SET NO. _____

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PLANT REHABILITATION

CONTRACT DOCUMENTS

VOLUME III - DRAWINGS

JUNE 2024

SPECIFICATION SD-428

EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

Recommended _____
Garin D. Warren
Mgr. of Wastewater Engineering Division
R.P.E. No. C 65259

Approved _____
Amit K. Mutsuddy
Director of Wastewater
R.P.E. No. C 68285

USER: $$USER$$$$
DATE: $$$$$$$DATE$$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$

GENERAL

USER: omunoz
DATE: 09-JUL-2007 12:08 PLOT SCALE: 0.166834:1
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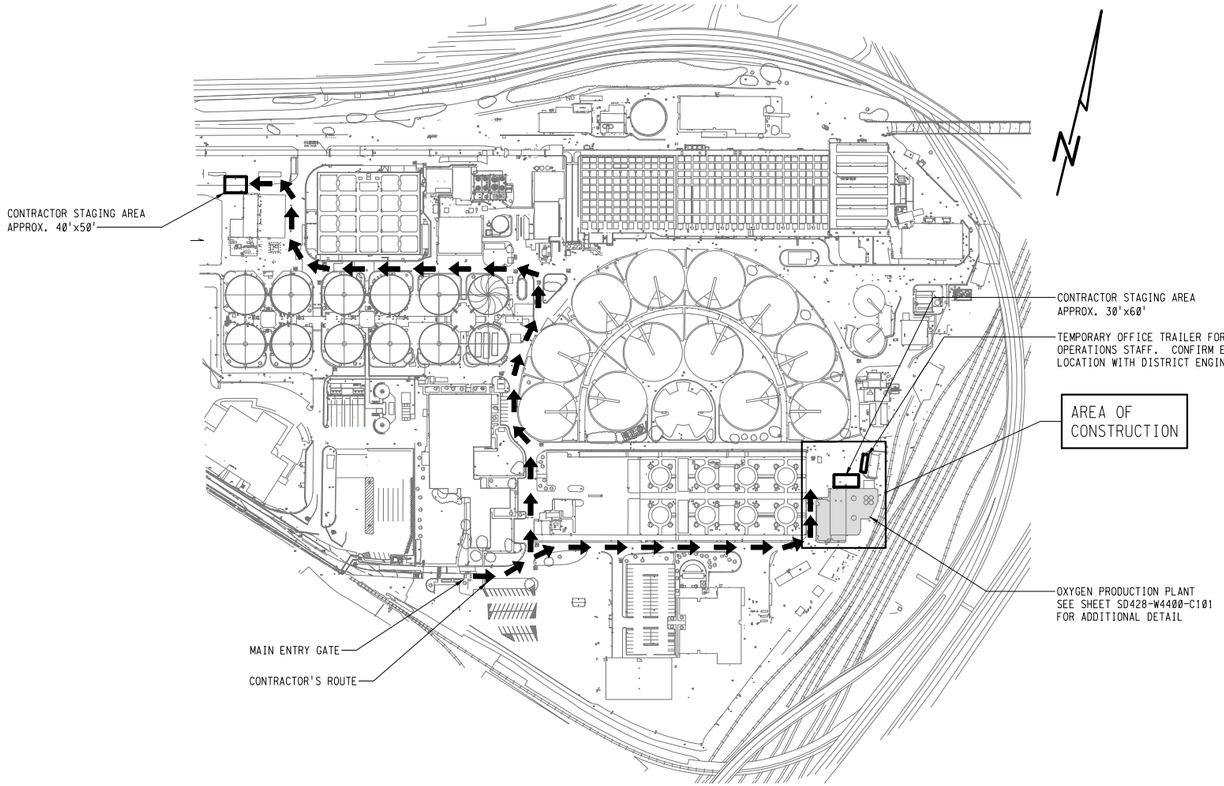
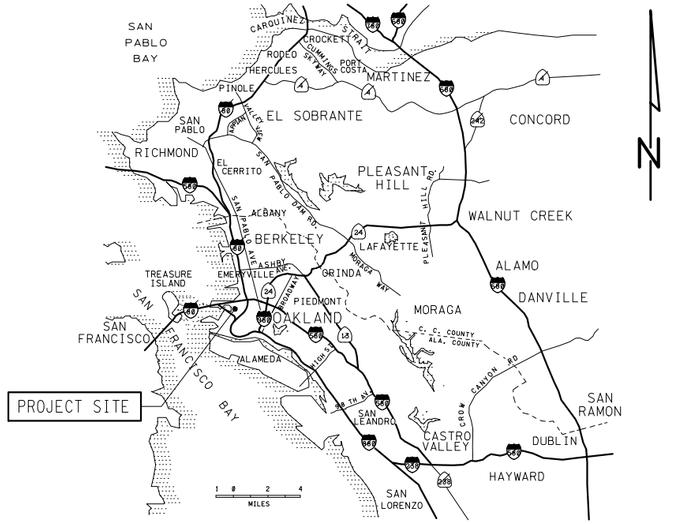


SITE PLAN
NOT TO SCALE



LOCATION MAP
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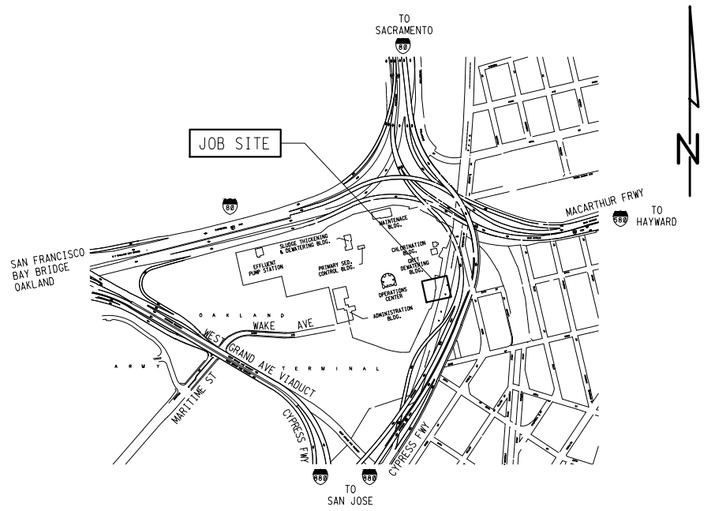

VICINITY MAP
NOT TO SCALE

REGISTERED PROFESSIONAL ENGINEER
DAVID LLOYD RICHARDSON
No. 37097
Exp. 06-30-24
CIVIL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	J. JANCAITIS
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
GENERAL
LOCATION MAP, VACINITY MAP AND SITE PLAN

SCALE NONE
DATE 28JUN24

SD428-W4400-G001
DRAWING NUMBER

REV. 0

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME
REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME
REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

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DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

DRAWING INDEX - VOLUME III

DRAWING NO.	REV NO.	DRAWING TITLE
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GENERAL		
SD428-W4400-G001	0	LOCATION MAP, VICINTY MAP AND SITE PLAN
SD428-W4400-G002	0	DRAWING INDEX - VOLUME III
CIVIL		
SD428-W4400-C101	0	OVERVIEW PLAN
SD428-W4400-C102	0	COLD BOX RE-COATING
STRUCTURAL		
SD428-W4400-S001	0	ABBREVIATIONS, GENERAL NOTES AND DETAILS
SD428-W4400-S002	0	STEEL NOTES AND DETAILS
SD428-W4400-S003	0	DETAILS
SD428-W4400-S102	0	OVERVIEW PLAN
MECHANICAL		
SD428-W4400-M102	0	OVERVIEW PLAN
SD428-W4400-M102.1D	0	PARTIAL DEMOLITION PLAN 1
SD428-W4400-M102.1	0	PARTIAL PLAN 1
SD428-W4400-M102.2D	0	PARTIAL DEMOLITION PLAN 2
SD428-W4400-M102.2	0	PARTIAL PLAN 2
SD428-W4400-M102.3D	0	PARTIAL DEMOLITION PLAN 3
SD428-W4400-M102.3	0	PARTIAL PLAN 3
SD428-W4400-M102.4D	0	PARTIAL DEMOLITION PLAN 4
SD428-W4400-M102.4	0	PARTIAL PLAN 4
SD428-W4400-M102.5D	0	PARTIAL DEMOLITION PLAN 5
SD428-W4400-M102.5	0	PARTIAL PLAN 5
SD428-W4400-M102.6D	0	PARTIAL DEMOLITION PLAN 6
SD428-W4400-M102.6	0	PARTIAL PLAN 6
SD428-W4400-M301	0	PNEUMATIC TUBING SCHEDULE 1
SD428-W4400-M302	0	PNEUMATIC TUBING SCHEDULE 2
SD428-W4400-M303	0	PNEUMATIC TUBING SCHEDULE 3
SD428-W4400-M901D	0	CONTROL PANELS PLANT NO. 1 AND 2 DEMOLITION DETAILS
ELECTRICAL		
SD428-W4400-E102	0	POWER AND SIGNAL OVERVIEW PLAN
SD428-W4400-E102.1D	0	PARTIAL POWER AND SIGNAL DEMOLITION PLAN 1
SD428-W4400-E102.1	0	PARTIAL POWER AND SIGNAL PLAN 1
SD428-W4400-E102.2D	0	PARTIAL POWER AND SIGNAL DEMOLITION PLAN 2
SD428-W4400-E102.2	0	PARTIAL POWER AND SIGNAL PLAN 2
SD428-W4400-E102.3D	0	PARTIAL POWER AND SIGNAL DEMOLITION PLAN 3
SD428-W4400-E102.3	0	PARTIAL POWER AND SIGNAL PLAN 3
SD428-W4400-E102.4D	0	PARTIAL POWER AND SIGNAL DEMOLITION PLAN 4
SD428-W4400-E102.4	0	PARTIAL POWER AND SIGNAL PLAN 4
SD428-W4400-E102.5D	0	PARTIAL POWER AND SIGNAL DEMOLITION PLAN 5
SD428-W4400-E102.5	0	PARTIAL POWER AND SIGNAL PLAN 5
SD428-W4400-E102.6D	0	PARTIAL POWER AND SIGNAL DEMOLITION PLAN 6
SD428-W4400-E102.6	0	PARTIAL POWER AND SIGNAL PLAN 6
SD428-W4400-E121	0	CONDUIT SCHEDULE 1 CONTROLS
SD428-W4400-E122	0	CONDUIT SCHEDULE 2 SIGNAL
SD428-W4400-E123	0	CONDUIT SCHEDULE 3 SIGNAL
SD428-W4400-E124	0	CONDUIT SCHEDULE 4 POWER
SD428-W4400-E201D	0	SWITCHGEAR S3 SINGLE LINE DIAGRAM DEMOLITION
SD428-W4400-E201	0	SWITCHGEAR S3 SINGLE LINE DIAGRAM
SD428-W4400-E230D	0	PANELBOARD SCHEDULES DEMOLITION
SD428-W4400-E230	0	PANELBOARD SCHEDULES
SD428-W4400-E311D	0	MAC MOTOR STARTER 1-1 CONTROL SCHEMATIC DEMOLITION
SD428-W4400-E311	0	MAC MOTOR STARTER 1-1 CONTROL SCHEMATIC
SD428-W4400-E312D	0	MAC MOTOR STARTER 1-2 CONTROL SCHEMATIC DEMOLITION
SD428-W4400-E312	0	MAC MOTOR STARTER 1-2 CONTROL SCHEMATIC
SD428-W4400-E313D	0	MAC MOTOR STARTER 2-1 CONTROL SCHEMATIC DEMOLITION
SD428-W4400-E313	0	MAC MOTOR STARTER 2-1 CONTROL SCHEMATIC
SD428-W4400-E314D	0	MAC MOTOR STARTER 2-2 CONTROL SCHEMATIC DEMOLITION
SD428-W4400-E314	0	MAC MOTOR STARTER 2-2 CONTROL SCHEMATIC
SD428-W4400-E315	0	MAC PLANT 1 CONTROL SCHEMATIC
SD428-W4400-E316	0	MAC PLANT 2 CONTROL SCHEMATIC
SD428-W4400-E317	0	TURBINE/CRYO PLANT 1 CONTROL SCHEMATIC
SD428-W4400-E318	0	TURBINE/CRYO PLANT 2 CONTROL SCHEMATIC

DRAWING NO.	REV NO.	DRAWING TITLE
ELECTRICAL CON'T		
SD428-W4400-E501	0	DCS DROP 15/65 ELEVATION
SD428-W4400-E501-511	0	DCS DROP 15/65 I/O MODULE SCHEMATIC
SD428-W4400-E501-512	0	DCS DROP 15/65 I/O MODULE SCHEMATIC
SD428-W4400-E501-513	0	DCS DROP 15/65 I/O MODULE SCHEMATIC
SD428-W4400-E501-514	0	DCS DROP 15/65 I/O MODULE SCHEMATIC
SD428-W4400-E501-519D	0	DCS DROP 15/65 ANALOG INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-520D	0	DCS DROP 15/65 ANALOG INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-521D	0	DCS DROP 15/65 ANALOG INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-522D	0	DCS DROP 15/65 ANALOG INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-523D	0	DCS DROP 15/65 ANALOG INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-524D	0	DCS DROP 15/65 ANALOG INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-525	0	DCS DROP 15/65 ANALOG INPUT MODULE SCHEMATIC
SD428-W4400-E501-526D	0	DCS DROP 15/65 DIGITAL INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-527D	0	DCS DROP 15/65 DIGITAL INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-528D	0	DCS DROP 15/65 DIGITAL OUTPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-529D	0	DCS DROP 15/65 DIGITAL INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E501-530D	0	DCS DROP 15/65 ANALOG INPUT MODULE SCHEMATIC DEMOLITION
SD428-W4400-E502	0	DCS DROP 23/73 PANEL EQUIPMENT ELEVATION
SD428-W4400-E502-510	0	DCS DROP 23/73 PANEL POWER DISTRIBUTION
SD428-W4400-E502-511	0	DCS DROP 23/73 I/O MODULE SCHEMATIC
SD428-W4400-E502-512	0	DCS DROP 23/73 I/O MODULE SCHEMATIC
SD428-W4400-E502-513	0	DCS DROP 23/73 I/O MODULE SCHEMATIC
SD428-W4400-E503	0	RIO-15-1 MAC 1-1 PANEL EQUIPMENT ELEVATION
SD428-W4400-E503-510	0	RIO-15-1 MAC 1-1 PANEL POWER DISTRIBUTION
SD428-W4400-E503-511	0	RIO-15-1 MAC 1-1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E503-512	0	RIO-15-1 MAC 1-1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E503-513	0	RIO-15-1 MAC 1-1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E503-514	0	RIO-15-1 MAC 1-1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E504	0	RIO-23-1 MAC 2-1 PANEL EQUIPMENT ELEVATION
SD428-W4400-E504-510	0	RIO-23-1 MAC 2-1 PANEL POWER DISTRIBUTION
SD428-W4400-E504-511	0	RIO-23-1 MAC 2-1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E504-512	0	RIO-23-1 MAC 2-1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E504-513	0	RIO-23-1 MAC 2-1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E504-514	0	RIO-23-1 MAC 2-1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E505	0	RIO-15-2 MAC 1-2 PANEL EQUIPMENT ELEVATION
SD428-W4400-E505-510	0	RIO-15-2 MAC 1-2 PANEL POWER DISTRIBUTION
SD428-W4400-E505-511	0	RIO-15-2 MAC 1-2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E505-512	0	RIO-15-2 MAC 1-2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E505-513	0	RIO-15-2 MAC 1-2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E505-514	0	RIO-15-2 MAC 1-2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E506	0	RIO-23-2 MAC 2-2 PANEL EQUIPMENT ELEVATION
SD428-W4400-E506-510	0	RIO-23-2 MAC 2-2 PANEL POWER DISTRIBUTION
SD428-W4400-E506-511	0	RIO-23-2 MAC 2-2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E506-512	0	RIO-23-2 MAC 2-2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E506-513	0	RIO-23-2 MAC 2-2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E506-514	0	RIO-23-2 MAC 2-2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL EQUIPMENT ELEVATION
SD428-W4400-E507-510	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL POWER DISTRIBUTION
SD428-W4400-E507-511	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-512	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-513	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-514	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-515	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-516	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-517	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-518	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-519	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E507-520	0	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL EQUIPMENT ELEVATION
SD428-W4400-E508-510	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL POWER DISTRIBUTION
SD428-W4400-E508-511	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508-512	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508-513	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508-514	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508-515	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508-516	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508-517	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508-518	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E508-519	0	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC
SD428-W4400-E901	0	DETAILS 1
SD428-W4400-E902	0	DETAILS 2

DRAWING NO.	REV NO.	DRAWING TITLE
INSTRUMENTATION		
SD428-W4400-I001	0	LEGENDS, SYMBOLS , ABBREVIATIONS AND NOTES
SD428-W4400-I002	0	OVERALL PROCESS FLOW DIAGRAM
SD428-W4400-I101	0	OIL RESERVOIR NO. 1-1 AND OIL COOLER
SD428-W4400-I102	0	AIR COMPRESSOR NO. 1-1
SD428-W4400-I103	0	OIL RESERVOIR NO. 1-2 AND OIL COOLER
SD428-W4400-I104	0	AIR COMPRESSOR NO. 1-2
SD428-W4400-I105	0	AFTERCOOLERS NO. 1-1 AND 1-2
SD428-W4400-I106	0	AIR SURGE TANK COLD BOX NO. 1
SD428-W4400-I107	0	RHX COLD BOX NO. 1
SD428-W4400-I108	0	RHX AND TURBINE COLD BOX NO. 1
SD428-W4400-I109	0	TURBINE COLD BOX NO. 1
SD428-W4400-I110	0	RHX AND TURBINE COLD BOX NO. 1
SD428-W4400-I111	0	UPPER COLUMN SUPERHEATER COLD BOX NO. 1
SD428-W4400-I112	0	N2 AND O2 SUPERHEATER COLD BOX NO. 1
SD428-W4400-I113	0	LOWER COLUMN SUPERHEATER COLD BOX NO. 1
SD428-W4400-I114	0	DRIOX TANK NO. 1-1
SD428-W4400-I115	0	DRIOX TANK NO. 1-2
SD428-W4400-I151	0	OIL RESERVOIR NO. 2-1 AND OIL COOLER
SD428-W4400-I152	0	AIR COMPRESSOR NO. 2-1
SD428-W4400-I153	0	OIL RESERVOIR NO. 2-2 AND OIL COOLER
SD428-W4400-I154	0	AIR COMPRESSOR NO. 2-2
SD428-W4400-I155	0	AFTERCOOLERS NO. 2-1 AND 2-2
SD428-W4400-I156	0	AIR SURGE TANK COLD BOX NO. 2
SD428-W4400-I157	0	RHX COLD BOX NO. 2
SD428-W4400-I158	0	RHX AND TURBINE COLD BOX NO. 2
SD428-W4400-I159	0	TURBINE COLD BOX NO. 2
SD428-W4400-I160	0	RHX AND TURBINE COLD BOX NO. 2
SD428-W4400-I161	0	UPPER COLUMN SUPERHEATER COLD BOX NO. 2
SD428-W4400-I162	0	N2 AND O2 SUPERHEATER COLD BOX NO. 2
SD428-W4400-I163	0	LOWER COLUMN SUPERHEATER COLD BOX NO. 2
SD428-W4400-I164	0	DRIOX TANK NO. 2-1
SD428-W4400-I165	0	DRIOX TANK NO. 2-2
SD428-W4400-I166	0	LOX FILL PANEL PLC
SD428-W4400-I167	0	O2 COOLING PLC CONTROL PANEL
SD428-W4400-I168	0	DRIOX VAPORIZER
SD428-W4400-I169	0	DRIOX VAPORIZER
REFERENCE DRAWINGS		
ELECTRICAL		
WWP.00-E-201	3	POWER SINGLE LINE DIAGRAM SHEET 1 OF 2
WWP.00-E-202	4	POWER SINGLE LINE DIAGRAM SHEET 2 OF 2
W44.00-E-201	3	MCC P15 AND MCC P16 SINGLE LINE DIAGRAM
W44.00-E-202	0	MCC P17 SINGLE LINE DIAGRAM
W44.00-E-220	2	MCC-P15 AND MCC-P16 ELEVATIONS
W44.00-E-221	0	MCC P17 ELEVATIONS
CT-E-268	-	SCHEMATIC DIAGRAMS SWITCHGEAR S3 & MCC PANELS P15, P16 & P17
CT-E-269	-	SCHEMATIC DIAGRAMS MCC PANELS P15 & P16
SD428-W4400-E561	0	OXYGENATION BUILDING FIBER CABLE, ETHERNET CABLE & CONDUIT LAYOUT
STANDARD DRAWINGS		
STD-G-001	7	ABBREVIATIONS FOR WASTEWATER FACILITIES A THRU G
STD-G-002	5	ABBREVIATIONS FOR WASTEWATER FACILITIES H THRU S
STD-G-002.1	0	ABBREVIATIONS FOR WASTEWATER FACILITIES T THRU Z AND SYMBOLS
STD-G-003	4	LEGENDS, SECTION, DETAIL, ELEVATION, PHOTO, AND PIPING SYSTEMS DESIGNATIONS
STD-G-004	6	EQUIPMENT TAG AREA CODES FOR MAIN WASTEWATER TREATMENT PLANT
STD-G-004.1	3	EQUIPMENT TAG AREA CODES FOR REMOTE FACILITIES
STD-G-005	8	EQUIPMENT TAG SYSTEM CODES, COLORS AND SIGNAGE DETAILS
STD-G-006	4	EQUIPMENT TAG EQUIPMENT TYPE CODES
STD-M-001	5	SYMBOLS, DESIGNATIONS AND NOTES
STD-M-002	2	HVAC SYMBOLS AND LEGENDS, ABBREVIATIONS, AND NOTES
STD-E-001	8	LEGENDS, ABBREVIATIONS AND NOTES
STD-E-001.1	0	SUPPLEMENTARY LEGENDS, ABBREVIATIONS AND NOTES 1
STD-I-001	4	LEGENDS, SYMBOLS AND ABBREVIATIONS
STD-I-001.1	0	SUPPLEMENTARY LEGENDS, SYMBOLS AND ABBREVIATIONS 1

REGISTERED PROFESSIONAL ENGINEER
DAVID LLOYD RICHARDSON
No. 37097
Exp. 06-30-24
CIVIL
STATE OF CALIFORNIA
05/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT

DESIGN BY:	J. JANCAITIS
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
GENERAL
DRAWING INDEX - VOLUME III

SCALE NONE
DATE 28JUN24
SD428-W4400-G002 DRAWING NUMBER
0 REV.

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME
REF 4: REF4#FILENAME
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REF 8: REF8#FILENAME
REF 9: REF9#FILENAME
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CIVIL

USER: omunoz PLOT SCALE: 0.166834:1
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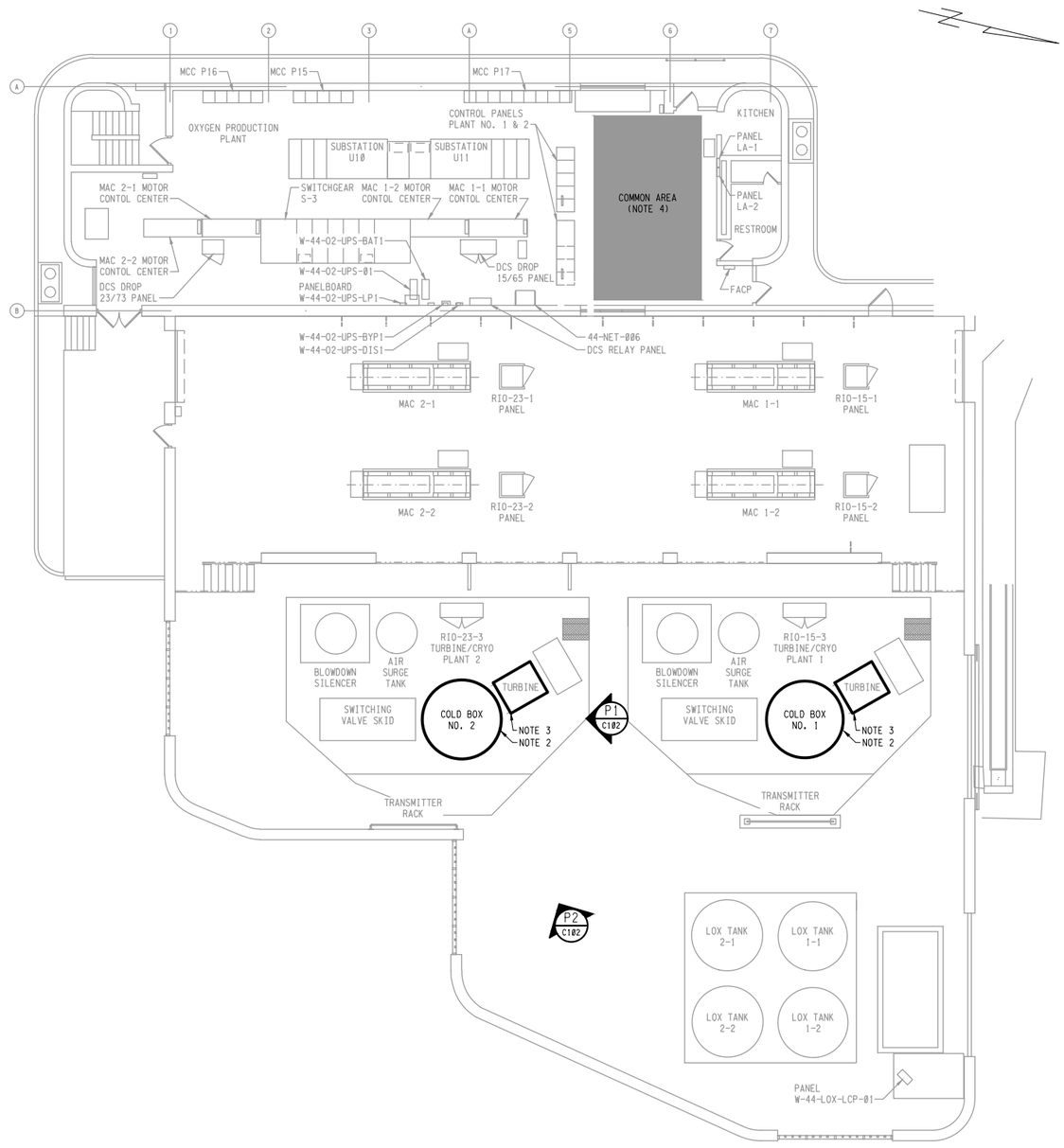

PLAN

NOTES:

1. NOT ALL EXISTING FACILITIES, EQUIPMENT, PIPING, AND CONDUIT ARE SHOWN ON DRAWINGS. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS.
2. LOWER PORTION OF EACH COLD BOX SHALL BE PREPARED AND RE-COATED IN ACCORDANCE WITH SECTION 09 90 00 PAINTINGS AND COATINGS.
3. COAT ALL EXPOSED SIDES OF TURBINE DUCT ASSEMBLIES (2 TOTAL)
4. MAINTAIN ACCESS TO RESTROOM AND KITCHEN FOR DISTRICT USE DURING CONSTRUCTION. PROVIDE DUST BARRIER BETWEEN CONTRACTOR'S WORK AREA AND SHARED COMMON AREAS.

REGISTERED PROFESSIONAL ENGINEER
DAVID LLOYD RICHARDSON
No. 37097
Exp. 06-30-24
CIVIL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT	DESIGN BY:	J. JANCAITIS
	DRAWN BY:	L. MAXWELL
	DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95846	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
CIVIL
OVERVIEW PLAN

SCALE 1"=10'
DATE 28JUN24

SD428-W4400-C101
DRAWING NUMBER

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STRUCTURAL

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STRUCTURAL ABBRIVIATIONS

&	AND
@	AT
ACI	AMERICAN CONCRETE INSTITUTE
AFF	ABOVE FINISH FLOOR
ASCE	AMERICAN SOCIETY OF CIVIL ENGINEERS
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ALUM	ALUMINUM
BOC	BOTTOM OF CONCRETE
BOT	BOTTOM
℄	CENTER LINE
ci	CONTINUOUS INSULATION
CJ	CONSTRUCTION JOINT
CLR	CLEAR
CONC	CONCRETE
CONT	CONTINUOUS
COORD	COORDINATE
DIA	DIAMETER
DIAG	DIAGONAL
DWGS	DRAWINGS
EA	EACH
EL	ELEVATION
EQ	EQUAL
EQUIP	EQUIPMENT
EXG	EXISTING
EXT	EXTERIOR
FF	FINISHED FLOOR
FIN	FINISHED
FT	FOOT, FEET
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
GRTG	GRATING
GWB	GYPSUM WALL BOARD
HOR	HORIZONTAL
HP	HIGH POINT
IJ	ISOLATION JOINT
IN	INCH(ES)
INT	INTERIOR
LB	POUNDS
LF	LINEAR FEET
LLV	LONG LEG VERTICAL
LP	LOW POINT
MECH	MECHANICAL
MIN	MINIMUM
N/A	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NTS	NOT TO SCALE
OC	ON CENTER
OCEW	ON CENTER EACH WAY
OPNG(S)	OPENING
PCI	POUNDS PER CUBIC INCH
PM	PAINTED METAL
PSF	POUNDS PER SQUARE FEET
PSI	POUNDS PER SQUARE INCH
PT	PRESERVATIVE TREATED
PTD	PAINTED
PVC	POLYVINYL CHLORIDE PLASTIC
REINF	REINFORCE,REINFORCING
REQ'D	REQUIRED
RO	ROUGH OPENING
SF	SQUARE FEET
SP	SPACE
SPEC	SPECIFICATION
SQ	SQUARE
SS	STAINLESS STEEL
STD	STANDARD
TOC	TOP OF CONCRETE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
W/	WITH
W/O	WITHOUT

NOTES:

1. THIS IS A GENERAL LIST OF SYMBOLS AND ABBREVIATIONS. NOT ALL ITEMS SHOWN HERE APPEAR ON CONTRACT DOCUMENTS.

SYMBOLS

1 / S001 — DETAIL NO / DWG NO — PLAN OR SECTION DETAIL

STRUCTURAL GENERAL NOTES

A. GENERAL DESIGN NOTES:

1. DESIGN IS IN ACCORDANCE WITH CALIFORNIA BUILDING CODE, 2022
2. THESE NOTES SHALL APPLY TO ALL STRUCTURAL WORK SHOWN ON THESE DRAWINGS, UNO.
3. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE DRAWINGS AND SPECIFICATIONS OF ALL DISCIPLINES WHICH SHALL BE REFERRED TO FOR SIZES AND LOCATIONS OF ALL PADS, CONDUIT, AND EQUIPMENT ETC.
4. WHERE DIFFERENCES BETWEEN STRUCTURAL DRAWINGS, NOTES OR SPECIFICATIONS OCCUR, THE MOST STRINGENT REQUIREMENT SHALL GOVERN AND THE CONTRACTOR SHALL REQUEST IMMEDIATE CLARIFICATION BEFORE PROCEEDING WITH THE WORK.

B. EXISTING CONDITIONS AND CONSTRUCTION:

1. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AND LAYOUT BEFORE BIDDING AND CONSTRUCTION. WHERE ELEVATIONS OF EXISTING STRUCTURES ARE GIVEN, CONTRACTOR SHALL FIELD VERIFY THOSE RECORD DRAWING ELEVATIONS BEFORE CONSTRUCTION. IF EXISTING CONDITIONS DIFFER FROM THAT SHOWN ON THE ATTACHED DRAWINGS, NOTIFY ENGINEER BEFORE PROCEEDING WITH THE WORK.
2. FIELD VERIFY LOCATION OF ALL UTILITIES. UTILITY RELOCATION AND/OR REROUTING MAY BE REQUIRED. LOCATIONS OF ALL UTILITIES ARE NOT SHOWN ON THE DRAWINGS.
3. CONTRACTOR SHALL COORDINATE ALL WORK WITH OWNER WITH RESPECT TO WORK HOURS, AVAILABLE WORK AREAS, DEMOLITION DISTURBANCE, ETC.
4. DURING DEMOLITION AND SURFACE PREPARATION, CONTRACTOR SHALL MINIMIZE DISTURBANCE TO OWNER'S DAILY OPERATIONS DUE TO DUST, DEBRIS, EXCESSIVE NOISE, ETC. PROVIDE TEMPORARY BARRICADES AND OTHER FORMS OF PROTECTION AS NECESSARY TO PROTECT THE OWNER'S PERSONNEL, PROPERTY AND THE GENERAL PUBLIC FROM INJURY.
5. ALL MATERIAL SHALL BE FURNISHED BY THE CONTRACTOR AND ALL DEMOLITION, SURFACE PREPARATION, AND OTHER WASTE DEBRIS SHALL BE REMOVED AND DISPOSED OF AT AN APPROVED FACILITY BY THE CONTRACTOR, UNLESS NOTED OTHERWISE. COSTS ASSOCIATED WITH TESTING AND/OR CHARACTERIZATION OF WASTE DEBRIS, AS MAY BE REQUIRED TO PERMIT DISPOSAL AT THE APPROPRIATE WASTE FACILITY, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. CARE SHALL BE TAKEN WHEN WORKING WITH OR AROUND ALL EXISTING MATERIALS. DAMAGE TO EXISTING MATERIALS SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER. RESTORE ALL AREAS DISTURBED BY THE WORK TO MATCH EXISTING CONSTRUCTION/FINISH.
7. THE CONTRACTOR SHALL OBTAIN ALL STATE, LOCAL, UTILITY, AND OTHER MISCELLANEOUS PERMITS REQUIRED FOR COMPLETION OF WORK. ANY AND ALL FEES ASSOCIATED WITH THIS WORK ARE THE RESPONSIBILITY OF THE CONTRACTOR.
8. ANY WORK DETERMINED TO BE DEFECTIVE/INCOMPLETE BY THE ENGINEER SHALL BE REPAIRED, REWORKED AND/OR COMPLETED PER THE APPROVAL OF THE ENGINEER.

B. EQUIPMENT PADS:

1. CONTRACTOR TO VERIFY THE SIZE (PLAN DIMENSIONS) WITH THE ACTUAL EQUIPMENT. LOCATIONS OF THE EQUIPMENT PADS SHALL BE PER THE ELECTRICAL DRAWINGS.

C. STRUCTURAL FILL SUBGRADE COMPACTION

1. SUBGRADE SOILS AND STRUCTURAL FILL SHALL BE COMPACTED TO A MINIMUM OF 97% OF ITS MAXIMUM DENSITY PER STANDARD PROCTOR (ASTM D698)
2. LIFTS SHALL NOT EXCEED 10"

D. REINFORCED CONCRETE:

1. PROVIDE 4,000 PSI COMPRESSIVE STRENGTH AT 28 DAYS, ALONG WITH ALL SPECIFIED SUBMITTALS AND TESTING, PER SECTION 03 30 00.
2. ALL DESIGN IN ACCORDANCE WITH ACI 318-19 CONCRETE BUILDING CODE. ALL CONCRETE SHALL BE PROVIDED, PLACED, AND MOIST CURED (MIN 7 DAYS) AS PER ALL APPLICABLE SECTIONS OF ACI, AS APPROVED BY THE ENGINEER.
3. REINFORCEMENT: ASTM A615 GRADE 60 – ALL SPLICES CLASS B (UNO). REINFORCEMENT PROVIDED PER SECTION 03 20 00.
4. ALL CONCRETE SHALL BE FIELD TESTED BY AN INDEPENDENT TESTING LABORATORY AS PER ASTM SPECIFICATIONS AND SECTION 03 30 00.
5. GROUT: PROVIDE MINIMUM 1/2" THICK NON-SHRINK NON-METALLIC CONFORMING SECTION 03 30 00 BELOW SUPPORT/EQUIPMENT BASE PLATES, SKID, ETC. GROUT PAD SHALL BE PLACED BELOW ENTIRE PLATE/SKID FOR ALL EQUIPMENT. MINIMUM WIDTH OF GROUT PADS SHALL BE THE WIDTH OF THE PLATE/SKID CHANNELS THAT WILL BARE ON THE GROUT PADS. SLOPE THE GROUT PADS DOWN TO THE CONCRETE PAD AT A 1H:1V SLOPE.
6. CONCRETE CURING/SEALING COMPOUND: PROVIDE PER SECTION 03 30 00 FOR HORIZONTAL AND VERTICAL EXPOSED TO VIEW CONCRETE SURFACES OF THE SLAB. APPLY IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. PRIOR TO APPLICATION, SUBMIT PRODUCT TO BE USED TO THE ENGINEER FOR APPROVAL.
7. CONCRETE ANCHORS
   ANCHORS AND ADHESIVE SHALL BE PROVIDED AND INSTALLED PER SECTION 05 05 19.

   ADHESIVE ANCHORS:
   ANCHOR — HILTI HIT HAS-316SS
   ADHESIVE — HILTI HIT-RE 500VS OR SIMPSON STRONG-TIE SET-XP
8. PROVIDE 3/4" CHAMFER ON EXPOSED EDGES OF CONCRETE, UNO.
9. CONCRETE FINISH: ALL EQUIPMENT PADS SHALL BE LEVEL WITHIN 1/8". SLAB TOP SHALL RECEIVE A TROWEL FINISH TO MATCH ADJACENT CONCRETE. SLAB SIDES EXPOSED TO VIEW SHALL RECEIVE A SACK RUBBED FINISH.

D. EPOXY BONDING COMPOUND

1. BONDING COMPOUND SHALL BE PROVIDED PER SECTION 03 30 00.
2. PRIOR TO APPLYING THE EPOXY BONDING COMPOUND, THE SUBSTRATE SHALL BE ROUGHENED TO A SURFACE PROFILE CSP VALUE BETWEEN 5-7. IF THE SUBSTRATE HAS AN EXISTING COATING, THE COATING SHALL BE FULLY REMOVED IN THE AREA OF THE PAD EXTENSION PRIOR TO PLACING THE EPOXY BONDING COMPOUND.
3. SUBMIT EPOXY BONDING COMPOUND FOR ENGINEERS APPROVAL.

E. EMBEDDED CONDUITS AND PIPES:

1. ALL ELECTRICAL/INSTRUMENTATION CONDUIT EMBEDDED IN CONCRETE SHALL BE INSTALLED, ARRANGED, AND SPACED AS PER THE REQUIREMENTS OF ACI 318-19, SECTION 20.6, AND AS FOLLOWS.
2. OUTSIDE DIAMETER OF CONDUIT SHALL NOT EXCEED 1/3 OF CONCRETE THICKNESS.
3. SPACING SHALL NOT BE LESS THAN 3 OUTSIDE DIAMETERS ON CENTER. ROUTE CONDUIT AS REQUIRED TO MINIMIZE CROSSING OF DIFFERENT CONDUIT RUNS.
4. CONDUITS SHALL NOT BE EMBEDDED IN CONCRETE SLABS LESS THAN 4 INCHES THICK.
5. ONLY 2 CONDUITS MAY CROSS AT ANY POINT AND THE SUM OF THE OUTSIDE DIAMETER OF THE CROSSING CONDUITS SHALL NOT EXCEED 1/3 OF THE CONCRETE THICKNESS.
6. PROVIDE A MINIMUM 1-1/2 INCH CONCRETE COVER OVER CONDUITS.
7. CONDUITS SHALL NOT BE LOCATED BETWEEN BOTTOM OF REINFORCING STEEL AND BOTTOM OF SLAB.
8. ALUMINUM CONDUIT SHALL NOT BE EMBEDDED IN CONCRETE.
9. PROVIDE ADDITIONAL REINFORCEMENT AROUND ALL GROUPS OF CONDUITS WHICH STUB UP THROUGH SLABS.

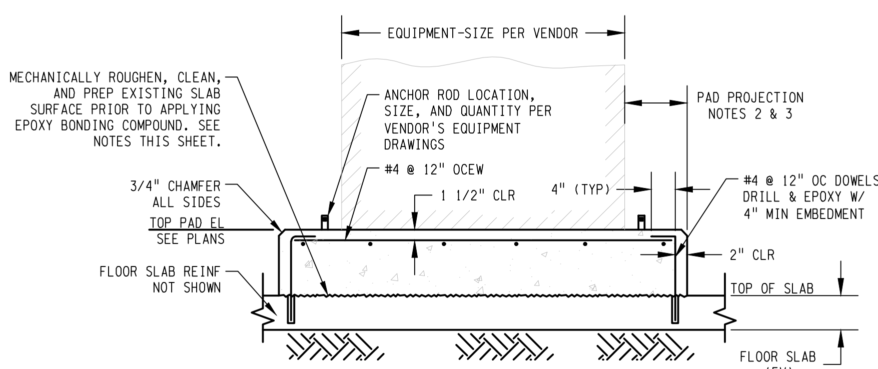
F. DESIGN LOADS: (CALIFORNIA BUILDING CODE, 2022)

1. PROJECT SCOPE IS CONSTRAINED TO EXTERIOR & INTERIOR EQUIPMENT PADS AND TRANSMITTER RACK FOOTING.
2. RISK CATEGORY III - WATER TREATMENT FACILITY
3. WIND FORCES

DESIGN WIND SPEED	V ult = 99mph
EXPOSURE CATEGORY	C

4. SEISMIC LOADS:
   REFER TO SPECIFICATION 01 33 12 FOR DETAILS

SITE CLASS	D (ASSUMED)
DESIGN SPECTRAL ACCEL - 0.2s	SDS= 1.111g
DESIGN SPECTRAL ACCEL - 0.2s	SD1= 1.056g
IMPORTANCE FACTOR	Ie = 1.5
SEISMIC DESIGN CATEGORY	D



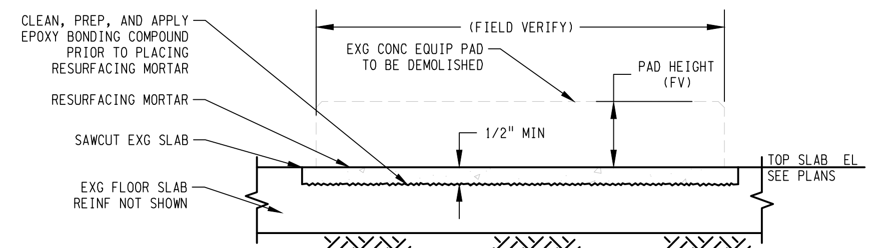
NOTES:

1. SEE ELECTRICAL DRAWINGS FOR EQUIPMENT LOCATIONS, QUANTITIES, AND LAYOUT.
2. EQUIPMENT PAD PROJECTIONS PAST FACE OF MECHANICAL EQUIPMENT:
   FOR ANCHOR RODS GREATER THAN 5/8" DIAMETER: MINIMUM 9-INCH PROJECTION
   FOR ANCHOR RODS 5/8" DIAMETER OR LESS: MINIMUM 6-INCH PROJECTION
3. EQUIPMENT PAD PROJECTIONS PAST FACE OF ELECTRICAL MOTOR CONTROLS, SWITCHBOARDS, TRANSFORMERS, AND CONTROL PANELS: 4-INCH MINIMUM
4. ELECTRICAL EQUIPMENT PADS SHALL BE 4" THICK (MINIMUM); MATCH EXISTING ELECTRICAL PADS.
5. IN THE CASE OF SLOPED FLOORS, PADS SHALL BE 4" THICK AT THE HIGHEST TOP OF SLAB ELEVATION AND MAINTAIN A CONSTANT TOP OF PAD ELEVATION. ADJUST DOWEL LENGTH TO MAINTAIN SPECIFIED EMBEDMENT AND CLEAR COVER.
6. PROVIDE SAWED JOINT (SJ) IN EQUIPMENT PADS, IF SHOWN AND NOTED ON PLANS.
7. ANCHOR RODS SHALL BE 316 AISI STAINLESS STEEL, UNLESS NOTED OTHERWISE.

EQUIPMENT PAD

DETAIL 1

SD428-W4400-E102.3
SD428-W4400-E102.4



NOTES:

1. CONCRETE RESURFACING SHALL BE PROVIDED PER SECTION 03 01 30.61
2. SEE DEMOLITION DRAWINGS FOR LOCATION, QUANTITY, AND APPROXIMATE SIZE OF EXISTING CONCRETE EQUIPMENT PADS TO BE DEMOLISHED.
3. EXISTING CONCRETE SLAB REINFORCEMENT SHALL NOT BE CUT OR DAMAGED DURING DEMOLITION. IF SLAB REINFORCEMENT IS ENCOUNTERED PRIOR TO REACHING THE REQUIRED 1/2-INCH DEPTH OF SLAB DEMOLITION, IMMEDIATELY TERMINATE SLAB DEMOLITION AT ENCOUNTERED REINFORCEMENT LAYER.
4. EXISTING SLAB SHALL BE SAWCUT AROUND FULL PERIMETER OF EXISTING CONCRETE PAD WITHOUT OVER-CUTTING CORNERS.
5. APPLY AND FINISH RESURFACING MORTAR TO MATCH ELEVATION AND TEXTURE OF ADJACENT SLAB SURFACES.
6. IF EXISTING FLOOR SLAB IS PAINTED, CLEAN AREA AND APPLY COLOR MATCHING PAINT SYSTEM OVERLAPPING EXISTING COATING A MINIMUM OF 1-FOOT. REFER TO SPECIFICATION 09 90 00 FOR PAINTS AND COATINGS.

SLAB REPAIR AT PAD DEMO

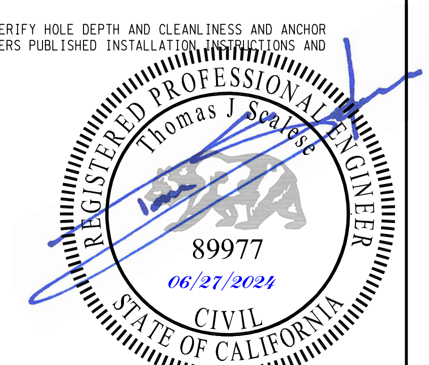
DETAIL 2

SD428-W4400-E102.3
SD428-W4400-E102.4

SPECIAL INSPECTIONS

A. SPECIAL INSPECTION SHALL BE PAID FOR THE BY THE CONTRACTOR AND CONDUCTED IN ACCORDANCE WITH THE REQUIREMENTS SEOFORTH IN CHAPTER 17 OF THE CALIFORNIA BUILDING CODE (CBC). THE FOLLOWING ITEMS, AS A MINIMUM SHALL RECEIVE SPECIAL INSPECTION:

1. REINFORCING STEEL - REINFORCING STEEL SHALL BE INSPECTED PRIOR TO CLOSING THE FORMS OR DELIVERY OF CONCRETE TO JOBSITE.
2. CONCRETE - THE INSPECTOR SHALL BE PRESENT DURING PLACEMNT OF REINFORCED CONCRETE AND SHALL OBSERVE THE PREPARATION OF THE COMPRESSION TEST SPECIMENS. THE INSPECTOR SHALL VERIFY THE USE OF THE REQUIRED DESIGN MIX, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.
3. POST INSTALLED ANCHORS - THE INSPECTOR SHALL VERIFY HOLE DEPTH AND CLEANLINESS AND ANCHOR INSTALLATION IN ACCORDANCE WITH THE MANUFACTURERS PUBLISHED INSTALLATION INSTRUCTIONS AND ICC-ES EVALUATION REPORT.



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SOLUTIONWERKS™ INCORPORATED

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SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	T. SCALESE
	DRAWN BY:	T. SCALESE
	DESIGN CHECKED BY R.P.E. NO. 89977	T. SCALESE
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
STRUCTURAL
ABBREVIATIONS, GENERAL NOTES AND DETAILS

SCALE NONE
DATE 28JUN24

SD428-W4400-S001 DRAWING NUMBER

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MISCELLANEOUS METALS NOTES

A. STRUCTURAL FRAMING:

1. STEEL SHALL COMPLY WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION AISC 360-16 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 303-16 CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES AND THE 15TH EDITION OF STEEL CONSTRUCTION MANUAL. ALL STEEL MEMBERS, BOLTS, AND CONNECTIONS SHALL BE DESIGNED TO LOAD AND RESISTANCE FACTOR DESIGN (LRFD).

2. ALL MISCELLANEOUS METALS SHALL BE NEW STAINLESS STEEL TYPE 316L PER SECTION 05 50 00.

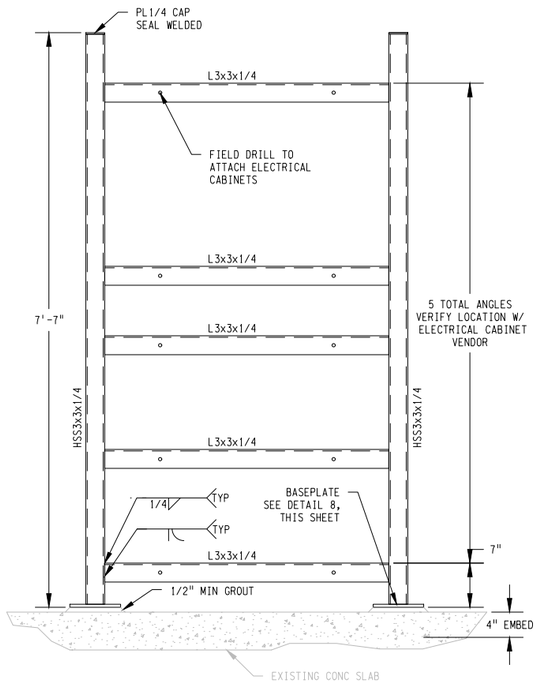
3. WELDS: ELECTRODES FOR ALL FIELD AND SHOP WELDING SHALL CONFORM TO AWS E308L-XX WITH 75 KSI TENSILE STRENGTH. WELDING SHALL CONFORM TO THE STRUCTURAL WELDING CODE-STEEL, AWS D1.6, LATEST EDITION. ALL WELDERS SHALL BE AWS-CERTIFIED. WELDING SHALL ALSO COMPLY WITH LOCAL LAWS AND ORDINANCES. WHERE THERE MAY BE CONFLICTING REQUIREMENTS, THE MORE STRINGENT REQUIREMENT SHALL APPLY.

4. BOLTING: BOLTING MATERIALS SHALL BE TYPE 316 STAINLESS STEEL AND CONFORM TO ASTM F593 TYPE 316. ALL BOLTING SHALL BE PERFORMED PER THE SPECIFICATIONS FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS (RCSC, CURRENT EDITION)

5. ANCHOR BOLTS: SEE CONCRETE NOTES, SHEET S001

6. TEMPORARY BRACING / EQUIPMENT SUPPORT IS THE RESPONSIBILITY OF THE CONTRACTOR.

7. FIELD CUTTING OR DRILLING IN STRUCTURAL MEMBERS IS PROHIBITED, UNLESS PREVIOUSLY APPROVED BY THE STRUCTURAL STRUCTURAL ENGINEER-OF-RECORD.



SURGE PROTECTION STAND

DETAIL 3

SCALE: 1" = 1'-0"

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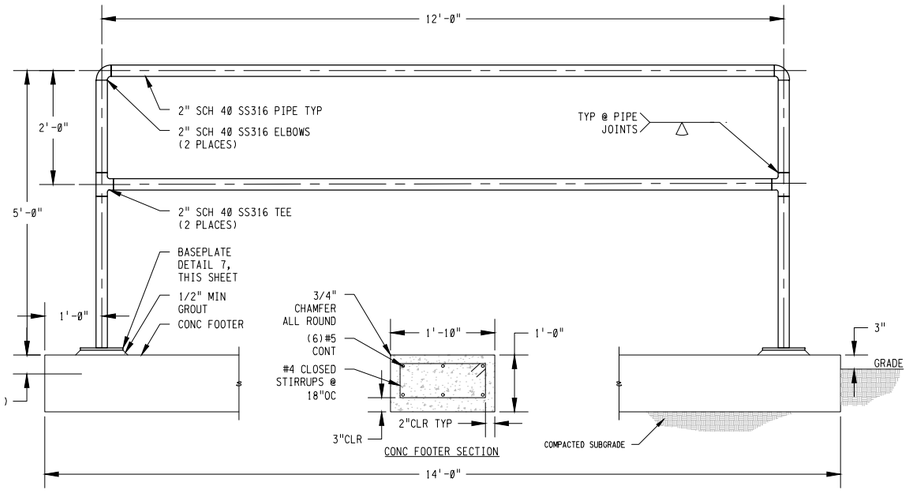
SD428-W4400-E102.2



FLOOR MOUNTED TRANSMITTER RACK

DETAIL 4

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

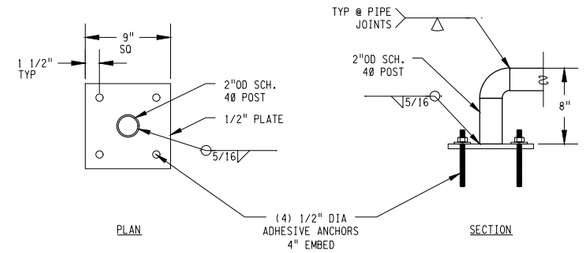
SD428-W4400-E102.3

WALL MOUNTED TRANSMITTER RACK

DETAIL 5

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

SD428-W4400-E102.4

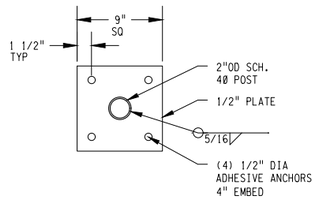


WALLPLATE

DETAIL 6

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

SD428-W4400-S002

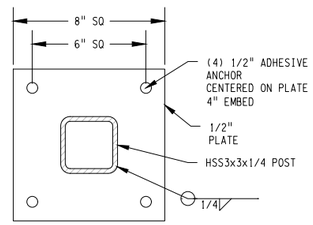


BASEPLATE

DETAIL 7

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

SD428-W4400-S002



BASEPLATE

DETAIL 8

SCALE: 3" = 1'-0"

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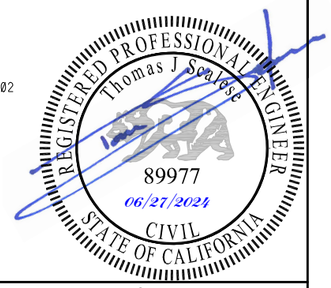

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RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
STRUCTURAL
STEEL NOTES AND DETAILS

SCALE AS NOTED
DATE 28JUN24

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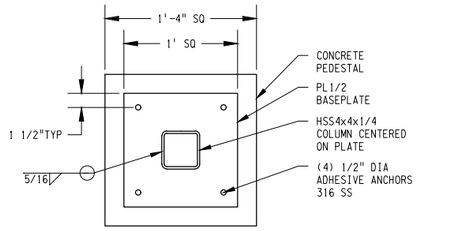
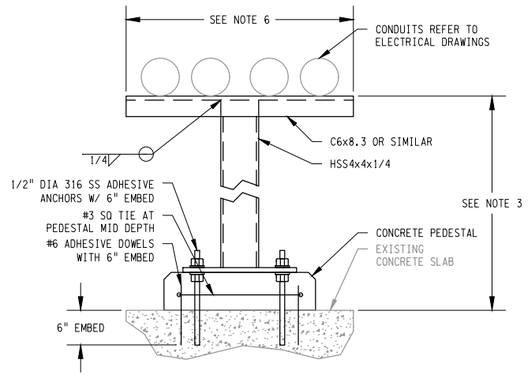




NOTES:

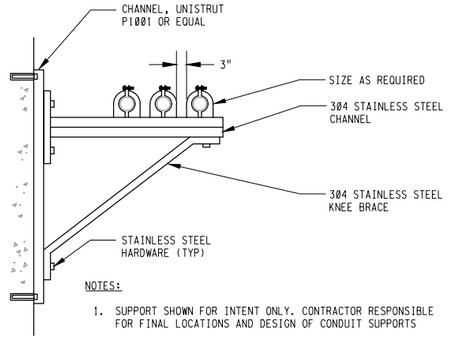
1. DRILL AND EPOXY THE ANCHOR BOLTS INTO PLACE PRIOR TO CASTING THE CONCRETE PEDESTAL. THE CONCRETE PEDESTAL SHALL BE CAST AROUND THE ANCHORS. NO DRILLING OF THE CONCRETE PEDESTAL SHALL BE APPROVED
2. THE COLUMNS SHALL BE SPACED AT A MAXIMUM OF 10'-0". CONTRACTOR SHALL FIELD VERIFY COLUMN SPACING AND COORDINATED THE SUPPORT LOCATIONS WITH THE ENGINEER.
3. CONTRACTOR SHALL COORDINATE FINAL COLUMN AND CHANNEL HEIGHTS WITH ACTUAL ELECTRICAL CONDUIT ELEVATIONS.
4. ANY ALUMINUM IN CONTACT WITH CONCRETE OR MASONRY SHALL RECEIVE A BITUMINOUS PROTECTIVE COATING.
5. ANY ALUMINUM TO BE IN CONTRACT WITH STAINLESS STEEL SHALL BE SEPARATED BY A NEOPRENE GASKET.
6. CONDUIT RACK WIDTHS WILL VARY AND ACCOMMODATE QUANTITY OF CONDUITS BEING SUPPORTED WITHIN AREA.
7. ALL METAL CONSTRUCTION SHALL BE STAINLESS STEEL TYPE 304 PER MISC METALS NOTES, THIS SHEET

OVERHEAD CONDUIT SUPPORT

DETAIL 9

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

SD428-W4400-S102



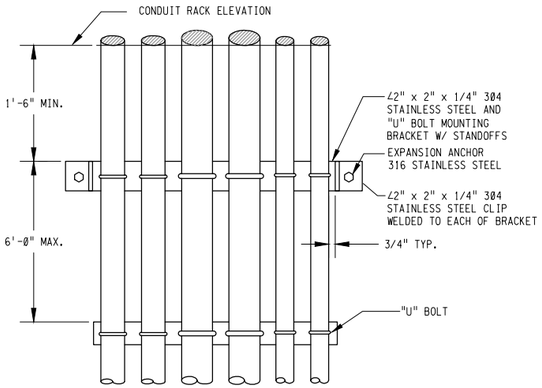
NOTES:

1. SUPPORT SHOWN FOR INTENT ONLY. CONTRACTOR RESPONSIBLE FOR FINAL LOCATIONS AND DESIGN OF CONDUIT SUPPORTS
2. REFER TO SPECIFICATIONS SECTION 26 05 33 FOR APPROVED SUPPORTING MATERIALS WITHIN SPECIFIC AREAS OF THE FACILITY.

HORIZONTAL WALL MOUNTED CONDUIT SUPPORT

DETAIL 10

SD428-W4400-S003



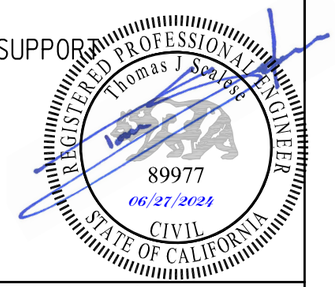
NOTES:

1. SUPPORT SHOWN FOR INTENT ONLY. CONTRACTOR SHALL COORDINATE WITH ENGINEER FOR THE DESIGN AND BE RESPONSIBLE FOR FINAL LOCATIONS OF CONDUIT SUPPORTS.
2. REFER TO SPECIFICATIONS SECTION 26 05 33 FOR APPROVED SUPPORTING MATERIALS WITHIN SPECIFIC AREAS OF THE FACILITY.

VERTICAL WALL MOUNTED CONDUIT SUPPORT

DETAIL 11

SD428-W4400-TYP



3" ON ORIGINAL DOCUMENT

0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	T. SCALESE
DRAWN BY:	T. SCALESE
DESIGN CHECKED BY R.P.E. NO. 89977	T. SCALESE
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD PROJECT MANAGER R.P.E. NO. 95046	J. LAW
EBMUD RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
STRUCTURAL
DETAILS

SCALE AS NOTED
DATE 28JUN24

SD428-W4400-S003
DRAWING NUMBER

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(NOTE 6)
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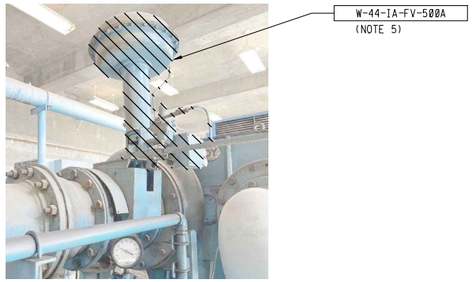

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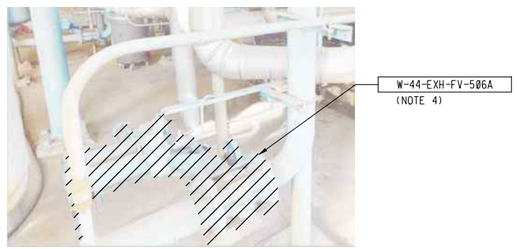

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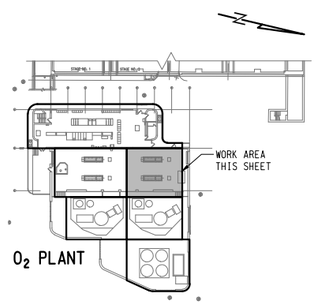
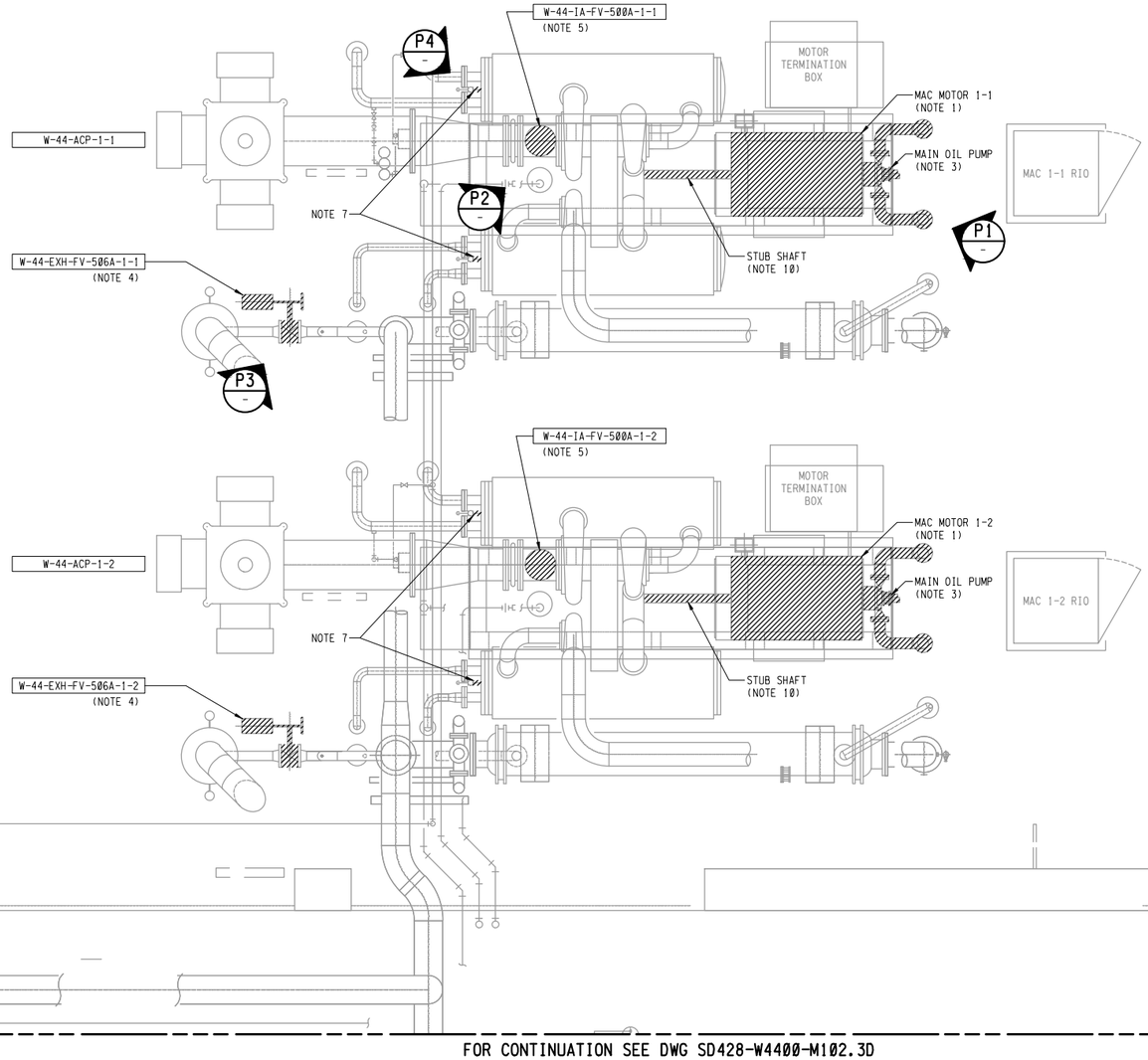


KEY PLAN

FOR CONTINUATION SEE DWG SD428-W4400-M102.6D



FOR CONTINUATION SEE DWG SD428-W4400-M102.2D

FOR CONTINUATION SEE DWG SD428-W4400-M102.3D

PLAN

NOTES:

1. DISCONNECT LEADS AND DEMOLISH MAC MOTOR.
2. CLEAN MOTOR BASE PRIOR TO INSTALLATION OF NEW MAC MOTOR.
3. REMOVE MAIN OIL PUMP AND ANY NECESSARY ASSOCIATED PIPING AND STORE FOR RE-INSTALLATION. DRAIN OIL RESERVOIR AND SAVE OIL PRIOR TO THE REMOVAL OF MAC MOTOR.
4. DEMOLISH AND REPLACE VALVE ASSEMBLY.
5. DEMOLISH AND REPLACE ACTUATOR AND POSITIONER.
6. PHOTOS TYPICAL FOR MAC 1-1, MAC 1-2, MAC 2-1 AND MAC 2-2.
7. DEMOLISH PIPE SECTION BEFORE BALL VALVE FOR INSTALLATION OF TEE AND RELIEF VALVE.
8. DEMOLISH AND REPLACE PNEUMATIC TUBING. REFER TO PNEUMATIC TUBING SCHEDULE ON DWG. SD428-W4400-M301.
9. TEMPORARILY COVER OR BLIND FLANGE OPEN PIPING UNTIL NEW WORK IS COMPLETE TO PREVENT DUST AND DEBRIS FROM ENTERING MAC PIPING.
10. REMOVE STUB SHAFT AND HALF COUPLING FITTING AND STORE FOR RE-INSTALLATION.

(NOTE 6)
PHOTO DETAIL P4
NO SCALE

REGISTERED PROFESSIONAL ENGINEER
DAVID LLOYD RICHARDSON
No. 37097
Exp. 06-30-24
CIVIL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran
SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	B. WESLEY/D. BOGGS
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
MECHANICAL
PARTIAL DEMOLITION PLAN 1

SCALE 3/8"=1'-0"
DATE 28JUN24

SD428-W4400-M102.1D
DRAWING NUMBER

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(NOTE 6)
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(NOTE 6)
PHOTO DETAIL P2
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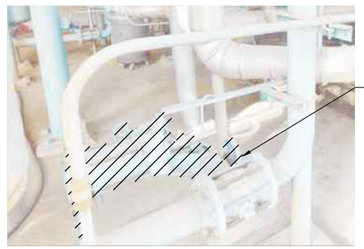

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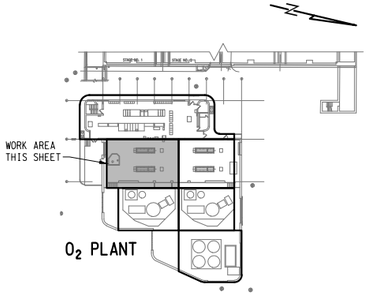
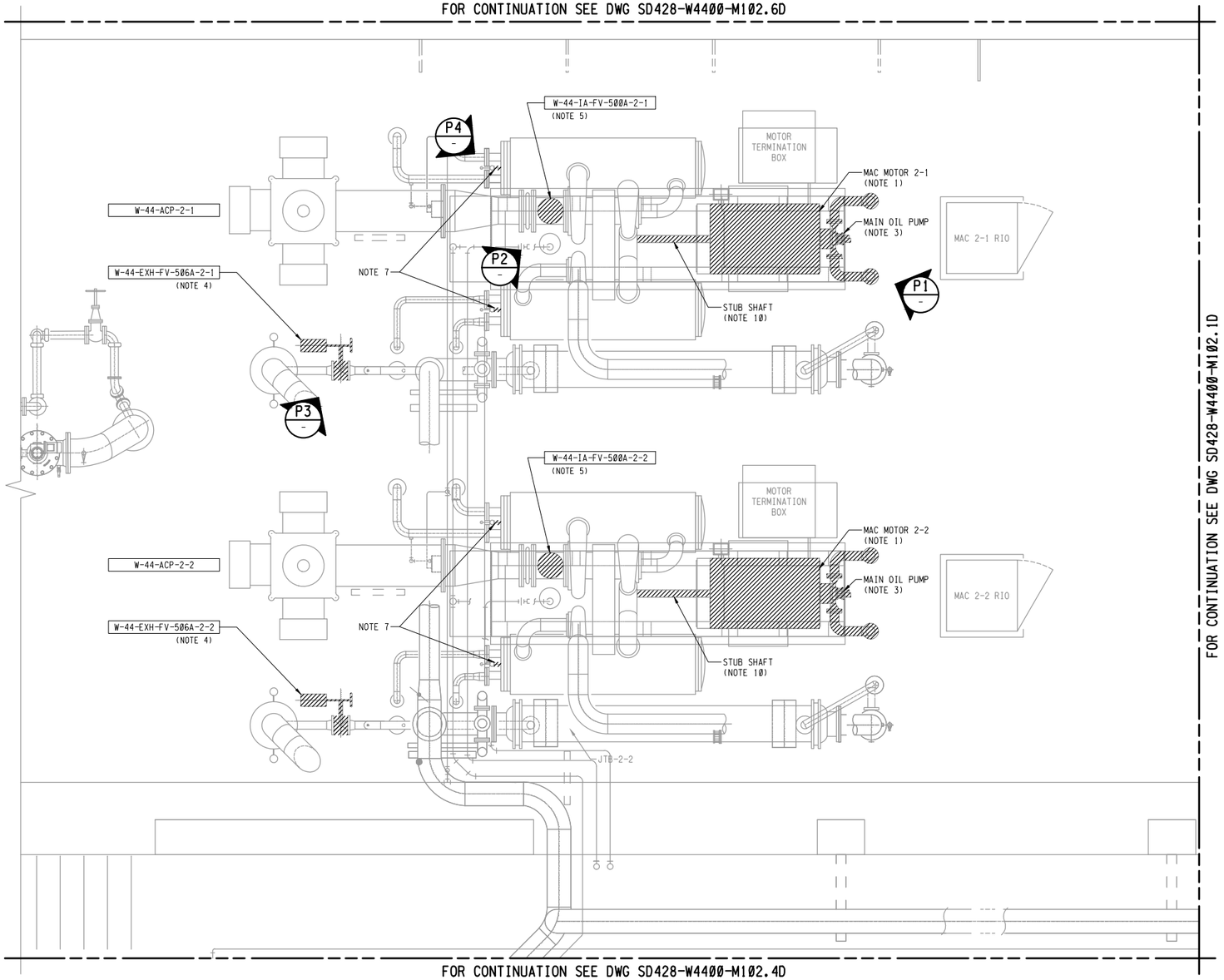


KEY PLAN

FOR CONTINUATION SEE DWG SD428-W4400-M102.6D



FOR CONTINUATION SEE DWG SD428-W4400-M102.4D

PLAN

FOR CONTINUATION SEE DWG SD428-W4400-M102.1D

NOTES:

1. DISCONNECT LEADS AND DEMOLISH MAC MOTOR.
2. CLEAN MOTOR BASE PRIOR TO INSTALLATION OF NEW MAC MOTOR.
3. REMOVE MAIN OIL PUMP AND ANY NECESSARY ASSOCIATED PIPING AND STORE FOR RE-INSTALLATION. DRAIN OIL RESERVOIR AND SAVE OIL PRIOR TO THE REMOVAL OF MAC MOTOR.
4. DEMOLISH AND REPLACE VALVE ASSEMBLY.
5. DEMOLISH AND REPLACE ACTUATOR AND POSITIONER.
6. PHOTOS TYPICAL FOR MAC 1-1, MAC 1-2, MAC 2-1 AND MAC 2-2.
7. DEMOLISH PIPE SECTION BEFORE BALL VALVE FOR INSTALLATION OF TEE AND RELIEF VALVE.
8. DEMOLISH AND REPLACE PNEUMATIC TUBING. REFER TO PNEUMATIC TUBING SCHEDULE ON DWG. SD428-W4400-M301.
9. TEMPORARILY COVER OR BLIND FLANGE OPEN PIPING UNTIL NEW WORK IS COMPLETE TO PREVENT DUST AND DEBRIS FROM ENTERING MAC PIPING.
10. REMOVE STUB SHAFT AND HALF COUPLING FITTING AND STORE FOR RE-INSTALLATION.

(NOTE 6)
PHOTO DETAIL P4
NO SCALE

REGISTERED PROFESSIONAL ENGINEER
DAVID LLOYD RICHARDSON
No. 37097
Exp. 06-30-24
CIVIL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT	DESIGN BY:	B. WESLEY/D. BOGGS
	DRAWN BY:	L. MAXWELL
	DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95846	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

MECHANICAL

PARTIAL DEMOLITION PLAN 2

SCALE 3/8"=1'-0"
DATE 28JUN24

SD428-W4400-M102.2D
DRAWING NUMBER

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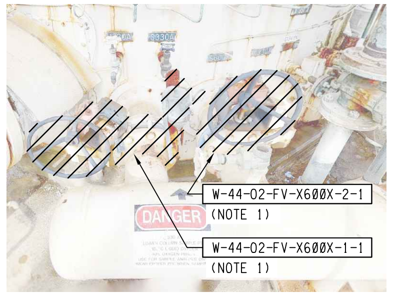

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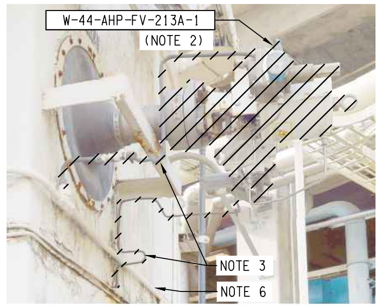

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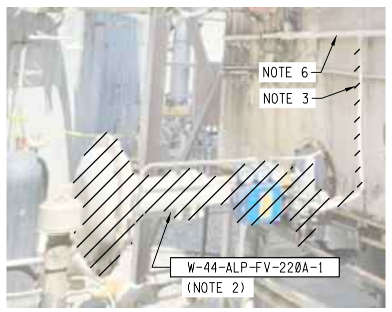

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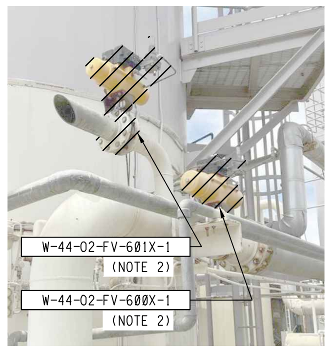

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(NOTE 4)
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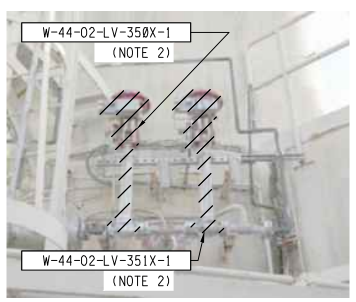

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(NOTE 4)
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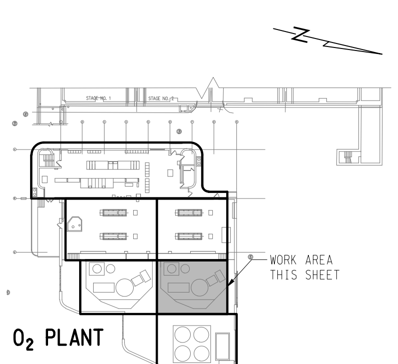
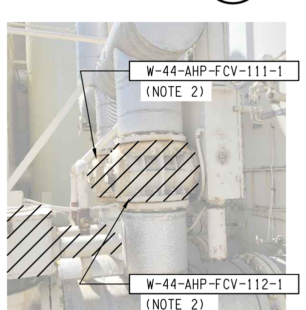


KEY PLAN



(NOTE 4)
PHOTO DETAIL P8 -
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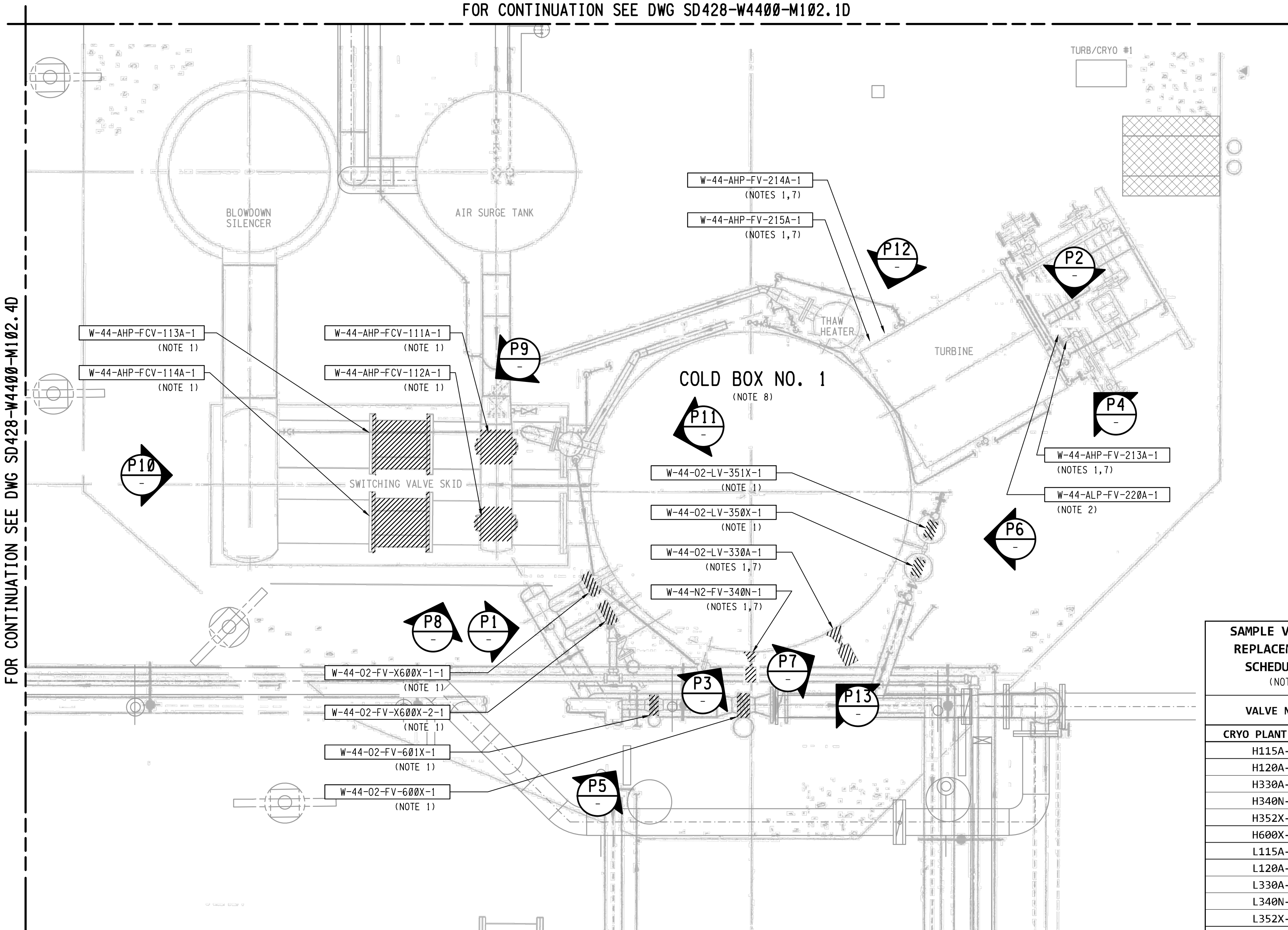
FOR CONTINUATION SEE DWG SD428-W4400-M102.1D

FOR CONTINUATION SEE DWG SD428-W4400-M102.4D

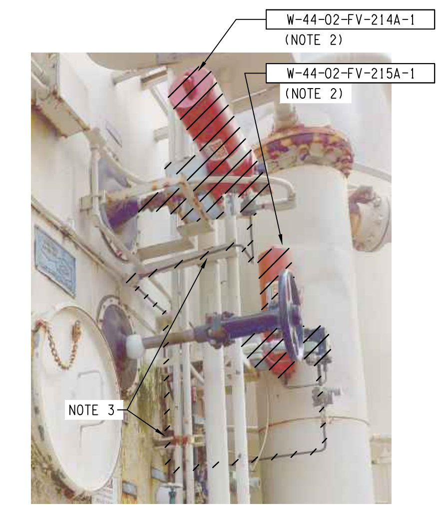


FOR CONTINUATION SEE DWG SD428-W4400-M102.5D

PLAN

NOTES:

1. DEMOLISH AND REPLACE VALVE ASSEMBLY.
2. DEMOLISH AND REPLACE ACTUATOR AND POSITIONER.
3. DEMOLISH ALL PNEUMATIC TUBING IN COLD BOX AREA UNLESS OTHERWISE NOTED.
4. PHOTO SIMILAR FOR BOTH COLD BOXES.
5. DEMOLISH AND REPLACE SAMPLE VALVES (NOT SHOWN ON PLAN) ACCORDING TO SCHEDULE.
6. MAIN SUPPLY PNEUMATIC TUBING TO REMAIN
7. DEMOLISH AND REPLACE VALVE BOOT
8. AFTER REMOVAL OF PERLITE, REMOVE EXISTING COLD END CHECK VALVES HV-Y112A-1, HV-113A-1, HV-140N-1, HV-141N-1, HV-Y142N-1 AND HV-Y143N-1 (TOTAL OF 6 VALVES, NOT SHOWN ON PLAN) FROM COLD BOX INTERIOR AND DELIVER TO DISTRICT. REPLACE CHECK VALVES WITH REFURBISHED CHECK VALVES SUPPLIED BY DISTRICT DISTRICT.



(NOTE 4)
PHOTO DETAIL P12 -
NO SCALE

SAMPLE VALVE REPLACEMENT SCHEDULE (NOTE 5)
VALVE NO.
CRYO PLANT NO. 1
H115A-1
H120A-1
H330A-1
H340N-1
H352X-1
H600X-1
L115A-1
L120A-1
L330A-1
L340N-1
L352X-1
L600X-1
P200A-1
P300N-1
P349N-1
P352X-1
P590A-1
P600A-1
S350N-1
S355X-1
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TURBINE NO. 1
H215A-1
L215A-1
P216A-1

(NOTE 4)
PHOTO DETAIL P13 -
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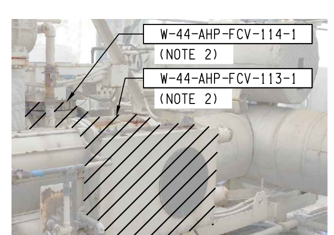

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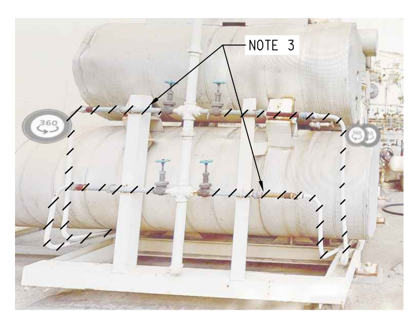

(NOTE 4)
PHOTO DETAIL P10 -
NO SCALE

(NOTE 4)
PHOTO DETAIL P11 -
NO SCALE

REGISTERED PROFESSIONAL ENGINEER DAVID LLOYD RICHARDSON No. 37097 Exp. 06-30-24 CIVIL STATE OF CALIFORNIA 06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran
SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	D. BOGGS
	DRAWN BY:	L. MAXWELL
	DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
MECHANICAL
PARTIAL DEMOLITION PLAN 3

SCALE 3/8"=1'-0"
DATE 28JUN24
SD428-W4400-M102.3D
DRAWING NUMBER
0
REV.

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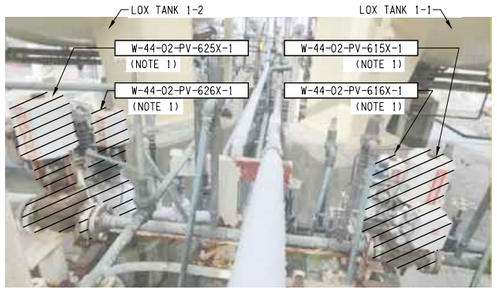

(NOTE 2)
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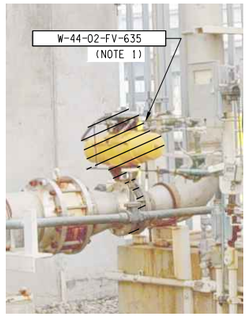

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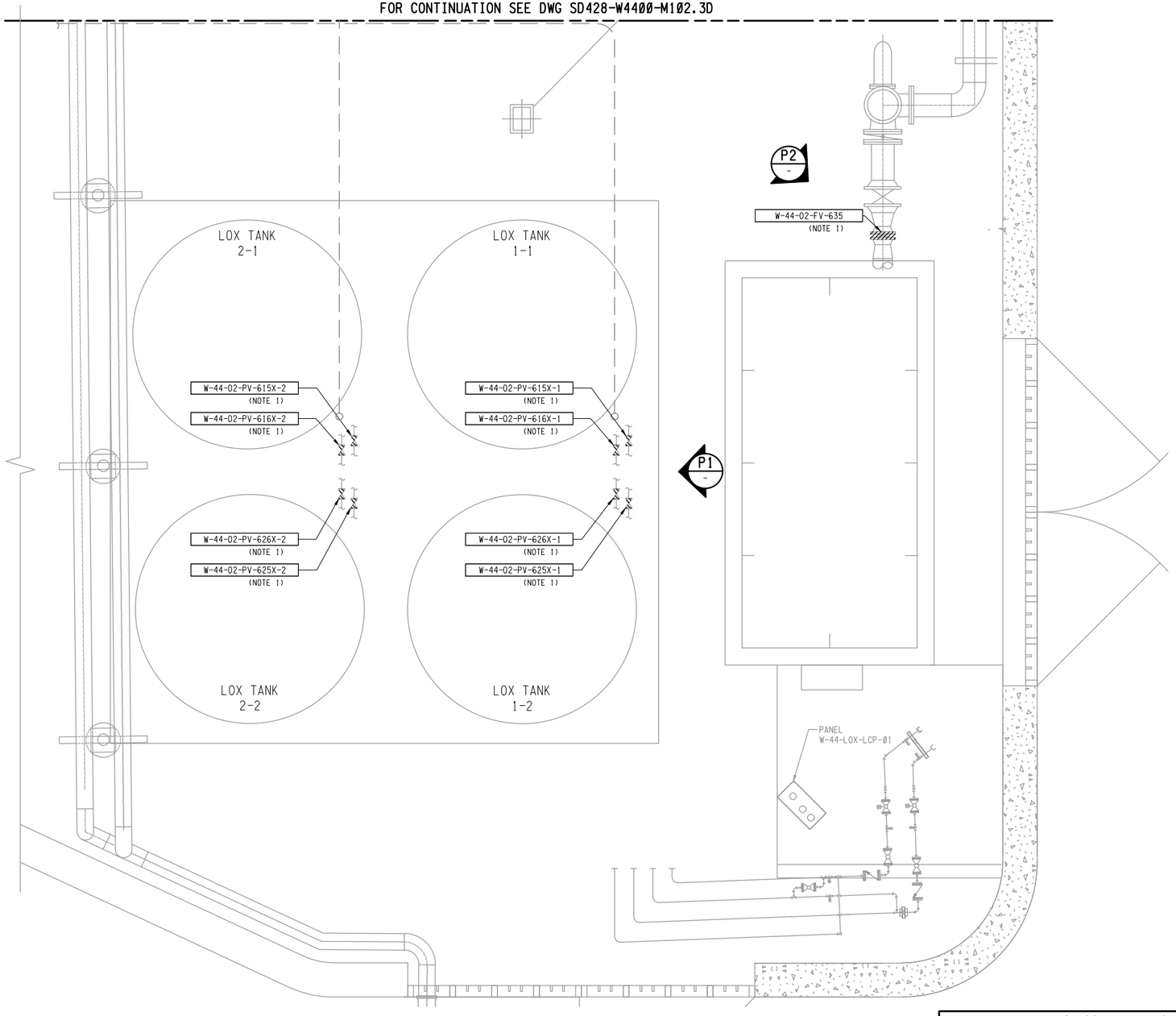
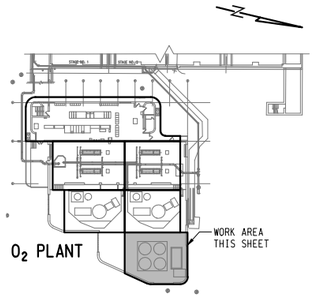
FOR CONTINUATION SEE DWG SD428-W4400-M102.3D



PLAN

NOTES:

1. DEMOLISH AND REPLACE VALVE ASSEMBLY.
2. PHOTO TYPICAL FOR LOX TANKS 2-1 & 2-2
3. DEMOLISH AND REPLACE PNEUMATIC TUBING



KEY PLAN

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

REGISTERED PROFESSIONAL ENGINEER
DAVID LLOYD RICHARDSON
No. 37097
Exp. 06-30-24
CIVIL
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. BOGGS
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
MECHANICAL
PARTIAL DEMOLITION PLAN 5

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DATE 28JUN24	DRAWING NUMBER	REV.

