustable from 2-10 Hz below reference governor set point, for a 5-20 second time delay. Default: 6 Hz, 10 seconds. Under frequency protection is disabled when excitation is switched off, such as when engine is operating in idle speed mode.

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Over frequency shutdown/warning (81o) - Genset is operating at a potentially damaging frequency level. Settings are adjustable from 2-10 Hz above nominal governor set point for a 1-20 second time delay. Default: 6 Hz, 20 seconds, disabled.

Overcurrent warning/shutdown (51) - Implementation of the thermal damage curve with instantaneous trip level calculated based on current transformer ratio and application power rating.

Loss of sensing voltage shutdown - Shutdown of genset will occur on loss of voltage sensing inputs to the control.

Field overload shutdown - Monitors field voltage to shutdown genset when a field overload condition occurs.

Over load (kW) warning - Provides a warning indication when engine is operating at a load level over a set point. Adjustment range: 80-140% of application rated kW, 0-120 second delay. Defaults: 105%, 60 seconds.

Reverse power shutdown (32) - Adjustment range: 5-20% of Standby kW rating, delay 1-15 seconds. Default: 10%, 3 seconds.

Reverse Var shutdown - Shutdown level is adjustable: 15- 50% of rated Var output, delay 10-60 seconds. Default: 20%, 10 seconds.

Short circuit protection - Output current on any phase is more than 175% of rating and approaching the thermal damage point of the alternator. Control includes algorithms to protect alternator from repeated over current conditions over a short period of time.

Negative sequence overcurrent warning (46) – Control protects the generator from damage due to excessive imbalances in the three phase load currents and/or power factors.

Custom overcurrent warning/shutdown (51) – Control provides the ability to have a custom time overcurrent protection curve in addition to the AmpSentry protective relay function.

Ground fault overcurrent (51G) – Control detects a ground fault either by an external ground fault relay via a contact input or the control can measure the ground current from an external current transformer. Associated time delays and thresholds are adjustable via InPower or HMI.

Paralleling protection

Breaker fail to close warning: When the control signals a circuit breaker to close, it will monitor the breaker auxiliary contacts and verify that the breaker has closed. If the control does not sense a breaker closure within an adjustable time period after the close signal, the fail to close warning will be initiated.

Breaker fail to open warning: The control system monitors the operation of breakers that have been signalled to open. If the breaker does not open within and adjustable time delay, a Breaker Fail to Open warning is initiated.

Breaker position contact warning: The controller will monitor both 'a' and 'b' position contacts from the breaker. If the contacts disagree as to the breaker position, the breaker position contact warning will be initiated.

Breaker tripped warning: The control accepts inputs to monitor breaker trip / bell alarm contact and will initiate a breaker tripped warning if it should activate.

Fail to disconnect warning: In the controller is unable to open either breaker, a fail to disconnect warning is initiated. Typically this would be mapped to a configurable output, allowing an external device to trip a breaker.

Fail to synchronize warning: Indicates that the genset could not be brought to synchronization with the bus. Configurable for adjustable time delay of 10 -900 seconds, 120 default.

Phase sequence sensing warning: Verifies that the genset phase sequence matches the bus prior to allowing the paralleling breaker to close.

Maximum parallel time warning (power transfer control mode only): During closed transition load transfers, control independently monitors paralleled time. If time is exceeded, warning is initiated and genset is disconnected.

Bus or genset PT input calibration warning: The control system monitors the sensed voltage from the bus and genset output voltage potential transformers. When the paralleling breaker is closed, it will indicate a warning condition if the read values are different.

Field control interface

Input signals to the PowerCommand control include:

- Coolant level (where applicable)
- Fuel level (where applicable)
- Remote emergency stop
- Remote fault reset
- Remote start
- Rupture basin
- Start type signal
- Battle short
- Load demand stop
- Synchronize enable
- Genset circuit breaker inhibit
- Utility circuit breaker inhibit
- Single mode verify
- Transfer inhibit – prevent transfer to utility (in power transfer control mode)
- Retransfer inhibit – prevent retransfer to genset (in power transfer control mode)
- kW and kVAr load setpoints
- Configurable inputs - Control includes (4) input signals from customer discrete devices that are configurable for warning, shutdown or status indication, as well as message displayed

For lean burn natural gas engine applications:

- Gearbox oil pressure/temperature protection
- Fire fault
- Earth fault
- Differential fault
- DC power supply fault
- Genset Interface Box (GIB) isolator open fault
- Start inhibit/enable (x3)
- Radiator fan trip

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- Ventilator fan trip
- Ventilation louvers closed
- Start system trip
- Alternator heater trip
- Alternator heater status
- Alternator winding temperature (PT100 RTDx3)
- Alternator drive end bearing temperature (PT100 RTD)
- Alternator non-drive end bearing temperature (PT100 RTD)

Output signals from the PowerCommand control include:

- Load dump signal: Operates when the genset is in an overload condition.
- Delayed off signal: Time delay based output which will continue to remain active after the control has removed the run command. Adjustment range: 0 - 120 seconds.
  Default: 0 seconds.
- Configurable relay outputs: Control includes (4) relay output contacts (3 A, 30 VDC). These outputs can be configured to activate on any control warning or shutdown fault as well as ready to load, not in auto, common alarm, common warning and common shutdown.
- Ready to load (genset running) signal: Operates when the genset has reached 90% of rated speed and voltage and latches until genset is switched to off or idle mode.
- Paralleling circuit breaker relays outputs: Control includes (4) relay output contacts (3.5 A, 30 VDC) for opening and closing of the genset and utility breakers.

For lean burn natural gas engine applications:

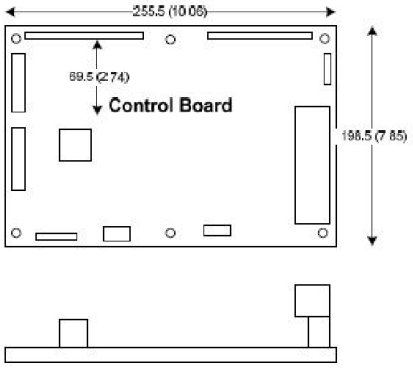
- Start inhibit/enable event
- Emergency stop event
- Ventilator fan run control
- Louvre control
- Radiator fan control
- Alternator heater control
- Engine at idle speed event

Communications connections include:

- PC tool interface: This RS-485 communication port allows the control to communicate with a personal computer running InPower software.
- ModBus RS-485 port: Allows the control to communicate with external devices such as PLCs using ModBus protocol.

  Note - An RS-232 or USB to RS-485 converter is required for communication between PC and control.
- Networking: This RS-485 communication port allows connection from the control to the other Cummins products.

Mechanical drawing



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PowerCommand Human Machine Interface HMI320

Description

This control system includes an intuitive operator interface panel that allows for complete genset control as well as system metering, fault annunciation, configuration and diagnostics. The interface includes five genset status LED lamps with both internationally accepted symbols and English text to comply with customer's needs. The interface also includes an LED backlit LCD display with tactile feel soft-switches for easy operation and screen navigation. It is configurable for units of measurement and has adjustable screen contrast and brightness.

The run/off/auto switch function is integrated into the interface panel.

All data on the control can be viewed by scrolling through screens with the navigation keys. The control displays the current active fault and a time-ordered history of the five previous faults.

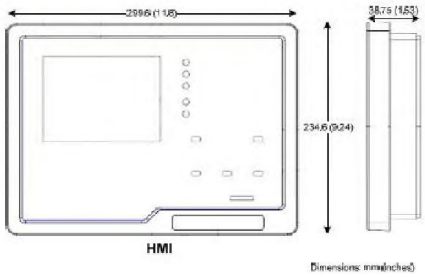
Features

- LED indicating lamps:
- Genset running
- Remote start
- Not in auto
- Shutdown
- Warning
- Auto
- Manual and stop
- Circuit breaker open (if equipped)
- Circuit breaker closed (if equipped)
- 320 x 240 pixels graphic LED backlight LCD.
- Four tactile feel membrane switches for LCD defined operation. The functions of these switches are defined dynamically on the LCD.
- Seven tactile feel membrane switches dedicated screen navigation buttons for up, down, left, right, ok, home and cancel.
- Six tactile feel membrane switches dedicated to control for auto, stop, manual, manual start, fault reset and lamp test/panel lamps.
- Two tactile feel membrane switches dedicated to control of circuit breaker (where applicable).
- Allows for complete genset control setup.
- Certifications: Suitable for use on gensets that are designed, manufactured, tested and certified to relevant UL, NFPA, ISO, IEC, Mil Std. and CE standards.
- LCD languages supported: English, Spanish, French, German, Italian, Greek, Dutch, Portuguese, Finnish, Norwegian, Danish, Russian and Chinese characters.

Communications connections include:

- PC tool interface - This RS-485 communication port allows the HMI to communicate with a personal computer running InPower.
- This RS-485 communication port allows the HMI to communicate with the main control board.

Mechanical drawing



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Software

InPower (beyond 6.5 version) is a PC-based software service tool that is designed to directly communicate to PowerCommand gensets and transfer switches, to facilitate service and monitoring of these products.

Environment

The control is designed for proper operation without recalibration in ambient temperatures from -40 °C (-40 °F) to +70 °C (158 °F), and for storage from -55 °C (-67 °F) to +80 °C (176 °F). Control will operate with humidity up to 95%, non-condensing.

The HMI is designed for proper operation in ambient temperatures from -20 °C (-4 °F) to +70 °C (158 °F), and for storage from -30 °C (-22 °F) to +80 °C (176 °F).

The control board is fully encapsulated to provide superior resistance to dust and moisture. Display panel has a single membrane surface, which is impervious to effects of dust, moisture, oil and exhaust fumes. This panel uses a sealed membrane to provide long reliable service life in harsh environments.

The control system is specifically designed and tested for resistance to RFI/EMI and to resist effects of vibration to provide a long reliable life when mounted on a genset. The control includes transient voltage surge suppression to provide compliance to referenced standards.

Certifications

PowerCommand meets or exceeds the requirements of the following codes and standards:

- NFPA 110 for level 1 and 2 systems.
- ISO 8528-4: 1993 compliance, controls and switchgear.
- CE marking: The control system is suitable for use on generator sets to be CE-marked.
- EN 50081-1,2 residential/light industrial emissions or industrial emissions.
- EN 50082-1,2 residential/light industrial or industrial susceptibility.
- ISO 7637-2, level 2; DC supply surge voltage test.
- Mil Std 202C, Method 101 and ASTM B117: Salt fog test.
- UL 508 recognized or Listed and suitable for use on UL 2200 Listed generator sets.
- CSA C282-M1999 compliance
- CSA 22.2 No. 14 M91 industrial controls.
- PowerCommand control systems and generator sets are designed and manufactured in ISO 9001 certified facilities.

Warranty

All components and subsystems are covered by an express limited one year warranty. Other optional and extended factory warranties and local distributor maintenance agreements are available.

PCCNet COMPATIBLE

For more information contact your local Cummins distributor or visit power.cummins.com

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Data sheet

Rental Circuit Breakers

Description

This data sheet provides circuit breaker manufacturer part numbers and specifications for Rental products. Please refer to the website of the circuit breaker manufacturer for breaker specific ratings and technical information.

Instructions

1. Locate the circuit breaker feature code or part number and use the charts below to find the corresponding manufacturer circuit breaker catalog number.

2. Use the first letter of the circuit breaker catalog number to determine the "frame" of the breaker. Then follow the corresponding website link from the table below to find the breaker catalog number description.

Frame	Catalog name*	Catalog number description page(s)
P	0612CT0101 http://www.schneider-electric.us/en/download/document/0612CT0101/	16 – 17
H and L	0611CT1001 http://www.schneider-electric.us/en/download/document/0611CT1001/	8 – 9

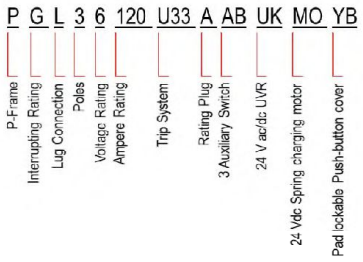
*The following link may also be used to search specifically by the breaker part number or for the catalog name listed above.
http://products.schneider-electric.us/technical-library/

3. Search the catalog by using the first 3 letters of the breaker catalog number and the first 5 numbers to find information such as trip curves, accessories, and dimensional details regarding the circuit breaker.

Example

After finding your circuit breaker catalog number to be "PGL36120U33AABUKMOYB," navigate to the P-frame catalog by using the link provided. Look at pages 16-17 of the pdf catalog to find the nomenclature of the breaker.

Search the P-frame spec sheet using the search "PGL36120."



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Genset	Voltages	Auto/Manual Breaker	Size	Cummins Part No.	Manufacturer	Manufacturer Part No.	Breaker Catalog No.	Trip Unit
C70D2RE	600	Manual	150A	A057G231	Schneider Electric	HGL36150U33XSO	0611CT1001	LSI 3.2S2
C70D2RE	480/208	Manual	400A	A057L891	Schneider Electric	LGL36400U33XSO	0611CT1001	LSI 3.3S2
C100D2RE	600	Manual	150A	A057G231	Schneider Electric	HGL36150U33XSO	0611CT1001	LSI 3.2S2
C100D2RE	480/208 switchable	Manual	400A	A057L891	Schneider Electric	LGL36400U33XSO	0611CT1001	LSI 3.3S2
C100D2RE	600	Auto	150A	A057L885	Schneider Electric	HGL36150U33XABUOMO	0611CT1001	LSI 3.2S2
C100D2RE	480/208 switchable	Auto	400A	A055A272	Schneider Electric	LGL36400U33XABUOMO	0611CT1001	LSI 3.3S2
C150D2RE	208/240/480	Auto	600A	A051C957	Schneider Electric	PGL36060U33AABUKMOYB	0612CT0101	Micrologic 5.0
C200D2RE	208/240/480	Auto	800A	A051C959	Schneider Electric	PGL36080U33AABUKMOYB	0612CT0101	Micrologic 5.0
C275D2RE	208/240/480	Auto	1200A	A051C966	Schneider Electric	PGL36120U33AABUKMOYB	0612CT0101	Micrologic 5.0

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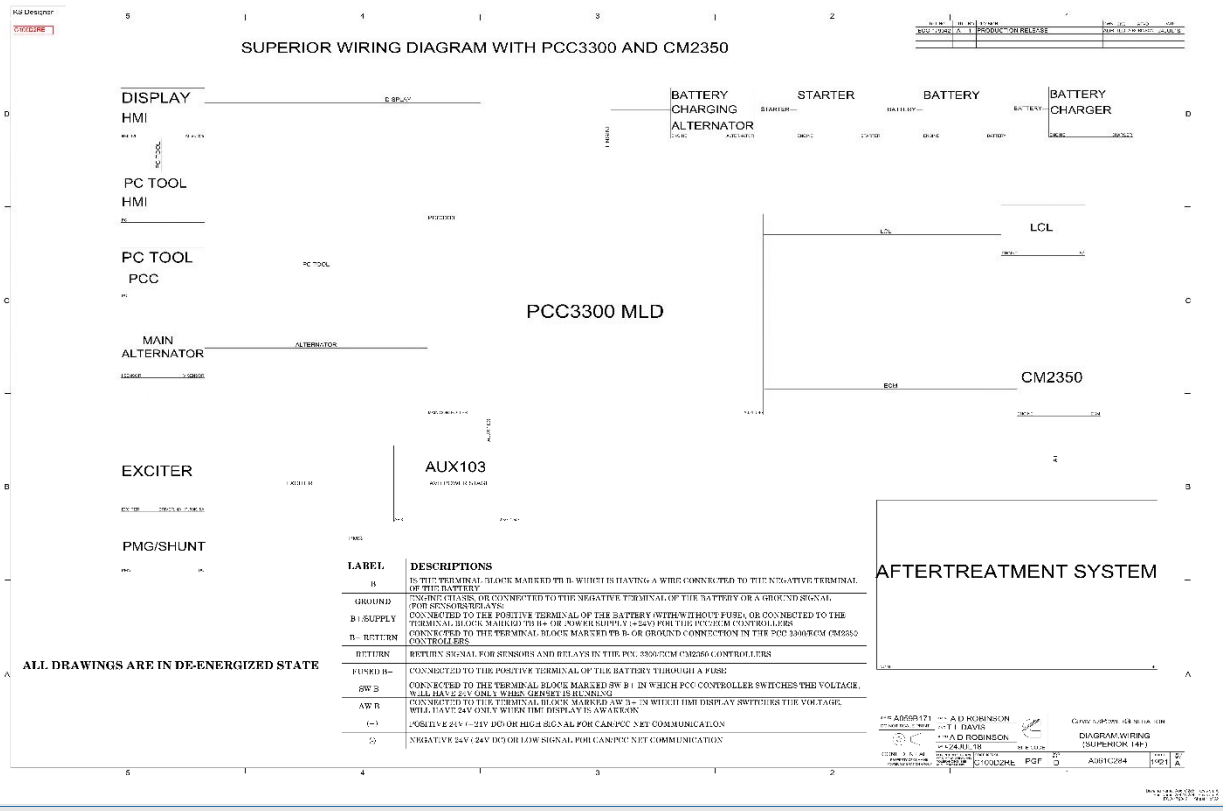
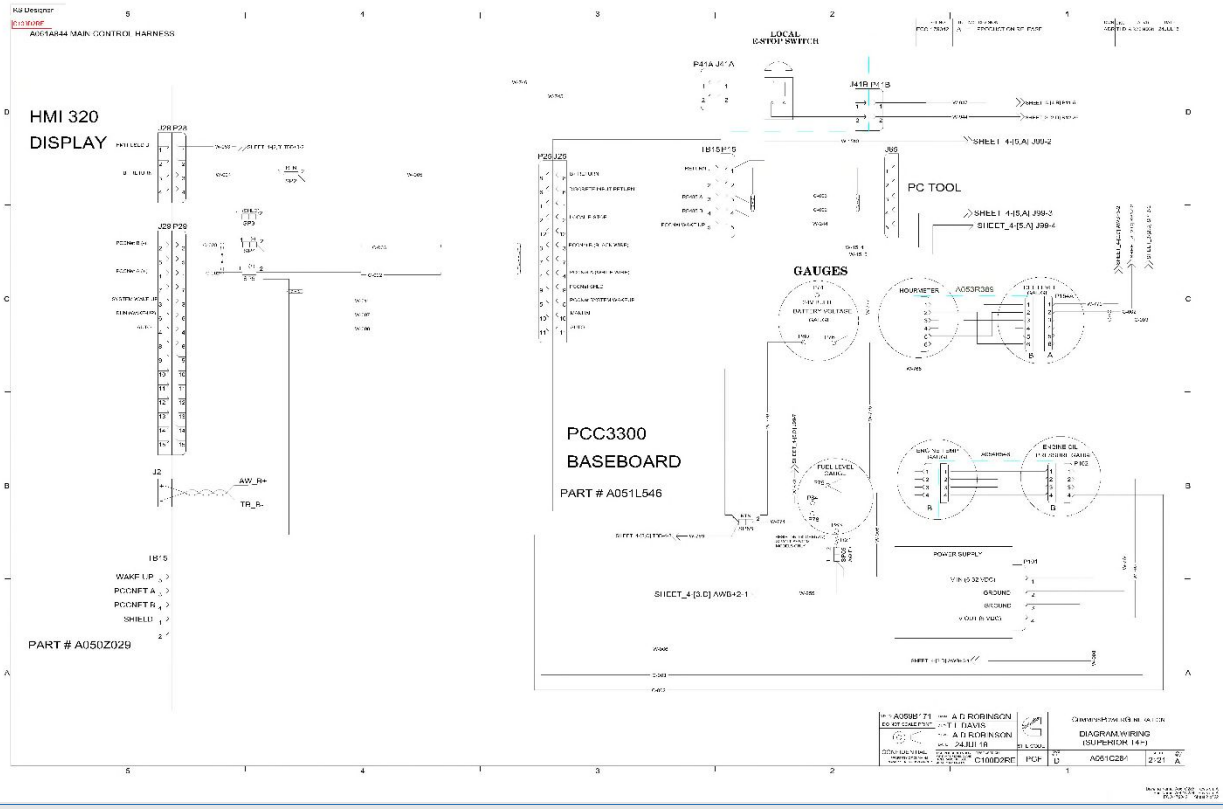
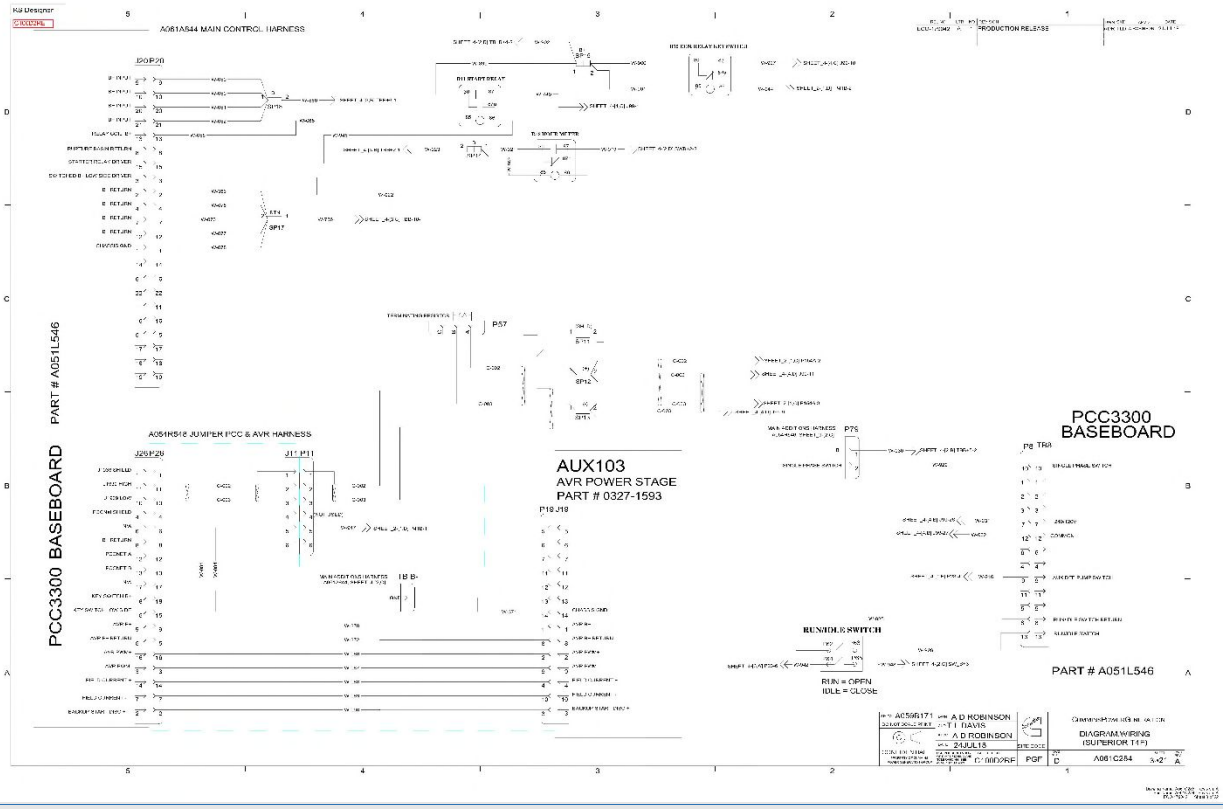
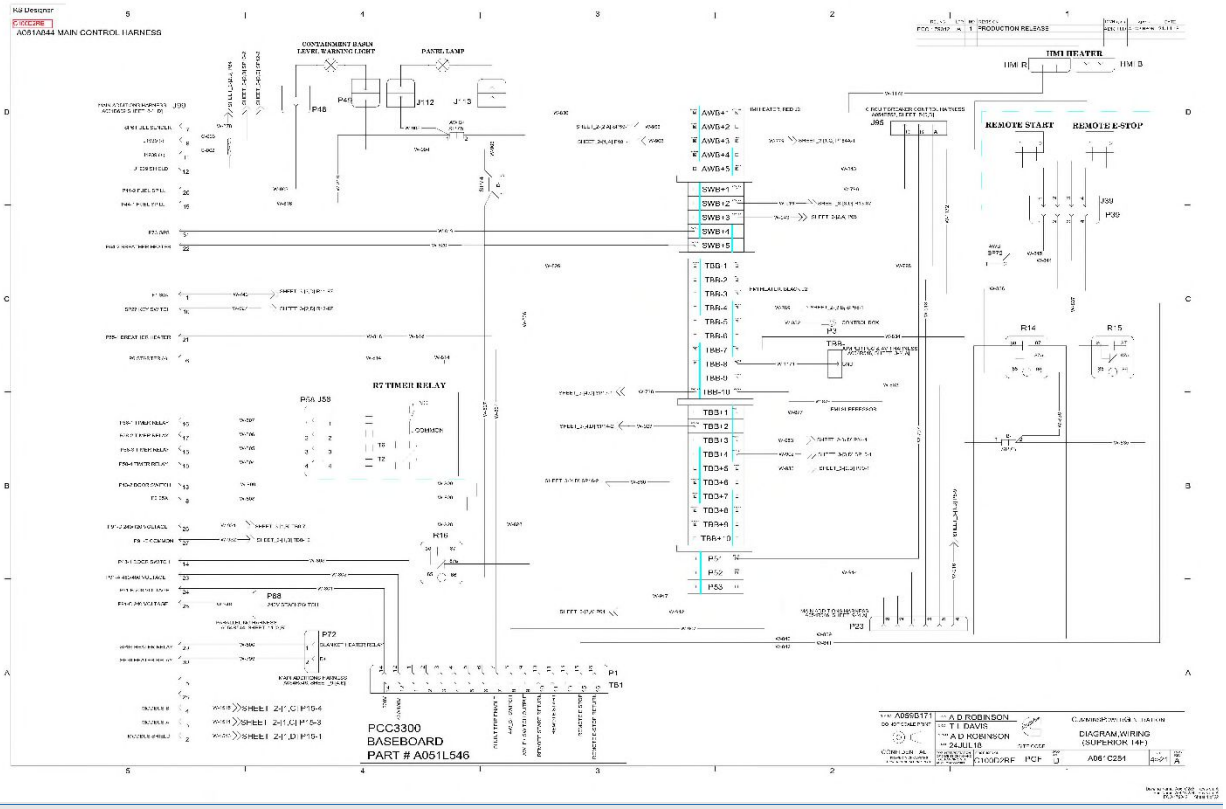
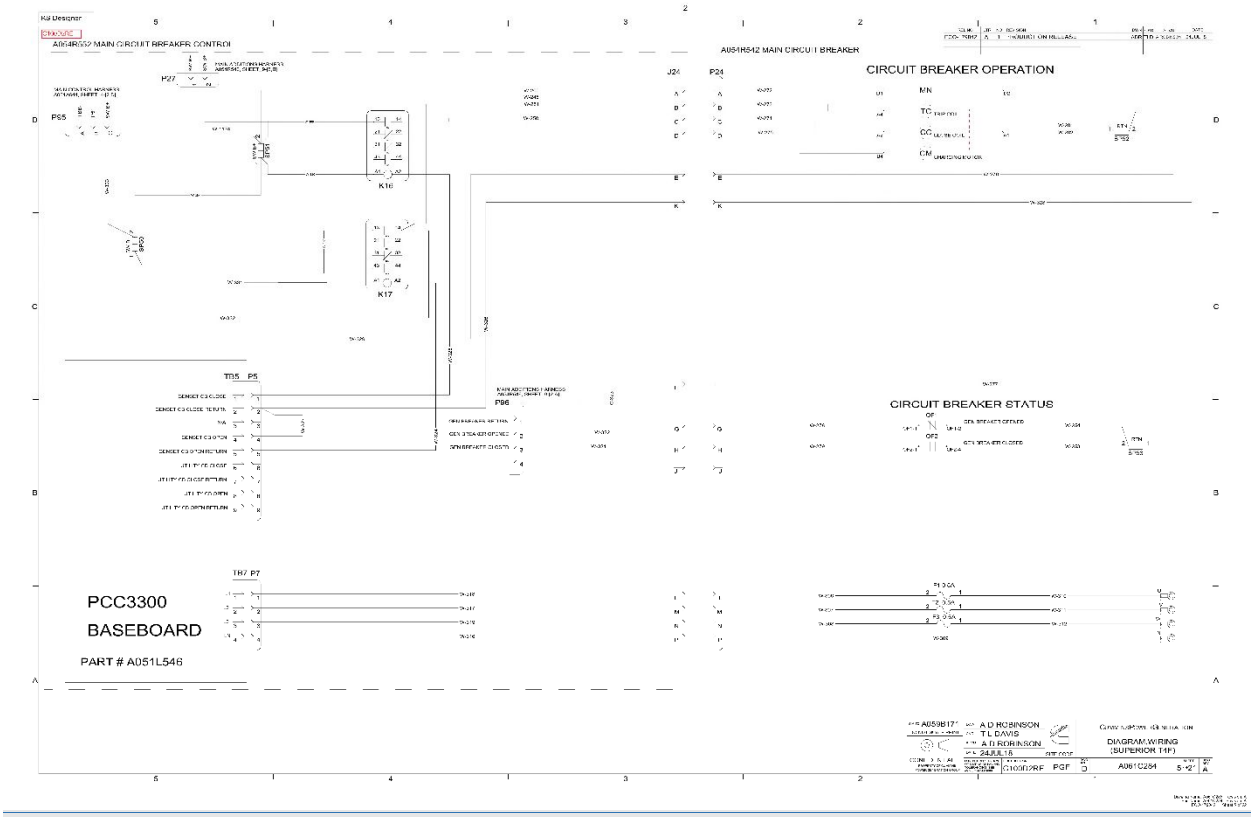
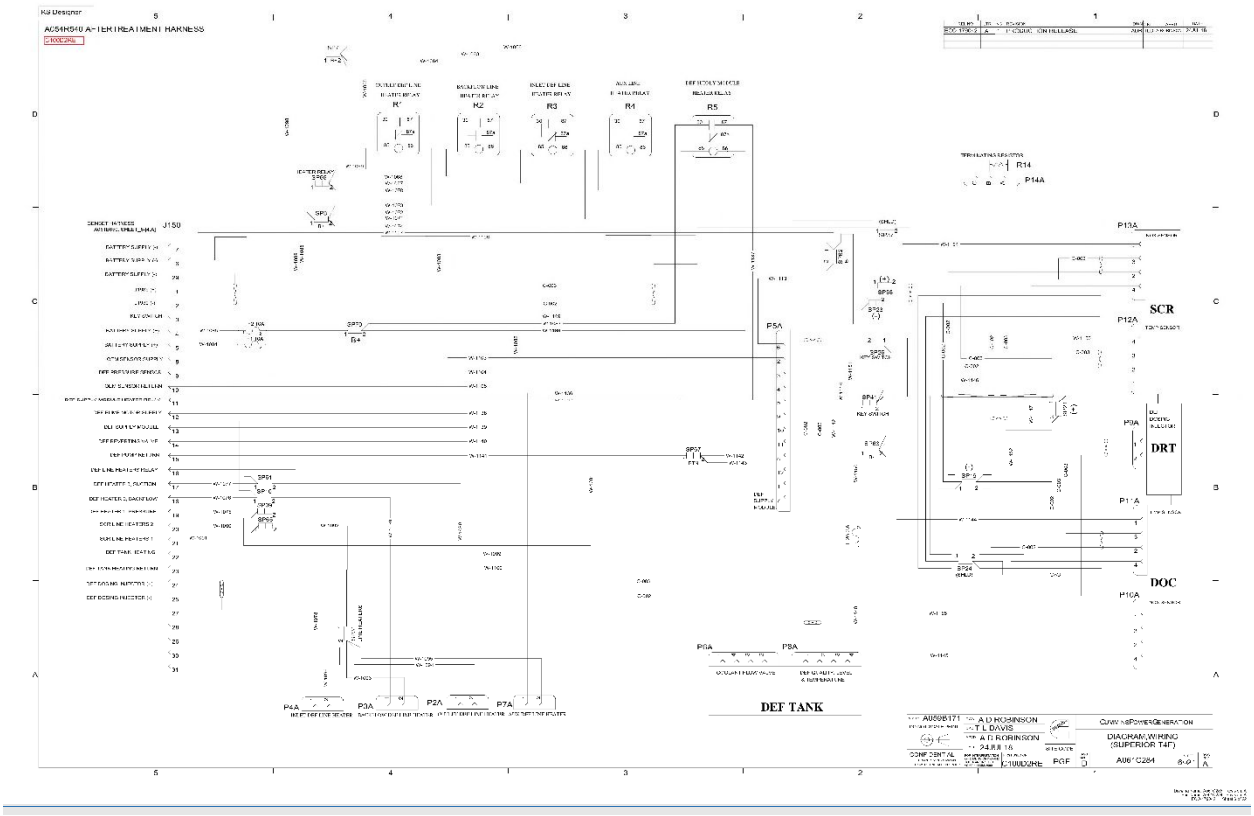

SUPERIOR WIRING DIAGRAM WITH PCC3300 AND CM2350
DISPLAY
HMI
PC TOOL
HMI
PC TOOL
PCC
MAIN
ALTERNATOR
EXCITER
PMG/SHUNT
PCC3300 MLD
BATTERY
CHARGING
ALTERNATOR
STARTER
BATTERY
BATTERY
CHARGER
LCL
CM2350
AUX103
AFTERTREATMENT SYSTEM
ALL DRAWINGS ARE IN DE-ENERGIZED STATE
LABEL
DESCRIPTIONS
B-
IS THE TERMINAL BLOCK MARKED TB B- WHICH IS HAVING A WIRE CONNECTED TO THE NEGATIVE TERMINAL OF THE BATTERY
GROUND
ENGINE CHASSIS, OR CONNECTED TO THE NEGATIVE TERMINAL OF THE BATTERY OR A GROUND SIGNAL (FOR SENSORS/RELAYS)
B (+)SUPPLY
CONNECTED TO THE POSITIVE TERMINAL OF THE BATTERY (WITH/WITHOUT FUSE), OR CONNECTED TO THE TERMINAL BLOCK MARKED TB B+ OR POWER SUPPLY (+24V) FOR THE PCC/ECM CONTROLLERS
B- RETURN
CONNECTED TO THE TERMINAL BLOCK MARKED TB B- OR GROUND CONNECTION IN THE PCC 3300/ECM (CM2350) CONTROLLERS
RETURN
RETURN SIGNAL FOR SENSORS AND RELAYS IN THE PCC 3300/ECM CM2350 CONTROLLERS
FUSED B+
CONNECTED TO THE POSITIVE TERMINAL OF THE BATTERY THROUGH A FUSE
SW B+
CONNECTED TO THE TERMINAL BLOCK MARKED SW B+ IN WHICH PCC CONTROLLER SWITCHES THE VOLTAGE, WILL HAVE 24V ONLY WHEN GENSET IS RUNNING
AW R-
CONNECTED TO THE TERMINAL BLOCK MARKED AW R- IN WHICH HMI DISPLAY SWITCHES THE VOLTAGE, WILL HAVE 24V ONLY WHEN HMI DISPLAY IS AWAKE/ON
(+)
POSITIVE 24V (+24V DC) OR HIGH SIGNAL FOR CAN/PCC XNET COMMUNICATION
(-)
NEGATIVE 24V (24V DC) OR LOW SIGNAL FOR CAN/PCC XNET COMMUNICATION

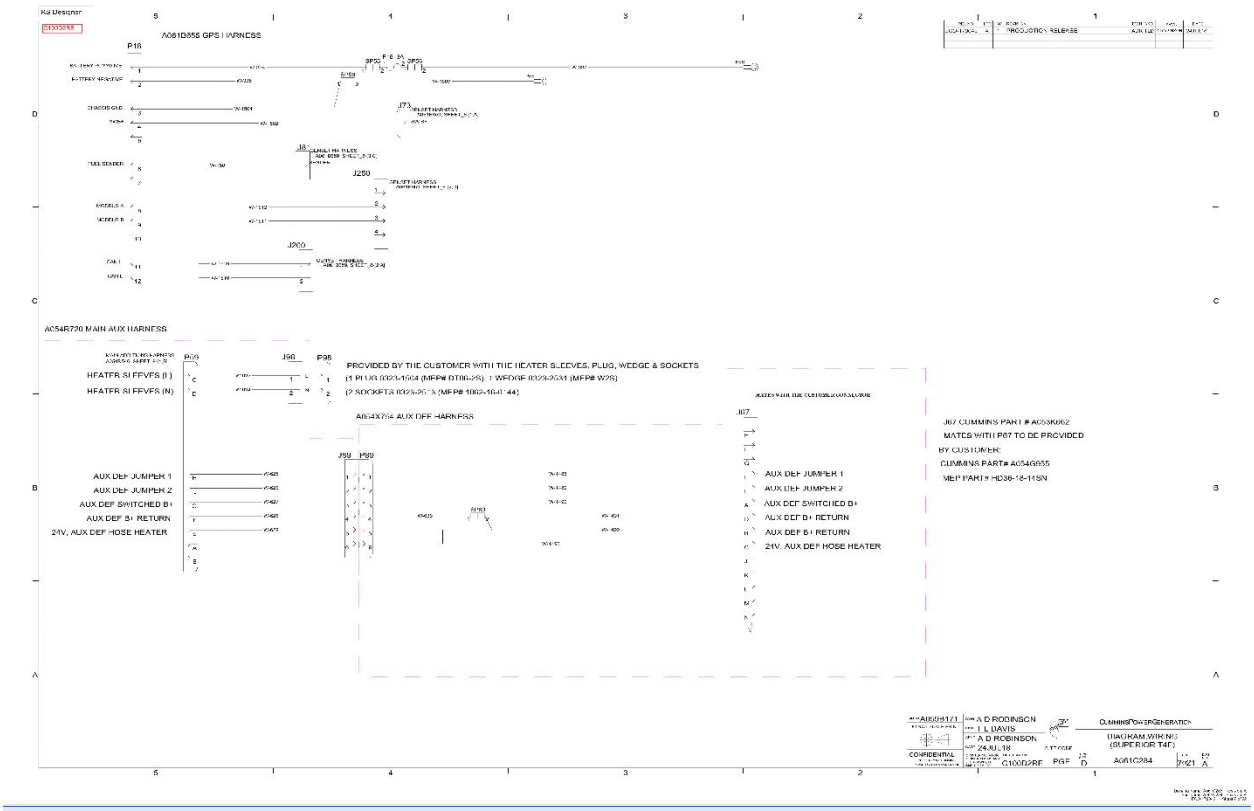

A0614844 MAIN CONTROL HARNESS
HMI 320
DISPLAY
PART # A050Z029
LOCAL
START/STOP SWITCH
PC TOOL
GAUGES
PCC3300
BASEBOARD
PART # A051L546
POWER SUPPLY

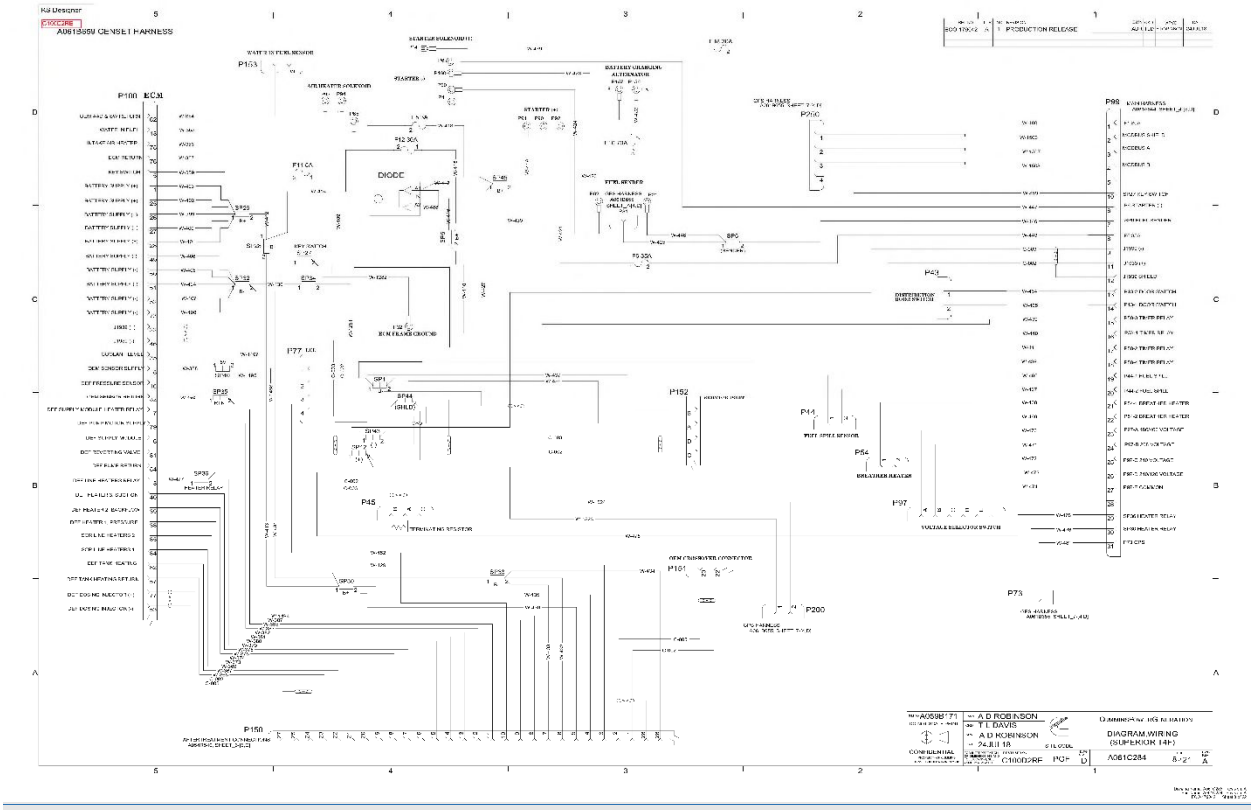

A051A544 MAIN CONTROL HARNESS
PART # A051L546
PCC3300 BASEBOARD
A051K516 JUMPER PCC & AVR HARNESS
AUX103
AVR POWER STAGE
PART # 0327-1593
PCC3300
BASEBOARD
RUN/IDLE SWITCH
RUN = OPEN
IDLE = CLOSE
PART # A051L546
PRODUCTION RELEASE
A D ROBINSON
T I DAVIS
24JUL18
DIAGRAM,WIRING
(SUPERIOR 14P)

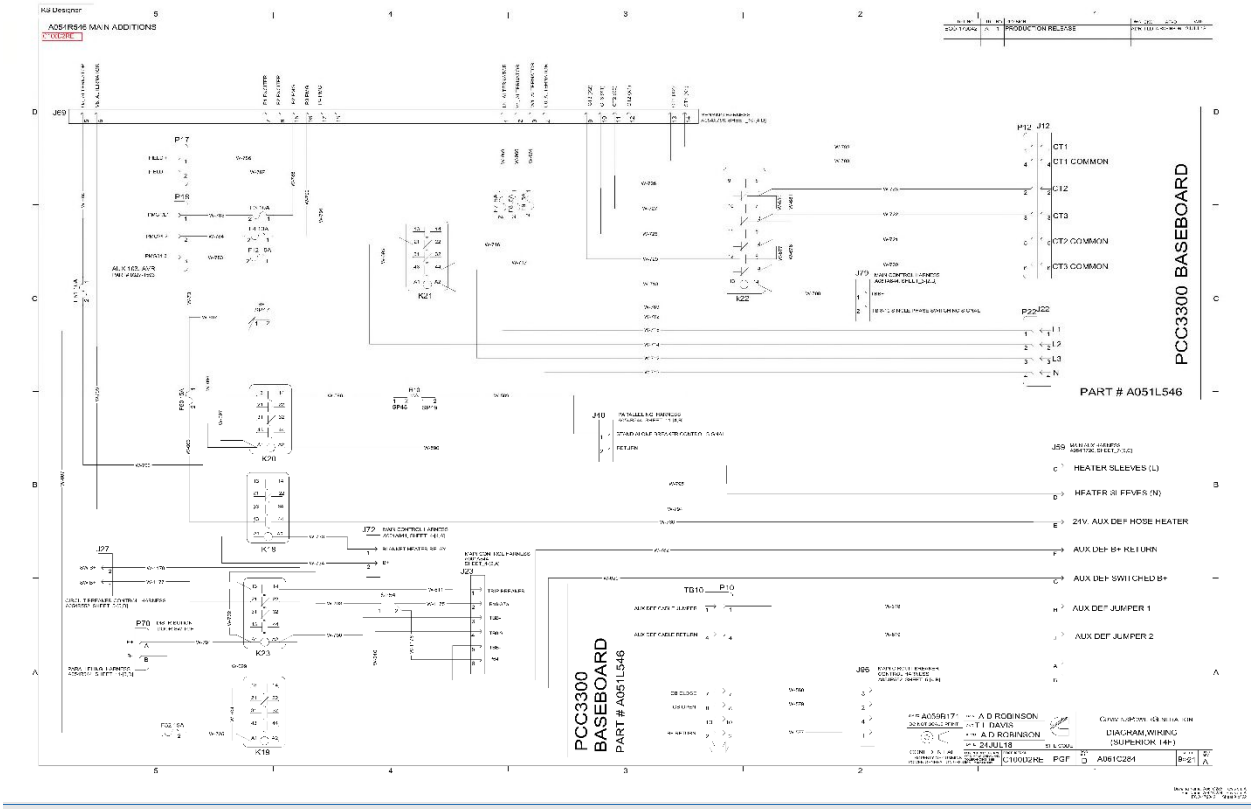

A051A544 MAIN CONTROL HARNESS
CONTAINMENT BARN
LEVEL WARNING LIGHT
PANEL LAMP
HMI HEATER
REMOTE START
REMOTE E-STOP
R7 TIMER RELAY
PCC3300
BASEBOARD
PART # A051L546
PRODUCTION RELEASE
A D ROBINSON
T I DAVIS
24JUL18
DIAGRAM,WIRING
(SUPERIOR 14P)

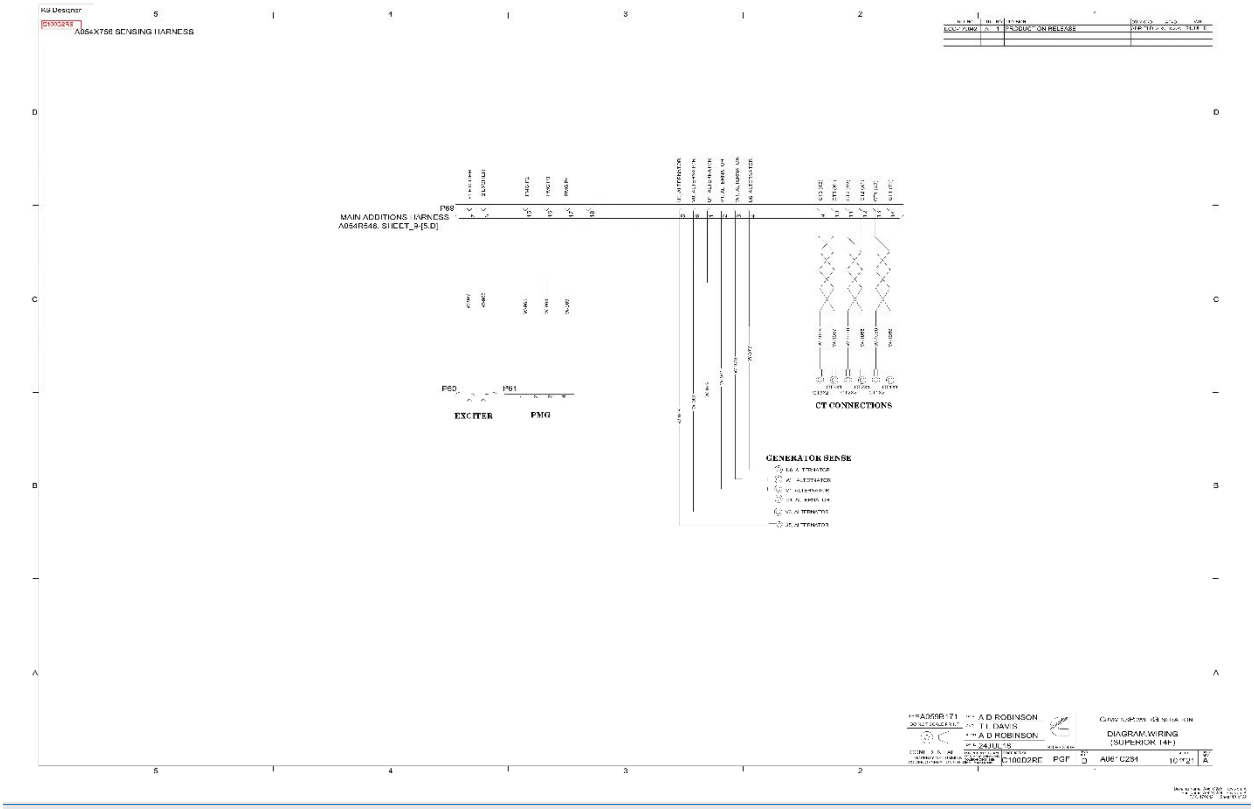

A054R552 MAIN CIRCUIT BREAKER CONTROL
A054R542 MAIN CIRCUIT BREAKER
CIRCUIT BREAKER OPERATION
CIRCUIT BREAKER STATUS
PCC3300
BASEBOARD
PART # A051L546