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PNEUMATIC TUBING SCHEDULE

LOCATION	FROM	TO	ESTIMATED LENGTH (IN)	ESTIMATED LENGTH (FT)	TUBING DIAM.	MATERIAL	COMMENTS
MAC-1-1							
MAC-1-1	ORIFICE PLATE	FIT-502-1-1 HIGH	96	8	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-1	ORIFICE PLATE	FIT-502-1-1 LOW	96	8	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-1	P506A-1-1	PIT-506-1-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-1	P53L-1-1	PIT-53-1-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-1	P54L-1-1	PSL-53-1-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-1	3RD STAGE DISCHARGE	PSH-503-1-1	24	2	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-1-1	IA SUPPLY LINE	PCV-500A-1-1	60	5	3/8"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-1-1	IA SUPPLY LINE	PCV-506A-1-1	60	5	3/8"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-1-2							
MAC-1-2	ORIFICE PLATE	FIT-502-1-2 HIGH	96	8	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-2	ORIFICE PLATE	FIT-502-1-2 LOW	96	8	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-2	P506A-1-2	PIT-506-1-2	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-2	P53L-1-2	PIT-53-1-2	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-2	P54L-1-2	PSL-53-1-2	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-2	3RD STAGE DISCHARGE	PSH-503-1-2	24	2	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-1-2	IA SUPPLY LINE	PCV-500A-1-2	60	5	3/8"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-1-2	IA SUPPLY LINE	PCV-506A-1-2	60	5	3/8"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-2-1							
MAC-2-1	ORIFICE PLATE	FIT-502-2-1 HIGH	96	8	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-1	ORIFICE PLATE	FIT-502-2-1 LOW	96	8	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-1	P506A-2-1	PIT-506-2-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-1	P53L-2-1	PIT-53-2-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-1-1	P54L-2-1	PSL-53-2-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-1	3RD STAGE DISCHARGE	PSH-503-2-1	24	2	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-2-1	IA SUPPLY LINE	PCV-500A-2-1	60	5	3/8"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-2-1	IA SUPPLY LINE	PCV-506A-2-1	60	5	3/8"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-2-2							
MAC-2-2	ORIFICE PLATE	FIT-502-2-2 HIGH	96	8	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-2	ORIFICE PLATE	FIT-502-2-2 LOW	96	8	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-2	P506A-2-2	PIT-506-2-2	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-2	P53L-2-2	PIT-53-2-2	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-2	P54L-2-2	PSL-53-2-2	60	5	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
MAC-2-2	3RD STAGE DISCHARGE	PSH-503-2-2	24	2	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-2-2	PCV-506A-2-2	FY-506A-2-2	12	1	3/8"	316 STAINLESS STL .035 IN THICK	NPT TO TUBING CONNECTION FROM SUPPLY REGULATOR
MAC-2-2	IA SUPPLY LINE	PCV-500A-2-2	120	10	3/8"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-2-2	IA SUPPLY LINE	PCV-506A-2-2	120	10	3/8"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
MAC-2-2	PCV-500A-2-2	FY-500-2-2	12	1	3/8"	316 STAINLESS STL .035 IN THICK	NPT TO TUBING CONNECTION FROM SUPPLY REGULATOR

REGISTERED PROFESSIONAL ENGINEER
DAVID LLOYD RICHARDSON
No. 37097
Exp. 06-30-24
CIVIL
STATE OF CALIFORNIA
06/28/2024

Woodard & Curran
SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	D. BOGGS
	DRAWN BY:	L. MAXWELL
	DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

MECHANICAL

PNEUMATIC TUBING SCHEDULE 1

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DATE 28JUN24

SD428-W4400-M301
DRAWING NUMBER

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PNEUMATIC TUBING SCHEDULE

LOCATION	FROM	TO	ESTIMATED LENGTH (IN)	ESTIMATED LENGTH (FT)	TUBING DIAM.	MATERIAL	COMMENTS
CRYO PLANT #1							
CRYO PLANT #1	S350N-1	AIT-312-1	1200	100	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	S600X-1	AIT-352-1	1200	100	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	S355X-1	AIT-355-1	1200	100	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	P800A-1	PSL-800-1	12	1	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #1	X111A-1	PCV-111-1	120	10	1/2"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/2" TUBING
CRYO PLANT #1	X112A-1	PCV-112-1	120	10	1/2"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/2" TUBING
CRYO PLANT #1	X113A-1	PCV-113-1	120	10	1/2"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/2" TUBING
CRYO PLANT #1	X114A-1	PCV-114-1	120	10	1/2"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/2" TUBING
CRYO PLANT #1	H115A-1	FIT-115-1 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	L115A-1	FIT-115-1 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	H120A-1	FIT-120-1 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	L120A-1	FIT-120-1 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	H340N-1	FIT-340-1 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	L340N-1	FIT-340-1 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	H600X-1	FIT-600-1 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	L600X-1	FIT-600-1 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	H330A-1	LIT-330-1 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	L330A-1	LIT-330-1 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	H352X-1	LIT-352-1 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	L352X-1	LIT-352-1 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	IA SUPPLY LINE	PCV-340-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #1	IA SUPPLY LINE	PCV-600-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #1	IA SUPPLY LINE	PCV-601-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #1	P200A-1	PIT-200-1	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	P300N-1	PIT-300-1	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	P349N-1	PIT-349-1	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	P352X-1	PIT-352-1	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	P590A-1	PIT-590-1	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	P600A-1	PIT-600-1	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #1	IA SUPPLY LINE	PCV-X600X-1-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	NEW CONNECTION NEEDS TEE FITTING WHERE FCV-120 WOULD BE CONNECTED
CRYO PLANT #1	IA SUPPLY LINE	PCV-X600X-1-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	NEW CONNECTION NEEDS TEE FITTING WHERE FCV-120 WOULD BE CONNECTED
CRYO PLANT #1	IA SUPPLY LINE	PCV-330-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #1	IA SUPPLY LINE	PCV-350X-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	NPT TO TUBING CONNECTION FROM SUPPLY REGULATOR
CRYO PLANT #1	IA SUPPLY LINE	PCV-351X-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #2							
CRYO PLANT #2	S350N-2	AIT-312-2	1680	140	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	S600X-2	AIT-352-2	1680	140	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	S355X-2	AIT-355-2	1500	125	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	X111A-2	PCV-111-2	120	10	1/2"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/2" TUBING
CRYO PLANT #2	X112A-2	PCV-112-2	120	10	1/2"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/2" TUBING
CRYO PLANT #2	X113A-2	PCV-113-2	120	10	1/2"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/2" TUBING
CRYO PLANT #2	X114A-2	PCV-114-2	120	10	1/2"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/2" TUBING
CRYO PLANT #2	H115A-2	FIT-115-2 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	L115A-2	FIT-115-2 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	H120A-2	FIT-120-2 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	L120A-2	FIT-120-2 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	H340N-2	FIT-340-2 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	L340N-2	FIT-340-2 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	H600X-2	FIT-600-2 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	L600X-2	FIT-600-2 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	H330A-2	LIT-330-2 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	L330A-2	LIT-330-2 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	H352X-2	LIT-352-2 HIGH	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	L352X-2	LIT-352-2 LOW	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	IA SUPPLY LINE	PCV-340-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #2	IA SUPPLY LINE	PCV-600-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #2	IA SUPPLY LINE	PCV-601-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #2	P200A-2	PIT-200-2	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	P300N-2	PIT-300-2	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	P349N-2	PIT-349-2	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	P352X-2	PIT-352-2	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	P590A-2	PIT-590-2	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	P600A-2	PIT-600-2	240	20	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
CRYO PLANT #2	IA SUPPLY LINE	PCV-X600X-2-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	NEW CONNECTION NEEDS TEE FITTING WHERE FCV-120 WOULD BE CONNECTED
CRYO PLANT #2	IA SUPPLY LINE	PCV-X600X-2-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	NEW CONNECTION NEEDS TEE FITTING WHERE FCV-120 WOULD BE CONNECTED
CRYO PLANT #2	IA SUPPLY LINE	PCV-330-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
CRYO PLANT #2	IA SUPPLY LINE	PCV-350X-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	NPT TO TUBING CONNECTION FROM SUPPLY REGULATOR
CRYO PLANT #2	IA SUPPLY LINE	PCV-351X-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING

REGISTERED PROFESSIONAL ENGINEER
DAVID LLOYD RICHARDSON
No. 37097
Exp. 06-30-24
CIVIL
STATE OF CALIFORNIA
06/28/2024

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. BOGGS
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 37097	D. RICHARDSON
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	D. RUSSELL

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
MECHANICAL
PNEUMATIC TUBING SCHEDULE 2

SCALE NONE
DATE 28JUN24

SD428-W4400-M302
DRAWING NUMBER

0
REV.

PNEUMATIC TUBING SCHEDULE

LOCATION	FROM	TO	ESTIMATED LENGTH (IN)	ESTIMATED LENGTH (FT)	TUBING DIAM.	MATERIAL	COMMENTS
TURBINE #1							
TURBINE #1	IA SUPPLY LINE	PCV-214-1	24	2	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #1	IA SUPPLY LINE	PCV-213-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #1	IA SUPPLY LINE	PCV-215-1	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #1	IA SUPPLY LINE	PCV-220-1	96	8	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #1	P23L-1	PIT-23-1	120	10	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
TURBINE #1	L215A-1	PIT-214-1	180	15	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
TURBINE #1	P216A-1	PIT-216-1	180	15	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
TURBINE #1	P580A-1	PSL-580-1	12	1	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #2							
TURBINE #2	IA SUPPLY LINE	PCV-214-2	24	2	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #2	IA SUPPLY LINE	PCV-213-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #2	IA SUPPLY LINE	PCV-215-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #2	IA SUPPLY LINE	PCV-220-2	36	3	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
TURBINE #2	P23L-2	PIT-23-2	120	10	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
TURBINE #2	L215A-2	PIT-214-2	180	15	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
TURBINE #2	P216A-2	PIT-216-2	180	15	1/4"	316 STAINLESS STL .035 IN THICK	REPLACE FITTING WITH SST 1/2" NPT TO 1/4" COMPRESSION
TURBINE #2	P580A-2	PSL-580-2	12	1	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
LOX BACK-UP							
LOX BACK-UP	PCV-635	FY-635	12	1	1/4"	316 STAINLESS STL .035 IN THICK	NPT TO TUBING CONNECTION FROM SUPPLY REGULATOR
LOX BACK-UP	IA SUPPLY LINE	FY-690	48	4	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
LOX BACK-UP	IA SUPPLY LINE	PCV-616-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
LOX BACK-UP	IA SUPPLY LINE	PCV-616-2	60	5	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
LOX BACK-UP	IA SUPPLY LINE	PCV-626-1	60	5	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
LOX BACK-UP	IA SUPPLY LINE	PCV-626-2	60	5	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
LOX BACK-UP	IA SUPPLY LINE	PCV-635	24	2	1/4"	316 STAINLESS STL .035 IN THICK	FITTING FROM 1/2" NPT TO 1/4" TUBING
LOX BACK-UP	L616X-1	PIT-616-1	12	1	1/4"	316 STAINLESS STL .035 IN THICK	TAP INTO TUBING AROUND LIT-616
LOX BACK-UP	L616X-2	PIT-616-2	12	1	1/4"	316 STAINLESS STL .035 IN THICK	TAP INTO TUBING AROUND LIT-616
LOX BACK-UP	L626X-1	PIT-626-1	12	1	1/4"	316 STAINLESS STL .035 IN THICK	TAP INTO TUBING AROUND LIT-626
LOX BACK-UP	L626X-2	PIT-626-2	12	1	1/4"	316 STAINLESS STL .035 IN THICK	TAP INTO TUBING AROUND LIT-626
LOX BACK-UP	P630X	PIT-630	24	2	1/4"	316 STAINLESS STL .035 IN THICK	3/4" NPT TO 1/4" TUBING FITTING NEEDED
LOX BACK-UP	P600X	PIT-635	24	2	1/4"	316 STAINLESS STL .035 IN THICK	3/4" NPT TO 1/4" TUBING FITTING NEEDED
LOX BACK-UP	IA SUPPLY LINE	PCV-615-1	48	4	1/4"	316 STAINLESS STL .035 IN THICK	TUBED INTO THE ACTUATOR
LOX BACK-UP	IA SUPPLY LINE	PCV-615-2	48	4	1/4"	316 STAINLESS STL .035 IN THICK	TUBED INTO THE ACTUATOR
LOX BACK-UP	IA SUPPLY LINE	PCV-625-1	48	4	1/4"	316 STAINLESS STL .035 IN THICK	TUBED INTO THE ACTUATOR
LOX BACK-UP	IA SUPPLY LINE	PCV-625-2	48	4	1/4"	316 STAINLESS STL .035 IN THICK	TUBED INTO THE ACTUATOR

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ELECTRICAL

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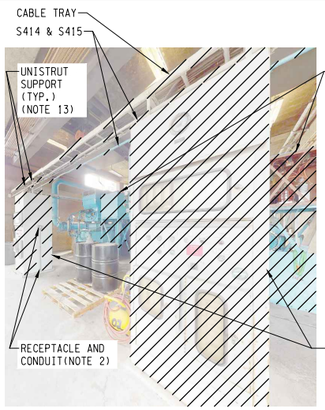

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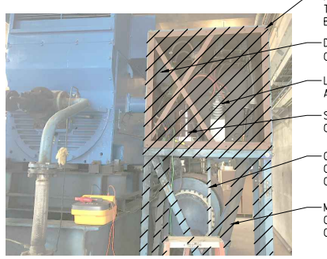

(NOTE 6)
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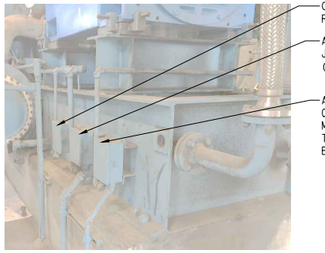

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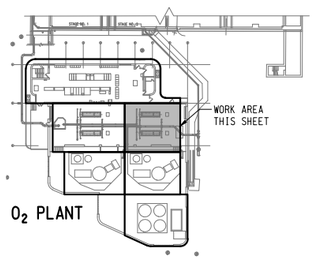
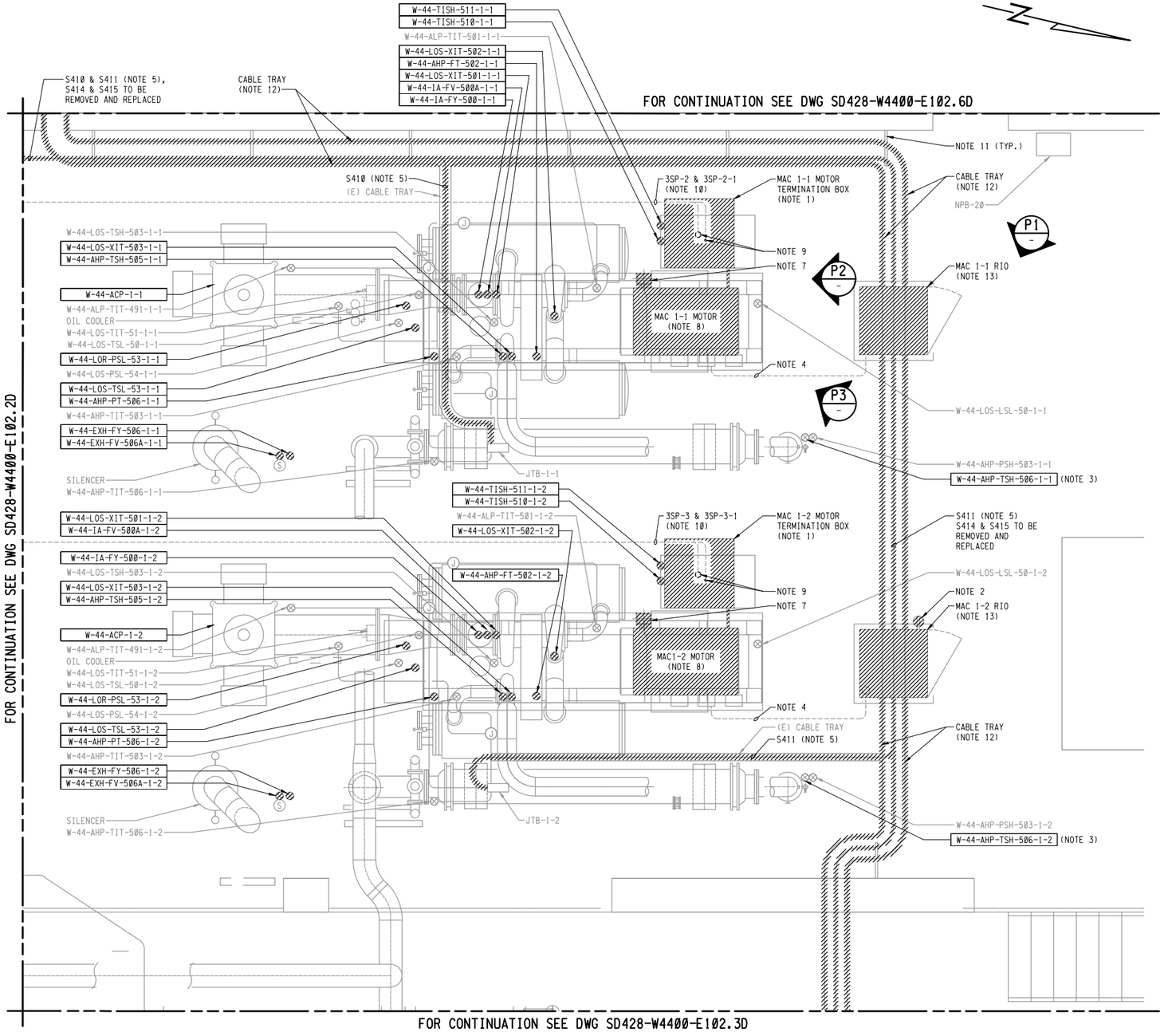


KEY PLAN



PLAN

NOTES:

1. REMOVE AND REPLACE MOTOR TERMINATION BOX, BOX SUPPORTS, SURGE CAPACITORS, DIFFERENTIAL CT'S, AND LIGHTNING ARRESTOR. PRIOR TO REMOVALS COORDINATE WITH DISTRICT TO DISCONNECT POWER AT SWITCHGEAR S-3. REMOVE MOTOR FEEDER CABLES AND EXISTING GROUNDING CONDUCTOR. SAFELY DISCHARGE SURGE CAPACITOR TO AVOID POTENTIAL SHOCK HAZARD PRIOR TO REMOVING.
2. REMOVE AND REPLACE RECEPTACLE. PROTECT 120V CIRCUIT CABLES IN PLACE FOR RECONNECTION
3. DEVICE TO REMAIN, INSTRUMENT TO BE RENAMED AS SHOWN ON DWG. SD428-W4400-E102.1.
4. WIRES IN AIR COMPRESSOR JUNCTION BOX ROUTED TO EXISTING MAC RIO PANELS SHALL REMAIN, BE COILED UP WHERE CONDUIT DAYLIGHTS AND BE PROTECTED DURING REPLACEMENT OF MAC RIO PANEL.
5. DISCONNECT SIGNAL WIRES S410 AND S411 AT O2 COOLING PLC AND PULL CABLE BACK TO JTB FOR INSTALLATION OF CONDUIT.
6. PHOTO TYPICAL FOR MAC 1-1 AND MAC 1-2
7. STATOR AND BEARING RTD BOX AND SPACE HEATER CONDUIT ENTRY. REMOVE RTD AND SPACE HEATER CABLES (NOT SHOWN).
8. MAC BLOW4ER MOTOR REMOVED AS PART OF THIS WORK. SEE MECHANICAL DEMOLITION DWG. SD428-W4400-M102.1D
9. CONDUIT FOR BOTH THE MOTOR FEEDER CABLE AND GROUNDING CONDUCTOR SHALL BE CUT AND TRIMMED TO THE HEIGHT OF THE NEW MOTOR TERMINATION BOX.
10. BELOW GRADE CONDUIT ROUTED FROM MOTOR CONTROL CENTER TO MOTOR TERMINATION BOX TO REMAIN. REMOVE AND REPLACE CABLES 3SP-2, 3SP-2-1, 3SP-3 & 3SP-3-1.
11. CABLE TRAY SUPPORTS ALONG WALL SHALL REMAIN.
12. WHERE CABLE TRAYS ARE BEING DEMOLISHED AND PNEUMATIC TUBING REMAINS, UTILIZE EXISTING WALL BRACKETS AND NEW CONDUIT RACKS FOR SUPPORT. SEE DWG. SD428-W4400-E102.1 FOR RACK LOCATIONS
13. UNISTRUT ATTACHED TO MAC RIO PANELS SHALL BE REMOVED WITH PANEL.

REGISTERED PROFESSIONAL ENGINEER DONNALYNN RAMMELL No. 16928 Exp. 06-30-25 ELECTRICAL STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran
SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	L. MAXWELL	
DRAWN BY:	L. MAXWELL	
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL	
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS	
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON	
PROJECT MANAGER R.P.E. NO. 95046	J. LAW	
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC	

EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PARTIAL POWER AND SIGNAL DEMOLITION PLAN 1

SCALE 3/8"=1'-0"
DATE 28JUN24

SD428-W4400-E102.1D
DRAWING NUMBER

0
REV.

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P111 FROM PANEL W-44-02-UPS-LP1 (NOTE 6)
C423 FROM (E) DCS DROP 15/65 PANEL
S423 FROM (E) DCS DROP 15/65 PANEL
P101, P151 & P301 FROM (E) PANEL LP1
P311A (VIA JUNCTION BOX)
S601 & S604 FROM (E) DCS DROP 15/65 PANEL
S001 FROM (E) MAC 1-1 MOTOR CONTROL CENTER
S002 FROM (E) MAC 1-2 MOTOR CONTROL CENTER
C362 (VIA JUNCTION BOX)
C364 FROM (E) MAC 1-1 MOTOR CONTROL CENTER
C365 FROM (E) MAC 1-2 MOTOR CONTROL CENTER
S424 FROM (E) MAC 1-1 MOTOR CONTROL CENTER
S425 FROM (E) MAC 1-2 MOTOR CONTROL CENTER
S613, S614, S615 & S619 FROM (E) 44-NET-006
S410 & S411 (NOTE 10), S414 & S415
FROM (E) O2 COOLING PLC CONTROL PANEL
3SP-2 & 3SP-2-1 FROM
(E) MAC 1-1 MOTOR CONTROL CENTER (NOTE 12)
SEE DWG. SD428-W4400-E102.6

NOTE 13

FOR CONTINUATION SEE DWG SD428-W4400-E102.2

3SP-3 & 3SP-3-1 FROM
(E) MAC 1-2 MOTOR CONTROL CENTER (NOTE 12)
SEE DWG. SD428-W4400-E102.6

FOR CONTINUATION SEE DWG SD428-W4400-E102.6

W-44-ALP-TIT-501-1-1
W-44-LOS-VE-502-1-1
W-44-AHP-FIT-502-1-1
W-44-LOS-VE-501-1-1
W-44-IA-FV-500A-1-1
W-44-IA-FY-500-1-1

MAC 1-1 MOTOR TERMINATION BOX (NOTE 9)
P111 (NOTE 6)
C423
S423
S411, S414 & S415
P101, P151 & P301
P311A
S001, S002, S601 & S604
C362 & C365
S424, S425, S613, S614, S615 & S619

NPB-20

48" MIN. CLEARANCE

(E) CABLE TRAY
S410 (NOTE 10)

W-44-LOS-TSH-503-1-1
W-44-LOS-VE-503-1-1
W-44-AHP-TIT-505-1-1
W-44-ACP-1-1
W-44-ALP-TIT-491-1-1
OIL COOLER
W-44-LOS-TIT-51-1-1
W-44-LOS-TSL-50-1-1
W-44-LOR-PIT-53-1-1
W-44-LOS-PSL-54-1-1
W-44-LOS-TIT-53-1-1
W-44-AHP-PIT-506-1-1
W-44-AHP-TIT-503-1-1
W-44-EXH-FY-506-1-1
W-44-EXH-FV-506A-1-1
SILENCER
W-44-AHP-TIT-506-1-1

NOTES 7,8

1500
MAC 1-1 MOTOR

C364
NOTE 11
S424
S102 & S103
S101B
S101A
S101C
S100A
S100B
S101
S100
C100
C100A
S100F
S100E
S100D
C100B
S100C
S100G
C100C
JTB-1-1

W-44-LOS-LSL-50-1-1
C362D
S102 & S103
S613
P111A & P111B
P111A
P101
S001 & S601
S101
RIO-15-1 MAC 1-1 PANEL
S602
S100
C100
NOTE 5

W-44-AHP-TSHH-506-1-1 (NOTE 4)
W-44-AHP-PSH-503-1-1
C365
S425, S614, S615 & S619
C362D
S604
S002
S602
P311A
P151 & P301
S423
C423
S411, S414 & S415
P111B

W-44-ALP-TIT-501-1-2
W-44-LOS-VE-502-1-2
W-44-AHP-FIT-502-1-2
W-44-LOS-VE-501-1-2
W-44-IA-FV-500A-1-2
W-44-IA-FY-500-1-2
W-44-LOS-TSH-503-1-2
W-44-LOS-VE-503-1-2
W-44-AHP-TIT-505-1-2
W-44-ACP-1-2
W-44-ALP-TIT-491-1-2
OIL COOLER
W-44-LOS-TIT-51-1-2
W-44-LOS-TSL-50-1-2
W-44-LOR-PIT-53-1-2
W-44-LOS-PSL-54-1-2
W-44-LOS-TIT-53-1-2
W-44-AHP-PIT-506-1-2
W-44-AHP-TIT-503-1-2
W-44-EXH-FY-506-1-2
W-44-EXH-FV-506A-1-2
SILENCER
W-44-AHP-TIT-506-1-2

MAC 1-2 MOTOR TERMINATION BOX (NOTE 9)

48" MIN. CLEARANCE

NOTES 7,8

1500
MAC 1-2 MOTOR

NOTE 11
S425
C365
S152 & S153
S151B
S151A
S151C
S150A
S150B
S151
S150
C150
C150A
S150F
S150E
S150D
C150B
S150C
S150G
C150C
JTB-1-2

C362E
S152 & S153
S614
NOTE 1
P111B
P151
S002 & S602
S151
RIO-15-2 MAC 1-2 PANEL
S603
S150
C150
S002
NOTE 5
NOTE 2 (TYP.)

W-44-LOS-LSL-50-1-2
W-44-AHP-PSH-503-1-2
W-44-AHP-TSHH-506-1-2 (NOTE 4)
NOTE 3 (TYP.)

S411 (NOTE 10)
(E) CABLE TRAY

S615 TO RIO-15-3
TURBINE/CRYO PLANT 1 PANEL
S619 TO (E) PANEL
W-44-LOX-LCP-01

S604 FROM RIO-15-3
TURBINE/CRYO PLANT 1 PANEL

S603 TO RIO-15-3
TURBINE/CRYO PLANT 1 PANEL

P311A TO RIO-15-3 TURBINE/CRYO
PLANT 1 PANEL (NOTE 6)

P301 TO RIO-15-3
TURBINE/CRYO PLANT 1 PANEL

S414 TO W-44-LOS-TIT-21-1
S415 TO W-44-LOS-TIT-23-1

C423 TO W-44-02-FY-635
SEE DWG. SD428-W4400-E102.5

S423 TO JUNCTION BOX
SEE DWG. SD428-W4400-E102.5

S400 P402 P405
C400 P403 P406
P404 P407

FOR CONTINUATION SEE DWG SD428-W4400-E102.3

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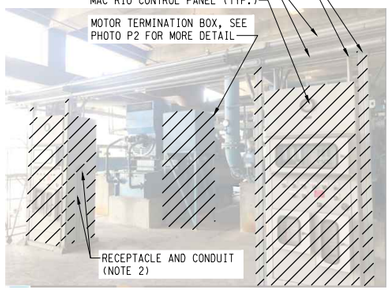

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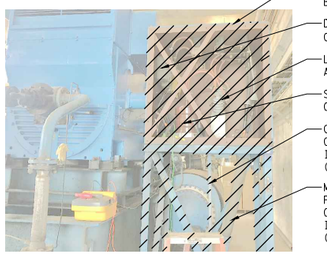

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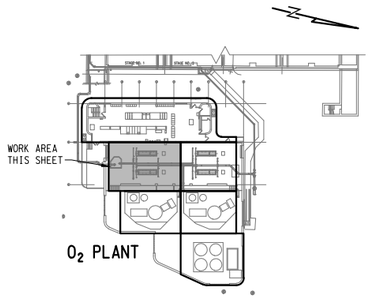
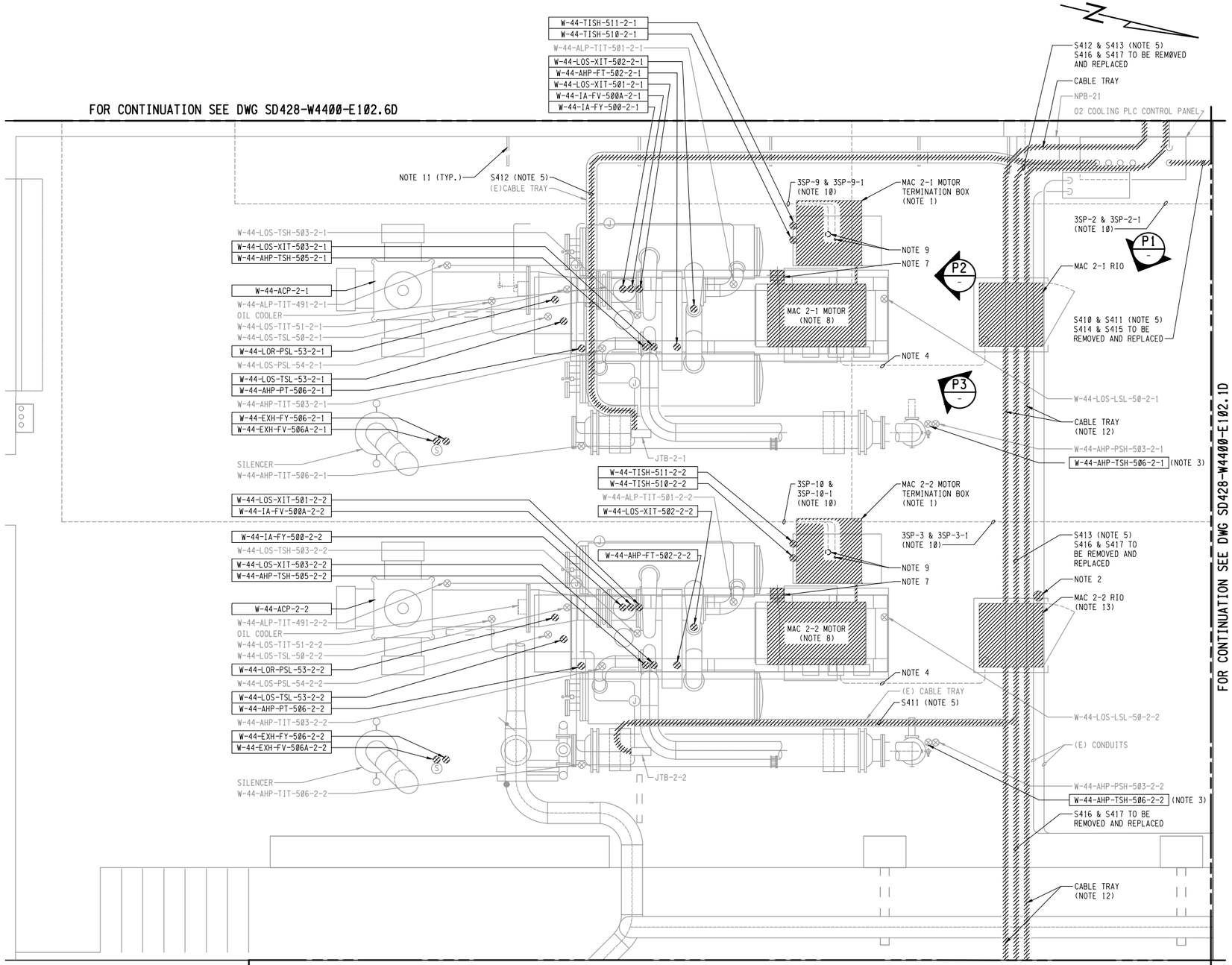


KEY PLAN

FOR CONTINUATION SEE DWG SD428-W4400-E102.6D



FOR CONTINUATION SEE DWG SD428-W4400-E102.4D

PLAN

NOTES:

1. REMOVE AND REPLACE MOTOR TERMINATION BOX, BOX SUPPORTS, SURGE CAPACITORS, DIFFERENTIAL CT'S, AND LIGHTNING ARRESTOR. PRIOR TO REMOVALS COORDINATE WITH DISTRICT TO DISCONNECT POWER AT SWITCHGEAR S-3. REMOVE MOTOR FEEDER CABLES AND EXISTING GROUNDING CONDUCTOR. SAFELY DISCHARGE SURGE CAPACITOR TO AVOID POTENTIAL SHOCK HAZARD PRIOR TO REMOVING.
2. REMOVE AND REPLACE RECEPTACLE. PROTECT 120V CIRCUIT CABLES IN PLACE FOR RECONNECTION
3. DEVICE TO REMAIN, INSTRUMENT TO BE RENAMED AS SHOWN ON DWG. SD428-W4400-E102.1.
4. WIRES IN AIR COMPRESSOR JUNCTION BOX ROUTED TO EXISTING MAC RIO PANELS SHALL REMAIN, BE COILED UP WHERE CONDUIT DAYLIGHTS AND BE PROTECTED DURING REPLACEMENT OF MAC RIO PANEL.
5. DISCONNECT SIGNAL WIRES S410, S411, S412 AND S413 AT O2 COOLING PLC AND PULL CABLE BACK TO JTB FOR INSTALLATION OF CONDUIT.
6. PHOTO TYPICAL FOR MAC 1-1 AND MAC 1-2
7. STATOR AND BEARING RTD BOX AND SPACE HEATER CONDUIT ENTRY. REMOVE RTD AND SPACE HEATER CABLES (NOT SHOWN).
8. MAC BLOW4ER MOTOR REMOVED AS PART OF THIS WORK. SEE MECHANICAL DEMOLITION DWG. SD428-W4400-M102.1D
9. CONDUIT FOR BOTH THE MOTOR FEEDER CABLE AND GROUNDING CONDUCTOR SHALL BE CUT AND TRIMMED TO THE HEIGHT OF THE NEW MOTOR TERMINATION BOX.
10. BELOW GRADE CONDUIT ROUTED FROM MOTOR CONTROL CENTER TO MOTOR TERMINATION BOX TO REMAIN. REMOVE AND REPLACE CABLES 3SP-9, 3SP-9-1, 3SP-10 & 3SP-10-1.
11. CABLE TRAY SUPPORTS ALONG WALL SHALL REMAIN.
12. WHERE CABLE TRAYS ARE BEING DEMOLISHED AND PNEUMATIC TUBING REMAINS, UTILIZE EXISTING WALL BRACKETS AND NEW CONDUIT RACKS FOR SUPPORT. SEE DWG. SD428-W4400-E102.1 FOR RACK LOCATIONS
13. UNISTRUT ATTACHED TO MAC RIO PANELS SHALL BE REMOVED WITH PANEL.

FOR CONTINUATION SEE DWG SD428-W4400-E102.1D

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

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0 1 2 3

Woodard & Curran
SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	L. MAXWELL
	DRAWN BY:	L. MAXWELL
	DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PARTIAL POWER AND SIGNAL DEMOLITION PLAN 2

SCALE 3/8"=1'-0"
DATE 28JUN24
SD428-W4400-E102.2D
DRAWING NUMBER
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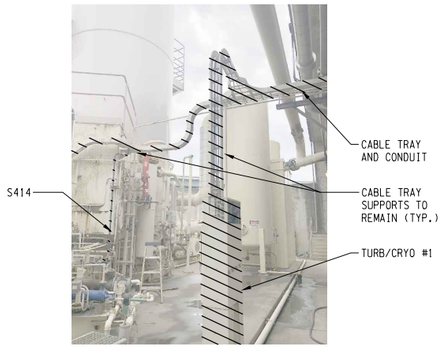

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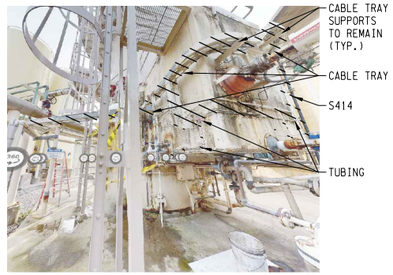

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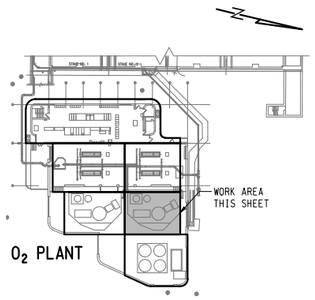
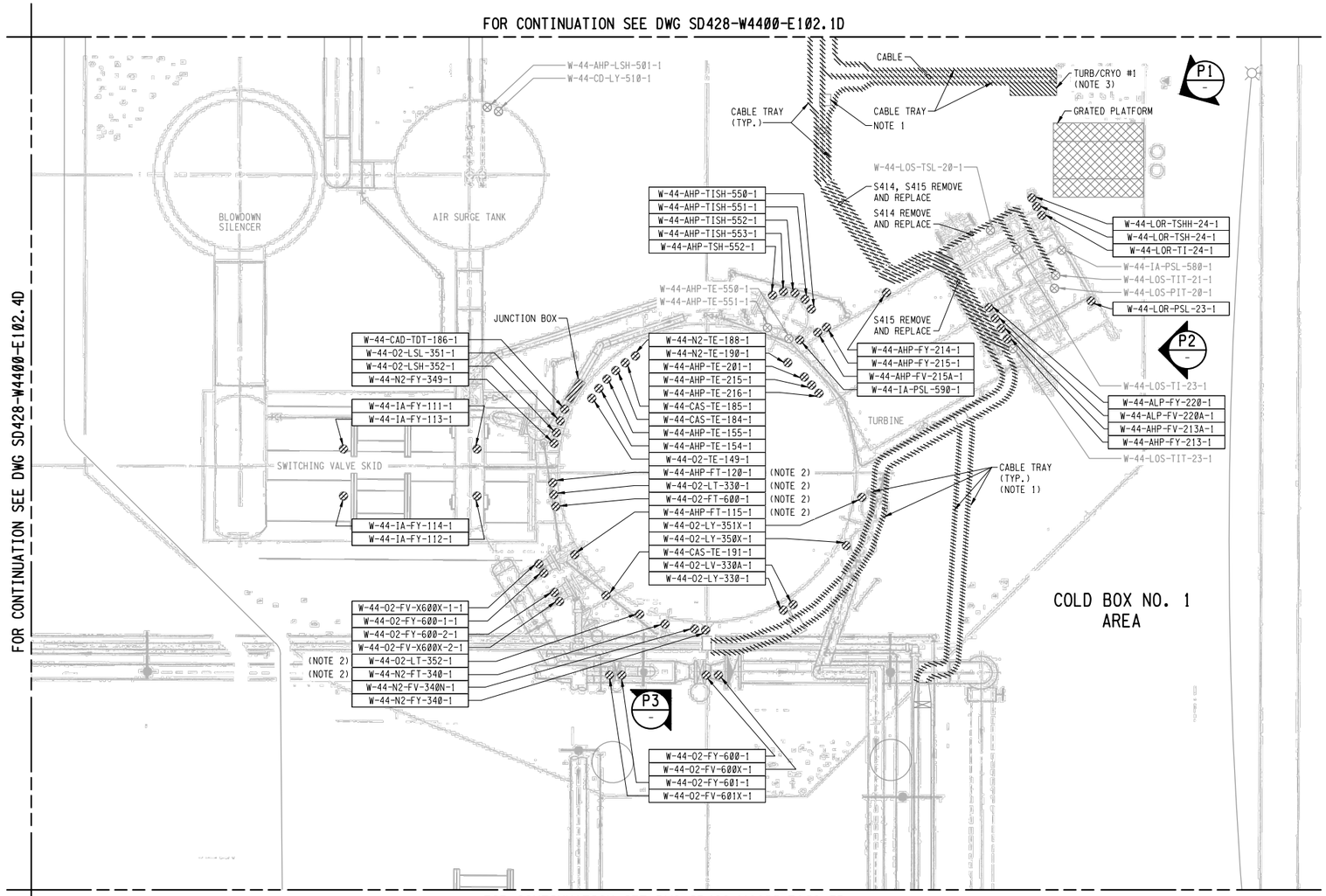


KEY PLAN

NOTES:

1. CABLE TRAY SUPPORTS TO REMAIN.
2. INSTRUMENTS TO BE RELOCATED
3. UNDERGROUND CONDUIT SHALL BE ABANDONED. CUT AND CAP IN PLACE.



PLAN

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	L. MAXWELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PARTIAL POWER AND SIGNAL DEMOLITION PLAN 3

SCALE NONE
DATE 28JUN24

SD428-W4400-E102.3D
DRAWING NUMBER

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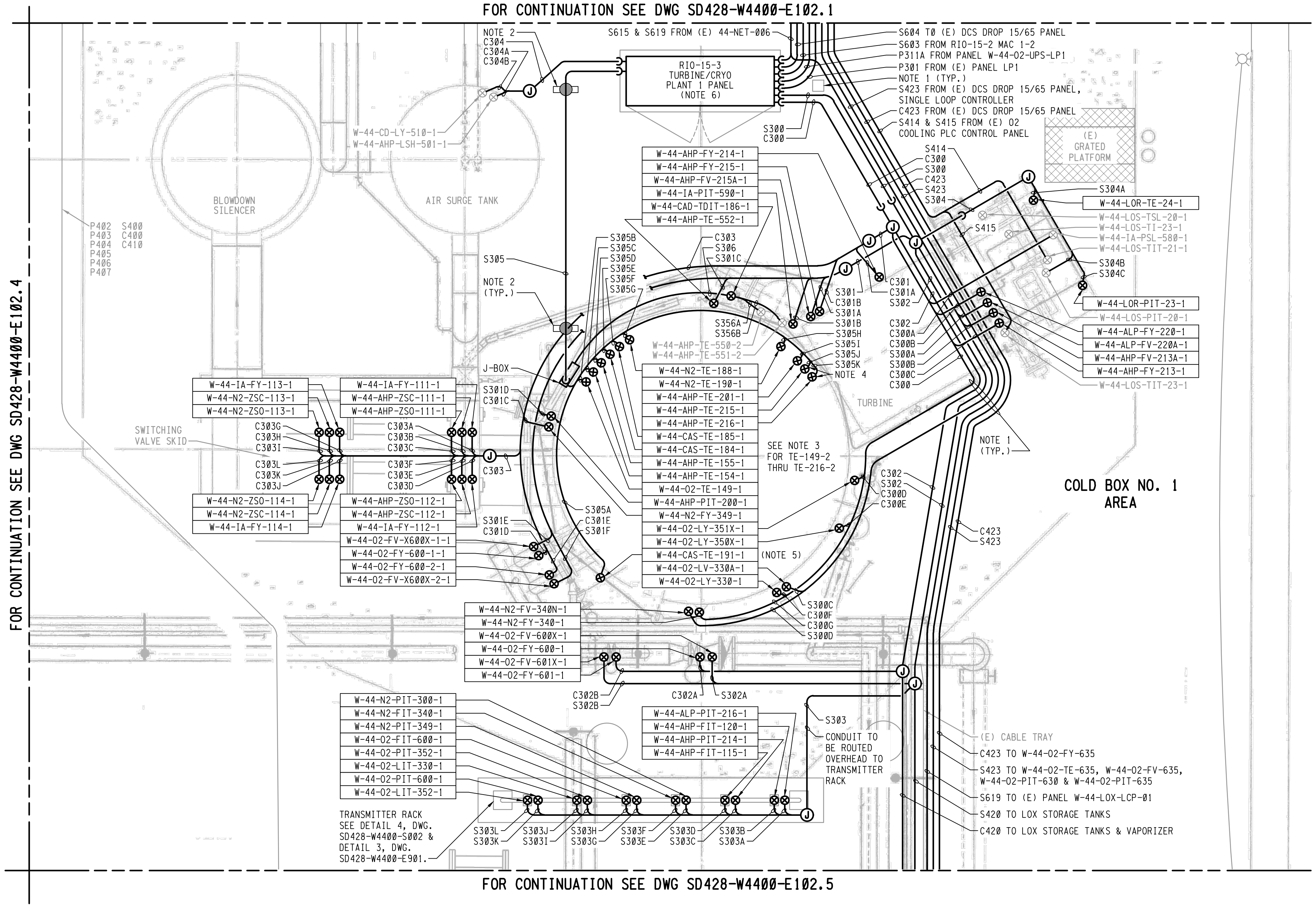
NOTES:

1. UTILIZE EXISTING CONDUIT AND CABLE TRAY SUPPORTS FOR CONDUIT WHEN POSSIBLE.
2. PROVIDE CONDUIT RACK SUPPORTS FOR SIGNAL AND CONTROL CONDUITS
3. FIELD VERIFY LOCATIONS OF TE-149-1 THRU TE-190-1 AND TE-201-1 THRU TE-216-1 LOCATED WITHIN THE COLD BOX.
4. TE-215-1 AND TE-216-1 LOCATED INSIDE TURBINE BOX
5. TE-191-1 SERVES COOL DOWN HEADER
6. ALL CONDUITS CONNECTING TO PANELS LOCATED OUTDOORS SHALL BE SIDE ENTRY.



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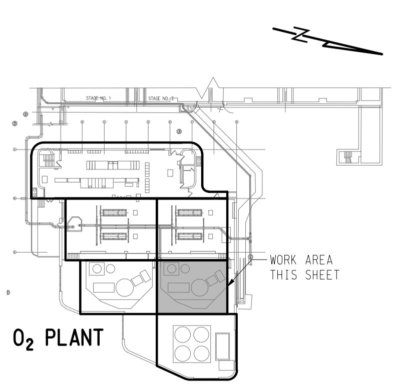

KEY PLAN

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SOLUTIONWERKS INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

REGISTERED PROFESSIONAL ENGINEER DONNA LYNN RAMMELL No. 16928 Exp. 06-30-25 ELECTRICAL STATE OF CALIFORNIA

06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

DESIGN BY:	L. MAXWELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

CONSULTANT / EBMUD

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

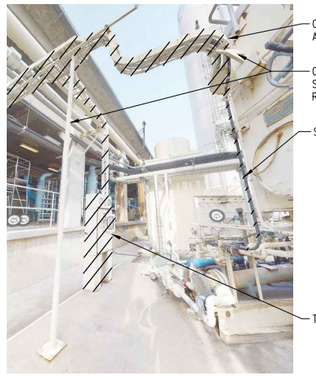
ELECTRICAL

PARTIAL POWER AND SIGNAL PLAN 3

SCALE 3/8"=1'-0"
DATE 28JUN24

SD428-W4400-E102.3 DRAWING NUMBER

REV. 0



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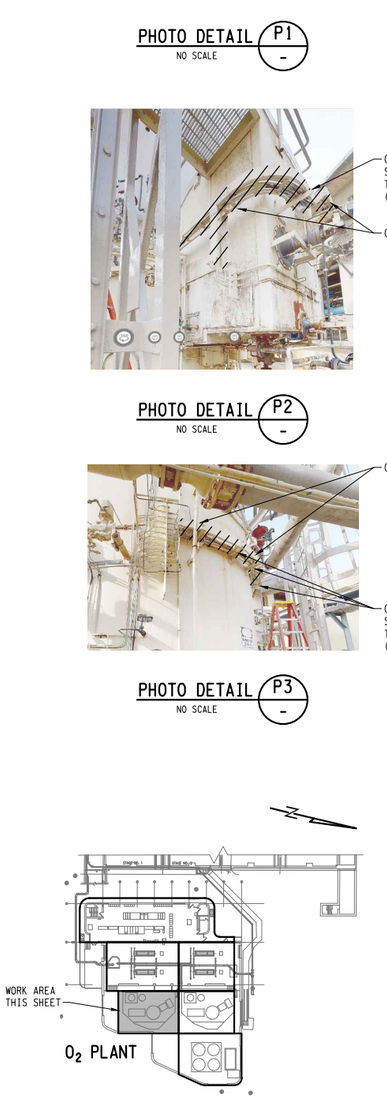

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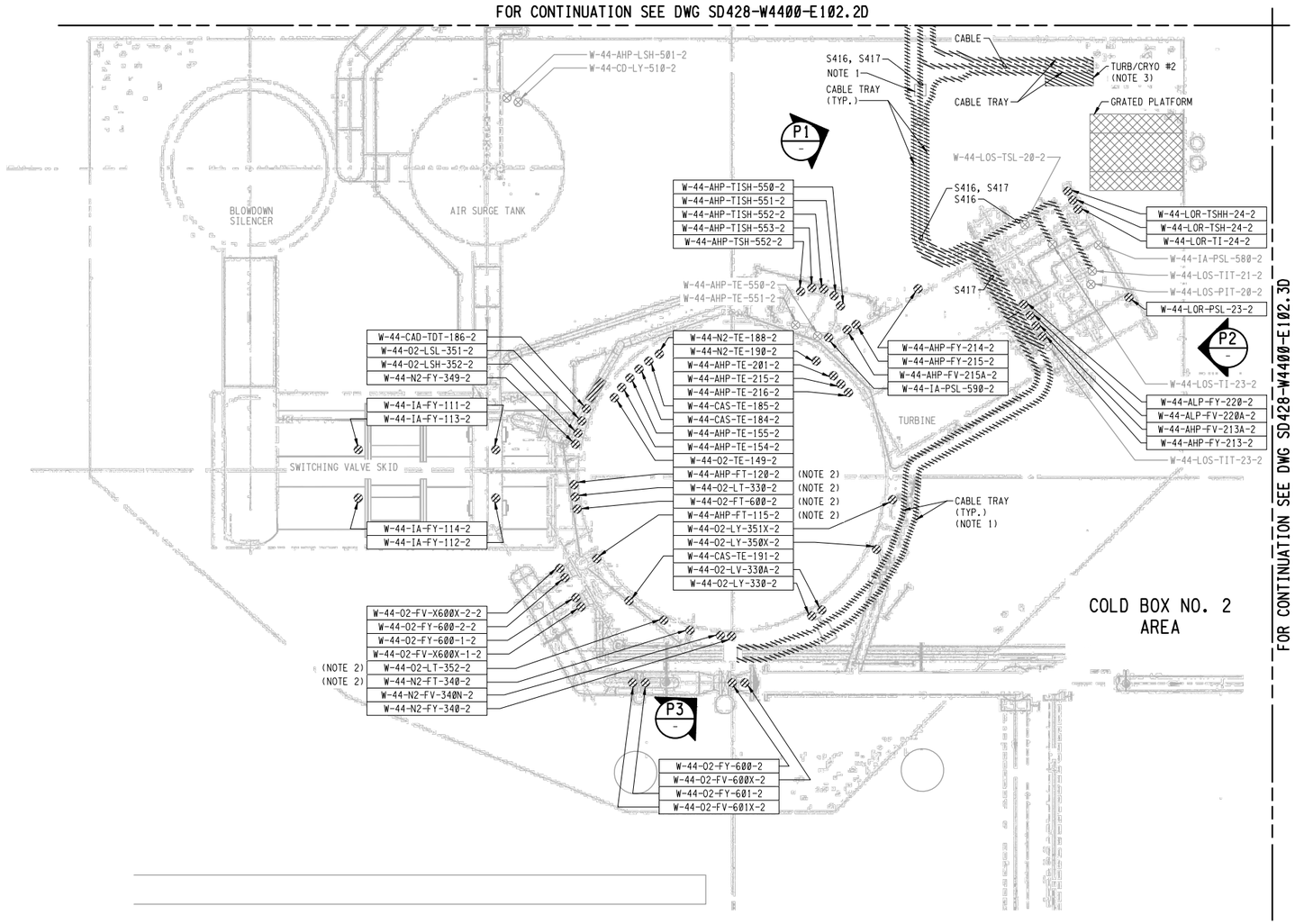
FOR CONTINUATION SEE DWG SD428-W4400-E102.2D



PLAN

NOTES:

1. CABLE TRAY SUPPORTS TO REMAIN.
2. INSTRUMENTS TO BE RELOCATED.
3. UNDERGROUND CONDUIT SHALL BE ABANDONED. CUT AND CAP IN PLACE.

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran
SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	L. MAXWELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PARTIAL POWER AND SIGNAL DEMOLITION PLAN 4

SCALE NONE
DATE 28JUN24

SD428-W4400-E102.4D
DRAWING NUMBER

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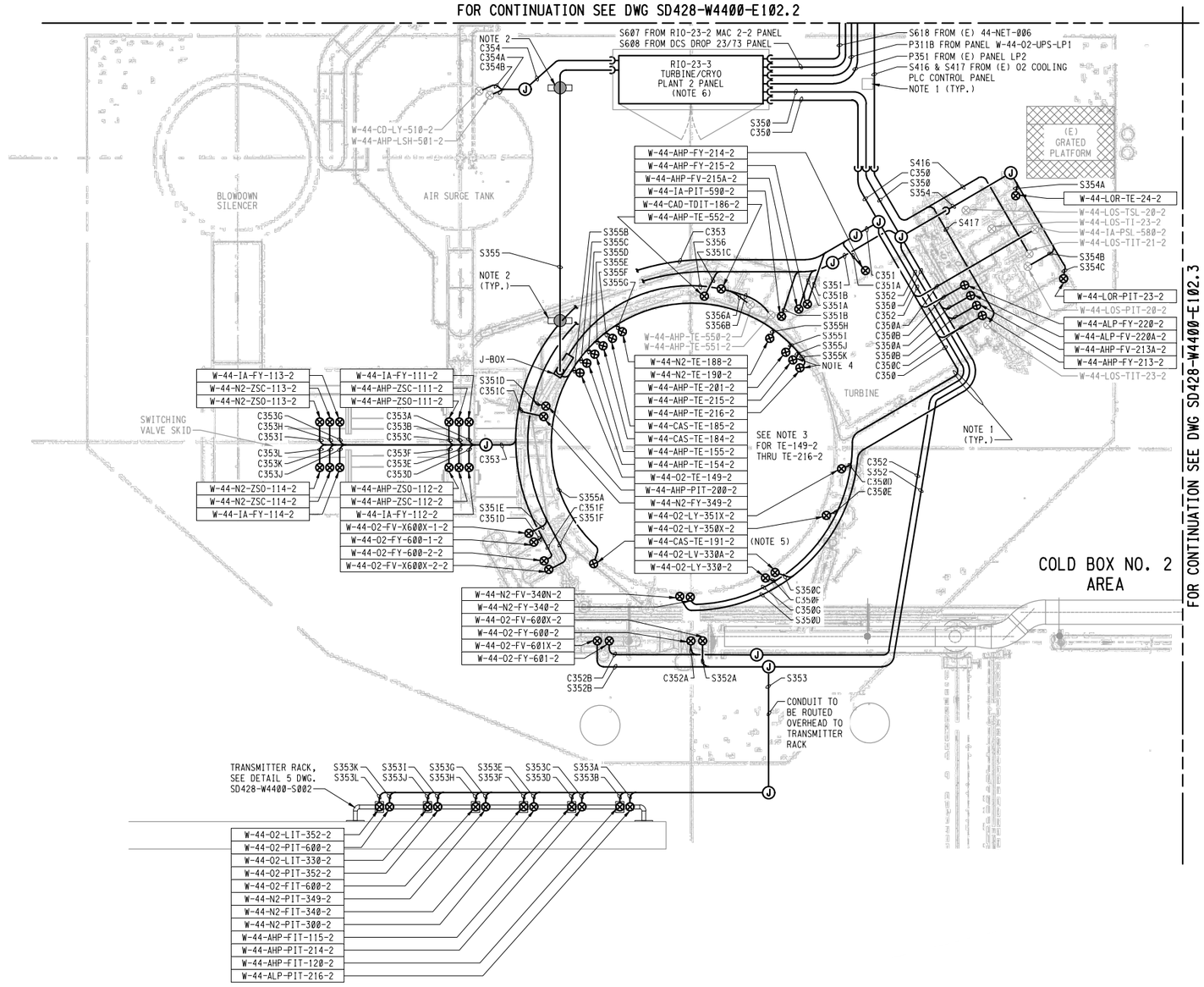

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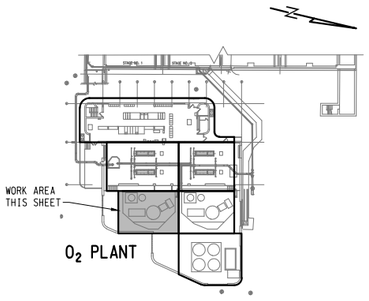

KEY PLAN

NOTES:

1. UTILIZE EXISTING CONDUIT AND CABLE TRAY SUPPORTS FOR CONDUIT WHEN POSSIBLE.
2. PROVIDE CONDUIT RACK SUPPORTS FOR SIGNAL AND CONTROL CONDUITS
3. FIELD VERIFY LOCATIONS OF TE-149-2 THRU TE-190-2 AND TE-201-2 THRU TE-216-2 LOCATED WITHIN THE COLD BOX.
4. TE-215-2 AND TE-216-2 LOCATED INSIDE TURBINE BOX
5. TE-191-2 SERVES COOL DOWN HEADER
6. ALL CONDUITS CONNECTING TO PANELS LOCATED OUTDOORS SHALL BE SIDE ENTRY.

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0 1 2 3

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SOLUTIONWERKS™ INCORPORATED

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REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

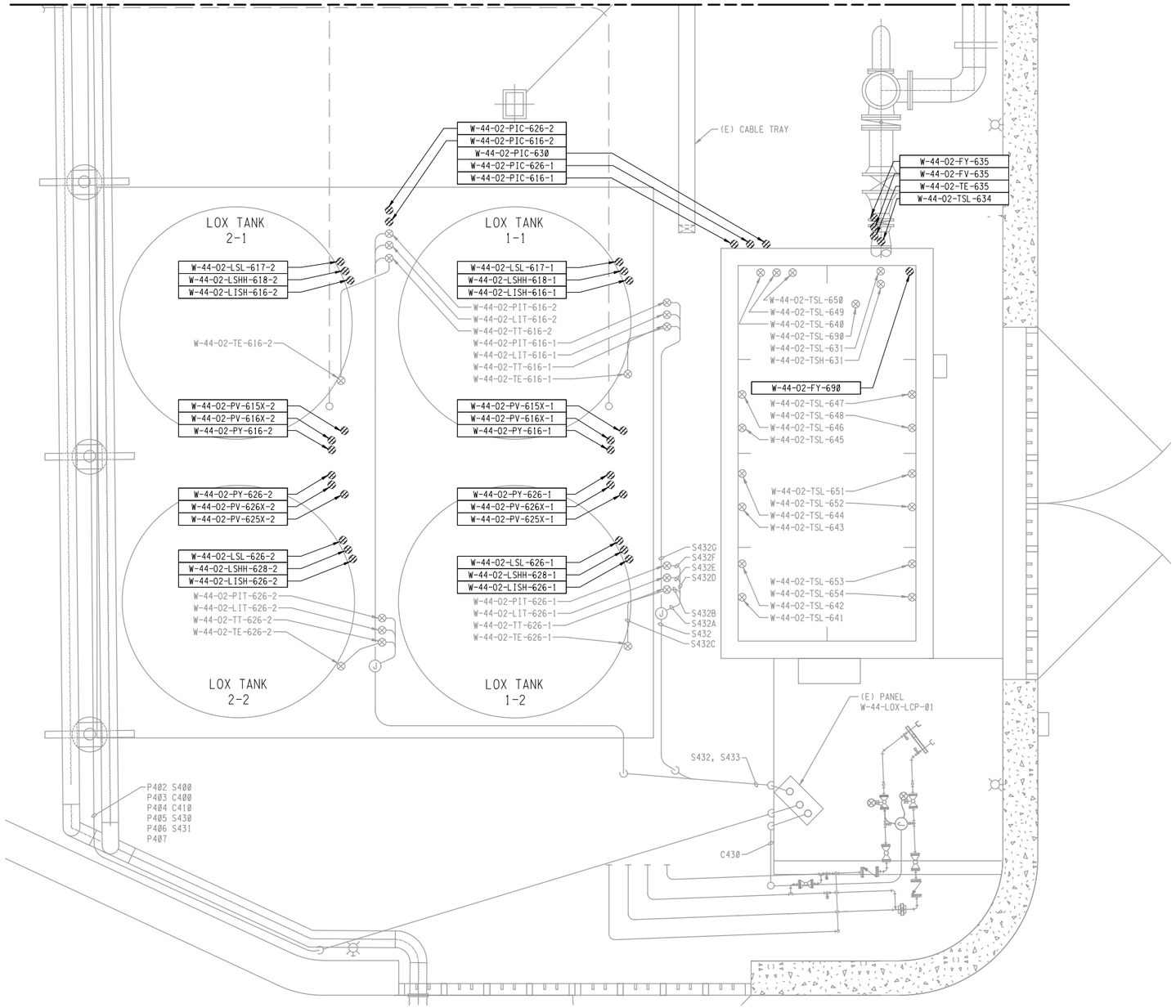
CONSULTANT		
DESIGN BY:	L. MAXWELL	
DRAWN BY:	L. MAXWELL	
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL	
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS	
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON	
EBMUD		
PROJECT MANAGER R.P.E. NO. 95046	J. LAW	
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC	

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PARTIAL POWER AND SIGNAL PLAN 4

SCALE 3/8"=1'0"	SD428-W4400-E102.4	0
DATE 28JUN24	DRAWING NUMBER	REV.

FOR CONTINUATION SEE DWG SD428-W4400-E102.3D



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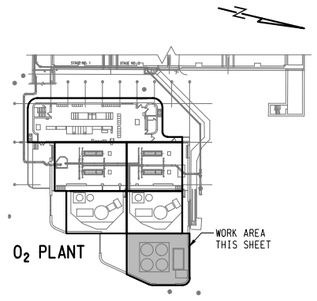

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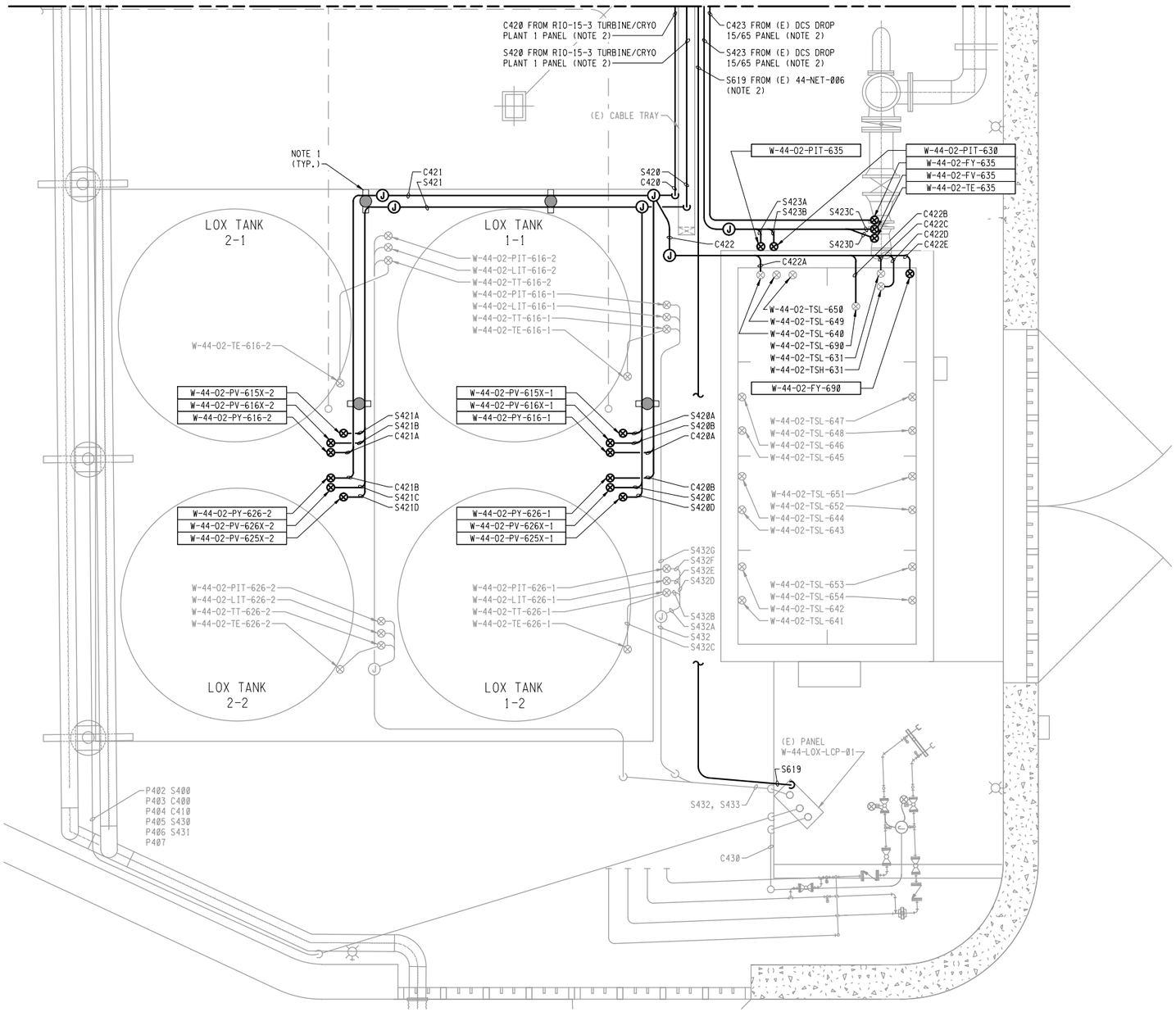

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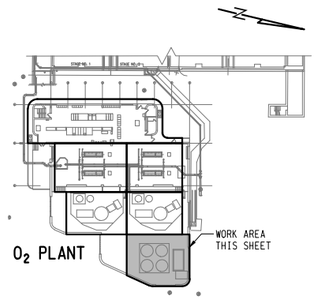

KEY PLAN

NOTES:

1. PROVIDE CONDUIT RACK SUPPORTS FOR SIGNAL AND CONTROL CONDUITS.
2. ROUTE CONDUITS IN EXISTING CABLE TRAY

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA

06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	L. MAXWELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
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PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PARTIAL POWER AND SIGNAL PLAN 5

SCALE 3/8"=1'0"
DATE 28JUN24

SD428-W4400-E102.5
DRAWING NUMBER

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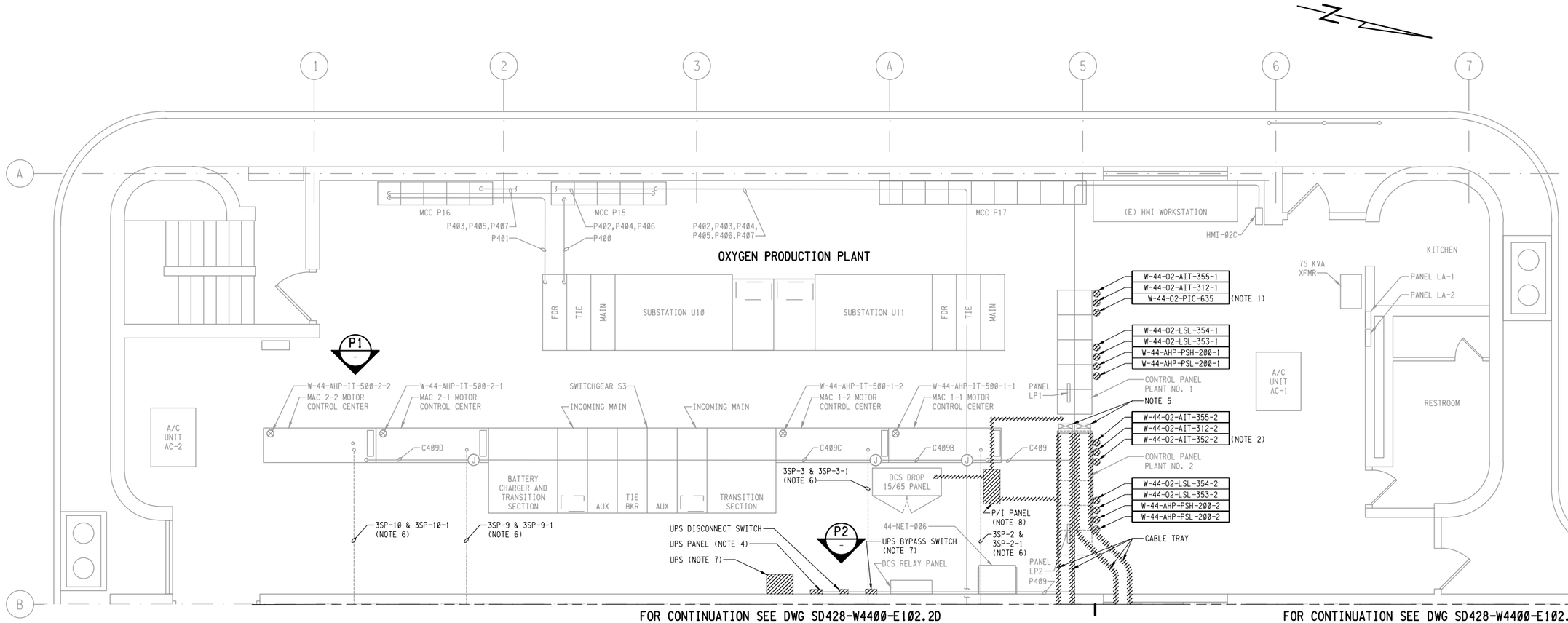


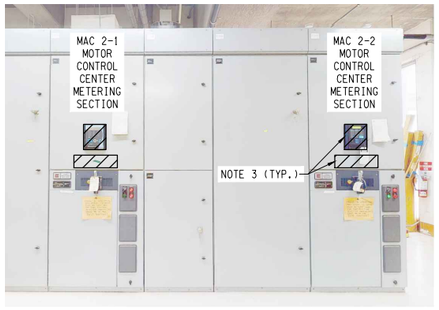
FOR CONTINUATION SEE DWG SD428-W4400-E102.2D

FOR CONTINUATION SEE DWG SD428-W4400-E102.1D

PLAN

NOTES:

1. W-44-O2-PIC-635 SHALL REMAIN UNTIL LOX PORTION OF THE PROIECT IS COMPLETE
2. W-44-O2-AIT-352-2 SHALL REMAIN IN THE EVENT THAT CONSTRUCTION BEGINS ON PLANT 2 AND PLANT 1 IS STILL RUNNING.
3. DISCONNECT AND REMOVE MULTILIN RELAY AND ALL ASSOCIATED WIRING. ENLARGE AND CUT ENCLOSURE FACE AS REQUIRED FOR NEW MOTOR STARTERS AND TEST SWITCHES PHOTO TYPICAL FOR MAC 1-1 & MAC 1-2 MOTOR CONTROL CENTERS
4. DISCONNECT AND DEMOLISH UPS PANELBOARD. COORDINATE EXISTING CIRCUITS WITH DISTRICT PRIOR TO DISCONNECTING POWER. PROVIDE TEMPORARY POWER DURING REPLACEMENT OF PANELBOARD. EXISTING CONDUIT AND CIRCUIT WIRING SHALL REMAIN AND BE RECONNECTED TO NEW W-44-02-UPS-LP1 PANELBOARD. SEE DWG. SD428-W4400-E102.6 FOR NEW UPS PANELBOARD LOCATION
5. CABLE TRAY TRANSITION SHALL REMAIN
6. BELOW GRADE CONDUIT ROUTED FROM MOTOR CONTROL CENTER TO MOTOR TERMINATION BOX TO REMAIN. REMOVE AND REPLACE CABLES 3SP-2 (MOTOR CABLE FEED) & 3SP-2-1 (GROUNDING CONDUCTOR) FOR MAC MOTOR 1-1. TYPICAL FOR ALL MAC MOTORS.
7. CONTRACTOR TO HAND OVER UPS AND MANUAL BY-PASS SWITCH TO THE DISTRICT.
8. DEMOLISH P/I PANEL AND ALL ASSOCIATED CONDUIT, WIREWAYS, DUCTING, WIRE AND TUBING AT THE END OF THE PROJECT. P/I CONVERTERS SHALL BE PROTECTED AND TURNED OVER TO THE DISTRICT. 120 VAC WIRE AND ASSOCIATED CONDUIT SHALL BE REMOVED FROM PANEL LA-2 , CKT NO. 52 (CONTRACTOR TO VERIFY)



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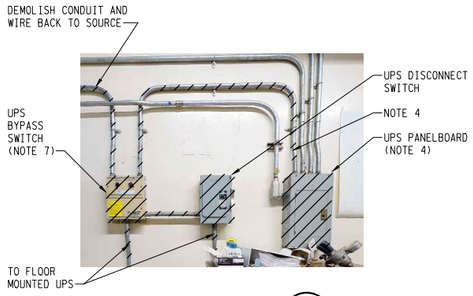

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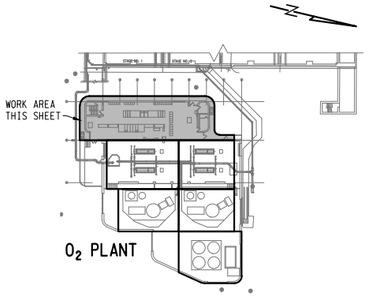

KEY PLAN

3" ON ORIGINAL DOCUMENT
0 1 2 3

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	L. MAXWELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PARTIAL POWER AND SIGNAL DEMOLITION PLAN 6

SCALE 1/4"=1'-0"
DATE 28JUN24

SD428-W4400-E102.6D
DRAWING NUMBER

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CONDUIT SCHEDULE - CONTROLS

CONDUIT NUMBER	CONDUIT SIZE	CONDUCTOR QTY AND SIZE	FROM	TO	COMMENTS
C100	3/4"	6#14, 3#14GND	RIO-15-1 MAC 1-1 PANEL	J-BOX	MAIN AIR COMPRESSOR 1-1
C100A	3/4"	2#14, 1#14GND	J-BOX	W-44-LOS-TSH-503-1-1	MAIN AIR COMPRESSOR 1-1
C100B	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-500-1-1	MAIN AIR COMPRESSOR 1-1, INLET VALVE'S I/P
C100C	3/4"	2#14, 1#14GND	J-BOX	W-44-EXH-FY-506-1-1	MAIN AIR COMPRESSOR 1-1, F.O. DISCHARGE (ANTI-SURGE) VENT VALVE'S IP
C150	3/4"	6#14, 3#14GND	RIO-15-2 MAC 1-2 PANEL	J-BOX	MAIN AIR COMPRESSOR 1-2
C150A	3/4"	2#14, 1#14GND	J-BOX	W-44-LOS-TSH-503-1-2	MAIN AIR COMPRESSOR 1-2
C150B	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-500-1-2	MAIN AIR COMPRESSOR 1-2, INLET VALVE'S I/P
C150C	3/4"	2#14, 1#14GND	J-BOX	W-44-EXH-FY-506-1-2	MAIN AIR COMPRESSOR 1-2, DISCHARGE PRESSURE FOR ANTI-SURGE CONTROL
C200	3/4"	6#14, 3#14GND	RIO-23-1 MAC 2-1 PANEL	J-BOX	MAIN AIR COMPRESSOR 2-1
C200A	3/4"	2#14, 1#14GND	J-BOX	W-44-LOS-TSH-503-2-1	MAIN AIR COMPRESSOR 2-1
C200B	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-500-2-1	MAIN AIR COMPRESSOR 2-1, INLET VALVE'S I/P
C200C	3/4"	2#14, 1#14GND	J-BOX	W-44-EXH-FY-506-2-1	MAIN AIR COMPRESSOR 2-1, DISCHARGE PRESSURE FOR ANTI-SURGE CONTROL
C250	3/4"	6#14, 3#14GND	RIO-23-2 MAC 2-2 PANEL	J-BOX	MAIN AIR COMPRESSOR 2-2
C250A	3/4"	2#14, 1#14GND	J-BOX	W-44-LOS-TSH-503-2-2	MAIN AIR COMPRESSOR 2-2
C250B	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-500-2-2	MAIN AIR COMPRESSOR 2-2, INLET VALVE'S I/P
C250C	3/4"	2#14, 1#14GND	J-BOX	W-44-EXH-FY-506-2-2	MAIN AIR COMPRESSOR 2-2, DISCHARGE PRESSURE FOR ANTI-SURGE CONTROL
C300	2"	54#14, 27#14GND	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL	J-BOX	COLD BOX NO. 1
C300A	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-PSL-580-1	COLD BOX NO. 1
C300B	3/4"	2#14, 1#14GND	J-BOX	W-44-ALP-FY-220-1	COLD BOX NO. 1
C300C	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-FY-213-1	COLD BOX NO. 1
C300D	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-LY-351X-1	COLD BOX NO. 1
C300E	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-LY-350X-1	COLD BOX NO. 1
C300F	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-FY-340-1	COLD BOX NO. 1
C300G	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-LY-330-1	COLD BOX NO. 1
C301	2"	34#14, 17#14GND	J-BOX	J-BOX	COLD BOX NO. 1
C301A	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-FY-214-1	COLD BOX NO. 1
C301B	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-FY-215-1	COLD BOX NO. 1
C301C	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-FY-349-1	COLD BOX NO. 1
C301D	3/4"	2#14, 1#14GND	J-BOX	W-44-02-FY-600-1-1	COLD BOX NO. 1
C301E	3/4"	2#14, 1#14GND	J-BOX	W-44-02-FY-600-2-1	COLD BOX NO. 1
C302	3/4"	4#14, 2#14 GND	J-BOX	J-BOX	COLD BOX NO. 1
C302A	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-FY-600-1	COLD BOX NO. 1
C302B	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-FY-601-1	COLD BOX NO. 1
C303	1 1/2"	24#14, 12#14GND	J-BOX	J-BOX	COLD BOX NO. 1
C303A	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-111-1	COLD BOX NO. 1
C303B	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-ZSC-111-1	COLD BOX NO. 1
C303C	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-ZSO-111-1	COLD BOX NO. 1
C303D	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-112-1	COLD BOX NO. 1
C303E	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-ZSC-112-1	COLD BOX NO. 1
C303F	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-ZSO-112-1	COLD BOX NO. 1
C303G	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-113-1	COLD BOX NO. 1
C303H	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-ZSC-113-1	COLD BOX NO. 1
C303I	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-ZSO-113-1	COLD BOX NO. 1
C303J	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-114-1	COLD BOX NO. 1
C303K	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-ZSC-114-1	COLD BOX NO. 1
C303L	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-ZSO-114-1	COLD BOX NO. 1
C304	3/4"	4#14, 2#14GND	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL	J-BOX	COLD BOX NO. 1
C304A	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-LSH-501-1	COLD BOX NO. 1
C304B	3/4"	2#14, 1#14GND	J-BOX	W-44-CD-LY-510-1	COLD BOX NO. 1
C350	2"	54#14, 27#14GND	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL	J-BOX	COLD BOX NO. 2
C350A	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-PSL-580-2	COLD BOX NO. 2
C350B	3/4"	2#14, 1#14GND	J-BOX	W-44-ALP-FY-220-2	COLD BOX NO. 2
C350C	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-FY-213-2	COLD BOX NO. 2
C350D	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-LY-351X-2	COLD BOX NO. 2
C350E	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-LY-350X-2	COLD BOX NO. 2
C350F	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-FY-340-2	COLD BOX NO. 2
C350G	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-LY-330-2	COLD BOX NO. 2
C351	2"	34#14, 17#14GND	J-BOX	J-BOX	COLD BOX NO. 2
C351A	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-FY-214-2	COLD BOX NO. 2
C351B	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-FY-215-2	COLD BOX NO. 2
C351C	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-FY-349-2	COLD BOX NO. 2
C351D	3/4"	2#14, 1#14GND	J-BOX	W-44-02-FY-600-1-2	COLD BOX NO. 2
C351E	3/4"	2#14, 1#14GND	J-BOX	W-44-02-FY-600-2-2	COLD BOX NO. 2
C352	3/4"	4#14, 2#14 GND	J-BOX	J-BOX	COLD BOX NO. 2
C352A	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-FY-600-2	COLD BOX NO. 2
C352B	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-FY-601-2	COLD BOX NO. 2

CONDUIT SCHEDULE - CONTROLS CON'T

CONDUIT NUMBER	CONDUIT SIZE	CONDUCTOR QTY AND SIZE	FROM	TO	COMMENTS
C353	1 1/2"	24#14, 12#14GND	J-BOX	J-BOX	COLD BOX NO. 2
C353A	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-111-2	COLD BOX NO. 2
C353B	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-ZSC-111-2	COLD BOX NO. 2
C353C	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-ZSO-111-2	COLD BOX NO. 2
C353D	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-112-2	COLD BOX NO. 2
C353E	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-ZSC-112-2	COLD BOX NO. 2
C353F	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-ZSO-112-2	COLD BOX NO. 2
C353G	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-113-2	COLD BOX NO. 2
C353H	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-ZSC-113-2	COLD BOX NO. 2
C353I	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-ZSO-113-2	COLD BOX NO. 2
C353J	3/4"	2#14, 1#14GND	J-BOX	W-44-IA-FY-114-2	COLD BOX NO. 2
C353K	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-ZSC-114-2	COLD BOX NO. 2
C353L	3/4"	2#14, 1#14GND	J-BOX	W-44-N2-ZSO-114-2	COLD BOX NO. 2
C354	3/4"	4#14, 2#14GND	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL	J-BOX	COLD BOX NO. 2
C354A	3/4"	2#14, 1#14GND	J-BOX	W-44-AHP-LSH-501-2	COLD BOX NO. 2
C354B	3/4"	2#14, 1#14GND	J-BOX	W-44-CD-LY-510-2	COLD BOX NO. 2
C360	3/4"	2#14, 1#14GND	(E) DCS DROP 15/65 PANEL	(E) MAC 1-1 MOTOR CONTROL CENTER	RUN STATUS
C362	3/4"	16#14, 2#14GND	J-BOX	J-BOX	RIO-15-1 AND RIO-15-2 MAC PANELS
C362A	3/4"	8#14, 1#14GND	J-BOX	(E) MAC 1-1 MOTOR CONTROL CENTER	RIO-15-1 AND RIO-15-2 MAC PANELS
C362B	3/4"	8#14, 1#14GND	J-BOX	(E) MAC 1-2 MOTOR CONTROL CENTER	RIO-15-1 AND RIO-15-2 MAC PANELS
C362C	3/4"	8#14, 1#14GND	J-BOX	(E) CONTROL PANEL PLANT NO. 1	CONTROL ROOM
C362D	3/4"	8#14, 1#14GND	J-BOX	RIO-15-1 MAC 1-1 PANEL	RIO-15-1 MAC 1-1 PANEL
C362E	3/4"	4#14, 1#14GND	J-BOX	RIO-15-2 MAC 1-2 PANEL	RIO-15-2 MAC 1-2 PANEL
C363	3/4"	2#14, 1#14GND	(E) DCS DROP 15/65 PANEL	(E) MAC 1-2 MOTOR CONTROL CENTER	RUN STATUS
C364	3/4"	3#10, 1#10GND	MAC 1-1 MOTOR TERMINATION BOX	(E) MAC 1-1 MOTOR CONTROL CENTER	DIFFERENTIAL CT
C365	3/4"	3#10, 1#10GND	MAC 1-2 MOTOR TERMINATION BOX	(E) MAC 1-2 MOTOR CONTROL CENTER	DIFFERENTIAL CT
C370	3/4"	2#14, 1#14GND	DCS DROP 23/73 PANEL	(E) MAC 2-1 MOTOR CONTROL CENTER	RUN STATUS
C372	3/4"	16#14, 2#14GND	J-BOX	J-BOX	RIO-23-1 AND RIO-23-2 MAC PANELS
C372A	3/4"	8#14, 1#14GND	J-BOX	(E) MAC 2-1 MOTOR CONTROL CENTER	RIO-23-1 AND RIO-23-2 MAC PANELS
C372B	3/4"	8#14, 1#14GND	J-BOX	(E) MAC 2-2 MOTOR CONTROL CENTER	RIO-23-1 AND RIO-23-2 MAC PANELS
C372C	3/4"	4#14, 1#14GND	J-BOX	(E) CONTROL PANEL PLANT NO. 2	CONTROL ROOM
C372D	3/4"	8#14, 1#14GND	J-BOX	RIO-23-1 MAC 2-1 PANEL	RIO-23-1 MAC 2-1 PANEL
C372E	3/4"	8#14, 1#14GND	J-BOX	RIO-23-2 MAC 2-2 PANEL	RIO-23-2 MAC 2-2 PANEL
C373	3/4"	2#14, 1#14GND	DCS DROP 23/73 PANEL	(E) MAC 2-2 MOTOR CONTROL CENTER	RUN STATUS
C374	3/4"	3#10, 1#10GND	MAC 2-1 MOTOR TERMINATION BOX	(E) MAC 2-1 MOTOR CONTROL CENTER	DIFFERENTIAL CT
C375	3/4"	3#10, 1#10GND	MAC 2-2 MOTOR TERMINATION BOX	(E) MAC 2-2 MOTOR CONTROL CENTER	DIFFERENTIAL CT
C420	1-1/2"	20#14, 20#14GND	J-BOX	J-BOX	LOX (SPARE 6#14, 6#16 GND)
C420A	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-PY-616-1	LOX TANK 1-1
C420B	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-PY-626-1	LOX TANK 1-2
C421	3/4"	4#14, 4#14GND	J-BOX	J-BOX	LOX
C421A	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-PY-616-2	LOX TANK 2-1
C421B	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-PY-626-2	LOX TANK 2-2
C422	3/4"	10#14, 5#14GND	J-BOX	J-BOX	LOX VAPORIZER
C422A	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-TSL-640	LOX VAPORIZER
C422B	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-TSL-690	LOX VAPORIZER
C422C	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-TSL-631	LOX VAPORIZER
C422D	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-TSH-631	LOX VAPORIZER
C422E	3/4"	2#14, 1#14GND	J-BOX	W-44-O2-FY-690	LOX VAPORIZER
C423	3/4"	2#14, 1#14GND	(E) DCS DROP 15/65 PANEL	W-44-O2-FY-635	LOX VAPORIZER

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CONDUIT SCHEDULE - SIGNAL

CONDUIT NUMBER	CONDUIT SIZE	CONDUCTOR QTY AND SIZE	FROM	TO	COMMENTS
S350	3"	39#18TSP, 39#14GND	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL	J-BOX	COLD BOX NO. 2
S350A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-ALP-FV-220A-2	COLD BOX NO. 2
S350B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-AHP-FV-213A-2	COLD BOX NO. 2
S350C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-N2-FV-340N-2	COLD BOX NO. 2
S350D	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-LV-330A-2	COLD BOX NO. 2
S351	1 1/2"	7#18TSP, 7#14GND	J-BOX	J-BOX	COLD BOX NO. 2
S351A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-AHP-FV-215A-2	COLD BOX NO. 2
S351B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-IA-PIT-590-2	COLD BOX NO. 2
S351C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-AHP-TE-552-2	COLD BOX NO. 2
S351D	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-AHP-PIT-200-2	COLD BOX NO. 2
S351E	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-FV-X600X-1-2	COLD BOX NO. 2
S351F	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-FV-X600X-2-2	COLD BOX NO. 2
S352	3/4"	2#18TSP,2#14GND	J-BOX	J-BOX	COLD BOX NO. 2
S352A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-FV-600X-2	COLD BOX NO. 2
S352B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-FV-601X-2	COLD BOX NO. 2
S353	2"	12#18TSP, 12#14GND	J-BOX	J-BOX	COLD BOX NO. 2
S353A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-ALP-PIT-216-2	COLD BOX NO. 2
S353B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-AHP-FIT-120-2	COLD BOX NO. 2
S353C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-AHP-PIT-214-2	COLD BOX NO. 2
S353D	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-AHP-FIT-115-2	COLD BOX NO. 2
S353E	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-N2-PIT-300-2	COLD BOX NO. 2
S353F	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-N2-FIT-340-2	COLD BOX NO. 2
S353G	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-N2-PIT-349-2	COLD BOX NO. 2
S353H	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-FIT-600-2	COLD BOX NO. 2
S353I	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PIT-352-2	COLD BOX NO. 2
S353J	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-LIT-330-2	COLD BOX NO. 2
S353K	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PIT-600-2	COLD BOX NO. 2
S353L	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-LIT-352-2	COLD BOX NO. 2
S354	3/4"	3#18TSP, 3#14GND	J-BOX	J-BOX	COLD BOX NO. 2
S354A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-LOR-TE-24-2	COLD BOX NO. 2
S354B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-LOS-PIT-20-2	COLD BOX NO. 2
S354C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-LOR-PIT-23-2	COLD BOX NO. 2
S355	1 1/2"	11 TYPE T, 2 TYPE K	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL	J-BOX	COLD BOX NO. 2
S355A	3/4"	BY VENDOR	J-BOX	W-44-CAS-TE-191-2	COLD BOX NO. 2
S355B	3/4"	BY VENDOR	J-BOX	W-44-O2-TE-149-2	COLD BOX NO. 2
S355C	3/4"	BY VENDOR	J-BOX	W-44-AHP-TE-154-2	COLD BOX NO. 2
S355D	3/4"	BY VENDOR	J-BOX	W-44-AHP-TE-155-2	COLD BOX NO. 2
S355E	3/4"	BY VENDOR	J-BOX	W-44-CAS-TE-184-2	COLD BOX NO. 2
S355F	3/4"	BY VENDOR	J-BOX	W-44-CAS-TE-185-2	COLD BOX NO. 2
S355G	3/4"	BY VENDOR	J-BOX	W-44-N2-TE-188-2	COLD BOX NO. 2
S355H	3/4"	BY VENDOR	J-BOX	W-44-N2-TE-190-2	COLD BOX NO. 2
S355I	3/4"	BY VENDOR	J-BOX	W-44-AHP-TE-201-2	COLD BOX NO. 2
S355J	3/4"	BY VENDOR	J-BOX	W-44-AHP-TE-215-2	COLD BOX NO. 2
S355K	3/4"	BY VENDOR	J-BOX	W-44-AHP-TE-216-2	COLD BOX NO. 2
S356	3/4"	2 TYPE K	J-BOX	W-44-CAD-TDIT-186-2	COLD BOX NO. 2
S356A	3/4"	BY VENDOR	W-44-CAD-TDIT-186-2	W-44-AHP-TE-550-2	COLD BOX NO. 2
S356B	3/4"	BY VENDOR	W-44-CAD-TDIT-186-2	W-44-AHP-TE-551-2	COLD BOX NO. 2
S360	3/4"	3#18TSP, 3#14GND	(E) DCS DROP 15/65 PANEL	J-BOX	CONTROL PANEL PLANT NO. 1
S360A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-AIT-352-1	CONTROL PANEL PLANT NO. 1
S360B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-AIT-312-1	CONTROL PANEL PLANT NO. 1
S360C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-AIT-355-1	CONTROL PANEL PLANT NO. 1
S361	3/4"	4#18TSP, 4#14GND	(E) DCS DROP 15/65 PANEL	J-BOX	CONTROL PANEL PLANT NO. 1
S361A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-ZC-635	CONTROL PANEL PLANT NO. 1
S361B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-TIC-635	CONTROL PANEL PLANT NO. 1
S361C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PIC-630	CONTROL PANEL PLANT NO. 1
S361D	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PIC-635	CONTROL PANEL PLANT NO. 1
S370	3/4"	3#18TSP, 3#14GND	DCS DROP 23/73 PANEL	J-BOX	CONTROL PANEL PLANT NO. 1
S370A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-AIT-352-2	CONTROL PANEL PLANT NO. 2
S370B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-AIT-312-2	CONTROL PANEL PLANT NO. 2
S370C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-AIT-355-2	CONTROL PANEL PLANT NO. 2
S410	3/4"	(E) MULTI-CONDUCTOR CABLE	(E) O2 COOLING PLC CONTROL PANEL	(E) JTB-1-1	MAIN AIR COMPRESSOR 1-1
S411	3/4"	(E) MULTI-CONDUCTOR CABLE	(E) O2 COOLING PLC CONTROL PANEL	(E) JTB-1-2	MAIN AIR COMPRESSOR 1-2
S412	3/4"	(E) MULTI-CONDUCTOR CABLE	(E) O2 COOLING PLC CONTROL PANEL	(E) JTB-2-1	MAIN AIR COMPRESSOR 2-1 NOTE 1
S413	3/4"	(E) MULTI-CONDUCTOR CABLE	(E) O2 COOLING PLC CONTROL PANEL	(E) JTB-2-2	MAIN AIR COMPRESSOR 2-2 NOTE 1
S414	3/4"	1#18TSP, 1#14GND	(E) O2 COOLING PLC CONTROL PANEL	W-44-LOS-TIT-21-1	COLD BOX NO. 1 NOTE 1
S415	3/4"	1#18TSP, 1#14GND	(E) O2 COOLING PLC CONTROL PANEL	W-44-LOS-TIT-23-1	COLD BOX NO. 1 NOTE 1
S416	3/4"	1#18TSP, 1#14GND	(E) O2 COOLING PLC CONTROL PANEL	W-44-LOS-TIT-21-2	COLD BOX NO. 2
S417	3/4"	1#18TSP, 1#14GND	(E) O2 COOLING PLC CONTROL PANEL	W-44-LOS-TIT-23-2	COLD BOX NO. 2
S420	1 1/2"	8#18TSP, 8#14GND	RIO-15-3 TURBINE/CRYO PLANT 1 PANEL	J-BOX	LOX
S420A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PV-615X-1	LOX TANK 1-1
S420B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PV-616X-1	LOX TANK 1-1
S420C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PV-626X-1	LOX TANK 1-2
S420D	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PV-625X-1	LOX TANK 1-2
S421	3/4"	4#18TSP, 4#14GND	J-BOX	J-BOX	LOX
S421A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PV-615X-2	LOX TANK 2-1

CONDUIT SCHEDULE - SIGNAL CON'T

CONDUIT NUMBER	CONDUIT SIZE	CONDUCTOR QTY AND SIZE	FROM	TO	COMMENTS
S421B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PV-616X-2	LOX TANK 2-1
S421C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PV-626X-2	LOX TANK 2-2
S421D	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PV-625X-2	LOX TANK 2-2
S423	3/4"	4#18TSP, 4#14GND	(E) DCS DROP 15/65 PANEL	J-BOX	LOX
S423A	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PIT-635	LOX
S423B	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-PIT-630	LOX
S423C	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-FV-635	LOX
S423D	3/4"	1#18TSP, 1#14GND	J-BOX	W-44-O2-TE-635	LOX
S424	3/4"	4#24, 3 TWISTED, SH	MAC 1-1 MOTOR TERMINATION BOX	(E) MAC 1-1 MOTOR CONTROL CENTER	BEARING RTD
S425	3/4"	4#24, 3 TWISTED, SH	MAC 1-2 MOTOR TERMINATION BOX	(E) MAC 1-2 MOTOR CONTROL CENTER	BEARING RTD
S426	3/4"	4#24, 3 TWISTED, SH	MAC 2-1 MOTOR TERMINATION BOX	(E) MAC 2-1 MOTOR CONTROL CENTER	BEARING RTD
S427	3/4"	4#24, 3 TWISTED, SH	MAC 2-2 MOTOR TERMINATION BOX	(E) MAC 2-2 MOTOR CONTROL CENTER	BEARING RTD

CONDUIT SCHEDULE - NETWORK COMMUNICATIONS

CONDUIT NUMBER	CONDUIT SIZE	CONDUCTOR QTY AND SIZE	FROM	TO	COMMENTS
S601	1"	OM4 MULTIMODE FIBER 12 FIBER STRANDS	(E) DROP 15/65 PATCH PANEL	RIO-15-1 PATCH PANEL	UTILIZE FIBER PP PORTS 1-6 AT (E) DROP 15/65 AND FIBER PP PORTS 7-12 AT RIO-15-1
S602	1"	OM4 MULTIMODE FIBER 12 FIBER STRANDS	RIO-15-1 PATCH PANEL	RIO-15-2 PATCH PANEL	UTILIZE FIBER PP PORTS 1-6 AT RIO-15-1 AND FIBER PP PORTS 7-12 AT RIO-15-2
S603	1"	OM4 MULTIMODE FIBER 12 FIBER STRANDS	RIO-15-2 PATCH PANEL	RIO-15-3 PATCH PANEL	UTILIZE FIBER PP PORTS 1-6 AT RIO-15-2 AND FIBER PP PORTS 7-12 AT RIO-15-3
S604	1"	OM4 MULTIMODE FIBER 12 FIBER STRANDS	RIO-15-3 PATCH PANEL	(E) DROP 15/65 PATCH PANEL	UTILIZE FIBER PP PORTS 1-6 AT RIO-15-3 AND FIBER PP PORTS 7-12 AT (E) DROP 15/65
S605	1"	OM4 MULTIMODE FIBER 12 FIBER STRANDS	DROP 23/73 PATCH PANEL	RIO-23-1 PATCH PANEL	UTILIZE FIBER PP PORTS 1-6 AT DROP 23/73 AND FIBER PP PORTS 7-12 AT RIO-23-1
S606	1"	OM4 MULTIMODE FIBER 12 FIBER STRANDS	RIO-23-1 PATCH PANEL	RIO-23-2 PATCH PANEL	UTILIZE FIBER PP PORTS 1-6 AT RIO-23-1 AND FIBER PP PORTS 7-12 AT RIO-23-2
S607	1"	OM4 MULTIMODE FIBER 12 FIBER STRANDS	RIO-23-2 PATCH PANEL	RIO-23-3 PATCH PANEL	UTILIZE FIBER PP PORTS 1-6 AT RIO-23-2 AND FIBER PP PORTS 7-12 AT RIO-23-3
S608	1"	OM4 MULTIMODE FIBER 12 FIBER STRANDS	RIO-23-3 PATCH PANEL	DROP 23/73 PATCH PANEL	UTILIZE FIBER PP PORTS 1-6 AT RIO-23-3 AND FIBER PP PORTS 7-12 AT DROP 23/73
S611	2"	12-CAT 5E ETHERNET CABLE	(E) DROP 15/65 PATCH PANEL	(E) 44-NET-006-PPA (E) 44-NET-006-PPB	UTILIZE PP PORTS 1-6 AT DROP 15/65 AND PP PORTS 1-6 AT (E) 44-NET-006 NEW PPA UTILIZE PP PORTS 7-12 AT DROP 15/65 AND PP PORTS 1-6 AT (E) 44-NET-006 NEW PPB
S612	2"	12-CAT 5E ETHERNET CABLE	DROP 23/73 PATCH PANEL	(E) 44-NET-006-PPA (E) 44-NET-006-PPB	UTILIZE PP PORTS 1-6 AT DROP 23/73 PP AND PP PORTS 7-12 AT (E) 44-NET-006 NEW PPA UTILIZE PP PORTS 7-12 AT DROP 23/73 PP AND PP PORTS 7-12 AT (E) 44-NET-006 NEW PPB
S613	3/4"	4-CAT 5E ETHERNET CABLE	(E) 44-NET-006-PPA (E) 44-NET-006-PPB	RIO-15-1 PATCH PANEL	UTILIZE PP PORTS 13-14 AT (E) 44-NET-006 NEW PPA AND PP PORTS 1-2 AT RIO-15-1 UTILIZE PP PORTS 13-14 AT (E) 44-NET-006 NEW PPB AND PP PORTS 3-4 AT RIO-15-1
S614	3/4"	4-CAT 5E ETHERNET CABLE	(E) 44-NET-006-PPA (E) 44-NET-006-PPB	RIO-15-2 PATCH PANEL	UTILIZE PP PORTS 15-16 AT (E) 44-NET-006 NEW PPA AND PP PORTS 1-2 AT RIO-15-2 UTILIZE PP PORTS 15-16 AT (E) 44-NET-006 NEW PPB AND PP PORTS 3-4 AT RIO-15-2
S615	3/4"	4-CAT 5E ETHERNET CABLE	(E) 44-NET-006-PPA (E) 44-NET-006-PPB	RIO-15-3 PATCH PANEL	UTILIZE PP PORTS 17-18 AT (E) 44-NET-006 NEW PPA AND PP PORTS 1-2 AT RIO-15-3 UTILIZE PP PORTS 17-18 AT (E) 44-NET-006 NEW PPB AND PP PORTS 3-4 AT RIO-15-3
S616	3/4"	4-CAT 5E ETHERNET CABLE	(E) 44-NET-006-PPA (E) 44-NET-006-PPB	RIO-23-1 PATCH PANEL	UTILIZE PP PORTS 19-20 AT (E) 44-NET-006 NEW PPA AND PP PORTS 1-2 AT RIO-23-1 UTILIZE PP PORTS 19-20 AT (E) 44-NET-006 NEW PPB AND PP PORTS 3-4 AT RIO-23-1
S617	3/4"	4-CAT 5E ETHERNET CABLE	(E) 44-NET-006-PPA (E) 44-NET-006-PPB	RIO-23-2 PATCH PANEL	UTILIZE PP PORTS 21-22 AT (E) 44-NET-006 NEW PPA AND PP PORTS 1-2 AT RIO-23-2 UTILIZE PP PORTS 21-22 AT (E) 44-NET-006 NEW PPB AND PP PORTS 3-4 AT RIO-23-2
S618	3/4"	4-CAT 5E ETHERNET CABLE	(E) 44-NET-006-PPA (E) 44-NET-006-PPB	RIO-23-3 PATCH PANEL	UTILIZE PP PORTS 23-24 AT (E) 44-NET-006 NEW PPA AND PP PORTS 1-2 AT RIO-23-3 UTILIZE PP PORTS 23-24 AT (E) 44-NET-006 NEW PPB AND PP PORTS 3-4 AT RIO-23-3
S619	3/4"	2-CAT 5E ETHERNET CABLE	(E) 44-NET-006-PPC	(E) W-(E) 44-LOX-LCP-01	UTILIZE FIBER PP PORTS 1-2 AT (E) 44-NET-006 NEW PPC AND PP PORTS 3-4 AT LOX PANEL
S620	3/4"	2-CAT 5E ETHERNET CABLE	(E) 44-NET-006-PPC	(E) O2 COOLING PLC CONTROL PANEL	UTILIZE FIBER PP PORTS 3-4 AT (E) 44-NET-006 NEW PPC AND PP PORTS 1-2 AT (E) O2 COOLING PLC CONTROL PANEL

NOTE:

1. EXISTING CONDUIT TO BE REUSED FOR NEW WORK.

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA

06/28/2024

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

CONDUIT SCHEDULE 3
SIGNAL

SCALE NONE
DATE 28JUN24

SD428-W4400-E123
DRAWING NUMBER

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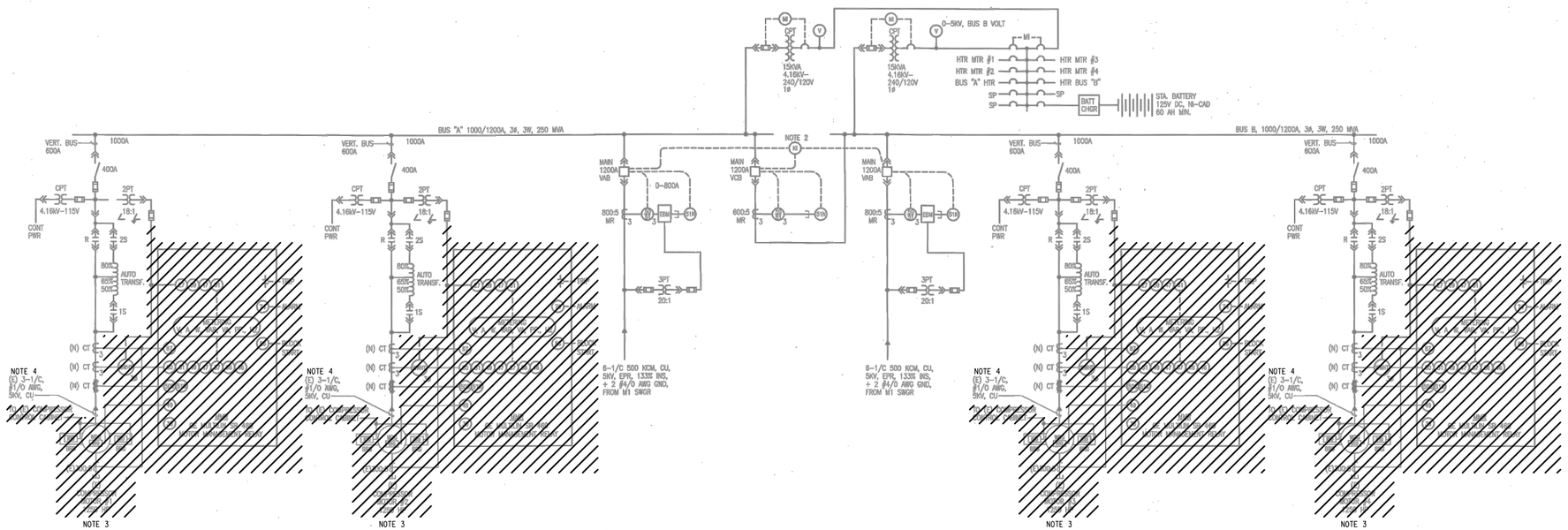

1 SINGLE LINE METER AND RELAY DIAGRAM
N.T.S.

MMP INTEGRATED PROTECTION PACKAGE

DEVICE NO.	DESCRIPTION OF MOTOR PROTECTIVE FUNCTION	OPTIONAL FUNCTION
27	PHASE UNDERVOLTAGE	TRIP OR ALARM (CHECK BOXES)
46	CURRENT UNBALANCE	TRIP OR ALARM (CHECK BOXES)
48	STARTER FAILED TO TRANSITION FROM START	TRIP OR ALARM (CHECK BOXES)
49	THERMISTORS O.T.	TRIP OR ALARM (CHECK BOXES)
50	INSTANTANEOUS OVERCURRENT	TRIP OR ALARM (CHECK BOXES)
51	TIME OVERCURRENT	TRIP OR ALARM (CHECK BOXES)
55	LOW POWER FACTOR	TRIP OR ALARM (CHECK BOXES)
49/51	OVERLOAD TRIP AND ALARM	TRIP OR ALARM (CHECK BOXES)
47	PHASE REVERSAL	TRIP OR ALARM (CHECK BOXES)
37	UNDERCURRENT	TRIP OR ALARM (CHECK BOXES)
40	FIELD FAILURE (LOSS OF EXCITATION)	TRIP OR ALARM (CHECK BOXES)
66	NUMBER STARTS/TIME INTERVAL	TRIP OR ALARM (CHECK BOXES)
81	SPEED SWITCH	TRIP OR ALARM (CHECK BOXES)
27,59	UNDERVOLTAGE OR OVERVOLTAGE	TRIP OR ALARM (CHECK BOXES)
74	ALARM RELAYS	TRIP OR ALARM (CHECK BOXES)
47	NEGATIVE PHASE SEQUENCE VOLTAGE	TRIP OR ALARM (CHECK BOXES)
27,59	POWER RELAYS	TRIP OR ALARM (CHECK BOXES)

NOTE: MOTOR MANAGEMENT RELAY IS SHOWN IN DC MOTOR SYSTEM. ALL MOTOR MONITORING AND DISPLAY FUNCTIONS ARE INCLUDED.