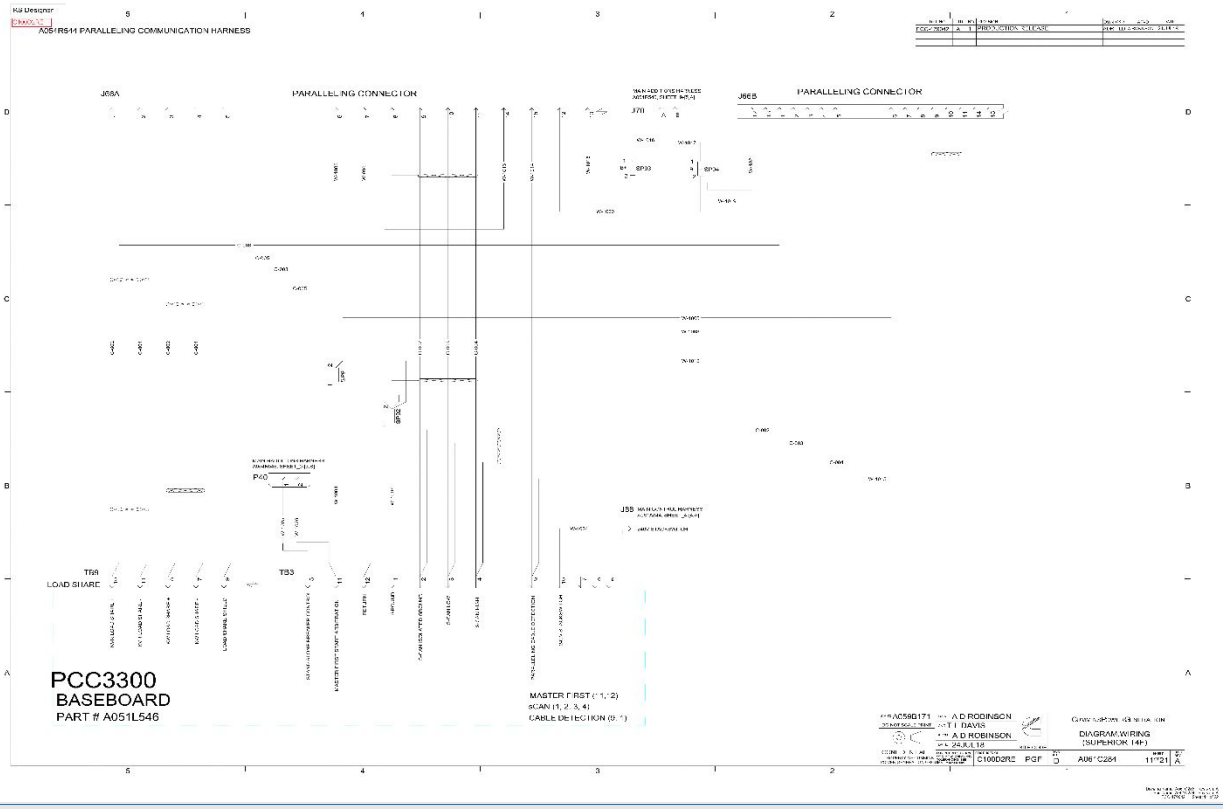

A054R546 AFTERTREATMENT HARNESS
SCR
DRT
DOC
DEF TANK

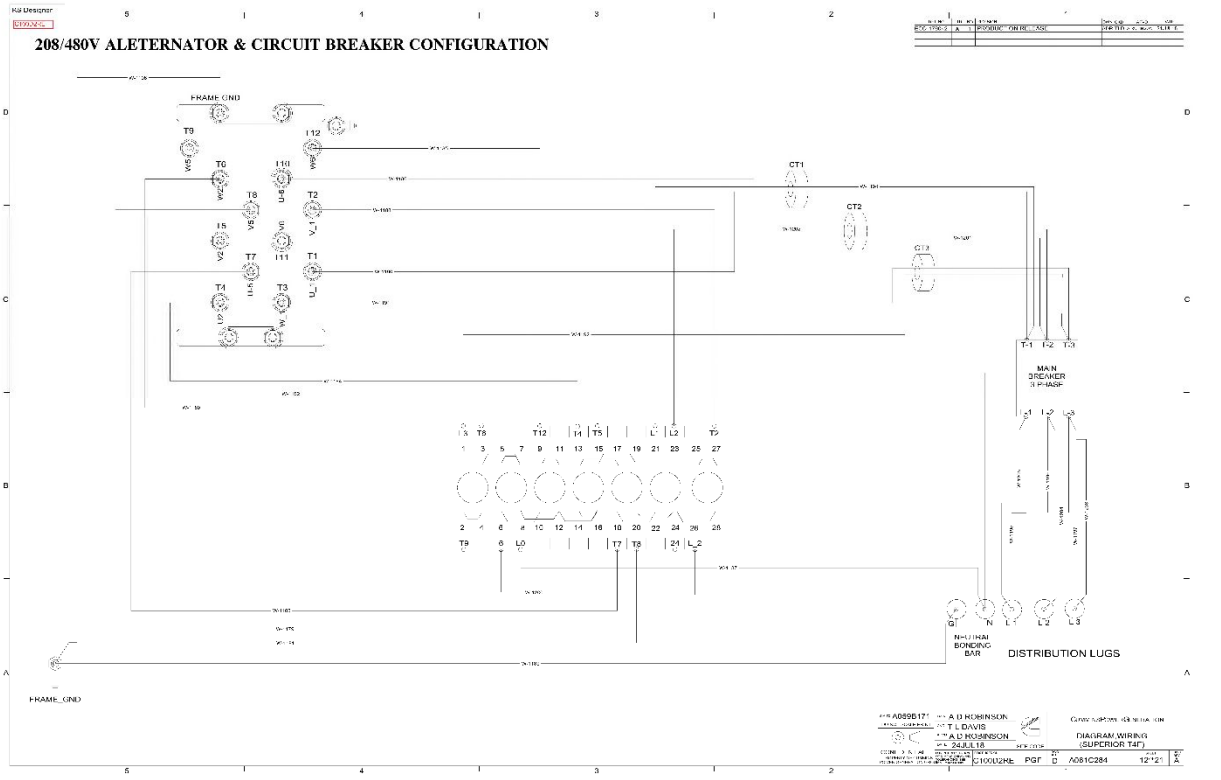

A061D855 GPS I HARNESS
A054R726 MAIN AUX HARNESS
PROVIDED BY THE CUSTOMER WITH THE HEATER SLEEVES, PLUG, WEDGE & SOCKETS
AUX DEF JUMPER 1
AUX DEF JUMPER 2
AUX DEF SWITCHED B+
AUX DEF B+ RETURN
24V, AUX DEF HOSE HEATER
A054X704 AUX DEF HARNESS
J87 CUMMINS PART # A053K062
MATES WITH P87 TO BE PROVIDED BY CUSTOMER
CUMMINS PART# A054G955
MFP PART# HD36-18-11SN
PRODUCTION RELEASE
DIAGRAM,WIRING (SUPERIOR T4F)
A061C284

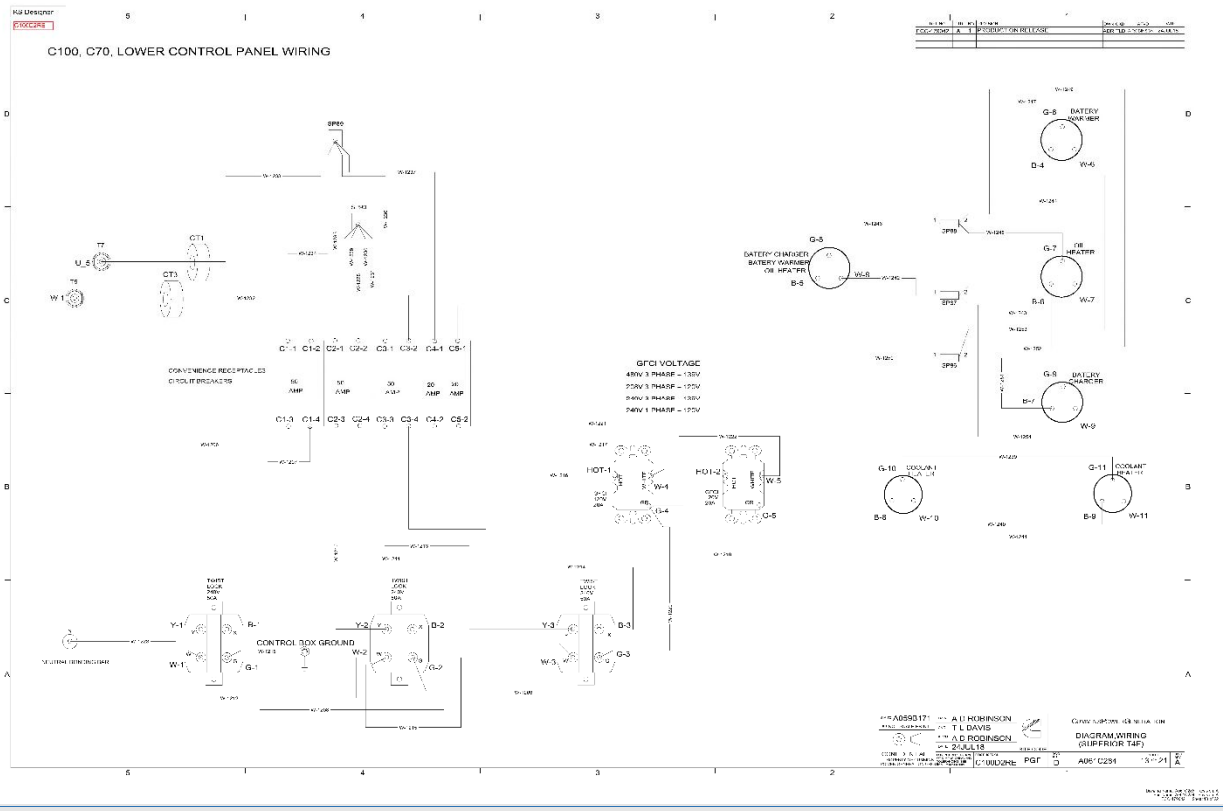

A061S69V GENSET HARNESS
DIODE
PRODUCTION RELEASE
DIAGRAM,WIRING (SUPERIOR 14H)
A061C284

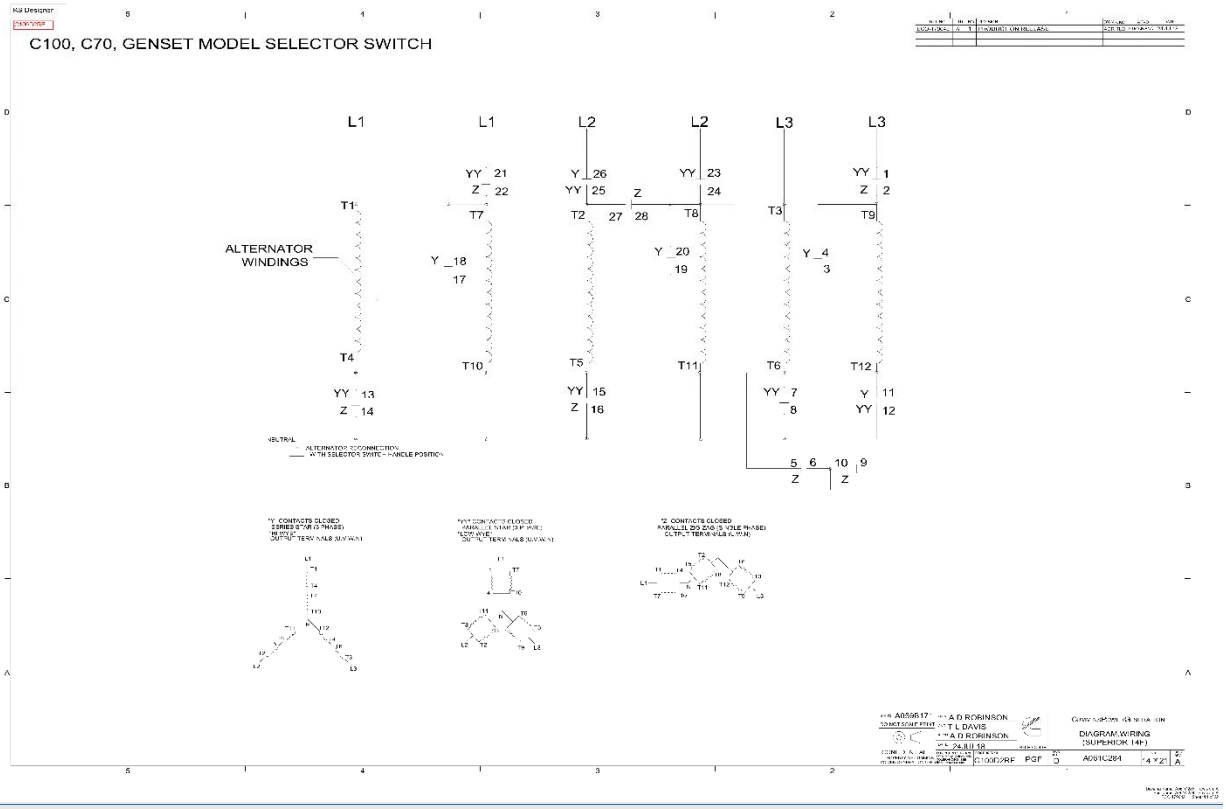

A051R546 MAIN ADDITIONS
PRODUCTION RELEASE
PCC3300 BASEBOARD
PART # A051L546
CT1
CT1 COMMON
CT2
CT3
CT2 COMMON
CT3 COMMON
L1
L2
L3
N
HEATER SLEEVES (L)
HEATER SLEEVES (N)
24V. AUX DEF HOSE HEATER
AUX DEF B+ RETURN
AUX DEF SWITCHED B+
AUX DEF JUMPER 1
AUX DEF JUMPER 2
PCC3300 BASEBOARD
PART # A051L546
A.D ROBINSON
T.L DAVIS
A.D ROBINSON
24JUL18
DIAGRAM,WIRING (SUPERIOR 14H)
A061C284

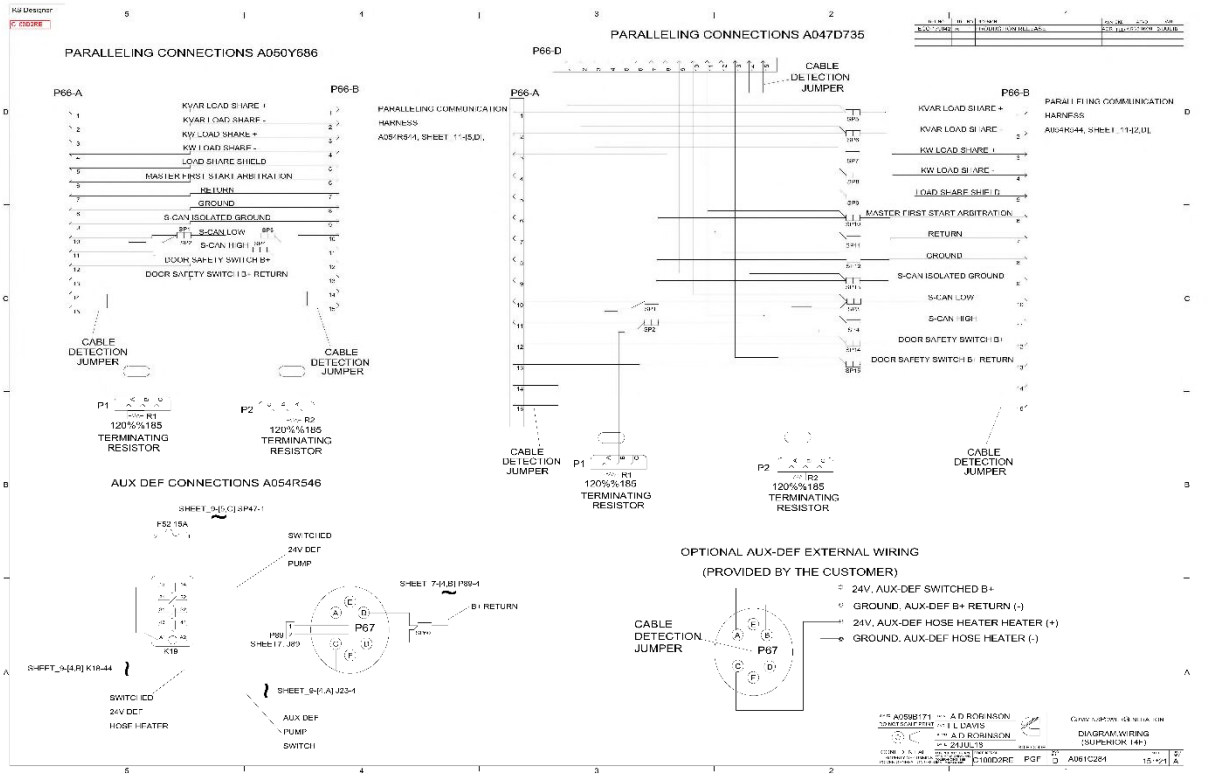

A054X756 SENSING HARNESS
PRODUCTION RELEASE
MAIN ADDITIONS HARNESS
A054R548, SHEET_9 (S.D)
EXCITER
PMG
CT CONNECTIONS
GENERATOR SENSE
A.D ROBINSON
T.L DAVIS
A.D ROBINSON
24JUL15
DIAGRAM,WIRING (SUPERIOR 14H)
A061C284

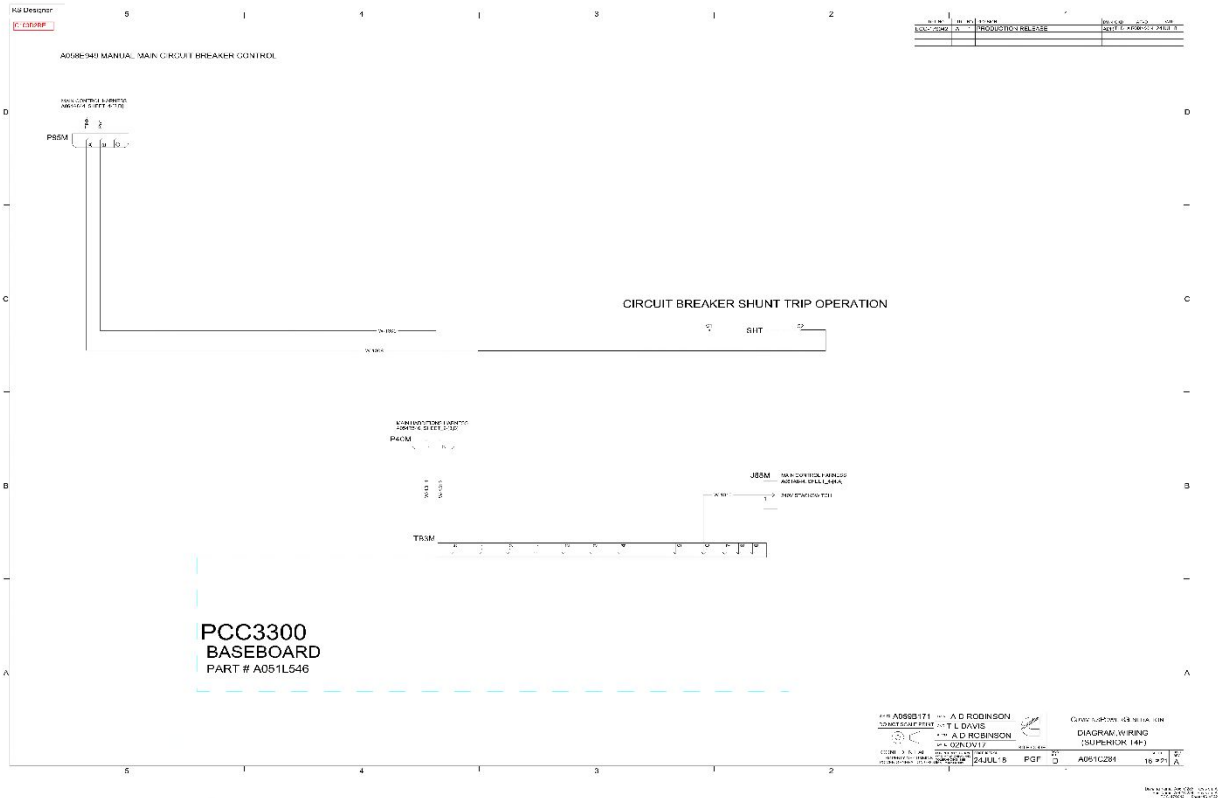

A051R544 PARALLELING COMMUNICATION HARNESS
J68A
PARALLELING CONNECTION
J68B
PARALLELING CONNECTION
T68
LOAD SHARE
T83
PCC3300
BASEBOARD
PART # A051L546
MASTER FIRST (1, 12)
SCAN (1, 2, 3, 4)
CABLE DETECTION (9, 1)
A.D ROBINSON
T L DAVIS
A.D ROBINSON
DIAGRAM,WIRING
(SUPERIOR 14F)
A061C284

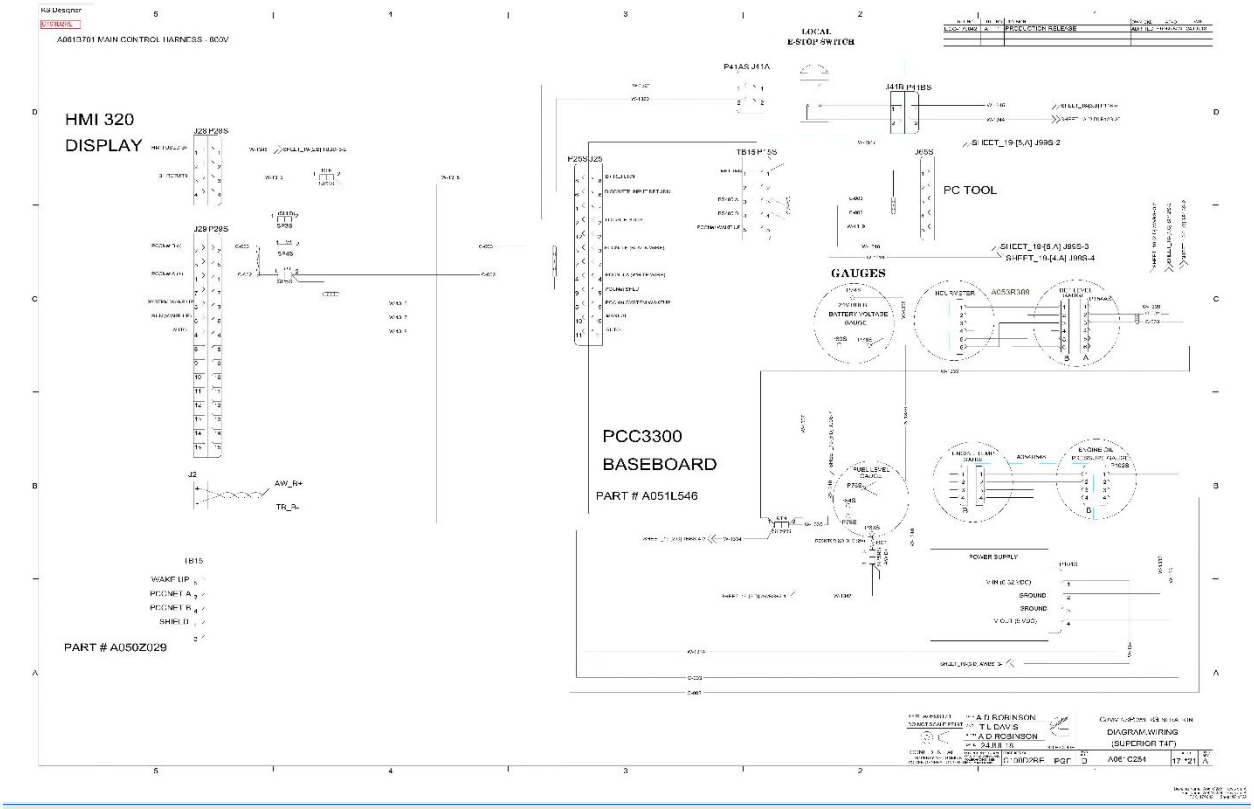

208/480V ALETERNATOR & CIRCUIT BREAKER CONFIGURATION
FRAME GND
CT1
CT2
CT3
MAIN
BREAKER
3 PHASE
NEUTRAL
BONDING
BAR
DISTRIBUTION LUGS
FRAME_GND
A.D ROBINSON
T L DAVIS
A.D ROBINSON
DIAGRAM,WIRING
(SUPERIOR 14F)
A061C284

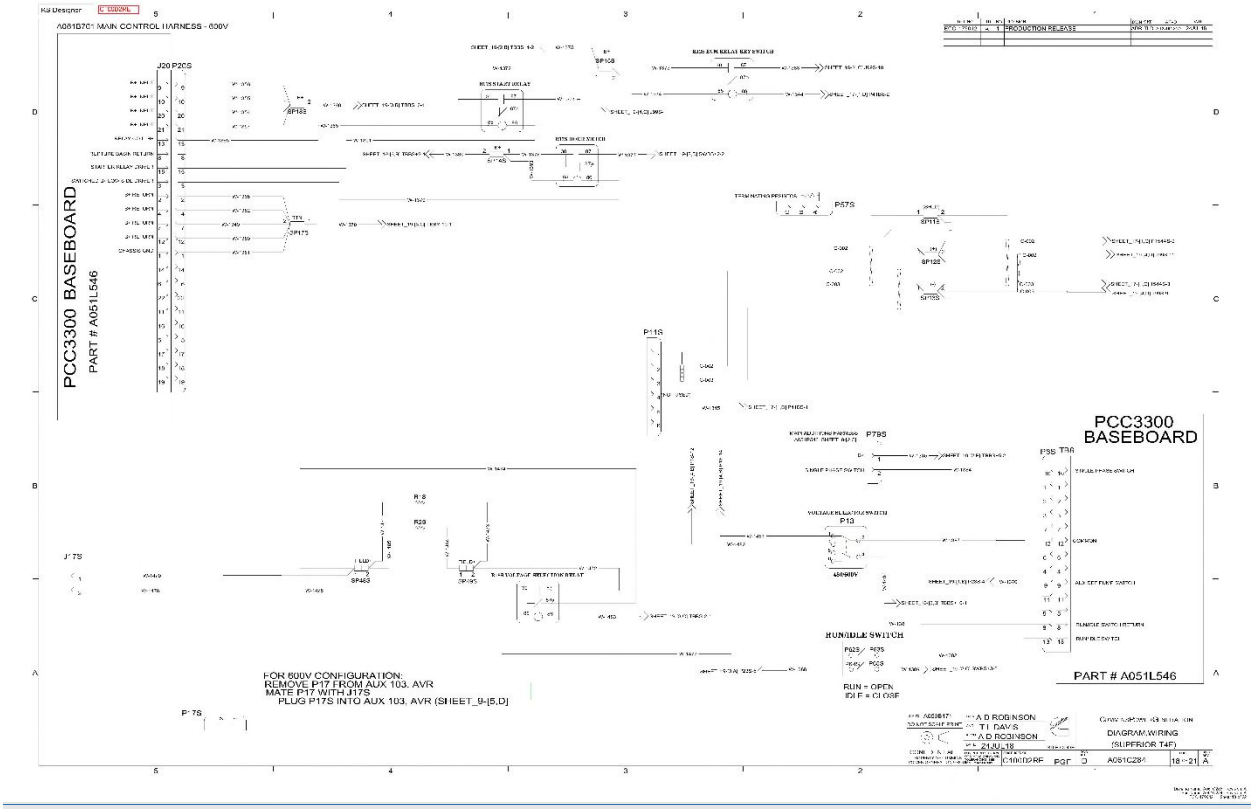

C100, C70, LOWER CONTROL PANEL WIRING
GFCI VOLTAGE
CONTROL BOX GROUND
DIAGRAM,WIRING
(SUPERIOR T4F)

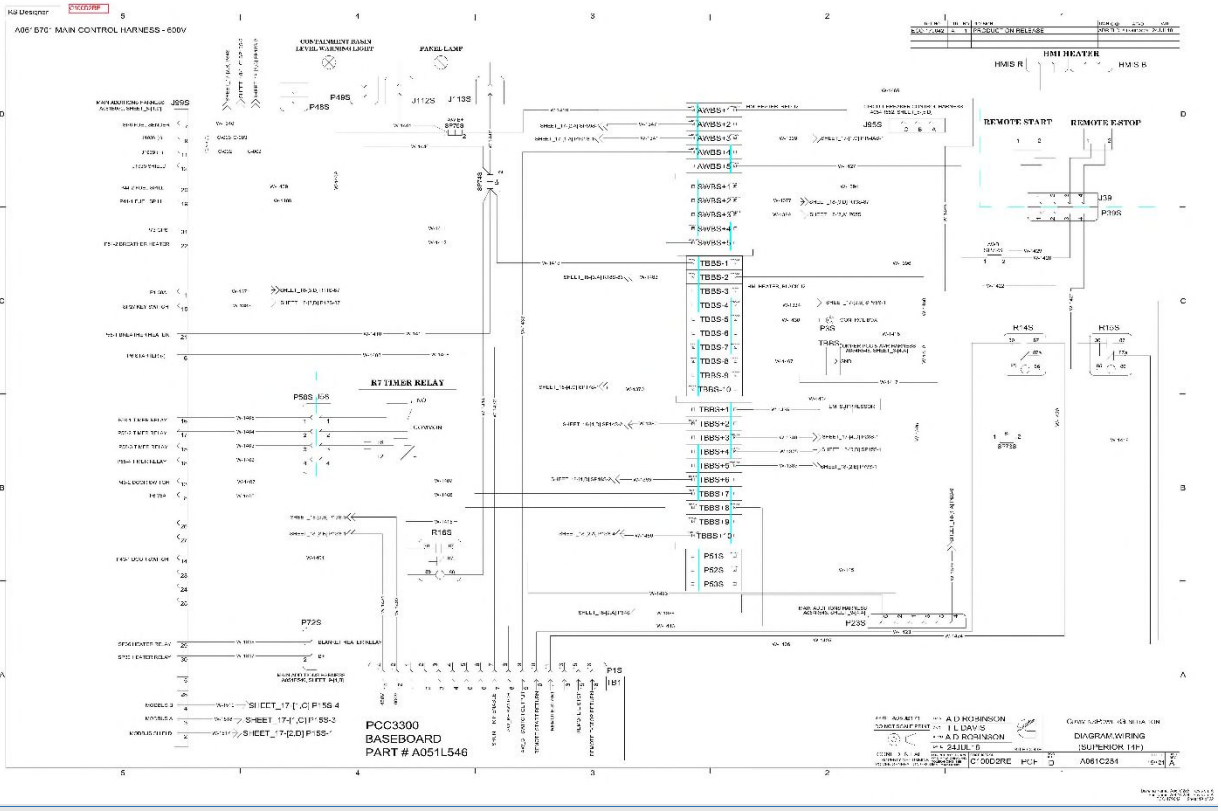

C100, C70, GENSET MODEL SELECTOR SWITCH
ALTERNATOR
WINDINGS
DIAGRAM,WIRING
(SUPERIOR 14F)

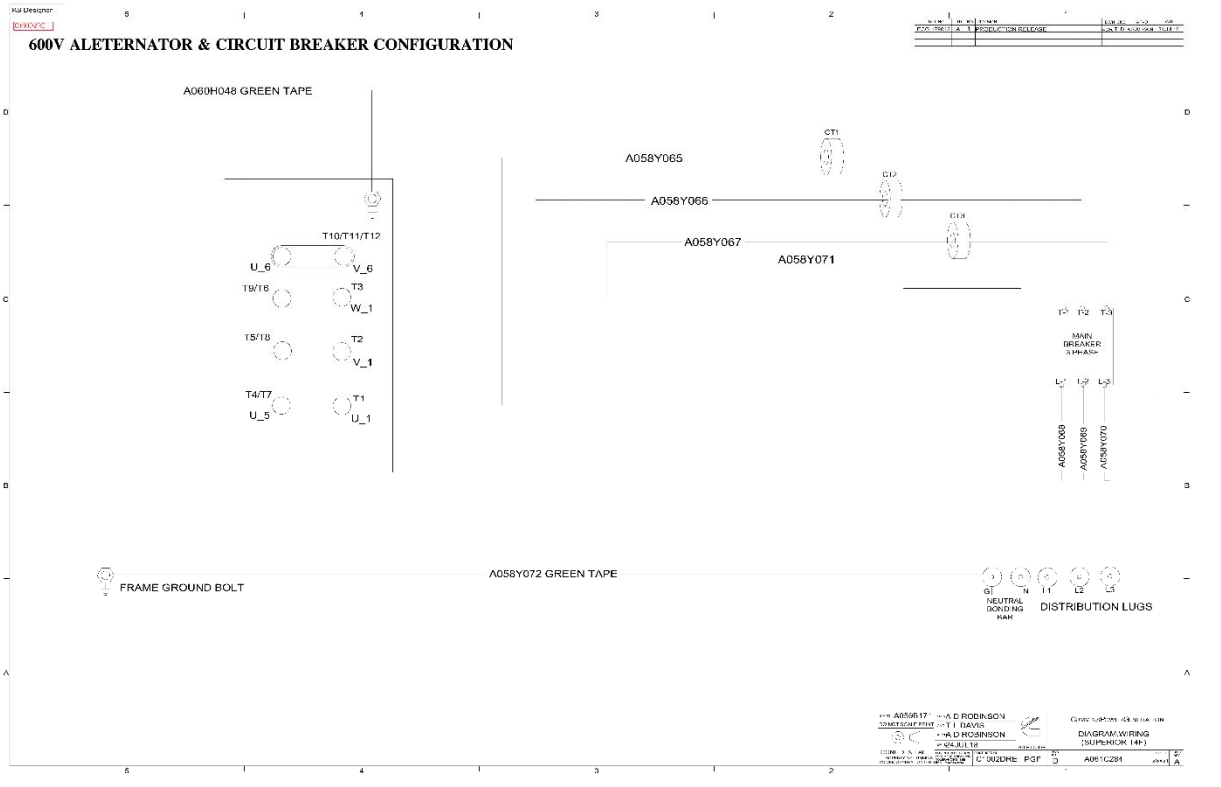

PARALLELING CONNECTIONS A050Y686
P66-A
P66-B
KVAR LOAD SHARE +
KVAR LOAD SHARE -
KW LOAD SHARE +
KW LOAD SHARE -
LOAD SHARE SHIELD
MASTER FIRST START ARBITRATION
RETURN
GROUND
S-CAN ISOLATED GROUND
S-CAN LOW
S-CAN HIGH
DOOR SAFETY SWITCH B+
DOOR SAFETY SWITCH B- RETURN
PARALLELING COMMUNICATION HARNESS
A054R544, SHEET 11-15,D,
CABLE DETECTION JUMPER
P1
P2
120%%185 TERMINATING RESISTOR
PARALLELING CONNECTIONS A047D735
P66-D
P66-A
P66-B
PARALLELING COMMUNICATION HARNESS
A054R544, SHEET 11-12,D1
AUX DEF CONNECTIONS A054R546
SHEET_9-[5,C] SP47-1
F52 15A
SWITCHED 24V DCT PUMP
K18
P67
P69
SHEET 7-[4,B] P69-1
B- RETURN
SHEET_9-[4,B] K18-44
SWITCHED 24V DCT HOSE HEATER
SHEET_9-[5,A] J23-1
AUX DEF PUMP SWITCH
OPTIONAL AUX-DEF EXTERNAL WIRING
(PROVIDED BY THE CUSTOMER)
24V, AUX-DEF SWITCHED B+
GROUND, AUX-DEF B+ RETURN (-)
24V, AUX-DEF HOSE HEATER HEATER (+)
GROUND, AUX-DEF HOSE HEATER (-)
A.D ROBINSON
T.L DAVIS
DIAGRAM,WIRING (SUPERIOR 14H)
24JUL15
C100D2RE
PGF
A051C281

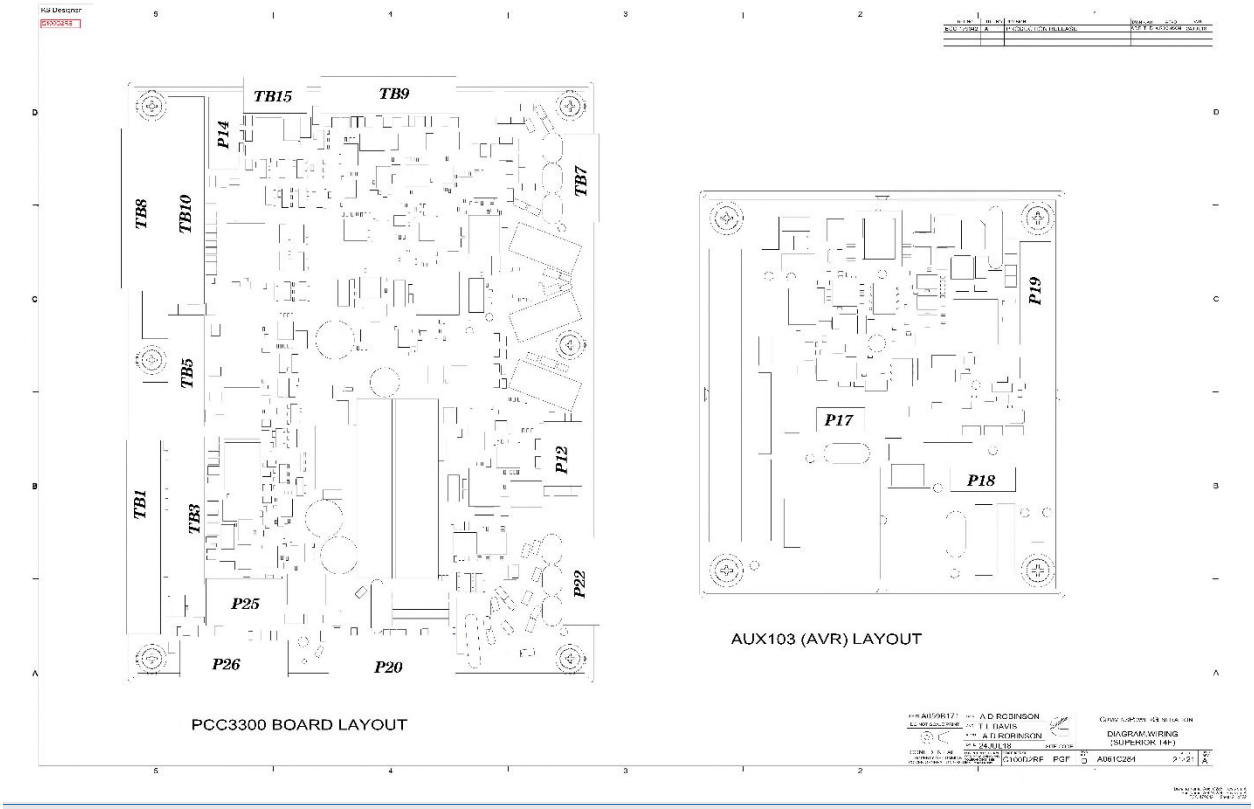

A058R949 MANUAL MAIN CIRCUIT BREAKER CONTROL
P85M
CIRCUIT BREAKER SHUNT TRIP OPERATION
SHT
P40M
J85M
T83M
PCC3300
BASEBOARD
PART # A051L546
A.D ROBINSON
T.L DAVIS
DIAGRAM,WIRING (SUPERIOR 14H)
24JUL15
PGF
A051C281

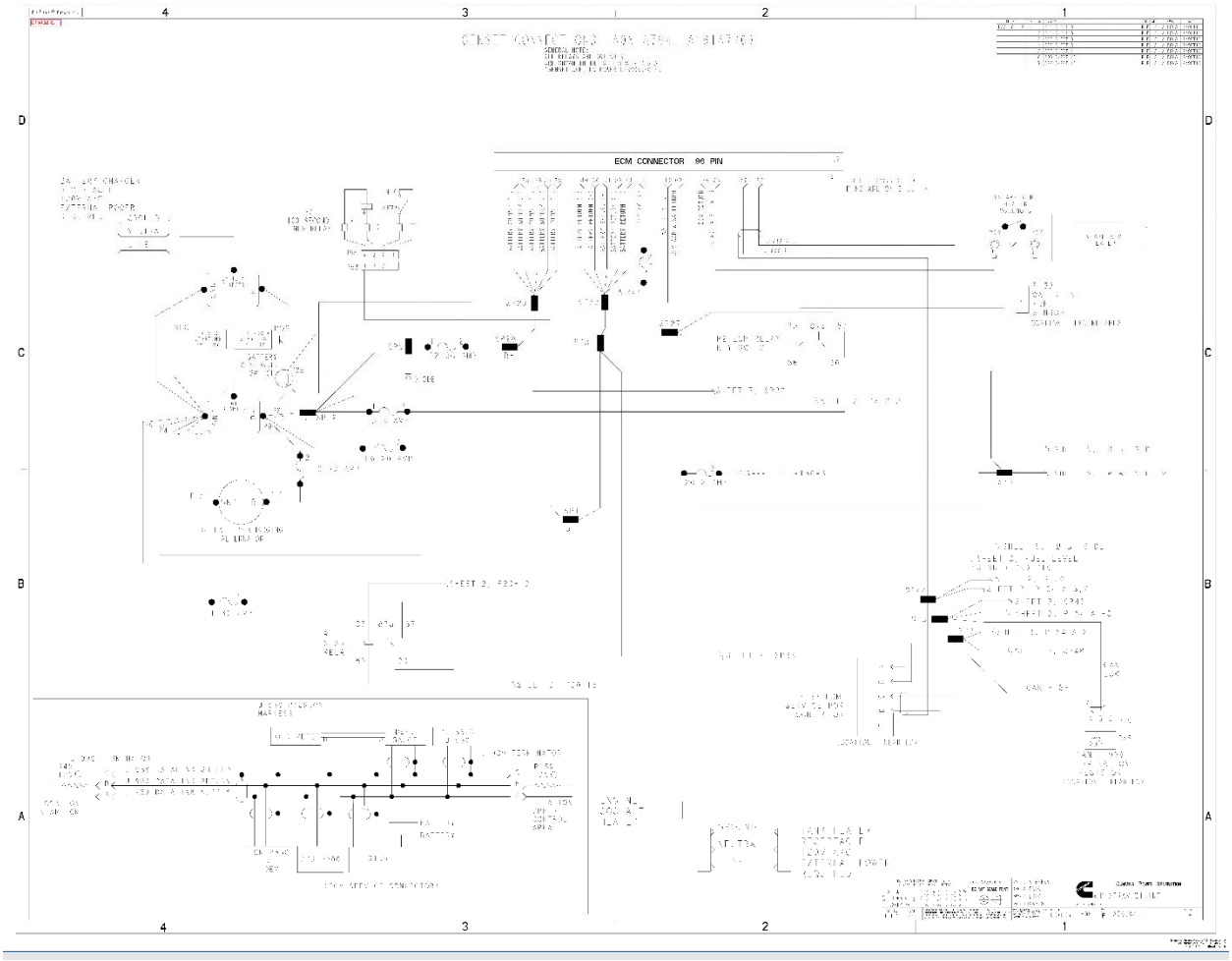

A0613701 MAIN CONTROL HARNESS - 600V
HMI 320
DISPLAY
PART # A050Z029
LOCAL
E-STOP SWITCH
PC TOOL
GAUGES
PCC3300
BASEBOARD
PART # A051L546
POWER SUPPLY
PRODUCTION RELEASE
DIAGRAM,WIRING
(SUPERIOR T4F)

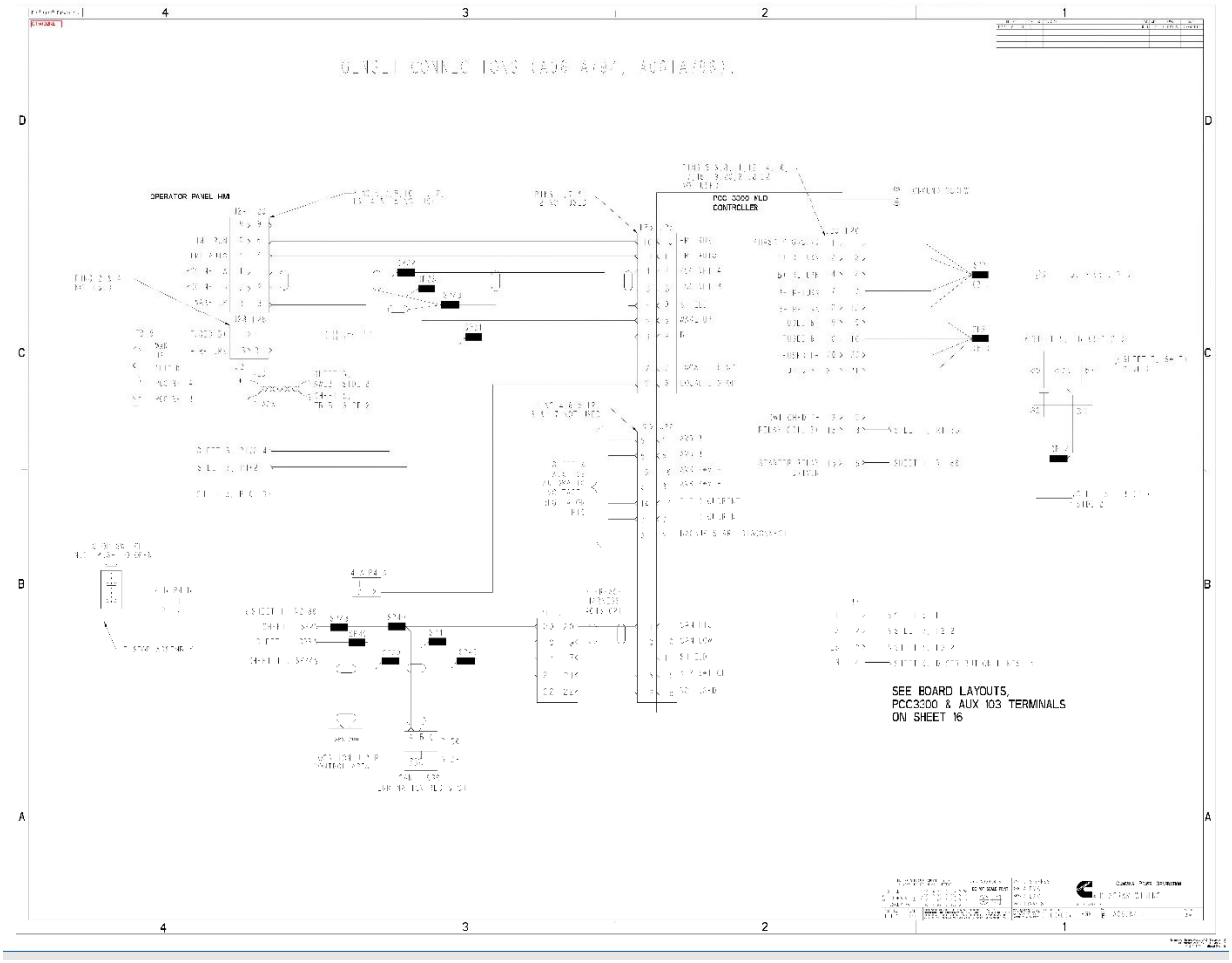

A0613701 MAIN CONTROL HARNESS - 600V
PCC3300 BASEBOARD
PART # A051L546
PCC3300
BASEBOARD
PART # A051L546
FOR 600V CONFIGURATION:
REMOVE P17 FROM AUX 103. AVR
MATE P17 WITH J17S
PLUG P17S INTO AUX 103. AVR (SHEET_9-[5,D]
RUN = OPEN
IDLE = CLOSE
PRODUCTION RELEASE
DIAGRAM,WIRING
(SUPERIOR T4F)