INCOMING LINES PROTECTIVE RELAYS

ANSI DEV. NO.	DESCRIPTION	RECOMMENDED RELAYS BASLER	GE	WEST/ABB	OTHERS
50/51	PHASE TIME OVERCURRENT RELAY WITH INSTANTANEOUS ELEMENT EXTREMELY INVERSE	BE1 50/51B			SEL-501-2
51N	RESIDUAL TIME OVERCURRENT RELAY, VERY INVERSE	BE1 50/51B			↓

2 METERING AND PROTECTIVE RELAY INDEX
N.T.S.

NOTES:

1. THE INFORMATION PROVIDED IN THIS DRAWING IS FROM PROJECT SD-227 BID DOCUMENT AND IS NOT "ASBUILT" AND WHERE EQUIPMENT IS MODIFIED SHOULD BE FIELD VERIFIED PRIOR TO WORK PERFORMED.
2. PRIOR TO DOING ANY WORK, COORDINATE SHUTDOWN AND DISCONNECT OF POWER WITH DISTRICT.
3. REMOVE MOTOR AND ASSOCIATED DEVICES INCLUDING BEARING AND STATOR RTD'S, TERMINATION BOX AND THOSE COMPONENTS WHICH ARE LOCATED WITHIN THE MOTOR TERMINATION BOX (NOT SHOWN ON THIS DRAWING) THAT INCLUDE DIFFERENTIAL CT'S, LIGHTNING ARRESTOR AND SURGE CAPACITOR. REMOVE AND REPLACE WIRING TO EXISTING RTD'S AS INDICATED.
4. EXISTING CABLES TO MOTORS SHALL REMAIN AND BE PROTECTED IN PLACE DURING CONSTRUCTION, THIS INCLUDES THE EXISTING EQUIPMENT GROUNDING CABLE.

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL

SWITCHGEAR S3 SINGLE LINE DIAGRAM DEMOLITION

SCALE NONE
DATE 28JUN24

SD428-W4400-E201D
DRAWING NUMBER

0
REV.

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DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

DIRECTORY	BRKR	POLE	CKT #	KVA	KVA LOADS A	B	C	KVA	CKT #	POLE	BRKR	DIRECTORY
#2 AIR COMPRESSOR START	15	1	1						2	1	15	CENTRAL ALARMS
LIQUID MAKE-UP CONTROL	15	1	3						4	1	15	EXPANDER TURBINE CONTROL
FV6980X DRAIN VAPORIZER	15	1	5						6	1	15	MHX CONTROL
MHX CONTROL	15	1	7						8	1	15	ANALYZER POWER
#1 AIR COMPRESSOR ALARM	15	1	9						10	1	15	CNTRL PNL PLANT NO. 1 UTILITY CIRCS.
TURBINE OIL HEATER	20	1	11						12	1	15	#1 AIR COMPRESSOR START
#2 AIR COMPRESSOR ALARM	15	1	13						14	1	15	AIR COMPRESSOR COMMON CONTROL
INST. AIR COMPRESSOR UTILITIES	15	1	15						16	1	15	INST. AIR COMPRESSOR CONTROLS
AIR COMPRESSOR COMMON CONTROL PLANTA	15	1	17						18	1	15	SPARE
SPARE	15	1	19						20	1	15	SPARE
SPARE	15	1	21						22	1	15	SPARE
SPARE	15	1	23						24	1	15	SPARE
SPACE			25						26			
SPACE			27						28	3	100	MAIN
SPACE			29						30			
				SUBTOTAL								
VOLTAGE:	120/208		TOTAL kVA							PANEL NAME:		EXISTING PANEL LP1
MAIN BREAKER:	100		TOTAL AMPS							LOCATION:		MAIN CONTROL PANEL
BUSES:	100									MOUNTING:		SURFACE
PH & WIRES:	3PH 4W									AIC RATING:		
NOTES:												

DIRECTORY	BRKR	POLE	CKT #	KVA	KVA LOADS A	B	C	KVA	CKT #	POLE	BRKR	DIRECTORY
#1 AIR COMPRESSOR START CIRCUIT	15	1	1						2	1	15	CENTRAL ALARMS
LIQUID MAKE-UP CONTROL	25	1	3						4	1	15	EXPANDER TURBINE CONTROL
THAW HEATER CONTROL	15	1	5						6	1	15	MHX CONTROL
MHX CONTROL	15	1	7						8	1	15	ANALYZER POWER
AIR COMPRESSOR #2 ALARM	15	1	9						10	1	15	CNTRL PNL PLANT NO. 2 UTILITY CIRCS.
TURBINE OIL HEATER	20	1	11						12	1	15	#2 AIR COMPRESSOR START CIRCUIT
#1 AIR COMPRESSOR ALARM	15	1	13						14	1	15	AIR COMPRESSOR COMMON CONTROL
INST. AIR COMP. UTIL	15	1	15						16	1	15	INST. AIR COMP. CONTROLS
SPARE	15	1	17						18	1	15	SPARE
SPARE	25	1	19						20	1	15	SPARE
SPARE	15	1	21						22	1	15	SPARE
SPARE	15	1	23						24	1	15	SPARE
SPACE			25						26			
SPACE			27						28	3	100	MAIN
SPACE			29						30			
				SUBTOTAL								
VOLTAGE:	120/208		TOTAL kVA							PANEL NAME:		EXISTING PANEL LP2
MAIN BREAKER:	100		TOTAL AMPS							LOCATION:		MAIN CONTROL PANEL
BUSES:	100									MOUNTING:		SURFACE
PH & WIRES:	3PH 4W									AIC RATING:		
NOTES:												

DIRECTORY	BRKR	POLE	CKT #	KVA	KVA LOADS A	B	C	KVA	CKT #	POLE	BRKR	DIRECTORY
(1) DPU 15	15	1	1	0.63	2.07			1.44	2	1	15	(1) WESTATION
(1) NETWORK ENCLOSURE	15	1	3	1.62		2.92			4	1	15	SPARE
(1) DROP 15/65	15	1	5	0.63	0.63				6	1	15	SPARE
	25	1	7						8	1	15	
				SUBTOTAL				SUBTOTAL				
VOLTAGE:	120/208		TOTAL kVA							PANEL NAME:		EXISTING PN-UPS
MAIN BREAKER:	70		TOTAL AMPS							LOCATION:		CONTROL ROOM
BUSES:	100									MOUNTING:		SURFACE
PH & WIRES:	1PH 3W									AIC RATING:		10 KAIC
NOTE: (1) CIRCUIT TO BE REMOVED AND RELOCATED TO PANELBOARD W-44-02-UPS-LP1												

DIRECTORY	BRKR	POLE	CKT #	KVA	KVA LOADS A	B	C	KVA	CKT #	POLE	BRKR	DIRECTORY
SPARE	20	1	31						32	1	20	SPARE
SPARE	20	1	33						34	1	20	SPARE
SPARE	20	1	35						36	1	20	SPARE
SPARE	20	1	37						38	1	20	SPARE
SPARE	20	1	39						40	1	20	SPARE
SPARE	20	1	41						42	1	20	SPARE
OUTSIDE LTG & TIMER CONTROL	20	1	43						44	1	20	SPARE
OUTSIDE LTG	20	1	45						46	1	20	SPARE
SPARE	20	1	47						48	1	20	UPS
SPARE	20	1	49						50	1	20	RELAY PNL
SPACE		1	51						52	1	20	I/O INTERFACE PNL
SPACE		1	53						54	1	20	DPU 15
SHUT DOWN LP1 PNL	50	3	55						56	3	50	SHUT DOWN LP2 PNL
			57						58			
			59						60			
SPACE		1	61						62	1		SPACE
SPACE		1	63						64	1		SPACE
SPACE		1	65						66	1		SPACE
SPACE		1	67						68	1		SPACE
SPACE		1	69						70	1		SPACE
SPACE		1	71						72	1		SPACE
				Ckt				SUBTOTAL				
VOLTAGE:	120/208		TOTAL kVA							PANEL NAME:		EXISTING PANEL LA-2 SECTION 2
MAIN BREAKER:	225		TOTAL AMPS							LOCATION:		CONTROL ROOM
BUSES:	225									MOUNTING:		FLUSH
PH & WIRES:	3PH 4W									AIC RATING:		
NOTES:												

NOTE:

1. EXISTING PANELBOARD INFORMATION SHOWN ON THIS DRAWING IS BASED ON HARD COPY SCHEDULES WITH HAND WRITTEN DESCRIPTION ONLY AND DO NOT INCLUDE THE ACTUAL kVA VALVES (NOT INCLUDED IN SCHEDULE).

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PANELBOARD SCHEDULES DEMOLITION

SCALE NONE
DATE 28JUN24

SD428-W4400-E230D
DRAWING NUMBER

0
REV.

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DIRECTORY	BRKR	POLE	CKT #	KVA	KVA LOADS A	B	C	KVA	CKT #	POLE	BRKR	DIRECTORY
RIO-15-1 MAC 1-1 PNL CNTRL	**20**	**1**	**1**	**0.25**				**2.42**	**2**	**1**	**30**	**RIO-15-3 TURB/CRYO PLANT 1 PNL UTILITY AC**
SPARE	**20**	**1**	**3**					**0.25**	**4**	**1**	**20**	**RIO-15-3 TURB/CRYO PLANT 1 PNL CNTRL**
FV690X DRAIN VAPORIZER	15	1	5						**6**	**1**	**20**	**SPARE**
SPARE	**20**	**1**	**7**					**0.60**	**8**	**1**	**20**	**ANALYZERS AIT-312-1, AIT-352-1 & AIT-355-1**
RIO-15-1 MAC 1-1 PNL UTILITY AC	**20**	**1**	**9**	**0.50**					10	1	15	CONTRL PNL PLANT NO. 1 UTILITY CIRCS.
TURBINE OIL HEATER	20	1	11					**0.25**	**12**	**1**	**20**	**RIO-15-2 MAC 1-2 PNL CNTRL**
SPARE	**20**	**1**	**13**						**14**	**1**	**20**	**SPARE**
INST. AIR COMPRESSOR UTILITIES	**15**	1	**15**						16	1	15	INST. AIR COMPRESSOR CONTROLS
SPARE	**20**	**1**	**17**					**0.50**	**18**	**1**	**20**	**RIO-15-2 MAC 1-2 PNL UTILITY AC**
SPARE	15	1	19						**20**	**1**	**20**	**SPARE**
SPARE	15	1	21						**22**	**1**	**20**	**SPARE**
SPARE	15	1	23						24	1	15	SPARE
SPACE			25						26			
SPACE			27						28	3	100	MAIN
SPACE			29						30			
				SUBTOTAL								
VOLTAGE:	120/208		TOTAL kVA						PANEL NAME:			EXISTING PANEL LP1
MAIN BREAKER:	100		TOTAL AMPS						LOCATION:			MAIN CONTROL PANEL
BUSES:	100								MOUNTING:			SURFACE
PH & WIRES:	3PH 4W								AIC RATING:			
NOTES:												

MAIN BREAKER:	BRKR	POLE	CKT #	KVA	KVA LOADS A	B	C	KVA	CKT #	POLE	BRKR	DIRECTORY
RIO-23-1 MAC 2-1 PNL CNTRL	**20**	**1**	**1**	**0.25**				**2.42**	**2**	**1**	**30**	**RIO-23-3 TURB/CRYO PLANT 2 PNL UTILITY AC**
SPARE	**20**	**1**	**3**					**0.25**	**4**	**1**	**20**	**RIO-23-3 TURB/CRYO PLANT 2 PNL CNTRL**
THAW HEATER CONTROL	15	1	5						**6**	**1**	**20**	**SPARE**
SPARE	**20**	**1**	**7**					**0.60**	**8**	**1**	**20**	**ANALYZERS AIT-312-2, AIT-352-2 & AIT-355-2**
RIO-23-1 MAC 2-1 PNL UTILITY AC	**20**	**1**	**9**	**0.50**					10	1	15	CNTRL PNL PLANT NO. 2 UTILITY CIRCS.
TURBINE OIL HEATER	20	1	11					**0.25**	**12**	**1**	**20**	**RIO-23-2 MAC 2-2 PNL CNTRL**
SPARE	**20**	**1**	**13**						**14**	**1**	**20**	**SPARE**
INST. AIR COMP. UTIL	15	1	15						16	1	15	INST. AIR COMP. CONTROLS
SPARE	**20**	**1**	**17**					**0.50**	**18**	**1**	**20**	**RIO-23-2 MAC 2-2 PNL UTILITY AC**
DCS DROP 23/73 PNL UTILITY	**20**	**1**	**19**	**0.41**					**20**	**1**	**20**	**SPARE**
SPARE	15	1	21						**22**	**1**	**20**	**SPARE**
SPARE	15	1	23						24	1	15	SPARE
SPACE			25						26			
SPACE			27						28	3	100	MAIN
SPACE			29						30			
				SUBTOTAL								
VOLTAGE:	120/208		TOTAL kVA								PANEL NAME:	EXISTING PANEL LP2
MAIN BREAKER:	100		TOTAL AMPS								LOCATION:	MAIN CONTROL PANEL
BUSES:	100										MOUNTING:	SURFACE
PH & WIRES:	3PH 4W										AIC RATING:	
NOTES:												

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REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

DIRECTORY	BRKR	POLE	CKT #	KVA	KVA LOADS A	B	KVA	CKT #	POLE	BRKR	DIRECTORY
(1) DPU 15	**20**	**1**	**1**	0.63	**2.07**		1.44	**2**	**1**	**20**	**(1)** WESTATION
(1) NETWORK ENCLOSURE	**20**	**1**	**3**	1.92		**2.33**	**0.41**	**4**	**1**	**20**	**RIO-15-1 MAC 1-1 PNL CNTRL**
(1) DROP 15/65	**20**	**1**	**5**	0.63	**1.04**		**0.41**	**6**	**1**	**20**	**RIO-15-2 MAC 1-2 PNL CNTRL**
RIO-23-1 MAC 2-1 PNL CNTRL	**20**	**1**	**7**	**0.41**		**0.82**	**0.41**	**8**	**1**	**20**	**RIO-15-3 TURB/CRYO PLANT 1 PNL CNTRL**
RIO-23-2 MAC 2-2 PNL CNTRL	**20**	**1**	**9**	**0.41**	**0.82**		**0.41**	**10**	**1**	**20**	**DCS DROP 23/73 PNL CNTRL**
RIO-23-3 TURB/CRYO PLANT 2 PNL CNTRL	**20**	**1**	**11**	**0.41**		**0.66**	**0.25**	**12**	**1**	**20**	**FIRE ALARM CONTROL PNL**
SPARE	**20**	**1**	**13**					**14**	**1**	**20**	**SPARE**
SPARE	**20**	**1**	**15**					**16**	**1**	**20**	**SPARE**
SPARE	**20**	**1**	**17**					**18**	**1**	**20**	**SPARE**
SPARE	**20**	**1**	**19**					**20**	**1**	**20**	**SPARE**
				SUBTOTAL	**3.93**	**3.81**	**SUBTOTAL**				
VOLTAGE:	**120/240**		**TOTAL kVA**		**7.74**				**PANEL NAME:**		**W-44-O2-UPS-LP1**
MAIN BREAKER:	**100**		**TOTAL AMPS**		**32**				**LOCATION:**		**CONTROL ROOM**
BUSES:	**100**								**MOUNTING:**		**SURFACE**
PH & WIRES:	**1PH 3W**								**AIC RATING:**		**10 kAIC**
NOTE: (1) CIRCUIT RELOCATED FROM EXISTING PANELBOARD PN-UPS											

DIRECTORY	BRKR	POLE	CKT #	KVA	KVA LOADS A	B	C	KVA	CKT #	POLE	BRKR	DIRECTORY
SPARE	20	1	31						32	1	20	SPARE
SPARE	20	1	33						34	1	20	SPARE
SPARE	20	1	35						36	1	20	SPARE
SPARE	20	1	37						38	1	20	SPARE
SPARE	20	1	39						40	1	20	SPARE
SPARE	20	1	41						42	1	20	SPARE
OUTSIDE LTG & TIMER CONTROL	20	1	43						44	1	20	SPARE
OUTSIDE LTG	20	1	45						46	1	20	SPARE
SPARE	20	1	47						**48**	**1**	**20**	**SPARE**
SPARE	20	1	49						50	1	20	RELAY PNL
DCS DROP 23/73 PNL UTILITY	**20**	**1**	**51**	**0.41**					52	1	20	I/O INTERFACE PNL
DCS DROP 23/73 PNL UTILITY AC	**20**	**1**	**53**	**0.75**					54	1	20	DPU 15
SHUT DOWN LP1 PNL	50	3	55						56	3	50	SHUT DOWN LP2 PNL
			57						58			
			59						60			
(1) W-44-O2-UPS-01	**100A**	**2**	**61**						62	1		SPACE
			63						64	1		SPACE
SPACE		1	65						66	1		SPACE
SPACE		1	67						68	1		SPACE
SPACE		1	69						70	1		SPACE
SPACE		1	71						72	1		SPACE
				SUBTOTAL				SUBTOTAL				
VOLTAGE:	120/208		TOTAL kVA							PANEL NAME:		EXISTING PANEL LA-2 SECTION 2
MAIN BREAKER:	225		TOTAL AMPS							LOCATION:		CONTROL ROOM
BUSES:	225									MOUNTING:		FLUSH
PH & WIRES:	3PH 4W									AIC RATING:		
NOTES: (1) CIRCUIT BREAKER TO MATCH MAKE AND MODEL OF PANELBOARD												

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REF 3: REF3#FILENAME

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA

Donna L. Rammell 06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

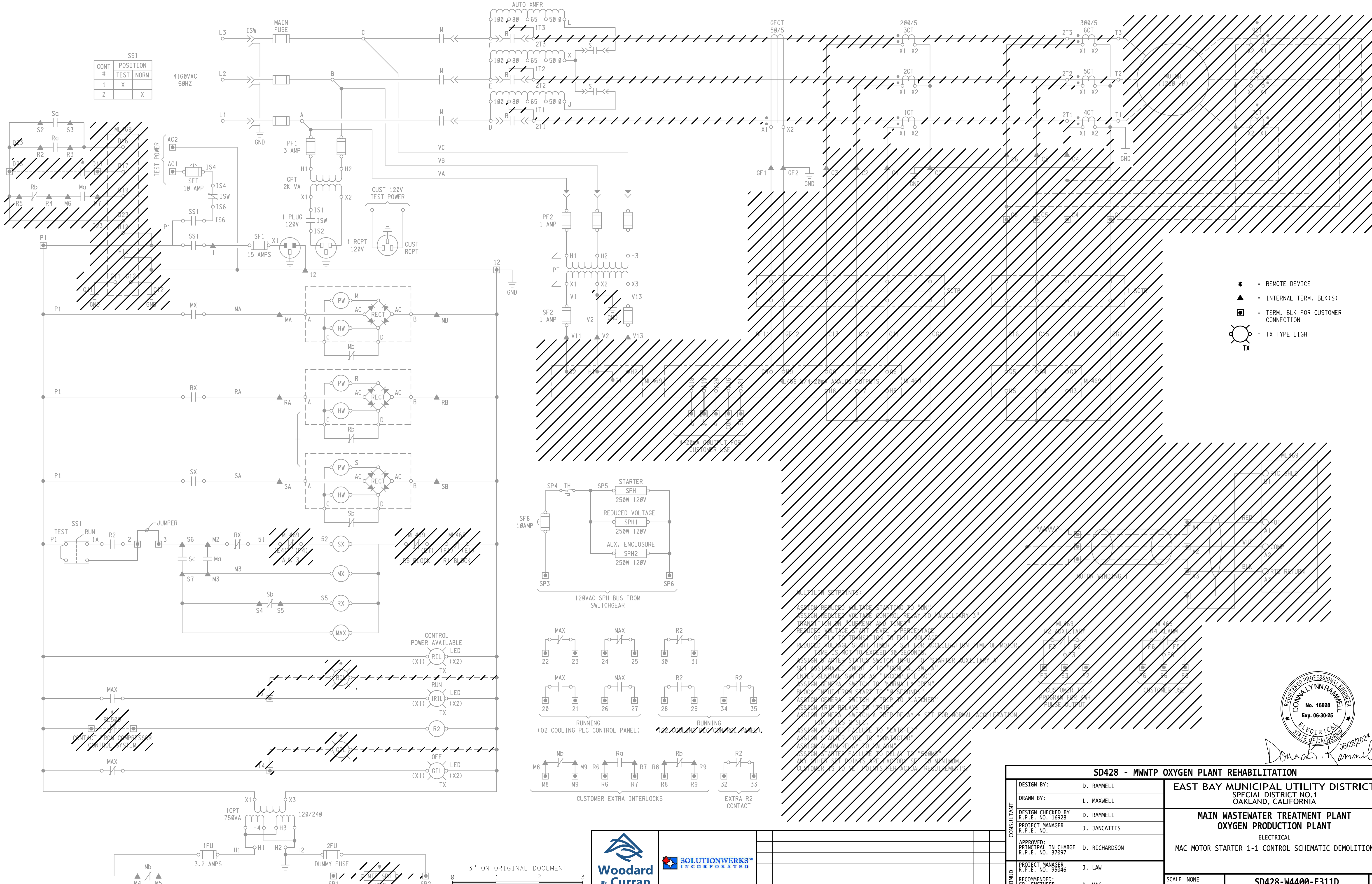
EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
PANELBOARD SCHEDULES

SCALE NONE
DATE 28JUN24
SD428-W4400-E230
DRAWING NUMBER
0
REV.



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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	D. RAMMELL
	DRAWN BY:	L. MAXWELL
	DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

MAC MOTOR STARTER 1-1 CONTROL SCHEMATIC DEMOLITION

SCALE NONE
DATE 28JUN24

SD428-W4400-E311D
DRAWING NUMBER

0
REV.

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NOTE 2 (TYP.)

AUTO XMFR

MAIN FUSE

4160VAC 60HZ

L3 ISW C M

L2 B M

L1 A M

GND

SSI

CONT #	POSITION TEST	POSITION NORM
1	X	
2		X

SEL 710-5

Sa S2 S3 Ra R2 R3 Rb R5 R4 Ma M6 M7

C09 C10 C11 C12 C13 C14 A01 A02 GND

P1

TEST POWER AC2 AC1

SFT 10 AMP IS4 ISW IS6 SS1

SF1 15 AMPS X1

PF1 3 AMP H1 H2

CPT 2K VA X1 X2

1 PLUG 120V IS1 ISW IS2

1 RCPT 120V

CUST 120V TEST POWER

CUST RCPT

VC VB VA

PF2 1 AMP H1 H2 H3

PT X1 X2 X3

SF2 1 AMP V1 V2 V13 V11

12

TS1-1A

Z09 Z10 Z11 Z12 SEL 710-5

MX MA PW RECT HW M AC A B C D MB Mb

RX RA R RB Rb

SX SA S SB Sb

JUMPER

TEST RUN 1A R2 2 3 S6 M2 RX Sa Ma S7 M3 Sb S4 S5

SEL 710-5 C01 C02 OUT301

SEL 710-5 A07 A09 OUT103 TRIP AND BLOCK

CONTROL POWER AVAILABLE LED RIL (X1) (X2) TX

RUN LED 1RIL (X1) (X2) TX

P1 RL500 11 CONTACT FROM THE RIO-15-1 PANEL R2

OFF LED GIL (X1) (X2) TX

1CPT 750VA X1 X3 H4 H3 120/240

1FU 3.2 AMPS H1 H2 2FU DUMMY FUSE

Mb M4 M5

* MTR SPH 300W SP1 SP2

SP4 TH SP5 STARTER SPH 250W 120V

SF8 10AMP

REDUCED VOLTAGE SPH1 250W 120V

AUX. ENCLOSURE SPH2 250W 120V

SP3 SP6

120VAC SPH BUS FROM SWITCHGEAR

MAX R2 22 23 24 25 30 31

20 21 26 27 RUNNING (O2 COOLING PLC CONTROL PANEL)

28 29 34 35 RUNNING (RIO-15-1 MAC 1-1 PANEL) (NOTE 5)

Mb M8 M9 Ra R6 R7 Rb R8 R9 R2 32 33

CUSTOMER EXTRA INTERLOCKS

EXTRA R2 CONTACT

SEL 710-5 C03 C04 OUT302 RIO-15-1 MAC 1-1 PANEL SEE DWG. SD428-W4400-E315

GFCT 50/5

200/5 3CT 2CT 1CT

300/5 6CT 5CT 4CT

MOTOR (1500 HP) NOTE 4

9CT 8CT 7CT

TB TS1-1B TS1-1A

Z07 Z08 Z05 Z06 Z03 Z04 Z01 Z02 SEL710-5

E09 E08 E07 E10 SEL710-5

SEL 2600

STATOR WINDING RTD 1 … RTD 6

RTD1 … RTD6 (01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 RTN)

RTD7 … RTD12 (27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 RTN)

STATOR WINDING RTD 7 … RTD 12

NOTE 3

23 120VAC H

24 120VAC N

26 GND

LOCATED IN RIO-15-1 MAC 1-1 PANEL

TX FIBER OPTIC CABLE RX

SEL 710-5

DRIVE END RTD 1 … NON DRIVE END RTD 2

D01 D02 D03 D04 D05 D06 D07 D08 D09 D10 D11 D12

* = REMOTE DEVICE

▲ = INTERNAL TERM. BLK(S)

▣ = TERM. BLK FOR CUSTOMER CONNECTION

TX = TX TYPE LIGHT

NOTES:

1. THE INFORMATION PROVIDED IN THIS DRAWING IS FROM PROJECT SD-227 CUTLER HAMMER O&M DOCUMENTS AND IS NOT "ASBUILT" AND WHERE EQUIPMENT IS MODIFIED SHOULD BE FIELD VERIFIED PRIOR TO WORK PERFORMED.
2. CHANGE TAP SETTING TO 65% AS SHOWN.
3. SEE DWG. SD428-W4400-E503-E510 FOR CIRCUIT NUMBER
4. DISTRICT FURNISHED MOTOR
5. RUNNING SIGNAL IS CURRENTLY CONNECTED TO O2 COOLING PLC CONTROL PANEL AND SHALL BE RELOCATED TO RIO PANEL AS INDICATED

3" ON ORIGINAL DOCUMENT 0 1 2 3

REGISTERED PROFESSIONAL ENGINEER DONNA LYNN RAMMELL No. 16928 Exp. 06-30-25 ELECTRICAL STATE OF CALIFORNIA

06/28/2024

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL

MAC MOTOR STARTER 1-1 CONTROL SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E311
DRAWING NUMBER

0
REV.

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PLOT SCALE: PLOT#SCALE

USER: #USER#
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NOTE 2 (TYP.)

SSI

CONT #	POSITION TEST	POSITION NORM
1	X	
2		X

4160VAC 60HZ

L3 ISW MAIN FUSE C M
L2 B M
L1 A M
GND

AUTO XMFR
100 80 65 50 0
F R 1T3 2T3 L
E R 1T2 2T2 S X
D R 1T1 2T1 S J

GFCT 50/5 X1 X2

200/5 3CT X1 X2 2T3 300/5 6CT X1 X2 T3
2CT X1 X2 2T2 5CT X1 X2 T2
1CT X1 X2 2T1 4CT X1 X2 T1
GND

MOTOR (1500 HP) NOTE 4

* 9CT X2 X1
* 8CT X2 X1
* 7CT X2 X1

TB TB GND
6 4 5 3 TS1-1B
Z07 Z08

TB TB TB TB GND
18 16 14 12 10 8 17 15 13 11 9 7 TS1-1A
Z05 Z06 Z03 Z04 Z01 Z02
SEL710-5

TB TB TB TB GND
18 16 14 12 10 8 17 15 13 11 9 7 TS1-1B
E09 E08 E07 E10
SEL710-5

SEL 710-5
C09 C10 C11 C12 C13 C14 A01 A02 GND

Sa S2 S3 Ra R2 R3 Rb R5 R4 Ma M6 M7
P1

TEST POWER AC2 AC1
SFT 10 AMP IS4 ISW IS6
SS1 P1 1
SF1 15 AMPS X1 12

PF1 3 AMP H1 H2
CPT 2K VA X1 X2
1 PLUG 120V IS1 ISW IS2
CUST 120V TEST POWER
1 RCPT 120V CUST RCPT

VC VB VA
PF2 1 AMP H1 H2 H3
PT X1 X2 X3
SF2 1 AMP V1 V2 V13
V11 V2 V13
2 4 6 1 3 5 GND TS1-1A
Z09 Z10 Z11 Z12
SEL 710-5

P1 MX MA MA PW M AC RECT AC A B MB HW C D Mb
P1 RX RA RA PW R AC RECT AC A B RB HW C D Rb
P1 SX SA SA PW S AC RECT AC A B SB HW C D Sb

SS1 TEST P1 RUN 1A R2 2 JUMPER 3 S6 M2 RX 51 C01 SEL 710-5 C02 52 SX
OUT301
A07 SEL 710-5 A09
OUT103 TRIP AND BLOCK
Sa S7 Ma M3 M3 MX P1
P1 Sb S4 S5 RX P1
MAX

CONTROL POWER AVAILABLE RIL LED (X1) (X2) TX
MAX RUN 1RIL LED (X1) (X2) TX
P1 RL500 11 R2
CONTACT FROM THE RIO-15-2 PANEL
MAX OFF GIL LED (X1) (X2) TX

X1 X3 1CPT 750VA 120/240 H4 H3
1FU 3.2 AMPS H1 H1 H2 H2 2FU DUMMY FUSE
Mb M4 M5
* MTR SPH 300W SP1 SP2

SP4 TH SP5 STARTER SPH 250W 120V
SF8 10AMP REDUCED VOLTAGE SPH1 250W 120V
AUX. ENCLOSURE SPH2 250W 120V
SP3 SP6
120VAC SPH BUS FROM SWITCHGEAR

MAX 22 23 MAX 24 25 R2 30 31
MAX 20 21 MAX 26 27 R2 28 29 R2 34 35
RUNNING (O2 COOLING PLC CONTROL PANEL)
RUNNING (RIO-15-2 MAC 1-2 PANEL) (NOTE 5)

Mb M8 M9 Ra R6 R7 Rb R8 R9 R2 32 33
CUSTOMER EXTRA INTERLOCKS
EXTRA R2 CONTACT

SEL 2600

STATOR WINDING RTD 1	01 02 03	+ - RTN	RTD1
STATOR WINDING RTD 2	04 05 06	+ - RTN	RTD2
STATOR WINDING RTD 3	07 08 09	+ - RTN	RTD3
STATOR WINDING RTD 4	10 11 12	+ - RTN	RTD4
STATOR WINDING RTD 5	13 14 15	+ - RTN	RTD5
STATOR WINDING RTD 6	16 17 18	+ - RTN	RTD6
STATOR WINDING RTD 7	RTD7	+ - RTN 27 28 29	
STATOR WINDING RTD 8	RTD8	+ - RTN 30 31 32	
STATOR WINDING RTD 9	RTD9	+ - RTN 33 34 35	
STATOR WINDING RTD 10	RTD10	+ - RTN 36 37 38	
STATOR WINDING RTD 11	RTD11	+ - RTN 39 40 41	
STATOR WINDING RTD 12	RTD12	+ - RTN 42 43 44	

NOTE 3
23 120VAC H
24 120VAC N
26 GND
LOCATED IN RIO-15-2 MAC 1-2 PANEL

TX FIBER OPTIC CABLE RX

SEL 710-5

DRIVE END RTD 1	D01 D02 D03
DRIVE END RTD 2	D04 D05 D06
NON DRIVE END RTD 1	D07 D08 D09
NON DRIVE END RTD 2	D10 D11 D12

SEL 710-5
C03 C04
OUT302
RIO-15-2 MAC 1-2 PANEL
SEE DWG. SD428-W4400-E315

* = REMOTE DEVICE
▲ = INTERNAL TERM. BLK(S)
▣ = TERM. BLK FOR CUSTOMER CONNECTION
TX = TX TYPE LIGHT

NOTES:

1. THE INFORMATION PROVIDED IN THIS DRAWING IS FROM PROJECT SD-227 CUTLER HAMMER O&M DOCUMENTS AND IS NOT "ASBUILT" AND WHERE EQUIPMENT IS MODIFIED SHOULD BE FIELD VERIFIED PRIOR TO WORK PERFORMED.
2. CHANGE TAP SETTING TO 65% AS SHOWN.
3. SEE DWG. SD428-W4400-E505-E510 FOR CIRCUIT NUMBER
4. DISTRICT FURNISHED MOTOR
5. RUNNING SIGNAL IS CURRENTLY CONNECTED TO O2 COOLING PLC CONTROL PANEL AND SHALL BE RELOCATED TO RIO PANEL AS INDICATED

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran
SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
MAC MOTOR STARTER 1-2 CONTROL SCHEMATIC

SCALE NONE
DATE 28JUN24
SD428-W4400-E312
DRAWING NUMBER
0
REV.

REF 7; REF7##FILENAME
REF 8; REF8##FILENAME
REF 9; REF9##FILENAME

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REF 5; REF5##FILENAME
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USER: #USER####
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NOTE 2 (TYP.)

AUTO XMFR

MAIN FUSE

4160VAC 60HZ

L3 ISW C M

L2 B M

L1 A M

GND

SSI

CONT #	POSITION TEST	POSITION NORM
1	X	
2		X

SEL 710-5

Sa S2 S3 Ra R2 R3 Rb R5 R4 Ma M6 M7

C09 C10 C11 C12 C13 C14 A01 A02 GND

P1

TEST POWER AC2 AC1

SFT 10 AMP IS4 ISW IS6

SS1

SF1 15 AMPS X1

PF1 3 AMP H1 H2

CPT 2K VA X1 X2

1 PLUG 120V IS1 ISW IS2

1 RCPT 120V

CUST 120V TEST POWER

CUST RCPT

VC VB VA

PF2 1 AMP H1 H2 H3

PT X1 X2 X3

SF2 1 AMP V1 V2 V13 V11

1T3 2T3 1T2 2T2 1T1 2T1

F E D R S X J

GFCT 50/5

200/5 3CT 2CT 1CT

300/5 6CT 5CT 4CT

T3 T2 T1

MOTOR (1500 HP) NOTE 4

9CT 8CT 7CT

TB TS1-1B TS1-1A

Z07 Z08 Z05 Z06 Z03 Z04 Z01 Z02 SEL710-5

E09 E08 E07 E10 SEL710-5

P1 MX MA PW RECT HW M AC A B C D MB Mb

P1 RX RA R RB Rb

P1 SX SA S SB Sb

SS1 TEST RUN 1A R2 JUMPER Sa S6 M2 RX S7 M3 Ma Sb S4 S5

SEL 710-5 C01 C02 OUT301

SEL 710-5 A07 A09 OUT103 TRIP AND BLOCK

CONTROL POWER AVAILABLE RIL LED (X1) (X2) TX

RUN 1RIL

MAX R2

P1 RL500 11 CONTACT FROM THE RIO-23-1 PANEL

OFF GIL

1CPT 750VA X1 X3 H4 H3 120/240

1FU 3.2 AMPS H1 H2 2FU DUMMY FUSE

Mb M4 M5

MTR SPH 300W SP1 SP2

TS1-1A Z09 Z10 Z11 Z12 SEL 710-5

SP4 TH SP5 STARTER SPH 250W 120V

SF8 10AMP

REDUCED VOLTAGE SPH1 250W 120V

AUX. ENCLOSURE SPH2 250W 120V

SP3 SP6

120VAC SPH BUS FROM SWITCHGEAR

MAX 22 23 MAX 24 25 R2 30 31

MAX 20 21 MAX 26 27 R2 28 29 R2 34 35

RUNNING (O2 COOLING PLC CONTROL PANEL)

RUNNING (RIO-23-1 MAC 2-1 PANEL) (NOTE 5)

Mb M8 M9 Ra R6 R7 Rb R8 R9 R2 32 33

CUSTOMER EXTRA INTERLOCKS

EXTRA R2 CONTACT

SEL 2600

STATOR WINDING RTD 1 RTD1 01 02 03 RTN

STATOR WINDING RTD 2 RTD2 04 05 06 RTN

STATOR WINDING RTD 3 RTD3 07 08 09 RTN

STATOR WINDING RTD 4 RTD4 10 11 12 RTN

STATOR WINDING RTD 5 RTD5 13 14 15 RTN

STATOR WINDING RTD 6 RTD6 16 17 18 RTN

RTD7 27 28 29 RTN STATOR WINDING RTD 7

RTD8 30 31 32 RTN STATOR WINDING RTD 8

RTD9 33 34 35 RTN STATOR WINDING RTD 9

RTD10 36 37 38 RTN STATOR WINDING RTD 10

RTD11 39 40 41 RTN STATOR WINDING RTD 11

RTD12 42 43 44 RTN STATOR WINDING RTD 12

NOTE 3 23 120VAC H 24 120VAC N 26 GND

LOCATED IN RIO-23-1 MAC 2-1 PANEL

TX FIBER OPTIC CABLE RX

SEL 710-5 C03 C04 OUT302 RIO-23-1 MAC 2-1 PANEL SEE DWG. SD428-W4400-E315

SEL 710-5

DRIVE END RTD 1 D01 D02 D03

DRIVE END RTD 2 D04 D05 D06

NON DRIVE END RTD 1 D07 D08 D09

NON DRIVE END RTD 2 D10 D11 D12

* = REMOTE DEVICE

▲ = INTERNAL TERM. BLK(S)

◘ = TERM. BLK FOR CUSTOMER CONNECTION

TX = TX TYPE LIGHT

NOTES:

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2. CHANGE TAP SETTING TO 65% AS SHOWN.
3. SEE DWG. SD428-W4400-E504-E510 FOR CIRCUIT NUMBER
4. DISTRICT FURNISHED MOTOR
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REGISTERED PROFESSIONAL ENGINEER DONNA LYNN RAMMELL No. 16928 Exp. 06-30-25 ELECTRICAL STATE OF CALIFORNIA

06/28/2024

3" ON ORIGINAL DOCUMENT 0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL

MAC MOTOR STARTER 2-1 CONTROL SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E313
DRAWING NUMBER

0
REV.

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NOTE 2 (TYP.)

SSI

CONT #	POSITION TEST	POSITION NORM
1	X	
2		X

4160VAC 60HZ

L3 L2 L1 ISW MAIN FUSE GND

AUTO XMFR 100 80 65 50 0

1T3 2T3 1T2 2T2 1T1 2T1

GFCT 50/5

200/5 3CT 2CT 1CT

300/5 6CT 5CT 4CT

MOTOR (1500 HP) NOTE 4

9CT 8CT 7CT

TB GND

TSW1-1B

TS1-1A

TS1-1B

SEL710-5

SEL 710-5

C09 C10 C11 C12 C13 C14 A01 A02 GND

Sa S2 S3 Ra R2 R3 Rb R5 R4 Ma M6 M7

TEST POWER AC2 AC1

SFT 10 AMP IS4 ISW IS6 SS1

PF1 3 AMP

CPT 2K VA H1 H2 X1 X2

1 PLUG 120V IS1 ISW IS2

1 RCPT 120V

CUST 120V TEST POWER CUST RCPT

SF1 15 AMPS

VC VB VA

PF2 1 AMP

PT H1 H2 H3 X1 X2 X3

SF2 1 AMP V1 V2 V13 V11

TS1-1A

SEL 710-5

Z09 Z10 Z11 Z12

P1 12

MX MA RA RX MB RB Mb Rb

PW HW RECT AC A B C D M R S

SX SA SB Sb

SS1 TEST RUN 1A R2 2 3 JUMPER

S6 M2 RX 51 C01 SEL 710-5 C02 52 SX OUT301

Sa M3 S7 Ma

SEL 710-5 A07 A09 OUT103 TRIP AND BLOCK

Sb S4 S5 RX MAX

CONTROL POWER AVAILABLE LED RIL (X1) (X2) TX

RUN LED 1RIL (X1) (X2) TX

RL500 11 CONTACT FROM THE RIO-23-2 PANEL R2

OFF LED GIL (X1) (X2) TX

1CPT 750VA X1 X3 H4 H3 120/240

1FU 3.2 AMPS H1 H2 2FU DUMMY FUSE

Mb M4 M5

* MTR SPH 300W SP1 SP2

SP4 TH SP5 STARTER SPH 250W 120V

SF8 10AMP

REDUCED VOLTAGE SPH1 250W 120V

AUX. ENCLOSURE SPH2 250W 120V

SP3 SP6

120VAC SPH BUS FROM SWITCHGEAR

MAX R2 RUNNING (O2 COOLING PLC CONTROL PANEL)

RUNNING (RIO-23-2 MAC 2-2 PANEL) (NOTE 5)

Mb Ra Rb R2 M8 M9 R6 R7 R8 R9 32 33

CUSTOMER EXTRA INTERLOCKS

EXTRA R2 CONTACT

SEL 710-5 C03 C04 OUT302 RIO-23-2 MAC 2-2 PANEL SEE DWG. SD428-W4400-E315

SEL 2600

STATOR WINDING RTD 1 … RTD 6

RTD1 … RTD12 01 … 44

NOTE 3 23 120VAC H 24 120VAC N 26 GND

LOCATED IN RIO-23-2 MAC 2-2 PANEL

TX FIBER OPTIC CABLE RX

SEL 710-5

DRIVE END RTD 1 DRIVE END RTD 2 NON DRIVE END RTD 1 NON DRIVE END RTD 2

D01 D02 D03 D04 D05 D06 D07 D08 D09 D10 D11 D12

* = REMOTE DEVICE

▲ = INTERNAL TERM. BLK(S)

▣ = TERM. BLK FOR CUSTOMER CONNECTION

TX = TX TYPE LIGHT

NOTES:

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3. SEE DWG. SD428-W4400-E506-E510 FOR CIRCUIT NUMBER
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REGISTERED PROFESSIONAL ENGINEER DONNA LYNN RAMMELL No. 16928 Exp. 06-30-25 ELECTRICAL STATE OF CALIFORNIA

06/28/2024

3" ON ORIGINAL DOCUMENT 0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

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PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

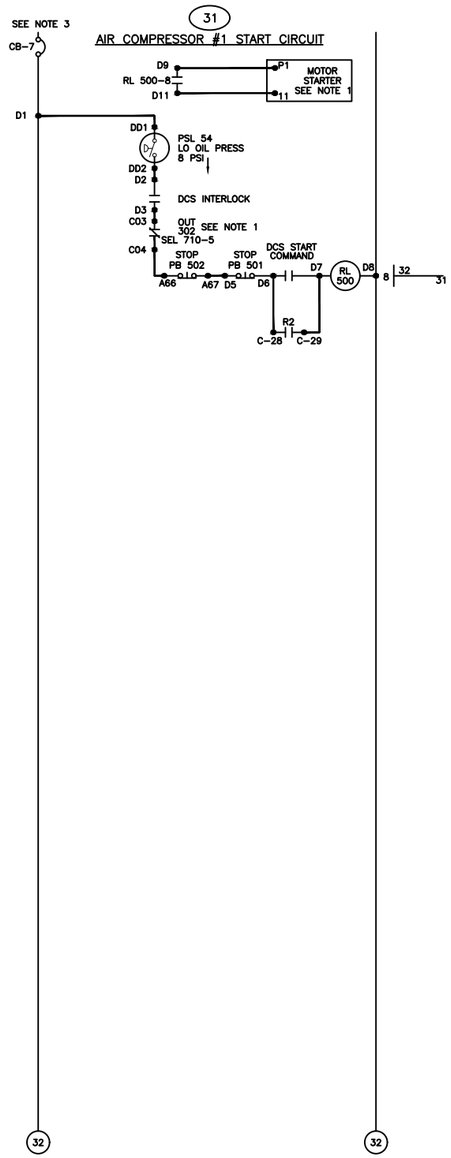
MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL

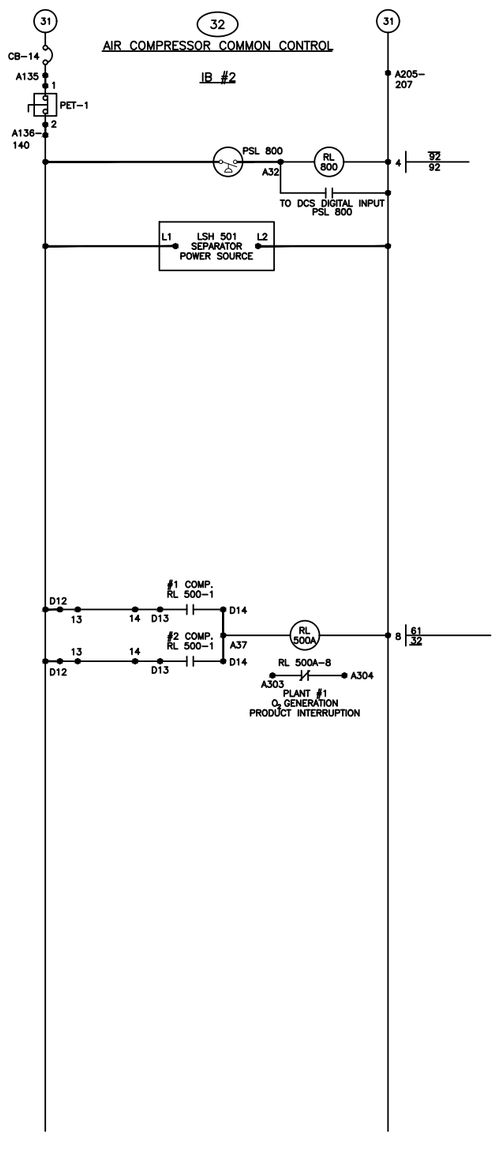
MAC MOTOR STARTER 2-2 CONTROL SCHEMATIC

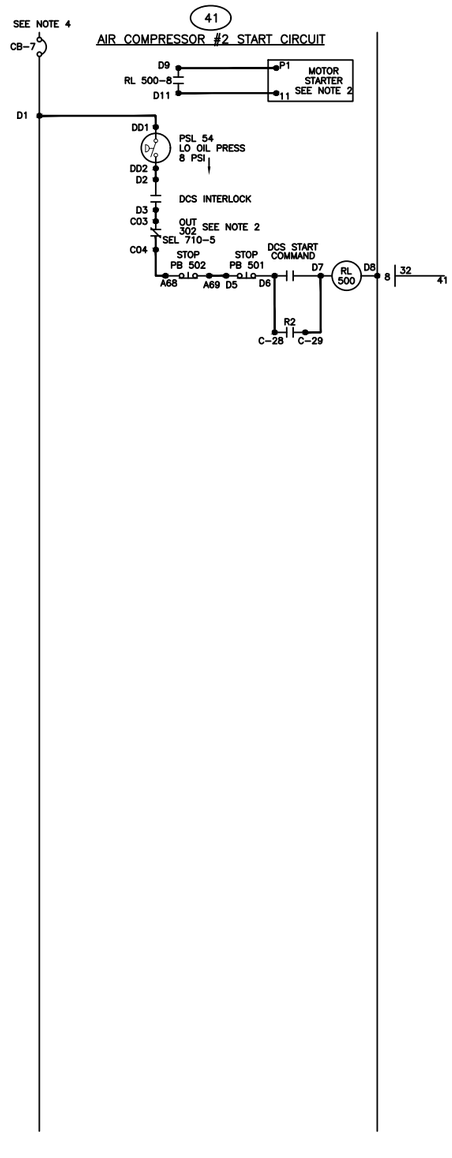
SCALE NONE
DATE 28JUN24

SD428-W4400-E314
DRAWING NUMBER

0
REV.







PANEL TERMINAL LEGEND:

'A' – MAIN INSTRUMENT PANEL / MAIN CONTROL PANEL
'B' – COLUMN JUNCTION BOX
'BB' – VALVE SKID JUNCTION BOX
'C' – MAC MOTOR STARTER
'D' – MAC RIO PANEL
'DD' – AIR COMPRESSOR JUNCTION BOX
'F' – TURBINE DUCT JUNCTION BOX
'T' – TURBINE/CRYO RIO PANEL
'TT' – TURBINE

NOTES:

1. REFER TO DWG. SD428-W4400-E311
2. REFER TO DWG. SD428-W4400-E312
3. REFER TO DWG. SD428-W4400-E503-510
4. REFER TO DWG. SD428-W4400-E505-510

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

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REF 2: REF2$FILENAME
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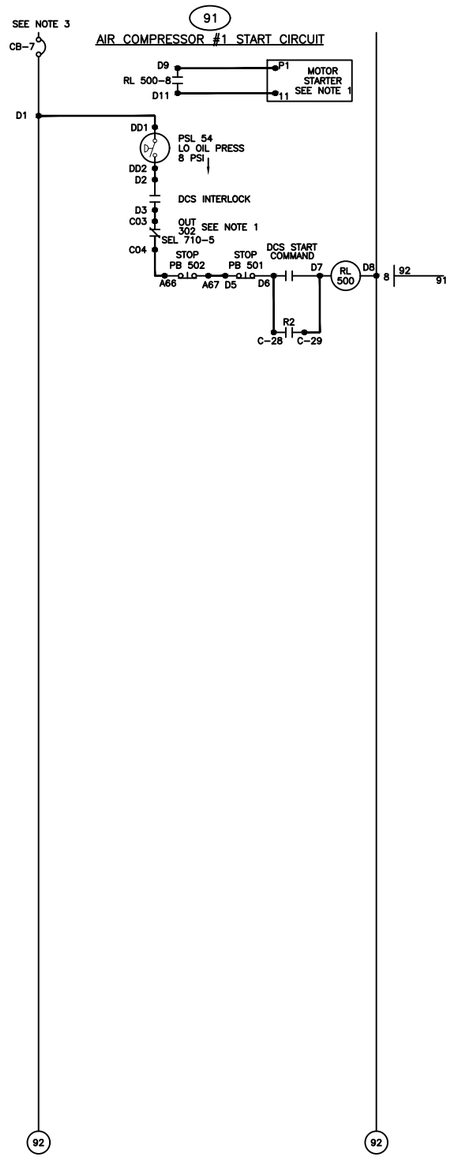

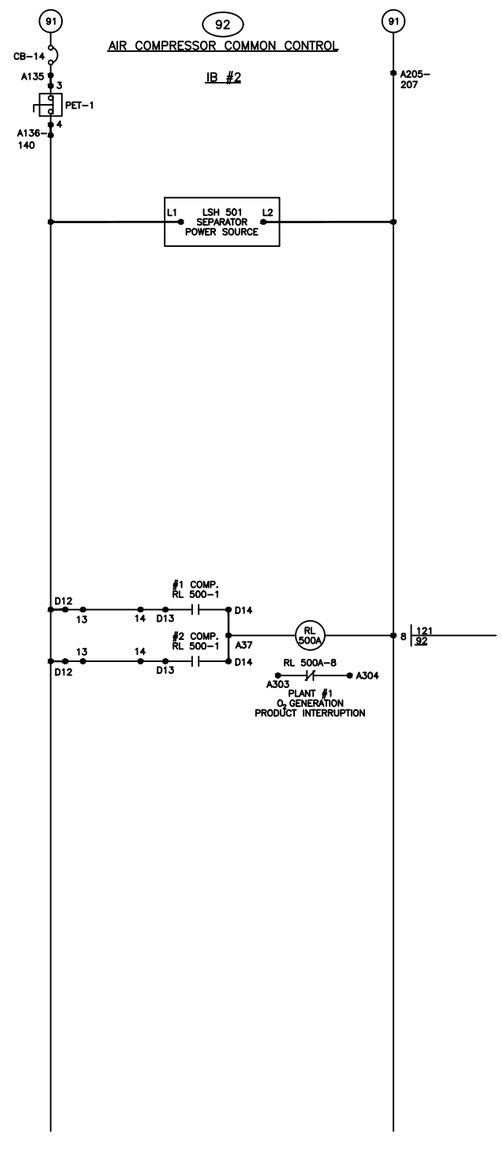

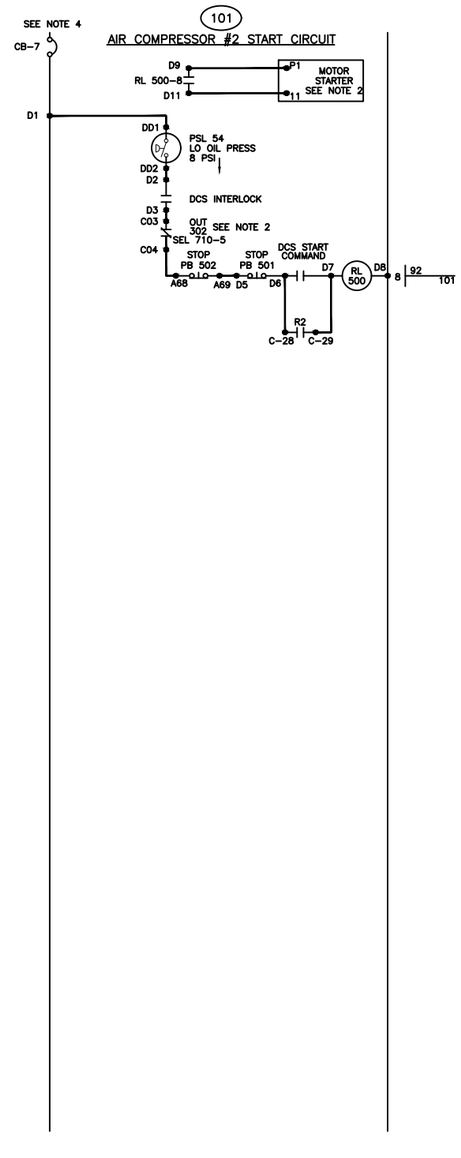

PANEL TERMINAL LEGEND:

'A' – MAIN INSTRUMENT PANEL / MAIN CONTROL PANEL
'B' – COLUMN JUNCTION BOX
'BB' – VALVE SKID JUNCTION BOX
'C' – MAC MOTOR STARTER
'D' – MAC RIO PANEL
'DD' – AIR COMPRESSOR JUNCTION BOX
'F' – TURBINE DUCT JUNCTION BOX
'T' – TURBINE/CRYO RIO PANEL
'TT' – TURBINE

NOTES:

1. REFER TO DWG. SD428-W4400-E313
2. REFER TO DWG. SD428-W4400-E314
3. REFER TO DWG. SD428-W4400-E504-510
4. REFER TO DWG. SD428-W4400-E506-510

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

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0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. SPEYRER
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

MAC PLANT 2
CONTROL SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E316
DRAWING NUMBER

0
REV.

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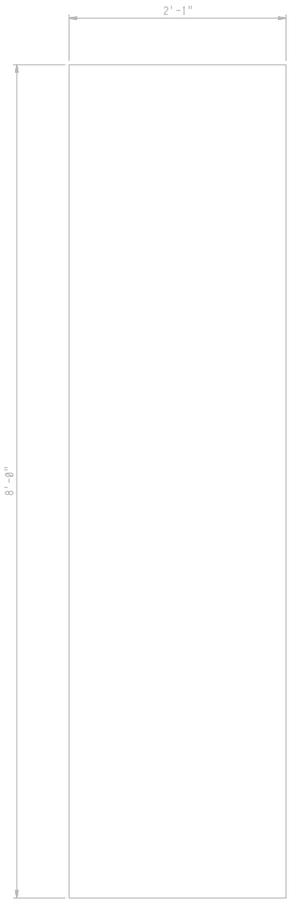
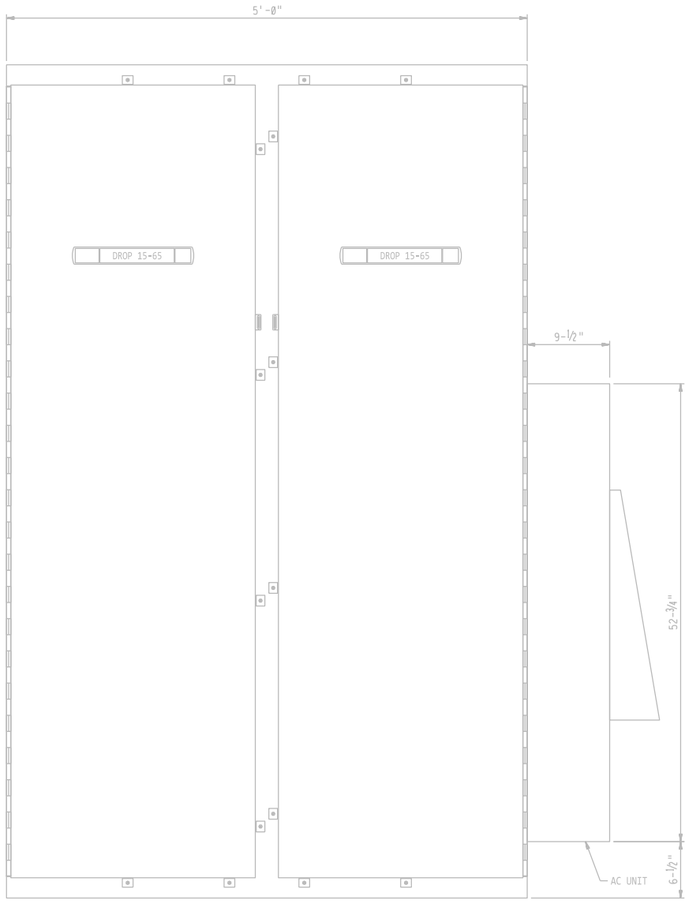
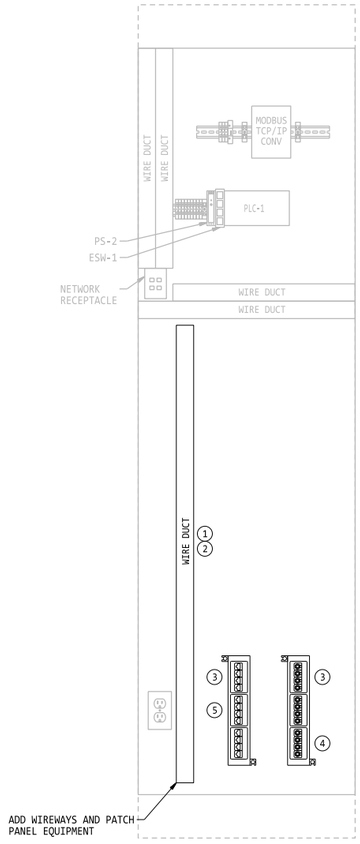


LEFT SIDE VIEW

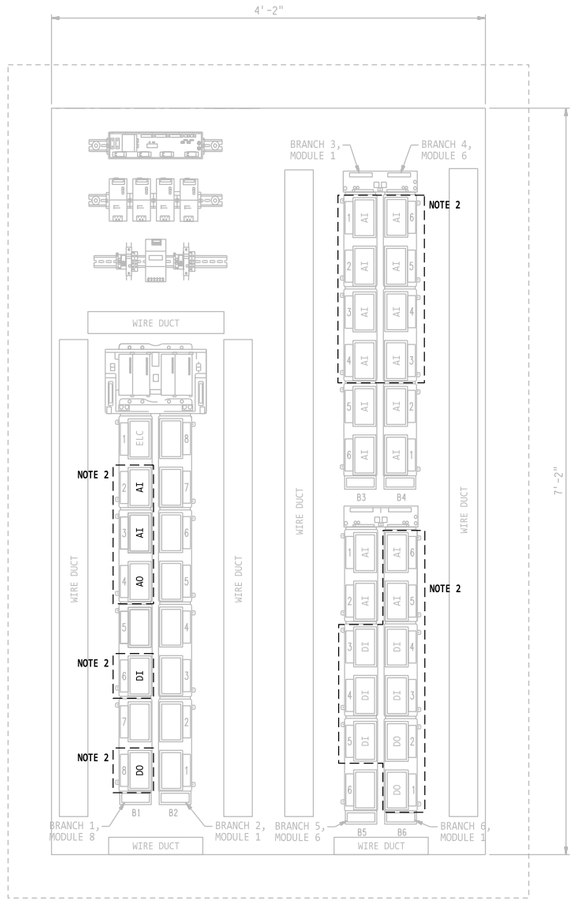


FRONT VIEW

DCS DROP 15/65 EXTERIOR ELEVATION



LEFT SIDE LAYOUT



FRONT LAYOUT

DCS DROP 15/65 INTERIOR LAYOUT

BILL OF MATERIALS

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
				ENCLOSURE & RELATED EQUIPMENT	
1	6FT	PANDUIT	F2X2LG6	WIRING DUCT, 2"W x 2"H	
2	6FT	PANDUIT	C2LG6	WIRING DUCT COVER, 2"W	
3	2	EMERSON	5X00133G05	MINI-COM PATCH PANEL - 12 PORTS	
4	1	EMERSON	1X00118H01	MINI-COM MODULE FOR FO-ST	
5	1	PANDUIT	CJ6C881GIW	MINI-COM MODULE FOR TX6 10GIG UTP JACK	

NOTES

1. DISTRICT FURNISHED EQUIPMENT. CONTRACTOR TO INSTALL WIRE AND WIRE LABELS IN ACCORDANCE TO THE DWG.
2. **AREA OF WORK.**

KYLE EVAN TRACY
LICENSED PROFESSIONAL ENGINEER
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. DI DONATO
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
ELEVATION

SCALE NONE
DATE 28JUN24

SD428-W4400-E501
DRAWING NUMBER

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REV.

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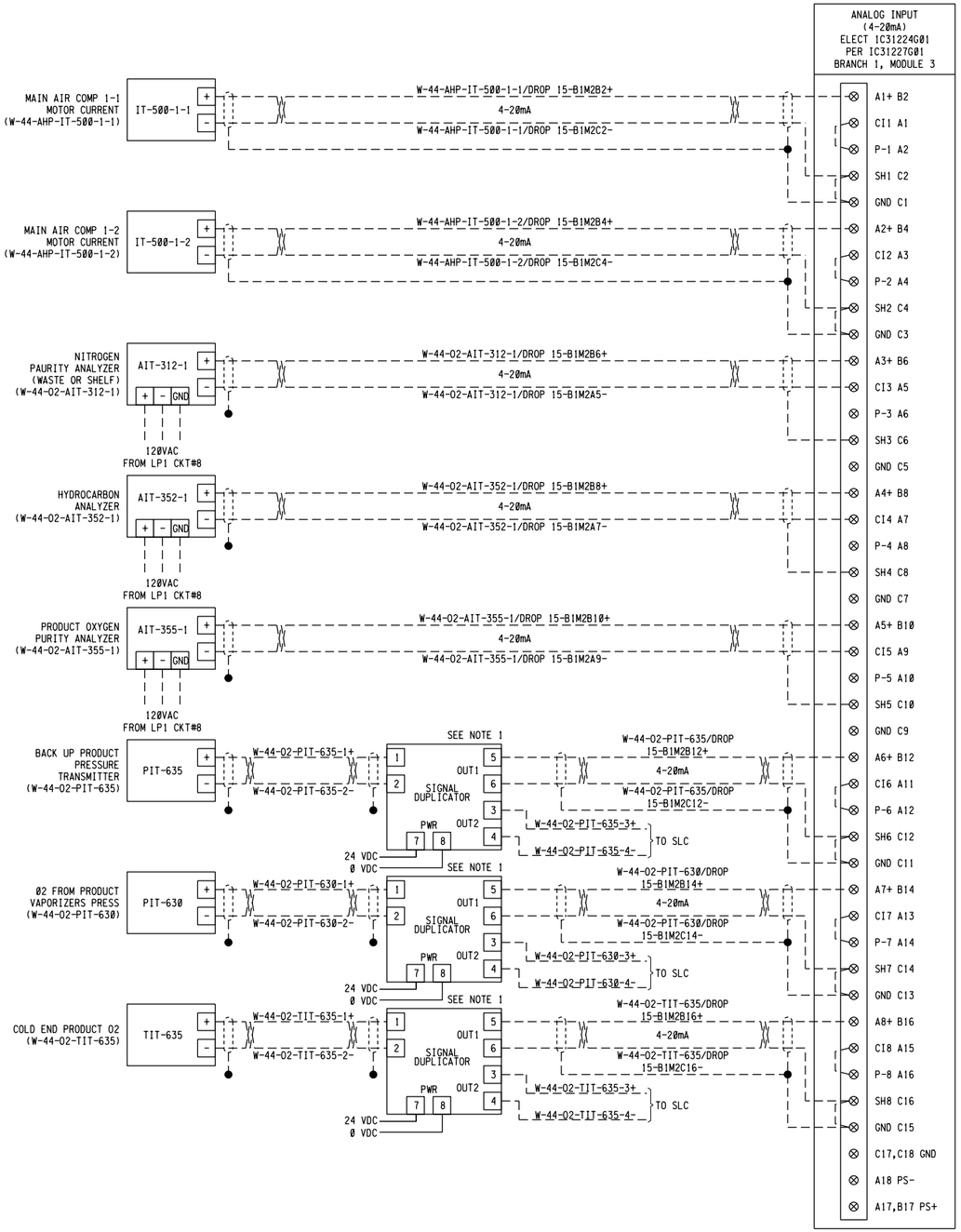

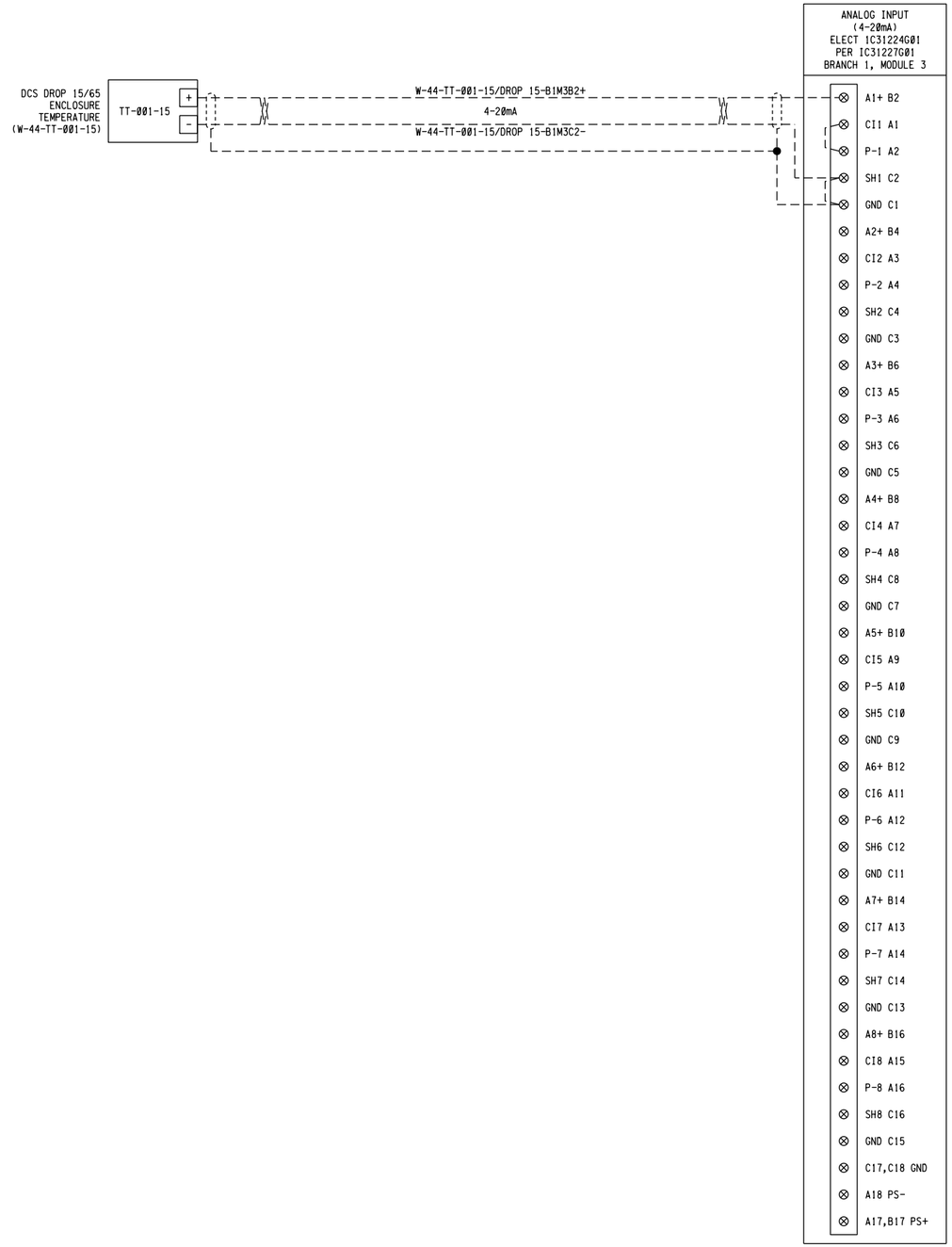

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NOTES:

1) PROVIDE MINI MCR-2-UNI-UI-2UI-PT - SINNAL DUPLICATOR 2905028 - PHOENIX CONTACT OR EQUAL

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

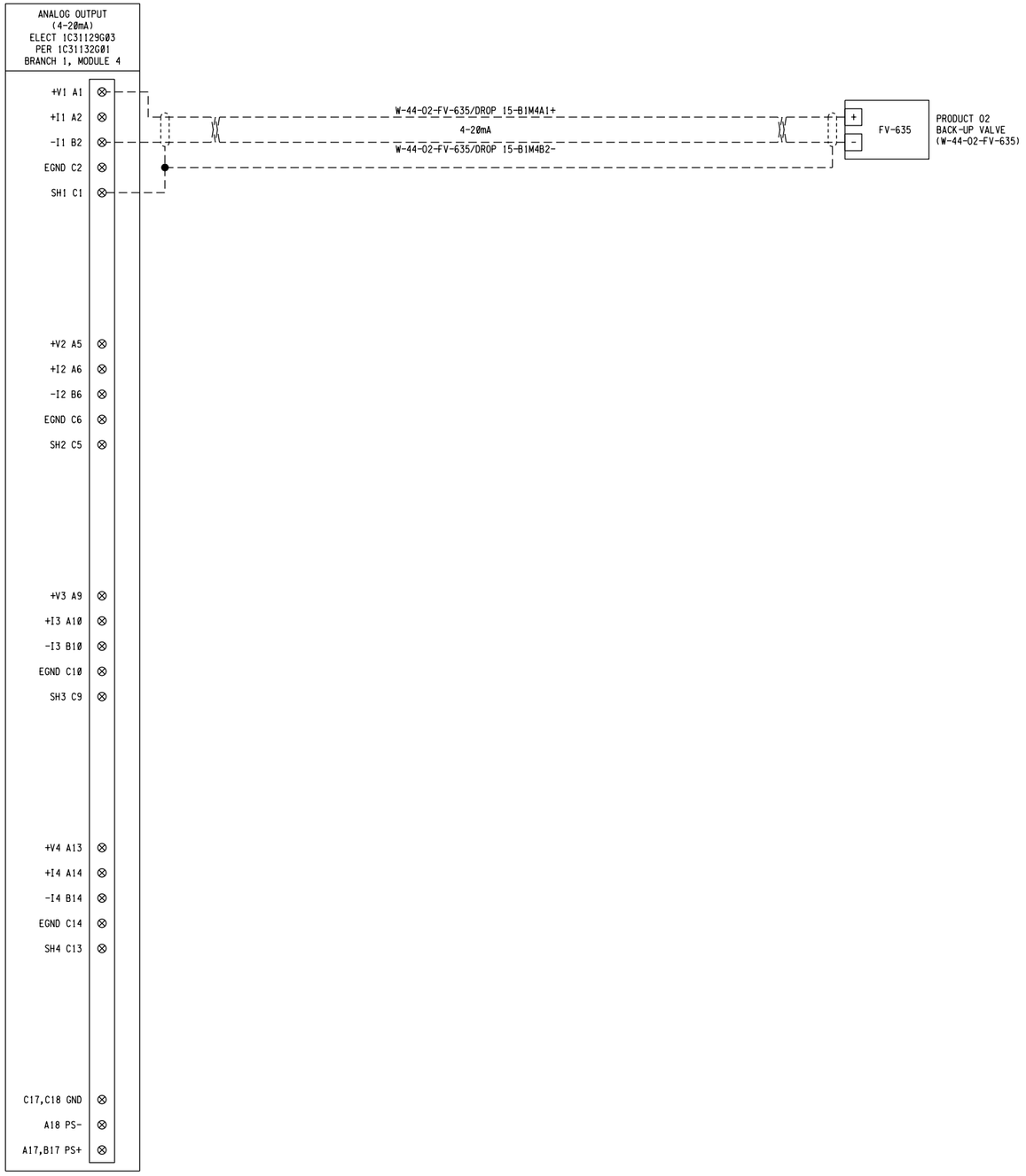
MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E501-511
DRAWING NUMBER

Ø
REV.



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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
C.S. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E501-512
DRAWING NUMBER

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REV.

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REF 6:
REF 7:
REF 8:
REF 9:

		DIGITAL INPUT 24/48VDC FUSED ELECT IC31232G02 PER 15X00034G01 BRANCH 1, MODULE 6
MAC 1-1 MAIN CONTROL PANEL E-STOP (W-44-AHP-PB-502-1-1)	W-44-AHP-PB-502-1-1/DROP 15-B1M6A2+	2+ A2
	W-44-AHP-PB-502-1-1/DROP 15-B1M6B2-	2- B2
MAC 1-2 MAIN CONTROL PANEL E-STOP (W-44-AHP-PB-502-1-2)	W-44-AHP-PB-502-1-2/DROP 15-B1M6A3+	3+ A3
	W-44-AHP-PB-502-1-2/DROP 15-B1M6B3-	3- B3
THAW HEATER ELEMENT 1 ON STATUS (YI-TH-1)	W44-YI-TH-1/DROP 15-B1M6A4+	4+ A4
	W44-YI-TH-1/DROP 15-B1M6B4-	4- B4
		5+ A5
		5- B5
MAC 1-1 RUN STATUS (YI-500-1-1)	W44-YI-500-1-1/DROP 15-B1M6A6+	6+ A6
	W44-YI-500-1-1/DROP 15-B1M6B6-	6- B6
		7+ A7
		7- B7
MAC 1-2 RUN STATUS (YI-500-1-2)	W44-YI-500-1-2/DROP 15-B1M6A8+	8+ A8
	W44-YI-500-1-2/DROP 15-B1M6B8-	8- B8
LOW COOLING WATER PRESSURE (W-44-CWS-PSL-800)	W-44-CWS-PSL-800/DROP 15-B1M6A9+	9+ A9
	W-44-CWS-PSL-800/DROP 15-B1M6B9-	9- B9
		10+ A10
		10- B10
		11+ A11
		11- B11
		12+ A12
		12- B12
		13+ A13
		13- B13
		14+ A14
		14- B14
		15+ A15
		15- B15
		16+ A16
		16- B16
		C17, C18 GND
		A18 PS-
		A17, B17 PS+
		C1-C17 RSV

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SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
C.S. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E501-513
DRAWING NUMBER

0
REV.

RELAY OUTPUT
10A@250VAC/3A@150VDC
ELECT 5A26457G01
PER N/A
BRANCH 1, MODULE 8

L — 120 VAC — N

TB1 NO — W-44-02-FY-635/DROP 15-B1M8NO+ — W-44-02-FY-635 — PRODUCT VALVE SOLENOID (W-44-02-FY-635)

TB1 C — TB2 C — TB3 C — TB4 C — TB5 C — TB6 C — TB7 C — TB8 C — TB9 C — TB10 C — TB11 C — TB12 C — C17, C18 GND — A18 PS- — A17, B17 PS+ — C1-C17 RSV

TB3 NO — WW44-YC-213-1/DROP 15-B1M8NO+3 — T44 PLANT 1 EXPANDER OIL PUMP RUN COMMAND (SEE DWG. SD-428-W4400-E317 FOR DETAILED INTERCONNECTION DIAGRAM)

TB3 C — WW44-YC-213-1/DROP 15-B1M8C-3 — T43

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REF 9:

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E501-514
DRAWING NUMBER

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REV.

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REF 5:
REF 6:
REF 7:
REF 8:
REF 9:

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 3, MODULE 1

O2 NO.1 TURBINE INLET PRESSURE (OPI2101)
O2 NO.1 TURBINE OUTLET PRESSURE (OPI2111)
O2 NO.1 LOWER COLUMN PRESSURE (OPI3001)
O2 NO.1 MAIN CONDENSER PRESSURE (OPI3511)
O2 NO.1 UPPER COLUMN PRESSURE (OPI3401)
O2 NO.1 COLD END DELTA TEMPERATURE (OSDTI1081)
SPARE
SPARE

(A1) CI1
(A2) P-1
(B2) A1+
(C1) GND
(C2) SH1
(A3) CI2
(A4) P-2
(B4) A2+
(C3) GND
(C4) SH2
(A5) CI3
(A6) P-3
(B6) A3+
(C5) GND
(C6) SH3
(A7) CI4
(A8) P-4
(B8) A4+
(C7) GND
(C8) SH4
(A9) CI5
(A10) P-5
(B10) A5+
(C9) GND
(C10) SH5
(A11) CI6
(A12) P-6
(B12) A6+
(C11) GND
(C12) SH6
(A13) CI7
(A14) P-7
(B14) A7+
(C13) GND
(C14) SH7
(A15) CI8
(A16) P-8
(B16) A8+
(C15) GND
(C16) SH8
(A17,B17) PS+
(A18) PS-
(C17,C18) GND

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 3, MODULE 2

O2 NO.1 TURBINE SPEED (OSI2191)
O2 NO.1 COMPRESSOR 1 INLET GUIDE VANES POSITION (OHI20111)
O2 NO.1 COMPRESSOR 1 VENT VALVE POSITION (OHI20711)
O2 NO.1 COMPRESSOR 2 INLET GUIDE VANES POSITION (OHI20121)
O2 NO.1 COMPRESSOR 2 VENT VALVE POSITION (OHI20721)
O2 NO.1 COMPRESSOR 1 AIR DISCHARGE PRESSURE (OPI20611)
SPARE
SPARE

(A1) CI1
(A2) P-1
(B2) A1+
(C1) GND
(C2) SH1
(A3) CI2
(A4) P-2
(B4) A2+
(C3) GND
(C4) SH2
(A5) CI3
(A6) P-3
(B6) A3+
(C5) GND
(C6) SH3
(A7) CI4
(A8) P-4
(B8) A4+
(C7) GND
(C8) SH4
(A9) CI5
(A10) P-5
(B10) A5+
(C9) GND
(C10) SH5
(A11) CI6
(A12) P-6
(B12) A6+
(C11) GND
(C12) SH6
(A13) CI7
(A14) P-7
(B14) A7+
(C13) GND
(C14) SH7
(A15) CI8
(A16) P-8
(B16) A8+
(C15) GND
(C16) SH8
(A17,B17) PS+
(A18) PS-
(C17,C18) GND

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
No. CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. DI DONATO
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
ANALOG INPUT MODULE SCHEMATIC DEMOLITION

SCALE NONE
DATE 28JUN24
SD428-W4400-E501-519D
DRAWING NUMBER
0
REV.

USER: robert
DATE: 28JUN2024 10:06
FILE: F:\Projects\Woodard Curran\EBMUD SD-428\DGN\SD428-W4400-E501-5200.dgn
PLOT SCALE: 0.166667:1
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REF 2: F:\Projects\Woodard Curran\EBMUD SD-428\DGN\Xref\MST-W4400-BBR20.dgn
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ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 3, MODULE 3

O2 NO.1 COMPRESSOR 2 AIR DISCHARGE PRESSURE (OPRS6221)	(A1) CI1
	(A2) P-1
	(B2) A1+
	(C1) GND
	(C2) SH1
O2 NO.1 COLD AIR UNBALANCED AIR RATIO (OFFC1201)	(A3) CI2
	(A4) P-2
	(B4) A2+
	(C3) GND
	(C4) SH2
O2 NO.1 FIC13 / 225 UNBALANCED AIR FLOW (OFV2151)	(A5) CI3
	(A6) P-3
	(B6) A3+
	(C5) GND
	(C6) SH3
O2 NO.1 UNBALANCED AIR FLOW VALVE POSITION (OFI2151)	(A7) CI4
	(A8) P-4
	(B8) A4+
	(C7) GND
	(C8) SH4
O2 NO.1 TURBINE INLET FV120A POSITION (OHI2514)	(A9) CI5
	(A10) P-5
	(B10) A5+
	(C9) GND
	(C10) SH5
O2 NO.1 KETTLE LEVEL (OLTC1201)	(A11) CI6
	(A12) P-6
	(B12) A6+
	(C11) GND
	(C12) SH6
	(A13) CI7
	(A14) P-7
	(B14) A7+
	(C13) GND
	(C14) SH7
	(A15) CI8
	(A16) P-8
	(B16) A8+
SPARE	(C15) GND
	(C16) SH8
SPARE	(A17,B17) PS+
	(A18) PS-
	(C17,C18) GND

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 3, MODULE 4

O2 NO.2 KETTLE LEVEL VALVE LV330A POSITION (OLV3304)	(A1) CI1
	(A2) P-1
	(B2) A1+
	(C1) GND
	(C2) SH1
O2 NO.2 MAIN CONDENSER LEVEL (OLR3524)	(A3) CI2
	(A4) P-2
	(B4) A2+
	(C3) GND
	(C4) SH2
O2 NO.2 COLD END AIR SHELL TRANSFER RATIO (OFC3402)	(A5) CI3
	(A6) P-3
	(B6) A3+
	(C5) GND
	(C6) SH3
O2 NO.2 SHELL TRANSFER (OFIC3402)	(A7) CI4
	(A8) P-4
	(B8) A4+
	(C7) GND
	(C8) SH4
O2 NO.2 SHELL TRANSFER VALVE FV340A POSITION (OFV3401)	(A9) CI5
	(A10) P-5
	(B10) A5+
	(C9) GND
	(C10) SH5
O2 NO.2 COLD END AIR FLOW (OFR1201)	(A11) CI6
	(A12) P-6
	(B12) A6+
	(C11) GND
	(C12) SH6
	(A13) CI7
	(A14) P-7
	(B14) A7+
	(C13) GND
	(C14) SH7
	(A15) CI8
	(A16) P-8
	(B16) A8+
SPARE	(C15) GND
	(C16) SH8
SPARE	(A17,B17) PS+
	(A18) PS-
	(C17,C18) GND

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
No. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. DI DONATO
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
ANALOG INPUT MODULE SCHEMATIC DEMOLITION

SCALE NONE
DATE 28JUN24

SD428-W4400-E501-520D
DRAWING NUMBER

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REF 3:
REF 4: 15-65.dgn
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ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 3, MODULE 5

- (A1) CI1 — O2 NO. 1 OXYGEN PRODUCTION (O2IC6002)
- (A2) P-1
- (B2) A1+
- (C1) GND
- (C2) SH1
- (A3) CI2 — O2 NO. 1 FV6002 / FV6003 POSITION (O2FV6001)
- (A4) P-2
- (B4) A2+
- (C3) GND
- (C4) SH2
- (A5) CI3 — O2 NO. 1 OXYGEN PRODUCT PURITY (O2AI3551)
- (A6) P-3
- (B6) A3+
- (C5) GND
- (C6) SH3
- (A7) CI4 — O2 NO. 1 OXYGEN PRODUCT PURITY FV6003 OPEN (O2AI3552)
- (A8) P-4
- (B8) A4+
- (C7) GND
- (C8) SH4
- (A9) CI5 — SPARE
- (A10) P-5
- (B10) A5+
- (C9) GND
- (C10) SH5
- (A11) CI6 — O2 NO. 1 NITROGEN PURITY (O2AR3121)
- (A12) P-6
- (B12) A6+
- (C11) GND
- (C12) SH6
- (A13) CI7 — SPARE
- (A14) P-7
- (B14) A7+
- (C13) GND
- (C14) SH7
- (A15) CI8 — SPARE
- (A16) P-8
- (B16) A8+
- (C15) GND
- (C16) SH8
- (A17,B17) PS+
- (A18) PS-
- (C17,C18) GND

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 3, MODULE 6

- (A1) CI1 — O2 NO. 1 LIQUID MAKE-UV3508 (O2AI3501)
- (A2) P-1
- (B2) A1+
- (C1) GND
- (C2) SH1
- (A3) CI2 — O2 NO. 1 LIQUID ADD-UV3512 (O2AI3511)
- (A4) P-2
- (B4) A2+
- (C3) GND
- (C4) SH2
- (A5) CI3 — SPARE
- (A6) P-3
- (B6) A3+
- (C5) GND
- (C6) SH3
- (A7) CI4 — O2 NO. 1 DRIER PRESSURE (O2IC6350)
- (A8) P-4
- (B8) A4+
- (C7) GND
- (C8) SH4
- (A9) CI5 — O2 NO. 1 DRIER PRESSURE CONTROL SIGNAL (O2FV6354)
- (A10) P-5
- (B10) A5+
- (C9) GND
- (C10) SH5
- (A11) CI6 — SPARE
- (A12) P-6
- (B12) A6+
- (C11) GND
- (C12) SH6
- (A13) CI7 — SPARE
- (A14) P-7
- (B14) A7+
- (C13) GND
- (C14) SH7
- (A15) CI8 — SPARE
- (A16) P-8
- (B16) A8+
- (C15) GND
- (C16) SH8
- (A17,B17) PS+
- (A18) PS-
- (C17,C18) GND

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
No. CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

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SD428 - MWWTP OXYGEN PLANT REHABILITATION

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DESIGN BY:	R. SPEYRER
DRAWN BY:	R. DI DONATO
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
ANALOG INPUT MODULE SCHEMATIC DEMOLITION

SCALE	NONE	SD428-W4400-E501-521D	0
DATE	28JUN24	DRAWING NUMBER	REV.

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REF 3:
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ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 4, MODULE 1

- (C17,C18) GND
- (A18) PS-
- (A17,B17) PS+
- (C16) SH8
- (C15) GND
- (B16) A8+
- (A16) P-8
- (A15) CI8
- (C14) SH7
- (C13) GND
- (B14) A7+
- (A14) P-7
- (A13) CI7
- (C12) SH6
- (C11) GND
- (B12) A6+
- (A12) P-6
- (A11) CI6
- (C10) SH5
- (C9) GND
- (B10) A5+
- (A10) P-5
- (A9) CI5
- (C8) SH4
- (C7) GND
- (B8) A4+
- (A8) P-4
- (A7) CI4
- (C6) SH3
- (C5) GND
- (B6) A3+
- (A6) P-3
- (A5) CI3
- (C4) SH2
- (C3) GND
- (B4) A2+
- (A4) P-2
- (A3) CI2
- (C2) SH1
- (C1) GND
- (B2) A1+
- (A2) P-1
- (A1) CI1

SPARE

SPARE

SPARE

SPARE

SPARE

O2 NO.2 LIQUID ADD
LV351
(0M23512)

O2 NO.2 LIQUID MAKE
LV350
(0M23502)

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 4, MODULE 2

- (C17,C18) GND
- (A18) PS-
- (A17,B17) PS+
- (C16) SH8
- (C15) GND
- (B16) A8+
- (A16) P-8
- (A15) CI8
- (C14) SH7
- (C13) GND
- (B14) A7+
- (A14) P-7
- (A13) CI7
- (C12) SH6
- (C11) GND
- (B12) A6+
- (A12) P-6
- (A11) CI6
- (C10) SH5
- (C9) GND
- (B10) A5+
- (A10) P-5
- (A9) CI5
- (C8) SH4
- (C7) GND
- (B8) A4+
- (A8) P-4
- (A7) CI4
- (C6) SH3
- (C5) GND
- (B6) A3+
- (A6) P-3
- (A5) CI3
- (C4) SH2
- (C3) GND
- (B4) A2+
- (A4) P-2
- (A3) CI2
- (C2) SH1
- (C1) GND
- (B2) A1+
- (A2) P-1
- (A1) CI1

SPARE

SPARE

O2 NO.2 NITROGEN
PURITY
(0M23122)

SPARE

O2 NO.2 OXYGEN
PRODUCTION PURITY
FV6000 OPEN
(0M13558)

O2 NO.2 OXYGEN
PRODUCTION PURITY
(0M23552)

O2 NO.2 FV6002 /
FV6003
(0M26002)

O2 NO.2 OXYGEN
PRODUCTION
(0M26003)

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
No. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

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SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. DI DONATO
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
ANALOG INPUT MODULE SCHEMATIC DEMOLITION

SCALE NONE
DATE 28JUN24

SD428-W4400-E501-522D
DRAWING NUMBER

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ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 4, MODULE 3

- (C17,C18) GND
- (A18) PS-
- (A17,B17) PS+
- (C16) SH8
- (C15) GND
- (B16) A8+
- (A16) P-8
- (A15) CI8
- (C14) SH7
- (C13) GND
- (B14) A7+
- (A14) P-7
- (A13) CI7
- (C12) SH6
- (C11) GND
- (B12) A6+
- (A12) P-6
- (A11) CI6
- (C10) SH5
- (C9) GND
- (B10) A5+
- (A10) P-5
- (A9) CI5
- (C8) SH4
- (C7) GND
- (B8) A4+
- (A8) P-4
- (A7) CI4
- (C6) SH3
- (C5) GND
- (B6) A3+
- (A6) P-3
- (A5) CI3
- (C4) SH2
- (C3) GND
- (B4) A2+
- (A4) P-2
- (A3) CI2
- (C2) SH1
- (C1) GND
- (B2) A1+
- (A2) P-1
- (A1) CI1

SPARE

SPARE

OZ NO.2 COLD END AIR FLOW (OEC3202)

OZ NO.2 SHELF TRANSFER FV330A (OEC3402)

OZ NO.2 SHELF TRANSFER (OEC3403)

OZ NO.2 COLD END AIR SHELF TRANSFER RATIO (OEC3403)

OZ NO.2 MAIN CONDENSER LEVEL (OEC3522)

OZ NO.2 KETTLE LEVEL VALVE FV330A (OEC330A)

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 4, MODULE 4

- (C17,C18) GND
- (A18) PS-
- (A17,B17) PS+
- (C16) SH8
- (C15) GND
- (B16) A8+
- (A16) P-8
- (A15) CI8
- (C14) SH7
- (C13) GND
- (B14) A7+
- (A14) P-7
- (A13) CI7
- (C12) SH6
- (C11) GND
- (B12) A6+
- (A12) P-6
- (A11) CI6
- (C10) SH5
- (C9) GND
- (B10) A5+
- (A10) P-5
- (A9) CI5
- (C8) SH4
- (C7) GND
- (B8) A4+
- (A8) P-4
- (A7) CI4
- (C6) SH3
- (C5) GND
- (B6) A3+
- (A6) P-3
- (A5) CI3
- (C4) SH2
- (C3) GND
- (B4) A2+
- (A4) P-2
- (A3) CI2
- (C2) SH1
- (C1) GND
- (B2) A1+
- (A2) P-1
- (A1) CI1

SPARE

SPARE

OZ NO.2 KETTLE LEVEL IN W.C. (OEC330)

OZ NO.2 TURBINE INLET VALVE FV220A POSITION (OEC2212)

OZ NO.2 UNBALANCED AIR FLOW VALVE POSITION (OEC1152)

OZ NO.2 UNBALANCED AIR FLOW FV213 / 215 (OEC2132)

OZ NO.2 COLD AIR / UNBALANCED AIR RATIO (OEC1203)

OZ NO.2 COMPRESSOR AIR DISCHARGE PRESSURE (OEC5062)

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CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
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SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

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DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
ANALOG INPUT MODULE SCHEMATIC DEMOLITION

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PLOT SCALE: 0.166667:1

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 4, MODULE 5

(C17,C18) GND
(A18) PS-
(A17,B17) PS+
(C16) SH8
(C15) GND
(B16) A8+
(A16) P-8
(A15) CI8
(C14) SH7
(C13) GND
(B14) A7+
(A14) P-7
(A13) CI7
(C12) SH6
(C11) GND
(B12) A6+
(A12) P-6
(A11) CI6
(C10) SH5
(C9) GND
(B10) A5+
(A10) P-5
(A9) CI5
(C8) SH4
(C7) GND
(B8) A4+
(A8) P-4
(A7) CI4
(C6) SH3
(C5) GND
(B6) A3+
(A6) P-3
(A5) CI3
(C4) SH2
(C3) GND
(B4) A2+
(A4) P-2
(A3) CI2
(C2) SH1
(C1) GND
(B2) A1+
(A2) P-1
(A1) CI1

SPARE

SPARE

02 NO.2 COMPRESSOR 3
AIR DISCHARGE PRESSURE
(ORI30612)

02 NO.2 COMPRESSOR 3
VENT VALVE POSITION
(ORI30722)

02 NO.2 COMPRESSOR 2
INLET GUIDE VANES
POSITION
(ORI50122)

02 NO.2 COMPRESSOR 1
VENT VALVE POSITION
(ORI30712)

02 NO.2 COMPRESSOR 1
INLET GUIDE VANES
POSITION
(ORI50112)

02 NO.1 TURBINE
SPEED
(ORI21921)

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 4, MODULE 6

(C17,C18) GND
(A18) PS-
(A17,B17) PS+
(C16) SH8
(C15) GND
(B16) A8+
(A16) P-8
(A15) CI8
(C14) SH7
(C13) GND
(B14) A7+
(A14) P-7
(A13) CI7
(C12) SH6
(C11) GND
(B12) A6+
(A12) P-6
(A11) CI6
(C10) SH5
(C9) GND
(B10) A5+
(A10) P-5
(A9) CI5
(C8) SH4
(C7) GND
(B8) A4+
(A8) P-4
(A7) CI4
(C6) SH3
(C5) GND
(B6) A3+
(A6) P-3
(A5) CI3
(C4) SH2
(C3) GND
(B4) A2+
(A4) P-2
(A3) CI2
(C2) SH1
(C1) GND
(B2) A1+
(A2) P-1
(A1) CI1

SPARE

SPARE

02 NO.2 COLD END
DELTA TEMPERATURE
(ORI31867)

02 NO.2 UPPER
COLUMN PRESSURE
(ORI34921)

02 NO.2 MAIN
CONDENSER PRESSURE
(ORI35221)

02 NO.2 LOWER
COLUMN PRESSURE
(ORI30021)

02 NO.2 TURBINE
OUTLET PRESSURE
(ORI21621)

02 NO.2 TURBINE
INLET PRESSURE
(ORI21421)

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
No. CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. DI DONATO
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
ANALOG INPUT MODULE SCHEMATIC DEMOLITION

SCALE NONE
DATE 28JUN24
SD428-W4400-E501-524D
DRAWING NUMBER
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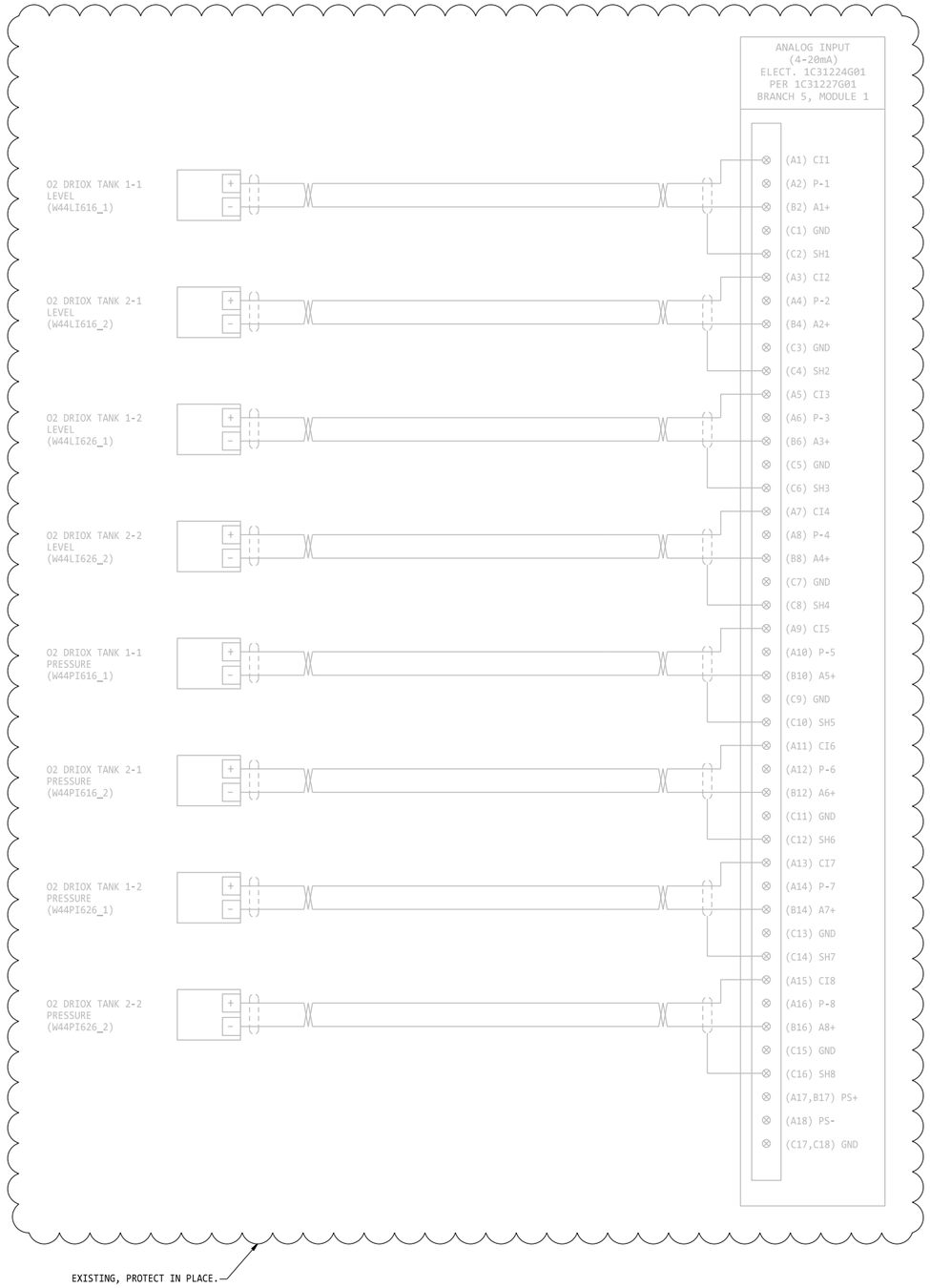
REV.



SPARE

SPARE

SPARE

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SOLUTIONWERKS™ INCORPORATED

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CONSULTANT

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APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
ANALOG INPUT MODULE SCHEMATIC

SCALE	NONE	SD428-W4400-E501-525	0
DATE	28JUN24	DRAWING NUMBER	REV.

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REF 3:

DIGITAL INPUT (24VDC) ELECT 1C31232G02 PER 5X00034G01 BRANCH 5, MODULE 3

O2 NO.1 COMPRESSOR 1 SHUTDOWN (XXA501A1)	(A1) 1+
	(B1) 1-
O2 NO.1 COMPRESSOR 2 SHUTDOWN (XXA501A1)	(A2) 2+
	(B2) 2-
O2 NO.1 TURBINE SHUTDOWN (XXA219A1)	(A3) 3+
	(B3) 3-
O2 NO.1 THRM FAILURE (XXA101A1)	(A4) 4+
	(B4) 4-
O2 NO.1 DRIER TANK 1 HIGH/LOW LEVEL (XXA639A1)	(A5) 5+
	(B5) 5-
O2 NO.1 DRIER GAS LOW TEMPERATURE (XTAL623A1)	(A6) 6+
	(B6) 6-
O2 NO.1 VAPORIZER WATER TEMPERATURE ALARM (XXA101A1)	(A7) 7+
	(B7) 7-
EXISTING, PROTECT IN PLACE	
O2 LIQUID FILL STATION ALARM (W44LOX_NA01)	(A8) 8+
	(B8) 8-
O2 NO.1 OXYGEN LOW PURITY (XXA355A1)	(A9) 9+
	(B9) 9-
O2 NO.1 BACKUP INSTRUMENT AIR LOW PRESSURE (XXA101A1)	(A10) 10+
	(B10) 10-
O2 NO.1 DRIER TANK 2 HIGH/LOW LEVEL (XXA639A1)	(A11) 11+
	(B11) 11-
O2 NO.1 DRIER BACKUP TANK LOW PRESSURE (XXA639B-PLT1)	(A12) 12+
	(B12) 12-
O2 NO.1 INSTRUMENT AIR PACKAGE HIGH MOISTURE (XXA101A1)	(A13) 13+
	(B13) 13-
O2 NO.1 SURGE TANK HIGH LEVEL (XXA101A1)	(A14) 14+
	(B14) 14-
SPARE	(A15) 15+
	(B15) 15-
SPARE	(A16) 16+
	(B16) 16-
	(A17,B17) PS+
	(A18) PS-
	(C17,C18) GND
	(C1-C16) RSV

DIGITAL INPUT (24VDC) ELECT 1C31232G02 PER 5X00034G01 BRANCH 5, MODULE 4

O2 NO.1 LIQUID MAKE VALVE OPEN (OPL350B1)	(A1) 1+
	(B1) 1-
O2 NO.1 LIQUID ADD VALVE OPEN (OPL351B1)	(A2) 2+
	(B2) 2-
O2 NO.1 AIR COMPRESSOR 1 SHUTDOWN BYPASS (OPL101A1)	(A3) 3+
	(B3) 3-
O2 NO.1 AIR COMPRESSOR 2 SHUTDOWN BYPASS (OPL101B1)	(A4) 4+
	(B4) 4-
SPARE	(A5) 5+
	(B5) 5-
SPARE	(A6) 6+
	(B6) 6-
O2 NO.1 NITROGEN BYPASS PL111 (OPL114N1)	(A7) 7+
	(B7) 7-
O2 NO.1 AIR BYPASS PL111 (OPL111A1)	(A8) 8+
	(B8) 8-
O2 NO.1 AIR BYPASS PL111 (OPL112A1)	(A9) 9+
	(B9) 9-
O2 NO.1 NITROGEN BYPASS PL111 (OPL113N1)	(A10) 10+
	(B10) 10-
SPARE	(A11) 11+
	(B11) 11-
SPARE	(A12) 12+
	(B12) 12-
SPARE	(A13) 13+
	(B13) 13-
SPARE	(A14) 14+
	(B14) 14-
SPARE	(A15) 15+
	(B15) 15-
SPARE	(A16) 16+
	(B16) 16-
	(A17,B17) PS+
	(A18) PS-
	(C17,C18) GND
	(C1-C16) RSV

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
No. CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. DI DONATO
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

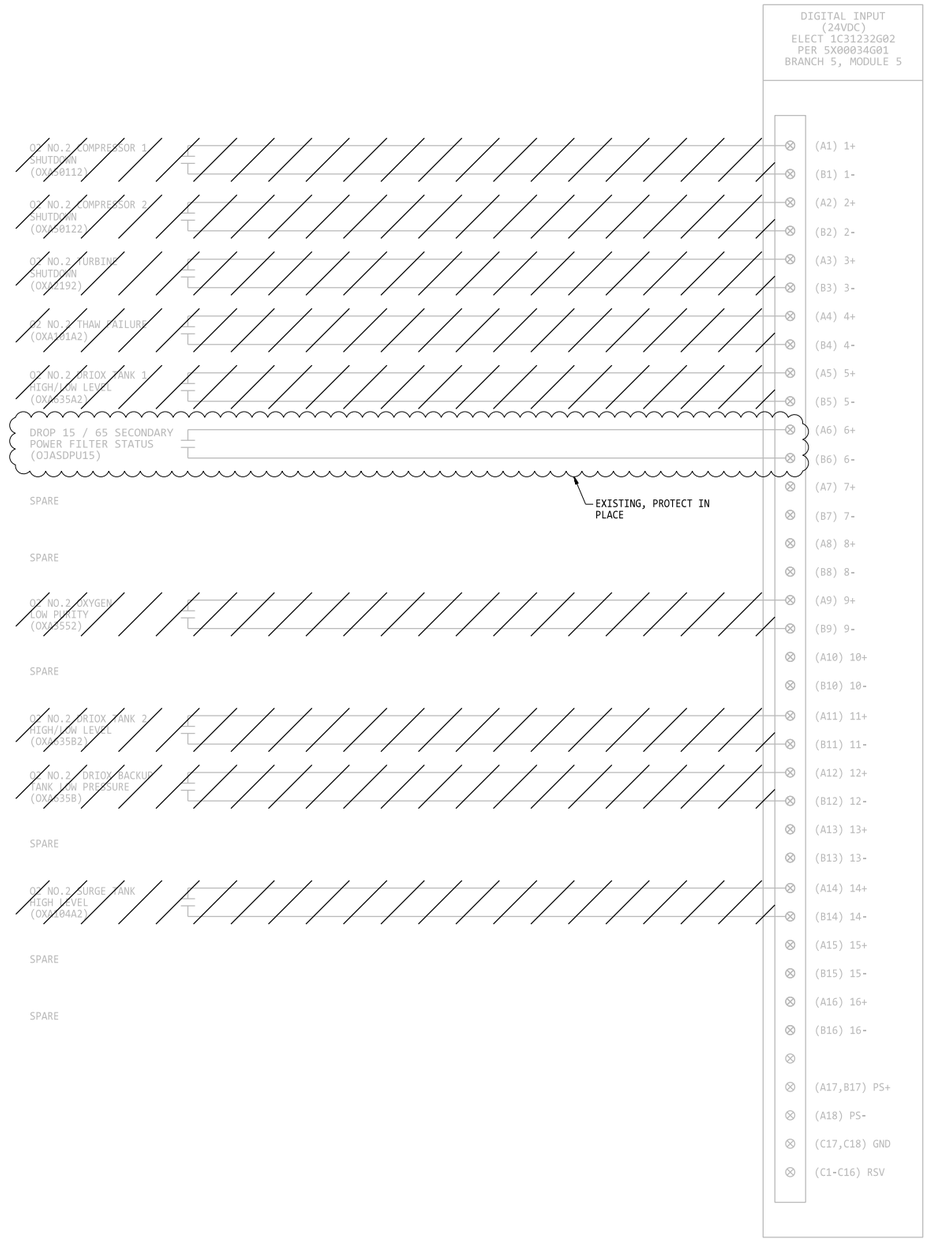
SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
DIGITAL INPUT MODULE SCHEMATIC DEMOLITION

SCALE NONE	SD428-W4400-E501-526D	0
DATE 28JUN24	DRAWING NUMBER	REV.



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SOLUTIONWERKS™ INCORPORATED

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
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MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 15/65
DIGITAL INPUT MODULE SCHEMATIC DEMOLITION

SCALE NONE
DATE 28JUN24

SD428-W4400-E501-527D
DRAWING NUMBER

0
REV.

DIGITAL OUTPUT
(24VDC)
ELECT. 1C31219G01
PER 3A99238G
BRANCH 6, MODULE 1

R12 C NO NC
R11 C NO NC
R10 C NO NC
R9 C NO NC
R8 C NO NC
R7 C NO NC
R6 C NO NC
R5 C NO NC
R4 C NO NC
R3 C NO NC
R2 C NO NC
R1 C NO NC

SPARE
SPARE
SPARE
SPARE
SPARE
SPARE
SPARE
SPARE
SPARE
SPARE
SPARE
SPARE

EXISTING, PROTECT IN PLACE

O2 PLANT OUTSIDE BELL
(OO2ALRM)

O2 NO.2 REMOTE PANEL
ALARM RESET
(OXL12A1)

DIGITAL OUTPUT
(24VDC)
ELECT. 1C31219G01
PER 3A99238G
BRANCH 6, MODULE 2

R12 C NO NC
R11 C NO NC
R10 C NO NC
R9 C NO NC
R8 C NO NC
R7 C NO NC
R6 C NO NC
R5 C NO NC
R4 C NO NC
R3 C NO NC
R2 C NO NC
R1 C NO NC

SPARE
SPARE
SPARE
SPARE
SPARE
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SPARE
SPARE
SPARE
SPARE
SPARE
SPARE

O2 TURBINE 1 OUTLET
LOW TEMPERATURE SHUTDOWN
(O_TURB1_TEMP_SD)

O2 TURBINE 2 OUTLET
LOW TEMPERATURE SHUTDOWN
(O_TURB2_TEMP_SD)

CALL TO CLOSE
COND BOX 2 VENT
(OVENT1X2)

CALL TO CLOSE
COND BOX 1 VENT
(OVENT1X1)

O2 NO.1 REMOTE PANEL
ALARM RESET
(OXL12A1)

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SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

DCS DROP 15/65

DIGITAL OUTPUT MODULE SCHEMATIC DEMOLITION

SCALE NONE
DATE 28JUN24

SD428-W4400-E501-528D
DRAWING NUMBER

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REF 3:
REF 4:
REF 5:
REF 6:
REF 7:
REF 8:
REF 9:

DIGITAL INPUT
(24VDC)
ELECT 1C31232G02
PER 5X00034G01
BRANCH 6, MODULE 3

- (C1-C16) RSV
- (C17,C18) GND
- (A18) PS-
- (A17,B17) PS+
- (B16) 16-
- (A16) 16+
- (B15) 15-
- (A15) 15+
- (B14) 14-
- (A14) 14+
- (B13) 13-
- (A13) 13+
- (B12) 12-
- (A12) 12+
- (B11) 11-
- (A11) 11+
- (B10) 10-
- (A10) 10+
- (B9) 9-
- (A9) 9+
- (B8) 8-
- (A8) 8+
- (B7) 7-
- (A7) 7+
- (B6) 6-
- (A6) 6+
- (B5) 5-
- (A5) 5+
- (B4) 4-
- (A4) 4+
- (B3) 3-
- (A3) 3+
- (B2) 2-
- (A2) 2+
- (B1) 1-
- (A1) 1+

SPARE
SPARE
SPARE

USER: robert
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REF 7:
REF 8:
REF 9:

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 6, MODULE 5

- (C17,C18) GND
- (A18) PS-
- (A17,B17) PS+
- (C16) SH8
- (C15) GND
- (B16) A8+
- (A16) P-8
- (A15) CI8
- (C14) SH7
- (C13) GND
- (B14) A7+
- (A14) P-7
- (A13) CI7
- (C12) SH6
- (C11) GND
- (B12) A6+
- (A12) P-6
- (A11) CI6
- (C10) SH5
- (C9) GND
- (B10) A5+
- (A10) P-5
- (A9) CI5
- (C8) SH4
- (C7) GND
- (B8) A4+
- (A8) P-4
- (A7) CI4
- (C6) SH3
- (C5) GND
- (B6) A3+
- (A6) P-3
- (A5) CI3
- (C4) SH2
- (C3) GND
- (B4) A2+
- (A4) P-2
- (A3) CI2
- (C2) SH1
- (C1) GND
- (B2) A1+
- (A2) P-1
- (A1) CI1

SPARE
SPARE
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SPARE
SPARE

ANALOG INPUT
(4-20mA)
ELECT. 1C31224G01
PER 1C31227G01
BRANCH 6, MODULE 6

- (C17,C18) GND
- (A18) PS-
- (A17,B17) PS+
- (C16) SH8
- (C15) GND
- (B16) A8+
- (A16) P-8
- (A15) CI8
- (C14) SH7
- (C13) GND
- (B14) A7+
- (A14) P-7
- (A13) CI7
- (C12) SH6
- (C11) GND
- (B12) A6+
- (A12) P-6
- (A11) CI6
- (C10) SH5
- (C9) GND
- (B10) A5+
- (A10) P-5
- (A9) CI5
- (C8) SH4
- (C7) GND
- (B8) A4+
- (A8) P-4
- (A7) CI4
- (C6) SH3
- (C5) GND
- (B6) A3+
- (A6) P-3
- (A5) CI3
- (C4) SH2
- (C3) GND
- (B4) A2+
- (A4) P-2
- (A3) CI2
- (C2) SH1
- (C1) GND
- (B2) A1+
- (A2) P-1
- (A1) CI1

SPARE
SPARE
SPARE
SPARE
SPARE

CS. NO. 2 HYDROCARBON ANALYZER CONCENTRATION (ORI 73522)

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

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SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. DI DONATO
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
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EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

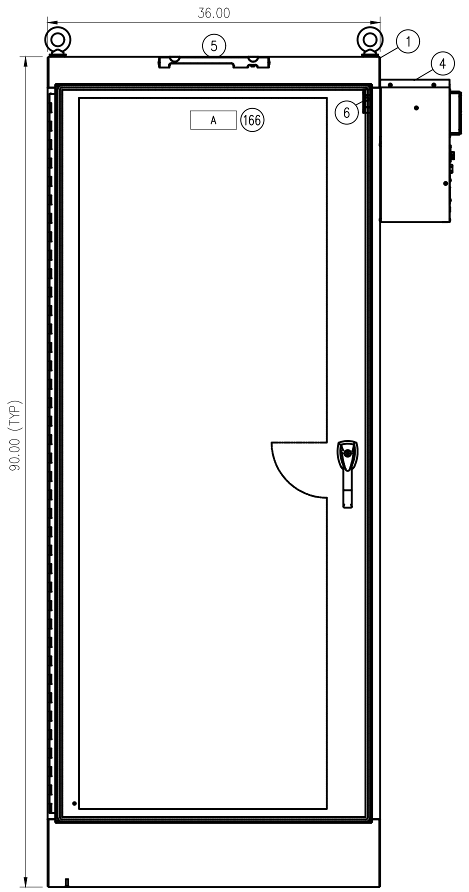
DCS DROP 15/65

ANALOG INPUT MODULE SCHEMATIC DEMOLITION

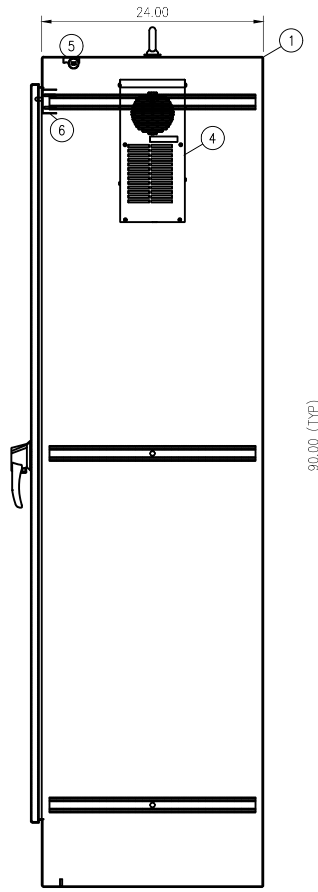
SCALE NONE
DATE 28JUN24

SD428-W4400-E501-530D
DRAWING NUMBER

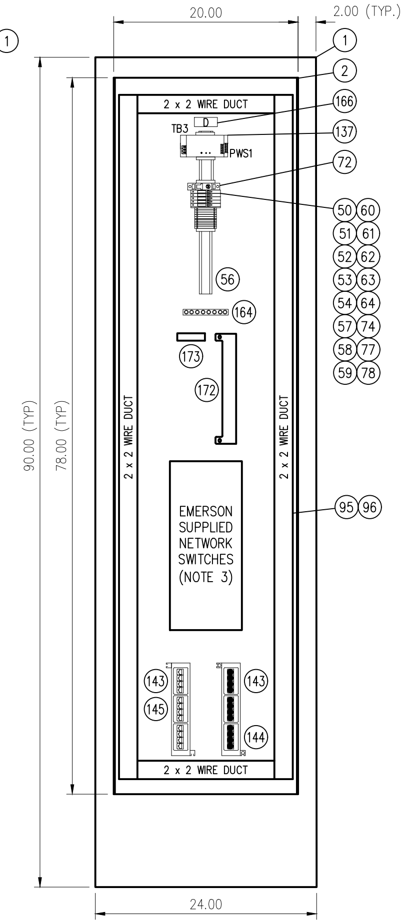
Ø
REV.



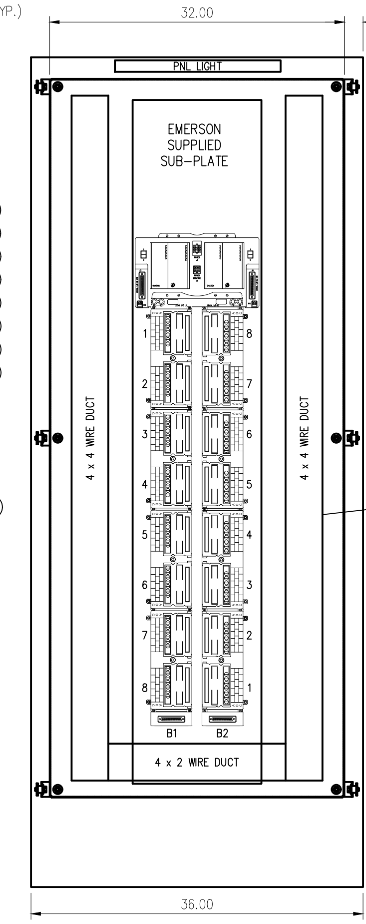
ENCLOSURE EXTERIOR FRONT VIEW
(NOTES 1 & 2)



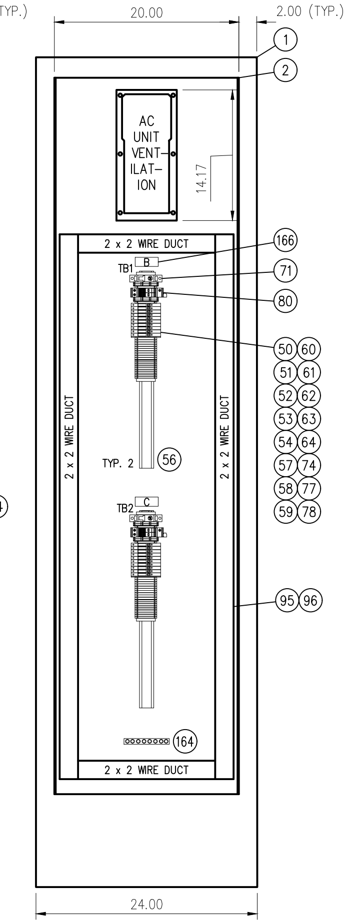
ENCLOSURE EXTERIOR SIDE VIEW
(NOTES 1 & 2)



LEFT PANEL
(NOTE 3)



BACK PLATE
(NOTE 3)



RIGHT PANEL

NOTES:

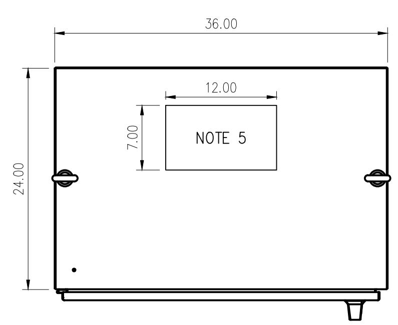
1. ENCLOSURE SHALL SIT ON A 4" HEIGHT HOUSEKEEPING PAD.
2. ENCLOSURE SHALL BE PAINTED STEEL, TYPE NEMA 12, AND HAVE PROVISION FOR PADLOCK.
3. SUBPLATE AND NETWORK SWITCHES SHALL BE SUPPLIED BY EMERSON AND INSTALLED BY THE CONTRACTOR AFTER COMPLETION OF PANEL. CONTRACTOR SHALL COORDINATE WITH EMERSON FOR RECEIVING THE EQUIPMENT AND INSTALLATION SEQUENCE AND SCHEDULE. EMERSON SHALL SUPPLY ETHERNET AND FIBER PATCH CORDS. CONTRACTOR SHALL PROVIDE AND INSTALL POWER CONNECTIONS TO EMERSON EQUIPMENT AS DIRECTED BY EMERSON.
4. NAMEPLATE SHALL BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375
5. AREA RESERVED FOR CONDUIT ENTRY.
6. ENCLOSURE LIGHT AND INTRUSION SWITCH SHALL BE MOUNTED WITH STAINLESS STEEL SCREWS, NUTS AND NEOPRENE BONDED SEALING WASHERS TO MAINTAIN THE NEMA 4X RATING OF ENCLOSURE. (SEALING WASHER MANUFACTURER & ITEM NUMBER: THE HILLMAN GROUP #290250 OR EQUAL)

NAMEPLATE SCHEDULE (NOTE 4)

ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 2"	DROP 23/73 PANEL	NOTE 4
B	2.5" x 1"	TB1	NOTE 4
C	2.5" x 1"	TB2	NOTE 4
D	2.5" x 1"	TB3	NOTE 4

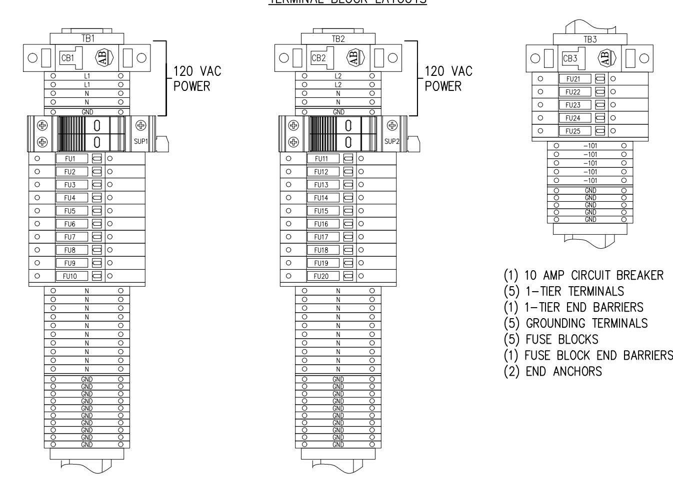
BILL OF MATERIALS

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
				****ENCLOSURE & RELATED EQUIPMENT****	
1	1	HAMMOND MANUFACTURING	1418YY24	ENCLOSURE, NEMA 12, 90.00" x 36.00" x 24.00", PAINTED STEEL	ENCLOSURE
2	1	HAMMOND MANUFACTURING	90YFW	INTERNAL PANEL, 78" X 32"	BACK PANEL
3	2	SAGINAW CONTROL	SCE-90SMP20	SIDE PANEL, 78" X 20"	SIDE PANELS
4	1	HAMMOND MANUFACTURING	DTS3021A115LG	AC UNIT 900-1300 BTU/HR - 115V - NEMA 12	AC UNIT
5	1	HOFFMAN	LEDA1S35	ENCLOSURE LIGHT	LT-01
6	1	HOFFMAN	ALFSWD	ENCLOSURE DOOR SWITCH	SW-01
				****TERMINAL BLOCKS & RELATED EQUIPMENT****	
50	33	ALLEN BRADLEY	1492-J4	TERMINAL BLOCK 1 TIER	TB1, TB2, TB3
51	5	ALLEN BRADLEY	1492-EBJ3	TERMINAL BLOCK END BARRIER, 1 TIER	TB1, TB2, TB3
52	8	ALLEN BRADLEY	1492-EAJ35	TERMINAL BLOCK END ANCHOR	TB1, TB2, TB3
53	2	ALLEN BRADLEY	1492-CJJ5-10	TERMINAL BLOCK JUMPER, 10 POLE	TB1, TB2
54	27	ALLEN BRADLEY	1492-JG3	TERMINAL BLOCK, GROUNDING	TB1, TB2
56	3	ALLEN BRADLEY	1492-DR6	DIN RAIL, RAISED	TB1, TB2, TB3, TB4
57	20	ALLEN BRADLEY	1492-H4	FUSED TERMINAL BLOCK, NEON INDICATOR	FU1-FU20
58	5	ALLEN BRADLEY	1492-H5	FUSED TERMINAL BLOCK, LED INDICATOR	FU21-25
59	3	ALLEN BRADLEY	1492-N37	FUSED TERMINAL BLOCK END BARRIER	FU10, FU20, FU25
60	3	ALLEN BRADLEY	1492-N49	FUSE BLOCK SIDE JUMPERS 10 POLE	FU1-FU10, FU11-20, FU21-FU25
61	3	ALLEN BRADLEY	1492-SJS	FUSE BLOCK SIDE JUMPER INSULATING SLEEVE	FU1-FU10, FU11-20, FU21-FU25
62	1	ALLEN BRADLEY	1492-M5X12	GROUNDING TERMINAL BLOCK BLANK MARKING TAGS, 144 CT.	TB1, TB2, TB3
63	2	ALLEN BRADLEY	1492-M5X8	TERMINAL BLOCK BLANK MARKING TAGS, 2 TIER, 144 CT.	TB1, TB2, TB3
64	1	ALLEN BRADLEY	1492-MS8X12	FUSE BLOCK BLANK MARKING TAGS, 100 CT.	FU1-FU25
71	3	ALLEN-BRADLEY	1489-M1D200	CIRCUIT BREAKER, 20AMP, SINGLE POLE	CB1, CB2, CB6
72	1	ALLEN-BRADLEY	1489-M1D100	CIRCUIT BREAKER, 10AMP, SINGLE POLE	CB3
74	30	BUSSMANN	AGC-1	FUSE, 1A, 250V, FAST ACTING	FU2-FU9, FU12-FU20, FU22-25 PLUS SPARES
77	2	BUSSMANN	AGC-10	FUSE, 10A, 250V FAST ACTING	FU10 PLUS SPARE
78	5	BUSSMANN	AGC-2	FUSE, 2A, 250V, FAST ACTING	FU1, FU11, FU21, PLUS SPARES
80	3	PHOENIX CONTACT	2905348	VAL-SEC-T2-1S-175-FM, 120VAC SURGE PROTECTOR	SUP1, SUP2, PLUS 1 SPARE
				****WIREDUCT****	
93	18FT	PANDUIT	F4X4LG6	WIRING DUCT, 4"W x 4"H	
94	18FT	PANDUIT	C4LG6	WIRING DUCT COVER, 4"W	
95	36FT	PANDUIT	F2X2LG6	WIRING DUCT, 2"W x 2"H	
96	36FT	PANDUIT	C2LG6	WIRING DUCT COVER, 2"W	
				****POWER SUPPLIES****	
137	1	PHOENIX CONTACT	2866763	POWER SUPPLY, 240/120VAC IN, 24VDC, 10 AMP	PWS1
				****COMMUNICATIONS****	
143	1	EMERSON	5X00133G05	MINI-COM PATCH PANEL - 12 PORTS	
144	1	EMERSON	1X00118H01	MINI-COM MODULE FOR FO-ST	
145	1	PANDUIT	CJ6C88YGIW	MINI-COM MODULE FOR TX6 10GIG UTP JACK	
				****MISCELLANEOUS PANEL EQUIPMENT****	
164	3	PANDUIT	UGB2/0-414-6	GROUND BAR	
166	4	PANEL FABRICATOR		NAMEPLATE, PHENOLIC, ENGRAVED	SEE SCHEDULE ON EQUIPMENT LAYOUT
172	1	EMERSON	2379C68G01	RTD ASSEMBLY	
173	1	PHOENIX CONTACT	2864587	TEMP XMIT MCR-FL-TS-LP-I-EX	



ENCLOSURE EXTERIOR TOP VIEW

TERMINAL BLOCK LAYOUTS



(1) 20 AMP CIRCUIT BREAKER
(1) 120 VAC SURGE PROTECTOR
(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS

(1) 20 AMP CIRCUIT BREAKER
(1) 120 VAC SURGE PROTECTOR
(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS

(1) 10 AMP CIRCUIT BREAKER
(5) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(5) GROUNDING TERMINALS
(5) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(2) END ANCHORS

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER KYLE EVAN TRACY CS. 7556 CONTROL SYSTEM STATE OF CALIFORNIA 06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	R. SPEYRER
	DRAWN BY:	R. SPEYRER
	DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
DCS DROP 23/73 PANEL
EQUIPMENT ELEVATION

SCALE NONE
DATE 28JUN24
SD428-W4400-E502 DRAWING NUMBER
0 REV.

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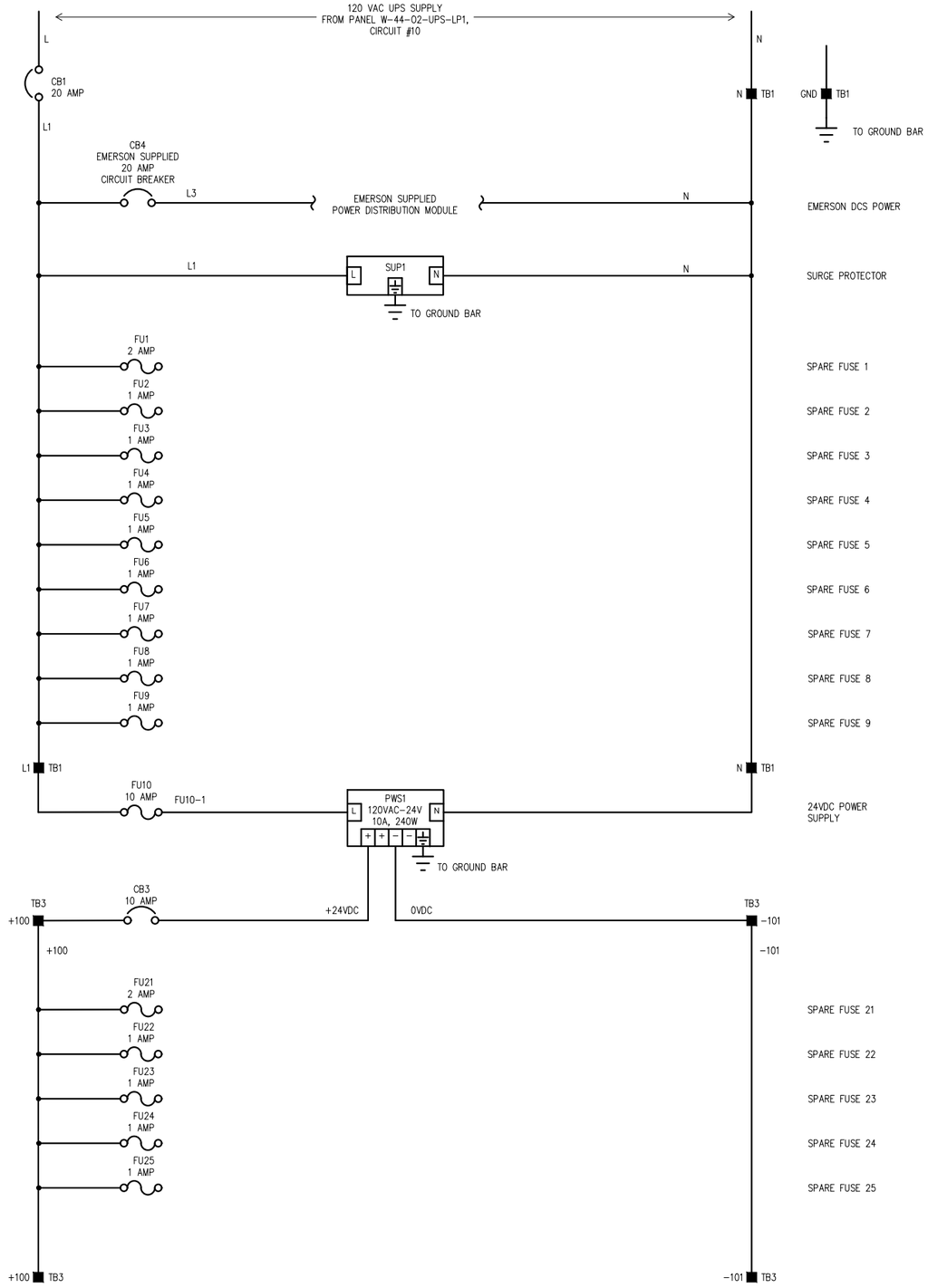

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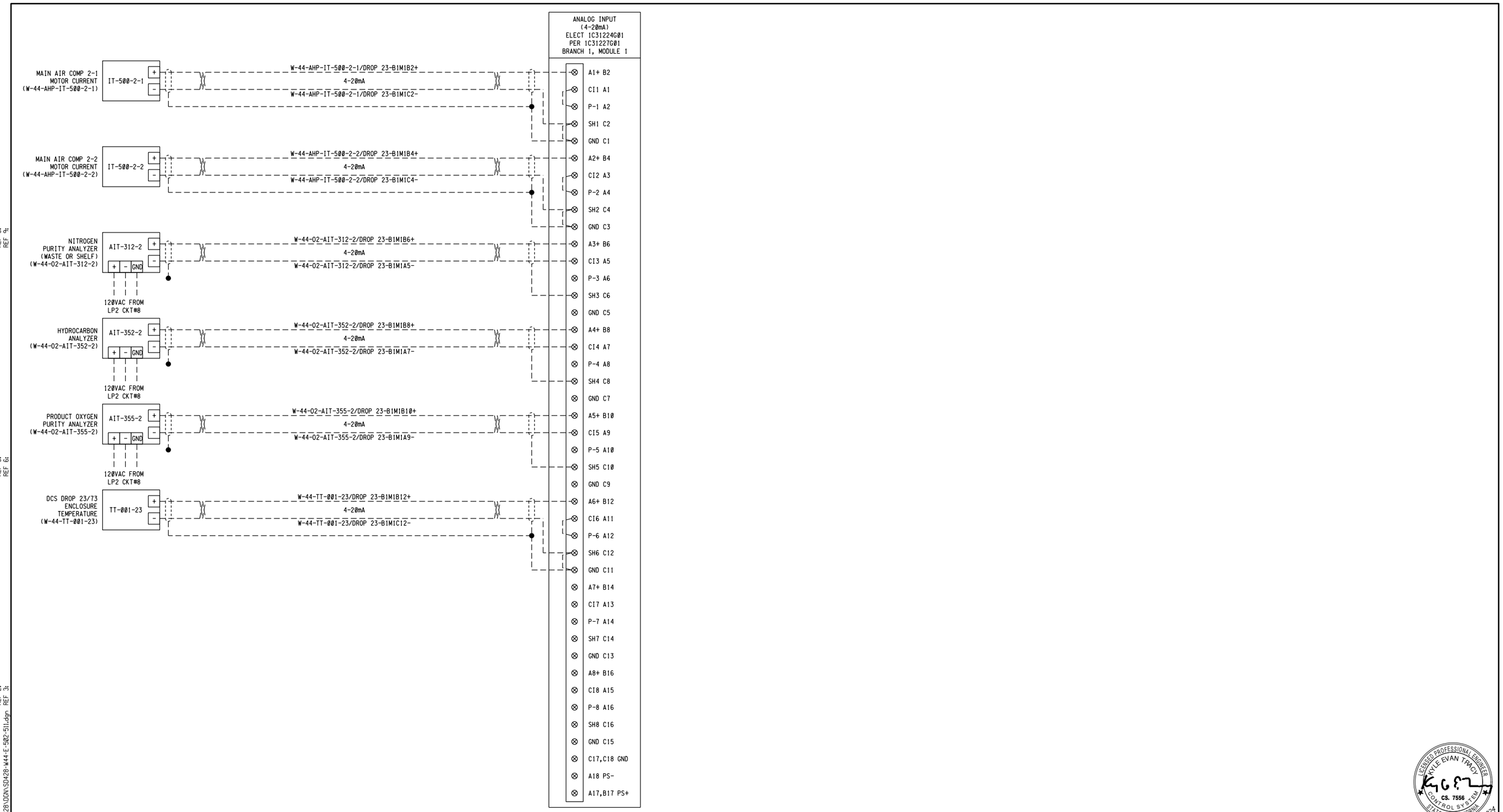

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SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 23/73
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E502-511
DRAWING NUMBER

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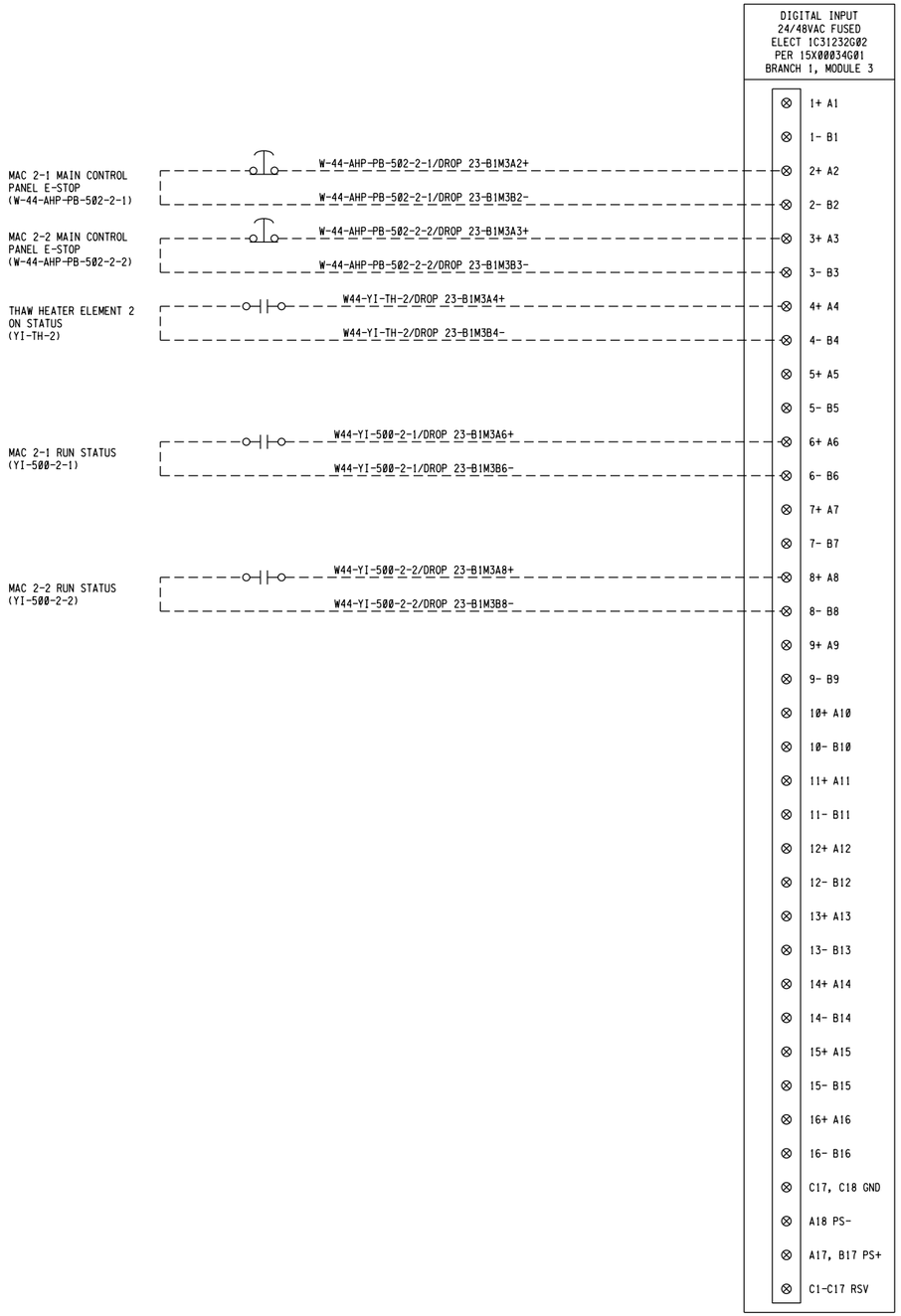

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
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PROJECT MANAGER R.P.E. NO. 95046	J. LAW
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 23/73
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E502-512
DRAWING NUMBER

0
REV.

RELAY OUTPUT
10A@250VAC/3A@150VDC
ELECT 5A26457G01
PER N/A
BRANCH 1, MODULE 5

TB1	NO	
	NC	
	C	W-44-YC-213-2/DROP 23-B1M5C-1 → T43
TB1	NO	W-44-YC-213-2/DROP 23-B1M5NO+1 → T44 PLANT 2 EXPANDER OIL PUMP RUN COMMAND (SEE DWG. SD-428-W4400-E318 FOR DETAILED INTERCONNECTION DIAGRAM)
	NC	
	C	
TB2	NO	
	NC	
	C	
TB3	NO	
	NC	
	C	
TB4	NO	
	NC	
	C	
TB5	NO	
	NC	
	C	
TB6	NO	
	NC	
	C	
TB7	NO	
	NC	
	C	
TB8	NO	
	NC	
	C	
TB9	NO	
	NC	
	C	
TB10	NO	
	NC	
	C	
TB11	NO	
	NC	
	C	
TB12	NO	
	NC	
	C	
C17, C18 GND		
A18 PS-		
A17, B17 PS+		
C1-C17 RSV		

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
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EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
DCS DROP 23/73
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E502-513
DRAWING NUMBER

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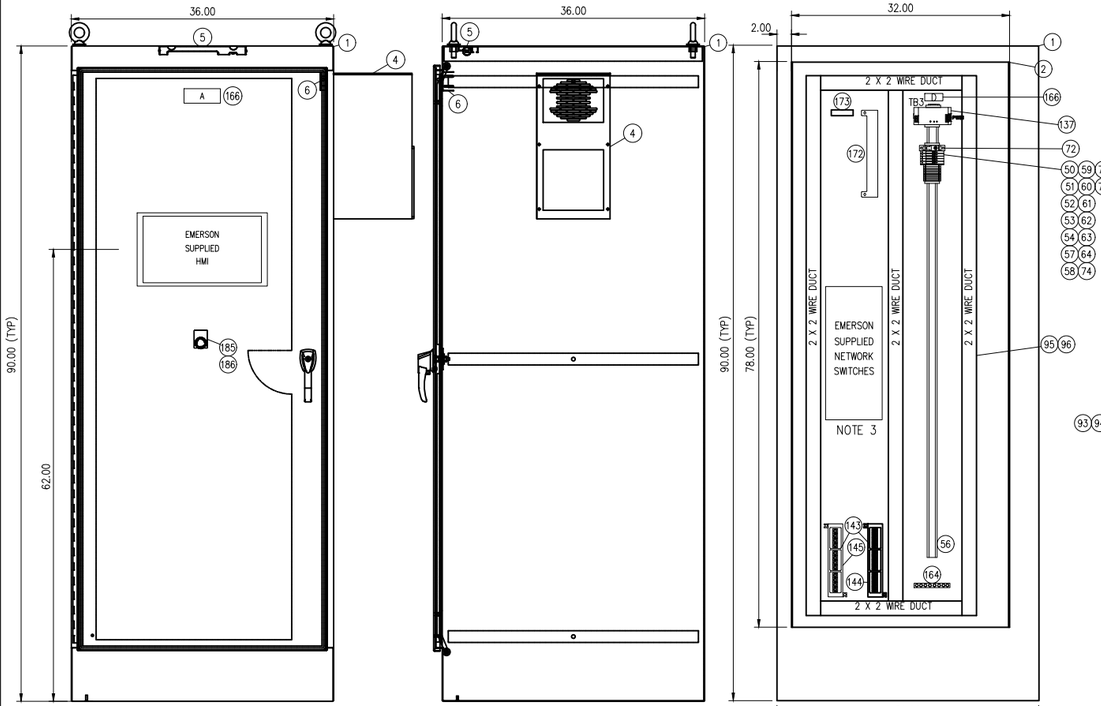
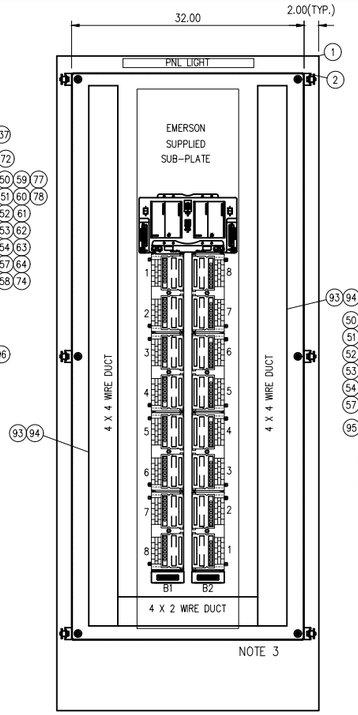
REV.



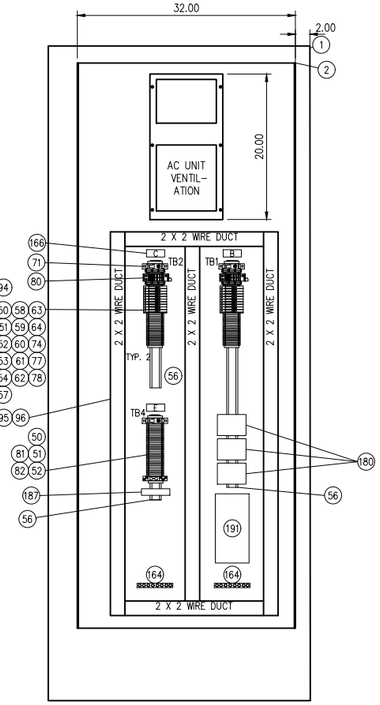
ENCLOSURE EXTERIOR FRONT VIEW
(NOTES 1 & 2)

ENCLOSURE EXTERIOR SIDE VIEW
(NOTES 1 & 2)

LEFT PANEL



BACK PLATE



RIGHT PANEL

NOTES:

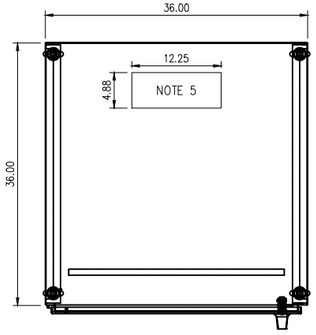
1. ENCLOSURE SHALL SIT ON A 4" HEIGHT HOUSEKEEPING PAD.
2. ENCLOSURE SHALL BE SS316, TYPE NEMA 4X, AND HAVE PROVISION FOR PADLOCK.
3. SUBPLATE, HMI, AND NETWORK SWITCHES SHALL BE SUPPLIED BY EMERSON AND INSTALLED BY THE CONTRACTOR AFTER COMPLETION OF PANEL. CONTRACTOR SHALL COORDINATE WITH EMERSON FOR RECEIVING THE EQUIPMENT AND INSTALLATION SEQUENCE AND SCHEDULE. EMERSON SHALL SUPPLY ETHERNET AND FIBER PATCH CORDS. CONTRACTOR SHALL PROVIDE AND INSTALL POWER CONNECTIONS TO EMERSON EQUIPMENT AS DIRECTED BY EMERSON.
4. NAMEPLATE SHALL BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375
5. AREA RESERVED FOR CONDUIT ENTRY.
6. ENCLOSURE LIGHT AND INTRUSION SWITCH SHALL BE MOUNTED WITH STAINLESS STEEL SCREWS, NUTS AND NEOPRENE BONDED SEALING WASHERS TO MAINTAIN THE NEMA 4X RATING OF ENCLOSURE. (SEALING WASHER MANUFACTURER & ITEM NUMBER: THE HILLMAN GROUP #290250 OR EQUAL)

NAMEPLATE SCHEDULE (NOTE 4)

ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 2"	RIO-15-1 MAC 1-1 PANEL	NOTE 4
B	2.5" x 1"	TB1	NOTE 4
C	2.5" x 1"	TB2	NOTE 4
D	2.5" x 1"	TB3	NOTE 4
E	2.5" x 1"	TB4	NOTE 4

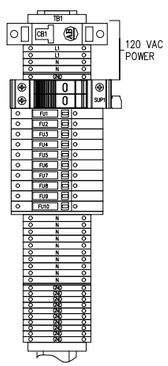
BILL OF MATERIALS

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
				ENCLOSURE & RELATED EQUIPMENT	
1	1	HAMMOND MANUFACTURING	HNMF090636316	ENCLOSURE, NEMA 4X, 90.00" x 36.00" x 36.00", 316SS	ENCLOSURE
2	1	HAMMOND MANUFACTURING	90YPTW	INTERNAL PANEL, 78" X 32"	BACK PANEL
3	2	SAGINAW CONTROL	SCE-90S36P50	SIDE PANEL, 78" X 36"	SIDE PANELS
4	1	HAMMOND MANUFACTURING	DTS30E1A1194SS	AC UNIT 2500 BTU/HR - 115V - NEMA 4X	AC UNIT
5	1	HOFFMAN	LED4I1S5	ENCLOSURE LIGHT	LT-01
6	1	HOFFMAN	ALPSWD	ENCLOSURE DOOR SWITCH	SW-01
				TERMINAL BLOCKS & RELATED EQUIPMENT	
50	63	ALLEN BRADLEY	1492-J4	TERMINAL BLOCK 4 TIER	TB1, TB2, TB3, TB4
51	6	ALLEN BRADLEY	1492-EBJ3	TERMINAL BLOCK END BARRIER, 1 TIER	TB1, TB2, TB3, TB4
52	10	ALLEN BRADLEY	1492-EAJ35	TERMINAL BLOCK END ANCHOR	TB1, TB2, TB3, TB4
53	2	ALLEN BRADLEY	1492-CJJ5-10	TERMINAL BLOCK JUMPER, 10 POLE	TB1, TB2
54	27	ALLEN BRADLEY	1492-JG3	TERMINAL BLOCK, GROUNDING	TB1, TB2
55	3	ALLEN BRADLEY	1492-DR6	DIN RAIL, 6"RISED	TB1, TB2, TB3
57	30	ALLEN BRADLEY	1492-H4	FUSED TERMINAL BLOCK, NEON INDICATOR	FU1-FU29
58	6	ALLEN BRADLEY	1492-H5	FUSED TERMINAL BLOCK, LED INDICATOR	FU21-26
59	3	ALLEN BRADLEY	1492-N37	FUSED TERMINAL BLOCK END BARRIER	FU10, FU20, FU26
60	3	ALLEN BRADLEY	1492-N49	FUSE BLOCK SIDE JUMPER 5.10 POLE	FU1-FU10, FU11-20, FU21-FU25
61	3	ALLEN BRADLEY	1492-SJ5	FUSE BLOCK SIDE JUMPER INSULATING SLEEVE	FU1-FU10, FU11-20, FU21-FU25
62	1	ALLEN BRADLEY	1492-WSX12	GROUNDING TERMINAL BLOCK BLANK MARKING TAGS, 144 CT.	TB1, TB2, TB3
63	3	ALLEN BRADLEY	1492-WSX8	TERMINAL BLOCK BLANK MARKING TAGS, 2 TIER, 144 CT.	TB1, TB2, TB3
64	1	ALLEN BRADLEY	1492-WSBX12	FUSE BLOCK BLANK MARKING TAGS, 100 CT.	FU1-FU29
71	3	ALLEN BRADLEY	1489-M1D200	CIRCUIT BREAKER, 20AMP, SINGLE POLE	CB1, CB2, CB5
72	3	ALLEN BRADLEY	1489-M1D100	CIRCUIT BREAKER, 10AMP, SINGLE POLE	CB3, CB7
74	29	BUSSMANN	AGC-1	FUSE, 1A 250V, FAST ACTING	FU3-FU9, FU12-FU20, FU23 PLUS SPARES
77	2	BUSSMANN	AGC-10	FUSE, 10A 250V, FAST ACTING	FU10 PLUS SPARE
78	11	BUSSMANN	AGC-2	FUSE, 2A 250V, FAST ACTING	FU1, FU2, FU11, FU21-24, PLUS SPARES
80	3	PHOENIX CONTACT	2905348	VAL-SEC-T2-1S-175-FM, 120VAC SURGE PROTECTOR	SUP1, SUP6, PLUS 1 SPARE
81	1	ALLEN BRADLEY	700-HK32A1	GENERAL PURPOSE 8 LIM LINE RELAY, 120VAC	RL500
82	1	ALLEN BRADLEY	700-HN121	RELAY SOCKET	RL500
				WIRED UCT	
93	18FT	PANDUIT	F4X4LG-S	WIRING DUCT, 4"W X 4"H	
94	18FT	PANDUIT	C4LG-S	WIRING DUCT COVER, 4"W	
95	48FT	PANDUIT	F2X2LG-S	WIRING DUCT, 2"W x 2"H	
96	48FT	PANDUIT	C2LG-S	WIRING DUCT COVER, 2"W	
				POWER SUPPLIES	
137	1	PHOENIX CONTACT	2866763	POWER SUPPLY, 240/120VAC IN, 24VDC, 10 AMP	PW-S1
				COMMUNICATIONS	
143	1	EMERSON	EX9013SG05	MINI-COM PATCH PANEL - 12 PORTS	
144	1	EMERSON	EX9011BN01	MINI-COM MODULE FOR FO-ST	
145	1	PANDUIT	CJ6C88YGIW	MINI-COM MODULE FOR TX6 10GIG UTP JACK	
				MISCELLANEOUS PANEL EQUIPMENT	
164	3	PANDUIT	UGB90-414-S	GROUND BAR	
166	4	PANEL FABRICATOR		NAMEPLATE, PHENOLIC, ENGRAVED	SEE SCHEDULE ON EQUIPMENT LAYOUT
172	1	EMERSON	2375C68G01	RTD ASSEMBLY	
173	1	PHOENIX CONTACT	2864287	TEMP XMITMICR-PL-TS-UP-1-EX	
180	3	BENTLY NEVADA	990-05-70-03-00	VIBRATION TRANSMITTER	
185	1	ALLEN BRADLEY	800H-FBCTA1	30MM PUSH-PULL/TWIST-TO-RESET/BUTTON, MUSHROOM HEAD, RED	
186	1	ALLEN BRADLEY	800H-W30XJE	30MM PUSH-BUTTON LEGEND PLATE, JUMBO, CUSTOM TEXT, "SYSTEM STOP"	
187	1	WILCOXON	7301	USER-CONFIGURABLE INTELLIGENT VIBRATION TRANSMITTER	
191	1	SEL	SEL-2600A	RTD MODULE	PROVIDED BY ELECTRICAL CONTRACTOR

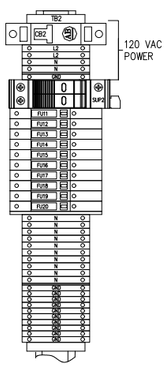


ENCLOSURE EXTERIOR TOP VIEW

TERMINAL BLOCK LAYOUTS



(1) 20 AMP CIRCUIT BREAKER
(1) 120 VAC SURGE PROTECTOR
(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS



(1) 20 AMP CIRCUIT BREAKER
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(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
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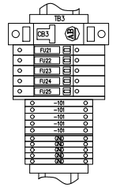
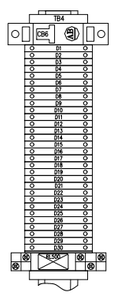


(1) 10 AMP CIRCUIT BREAKER
(5) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(5) GROUNDING TERMINALS
(5) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(30) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(1) 120V RELAY
(2) END ANCHORS

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. SPEYRER
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
RIO-15-1 MAC 1-1 PANEL
EQUIPMENT ELEVATION

SCALE NONE
DATE 28JUN24
DRAWING NUMBER SD428-W4400-E503
REV. 0

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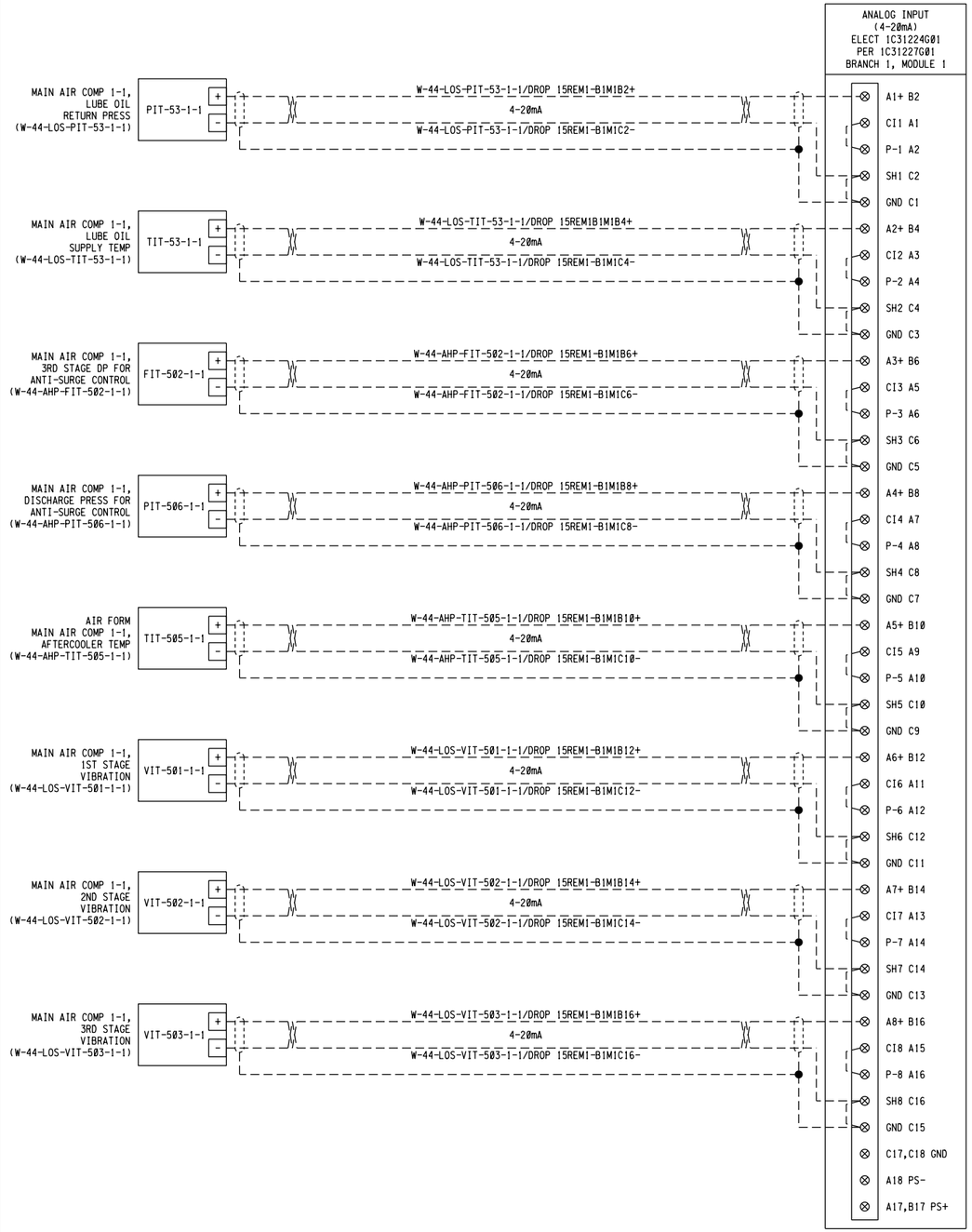

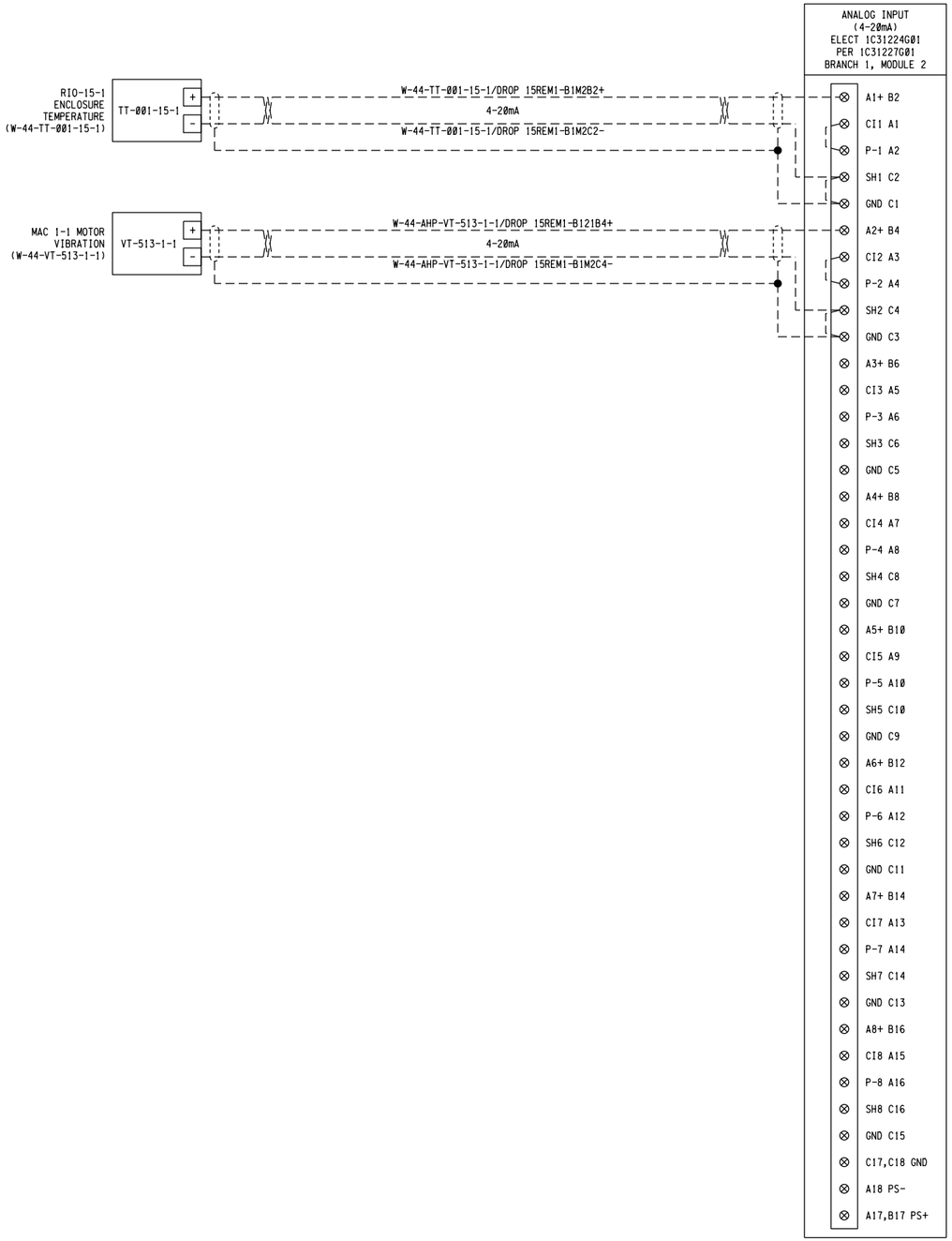

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3" ON ORIGINAL DOCUMENT
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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
C.S. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-1 MAC 1-1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E503-511
DRAWING NUMBER

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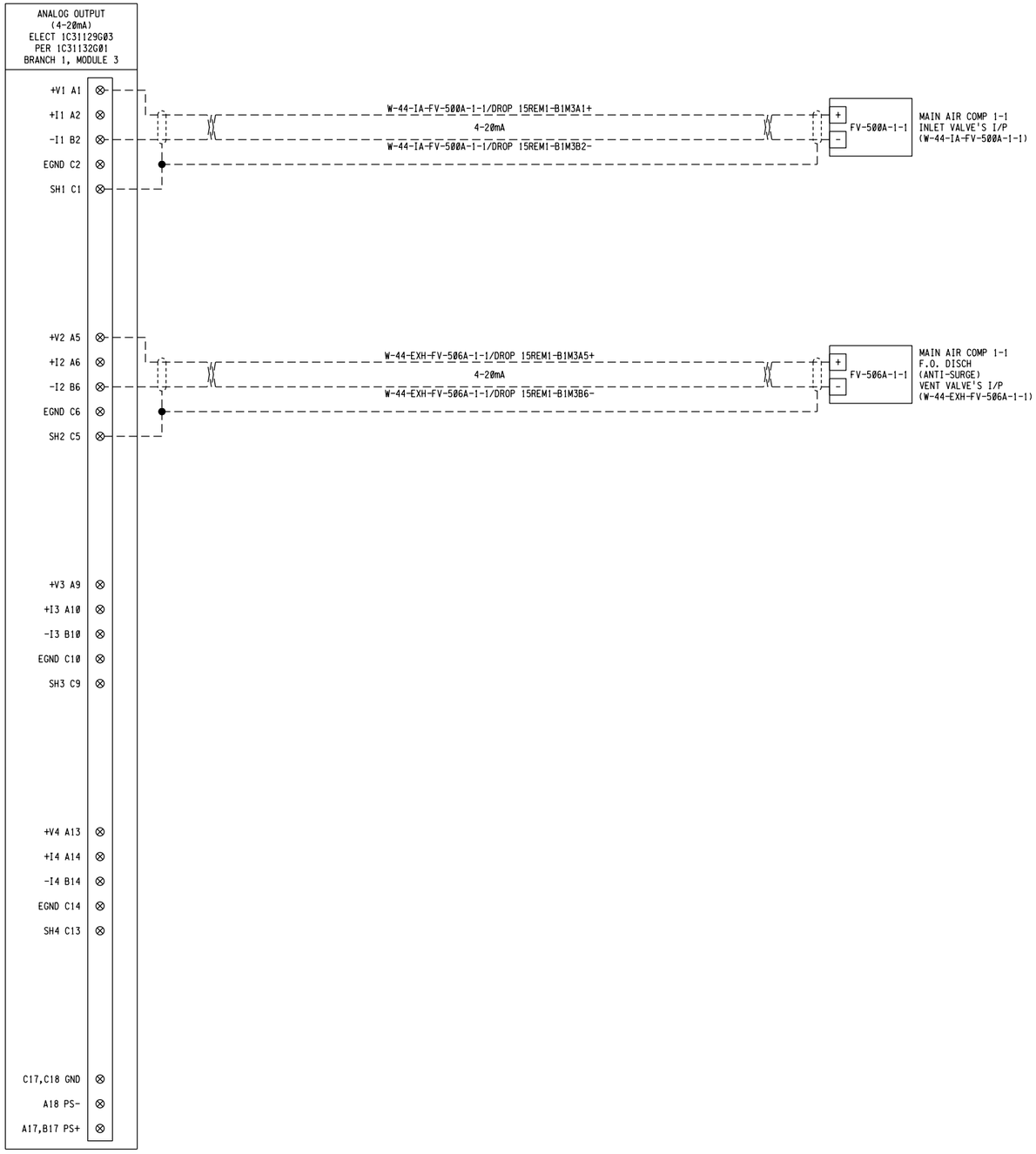

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EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-1 MAC 1-1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E503-512
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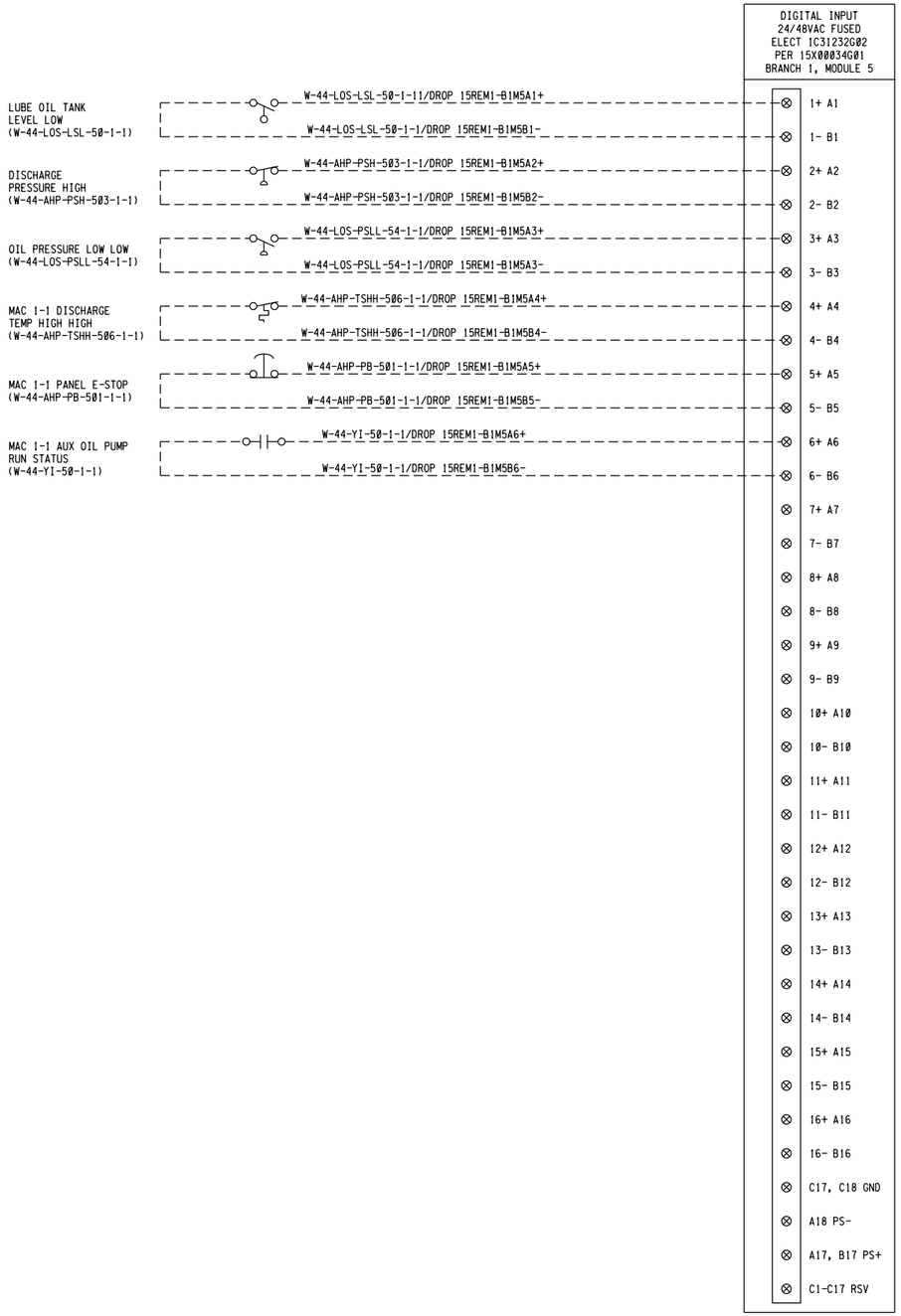

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RIO-15-1 MAC 1-1 PANEL
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SD428-W4400-E503-513
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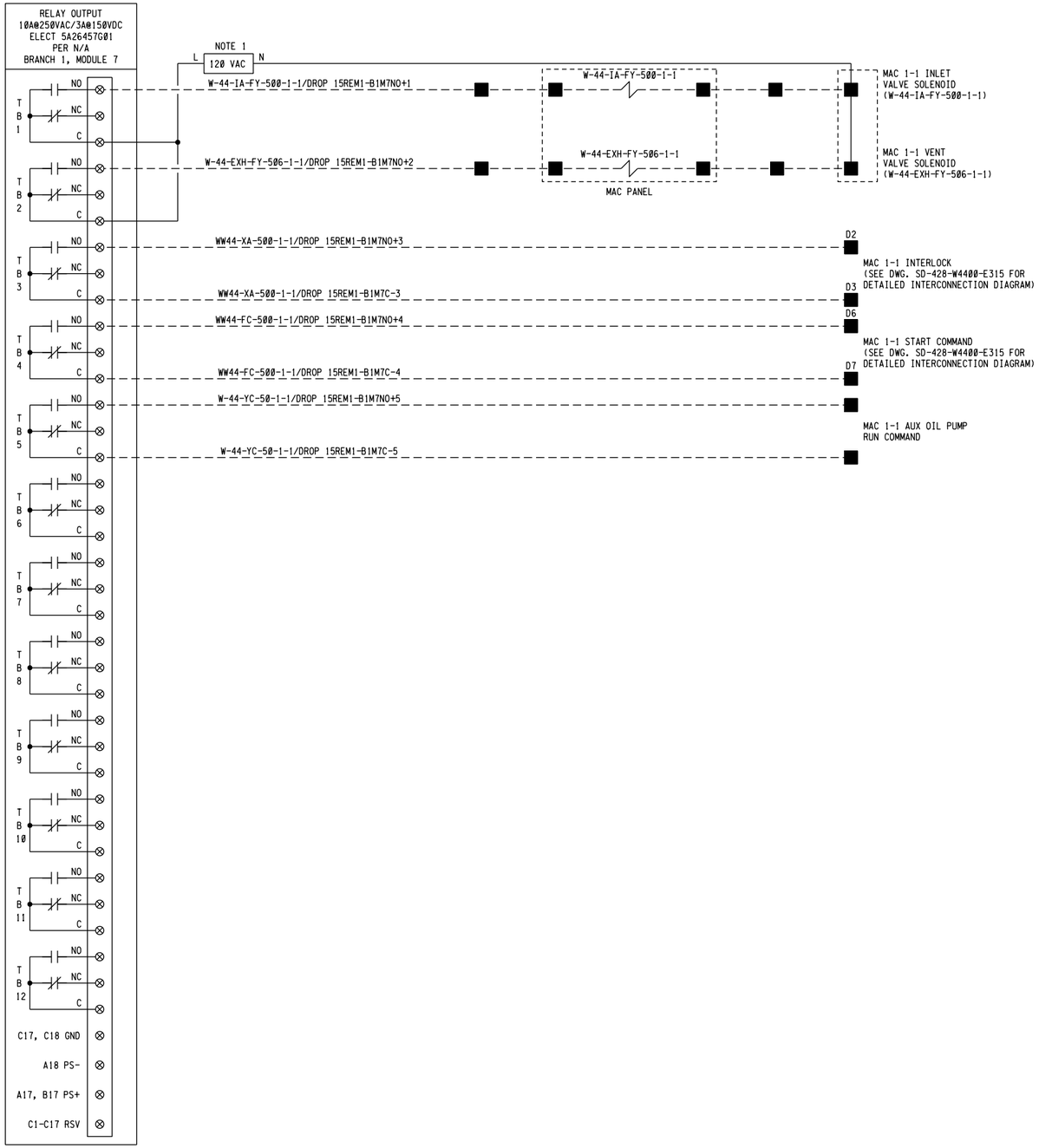

NOTES:

1. FOR POWER DETAILS, SEE SHEET SD428-W4400-E502-E510

3" ON ORIGINAL DOCUMENT

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SOLUTIONWERKS™ INCORPORATED

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CONTROL SYSTEM
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06/28/2024

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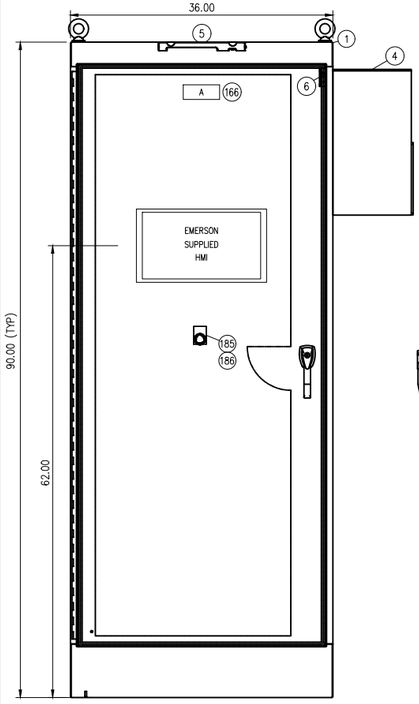
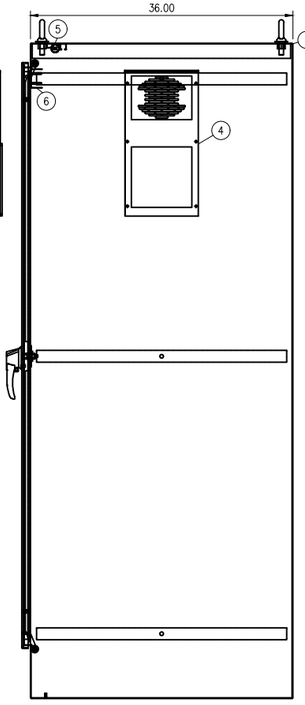
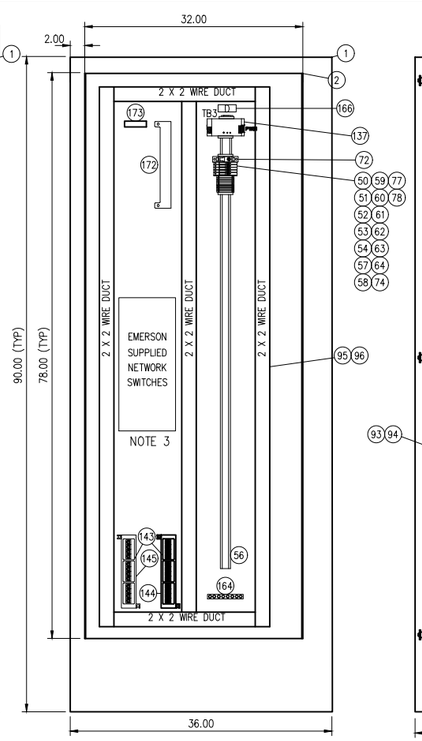


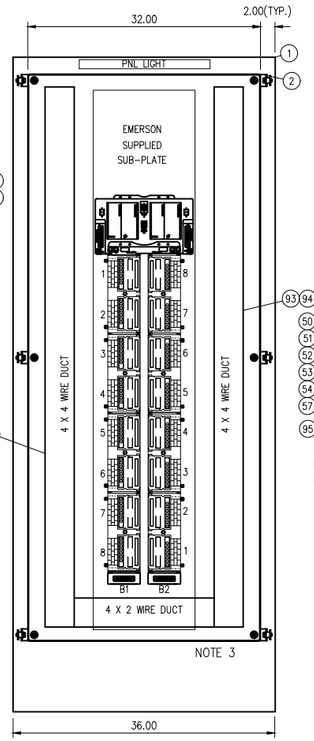
ENCLOSURE EXTERIOR FRONT VIEW
(NOTES 1 & 2)



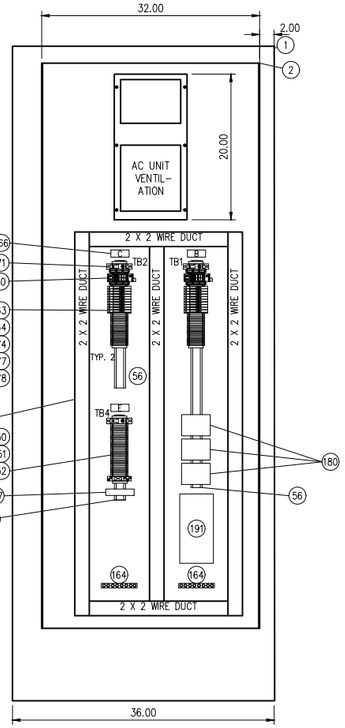
ENCLOSURE EXTERIOR SIDE VIEW
(NOTES 1 & 2)



LEFT PANEL



BACK PLATE



RIGHT PANEL

NOTES:

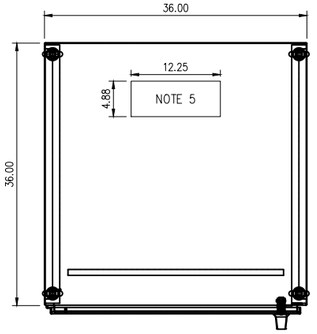
1. ENCLOSURE SHALL SIT ON A 4" HEIGHT HOUSEKEEPING PAD.
2. ENCLOSURE SHALL BE SS316, TYPE NEMA 4X, AND HAVE PROVISION FOR PADLOCK.
3. SUBPLATE, HMI, AND NETWORK SWITCHES SHALL BE SUPPLIED BY EMERSON AND INSTALLED BY THE CONTRACTOR AFTER COMPLETION OF PANEL. CONTRACTOR SHALL COORDINATE WITH EMERSON FOR RECEIVING THE EQUIPMENT AND INSTALLATION SEQUENCE AND SCHEDULE. EMERSON SHALL SUPPLY ETHERNET AND FIBER PATCH CORDS. CONTRACTOR SHALL PROVIDE AND INSTALL POWER CONNECTIONS TO EMERSON EQUIPMENT AS DIRECTED BY EMERSON.
4. NAMEPLATE SHALL BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375
5. AREA RESERVED FOR CONDUIT ENTRY.
6. ENCLOSURE LIGHT AND INTRUSION SWITCH SHALL BE MOUNTED WITH STAINLESS STEEL SCREWS, NUTS AND NEOPRENE BONDED SEALING WASHERS TO MAINTAIN THE NEMA 4X RATING OF ENCLOSURE. (SEALING WASHER MANUFACTURER & ITEM NUMBER: THE HILLMAN GROUP #290250 OR EQUAL)

NAMEPLATE SCHEDULE (NOTE 4)

ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 2"	RIO-23-1 MAC 2-1 PANEL	NOTE 4
B	2.5" x 1"	TB1	NOTE 4
C	2.5" x 1"	TB2	NOTE 4
D	2.5" x 1"	TB3	NOTE 4
E	2.5" x 1"	TB4	NOTE 4

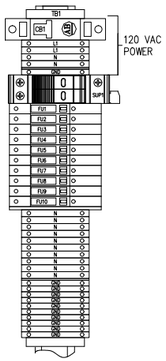
BILL OF MATERIALS

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
				ENCLOSURES & RELATED EQUIPMENT	
1	1	HAMMOND MANUFACTURING	HNAF990306816	ENCLOSURE, NEMA 4X, 90.00" x 36.00" x 36.00", 316SS	ENCLOSURE
2	1	HAMMOND MANUFACTURING	80YTW	INTERNAL PANEL, 78" X 32"	BACK PANEL
3	2	SAGINAW CONTROL	SCE-96SMP30	SIDE PANEL, 78" X 30"	SIDE PANELS
4	1	HAMMOND MANUFACTURING	DTB36E1A1194SS	AC UNIT 2500 BTU/HR - 115V - NEMA 4X	AC UNIT
5	1	HOFFMAN	LEDA1S3S	ENCLOSURE LIGHT	LT-01
6	1	HOFFMAN	ALPSWD	ENCLOSURE DOOR SWITCH	SW-01
				TERMINAL BLOCKS & RELATED EQUIPMENT	
50	63	ALLEN BRADLEY	1492-J4	TERMINAL BLOCK 1 TIER	TB1, TB2, TB3, TB4
51	6	ALLEN BRADLEY	1492-EBJ3	TERMINAL BLOCK END BARRIER, 1 TIER	TB1, TB2, TB3, TB4
52	10	ALLEN BRADLEY	1492-EAJ35	TERMINAL BLOCK END ANCHOR	TB1, TB2, TB3, TB4
53	2	ALLEN BRADLEY	1492-CJJ5-10	TERMINAL BLOCK JUMPER, 10 POLE	TB1, TB2
54	27	ALLEN BRADLEY	1492-J53	TERMINAL BLOCK, GROUNDING	TB1, TB2
56	3	ALLEN BRADLEY	1492-DR6	DIN RAIL, 6 INSED	TB1, TB2, TB3
57	30	ALLEN BRADLEY	1492-H4	FUSED TERMINAL BLOCK, NEON INDICATOR	FU1-FU20
58	5	ALLEN BRADLEY	1492-H5	FUSED TERMINAL BLOCK, LED INDICATOR	FU21-25
59	3	ALLEN BRADLEY	1492-N37	FUSED TERMINAL BLOCK END BARRIER	FU10, FU20, FU25
60	3	ALLEN BRADLEY	1492-N49	FUSE BLOCK, SIDE JUMPER 5 10 POLE	FU1-FU10, FU11-20, FU21-FU25
61	3	ALLEN BRADLEY	1492-SJ5	FUSE BLOCK, SIDE JUMPER INSULATING SLEEVE	FU1-FU10, FU11-20, FU21-FU25
62	1	ALLEN BRADLEY	1492-MSX12	GROUNDING TERMINAL BLOCK BLANK MARKING TAGS, 144 CT.	TB1, TB2, TB3
63	2	ALLEN BRADLEY	1492-MSX2	TERMINAL BLOCK BLANK MARKING TAGS, 2 TIER, 144 CT.	TB1, TB2, TB3
64	1	ALLEN BRADLEY	1492-MSBX12	FUSE BLOCK BLANK MARKING TAGS, 100 CT.	FU1-FU25
71	3	ALLEN BRADLEY	1489-M1D200	CIRCUIT BREAKER, 20 AMP, SINGLE POLE	CB1, CB2, CB6
72	2	ALLEN BRADLEY	1489-M1D100	CIRCUIT BREAKER, 10 AMP, SINGLE POLE	CB3, CB7
74	26	BUSSMANN	AGC-1	FUSE, 1A, 250V, FAST ACTING	FU3-FU8, FU12-FU20, FU23 PLUS SPARES
77	3	BUSSMANN	AGC-10	FUSE, 10A, 250V FAST ACTING	FU10 PLUS SPARE
78	11	BUSSMANN	AGC-2	FUSE, 2A, 250V, FAST ACTING	FU1, FU2, FU11, FU21-24, PLUS SPARES
80	3	PHOENIX CONTACT	2900348	VAL-SEC-T2-1S-175 FM, 120VAC SURGE PROTECTOR	SUP1, SUP2, PLUS 1 SPARE
81	1	ALLEN BRADLEY	700-HK32A1	GENERAL PURPOSE SLIM LINE RELAY, 120VAC	RL500
82	1	ALLEN BRADLEY	700-HN121	RELAY SOCKET	RL500
				WIREDUCT	
93	18FT	PANDUIT	F4X4LG-E	WIRING DUCT, 4"W x 4"H	
94	18FT	PANDUIT	C4LG-E	WIRING DUCT COVER, 4"W	
95	48FT	PANDUIT	F2X2LG-E	WIRING DUCT, 2"W x 2"H	
96	48FT	PANDUIT	C2LG-E	WIRING DUCT COVER, 2"W	
				POWER SUPPLIES	
137	1	PHOENIX CONTACT	2866763	POWER SUPPLY, 24VDC/120VAC IN, 24VDC, 10 AMP	PWS1
				COMMUNICATION	
143	1	EMERSON	EX0013G05	MINI-COM PATCH PANEL - 12 PORTS	
144	1	EMERSON	1X0011BH01	MINI-COM MODULE FOR FO ST	
145	1	PANDUIT	CJ6CBWGW	MINI-COM MODULE FOR TIA 1005 U/UTP JACK	
				MISCELLANEOUS PANEL EQUIPMENT	
164	3	PANDUIT	UGBSD-414-E	GROUND BAR	
166	4	PANEL FABRICATOR		NAMEPLATE, PHENOLIC, ENGRAVED	SEE SCHEDULE ON EQUIPMENT LAYOUT
172	1	EMERSON	3375C68G01	RTD ASSEMBLY	
173	1	PHOENIX CONTACT	2864287	TEMP XMIT MCR-PL-TS-LP-I-EX	
180	3	B/B TECHNICAL	990-08-70-03-00	VIBRATION TRANSMITTER	
186	1	ALLEN BRADLEY	800H-FRXTRA1	30MM PUSH-PULL/TWIST PB/SHUTTON, MUSHROOM HEAD, RED	
				30MM PUSH-BUTTON LEGEND PLATE, JUMBO CU STOM TEXT	
186	1	ALLEN BRADLEY	800H-W300JE	"SYSTEM STOP"	
187	1	WILCOXON	731H	USER-CONFIGURABLE INTELLIGENT VIBRATION TRANSMITTER	
191	1	S.S.L.	S.S.L. 2600A	RTD MODULE	PROVIDED BY ELECTRICAL CONTRACTOR



ENCLOSURE EXTERIOR TOP VIEW

TERMINAL BLOCK LAYOUTS



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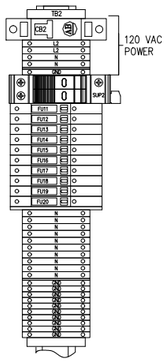
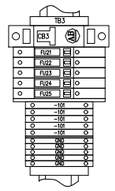
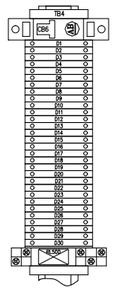
(1) 120VAC RELAY
(2) END ANCHORS



(1) 20 AMP CIRCUIT BREAKER
(1) 120 VAC SURGE PROTECTOR
(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(5) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(5) GROUNDING TERMINALS
(5) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(30) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(1) 120V RELAY
(2) END ANCHORS

3" ON ORIGINAL DOCUMENT
0 1 2 3

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. SPEYRER
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
RIO-23-1 MAC 2-1 PANEL
EQUIPMENT ELEVATION

SCALE NONE
DATE 28JUN24
SD428-W4400-E504
DRAWING NUMBER
0
REV.