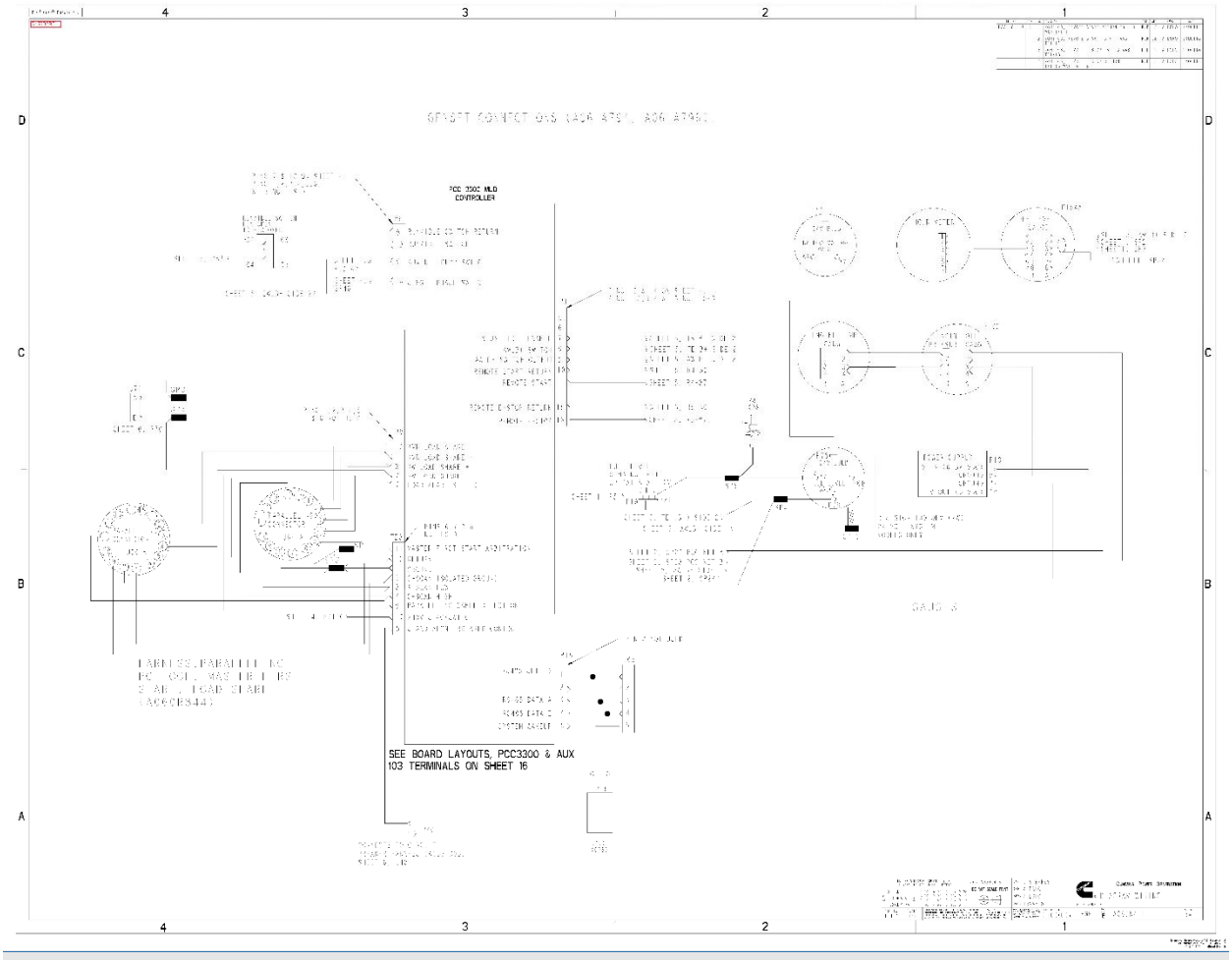

A06*670* MAIN CONTROL HARNESS - 600V
CONTAINMENT BASIN LEVEL WARNING LIGHT
PANEL LAMP
HMI HEATER
HMI S R
HMI S B
REMOTE START
REMOTE ESTOP
K7 TIMER RELAY
PCC3300
BASEBOARD
PART # A051L546
A. D ROBINSON
T. L DAVIS
A. D ROBINSON
24 JUL 16
DIAGRAM,WIRING
(SUPERIOR 14P)
A061C284

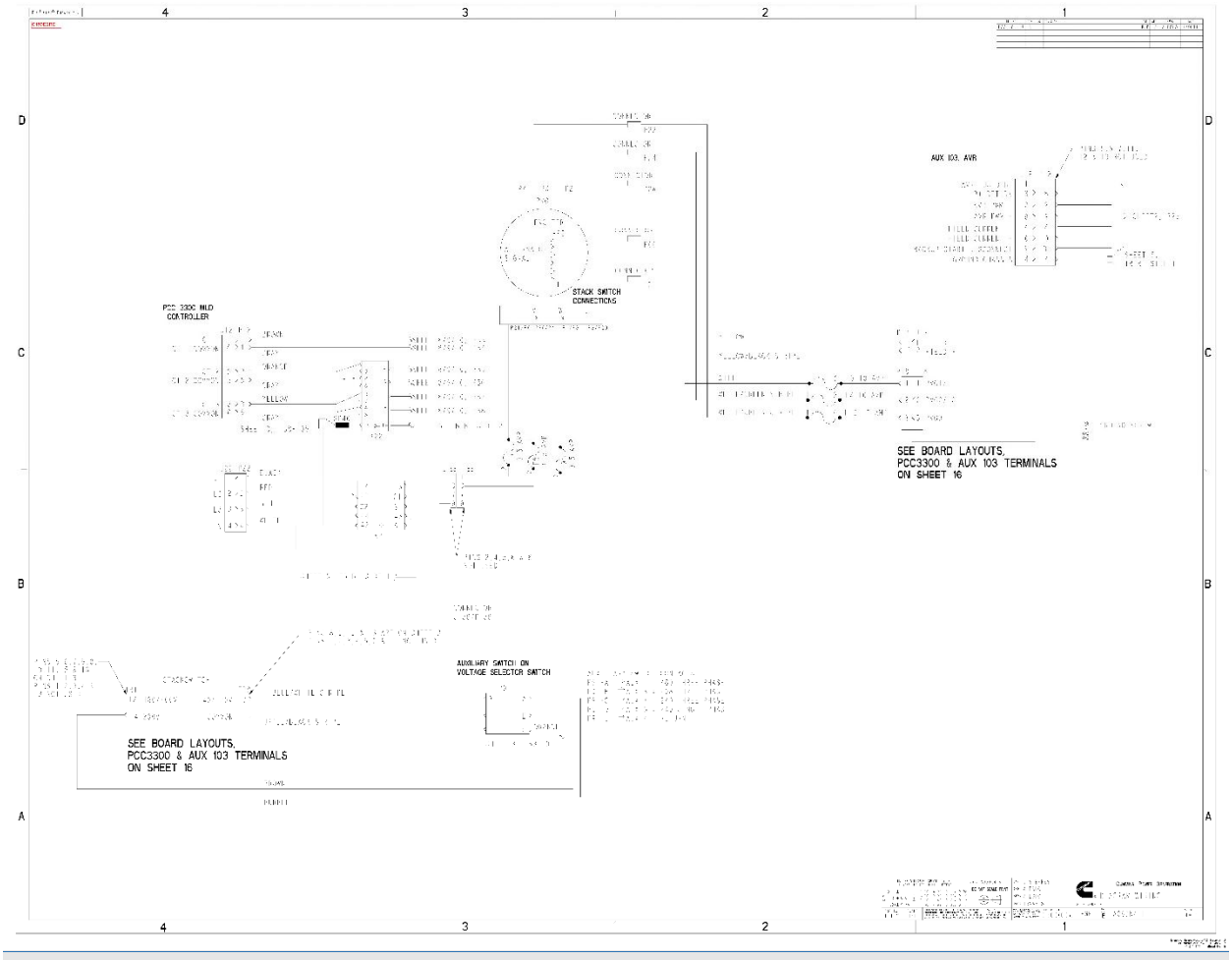

600V ALETERNATOR & CIRCUIT BREAKER CONFIGURATION
A060H048 GREEN TAPE
T10/T11/T12
U_6
V_6
T9/T6
T3
W_1
T5/T8
T2
V_1
T4/T7
T1
U_5
U_1
A058Y065
A058Y066
A058Y067
A058Y071
CT1
CT2
CT3
MAIN BREAKER 3 PHASE
A058Y068
A058Y069
A058Y070
A058Y072 GREEN TAPE
FRAME GROUND BOLT
NEUTRAL BONDING BAR
DISTRIBUTION LUGS
A. D ROBINSON
T. L DAVIS
A. D ROBINSON
24 JUL 16
DIAGRAM,WIRING
(SUPERIOR 14P)
A061C284

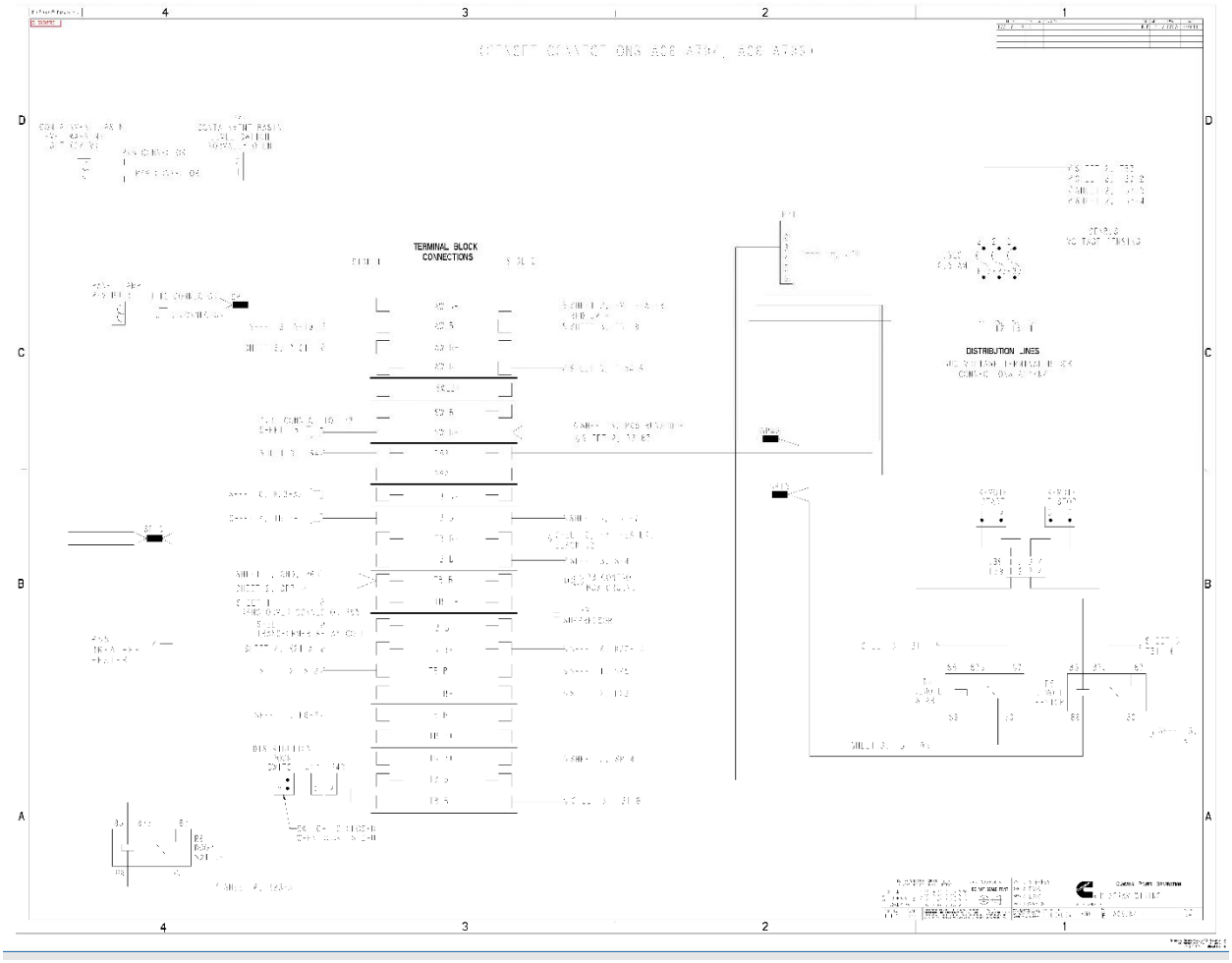

TB15
TB9
P14
TB8
TB10
TB7
TB5
P12
TB1
TB3
P22
P25
P26
P20
P19
P17
P18
PCC3300 BOARD LAYOUT
AUX103 (AVR) LAYOUT
A.D.ROBINSON
T.T.DAVIS
A.D.ROBINSON
24JUL18
DIAGRAM,WIRING
(SUPERIOR 14P)
G100D/RF
PGF
A061C284

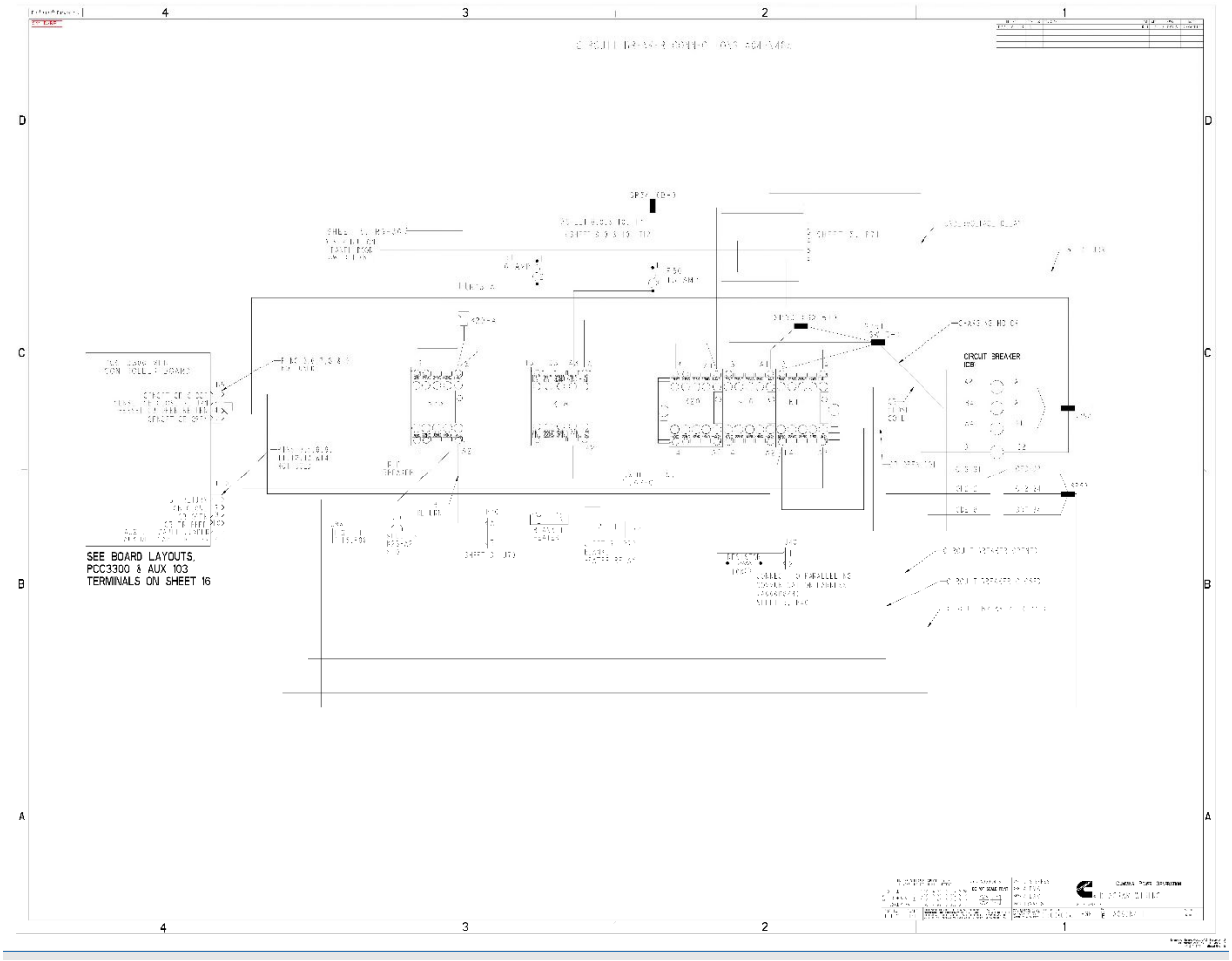

ECM CONNECTOR 96 PIN

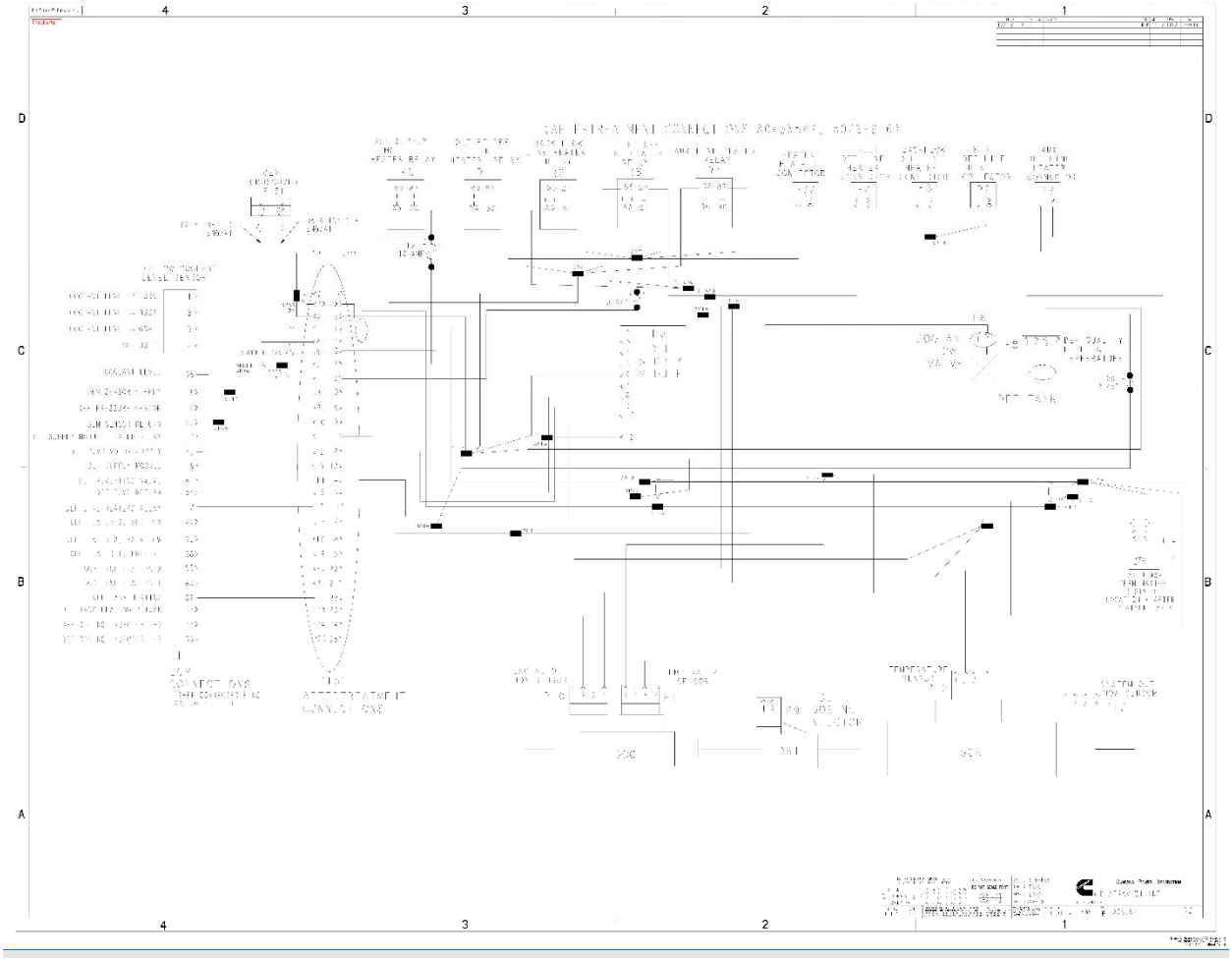

OPERATOR PANEL HMI
PCC 3300 MLD
CONTROLLER
SEE BOARD LAYOUTS,
PCC3300 & AUX 103 TERMINALS
ON SHEET 16

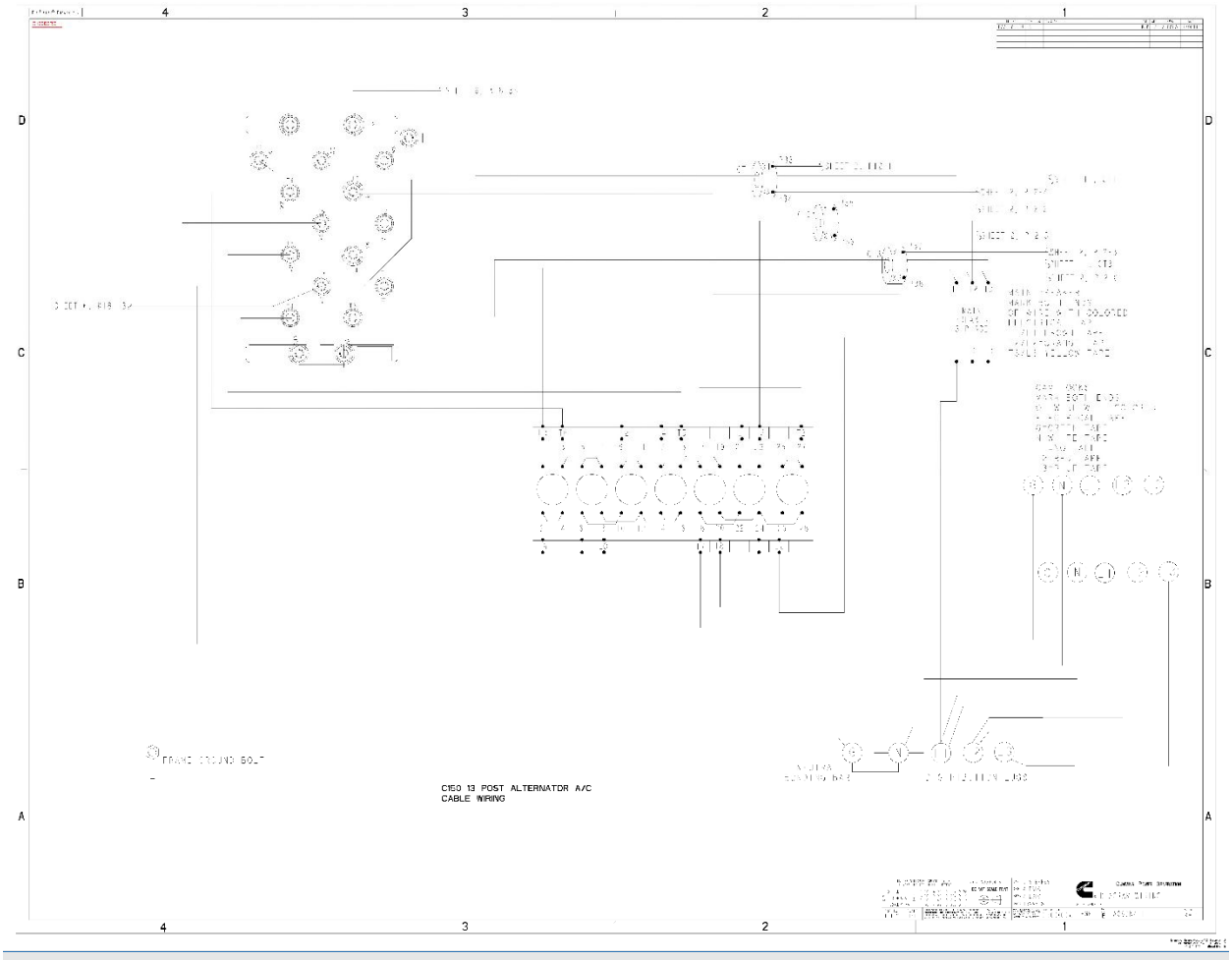

PCC 3300 MLD
CONTROLLER
SEE BOARD LAYOUTS, PCC3300 & AUX
103 TERMINALS ON SHEET 16

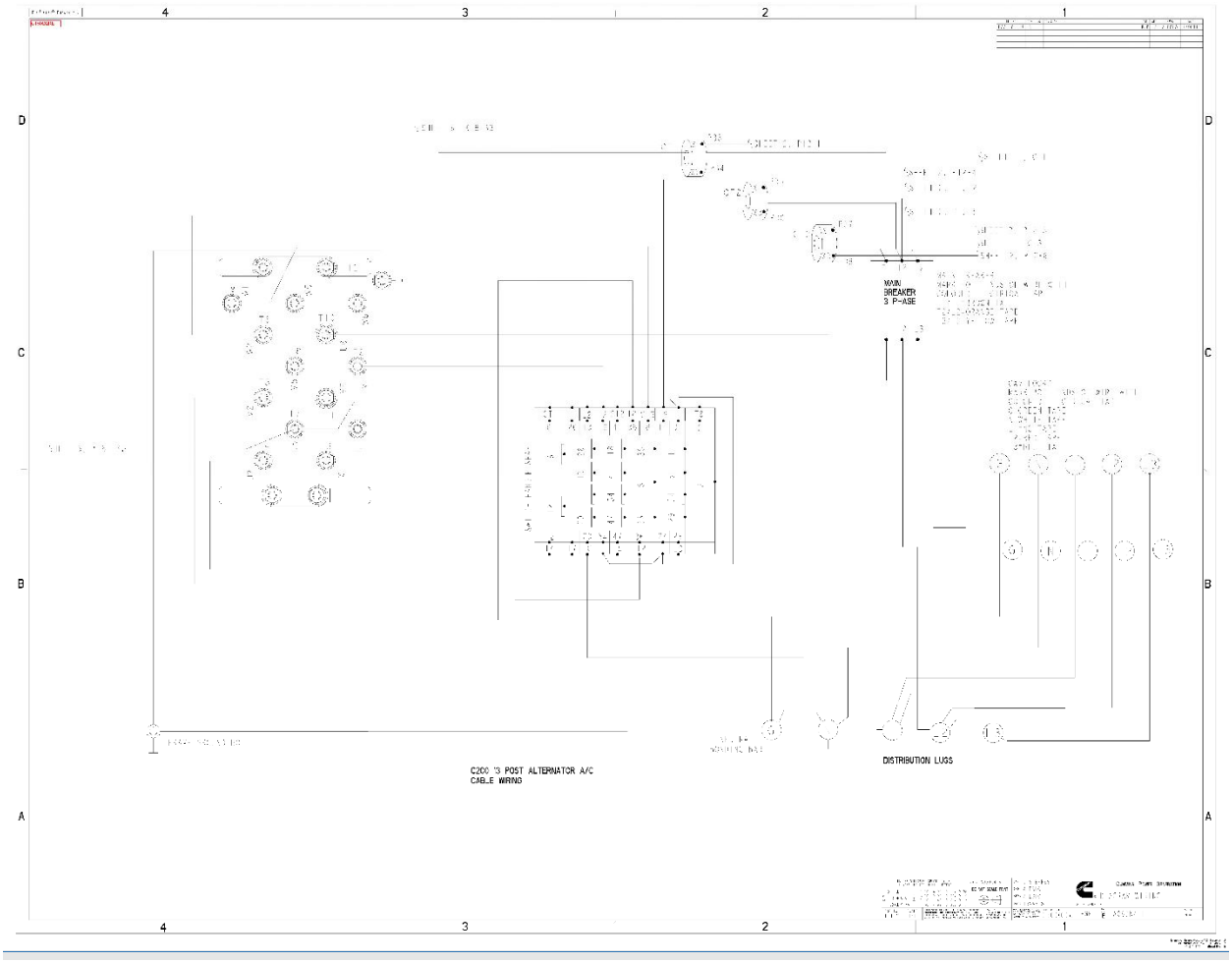

AUX 103. AVR
STACK SWITCH CONNECTIONS
SEE BOARD LAYOUTS, PCC3300 & AUX 103 TERMINALS ON SHEET 16
AUXILIARY SWITCH ON VOLTAGE SELECTOR SWITCH
SEE BOARD LAYOUTS, PCC3300 & AUX 103 TERMINALS ON SHEET 16

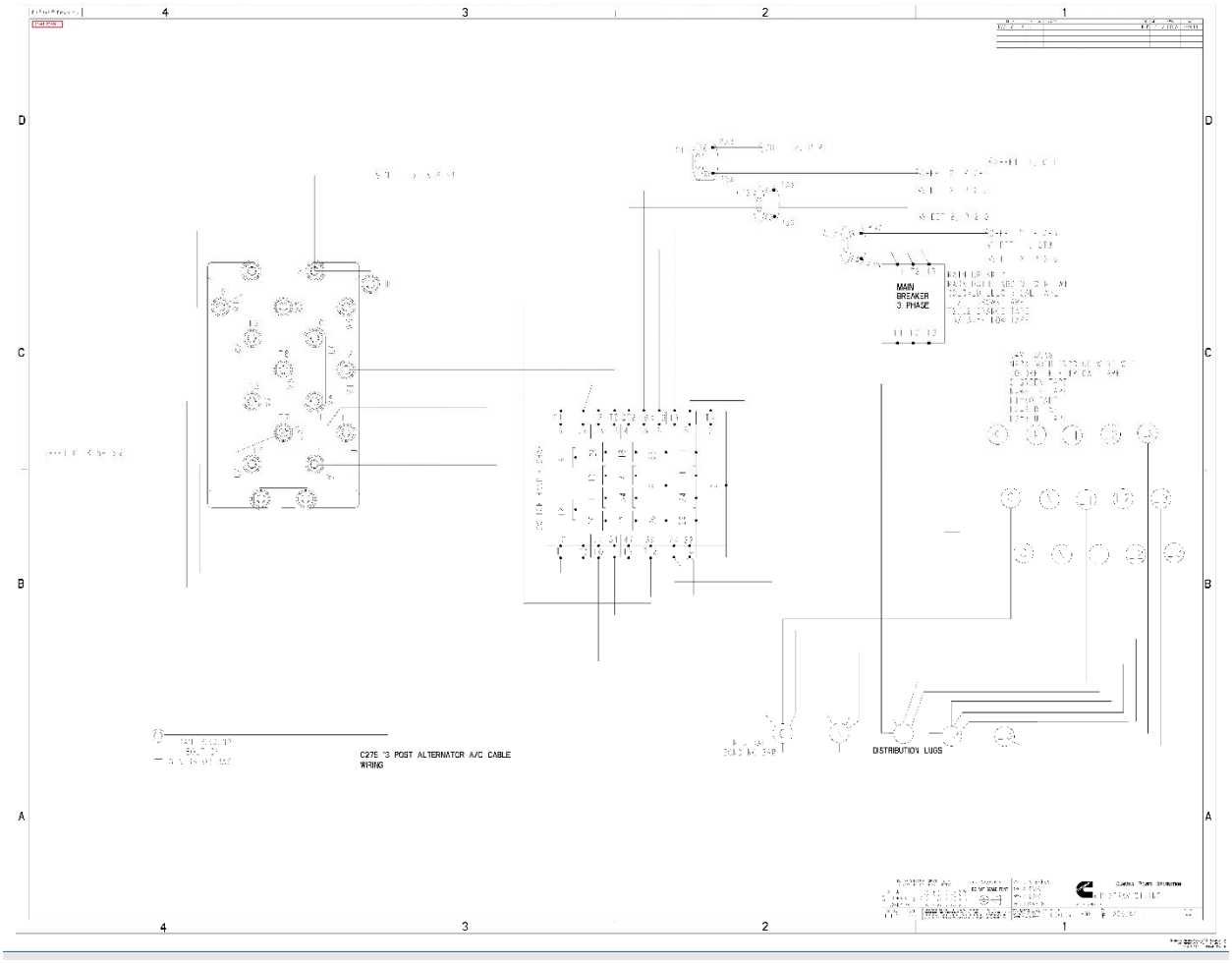

TERMINAL BLOCK
CONNECTIONS
DISTRIBUTION LINES

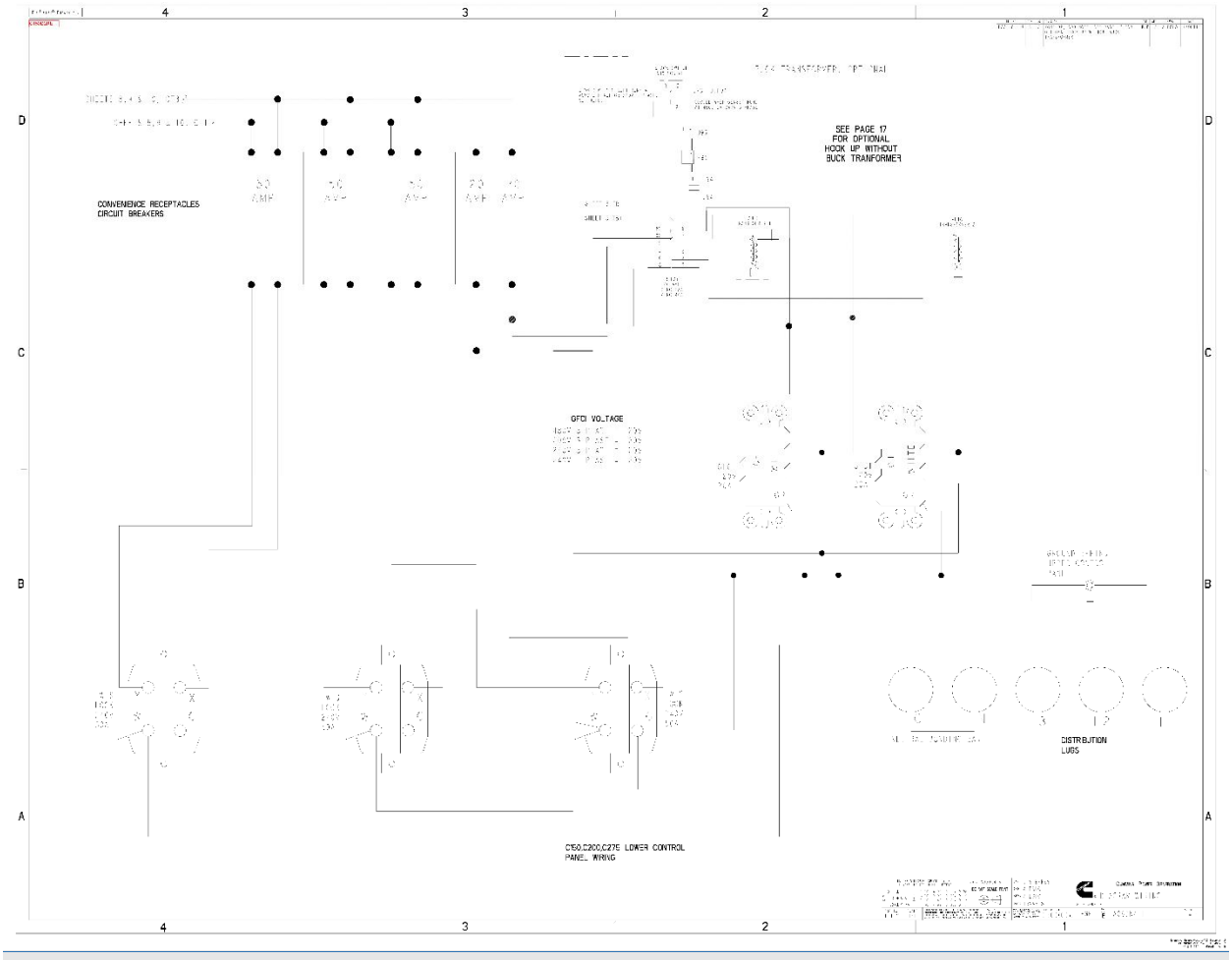

SEE BOARD LAYOUTS.
PCC3300 & AUX 103.
TERMINALS ON SHEET 16
CIRCUIT BREAKER
IDB



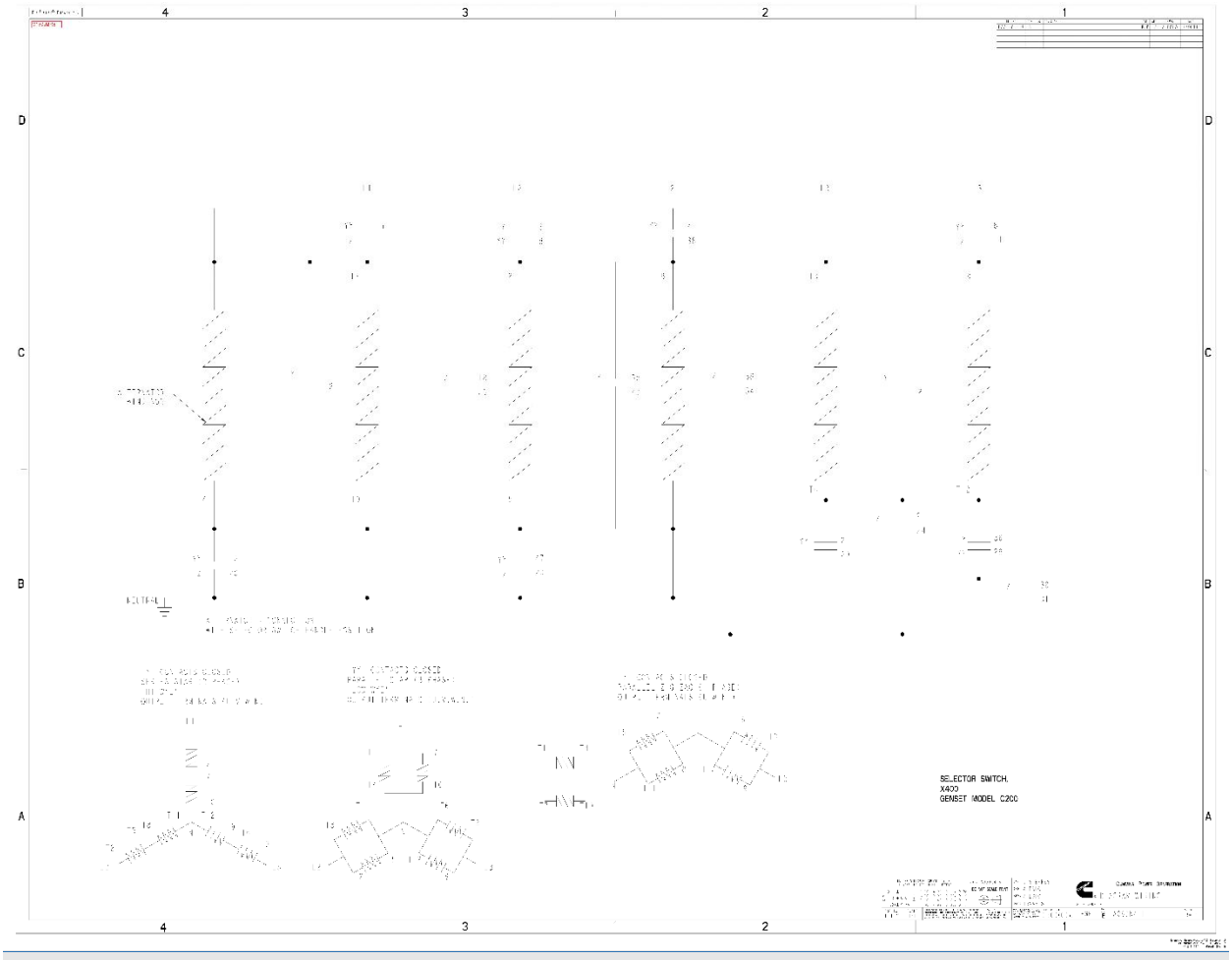

C150 13 POST ALTERNATOR A/C
CABLE WIRING

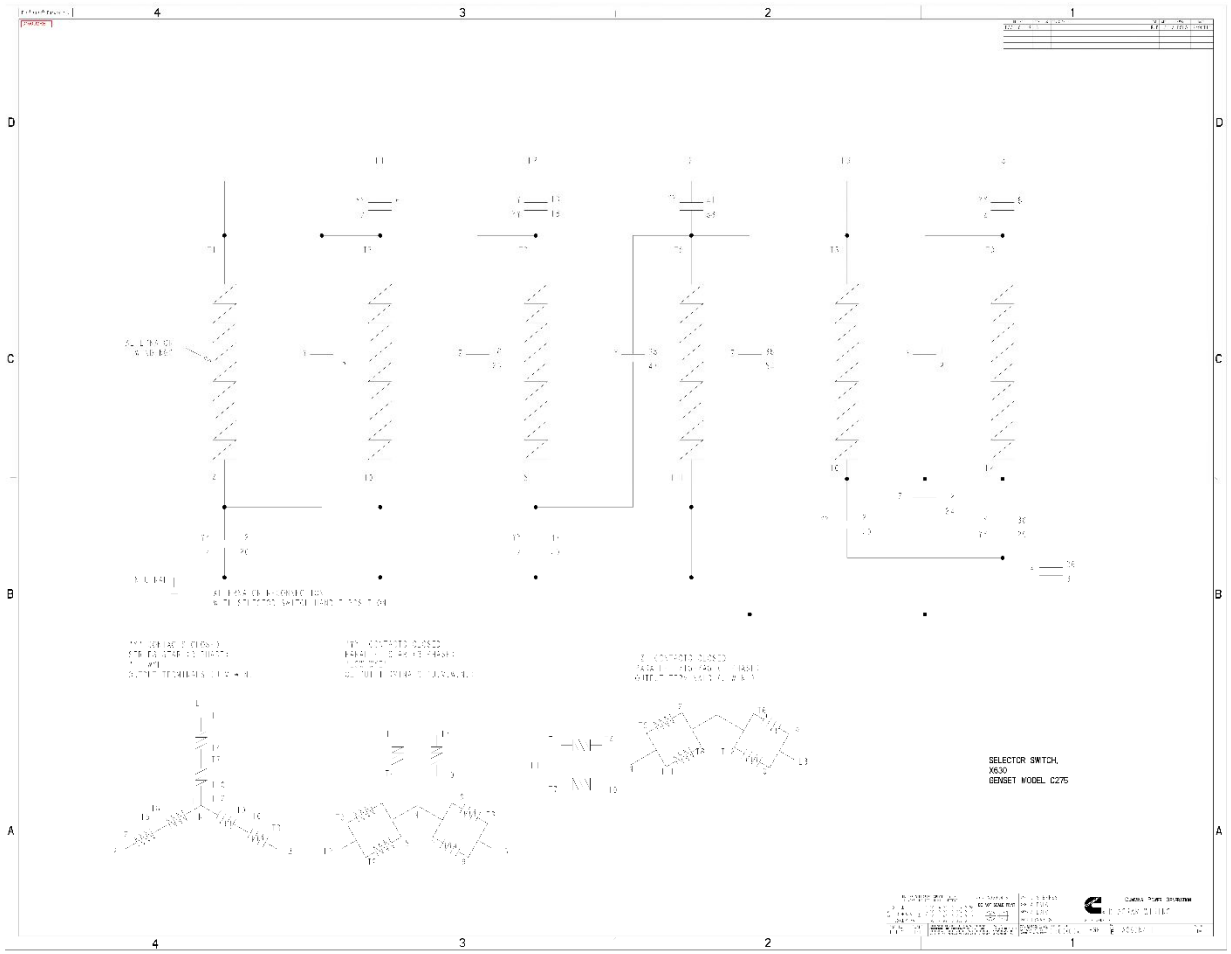

MAIN
BREAKER
3 P-ASE
DISTRIBUTION LUGS
C200 '3 POST ALTERNATOR A/C
CABLE WIRING

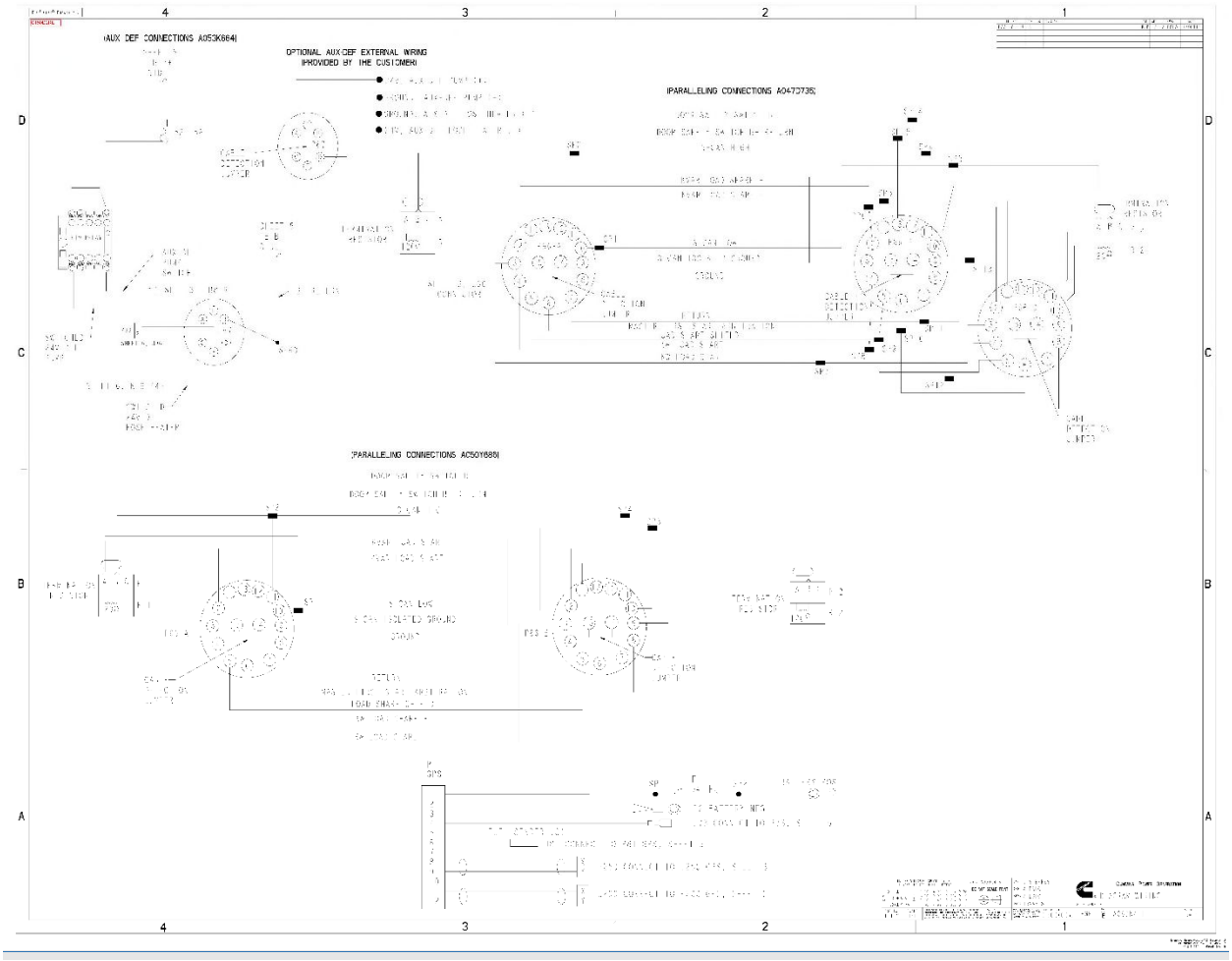

MAIN
BREAKER
3 PHASE
C27E '3 POST ALTERNATOR A/C CABLE
WIRING
DISTRIBUTION LUGS

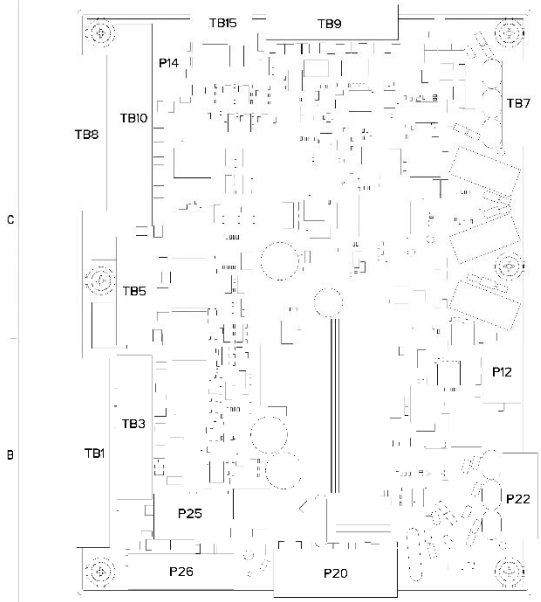

SEE PAGE 17
FOR OPTIONAL
HOOK UP WITHOUT
BUCK TRANFORMER
CONVENIENCE RECEPTACLES
CIRCUIT BREAKERS
GFCI VOLTAGE
DISTRIBUTION
LUGS
C150,C200,C275 LOWER CONTROL
PANEL WIRING