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REF 3: REF3$FILENAME
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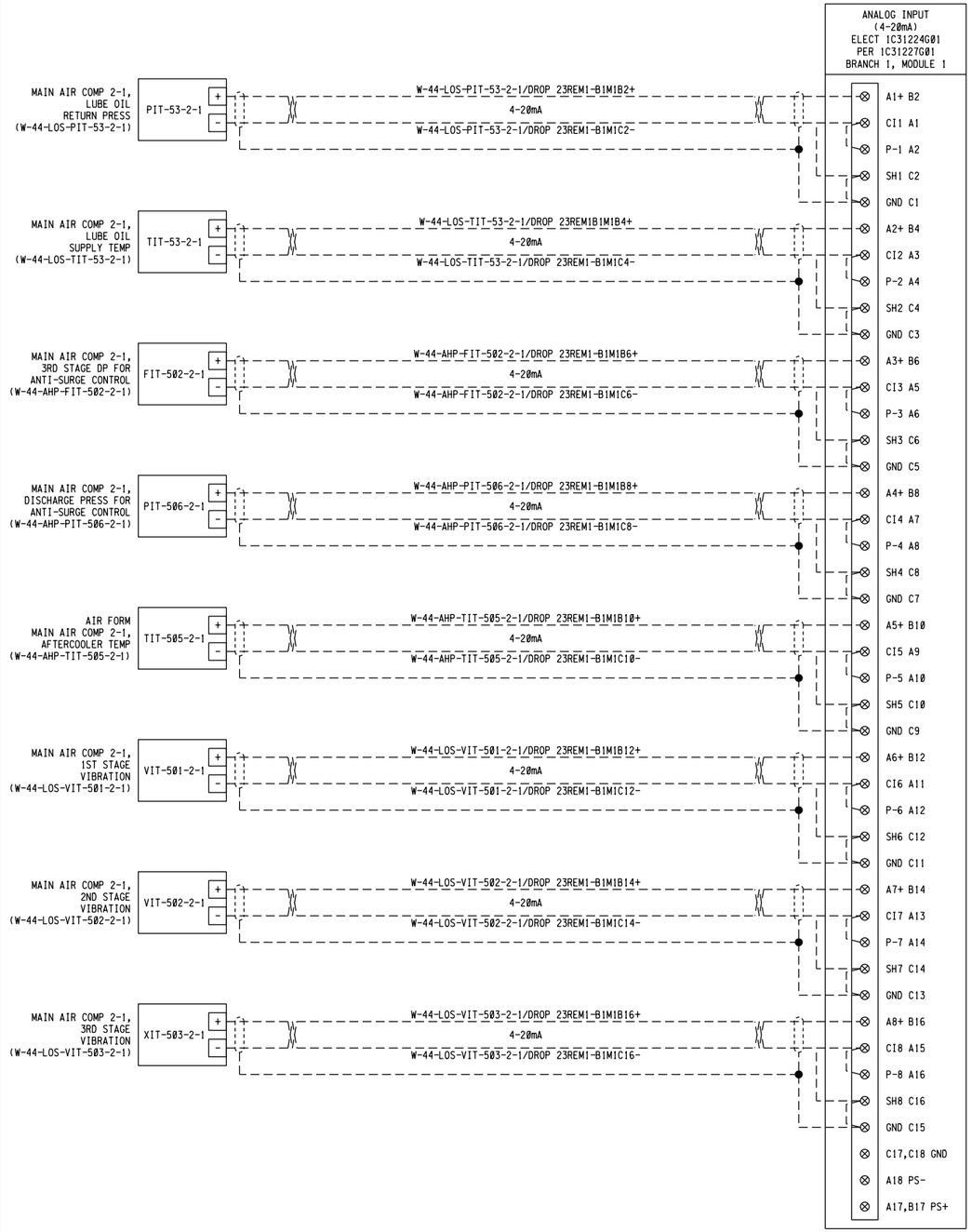

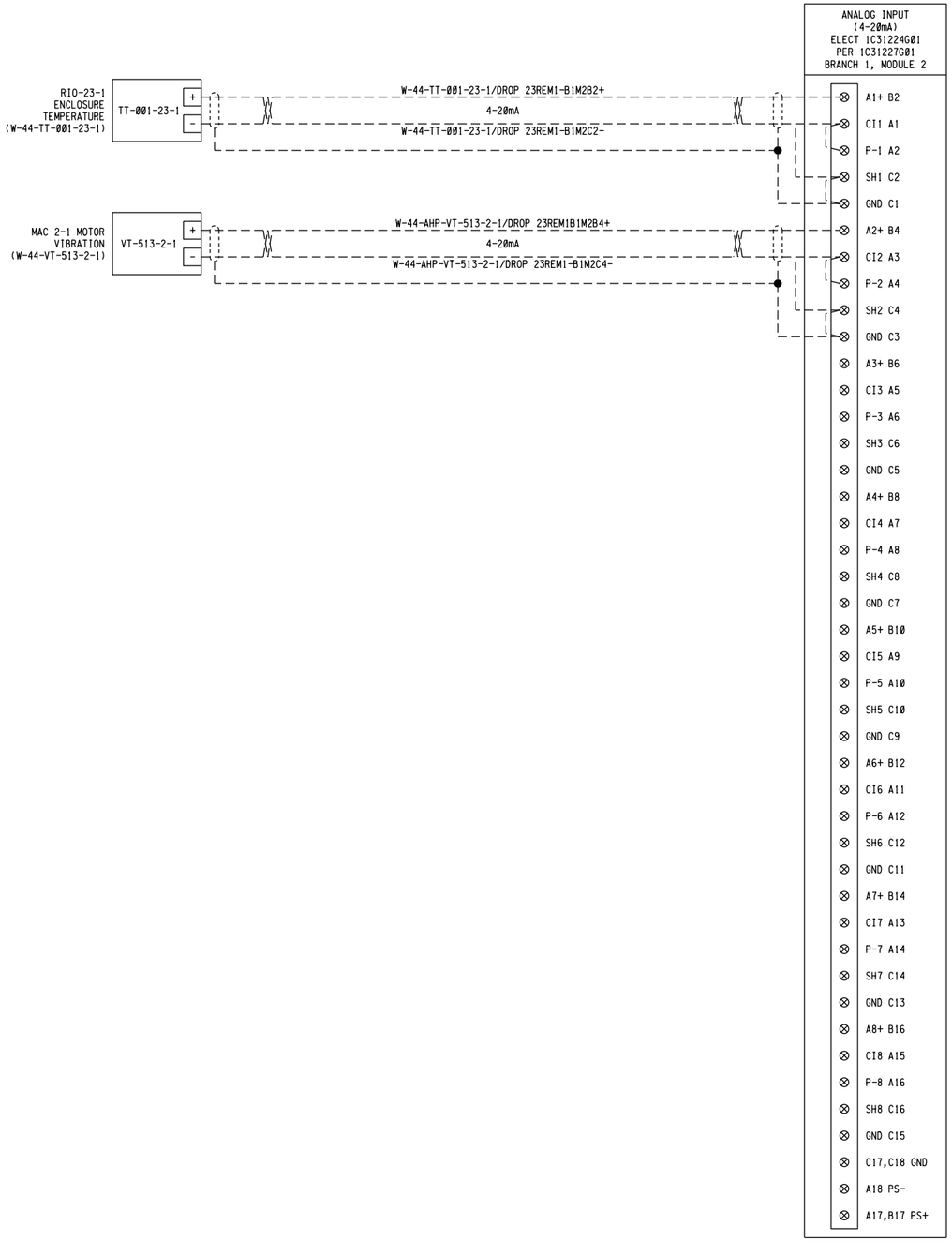

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3" ON ORIGINAL DOCUMENT
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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-1 MAC 2-1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E504-511
DRAWING NUMBER

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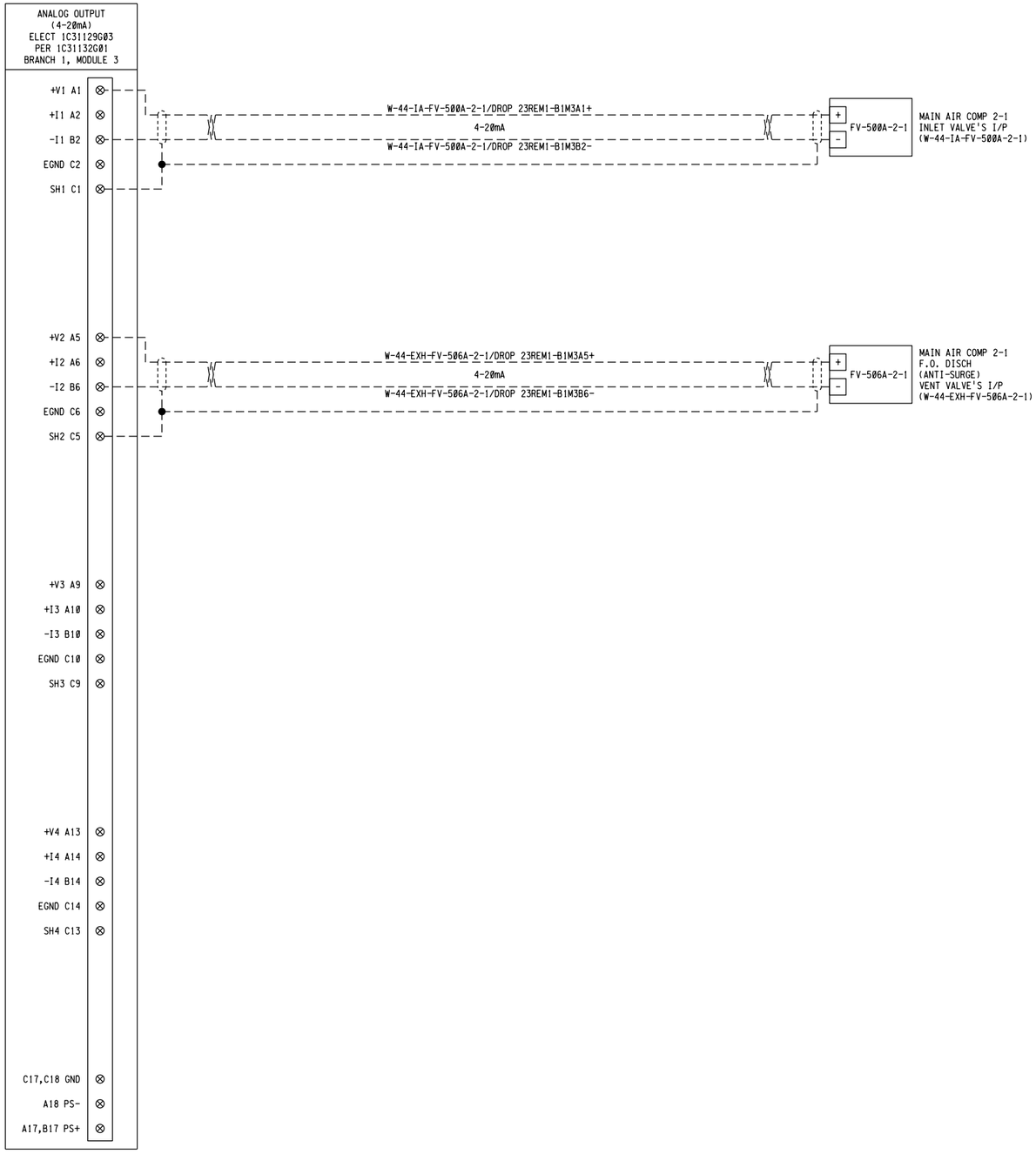

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3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
C.S. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-1 MAC 2-1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E504-512
DRAWING NUMBER

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LUBE OIL TANK LEVEL LOW (W-44-LOS-LSL-50-2-1)	W-44-LOS-LSL-50-2-1/DROP 23REM1-B1M5A1+	I+ A1
	W-44-LOS-LSL-50-2-1/DROP 23REM1-B1M5B1-	I- B1
DISCHARGE PRESSURE HIGH (W-44-AHP-PSH-503-2-1)	W-44-AHP-PSH-503-2-1/DROP 23REM1-B1M5A2+	2+ A2
	W-44-AHP-PSH-503-2-1/DROP 23REM1-B1M5B2-	2- B2
OIL PRESSURE LOW LOW (W-44-LOS-PSLL-54-2-1)	W-44-LOS-PSLL-54-2-1/DROP 23REM1-B1M5A3+	3+ A3
	W-44-LOS-PSLL-54-2-1/DROP 23REM1-B1M5A3-	3- B3
MAC 2-1 DISCHARGE TEMP HIGH HIGH (W-44-AHP-TSHH-506-2-1)	W-44-AHP-TSHH-506-2-1/DROP 23REM1-B1M5A4+	4+ A4
	W-44-AHP-TSHH-506-2-1/DROP 23REM1-B1M5A4-	4- B4
MAC 2-1 PANEL E-STOP (W-44-AHP-PB-501-2-1)	W-44-AHP-PB-501-2-1/DROP 23REM1-B1M5A5+	5+ A5
	W-44-AHP-PB-501-2-1/DROP 23REM1-B1M5A5-	5- B5
MAC 2-1 AUX OIL PUMP RUN STATUS (W-44-YI-50-2-1)	W-44-YI-50-2-1/DROP 23REM1-B1M5A6+	6+ A6
	W-44-YI-50-2-1/DROP 23REM1-B1M5B6-	6- B6
		7+ A7
		7- B7
		8+ A8
		8- B8
		9+ A9
		9- B9
		10+ A10
		10- B10
		11+ A11
		11- B11
		12+ A12
		12- B12
		13+ A13
		13- B13
		14+ A14
		14- B14
		15+ A15
		15- B15
		16+ A16
		16- B16
		C17, C18 GND
		A18 PS-
		A17, B17 PS+
		C1-C17 RSV

DIGITAL INPUTS
24/48VDC FUSED
ELECT 1C31232G02
PER 15X00034G01
BRANCH 1, MODULE 5

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-1 MAC 2-1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E504-513
DRAWING NUMBER

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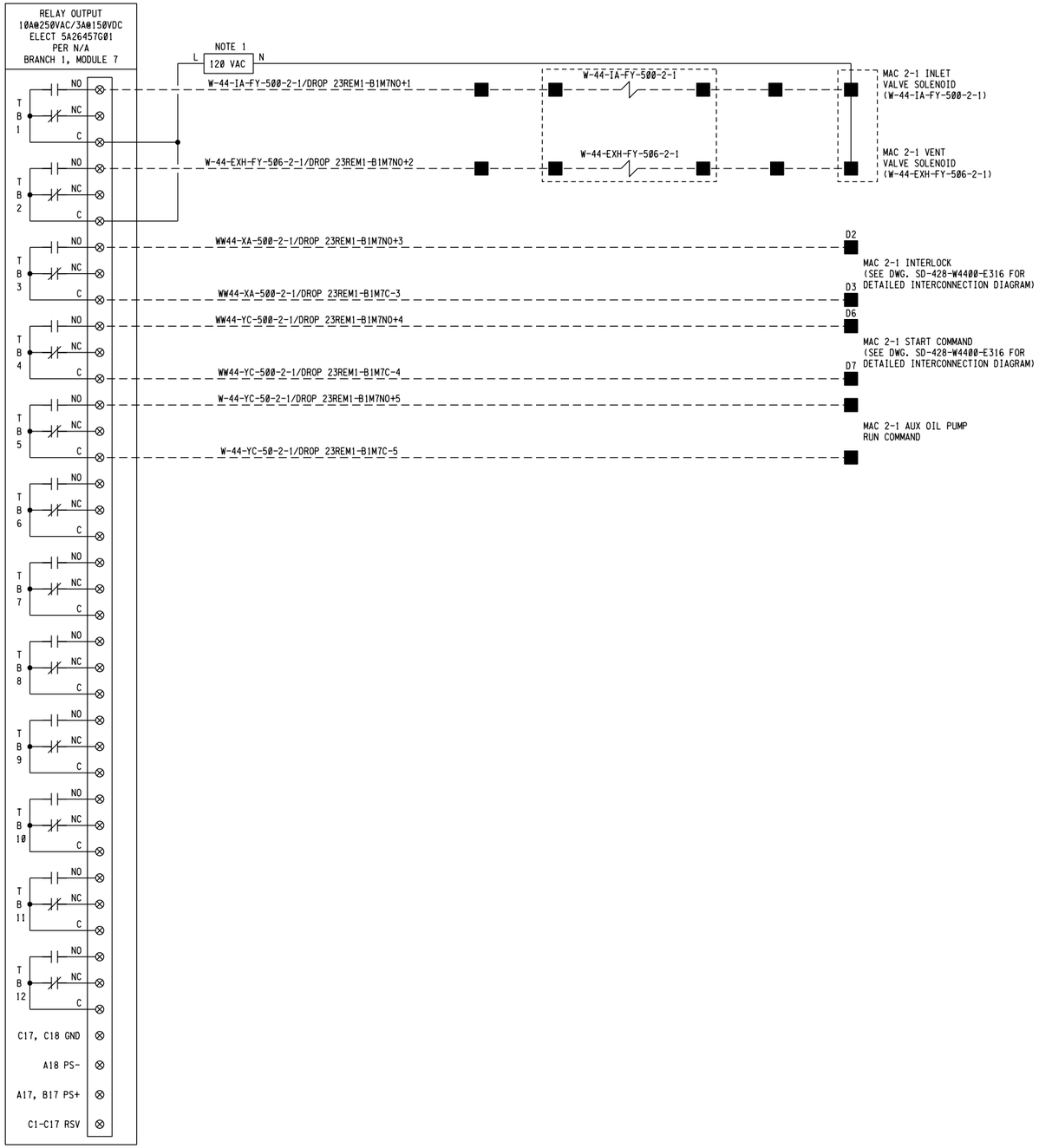
REV.



NOTES:

1. FOR POWER DETAILS, SEE SHEET SD428-W4400-E504-510

3" ON ORIGINAL DOCUMENT
0 1 2 3

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT	DESIGN BY: R. SPEYRER	EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO.1 OAKLAND, CALIFORNIA
	DRAWN BY: X. SUN	
	DESIGN CHECKED BY R.P.E. NO. 7556 K. TRACY	MAIN WASTEWATER TREATMENT PLANT OXYGEN PRODUCTION PLANT
	PROJECT MANAGER R.P.E. NO. J. JANCAITIS	ELECTRICAL
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097 D. RICHARDSON	RIO-23-1 MAC 2-1 PANEL I/O MODULE SCHEMATIC
EBMUD	PROJECT MANAGER R.P.E. NO. 95046 J. LAW	
	RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604 R. MAC	SCALE NONE DATE 28JUN24

SD428 - MWWTP OXYGEN PLANT REHABILITATION

SD428-W4400-E504-514 (DRAWING NUMBER) — Ø (REV.)

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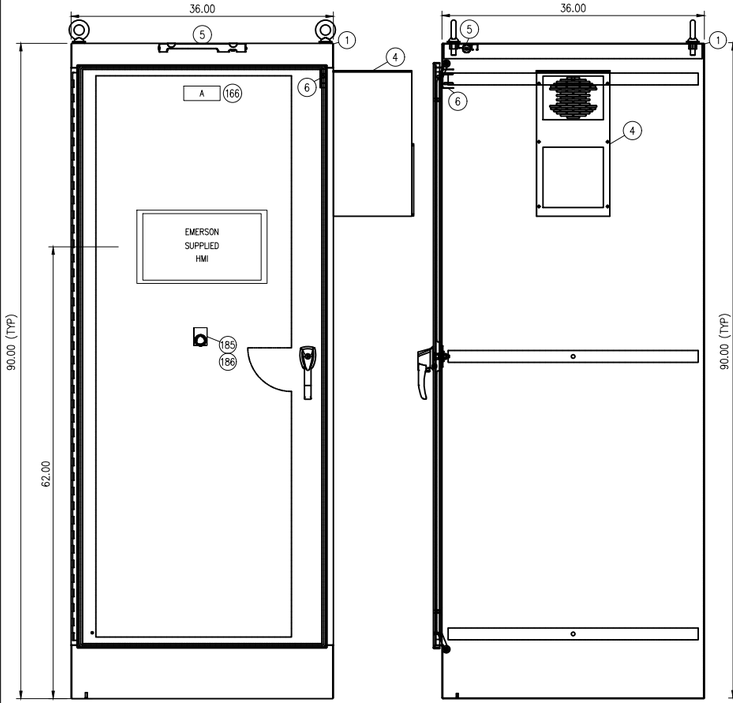
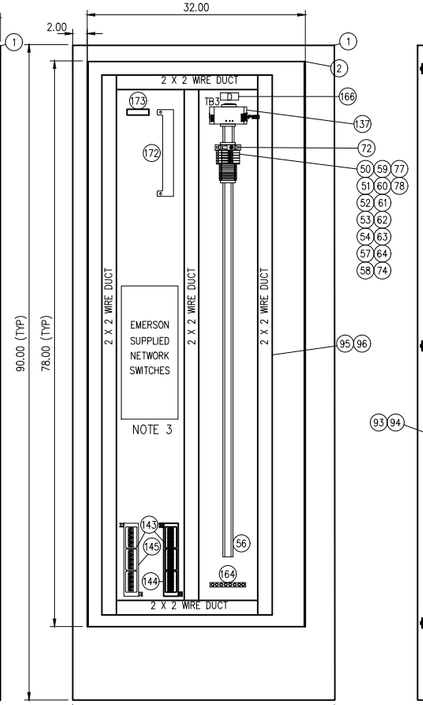
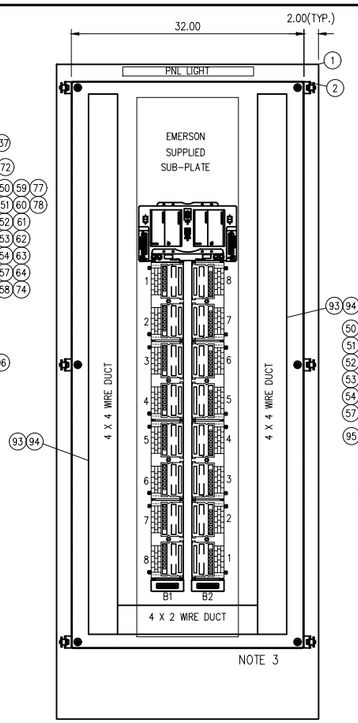


ENCLOSURE EXTERIOR FRONT VIEW
(NOTES 1 & 2)

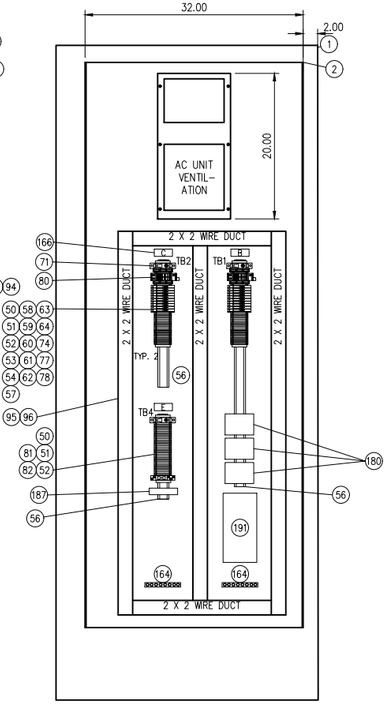
ENCLOSURE EXTERIOR SIDE VIEW
(NOTES 1 & 2)



LEFT PANEL



BACK PLATE



RIGHT PANEL

NOTES:

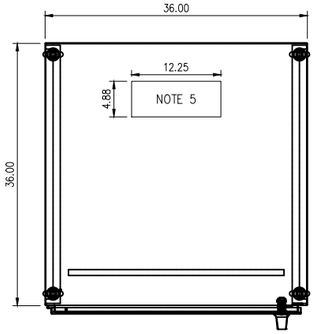
1. ENCLOSURE SHALL SIT ON A 4" HEIGHT HOUSEKEEPING PAD.
2. ENCLOSURE SHALL BE SS316, TYPE NEMA 4X, AND HAVE PROVISION FOR PADLOCK.
3. SUBPLATE, HMI, AND NETWORK SWITCHES SHALL BE SUPPLIED BY EMERSON AND INSTALLED BY THE CONTRACTOR AFTER COMPLETION OF PANEL. CONTRACTOR SHALL COORDINATE WITH EMERSON FOR RECEIVING THE EQUIPMENT AND INSTALLATION SEQUENCE AND SCHEDULE. EMERSON SHALL SUPPLY ETHERNET AND FIBER PATCH CORDS. CONTRACTOR SHALL PROVIDE AND INSTALL POWER CONNECTIONS TO EMERSON EQUIPMENT AS DIRECTED BY EMERSON.
4. NAMEPLATE SHALL BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375
5. AREA RESERVED FOR CONDUIT ENTRY.
6. ENCLOSURE LIGHT AND INTRUSION SWITCH SHALL BE MOUNTED WITH STAINLESS STEEL SCREWS, NUTS AND NEOPRENE BONDED SEALING WASHERS TO MAINTAIN THE NEMA 4X RATING OF ENCLOSURE. (SEALING WASHER MANUFACTURER & ITEM NUMBER: THE HILLMAN GROUP #290250 OR EQUAL)

NAMEPLATE SCHEDULE (NOTE 4)

ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 2"	RIO-23-1 MAC 2-1 PANEL	NOTE 4
B	2.5" x 1"	TB1	NOTE 4
C	2.5" x 1"	TB2	NOTE 4
D	2.5" x 1"	TB3	NOTE 4
E	2.5" x 1"	TB4	NOTE 4

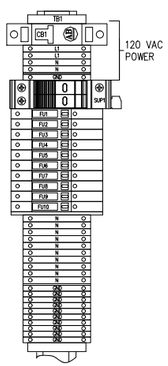
BILL OF MATERIALS

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
				ENCLOSURE & RELATED EQUIPMENT	
1	1	HAMMOND MANUFACTURING	HNMF8903636816	ENCLOSURE, NEMA 4X, 90.00" x 36.00" x 36.00", 316SS	ENCLOSURE
2	1	HAMMOND MANUFACTURING	90YP3V	INTERNAL PANEL, 78" X 32"	BACK PANEL
3	2	S-&-N-INV CONTROL	SCE-9068MP30	SIDE PANEL, 78" X 30"	SIDE PANELS
4	1	HAMMOND MANUFACTURING	DTS3081A1156455	AC UNIT 2000 BTU/HR - 115V - NEMA 4X	AC UNIT
5	1	HOFFMAN	LED24150	ENCLOSURE LIGHT	LT-01
6	1	HOFFMAN	ALPSWD	ENCLOSURE DOOR SWITCH	SW-01
				TERMINAL BLOCKS & RELATED EQUIPMENT	
50	63	ALLEN BRADLEY	1492-J4	TERMINAL BLOCK, 1 TIER	TB1, TB2, TB3, TB4
51	6	ALLEN BRADLEY	1492-EBJ3	TERMINAL BLOCK END BARRIER, 1 TIER	TB1, TB2, TB3, TB4
52	10	ALLEN BRADLEY	1492-EAJ35	TERMINAL BLOCK END ANCHOR	TB1, TB2, TB3, TB4
53	2	ALLEN BRADLEY	1492-CJJ5-10	TERMINAL BLOCK JUMPER, 10 POLE	TB1, TB2
54	27	ALLEN BRADLEY	1492-JG3	TERMINAL BLOCK, GROUNDING	TB1, TB2
55	3	ALLEN BRADLEY	1492-DR6	DIN RAIL, 6 INSED	TB1, TB2, TB3
57	20	ALLEN BRADLEY	1492-H4	FUSED TERMINAL BLOCK, NEON INDICATOR	FU1-FU20
58	6	ALLEN BRADLEY	1492-H5	FUSED TERMINAL BLOCK, LED INDICATOR	FU21-25
59	3	ALLEN BRADLEY	1492-N37	FUSED TERMINAL BLOCK END BARRIER	FU10, FU20, FU25
60	3	ALLEN BRADLEY	1492-N49	FUSE BLOCK SIDE JUMPER 5-10 POLE	FU1-FU10, FU11-20, FU21-FU25
61	3	ALLEN BRADLEY	1492-SJ5	FUSE BLOCK SIDE JUMPER INSULATING SLEEVE	FU1-FU10, FU11-20, FU21-FU25
62	1	ALLEN BRADLEY	1492-MSX12	GROUNDING TERMINAL BLOCK BLANK MARKING TAGS, 144 CT.	TB1, TB2, TB3
63	2	ALLEN BRADLEY	1492-MSX6	TERMINAL BLOCK BLANK MARKING TAGS, 2 TIER, 144 CT.	TB1, TB2, TB3
64	1	ALLEN BRADLEY	1492-MSBX12	FUSE BLOCK BLANK MARKING TAGS, 100 CT.	FU1-FU25
71	3	ALLEN BRADLEY	1489-M1D200	CIRCUIT BREAKER, 20 AMP, SING LE POLE	CB1, CB2, CB6
72	3	ALLEN BRADLEY	1489-M1D100	CIRCUIT BREAKER, 10 AMP, SING LE POLE	CB3, CB7
74	26	BUSSMANN	AGC-1	FUSE, 1A 250V, FAST ACTING	FU3-FU9, FU12-FU20, FU23 PLUS SPARES
77	2	BUSSMANN	AGC-10	FUSE, 10A 250V, FAST ACTING	FU10 PLUS SPARE
78	11	BUSSMANN	AGC-2	FUSE, 2A 250V, FAST ACTING	FU1, FU2, FU11, FU21-24, PLUS SPARES
80	3	PHOENIX CONTACT	2905348	VAL-SEC-T2-1S-175-FM, 120VAC SURGE PROTECTOR	SUP1, SUP2, PLUS 1 SPARE
81	1	ALLEN BRADLEY	700-HK32A1	GENERAL PURPOSE BLIMI LINE RELAY, 120VAC	RL600
82	1	ALLEN BRADLEY	700-HN121	RELAY SOCKET	RL600
				WIRE DUCT	
93	18FT	PANDUIT	F4X4LG6	WIRING DUCT, 4"W X 4"H	
94	18FT	PANDUIT	C4LG6	WIRING DUCT COVER, 4"W	
95	48FT	PANDUIT	F2X2LG6	WIRING DUCT, 2"W X 2"H	
96	48FT	PANDUIT	C2LG6	WIRING DUCT COVER, 2"W	
				POWER SUPPLIES	
137	1	PHOENIX CONTACT	2866783	POWER SUPPLY, 240/120VAC IN, 24VDC, 10 AMP	PWS1
				COMMUNICATIONS	
143	1	EMERSON	5X00133G05	MINI-COM PATCH PANEL - 12 PORTS	
144	1	EMERSON	1X00118H01	MINI-COM MODULE FO-ST	
145	1	PANDUIT	C-NCBEYGLW	MINI-COM MODULE FOR TX6 10GIG UTP JACK	
				MISCELLANEOUS PANEL EQUIPMENT	
164	3	PANDUIT	LGSB20-414-6	GROUND BAR	
166	4	PANEL FABRICATOR		NAMEPLATE, PHENOLIC, ENGRAVED	SEE SCHEDULE ON EQUIPMENT LAYOUT
172	1	EMERSON	2375C68G01	RTD ASSEMBLY	
173	1	PHOENIX CONTACT	2864587	TEMP XMIT MC R PL TS-1,R-1 EX	
180	3	BENTLY NEVADA	990-05-70-03-00	VIBRATION TRANSMITTER	
185	1	ALLEN BRADLEY	800H-FX3TA1	30MM PUSH-PULL/TWIST-TO-EXHIBUTTON, MUSHROOM HEAD, R/ED	
186	1	ALLEN BRADLEY	800H-W30MJE	30MM PUSH-BUTTON LEGEND PLATE, JUMBO, CUSTOM TEXT, "SYSTEM STOP"	
187	1	WILCOXON	IT201	USER-CONFIGURABLE INTELLIGENT VIBRATION TRANSMITTER	
191	1	SIEL	SIEL-2600A	RTD MODULE	PROVIDED BY ELECTRICAL CONTRACTOR

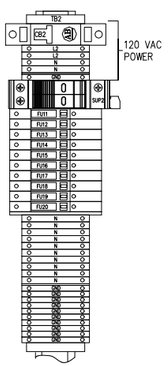


ENCLOSURE EXTERIOR TOP VIEW

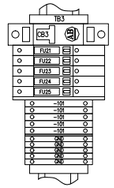
TERMINAL BLOCK LAYOUTS



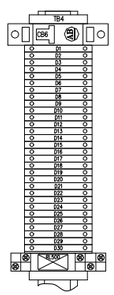
(1) 20 AMP CIRCUIT BREAKER
(1) 120 VAC SURGE PROTECTOR
(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS



(1) 20 AMP CIRCUIT BREAKER
(1) 120 VAC SURGE PROTECTOR
(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(5) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(5) GROUNDING TERMINALS
(5) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(30) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(1) 120V RELAY
(2) END ANCHORS

3" ON ORIGINAL DOCUMENT
0 1 2 3

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. SPEYRER
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
RIO-15-2 MAC 1-2 PANEL
EQUIPMENT ELEVATION

SCALE NONE
DATE 28JUN24

SD428-W4400-E505
DRAWING NUMBER

0
REV.

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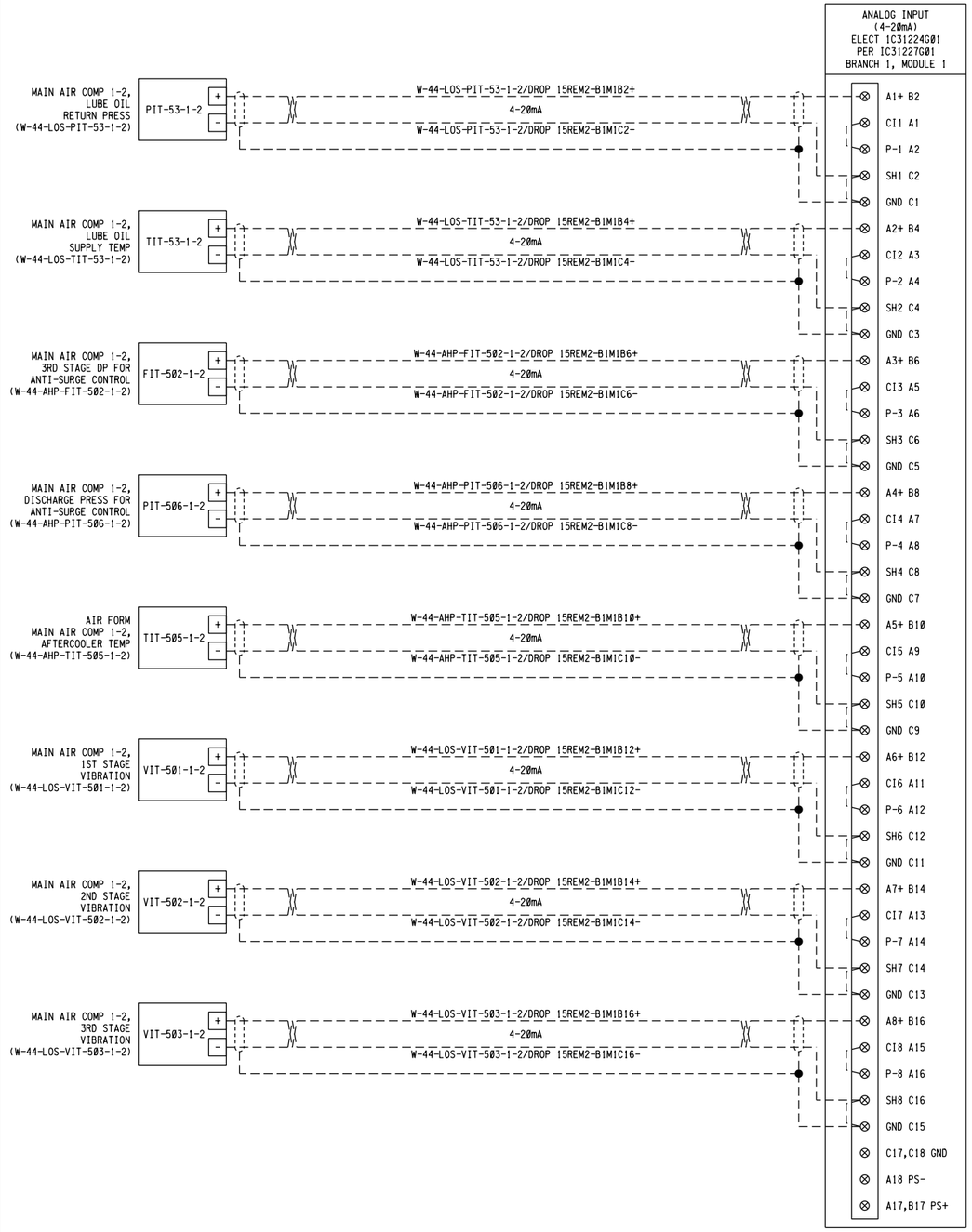

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-2 MAC 1-2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E505-511
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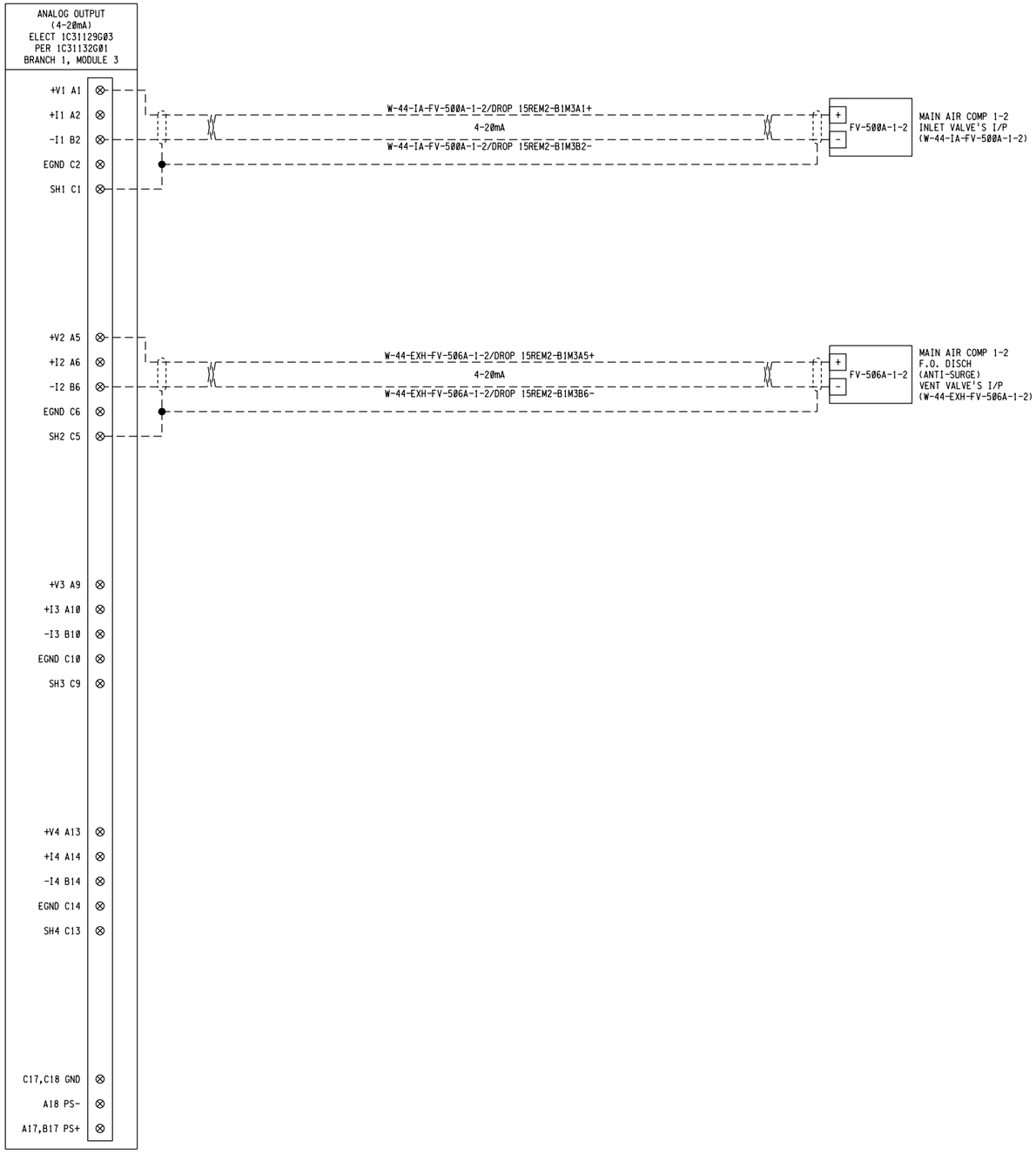

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3" ON ORIGINAL DOCUMENT
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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
C.S. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-2 MAC 1-2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E505-512
DRAWING NUMBER

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REF 9:

LUBE OIL TANK LEVEL LOW (W-44-LOS-LSL-50-1-2)	W-44-LOS-LSL-50-1-2/DROP 15REM2-B1M5A1+	I+ A1
	W-44-LOS-LSL-50-1-2/DROP 15REM2-B1M5B1-	I- B1
DISCHARGE PRESSURE HIGH (W-44-AHP-PSH-503-1-2)	W-44-AHP-PSH-503-1-2/DROP 15REM2-B1M5A2+	2+ A2
	W-44-AHP-PSH-503-1-2/DROP 15REM2-B1M5B2-	2- B2
OIL PRESSURE LOW LOW (W-44-LOS-PSLL-54-1-2)	W-44-LOS-PSLL-54-1-2/DROP 15REM2-B1M5A3+	3+ A3
	W-44-LOS-PSLL-54-1-2/DROP 15REM2-B1M5B3-	3- B3
MAC 1-2 DISCHARGE TEMP HIGH HIGH (W-44-AHP-TSHH-506-1-2)	W-44-AHP-TSHH-506-1-2/DROP 15REM2-B1M5A4+	4+ A4
	W-44-AHP-TSHH-506-1-2/DROP 15REM2-B1M5B4-	4- B4
MAC 1-2 PANEL E-STOP (W-44-AHP-PB-501-1-2)	W-44-AHP-PB-501-1-2/DROP 15REM2-B1M5A5+	5+ A5
	W-44-AHP-PB-501-1-2/DROP 15REM2-B1M5B5-	5- B5
MAC 1-2 AUX OIL PUMP RUN STATUS (W-44-YI-50-1-2)	W-44-YI-50-1-2/DROP 15REM2-B1M5A6+	6+ A6
	W-44-YI-50-1-2/DROP 15REM2-B1M5B6-	6- B6
		7+ A7
		7- B7
		8+ A8
		8- B8
		9+ A9
		9- B9
		10+ A10
		10- B10
		11+ A11
		11- B11
		12+ A12
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		13+ A13
		13- B13
		14+ A14
		14- B14
		15+ A15
		15- B15
		16+ A16
		16- B16
		C17, C18 GND
		A18 PS-
		A17, B17 PS+
		C1-C17 RSV

DIGITAL INPUTS
24/48VDC FUSED
ELECT 1C31232G02
PER 15X00034G01
BRANCH 1, MODULE 5

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-2 MAC 1-2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E505-513
DRAWING NUMBER

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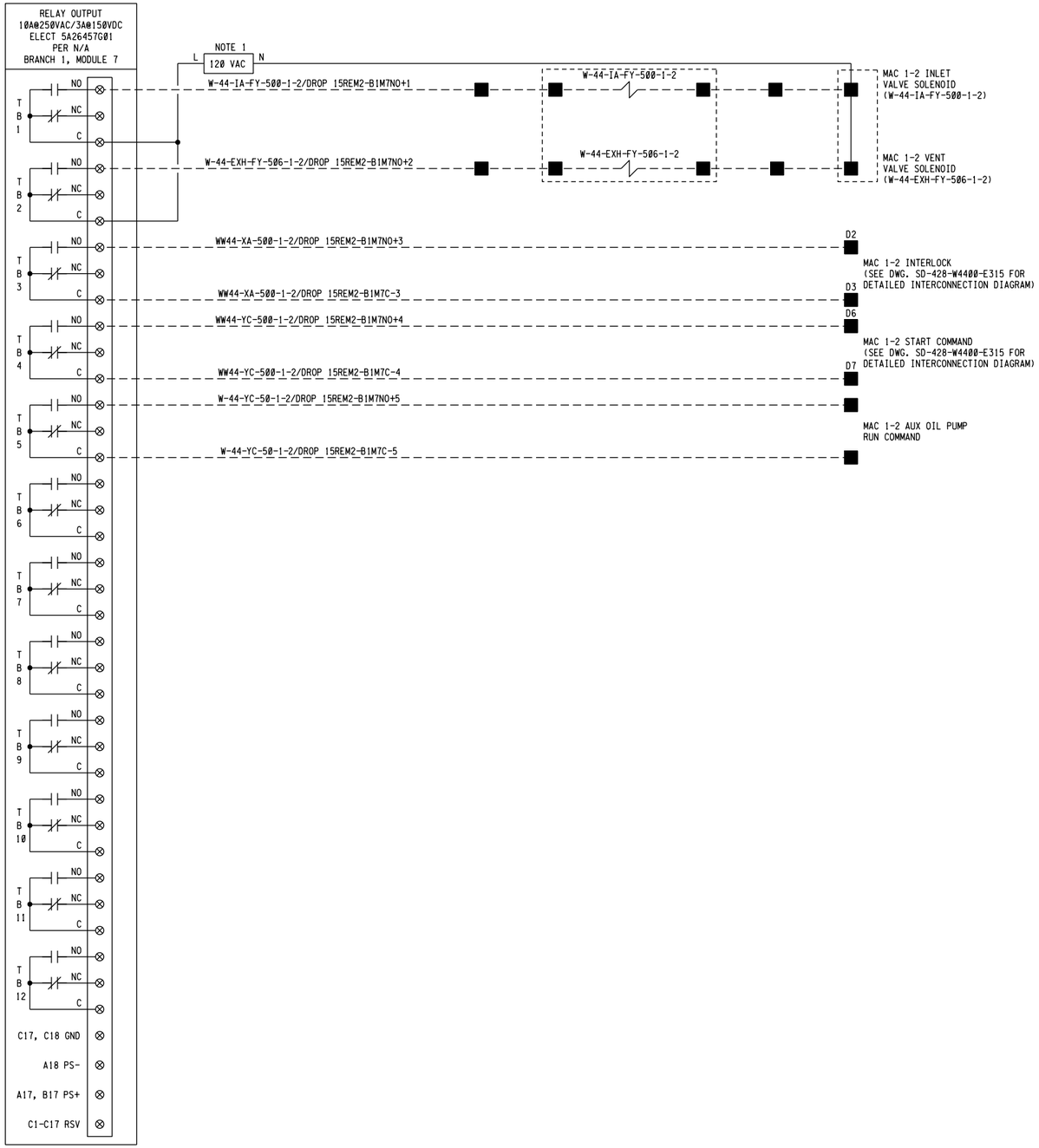
REV.



NOTES:

1. FOR POWER DETAILS, SEE SHEET SD428-W4400-E505-510

3" ON ORIGINAL DOCUMENT

0 1 2 3

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT	DESIGN BY: R. SPEYRER	EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO.1 OAKLAND, CALIFORNIA
	DRAWN BY: X. SUN	
	DESIGN CHECKED BY R.P.E. NO. 7556 K. TRACY	MAIN WASTEWATER TREATMENT PLANT OXYGEN PRODUCTION PLANT
	PROJECT MANAGER R.P.E. NO. J. JANCAITIS	ELECTRICAL
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097 D. RICHARDSON	RIO-15-2 MAC 1-2 PANEL I/O MODULE SCHEMATIC
EBMUD	PROJECT MANAGER R.P.E. NO. 95046 J. LAW	
	RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604 R. MAC	SCALE NONE DATE 28JUN24

SD428 - MWWTP OXYGEN PLANT REHABILITATION

SD428-W4400-E505-514 (DRAWING NUMBER) — Ø (REV.)

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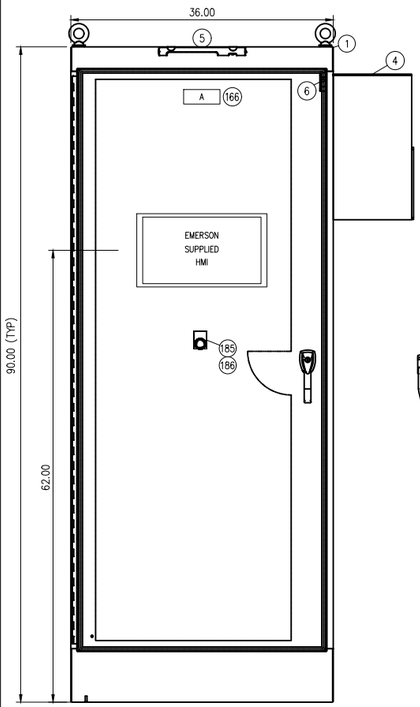
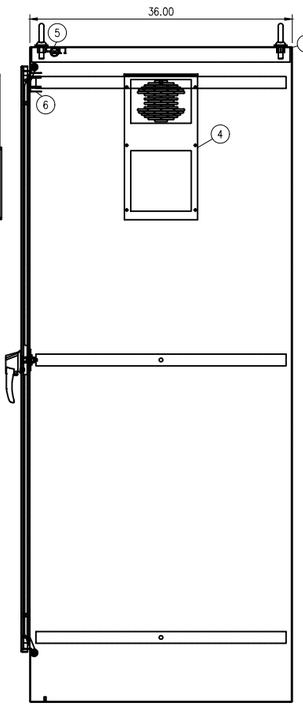
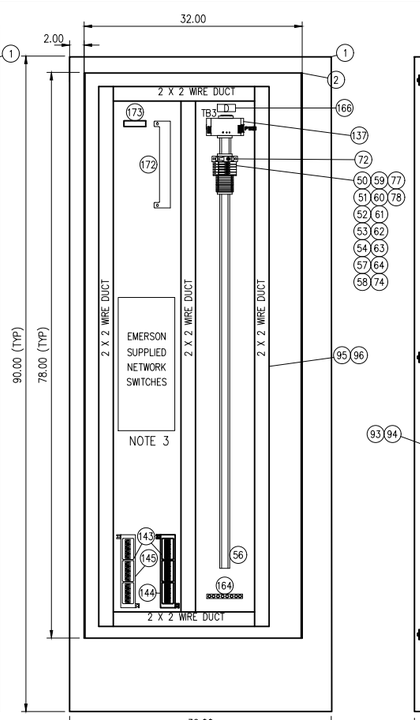


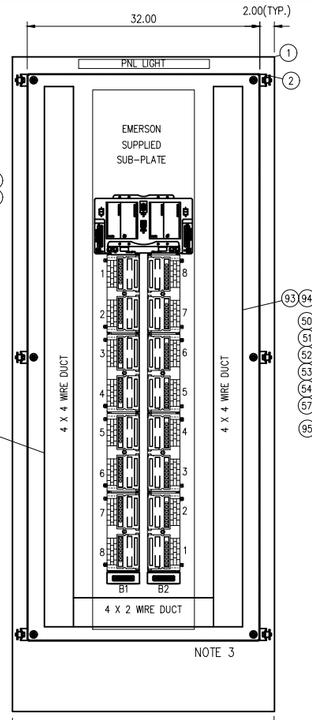
ENCLOSURE EXTERIOR FRONT VIEW
(NOTES 1 & 2)



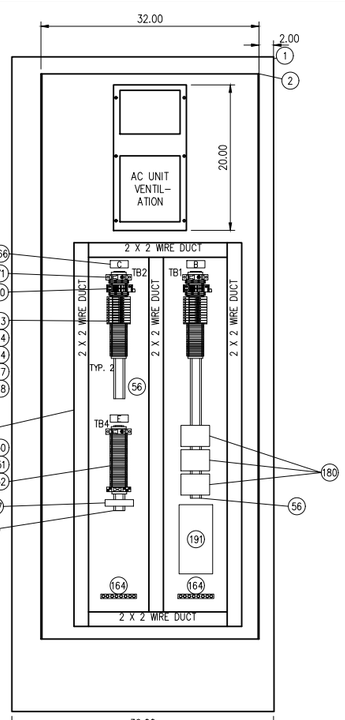
ENCLOSURE EXTERIOR SIDE VIEW
(NOTES 1 & 2)



LEFT PANEL



BACK PLATE



RIGHT PANEL

NOTES:

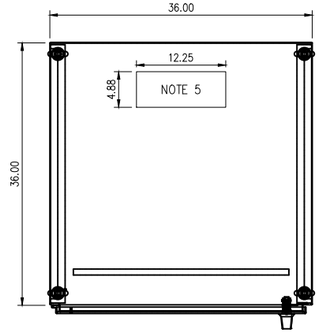
1. ENCLOSURE SHALL SIT ON A 4" HEIGHT HOUSEKEEPING PAD.
2. ENCLOSURE SHALL BE SS316, TYPE NEMA 4X, AND HAVE PROVISION FOR PADLOCK.
3. SUBPLATE, HMI, AND NETWORK SWITCHES SHALL BE SUPPLIED BY EMERSON AND INSTALLED BY THE CONTRACTOR AFTER COMPLETION OF PANEL. CONTRACTOR SHALL COORDINATE WITH EMERSON FOR RECEIVING THE EQUIPMENT AND INSTALLATION SEQUENCE AND SCHEDULE. EMERSON SHALL SUPPLY ETHERNET AND FIBER PATCH CORDS. CONTRACTOR SHALL PROVIDE AND INSTALL POWER CONNECTIONS TO EMERSON EQUIPMENT AS DIRECTED BY EMERSON.
4. NAMEPLATE SHALL BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375
5. AREA RESERVED FOR CONDUIT ENTRY.
6. ENCLOSURE LIGHT AND INTRUSION SWITCH SHALL BE MOUNTED WITH STAINLESS STEEL SCREWS, NUTS AND NEOPRENE BONDED SEALING WASHERS TO MAINTAIN THE NEMA 4X RATING OF ENCLOSURE. (SEALING WASHER MANUFACTURER & ITEM NUMBER: THE HILLMAN GROUP #290250 OR EQUAL)

NAMEPLATE SCHEDULE (NOTE 4)

ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 2"	RIO-23-2 MAC 2-2 PANEL	NOTE 4
B	2.5" x 1"	TB1	NOTE 4
C	2.5" x 1"	TB2	NOTE 4
D	2.5" x 1"	TB3	NOTE 4
E	2.5" x 1"	TB4	NOTE 4

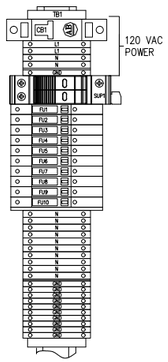
BILL OF MATERIALS

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
				ENCLOSURE & RELATED EQUIPMENT	
1	1	HAMMOND MANUFACTURING	HNMF090636SS	ENCLOSURE, NEMA 4X, 90.00"H x 36.00"W x 36.00"D, 316SS	ENCLOSURE
2	1	HAMMOND MANUFACTURING	90YP3V	INTERNAL PANEL, 78" X 32"	BACK PANEL
3	2	SAGINAW CONTROL	SCE-9068MP50	SIDE PANEL, 78" X 30"	SIDE PANELS
4	1	HAMMOND MANUFACTURING	DTS3081A1115N4SS	AC UNIT 2500 BTU/HR - 115V - NEMA 4X	AC UNIT
5	1	HOFFMAN	LED4150S	ENCLOSURE LIGHT	LT-01
6	1	HOFFMAN	ALPSWD	ENCLOSURE DOOR SWITCH	SW-01
				TERMINAL BLOCKS & RELATED EQUIPMENT	
50	63	ALLEN BRADLEY	1492-J4	TERMINAL BLOCK 1 TIER	TB1, TB2, TB3, TB4
51	6	ALLEN BRADLEY	1492-EBJ3	TERMINAL BLOCK END BARRIER, 1 TIER	TB1, TB2, TB3, TB4
52	10	ALLEN BRADLEY	1492-EAJ35	TERMINAL BLOCK END ANCHOR	TB1, TB2, TB3, TB4
53	2	ALLEN BRADLEY	1492-CAJ5-10	TERMINAL BLOCK JUMPER, 10 POLE	TB1, TB2
54	27	ALLEN BRADLEY	1492-JG3	TERMINAL BLOCK, GROUNDING	TB1, TB2
55	3	ALLEN BRADLEY	1492-DR6	DIN RAIL, SLOTTED	TB1, TB2, TB3
57	30	ALLEN BRADLEY	1492-H4	FUSED TERMINAL BLOCK, NEON INDICATOR	FU1-FU29
58	6	ALLEN BRADLEY	1492-H6	FUSED TERMINAL BLOCK, LED INDICATOR	FU21-26
59	3	ALLEN BRADLEY	1492-N37	FUSED TERMINAL BLOCK END BARRIER	FU10, FU20, FU30
60	3	ALLEN BRADLEY	1492-N49	FUSE BLOCK SIDE JUMPER 5-10 POLE	FU1-FU10, FU11-20, FU21-FU25
61	3	ALLEN BRADLEY	1492-SJ5	FUSE BLOCK SIDE JUMPER INSULATING SLEEVE	FU1-FU10, FU11-20, FU21-FU25
62	1	ALLEN BRADLEY	1492-MSX12	GROUNDING TERMINAL BLOCK BLANK MARKING TAGS, 144 CT.	TB1, TB2, TB3
63	2	ALLEN BRADLEY	1492-MSX8	TERMINAL BLOCK BLANK MARKING TAGS, 2 TIER, 144 CT.	TB1, TB2, TB3
64	1	ALLEN BRADLEY	1492-MSBX12	FUSE BLOCK BLANK MARKING TAGS, 100 CT.	FU1-FU25
71	3	ALLEN BRADLEY	1489-M1D200	CIRCUIT BREAKER, 20AMP, SINGLE POLE	CB1, CB2, CB6
72	3	ALLEN BRADLEY	1489-M1D100	CIRCUIT BREAKER, 10AMP, SINGLE POLE	CB3, CB7
74	26	BUSSMANN	AGC-1	FUSE, 1A, 250V, FAST ACTING	FU3-FU5, FU12-FU20, FU26 PLUS SPARES
77	9	BUSSMANN	AGC-10	FUSE, 10A, 250V, FAST ACTING	FU10 PLUS SPARE
78	11	BUSSMANN	AGC-3	FUSE, 3A, 250V, FAST ACTING	FU1, FU2, FU11, FU21-24, PLUS SPARES
80	3	PHOENIX CONTACT	2905348	VAL-SEC-T2-18-175-FM, 120VAC SURGE PROTECTOR	SUP1, SUP2, PLUS 1 SPARE
81	1	ALLEN BRADLEY	700-HK32A1	GENERAL PURPOSE SLIM LINE RELAY, 120VAC	RL500
82	1	ALLEN BRADLEY	700-HN121	RELAY SOCKET	RL500
				WIREDUCT	
93	18FT	PANDUIT	F4X4LG-5	WIRING DUCT, 4"W x 4"H	
94	18FT	PANDUIT	C-4LG-5	WIRING DUCT COVER, 4"W	
95	48FT	PANDUIT	F2X2LG-5	WIRING DUCT, 2"W x 2"H	
96	48FT	PANDUIT	C2LG-5	WIRING DUCT COVER, 2"W	
				POWER SUPPLIES	
137	1	PHOENIX CONTACT	2866763	POWER SUPPLY, 24A/120VAC IN, 24VDC, 10 AMP	PWR1
				COMMUNICATION	
143	1	EMERSON	EX9013305	MINI-COM PATCH PANEL - 12 PORTS	
144	1	EMERSON	EX9011BH01	MINI-COM MODULE FOR FO ST	
145	1	PANDUIT	CJ6GBBYSWW	MINI-COM MODULE FOR TIA 568G.1/T8 JACK	
				MISCELLANEOUS PANEL EQUIPMENT	
164	2	PANDUIT	LUGB2/0-414-6	GROUND BAR	
166	1	PANEL FABRICATOR		NAMEPLATE, PHENOLIC, ENGRAVED	SEE SCHEDULE ON EQUIPMENT LAYOUT
172	1	EMERSON	2379C68001	RTD ASSEMBLY	
173	1	PHOENIX CONTACT	2864587	TEMP XMIT MICR PL TS-LP-1-EX	
180	1	BENTLY NEVADA	950-35-70-03-00	VIBRATION TRANSMITTER	
185	1	ALLEN BRADLEY	800H-FRXTBA1	30MM PUSH-PULL/TWIST PLUSHBUTTON, MUSHROOM HEAD, RED	
186	1	ALLEN BRADLEY	800H-W30UE	30MM PUSH BUTTON LEGEND PLATE, JUMBO, CUSTOM TEXT, "SYSTEM STOP"	
187	1	WILCOXON	73301	USER-CONFIGURABLE INTELLIGENT VIBRATION TRANSMITTER	
191	1	BEL	BEL-3600A	RTD MODULE	PROVIDED BY ELECTRICAL CONTRACTOR



ENCLOSURE EXTERIOR TOP VIEW

TERMINAL BLOCK LAYOUTS



(1) 20 AMP CIRCUIT BREAKER
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(14) 1-TIER TERMINALS
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(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
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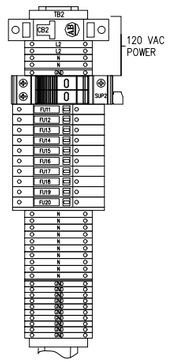

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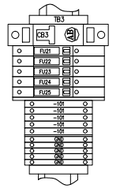
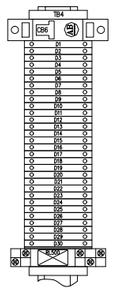
(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(5) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(5) GROUNDING TERMINALS
(5) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(30) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(1) 120V RELAY
(2) END ANCHORS

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

NO.	DATE	REVISION	BY	REC.	APP.

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. SPEYRER
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

RIO-23-2 MAC 2-2 PANEL
EQUIPMENT ELEVATION

SCALE NONE	SD428-W4400-E506	0
DATE 28JUN24	DRAWING NUMBER	REV.

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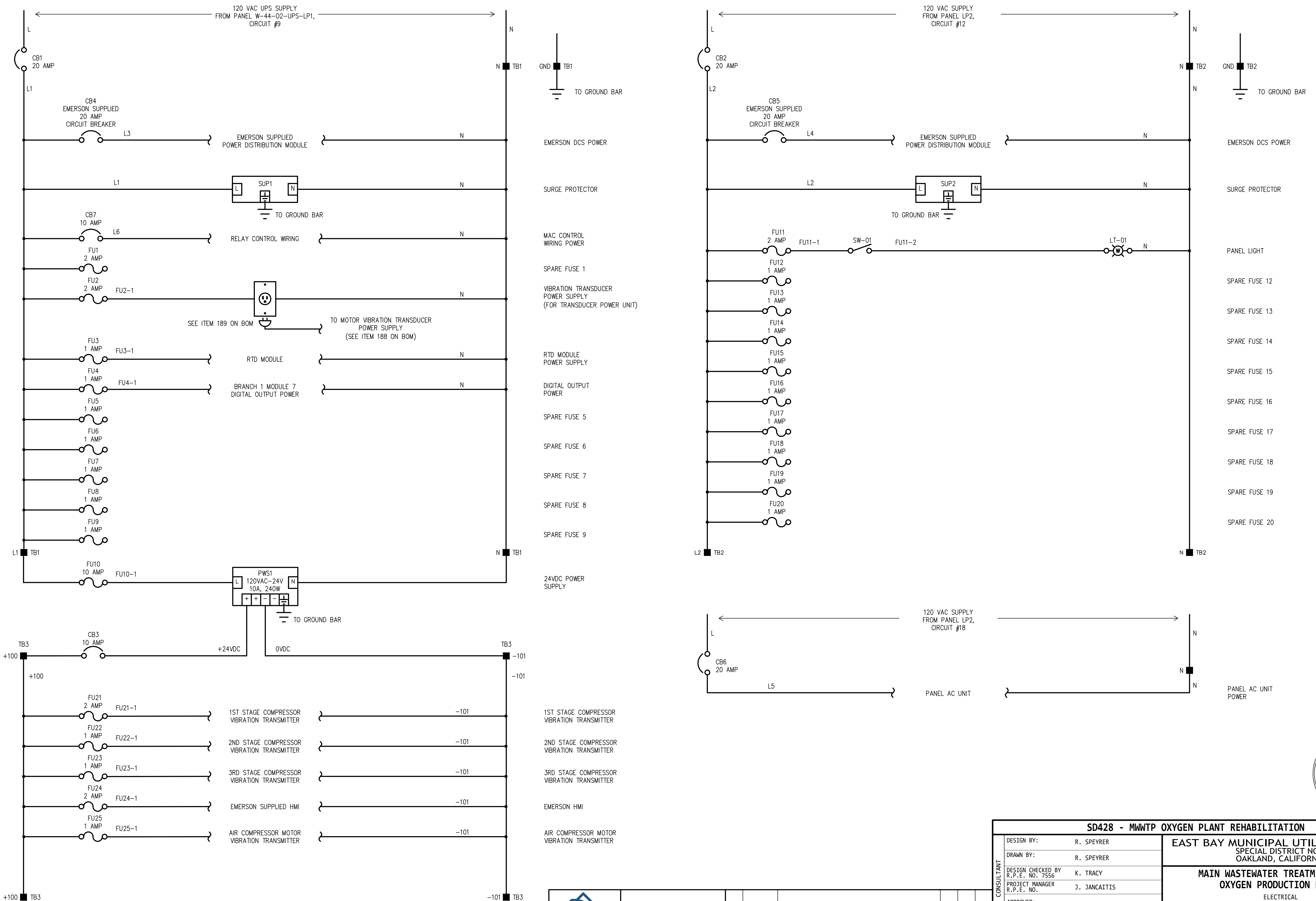

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER KYLE EVAN TRACY CS. 7556 CONTROL SYSTEM STATE OF CALIFORNIA 06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	R. SPEYRER
	DRAWN BY:	R. SPEYRER
	DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-2 MAC 2-2 PANEL
POWER DISTRIBUTION

SCALE NONE
DATE 28JUN24

SD428-W4400-E506-E510
DRAWING NUMBER

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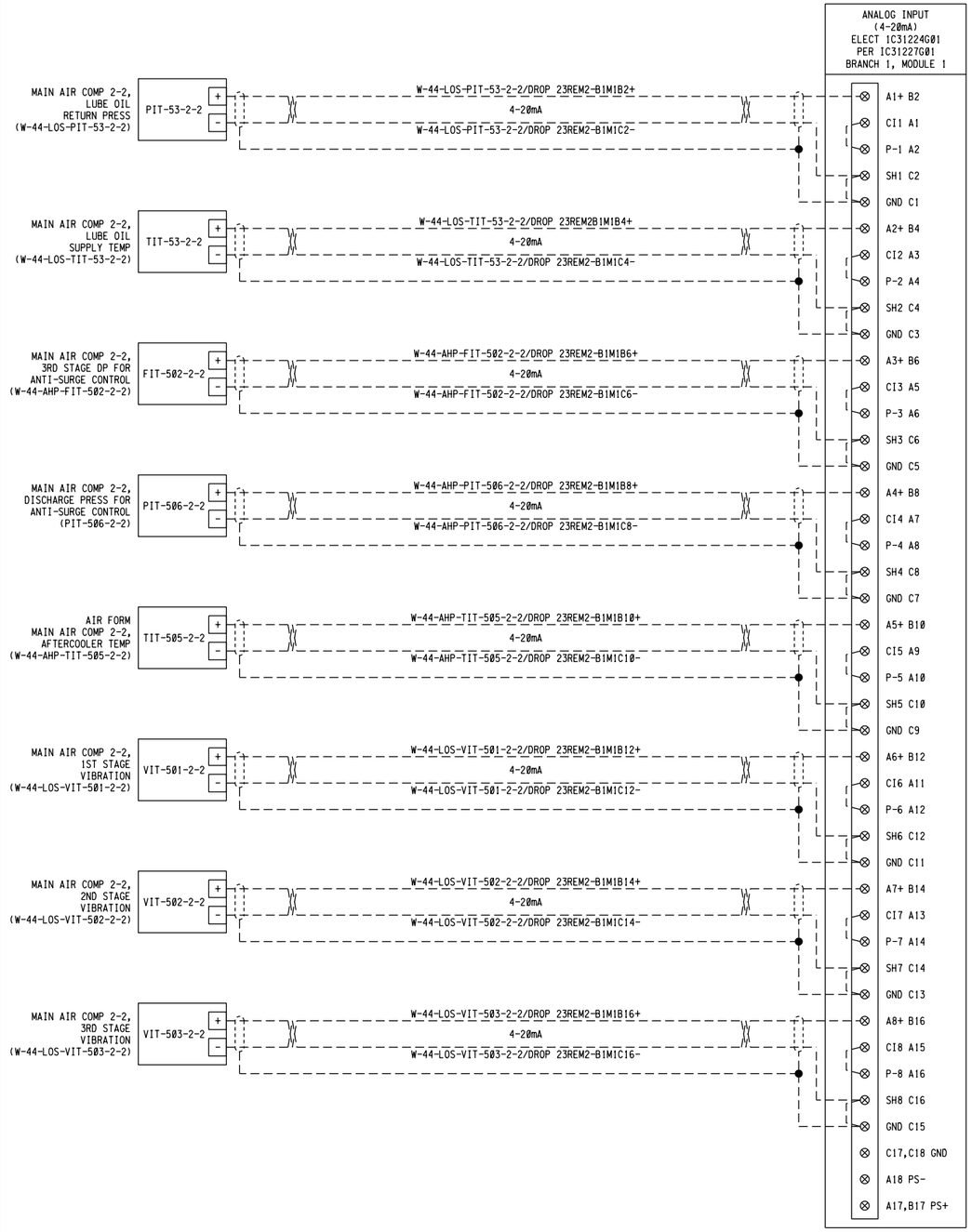

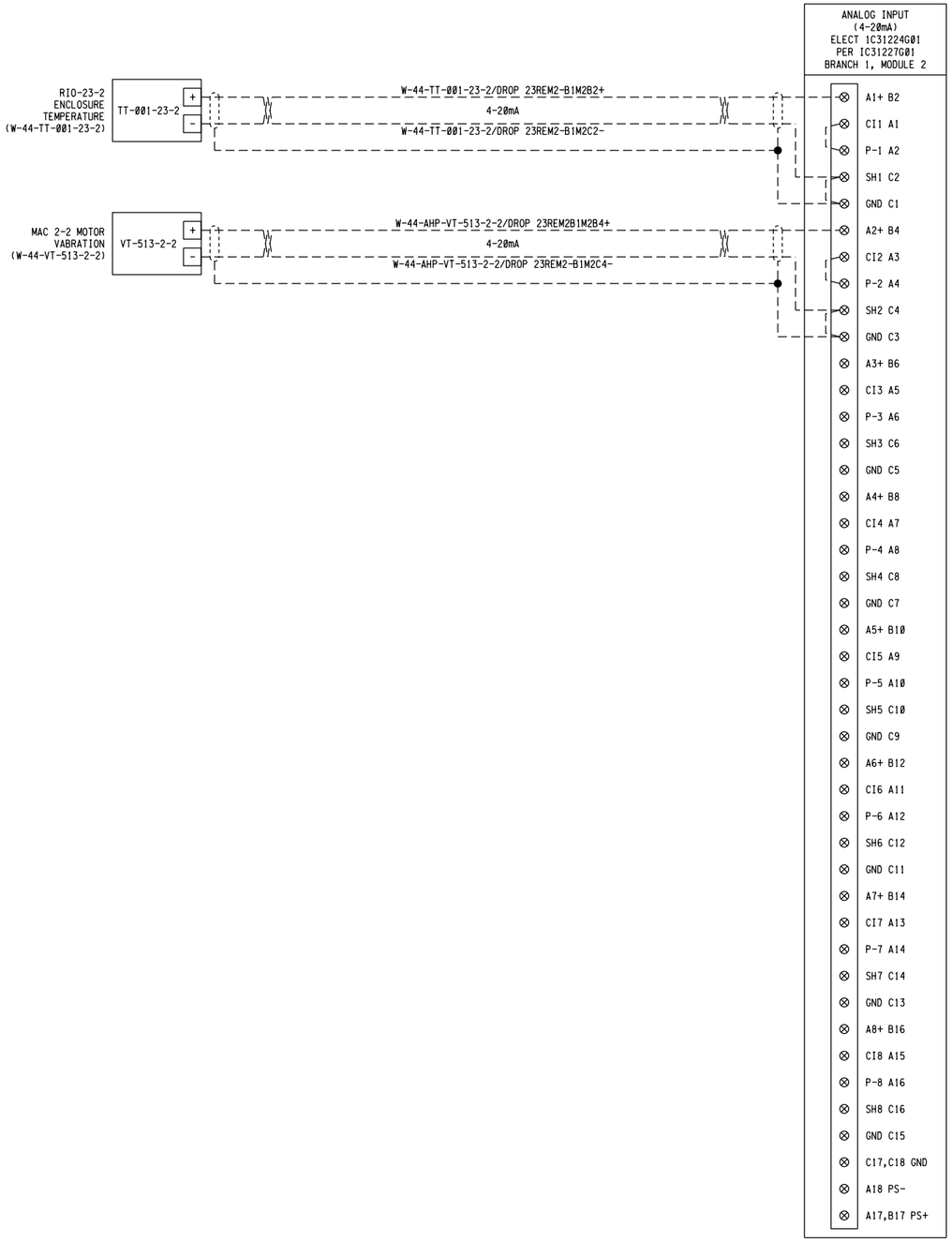

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SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-2 MAC 2-2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E506-511
DRAWING NUMBER

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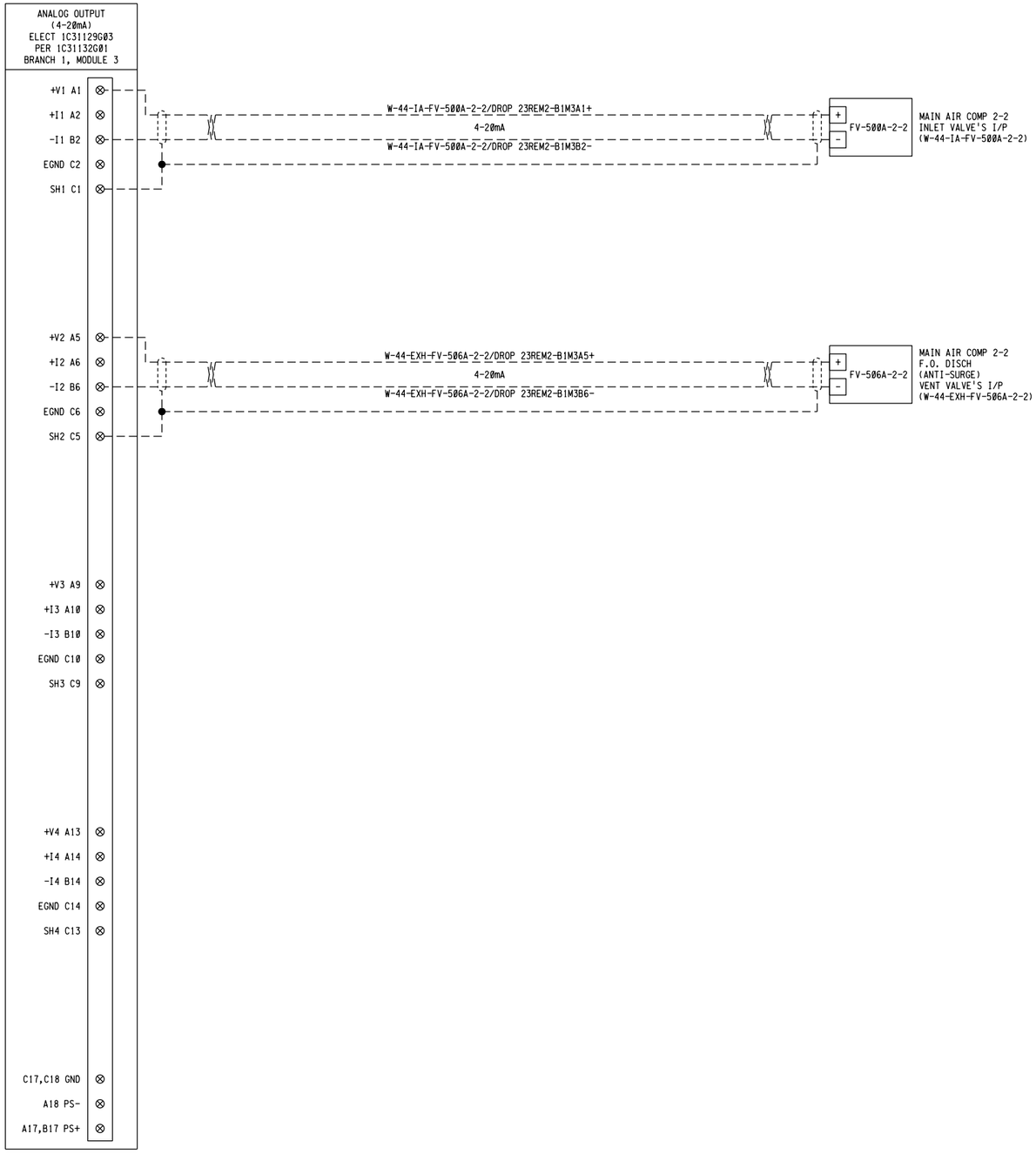

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
C.S. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-2 MAC 2-2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E506-512
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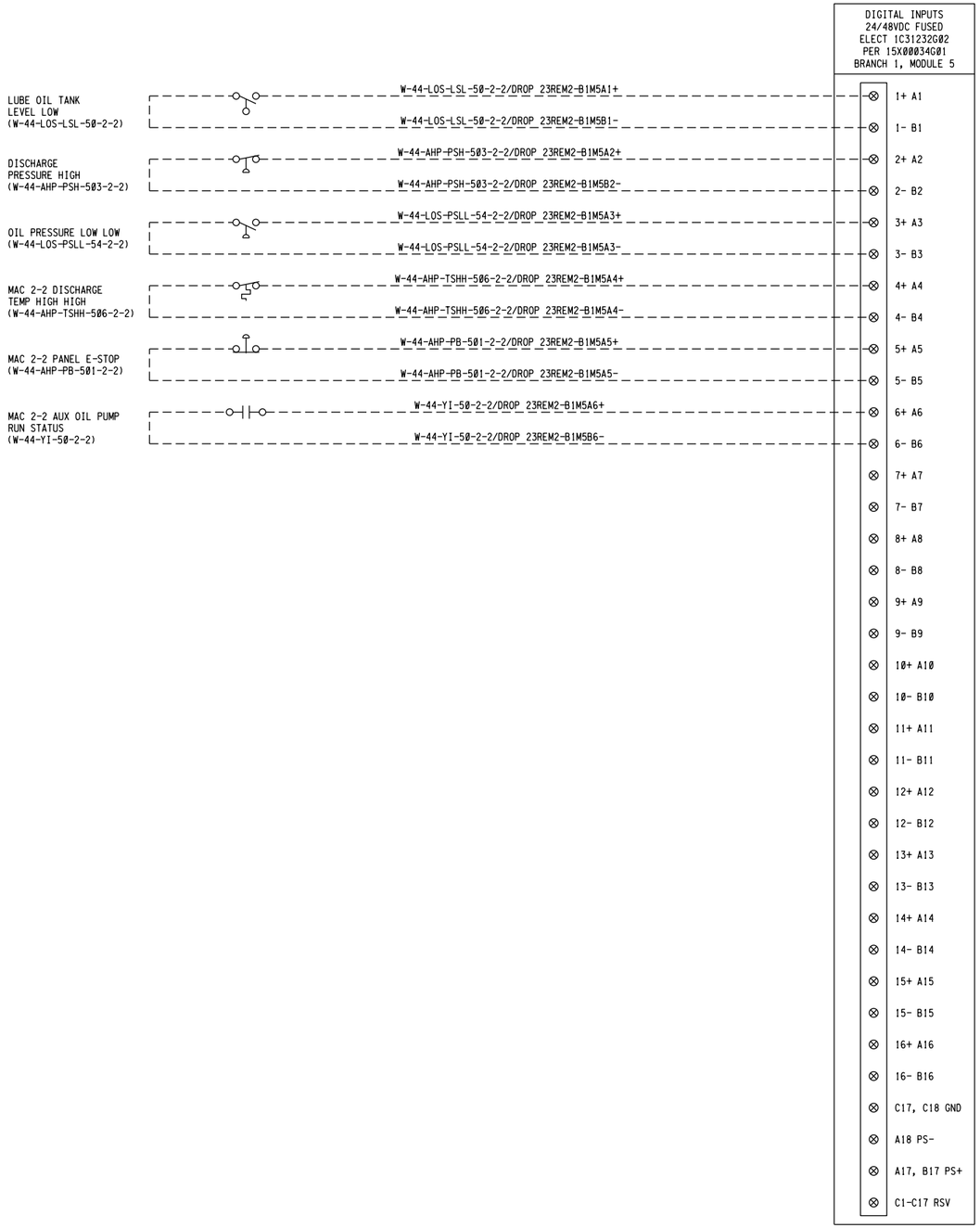

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

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PROJECT MANAGER R.P.E. NO. 95046	J. LAW
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-2 MAC 2-2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E506-513
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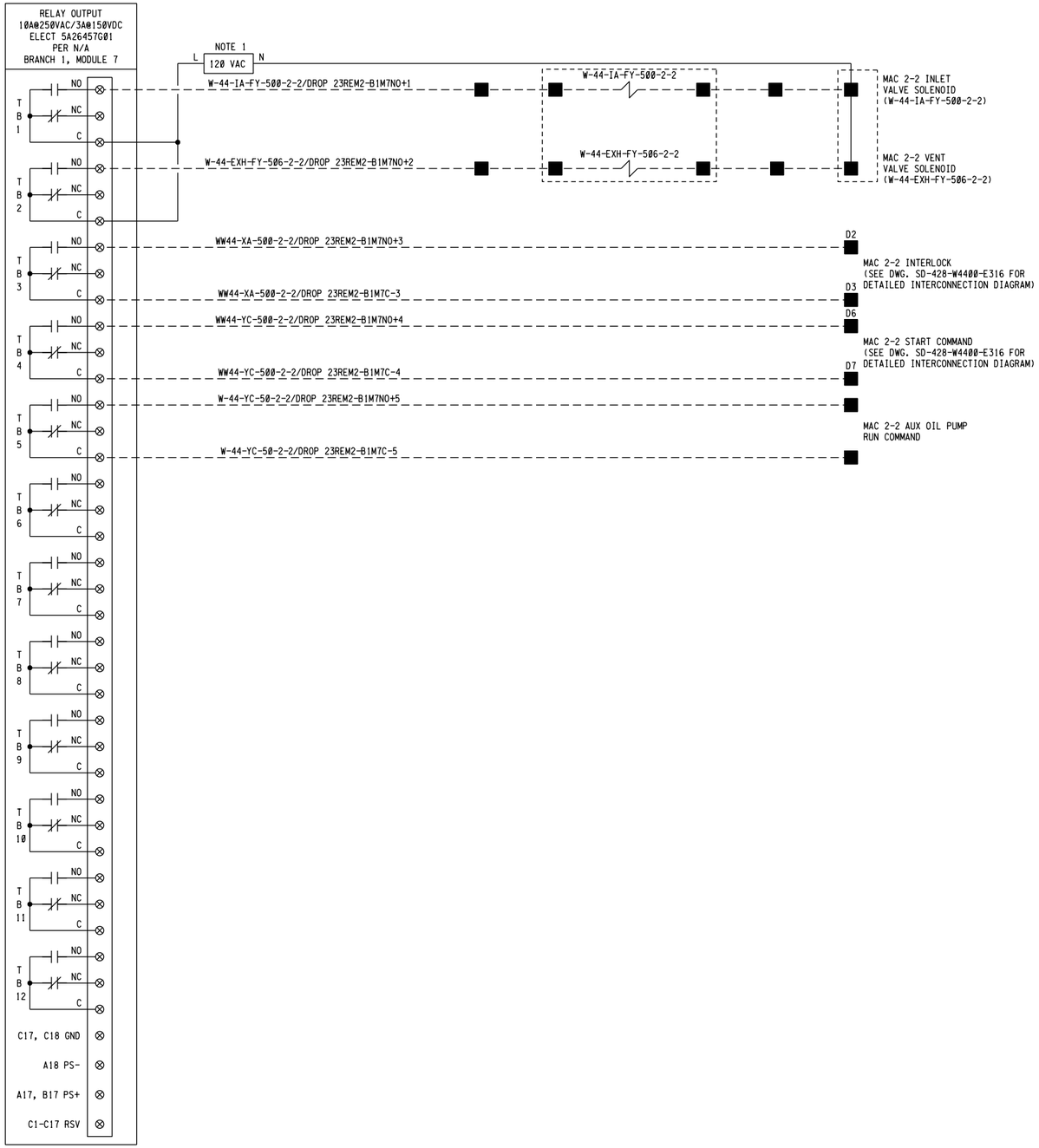

NOTES:

1. FOR POWER DETAILS, SEE SHEET SD428-W4400-E506-510

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-2 MAC 2-2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E506-514
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DATE: 28JUN-2024 10:05
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PLOT SCALE: 0.166667:1

ANALOG INPUT (4-20mA)
ELECT 1C31224G01
PER 1C31227G01
BRANCH 1, MODULE 1

UNBALANCED AIR FLOW TRANSMITTER (W-44-AHP-FIT-115-1)	FIT-115-1	W-44-AHP-FIT-115-1/DROP 15REM3-B1M1B2+	4-20mA	W-44-AHP-FIT-115-1/DROP 15REM3-B1M1C2-
COLD END AIR FLOW TRANSMITTER (W-44-AHP-FIT-120-1)	FIT-120-1	W-44-AHP-FIT-120-1/DROP 15REM3B1M1B4+	4-20mA	W-44-AHP-FIT-120-1/DROP 15REM3-B1M1C4-
SHELF FLOW TRANSMITTER (W-44-N2-FIT-340-1)	FIT-340-1	W-44-N2-FIT-340-1/DROP 15REM3-B1M1B6+	4-20mA	W-44-N2-FIT-340-1/DROP 15REM3-B1M1C6-
RHX PASS "A" AIR / WASTE PRESS (W-44-AHP-PIT-200-1)	PIT-200-1	W-44-AHP-PIT-200-1/DROP 15REM3-B1M1B8+	4-20mA	W-44-AHP-PIT-200-1/DROP 15REM3-B1M1C8-
RHX PASS "A" AIR / WASTE PRESS (W-44-N2-PIT-300-1)	PIT-300-1	W-44-N2-PIT-300-1/DROP 15REM3-B1M1B10+	4-20mA	W-44-N2-PIT-300-1/DROP 15REM3-B1M1C10-
KETTLE LEVEL TRANSMITTER (IN W.C) (W-44-O2-LIT-330-1)	LIT-330-1	W-44-O2-LIT-330-1/DROP 15REM3-B1M1B12+	4-20mA	W-44-O2-LIT-330-1/DROP 15REM3-B1M1C12-
COLD BOX UPPER COLUMN PURSSURE (W-44-N2-PIT-349-1)	PIT-349-1	W-44-N2-PIT-349-1/DROP 15REM3-B1M1B14+	4-20mA	W-44-N2-PIT-349-1/DROP 15REM3-B1M1C14-
COLD BOX MAIN CONDENSER LEVEL TRANSMITTER (W-44-O2-LIT-352-1)	LIT-352-1	W-44-O2-LIT-352-1/DROP 15REM3-B1M1B16+	4-20mA	W-44-O2-LIT-352-1/DROP 15REM3-B1M1C16-

A1+ B2	
CI1 A1	
P-1 A2	
SH1 C2	
GND C1	
A2+ B4	
CI2 A3	
P-2 A4	
SH2 C4	
GND C3	
A3+ B6	
CI3 A5	
P-3 A6	
SH3 C6	
GND C5	
A4+ B8	
CI4 A7	
P-4 A8	
SH4 C8	
GND C7	
A5+ B10	
CI5 A9	
P-5 A10	
SH5 C10	
GND C9	
A6+ B12	
CI6 A11	
P-6 A12	
SH6 C12	
GND C11	
A7+ B14	
CI7 A13	
P-7 A14	
SH7 C14	
GND C13	
A8+ B16	
CI8 A15	
P-8 A16	
SH8 C16	
GND C15	
C17,C18 GND	
A18 PS-	
A17,B17 PS+	

ANALOG INPUT (4-20mA)
ELECT 1C31224G01
PER 1C31227G01
BRANCH 1, MODULE 2

MAIN CONDENSER PRESSURE (W-44-O2-PIT-352-1)	PIT-352-1	W-44-O2-PIT-352-1/DROP 15REM3-B1M2B2+	4-20mA	W-44-O2-PIT-352-1/DROP 15REM3-B1M2C2-
INSTRUMENT AIR PRESS (W-44-IA-PIT-590-1)	PIT-590-1	W-44-IA-PIT-590-1/DROP 15REM3-B1M2B4+	4-20mA	W-44-IA-PIT-590-1/DROP 15REM3-B1M2C4-
OXYGEN FLOW TRANSMITTER (W-44-O2-FIT-600-1)	FIT-600-1	W-44-O2-FIT-600-1/DROP 15REM3-B1M2B6+	4-20mA	W-44-O2-FIT-600-1/DROP 15REM3-B1M2C6-
PRODUCT Ø2 FROM COLD BOX PRESS (W-44-O2-PIT-600-1)	PIT-600-1	W-44-O2-PIT-600-1/DROP 15REM3-B1M2B8+	4-20mA	W-44-O2-PIT-600-1/DROP 15REM3-B1M2C8-
COLD END DELTA TEMP (W-44-CAD-TDIT-186-1)	TDIT-186-1 (+ / - / GND)	W-44-CAD-TDIT-186-1/DROP 15REM3-B1M2B10+	4-20mA	W-44-CAD-TDIT-186-1/DROP 15REM3-B1M2A9-
TURBINE LUBE OIL PUMP DISCHARGE PRESS (W-44-LOR-PIT-20-1)	PIT-20-1	W-44-LOR-PIT-20-1/DROP 15REM3-B1M2B14+	4-20mA	W-44-LOR-PIT-20-1/DROP 15REM3-B1M2C14-

TDIT-186-1: 24V DC, GND

A1+ B2	
CI1 A1	
P-1 A2	
SH1 C2	
GND C1	
A2+ B4	
CI2 A3	
P-2 A4	
SH2 C4	
GND C3	
A3+ B6	
CI3 A5	
P-3 A6	
SH3 C6	
GND C5	
A4+ B8	
CI4 A7	
P-4 A8	
SH4 C8	
GND C7	
A5+ B10	
CI5 A9	
P-5 A10	
SH5 C10	
GND C9	
A6+ B12	
CI6 A11	
P-6 A12	
SH6 C12	
GND C11	
A7+ B14	
CI7 A13	
P-7 A14	
SH7 C14	
GND C13	
A8+ B16	
CI8 A15	
P-8 A16	
SH8 C16	
GND C15	
C17,C18 GND	
A18 PS-	
A17,B17 PS+	

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SOLUTIONWERKS™ INCORPORATED

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
No. CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
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RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

RIO-15-3 TURBINE/CRYO PLANT 1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E507-511
DRAWING NUMBER

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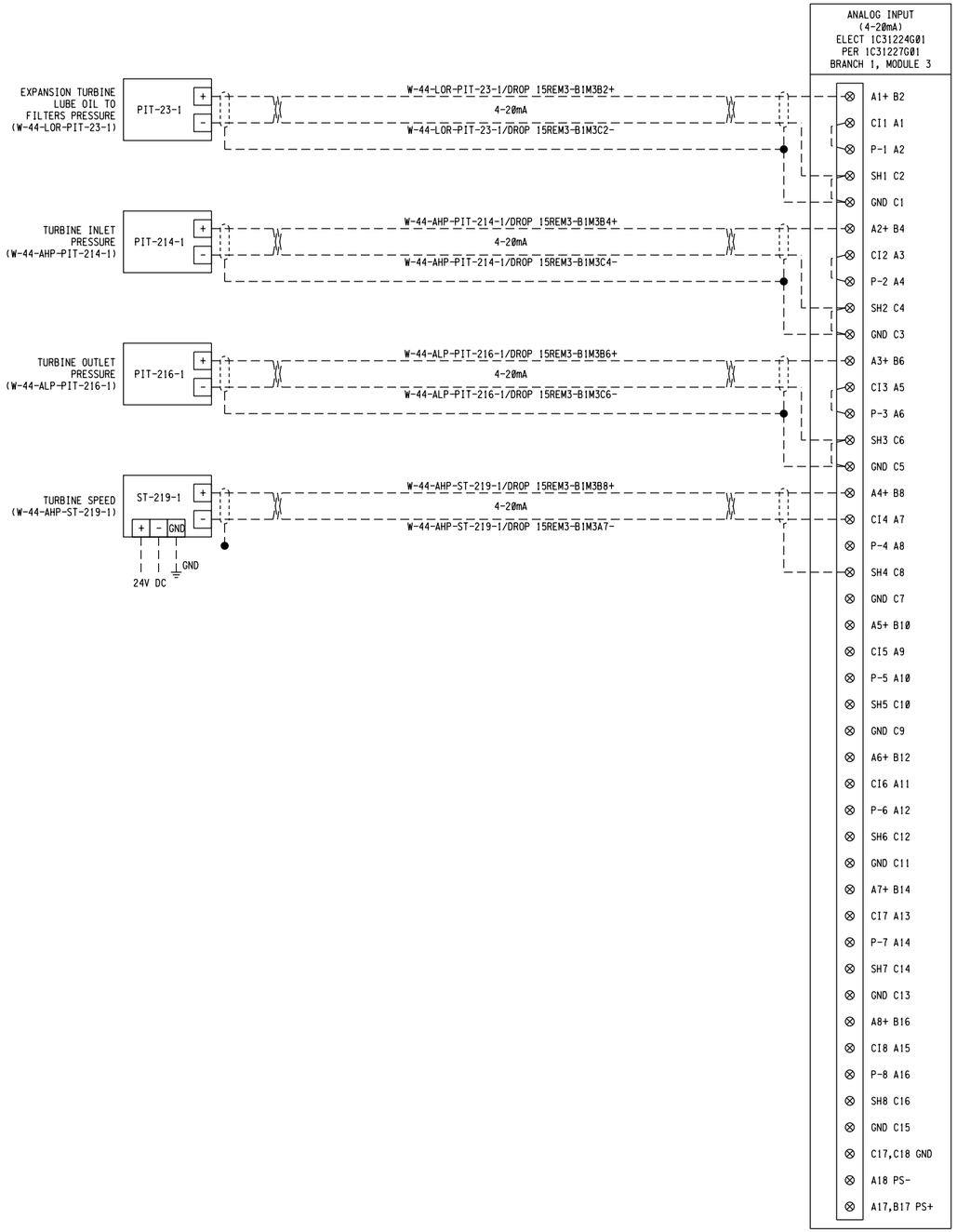
REV.



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STATE OF CALIFORNIA
05/29/2024

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OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

RIO-15-3 TURBINE/CRYO PLANT 1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E507-512
DRAWING NUMBER

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REF 5:
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ANALOG OUTPUT
(4-20mA)
ELECT 1C31129G03
PER 1C31132G01
BRANCH 1, MODULE 5

+V1 A1
+I1 A2
-I1 B2
EGND C2
SH1 C1

W-44-O2-LV-330A-1/DROP 15REM3-B1M5A1+
4-20mA
W-44-O2-LV-330A-1/DROP 15REM3-B1M5B2-

LV-330A-1
KETTLE LEVEL
CONTROL VALVE
(W-44-AHP-PIT-214-1)

+V2 A5
+I2 A6
-I2 B6
EGND C6
SH2 C5

W-44-N2-FV-340N-1/DROP 15REM3-B1M5A5+
4-20mA
W-44-N2-FV-340N-1/DROP 15REM3-B1M5B6-

FV-340N-1
SHELF FLOW
CONTROL VALVE
(W-44-N2-FV-340N-1)

+V3 A9
+I3 A10
-I3 B10
EGND C10
SH3 C9

W-44-O2-FV-X600X-1-1/DROP 15REM3-B1M5A9+
4-20mA
W-44-O2-FV-X600X-1-1/DROP 15REM3-B1M5B10-

FV-X600X-1-1
OYGEN PRODUCT
MID-POINT TEMPERATURE
CONTROL VALVE #1
(W-44-O2-FV-X600X-1-1)

+V4 A13
+I4 A14
-I4 B14
EGND C14
SH4 C13

W-44-O2-FV-X600X-1-2/DROP 15REM3-B1M5A13+
4-20mA
W-44-O2-FV-X600X-1-2/DROP 15REM3-B1M5B14-

FV-X600X-1-2
OXYGEN PRODUCT
MID-POINT TEMPERATURE
CONTROL VALVE #2
(W-44-O2-FV-X600X-1-2)

C17,C18 GND
A18 PS-
A17,B17 PS+

ANALOG OUTPUT
(4-20mA)
ELECT 1C31129G03
PER 1C31132G01
BRANCH 1, MODULE 6

+V1 A1
+I1 A2
-I1 B2
EGND C2
SH1 C1

W-44-O2-FV-600X-1/DROP 15REM3-B1M6A1+
4-20mA
W-44-O2-FV-600X-1/DROP 15REM3-B1M6B2-

FV-600X-1
OXYGEN
PRODUCT VALVE
(W-44-O2-FV-600X-1)

+V2 A5
+I2 A6
-I2 B6
EGND C6
SH2 C5

W-44-O2-FV-601X-1/DROP 15REM3-B1M6A5+
4-20mA
W-44-O2-FV-601X-1/DROP 15REM3-B1M6B6-

FV-601X-1
OXYGEN
VENT VALVE
(W-44-O2-FV-601X-1)

+V3 A9
+I3 A10
-I3 B10
EGND C10
SH3 C9

+V4 A13
+I4 A14
-I4 B14
EGND C14
SH4 C13

C17,C18 GND
A18 PS-
A17,B17 PS+

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-3 TURBINE/CRYO PLANT 1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E507-513
DRAWING NUMBER

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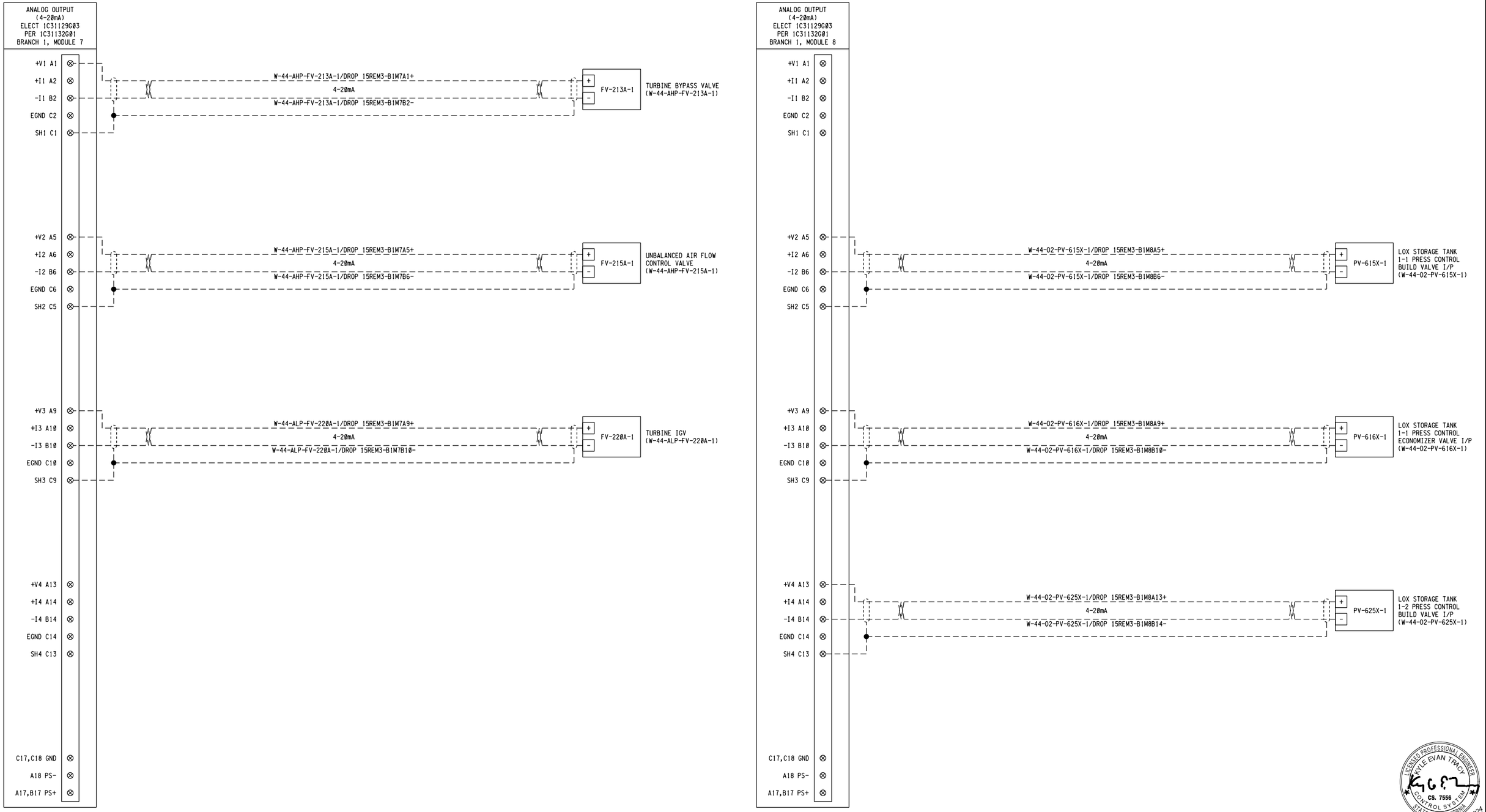

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KYLE EVAN TRACY
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STATE OF CALIFORNIA
06/28/2024

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OAKLAND, CALIFORNIA

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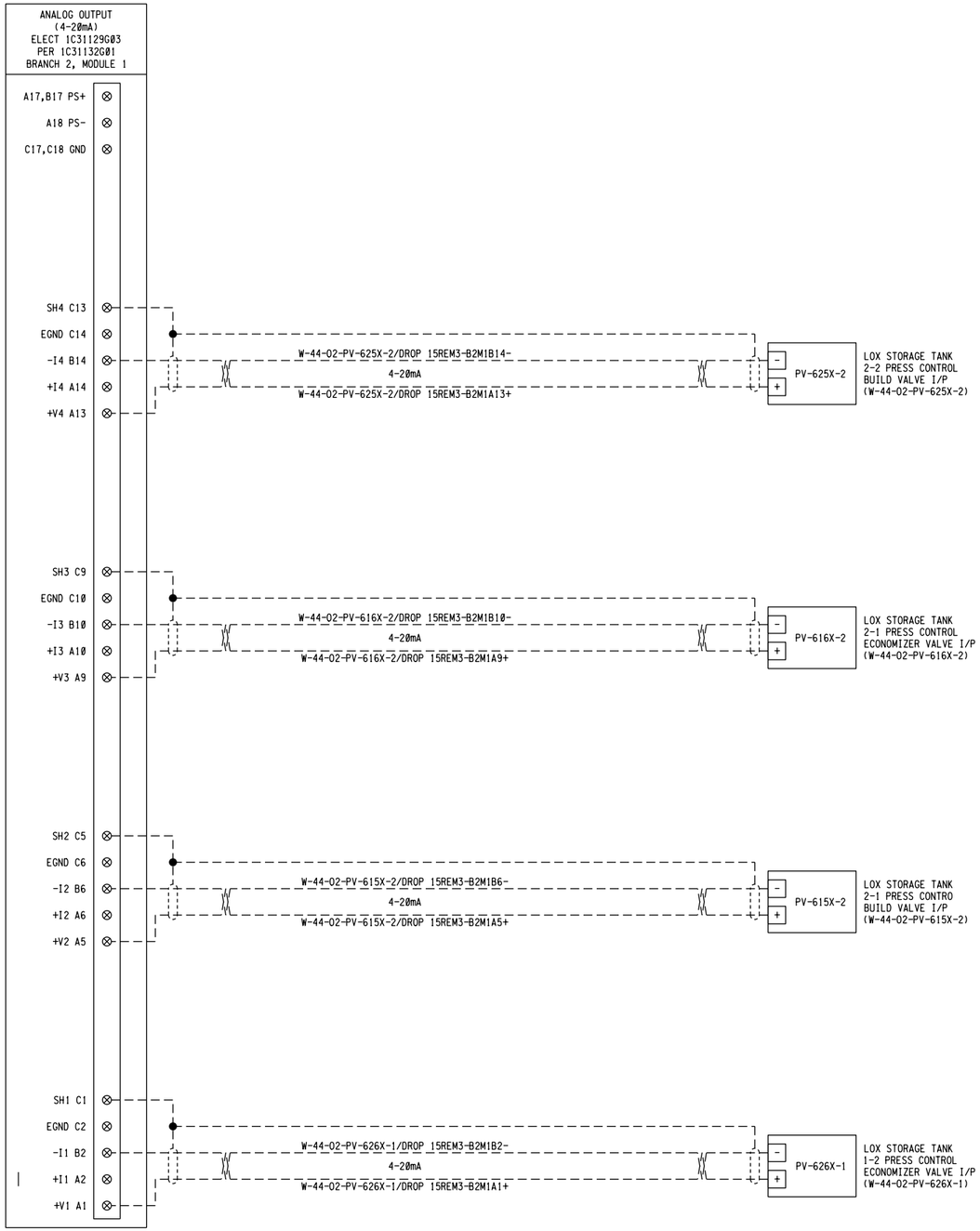

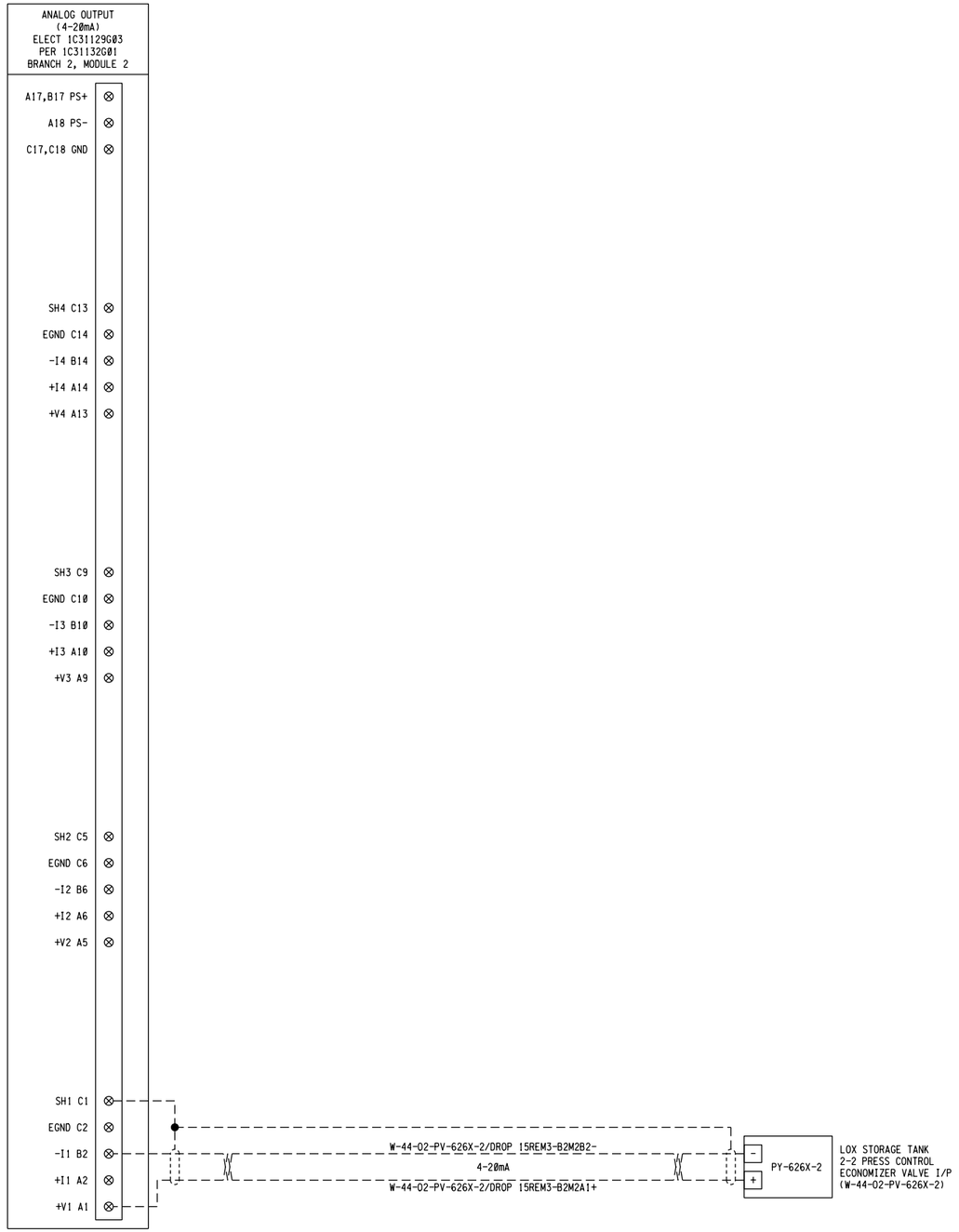

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CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

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SD428 - MWWTP OXYGEN PLANT REHABILITATION

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PROJECT MANAGER R.P.E. NO. 95046	J. LAW
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-3 TURBINE/CRYO PLANT 1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E507-515
DRAWING NUMBER

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DIGITAL INPUT
24/48VDC FUSED
ELECT 1C31232G02
PER 15X00034G01
BRANCH 2, MODULE 4

C1-C17 RSV	
A17, B17 PS+	
A18 PS-	
C17, C18 GND	
I6- B16	
I6+ A16	
I5- B15	
I5+ A15	
I4- B14	
I4+ A14	
I3- B13	
I3+ A13	
I2- B12	
I2+ A12	
I1- B11	
I1+ A11	
I0- B10	SEAL GAS PRESSURE LOW (W-44-IA-PSL-580-1) — W-44-IA-PSL-580-1/DROP 15REM3-B2M4B10- / W-44-IA-PSL-580-1/DROP 15REM3-B2M4A10+
I0+ A10	
9- B9	#1 CRYO FCV-114N WASTE NITROGEN SWITCH VALVE OPEN INDICATION (W-44-N2-ZSO-114-1) — W-44-N2-ZSO-114-1/DROP15REM3-B2M4B9- / W-44-N2-ZSO-114-1/DROP15REM3-B2M4A9+
9+ A9	
8- B8	#1 CRYO FCV-114 WASTE NITROGEN SWITCH VALVE CLOSED INDICATION (W-44-N2-ZSC-114-1) — W-44-N2-ZSC-114-1/DROP15REM3-B2M4B8- / W-44-N2-ZSC-114-1/DROP15REM3-B2M4A8+
8+ A8	
7- B7	#1 CRYO FCV-113N WASTE NITROGEN SWITCH VALVE OPEN INDICATION (W-44-N2-ZSO-113-1) — W-44-N2-ZSO-113-1/DROP15REM3-B2M4B7- / W-44-N2-ZSO-113-1/DROP15REM3-B2M4A7+
7+ A7	
6- B6	#1 CRYO FCV-113N WASTE NITROGEN SWITCH VALVE CLOSED INDICATION (W-44-N2-ZSC-113-1) — W-44-N2-ZSC-113-1/DROP15REM3-B2M4B6- / W-44-N2-ZSC-113-1/DROP15REM3-B2M4A6+
6+ A6	
5- B5	#1 CRYO FCV-112A AIR SWITCH VALVE OPEN INDICATION (W-44-AHP-ZSO-112-1) — W-44-AHP-ZSO-112-1/DROP15REM3-B2M4B5- / W-44-AHP-ZSO-112-1/DROP15REM3-B2M4A5+
5+ A5	
4- B4	#1 CRYO FCV-112A AIR SWITCH VALVE CLOSED INDICATION (W-44-AHP-ZSC-112-1) — W-44-AHP-ZSC-112-1/DROP15REM3-B2M4B4- / W-44-AHP-ZSC-112-1/DROP15REM3-B2M4A4+
4+ A4	
3- B3	#1 CRYO FCV-111A AIR SWITCH VALVE OPEN INDICATION (W-44-AHP-ZSO-111-1) — W-44-AHP-ZSO-111-1/DROP15REM3-B2M4B3- / W-44-AHP-ZSO-111-1/DROP15REM3-B2M4A3+
3+ A3	
2- B2	#1 CRYO FCV-111A AIR SWITCH VALVE CLOSED INDICATION (W-44-AHP-ZSC-111-1) — W-44-AHP-ZSC-111-1/DROP15REM3-B2M4B2- / W-44-AHP-ZSC-111-1/DROP15REM3-B2M4A2+
2+ A2	
1- B1	SURGE TANK HIGH WATER LEVEL (W-44-AHP-LSH-501-1) — W-44-AHP-LSH-501-1/DROP 15REM3-B2M4B1- / W-44-AHP-LSH-501-1/DROP 15REM3-B2M4A1+
1+ A1	

DIGITAL INPUT
24/48VDC FUSED
ELECT 1C31232G02
PER 15X00034G01
BRANCH 2, MODULE 5

C1-C17 RSV	
A17, B17 PS+	
A18 PS-	
C17, C18 GND	
I6- B16	
I6+ A16	
I5- B15	
I5+ A15	
I4- B14	
I4+ A14	
I3- B13	
I3+ A13	
I2- B12	
I2+ A12	
I1- B11	
I1+ A11	
I0- B10	
I0+ A10	
9- B9	
9+ A9	
8- B8	
8+ A8	
7- B7	
7+ A7	
6- B6	
6+ A6	
5- B5	
5+ A5	
4- B4	DRAIN VAPORIZER OUTLET TEMP LOW (W-44-O2-TSL-640) — W-44-O2-TSL-640/DROP 15REM3-B2M5A4- / W-44-O2-TSL-640/DROP 15REM3-B2M5A4+
4+ A4	
3- B3	DRAIN VAPORIZER OUTLET TEMP LOW (W-44-O2-TSL-690) — W-44-O2-TSL-690/DROP 15REM3-B2M5A3- / W-44-O2-TSL-690/DROP 15REM3-B2M5A3+
3+ A3	
2- B2	WATER BOTH TEMP LOW (100 DEGF) (W-44-O2-TSL-631) — W-44-O2-TSL-631/DROP 15REM3-B2M5B2- / W-44-O2-TSL-631/DROP 15REM3-B2M5A2+
2+ A2	
1- B1	WATER BATH TEMP HIGH (200 DEGF) (W-44-O2-TSH-631) — W-44-O2-TSH-631/DROP 15REM3-B2M5B1- / W-44-O2-TSH-631/DROP 15REM3-B2M5A1+
1+ A1	

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-3 TURBINE/CRYO PLANT 1 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E507-516
DRAWING NUMBER

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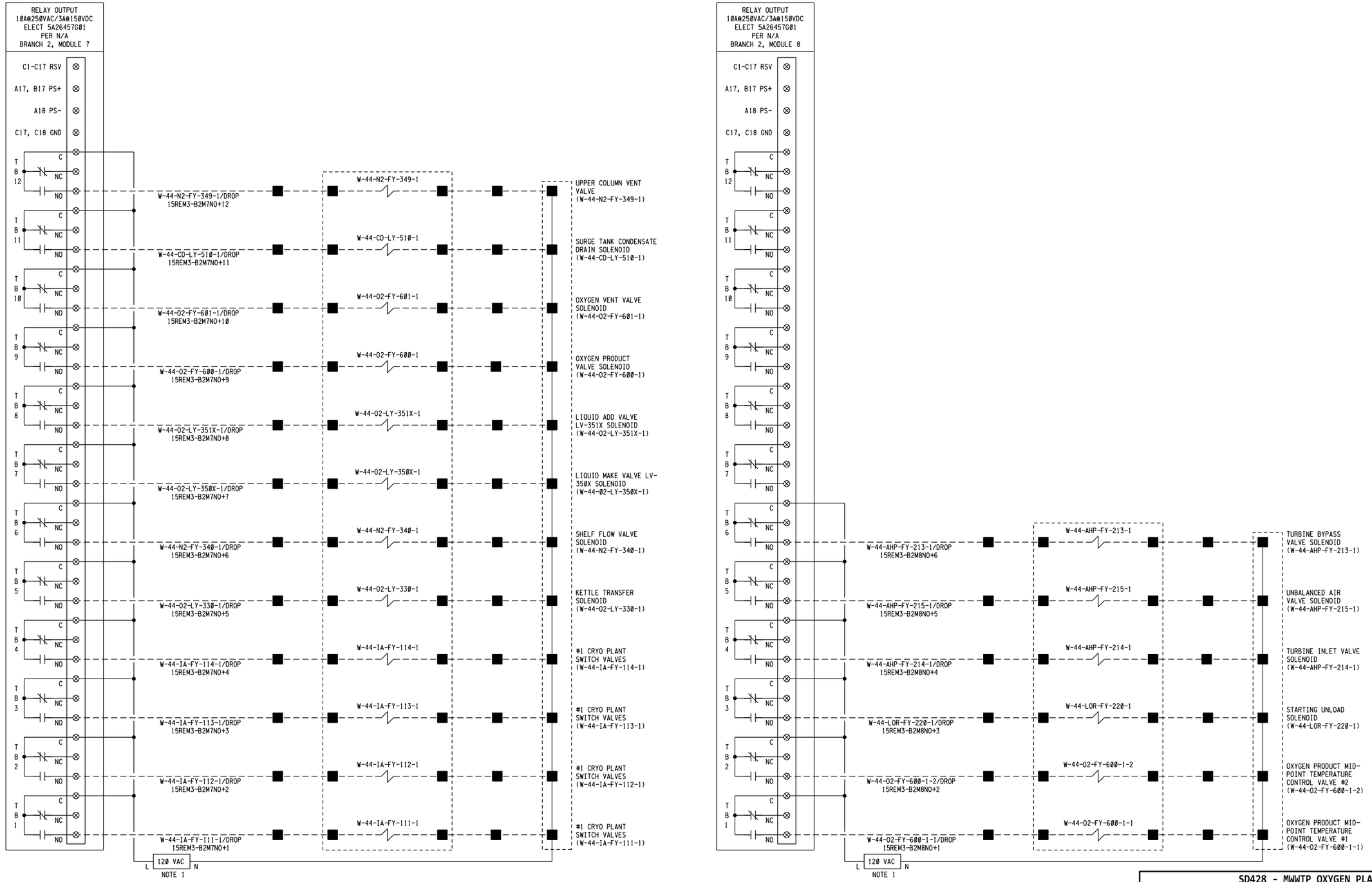

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NOTES:

1. FOR POWER DETAILS, SEE SHEET SD428-W4400-E507-510

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STATE OF CALIFORNIA
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PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
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MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

RIO-15-3 TURBINE/CRYO PLANT 1 PANEL I/O MODULE SCHEMATIC

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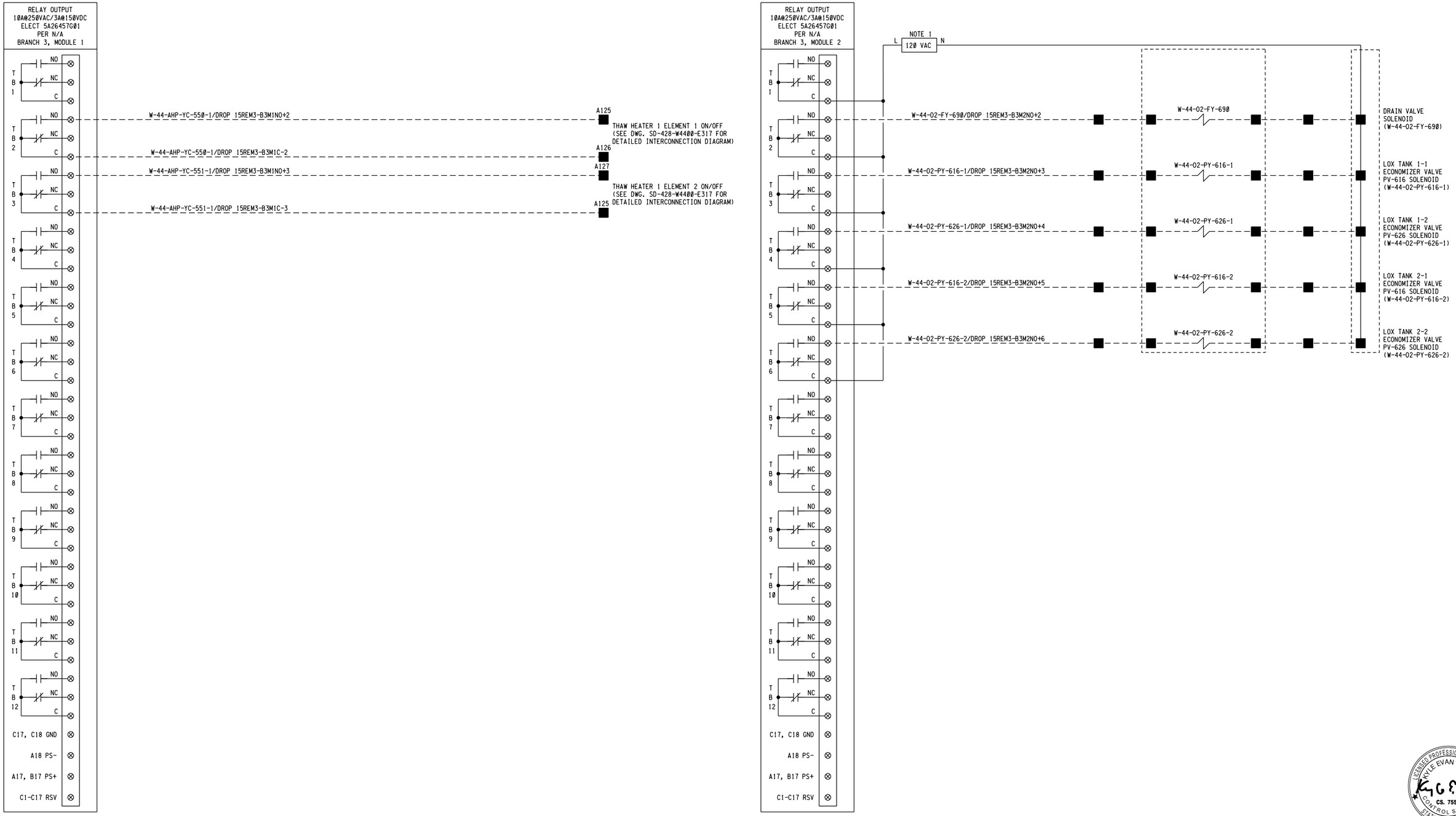

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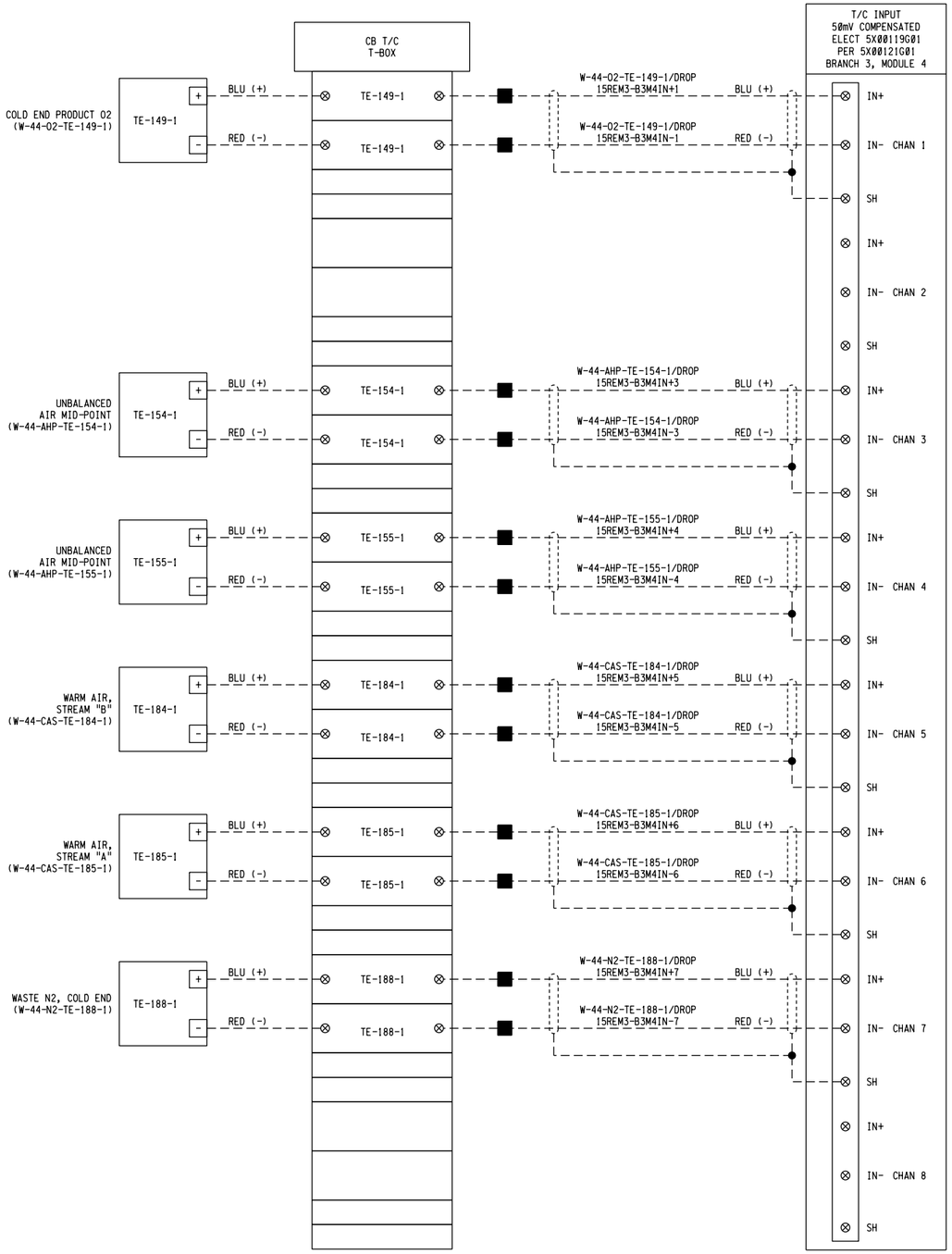

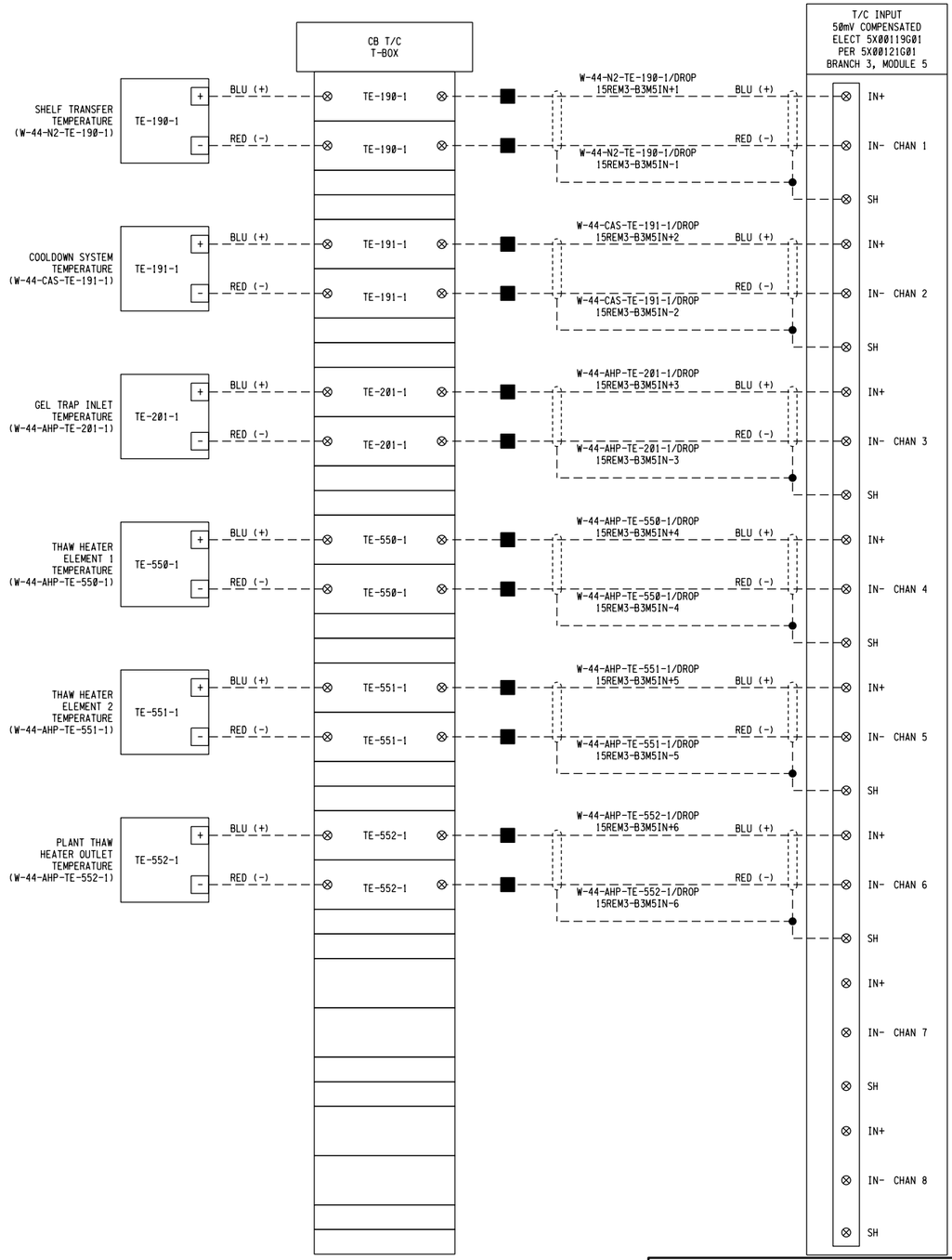

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SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
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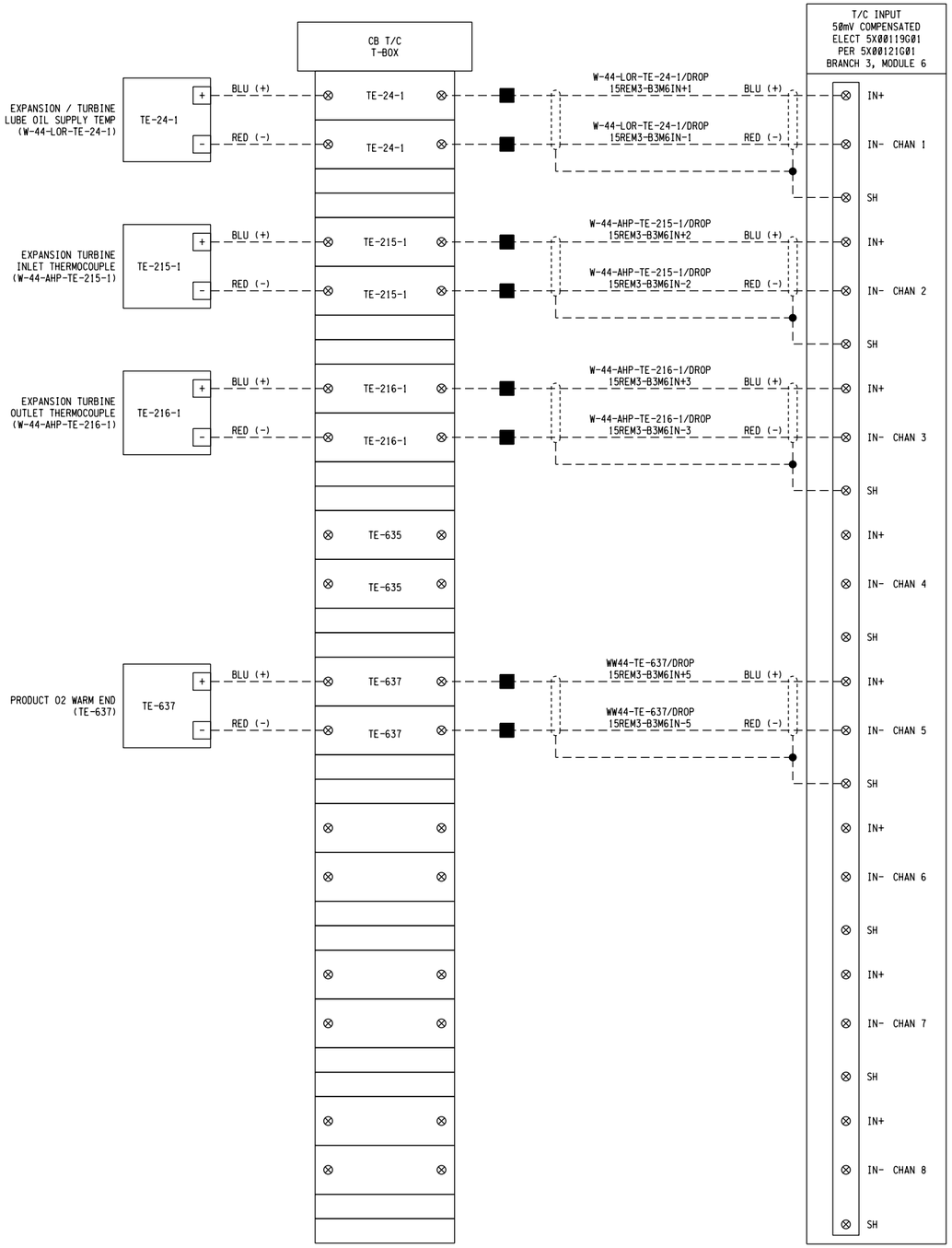

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

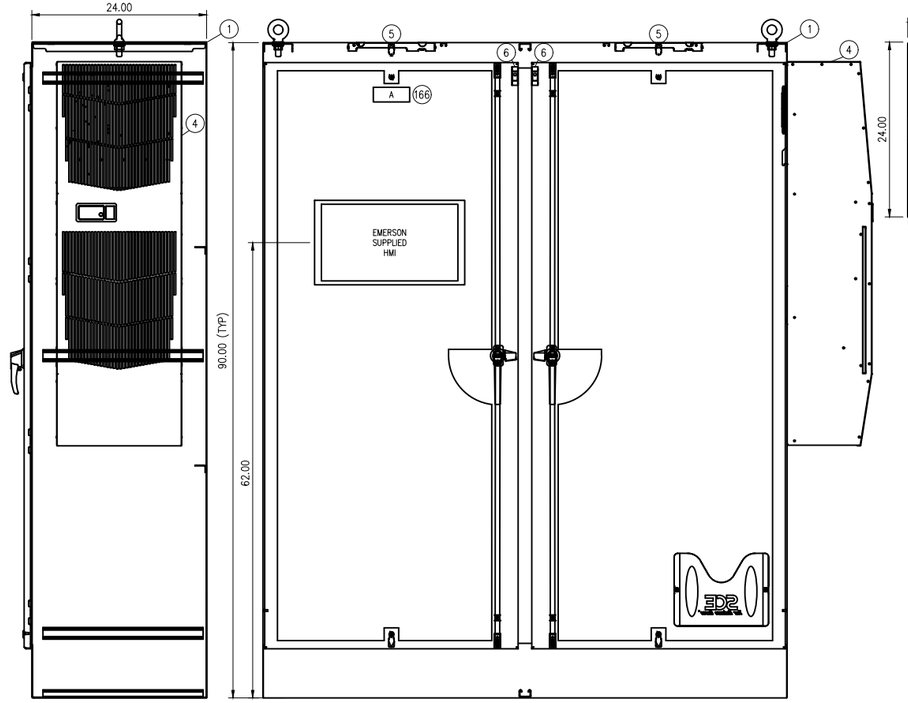
MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-15-3 TURBINE/CRYO PLANT 1 PANEL
I/O MODULE SCHEMATIC

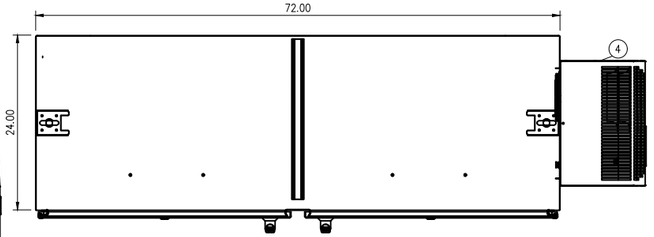
SCALE NONE
DATE 28JUN24

SD428-W4400-E507-520
DRAWING NUMBER

0
REV.



ENCLOSURE EXTERIOR SIDE VIEW
(NOTES 1 & 2)



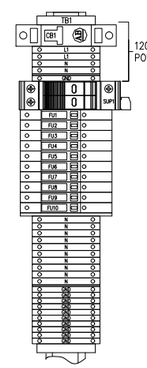
ENCLOSURE EXTERIOR TOP VIEW

NAMEPLATE SCHEDULE (NOTE 4)			
ITEM	DIMENSION	DESCRIPTION	FABRICATION COMMENTS
A	5" x 2"	RIO-23-3 TURBINE/CRYO PLANT 2 PANEL	NOTE 4
B	2.5" x 1"	TB1	NOTE 4
C	2.5" x 1"	TB2	NOTE 4
D	2.5" x 1"	TB3	NOTE 4
E	2.5" x 1"	TB4	NOTE 4

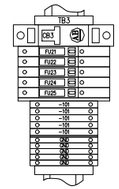
NOTES:

1. ENCLOSURE SHALL SIT ON A 4" HEIGHT HOUSEKEEPING PAD.
2. ENCLOSURE SHALL BE SS316, TYPE NEMA 4X, AND HAVE PROVISION FOR PADLOCK.
3. SUBPLATE AND NETWORK SWITCHES SHALL BE SUPPLIED BY EMERSON AND INSTALLED BY THE CONTRACTOR AFTER COMPLETION OF PANEL. CONTRACTOR SHALL COORDINATE WITH EMERSON FOR RECEIVING THE EQUIPMENT AND INSTALLATION SEQUENCE AND SCHEDULE. EMERSON SHALL SUPPLY ETHERNET AND FIBER PATCH CORDS. CONTRACTOR SHALL PROVIDE AND INSTALL POWER CONNECTIONS TO EMERSON EQUIPMENT AS DIRECTED BY EMERSON.
4. NAMEPLATE SHALL BE BLACK WITH WHITE LETTERS WITH ADHESIVE BACK. TEXT SIZE TO BE .375
5. AREA RESERVED FOR CONDUIT ENTRY.
6. ENCLOSURE LIGHT AND INTRUSION SWITCH SHALL BE MOUNTED WITH STAINLESS STEEL SCREWS, NUTS AND NEOPRENE BONDED SEALING WASHERS TO MAINTAIN THE NEMA 4X RATING OF ENCLOSURE. (SEALING WASHER MANUFACTURER & ITEM NUMBER: THE HILLMAN GROUP #290250 OR EQUAL)

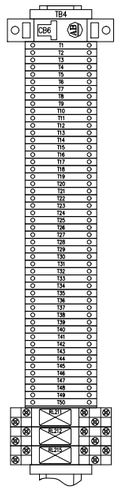
TERMINAL BLOCK LAYOUTS



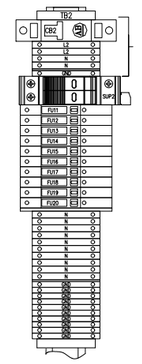
(1) 20 AMP CIRCUIT BREAKER
(1) 120 VAC SURGE PROTECTOR
(14) 1-TIER TERMINALS
(2) 1-TIER END BARRIERS
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(5) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(5) GROUNDING TERMINALS
(5) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(2) END ANCHORS



(1) 10 AMP CIRCUIT BREAKER
(50) 1-TIER TERMINALS
(1) 1-TIER END BARRIERS
(3) 120V RELAY
(2) END ANCHORS



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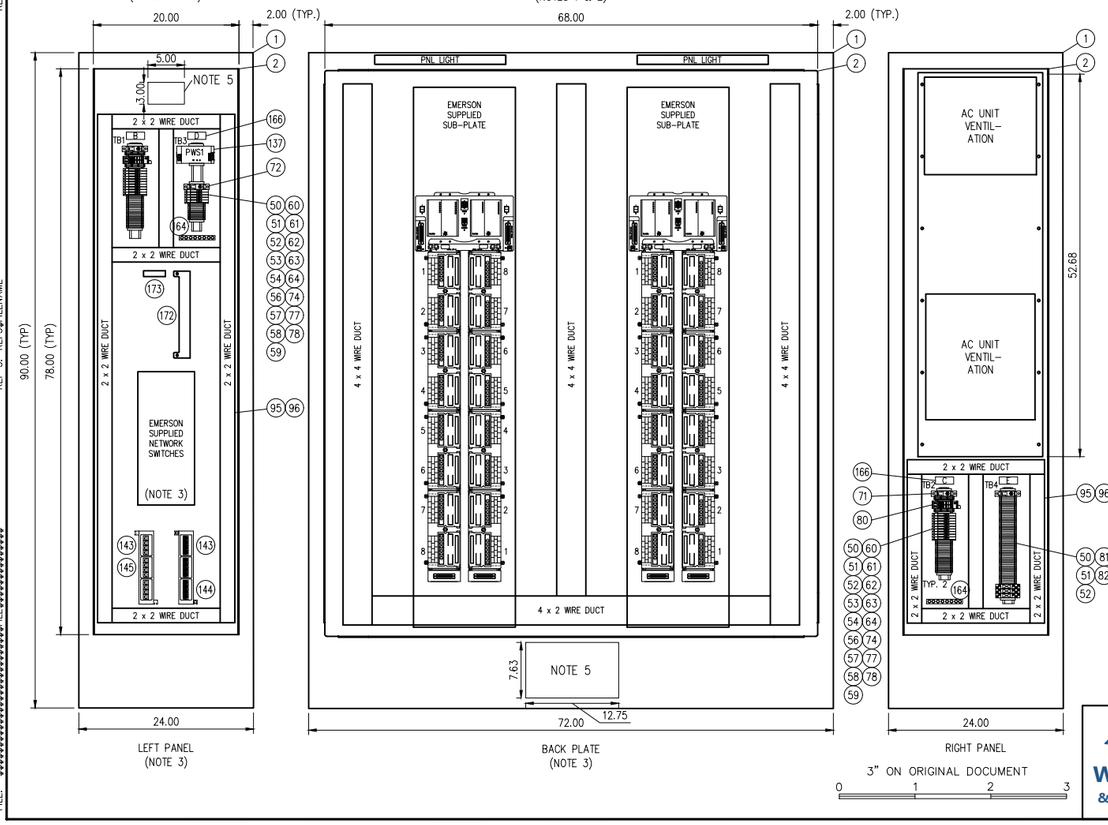
(11) GROUNDING TERMINALS
(10) FUSE BLOCKS
(1) FUSE BLOCK END BARRIERS
(1) 120VAC RELAY
(2) END ANCHORS

BILL OF MATERIALS

ITEM	QTY.	MANUFACTURER	PART NUMBER	DESCRIPTION	DESIGNATION
			****ENCLOSURE & RELATED EQUIPMENT****		
1	1	SAGINAW CONTROL	SCE-90EL7224S6FSD	ENCLOSURE, NEMA 4X, 90.00" x 72.00" x 24.00", 316SS	ENCLOSURE
2	1	SAGINAW CONTROL	SCE-90P72F1	INTERNAL PANEL, 78" X 66"	BACK PANEL
3	2	SAGINAW CONTROL	SCE-90S18P20	SIDE PANEL, 78" X 20"	SIDE PANELS
4	1	HOFFMAN	G32121850102	AC UNIT 12000 BTU - 115V - NEMA 4X	AC UNIT
5	2	HOFFMAN	LEDA1S3S	ENCLOSURE LIGHT	LT-01, LT-02
6	2	HOFFMAN	ALFSWD	ENCLOSURE DOOR SWITCH	SW-01, SW-02
			****TERMINAL BLOCKS & RELATED EQUIPMENT****		
50	83	ALLEN BRADLEY	1492-J4	TERMINAL BLOCK 1 TIER	TB1, TB2, TB3, TB4
51	6	ALLEN BRADLEY	1492-EBJ3	TERMINAL BLOCK END BARRIER, 1 TIER	TB1, TB2, TB3, TB4
52	10	ALLEN BRADLEY	1492-EAJ35	TERMINAL BLOCK END ANCHOR	TB1, TB2, TB3, TB4
53	2	ALLEN BRADLEY	1492-CJJ5-10	TERMINAL BLOCK JUMPER, 10 POLE	TB1, TB2
54	27	ALLEN BRADLEY	1492-JG3	TERMINAL BLOCK, GROUNDING	TB1, TB2
56	2	ALLEN BRADLEY	1492-DR6	DIN RAIL, RAISED	TB1, TB2, TB3
57	20	ALLEN BRADLEY	1492-H4	FUSED TERMINAL BLOCK, NEON INDICATOR	FU1-FU20
58	5	ALLEN BRADLEY	1492-H5	FUSED TERMINAL BLOCK, LED INDICATOR	FU21-25
59	3	ALLEN BRADLEY	1492-N37	FUSED TERMINAL BLOCK END BARRIER	FU10, FU20, FU25
60	3	ALLEN BRADLEY	1492-N49	FUSE BLOCK SIDE JUMPERS 10 POLE	FU1-FU10, FU11-20, FU21-FU25
61	3	ALLEN BRADLEY	1492-SJ6	FUSE BLOCK SIDE JUMPER INSULATING SLEEVE	FU1-FU10, FU11-20, FU21-FU25
62	1	ALLEN BRADLEY	1492-M5K12	GROUNDING TERMINAL BLOCK BLANK MARKING TAGS, 144 CT.	TB1, TB2, TB3
63	2	ALLEN BRADLEY	1492-M5K8	TERMINAL BLOCK BLANK MARKING TAGS, 2 TIER, 144 CT.	TB1, TB2, TB3
64	1	ALLEN BRADLEY	1492-M5BK12	FUSE BLOCK BLANK MARKING TAGS, 100 CT.	FU1-FU25
71	3	ALLEN-BRADLEY	1489-M1D200	CIRCUIT BREAKER, 20AMP, SINGLE POLE	CB1, CB2, CB8
72	2	ALLEN-BRADLEY	1489-M1D100	CIRCUIT BREAKER, 10AMP, SINGLE POLE	CB3, CB7
74	30	BUSSMANN	AGC-1	FUSE, 1A, 250V, FAST ACTING	FU2-FU9, FU12-FU20, FU22-25 PLUS SPARES
77	2	BUSSMANN	AGC-10	FUSE, 10A, 250V FAST ACTING	FU10 PLUS SPARE
78	5	BUSSMANN	AGC-2	FUSE, 2A, 250V, FAST ACTING	FU1, FU11, FU21 PLUS SPARES
80	3	PHOENIX CONTACT	2905348	VAL-S-EC-T2-15-175-FM, 120VAC SURGE PROTECTOR	S UP1, S UP2, PLUS 1 SPARE
81	3	ALLEN-BRADLEY	700-HK32A1	GENERAL PURPOSE SLIM LINE RELAY, 120VAC	RL211, RL212, RL215
82	3	ALLEN-BRADLEY	700-HN121	RELAY SOCKET	RL211, RL212, RL215
			****WIREDUCT****		
93	30FT	PANDUIT	F4X4LG6	WIRING DUCT, 4"W x 4"H	
94	30FT	PANDUIT	C4LG6	WIRING DUCT COVER, 4"W	
95	36FT	PANDUIT	F2X2LG6	WIRING DUCT, 2"W x 2"H	
96	36FT	PANDUIT	C2LG6	WIRING DUCT COVER, 2"W	
			****POWER SUPPLIES****		
137	1	PHOENIX CONTACT	2866763	POWER SUPPLY, 240/120VAC IN, 24VDC, 10 AMP	PWS1
			****COMMUNICATIONS****		
143	1	EMERSON	5X00133G05	MINI-COM PATCH PANEL - 12 PORTS	
144	1	EMERSON	1X00119H01	MINI-COM MODULE FOR FO-ST	
145	1	PANDUIT	CJ6C-SBYGIW	MINI-COM MODULE FOR TX6 10GIG UTP JACK	
			****MISCELLANEOUS PANEL EQUIPMENT****		
164	3	PANDUIT	UGB2/0-414-6	GROUND BAR	
166	4	PANEL FABRICATOR		NAMEPLATE, PHENOLIC, ENGRAVED	SEE SCHEDULE ON EQUIPMENT LAYOUT
172	1	EMERSON	2379C68G01	RTD ASSEMBLY	
173	1	PHOENIX CONTACT	2864587	TEMP XMIT MCR-FL-TS-1-PI-EX	



LEFT PANEL
(NOTE 3)

BACK PLATE
(NOTE 3)

RIGHT PANEL

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LICENSED PROFESSIONAL ENGINEER
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CS. 7556
CONTROL SYSTEMS
STATE OF CALIFORNIA
06/28/2024

Woodard & Curran

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SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	R. SPEYRER
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
RIO-23-3 TURBINE/CRYO PLANT 2 PANEL
EQUIPMENT ELEVATION

SCALE NONE
DATE 28JUN24

SD428-W4400-E508
DRAWING NUMBER

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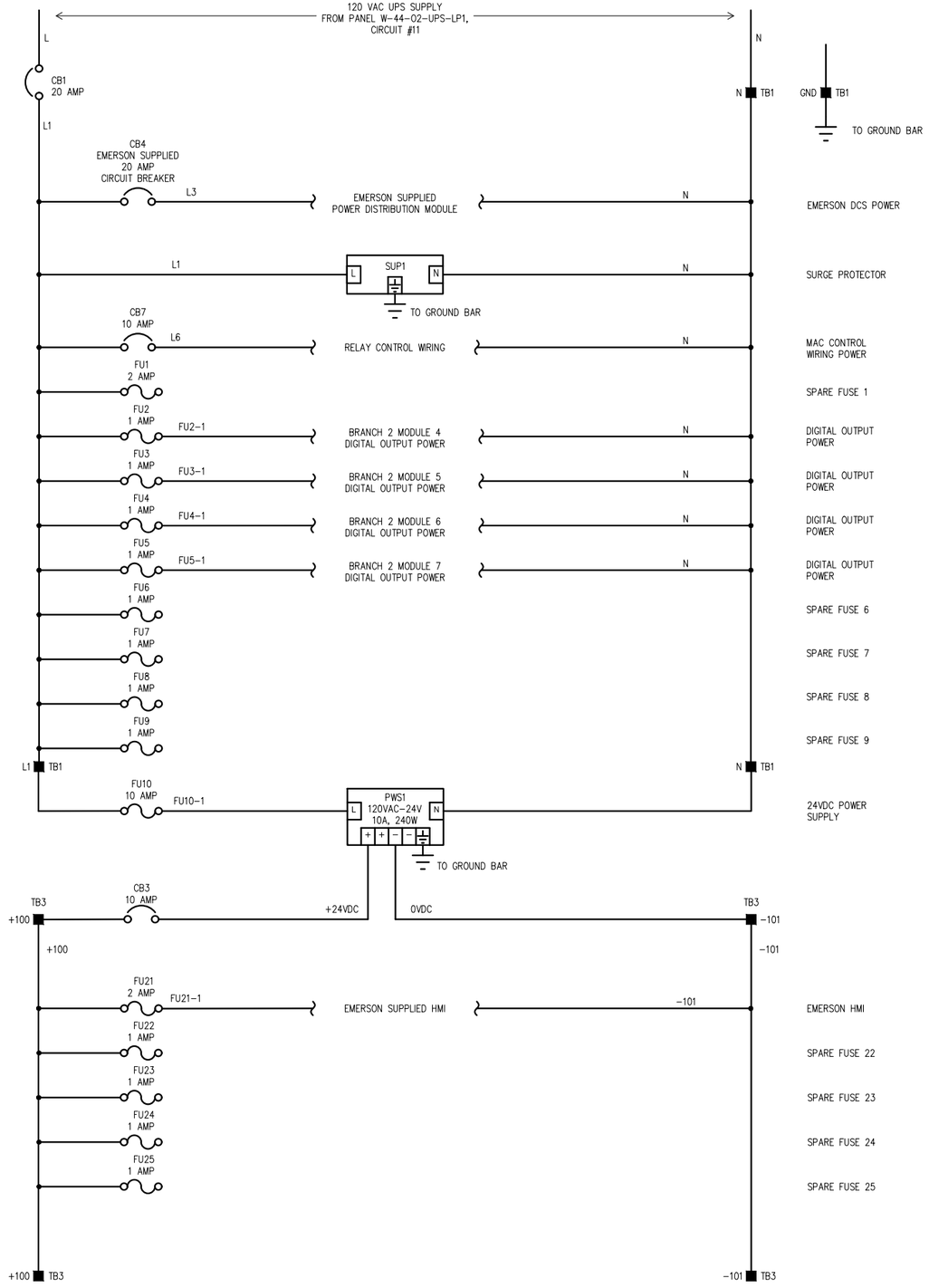

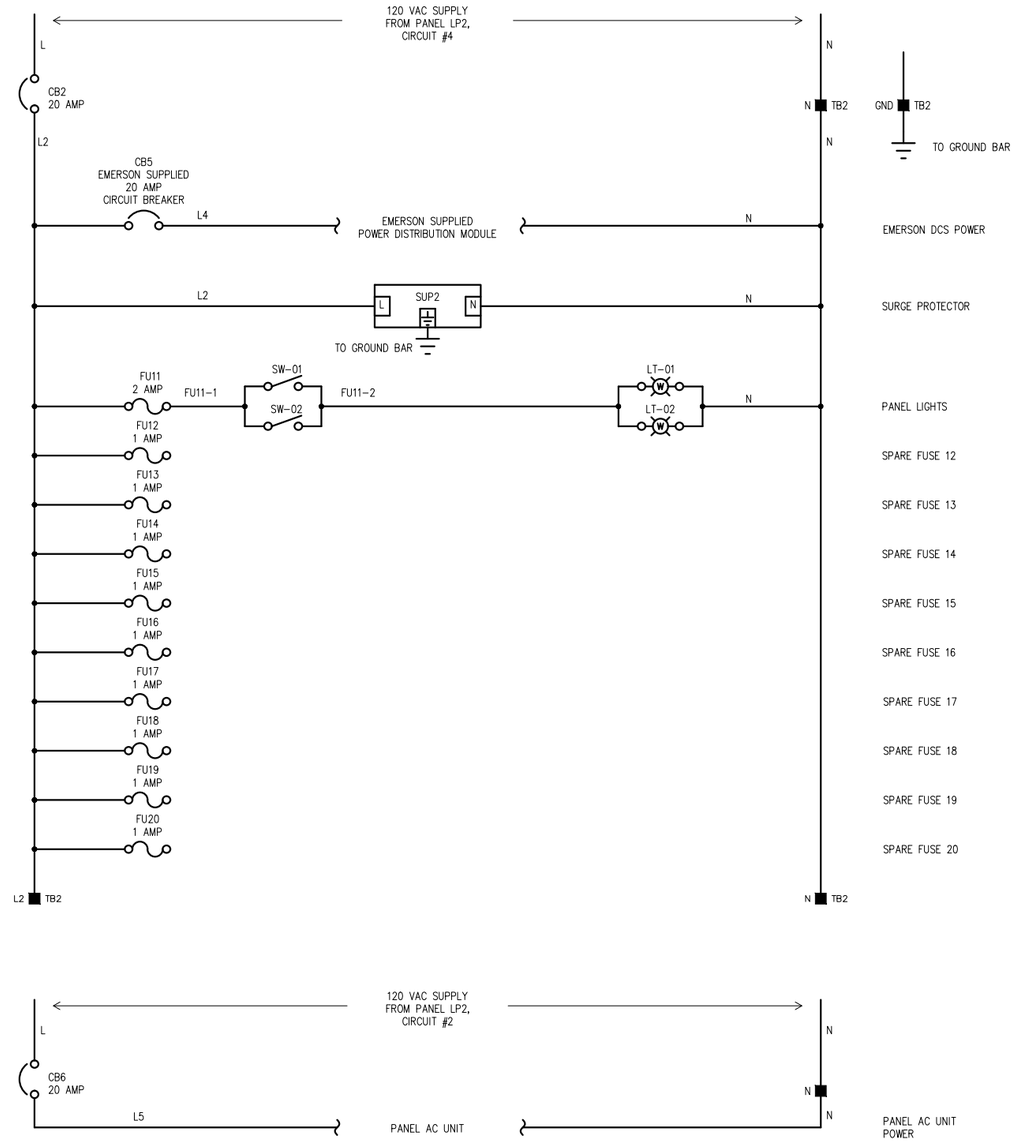

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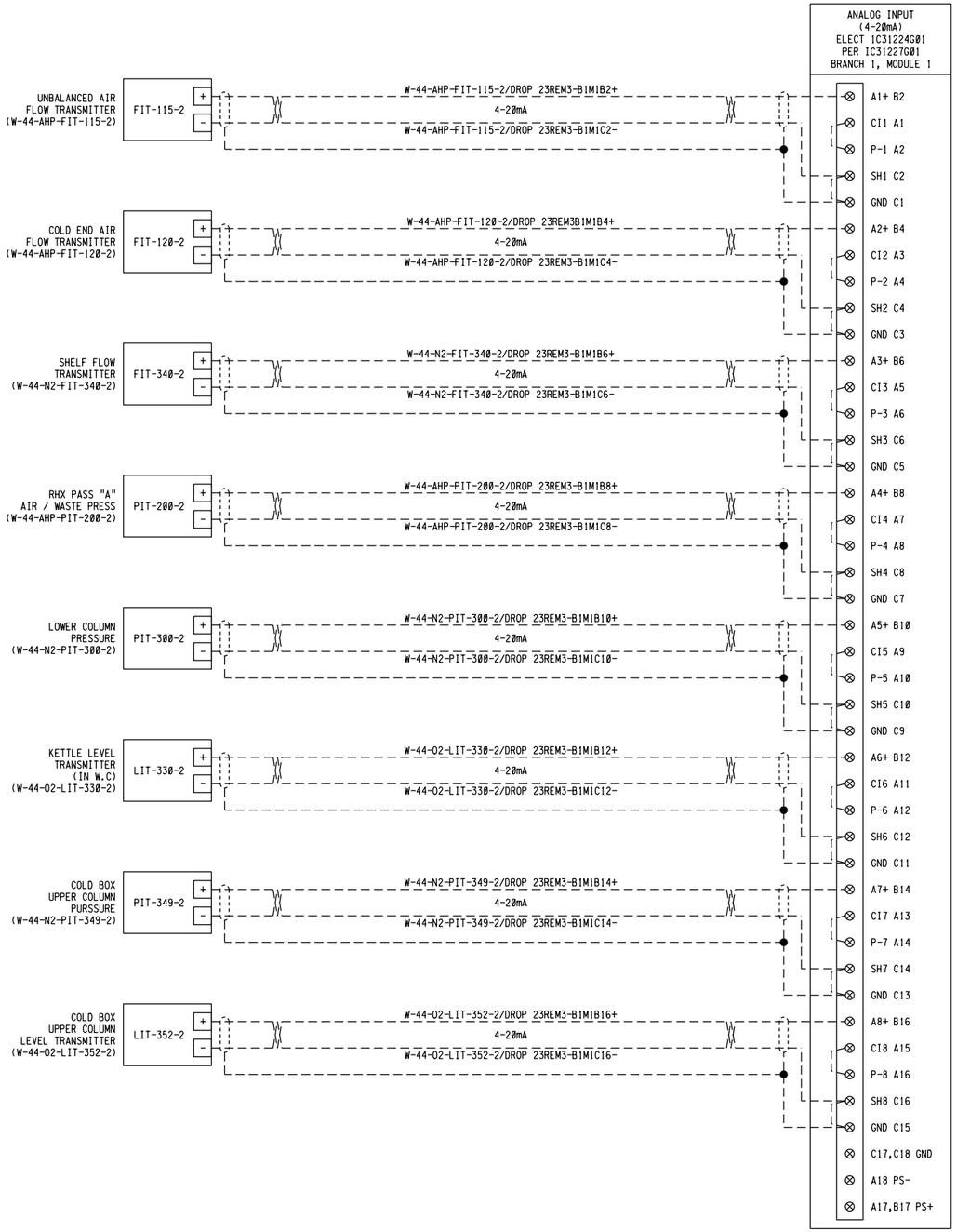

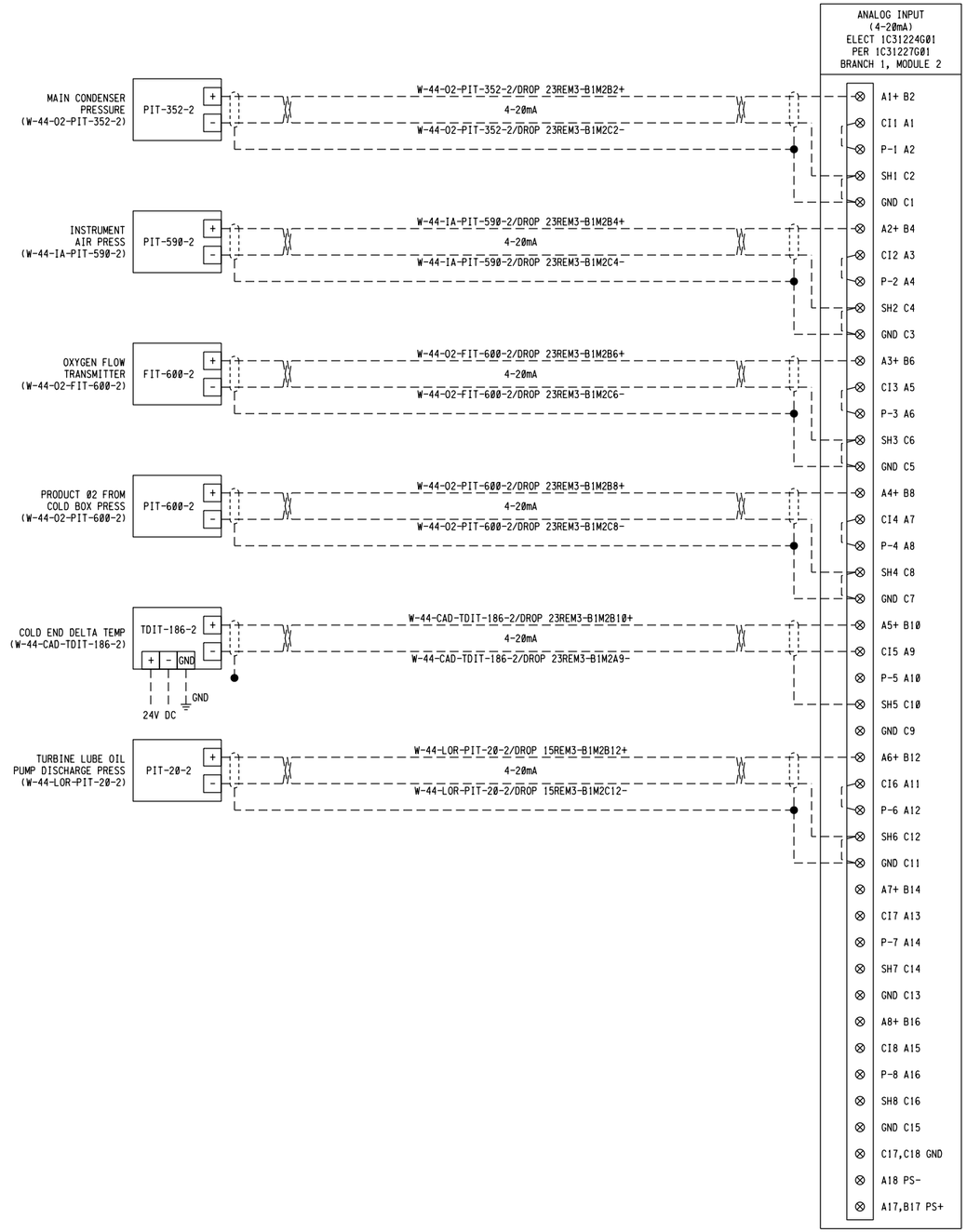

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MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-3 TURBINE/CRYO PLANT 2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

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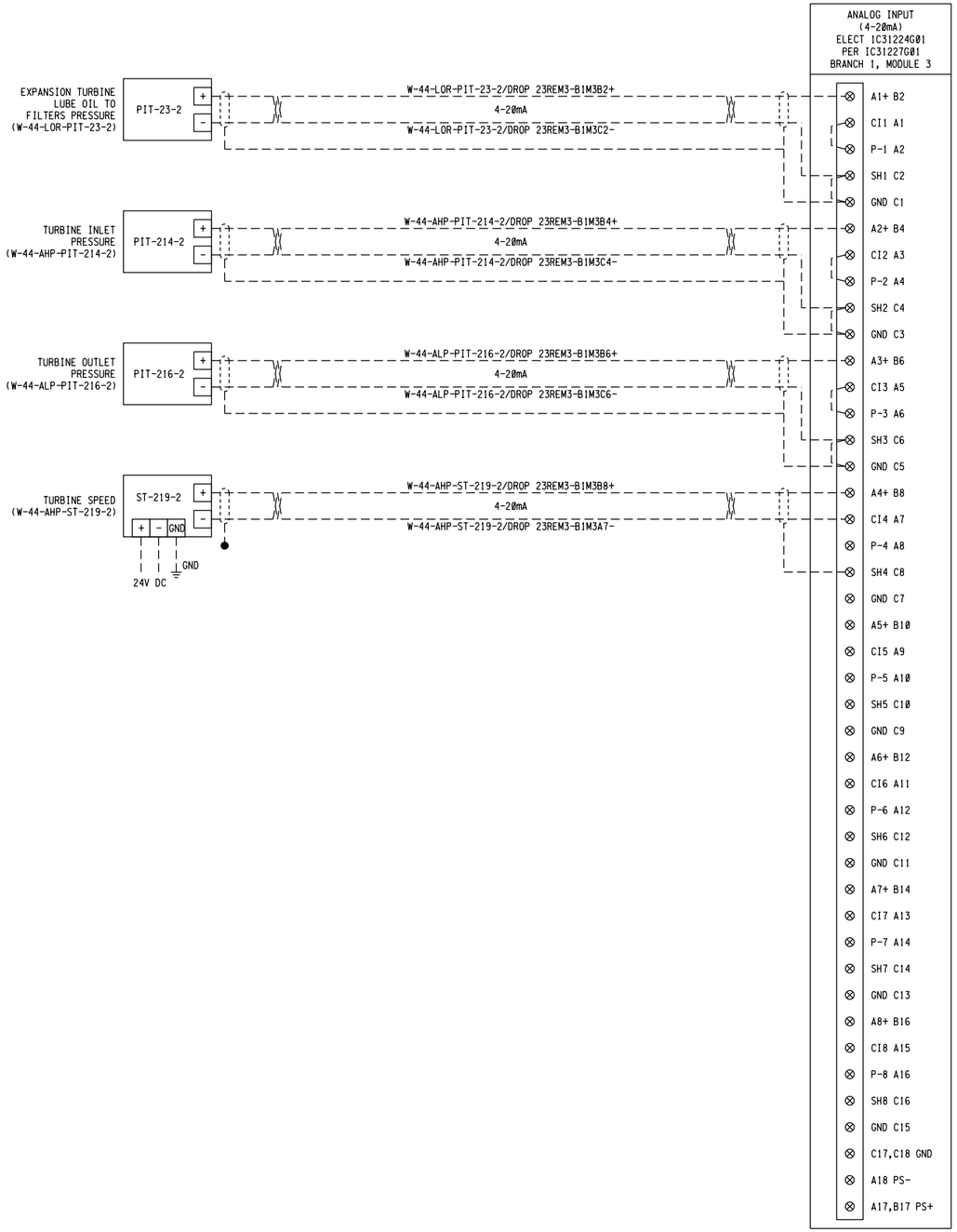

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ANALOG OUTPUT
(4-20mA)
ELECT 1C31129G03
PER 1C31132G01
BRANCH 1, MODULE 5

+V1 A1
+I1 A2
-I1 B2
EGND C2
SH1 C1

W-44-O2-LV-330A-2/DROP 23REM3-B1M5A1+
4-20mA
W-44-O2-LV-330A-2/DROP 23REM3-B1M5B2-

LV-330A-2

KETTLE LEVEL
CONTROL VALVE
(W-44-O2-LV-330A-2)

+V2 A5
+I2 A6
-I2 B6
EGND C6
SH2 C5

W-44-N2-FV-340N-2/DROP 23REM3-B1M5A5+
4-20mA
W-44-N2-FV-340N-2/DROP 23REM3-B1M5B6-

FV-340N-2

SHELF FLOW
CONTROL VALVE
(W-44-N2-FV-340N-2)

+V3 A9
+I3 A10
-I3 B10
EGND C10
SH3 C9

W-44-O2-FV-X600X-2-1/DROP 23REM3-B1M5A9+
4-20mA
W-44-O2-FV-X600X-2-1/DROP 23REM3-B1M5B10-

FV-X600X-2-1

OYGEN PRODUCT
MID-POINT TEMPERATURE
CONTROL VALVE #1
(W-44-O2-FV-X600X-2-1)

+V4 A13
+I4 A14
-I4 B14
EGND C14
SH4 C13

W-44-O2-FV-X600X-2-2/DROP 23REM3-B1M5A13+
4-20mA
W-44-O2-FV-X600X-2-2/DROP 23REM3-B1M5B14-

FV-X600X-2-2

OXYGEN PRODUCT
MID-POINT TEMPERATURE
CONTROL VALVE #2
(W-44-O2-FV-X600X-2-2)

C17,C18 GND
A18 PS-
A17,B17 PS+

ANALOG OUTPUT
(4-20mA)
ELECT 1C31129G03
PER 1C31132G01
BRANCH 1, MODULE 6

+V1 A1
+I1 A2
-I1 B2
EGND C2
SH1 C1

W-44-O2-FV-600X-2/DROP 23REM3-B1M6A1+
4-20mA
W-44-O2-FV-600X-2/DROP 23REM3-B1M6B2-

FV-600X-2

OXYGEN
PRODUCT VALVE
(W-44-O2-FV-600X-2)

+V2 A5
+I2 A6
-I2 B6
EGND C6
SH2 C5

W-44-O2-FV-601X-2/DROP 23REM3-B1M6A5+
4-20mA
W-44-O2-FV-601X-2/DROP 23REM3-B1M6B6-

FV-601X-2

OXYGEN
VENT VALVE
(W-44-O2-FV-601X-2)

+V3 A9
+I3 A10
-I3 B10
EGND C10
SH3 C9

+V4 A13
+I4 A13
-I4 B14
EGND C14
SH4 C13

C17,C18 GND
A18 PS-
A17,B17 PS+

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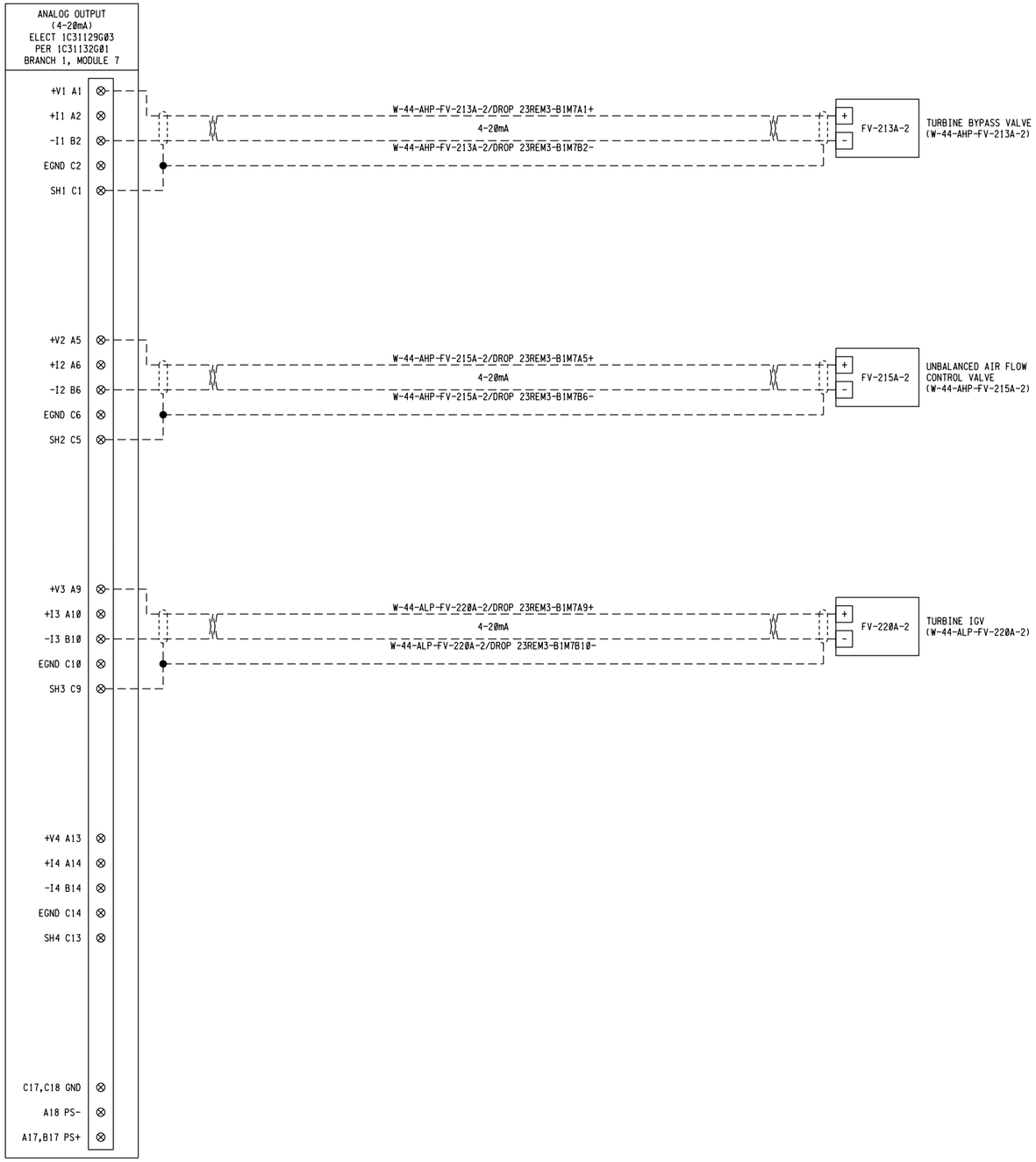

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

RIO-23-3 TURBINE/CRYO PLANT 2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E508-514
DRAWING NUMBER

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REF 6:
REF 7:
REF 8:
REF 9:

DIGITAL INPUTS
24/48VDC FUSED
ELECT 1C31232G02
PER 15X00034G01
BRANCH 2, MODULE 1

	C1-C17 RSV	
	A17, B17 PS+	
	A18 PS-	
	C17, C18 GND	
	I6- B16	
	I6+ A16	
	I5- B15	
	I5+ A15	
	I4- B14	
	I4+ A14	
	I3- B13	
	I3+ A13	
	I2- B12	
	I2+ A12	
	I1- B11	
	I1+ A11	
	I0- B10	
	I0+ A10	
#2 CRYO FCV-114N WASTE NITROGEN SWITCH VALVE OPEN INDICATION (W-44-N2-ZSO-114-2)	W-44-N2-ZSO-114-2/DROP23REM3-B2M1B9-	9- B9
	W-44-N2-ZSO-114-2/DROP23REM3-B2M1A9+	9+ A9
#2 CRYO FCV-114N WASTE NITROGEN SWITCH VALVE CLOSED INDICATION (W-44-N2-ZSC-114-2)	W-44-N2-ZSC-114-2/DROP23REM3-B2M1B8-	8- B8
	W-44-N2-ZSC-114-2/DROP23REM3-B2M1A8+	8+ A8
#2 CRYO FCV-113N WASTE NITROGEN SWITCH VALVE OPEN INDICATION (W-44-N2-ZSO-113-2)	W-44-N2-ZSO-113-2/DROP23REM3-B2M1B7-	7- B7
	W-44-N2-ZSO-113-2/DROP23REM3-B2M1A7+	7+ A7
#2 CRYO FCV-113N WASTE NITROGEN SWITCH VALVE CLOSED INDICATION (W-44-N2-ZSC-113-2)	W-44-N2-ZSC-113-2/DROP23REM3-B2M1B6-	6- B6
	W-44-N2-ZSC-113-2/DROP23REM3-B2M1A6+	6+ A6
#2 CRYO FCV-112A AIR SWITCH VALVE OPEN INDICATION (W-44-AHP-ZSO-112-2)	W-44-AHP-ZSO-112-2/DROP23REM3-B2M1B5-	5- B5
	W-44-AHP-ZSO-112-2/DROP23REM3-B2M1A5+	5+ A5
#2 CRYO FCV-112A AIR SWITCH VALVE CLOSED INDICATION (W-44-AHP-ZSC-112-2)	W-44-AHP-ZSC-112-2/DROP23REM3-B2M1B4-	4- B4
	W-44-AHP-ZSC-112-2/DROP23REM3-B2M1A4+	4+ A4
#2 CRYO FCV-111A AIR SWITCH VALVE OPEN INDICATION (W-44-AHP-ZSO-111-2)	W-44-AHP-ZSO-111-2/DROP23REM3-B2M1B3-	3- B3
	W-44-AHP-ZSO-111-2/DROP23REM3-B2M1A3+	3+ A3
#2 CRYO FCV-111A AIR SWITCH VALVE CLOSED INDICATION (W-44-AHP-ZSC-111-2)	W-44-AHP-ZSC-111-2/DROP23REM3-B2M1B2-	2- B2
	W-44-AHP-ZSC-111-2/DROP23REM3-B2M1A2+	2+ A2
SURGE TANK HIGH WATER LEVEL (W-44-AHP-LSH-501-2)	W-44-AHP-LSH-501-2/DROP 23REM3-B2M1B1-	1- B1
	W-44-AHP-LSH-501-2/DROP 23REM3-B2M1A1+	1+ A1

DIGITAL INPUTS
24/48VDC FUSED
ELECT 1C31232G02
PER 15X00034G01
BRANCH 2, MODULE 2

	C1-C17 RSV	
	A17, B17 PS+	
	A18 PS-	
	C17, C18 GND	
	I6- B16	
	I6+ A16	
	I5- B15	
	I5+ A15	
	I4- B14	
	I4+ A14	
	I3- B13	
	I3+ A13	
	I2- B12	
	I2+ A12	
	I1- B11	
	I1+ A11	
	I0- B10	
	I0+ A10	
	9- B9	
	9+ A9	
	8- B8	
	8+ A8	
	7- B7	
	7+ A7	
	6- B6	
	6+ A6	
	5- B5	
	5+ A5	
	4- B4	
	4+ A4	
	3- B3	
	3+ A3	
	2- B2	
	2+ A2	
SEAL GAS PRESSURE LOW (W-44-IA-PSL-580-2)	W-44-IA-PSL-580-2/DROP 23REM3-B2M2B1-	1- B1
	W-44-IA-PSL-580-2/DROP 23REM3-B2M2A1+	1+ A1

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

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SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-3 TURBINE/CRYO PLANT 2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E508-515
DRAWING NUMBER

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REV.

REF 7:
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RELAY OUTPUT
10A@250VAC/3A@150VDC
ELECT 5A26457G01
PER N/A
BRANCH 2, MODULE 4

C1-C17 RSV
A17, B17 PS+
A18 PS-
C17, C18 GND

TB12 C NC NO
TB11 C NC NO
TB10 C NC NO
TB9 C NC NO
TB8 C NC NO
TB7 C NC NO
TB6 C NC NO
TB5 C NC NO
TB4 C NC NO
TB3 C NC NO
TB2 C NC NO
TB1 C NC NO

W-44-O2-LY-351X-2/DROP 23REM3-B2M4NO+8	W-44-02-LY-351X-2	LIQUID ADD VALVE LV-351X SOLENOID (W-44-02-LY-351X-2)
W-44-O2-LY-350X-2/DROP 23REM3-B2M4NO+7	W-44-O2-LY-350X-2	LIQUID MAKE VALVE LV-350X SOLENOID (W-44-02-LY-350X-2)
W-44-N2-FY-340-2/DROP 23REM3-B2M4NO+6	W-44-N2-FY-340-2	SHELF FLOW VALVE SOLENOID (W-44-N2-FY-340-2)
W-44-O2-LY-330-2/DROP 23REM3-B2M4NO+5	W-44-O2-LY-330-2	KETTLE TRANSFER SOLENOID (W-44-O2-LY-330-2)
W-44-IA-FY-114-2/DROP 23REM3-B2M4NO+4	W-44-IA-FY-114-2	#2 CRYO PLANT SWITCH VALVES (W-44-IA-FY-114-2)
W-44-IA-FY-113-2/DROP 23REM3-B2M4NO+3	W-44-IA-FY-113-2	#2 CRYO PLANT SWITCH VALVES (W-44-IA-FY-113-2)
W-44-IA-FY-112-2/DROP 23REM3-B2M4NO+2	W-44-IA-FY-112-2	#2 CRYO PLANT SWITCH VALVES (W-44-IA-FY-112-2)
W-44-IA-FY-111-2/DROP 23REM3-B2M4NO+1	W-44-IA-FY-111-2	#2 CRYO PLANT SWITCH VALVES (W-44-IA-FY-111-2)

120 VAC
L N
NOTE 1

RELAY OUTPUT
10A@250VAC/3A@150VDC
ELECT 5A26457G01
PER N/A
BRANCH 2, MODULE 5

C1-C17 RSV
A17, B17 PS+
A18 PS-
C17, C18 GND

TB12 C NC NO
TB11 C NC NO
TB10 C NC NO
TB9 C NC NO
TB8 C NC NO
TB7 C NC NO
TB6 C NC NO
TB5 C NC NO
TB4 C NC NO
TB3 C NC NO
TB2 C NC NO
TB1 C NC NO

W-44-LOR-FY-220-2/DROP 23REM3-B2M5NO+7	W-44-LOR-FY-220-2	STARTING UNLOAD SOLENOID (W-44-LOR-FY-220-2)
W-44-O2-FY-600-2-2/DROP 23REM3-B2M5NO+6	W-44-O2-FY-600-2-2	OXYGEN PRODUCT MID-POINT TEMPERATURE CONTROL VALVE #2 (W-44-O2-FY-600-2-2)
W-44-O2-FY-600-2-1/DROP 23REM3-B2M5NO+5	W-44-O2-FY-600-2-1	OXYGEN PRODUCT MID-POINT TEMPERATURE CONTROL VALVE #1 (W-44-O2-FY-600-2-1)
W-44-N2-FY-349-2/DROP 23REM3-B2M5NO+4	W-44-N2-FY-349-2	UPPER COLUMN VENT VALVE (W-44-N2-FY-349-2)
W-44-CD-LY-510-2/DROP 23REM3-B2M5NO+3	W-44-CD-LY-510-2	SURGE TANK CONDENSATE DRAIN SOLENOID (W-44-CD-LY-510-2)
W-44-O2-FY-601-2/DROP 23REM3-B2M5NO+2	W-44-O2-FY-601-2	OXYGEN VENT VALVE SOLENOID (W-44-O2-FY-601-2)
W-44-O2-FY-600-2/DROP 23REM3-B2M5NO+1	W-44-O2-FY-600-2	OXYGEN PRODUCT VALVE SOLENOID (W-44-O2-FY-600-2)

120 VAC
L N
NOTE 1

NOTES:

1. FOR POWER DETAILS, SEE SHEET SD428-W4400-E508-510

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
No. CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-3 TURBINE/CRYO PLANT 2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E508-516
DRAWING NUMBER

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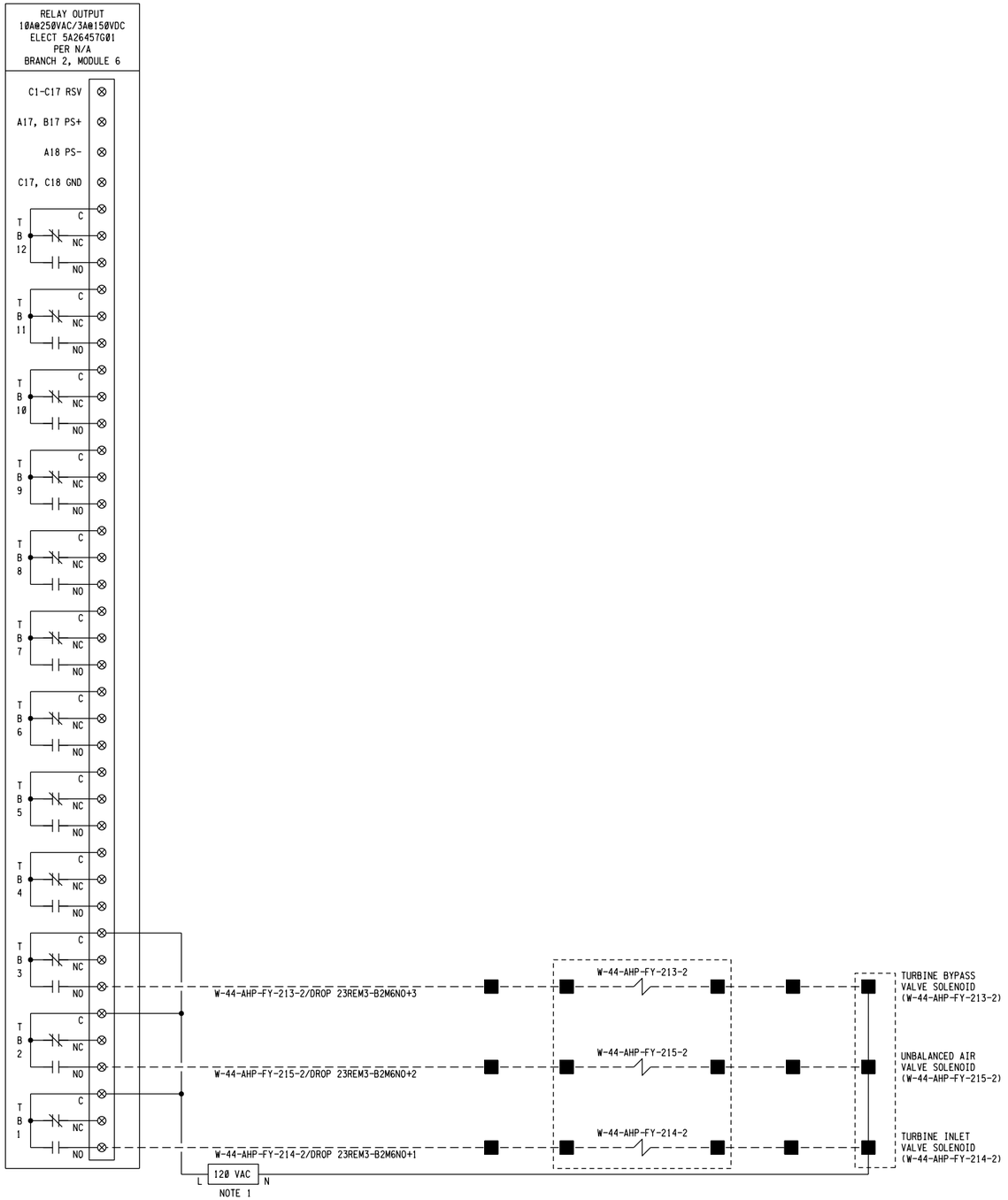

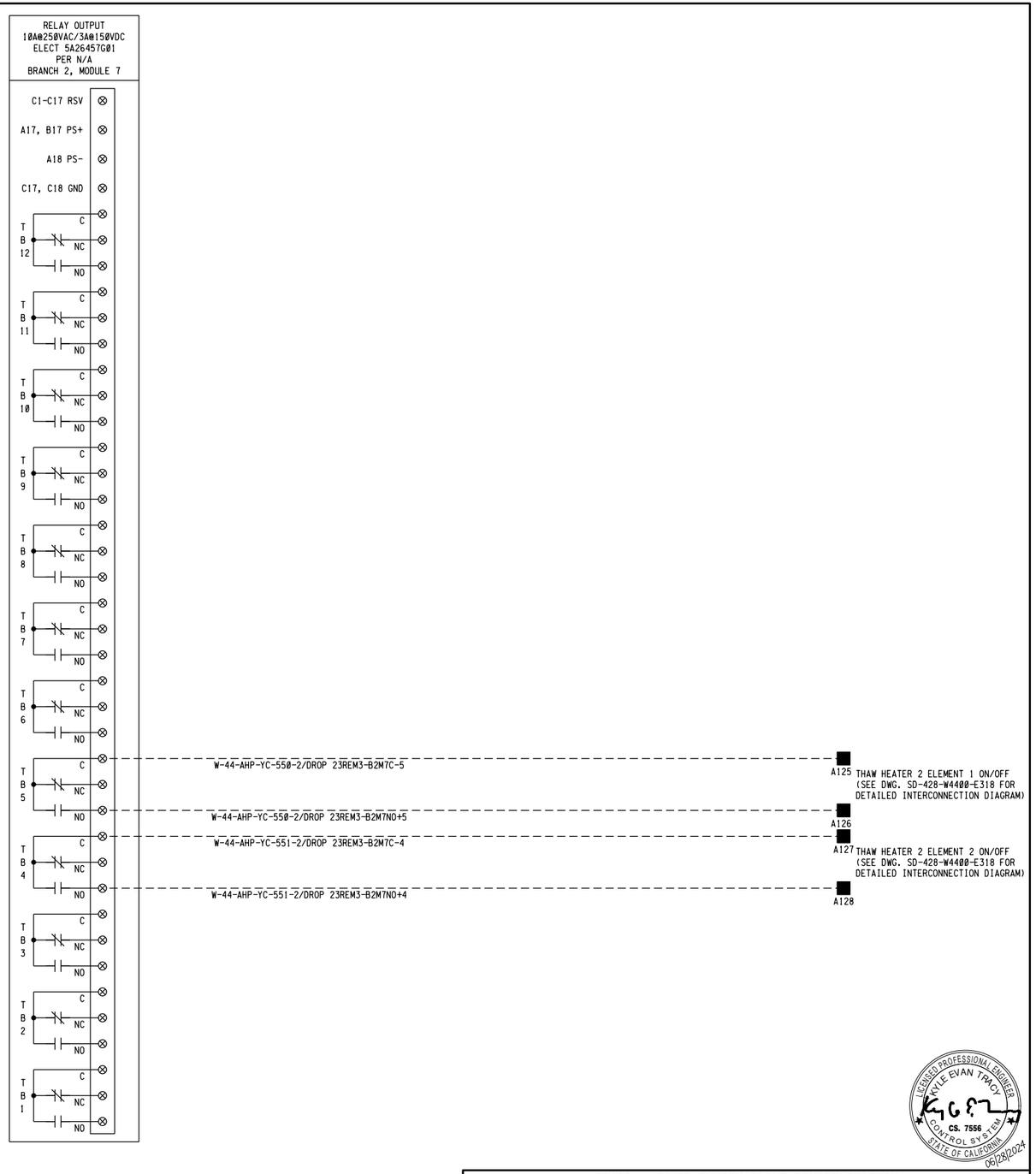

NOTES:

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

RIO-23-3 TURBINE/CRYO PLANT 2 PANEL I/O MODULE SCHEMATIC

SCALE	NONE	SD428-W4400-E508-517	Ø
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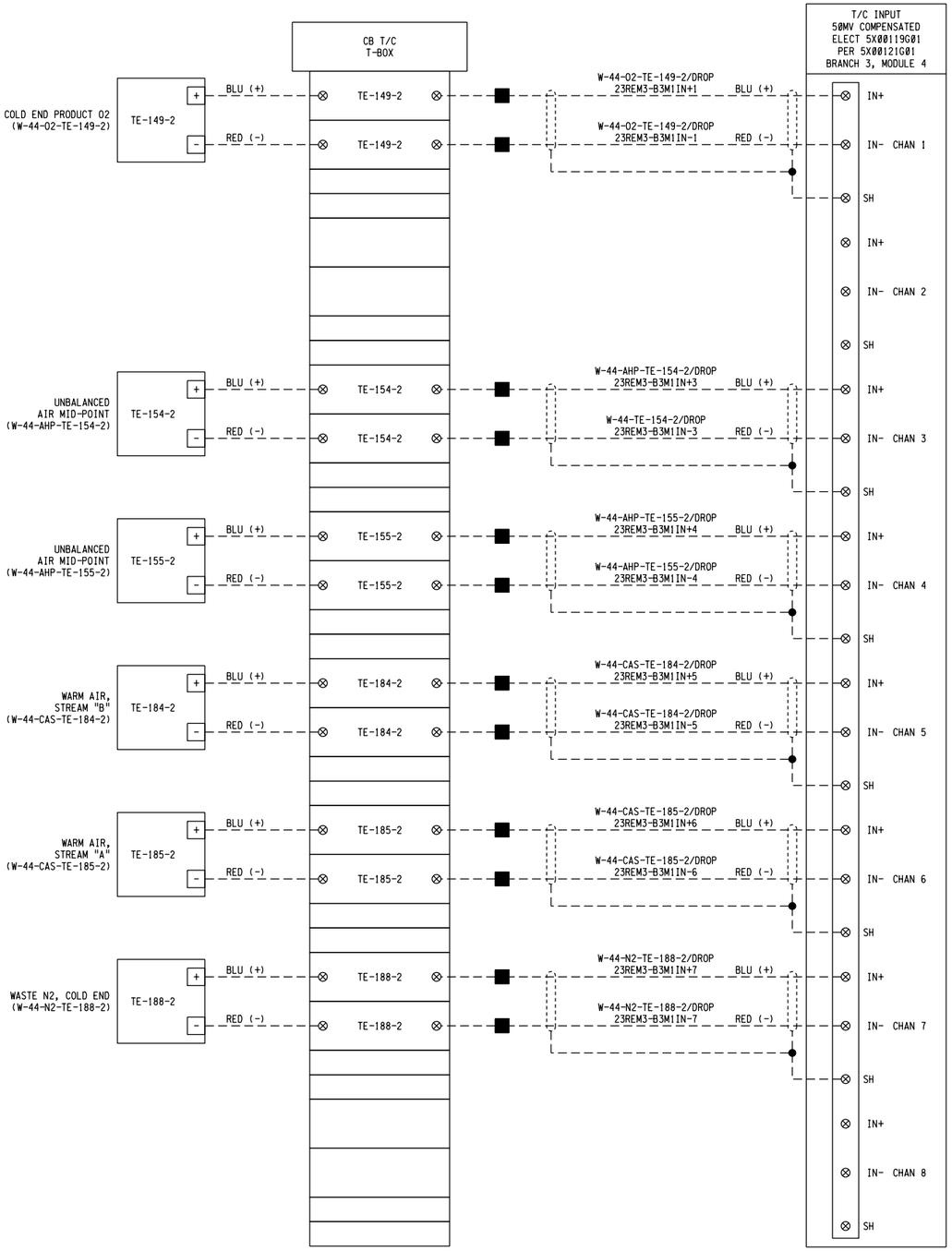

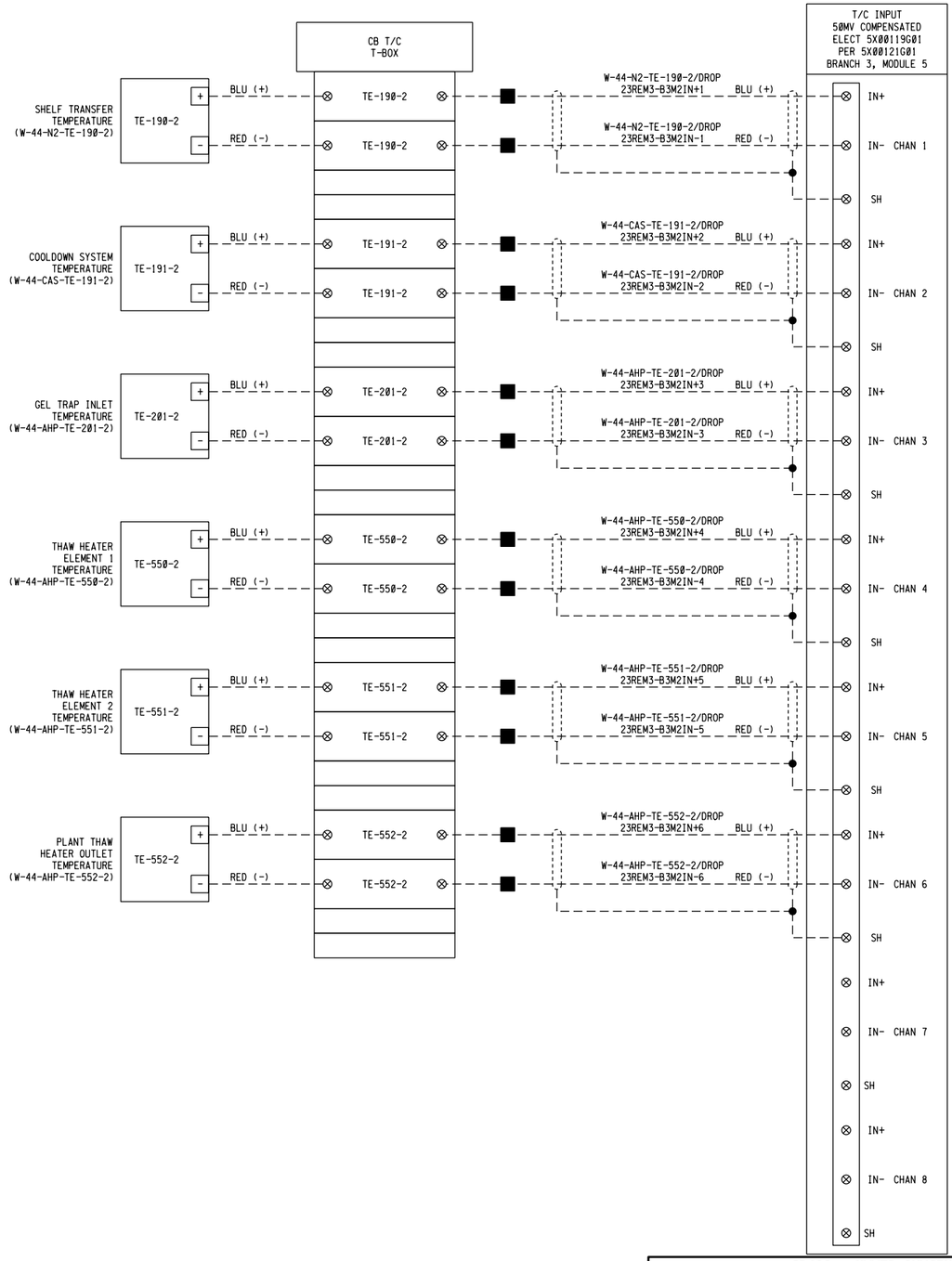

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/29/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO. 7556	K. TRACY
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APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
RIO-23-3 TURBINE/CRYO PLANT 2 PANEL
I/O MODULE SCHEMATIC

SCALE NONE
DATE 28JUN24

SD428-W4400-E508-518
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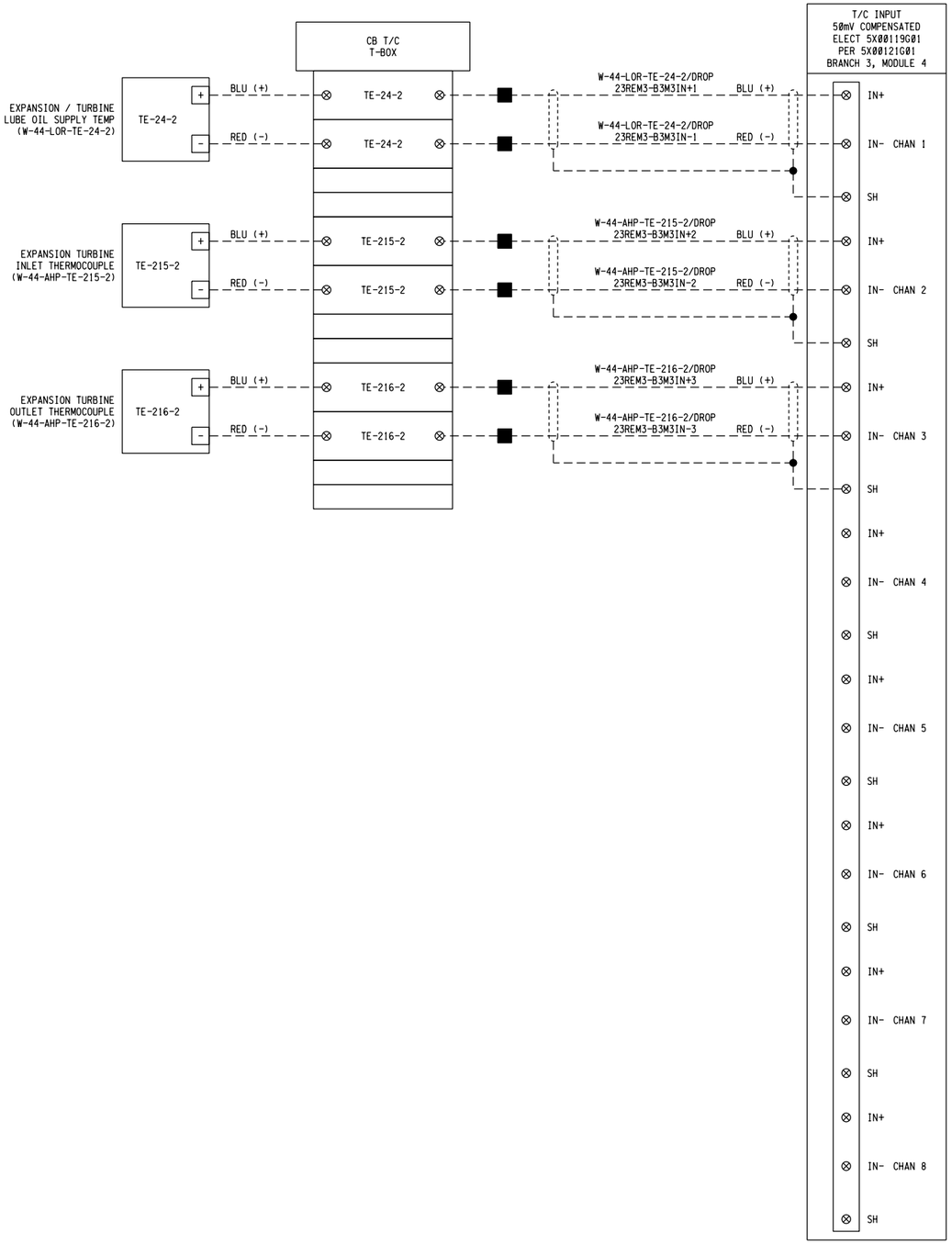

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LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL

RIO-23-3 TURBINE/CRYO PLANT 2 PANEL
I/O MODULE SCHEMATIC

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DATE 28JUN24

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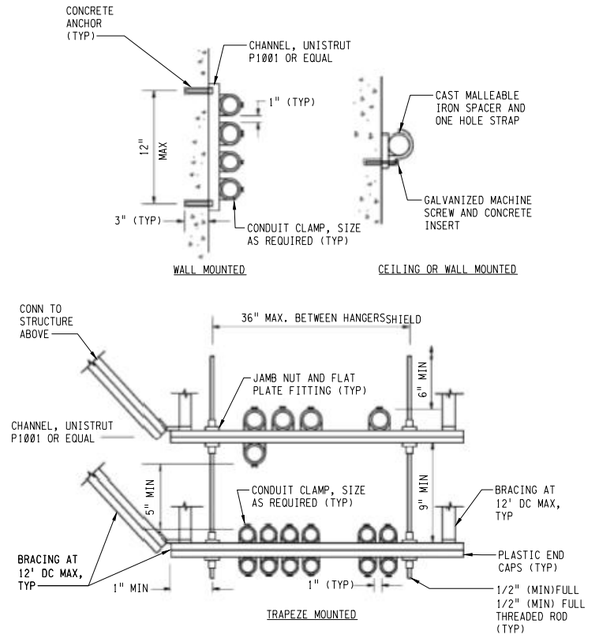
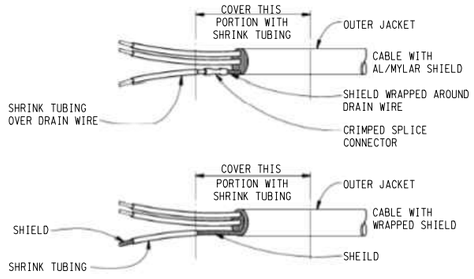


CONDUIT MOUNTING DETAIL

DETAIL 7
SD428-W4400-E902

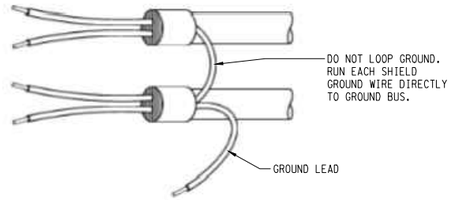


NOTES:

1. SHIELD GROUNDED AT TERMINATION CABLES MAY BE MULTIPLE PAIRS.
2. FOR USE WHENEVER SHIELDED CONTROL CABLES ARE USED. APPLIES AT TERMINATIONS WHERE SHIELD IS TO BE GROUNDED. SEE OTHER DETAILS FOR GROUNDING SHIELD. GROUND ONE END OF CABLE ONLY.