SELECTOR SWITCH
GENSET MODEL C
ISO

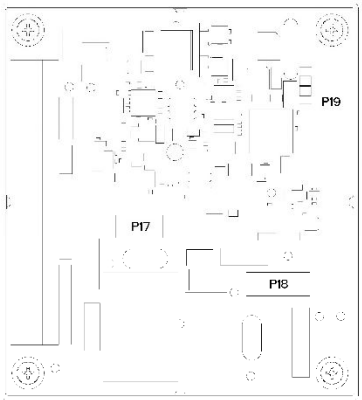

SELECTOR SWITCH,
3400
GENSET MODEL C20D


SELECTOR SWITCH,
X630
GENSET MODEL C275

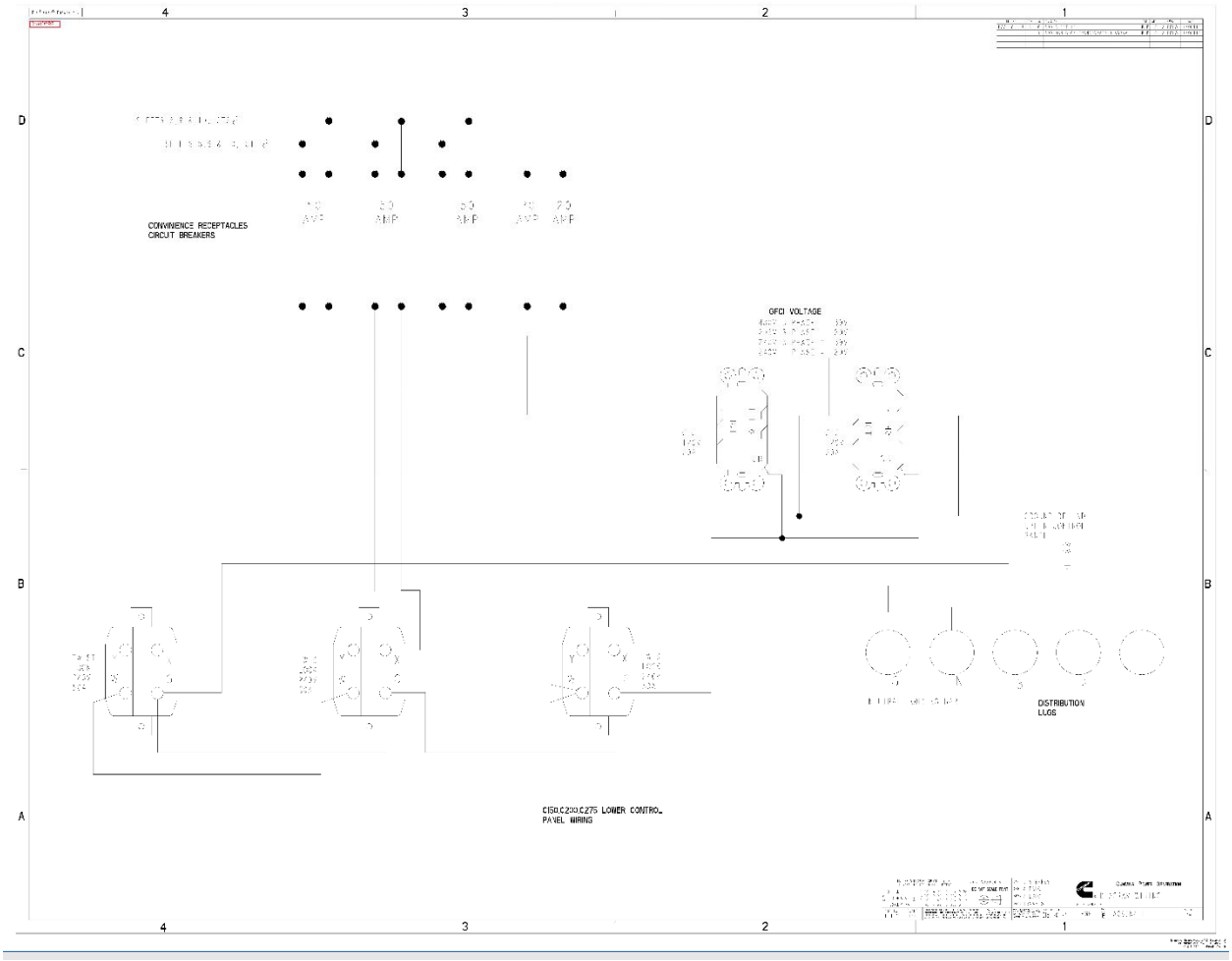

AUX DEF CONNECTIONS A053K664
OPTIONAL AUX DEF EXTERNAL WIRING
PARALLELING CONNECTIONS A047273
PARALLELING CONNECTIONS AC501688

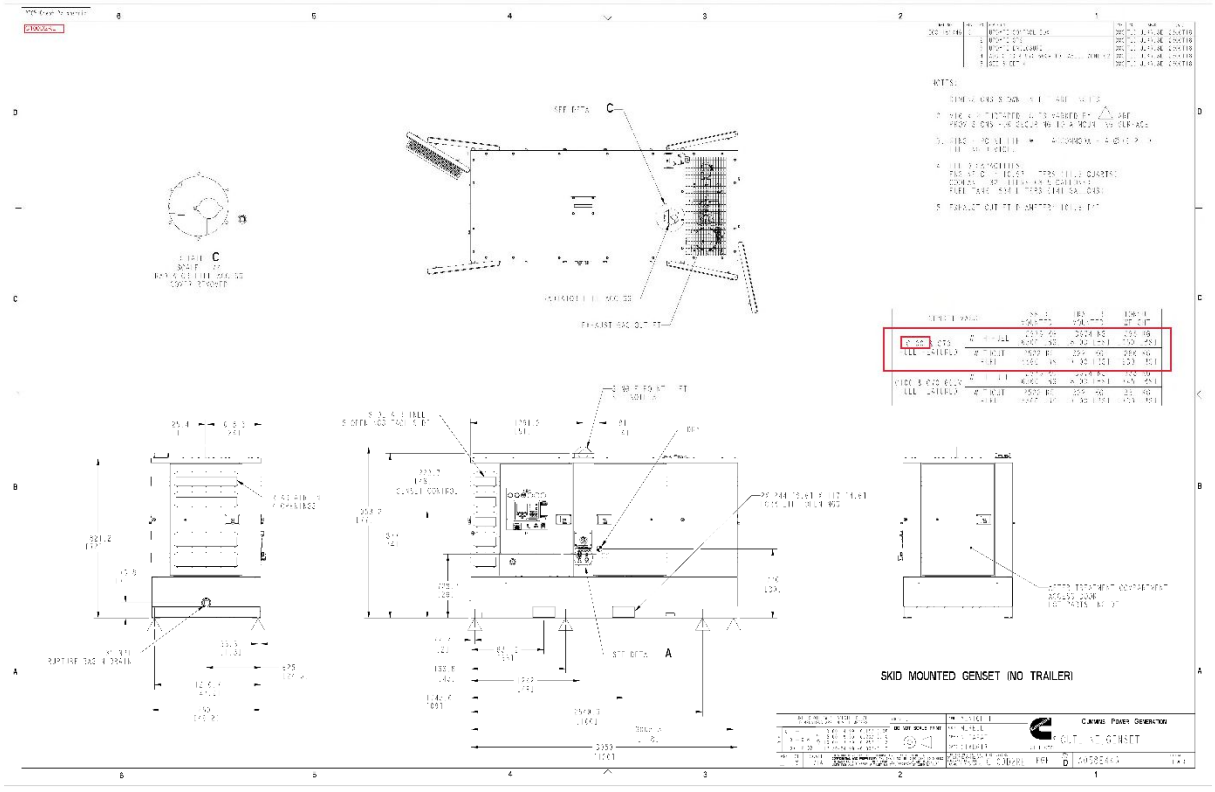


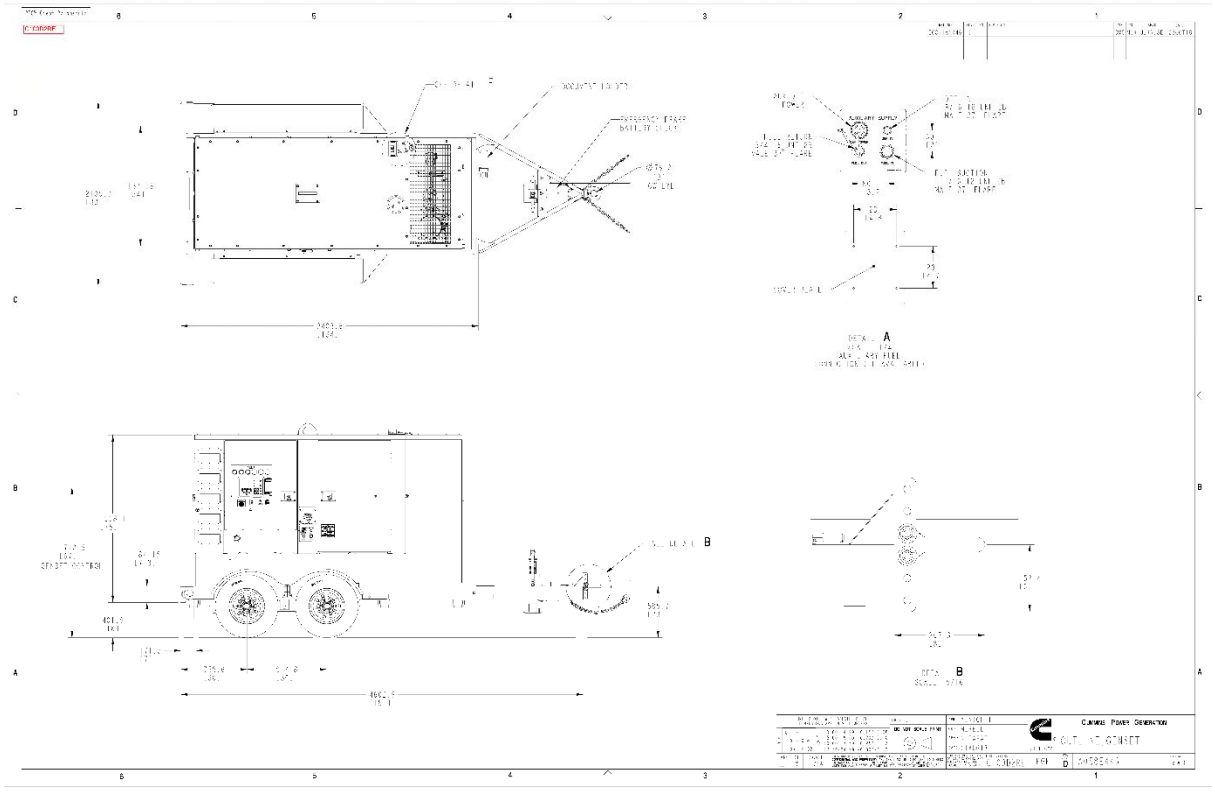
PCC3300 BOARD LAYOUT

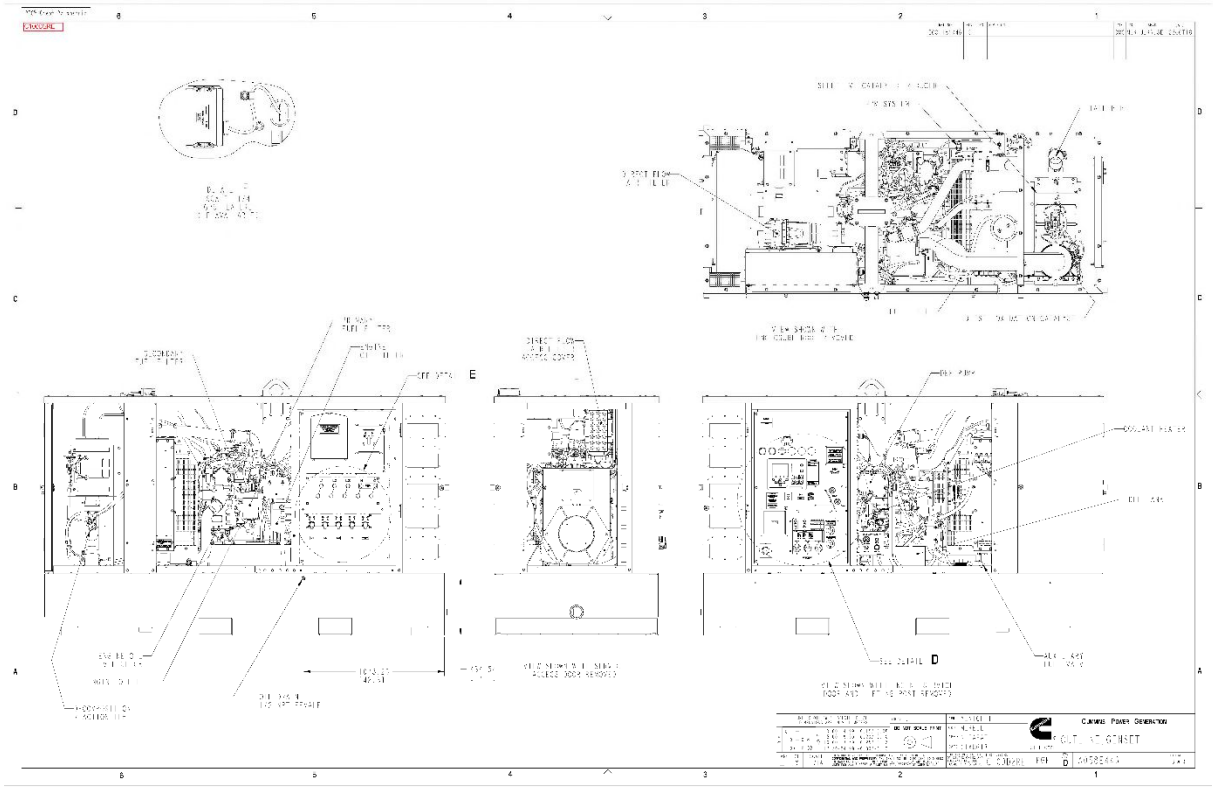


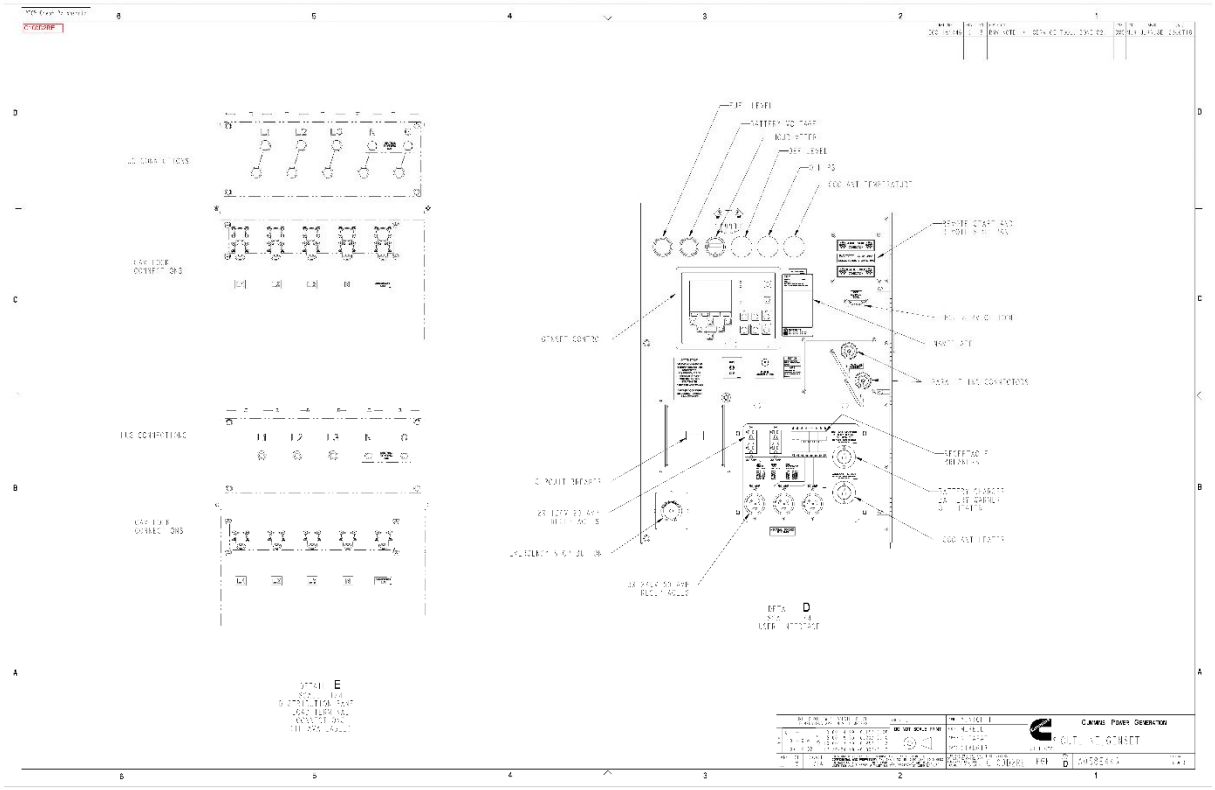
AUX 103 (AVR) LAYOUT

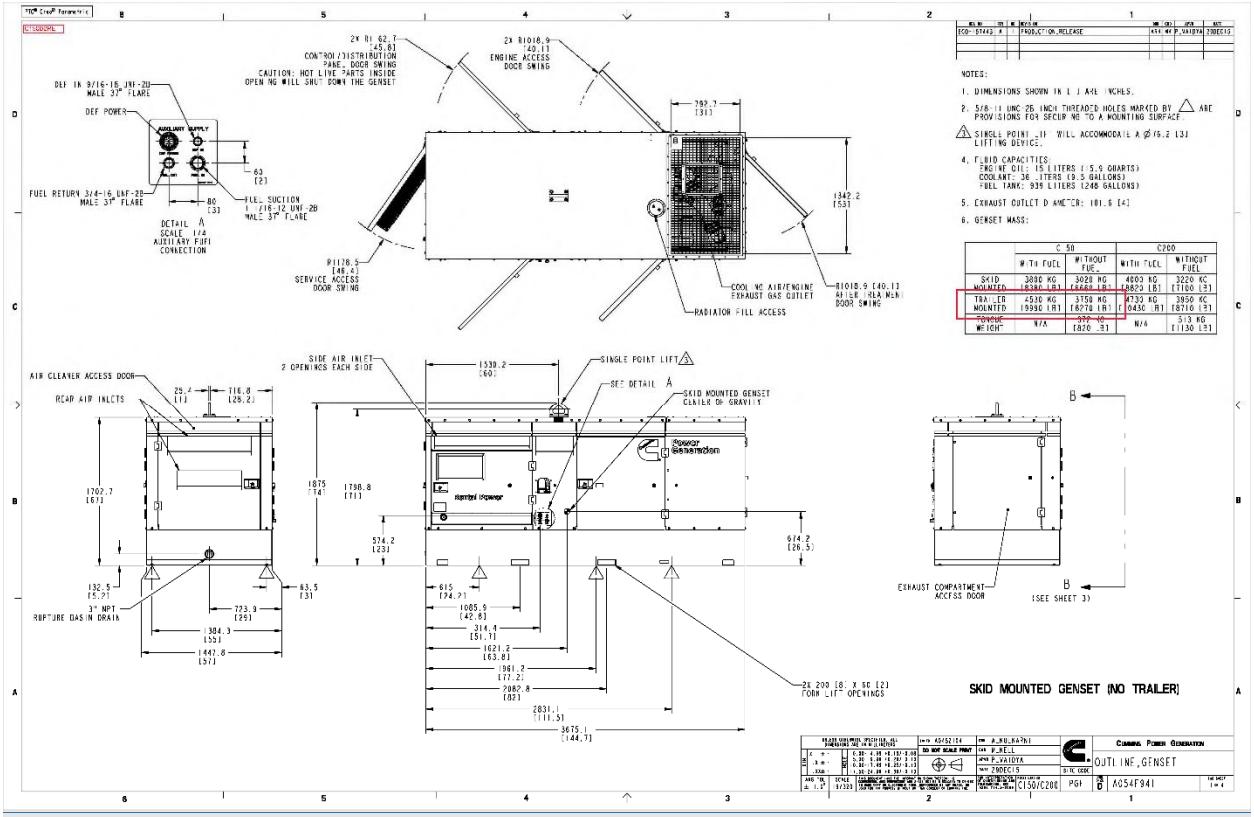

CONVINENCE RECEPTACLES
CIRCUIT BREAKERS
GFCI VOLTAGE
DISTRIBUTION
LUGS
C150,C200,C275 LOWER CONTRO_
PANEL WIRING

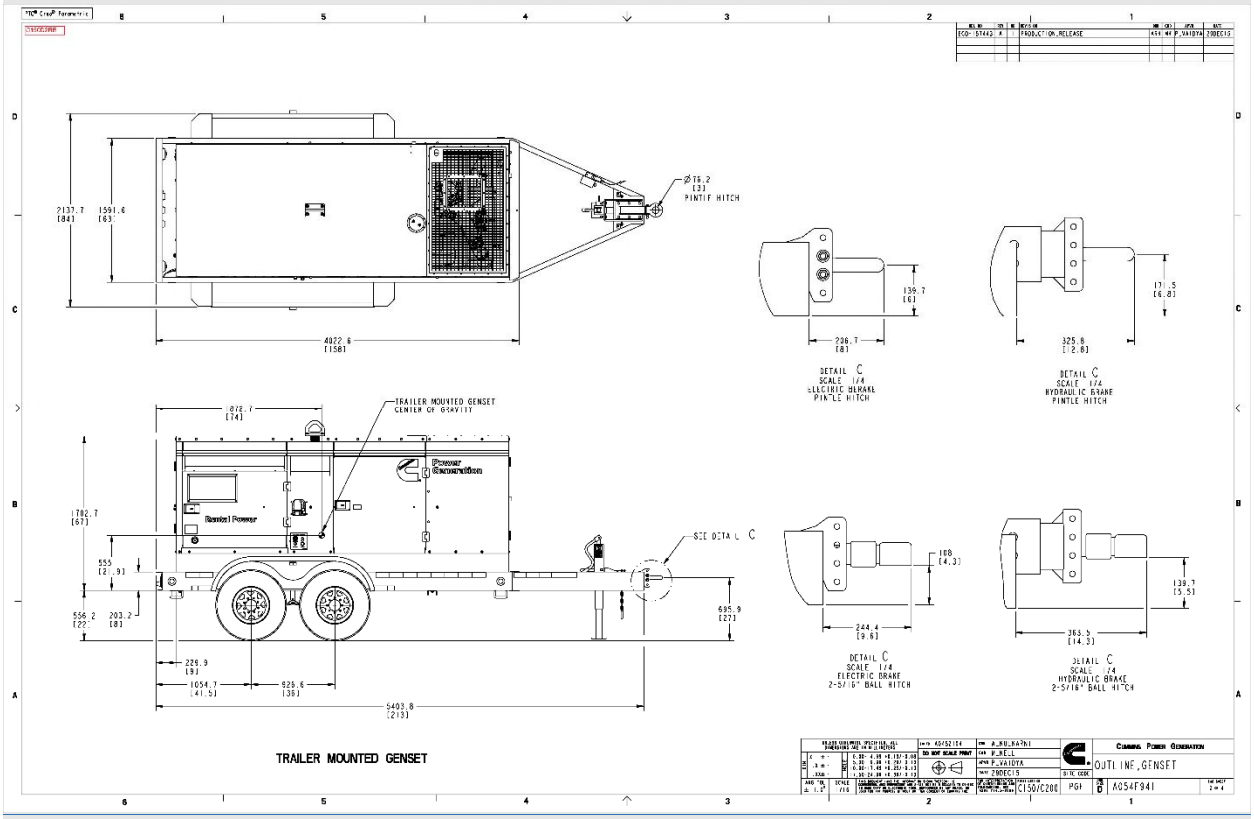

SKID MOUNTED GENSET (NO TRAILER)
CUMMINS POWER GENERATION

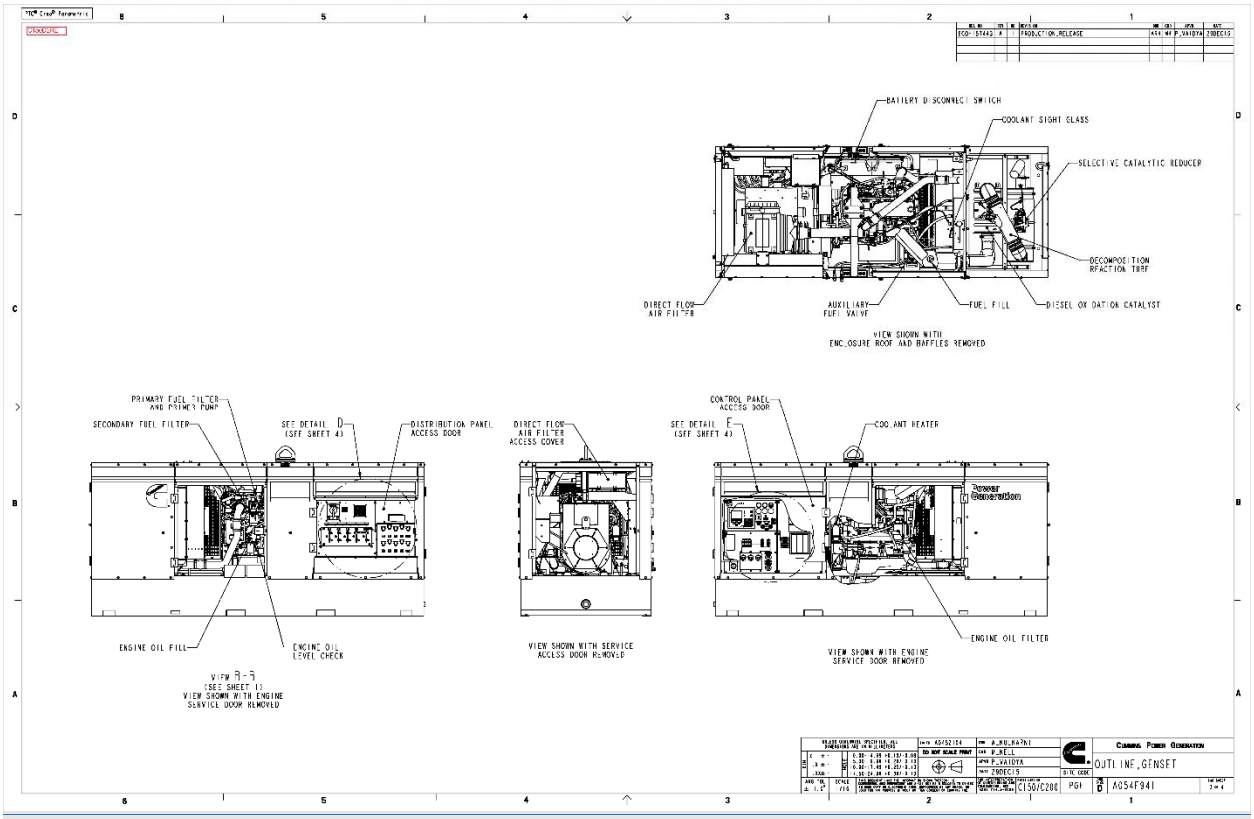

CUMMINS POWER GENERATION

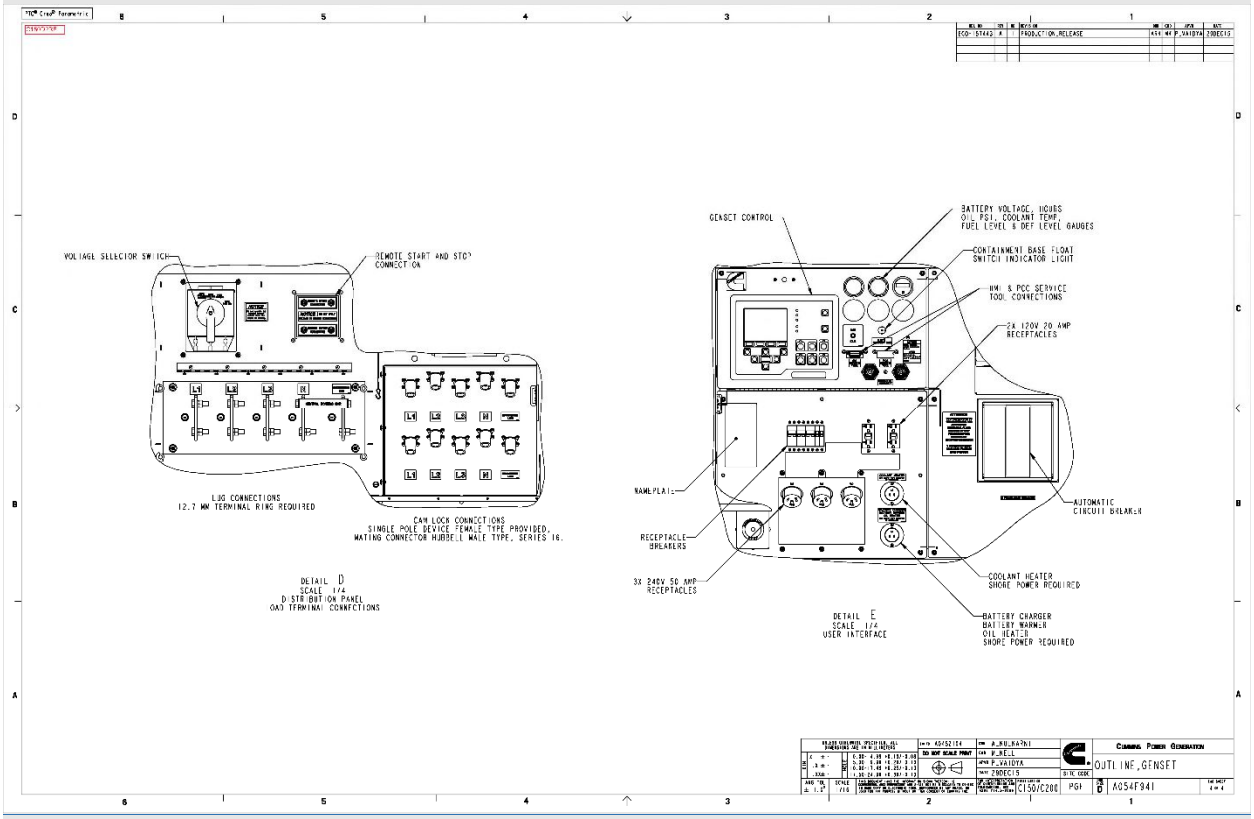





NOTES:
1. DIMENSIONS SHOWN IN [ ] ARE INCHES.
2. 5/8-11 UNC-2B INCH THREADED HOLES MARKED BY △ ARE PROVISIONS FOR SECURING TO A MOUNTING SURFACE.
△1 SINGLE POINT LIFTING DEVICE WILL ACCOMMODATE A Ø76.2 [3]
4. FLUID CAPACITIES:
ENGINE OIL: 15 LITERS (5.9 QUARTS)
COOLANT: 36 LITERS (9.5 GALLONS)
FUEL TANK: 935 LITERS (248 GALLONS)
5. EXHAUST OUTLET DIAMETER: 101.6 [4]
6. GENSET MASS:
C 50
C200
WITH FUEL
WITHOUT FUEL
SKID MOUNTED
TRAILER MOUNTED
TONGUE WEIGHT
3030 KG (6680 LB)
3028 KG (6668 LB)
4090 KG (8820 LB)
3220 KG (7100 LB)
4510 KG (9990 LB)
3758 KG (8278 LB)
4733 KG (10430 LB)
3950 KG (8710 LB)
N/A
372 KG (820 LB)
N/A
513 KG (1130 LB)
SKID MOUNTED GENSET (NO TRAILER)
OUTLINE,GENSET
C150/C200
A054F941


TRAILER MOUNTED GENSET
TRAILER MOUNTED GENSET CENTER OF GRAVITY
DETAIL C SCALE 1/4 ELECTRIC BRAKE PINTLE HITCH
DETAIL C SCALE 1/4 HYDRAULIC BRAKE PINTLE HITCH
DETAIL C SCALE 1/4 ELECTRIC BRAKE 2-5/16" BALL HITCH
DETAIL C SCALE 1/4 HYDRAULIC BRAKE 2-5/16" BALL HITCH
OUTLINE,GENSET
C150/C200
A054F941


BATTERY DISCONNECT SWITCH
COOLANT SIGHT GLASS
SELECTIVE CATALYTIC REDUCER
DECOMPOSITION REACTION TUBE
DIESEL OXIDATION CATALYST
FUEL FILL
AUXILIARY FUEL VALVE
DIRECT FLOW AIR FILTER
VIEW SHOWN WITH ENCLOSURE ROOF AND BAFFLES REMOVED
PRIMARY FUEL FILTER AND PRIME PUMP
SECONDARY FUEL FILTER
SEE DETAIL D (SHEET 4)
DISTRIBUTION PANEL ACCESS DOOR
ENGINE OIL FILL
ENGINE OIL LEVEL CHECK
VIEW A-A (SEE SHEET 1) VIEW SHOWN WITH ENGINE SERVICE DOOR REMOVED
DIRECT FLOW AIR FILTER ACCESS COVER
VIEW SHOWN WITH SERVICE ACCESS DOOR REMOVED
CONTROL PANEL ACCESS DOOR
SEE DETAIL E (SHEET 4)
COOLANT HEATER
ENGINE OIL FILTER
VIEW SHOWN WITH ENGINE SERVICE DOOR REMOVED
Power Generation
ECO- 57442- A
PRODUCTION RELEASE
OUTLINE,GENSET
C150/C200
A054F941


VOLTAGE SELECTOR SWITCH
REMOTE START AND STOP CONNECTION
LUG CONNECTIONS
12.7 MM TERMINAL RING REQUIRED
CAM LOCK CONNECTIONS
SINGLE POLE DEVICE FEMALE TYPE PROVIDED, MATING CONNECTOR HUBBELL MALE TYPE, SERIES 16.
DETAIL D
SCALE 1/4
D-STR BUTION PANEL
OAD TERMINAL CONNECTIONS
GENSET CONTROL
BATTERY VOLTAGE, HOURS OIL PSI, COOLANT TEMP, FUEL LEVEL & DEF LEVEL GAUGES
CONTAINMENT BASE FLOAT SWITCH INDICATOR LIGHT
HMI & PCC SERVICE TOOL CONNECTIONS
2X 120V 20 AMP RECEPTACLES
NAMEPLATE
AUTOMATIC CIRCUIT BREAKER
RECEPTACLE BREAKERS
3X 240V 50 AMP RECEPTACLES
COOLANT HEATER SHORE POWER REQUIRED
BATTERY CHARGER BATTERY WARMER OIL HEATER SHORE POWER REQUIRED
DETAIL E
SCALE 1/4
USER INTERFACE
ECO- 57442- A
PRODUCTION RELEASE
OUTLINE,GENSET
C150/C200
A054F941

Warranty Statement

Generator Set

Global Industrial Mobile Extended Warranty

English
Original Instructions

5-2015

A040H849 Issue B

Limited Industrial Mobile 5 Year or 5,000 Hours Comprehensive Extended Warranty

Industrial Mobile Generating Set

This limited warranty applies to all Cummins Power Generation® branded Industrial Mobile generating sets and associated accessories (hereinafter referred to as "Product").

This warranty covers any failures of the Product, under normal use and service, which result from a defect in material or factory workmanship.

Warranty Period:

The warranty start date is the date of delivery to first retail purchaser, after 50 hours of demonstration or 18 months after factory ship date, whichever is sooner. The coverage duration is 5 years from warranty start date or 5,000 hours, whichever occurs first.

Prime Power (PRP) is defined as being the maximum power which a generating set is capable of delivering continuously whilst supplying a variable electrical load when operated for an unlimited number of hours per year. The permissible average power output over 24 hours of operation shall not exceed 70% of the PRP. For applications requiring permissible average output higher than stated, a COP rating should be used.

Cummins Power Generation® Responsibilities:

In the event of a failure of the Product during the warranty period due to defects in material or workmanship, Cummins Power Generation® will only be responsible for the following costs:

- All parts and labor required to repair the Product.
- Reasonable travel expenses to and from the Product site location or Product transportation if required by Cummins.
- Maintenance items that are contaminated or damaged by a warrantable failure.

Owner Responsibilities:

The owner will be responsible for the following:

- Notifying Cummins Power Generation® distributor or dealer within 30 days of the discovery of failure.
- Installing, operating, commissioning and maintaining the Product in accordance with Cummins Power Generation®'s published policies and guidelines.
- Providing evidence of delivery date for establishing start of coverage.
- Providing sufficient access to and reasonable ability to remove the Product from the installation in the event of a warrantable failure.

In addition, the owner will be responsible for:

- Incremental costs and expenses associated with Product removal and reinstallation resulting from non-standard installations.
- Costs associated with rental of generating sets used to replace the Product being repaired.
- Costs associated with labor overtime and premium shipping requested by the owner.
- All downtime expenses, fines, all applicable taxes, and other losses resulting from a warrantable failure.

Limitations:

This limited warranty does not cover Product failures resulting from:

- Inappropriate use relative to designated power rating.
- Inappropriate use relative to application guidelines.
- Normal wear and tear.
- Improper and/or unauthorized installation.
- Negligence, accidents or misuse.
- Lack of maintenance or unauthorized repair.
- Noncompliance with any Cummins Power Generation® published guideline or policy.
- Use of improper or contaminated fuels, coolants or lubricants.
- Improper storage before and after commissioning.
- Owner's delay in making Product available after notification of potential Product problem.
- Replacement parts and accessories not authorized by Cummins Power Generation®.
- Use of Battle Short Mode.
- Owner or operator abuse or neglect such as: operation without adequate coolant or lubricants; overfueling; overspeeding; lack of maintenance to lubricating, cooling or air intake systems; late servicing and maintenance; improper storage, starting, warm-up, run-in or shutdown practices, or for progressive damage resulting from a defective shutdown or warning device.
- Damage to parts, fixtures, housings, attachments and accessory items that are not part of the generating set.

Items not covered by this limited warranty:

- Batteries
- Enclosures
- Coolant heaters
- Exhaust systems and aftertreatment components
- Maintenance items

This limited warranty also does not cover costs resulting from:

- Difficulty in gaining access to the Product.
- Damage to customer property.

Please contact your local Cummins Power Generation® Distributor for clarification concerning these limitations.

CUMMINS POWER GENERATION® RIGHT TO FAILED COMPONENTS:

Failed components claimed under warranty remain the property of Cummins Power Generation®. Cummins Power Generation® has the right to reclaim any failed component that has been replaced under warranty.

www.power.cummins.com

THE WARRANTIES SET FORTH HEREIN ARE THE SOLE WARRANTIES MADE BY CUMMINS POWER GENERATION ® IN REGARD TO THE PRODUCT. CUMMINS POWER GENERATION® MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, OR OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT IS CUMMINS POWER GENERATION® LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES.

This limited warranty shall be enforced to the maximum extent permitted by applicable law. This limited warranty gives the owner specific rights that may vary from state to state or from jurisdiction to jurisdiction.

Coverage ID:_____

Product Model Number:_____

Product Serial Number:_____

Delivery Date:_____

Cummins Power Generation
1400 73rd Ave. NE
Minneapolis, MN 55432 USA

Phone 1 763 574 5000
Toll-free 1 800 888 6626
Fax 1 763 574 5298
Email ask.powergen@cummins.com
www.cumminspower.com

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Group 31 Battery Installation Standards and Procedures

Section 1 Safety

Cummins Pacific is committed to a safe work environment. To ensure job site safety, all Cummins Pacific technicians will follow the Safety Guidelines outlined in the Cummins Pacific Safety Policy and Procedure Manual. This manual can be accessed through the Cummins intranet at: http://cpintranet/HSE/HSEProcedures

1. Technician will arrive on site and check in.
2. Perform a Pre-Job JSA
3. All required PPE as needed for NFPA 70E compliance
4. Minimum required PPE
5. Additional PPE (as required)
    a. Hearing Protection (CPSAF016)
    b. Electrical gloves (CPSAF011 & NFPA 70E)
    c. Face shield and Balaclava (CPSAF011 & NFPA 70E)
    d. FRC rated clothing (CPSAF011 & NFPA 70E)
    e. Ladders safety (CPSAF025)
    f. Fall Protection Harness (CPSAF013)
6. Secure equipment using Lock-Out Tag-Out procedures (CPSAF026)
7. Safe Electrical Work Procedure (CPSAF-012)

The technician will update the JSA throughout the repair and stop work if any hazards arise. The technician will not work in an unsafe manner and will inform the contractor and supervisor of any hazards impeding his work.

Section 2 Support Material

Prior to installing batteries the Power Generation Engineering Team will provide the following documentation to the technician:

1. A scope of work to include battery installation
2. The batteries
    a. Authorization for the Service Branch to provide the batteries
3. Any special instructions on additional equipment

a. Best battery Systems
b. Additional charges
c. Wiring Diagram for additional systems

4. Battery placement and weight will determine if two technicians are needed to install the batteries
    a. Any item weighing greater than 50 pounds will require a second Cummins Pacific technician to support lifting during the installation

Section 3 Procedure

WARNING

Batteries can emit explosive gases. To reduce the possibility of personal injury, always ventilate the compartment before servicing the batteries. To reduce the possibility of arcing, remove the negative (-) battery cable first and attach the negative (-) battery cable last.

WARNING

This component or assembly weighs greater than 23 kg [50 lb]. To prevent serious personal injury, be sure to have assistance or use appropriate lifting equipment to lift this component or assembly.

WARNING

To reduce the risk of high voltage shock, always follow all warnings and service instructions. Always assume the vehicle and its high voltage system are energized, even if the engine is not running.

The technician(s) will install the battery or batteries as out lined in the Cummins Engine Service Manual or Power Generation Service Manual. The installation will include:

1. Key switch off.
2. E-stop engaged and all required Lock-Out Tag-Out.

3. Remove packing material from battery/batteries.
4. Inspect battery tray and hold downs, ensure there are no sharp objects in the battery tray or puncture hazards.
5. Install battery/batteries in battery tray.
6. Optional battery heaters will be installed at this time.
7. Install battery hold downs or straps
8. Installation of battery cables
9. Set up battery charger
    a. Check float voltage
    b. Check correct settings
10. Check voltage settings in the PCC

Section 4 Duration

The Battery installation time will be determined by site access, technicians required and the total number of batteries installed. Based on the number and size of batteries, the installation typically takes between 1 - 4 hours per unit. This does not include travel.

Section 5 Miscellaneous & Special Instructions

1. Damaged equipment will be noted and brought to the contractor's attention immediately.
2. Missing equipment will be noted and brought to the contractor's attention immediately.

Start & Test Standards and Procedures

Section 1 Safety

Cummins Pacific is committed to a safe work environment. To ensure job site safety, all Cummins Pacific technicians will follow the Safety Guidelines outlined in the Cummins Pacific Safety Policy and Procedure Manual. This manual can be accessed through the Cummins intranet at: http://cpintranet/HSE/HSEProcedures

1. Technician will arrive on site and check in.
2. Perform a Pre-Job JSA
3. Minimum required PPE
4. Additional PPE (as required)
    a. Hearing Protection (CPSAF016)
    b. Electrical gloves (CPSAF011 & NFPA 70E)
    c. Face shield and Balaclava (CPSAF011 & NFPA 70E)
    d. FRC rated clothing (CPSAF011 & NFPA 70E)
    e. Ladders safety (CPSAF025)
    f. Fall Protection Harness (CPSAF013)
5. Secure equipment using LOTO procedures (CPSAF026)
6. Safe Electrical Work Procedure (CPSAF-012)

The technician will update the JSA throughout the repair and stop work if any hazards arise. The technician will not work in an unsafe manner and will inform the contractor and supervisor of any hazards impeding his work.

Section 2 Support Material

Prior to performing the Start & Test the Power Generation Engineering Team will provide the following documentation to the technician:

1. A scope of work authorizing S&T
    a. Equipment included in testing
    b. Special instructions not outlined in Start & Test scope of work
    c. Modifications to the generator control panel (single line) as applicable
    d. Alarm function and testing
    e. Annunciation template and customer requested faults

f. A completed Customer Pre Start Checklist (if applicable)

Section 3 Procedure

Cummins Pacific service personnel will then perform the following work on site as part of our standard start & test:

1. Perform a detailed review of the installing contractors completed installation and advise of any issues or recommendations. See attached "ST Report Form" form for details.
2. Check the mounting hardware and anchors associated with the generator set and the automatic transfer switch. Verify vibration isolators are adjusted correctly.
3. Check the electrical terminations on the generator set and transfer switch.
4. Check the control wiring terminations on the generator, transfer switch, and annunciator.
5. Check the fuel system/tank for proper plumbing and vent installation. Fuel is not included unless otherwise specified.
6. Inspect exhaust system for correct installation, and clearance from combustible materials or fire sprinklers.
7. Inspect cooling system for proper installation and adequate air ventilation.
8. Connect the engine starting batteries.
9. Connect to systems and ensure the latest software calibration is loaded.
10. Review control and annunciator programming as required. Configure customer inputs/relays as required.
11. Start the generator set for the first time, and verify correct operation.
12. Check the phase rotation of the generator set and utility.
13. Perform adjustments to generator and transfer switch as required for correct operation.
14. Verify correct steady state operation and load acceptance.
15. Provide up to 30 minutes of basic operator training, at time of start & test.