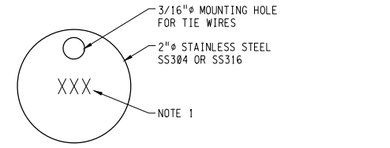
TERMINATION OF SHIELDED CONTROL CABLE (GROUNDED ENDS)

DETAIL 8
SD428-W4400-E902

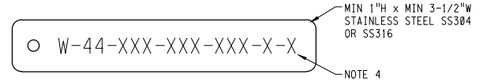


UNACCEPTABLE METHOD OF GROUNDING CONTROL CABLE SHIELD

DETAIL 10
SD428-W4400-E902



CONDUIT TAG



HANGING EQUIPMENT TAG

NOTES:

1. WHERE XXX IS THE CONDUIT TAG NAME OR TAG NUMBER IN COMPLIANCE WITH DISTRICT TAG NAME CONVENTIONS OR IN ACCORDANCE WITH THE CONDUIT SCHEDULE.
2. LETTER SIZE SHALL BE IN ACCORDANCE WITH Ø1 91 13.10.
3. ATTACH CONDUIT TAG WITH STAINLESS STEEL WIRE ROPE.
4. FOR EQUIPMENT LISTED IN THE SPECIFICATIONS AND DRAWINGS, EQUIPMENT TAG SHALL BE IN ACCORDANCE WITH THE FOLLOWING FORMAT:

   W-AREA CODE-SYSTEM CODE-EQUIPMENT CODE-ID NUMBER-MODIFIER

   SEE SPECIFICATIONS (INSTRUMENT SCHEDULE, VALVE SCHEDULE, CONTROL NARRATIVES) AND DRAWINGS FOR TAG NAMES. FOR CONFLICTING TAG NAMES, CONFIRM THE APPROPRIATE TAG NAME WITH THE ENGINEER.
5. PRINTING OF TAGS SHALL BE IN ACCORDANCE WITH Ø1 91 13.10

EQUIPMENT AND CONDUIT TAG

DETAIL 9
SD428-W4400-E902

REGISTERED PROFESSIONAL ENGINEER
DONNA LYNN RAMMELL
No. 16928
Exp. 06-30-25
ELECTRICAL
STATE OF CALIFORNIA

06/28/2024

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	D. RAMMELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
DETAILS 2

SCALE NONE
DATE 28JUN24

SD428-W4400-E902
DRAWING NUMBER

0
REV.

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME
REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME
REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

INSTRUMENTATION

USER: omunoz PLOT SCALE: 0.166834:1
DATE: 09-JUL-2007 12:24
FILE: \\Oes-wktp-01\Data\drafters_drawing_templates\INSERTS-discipline\insert-inst.dgn

REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

PLOT SCALE: PLOT#SCALE
USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

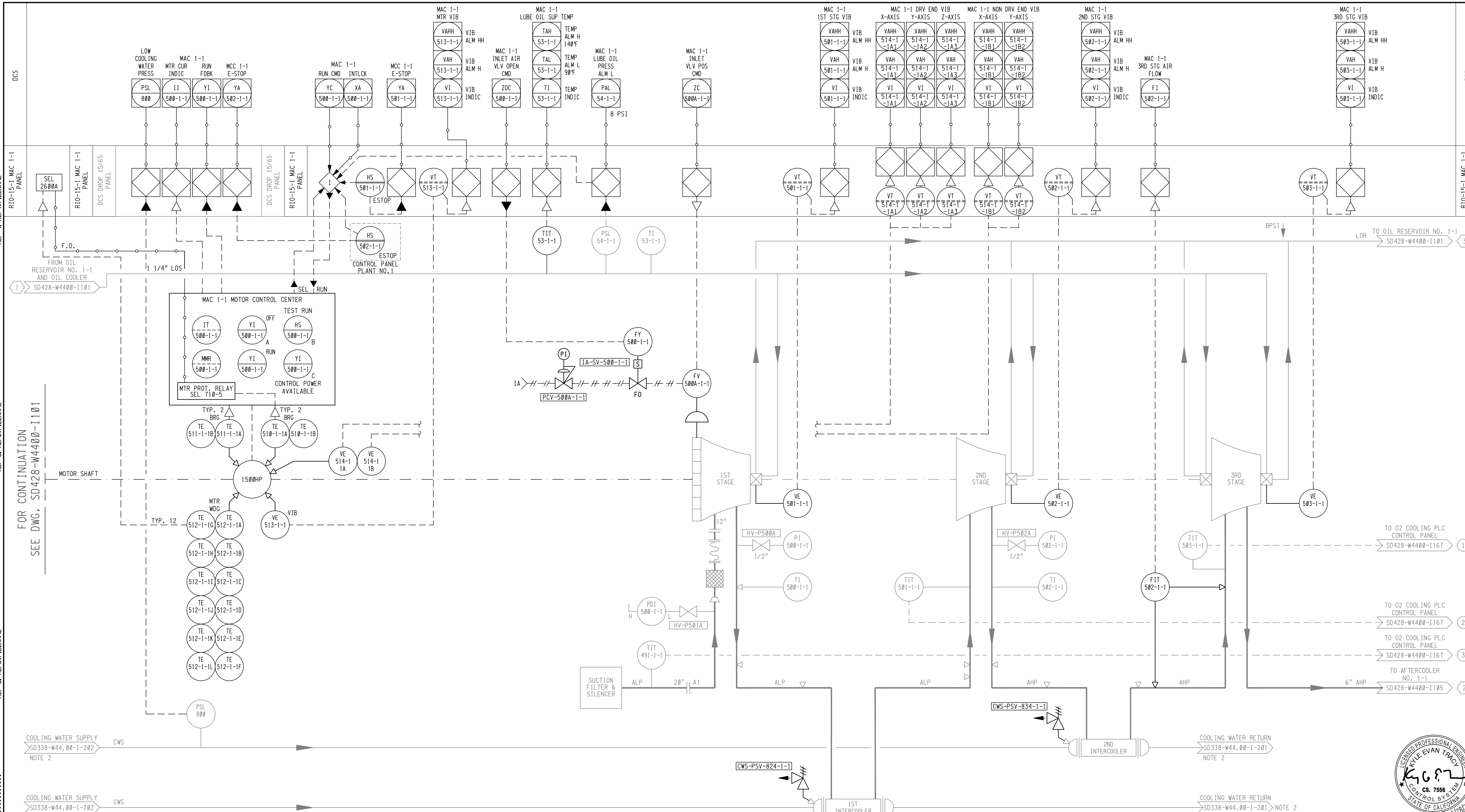
REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

PLOT SCALE: PLOT#SCALE

USER: $$USER$$$$
DATE: $$$$$DATE$$$$$$
FILE: $$$$$$$



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REF 8: REF8$FILENAME
REF 9: REF9$FILENAME
REF 4: REF4$FILENAME
REF 5: REF5$FILENAME
REF 6: REF6$FILENAME
REF 1: REF1$FILENAME
REF 2: REF2$FILENAME
REF 3: REF3$FILENAME
PLOT SCALE: PLOT$SCALE
USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$$$

NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.
2. SEE DRAWINGS SD338-W44.00-I-202 FOR CLOSED LOOP COOLING WATER SYSTEM.

3" ON ORIGINAL DOCUMENT

0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

SUPERSEDES: OLD DRAWING NUMBER

A COPY OF ORIGINAL DOCUMENT CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	R. SPEYRER
	DRAWN BY:	L. MAXWELL
	DESIGN CHECKED BY R.P.E. NO.	K. TRACY
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

INSTRUMENTATION

AIR COMPRESSOR NO. 1-1

SCALE NONE

DATE 5APR24

SD428-W4400-I102
DRAWING NUMBER

REV. 0

REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

PLOT SCALE: PLOT#SCALE

USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

DCS

RIO-15-2 MAC 1-2 PANEL | RIO-15-2 MAC 1-2 PANEL | DCS DROP 15/65 PANEL | DCS DROP 15/65 PANEL | RIO-15-2 MAC 1-2 PANEL

MAC 1-2 MTR CUR II 500-1-2 | MAC 1-2 RUN FDBK YI 500-1-2 | MCC 1-2 E-STOP YA 502-1-2 | MAC 1-2 RUN CMD YC 500-1-2 | MAC 1-2 INTLCK XA 500-1-2 | MCC 1-2 E-STOP YA 501-1-2 | MAC 1-2 MTR VIB VAHH 513-1-2 VIB ALM HH, VAH 513-1-2 VIB ALM H, VI 513-1-2 VIB INDIC | MAC 1-2 INLET AIR VLV OPEN CMD ZOC 500-1-2 | MAC 1-2 LUBE OIL SUP TEMP TAH 53-1-2 TEMP ALM H 140°F, TAL 53-1-2 TEMP ALM L 90°F, TI 53-1-2 TEMP INDIC | MAC 1-2 LUBE OIL PRESS ALM L PAL 54-1-2 8 PSI | MAC 1-2 INLET VLV POS CMD ZC 500A-1-2 | MAC 1-2 1ST STG VIB VAHH 501-1-2 VIB ALM HH, VAH 501-1-2 VIB ALM H, VI 501-1-2 VIB INDIC | MAC 1-2 DRV END VIB X-AXIS / Y-AXIS / Z-AXIS VAHH 514-1-2A1 / 514-1-2A2 / 514-1-2A3, VAH 514-1-2A1 / 514-1-2A2 / 514-1-2A3, VI 514-1-2A1 / 514-1-2A2 / 514-1-2A3 | MAC 1-2 NON DRV END VIB X-AXIS / Y-AXIS VAHH 514-1-2B1 / 514-1-2B2, VAH 514-1-2B1 / 514-1-2B2, VI 514-1-2B1 / 514-1-2B2 | MAC 1-2 2ND STG VIB VAHH 502-1-2 VIB ALM HH, VAH 502-1-2 VIB ALM H, VI 502-1-2 VIB INDIC | MAC 1-2 3RD STG AIR FLOW FI 502-1-2 | MAC 1-2 3RD STG VIB VAHH 503-1-2 VIB ALM HH, VAH 503-1-2 VIB ALM H, VI 503-1-2 VIB INDIC

SEL 2600A | HS 501-1-2 ESTOP | VT 513-1-2 | VT 501-1-2 | VT 514-1-2A1 / 514-1-2A2 / 514-1-2A3 | VT 514-1-2B1 / 514-1-2B2 | VT 502-1-2 | VT 503-1-2

F.O.

FROM OIL RESERVOIR NO. 1-2 AND OIL COOLER 1 SD428-W4400-I103

1 1/4" LOS

HS 502-1-2 ESTOP CONTROL PANEL PLANT NO.1

TIT 53-1-2 | PSL 54-1-2 | TI 53-1-2

BPSI

TO OIL RESERVOIR NO. 1-2 LOR SD428-W4400-I103 3

SEL RUN

MAC 1-2 MOTOR CONTROL CENTER

IT 500-1-2 | YI 500-1-2 OFF/A | HS 500-1-2 TEST RUN/B | MMR 500-1-2 | YI 500-1-2 RUN | YI 500-1-2 C CONTROL POWER AVAILABLE

MTR PROT. RELAY SEL 710-5

FY 500-1-2 | PI | IA-SV-500-1-2 S | IA | PCV-500A-1-2 | FO | FV 500A-1-2

TYP. 2 BRG: TE 511-1-2B, TE 511-1-2A | TE 510-1-2A, TE 510-1-2B

VE 514-1 2A | VE 514-1 2B

MOTOR SHAFT

1500HP

MTR WDG: TE 512-1-2G, TE 512-1-2A | TE 512-1-2H, TE 512-1-2B | TE 512-1-2J, TE 512-1-2C | TE 512-1-2K, TE 512-1-2D | TE 512-1-2L, TE 512-1-2E | TE 512-1-2F, TE 512-1-2F

TYP. 12

VE 513-1-2 VIB

1ST STAGE | VE 501-1-2 | 12" | HV-P500A 1/2" | P1 500-1-2 | TI 500-1-2 | PDI 500-1-2 H/L | HV-P501A | TIT 491-1-2 | SUCTION FILTER & SILENCER | ALP | 20" A1

2ND STAGE | VE 502-1-2 | HV-P502A 1/2" | P1 502-1-2 | TI 502-1-2 | TIT 501-1-2 | ALP | AHP

3RD STAGE | VE 503-1-2 | TIT 503-1-2 | FIT 502-1-2 | AHP | 6" AHP

TO O2 COOLING PLC CONTROL PANEL SD428-W4400-I167 1

TO O2 COOLING PLC CONTROL PANEL SD428-W4400-I167 2

TO O2 COOLING PLC CONTROL PANEL SD428-W4400-I167 3

TO AFTERCOOLER NO. 1-2 SD428-W4400-I105 2

CWS-PSV-834-1-1 | 2ND INTERCOOLER

CWS-PSV-824-1-1 | 1ST INTERCOOLER

COOLING WATER SUPPLY SD338-W44.00-I-202 NOTE2 — CWS — COOLING WATER RETURN SD338-W44.00-I-202 NOTE2

COOLING WATER SUPPLY SD338-W44.00-I-202 NOTE2 — CWS — COOLING WATER RETURN SD338-W44.00-I-202 NOTE2

FOR CONTINUATION SEE DWG. SD428-W4400-I103

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REF 2: REF2#FILENAME
REF 3: REF3#FILENAME
REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME
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REF 9: REF9#FILENAME

PLOT SCALE: PLOT#SCALE
USER: @USER#@@@@
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.
2. SEE DRAWINGS SD338-W44.00-I-202 FOR CLOSED LOOP COOLING WATER SYSTEM.

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran | SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER KYLE EVAN TRACY No. CS. 7556 CONTROL SYSTEM STATE OF CALIFORNIA 06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
AIR COMPRESSOR NO. 1-2

SCALE NONE
DATE SAPR24

SD428-W4400-I104
DRAWING NUMBER

0
REV.

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REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

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REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

PLOT SCALE: PLOT$SCALE

USER: $$USER$$$$
DATE: $$$$$$$$DATE$$$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$FILE$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

DCS

MAC 1-1 DISCH PRESS ALM H — PAH 503-1-1
MAC 1-1 DISCH AIR TEMP — TI 505-1-1
MAC 1-1 DISCH AIR TEMP ALM HH — TAHH 506-1-1
MAC 1-1 DISCH PRESS — PI 506-1-1
MAC 1-1 DISCH VENT VLV POS CMD — ZC 506A-1-1
MAC 1-1 VENT VLV OPEN CMD — ZOC 506-1-1
MAC 1-2 DISCH PRESS ALM H — PAH 503-1-2
MAC 1-2 DISCH AIR TEMP — TI 505-1-2
MAC 1-2 DISCH AIR TEMP ALM HH — TAHH 506-1-2
MAC 1-2 DISCH PRESS — PI 506-1-2
MAC 1-2 DISCH VENT VLV POS CMD — ZC 506A-1-2
MAC 1-2 VENT VLV OPEN CMD — ZOC 506-1-2

RIO-15-1 MAC 1-1 PANEL
RIO-15-2 MAC 1-2 PANEL

FROM AIR COMPRESSOR NO. 1-2 — 2 — SD428-W4400-I104 — AHP
COOLING WATER SUPPLY — SD338-W44.00-I-202 — CWS — NOTE 2

PSH 503-1-2 · PI 503-1-2 · TIT 505-1-2 · TSHH 506-1-2 · HV-P503A 1/2" · 10" · A2 · 10" · AFTERCOOLER NO. 1-2 · 4" · 4" · 10" · TI 505-1-2 · TIT 506-1-2 · 80# · A3 · 10" · PIT 506-1-2 · HV-P506A S · EXH · BA1 · VENT SILENCER SYSTEM · FV 506A-1-2 · FO 4" · 4-20ma · FO · FY 506-1-2 · PI · AS-1 · PCV 507-1-2 · A3 | A4 · HV-Y500A · HV-X500A

TO AIR SURGE TANK — SD428-W4400-I106 — 2 — AHP
COOLING WATER RETURN — SD338-W44.00-I-202 — CWR — NOTE 2
TO O2 COOLING PLC CONTROL PANEL — SD428-W4400-I167 — 2
SD428-W4400-I167 — 1 — TO O2 COOLING PLC CONTROL PANEL

FROM AIR COMPRESSOR NO. 1-1 — 2 — SD428-W4400-I102 — 10" AHP
COOLING WATER SUPPLY — SD338-W44.00-I-202 — CWS — NOTE 2

PSH 503-1-1 · PI 503-1-1 · TIT 505-1-1 · TSHH 506-1-1 · HV-P503A 1/2" · 10" · A2 · 10" · AFTERCOOLER NO. 1-1 · 4" · 4" · 10" · TI 505-1-1 · TIT 506-1-1 · 80# · A3 · PIT 506-1-1 · HV-P506A S · EXH · BA1 · VENT SILENCER SYSTEM · FV 506A-1-1 · FO 4" · 4-20ma · FO · FY 506-1-1 · PI · AS-1 · PCV 507-1-1 · A3 | A4 · HV-Y500A · HV-X500A

TO AIR SURGE TANK — SD428-W4400-I106 — 1 — AHP
COOLING WATER RETURN — SD338-W44.00-I-202 — CWR — NOTE 2

NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.
2. SEE DRAWINGS SD338-W44.00-I-202 FOR CLOSED LOOP COOLING WATER SYSTEM.

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

SUPERSEDES: OLD DRAWING NUMBER

A COPY OF ORIGINAL DOCUMENT CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER — KYLE EVAN TRACY — CS. 7556 — CONTROL SYSTEM — STATE OF CALIFORNIA — 06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
AFTERCOOLERS NO. 1-1 AND 1-2

SCALE NONE
DATE 5APR24

SD428-W4400-I105
DRAWING NUMBER

0
REV.

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REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

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REF 8: REF8@FILENAME
REF 9: REF9@FILENAME

REF 4: REF4@FILENAME
REF 5: REF5@FILENAME
REF 6: REF6@FILENAME

REF 1: REF1@FILENAME
REF 2: REF2@FILENAME
REF 3: REF3@FILENAME

PLOT SCALE: PLOT@SCALE

USER: $$USER@$$$
DATE: $$$$

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REF 8: REF8#*FILENAME
REF 9: REF9#*FILENAME

REF 4: REF4#*FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#*FILENAME

REF 1: REF1#*FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

USER: &%USER%&&&
DATE: $$$$

REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

PLOT SCALE: PLOT#SCALE

USER: $#USER#$$$
DATE: $$$$$#DATE#$$$$$
FILE: $$$$$$

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REF 8: REF8#FILENAME
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REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
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REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

PLOT SCALE: PLOT$SCALE

USER: $#USER#$$$
DATE: $$$$$$$DATE#$$$$$$
FILE: $$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$FILE#$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$

DCS

DCS DROP 15/65 PANEL

RIO-15-3 TURBINE/CRYO PANEL PLANT 1

COLD BX 1 HYDROCARBON AI 352-1

COLD BX 1 UPPER COLM LIQUID
LEVEL LI 352-1
LEVEL ALM L LAL 352-1
LAHH 352-1 LEVEL ALM HH
LAH 352-1 LEVEL ALM H
LALL 352-1 LEVEL ALM LL

COLD BX 1 UPPER COLM
PRESS INDIC PI 352-1
PAH 349-1 PRESS ALM H
PI 349-1 PRESS INDIC

COLD BX 1 UPPER VENT COLUMN VLV OPEN CMD ZOC 349-1

COLD BX 1 SHELF TRANSF TEMP TI 190-1

FROM N2 SUPERHEATER SHELF TRANSFER
1 SD428-W4400-I112
2" N2 SHELF TRANSFER

FROM N2 SUPERHEATER KETTLE TRANSFER
2 SD428-W4400-I112
2" O2 KETTLE TRANSFER

FROM TURBINE
1 SD428-W4400-I110
8" ALP TURBINE AIR

FROM LOWER COLUMN SUPERHEATER
2 SD428-W4400-I113
10" N2

FY 349-1
PIT 349-1
PI 349-1
A P349
B P349
S
8"
HV-X349N
PSV 349N-1
BN1
HV-P349N
02
1/2"
MODIFICATION TO UPPER COLUMN PSV MANUAL VERTICAL GROUND LEVEL

TO N2 SUPERHEATER WASTE
18" N2
SD428-W4400-I112
3

UPPER COLUMN

HV-X349N
HV-V349N
1/2"
S
HV-V349NA
GROUND LEVEL DRAIN
OLD349N

PIT 352-1
A P352
B P352
HV-L352X
1/2"
HV-S358X
B S358
(LIQUID TRYCOCK)

AIT 352-1
CONTROL PANEL PLANTE NO.1
A S360X
B S360X
02
HV-602X

PSE 352-1 L
LIT 352-1
0-100" H_2O
PSE 352-1 H
1"
HV-H352X
1/2"

MAIN CONDENSER
3"

HV-L351X
HV-V351X
HV-H351X
1/2"
83"
PSE 351-1 L
PSE 351-1 H

HV-V341N
2"
TE 190-1

8" 02
TO O2 SUPERHEATER
SD428-W4400-I112
4

TO LOWER COLUMN AND N2 SUPERHEATER SHELF TRANSFER
2" N2 SHELF TRANSFER
SD428-W4400-I112
5

TO ORIOX TANKS NO. 1-1 AND 1-2
2" 02
SD428-W4400-I113
1

NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
05/23/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
UPPER COLUMN SUPERHEATER COLD BOX NO. 1

SCALE NONE
DATE SAPR24

SD428-W4400-I111
DRAWING NUMBER

0
REV.

DCS

R10-15-3 TURBINE/CRYO PANEL PLANT 1

PLT 1 KETTLE LVL VLV OPEN CMD ZOC 330-1

PLT 1 KETTLE LVL VLV POS CMD ZC 330A-1

R10-15-3 TURBINE/CRYO PANEL PLANT 1

DCS DROP 15/65 PANEL

PLT 1 PROD O2 PURITY ASL 355-1 / AI 355-1

DCS DROP 15/65 PANEL

R10-15-3 TURBINE/CRYO PANEL PLANT 1

PLT 1 SHELF FLOW FI 340-1

PLT 1 SHELF VLV POS CMD ZC 340-1

PLT 1 SHELF VLV OPEN CMD ZOC 340-1

DCS

R10-15-3 TURBINE/CRYO PANEL PLANT 1

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DCS

R10-15-3 TURBINE/CRYO PANEL PLANT 1

DCS DROP 15/65 PANEL

COLD BX 1 LOWER COLM LIQUID LVL — LI 330-1

COLD BX 1 LOWER COLM PRESS — PI 300-1

PLT 1 PROD N2 PURITY — AI 312-1

PLT 1 COOL DOWN SYS TEMP — TI 191-1

PLT 1 LIQUID ADD VLV OPEN CMD — ZOC 351-1

PLT 1 LIQUID MAKE UP VLV OPEN CMD — ZOC 350-1

FROM UPPER COLUMN SUPERHEATER — SD428-W4400-I111 — 2" O2

FROM DRIOX TANK NO. 1-1 — SD428-W4400-I114 — 1" O2 L02-1

FROM DRIOX PRODUCT VAPORIZER — SD428-W4400-I169 — 2" CD01 COOL DOWN SYSTEM

FROM UPPER COLUMN SUPERHEATER — SD428-W4400-I112 — 2" N2 SHELF TRANSFER

FROM O2 SUPERHEATER — SD428-W4400-I112 — 1" AHP

FROM CEGT — SD428-W4400-I112 — 10" C.E. AIR

TO DRIOX TANKS NO. 1-1 AND 1-2 — SD428-W4400-I114 — 1" O2 L01-1

TO UPPER COLUMN SUPERHEATER — SD428-W4400-I111 — 10" N2

TO N2 SUPERHEATER KETTLE TRANSFER — SD428-W4400-I112 — 2" O2 KETTLE TRANSFER

TO DRAIN VAPORIZER — SD428-W4400-I168 — 3" WGS LD1

HV-Y350X, HV-S356X, HV-X351X, HV-B351X, HV-P300N, HV-P301N, HV-T340N, HV-S350N, HV-D350X, HV-L330A, HV-S330A, HV-H330A, HV-V330A, HV-D330A, HV-X330X, HV-D332X

PSV 351X-1, PSV 352X-1, PSV 301-1 N, PSV 330-1 L, PSV 330-1 H, PSV 330-1 X

PIT 300-1, PI 301-1, PCV 351-1, PCV 312-1, FI 313-1, AIT 312-1, LIT 330-1, PSE 330-1 L, PSE 330-1 H, TE 191-1

LY 350X-1, LY 351X-1, LV 350X-1, LV 351X-1

LOWER COLUMN

CONTROL PANEL PLANT NO.1

DRAIN MANIFOLD

0-100" H 0

25.5"

NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.

3" ON ORIGINAL DOCUMENT
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NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER — KYLE EVAN TRACY — CS. 7556 — CONTROL SYSTEM — STATE OF CALIFORNIA — 06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R, SPEYRER
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

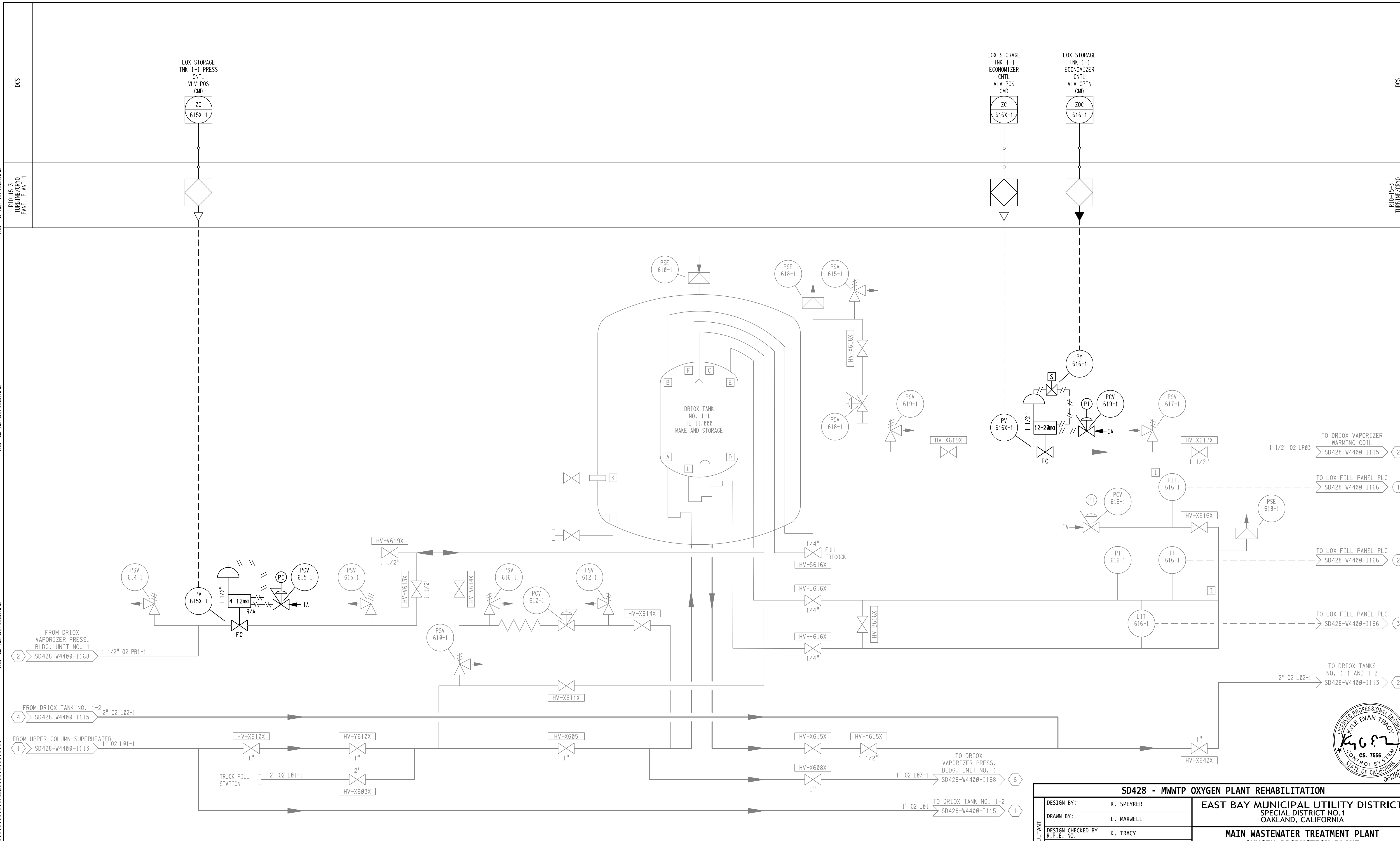
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
LOWER COLUMN SUPERHEATER COLD BOX NO. 1

SCALE NONE
DATE SAPR24

SD428-W4400-I113
DRAWING NUMBER

0
REV.



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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	R. SPEYRER
	DRAWN BY:	L. MAXWELL
	DESIGN CHECKED BY R.P.E. NO.	K. TRACY
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

INSTRUMENTATION

DRIOX TANK NO. 1-1

SCALE NONE
DATE 5APR24

SD428-W4400-I114
DRAWING NUMBER

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REV.

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DCS

LOX STORAGE TNK 1-2 PRESS CNTL VLV POS CMD
ZC 625X-1

LOX STORAGE TNK 1-2 ECONOMIZER CNTL VLV POS CMD
ZC 626X-1

LOX STORAGE TNK 1-2 ECONOMIZER CNTL VLV OPEN CMD
ZOC 626-1

DCS

RIO-15-3 TURBINE/CRYO PANEL PLANT 1

RIO-15-3 TURBINE/CRYO PANEL PLANT 1

2 SD428-W4400-I114 — 1 1/2" O2 LP03
FROM DRIOX TANK NO. 1-1 VENT RECOVERY

2" O2 LP03 — SD428-W4400-I169 — 5
TO DRIOX VAPORIZER WARMING COIL

PSE 620-1

PSV 628-1 2A
PSE 628-1 2A
HV 628-1 2-1
PSE 628-1 2B
PSV 628-1 2B

HV-X628-1A
HV-X628-1B

PCV 628-1 2A
HV 628-1 2D
PCV 628-1 2B
PSV 639-1

HV-X629X

PY 626-1
S
PV 626X-1
1 1/2"
12-20ma
PI
PCV 627-1
IA
FC

HV-X627X
1 1/2"

PSV 629-1

I
PIT 626-1
TO LOX FILL PANEL PLC
SD428-W4400-I166 — 1

PI
PCV 626-1
IA

HV-X616X

PSE 628-1

PI 626-1
TT 626-1
TO LOX FILL PANEL PLC
SD428-W4400-I166 — 2

I
LIT 626-1
TO LOX FILL PANEL PLC
SD428-W4400-I166 — 3

DRIOX TANK NO. 1-2 TL 11,000 MAKE AND STORAGE

HV-X626X
1 1/2"

1/4" FULL TRICOCK
HV-S626X

HV-L626X
1/4"

HV-H626X
1/4"

HV-X629X

PSV 624-1
PV 625X-1
1 1/2"
4-12ma
R/A
PI
PCV 625-1
IA
FC

PSV 625-1
HV-X623X
1 1/2"

HV-X624X

PSV 626-1
PCV 622-1
PSV 622-1

PSV 620-1

HV-X621X

HV-X606X

FROM DRIOX VAPORIZER PRESS. BLDG. UNIT NO. 2
3 SD428-W4400-I168 — 1 1/2" O2 PB1-2

FROM UPPER COLUMN SUPERHEATER
1 SD428-W4400-I114 — 1" O2 L01

HV-X620X
1"
HV-Y620X
1"

TRUCK FILL STATION
2" O2 L01-1
2"
HV-X603X-4

TO DRIOX VAPORIZER PRESS. BLDG. UNIT NO. 2
1" O2 L03-2
SD428-W4400-I168 — 4

HV-X607X
1"

PSV 605-1

2" COZ
HV-Y625X
1 1/2"
HV-X625X

HV-X609X
2"
L02-1 L02

DRIOX BACK-UP TO DRIOX PRODUCT VAPORIZER
2" O2 L02 — SD428-W4400-I169 — 3

TO DRIOX TANKS NO. 1-1 AND 1-2
2" O2 L02-1 — SD428-W4400-I114 — 4

3" ON ORIGINAL DOCUMENT
0 1 2 3

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NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
DRIOX TANK NO. 1-2

SCALE NONE
DATE SAPR24

SD428-W4400-I115
DRAWING NUMBER

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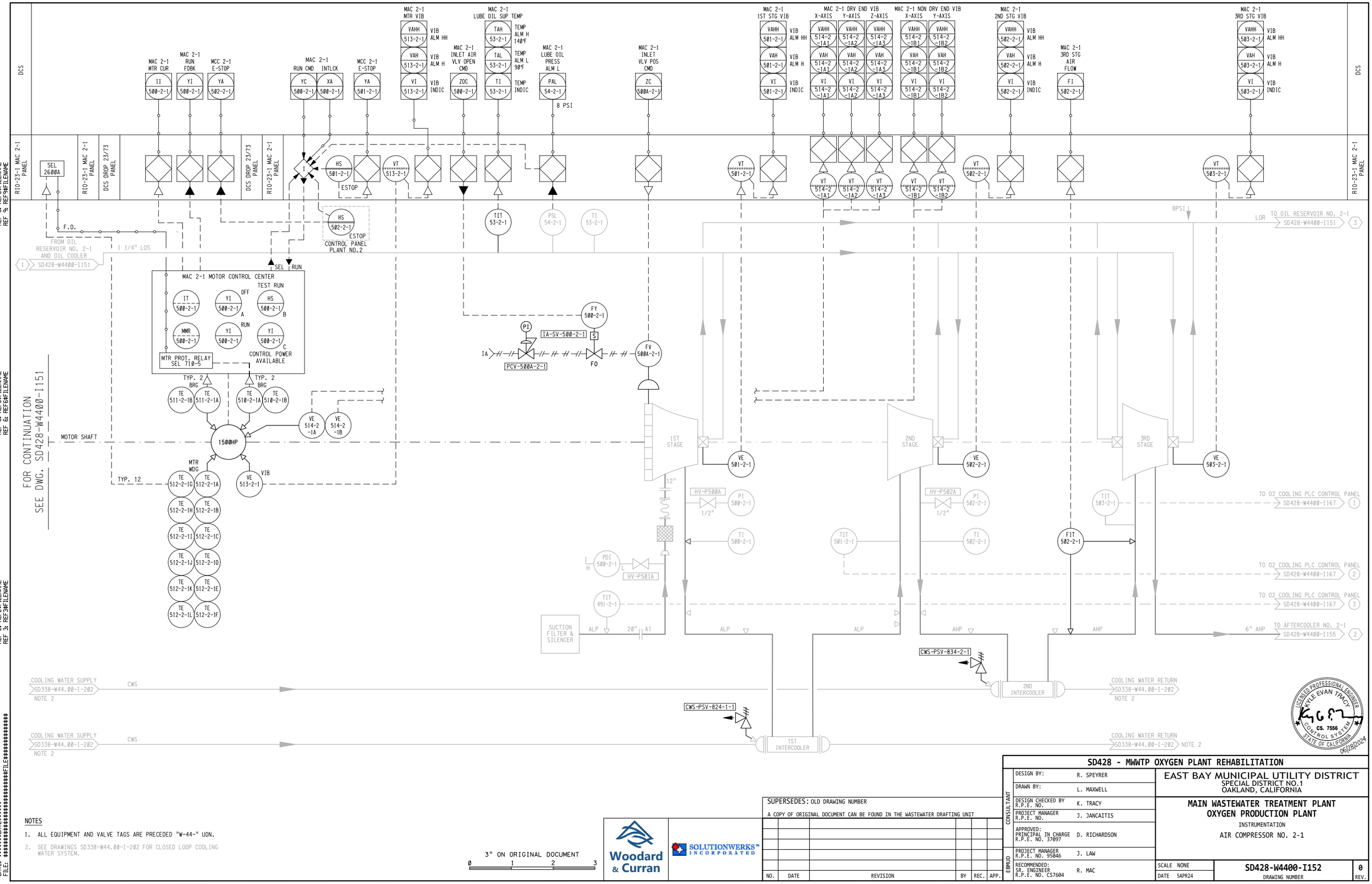

NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.
2. SEE DRAWINGS SD338-W44.00-I-202 FOR CLOSED LOOP COOLING WATER SYSTEM.

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0 1 2 3

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SUPERSEDES: OLD DRAWING NUMBER

A COPY OF ORIGINAL DOCUMENT CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER KYLE EVAN TRACY CS. 7556 CONTROL SYSTEM STATE OF CALIFORNIA 06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
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EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
AIR COMPRESSOR NO. 2-1

SCALE NONE
DATE SAPR24

SD428-W4400-I152
DRAWING NUMBER

0
REV.

DCS

RIO-23-2 MAC 2-2 PANEL

RIO 23-2 ENCL. TEMP
TI 001-23-2
TT 001-23-2
TE 001-23-2

LUBE OIL TNK 1-1 LVL ALM L
LAL 50-2-2

MAC 2-2 AUX OIL PUMP
RUN FDBK YI 50-2-2
RUN CMD YC 50-2-2

MAC 2-2 LUBE OIL RET.
PAL 53-2-2 PRESS ALM L
PI 53-2-2 PRESS INDIC

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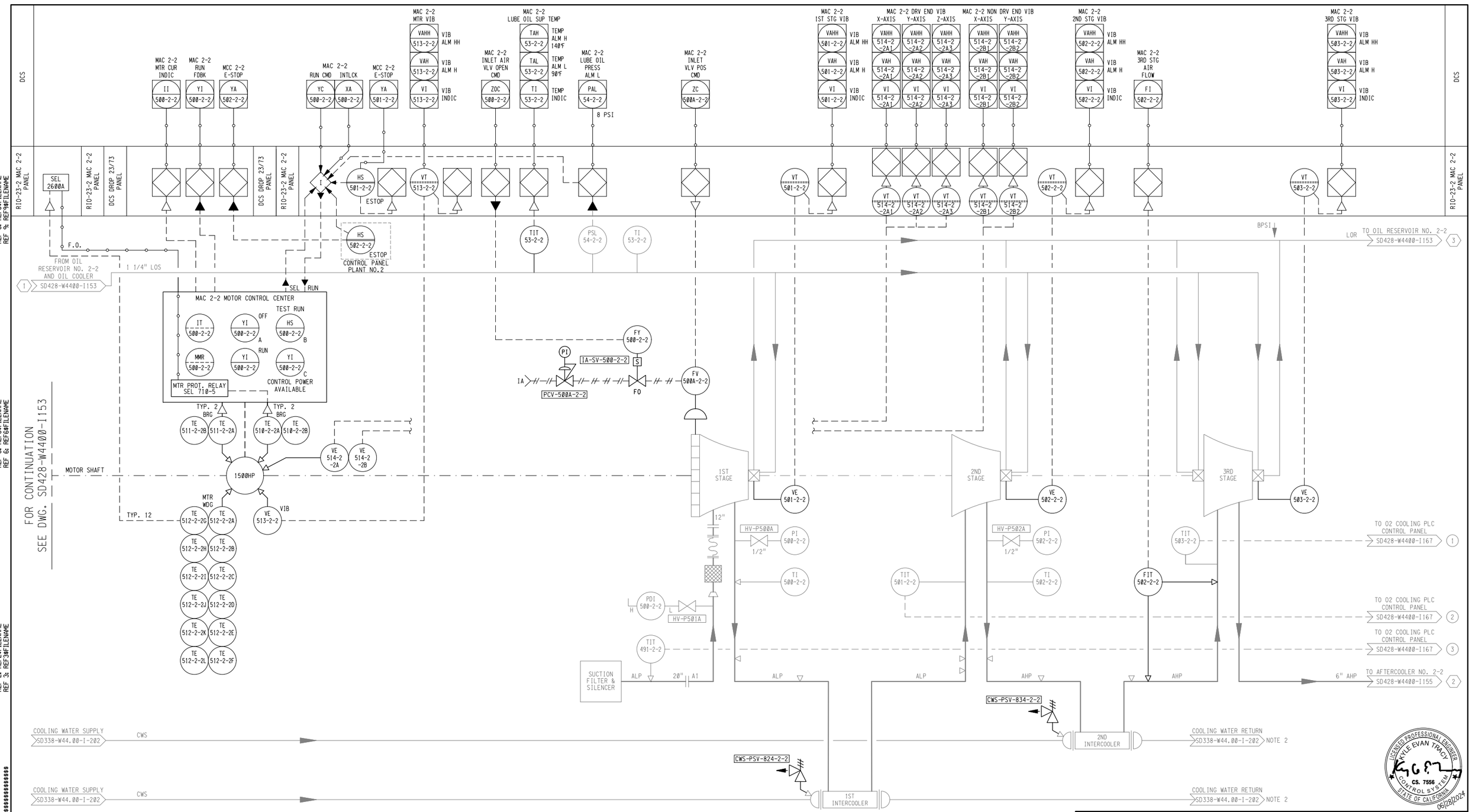

NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.
2. SEE DRAWINGS SD338-W44.00-I-202 FOR CLOSED LOOP COOLING WATER SYSTEM.

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NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER KYLE EVAN TRACY No. CS. 7556 CONTROL SYSTEMS STATE OF CALIFORNIA 06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

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DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
AIR COMPRESSOR NO. 2-2

SCALE NONE
DATE SAPR24

SD428-W4400-I154
DRAWING NUMBER

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REF 2: REF2*#FILENAME
REF 3: REF3*#FILENAME

PLOT SCALE: PLOT$SCALE

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DATE: $$$$

DCS

RIO 23-3 ENCL. TEMP
TI Ø01-23-3

RIO-23-3 TURBINE/CRYO PANEL PLANT 2
TT Ø01-23-3
TE Ø01-23-3

PLT 2 THAW HEATER
PLANT THAW CMD YC 550-2
TURBINE THAW CMD YC 551-2

PLT 2 SURGE TNK H2O
LVL ALM H LAH 501-2
COND. DRAIN VLV OPEN CMD ZOC 510-2

PLT 2 THAW HTR ELEM 1
TAH 550-2 TEMP ALM H
TI 550-2 TEMP INDIC

PLT 2 THAW HTR ELEM 2
TAH 551-2 TEMP ALM H
TI 551-2 TEMP INDIC

PLT 2 THAW HTR OUTLET
TAHH 552-2 TEMP ALM HH 350°F
TAH 552-2 TEMP ALM H 300°F
TALL 552-2 TEMP ALM LL 140°F
TAL 552-2 TEMP ALM L 150°F
TI 552-2 TEMP INDIC

NO. 2 CRYO AIR SW
VLV 2 FULLY OPEN ZIO 112-2
VLV 2 FULLY CLOSED ZIC 112-2

NO. 2 CRYO WASTE N2 SW
VLV 2 FULLY OPEN ZIO 114-2
VLV 2 FULLY CLOSED ZIC 114-2
VLV 1 FULLY OPEN ZIO 113-2
VLV 1 FULLY CLOSED ZIC 113-2

NO. 2 CRYO AIR SW
VLV 1 FULLY OPEN ZIO 111-2
VLV 1 FULLY CLOSED ZIC 111-2

NO. 2 CRYO AIR SW
VLV 1 OPEN CMD HS 111-2

NO. 2 CRYO WASTE N2 SW
VLV 1 OPEN CMD HS 113-2
VLV 2 OPEN CMD HS 114-2

NO. 2 CRYO AIR SW
VLV 2 OPEN CMD HS 112-2

DCS

RIO-23-3 TURBINE/CRYO PANEL PLANT 2

CONTROL PANEL PLANT NO.2

FROM RHX 5 SD428-W4400-I158 — IA
FROM RHX 1 SD428-W4400-I158
Ø591A
HV-X594A
HV-X595A
IA4
C
IA3
HV-FV215A
HV-FV213A
HV-FV214A
TURBINE TRIP VALV

HV-FV500A
HV-FV506A
HV-PV615X
HV-PV616X
HV-PV615X
HV-PV262X
HV-PIC616
HV-PIC626
HV-PT635
IA2
HV-X592A
MAIN INSTRUMENT PANEL
TURBINE PANEL

3/4" AHP
3/4"
HV-X512A
COMPRESSED AIR
TO AIR EJECTOR NO. 2-2 SD428-W4400-I153 1
TO AIR EJECTOR NO. 2-1 SD428-W4400-I151 1

HV-X555A
HV-Y555A
A6
1/2"
TE 550-2
TE 551-2
53KW
137KW
TI 552-2
TE 552-2
THAW MANIFOLD
HV-Y555A
HV-X550A
HV-T210A GECT 2"
HV-T340N LOWER COLUMN 2"
HV-T215A TURBINE 1"
HV-T216A
AT2
AT1

12"
A5
14"
AHP
PI 510-2
6"
AIR SURGE TANK
3/4"
LI 501-2
LSH 501-2
2"
HV-B510C
HV-X510C
S510C
LY 510-2
CD4
1A1
4"

FROM AFTERCOOLER NO. 2-1 SD428-W4400-I155 1 — AHP 12"
FROM AFTERCOOLER NO. 2-2 SD428-W4400-I155 2 — AHP
FROM RHX INSTRUMENT AIR ACCUMULATOR SD428-W4400-I158 3 — 1" IAI

HV-B111A
2"
ZSO 111-2
ZSC 111-2
FY 111-2
HV-X111A
12"
FCV 111A-2
AHP-FCV-111A-I
HV-X113N
ZSO 113-2
ZSC 113-2
FY 113-2
WASTE VENT SILENCER
24" N2
20"
FCV 113N-2
N2-FCV-113N-I
HV-X114N
ZSO 114-2
ZSC 114-2
FY 114-2
FCV 114N-2
N2-FCV-114N-I
HV-X112A
ZSO 112-2
ZSC 112-2
FY 112-2
FCV 112A-2
AHP-FCV-112A-I
HV-B112A
TO RHX SD428-W4400-I157 1
TO RHX SD428-W4400-I157 2

LICENSED PROFESSIONAL ENGINEER KYLE EVAN TRACY CS. 7556 CONTROL SYSTEMS STATE OF CALIFORNIA 06/28/2024

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NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.

3" ON ORIGINAL DOCUMENT
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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

CONSULTANT

DESIGN BY:	R. SPEYRER	
DRAWN BY:	L. MAXWELL	
DESIGN CHECKED BY R.P.E. NO.	K. TRACY	
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS	
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON	
EBMUD PROJECT MANAGER R.P.E. NO. 95046	J. LAW	
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC	

SD428 - MWWTP OXYGEN PLANT REHABILITATION

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
AIR SURGE TANK COLD BOX NO. 2

SCALE NONE
DATE 5APR24
SD428-W4400-I156 DRAWING NUMBER
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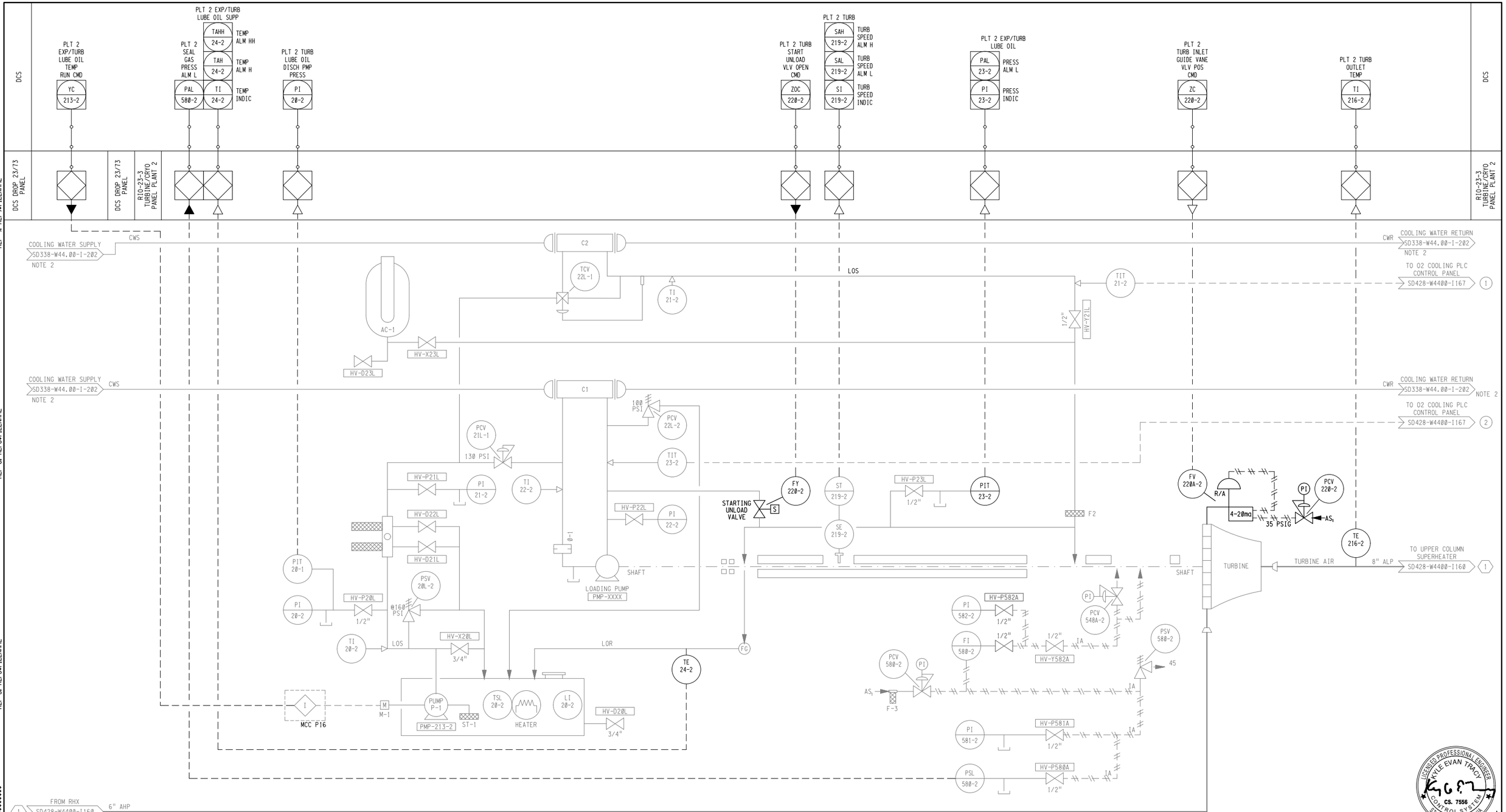

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USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
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NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.
2. SEE DRAWING SD338-W44.00-I-202 FOR CLOSED LOOP COOLING WATER SYSTEM.

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

SUPERSEDES: OLD DRAWING NUMBER

A COPY OF ORIGINAL DOCUMENT CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
INSTRUMENTATION
TURBINE COLD BOX NO. 2

SCALE NONE	**SD428-W4400-I159**	0
DATE SAPR24	DRAWING NUMBER	REV.

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REF 9: REF9##FILENAME

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REF 5: REF5##FILENAME
REF 6: REF6##FILENAME

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REF 2: REF2##FILENAME
REF 3: REF3##FILENAME

USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

REF 7: REF7#FILENAME
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REF 3: REF3#FILENAME

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REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

PLOT SCALE: PLOT#SCALE

USER: #USER#####
DATE: ##########DATE##########
FILE: ##FILE##

DCS

PLT 2 KETTLE LVL VLV OPEN CMD ZOC 330-2

PLT 2 KETTLE LVL VLV POS CMD ZC 330A-2

PLT 2 PROD O2 PURITY ASL 355-2 / AI 355-2

PLT 2 SHELF FLOW FI 340-2

PLT 2 SHELF VLV POS CMD ZC 340-2

PLT 2 SHELF VLV OPEN CMD ZOC 340-2

DCS

R10-23-3 TURBINE/CRYO PANEL PLANT 2

DCS DROP 23/73 PANEL

R10-23-3 TURBINE/CRYO PANEL PLANT 2

DCS DROP 23/73 PANEL

R10-23-3 TURBINE/CRYO PANEL PLANT 2

R10-23-3 TURBINE/CRYO PANEL PLANT 2

FROM UPPER COLUMN SUPERHEATER SD428-W4400-I161 (4) — 8" O2

FROM UPPER COLUMN SUPERHEATER SD428-W4400-I161 (3) — 18" N2

N2 SUPERHEATER WASTE — SHELF / KETTLE / AIR

HV-0349N 1/2"

HV-0331A 1/2"

HV-0121A 1/2"

HV-0120A 1/2"

O2 SUPERHEATER

HV-S355X 1/2" — B HV-S355 — A HV-S354X

90% O_2 10% N_2 (K CYLINDER) — A SPAN HV-S357X

100% O_2 (K CYLINDER) — A ZERO HV-S359X

FI 355-2

AIT 355-2

CONTROL PANEL PLANT NO.2

PI 355-2 — HV-P356X — VENT A

FI 356-2

PI — ABSOLUTE PRESSURE — PCV 357-2 / PCV 356-2

BACK PRESSURE — PCV 355-2 — A VENT

8" LY 330-2 — PCV 330-2 — PI — S — FO — AS_2 — 4-20ma — LV 330A-2

FC

HV-X301N 2"

HV-0341N — TO DRAIN HDR

N2

N2

O2

O2

FROM UPPER COLUMN SUPERHEATER SD428-W4400-I161 (5) — 2" N2 SHELF TRANSFER

FROM UPPER COLUMN SUPERHEATER SD428-W4400-I163 (5) — 2" O2 KETTLE TRANSFER

FROM CEGT SD428-W4400-I160 (2) — 10" C.E. AIR

PSE 340-2 H — HV-H340N 1/2" — FIT 340-2 — FE 340N-2 — PSE 340-2 L — HV-L340N 1/2" — HV-D340N

FV 340N-2 — 4-20ma — FC 2" — FO — S — PI — PCV 340-2 — AS_2 — FY 340-2

HV-S5312N — B HV-5312 — A HV-5312 — 5313N

18" N2 WASTE — TO RHX SD428-W4400-I157 (2)

8" PRODUCT O2 — TO RHX SD428-W4400-I157 (1)

1" AHP — TO LOWER COLUMN SUPERHEATER SD428-W4400-I163 (4)

2" O2 KETTLE TRANSFER — TO UPPER COLUMN SUPERHEATER SD428-W4400-I161 (2)

2" N2 SHELF TRANSFER — TO LOWER COLUMN SUPERHEATER SD428-W4400-I163 (3)

2" N2 SHELF TRANSFER — TO UPPER COLUMN SUPERHEATER SD428-W4400-I161 (1)

10" C.E. AIR — TO LOWER COLUMN SUPERHEATER SD428-W4400-I163 (6)

LICENSED PROFESSIONAL ENGINEER — KYLE EVAN TRACY — CS. 7556 — CONTROL SYSTEM — STATE OF CALIFORNIA — 06/28/2024

NOTES

1. ALL EQUIPMENT AND VALVE TAGS ARE PRECEDED "W-44-" UON.

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. C57604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

INSTRUMENTATION

N2 AND O2 SUPERHEATER COLD BOX NO. 2

SCALE NONE
DATE SAPR24

SD428-W4400-I162
DRAWING NUMBER

0
REV.

REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

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REF 2: REF2#FILENAME
REF 3: REF3#FILENAME

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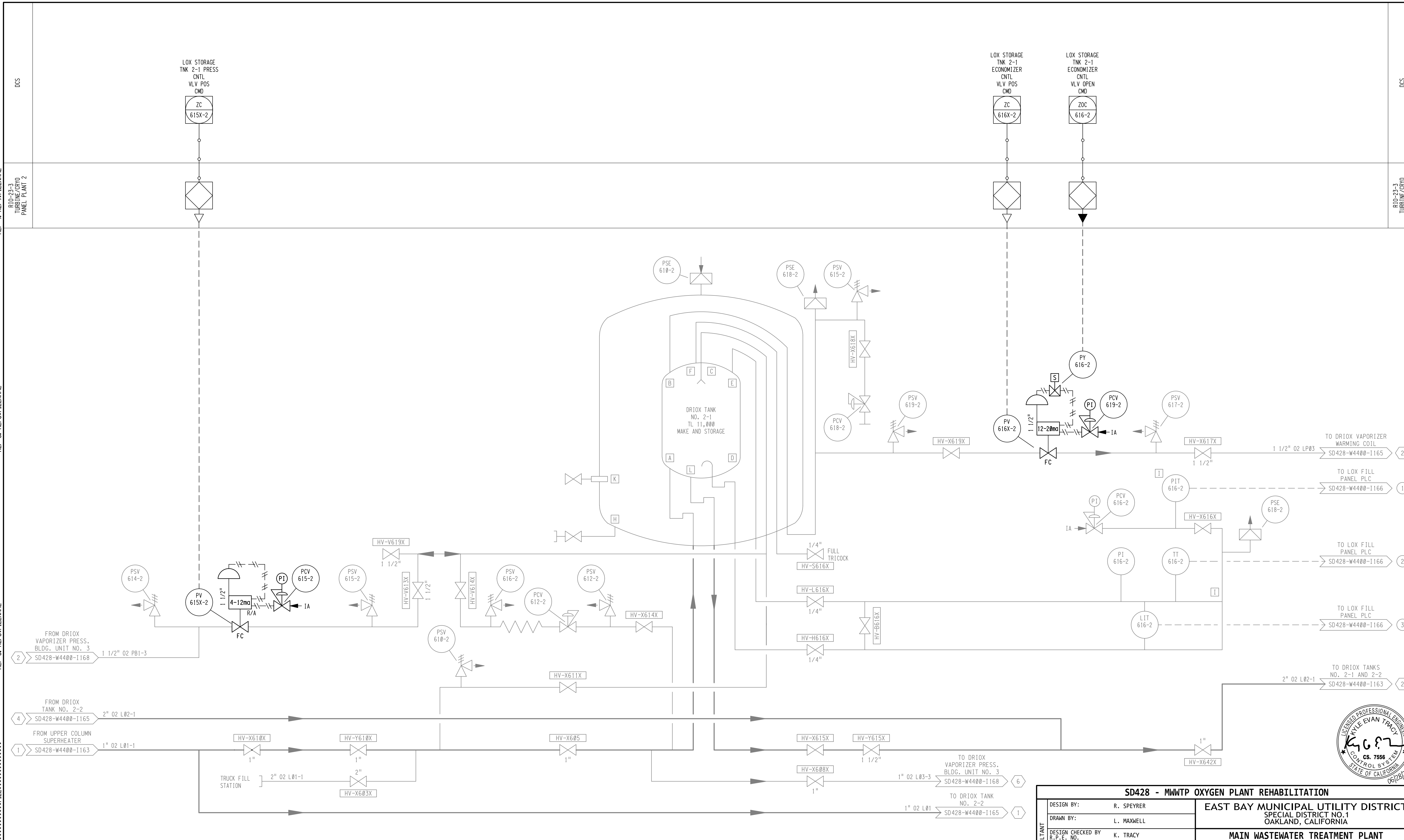

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0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT	DESIGN BY:	R. SPEYRER
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	DESIGN CHECKED BY R.P.E. NO.	K. TRACY
	PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
	APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON
EBMUD	PROJECT MANAGER R.P.E. NO. 95046	J. LAW
	RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

INSTRUMENTATION

DRIOX TANK NO. 2-1

SCALE NONE
DATE 5APR24

SD428-W4400-I164
DRAWING NUMBER

0
REV.

REF 1: REF1#$FILENAME
REF 2: REF2#$FILENAME
REF 3: REF3#$FILENAME
REF 4: REF4#$FILENAME
REF 5: REF5#$FILENAME
REF 6: REF6#$FILENAME
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REF 8: REF8#$FILENAME
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USER: $$USER$$$$
DATE: $$$$$$DATE$$$$$$
FILE: $$$$$$$

REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

DCS

DCS DROP 15/65 PANEL

TEMP INDIC TI 616-1
TEMP INDIC TI 626-1
TEMP INDIC TI 616-2
TEMP INDIC TI 626-2

ELC

CAT. 5e

PAL 616-1 PRESS ALM L
PI 616-1 PRESS INDIC

LEVEL INDIC LI 616-1
LAHH 616-1 LEVEL ALM HH
LAH 616-1 LEVEL ALM H
LAL 616-1 LEVEL ALM L
LALL 616-1 LEVEL ALM LL

PAL 626-1 PRESS ALM L
PI 626-1 PRESS INDIC

LEVEL INDIC LI 626-1
LAHH 626-1 LEVEL ALM HH
LAH 626-1 LEVEL ALM H
LAL 626-1 LEVEL ALM L
LALL 626-1 LEVEL ALM LL

PAL 616-2 PRESS ALM L
PI 616-2 PRESS INDIC

LEVEL INDIC LI 616-2
LAHH 616-2 LEVEL ALM HH
LAH 616-2 LEVEL ALM H
LAL 616-2 LEVEL ALM L
LALL 616-2 LEVEL ALM LL

PAL 626-2 PRESS ALM L
PI 626-2 PRESS INDIC

LEVEL INDIC LI 626-2
LAHH 626-2 LEVEL ALM HH
LAH 626-2 LEVEL ALM H
LAL 626-2 LEVEL ALM L
LALL 626-2 LEVEL ALM LL

TRYCOCK FLW ALM NA Ø1

LOX FILL PANEL PLC

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1 FROM PIT-616-1 SD428-W4400-I114
2 FROM TT-616-1 SD428-W4400-I114
3 FROM LIT-616-1 SD428-W4400-I114
1 FROM PIT-626-1 SD428-W4400-I115
2 FROM TT-626-1 SD428-W4400-I115
3 FROM LIT-626-1 SD428-W4400-I115
1 FROM PIT-616-2 SD428-W4400-I164
2 FROM TT-616-2 SD428-W4400-I164
3 FROM LIT-616-2 SD428-W4400-I164
1 FROM PIT-626-2 SD428-W4400-I165
2 FROM TT-626-2 SD428-W4400-I165
3 FROM LIT-626-2 SD428-W4400-I165

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO.	K. TRACY
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. CS7604	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

INSTRUMENTATION

LOX FILL PANEL PLC

SCALE NONE
DATE SAPR24

SD428-W4400-I166
DRAWING NUMBER

0
REV.

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REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

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REF 5: REF5#FILENAME
REF 6: REF6#FILENAME

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
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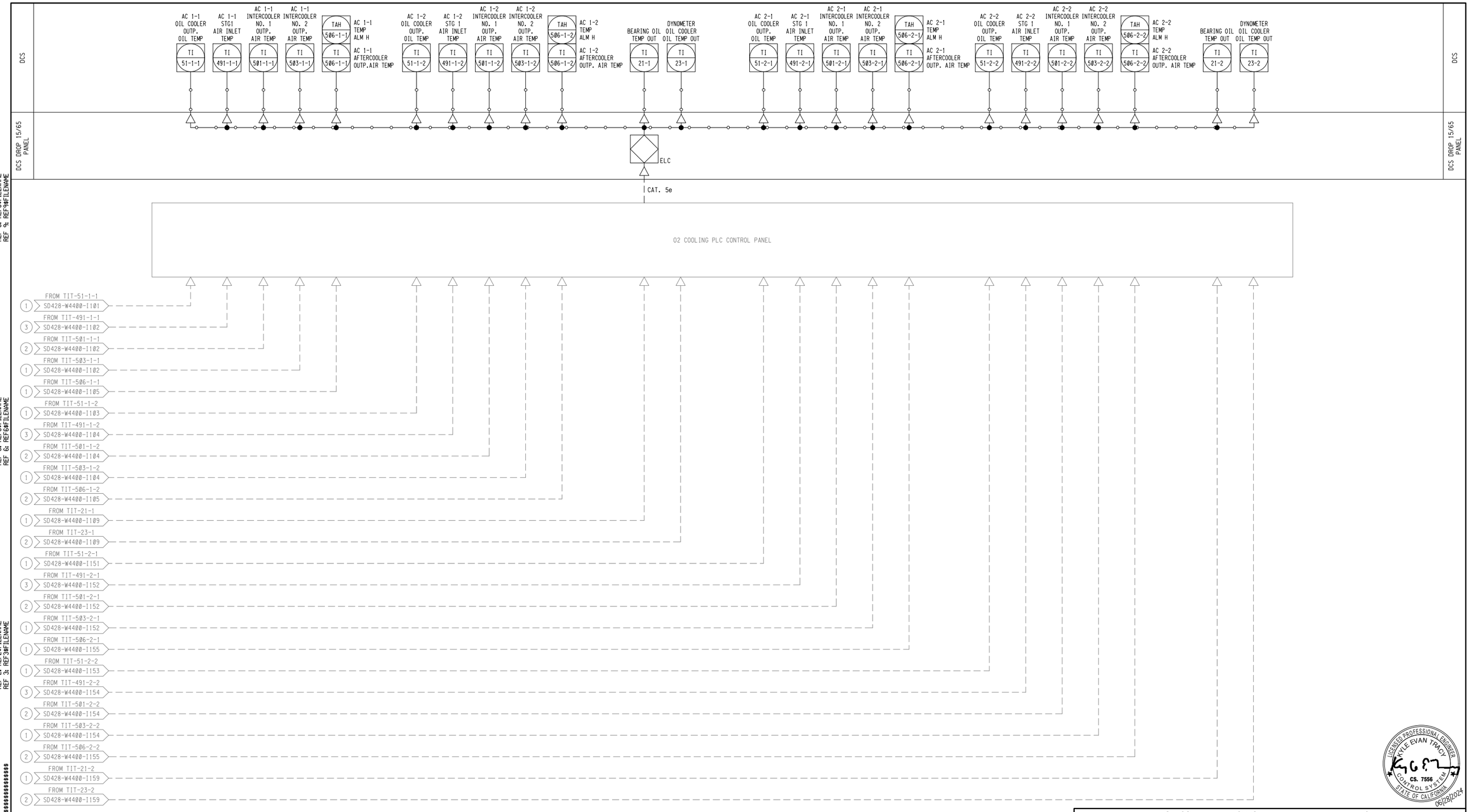

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Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

LICENSED PROFESSIONAL ENGINEER
KYLE EVAN TRACY
CS. 7556
CONTROL SYSTEM
STATE OF CALIFORNIA
06/28/2024

SD428 - MWWTP OXYGEN PLANT REHABILITATION

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DESIGN BY:	R. SPEYRER
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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

INSTRUMENTATION

O2 COOLING PLC CONTROL PANEL

SCALE NONE
DATE SAPR24

SD428-W4400-I167
DRAWING NUMBER

0
REV.

DCS

DRAIN VAPOR VLV OPEN CMD
ZOC 690

DRAIN VAPOR TEMP ALM
TAL 690

RIO 15-3 TURBINE/CRYO PANEL PLANT 1

TSL 690

WGS 1 OV

TO DROP PRESS BLDG. PV-625X-2
1 1/2" O2 PB1-4
SD428-W4400-I165 3

TO DROP PRESS BLDG. PV-616X-2
1 1/2" O2 PB1-3
SD428-W4400-I164 2

TO DROP PRESS BLDG. PV-625X-1
1 1/2" O2 PB1-2
SD428-W4400-I115 3

TO DROP PRESS BLDG. PV-615X-1
1 1/2" O2 PB1-1
SD428-W4400-I114 2

FROM DRIOX TANK NO. 1-1
6 SD428-W4400-I114
1" O2 L03-1

FROM DRIOX TANK NO. 1-2
4 SD428-W4400-I115
1" O2 L03-2

FROM DRIOX TANK NO. 2-1
6 SD428-W4400-I164
1" O2 L03-3

FROM DRIOX TANK NO. 2-2
4 SD428-W4400-I165
1" O2 L03-4

FY 690

PSV 690 X

S
FO
AS
I

FROM DRAIN MANIFOLD PLANT NO. 1
5 SD428-W4400-I113
3" WGS LD1

FROM DRAIN MANIFOLD PLANT NO.2
5 SD428-W4400-I163
3" WGS LD1

FC

FV 690 X

TSL 649
72KW

TSL 650
72KW

DRAIN VAPORIZER

TSL 651
104KW

TSL 653
104KW

PRESSURE BLDG. UNIT NO. 4

PRESSURE BLDG. UNIT NO. 3

TSL 652
104KW

TSL 654
104KW

PRESSURE BLDG. UNIT NO. 2

PRESSURE BLDG. UNIT NO. 1

FOR CONTINUATION
SEE DWG. SD428-W4400-I169

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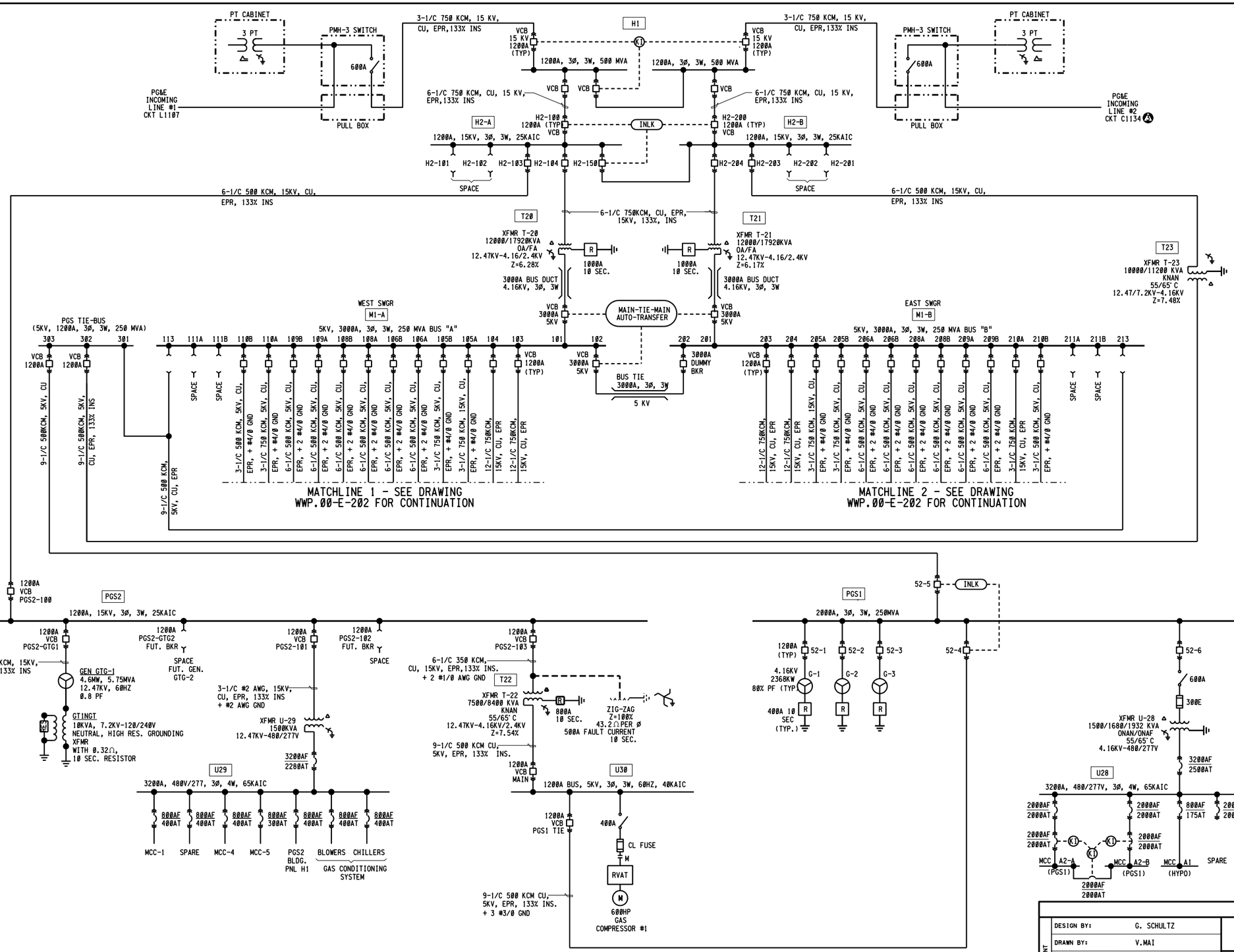

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engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

NO.	DATE	REVISION	BY	REC.	APP.
3	06MAY2016	REVISED PER RECORD DRAWING	RM	P.M	P.M
2	04OCT2012	RECORD DRAWING		AL	P.M
1	06JUL2012	REDRAWN FOLLOWING PGS2 CONSTRUCTION	MTH		

CONSULTANT

EBMUD

DESIGN BY:	G. SCHULTZ
DRAWN BY:	V.MAI
DESIGN CHECKED BY: R.P.E. No.	C. TAKAHASHI
PROJECT MANAGER R.P.E.No.	
APPROVED: PRINCIPAL IN CHARGE R.P.E. No.	
PROJECT MANAGER R.P.E. No. E13444	ANDY A. LY
RECOMMENDED: SR. ENGINEER R.P.E. No. E15544	MICHAEL T. NAKAMURA

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT

ELECTRICAL
POWER
SINGLE LINE DIAGRAM
SHEET 1 OF 2

SCALE NONE
DATE JULY 2012

WWP.00-E-201
DRAWING NUMBER

3
REV.

MATCHLINE 1 - SEE DRAWING WWP.00-E-201 FOR CONTINUATION

MATCHLINE 2 - SEE DRAWING WWP.00-E-201 FOR CONTINUATION

TO BREAKER 110B | TO BREAKER 110A | TO BREAKER 109B | TO BREAKER 109A | TO BREAKER 108B | TO BREAKER 108A | TO BREAKER 106B | TO BREAKER 106A | TO BREAKER 105B | TO BREAKER 105A | TO BREAKER 104 | TO BREAKER 103

TO BREAKER 203 | TO BREAKER 204 | TO BREAKER 205A | TO BREAKER 205B | TO BREAKER 206A | TO BREAKER 206B | TO BREAKER 208A | TO BREAKER 208B | TO BREAKER 209A | TO BREAKER 209B | TO BREAKER 210A | TO BREAKER 210B

12-1/C 750KCM CU, 15KV, EPR

1200A

1200A, 3Ø, 3W, 250 MVA BUS B

IPS S1

1200A, 3Ø, 3W, 250 MVA BUS A

1200A, 3Ø, 3W, 250 MVA BUS B

EPS S2

1200A, 3Ø, 3W, 250 MVA BUS A

T6 T5 T4 T3 T2 T1 SPACE SPARE

1200A (TYP)

700KVA 4.16KV -600V (TYP.)

HARMONIC FILTER

700

150ØKVA 4.16KV- 480-277V Z=5.69%

2000A

IPS U21

IPS U20

1200AF 900AT | 600AF 300AT | 800AF 450AT | 600AF 350AT | 600AF 300AT | SPARE

2000AF 1600AT

1200AF 900AT | 600AF 300AT | 800AF 500AT | 800AF 500AT | 600AF 150AT | SPARE

MCC-P1B (IPS) | MCC-P2B (IPS) | MCC-P30B (PRE-CHLOR) | MCC-P31 (PRE-CHLOR)

MCC-P3B

MCC-P1A (IPS) | MCC-P2A (IPS) | MCC-P30A (PRE-CHLOR) | MCC-P39 (GRIT)

MCC-P3A

1000 KVA 4.16KV- 600V

1000 HP

400KVA 4.16KV- 480/277V

400A

600A

VFD

700HP DP-1

700HP DP-2

500 KVA 4.16KV-480/277 Z=5.34%

MCC P4B (EPS)

MCC P4A (EPS)

MH-46

MH-42

600A | KI | 600A

MID-PLANT U22

1000 KVA, OIL 4.16KV- 480/277V Z=5.63%

1600A, 3Ø, 3W, 42KAIC

1600A | 800A SPARE

1200A 100AT

MCC P34 (MID-PLANT)

MAINT

500 KVA 4.16 KV-480/277V

800A

SWBD MCB

SOUTH REACTOR DECK U8/U9

600A | 400E | 2000 KVA, DRY 4.16 KV- 480/277V Z=5.75%

3200AF 3000AT

4000A, 3Ø, 4W

1600AF 1200AT

MCC P13B | MCC P13A | MCC P14A | MCC P14B

BUS "A" 5KV, 1200A, 3Ø, 3W, 250 MVA

BUS "B" 5KV, 1200A, 3Ø, 3W, 250 MVA

O2 PLANT S3

CL FUSE (TYP.)

ISO SWITCH (TYP.)

MAIN VAC CONTACTOR

RVAT

1250 HP COMPRESSOR MOTORS

3-1/C 750 KCM CU, 5KV, EPR, 133% INS.

AERATED GRIT U1

1500KVA, OIL 4.16KV- 480/277V Z=6.16%

2000A, 3Ø, 4W

MCC P7A | MCC P7B | MCC P7C | MCC P7D (GRIT HANDLING)

MH-H40

EAST BAYSHORE U3

300E

1500KVA, OIL 4.16KV- 480/277V Z=5.75%

ATS

SWBD 3200A, 3Ø, 4W

16-1/C 350 KCM | 3-1/C 500 KCM | 12-1/C 500 KCM | 12-1/C 500 KCM | 9-1/C 500 KCM, XHHW | 9-1/C 500 KCM, XHHW

MCC P1C | MCC WD | MCC P2C | SWBD DP3 MAINT. | MCC P33B | MCC P33A

SOLID / LIQUID 150E U13

750KVA, OIL 4.16KV- 480/277V Z=5.75%

1600AF 1000AT

1200A, 3Ø, 4W

800AF 800AT

MCC P22A (SOLID/LIQUID RECV STATION)

MCC P22C

MH-1

REACTOR 400A, 0.3Ω 0.8 MH

SLUDGE DEWATERING U14/U15

2000KVA, OIL 4.16KV- 480/277V

Z=5.52%

Z=5.32%

3200AF 3000AT

4000A, 3Ø, 4W

1600AF 800AT | 1600AF 1200AT | 1600AF 1200AT | 1600AF 800AT | 1600AF 1600AT

MCC DW | MCC P8A | MCC P23A | MCC P23B | MCC P8B | MCC P23E

MCC P23C

MCC P23D

MH-13

OPS CENTER U4/U5

600A | 200E | 1000 KVA, DRY 4.16 KV- 480/277V Z=5.75%

1600AF 1600AT

2000A, 3Ø, 4W

1600AF 1000AT

1000A

MCC P9 (OPS)

MCC P10 (OPS CENTER)

MCC P20 (GRIT HANDLING)

MH-16

U12

1000 KVA, OIL 4.16 KV- 480/277V Z=5.75%

2000A, 3Ø, 4W

1600AF 1200AT

1600AF 1500AT

FOR CONTINUATION SEE E-203

MCC P5A DIGESTERS

MCC P5B

MCC P5C

MH-H59

U16

2000/2300KVA, OIL 2240/2576KVA, ONAN/ONAF, 55/65°C, 4.16KV-480/277V Z=5.75%

450E

3200AF 3200AT

A SWGR "16A" 3200A, 3Ø, 3W, 65KAIC

B SWGR "16B" 3200A, 3Ø, 3W, 65KAIC

800AF 400AT

3-1/C 500KCM + #2(G)

24-1/C 75ØKCM + 8#25Ø(G)

MCC P40 | MCC P41 | MCC P42 | MCC P43 | MCC P28

3-1/C 500KCM + #2 AWG (G) (TYP)

BLDG.

NORTH REACTOR DECK U6/U7

2000 KVA, DRY 4.16 KV- 480/277V Z=5.75%

U6 | U7

4000A, 3Ø, 4W

MCC P11B | MCC P11A | MCC P12A | MCC P12B

O2 PLANT U10/U11

1500 KVA, DRY 4.16KV- 480/277V Z=5.75%

U10 | U11

3200A, 3Ø, 4W

MCC P15 | MCC P16 | MCC P17 (O2 PLANT)

3" ON ORIGINAL DOCUMENT

0 1 2 3

engineers, inc.
3350 scott blvd., bldg. 11
santa clara, ca 95054
(408) 986-8558
FAX (408) 986-9627
PROJECT NO. 07688-01-03

NO.	DATE	REVISION	BY	REC.	APP.
4	06MAY2016	REVISED PER RECORD DRAWING	RM	RM	RM
3	25SEP2013	REVISED TO REFERENCE E-203/RECORD DRAWING	BL	BL	GPW
2	07NOV2012	REVISED PER EBMUD COMMENTS/RECORD DRAWING	MTH	BL	RM
1	07JUL2012	REDRAW FOLLOWING PGS2 CONSTRUCTION	MTH		

CONSULTANT

DESIGN BY: G. SCHULTZ
DRAWN BY: V. MAI
DESIGN CHECKED BY: C. TAKAHASHI
R.P.E. No.
PROJECT MANAGER
R.P.E.No.
APPROVED:
PRINCIPAL IN CHARGE
R.P.E. No.

EBMUD

PROJECT MANAGER
SR. ENGINEER
R.P.E. No. E13444 — ANDY A. LY
RECOMMENDED:
R.P.E. No. E15544 — MICHAEL T. NAKAMURA

FACILITY DRAWING

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT

ELECTRICAL
POWER
SINGLE LINE DIAGRAM
SHEET 2 OF 2

SCALE NONE
DATE 07JUL2012
WWP.00-E-202
DRAWING NUMBER
4
REV.

REF 7; REF 8; REF 9;
REF 4; REF 5; REF 6;
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REF 2:
REF 3:

USER: supsorna
DATE: 31 JUL 2018 09:55
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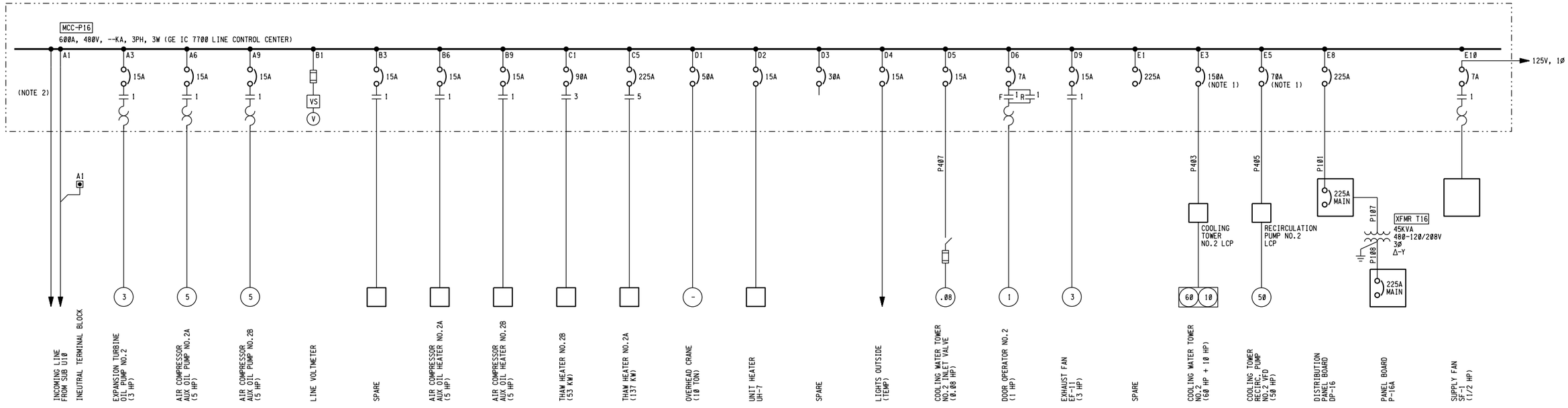
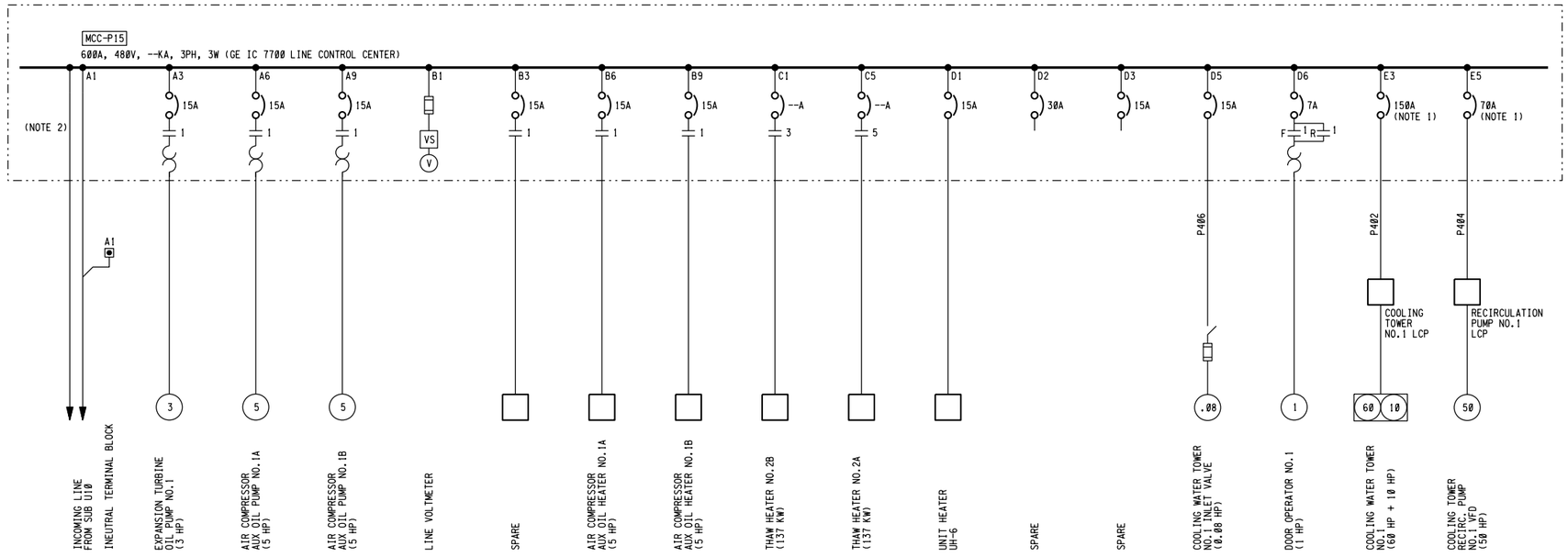


MCC P16 SINGLE LINE DIAGRAM



MCC P15 SINGLE LINE DIAGRAM

NOTES

1. PROVIDE NEW BREAKER, RATINGS AS SHOWN. SEE DWG W44.00-E-220 FOR MORE DETAILS.
2. NEW FEEDER CABLES. REFER TO DWG W44.00-E-203 FOR MORE DETAILS.

3" ON ORIGINAL DOCUMENT
0 1 2 3

SUPERSEDES PORTION OF: W44-E-301 (SD307)
A COPY OF THE ORIGINAL DRAWING CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT

NO.	DATE	REVISION	BY	REC.	APP.
A		REVISED DWG PER AS-BUILT	BW		R.M
A		IN SERVICE 09APR2014 RECORD DRAWING INSP. MB SD338	WP	WP	
A	17SEP2012	ADDENDUM NO.# PER SD	RR	RR	
A	10AUG2012	REVISED AND RENUMBERED DWG PER SD338	WP	RR	

FACILITY DRAWING

DESIGN
DESIGN BY: M. KAGUCHIA
DRAWN BY: R. MOJICA/D.MAMANGUN

REVIEW
DESIGN CHECKED BY: R.P.E. No. E13444 — ANDY A. LY
CONSTRUCTABILITY CHECKED BY: M30703 — JOSEPH K. WONG
ELECTRICAL CHECKED BY: R.P.E. No. E15544 — MICHAEL TEKAMURA
PROJECT ENGINEER R.P.E. No. — RAUL RUIZ
PROJECT MANAGER R.P.E. No. — RAUL RUIZ
RECOMMENDED: SR. ENGINEER R.P.E. No. E15544 — MICHAEL TEKAMURA

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
MCC P15 AND MCC P16
SINGLE LINE DIAGRAM

SCALE AS SHOWN
DATE 10AUG2012
W44.00-E-201 DRAWING NUMBER
3 REV.