The S&T Coordinator will provide a completed copy of the Start and Test Report upon customer's request.

Section 4 Duration

The Start and Test time will be determined by site access, technicians required, contractor readiness and the equipment being tested. Start and Test times do not include additional tests which are quoted separately. This procedure does not include travel.

Section 5 Miscellaneous & Special Instructions

1. Damaged equipment will be noted and brought to the contractor's attention immediately.
2. Missing equipment will be noted and brought to the contractor's attention immediately.
3. Site issues or installation deficiencies that prevent completion of the Start & Test will be noted and brought to the contractor's attention immediately. Additional time and material charges may apply.

Load Bank Test Standards and Procedures

Section 1 Safety

Cummins Pacific is committed to a safe work environment. To ensure job site safety, all Cummins Pacific technicians will follow the Safety Guidelines outlined in the Cummins Pacific Safety Policy and Procedure Manual. This manual can be accessed through the Cummins intranet at: http://cpintranet/HSE/HSEProcedures

1. Technician will arrive on site and check in.
2. Perform a Pre-Job JSA
3. Minimum required PPE
4. Additional PPE (as required)
    a. Hearing Protection (CPSAF016)
    b. Electrical gloves (CPSAF011 & NFPA 70E)
    c. Face shield and Balaclava (CPSAF011 & NFPA 70E)
    d. FRC rated clothing (CPSAF011 & NFPA 70E)
    e. Ladders safety (CPSAF025)
    f. Fall Protection Harness (CPSAF013)
5. Secure equipment using Lock-Out Tag-Out procedures (CPSAF026)
6. Safe Electrical Work Procedure (CPSAF-012)
7. Load Bank Test JSA

The technician will update the JSA throughout the repair and stop work if any hazards arise. The technician will not work in an unsafe manner and will inform the contractor and supervisor of any hazards impeding his work.

Section 2 Support Material

Prior to performing a Load Bank Test the Power Generation Engineering Team will provide the following documentation to the technician:

1. A scope of work to include the Load Bank Test
2. The scope of work will include
    a. Duration of the test (1 hour, 2 hours etc.)
    b. Type of Load (resistive “standard” or reactive “specified”)
    c. Generator Voltage
    d. NFPA 110 load bank

e. Step loading
f. Special hook up instructions

3. Power Generation Project Engineer special instructions (if required)

Section 3 Procedure

The technician will perform a Load Bank Test Job Safety Analysis and secure the area before performing the test.

1. Park Load Bank trailer and secure
    a. Install vehicle chock
    b. Put out cone
2. Inspect Load Bank
3. Fill out JSA
4. Determine the amount of cable needed per phase
5. Install load bank connectors
6. Connect cables to load bank connector and to Load Bank trailer.
    a. One cable at a time
    b. One phase at a time
7. Install ground connection
8. Connect InPower and prepare a Load Bank Test sheet
9. Start unit
10. Perform Load Bank test per defined Statement of Work
    a. Run for hours noted in the SOW
    b. Allow unit to cool down at no load
    c. Shut down unit
11. Disconnect cables
12. Reconnected cables on generator and torque
13. Install panels
14. Complete paperwork and send to S&T Engineer

Section 4 Duration

The duration of this Load Bank Test procedure is dependent on the duration of the testing and the KW size of the unit. Multiple load banks, extra cable, and medium voltage requirements will also increase the duration of this test. This does not include travel.

Section 5 Miscellaneous & Special Instructions

1. Damaged equipment will be noted and brought to the contractor's attention immediately.
2. Missing equipment will be noted and brought to the contractor's attention immediately.
3. Generator failures identified during the load bank test will be noted and brought to the contractor's attention immediately.

DCA45SSIU4F

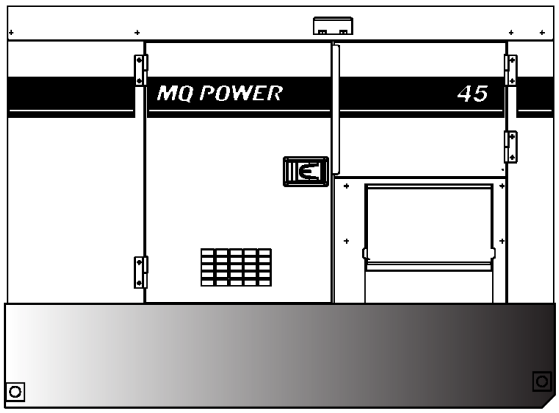
MQ POWER Series Generator

WhisperWatt™

Prime Rating — 36 kW (45 kVA)

Standby Rating — 40 kW (50 kVA)

Three-Phase, 60 Hertz, 0.8 PF



STANDARD FEATURES

- Heavy duty, 4-cycle, direct injection, turbocharged, charge air cooled diesel engine provides maximum reliability.
- Brushless alternator reduces service and maintenance requirements and meets temperature rise standards for Class H insulation systems.
  - Open delta excitation design provides virtually unlimited excitation for maximum motor starting capability.
  - Automatic voltage regulator (AVR) provides precise regulation.
- Electronic Governor Control — isochronous control, maintains frequency to within ±0.25% from no load to full load.
- Full load acceptance of standby nameplate rating in one step (NFPA 110, para 5-13.2.6).
- Sound attenuated, weather resistant, steel housing provides operation at 66 dB(A) at 23 feet. Fully lockable enclosure allows safe unattended operation.
- Internal fuel tank with direct reading of fuel gauge.
- E-coat and powder coat paint provides durability and weather protection.
- Fuel/water separator removes condensation from fuel for extended engine life. Panel mounted alarm light included.
- Complete engine analog instrumentation includes DC ammeter, oil pressure gauge, water temp. gauge, fuel level gauge, tachometer/hour meter, preheat indicator, and emergency shutdown monitors.
- ECU750 — automatic CANBUS engine control with LED status indicator lights.
- Automatic start/stop control — automatically starts the generator set during a commercial power failure when used in conjunction with a transfer switch.
- Complete generator analog instrumentation includes voltage regulator control, ammeter phase selector switch, voltmeter phase selector switch, AC voltmeter, AC ammeter, frequency meter, panel light, and circuit breaker.
- Automatic safety shutdown system monitors the water temperature, engine oil pressure, overspeed and overcrank. Warning lights indicate abnormal conditions.
- Complete power panel. Fully covered; three-phase terminals and single phase receptacles allow fast and convenient hookup for most applications including temporary power boxes, tools and lighting equipment. The GFCI receptacles are NEMA 5-20, and the auxiliary outputs use CS6369 twist-lock receptacles.
- Voltage selector switch offers the operator a wide range of voltages that are manually selectable. Fine tuning of the output voltage can be accomplished by adjusting the voltage regulator control knob to obtain the desired voltage.
- EPA emissions certified — Tier 4 final emissions compliant.
- Spill containment — Bunded design protects environment by capturing up to 119% of engine fluids.

DCA45SSIU4F

MQ POWER Series Generator

SPECIFICATIONS

Generator Specifications		
Design	Revolving field, self-ventilated Drip-proof, single bearing	
Armature Connection	Star with Neutral	Zig Zag
Phase	3	Single
Standby Output	40 KW (50 KVA)	28.8 KW
Prime Output	36 KW (45 KVA)	26 KW
3Ø Voltage (L-L/L-N) Voltage Selector Switch at 3Ø 240/139	208Y/120, 220Y/127, 240Y/139	N/A
3Ø Voltage (L-L/L-N) Voltage Selector Switch at 3Ø 480/277	416Y/240, 440Y/254, 480Y/277	N/A
1Ø Voltage (L-L/L-N) (Voltage Selector Switch at 1Ø 240/120)	N/A	240/120
Power Factor	0.8	1.0
Voltage Regulation (No load to full load)	±0.5%	
Generator RPM	1800	
Frequency	60 Hz	
No. of Poles	4	
Excitation	Brushless with AVR	
Frequency Regulation: No Load to Full Load	Isochronous under varying loads from no load to 100% rated load	
Frequency Regulation: Steady State	±0.25% of mean value for constant loads from no load to full load.	
Insulation	Class H	
Sound Level dB(A) Full load at 23 feet	66	

Engine Specifications	
Make / Model	Isuzu / 4LE2X
Emissions	EPA Tier 4 Final Certified
Starting System	Electric
Design	4-cycle, water cooled, direct injection, turbocharged, charge air cooled and EGR
Displacement	133.0 in³ (2179 cc)
No. cylinders	4
Bore x Stroke (mm)	85 x 96
Gross Engine Power Output	65.7 hp (49 kW)
BMEP	217 psi (1499 kPa)
Piston Speed	1133.9 ft./min. (5.76 m/s)
Compression Ratio	17.6:1
Engine Speed	1800 rpm
Overspeed Limit	2070 rpm
Oil Capacity	3.2 gallons (12.2 liters)
Battery	12V 72Ah x 1

Fuel System		
Recommended Fuel	ASTM-D975-No.1 & No.2-D	
Maximum Fuel Flow (per hour)	3.4 gallons (13 liters)	
Maximum Inlet Restriction (Hg)	11 in. (280 mm)	
Fuel Tank Capacity	79.2 gallons (300 liters)	
Fuel Consumption	**gph**	**lph**
At full load	2.93	11.1
At 3/4 load	2.20	8.31
At 1/2 load	1.60	6.04
At 1/4 load	1.04	3.92

Cooling System	
Fan Load	2.01 hp (1.5 kW)
Coolant Capacity (with radiator)	4.44 gallons (16.8 liters)
Coolant Flow Rate (per minute)	16.9 gallons (64.2 liters)
Heat Rejection to Coolant (per minute)	1934 Btu (2.04 MJ)
Maximum Coolant Friction Head	14.5 psi (100 kPa)
Maximum Coolant Static Head	3.35 feet (1.04 meters)
Ambient Temperature Rating	104°F (40°C)

Air	
Combustion Air	174 cfm (4.94 m³/min)
Maximum Air Cleaner Restriction	25 in. H_2O (6.23 kPa)
Alternator Cooling Air	526 cfm (14.9 m³/min)
Radiator Cooling Air	1900 cfm (53.8 m³/min)
Minimum Air Opening to Room	3.5 ft² (0.33 m²)
Minimum Discharge Opening	2.27 ft² (0.21 m²)

Exhaust System	
Gas Flow (full load)	237 cfm (6.7 m³/min)
Gas Temperature	1078°F (581°C)
Maximum Back Pressure	38.1 in. H_2O (9.5 kPa)

Amperage	
Rated Voltage	**Maximum Amps**
1Ø 120 Volt	100 Amps (4 wire),108A x 2 (Zigzag)
1Ø 240 Volt	50 Amps (4 wire),108A (Zigzag
3Ø 240 Volt	108 Amps
3Ø 480 Volt	54 Amps
Main Line Circuit Breaker Rating	125 Amps
Over Current Relay Trip Set Point 480V Mode Only	54 Amps

WARRANTY*

Isuzu Engine

12 months from date of purchase with unlimited hours or 60 months from date of purchase with 5000 hours (whichever comes first).

Generator

24 months from date of purchase or 2000 hours (whichever occurs first).

Trailer

12 months excluding normal wear items.

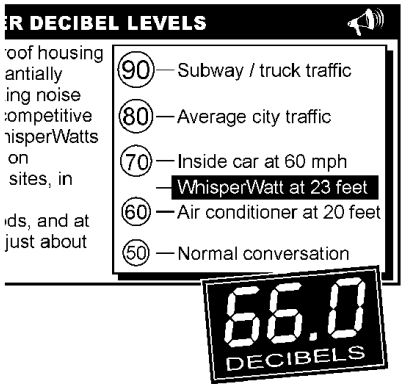
*Refer to the express written, one-year limited warranty sheet for additional information.

NOTICE

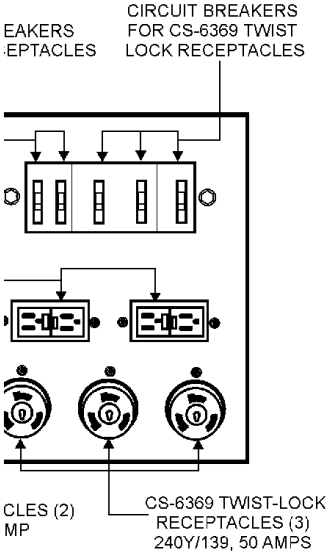
Specifications sheet is subject to change and is not intended for use in installation design.

DCA45SSIU4F

MQ POWER Series Generator



GENERATOR OUTPUT PANEL



OPTIONAL GENERATOR FEATURES

- **PowerBalance™** — designed to assist generators when operating under low temperature and/or low load conditions to insure peak performance.
- **Battery Charger** — provides fully automatic and self-adjusting charging to the generator's battery system.
- **Jacket Water Heater** — for easy starting in cold weather climates.
- **Heavy-Duty Batteries** — long life batteries provide extra engine cranking power.
- **Low Coolant Level Shutdown** — provides protection from critically low coolant levels. Includes control panel warning light.
- **Spring Isolators** — provides extra vibration protection for standby applications.
- **Trailer Mounted Package** — meets National Highway Traffic Safety Administration (NHTSA) regulations. Trailer is equipped with electronic or surge brakes with double or triple axle configuration.

OPTIONAL CONTROL FEATURES

- **Emergency Stop Switch** — when manually activated shuts down generator in the event of an emergency.
- **Audible alarm** — alerts operator of abnormal conditions

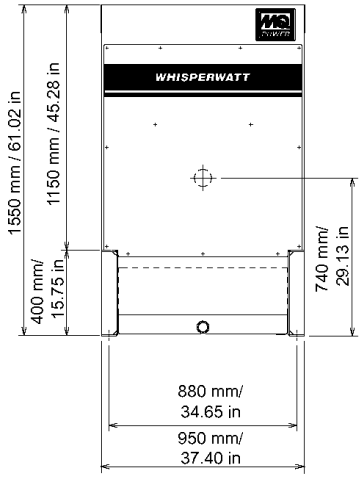
OPTIONAL OUTPUT CONNECTIONS

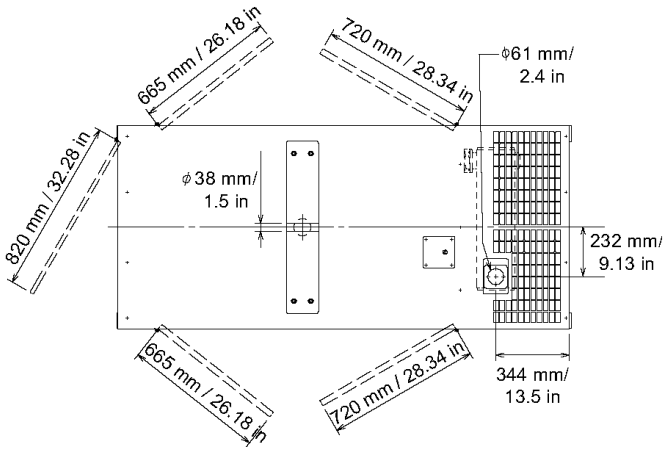
- **Cam-Lok Connectors** — provides quick disconnect alternative to bolt-on connectors.
- **Pin and Sleeve Connectors** — provides industry standard connectors for all voltage requirements.
- **Output Cable** — available in any custom length and size configuration.

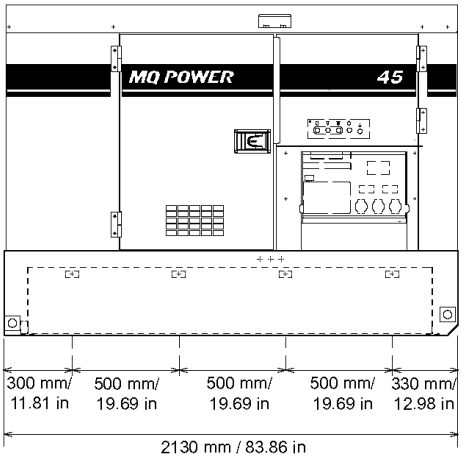
DCA45SSIU4F

MQ POWER Series Generator

DIMENSIONS







Weight	
Dry Weight	2,337 lbs. (1,060 kg)
Wet Weight	2,976 lbs. (1,350 kg)
Max. Lifting Point Capacity	5,150 lbs. (2,335 kg)

NOTICE

Features and Specifications are subject to change without notice.

Generator can be placed on MQ Trailer Models TRLR45 and TRLR75XF2.

Manufactured by Denyo Co.

Your Multiquip dealer is:

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DCA45SSIU4F Rev. #4 (12/13/17)

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Section G.

Other Projects

District – Customer Support Services

PID #132210

MSPO Configuration/Upgrades

Introduction

Cal Water has a Capital Program which is now more than $300 million per year. This program is growing over time as Cal Water needs to replace aging infrastructure at an accelerated rate.

Cal Water uses Powerplan as its enterprise software for tracking capital projects and assets. This system is very effective at meeting many of Cal Water's needs but is intended primarily as an accounting software. It does not allow for creation of a detailed work breakdown structure, resource allocation, and schedule. It does not link well with data repositories where project files are kept, collaborative software, mapping software or other platforms used by Cal Water. Project Managers or teams within the organization have created their own solutions, with different teams and project managers using spreadsheets, the desktop version of Microsoft Project, Jira, Smartsheets, and other Project Management solutions. None of these solutions allow managers to accurately predict the workload of the team and assign resources effectively. This variety of solutions makes capital project reporting and analysis challenging and leads to a lot of rework. Cal Water needs a Project Management Information System (PMIS) which would allow for better project management, program management and portfolio management.

In 2020, Cal Water's Capital Delivery team in the Engineering Department took the first steps toward implementing Microsoft Project Online as a PMIS. Cal Water started with the Capital Delivery team because this team manages multiple, complex projects with large budgets. The effort has been largely successful and the team is better able to allocate resources. However, the pilot effort was not enough to implement all needed functionality, including cash flow predictions and earned value calculation. Cal Water started efforts to extend the use of MSPO to other teams within the Engineering Department and found that process differences made this difficult to do; the implementation had been built primarily with the use case for Capital Delivery in mind and did not work well for other teams without more effort put toward developing business needs and tailoring the solution.

In 2023, Cal Water hired Red Clay Consultants to develop a roadmap for MSPO implementation, which is titled "Microsoft Project Online Enterprise Transformation Strategy". Through this process, Cal Water learned that Microsoft's newer product, Project for the Web (PFW) would be a better fit for project teams who worked with large numbers of small capital project, such as the Asset Management team, and for teams who were "occasional project managers" such as district operations staff who may manage a few capital projects each year. MSPO and PFW integrate well for aggregated reporting. The roadmap included an implementation approach which included

With this project, Cal Water is proposing to implement the recommendations of the MSPO Roadmap.

Deficiencies and Issues

The MSPO Roadmap identified the following major challenges.

Portfolio Management Challenges:

1. **Project Intake, Authorization, and Prioritization.** Cal Water faces intricate challenges in harmonizing project intake, authorization, and prioritization with resource capacity and strategic objectives. This misalignment may potentially create resource bottlenecks, thus hindering the realization of strategic goals.

2. **Lack of Data Trust**. The organization has a pervasive lack of confidence in the quality and reliability of their data relating to Capital Projects. This lack of data trust poses a significant obstacle to effective project selection and execution, underscoring the urgency of data-informed decision-making.

3. **Lack of Enterprise Governance**. Cal Water currently operates without a comprehensive governance framework for Capital Projects spanning the entire enterprise. This absence of governance introduces inconsistencies in the program and project management practices, thereby impeding strategic alignment.

Project Management Challenges:

1. **Limited Integration of Cost and Schedule Data**. The absence of seamless integration between project cost tracking (actual labor hours) and project schedules presents a substantial challenge in assessing budget versus actuals in real-time, directly impacting the ability to exercise effective cost control.

2. **Resource Allocation and Over-Allocation**. Tracking resource allocation and mitigating over-allocation remain formidable challenges. The absence of a clear mechanism for our team members to identify over-allocation may lead to inefficiencies, constraining our valuable resources.

3. **Day-to-Day Portfolio and Project Management**. Project Managers are using Microsoft Project Online (MSPO) primarily as a repository for high-level project milestones, leaving a conspicuous gap in day-to-day project management, task assignments, and communications. This gap significantly influences the progression of projects.

4. **Lack of Alerts and Automated Notifications**. The absence of a built-in alert or automated notifications within MSPO may result in critical project milestones being inadvertently overlooked, potentially derailing the project timelines.

5. **Absence of Regular Cost Reporting**. Cal Water lacks a standardized reporting cadence for project costs, focusing mainly on schedule-related information. This gap hinders the ability to manage project costs proactively and effectively.

6. **Communication with External Stakeholders**. It is paramount to streamline communication with external stakeholders, including permitting agencies and

consultants for effective project coordination and stakeholder engagement. This requires immediate attention to bolster the project management capabilities.

Alternative Analysis

To address deficiencies identified above, Cal Water considered the following:

Alternative 1: Do Nothing

Cal Water could continue to manage projects as it always has and continue to report on projects using stand-alone spreadsheets. Resources could continue to be allocated by managers without resources analysis tools. This will become increasingly difficult as the size and complexity of the capital budget grows, and the results would be expected to become worse over time.

Alternative 2: Attempt to roll out MSPO or PFW slowly, without an overarching strategy

Cal Water attempted this approach in the past few years and found it to be ineffective. There is a need to "finish what we started" with developing the full capabilities of MSPO for large capital project management and to develop a tailored PFW solution for the management of smaller capital projects. There is also a need to develop the reporting capabilities to realize the full benefits.

Alternative 3: Implement the MSPO Roadmap

This alternative would require hiring a consultant team to work with Cal Water to create the final business requirements for each step of the process, to develop and customize the tools and create a training plan for each step of the roll out. The roadmap includes a phased approach which would start with the Capital Project Intake process and roll out to the Main Replacement Program as first steps, before rolling out to the rest of the company.

Recommended Solution

The MSPO Roadmap identifies three foundational pillars that will be implemented to address the challenges. The Roadmap includes detailed descriptions of each of these pillars and how they will be implemented.

1. Recommended technology enhancements to the existing MSPO ecosystem.
2. Recommended Enterprise PPM and Project Management governance processes.
3. Recommended System Migration Approach & Training Strategies

Project Summary

Details on each part of the project are included in the MSPO Roadmap.

Project Attachments

- Attachment A – Cost Estimate

- Attachment B - Microsoft Project Online Enterprise Transformation Strategy

Attachment A

Capital Project Cost Estimate

Project No. : 132210
Description MSPO Configuration/Upgrades
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2027
Prepared By: jagraham
Date Initiated: 10/13/2023
Base Year: 2023
Sub-Total: $936,320
Direct Cost: $1,008,511

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
10% CONTINGENCY	[EA]	1	$851,200.00	$851,200.00	Additional Factors
IMPLEMENT PROJECT MANAGEMENT SYSTEM	[EA]	1	$85,120.00	$85,120.00	Additional Factors

Sub-total = $936,320.00
Direct Cost = $1,008,511.06

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Cal Water
Microsoft Project Online
Enterprise Transformation Strategy

Red Clay
Consulting Team
Sept 29, 2023

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Building an Enterprise-Wide Integrated Planning and Execution Capability

Cal Water (CW) is dedicated to attaining operational excellence and nurturing sustainable growth. They acknowledge the critical significance of enhancing their program and project management capabilities to bring this vision to fruition.

To support this endeavor, the Red Clay Consulting team undertook a thorough evaluation of CW's current project management environment, encompassing the use of Microsoft Project Online (MSPO). Our analysis has identified specific areas that require immediate attention and has outlined suggested strategies for product implementation improvements to ensure the successful alignment of CW initiatives with their strategic objectives.

Current Challenges

Operating under the constraints of a lean staffing model, CW has encountered noteworthy challenges stemming from past initiatives that lacked dedicated project ownership, proper oversight, and essential resources. These challenges have, on occasion, impeded the successful execution of mission-critical projects.

To address these pressing issues, the organization must prioritize efforts to tackle the following critical challenges.

Portfolio Management (PPM) Challenges

1. **Project Intake, Authorization, and Prioritization.** CW faces intricate challenges in harmonizing project intake, authorization, and prioritization with resource capacity and strategic objectives. This misalignment may potentially create resource bottlenecks, thus hindering the realization of strategic goals.
2. **Lack of Data Trust.** The organization has a pervasive lack of confidence in the quality and reliability of their data. This lack of data trust poses a significant obstacle to effective project selection and execution, underscoring the urgency of data-informed decision-making.
3. **Lack of Enterprise Governance**. CW currently operates without a comprehensive governance framework spanning the entire enterprise. This absence of governance introduces inconsistencies in the program and project management practices, thereby impeding strategic alignment.

Project Management (PM) Challenges

1. **Limited Integration of Cost and Schedule Data**. The absence of seamless integration between project cost tracking (actual labor hours) and project schedules presents a

substantial challenge in assessing budget versus actuals in real-time, directly impacting the ability to exercise effective cost control.

2. **Resource Allocation and Over-Allocation**. Tracking resource allocation and mitigating over-allocation remain formidable challenges. The absence of a clear mechanism for our team members to identify over-allocation may lead to inefficiencies, constraining our valuable resources.
3. **Day-to-Day Portfolio and Project Management**. Project Managers are using Microsoft Project Online (MSPO) primarily as a repository for high-level project milestones, leaving a conspicuous gap in day-to-day project management, task assignments, and communications. This gap significantly influences the progression of projects.
4. **Lack of Alerts and Automated Notifications**. The absence of a built-in alert or automated notifications within MSPO may result in critical project milestones being inadvertently overlooked, potentially derailing the project timelines.
5. **Absence of Regular Cost Reporting**. CW lacks a standardized reporting cadence for project costs, focusing mainly on schedule-related information. This gap hinders the ability to manage project costs proactively and effectively.
6. **Communication with External Stakeholders**. It is paramount to streamline communication with external stakeholders, including permitting agencies and consultants for effective project coordination and stakeholder engagement. This requires immediate attention to bolster the project management capabilities.

Addressing these multifaceted challenges in both the portfolio management and project management disciplines is pivotal. This provides CW with an excellent way to enhance its overall project execution capabilities, align its initiatives with strategic goals, and optimize resource utilization and cost control.

This comprehensive implementation strategy outlines three foundational pillars that will guide CW in delivering on their vision:

1. Recommended technology enhancements to the existing MSPO ecosystem.
2. Recommended Enterprise PPM and Project Management governance processes.
3. Recommended System Migration Approach & Training Strategies

These fundamental principles will be the foundation of the journey toward a holistic and integrated planning and execution capability, designed to enable operational excellence and sustainable growth.

Recommended Technology Enhancements to the Existing MSPO Ecosystem

1. Optimize the General Rate Case, CapEx, and OpEx Intake Workflows

Context

Currently, segments of the General Rate Case project intake processes occur independently of MSPO and PowerPlan, requiring the use of numerous spreadsheets to manage ideas submitted by the districts and Engineering for the GRC process.

Strategy

This strategy makes use of the Microsoft Power Platform family of products, including Power BI, Power Apps, and Power Automate.

1. **Streamlining Project Proposal Capture**. Implement a robust digital system using Power Apps to seamlessly capture and track project proposals originating from the districts and engineering teams. These forms should comprehensively collect vital project details, including criticality ranking and other essential information. This same functionality should be used for the intake process for Op-Ex intake.
2. **Efficient Workflow Automation**. Harness the capabilities of Power Automate to introduce workflow automation that guides project requests through a predefined intake process. This automation intelligently routes requests to the appropriate approvers, such as Engineering or the Integrated Planning Office, based on established criteria. Automating this structured flow minimizes delays and bottlenecks, ensuring a smoother intake process.
3. **Enhancing Visibility with Pipeline View**. Leverage the power of Power Apps and Power BI to create a dynamic pipeline view. This view lets the engineering team and the Integrated Planning Office access a comprehensive list of project proposals submitted by all 23 districts, whether submissions are CapEx or OpEx projects. This offers a high-level overview of project costs, allowing for better budget planning and the identification of projects requiring further analysis.
4. **Resource Utilization Insights**. Maximize the potential of Power Apps and Power BI to provide real-time visibility into current resource utilization across critical roles. This feature aids in risk assessment and decision-making, ensuring that resources are allocated effectively and in alignment with project priorities.
5. **Proactive Approval Notifications**. Implemented automated email notifications through Power Automate to update stakeholders on the status of their project requests in PowerPlan and OpEx approvals. This approach emphasizes proactive communication, ensuring that requesters stay engaged during the approval process.

It's important to note that in this context, we're not syncing data with PowerPlan; instead, we're proposing the use of workflows and triggers. These can be designed and executed based on status updates in PowerPlan, as indicated by the multiple steps observed in the approval process diagrams.

6. **Centralized Documentation Repository**. Implement a go-forward approach by establishing a centralized document repository within Power Apps. This repository will securely store all CapEx and OpEx project-related documents, such as project charters, business cases, and supporting materials. Once the structure is in place, additional documents and artifacts can be manually migrated from their current locations. Given that some artifacts may currently reside in various places, including individual laptops, it is recommended to conduct a thorough examination of the number of sources and assess the migration process to the target locations. This centralized repository ensures easy access to project information not only during the intake process but also in the future, promoting an organized and efficient documentation management system.

7. **Empowering Users through Training and Support**. Prioritize user proficiency by providing comprehensive training and user support. Ensure that all stakeholders, including project requesters (such as teammates from districts, operations, Officers of the Company, etc.), approvers, and administrators (specifically, individuals from the integrated planning office in this context), are well-versed in Power Apps and Power Automate for the streamlined project intake process. This investment in user proficiency enhances the effectiveness and adoption of the technology-enhanced workflows.

By implementing these technology enhancements for General Rate Case, CapEx, and OpEx project intake, CW can streamline project requests intake, resource allocation, and documentation management. This results in improved efficiency, better decision-making, and enhanced transparency for all types of projects, ultimately optimizing expenditure management across the organization.

Note: We envision a future opportunity to harness the potential of AI and machine learning technology for predicting the rate and revenue impact of proposed projects, provided that the necessary data governance is established. This idea is grounded in the exploration of AI use cases by other utilities. Considering the data intricacies involved, it is a use case that merits careful consideration. Notably, this concept aligns with the goals outlined in the Cal Water strategic IT plan, which emphasizes the initiation of leveraging AI capabilities.

2. Integrate Project for the Web with Existing MSPO implementation

Context

The existing MSPO implementation at CW has made significant progress, but there are still missing features necessary to elevate the maturity levels of PPM and Project Management capabilities across the enterprise. Microsoft's *Project for the Web*, built on the Microsoft Power Platform, offers a more extensible and modern user interface for managing project portfolios, catering to both experienced and occasional Project Managers.

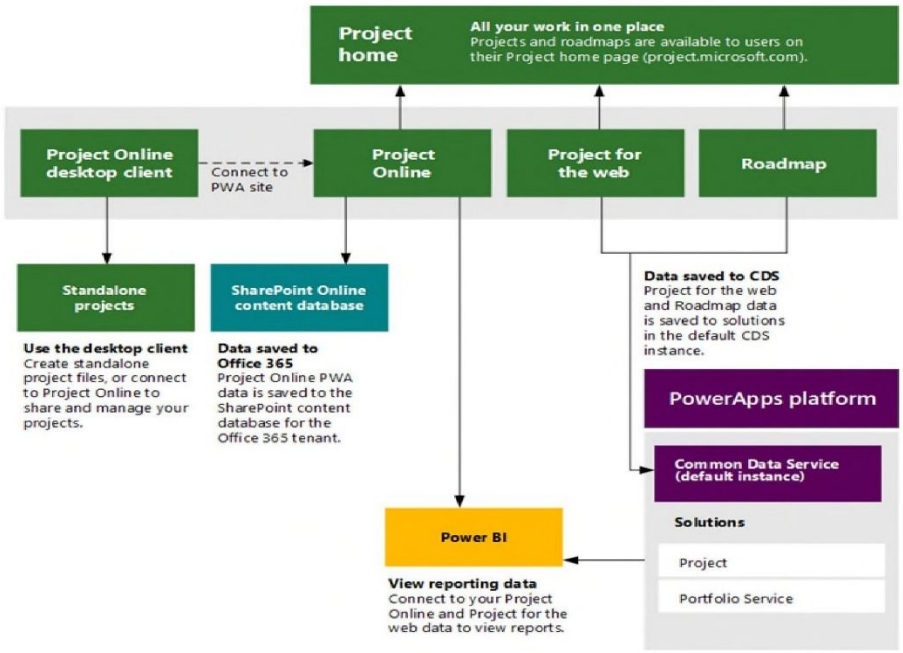
It's worth noting that Microsoft has shifted its innovation focus from MSPO to Project for the Web. Project for the Web is highly extensible, presenting an opportunity for Cal Water to leverage components from Project Online (Power Apps) to streamline intake processes, enhancing visibility into resource availability—a key area identified during the assessment. Moreover, the new capabilities in Project for the Web make certain aspects of PPM governance easier to build.

In terms of core project management features, Project for the Web supports creating projects from templates, critical path analysis, milestones, and task dependencies with adjustable start and finish dates. While it offers limited custom fields compared to Microsoft Project, it provides support for various dependency types, including start-to-start, finish-to-start, start-to-finish, and finish-to-finish.

Our recommendation is for Cal Water to capitalize on Project for the Web's capabilities for managing PPM functions and intake/resource management. For projects requiring advanced features or complex calculations, the use of Project Online can be maintained. It's important to clarify that our proposal does not advocate for the replacement of Project Online with Project for the Web; instead, it suggests leveraging both tools to provide the necessary capabilities for addressing identified opportunities and enhancing the organization's maturity level.

Proposed Technology Architecture

The diagram below shows the integration between Project Online and Project for the Web.



Core Technology Components of *Project for the Web*

Power BI. Provides advanced reporting, analytics, and visualization.

- **Dynamic Dashboards**. Design dashboard displaying real-time project metrics, KPIs, and other relevant data including Portfolio Health, PPM Lifecycle Stage tracking, Project Throughput, Portfolio Financial Performance, Project Level Health, and Strategic Benefits.
- **Semantic Layer**. By incorporating a semantic layer with tools like Microsoft Fabric. CW can infuse their unique business logic, terminologies, and KPI definitions into

their reports. This layer acts as an intermediary between the raw data and the end reports, ensuring that data is presented in a consistent and comprehensible manner to the end-users. Some benefits of this approach include:

- **Seamless Integration** with your existing task management tools, providing a single source of truth for all projects.
- **Data Consistency**. Ensures uniform definitions and calculations across all reports, eliminating discrepancies and confusion with the data.
- **Usability**. Non-technical users can easily understand and interpret data, as the semantic layer translates complex into familiar business terms.
- **Efficiency**. Report designers can quickly create or modify reports using the pre-defined business logic in the semantic layer, speeding up the report development process and reducing errors.
- **Flexibility**. As the business needs of CW evolve, changes can be made at the semantic layer level, ensuring that all subsequent reports reflect the updated business logic without requiring individual report modifications.

Power Apps. Extends the functionality of *Project for the Web*, building capabilities that support Project Intake, managing Risks, Issues, change controls, Key Decisions, resource management, lessons learned, etc.

- **Data Input**. Simplify and standardize data input with custom forms and interfaces.

Power Automate. Streamlines and automates workflows and standard tasks across the PPM and Project Management disciplines.

- **Notifications.** Set up flows to notify project stakeholders of changes, updates, or milestones reached or variances in the portfolio.

MS Teams. Centralized collaboration and real time communication for project teams.

- **Secure guest access**. Enable external partners, clients, or vendors to collaborate within a secure environment.
- **Seamless Office 365 integration**, customizable workspaces, robust security, and compliance.
- **Mobile accessibility.**
- **Scalability** and **analytics** for team performance monitoring.

Project for the Web Recommended Implementation Approach

We recommend integrating Project for the Web with MSPO to support existing projects already using MSPO. We believe that it would take approximately three months to build out the new PPM/PM capabilities, with the primary change involving the utilization of Project for the Web for PPM. This shift aims to enhance data quality and reporting with the proposed changes, while Cal Water can still leverage Project Online for their more complex projects. This is a strategic move that offers several benefits:

1. **Seamless Transition**. Integrating *Project for the Web* with MSPO allows for a smoother transition for ongoing projects. Project teams can continue using familiar tools and processes while gradually adopting the new platform.
2. **Data Continuity**. By integrating the two systems, CW can maintain data continuity. Historical project data and progress can be seamlessly transferred from MSPO *Project for the Web*, ensuring a complete project history for reporting and analysis.
3. **Reporting and Analytics**. Historical project data is invaluable for reporting and analytics. Integrating the systems ensures that you have access to historical data for generating reports, analyzing trends, and making data-driven decisions.
4. **Minimal Disruption**. Transitioning from one project management platform to another can be disruptive. By integrating Project for the Web with MSPO, CW can minimize disruption to ongoing projects and avoid the need for extensive retraining of project teams.
5. **Resource Optimization**. Integrating the two platforms can help optimize resource allocation. You can track resource availability and assignments more effectively, ensuring that resources are allocated efficiently across all projects.
6. **Risk Mitigation**. Ongoing projects are associated with risks and uncertainties. Having access to historical data can help in identifying potential risks and mitigating them effectively. It also ensures that lessons learned from past projects are applied to ongoing ones.
7. **Compliance and Audit**. There are compliance and audit requirements for project data. Integrating the systems ensures that historical project data is readily available for compliance checks and audits.
8. **Change Management**. This is a critical aspect of any technology transition. Integrating the systems allows you to implement changes gradually, reducing resistance from project teams and stakeholders.
9. **Cost Savings**. Implementing a parallel system while maintaining MSPO can be more cost-effective than an abrupt migration, as it allows you to phase out the older system over time.

10. **User Training**. Integration allows users to continue using MSPO while getting familiar with *Project for the Web* gradually. This can reduce the burden of extensive user training.

Integrating *Project for the Web* with MSPO to complete existing projects is a prudent approach that ensures a smooth transition, maintains historical data for reporting, and minimizes disruption. It allows you to leverage the benefits of a modern platform while preserving the investments made in ongoing projects.

Recommended Features and Capabilities in *Project for the Web*

To address some of the opportunities and pain points discovered across the PPM and Project Management lifecycle, we recommend that CW implement the following features in Project for the Web.

1. An Integrated Planning Office Home Page with the following dashboards for the:

• Portfolio Health. Display the number of approved projects where the PPM stage is "In Progress" (including On Track, At Risk, or Off Track) with drill-down capabilities to District- and Project-level health. Project status would be color-coded (red, yellow, green).

• PPM Lifecycle Stage. Show the number of projects in various stages (Backlog, Planning, Approved, In Progress, Completed, On Hold, Cancelled) across the enterprise with drill-down options.

• Project Throughput. Calculate and display the ratio of projects completed to projects approved in a given period.

• Portfolio Financial Performance. Provide summaries of project timeliness and budget compliance. Include drilldowns to District and Program/Project levels.

• Project Level Health. Indicate project health based on Project Manager status reports, using color codes (green, yellow, red). We will expand on the existing stoplight report ensuring data quality.

• Resource Utilization. Provide a Snapshot view of current Resource Capacity across critical roles.

• Change Control Approvals. Provide a list of change controls to be reviewed for approval.

• Strategic Benefits. Implement executive-level reporting on strategic goals and benefits at the enterprise level.

1. A CW District Leadership Home Page:
   - **Portfolio Health**. Similar to the enterprise-level reporting, this dashboard will display the number of approved projects in progress with color-coded statuses. Provides drill-down options for the viewing specific district-sponsored and project-level health data.
   - **PPM Lifecycle Stage**. Show the number of projects in various stages specifically for the district.
   - **Project Throughput**. Calculate the ratio of completed projects to approved projects for the district.
   - **Portfolio Financial Performance**. Summarize project timeliness and budget compliance at the district level with drill-down options.
   - **Project Health Criteria**. Indicate project health based on Project Manager status reports, using color codes (green, yellow, red) for the district.
   - **Strategic Benefits**. Executive-level reporting on strategic goals and benefits for the district level.

2. A CW Project Execution Delivery Teams Home Page:
   - **Project Delivery Intake Dashboard**. Display the number of projects ready to be assigned, with drill-down capabilities to view project details.
   - **Portfolio Financial Performance**. Summarize project timeliness and budget compliance specifically for this Delivery Group, with drill-down options.
     - **Summary of Projects Time**. (# of projects on time/total projects), (# of projects over time/total projects), (# of projects under time/total projects)
     - **Budget**. (# of projects on budget/total projects), (# of projects over budget/total projects), (# of projects under budget/total projects)
     - **Portfolio-wide.** Budget (Total spend across the portfolio)/(Total approved budget across the portfolio). This should have the capability to drill down to the District and Project Level)
   - **Program/Project Level Health**. Provide visibility into programs and projects managed by this team, based on Program or Project Manager status reports, using color codes (green, yellow, red).
   - **Grouping Options**. Allow users to group the view by PM Lifecycle phase, Project Classification, Project Category, or Project Type. Enable drill-down into details provided by PMs.
   - **Resource Demand**. Provide Delivery Managers with the ability to monitor resource utilization across key roles, including Project Managers, Engineers, and Technicians.

To achieve this, our approach involves developing capabilities in Project for the Web for timesheet tracking and resource allocations, thereby negating the necessity for integration with Workday.

- Enable the **Bookings** feature which allows Delivery Managers to book resources to a project and monitor for exceptions for over-allocations.
- Create and/or customize project schedule templates that can be used by Project Managers for various project types.
- Enable the capability to organize projects and track them as Programs.
- **Compliance Reporting**. Create a report to show the percentage of Project Managers who are submitting required information on time to manage their projects or programs. Provide Timesheet reporting compliance metrics as well.

4. A Home Page for Program/Project Managers.

- **Dashboard view** of Projects assigned, Key Dates, Upcoming tasks and or Deliverables.
- Enable **Resource Requests** via Bookings, and view **Resource Allocations** across Projects.
- **Project Scheduling** and **Task Management.**
- Resource Managers can assign resources based on request submitted.
- Timesheet Approvals (for resources assigned to projects)
    - Enable notification for timesheet submission.
- Project financials (Budgets, Forecasts and Actual costs to include Labor and actuals from PowerPlan). Project financials forecasting can be done by leveraging a Solution Accelerator built on Power Apps featuring labor costs tracked through the resource tracking capabilities. Actuals are sourced from PowerPlan, such as materials costs and other expenses.
- **Weekly Status Reporting**. Simplify Project Status reporting with color codes (green, yellow, red) based on Schedule Adherence, Budget & Cost Management, Scope, and Risk and Resource management. (This data will be rolled up to the various portfolio levels.)
- **Project Artifacts and Document** can be stored in MS Teams from this page.
- Ability to Track RAID Logs (risk, actions, issues, decisions).
- **Change Controls**. Provide the ability to submit Change Controls to the Integrated planning Office for approvals.

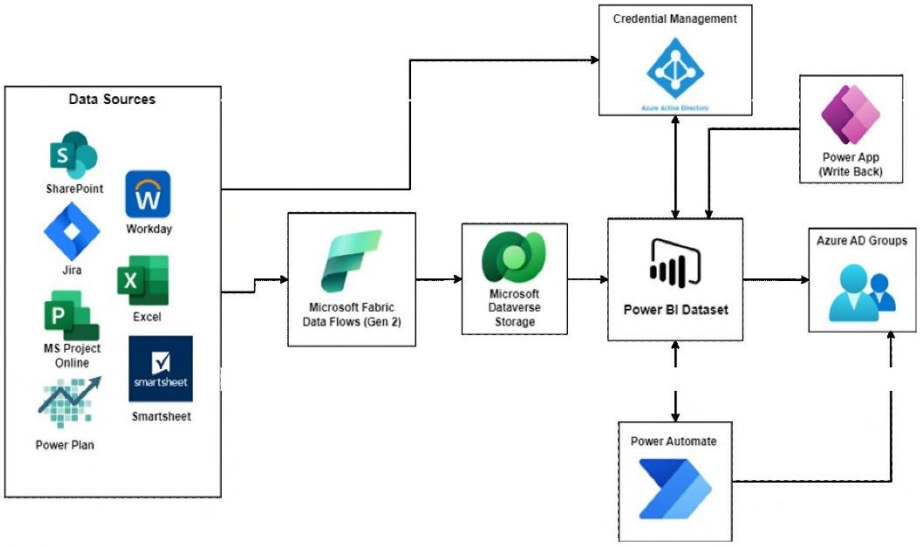
- Ability to store "Lessons Learned" in Microsoft Dataverse to be shared across the enterprise.
- Enable the system to send **automated alerts and notifications** to resources assigned to upcoming or past-due tasks.
- **Change Control** submission and approval processes.
- Create a workflow for **stakeholder sign-off** upon project completion.
- **Automations** to ensure proper closure of projects, releasing of resources, and managing benefits realization.
- **Feedback form** for PM to share feedback on their experience, to promote continuous improvement.
- Integration with Power Platform and MS Teams.

Recommended Enterprise System Integrations

We recommend that the following integrations be set up, to ensure that all the required data is available in one place to drive the Integrated Planning and Execution Strategy:

- **Project Online (MSPO).** Historical data from SharePoint content online database will be extracted and migrated over into the Dataverse for historical reporting.
- **Jira.** Key reporting data will be integrated into the Dataverse for project & portfolio reporting at the Department and Enterprise level. It is our understanding that Jira will continue to be utilized for some IT projects.

Proposed Data Architecture



Note: Our recommended approach is to utilize Microsoft Fabric for extracting the necessary data from PowerPlan and other required systems. Concerning Workday, our understanding is that Cal Water was not utilizing the timesheet tracking feature, and it wasn't mapped to any specific project. Therefore, an integration with Workday may not be necessary unless there is an undisclosed use case.

Recommended Security Access & Control

When implementing Project for the Web, it's crucial to follow best practices for security and access control to protect sensitive project data and ensure that the right people have appropriate access. Here are recommended best practices:

1. Role-Based Access Control (RBAC).
    - Implement RBAC to assign specific roles and permissions to users based on their responsibilities and needs within the project. Common roles may include Project Managers, team members, and stakeholders.
2. Least Privilege Principle.
    - Adhere to the principle of least privilege, where users are granted the minimum level of access necessary to perform their job functions. Avoid granting excessive permissions that could lead to data breaches or misuse.
3. User Authentication.

- Implement Okta's MFA capabilities to add an additional layer of security.
- Azure Active Directory (Azure AD).
    - Secondary Identity Store. While Okta is the primary identity provider, Azure AD can still be used to store synced users and groups and to facilitate integration with other Microsoft services.
- Integration with Azure AD. Okta can be configured to synchronize with Azure AD. This way, users managed in Okta are also reflected in Azure AD.
- Group Creation. Continue using Azure AD's application integration to create and manage groups for Microsoft for the Web.

4. Data Encryption.
    - Encrypt data both in transit and at rest. Use Secure Sockets Layer (SSL)/Transport Layer Security (TLS) for data transmission, and encryption mechanisms for data storage to protect against unauthorized access.
5. Data Backups.
    - Regularly back up project data and ensure that backups are securely stored and can be restored in the event of data loss or corruption.
6. Access Reviews.
    - Periodically review and audit user access rights to ensure that they align with current roles and responsibilities. Remove access for users who no longer require it.
7. Data Ownership and Classification.
    - Clearly define data ownership responsibilities within the organization. Classify project data based on sensitivity levels and apply access controls accordingly.
8. Data Retention Policies.
    - Establish data retention policies that define how long project data should be retained and when it should be securely deleted or archived.

Other Recommended Best Practice - Monitoring and Evaluation of Dashboards and Reports

To ensure the effectiveness of each dashboard and report, we suggest evaluating them using the following metrics.

Success Criteria	Metric
Reporting/dashboards are regularly reviewed for relevancy and effectiveness	• % of dashboards/reports formally reviewed for relevancy and effectiveness in the last quarter/year
Stakeholder requirements met by reports/dashboards	• % of stakeholder requirements that are not currently addressed by any dashboard/report for the quarter/year (trend: compared to previous quarters/years)
On-time delivery of reports/dashboards	• % of dashboards/reports delivered
Accuracy of reports/dashboards	• % of inaccuracies found in the dashboards/reports in the last quarter/year (trend: compared to previous quarter/year)
Level of stakeholder satisfaction with reports/dashboards	• Level of satisfaction with each report/dashboard last quarter/year (trend: compared to previous quarter/year)

Target metrics should be established by the Data & Analytics program and approved by IT Leadership and the Integrated Planning and Execution Office. The program will monitor each report/dashboard individually and track program-wide trends, identifying issues related to specific stakeholder groups or individuals as needed.

Recommended Strategic Opportunities to Leverage AI

Context

CW has adopted a lean operating model for its benefits such as efficiency and waste reduction. However, organizations might encounter resource constraints when implementing new work delivery methods and enterprise process changes. To meet the demand for establishing an Enterprise Integrated Planning and Execution Office, scaling effectively is essential.

Recommended Strategy

In the short term, we suggest integrating Power Virtual Agents with Azure OpenAI for swift deployment. These Virtual Agents ("chatbots") can undergo rapid training to handle PPM inquiries and project management policies. They can also be trained to disseminate lessons learned and best practices according to project types.

In the long run, CW can harness AI to enhance PMO productivity, including tasks such as project scheduling, cost forecasting, and quality assurance. Furthermore, Project Managers will adopt novel approaches to project planning, using AI to identify interdependencies and assess risks arising from intricate workstreams.

Recommended Enterprise PPM and Project Management Governance Process Changes

Context

Organizations often try to solve portfolio management problems with project management solutions. Symptoms of project failure include late projects, cancelled projects, going over budget, and more.

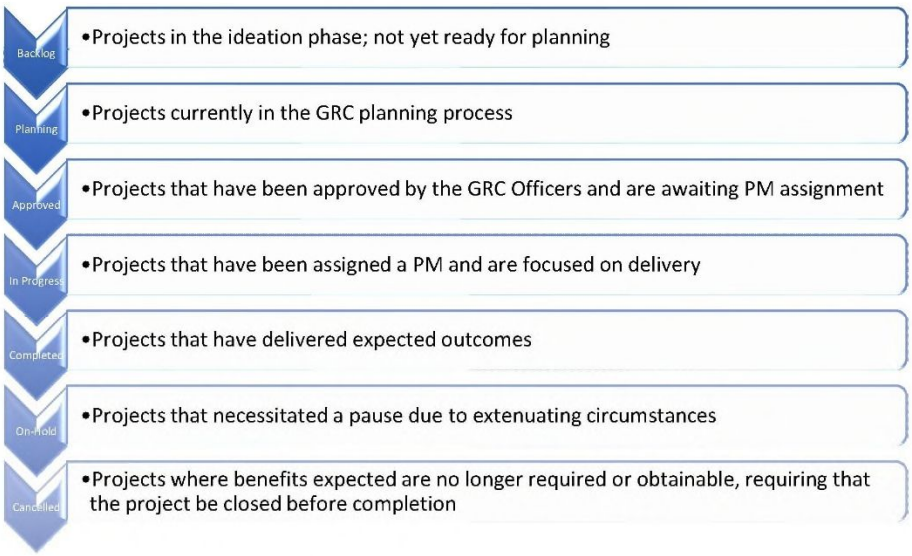
The fundamental problem is that you can do a great job of delivering projects on time, on budget, and in scope (through project management), but still do a poor job of selecting the right projects, at the right time, and using the right resources (through portfolio management), thereby adding no value to the business.

CW's qualitative maturity score across the Project Portfolio Management (PPM) process disciplines identified challenges with intake, approval and prioritization, resource management, and enterprise governance.

Strategy #1: Project Portfolio Stages (PPS)

We recommend that CW establish standard Project Portfolio Stages (PPS) for tracking projects across the PPM disciplines, driving more strategic, efficient, and effective management of CW's project portfolio. However, it's crucial to address missing steps, particularly distinguishing between the GRC cycle and the Annual Budget approval cycle so the classifications stages are appropriately aligned.

Stages



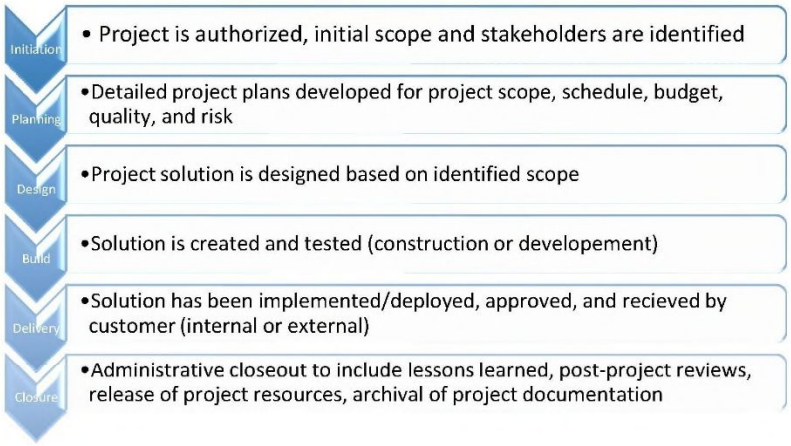
The benefits of implementing these recommendations include:

- **Improved Strategic Alignment**. PPS would allow CW to categorize and align projects with their strategic goals and objectives. This ensures that the project portfolio directly supports the organization's overall mission and vision.
- **Enhanced Decision-Making**. By defining clear stages for project evaluation and approval, PPS provides a structured framework for decision-making. This helps in selecting the projects that align with the organization's priorities and resources.
- **Better Resource Allocation**. PPS would enable CW to allocate resources more effectively by identifying resource requirements at each stage of a project's lifecycle. This prevents resource overallocation or underutilization.
- **Risk Management**. Projects go through different stages of evaluation and planning, allowing CW to assess and mitigate risks early in the process. This reduces the likelihood of costly project failures.
- **Prioritization**. PPS helps prioritize projects based on their strategic importance, potential ROI, and resource availability. This ensures that high-value projects receive the necessary attention.

- **Clear Milestones**. Each stage in PPS typically has defined milestones and criteria for advancement. This provides project teams with clear targets and objectives to meet, improving project management and tracking.
- **Resource Planning**. With PPS, CW can plan for resource needs in advance, ensuring that the right people and assets are available at each stage of the project.
- **Portfolio Optimization**. PPS would allow CW to continually assess the portfolio's health and adjust as needed. Projects that are no longer aligned with strategic goals can be deprioritized or terminated.
- **Transparency**. PPS promotes transparency in the project portfolio by making the evaluation and approval process visible to stakeholders. This fosters trust and accountability.
- **Scalability**. PPS can be tailored to the organization's size and complexity, making the stages suitable for both small and large enterprises.
- **Standardization**. Implementing PPS encourages the standardization of project evaluation criteria and processes across the organization. This consistency leads to more reliable decision-making.
- **Communication**. PPS provides a structured framework for communication between project teams, stakeholders, and decision-makers. This ensures that all parties are on the same page regarding project statuses and requirements.
- **Continuous Improvement**. CW can use feedback from each stage to refine their PPS and improve their project portfolio management practices over time.

Strategy #2: Enterprise Project Lifecycle Phases

We recommend CW establish standard enterprise project lifecycle phases, which are distinct stages providing structure, control, and communication throughout a project's journey, aiding risk assessment and resource allocation. This alignment with project phases and statuses in PowerPlan is essential to avoid duplicating work.



Strategy #3: Project Classification

We recommend that CW establishes a standardized project classification scorecard. This involves categorizing projects into *major, moderate,* and *minor* classifications through a comprehensive assessment of factors such as project scope, complexity, impact, and resource requirements. To structure this scorecard, we propose implementing a weighted scoring approach that accommodates both IT/CSS projects and standard capital construction project.

Here's a simplified outline for the Cal Water Project Classification Scorecard

Project Classification Scorecard

1. Project Scope
    - Major: Involves comprehensive changes across multiple departments or systems.
    - Moderate: Encompasses significant scope affecting one or more departments.
    - Minor: Entails limited scope, impacting a single department or process.
2. Project Complexity
    - Major: Signifies high complexity with multiple interdependencies and inherent risks.
    - Moderate: Represents moderate complexity with some interdependencies.
    - Minor: Indicates low complexity with minimal interdependencies.
3. Resource Requirements
    - Major: Demands extensive resources, including personnel, budget, and time.

- Moderate: Requires moderate resource allocation.
- Minor: Necessitates minimal resource allocation.

4. Project Duration
    - Major: Envisions a long-term project spanning months to years.
    - Moderate: Encompasses a medium-term project completed within weeks to months.
    - Minor: Covers a short-term project completed in weeks.
5. Stakeholder Impact
    - Major: Implies a broad impact across the organization and stakeholders.
    - Moderate: Signifies a significant impact within one or more departments.
    - Minor: Denotes limited impact on stakeholders.
6. Risk and Complexity
    - Major: Reflects high project risk and complexity.
    - Moderate: Indicates moderate project risk and complexity.
    - Minor: Suggests low project risk and complexity.
7. Strategic Alignment
    - Major: Represents a direct alignment with strategic objectives.
    - Moderate: Corresponds to partial alignment with strategic goals.
    - Minor: Aligns to a limited extent with strategic objectives.

Each of these factors is assigned a weight based on its significance in the Cal Water project classification process. For instance, Project Scope might carry a higher weight if it holds particular importance for the organization's decision-making.

To illustrate, here's a sample breakdown of how Cal Water can assign weights to these factors:

- Project Scope: 25%
- Project Complexity: 20%
- Resource Requirements: 15%
- Project Duration: 10%
- Stakeholder Impact: 15%
- Risk and Complexity: 10%
- Strategic Alignment: 5%

Once these weights are assigned, a scoring system can be established. For example, each factor could be rated on a scale of 1 to 5, with 5 indicating the highest relevance. Subsequently, the rating for each factor would be multiplied by its respective weight, and the summation of these scores would determine the overall project classification.

Strategy #4: Program Management

We recommend that CW further advance its Program Management practices by proactively identifying and managing projects within programs to maximize their benefits. The decision to include a project in a program should be guided by a comprehensive analysis of its scope, objectives, and alignment with Cal Water's strategic vision. Projects that demonstrate close interconnections, interdependencies, or contribute to shared strategic outcomes are ideal candidates for program inclusion.

Implementing Program Management offers a myriad of advantages, encompassing the optimization of resource allocation, efficient management of cross-functional impacts, streamlining of decision-making processes, and the enhancement of stakeholder engagement.

We strongly advise CW to establish a systematic process for assessing program eligibility during the initial planning phases. This protocol ensures effective governance and the successful delivery of projects by identifying those that can derive substantial benefits from Program Management.

Additionally, we recommend that CW consider introducing a dedicated "Program Manager" role, entrusted with the oversight and management of specific programs. This role guarantees well-coordinated program execution in alignment with the organization's overarching objectives.

Strategy #5 Key Performance Indicators (KPIs) for PPM and PM

Considering the current level of maturity for CW, we recommend implementing the following Key Performance Indicators (KPIs) to measure the effectiveness and success of their portfolio management practices. It's important to align these KPIs with higher-level business objectives, such as passing the Earnings Test or reducing carryover. These KPIs will provide metrics to assess how well Cal Water is executing the work required to achieve these objectives:

1. **Resource Utilization Rate**. Resource utilization measures how efficiently resources (such as personnel and budget) are allocated and used across the project portfolio. This KPI helps ensure that resources are not over-allocated or underutilized, leading to optimal resource allocation and cost management.
2. **ROI (Return on Investment)**. ROI assesses the financial performance of the project portfolio by measuring the benefits gained compared to the costs incurred. It provides insights into the profitability and value generated by the projects in the portfolio, helping organizations prioritize high-impact initiatives.

3. **Project Alignment with Strategic Goals**. This KPI evaluates the extent to which individual projects within the portfolio align with the organization's strategic objectives. It ensures that the portfolio is focused on projects that contribute directly to the company's mission and long-term vision.
4. **Project Risk Exposure**. Assessing a project's risk exposure is crucial for effective risk management in PPM. This KPI measures the level of risk associated with projects in the portfolio. It helps organizations identify high-risk projects that may require additional attention or mitigation strategies.
5. **Portfolio Health Index**. This KPI provides an overall assessment of the health and performance of the project portfolio. It considers factors such as project status, alignment with strategic objectives, resource allocation, and risk management. A high Portfolio Health Index indicates that the portfolio is well-balanced and effectively contributing to organizational goals.

Additionally, we recommend that CW implement the following Key Performance Indicators (KPIs) for **project management**:

1. **Project Schedule Adherence (Schedule Performance Index - SPI)**. SPI measures the project's progress concerning its planned schedule. It is calculated by dividing the Earned Value (EV) by the Planned Value (PV). An SPI greater than 1 indicates that the project is ahead of schedule, while an SPI less than 1 suggests delays.
2. **Cost Performance (Cost Performance Index - CPI)**. CPI assesses how well the project is performing in terms of cost control. It is calculated by dividing the EV by the Actual Cost (AC). A CPI greater than 1 indicates cost efficiency, while a CPI less than 1 indicates cost overruns.
3. **Resource Utilization**. This KPI assesses how efficiently project resources are being used. It involves monitoring such factors as resource allocation, workload balance, and resource availability. Efficient resource utilization helps prevent resource bottlenecks and delays.
4. **Stakeholder Satisfaction (Customer Satisfaction or Net Promoter Score - NPS)**. The satisfaction of project stakeholders, including customers and team members, is crucial for project success. Regularly collecting feedback and using metrics such as NPS can help gauge stakeholder satisfaction and identify areas for improvement.

Gradual Transition to Earned Value Management (EVM)

As part of CW's long-term evolution, we propose the gradual integration of Earned Value Management (EVM) into the project management methodology after improving baseline

maturity levels. This introduction will underscore the significant advantages of EVM in terms of cost and schedule control within the strategic framework.

Selection of Pilot Initiatives. To pave the way for EVM incorporation, we recommend selecting a limited number of planned initiatives within the portfolio to serve as pilot projects for EVM implementation. These initiatives should closely resemble the typical scope of our strategic endeavors.

Strategic EVM Training. It is imperative to provide goal-oriented training to the CW strategic leaders, Project Managers, and pertinent team members regarding the principles and practices of EVM. This knowledge will empower them to leverage key EVM concepts, including Earned Value (EV), Planned Value (PV), and Actual Cost (AC).

Strategic Alignment of Tools and Software. We propose carefully aligning the project management tools and software to facilitate calculations associated with EV, PV, and AC within the strategic framework.

Strategic EVM Implementation. We will systematically implement EVM on the identified pilot initiatives, beginning with the definition of well-thought-out budgets, schedules, and work breakdown structures (WBS).

Strategic Data Collection and Calculation. It is pivotal that we guide project teams in the systematic collection of data necessary for EVM calculations, such as EV, PV, and AC, within the strategic initiatives.

Strategic EVM Reporting. We recommend that CW create dedicated EVM-specific dashboards and reports to visualize EVM data. These reports will encompass key metrics such as the Cost Performance Index (CPI) and Schedule Performance Index (SPI).

Strategic Performance Analysis. We encourage the Project Managers to perform a careful analysis of EVM. This analysis will help identify trends, potential cost overruns, or schedule delays, enabling data-driven, forward-thinking decisions and timely corrective actions.

Embracing Continuous Improvement. We emphasize the importance of cultivating a culture of continuous improvement within the EVM practices. We encourage the systematic collection of feedback over time, and the assimilation of lessons learned from our pilot initiatives to continually refine and enhance the EVM processes.

Recommended Approach for Project for the Web Launch

Context

To ensure a smooth and effective migration to use of the new capabilities and processes, we recommend a phased approach for the departments in scope. This approach will help manage the transition and minimize disruptions.

Strategy

We recommend the following departments start leveraging the PM capabilities within Project for the Web after implementation, when the PM's are ready to start new projects.

First Wave

- **Asset Mgmt – EAM/GIS.** This department uses Excel and has a few projects that could be tracked leveraging Project for the Web.
- **Asset Mgmt – Field Services.** This department uses Excel and have small projects that can be tracked leveraging Project for the Web.
- **Asset Mgmt – Supply & Plant.** This department uses Excel and MSPO and have a small maintenance project that could leverage Project for the Web.
- **Asset Mgmt – Tank & Pipeline.** This department uses Excel and MSPO and have a small project that could leverage Project for the Web.

Second Wave

- **Accounting**. This department uses MS Project Desktop for managing their small initiatives and we believe they would find value in the web-based platform.
- **Facilities**. This department uses MS Project Desktop for managing their small projects so they would benefit from leveraging Project for the Web. Large complex projects will continue to use MSPO.
- **MRP Engineering.** This department uses Smartsheet's for managing projects. The tool for managing execution will be determined in Phase 2.

Third Wave

- The Operating Companies in Washington, Mexico, and Hawaii will start adoption in the third wave.
- Cal Water will be able to identify additional departments that can leverage Project for the Web based on project complexity.

Note: The suggested waves provided are recommendations only, but Cal Water should make the final selections based on the deep dive discussions that will be had in Phase 2. Some departments use JIRA for project management and tools. We will ensure that integration is in place before migrating them in the third wave.

We will ensure that each wave of migration is accompanied by thorough training and support to help users adapt to the new capabilities effectively. Additionally, we will continue to assess the specific needs and readiness of each group to ensure a successful transition.

Project for the Web Training Strategy

This training strategy empowers Project Managers to harness the full potential of Project for the Web quickly and effectively for their project management responsibilities.

Training Schedule. To minimize disruption, training schedules should accommodate Project Managers' availability and time constraints by offering multiple sessions.

Training Delivery. Training will be organized into core topics based on features and functionality to optimize learning. Virtual training sessions will be the default due to the geographical dispersion of Cal Water employees, with all sessions recorded for future reference. Hands-on sessions will support core training and cater to diverse learning styles. Additionally, on-demand training for self-paced learning will replicate live sessions, ensuring consistent training for new hires and serving as a refresher for existing or infrequent users.

Training Content: Training content will emphasize key areas, including Project Management, Resource Allocation and Management, and Reports and Analytics (for both providers and consumers).

Support Resources: To aid the teams, we recommend providing various support resources, including FAQs for real-time and post-transition assistance, open office hours for users seeking guidance, quick reference tools, wikis, and a "train the trainer" concept with system "champions."

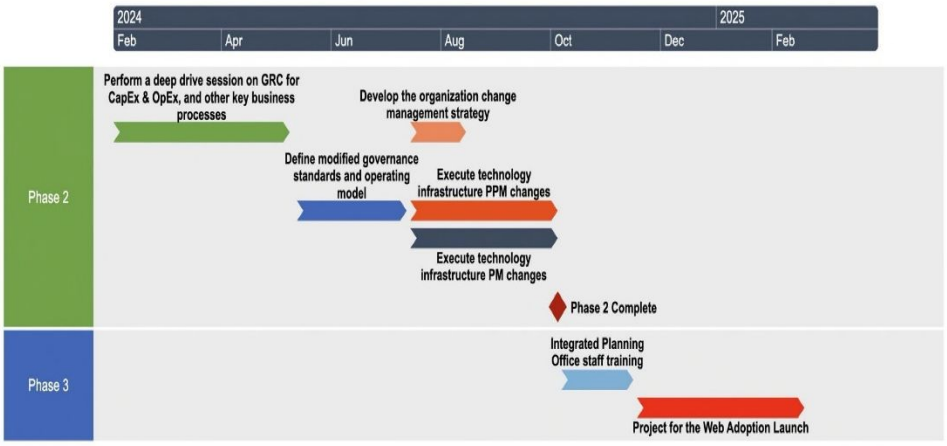
Assessment and Feedback: Regular assessment of Project Managers' progress during and after training is essential. Gathering feedback on the training program will enable necessary adjustments and improvements to the training strategy.

Monitoring and Evaluation: Ongoing monitoring of *Project for the Web's* adoption within Cal Water is critical. We will evaluate how effectively Project Managers apply their newly acquired skills to enhance project management practices. Benchmarking expected transition outcomes and tracking realized benefits will be an integral part of the evaluation process.

High Level Implementation RoadMap

By adopting the proposed governance enhancements and MSPO technology changes, CW can embark on the next phase of their journey towards transforming their Enterprise-Wide Integrated Planning and Execution Capability.

Cal Water MSPO Transformation Roadmap



Phase 2

Perform a deep drive session on GRC for CapEx & OpEx, and other key business processes	Task	3.3 months	02/01/2024	05/08/2024	0%
Define modified governance standards and operating model	Task	2 months	05/13/2024	07/12/2024	0%
Develop the organization change management strategy	Task	1 month	07/15/2024	08/14/2024	0%
Execute technology infrastructure PPM changes	Task	60 days	07/15/2024	10/04/2024	0%
Execute technology infrastructure PM changes	Task	60 days	07/15/2024	10/04/2024	0%
Phase 2 Complete	Milestone	0 days	10/04/2024	10/04/2024	0%
+ Add task or milestone					

Phase 3

Integrated Planning Office staff training	Task	30 days	10/07/2024	11/15/2024	0%
Project for the Web Adoption Launch	Task	3 months	11/18/2024	02/18/2025	0%
+ Add task or milestone					

Cal Water Target State PPM Qualitative Maturity Score

After executing the recommended MSPO transformation roadmap, we fully expect that CW's Qualitative Maturity Scores for PPM & PM process disciplines will have a significant improvement.

Old vs. New

Process Area	Current Process Completeness	Current Maturity Level	Target State Maturity	Process Area	Current Process Completeness	Current Maturity Level	Target State Maturity
1. Intake, Approval & Prioritization	32%	Initial	Managed	1. Intake, Approval & Prioritization	95%	Managed	Managed
2. Resource Management	4%	Absent	Managed	2. Resource Management	88%	Managed	Managed
3. Portfolio Reporting	6%	Absent	Managed	3. Portfolio Reporting	100%	Managed	Managed
4. Project Closure & Benefits Realization	10%	Absent	Managed	4. Project Closure & Benefits Realization	100%	Managed	Managed
5. Portfolio Administration	15%	Absent	Managed	5. Portfolio Administration	60%	Defined	Managed
Overall Maturity	**15%**	**Absent**	**Managed**	**Overall Maturity**	**91%**	**Managed**	**Managed**

Cal Water Target State PM Qualitative Maturity Score

Old vs. New

Process Area	Current Process Completeness	Current Maturity Level	Target State Maturity	Process Area	Current Process Completeness	Current Maturity Level	Target State Maturity
1. Initiate the Project	45%	Defined	Managed	1. Initiate the Project	95%	Managed	Managed
2. Define Project Scope and Develop Work Breakdown Structure	34%	Initial	Managed	2. Define Project Scope and Develop Work Breakdown Structure	80%	Repeatable	Managed
3. Plan Risks, Quality, and Benefits	39%	Initial	Managed	3. Plan Risks, Quality, and Benefits	93%	Managed	Managed
4. Communication and Organizational Change Management	7%	Absent	Repeatable	4. Communication and Organizational Change Management	80%	Repeatable	Repeatable
5. Manage Stakeholders and Team	36%	Initial	Managed	5. Manage Stakeholders and Team	89%	Managed	Managed
6. Manage Scope Changes	44%	Defined	Managed	6. Manage Scope Changes	100%	Managed	Managed
7. Manage Risks and Quality	35%	Initial	Managed	7. Manage Risks and Quality	98%	Managed	Managed
8. Close the Project	18%	Absent	Managed	8. Close the Project	86%	Managed	Managed
Overall Maturity	**34%**	**Initial**	**Managed**	**Overall Maturity**	**91%**	**Managed**	**Managed**

Recommended Organizational Structure

Context

To execute this strategic plan successfully, CW must establish the right organizational structure and operating model for effective oversight at every stage of the Enterprise Portfolio and Project lifecycle.

Strategy #1 – Integrated Planning Office Staffing Plan

We recommend that the Enterprise Integrated Planning Office or PMO be staffed with a minimum of two full-time team members in the following roles:

1. **Integrated Planning Manager.** Responsible for:
   - PMO strategy
   - Leadership
   - Governance
   - Resource management

- Stakeholder engagement
- Operations
- Portfolio management
- Performance monitoring
- Risk management
- Quality assurance
- Change management
- Training
- Reporting
- Budget management
- Vendor and tool management
- Customer focus

2. **Portfolio Administrator.** Vital for portfolio management efficiency and effectiveness. Responsibilities include:
   - Portfolio documentation
   - Data management
   - Reporting
   - Resource allocation support
   - Budget management support
   - Risk management support
   - Quality assurance
   - Communication facilitation
   - Portfolio governance support
   - Benefits realization tracking
   - Stakeholder engagement
   - Documentation and knowledge management
   - Continuous improvement
   - Administrative support
   - Compliance
   - Resource coordination

Note: Red Clay suggests hiring two full-time resources at a minimum to launch the Integrated Planning Office. After baselining the work activities, CW may find that it requires additional resources, but that can only be determined after quantifying the demand.

Strategy #2 – Key Committees

We recommend the following committees be established to provide the appropriate level of effective governance leadership.

1. **Executive Committee**
   - Comprises top-level executives responsible for overall strategic direction.
   - Addresses broad strategic issues and aligns investments with the company's mission.

2. **Portfolio Steering Committee**
   - Focuses on strategic oversight, management, and decisions for project portfolio.
   - Ensures that projects align with organizational strategy and are executed effectively.

   Note: There is overlap in Executive and Portfolio committee memberships. Portfolio Steering focuses on projects, while the Executive Committee looks at the whole organization. C-suite involvement in Portfolio Steering connects portfolio decisions with top leadership, enabling in-depth discussions on priorities, resources, and risk management. This dual-committee approach balances strategic oversight and project management.

3. **Project Change Advisory Board (CAB)**
   - Evaluates, approves, and manages project scope, schedule, budget changes.
   - Ensures that changes align with project objectives without disrupting success.

4. **Project Steering Committee**
   - Guides and oversees specific project's strategic direction and execution.
   - Includes Project Sponsor, Project Manager, Stakeholders, Experts, Governance, and Senior Managers.
   - Supports project success and alignment with organizational goals.

   Note: This committee will only be established for projects that require this level of oversight

Integrated Planning Office Training

Training will be required for the two new hired resources. Training will consist of Cal Water PPM & PM governance and processes, tool familiarity, core features utilized in Project for the Web, reporting and analytics and best practices for managing the PMO. This activity will be a prerequisite to starting the Project for the Web adoption launch.

District - CSS

PID # 133538

Halo Acetic Acids analytical tester

Introduction

Haloacetic Acids (HAAs) analytical testing is required by EPA (Environmental Protection Agency) under the Safe Drinking Water Act (SDWA) Disinfectant/Disinfection Byproduct (D/DBP) Rule. To ensure compliance with the D/DBP Rule regulatory requirements, samples must be collected from our distribution systems and tested on a quarterly basis for haloacetic acid compounds. HAAs are byproducts of the disinfection process and are regulated and monitored to meet designated Maximum Contamination Levels (MCLs) set by EPA.

Total Trihalomethanes (TTHM) are another regulated byproduct of disinfection that must be monitored to meet regulatory requirements. Based on the sampling requirements, TTHMs samples and HAAs samples must be collected at the same time. Currently the Water Quality Lab analyzes TTHMs in-house. However, often the TTHMs are sent to contract labs along with the HAAs for shipping convenience despite our internal Water Quality Lab's ability to analyze them in-house. In 2023, this occurred 132 times at the cost of $68 per sample for a 10 business days turnaround time and a total cost of $8,976 for the TTHMs samples. If these analyses were all performed in-house, analytical costs would be reduced by roughly 50%.

Deficiencies and Issues

Sending the D/DBP samples to outside contract labs significantly increases analytical cost and impacts decision-making because of the contract labs 2-3 weeks turnaround time for testing samples. These analyses can be done in-house in less than 5 business days turnaround time at no extra cost. On the other hand, rush turnaround time for analyzing samples is available at contract labs at a 300-400% markup.

Often, a rush turnaround is required for timely field decision-making at the markups indicated above.

Faster results and faster decision making in the field.

Purchasing this instrument allows the Water Quality lab to analyze these compliance samples in-house at a lower cost and improves the timeliness of results for decision-making. Reduced turn-around time is reduced response time and less downtime in operations due to pending results; increased public health protection and enhanced customer service.

High cost of Contract Lab Services

In 2023, 816 samples were contracted out for HAAs analysis at a cost of $90 per sample for 10 business days turnaround time. The cost of subcontracting these samples for analysis was $74,440. However, a faster turnaround time is often needed for timely treatment and distribution systems decisions.

Alternative Analysis

To address high cost and longer turn-around times, the following alternative was analyzed:

Alternative 1: Do Nothing

The Do Nothing alternative involves simply continuing to contract HAA analysis to an alternate lab. This option keeps the response time in the field after collection of samples to 10 business days instead of 5. This alternative also keeps the 4-5X analytical costs in situations where operation decisions cannot wait 10 business days.

Recommended Solution

Cal Water recommends purchasing appropriate instrumentation to bring analysis of HAA into our own internal Water quality lab. This solution would cut the response time in the field in half when timely results are needed for treatment and distribution decisions. This solution would also reduce the analytical costs for HAAs.

Project Summary

Purchase one triple quadrupole mass spectrometer for Haloacetic Acids analysis.

- Provides timely water quality data to assist in treatment and distribution systems operations to ensure compliance and public health protection.
- Avoids the additional cost associated with “rush” turnaround time.
- Better quality control and oversight of the analytical process.

Project Attachments

- Attachment A – Cost Estimate

Attachment A

Capital Project Cost Estimate

Project No. : 133538
Description Halo Acetic Acids analytical tester
District / Department: CSS
Project Start Date: 01/01/2025
Project Completion Date: 12/31/2025
Prepared By: shaw man
Date Initiated: 12/18/2023
Base Year: 2023
Sub-Total: $433,388
Direct Cost: $455,328

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
10% CONTINGENCY	[EA]	1	$39,398.91	$39,398.91	Additional Factors
SCIEX 5500- QTR MASS SPEC. ONLY	[EA]	1	$393,989.13	$393,989.13	Engineers Estimate

Sub-total = $433,388.04
Direct Cost = $455,328.25

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Section H.

Common Plant

The following table presents a list of Common Plant projects for this district. Please refer to the Common Plant Justification Book for further details, including project justifications.

Table 1 - List of Common Plant Projects – CSS District

PID	Description	Direct Cost	Inserted
330-NON-SP	330- General Office Non-specific	$1,200,700	X[(d)]
132319	CSS 2026 VEHICLE REPLACEMENT PROGRA	$396,589	X[(d)]
330-NON-SP	330- General Office Non-specific	$1,200,700	X[(d)]
132320	CSS 2027 VEHICLE REPLACEMENT PROGRA	$567,043	X[(d)]
330-NON-SP	330- General Office Non-specific	$1,200,700	X[(d)]
133646	CSS 2026 AMI INITIATIVE-IT INT/DEV	$1,537,615	X[(d)]

Section I.

Forecasted Projects in Progress

I1. Projects In Progress Over-Budget and/or Over-Schedule

District - CSS

PID# 119073
PowerPlan Budget Forecasting
Non-Specific In Progress Project

Project Justification and Information

1. **Project Justification:**

   This project was proposed as an ongoing project in the last GRC.

2. **Detailed Project Scope & Costs:**

   This project was written to implement the PowerPlan Budget forecasting module for project managers and responsible parties to utilize budgeting tools like templates, queries, dashboards, investment reports, and shortcuts. In the last PowerPlan upgrade, the working forecast was not included in the upgrade plan, so work on this project was deferred. However, another upgrade is proposed in this GRC cycle which will include an opportunity to revisit the working forecast.

3. **Customer Benefits**

   Regularly updating and forecasting capital work leads to efficient portfolio management. This results more timely completion of capital needed to ensure safe, reliable drinking water.

District - CSS

PID # 124691
CSS EWWM-Buildout of Integration
In Progress Specific Project

Project Justification and Update

This project continues to build on the mobile and integration foundation to automate additional processes, digitize paper-based operations, and aggregate data to support data analysis for various departments. Execution of the proposed scope is consistent with the recommendations outlined in the 2020 Technology Master Plan for Enterprise Work and Workforce Management IT Strategic Program.

1. **Explain why the costs for this project will exceed the approved GRC budget (If Applicable):**

   The primary reason for project budget exceedance is due to additional unanticipated work to complete the project. Two key drivers were the migration from KUBRA to Paymentus and then we also needed to upgrade our middleware software (MuleSoft) from an out-of-date version to a more modern version to ensure we could maintain support.

2. **Summarize the main issues cause delay in completion of this project (If Applicable):**

   No delays.

For all In Progress Projects, Answer the Following Questions:

1. **Explain major changes in the schedule of the project and why the project was not completed in the original year that was planned or approved:**

   This project was completed on-time.

2. **Explain why the new schedule for the project is needed:**

   No new schedule is needed.

3. **What other alternatives did Cal Water consider for this in progress project?**

   Alternative A: Not continuing with the Paymentus project. However, this would have abandoned all the work that had already been completed. Then we also evaluated not doing the middleware upgrade, but that would have put the company at tremendous risk due to the functionality middleware software provides.

4. **What happens if Cal Water cancels this project now?**

   This work has already been completed.

District - CSS

PID# 124693
CSS CC&B Cloud Upgrade
In Progress Specific Project

Project Justification and Update

The Customer Cloud Solution (CCS) is a cloud-based Service as a Service (SaaS) solution which provides the means of streamlining customer communications regarding bills and issues and provide more efficient methods for customers to pay their bills, improving revenue stream efficiency.

1. **Explain why the costs for this project will exceed the approved GRC budget (If Applicable):**

   The reason for the budget exceedance is due to unknown items at the time the original budget was proposed that arose as the project progressed such as:

   - The software developer contract was extended an additional seven months to take us through the various testing phases and through the go-live part of the project.
   - To support reporting requirements, we didn't anticipate building a reporting data warehouse using an outside company with expertise in data warehousing.
   - An additional CCS environment was purchased to accommodate rate changes needed for the finalized 2021 GRC decision.
   - A consultant was brought in to research existing data quality issues and fix them before going live with the Customer Cloud Solution (CCS).

For all In Progress Projects, Answer the Following Questions:

1. **Explain major changes in the schedule of the project and why the project was not completed in the original year that was planned or approved:**

   The project is still on schedule to be completed in 2024.

2. **Explain why the new schedule for the project is needed:**

   The project is still on schedule to be completed in 2024.

3. **What other alternatives did Cal Water consider for this in progress project?**

   - Alternative A: Not complete the project due to cost overage.
   - Alternative B: Complete the project as planned.

- Alternative C (Do Nothing):

4. **What happens if Cal Water cancels this project now?**

   The version of CC&B Cal Water currently uses is at the end of its useful life and requires replacement. Upgrading to the newest cloud release of software modernizes Cal Water's core Customer Service Management system which helps to ensure the software is always up to date and has the latest security patches. If Cal Water were to cancel the project now, it can’t go live with the current state of the project.

District - CSS

PID# 124853
CSS Energy Efficiency - HVAC
In Progress Specific Project

Project Justification and Update

With a focus on energy sustainability, it was determined that the HVAC optimization will yield the greatest potential economic benefit. The study included a multi-day audit of the CSS facility to create a model of energy consumption - where, when and how energy is currently used. A detailed model of electricity billing was developed, based on Time of Use (TOU) rate structures and current utility tariffs using PG&E data from 2020. The efficiency and performance improvements on the existing HVAC equipment and updated control system will produce forecasted electricity savings over $78,035 in the first year.

1. **Explain why the costs for this project will exceed the approved GRC budget (If Applicable):**

   The primary reason for project budget exceedance is due to the discovery of multiple seized isolation valves. Due to this type of failure, they could not be repaired, but required replacement. The proposal scope did not account for this volume of replacement valves.

2. **Summarize the main issues cause delay in completion of this project (If Applicable):**

   The initial start date was delayed by a reevaluation of the project approach due to increasing costs. The review resulted in a more focused approach on controls versus physical equipment to minimize cost increases and reach the expected annual cost savings.

For all In Progress Projects, Answer the Following Questions:

1. **Explain major changes in the schedule of the project and why the project was not completed in the original year that was planned or approved:**

   While the project was initiated in 2023 and will be completed in 2024, the project duration was not extended.

2. **Explain why the new schedule for the project is needed:**

   This project will be completed in 2024.

3. **What other alternatives did Cal Water consider for this in progress project?**

   - Alternative A: Re-Design HVAC System

Re-design the current HVAC system to a central system per building versus the current system of multiple small units. Rejected: This would require major structural and mechanical work for each building, if possible, to support a single larger system. Disruption during construction and to service would affect employees and their ability to continue to support our customers. High cost would not benefit the customer

- Alternative C (Do Nothing):

This is not an option as we have a responsibility to Cal Water customers and the communities we serve to lead by example.

4. **What happens if Cal Water cancels this project now?**

This project is now in the final stage focused on programming to optimize the new controls and providing training on the new control system to Cal Water facility staff.

These enhancements will reduce energy consumption, increase energy efficiency, and decrease recurring operational costs directly related to HVAC on the CSS campus.

District - CSS

PID# 126076
Enterprise AMI Feasibility Study
Non-Specific In Progress Project

Project Justification and Information

Recent drought, increasing cost of water, and upcoming conservation mandates necessitate a way for Cal Water and its customers to monitor and manage water consumption on an ongoing basis. Cal Water is seeking approval for the installation of advanced metering infrastructure (AMI) and hired a consultant to assist in examining the feasibility of implementing AMI in its districts.

1. **Detailed Project Scope & Costs:**

   The original scope for AMI Consulting Services from West Monroe Partners, LLC (WMP) was to provide Cal Water the following: 1) Detailed Evaluation of all AMI Platforms and Deployment Options, 2) Holistic & Dynamic Cost-Benefit Sensitivity Model with capabilities to change and adjust input variables, and 3) Evaluation Report for Enterprise-wide AMI. Further, in a follow-up to the completed deliverables above, WMP additionally provided support for the following, not exclusively, refining AMI strategy, developing/reviewing/revising justifications, authoring testimony, and assistance with AMI vendor selection via an RFP.

2. **Customer Benefits**

   AMI will benefit customers by empowering them to proactively conserve water for both environmental and financial reasons. Additionally, AMI can alert customers of suspected leaks, generating potentially significant water and cost savings.

District - CSS

PID# 128042
GRC 2021 Rev Rec Project
Non-Specific In Progress Project

Project Justification and Information

1. Project Justification:

In D.20-12-007, the California Public Utilities Commission eliminated the option of having full decoupling in the form of the Water Revenue Adjustment Mechanism (WRAM) and the Modified Cost Balancing Account (MCBA) starting with each water utility's next general rate case (GRC). California Water Service Company (Cal Water) filed its GRC in July 2021 for new rates beginning January 1, 2023.

In the absence of the WRAM/MCBA, Cal Water is proposing in its 2021 GRC modifications to the residential rate designs in most districts, including modifying the usage amount in each of the tier blocks, and increasing the number of quantity rate tiers by one additional tier.[1] In lieu of the full WRAM, Cal Water is also proposing to adopt a Monterey-Style Water Revenue Adjustment Mechanism (M-WRAM) to track the difference between the revenue billed to customers under the tiered rate structure, and the revenue Cal Water would have collected if the same water consumption had been billed using a single quantity rate.

Finally, in lieu of the MCBA, Cal Water is proposing the use of three Incremental Cost Balancing Accounts (ICBAs) – one each for purchased water, pump taxes, and purchased power – that will only track the changes in water production costs that result from wholesale water price changes.

2. Detailed Project Scope & Costs:

The conversion from full WRAM/MCBAs to M-WRAM/ICBAs impact both revenue and costs (income statement) and regulatory assets and Liabilities (balance sheet). This requires significant changes to implement within the company billing, accounting, reporting, and internal control systems. Each system will be re-configured to capture the information needed for the new regulatory mechanisms. These include:

- These include the Customer Care and Billing (CC&B) system,
- PeopleSoft General ledger (GL)
- California Public Utilities Commission (CPUC) PeopleSoft ledger,
- NVision reports
- SOX controls

- IRMA reporting for missed revenue because of Rates and MWRAM
- ICBA requirements

The new GRC rates and MWRAM process are being processed live with May 31st rate changes calculated in June 2024.

3. Customer Benefits

The project benefits customers by ensuring Cal Water can accurately calculate the MWRAM amounts and future sur-charges. The Monterey-style Water Revenue Adjustment Mechanism (MWRAM) is a rate design tool intended to address the uncertainty associated with increasing block rates (tiered rates). Increasing rate blocks are designed so rates increase as customer consumption increases. The MWRAM was adopted to protect the utility from reduced revenues collected under tiered rates as compared to a uniform rate design with the 2021 Rate Case.

Cal Water submitted the GRC 2021 Rate Case for the new customer rates effective January 1, 2023. There was a delay in approval, causing a delay in recording revenue from the rate increases. The California Public Utility Commission (CPUC) allowed a sur-charge or sur-credit to the amounts that were missed or as if the new rates were in place as of January 1, 2023. The 2021 GRC final decision was approved in March of 2024. This approval allows the ability to record revenue as if the new rates for the interim period were in effect.

District - CSS

PID# 129198
BLDG A - OFFICE UPDATES
Non-Specific In Progress Project

Project Justification and Information

1. **Project Justification:**

   The current office furniture in Building A does not offer any ergonomic adjustment options and the style and construction of the existing office furniture does not lend itself to a retrofit. Storage and filing casework will also be updated to better suit the employees' functional needs. The four administrative cubicles can be retrofit to add a height adjustable work surface in each. Building A is currently under construction per approved project #124818 Building A Improvements and as a result is vacant. This provides an opportune time to perform work in the private offices without any additional disruption to the employees.

2. **Detailed Project Scope & Costs:**

   - Replace private office furniture and task chairs
   - Retro-fit administrative staff cubicles to include height adjustable desks
   - Refresh paint in offices
   - Replace carpet and base in offices

3. **Customer Benefits**

   Prioritizing workstation ergonomics and maintaining good posture are important in minimizing the negative effects of prolonged sitting. Ergonomic furniture, and conscious efforts to uphold proper posture contribute not only to physical health but also enhance overall well-being and productivity.

District - CSS

PID# 131496
MSPO Roadmap
Non-Specific In Progress Project

Project Justification and Information

1. **Project Justification:**

   In late 2019, Cal Water began developing a centralized and comprehensive project management tool to efficiently monitor and manage company projects, resources, budgets, and schedules. The system would enable universal visibility into the entire program and enhance project performance relative to scope, schedule, and budget.

   By 2021, the first phase project management tool/system was developed and deployed in Capital Delivery, and by 2022, the asset management engineering team began exploring ways to use it as well. In 2023, a corporate goal was developed to expand the usage to the entire enterprise. This project addresses outside services needed to develop an approach to phasing in various departments into the MPSO project management system. The implementation of these findings is proposed in PID 00132210 and PID 00124278.

   The tool is a highly configured Microsoft Project Online system. During the three years since development, the system continued to be improved and is used regularly by one of its engineering departments, Capital Delivery. Powerplan is Cal Water's official project/capital accounting and asset recording system. MSPO connects to this system and data is pushed and pulled between Powerplan and MSPO.

2. **Detailed Project Scope & Costs:**

   The development of the roadmap consists of the following:

   - Understand current MSPO usage and integration
   - Review Client's IT Master Plan
   - Identify use cases and departments
   - Understand project controls, vision, and goals
   - Develop an implementation plan for each department
   - Develop business case justification
   - Develop company-wide approaches to business processes
   - Develop adoption and usage metrics
   - Determine approach for infrequent users
   - Develop training plan
   - Create long-term plan
   - Prioritize leveraging existing enterprise application
   - Finalize Phase 2 and Phase 3 recommendations (See PID 0013210 justification)

The activities above will result in 3 deliverables as follows:

Milestones	Deliverable
Milestone 1	**Current State Document** that incorporates the following: - MSPO usage and integration - Use cases and departments - Implementation strategy - High-level business case justification
Milestone 2	**Implementation Roadmap** that incorporates the following: - Company-wide approaches to business processes - Adoption and usage metrics - Recommendations for managing infrequent users - Training strategy
Milestone 3	**Final Implementation Strategy** that incorporates the following: - Prioritization of existing enterprise applications - Phase 2 and Phase 3 recommendations

3. Customer Benefits

This project improves the overall efficiency of the company's capital improvement program, which can lead to lower project overhead over time and improving completion times. The result is more affordable, safe, and reliable drinking water.

District - CSS

PID# 131989
TIME TRACKING IMPROVEMENT PHASE 2
Non-Specific In Progress Project

Project Justification and Information

1. **Project Justification:**

   Without having a clock in clock out system and process, Cal Water is limited in how it may demonstrate compliance with State mandates to show that breaks and lunches have been taken. The Company was tasked to identify a solution that would avoid this type of exposure on a go-forward basis.

   In 2022 Cal Water implemented Clock In and Clock Out processes within the Workday Time Tracking module for hourly employees. Due to time constraints, the project had to be broken into two phases. The first was completed in December of 2022. The second phase is to reduce manual effort through automation and minimize time and pay errors. The project will help Cal Water be in full compliance with labor regulation requirements and free up employees' time on manual data entries to better serve customers and maintain water systems.

2. **Detailed Project Scope & Costs:**

	Phase I	Phase II (1A&1B)	Help Desk Bronze	Notes
TopBloc	$ 33,900	$ 123,876	$ 48,000	Help Deks is for 9 months w/ one month credit. Paying for 8 months
				Phase II Support Phase 1A: -1 Week During the end of Architecture & Configurations Test Scenarios/scripts creation -1 Week During Testing & Training material development -3 Weeks of Deploy & Support Phase 1B: - 3 Weeks During the end of Architecture & Configurations Test Scenarios/scripts creation -10 weeks of Testing & Training Material development - 5 weeks of Deploy & Support
Alight		$ 117,600	$ -	**Help Desk:** 9 Months Approx 36 weeks for support as needed - Confirmed w/Irene internal team will be used.
Internal		$ 48,295	$ 9,600	20% of overall cost added to cost for internal labor

Approximate Total Cost	
TopBloc Total Cost	$ 205,776
Alight Total Cost	$ 117,600
Internal Total Cost	$ 57,895
Total	$ 381,271.20
+ 10% Contigencey	$ 38,127
Total Project Cost	$419,398

Time Tracking improvements:

- Configure

- Meal Break Attestations
    - 2 (New) Time Entry Templates
- New Time Calculations
- New Time Calculation Groups
- New Work Schedule Calendars
- New Validations
- Modifications to existing Time Entry Eligibility Rules
- Modifications to Domain Security Policies
- Modifications to existing reports to accommodate new Time Tracking configuration
- Project Tracking functionality:
    - Projects
    - Project Template

Payroll Improvements

- Payslip – Total Hours Paid (Create new memo earning)
- Deduction Priorities
- Configure and test new Payroll Earnings Codes to map to new Time Tracking configuration.
- Configure, confirm, and test Payroll Account Posting Rules for new Time Tracking configuration.
- Configure, confirm, and test necessary Union Eligibility Rules for Payroll.

3. **Customer Benefits**

Implementing the time tracking and payroll improvements minimizes Cal Water's risk of being out of compliance with labor regulation requirements. This benefits the customer by reducing the legal and labor cost when issues must be corrected.

I2. Projects In Progress Over-Schedule

Introduction

It is typical that projects may experience schedule delays due to a variety of reasons. While each project may be delayed for a specific reason, some typical reasons for schedule delay include:

1. **Local agency permitting issues** – Many projects that Cal Water completes require permits from local agencies such as cities or counties. These permits include Conditional Use Permits, Encroachment Permits, Building Permits, Construction Permits, Electrical, and Mechanical Permits. Discretionary permits also require that the local agency complete a review of the project under the California Environmental Quality Act (CEQA). Cal Water includes time in its project schedules to complete local permitting, however sometimes these processes take longer than anticipated due to staffing challenges at the local agencies, neighbor objections, concerns about site aesthetics or more complicated issues at the project sites such as endangered species, geotechnical conditions or cultural issues. In some cases, obtaining these permits can take more than one year and requires coordination between different agencies.

2. **State Agency Permitting Issues** – Many Cal Water projects require permitting from the State Water Resources Control Board Division of Drinking Water. Some Cal Water projects require permitting from other state agencies such as the Department of Fish and Wildlife. When these permits are known ahead of time, Cal Water includes a reasonable time for their completion in the project schedule, but the schedule may increase for a variety of reasons including the use of new technologies, site environmental issues or a backlog at the permitting agencies.

3. **Federal Agency Permitting/Licensing Issues** - Occasionally, Cal Water projects require permitting from a federal agency. These permits are complicated and, based on the agency's workload, permit time can vary significantly.

4. **Other Utilities Delay** – Cal Water needs to get electrical service from other utilities such as Pacific Gas and Electric (PG&E) and Southern California Edison. Cal Water also must obtain service from local wastewater and storm water utilities. Each utility has its own design, procurement and constructions scheduling processes impacted by their staff availability and competing priorities. Cal Water is largely at the mercy of the timelines of these other utilities.

5. **Material Availability** – Many of Cal Water's projects require specialized materials. If there is higher demand for these materials than production or if there are any supply chain issues, it results in longer wait times to get the materials. Because the market is highly specialized, and compliance with regulations and standards requires time and capital investment, it is difficult for new material suppliers to get into production. Cal Water tries to mitigate this effect by identifying and vetting new suppliers to keep the pool as large as possible, but there are often key areas where there are no additional suppliers available or where all suppliers are experiencing similar delays.

6. **Contractor/Consultant Availability** - Many of Cal Water's projects require specialized contractors, such as well drilling, pipe installation or industrial electrical contractors. If there is higher demand for these contractors, it results in contractors either starting

projects later or requiring premium payments to put Cal Water's projects first in line. Because these contractors require specialized equipment and knowledge, it is difficult for new contractors to enter the market. Cal Water tries to mitigate this effect by identifying and vetting new contractors to keep the pool as large as possible, but there are some areas where there are only a few contractors who meet Cal Water's minimum qualification requirements. Similarly, Cal Water hires consultants to complete specialized design and inspection work or to complete work that is more than its baseline level of work. If these consultants do not have availability, it can delay starting or completing design or inspection work.

7. **Unexpected Engineering/Technical Issues** – In some cases, preliminary design reveals a more complex approach/scope to the project. Accordingly, more detailed assessment and design will be required to move to the next phase(s) of the project. These issues are not easy to predict and can cause delays in the project's completion.

8. **Unexpected Construction Issues** – A variety of issues can come up during construction which delay the project completion schedule. Some examples are unexpected weather, identification of underground site conditions, neighbor issues resulting in projects being stopped, and contractor issues that result in termination.

9. **Project re-prioritization** – Cal Water had other, unforeseen issues that required more urgent attention. These could include things like system emergencies, changes in regulation, or local government actions such as road reconstruction. Often this requires shifting resources or funds to more urgent projects resulting in schedule delays on planned projects.

10. **Land Acquisition** - Search for appropriate land, negotiation with neighbors, and obtaining required permits for land use change is complicated, with uncertain timeline for completion. While, Cal Water works diligently to ensure resolving land acquisition issues promptly, sometime long delays happen out of our Control.

In addition to the reasons listed above which occur in any three-year period, Cal Water experienced unique reasons for delay between the time when the 2021 GRC was prepared and the submittal of the 2024 GRC. These reasons included:

1. **Covid 19 impacts on Supply Chain -** While the COVID 19 Pandemic began in 2020, there were ongoing effects on the availability of materials and contractor labor throughout the period leading up to the 2024 GRC. Cal Water did it's best to adjust to this reality by beginning early procurement of materials and creating master contracts with some key contractors, but many projects still experienced delays as this program ramped up.

2. **Covid 19 impacts on Cal Water Staff -** As it did for workers around the world in a variety of industries, the COVID 19 Pandemic also affected Cal Water's internal staff. Cal Water experienced higher-than-average turnover in areas which affect the ability to build capital projects. Higher than average turnover means that staff are learning the skills necessary to do the job and may miss opportunities to keep the projects on schedule. Every time a project is transitioned from one lead staff to another, work slows as the new team member gets "up to speed" on the details of the project. Cal Water has, through many years, tried to reduce this impact through better training programs

for new staff and through better project documentation to reduce the transition time, but there is still impact.

3. **Covid 19 impacts on Permitting Process -** The COVID Pandemic also affected the local agencies which permit projects. Many projects experienced permitting delays due to staffing shortages at local agencies.

4. **Delayed Decision on 2021 GRC -** A delayed decision from the Public Utilities Commission on the 2021 GRC. Cal Water prepares its capital budgets which include labor hours from internal staff and external resources. In the absence of a CPUC decision, it was difficult to ensure resources were available to work on projects proposed, but not yet approved. As a result, Cal Water had to apply its limited resources differently than anticipated and focus on only some of the more critical proposed projects.

The “in progress” projects in the following table(s) experienced a significant schedule delay as compared with what was presented in the 2021 GRC.

The CPUC includes an earnings test as part of the process for setting future rates. This ensures that, if there are significant schedule delays that result in projects not being completed per the plan presented in the rate case, the customers do not see these rate increases on their bills.

Project ID	Project Description	Project Delay Statement
00116896	CSI Technical Specs	• Unexpected Engineering/ Technical Issues • Covid-19 Impacts on Cal Water Staff
00116003	Portable Booster Pump	• Unexpected Engineering/ Technical Issues
00125030	CSS Dist. System Integrity Tools	• Project Re-prioritization
00115909	2019 Power Quality Analyzers	• Material Availability
00115202	SGMA support & review	• Given available in-house staff and consultant availability, some projects had schedule delays as those projects in Districts with greater water supply needs were prioritized.
00125327	CSS Survey Equipment for Eng South	• Covid-19 Impacts on Cal Water Staff
00125041	CSS AutoCAD AECC Subscriptions	• Covid-19 Impacts on Cal Water Staff
00116011	GIS Development for Valley District	• Covid-19 Impacts on Cal Water Staff
00125096	CSS 2022 Portable Large Test Meter	• Contractor/ Consultant Availability
00118564	RENOVATE HR AREA	• Work performed simultaneously with PID 118570 as both projects shifted to off-hours to minimize business disruption.
00118571	RECONFIGURE IT/ ADDITIONAL TRAILER	• Work delayed due to lack of temporary work space for displaced employees. PID 118570 to be completed prior to start of this project.
00115222	TM - APT Detection & Prevention	• Unexpected Engineering/ Technical Issues • The implementation of module was more complex than originally anticipated.
00114960	WQ-VOC GC/MS	• Unexpected Engineering/ Technical Issues • Project Re-prioritization
00118124	Mobile Comm trailer	• Unexpected Engineering/ Technical Issues • Covid-19 Impacts on Supply Chain • Delayed Decision on 2021 GRC
00124605	CSS SCADA Server & Network Replace	• Unexpected Engineering/ Technical Issues
00117587	REPLACE - DATA CENTER A/C	• Unexpected Engineering/ Technical Issues

Project ID	Project Description	Project Delay Statement
00115880	Supplier Invoice Process Automation	• Unexpected Engineering/ Technical Issues
00115224	File Integrity Monitoring	• Unexpected Engineering/ Technical Issues
00116566	Person Down Radio Solution	• Unexpected Engineering/ Technical Issues
00116215	ENERGY EFFICIENCY IMPROVEMENTS	• Unexpected Construction Challenges
00116910	ADDITIONAL CONF. ROOM -RDOM	• Unexpected Construction Challenges
00099383	FIN MGMT & RPT/TAX PROVISION	• Project Re-prioritization • The implementation of module was more complex than originally anticipated. Tax personnel needed to prioritize tax deadlines
00116819	PowerPlan Income Tax Provision Modu	• Project Re-prioritization
00124855	CSS Media Center - Furniture	• Project Re-prioritization
00115871	Sales and Use Tax Consolidation	• Project Re-prioritization
00115225	Cloud Access Security Broker	• Project Re-prioritization
00124667	CSS Meter Reading Handheld Replace	• Material Availability
00124968	CSS-SC RCC PHASE 2 OFFICE SP. BUILD	• Delayed Decision on 2021 GRC
00124910	CSS-WATER QUALITY SATELLITE LAB	• Delayed Decision on 2021 GRC
00124816	CSS CAMPUS SECURITY FENCING	• Delayed Decision on 2021 GRC
00116883	Groundwater Banking Study	• Delayed Decision on 2021 GRC
00116948	Emergency Response Trailers	• Covid-19 Impacts on Supply Chain • Delayed Decision on 2021 GRC
00123734	CSS 2022 Vehicle Replacement Program	• Covid-19 Impacts on Supply Chain
00115787	2021 Vehicle Replacement Program	• Covid-19 Impacts on Supply Chain
00118572	REPURPOSE FOUNTAIN AREA	• Covid-19 Impacts on Permitting Process
00118570	RECONFIG ENG/ACCTG	• Covid-19 Impacts on Permitting Process
00115888	Supplier Risk Management	• Covid-19 Impacts on Cal Water Staff

I3. Projects In Progress Other

PID	Description	Short Explanation
115207	SGMA support & review	Cal Water's Water Resources group requires strategic and technical support to assist multiple Cal Water districts as part of Cal Water's participation in the development of Groundwater Sustainability Plans (GSP) required with the passage of the 2014 Sustainable Groundwater Management Act (SGMA). It is certainly foreseeable that the GSPs will result in the identification of new water supply projects or programs that Cal Water will be a direct developer of or contributor to which will enable the basins to come into compliance. Given that approximately 50% of Cal Water's supplies are from groundwater and most of the groundwater basins they are extracted from have been determined to be in overdraft Cal Water customers will be significantly impacted by SGMA. SGMA requires groundwater-dependent regions to halt overdraft and bring basins into balanced levels of pumping and recharge. 21 of Cal Water's 24 districts overlie groundwater basins that are designated medium priority or higher as part of the California Department of Water Resources (DWR) basin prioritization process under the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. All of the basins serving these districts will require a GSP by 2020 at the earliest and 2022 at the latest. The development of GSPs will involve complex financial political and technical issues that if not properly addressed will have significant impacts on Cal Water's customers in the form of water supply cutbacks higher water rates and/or other water reliability impacts. Cal Water has limited hydrogeological expertise in house which is (1) not sufficient to meet the needs of the many districts impacted by the law and complex process for developing the plans and (2) already dedicated to other critical activities within Cal Water. In addition while the development of the required GSPs is a large multi-year undertaking there are set deadlines for their development so the resources necessary to support Cal Water are expected to diminish over time.

PID	Description	Short Explanation
124273	CSS PeopleSoft FS&PeopleTools Upgr.	PeopleSoft Financials (PeopleSoft FS) is the software application the Company uses for procurement accounts payable inventory general ledger and financial reporting. This application gathers transactions from several applications such as Oracle Customer Care and Billing WorkDay Power Plant KloudGin and Hyperion to enable Cal Water's day to day operation. The PeopleSoft FS system also supports critical month end and quarter end processes as required by different State and Federal agencies. PeopleSoft FS was last updated to version 9.2 in 2016 to keep the system secured and provide additional functionalities to the users. There are two major components of the system – the application itself and the set of technical tools called PeopleTools in the backend. Both of these components are overdue for a major upgrade but we were able to only focus on the PeopleTools upgrade and delay the application upgrade to keep cost down. The PeopleTools upgrade will fix many of the software bugs released by Oracle and allow for the continued integration with other systems mentioned above. This will help extend the life of PeopleSoft FS for at least one more cycle. The PeopleTools upgrade for the PeopleSoft FS is necessary to keep up with regulatory updates such as tax compliance maintain system security and take advantage of new functionalities that will streamline the user experience. Software updates are provided annually by Oracle to comply with new tax law changes. Additionally outdated software is extremely prone to cyber-attacks so best practice calls for companies to stay on the latest version released by the vendor. The PeopleTools upgrade will also fix some of the nagging issues causing user complaints related to bank reconciliation expense reporting and general ledger. Samples of new features that can provide business value are: From a security standpoint we need to apply security patches regularly to be consistent with the company policy. Non-PO voucher approval. Similar to mobile Expenses implementation of non-PO voucher approvals would also simplify and expedite transactions across the system leading to time and money savings to the organization. Bank reconciliation process improvement Improved searching capabilities by implementing Elasticsearch which is consistently

PID	Description	Short Explanation
		increasing the efficiency of both indexing and retrieving results which positively impacts both the administrator's and end user's performance. PeopleSoft Fluid User Interface

PID	Description	Short Explanation
124473	CSS Automate HR Bidding Process	A job bidding process allows union employees to bid on open union positions. Cal Water negotiated a Collective Bargaining Agreements (CBA) that governs the process in how open union jobs are filled. The Company averages over 3 000 bids annually. For each open position there's approximately 25 other job-related movements that need to be recorded and tracked. The current job bidding process is a manual paper-based process. Any union employees can place a bid for any opening in their district if they meet the required qualifications and skills per the CBA. This requires manual tracking of the bids by location permanent versus temporary job status job classification job description the bidder's disciplinary history employee seniority bidding timeline 90 day roll back rule and other CBA requirements. Imagine the work required to track this manually for two unions and twenty-four operating districts with a decentralized bidding process. A single open job can take up to six months to fill and may cause up to 25 or more open job movements. Each of the new open jobs goes through a similar bidding process as stated above. There are four to ten resolute personnel per district that engage in managing the manual bidding process. Depending on the complexity of the job on average it may take up to 8 hours per open job to validate review and process acceptance of successful bid. Additional hours may require for complex jobs such as IT Tech Support Desk Foreman and etc. Annually it cost the Company thousands of labor hours to manually track and manage the bidding process per the condition of CBA. Company expects to gain cost benefits of approximately $25 000 a year – see ROI worksheet. Cal Water has two unions – UWUA and IFPTE. The automated cloud solution will enable setup of job bidding rules based on the CBA. The solution will enable support for bids by locations open permanent and temporary positions job classifications job descriptions disciplinary history employee seniority bidding timeline 90 days roll back rules as well as other CBA rules. The current paper bidding process is difficult to administer and track time consuming and error prone. This can lead to grievances and disruptions in the workforce. There are approximately several hundred manual bids per month. We have not found any application in the market to fulfill this requirement. The industry

PID	Description	Short Explanation
		standard is to build a custom application based on internal needs that is tailored to the Union contracts in place and has built in flexibility to adopt changes that come out of Union negotiations. Cal Water would like to build a cloud based application that is fully integrated with Workday HCM to fulfill this requirement. This will help ensure union jobs are filled in a timely manner and doesn't impact the level of service provided to our customers and rate payers. The solution supports the following: Cloud system generated bid from Workday open positions and tracking of bids Multiple and interdepartmental bidding Timely filing of open union positions Track vacancies and successful bid awards Ability to create job requirements base on the CBA By locations Job classification Disciplinary history Seniority Bid timeline System generated bid letter Others as needed.

PID	Description	Short Explanation
124483	CSS Digitize Hist. Personnel Rec.	All employees' records are paper based and kept in individual personnel folders. An employee record contains personally identifiable information such as name date of birth Social Security number address and home phone number. The records also have personal documents such as business transactions employment applications tax forms performance reviews disciplinary letters compliance etc. A record serves as evidence of transactions or events that accumulates throughout an individual work-life. It can be used for documentation to support audit legal and official usage. It is estimated at the HR incurs approximately 65 hours a month working with these paper records. The current paper records create a significant risk (e.g. during litigation) to the Company when records are missing or destroyed. The digital records help the Company maintain evidence of activities transactions and personal information. A digital records management system can save money on accessibility storage material and improve efficiency. Compliance with California Consumer Privacy Act (CCPA) is another reason why this project is needed. CCPA was originally intended for consumer data but it will be extended to include employee records in 2021. Through digitizing personal records the Company expects to gain cost benefits of $15 000 a year – see ROI worksheet. Cal Water would like to implement a cloud solution that will integrate with our HR Workday cloud system. A digital personnel file can be opened with just one click. We can access all information and related documents within seconds – wherever we are. The direct integration of the digital personnel file with our HR system (WorkDay) makes it easy to automatically retrieve and synchronize data. HR system allows us to specify which documents and employee information can be viewed by HR staff employees and/or managers. Unlike paper files (which are currently placed in file cabinets) digital personnel files are scalable i.e. they can be adapted to a growing number of employees without incurring high storage costs. So we remain agile at all times and have predictable operating costs. Cal Water has approximately 1250 personnel and 2000 HIPPA and Pension paper files with approximately 150 000 pages from the year 1950 to present. These records include employment personnel performance reviews application resume taxes letters certifications loan applications checks policies medical pension elections and etc. These records are used for Job history promotion retirement grievance certification renewal pension medical

PID	Description	Short Explanation
		related LTD compliance work accommodation etc. Maintaining these documents in electronic form has obvious benefits including ease of accessibility and storage efficiency and to streamline time-consuming administrative tasks. The solution supports the following: 1. Provide secure storage of electronic data 2. Ensure the integrity accuracy authenticity and reliability of the records kept retaining preserving retrieving and reproducing the electronic records 3. Is able to readily convert paper originals stored in electronic format back into legible and readable paper copies electronic records are readily convertible into legible and readable paper copies

PID	Description	Short Explanation
124485	CSS Integrate Data-Dashboard Tool	Data is the new oil as you often hear. Organizations like Cal Water are relying on data to make key business decisions on a daily basis. The timeliness accuracy and accessibility of the data are paramount to the usefulness of the data set. Cal Water focuses on Key Performance Indicators or KPIs to measure the productivity and health of the business. KPIs provide a measurable value that demonstrates how effectively a company is achieving key business objectives. Cal Water is currently unable to provide relevant KPIs related to the number of valves exercises water quality samples taken vehicle accident rate etc. at a glance without committing an extraordinary amount of effort to pull data from disparate systems. Additionally the current dashboards require users to log in to a website versus accessing the information via a mobile app. With employees becoming more mobile the accessibility of the data from anywhere presents a major challenge with the current software platform. Due to the lack of common and centralized data analytics tools Cal Water is unable to efficiently turn their data into actionable intelligence that can support improve and even formally optimize operational policies practices decisions and behavior. Specifically there are multiple different sources of information including: PeopleSoft WorkDay KloudGin PowerPlan Laboratory Information Management Systems (LIMS) SCADA PI Customer Care and Billing (CC&B) and Hyperion. Currently there is no tool for combining these different sources of data into a single location and performing that analysis. In order to effectively manage the business performance Cal Water needs to build dashboards where these disparate data sources can be combined into a single source of data. These dashboards can then be effectively used to analyze information. The more the data is used the integrity is improved. The Company has Tableau Online as its analytics platform fully hosted in the cloud. This tool needs to be matured and developed to help meet the Company's goal The key performance indicator (KPI) dashboard has become a managerial must-have report for assessing business performance. Offering an at-a-glance view of important performance metrics (like customer support and revenue management) this dashboard lets decision makers quickly know if numbers are trending up or down. A well-framed KPI dashboard instantly highlights problem areas. The greatest value of a modern business dashboard lies in its ability to provide real-time information about a company's performance. As a result business leaders as well as project teams are able to

PID	Description	Short Explanation
		make informed and goal-oriented decisions acting on actual data instead of gut feelings. Additional benefits of the project include: Faster analysis intuitive dashboards - Business Intelligence platforms are designed to do heavy-duty processing of data in the cloud or on your company's servers. BI tools pull in data from multiple sources into a data warehouse and then analyzes the data according to user queries drag-and-drop reports and dashboards. The benefit of business intelligence dashboards is making data analysis easier and intuitive empowering non-technical users to tell stories with data without having to learn code. Increased organizational efficiency - BI provides officers the ability to access data and gain a holistic view of their operations and the ability to benchmark results against the larger organization. With a holistic view of the organization officers can identify areas of opportunity. When organizations spend fewer hours on data analysis and compiling reports BI gives them more time to use data to innovate on new programs and products for their business. Improved employee satisfaction - IT departments and analysts spend less time responding to business user requests. Departments who didn't have access to their own data without contacting analysts or IT can now jump into data analysis with little training. BI is designed to be scalable, providing data solutions to departments who need it and for employees who crave data. Trusted and governed data - BI systems enhance data organization and analysis. In traditional data analysis, different departments' data is siloed and users access several databases to answer their reporting questions. Now, modern BI platforms can combine multiple internal databases with external data sources such as customer data, social data, and even historical weather data into one data warehouse. Departments across an organization can access the same data at one time. Accessibility - Gaining access to the dashboards on a mobile device will increase the use and efficiency of the data. The old standard of tying the users to a desktop is no longer efficient and will end up delaying important business decisions.

PID	Description	Short Explanation
124488	CSS Procurement Process Improvm.	Cal Water procures upward of $300M in goods and services each year to support the Company's goal of providing safe and reliable water and excellent services to its customers. The company uses the procurement modules in PeopleSoft Financials as well as other peripheral software applications to support the Procure-to-Pay (P2P) processes. The current system processes in PeopleSoft that support Procurement are convoluted non-user-friendly and labor intensive. Users approvers as well as Procurement staff spend a lot of time creating requisitions approving requisitions issuing Purchase Orders and matching the receipts with invoices. Additionally there is no effective way to manage procurement contracts measure supplier performance and provide self-service features to suppliers. There are also substantial delays with issuing supplier payments due to receipts not having been entered in a timely manner causing hardship especially to small or diverse suppliers. Information across the board needs to be updated in a timely manner on a continuous basis. Cal Water has a mobile workforce that is out and about in the field supporting our customers. However in the current day and age of mobile devices our systems supporting business processes are still entirely desktop driven. This leads to delays with transaction processing that ultimately impact our suppliers and customers. We estimate annual cost avoidance of $223 274 per year – see ROI worksheet. Annual Spend under the current Procurement processes is over $280 million. On an annual basis Cal Water processes approximately: 8 500 Requisitions all of which need to go through approval 7 800 Purchase Orders (sourced via a combination of auto-sourcing & manual) 38 000 Receipts (all entered manually) 94 000 Invoices Currently an excessive amount of time is spent by the Procurement team as well as by requestors to manage these documents while complying with policies using the underlying

PID	Description	Short Explanation
		business processes. For instance the average time taken to source a requisition into a Purchase Order is 4+ days. Similarly the average time taken for a requisition approval is about 3 days. Our goal is to reduce this time spent on P2P transactional work handled by requestors and Procurement staff so that they spend more time working on other work that can better serve our customers. We would also like to reduce the amount of rework done on requisitions due to non-compliance issues. Our goal is to bring down the time taken for sourcing a requisition into a PO to within 24 hours. Currently the onboarding process for suppliers is cumbersome and involves a lot of time and effort. We have several full-time employees within Procurement who spend a large amount of their time maintaining supplier information and keeping our data current. Any delays with P2P processing that delay payments to suppliers lead to penalties for Cal Water and hardships for our suppliers. This is especially impactful to the cash flow of small medium and diverse Suppliers which ultimately will affect our customers and the communities we serve if we cannot receive the services from these small or diverse suppliers Best practices dictate that before an Invoice is paid it must be matched with the respective PO & Receipt. Our staff is often out in the field supporting customers which leads to delayed receiving which ends up clogging up the matching

PID	Description	Short Explanation
124489	CSS Inventory Management System	Inventory and spare parts are manually and independently managed by each district and there are over 20 districts. The inventory process is labor intensive and inconsistent across the Company. The inventory catalog is outdated and storeroom management can be improved. All these inefficiencies negatively impact our ability to serve customers promptly especially in the case of emergency such as wildfire and earthquake response. Company estimates cost savings/ cost avoidance of $211 296 per year starting year 4 – see ROI worksheet. California Water Service has 20+ operating districts (cities) across the state. We have 34 000+ inventory items and spare parts such as wells pump meters motors meter-repair parts valves generators hydrants chemicals pipes locks bolts nuts ductile iron materials etc. These are managed independently at each district's storeroom leading to inconsistent standards duplication of effort inefficiencies wasted materials and delayed response to emergency situations affecting our ability to serve our customers. An automated easier-to-use system would allow for a more efficient and consistent inventory management among all districts. This would for example give company-wide visibility on materials stored at different locations which could be transferred to needed locations during emergency situations. Standardizing and improving our inventory management will have a positive impact in our operations reduce the time it takes to fix damaged infrastructure ensure water quality and public health all of which will lead to better and more affordable service to our customers.

PID	Description	Short Explanation
124492	CSS SCADA security system	Cal Water relies on a Supervisory Control and Data Acquisition (SCADA) system to monitor and control its pump stations storage tanks and other critical equipment related to level pressure and flow. The SCADA system controls these equipment and ensure safe drinking water is readily accessible to our customers. During the past few years Cal Water has improved its SCADA system by upgrading the system in all its 24 district offices throughout the state. The new SCADA system uses the same software to make sure the system is a more uniform system to enable more efficient operation and support when needed. SCADA security was also upgraded to better safeguard the entire SCADA system from cybersecurity breaches and other types of cyber-crime. As with any software package best practice is to keep all software on a version supported by the vendor. The typical upgrade cycle for security software is approximately three years. The current SCADA security system will reach its End-of-life (EOL) in 2021. This poses a significant risk for Cal Water due to the decrease in performance and security. Keeping the software on a supported version will keep cost down since an upgrade is much cheaper than a replacement and vendors will price out of support software as a replacement project. Since SCADA security software will reach its ELO so it must be upgraded. The usual time cycle for upgrades such as these is once every three years. Cal Water is requesting approval for this project to update/refresh the SCADA security system software to continue protecting our water systems and remote access capabilities. A SCADA software refresh will enable the software to run efficiently and be better equipped to thwart any cyber-crime. Also since the software will be updated Cal Water will apply the most recent security patches to the system increasing its cybersecurity posture. Also Cal Water will maintain the system more efficiently because it is the latest version of the software. There are important security and regulatory compliance mandates that Cal Water must adhere to such as the National Institute of Standards and Technology (NIST) and Defense Federal Acquisition Regulation Supplement (DFARS). Updating the security software will ensure Cal Water complies with these critical regulations.

PID	Description	Short Explanation
124496	CSS Zoom Video Conference	The Company has operating Districts throughout California and its employees often communicate and collaborate through video conferencing. The current video conferencing platform was implemented in 2017. System performance is extremely slow it's no longer being manufactured or sold and the vendor announced it will no longer support the software by November 2021. Given the current working environment with COVID-19 employees working remotely is the new standard and the Company needs a better solution. The Company piloted Zoom Video Conferencing Rooms (Zoom Rooms) at the Customer Service Support (CSS) campus in early 2020 and it was widely accepted and used daily. A Zoom Room consists of an existing room of any size large television screen and mount video camera wireless set up iPad laptop and Zoom Software. At CSS campus the Zoom Rooms can host multiple employees. For example the Company's Emergency Operation Center uses a Zoom Room to coordinate its activities throughout the California. The Zoom room gives the approximately 80% of the employees working onsite a mean to communicate with the employees working remotely. Remote workers are also using Zoom as their primary videoconferencing system. The Company wants to install the Zoom Room experience in each California District where multiple employees can join participate and collaborate. Implement a single platform easy to use solution for site to site video meetings and webinars. During recent months due to the COVID-19 pandemic employees are holding virtual meetings with Zoom. The staff has been able to collaborate with social distancing. Rolling this tool out to all Districts will be beneficial for collaboration safety and communications. Even in a post COVID environment the Zoom Room will help reduce travel costs and increase productivity by reducing drive and flight time. Several of our districts like Guerneville CA and Bodfish CA are in very remote locations.

PID	Description	Short Explanation
124544	CSS PC Refresh 2023	Cal Water has over 4 000 technology devices such as desktops laptops monitors and mobile devices to support our employees in completing their daily duties. These devices enable our employees to complete Engineering drawings define the schedule for water quality sample collections communicate with other employees and city agencies and monitor the status of our water distribution and treatment systems. The equipment play a critical role in daily operation and are expected to have 100% uptime. Failure of these devices can result in water quality violations tank overflows degradation of customer service delays in emergency response etc. Its imperative Cal Water follows the standard hardware replacement cycle in order to provide safe drinking water. Computer equipment are not designed to be repaired beyond its useful life due to rapid technology improvements and the limited supplies of older parts. Additionally older hardware's do not work with current software versions due to compatible issues. It's industry best practice to replace technology hardware on a routine basis to achieve Cal Water's mission of providing safe reliable water and excellent service. This is a recurring replacement program to replace 25% of the company owned devices as the assets are reaching the end of life. We will be replacing 60 iPhones 71 iPads 230 workstations 100 laptops 14 Toughbook's and 355 monitors for this year. Department Homeland Security (DHS) considers Cal Water's computer equipment infrastructure to be critical. Cal Water's computer equipment is required to meet standards such as National Institute of Standards and Technology (NIST) Control Objectives for Information and Related Technologies (COBIT) and Information Technology Infrastructure Library (ITIL). As a result Cal Water needs to follow industry best practices. In order to complete a replacement project in a timely manner Cal Water has found it is most efficient to take a proactive approach and currently employs an annual replacement project to upgrade a quarter of the devices every year. Cal Water has maintained this schedule for more than thirteen years to consistently replace the devices according to a schedule which avoids jeopardizing productivity and while keeping replacement costs down. This project replaces obsolete computer equipment and accessories such as desktops laptops monitors tablets and printers used by employees to perform critical tasks. These tasks include but not limited to billing customer accounts producing customer water bills processing customer payments and adjustments starting/stopping service meter reading

PID	Description	Short Explanation
		reporting payroll book keeping backflow/cross connection processing engineering design monitoring the SCADA system water quality sampling and testing and providing essential human resource services. This project is part of the routine computer replacement program to maintain a stable computing environment and compatibility with software and security solutions. The Company has adopted a standard Personal Computer (PC) Refresh program to replace a quarter of the hardware annually in order to control costs and provide support for essential business functions

PID	Description	Short Explanation
124545	CSS PC Refresh 2024	Cal Water has over 4 000 technology devices such as desktops laptops monitors and mobile devices to support our employees in completing their daily duties. These devices enable our employees to complete Engineering drawings define the schedule for water quality sample collections communicate with other employees and city agencies and monitor the status of our water distribution and treatment systems. The equipment play a critical role in daily operation and are expected to have 100% uptime. Failure of these devices can result in water quality violations tank overflows degradation of customer service delays in emergency response etc. Its imperative Cal Water follows the standard hardware replacement cycle in order to provide safe drinking water. Computer equipment are not designed to be repaired beyond its useful life due to rapid technology improvements and the limited supplies of older parts. Additionally older hardware's do not work with current software versions due to compatible issues. It's industry best practice to replace technology hardware on a routine basis to achieve Cal Water's mission of providing safe reliable water and excellent service. This is a recurring replacement program to replace 25% of the company owned devices as the assets are reaching the end of life. We will be replacing 60 iPhones 71 iPads 230 workstations 100 laptops 14 Toughbook's and 355 monitors for this year. Department Homeland Security (DHS) considers Cal Water's computer equipment infrastructure to be critical. Cal Water's computer equipment is required to meet standards such as National Institute of Standards and Technology (NIST) Control Objectives for Information and Related Technologies (COBIT) and Information Technology Infrastructure Library (ITIL). As a result Cal Water needs to follow industry best practices. In order to complete a replacement project in a timely manner Cal Water has found it is most efficient to take a proactive approach and currently employs an annual replacement project to upgrade a quarter of the devices every year. Cal Water has maintained this schedule for more than thirteen years to consistently replace the devices according to a schedule which avoids jeopardizing productivity and while keeping replacement costs down. This project replaces obsolete computer equipment and accessories such as desktops laptops monitors tablets and printers used by employees to perform critical tasks. These

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		tasks include but not limited to billing customer accounts producing customer water bills processing customer payments and adjustments starting/stopping service meter reading reporting payroll book keeping backflow/cross connection processing engineering design monitoring the SCADA system water quality sampling and testing and providing essential human resource services. This project is part of the routine computer replacement program to maintain a stable computing environment and compatibility with software and security solutions. The Company has adopted a standard Personal Computer (PC) Refresh program to replace a quarter of the hardware annually in order to control costs and provide support for essential business functions.

PID	Description	Short Explanation
124552	CSS 2024 Website Enhancements	California Water Service (Cal Water) has created and maintains several websites for its customers. These websites are: www.Cal Water.com www.Cal Watergroup.com www.ccu.Cal Water.com www.challenge.Cal Water.com www.es.Cal Water.com myaccount.Cal Water.com (Cal Water customer portal) For 2020 the average number of monthly “visits” to Cal Water.com is 369 500. While monthly “visits” to Cal Watergroup.com averages a little over 18 000 per month. Approximately 168 000 Cal Water customers are signed up with Cal Water Portal accounts. For September 2020 over 66 000 visits were made to the Cal Water Portal site. California Water Service (Cal Water) has created these¿websites¿for its customers and other parties who interested to learn more about Cal Water. Some of the Information contained within the websites include but not limited to: District information Rates Other Billing information

PID	Description	Short Explanation
		Emergency Preparedness Water Quality. information and alerts Conservation efforts Rebate offers Corporate Charitable efforts and programs Frequently Asked Questions Special Projects Cal Water's websites also enables its customers to perform many self-service functions. Some of which include: Making payments Updating their emergency contact information Reporting Leaks Starting/Stopping Service Ordering Conservation Kits Taking advantage of rebates Finding a local payment center "Contact Us"

PID	Description	Short Explanation
		Cal Water seeks to have its customers become more efficient which in turn enables Cal Water to be more efficient. Since Cal Water's websites are ever evolving applications it is a challenge to keep the websites current and to maintain them. Due to new regulations and other improvements the websites must be updated on a yearly basis. The Corporate Communication and Information Technology teams strive to constantly improve the website to better serve our customers. In years past new functionality has been added to the website to make navigation easier and assist customers with their accounts. The websites must also be updated to adhere to new cyber security requirements that are always arising. As more sophisticated cyber security criminal increases the websites must "keep up" to thwart these access attempts. Also new regulations may be instituted by governing agencies such as the California Public Utilities Commission (CPUC) which may requirement updates to be made to the websites. In 2020 Cal Water updated the website to adhere to the California Consumer Privacy Act (CCPA). Cal Water anticipates additional requirements will be made in future years. In addition Cal Water may be required to make updates to the websites for state national or global events such as the Covid-19 Pandemic. For 2024 Government & Community Affairs and/or Water Resource Sustainability Departments will have new requirements for reporting that will require updates to the website. Also mapping of ongoing and/or upcoming infrastructure projects on the website which will enable Cal Water to better communicate with its customers about upcoming projects. Every year Cal Water performs an automated test for "accessibility" errors. This yearly testing is the equivalent to the "Spelling and Grammar" checker that is found on Microsoft Word. Cal Water seeks to constantly monitor its website for these types of errors and correct them to further improve the look and navigation through the website. Some of the accessibility errors are:

PID	Description	Short Explanation
		Incorrectly tagged images and videos Text incorrectly presented as an image Menu items or forms that are not keyboard accessible Incorrectly nested or labeled page areas Text that is difficult to read for persons with disabilities (because of size lack of contrast etc.) Pages that do not function as expected when using a screen reader A quote for the prior year is attached and Cal Water anticipated the cost this testing to be roughly the same as in prior years (Appendix A). For 2022, we plan on performing a more extensive manual test for the aforementioned “accessibility” errors. This testing will do a “deeper dive” into the Cal Water website to find any more intricate error that will need correcting. This more extensive testing will find structural, design, and procedural errors. Such as: Instructions that don't work for people with screen readers. Forms that can't be filled out correctly without a mouse. HTML tag organization that would not make sense to a blind person. A design or image that could cause difficulties for a person with a cognitive impairment.

PID	Description	Short Explanation
124576	CSS 2023 Network Hardware Replacmt.	Older networks were not built to support the technology demands of today's workforce.¿The modern workforce expects a work-from-anywhere environment. Mobile solutions and cloud-based business applications can overwhelm an outdated network infrastructure. Upgrading to a modernized network makes a real difference to productivity. A requirement for Power Over Ethernet (PoE or PoE+) for items such as security cameras phones and some high-end Wi-Fi access points (AP) is a must-have and using End of Life (EOL) network hardware is a big issue for our network operations due to outdated technology. In addition without replacing network switches and without continued support bug fixes and upgrades Cal Water's network switches are no longer secure leaving our business vulnerable to cyber threats legal complications network crashes and productivity. Using End of Life (EOL) network hardware is not just problematic – it's reckless. When a product's status is End of Life (EOL) replacement parts are also discontinued. This means that replacement parts often become challenging and expensive to find with the passage of time. Businesses must create "Band-Aid" solutions for more complex issues. Network hardware is refreshed using the IT industry best practice lifecycle for this hardware. At Cal Water we must replace it due to End of Life (EOL) hardware support. The Company continues practicing the replacement of network hardware every 4 years or 1/3 of its assets in place. Most network equipment is designed to have Mean Time Between Failures (MTBF) of approximately 50 000 hours (roughly over five years). Failures often occurs in power supplies and fans although environmental issues can also affect the longevity of semiconductor components. At Cal Water our network switches are equipped for Power Over Ethernet (PoE and PoE+) and are likely to have a shorter operating life then those without (PoE) because of larger power supplies more heat and increased air-cooling requirements. Currently all California districts and general office have a total of one hundred twenty Cisco Catalyst 2960 series network switches at thirty-three locations. Effective 2022 these network switches are no longer supported by Manufacturer (Cisco) due to End of Life (EOL) policy. End of Life (EOL) policy means that Manufacturer (Cisco) will NOT provide hardware/software updates technical support and hardware replacement. Therefore in order to avoid unexpected network outages we must replace the remaining eighty outdated network

PID	Description	Short Explanation
		switches in two years' time. This means that we must replace forty network switches starting in 2023 and 2024 respectively. We experienced several network issues last year where one of the two power supplies of a core network switch unexpectedly died, and we could not get a replacement part from Cisco due to End of Life (EOL) equipment. We were very fortunate both power supplies did not die at the same time, this would mean work grinds to a halt until the issue is resolved for the entire company. As a result, we had to purchase a used replacement part from an online vendor to correct the issue. We had another incident where an outdated network switch just died at one of our local offices. The result was a whole lot of people sitting around staring at each other until we replaced this defective switch six hours later. A network outage has serious consequences. Servers, applications and devices may be working perfectly, but they cannot communicate with each other when the network is down. Aside from lost time and output, you will also have the pleasure of dealing with frustrated staff. This project will allow Cal Water to take advantage of some huge benefits such as enhanced performance, increased security, reduced downtime, better communication. New hardware will always be quicker and more productive than the existing hardware. Cyper security is becoming more and more important. Not only is new hardware protected from all existing threats, hackers are unfamiliar with these new systems. Therefore, there is less chance of them becoming vulnerable to security threats for a significant period. Additionally, support will always be available for new hardware for much longer than the existing hardware. New hardware will reduce downtime in the long run. Older hardware becomes less reliable over time and, therefore crashes on older systems can easily become commonplace. However, with hardware upgraded, users will soon discover how downtime is reduced due to the increased reliability of the new hardware The refresh rate is determined by the manufacturer’s asset life expectancy. At Cal Water we must replace outdated network switches to ensure mission-critical systems can continue to run optimally. This project fits under the “Technology Management: umbrella of Cal Water’s Technology Master Plan to provide a robust enterprise architecture.

PID	Description	Short Explanation
124601	CSS 2024 Network Hardware Replacem.	Older networks were not built to support the technology demands of today's workforce.¿The modern workforce expects a work-from-anywhere environment. Mobile solutions and cloud-based business applications can overwhelm an outdated network infrastructure. Upgrading to a modernized network makes a real difference to productivity. A requirement for Power Over Ethernet (PoE or PoE+) for items such as security cameras phones and some high-end Wi-Fi access points (AP) is a must-have and using End of Life (EOL) network hardware is a big issue for our network operations due to outdated technology. In addition without replacing network switches and without continued support bug fixes and upgrades Cal Water's network switches are no longer secure leaving our business vulnerable to cyber threats legal complications network crashes and productivity. Using End of Life (EOL) network hardware is not just problematic – it's reckless. When a product's status is End of Life (EOL) replacement parts are also discontinued. This means that replacement parts often become challenging and expensive to find with the passage of time. Businesses must create "Band-Aid" solutions for more complex issues. Network hardware is refreshed using the IT industry best practice lifecycle for this hardware. At Cal Water we must replace it due to End of Life (EOL) hardware support. The Company continues practicing the replacement of network hardware every 4 years or 1/3 of its assets in place. Most network equipment is designed to have Mean Time Between Failures (MTBF) of approximately 50 000 hours (roughly over five years). Failures often occurs in power supplies and fans although environmental issues can also affect the longevity of semiconductor components. At Cal Water our network switches are equipped for Power Over Ethernet (PoE and PoE+) and are likely to have a shorter operating life then those without (PoE) because of larger power supplies more heat and increased air-cooling requirements. Currently all California districts and general office have a total of one hundred twenty Cisco Catalyst 2960 series network switches at thirty-three locations. Effective 2022 these network switches are no longer supported by Manufacturer (Cisco) due to End of Life (EOL) policy. End of Life (EOL) policy means that Manufacturer (Cisco) will NOT provide hardware/software updates technical support and hardware replacement. Therefore in order to avoid unexpected network outages we must replace the remaining eighty outdated network

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PID	Description	Short Explanation
124609	CSS 2023 SCADA Server Replacement	The older servers become the less value they produce on the efficiency level. Lagging performance means company resources are less responsive and there are increased chances of hardware failure. The warranties for older servers will eventually reach their expiration date which can be the difference between a provided replacement and a purchased investment. Cal Water wants to avoid downtime as much as possible we must replace them before the warranty expires. Network hardware must be refreshed every four years to maintain optimum operational support for integrity reliability and availability. Cal Water's business depends on the Supervisory Control and Data Acquisition (SCADA) systems to operate and distribute safe water to the customers. The hardware needed to support this process must be kept current using the latest technology so that continuous support is maintained. Thus replacing Supervisory Control and Data Acquisition (SCADA) network hardware is a requirement and part of the Company's Master Technology Plan. Applications fail because of data becoming corrupted by things going wrong with the older disks that those applications use. Decreasing the time needed to back up huge amounts of data is also one of the major disadvantages of an obsolete SAN. It's not just data backup that's important to our organization. Unfortunately disaster strikes when we're least expecting it. Whether it's a cyber-attack or a natural disaster if the worst happens we want to know that we can recover our critical business data from across multiple applications. While this isn't possible with all networks it's possible with an updated SAN. Threats to network are more sophisticated and targeted than ever before. The older the infrastructure the more vulnerable it becomes. Ensuring operational support is challenging with outdated/antiquated hardware or systems. The hardware needed to support this process must be kept current using the latest technology Supervisory Control and Data Acquisition (SCADA) system is a critical infrastructure that is required to manage our water systems. Cal Water follows best practices as per ISO 55001- Asset Management hardware lifecycle recommendations to ensure the availability confidentiality integrity and reliability of the hardware that supports this system. The following devices must be continually updated and refreshed to provide foundational support for Supervisory Control and Data Acquisition (SCADA) applications: servers network switches network firewalls and network storage.

PID	Description	Short Explanation
		The Supervisory Control and Data Acquisition (SCADA) system was recently upgraded in 2017 over a span of 3 years to complete in 2020. This critical infrastructure includes servers switches firewalls Active Directory etc. Due to the security requirements to protect the Supervisory Control and Data Acquisition (SCADA) infrastructure it must be kept isolated from other network connections. The NetApp storage hardware must be continually updated and refreshed to provide foundational support. The Storage Area Network (SAN) was purchased and implemented in 2017. It will need to be replaced by 2022 to ensure it follows ISO best practices. In addition we will need additional storage to accommodate data growth. Network switches provide data packet flow for Supervisory Control and Data Acquisition (SCADA) systems between the districts and headquarter.¿¿These devices must be updated continuously with new firmware as well as refreshed every four years to ensure access availability and reliability to SCADA applications.¿The Information Technology Infrastructure Library (ITIL) best practice is to replace hardware as needed to provide confidentiality integrity and availability to our customers. Network firewalls provide security protection that segregate and isolate Supervisory Control and Data Acquisition (SCADA) network from other network connections.¿¿Firewalls must be continuously updated with new firmware and refreshed every 4 years

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124611	CSS 2024 SCADA Server Replacement	The older servers become the less value they produce on the efficiency level. Lagging performance means company resources are less responsive and there are increased chances of hardware failure. The warranties for older servers will eventually reach their expiration date which can be the difference between a provided replacement and a purchased investment. Cal Water wants to avoid downtime as much as possible we must replace them before the warranty expires. Network hardware¿must be refreshed every four years to maintain optimum operational support for integrity reliability and availability. Cal Water's business depends on the Supervisory Control and Data Acquisition (SCADA) systems to operate and distribute safe water to the customers. The hardware needed to support this process must be kept current using the latest technology so that continuous support is maintained. Thus replacing Supervisory Control and Data Acquisition (SCADA) network hardware is a requirement and part of the Company's Master Technology Plan. Applications fail because of data becoming corrupted by things going wrong with the older disks that those applications use. Decreasing the time needed to back up huge amounts of data is also one of the major disadvantages of an obsolete SAN. It's not just data backup that's important to our organization. Unfortunately disaster strikes when we're least expecting it. Whether it's a cyber-attack or a natural disaster if the worst happens we want to know that we can recover our critical business data from across multiple applications. While this isn't possible with all networks it's possible with an updated SAN. Threats to network are more sophisticated and targeted than ever before. The older the infrastructure the more vulnerable it becomes. Ensuring operational support is challenging with outdated/antiquated hardware or systems. The hardware needed to support this process must be kept current using the latest technology Supervisory Control and Data Acquisition (SCADA) system is a critical infrastructure that is required to manage our water systems. Cal Water follows best practices as per ISO 55001- Asset Management hardware lifecycle recommendations to ensure the availability confidentiality integrity and reliability of the hardware that supports this system. The following devices must be continually updated and refreshed to provide foundational support for Supervisory Control and Data Acquisition (SCADA) applications: servers network switches network firewalls and network storage.

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PID	Description	Short Explanation
124612	CSS UPS and Storage Replacement	Older Uninterruptible Power Supplies and Storage Area Network (SAN) were not built to support the technology demands of today's workforce.¿¿Our biggest challenge is using outdated hardware. We may be putting our data and business at risk. The demand for reliable efficient power protection is greater than ever. Power outages are still one of the biggest and still growing challenges for many IT facility managers. The lack of intelligent features for better and easier to manage communication and monitoring capabilities. At around three-year Uninterruptible Power Supplies begin to degrade at a much higher rate. Applications fail because of data becoming corrupted by things going wrong with the older disks that those applications use. Decreasing the time needed to back up huge amounts of data is also one of the major disadvantages of an obsolete SAN. It is not just data backup that is important to our organization. Whether it's a cyber-attack or a natural disaster if the worst happens we want to know that we can recover our critical business data from across multiple applications. Additional storage is also needed to support data growth each year. Uninterruptible Power Supplies and Storage Area Network (SAN) are refreshed using the IT industry best practice lifecycle for these hardware devices. We must replace them every four years. Data storage is required for mission critical systems because it is built to have very high degrees of resiliency. Cal Water needs high availability for its applications faster backups rapid data migration increased data security and fault tolerance. Storage network needs to keep pace with the demands of applications and the ability to support bottleneck detection to identify and alert administrators. Refreshing our storage network provides a great opportunity to clean up our old configuration data and also makes our storage network more secure. Currently all California districts and general office utilize the storage Area (SAN) for electronic storage of company-wide data including databases and data that support the various enterprise resource planning system. This project will allow for getting access to the data and applications that are necessary for our organization implementing disaster recovery as we will be able to get back all the lost data via Disaster Recovery feature and adding additional storage shelves (SAN Arrays) as projected. This Storage Area Network system is critical to the company

PID	Description	Short Explanation
		because it houses all the company's electronic data. Uninterruptible Power Supplies maximize the performance and efficiency of our data center and ensure that power outages do not disrupt service availability or harm critical hardware equipment within the Company's network environment. Energy surges spikes or dips cause fluctuations and irregularities that can adversely affect our system and data so UPS systems provide a clean consistent and uninterrupted power flow that protects against those effects. Uninterruptible Power Supplies are installed in each of Cal Water's thirty-three data centers throughout the Company's service area in California. Cal Water follows best practice as per ISO 55001-Asset Management hardware lifecycle recommendations.

PID	Description	Short Explanation
124669	CSS EAM GIS Modernization	Cal Water maintains and manages the following assets: 4900 Miles of Water Mains, 141 800 Valves, 44 000 Hydrants, 430 Tanks, 610 Wells , 660 Leak Repairs Information for these assets are stored and managed in our Geographic Information System (GIS). The GIS data is currently used for specific use cases emergency response engineering analysis and production of maps for various business projects and requirements. In past rate case capabilities to leverage GIS for field access and collection of data asset location information and expanded user groups have led to improvements in operational efficiency and utilization in other areas. For example we used the GIS system extensively to monitor the four wildfires in 2020 directly in our service area. The maps show the proximity of the fires to our facilities and enable Cal Water to work closely with PG&E/SoCal Edison and Cal Fire on the response plan. Needless to say there's a strong dependency between firefighting and availability of water which relies on our water assets operating at full capacity. Additionally we use the GIS system to pinpoint the neighborhoods we need to contact during boil water or other water interruption events. This project request will continue to build out those capabilities for continued improvement. With the funding allocated in the 2018 GRC Cal Water accomplished the following in progressing our Geographic Information System from departmental and specific uses to supporting companywide operations and business process automation: Completed upgrade of ESRI ArcGIS software for unsupported 10.2 version to current fully supported 10.6.1 release which also eliminated several cyber security vulnerabilities through retirement of legacy hardware and software. Completed migration of legacy applications for utility locates and companywide GIS asset viewer to out-of-the-box GIS functionality based on the 10.6.1 software release noted above. Established GIS governance model and roadmap aligned with the Cal Water Technology Master Plan refreshed in 2020. Deploy GIS-enabled mobile Work Orders for Hydrant Inspection and Maintenance Fire Flow DigAlert Valve Exercising and Main and Service Leak Repair through integration with Kloudgin Unified Mobile Platform.

PID	Description	Short Explanation
		Design and built two-way integration between Kloudgin mobile and GIS to capture map corrections new asset installs inspection and work order results location of events such as main breaks and leaks. Integration of SCADA with GIS to provide locational view of SCADA information and ability to trigger events such as work orders or alerts on visually which can be correlated to other assets on a map. Integration of GIS and Customer data to support Customer Outreach Program for customer notifications outages boil water notices and water quality events. Leverage software to create applications and map services to support emergency operations for wildfires system outages and boil water notices Public Safety Power Shutoffs and COVID-19 response. Leverage software capabilities and publicly available GIS data sources to develop deployment plan for the installation of AMI metering devices to support RDOM pilot. The result of establishing an Enterprise GIS solution will provide the following capabilities and enhancements: Consolidating departmental GIS database, applications and mapping systems into enterprise platform which will reduce number of environments to manage, maintenance and administration cost, duplication of capabilities and functions by promoting reuse and sharing, and improved data governance and management. Establishes a common data schema for a build once, deploy many approach to GIS and mobile solutions such as Customer Outreach and notification, asset inspections, field data collection, and spatially enabled dashboards and reports. Provides a platform for self-service maps and performing GIS functions through the establishment of common data layers, features and functions built and exposed to share

PID	Description	Short Explanation
		across departments and constituents such as developers and contractors for repairs and asset installation. This project will continue to build on previous rate case investments to enhance existing and provide new capabilities for continued improvement.

PID	Description	Short Explanation
124682	CSS Cust. Serv. Analytics Software	Cal Water collects significant data and information about its customers - this initiatve will provide capabilities to aggregate customer data into usable information using technologies such as Art Intelligence Natural Language Processing Advaned Analytic processing spatial and locational information and big data. Access to information often requires IT assistance to extract transform load and format data for analysis - changes or modications require reiterative efforts to reproduce the data in different formats or views. Develop future-state decision processes for customer service and management; identify metrics trending and views/reports required to support the decision processes; build out the data standards to support the decision processes and required views/reports. This solution will focus on important factors for customers as noted in voice of the customer and other feedback channels. The solution will provide the following capabilities: 1) Introduce location to customer information to better understand and visualize usage patterns growth opportunities system performance target areas for new programs and services and other trends 2) Enhance customer experience by better understanding customer activities how they want to interact and transact business how they use our products and services 3) Leverage data to optimize staffing and operations through use of data trends categorization and current KPI's such as call volume appointments field operations.

PID	Description	Short Explanation
124692	CSS EAM-Work Digitization Analytics	As a water service provider California Water Service is part of the 16 critical infrastructure sectors identified by the federal Cybersecurity and Infrastructure Security Agency. The Agency has classified the assets systems and networks of these sectors as vital to the United States. Cal Water manages $3.3 billion of Utility Depreciable Plant and Equipment to provide clean and safe water to our customers located in 26 districts throughout the State of California. The assets include pipes valves tanks pumps wells hydrants treatment facilities instrumentation electrical panel boards meters etc. They are the physical components of a modern water system that allow the Company to provide reliable and safe water and waste water services covered under the Critical Infrastructure Sectors. In 2019 the Company spent $25.4 million to maintain these assets a $2.3 million increase over the previous year. Without an effective Asset Management Program and technology enablers to support it it is expected our annual maintenance costs will continue to increase. California Water Service Company has been developing their Asset Management Program for several years and needs to continue its journey. This project builds upon previous years completed Asset Management projects. The Company and its customers gain incremental value of the overall program after each project completion. As with all programs we will not see the entire value until the program is completed. An effective Asset Management Program with good data is important in ensuring proper operation of these assets at lowest cost while meeting the required level of service at an acceptable risk. To build and effective program the utility needs to be able to address the following five core questions based on US EPA and American Water Works Association (AWWA) guidelines: What is current state of assets? What are the required level of service of the assets? Cal Water continues to mature it Asset Management Program from ad-hoc reactive work to preventative planned programs for managing the life cycle of assets and address the five framework questions of the problem statement above.

PID	Description	Short Explanation
		The Company expects to realize cost benefits from this project starting in 2023 and increases cost benefits over $500 000 after completion via efficiencies cost avoidance and reduced maintenance costs as summarized in the ROI worksheet attached. Improvements and efficiencies have been gained over the last several rate cases to put in place standard operating processes and leverage technology such as mobile work orders and field data collection location enabled (GIS) work processes and work order scheduling. These enhancements to our EAM technology solutions provides the data and analytic tools for the creation of preventive maintenance programs based on asset condition service levels and performance data. This information is then used to support capital investment programs like our Main Replacement Program (MRP) and Capital Delivery projects. However there are still operational processes that differ district to district resulting in multiple data sources inconsistent collection forms and methods and manual or paper based managed systems for collecting and storing this information making it difficult for the data to be utilized for decision making to improve asset lifecycle management. Continued investment and extending the capabilities of this last rate case will allow for continued maturing of our Asset Management Lifecycle programs to standardize operations and data collection. This data can then be used to develop preventative programs to improve asset performance and integrated with other data sources like SCADA and GIS to develop predictive models for asset replacement or refurbishment. With the funding allocated in the 2018 GRC, Cal Water accomplished the following in progressing our Enterprise Asset Management program through standardization and automation of business processes in the following areas: Established federated asset registry and hierarchy leveraging capabilities of Maximo and ESRI GIS to store and maintain data and information for these assets. Integrated Maximo work orders performed by EMT and TMM field staff with Kloudgin to leverage scheduling and execution of the work and capture time worked to be returned to Maximo for timekeeping and reporting. Since implementation of the mobile integration in January 2019, 11824 work orders have been created and dispatched, 10056 completed.

PID	Description	Short Explanation
		Automated hydrant inspection and maintenance activities through integration of Kloudgin mobile platform and GIS. Operations maintenance staff have inspected over 6,700 hydrants since putting the application in service Q4 2019. Our hydrant inspection program ensures they are functioning correctly or perform necessary maintenance to ensure operability. Cal Water operations and contract construction partners repair on average 600 main breaks and leaks annually. The previous process was to record leaks on paper form and provide to office worker to key the leak data into our GIS. The new solution leverages out-of-the-box Kloudgin functionality to automate the field work for main and service leak reporting and repair. The solution also includes the ability to spatially locate the leak or break on a map and send this data to GIS for display, reporting and analysis. The data serves an input for our Main Replacement Program for optimizing capital expenditures. The MRP has been effective in extending the life or our water mains and reducing disruptions of service to our customers. Digitization of paper forms for mobile capture of information for BMP/NPDES processes using Kloudgin mobile platform. This provides the data capture and consistent reporting of unplanned water discharge.

PID	Description	Short Explanation
124699	CSS Customer Feedback Mngmt. System	Our current survey solution only allows a single channel and method for collecting customer feedback and only focuses on customers that have actually contacted us. The current solution limits us to 18 000 data points based on customer contacts which limits our abilities to do trending analysis and address specific Voice of Customer input. Cal Water implemented a base platform to replace the current Pinpoint solution to open up additional channels for receiving customer feedback and allow for more data points and types to be collected. Additionally the existing survey response rate hovers at round 1.2% which is extremely low. This project will allow us to add new functionalities to solicit feedback from customers through Social Media eBilling website mobile app and www.Cal Water.com. Cal Water is known for providing excellent customer service and this is another step in the right direction to continue setting our company programs policies and procedures centered around customer feedback. Cal Water has been providing contactless delivery of its water service for over 90 years. To ensure we provide the quality of product and services that are important to the customer it is key that we ask their opinions and feedback to shape our processes and systems that serve them. Cal Water routinely surveys customers that have had some level of contact either through our call center service centers or field service. These surveys are administered using traditional communication channels such as phone or mail in questionnaires. While the feedback we receive is valuable insight it only provides insight to a small percentage of our customer base. In 2019 Cal Water established the Voice of the Customer based on customer focus groups and feedback sessions. The Voice of the Customer identifies what is important to them in regards to services products and transacting with the company. The categories and most important items to customers included:

PID	Description	Short Explanation
		Setting Up My Home Caring for My Household Paying My Bill Resolving My Issues The implementation of the customer feedback management system in 2021 allows Cal Water to get more frequent feedback from expanded channels such as social media text websites and targeted campaigns. This project will be used to build out additional functionality based on these new capabilities of

PID	Description	Short Explanation
		the platform and implement integration points back to customer service management systems such as Customer Care and Billing. Implementation of these capabilities provide the following capabilities to Cal Water: Collect customer survey results in near real time via multiple channels (voice web and social media) Continue to gain important frequent feedback on what is important and adapt to meet these needs quickly. Respond quickly to events or issues to prevent negative customer experience Prioritize customer experience at all levels and segments

PID	Description	Short Explanation
		Establish a systematic as opposed to ad-hoc approach to continuous customer journey improvements.

PID	Description	Short Explanation
124700	CSS Compliance Monitorng Analytics	Monitoring tracking and reporting regulatory on our regulatory compliance sampling requires our water quality staff to compare multiple sampling schedules from the State and our LIMS system for the 70 water systems we support. We currently only complete this process once a year as it is time consuming manual process which can lead to missing samples or information resulting in notice of violation and possibly fines. In 2018 The Company received 2 notice of violation due missed reported samples related to scheduling problems. These missed reported samples could have been caught if we had an automated way to easily compare the State of California database samples versus the Company's LIMS samples. In 2019 there were no violations for this issue although some reporting issues were experienced. The current manual process of comparing the two systems is laborious and prone to error. The Company needs to have an automated way to compare the 2 systems and quickly identify any reconciling items. This project will consolidate the above data sources through integration and provide the user interface to effectively analyze State and Cal Water LIMS schedules to meet our corporate goal of no primary or secondary water quality violations. Implementing this system is expected to yield cost savings of $76 000 over a 5 year period with benefits starting immediately once the system is in service. An automated comparison tool and visual dashboard will provide improved tracking of

PID	Description	Short Explanation
		samples. Coupled with mobile data collection samples could be collected and compared with both LIMS and State schedules in near real time and reported or displayed on dynamic dashboards. This tool can be used to monitor track and compare schedules much more frequently and efficiently significantly reducing mistakes and missing samples allowing staff to effectively complete our required sample collections and analysis. This project will provide the funding to design a solution for the extract transform and load of data form State and local data sources and build out the reports and dashboards required to monitor tack and compare these data sources.

PID	Description	Short Explanation
124702	CSS Op. Data Management System	Cal Water's 20+ operating districts depend on many sources of data from various systems to perform their daily job measure workforce efficiency and monitor production and delivery processes. These include SCADA for production runtime and distribution system data; LIMS for Water Quality sampling and regulatory monitoring; Meter Data management (AMI AMR) to track usage and consumption; GIS for asset data and locations CCB for customer service and billing; Maximo for electrical-facility-production assets Power Plan for project and fixed assets; Peoplesoft for financial and material usage data; and Workday for employee wages-timekeeping-payroll-department information. Accessing these different systems to locate or lookup needed data for making operating and real time decisions scheduling work and planning capital delivery projects requires much time and manual processing. Extracting this data for analysis requires requests to IT to write programs to pull and aggregate the data from the source systems and provide in a usable format such as Excel or other data analysis software. This process is not timely or efficient making it difficult to effectively analyze data for decision making and identifying opportunities for developing programs and solutions for improving processes procedures and business practices. Design build and implementation of an Operational Data Management System will display data in easy to read maps and traditional tabular dashboards for district operations managers and executives that can be personalized based on required information needed responsible job duties and events. Implementing the highest payback use cases is expected to yield benefits of $2.3 million annually over the useful life of system.

PID	Description	Short Explanation
		The following use cases will be prioritized for implementation in this rate case and extended over subsequent rate cases. - Engineering and Rates can utilize the system for Water Production and Energy Usage for budgeting and identification of process improvements to save energy and reduce costs in the following two target areas. - District Manager can view all field work types and locations on a map whether meter exchange leak repair tank inspection and fire flow. - Engineering and Customer Service can view AMI usage data customer account information overlaid on our GIS system to identify usage patterns to support hydraulic models and proposed capital improvement projects main replacements or facility improvements that improve asset lifecycle system reliability and customer demand. - Regional Call Center Manager can see all Field Activities their status and priority fire flow or flushing activities and pressure data to better identify potential customer issues and provide

PID	Description	Short Explanation
		specific information on potential issues based on where the customer is calling from. - Customer Service Managers can see all customer appointments and setup conditions that can code them by time or duration that could lead to missed appointments in order to take proactive measures which improves our GO 103 Key Performance Indicators. - Engineering and Operations can view and filter assets by condition correlated with other facilities and customer complaints to identify assets for either preventative maintenance programs or full replacement. - Emergency Operations can leverage the OD

PID	Description	Short Explanation
124703	CSS LIMS Software Enhancements	Our LIMS system is used to track samples testing data and results and produce state and federal water quality regulatory reports. As regulatory requirements change our reporting requirements and LIMS software must accommodate new rules programs and needs. In addition systems will need to stay current with hardware and operating system application and database software to minimize cyber security risks. The LIMS software will need to be updated to address these changes. Without maintaining and getting our LIMS software up to date ensuring compliance would be challenging. Since our inception more than 90 years ago California Water Service (Cal Water) has been committed to enhancing the quality of life for our customers and communities. One of the most important ways we do this is by providing a reliable supply of safe high-quality water any time you turn on the tap. And while standards continue to become more stringent Cal Water continues to ensure high quality safe drinking water. In 2019 Cal Water lab staff conducted 37 938 tests on 6 639 water samples for 200 constituents and met every primary and secondary state and federal water quality standard. This information is stored and managed in our LIMS a sophisticated software program that enables us to react quickly to changes in water quality and analyze water quality trends in order to plan effectively for future needs. Continued investment in our LIMS software capabilities to stay current with regulatory requirements and cyber security standards to protect our data is critical to maintaining our operations and continuing to meet all water quality standards. As an example in early 2020 the Division of Drinking Water announced lower response levels for PFOA and PFOS (10 ppt for PFOA and 40 ppt for PFOS) from the previous level of 70 ppt combined. PFOS and PFOA are manmade compounds used prevalently in firefighting foams and to make carpets clothing fabrics for furniture paper packaging for food cookware and other items resistant to water grease fire or stains. They are also used in a number of industrial processes. They are part of a larger group of chemicals referred to as per- and poly-fluoroalkyl substances (PFAS). Knowing that these are constituents of emerging concern Cal Water had identified and tested water sources in 2019 and earlier that would be more likely to have these compounds present. With the updated response levels we are working through our plan to conduct additional testing for

PID	Description	Short Explanation
		these constituents in all of our water systems. This required us to configure and update our LIMS software
124978	CSS Energy Management System	We currently do not have a well established method for collecting energy data. We are required to provide reports on energy consumption to various agencies and the data takes time to produce and is not consistently available. Additionally we have no method for optimizing energy use within the company. Energy is the 3rd largest expense in the company with an average annual expenditure of approximately $30M. Energy optimization can improve energy efficiency by 2-3%. Additionally having energy data readily available reduces the time to develop different reports.
124754	CSS Recycled Water Strategic Plan	Develop a strategic plan for evaluating recycled water projects that are brought to Cal Water by other agencies. This plan will aid in the allocation of resources toward projects that would be most beneficial for Cal Water customers.

Section J.

Under Threshold Projects

PID	Description	Detail
132211	Workday Modification/Configuration	MSPO was developed to enhance the delivery of projects by providing project managers with a PM focused tool to manage scope schedule budget and by providing enhanced data and reporting including schedule variance risk, issues tracking and status etc. It is desired that MSPO be leveraged by the entire enterprise and the master plan will develop the plan to do that.
132318	CSS 2025 VEHICLE REPLACEMENT PROGRAM	Cal Water currently uses the Department of General Service's guidelines of 120,000 miles for vehicle replacement of the company fleet
132446	CSS 2025 SUV	The SCADA Supervisor travels frequently as part of the role and responsibilities of that position. They are required to work with districts routinely on training and enhancements of the SCADA system. In addition to routine travel for work, there is emergency response support that frequently requires travel during off duty hours. Approximately 60% of normal working days include travel to different work locations away from the home office and at times they can be on projects for extended periods which would reserve a pool vehicle for that entire period. A mid-size vehicle is suitable for this role.
132448	CSS 2025 Sedan	Vehicle needed for inspections, training, meetings and/or district audits. In one year where we were doing the audit program, the vehicle was reserved 63 times in that year with multiple days for some weeks which required multiple reservations per week. In person training has started as well requiring travel. The other issue is him being able to quickly get to a district to support an emergency and having his equipment and safety gear with him as is typical for program manager emergency support.

PID	Description	Detail
132579	Windows 11 Upgrade	Outdated computers can be problematic for many reasons. Any computer failure can result in system freezes, crashes or irreparable damage or loss of data. There are potential legal ramifications for data loss and customer service interruption/degradation. The company will suffer huge financial costs and wasted time and human output. Windows OS is the core of each computer system. It is essential to always maintain up-to-date computers. Computer equipment failure could cause some significant impact on the following: -Compliance - Potential legal ramifications -Water quality - Missing or corrupted data -Efficiency - Wasted time and human output; Huge financial costs -Safety – Inaccessible systems -Customer experience - Interrupted customer service and degraded service level
132791	2025 UPS Replacement	Replace and upgrade the outdated Uninterruptible Power Supplies (UPS) per the refresh rate and scheduled timeline. Safeguards against all the oddities of electricity such as surges, spikes, dips and failure because the UPS essentially senses those things and switches to alternate power before the anomalies cause damage. No service outages. The refresh rate is determined by either the manufacturer's asset life expectancy or the past realized lifecycle of the asset.

PID	Description	Detail
132809	Virtual Reality Safety / Ops Modules	The immersive nature of VR provides the flexibility to create various types of environments or experiences such as fire suppression, rotating equipment lock out / tag out and fall protection safety training. Accordingly, VR can be used to experience safety situations that are hard to come by in real life or that can be dangerous to go through in real life. For example, Cal Water districts have been experiencing heavy rainfall that results in flooding of our pump stations while rotating and energized equipment is operating. VR could be leveraged to create training scenarios for these types of natural disasters (e.g. flooding) that would be highly improbable to simulate in a live training session.
132924	Workstations (4) for future staff	Staffing needs continue to grow as the capital program grows. Torrance office lacks available workstations to accommodate staff additions.
132925	Workstations (4) for future staff	Staffing needs continue to grow as the capital program grows. Bakersfield office lacks available workstations to accommodate staff additions.
132926	Office Furnishing for Manager	Staffing needs continue to grow as the capital program grows. Torrance lacks available offices to accommodate management staff additions.
132927	Office Furnishings for Manager	Staffing needs continue to grow as the capital program grows. Bakersfield lacks available offices to accommodate management staff additions.
132962	Demand Model Update	Existing demand model created does not include water use objectives defined by upcoming state regulations and climate change impact.
133317	Design Electrical Service Expansion	California Water Service Company is developing its plan to electrify its fleet vehicles per the California mandate. California Executive Order (N-79-20) calls for the elimination of NEW internal combustion passenger vehicles by 2035. Additional electric vehicle charging stations are needed to support the transition

PID	Description	Detail
		of CSS pool and company vehicles to electric vehicles. A new power distribution plan to be developed to support the additional electric vehicle charging stations. Initial investigation has confirmed there is sufficient power service to the site, but a new distribution design and installation is required. This project to include: - design - permitting - electrical distribution panel wiring, Charge point electric vehicle stations - installation of electrical distribution panel(s) and EV charging stations A commissioned study by Mercury developed the vehicle conversion plan and schedule. The report also estimates savings through reductions in fuel consumption and maintenance costs.
133319	CSS- DESIGN NEW 4TH ST ENTRY	The California Department of Transportation (Caltrans) in cooperation with the Santa Clara Valley Transportation Authority (VTA) and the City of San Jose proposes to construct improvements on US Highway 101 (US 101) and adjacent local roadways in San José. The Project includes constructing a new overcrossing above US 101 connecting Zanker Road on the north with Fourth Street and Skyport Drive on the south, replacing nonstandard ramps on northbound US 101 at Old Bayshore Highway and Brokaw Road with new ramps at Bering Drive widening local roadways to accommodate the overcrossing and ramp modifications and incorporating bicycle and pedestrian facilities into the project design. The expansion along Skyport would include an eminent domain claim of the Northern strip of the Cal Water parcel that would eliminate the North entry and driveway from North 1st street through to the back of the parcel closest to North 4th Street. In anticipation of this claim, a plan needs to be developed to ensure Cal Water can continue to support safe access on and off the campus while maintaining emergency vehicle access and safety of employees walking on the property.

PID	Description	Detail
133493	ROV for Asset Condition Assessment	Tank and well assets are expensive but difficult to monitor condition. Inspection of a tank requires draining the tank (which disrupts operations) or contracting a diver (which carries risk and liability). Well casings which are ten to sixteen inches in diameter and hundreds of feet deep can be especially difficult to monitor over the decades the asset lasts. Obtaining condition data then becomes expensive and relies on the schedules of external contractors. Procurement of remote operated vehicles, aerial drones, wall thickness detectors and downhole well cameras would allow Cal Water to collect regular condition data in an efficient and cost-effective manner.
133584	CSS- STUDY TO RELOCATE GAS LINE	The presence of a gas line placed in an area to the South of CSS bldg. B at a depth of just 18" below grade impacts our ability to maximize the use of this space. This project will develop and execute a plan to relocate the gas line to enable use of this area for additional workspace or space for employee use.
133585	CSS-RDOM 2ND FL. REDESIGN	CSS departments occupy the second floor of the RDOM district office building. Growth in CSS presence, the departure of a longtime tenant and the planned downsizing have created the need to improve the floor plan to more effectively support the teams. Additionally the building's mechanical system has reached its expected useful life and needs to be replaced. The design of the mechanical system will be based on the floorplan and space it needs to support. It would be short-sighted to not update the floorplan to maximize the efficiency of the space and know the mechanical system will support the layout and use. The project will engage an architect to work with the departments to develop updated programming for current use and planned growth. Work adjacencies will be considered when developing new floorplans to address team needs for the long term.

PID	Description	Detail
133596	CSS 2025 mobile water stations	We get frequent requests for bottled water from cities and nonprofits to serve at public events. We also provide bottled water during emergencies. These mobile dispensers eliminate bottled water from those circumstances. We do not have to decline request for bottled water for public events and we can dispatch these to emergency situations in which people can use dispensers as fill stations.
133658	Upgrade Cal Water.com 2025	When it comes to our web properties our Group site stands as our corporate flagship. However, Cal Water.com is the site the majority of our customers know best. It is the digital face of Cal Water. Outside of providing the expected experience for the average consumer we also want to improve that experience for every customer while meeting current web standards and preparing for new standards that are forthcoming. For 2024 through 2027 we will be looking to improve the overall look and feel of the website while meeting or exceeding compliance and accessibility standards. In line with our “doing the right thing” mantra and to protect our organization from unnecessary risk our accessibility strategy is to maximize the customer experience while minimizing the potential for legal action. Maximizing the customer experience in the area of accessibility is not an easy task. It requires multiple vendors executing months of testing and maintaining routine checks consistently and perpetually. The digital content we provide on the website will be tested through automated cycles and through manual processes (this means tested by people who need the content in its most accessible form). It’s worth noting that we are in the process of refreshing the current site and are working towards current accessibility standards with that work. However, it’s also important to note that the accessibility landscape is changing rapidly and is becoming more of a touchpoint for governing bodies including the California State Legislature. This year AB1757 was introduced in Sacramento. This proposed law specifies that individuals may be entitled to statutory damages if a person “personally encountered a barrier that caused the plaintiff to experience a difference in their

PID	Description	Detail
		ability to access or use the website as compared to other users such that the plaintiff was unable to acquire the same information engage in the same interactions or enjoy the same services with substantially equivalent ease of use or to have the same
133709	ICP-MS	Replacement for an instrument at the end of its ten-year life span This instrument is required to perform DDW mandated tests.
132673	Upgrade/ Redesign Cal Water.com 2026	When it comes to our web properties, our Group site stands as our corporate flagship. However, Cal Water.com is the site the majority of our customers know best. It is the digital face of Cal Water. Outside of providing the expected experience for the average consumer we also want to improve that experience for every customer while meeting current web standards and preparing for new standards that are forthcoming. For 2024 through 2027 we will be looking to improve the overall look and feel of the website while meeting or exceeding compliance and accessibility standards. In line with our “doing the right thing” mantra and to protect our organization from unnecessary risk our accessibility strategy is to maximize the customer experience while minimizing the potential for legal action. Maximizing the customer experience in the area of accessibility is not an easy task. It requires multiple vendors executing months of testing and maintaining routine checks consistently and perpetually. The digital content we provide on the website will be tested through automated cycles and through manual processes (this means actually tested by people who need the content in its most accessible form). It’s worth noting that we are in the process of refreshing the current site and are working towards current accessibility standards with that work. However, it’s also important to note that the accessibility landscape is changing rapidly and is becoming more of a touchpoint for governing bodies including the California State Legislature.

PID	Description	Detail
		This year AB1757 was introduced in Sacramento. This proposed law specifies that individuals may be entitled to statutory damages if a person “personally encountered a barrier that caused the plaintiff to experience a difference in their ability to access or use the website as compared to other users such that the plaintiff was unable to acquire the same information engage in the same interactions or enjoy the same services with substantially equivalent ease of use or to have the
133491	CSS 2026 Asset Mgmt Large Tools	Diagnostic and calibration tools are necessary to perform corrective and preventive maintenance on all types of equipment such as chemical analyzers panelboards SCADA automatic control valves standby generators customer and production flowmeters pumps motors and other CWS assets. New technology can help us perform our duties more efficiently. Old equipment becomes unserviceable or is broken and needs to be replaced.
133602	CSS 2026 RO Model Improvements	To ensure that Cal Water maintains a stable, reliable and accurate model able to provide timely results it is essential to keep up with the ever-evolving maturity cycle. The model developed for Cal Water’s 2018 GRC contained basic functionality suited for initial use. Since that time additional experience has been gained from operating that model and future modifications have been identified. Utility Consulting Group LLC (UCG) has also produced functional updates to the RO Model for other peer companies at that time as well. While Cal Water’s initial model has since undergone some modifications it will be several years since implementation and time to leverage further updates in functionality. The planned enhancements to Cal Water’s RO Model will simplify the calculation of the revenue requirement and rate design. This will improve scenario planning reporting capabilities and enable quicker turnaround times in the GRC process. This update will also allow the Commission to view and operate models that are not too dissimilar from peer companies in functionality.

PID	Description	Detail
132578	IT Equipment for new headcounts	Cal Water will provide standard IT equipment for each approved new headcount. This is required for the new employees to provide essential customer service to the customers. Inadequate computer equipment could cause a significant impact on the following: -Compliance – delay incomplete report -Water quality – delay missed deadlines incomplete report -Efficiency – extra manual process the longer processing time -Safety – failed system alerts inaccessible systems -Customer experience – degraded customer services
132666	Audit and Compliance Management App	"An audit and compliance management cloud application are an essential tool for businesses of all sizes to manage their regulatory compliance, mitigate risks and ensure effective governance. The software can automate compliance monitoring risk assessment policy management and reporting among other critical functions. The below justification will explore the benefits of implementing compliance software and why it's necessary for any organization to consider. The primary beneficiary of the tool focuses on the following functional groups: Internal Audit ESG and Environmental Affairs. 1. Improved Compliance: Regulatory compliance is essential for any business and non-compliance can result in hefty fines and reputational damage. Compliance management software ensures that California Water Service stays up to date with the latest regulations and compliance requirements. The software can also automate compliance monitoring and help identify areas of non-compliance, reducing the risk of regulatory violations. 2. Enhanced Risk Management: Every business faces risks and compliance management software can help identify assess and mitigate these risks and associated costs to customers. The software can perform risk assessments, track risk mitigation strategies and generate risk reports to help organizations make informed decisions. With GRC software you can proactively manage risks and

PID	Description	Detail
		minimize their impact on your business. 3. Streamlined Governance: Effective governance is critical to ensuring that an organization operates efficiently and effectively. Compliance management software can automate policy management document workflows and create a centralized repository for standardized GRC data needs policies and procedures. This streamlines the governance process ensures that employees are aware of their responsibilities and reduces the risk of policy violations. 4. Increased Efficiency: Manual data collection compliance and risk management processes can be time-consuming resource-intensive
132667	ImageQuest Upgrade	"Efficiencies - Bug fixes and new functionality will be available. The system allows for AP invoice automation and provides paperless support for team members across California. Compliance – Cal Water relies on ImageQuest for the accurate reporting of our expenses. It provides paperless access for audit purposes. Customer Experience - These are critical for supporting the expense and capital charges submitted in the GRC rate cases."
132804	Integrate HIS with LIMS	Cal Water would like to set up an automated process to sync data from the Environmental Management platform with other Cal Water systems. This is to eliminate the manual work that is currently tedious and may lead to errors in reporting. And to also improve efficiency gather data and generation of reports and dashboards. The following Cal Water applications will have integrations built: -LIMS -Analytical data from LIMS may be transferred to the Environmental platform as

PID	Description	Detail
		required for reporting purposes. -Maximo (EAM) Assets regulated by environmental agencies require input of data from the Environmental platform in order to provide accurate data and up-to-date requirements to engineering operations and other internal departments. This also aids in the design and implementation of capital projects. Maintenance documented in Maximo is required to be reported to government agencies and will need to reside in some of the reporting data fields in the Environmental platform. -GIS Environmental data is required to be represented in GIS and/or Asset viewer to help with data analysis. This may be incorporated in to other plans for the GIS system. The initial plan is to provide site level visual cues (icons) and links to further information stored in the Environmental platform regarding important environmental compliance requirements. -ODMS (Data warehouse) All data contained in the Environmental platform should be available in ODMS. Future – There may be some data within ODMS that may need to be viewable in the Environmental platform data fields. In addition to the integration there will be reports and dashboards created to display consolidated data and replace the manual processes that create the current reports

PID	Description	Detail
133492	CSS 2027 Asset Mgmt Large Tools	Diagnostic and calibration tools are necessary to perform corrective and preventive maintenance on all types of equipment such as chemical analyzers panelboards SCADA automatic control valves standby generators customer and production flowmeters pumps motors and other CWS assets. New technology can help us perform our duties more efficiently. Old equipment becomes unserviceable or is broken and needs to be replaced.
133544	High perf PC's + CSSmonitors	The latest CAD software and advanced 3D packages require high performance PCs to run effectively. Standard issue PCs do not meet the stated minimum performance required by Autodesk run slowly and/or crash when running such software.
133659	Upgrade Cal Water.com 2027	When it comes to our web properties our Group site stands as our corporate flagship. However, Cal Water.com is the site the majority of our customers know best. It is the digital face of Cal Water. Outside of providing the expected experience for the average consumer we also want to improve that experience for every customer while meeting current web standards and preparing for new standards that are forthcoming. For 2024 through 2027 we will be looking to improve the overall look and feel of the website while meeting or exceeding compliance and accessibility standards. In line with our “doing the right thing” mantra and to protect our organization from unnecessary risk our accessibility strategy is to maximize the customer experience while minimizing the potential for legal action. Maximizing the customer experience in the area of accessibility is not an easy task. It requires multiple vendors executing months of testing and maintaining routine checks consistently and perpetually. The digital content we provide on the website will be tested through automated cycles and through manual processes (this means tested by people who need the content in its most accessible form). It’s worth noting that we are in the process of refreshing the current site and are working towards current accessibility standards with that work. However, it’s also important to note that the accessibility landscape is changing rapidly and is

PID	Description	Detail
		becoming more of a touchpoint for governing bodies including the California State Legislature. This year AB1757 was introduced in Sacramento. This proposed law specifies that individuals may be entitled to statutory damages if a person “personally encountered a barrier that caused the plaintiff to experience a difference in their ability to access or use the website as compared to other users such that the plaintiff was unable to acquire the same information engage in the same interactions or enjoy the same services with substantially equivalent ease of use or to have the
134646	CSS - VEHICLES FOR NEW COMPLEMENTS	Vehicle required for new complements. Please see justification for new complements.
133490	CSS 2025 Asset Mgmt Large Tools	Diagnostic and calibration tools are necessary to perform corrective and preventive maintenance on all types of equipment such as chemical analyzers panelboards SCADA automatic control valves standby generators customer and production flowmeters pumps motors and other CWS assets. New technology can help us perform our duties more efficiently. Old equipment becomes unserviceable or is broken and needs to be replaced.
132445	CSS 2025 Midsize Pickup W/4WD	Vehicle for SCADA Technician

California Water Service Company

CSS Project Justification Book

2024 General Rate Case

www.Cal Water.com

CAPITAL PROJECT JUSTIFICATION

Rancho Dominguez

2024 General Rate Case
A.24-07-____ (For Test Year 2026)
July 2024

California Water Service

Quality. Service. Value.

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Table 1. Capital Budget Summary – RDOM

Project ID	Description	Direct Cost[a]	Inserted [b]
132339	RD 2025 VEHICLE REPLACEMENT PROGRAM	$1,193,755	X[d]
132340	RD 2026 VEHICLE REPLACEMENT PROGRAM	$1,142,058	X[d]
132341	RD 2027 VEHICLE REPLACEMENT PROGRAM	$1,228,608	X[d]
133580	RDOM Replace Media Ctr Furniture	$79,754	X[e]
133598	RDOM-AMI INITIATIVE-VEHICLES/EQUIP	$559,957	X[d]
133605	RDOM Replace Office Furniture	$82,106	X[e]
133606	RDOM Replace Stairwell Carpet	$86,677	X[e]
133607	RDOM Replace Pergola	$88,844	X[e]
133608	RDOM LED Light Fixture Retrofit	$321,495	X
133609	RDOM Updated First Floor Space Plan	$97,954	
151-NON-SP	151- Rancho Dom Reg Non-specific	$269,800	X[d]
151-NON-SP	151- Rancho Dom Reg Non-specific	$276,600	X[d]
151-NON-SP	151- Rancho Dom Reg Non-specific	$283,500	X[d]
Total	**13**	**$5,711,107**	

Notes:

(a) Direct costs include escalation, but exclude construction overhead and AFUDC.

(b) Only projects above the District threshold of $100,000 direct cost are presented in this book with specific or programmatic justifications (see Section A for additional discussion).

(c) Due to confidentiality concerns, details for Physical Security projects are included separately within the Confidential justification book.

(d) Project presented in the Common Plant Justification Book.

(e) Projects presented in Section M. Under Threshold Projects

Section A.

Routine Replacements

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Section **B.**

Security Projects (Physical and Cyber)

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Section C.

Software/Hardware Upgrades

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Section D.

Water Supply and Reliability

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Section E.

Facilities Projects

District – RDOM

PID # 00133608
LED Light Fixture Retrofit

Introduction

As part of a 2017 sustainability report prepared by Impec Group, a Facility Management firm, calculated total energy usage by the Racho Dominguez district office represented 18% of all office facilities company wide. Based on their review, office lighting was identified as a key area to improve energy efficiency. These findings were reiterated in a more focused energy efficiency review conducted by Edison Energy in 2023.

Deficiencies and Issues

The Rancho Dominguez district building as the second largest office site consumes 18% of energy used among all office sites companywide. There is an energy sustainability opportunity by retrofitting current fluorescent interior lights to LED.

The LED retrofit kits will use approximately 72% less electrical usage compared to fluorescent T8 and T5 lamps. Fluorescent lighting has a life space of approximately 2-5 years, whereas LED lighting can last more than 10 years.

Alternative Analysis

The following alternatives were analyzed:

Alternative 1: Do Nothing

Continue as is. This would not address Cal Water's commitment to reduce our energy consumption.

Alternative 2: Light Fixture Replacement

Replacement of existing fluorescent light fixtures with LED fixtures would be more than double the proposed retrofit cost with minimally further improved energy efficiency.

Recommended Solution

Cal Water proposes to implement more efficient LED lighting retrofit kits throughout the facility to decrease energy consumption, provide better quality lighting for employees, and reduce both maintenance and energy costs.

Project Summary

LED lighting provides key benefits such as:

- Better for the environment as they are mercury free

- Provides the equivalent number of lumens (brightness measurement), with a reduced wattage consumption
- Reduce expenses related to energy consumption in a high cost state
- Provides better quality lighting
- Reduced replacement schedule and maintenance services

Office Building Utilties - 2016 Percent of Total Usage		
District	KWhr Total Sum of Usage	% of Usage
Atherton (Bear Gulch)	72,024	1.9
Bakersfield	165,498	4.4
Bayshore (Mid Peninsula)	82,187	2.2
Chico	29,351	0.8
Dixon	3,249	0.1
East Los Angeles	253,425	6.8
Guerneville (Armstrong)	11,991	0.3
Hawthorne	13,325	0.4
King City	31,546	0.8
Livermore	69,681	1.9
Los Altos	66,314	1.8
Marysville	42,065	1.1
Oroville	29,437	0.8
Palo Verdes	68,979	1.8
Rancho Dominguez	672,910	18
Salinas	133,628	3.6
San Jose	1,589,921	42.5
Selma	50,635	1.4
Stockton	139,985	3.7
Visalia	159,962	4.3
West Lake	51,349	1.4
Willows	5,294	0.1

Project Attachments

- Attachment A – Cost Estimate
- Attachment B – LED Fixture Retrofit Budgetary Estimate

Attachment A

Capital Project Cost Estimate

Project No. : 133608
Description LED Light Fixture Retrofit
District / Department: RDOM
Project Start Date: 01/01/26
Project Completion Date: 12/31/26
Prepared By: jagraham
Date Initiated: 12/13/2023
Base Year: 2023
Sub-Total: $298,540
Direct Cost: $321,495

Cost Table:

Item	Description [units]	Qty	Unit Cost	Total	Cost Basis
10% CONTINGENCY	LS	1	$27,140.00	$27,140.00	Additional Factors
Install new LED lights and controls	LS	1	$271,400.00	$271,400.00	

Sub-total = $298,540.00
Direct Cost = $321,494.93

Notes:
1. Sub-Total is defined as the summation of all project estimated materials, labor, and markups costs
2. Direct Cost is the escalate Sub-Total from the base year of 2023 to the project completion year assuming a 2.5% inflation rate
3. See Common Plant Book for additional details on cost estimating methodology and justification

Attachment B

Comfort International Inc.
2570 North First Street, 2nd Floor
San Jose, CA 95131
Phone: 888 518-1118
Fax: 888 600-3880
www.comfortintl.com

March 1, 2024

CALIFORNIA WATER SERVICE COMPANY
1720 N. First Street
San Jose, CA 95112-4598

Attn: Jennifer Olsen

Reference: 2632 237th Street, Torrance, CA LED door kit lighting upgrade

Dear Jennifer,

Comfort International Inc. is pleased to provide this proposal for the above reference project. Our proposal is based on the following scopes and assumptions.

Scope of Work:

- There are approx. (326) 2'x4' recessed troffer type fixtures with (1,196) fluorescent lamps to be retrofit with LED door kits.
- There are (42) 2x2 recessed troffer type fixtures with (84) fluorescent U-lamps to be replaced with LED door kits.
- There are (26) recessed can fixtures with (26) compact fluorescent lamps to be replaced with LED lamps only.

For the above scope of work we quote the sum of One Hundred Two Thousand Eight Hundred Fifty-Seven Dollars and no cents $102,857.00

Exclusions/Clarifications:

- Any work or material not mentioned above.
- Demo of existing ductwork
- Overtime premium costs unless stated in above scope.
- LEED certification
- Any Title 24 commissioning
- Any unforeseen existing conditions
- Any mechanical engineering designs or drawings
- Functionalities of existing control system or hardware before or after this project
- Any existing equipment, ie. control valves, sensors!
- Any VFD unless stated in above scope.
- Air or water balance unless stated above scope.
- Liquidated damages
- Electrical for 110VAC or above
- Plenum rated cables shall be freed run above ceilings.
- Installation or maintenance of phone lines or IP network connections
- Installation of control valves, temperature wells, pressure transmitters, or damper actuators
- Permits, plan check fees, performance and payment bonds

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A Minority Owned Company

Comfort International Inc.
2570 North First Street, 2nd Floor
San Jose, CA 95131
Phone: 888 518-1118
Fax: 888 600-3880
www.comfortintl.com

- Fire Protection and life safety systems.
- All cutting, coring, patching, painting, grouting, fireproofing, and framing of all openings in floor, decking, ceilings, roof, and walls.
- Trenching or backfill
- Demo and removal of hazardous or contaminated materials.
- Temporary utilities, including water, sanitary, construction water, power, heating, ventilation, and lighting etc. along with cost of same
- Seismic calculations

Thank you for the opportunity to provide this proposal for the above reference project. We look forward to working with you and your company. Please feel free to contact us if you have any questions or if we can be of further assistance. This proposal shall expire 30 days from the issuance date.

Regards,

Alan Pong
Comfort International, Inc.

Payment terms: 30% invoiced upon acceptance of this proposal.
25% invoiced upon delivery of material.
45% balance invoiced upon completion of work.

- Terms of Proposal: Comfort International Inc. will accept this project (see attached credit application) upon approval of our credit terms. Payment of Comfort International Inc. invoices are due thirty (30) days from invoice date. Interest at a rate of one and a half percent (1.5%) per month will be charged on all amounts not paid within thirty (30) days. If legal action is required to enforce this agreement, the prevailing party shall recover its attorney fees and costs.

If this proposal is acceptable, please sign and return one copy to the address above.

Proposal
Accepted By: _____ Approved By: _____
Alan Pong

Title: _____

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A Minority Owned Company

Section F.

Operational Enhancement Projects

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Section G.

Other Projects

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Section H.

Common Plant

The following table presents a list of Common Plant projects for this district. Please refer to the Common Plant Justification Book for further details, including project justifications.

Table 1 - List of Common Plant Projects – RDOM District

PID	Description	Direct Cost	Inserted
132339	RD 2025 VEHICLE REPLACEMENT PROGRAM	$1,193,755	X[(d)]
132340	RD 2026 VEHICLE REPLACEMENT PROGRAM	$1,142,058	X[(d)]
132341	RD 2027 VEHICLE REPLACEMENT PROGRAM	$1,228,608	X[(d)]
133598	RDOM-AMI INITIATIVE-VEHICLES/EQUIP	$559,957	X[(d)]
151-NON-SP	151- Rancho Dom Reg Non-specific	$269,800	X[(d)]
151-NON-SP	151- Rancho Dom Reg Non-specific	$276,600	X[(d)]
151-NON-SP	151- Rancho Dom Reg Non-specific	$283,500	X[(d)]

Section I.

Forecasted Projects in Progress

I1. Projects In Progress Over-Budget and/or Over-Schedule

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I2. Projects In Progress Over-Schedule

Project ID	Project Description	Project Delay Statement
00125170	Car Port/Cover For Vehicle Maint.	• Project Re-prioritization
00125171	Install Cover Over Spoils/Dump Area	• Material Availability • Delayed Decision on 2021 GRC
00125532	RD New Copier For Operations	• Delayed Decision on 2021 GRC
00125490	RD Replace 1st floor bathrooms	• Delayed Decision on 2021 GRC
00125198	RD 2022 Air Tools	• Delayed Decision on 2021 GRC
00125195	RD 2022 Hand Tools	• Delayed Decision on 2021 GRC
00125186	RD Purch. Meter Reading Handhelds	• Delayed Decision on 2021 GRC
00124312	RD Replace Signage	• Delayed Decision on 2021 GRC
00124137	RD Office Improvements 2022	• Delayed Decision on 2021 GRC
00123882	RD 2022 CARB Vehicle Replacement	• Covid-19 Impacts on Supply Chain
00123765	RD 2022 Vehicle Replacement Program	• Covid-19 Impacts on Supply Chain
00115826	2020 Vehicle Replacement Program	• Covid-19 Impacts on Supply Chain
00125543	RD Refurbish/Replace Clarifier	• Contractor/ Consultant Availability

I3. Projects In Progress Other

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Section J.

Under Threshold Projects

PID	Description	Detail
133580	RDOM Replace Media Ctr Furniture	Due to Long term regular use, the table surfaces have chipped edges and chairs have worn fabric and some have broken casters. The tables are difficult to store as they do not collapse or flip when they are not needed for larger theater style meetings only needing chairs.
133605	RDOM Replace Office Furniture	Replace two office set-ups per year to provide ergonomic features storage and lighting to support employee activities and productivity.
133606	RDOM Replace Stairwell Carpet	Carpet in high traffic areas installed over 23 years ago are showing significant wear. The carpet is beyond its expected useful life. Approximately 6,500 SF in three stairwells, the media center meeting room, and common area hallways on the first floor.
133607	RDOM Replace Pergola	The wood pergola that provides an outdoor space is often used for both district team meetings and by employees on break. It needs to be replaced to continue to provide a safe outdoor multi-use space for the district employees.
133609	RDOM Updated First Floor Space Plan	Work with an architect to develop a plan to meet current and forecasted needs to effectively support growing district day to day operations. High priority areas include: redesigning the locker room to support growing female field staff, water quality lab to support increasing number of required samples kit supplies and prep SCADA monitoring area, enlarge employee breakroom, and media center meeting space.

California Water Service Company

RDOM Project Justification Book

2024 General Rate Case

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