REF 1: J:\w44\bdr\wbdr.mst
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REF 4:
REF 5:
REF 6:
REF 7:
REF 8:
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USER: sagsorn
DATE: 08 JUL 2020 13:04
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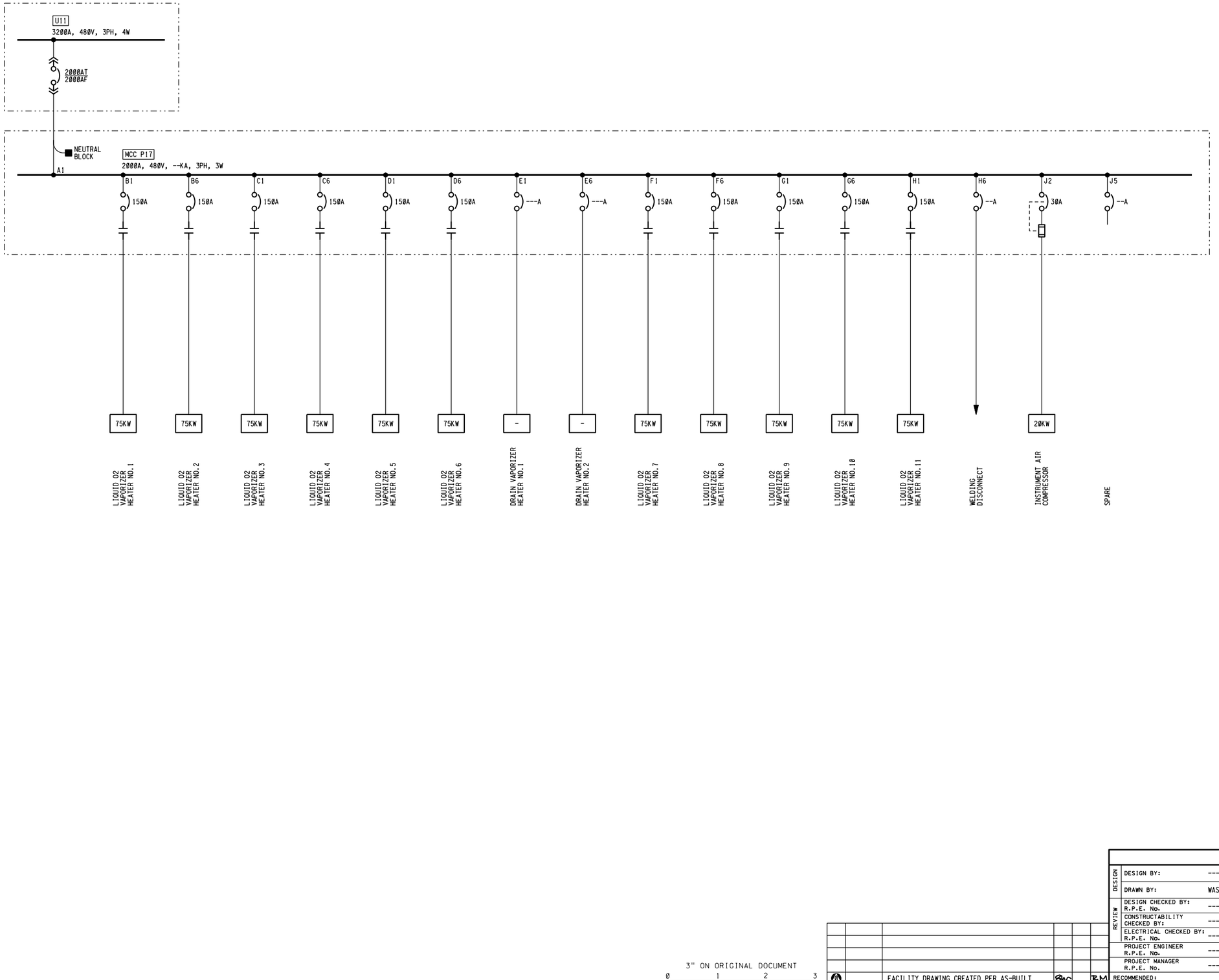

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REF 3:

USER: sugsorns
DATE: 08-JUL-2020 09:20
FILE: J:\w44\Oxygen Production Plant\w4400e202.r00

PLOT SCALE: 0.166667:1

3" ON ORIGINAL DOCUMENT
0 1 2 3

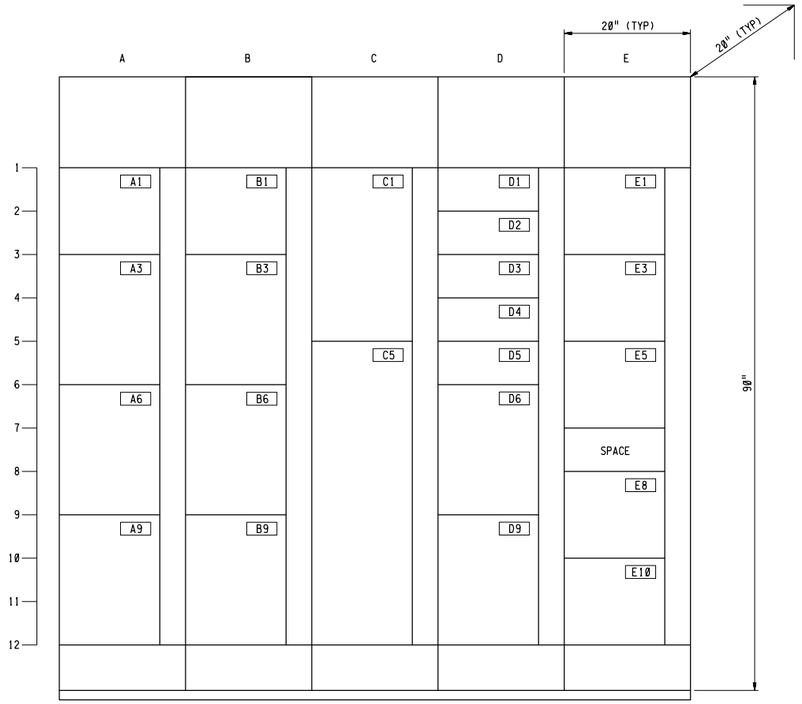
NO.	DATE	REVISION	BY	REC.	APP.
A		FACILITY DRAWING CREATED PER AS-BUILT	BW		RM

FACILITY DRAWING

DESIGN	DESIGN BY: ---	EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO. 1 OAKLAND, CALIFORNIA
	DRAWN BY: WASTEWATER DRAFTING	
REVIEW	DESIGN CHECKED BY: ---	MAIN WASTEWATER TREATMENT PLANT OXYGEN PRODUCTION PLANT ELECTRICAL MCC P17 SINGLE LINE DIAGRAM
	CONSTRUCTABILITY CHECKED BY: ---	
	ELECTRICAL CHECKED BY: R.P.E. No. ---	
	PROJECT ENGINEER R.P.E. No. ---	
	PROJECT MANAGER R.P.E. No. ---	
	RECOMMENDED: SR. ENGINEER R.P.E. No. ---	SCALE NONE DATE

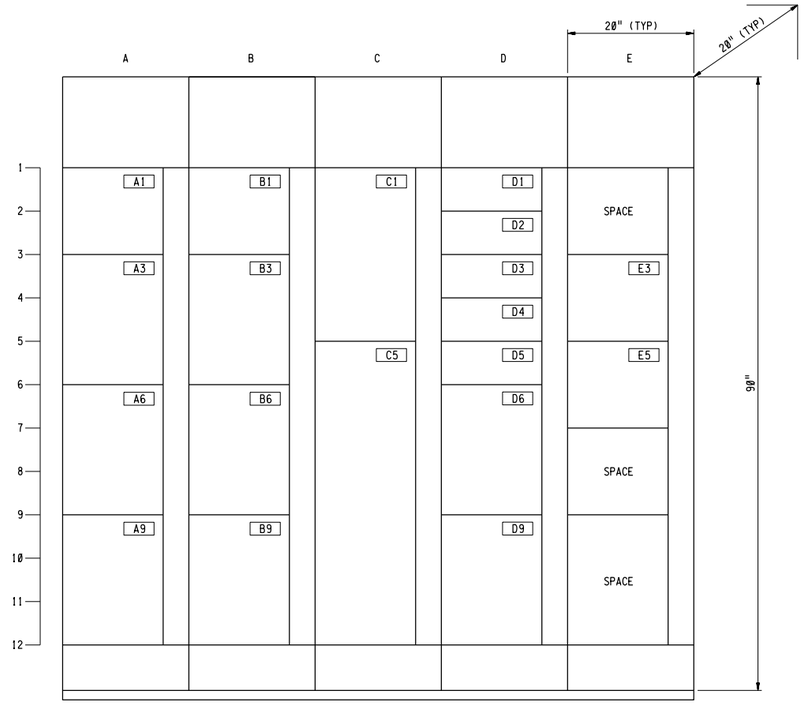
W44.00-E-202
DRAWING NUMBER

Ø
REV.



MCC P16 ELEVATION

MCC P16 NAMEPLATE SCHEDULE					
NP#	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	LINE 4 TEXT	NP SIZE (HxW)
A1	INCOMING LINE TERMINALS	& NEUTRAL	TERMINAL BLOCK		1" x 3"
A3	EXPANSION TURBINE	OIL PUMP NO.1			2" x 6"
A6	AIR COMPRESSOR	AUXILIARY	OIL PUMP NO.2A		1" x 3"
A9	AIR COMPRESSOR	AUXILIARY	OIL PUMP NO.2B		1" x 3"
B1	LINE VOLTMETER	& THERMOSTAT			1" x 3"
B3	SPARE				1" x 3"
B6	AIR COMPRESSOR	AUXILIARY	OIL HEATER NO.2A		1" x 3"
B9	AIR COMPRESSOR	AUXILIARY	OIL HEATER NO.2B		1" x 3"
C1	THAW HEATER	NO.2B			1" x 3"
C5	THAW HEATER	NO.2A			1" x 3"
D1	OVERHEAD	CRANE			1" x 3"
D2	UNIT HEATER	UH-7			1" x 3"
D3	AIR CONDITIONING	UNIT AC-2			1" x 3"
D4	(LIGHTS,	OUTSIDE	TEMP.)		1" x 3"
D5	COOLING WATER	TOWER	NO.2 INLET VLAVE	(0.08HP)	HANDWRITTEN
D6	DOOR OPERATOR	NO.2			1" x 3"
D9	EXHAUST FAN	EF-11			1" x 3"
E3	COOLING WATER	TOWER	NO.2	(60 HP+10 HP)	1" x 3"
E5	COOLING WATER	RECIRC. PUMP	NO. 1 VFD	(50HP)	1" x 3"
E8	DP-16				HANDWRITTEN
E10	SUPPLY FAN	SF-1			1" x 3"



MCC P15 ELEVATION

MCC P15 NAMEPLATE SCHEDULE					
NP#	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	LINE 4 TEXT	NP SIZE (HxW)
A1	INCOMING LINE TERMINALS	& NEUTRAL	TERMINAL BLOCK		1" x 3"
A3	EXPANSION TURBINE	OIL PUMP NO.1			2" x 6"
A6	AIR COMPRESSOR	AUXILIARY	OIL PUMP NO.1A		1" x 3"
A9	AIR COMPRESSOR	AUXILIARY	OIL PUMP NO.1B		1" x 3"
B1	LINE VOLTMETER	& THERMOSTAT			1" x 3"
B3	SPARE				1" x 3"
B6	AIR COMPRESSOR	AUXILIARY	OIL HEATER NO.1A		1" x 3"
B9	AIR COMPRESSOR	AUXILIARY	OIL HEATER NO.1B		1" x 3"
C1	THAW HEATER	NO.1B			1" x 3"
C5	THAW HEATER	NO.1A			1" x 3"
D1	UNIT HEATER	UN-6			1" x 3"
D2	AIR CONDITIONING	UNIT AC-1			1" x 3"
D3	CONDENSER	NO.1			1" x 3"
D4	TRANSFORMER				1" x 3"
D5	COOLING WATER	TOWER	NO.1 INLET VLAVE	(0.08HP)	1" x 3"
D6	DOOR OPERATOR	NO.1			1" x 3"
E3	COOLING WATER	TOWER	NO.1	(60 HP+10 HP)	1" x 3"
E5	COOLING WATER	RECIRC. PUMP	NO. 1 VFD	(80HP)	1" x 3"

NOTES

1. NOT USED.
2. PROVIDE A NEW 70AMP CIRCUIT BREAKER IN 2X SPACE FACTOR BUCKET. BUCKET SHALL BE PLUG-IN UNITS WITH COPPER BUS STABS COMPATIBLE WITH EXISTING GE IC7700 LINE CONTROL CENTER PROVIDE A NEW 2X SPACE FACTOR EMPTY BUCKET DOOR. BUCKET DOORS SHALL BE PAINTED YELLOW TO MATCH EXISTING.
3. PROVIDE A NEW 15AMP CIRCUIT BREAKER IN 2X SPACE FACTOR BUCKET. BUCKET SHALL BE PLUG-IN UNIT WITH COPPER BUS STABS COMPATIBLE WITH EXISTING GE IC7700 LINE CONTROL CENTER. BUCKET DOORS SHALL BE PAINTED YELLOW TO MATCH EXISTING.
4. NOT USED.
5. PROVIDE NEW 15AMP CIRCUIT BREAKER AND NEW NAMEPLATE WITH INSCRIPTIONS AS SHOWN.

3" ON ORIGINAL DOCUMENT
0 1 2 3

SUPERSEDES PORTION OF: W44-E-301 (SD307)

A COPY OF THE ORIGINAL DRAWING CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT

NO.	DATE	REVISION	BY	REC.	APP.
2		REVISED DWG PER AS-BUILLT	BW		RM
1	IN SERVICE 09APR2014	RECORD DRAWING INSP. MB SD338			
0	10AUG2012	REVISED AND RENUMBERED DWG PER SD338			

FACILITY DRAWING

DESIGN
DESIGN BY: M. KAGUCHIA
DRAWN BY: R. MOJICA/D.MAMANGUN

REVIEW
DESIGN CHECKED BY: R.P.E. No. E13444 — ANDY A. LY
CONSTRUCTABILITY CHECKED BY: M30703 — JOSEPH L. WONG
ELECTRICAL CHECKED BY: R.P.E. No. E15544 — MICHAEL T. NAKAMURA
PROJECT ENGINEER R.P.E. No. — RAUL RUIZ
PROJECT MANAGER R.P.E. No. — RAUL RUIZ
RECOMMENDED: SR. ENGINEER R.P.E. No. E15544 — MICHAEL T. NAKAMURA

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
MCC-P15 AND MCC-P16
ELEVATIONS

SCALE NONE
DATE 10AUG2012
W44.00-E-220
DRAWING NUMBER
2
REV.

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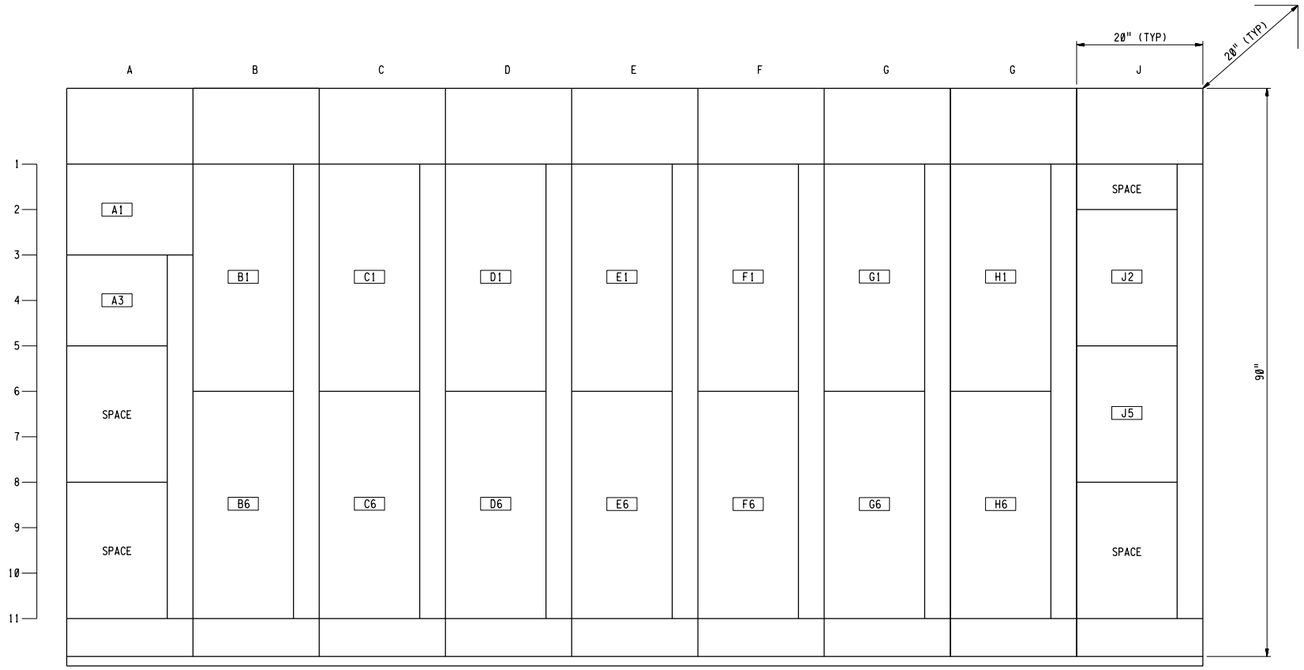

MCC P17 ELEVATION

MCC P17 NAMEPLATE SCHEDULE				
NP#	LINE 1 TEXT	LINE 2 TEXT	LINE 3 TEXT	NP SIZE (HxW)
A1	SECTION A VERT. BUD	CABLE COMPARTMENT	& NEUTRAL T.B.	1" x 3"
A3	LINE VOLTMETER	& THERMOSTAT		1" x 3"
B1	LIQUID O2	VAPORIZER	HEATER NO.1	1" x 3"
B6	LIQUID O2	VAPORIZER	HEATER NO.2	1" x 3"
C1	LIQUID O2	VAPORIZER	HEATER NO.3	1" x 3"
C6	LIQUID O2	VAPORIZER	HEATER NO.4	1" x 3"
D1	LIQUID O2	VAPORIZER	HEATER NO.5	1" x 3"
D6	LIQUID O2	VAPORIZER	HEATER NO.6	1" x 3"
E1	DRAIN	VAPORIZER	HEATER NO.1	1" x 3"
E6	DRAIN	VAPORIZER	HEATER NO.2	1" x 3"
F1	LIQUID O2	VAPORIZER	HEATER NO.7	1" x 3"
F6	LIQUID O2	VAPORIZER	HEATER NO.8	1" x 3"
G1	LIQUID O2	VAPORIZER	HEATER NO.9	1" x 3"
G6	LIQUID O2	VAPORIZER	HEATER NO.10	1" x 3"
H1	LIQUID O2	VAPORIZER	HEATER NO.11	1" x 3"
H6	WELDING	DISCONNECT		1" x 3"
J2	INSTRUMENT AIR	COMPRESSOR		1" x 3"

3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
0		DRAWING CREATED PER AS-BUILT	BW		RM

FACILITY DRAWING

DESIGN	DESIGN BY: ---	EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO. 1 OAKLAND. CALIFORNIA
	DRAWN BY: WASTEWATER DRAFTING	
REVIEW	DESIGN CHECKED BY: R.P.E. No. ---	MAIN WASTEWATER TREATMENT PLANT OXYGEN PRODUCTION PLANT ELECTRICAL MCC P17 ELEVATION
	CONSTRUCTABILITY CHECKED BY: ---	
	ELECTRICAL CHECKED BY: R.P.E. No. ---	
	PROJECT ENGINEER R.P.E. No. ---	
	PROJECT MANAGER R.P.E. No. ---	
	RECOMMENDED: SR. ENGINEER R.P.E. No. ---	SCALE NONE DATE
		W44.00-E-221 DRAWING NUMBER 0 REV.

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REF 5:
REF 6:

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USER: supsorns
DATE: 02 JUL 2020 16:44
FILE: J:\w44\Oxygen Production Plant\w4400e221.r00

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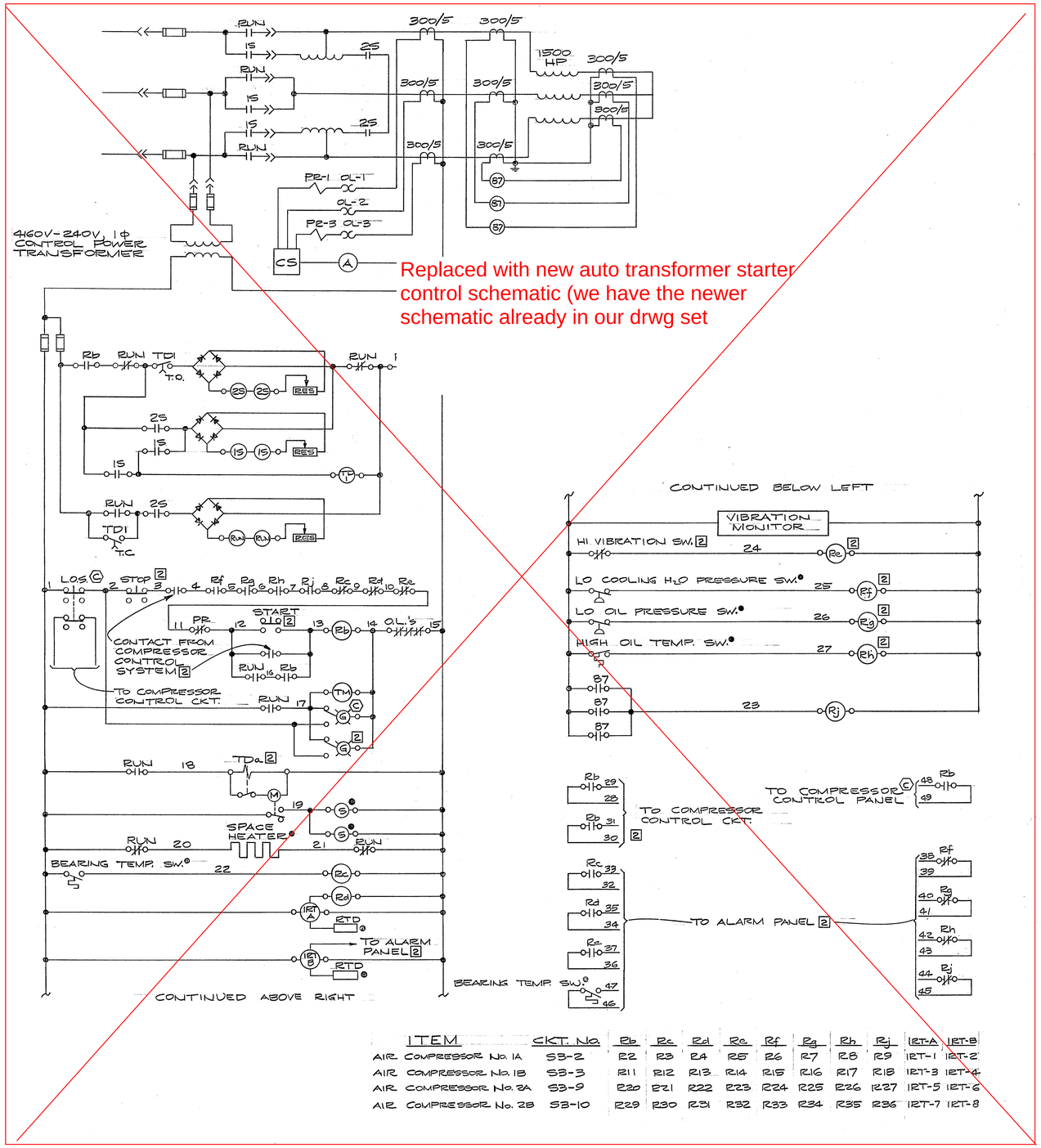
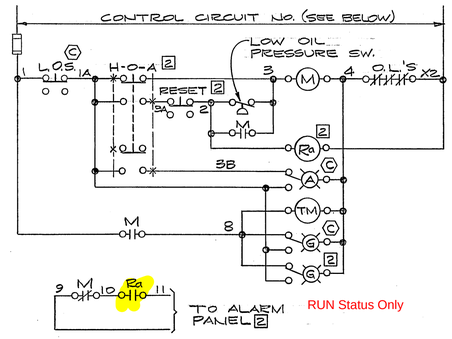
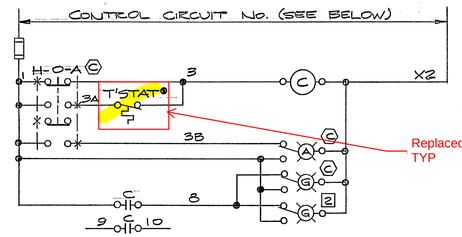


Replaced with new auto transformer starter control schematic (we have the newer schematic already in our drwg set

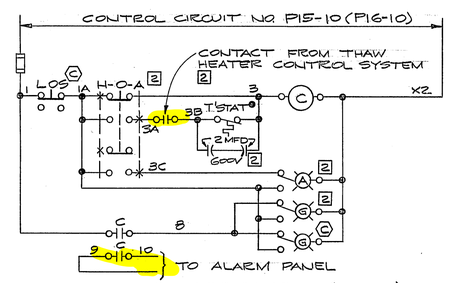
ITEM	CKT. NO.	Rb	Rc	Rd	Re	Rf	Rg	Rh	Rj	IRT-A	IRT-B
AIR COMPRESSOR No. 1A	S3-2	R2	R3	R4	R5	R6	R7	R8	R9	IRT-1	IRT-2
AIR COMPRESSOR No. 1B	S3-3	R11	R12	R13	R14	R15	R16	R17	R18	IRT-3	IRT-4
AIR COMPRESSOR No. 2A	S3-9	R20	R21	R22	R23	R24	R25	R26	R27	IRT-5	IRT-6
AIR COMPRESSOR No. 2B	S3-10	R29	R30	R31	R32	R33	R34	R35	R36	IRT-7	IRT-8



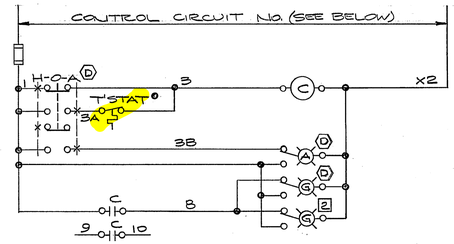
ITEM	CONTROL CIRCUIT NO	Ra
AIR COMPRESSOR NO. 1A AUXILIARY OIL PUMP	P15-6	R1
AIR COMPRESSOR NO. 1B AUXILIARY OIL PUMP	P15-8	R10
AIR COMPRESSOR NO. 2A AUXILIARY OIL PUMP	P16-6	R19
AIR COMPRESSOR NO. 2B AUXILIARY OIL PUMP	P16-8	R28



ITEM	CONTROL CIRCUIT NO.
AIR COMPRESSOR NO. 1A OIL HEATER	P15-7
AIR COMPRESSOR NO. 1B OIL HEATER	P15-9
AIR COMPRESSOR NO. 2A OIL HEATER	P16-7
AIR COMPRESSOR NO. 2B OIL HEATER	P16-9



THAW HEATER No. 1 (No. 2)



ITEM	CONTROL CIRCUIT NO.
VAPORIZER HEATER NO. 1	P17-5
VAPORIZER HEATER NO. 2	P17-6
VAPORIZER HEATER NO. 3	P17-7
VAPORIZER HEATER NO. 4	P17-8
VAPORIZER HEATER NO. 5	P17-9
VAPORIZER HEATER NO. 6	P17-10
VAPORIZER HEATER NO. 7	P17-11
VAPORIZER HEATER NO. 8	P17-12
VAPORIZER HEATER NO. 9	P17-13
VAPORIZER HEATER NO. 10	P17-14
VAPORIZER HEATER NO. 11	P17-15
VAPORIZER HEATER NO. 12	P17-16
VAPORIZER HEATER NO. 13	P17-17
VAPORIZER HEATER NO. 14	P17-18

NOTES:

1. THE MOTOR CONTROL CENTER MANUFACTURER SHALL USE THE NUMBERS SHOWN ON THE SCHEMATIC WIRING DIAGRAMS ON THIS SHEET ON TERMINAL BLOCKS OF THE STARTER UNITS. THE CONTRACTOR SHALL IDENTIFY ALL CONTROL CONDUCTORS INSTALLED WITH THESE SAME NUMBERS BY THE USE OF BRADY SELF-STICKING TAGS. THE IDENTIFICATION SHALL ALSO INCLUDE THE CIRCUIT NUMBER WHERE MORE THAN ONE CIRCUIT IS IN THE SAME ENCLOSURE.
2. ALL CONTROL WIRES INSTALLED BY THE CONTRACTOR SHALL BE COLOR CODED AS FOLLOWS:

WIRE DESIGNATION	COLOR
1, 1A	BLACK
2	RED
3	BLUE
4	BROWN
X2	WHITE
8	YELLOW
10	ORANGE
OTHERS	AS APPROVED

LEGEND:

- 2 IN MAIN INSTRUMENTATION PANEL NO. 2
- (C) IN AIR COMPRESSOR CONTROL PANEL
- (T) IN TURBINE CONTROL PANEL
- (D) IN DRIOX CONTROL PANEL
- ○ AT MOTOR

REGISTERED PROFESSIONAL ENGINEER FREDERICK N. VAN KIRK No. C 13286 CIVIL ENGINEER STATE OF CALIFORNIA

UNLESS OTHERWISE INDICATED ALL WORK ON THIS SHEET SHALL BE INCLUDED UNDER SCHEDULE I.

NO.	DATE	DESCRIPTION	BY	APPR'D
		REVISIONS		

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS SAN JOSE, CALIFORNIA

APPROVED
CT&A Frederick N. Van Kirk PARTNER
EBMUD E.G. Rueter MGR. WPCD

DESIGNED PAT
DRAWN MCT
CHECKED JPG-JGC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

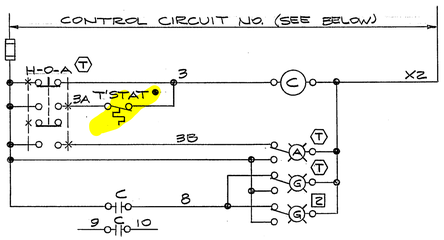
WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

SPECIFICATION NO. SD 120

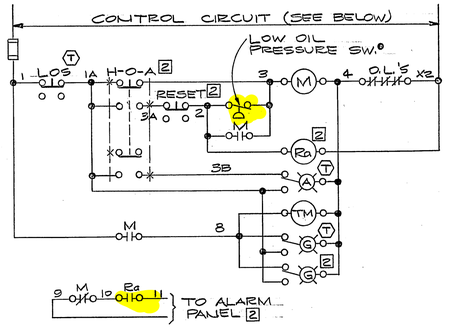
SCHEMATIC DIAGRAMS
SWITCHGEAR S3 & MCC PANELS P15, P16 & P17

DATE JAN, 1973 SCALE NONE
DRWG. NO. CT-E-268

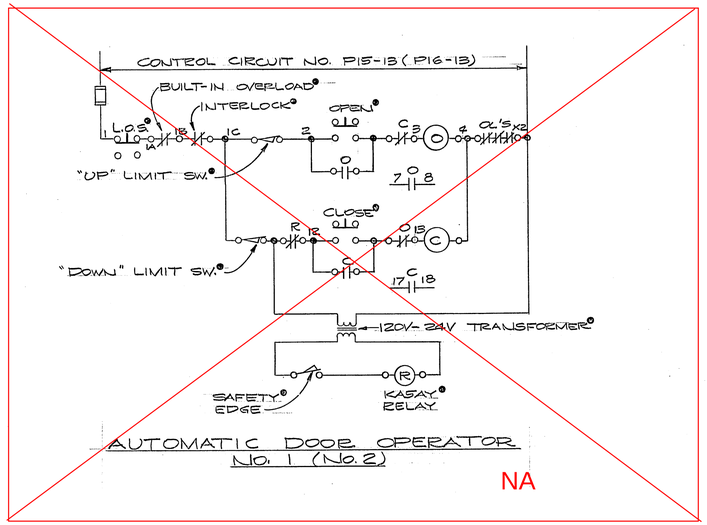
71100



ITEM	CONTROL CIRCUIT No.
EXPANSION TURBINE NO. 1 OIL HEATER	P15-4
EXPANSION TURBINE NO. 2 OIL HEATER	P16-4

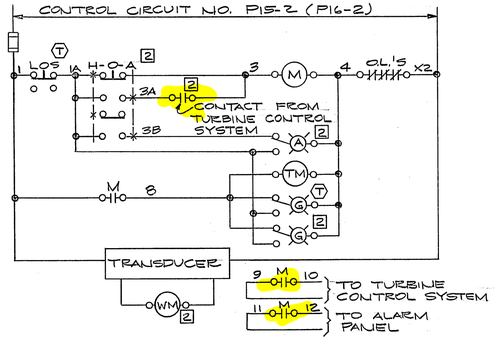


ITEM	CONTROL CIRCUIT No	Ra
EXPANSION TURBINE NO. 1 AUXILIARY OIL PUMP	P15-5	R37
EXPANSION TURBINE NO. 2 AUXILIARY OIL PUMP	P16-5	R38

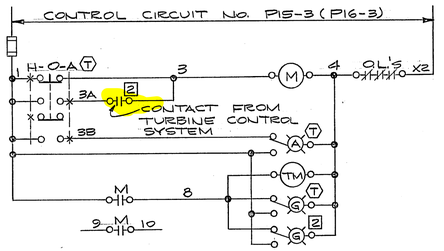


AUTOMATIC DOOR OPERATOR NO. 1 (NO. 2)

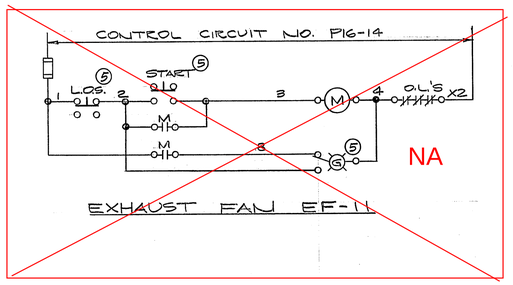
NA



EXPANSION TURBINE NO. 1 (NO. 2)

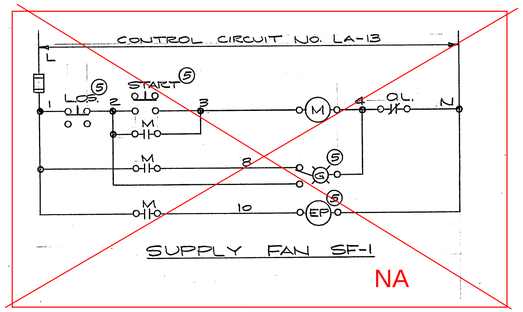


EXPANSION TURBINE OIL PUMP NO. 1 (NO. 2)



EXHAUST FAN EF-11

NA



SUPPLY FAN SF-1

NA

NOTES:

1. THE MOTOR CONTROL CENTER MANUFACTURER SHALL USE THE NUMBERS SHOWN ON THE SCHEMATIC WIRING DIAGRAMS ON THIS SHEET ON TERMINAL BLOCKS OF THE STARTER UNITS. THE CONTRACTOR SHALL IDENTIFY ALL CONTROL CONDUCTORS INSTALLED WITH THESE SAME NUMBERS BY THE USE OF BRADY SELF-STICKING TAGS. THE IDENTIFICATION SHALL ALSO INCLUDE THE CIRCUIT NUMBER WHERE MORE THAN ONE CIRCUIT IS IN THE SAME ENCLOSURE.

2. ALL CONTROL WIRES INSTALLED BY THE CONTRACTOR SHALL BE COLOR-CODED AS FOLLOWS:

WIRE DESIGNATION	COLOR
1A	BLACK
2	RED
3	BLUE
4	BROWN
X2	WHITE
8	YELLOW
10	ORANGE
OTHERS	AS APPROVED

LEGEND:

- ● AT MOTOR
- (T) IN TURBINE CONTROL PANEL
- [2] IN MAIN INSTRUMENTATION PANEL NO. 2
- (5) IN UNITIZED CONTROL PANEL UCP-5

UNLESS OTHERWISE INDICATED ALL WORK ON THIS SHEET SHALL BE INCLUDED UNDER SCHEDULE 1.

REGISTERED PROFESSIONAL ENGINEER FREDERICK N. VAN KIRK No. C 13286 CIVIL ENGINEER STATE OF CALIFORNIA

NO.	DATE	DESCRIPTION	BY	APPR'D

REVISIONS

CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
CHICAGO, ILLINOIS SAN JOSE, CALIFORNIA

APPROVED
CT&A PARTNER
EBMUD MGR. WPCD

DESIGNED PAT
DRAWN MCT
CHECKED JPG-JGC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WATER POLLUTION CONTROL PLANT
ADDITIONS AND IMPROVEMENTS

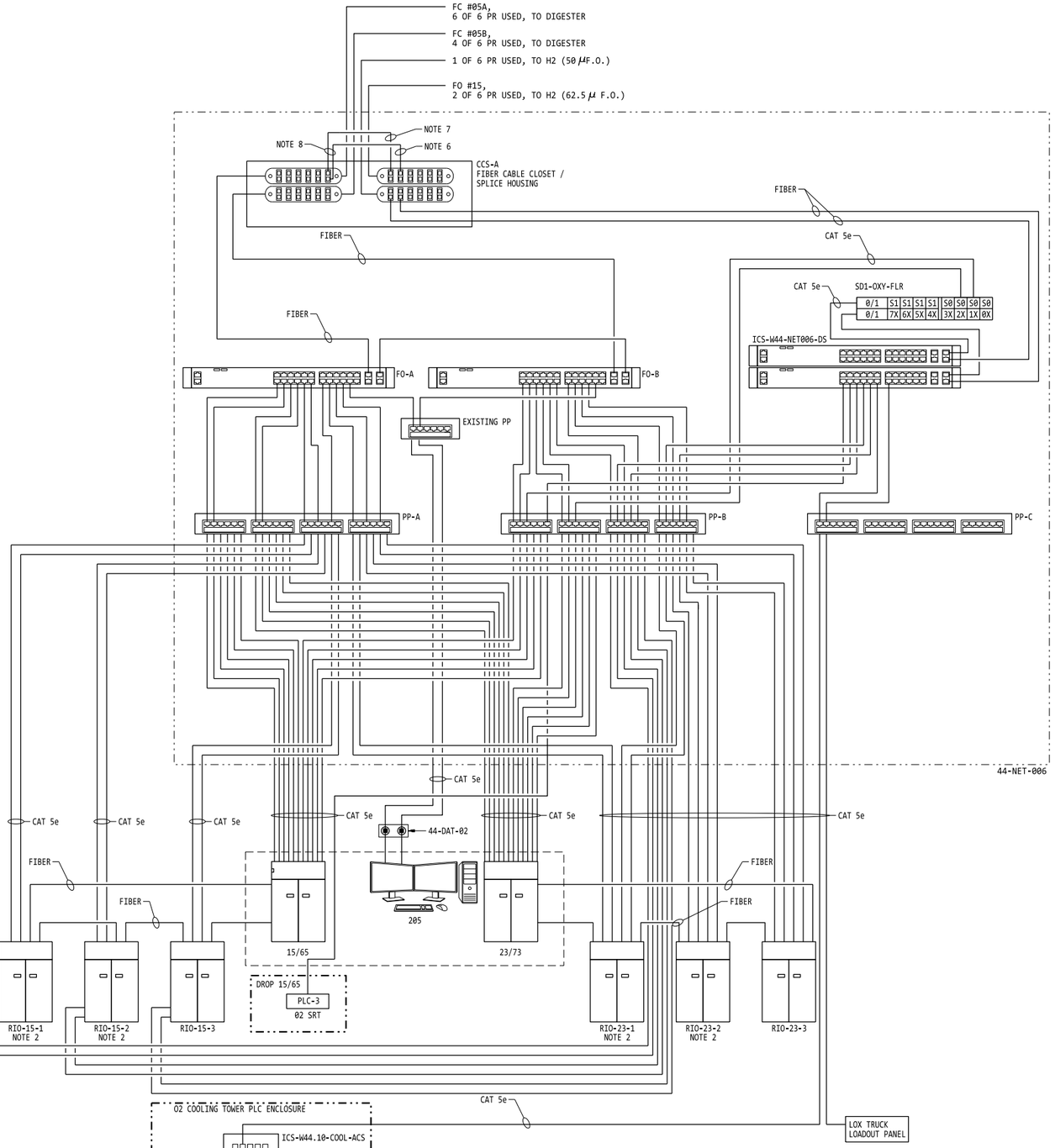
SPECIFICATION NO. SD-120

SCHEMATIC DIAGRAMS
MCC PANELS 'P15' & 'P16'

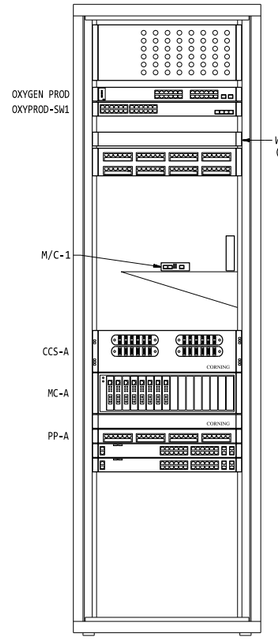
DATE JAN, 1973 SCALE NONE

DRWG. NO.
CT-E-269

71100



PHOTO



FRONT VIEW

(E) ISD NETWORK CABINET (44-NET-006)

NTS

GENERAL NOTES

G1. EXCEPT FOR FIBER OPTIC PATCH CORDS, ALL FIBER OPTIC CABLES SHALL HAVE MACHINE PRINTED LABELS ON BOTH ENDS. LABELS SHALL HAVE THE WORD "DCS NETWORK BACKBONE" AS THE 1ST LINE AND SHALL INDICATE THE SOURCE AND DESTINATION LOCATIONS OF THE BUILDINGS, ISD NETWORK CABINET NUMBERS, CCS NUMBERS, AND PANEL NUMBER INSIDE THE CCS OF THE DESTINATION BUILDING.

G2. EXCEPT FOR CAT. 5E PATCH CORDS, ALL CAT. 5E CABLES SHALL HAVE MACHINE PRINTED LABELS ON BOTH ENDS. LABELS SHALL INDICATE THE SOURCE SWITCH NUMBER (EITHER THE MEDIA CONVERTER OR FAN-OUT SWITCH OR IP TRAFFIC SWITCH) AND THE PORT NUMBER THE CABLE IT CONNECTS TO.

G3. ALL DCS NETWORK BACKBONE CABLES SHALL BE TAGGED WITH MACHINE PRINTED CABLE NUMBERS IN ALL MANHOLES AND PULLBOXES.

NOTES

1. DISTRICT FURNISHED. ALL CONDUITS AND CABLES SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR.
2. INCLUDES CAT 5e CONNECTION FOR MAC SEL-710.
3. TO SEL3355 DBASE SERVER IN H2.
4. N/A.
5. N/A.
6. TO SEL2730 GATEWAY SWITCH IN H2.
7. TO AB PLC IN H2.
8. F.O. JUMPER CABLE.

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	R. SPEYRER
DRAWN BY:	X. SUN
DESIGN CHECKED BY R.P.E. NO.	
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95846	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. 69681	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT

ELECTRICAL
OXYGENATION BUILDING FIBER CABLE, ETHERNET CABLE & CONDUIT LAYOUT

SCALE NONE
DATE 28JUN24
SD428-W4400-E561 (DRAWING NUMBER)
0 (REV.)

USER: robert
DATE: 28-JUN-2024 10:04
FILE: F:\Projects\Woodard Curran\EBMUD SD-428\DGN\SD428-W4400-E561.dgn
PLOT SCALE: 0.166667:1
REF 1: F:\Projects\Woodard Curran\EBMUD SD-428\DGN\wbdr_consultant-SD428.dgn
REF 2:
REF 3:
REF 4:
REF 5:
REF 6:
REF 7:
REF 8:
REF 9:

3405527-12

SIZE D

DRAWINGS MUST BE RETURNED WITH CORRECTIONS BY 5-17-74 IF NOT DELIVERY WILL BE AFFECTED ACCORDINGLY.

540007-148
② 540007-130
540007-92
ACTUATOR
SEE JOB E/M

SLOT (1 HOLE)

$10\frac{12}{16}$ R. $+\frac{1}{32}$ -0

$\frac{1}{2}$

1 (REF)

25°

.50

VIEW A-A

$10\frac{12}{32}$

3406128

3406127
INLET GUIDE VANE ASS'Y

1406121

900212-5

900470-6

FULL CLOSED POSITION (REF)

HANDLE

15°47'

$10\frac{3}{8}$

5°31'

90° OPEN POSITION (REF)

$10\frac{12}{16}$ R (REF)

FOR SLOT DIM'S SEE VIEW A-A

AIR FLOW

123-120° FLAT FACE FLANGE - TYP BOTH ENDS (REF)

18 (REF)

$9\frac{1}{2}$

$6\frac{1}{4}$ (REF) ②

HANDLE ACTUATOR

900020-34
900302-4

INLET GUIDE VANE MOUNTING BOLTS

900449-6

AIR FLOW

$\frac{1}{4}$ 12.5 TYP (SEE NOTE #1)

GUIDE VANE SUPPORTS AT THIS END OF VANE ASS'Y, TO BE SUPPLIED BY CUSTOMER.

1ST STAGE INLET

GASKET

APPROVED
APPROVED AS NOTED
DISAPPROVED
CONSOER, TOWNSEND & ASSOCIATES
CONSULTING ENGINEERS
DATE 5-2-74

② WILL BE REQUIRED
3407321 SHROUD ASS'Y
SUPPLIED ONLY WHEN SPECIFIED ON CONTRACT E/M.
(REF. FOR WEATHER EXPOSED INSTALLATIONS)
NOTE:
REMOVE SHROUD TO INSTALL GUIDE VANE ASS'Y

SECONDARY TREATMENT FACILITIES
Item S-7-75
CT-6-236
S D 120 ITEM No. 1
J.M. Koenig

③ NOTE: HAND PAINT OR STENCIL ARROW INDICATING DIRECTION OF AIR FLOW AFTER FINAL PAINTING OF GUIDE VANE ASSEMBLY

1) MOUNT ACTUATOR TO MOUNTING BRACKET BEFORE FINAL WELD

NOTE:

5/2/74 W.I.P.

CERTIFIED FOR
☐ FOUNDATION ☐ INFORMATION RECORD
☐ APPROVAL
CUST. ENGRS. EAST BAY DRIVE
CUST. P. O. 803-
JOY ORDER NO. AF 6031-236
DATE 4-22-74

ENG. ORDER RP320
DATE ISSUED 2-25-70

REVISIONS
NO. 1 DATED 5-1-74 BY RWB
NO. 2 DATED 11-13-74 BY RWB

UNLESS OTHERWISE NOTED:
ALL DIMENSIONS IN INCHES.
FRACTIONAL MACHINING DIM. LIMITED TO ± 1-64.
DO NOT SCALE THIS DRAWING

MATERIAL
HEAT TREAT ____ CARBURIZE
HARDEN ____ QUENCH
HARDEN ____ QUENCH
DRAW ____ HARDNESS
PATTERN NO.

FINISH SYMBOLS

SYM.	MICRO INCHES	DESCRIPTION	SYM.	MICRO INCHES	DESCRIPTION
A	4	PRECISION POLISH	G	250	ROUGH MACH.
B	8	FINE POLISH	H	500	HEAVY ROUGH
C	16	COMMON POLISH	K	1000	EX. HEAVY ROUGH
D	32	GRIND OR EQUAL			
E	63	SMOOTH MACH.			
F	125	COMMON MACH.			

JOY MANUFACTURING CO.
PLANT LOCATION AS INDICATED BELOW..

CLAREMONT, N. H.	NEW PHILADELPHIA, OHIO
DALLAS, TEXAS	ST. LOUIS, MISSOURI
FRANKLIN, PA.	BUFFALO, NEW YORK
GALT, ONTARIO, CANADA	
GREENOCK, SCOTLAND	
MICHIGAN CITY, IND.	

GUIDE VANE CONTROL DRIVE ASSY. TA-60/70

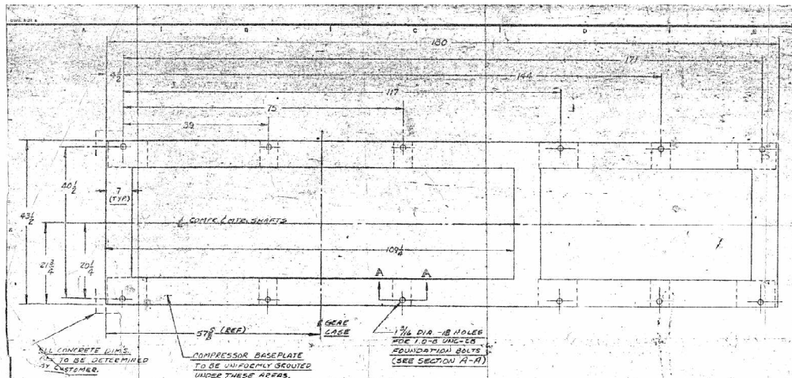
OUTER CDV

SIMILAR TO
SUPERSEDES
SUPERSEDED BY
REPLACES
REPLACED BY

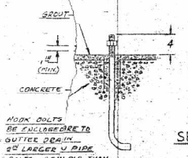
DR J.F.ANDREWS 5-2-74
TR.
CK J.P.K. 5-2-74
APPVD.

SCALE ____ CLASS ____

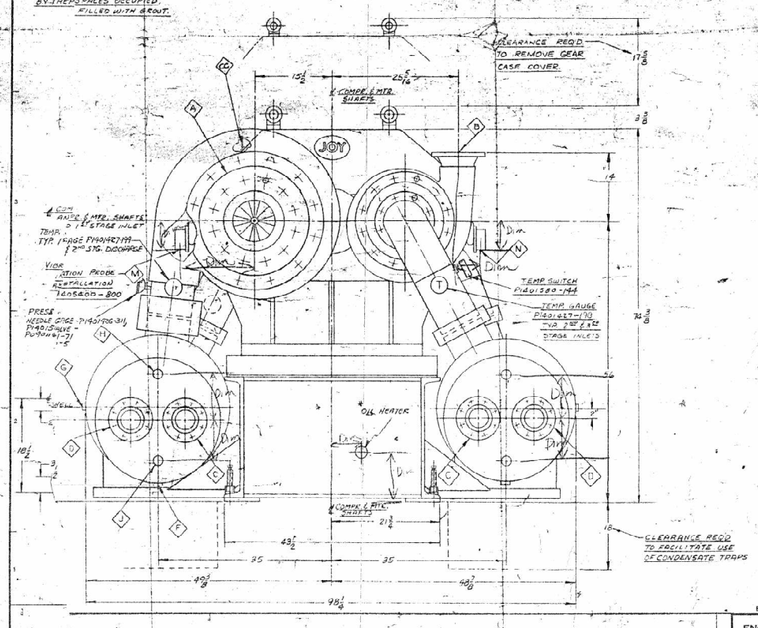
3405527-12

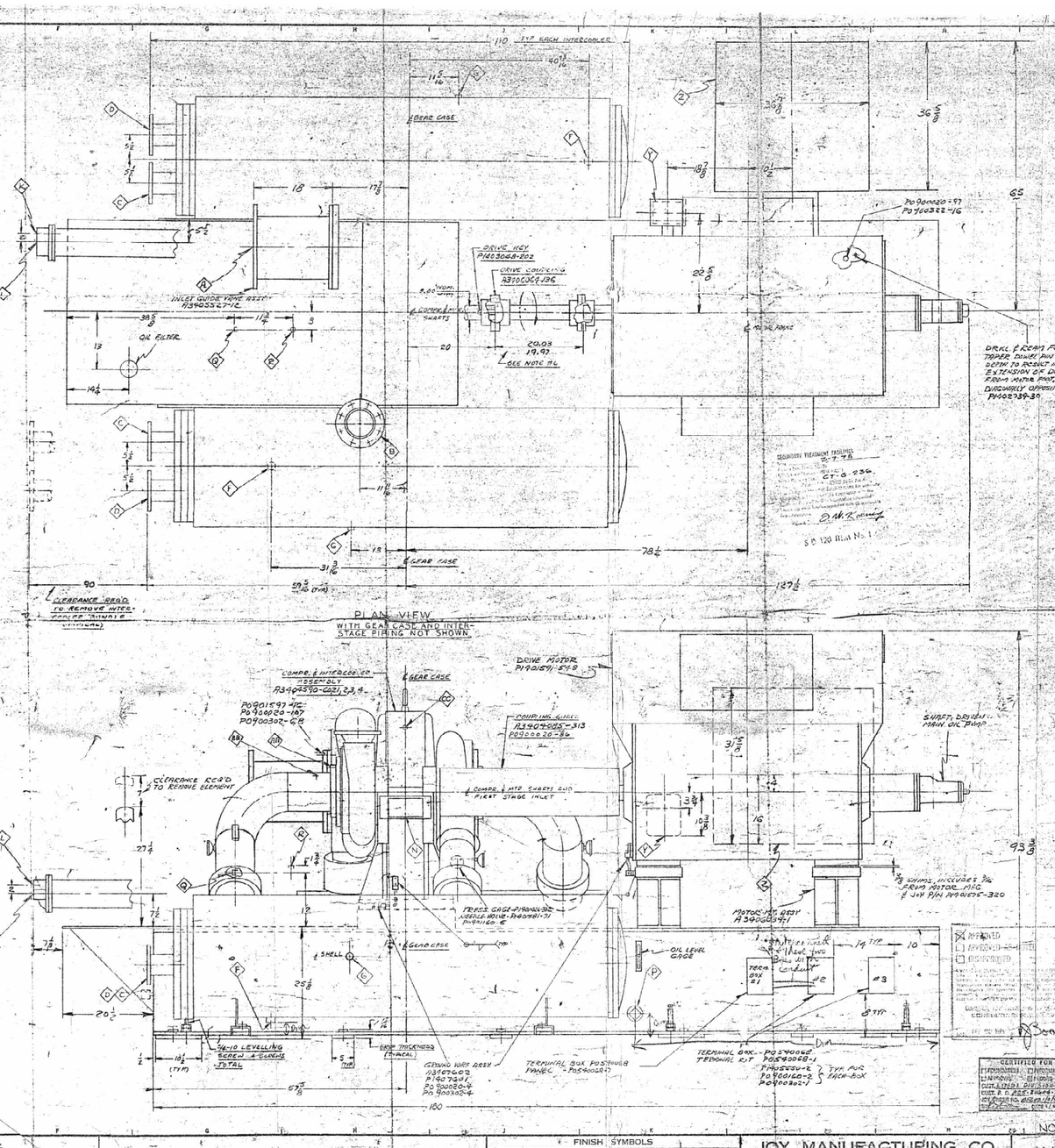


FOUNDATION PLAN VIEW
SCALE 3/32"=1" SIZE



SECTION A-A
N.T.S.





PLAN VIEW
WITH GEAR CASE AND INTER-STAGE PIPING NOT SHOWN.

CUSTOMER CONNECTIONS

	CONNECTION	NPT	FLANGE SIZE	ASA LBS.	RSD FACE DIA	RSD FACE THK	REMARKS
A	COMPRESSOR INLET		12	150			FURN FROM
B	COMPRESSOR DISCH		6	150	6.50	.08	
C	WATER IN		4	150			INTERCOOLERS
D	WATER OUT		4	150			INTERCOOLERS
E	TEMP SWITCH						HIGH AIR TEMP ON 3RD STAGE INLET
F	CONDENSATE DRAIN	1.00					INTERCOOLERS
G	TRAP BALL LINE	.50					INTERCOOLER COND. TRAP
H	VENT LINE	.75					INTERCOOLER WATER SIDE
J	DRAIN LINE	.75					
K	WATER IN	1.5					OIL COOLER
L	WATER OUT	1.5					
M	VIBRATION PROBE INSTALLATION						LOW SPEED PINION HIGH SPEED
P	OIL TANK DRAIN LINE	3.50					PLUGGED
Q	AIR EJECTOR PRESSURE	.38					SEE JOY DWG 540047-30
R	AIR EJECTOR BREATHER	1.25					
S	AUX. OIL PUMP ELEC. MOTOR						WIRED TO TERM. BOX #3
T	OIL IMMERSION HEATER						WIRED TO TERM. BOX #3 (SEE NOTE 4)
U	PRESSURE SWITCH						MAIN MOTOR TRIP (TERM. BOX #2)
V	TEMP. SWITCH						HIGH OIL TEMP.
W	PRESSURE SWITCH						AUX. PUMP START (TERM. BOX #2)
Y	DRIVE MOTOR (AUXILIARY CONDUIT BOX)						SECONDARY OF LEADS, SPACE HEATER LEADS, RTD LEADS, BOT. TEMP RESISTORS
Z	DRIVE MOTOR						VIBRATION PROBE (SEE NOTE 4)
AA	DIFFERENTIAL PRESS. TAP-LOW PRESS.	.12					PLUGGED
BB	DIFFERENTIAL PRESS. TAP-HIGH PRESS.	.12					PLUGGED
CC	VACUUM GAUGE CONN.-GEARCASE	.75					PLUGGED
X	LIQUID LEVEL SWITCH						WIRED TO TERM. BOX #1

* WIRED TO A TERMINAL BOX BY JOY MFG.

DESIGN COOLING WATER FLOW REQUIREMENTS 75°F WATER

	FLOW GPM	PRESS PSIG
1ST STAGE INTERCOOLER	120	
2ND STAGE INTERCOOLER	90	4
OIL COOLER	30	6

(1) DIMENSIONS TO PIPE CONNECTIONS ARE WITHIN PIPING TOLERANCES. FINAL CUSTOMER TO COMPR. CONN. SHOULD TO BE FIELD FABRICATED FOR EXACT ALIGNMENT.

(1) COMPONENT WEIGHT

DRIVE MOTOR	3950 LBS
COMPRESSOR BASE OIL TANK WITH COMPONENTS	5800 LBS
OIL	1500 LBS
COMPRESSOR	6500 LBS
GEAR BOX COVER (INCLUDED IN COMPRESSOR WEIGHT)	700 LBS
INTERCOOLER - 1ST STAGE	3200 LBS
INTERCOOLER - 2ND STAGE	3200 LBS
WATER - TOTAL INTERCOOLERS	350 LBS
TOTAL OPERATING WEIGHT	25300 LBS

(1) FOR SUGGESTED CONDENSATE DRAIN PIPING SCHEMATIC, SEE JOY DWG. FE9531-G.

(2) FOR SUGGESTED COOLING WATER FLOW SCHEMATIC, SEE JOY DWG. 540157-244

(3) FOR COMPRESSOR AIR FLOW SCHEMATIC, SEE JOY DWG. FF 61E1151

(3) FOR OIL FLOW DIAGRAM, SEE JOY DWG. FF5886-157

(4) THIS DIMENSION MUST BE MAINTAINED WHEN SCRIBE MARK INDICATING MAGNETIC CENTER OF MOTOR SHAFT LINES UP WITH ROSE OF MTR SHAFT SEAL

(5) THE PURCHASER WILL PROVIDE ALL COMPRESSOR INLET & DISCHARGE PIPING

(6) THE PURCHASER WILL PROVIDE A FOUNDATION, FOUNDATION BOLTS, NUTS & SHIMS. AN ADEQUATE FOUNDATION SHALL BE PROVIDED IN ORDER TO MAINTAIN PROPER COMPRESSOR ALIGNMENT. REFER TO COMPRESSED AIR & GAS HANDBOOK, THIRD EDITION, PAGES 3-67 TO 3-70.

(7) CONDENSATE DRAIN MUST SLOPE TO ASSURE ADEQUATE DRAINAGE OF WATER FROM INTERCOOLERS.

(8) ALL FORCES & MOMENTS EXERTED BY EXTERNAL PIPING CONNECTIONS TO THE COMPRESSOR FLUST NOT EXCEED LIMITS SPECIFIED BY PART 7 OF NEMA STANDARDS FOR MECHANICAL DRIVE TURBINES (SM-23-1970) FLEXIBLE JOINTS ARE NECESSARY ON THE INLET & DISCHARGE PIPING OF THE COMPRESSOR OR TO AID IN KEEPING THE PIPING LOADS ON THE COMPRESSOR BELOW SPECIFIED VALUES.

(9) PIPING TO THE SCRUBBER MUST NORMAL HAVE A MINIMUM STRAIGHT RUN OF FOUR PIPE DIAS. ELBOWS SHOULD BE OF THE LONG RADIUS TYPE. ANY COMPR. VELOCITY DAMPERS SHOULD BE PLACED AS FAR FROM THE COMPR. AS POSSIBLE. AT THE COMPR. INLET THE CUSTOMER SHOULD PROVIDE A REMOVABLE PIPE SECTION (APPROX. 10') WHICH WOULD BE USED AS A SUCTION TO THE FIRST STAGE INLET.

NOTES:

BF 6041/11/14

ENG. ORDER 6041-22
DATE ISSUED 12-9-24

REVISIONS

UNLESS OTHERWISE NOTED, ALL DIMENSIONS IN INCHES. MACHINING LIMITED TO FRACTIONAL ± 1/64, DECIMAL ± .005, ANGULAR ± 1/2°, STRUCTURAL DIMENSIONS LIMITED TO ± 1/16. DO NOT SCALE THIS DRAWING.

MATERIAL SEE B/M 703204-71
HEAT TREAT ____ CARBURIZE ____
HARDEN ____ QUENCH ____
HARDEN ____ QUENCH ____
DRAW ____ HARDNESS ____
PATTERN NO. ____

FINISH SYMBOLS

SYM.	MICRO INCHES	DESCRIPTION	SYM.	INCHES MICRO.	DESCRIPTION
A	4	PRECISION POLISH	G	250	ROUGH MACH.
B	8	FINE POLISH	H	500	HEAVY ROUGH
C	16	COMMON POLISH	K	1000	EX. HEAVY ROUGH
D	32	GRIND OR EQUAL			
E	63	SMOOTH MACH.			
F	125	COMMON MACH.			

JOY MANUFACTURING CO.
PLANT LOCATION AS INDICATED BELOW

BUFFALO, N. Y.	X	NEW PHILADELPHIA, OHIO
CLAREMONT, N. H.		
FRANKLIN, PA.		
GALT, ONTARIO, CANADA		
GREENOCK, SCOTLAND		
MICHIGAN CITY, IND.		

INSTALLATION ARRANGEMENT
TA-70L CENTRIFUGAL COMPRESSOR

SIMILAR TO	NAME OR INITIAL & DATE	SCALE 3/16"=1"	CLASS
SUPERSEDES	DR. [illegible] 12/9/24		
SUPERSEDED BY	TR. [illegible]		
REPLACES	CK. [illegible]	FF6704-6021	
REPLACED BY	APPD. [illegible]	CERT. DWG.	

1500-HP MAC MOTOR (NEW)

DATA

FRAME SIZE	6809 NEMA
MOTOR TYPE	WS INDUCTION MOTOR
ENCLOSURE	WP1
HORSEPOWER	1500
VOLTAGE	4160
BEARINGS	SPLIT SLEEVE
FULL LOAD AMPS	175
HERTZ	60
PHASE	3
SERVICE FACTOR	1.15
APPLICATION	CENTRIFUGAL COMPRESSOR
LOAD TORQUE CURVE	UNLOADED 60% TYP
LOAD WK^2 LB-FT^2	520
MOTOR WK^2 LB-FT^2	395
POLES	2
FULL LOAD RPM	3544
ROTATION FROM NON-DRIVE END	COUNTER-CLOCKWISE
INSULATION CLASS	F
AMBIENT TEMPERATURE	40 DEG C
ALTITUDE - FEET	3300
TEMPERATURE RISE	90 DEG C AT 1.15 S.F.
RISE BY	RESISTANCE
LOCKED ROTOR AMPS	1199
STARTING TORQUE %	125
BREAKDOWN TORQUE %	320
ACCELERATION TIME 100% V-SECS	3.3
SOUND LEVEL	85 DBA AT 3 FEET
MOTOR HEATER RATING	240V, 400W, 1PH
STATOR TEMP DETECTOR	100 OHM PLATINUM RTD
BEARING TEMP DETECTOR	100 OHM PLATINUM RTD

COMPONENT NOTES

A. Ø 1.50 THRU FRAME FOOT WITH Ø 3.00 SPOTFACE FOR HOLD DOWN BOLTS. (1 HOLE PER FOOT, 4 HOLES TOTAL)

B. MAIN CONDUIT BOX ADAPTER GASKET PROVIDED ON F1 SIDE. MAIN LEADS WILL EXTEND 72 INCHES BEYOND ADAPTER.

C. FOUR LIFTING LUGS FOR LIFTING ENTIRE MOTOR. A SPREADER BAR IS REQUIRED WHEN LIFTING MOTOR WITH AIR CABINET ATTACHED.

D. SPACE HEATER CONDUIT ENTRY IN AUX CONDUIT BOX TO BE DRILLED BY THE CUSTOMER.

E. STATOR AND BEARING TEMP DETECTOR CONDUIT ENTRY IN AUX CONDUIT TO BE DRILLED BY THE CUSTOMER.

F. BEARING TEMP DETECTOR PROVIDED EACH BEARING WITH LEADS THRU THE FRAME TERMINATING IN THE AUX CONDUIT BOX. LEADS ARE ROUTED INTERNALLY TO THE OPPOSITE SIDE.

G. PROVISION FOR DIFFERENTIAL PRESSURE SWITCH.

H. TWO 5/16-18 UNC TAPPED HOLES THROUGH .375 THICK SIDE SKIN LOCATED F1 SIDE AS SHOWN.

J. 1/4-28 UNF TAPPED HOLES ON EACH SIDE OF EACH BEARING HOUSING FOR USER SUPPLIED ACCELEROMETER MOUNTING. (4 HOLES TOTAL).

K. BREATHER DRAIN PROVIDED ON AUX BOXES.

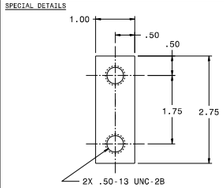
L. GROUNDING STRAP BETWEEN FRAME AND ENCLOSURE.

M. BREATHER DRAIN PROVIDED AT THE LOW POINT OF CONDUIT RUN.

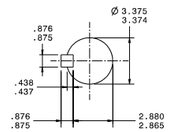
N. PROVISION FOR LIFTING ENCLOSURE ONLY.

MOTOR CENTER OF GRAVITY

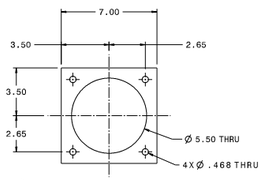
SPECIAL DETAILS



2 FOUR GROUNDING PADS LOCATED AS SHOWN

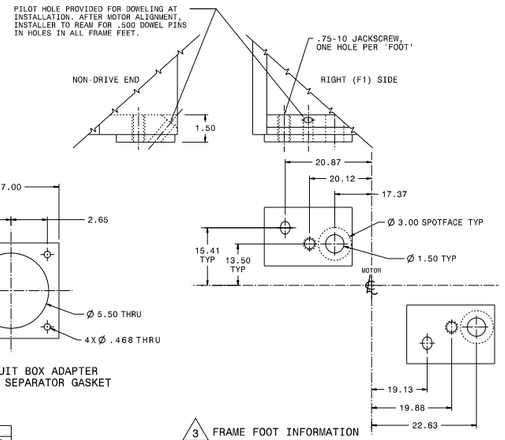


1 DRIVE END SHAFT EXTENSION

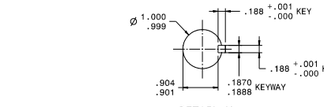


4 MAIN CONDUIT BOX ADAPTER WITH LEAD SEPARATOR GASKET REMOVED

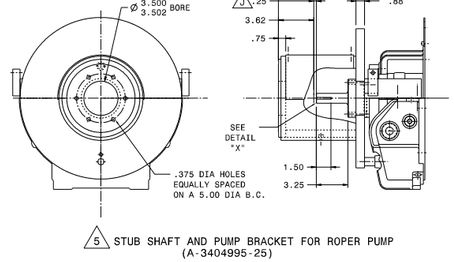
LOCATION OF STATOR RTD'S												
RTD #	1	2	3	4	5	6	7	8	9	10	11	12
PHASE	A1	C1	B1	A2	C2	B2	C1	B1	A2	C2	B2	A1



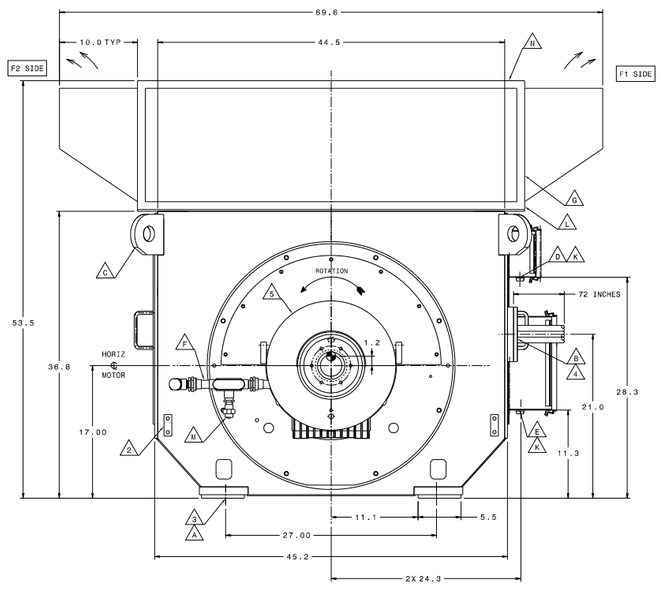
3 FRAME FOOT INFORMATION



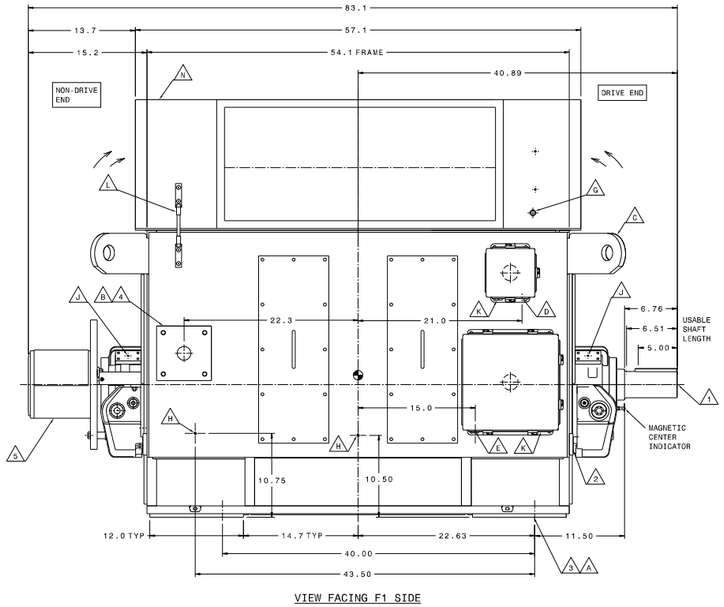
DETAIL X



5 STUB SHAFT AND PUMP BRACKET FOR ROPER PUMP (A-3404995-25)



VIEW FACING NON-DRIVE END



VIEW FACING F1 SIDE

W44-ACP-1-1	
W44-ACP-1-2	
W44-ACP-2-1	
W44-ACP-2-2	

APPROXIMATE WEIGHTS: (LBS)

FRAME & STATOR	5596
ROTOR	2695
BEARINGS & BRKTS	490
CONDUIT BOXES	30
VENTILATION BOX	400
TOTAL WEIGHT	9211

MOTOR OUTLINE DATA AND NOTES — TRANSMITTAL DATE:

CUSTOMER ORDER NUMBER	SHOP ORDER NUMBER	OUTLINE NUMBER
113120	9A07AA	C9A07AA

CUSTOMER: KOFFLER, SAN LEANDRO, CALIFORNIA — ULTIMATE USER: EBMUD

☐ FOR APPROVAL. TO MAINTAIN SHIPPING SCHEDULE APPROVED DRAWINGS MUST BE RECIEVED BY TECO-WESTINGHOUSE ON:

DRAWINGS ARE IN COMPLIANCE WITH YOUR SPECIFIED REQUIREMENTS. DRAWINGS "APPROVED" OR "APPROVED WITH MODIFICATIONS" AUTHORIZE WESTINGHOUSE TO PROCEED WITH MANUFACTURING. MODIFICATIONS NOT IN THE CONTRACT OR MODIFICATIONS MADE DURING OR AFTER DRAWING APPROVAL MAY RESULT IN A PRICE CHANGE AND/OR SHIPMENT DELAY.

☐ FOR CONSTRUCTION OR INSTALLATION. THE EQUIPMENT SHOWN ON THESE DRAWINGS HAS BEEN RELEASED FOR MANUFACTURE. ANY MODIFICATIONS MAY RESULT IN A PRICE CHANGE OR SHIPMENT DELAY.

☐ APPROVED BY

SEND APPROVALS OR INQUIRIES TO THE TECO-WESTINGHOUSE OFFICE WITH WHOM THE ORDER IS PLACED. THESE PRINTS SUPERSEDE PRINTS PREVIOUSLY PROVIDED.

NOTES:

01 FOR THE MANUFACTURER'S WARRANTY ON THIS EQUIPMENT TO BE IN EFFECT, THE EQUIPMENT MUST BE INSTALLED IN STRICT ACCORDANCE WITH THIS DRAWING AND THE INSTRUCTION BOOK.

02 TECO-WESTINGHOUSE DOES NOT HAVE RESPONSIBILITY FOR LATERAL AND TORSIONAL CRITICAL SPEED PERFORMANCE OF THE INSTALLATION.

03 TECO-WESTINGHOUSE IS NOT RESPONSIBLE FOR FOUNDATION DESIGN. MOTOR WEIGHTS ARE INDICATED ON THIS DRAWING AND THE SUPPORT REACTIONS NECESSARY FOR FOUNDATION DESIGN ARE AS FOLLOWS: LBS PER BOLT AT CENTERLINE OF HOLD DOWN BOLT HOLES:

STATIC X= MOTOR WEIGHT/4
RATED MOTOR TORQUE X= MOTOR WEIGHT/4 +/- 494
MAXIMUM MOTOR TORQUE X= MOTOR WEIGHT/4 +/- 3950

04 ACROSS-THE-LINE
WITH RATED VOLTAGE AND FREQUENCY (WITHIN NEMA TOLERANCE LIMITS) AT THE MOTOR TERMINALS AND WITH CONNECTED LOAD INERTIA NOT EXCEEDING 520 LB-FT^2 THE FOLLOWING STARTING DUTY SHOULD NOT BE EXCEEDED:

MOTOR COLD: 3 CONSECUTIVE STARTS.
MOTOR AT OPERATING TEMPERATURE: 2 CONSECUTIVE STARTS.
SUBSEQUENT STARTS WITH MOTOR RUNNING BETWEEN STARTS: 20 MINUTES APART.
OR WITH MOTOR STANDING BETWEEN STARTS: 45 MINUTES APART.
STARTS SHOULD NOT AVERAGE MORE THAN 6 PER DAY THROUGHOUT THE LIFE OF THE MOTOR.

05 MEASURE THE AIRGAP AT 4 PLACES 90 DEGREES APART. VARIATION OF THE MINIMUM AND MAXIMUM AIRGAP FROM THE AVERAGE OF THESE VALUES MUST NOT BE GREATER THAN 11%.

06 SHIMS USED TO ADJUST MOTOR ELEVATION MUST BE PLACED BETWEEN ALL MOTOR MOUNTING FOOT SURFACES AND THE STEEL MOUNTING SURFACES SO THAT ALL FOOT LOAD BEARING SURFACES ARE EQUALLY SUPPORTED BEFORE HOLD DOWN BOLTS ARE TIGHTENED. THE SHIMS SHOULD BE APPROXIMATELY THE SAME SIZE AS MOTOR MOUNTING.

07 NON-DRIVE END BEARING SIZE 3.1 X 2.4; OIL CAPACITY .6 GALLONS
DRIVE END BEARING SIZE 3.1 X 2.4; OIL CAPACITY .6 GALLONS

08 THE MOTOR ENDPLAY IS 0.5 INCH TOTAL. BEARINGS ARE NOT DESIGNED TO TAKE ENDTHRUST. A LIMITED END FLOAT TYPE COUPLING IS REQUIRED TO LIMIT ENDPLAY TO 0.19 INCH.

09 BOTH BEARINGS ARE INSULATED. ANY METAL CONNECTIONS TO THESE MUST BE INSULATED. A GROUND STRAP IS PROVIDED AT THE DRIVE END. BEARING INSULATION SHOULD BE CHECKED WITH AN OHMETER OR MEGGER BEFORE OPERATING MOTOR. DRIVE END BEARING MUST BE GROUNDED BY MEANS OF THE GROUND STRAP WHILE THE MOTOR IS OPERATING.

10 USE A GOOD QUALITY OF RUST AND OXIDATION INHIBITED TURBINE OIL WITH A VISCOSITY OF APPROXIMATELY 150-180 SSU AT 100°F (ISO-VG 32). VISCOSITY INDEX SHOULD NOT BE LESS THAN 95.

11 PARTS NOT SUPPLIED BY TECO-WESTINGHOUSE: FOUNDATION BOLTS, COUPLING GUARDS, LIFTING BEAMS, SLINGS, SPREADER BARS, LUBRICATING OIL, DOWELS, HOLD-DOWN BOLTS, SHIMS AND SOLEPLATES.

12 THE MOTOR IS TO BE MOUNTED ON SOLEPLATES OR ON A DRIVEN EQUIPMENT BEDPLATE SUPPLIED BY OTHERS.

13 MOTOR IS SHIPPED FULLY ASSEMBLED. MAIN LEAD BOX IS NOT PROVIDED BY TWMC. THE MOTOR WILL BE SHIPPED WITH THE CUSTOMER'S HALF COUPLING INSTALLED.

14 ENCLOSURE INLET AND EXHAUST OPENINGS ARE COVERED WITH STAINLESS STEEL SCREENS.

15 AIR INTAKE FILTERS ARE RE-USABLE STAINLESS STEEL. TO SERVICE THESE FILTERS, WASH THOROUGHLY AND DRAIN. CHARGE FILTERS WITH A COMMERCIAL ADHESIVE OR APPROPRIATE WEIGHT MINERAL OIL, THEN REINSTALL.

16 THE MOTOR IS DESIGNED WITH DIRECTIONAL BLOWERS AND MAY ONLY BE OPERATED IN THE DIRECTION OF ROTATION STATED ABOVE.

17 AUX CONDUIT BOXES ARE NEMA 4 CONSTRUCTION.

18 VERTICAL JACKSCREWS AND STAINLESS STEEL HARDWARE ARE PROVIDED.

19 THE FOLLOWING GROUND TERMINAL IS SUPPLIED WITH THIS MOTOR.
FRAME: QUANTITY 1 OF EA28-2N.

20 ANY PUMP OR ACCESSORY DRIVEN BY THE NON-DRIVE END OF THE MOTOR SHAFT, MUST USE AN INSULATED COUPLING TO AVOID SHAFT CIRCULATING CURRENTS.

21 THIS MOTOR IS DESIGNED TO REPLACE EXISTING MOTOR ORDER 9153AA AS SHOWN ON DRAWING C9153AA WITH REGARD TO FRAME AND SHAFT INTERFACE ONLY. MINOR DIFFERENCES IN MAIN LEAD AND INSTRUMENTATION CONNECTION POINTS WILL NEED TO BE ACCOMMODATED BY THE USER.

REVISION HISTORY

ZONE	REV	DESCRIPTION	DATE	APPROVED
	01	R173226: CHANGE DATA SECTION MOTOR HEATER RATING FROM 120V, 500W, 1PH TO 240V, 400W, 1PH. IN DRAWING SECTION CHANGE SPACE HEATER SCHEMATIC FROM 8627A07 TO 8627A05.	20240123	S. BARKER R. MASSEY L. OKOYE
	02	R173777: ADDED PROVISION BLOCK GRAPHICS TO BEARINGS AND REDIRECTED NOTE J. NOTE 11 -DELETED 'COUPLING'. NOTE 13 -ADDED 'THE MOTOR WILL BE SHIPPED WITH CUSTOMER'S HALF COUPLING....'.	20240506	K. WILMER R. MASSEY L. OKOYE S. deVILLIERS

DRAWINGS

MOTOR CONNECTION	8633A79
MOTOR SPACE HEATERS	8627A05
STATOR TEMP DETECTOR	7903A84
BEARING TEMP DETECTOR	9319A30
SHAFT PROFILE	M59A07AA

RECOMMENDED INSTRUMENT SETTINGS

STATOR TEMPERATURE °C
ALARM 150-160 TRIP 160-165

BEARING TEMPERATURE °C
ALARM 80-90 TRIP 90-100

HOUSING VIBRATION (IN/SEC PEAK)
ALARM 0.24 TRIP 0.40

UNLESS OTHERWISE SPECIFIED DIM ARE IN INCHES INTERPRET DIM AND TOL PER ASME Y14.5M - 1994

ANGLE PROJECTION

DRAWN	ajinerx	20230724
CHECKED		
MECHANICAL	S. deVILLIERS	20230731
ELECTRICAL	L. OKOYE	20230731
QAPD		
APPD	R. MASSEY	20230731
REF	C9153AA	

TECO-Westinghouse
5100 North IH-35
Round Rock, TX 78681

DRAWING TITLE: OUTLINE DRAWING
WS MOTOR
S.O. 9A07AA

SIZE J | CAGE CODE | DRAWING NUMBER C9A07AA | REV 02
SCALE: NTS | SHEET 1/1

STANDARD DRAWINGS

USER: amunoz PLOT SCALE: 0.166667:1
DATE: 2/07/2018 14:45
FILE: J:_drawing_templates\INSERTS-Discipline\insert-std.dgn

REF 7; REF 8; REF 9;

REF 4; REF 5; REF 6;

REF 1: J:\Standard Drawings\ref\std dwg bdr.mst
REF 2: stdg001.dd
REF 3:

PLOT SCALE: 0.166667:1

USER: amunoz
DATE: 24-JUN-2020 09:14
FILE: J:\standard drawings\stdg001..07

A

A	AMBER, AMMETER, AMPERES, AUTO
AB	ANCHOR BOLT, AGGREGATE BASE, ABANDONED
ABAND	ABANDONED
ABC	AGGREGATE BASE COURSE
ABS	ABSOLUTE, ACRYLONITRILE-BUTADIENE- STYRENE
ABV	ABOVE
A/C	ALTERNATING CURRENT
AC	AIR CONDITIONING, ALTERNATING CURRENT, ASBESTOS CEMENT, ASPHALTIC CONCRETE, ACRES, ACCUMULATOR
ACB	AIR CIRCUIT BREAKER
ACC	AREA CONTROL CENTER, ACCUMULATOR
ACI	AMERICAN CONCRETE INSTITUTE
ACK	ACKNOWLEDGE
ACST	ACOUSTIC
A/D	ANALOG TO DIGITAL
ADD	ADDITION
ADDL	ADDITIONAL
ADJ	ADJACENT, ADJUST
ADP ADPTR	ADAPTER
AF	AIR FILTER, AMPERE FRAME
AFD	ADJUSTABLE FREQUENCY DRIVE
AFF	ABOVE FINISH FLOOR
AFG	ABOVE FINISH GRADE
AGG	AGGREGATE
Ah	AMPERE HOUR
AHD	AHEAD
AHU	AIR HANDLING UNIT
AI	ANALOG INPUT
AIC	AMPERS INTERRUPTING CAPACITY
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AIT	ANALYTICAL INDICATOR TRANSMITTER
AL	ALUMINUM, ACOUSTIC LINED
ALLOW	ALLOWANCE
ALM	ALARM
ALT	ALTERNATE, ALTERNATIVE
ALUM	ALUMINUM
AM	AUTO-MANUAL
AMB	AMBIENT
AMP	AMPERES
ANSI	AMERICAN NATIONAL STANDARD INSTITUTE
AO	ANALOG OUTPUT
AP	ACCESS PANEL
APP	APPLIED
APPROX	APPROXIMATE
AR	AUXILIARY RELAY
ARCH	ARCHITECTURAL
ARND	AROUND
ARV	AIR RELEASE VALVE
AS	ADJUSTABLE SWITCH, AIR SUPPLY, AMMETER SWITCH, AMPERE SENSOR
ASB	ASBESTOS
ASC	ADJUSTABLE SPEED CONTROLLER
ASD	ADJUSTABLE SPEED DRIVE
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASPH	ASPHALT
ASSY	ASSEMBLY
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
ASU	AIR SUPPLY UNIT
AT	AMPERE TRIP
ATM	ATMOSPHERE
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
AVG	AVERAGE
AVR	AUTOMATIC VOLTAGE REGULATOR
AWG	AMERICAN WIRE GAUGE
AWS	AMERICAN WELDING SOCIETY
AWWA	AMERICAN WATER WORKS ASSOCIATION

B

B	BELL, BLUE, BOTTOM, BROADCASTING
BATT	BATTERY
BB	BOTTOM BAR
BBH	BASEBOARD HEATER
B/C	BOTTOM OF CONCRETE
BC	BARE COPPER, BEGINNING OF CURVE, BOLT CIRCLE
BCT	BUSHING CURRENT TRANSFORMER
BCV	BALL CHECK VALVE
B/D	BOTTOM OF DUCT
BD	BAUD, BOARD
BDD	BACKDRAFT DAMPER
BEG	BEGIN, BEGINNING
BF	BACKFLOW, BLIND FLANGE
BFP	BACKFLOW PREVENTER
BFV	BUTTERFLY VALVE
BG	BELOW GRADE
BHP	BRAKE HORSEPOWER
BIL	BASIC INSULATION LEVEL
BITUM	BITUMINOUS
BKR	BREAKER
BLDG	BUILDING
BLK	BLOCK, BLACK
BLKG	BLOCKING
BLO	BLOWER
BLT	BOLT
BLU	BLUE
BLV	BALL VALVE
BM	BEAM, BENCHMARK
BMCS	BUILDING MANAGEMENT CONTROL SYSTEM
BO	BLOWOFF
BOP	BALANCE OF PLANT
BOT	BOTTOM
B/P	BOTTOM OF PIPE , BLUE PRINT
BP, BYP	BYPASS
BPS	BITS PER SECOND
BRG	BEARING
BRK	BREAK
BRN	BROWN
BRS	BRASS
BRZ	BRONZE
B&S	BELL & SPIGOT
BS	BOTH SIDES
BSHG	BUSHING
BTF	BIOTRICKLING FILTER
BTU	BRITISH THERMAL UNIT
BTUH	BTU PER HOUR
BTWN	BETWEEN
Buna-N	NITRILE RUBBER
BV	BALL VALVE
BVC	BEGINNING OF VERTICAL CURVE
BW	BAND WIDTH
BWS	BACKWASH SUPPLY WATER
BWW	BACKWASH WASTE WATER

C

C	CONTROL CABLE, CENTIGRADE, CLOSE, CONDUIT, COMMAND, COMPUTER, STRUCTURAL STEEL CHANNEL
CA	CAUSTIC, CONCRETE ANCHOR, CABLE
CAB	CABINET
CAD	COMPUTER AIDED DESIGN
CALIB	CALIBRATE
CAP	CAPACITOR, CAPACITY
CAT	CATALOG, COMPUTER AIDED TOMOGRAPHY
CB	CATCH BASIN, CIRCUIT BREAKER
CBC	CALIFORNIA BUILDING CODE
CC	CONTROL CABLE, COOLING COIL, CONTINUOUS, CURRENT, CURB COCK, CONTROL CENTER
C-C	CENTER TO CENTER
CCTV	CLOSE-CIRCUIT TELEVISION

C (CONTINUED)

CCV	CUSHIONED CHECK VALVE
CCW	COUNTER CLOCKWISE
CD	CEILING DIFFUSER, CENTER DISTANCE
CDF	CONTROLLED DENSITY FILL
CEM	CEMENT
CER	CERAMIC
CFG	CENTRIFUGAL
CFH	CUBIC FEET PER HOUR
CFM	CUBIC FEET PER MINUTE
CFS	CUBIC FEET PER SECOND
CG	CEILING GRILLE
CHAM	CHAMFER
CHEM	CHEMICAL
CHK	CHECK, CHECKED
CI	CAST IRON
CIMJ	CAST IRON MECHANICAL JOINT
CIP	CAST-IN-PLACE, CAST IRON PIPE
CIR	CIRCLE
CIRC	CIRCULAR
CISP	CAST IRON SOIL PIPE
CJ	CONSTRUCTION JOINT, COLD JOINT
CJP	COMPLETE JOINT PENETRATION WELD
CKT	CIRCUIT
CKV	CHECK VALVE
CL2	CHLORINE
CL	CLASS, CONTROL LOOP, CLOSE, CENTERLINE
CLG	CEILING
CLJ	CONTROL JOINT
CLKG	CAULKING
CLO	CLOSET
CLR	CLEAR, CLEARANCE
CLSM	CONTROLLED LOW STRENGTH MATERIAL
CLT	CURRENT LIMITING
CMIL	CIRCULAR MILL
CML	CEMENT MORTAR LINED
CMP	CORRUGATED METAL PIPE,
CMU	CONCRETE MASONRY UNIT
CNDCT	CONDUCTIVITY
CNTL	CONTROL
CNTOR	CONTACTOR
CNTR	COUNTER
CNTOR	CONTACTOR
CO	CLEANOUT, CONTROL OUTPUT, COMPANY
CO2	CARBON DIOXIDE
COAX	COAXIAL
COL	COLUMN
COM	COMMON
COMM	COMMUNICATION
COMP	COMPACTION
COMPT	COMPARTMENT
CON	CONCENTRIC
CONC	CONCENTRATION, CONCRETE
COND	CONDENSER, CONDITION, CONDUCTIVITY
CONF	CONFERENCE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUATION, CONTINUOUS
CONTD	CONTINUED
COORD	COORDINATE
COP	COPPER PIPE
CORR	CORRUGATED
COTG	CLEANOUT TO GRADE
CP	CONTROL POINT, COMPLETE PENETRATION, CONTROL PANEL
CPJ	COMPLETE PENETRATION JOINT
CPS	CATHODIC PROTECTION STATION
CPT	CONTROL POWER TRANSFORMER
CPVC	CHLORINATED POLYVINYL CHLORIDE
CR	CEILING REGISTER, CONTROL RELAY
CRE	CORROSION RESISTANT

C (CONTINUED)

CRG	CARRIAGE
CRS	COTED RIGID STEEL CONDUIT, COLD ROLL SREEL
CS	CONTROL STATION, CONTROL SWITCH, CUP SINK
CSCP	CHEMICAL STORAGE CONTROL PANEL
CT	CONDENSATE TANK, CONDUIT, COUNTER, COURT, CURRENT TRANSFORMER,
CTD	CENTERED
CTR	CENTER
CU	COPPER
CU FT	CUBIC FOOT
CU IN	CUBIC INCH
CU YD	CUBIC YARD
CV	CONTROL VALVE
CW	COLD WATER, CLEAR WELL
CY	CUBIC YARD

D

d	PENNY (NAIL SIZE)
D	DEPTH, DIMMER, DISCHARGE
DAC	DIGITAL-TO-ANALOG CONVERTER
DB	DECIBEL, DRY BULB
DBL	DOUBLE
dc	DIRECT CURRENT
DC	DIRECT CURRENT , DOUBLE CONTAINMENT
DCS	DISTRIBUTED CONTROL SYSTEM
DECR	DECREASING
DEG	DEGREES
DEMO	DEMOLITION
DEPT	DEPARTMENT
DESC	DESCRIPTION
DET	DETAIL
DF	DOUGLAS FIR
DF/L	DOUGLAS FIR/LARCH
DG	DECOMPOSED GRANITE
DI	DIGITAL INPUT , DRAINAGE INLET , DROP INLET, DUCTILE IRON
DIA	DIAMETER
DIAG	DIAGRAM, DIAGONAL
DIFF	DIFFERENCE, DELTA
DIM	DIMENSION
DIMJ	DUCTILE IRON MECHANICAL JOINT
DIP	DUCTILE IRON PIPE
DISC	DISCONNECT, DISCONNECT SWITCH
DISCH	DISCHARGE
DISP	DISPENSER
DIST	DISTRIBUTION
DIV	DIVISION
DL	DAYLIGHT , DOOR LOUVER, DISCRETE LATCHED OUTPUT, DEAD LOAD
DMP	DAMPER
DMV	DIAPHRAGM VALVE
DMZ	DEMILITARIZED ZONE
DN	DOWN
DO2	DISSOLVED OXYGEN
DO	DIGITAL OUTPUT, DITTO
DP	DEEP, DIFFERENTIAL PRESSURE, DISCHARGE PRESSURE, DISTRIBUTION PANEL
DPDT	DOUBLE POLE DOUBLE THROW
DPM	DIAPHRAGM
DPU	DISTRIBUTION PROCESSING UNIT
DR	DOOR, DRAIN, DRIVE
DRN	DRAIN
DS	DOWNSPOUT, DISCONNECT SWITCH
DW	DECHLORINATED, DECHLORAMINATED WATER
DWG	DRAWING
DWGS	DRAWINGS
DWL	DOWEL
DWV	DRAIN WASTE VENT
DWY	DRIVEWAY

E

E	EAST, EMPTY, EMERGENCY, VOLTAGE SYMBOL
(E)	EXISTING
EA	EACH, EXHAUST AIR
EAD	EXHAUST AIR DAMPER
EAT	ENTERING AIR TEMPERATURE
EBMUD	EAST BAY MUNICIPAL UTILITY DISTRICT
EC	END OF CURVE
ECC	ECCENTRIC
E/E	VOLTAGE-TO-VOLTAGE
EE	EMERGENCY EYEWASH
EF	EACH FACE, EXHAUST FAN
EFF	EFFICIENCY
EFL	EFFLUENT
E/I	VOLTAGE-TO-CURRENT
EJ	EXPANSION JOINT
EL	ELEVATION (NUMERIC)
ELL	ELBOW
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATION (MEW), ELEVATOR
ELB	ELBOW
EMB, EMBED	EMBEDMENT
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
EMER	EMERGENCY
EMF	ELECTROMOTIVE FORCE
EMPU	ELECTRONIC MOTOR PROTECTION UNIT
EMT	ELETRICAL METTALIC TUBING
EMTY	EMPTY
ENCL	ENCLOSURE
ENG	ENGINE
ENGR	ENGINEER
ENT	ENTRANCE
EO	ELECTRIC OPERATOR
EP	EDGE OF PAVEMENT
EPDM	ETHYLENE PROPYLENE DIENE MONOMER ELASTOMER
EPU	ELECTRONIC PROTECTION UNIT
EPV	ECCENTRIC PLUG VALVE
EQ	EQUAL
EQPT	EQUIPMENT
EQUIV	EQUIVALENT
ESP	EXTERNAL STATIC PRESSURE
EST	ESTIMATE
ETM	ELAPSED TIME METER
ETW	EDGE OF TRAVELLED WAY
EVAP	EVAPORATOR
EVC	END OF VERTICAL CURVE
EW	EACH WAY
EWC	ELECTRIC WATER HEATER
EX	EXAMPLE, EXTRA, EXIT
EXH	EXHAUST
EXP	EXPANSION, EXPOSED
EXST	EXISTING
EXST	
EXT	EXTERIOR
EXTR	EXTRUDED
EYS	ELECTRICAL WYE SEAL
EYW	EMERGENCY EYEWASH

F

F	FUSE, FAHRENHEIT
(F)	FUTURE
FAB	FABRICATE
FAC	FACTORY
FACIL	FACILITY
FAT	FACTORY ACCEPTANCE TEST
FB	FIRE ALARM BELL, FLAT BAR
fc	FOOTCANDLE
F'c	CONCRETE COMPRESSIVE STRENGTH

F (CONTINUED)

FC	FACE OF CURB, FAIL CLOSED, FERRIC CHLORIDE, FLEXIBLE CONNECTION, FLEXIBLE COUPLING
FCA	FLANGED COUPLING ADAPTER
FCO	FLOOR CLEANOUT
FCU	FAN COIL UNIT
FCV	FLOW CONTROL VALVE
FD	FIRE DAMPER, FIRE DETECTOR, FLOOR DRAIN, FOUND
FDBK	FEEDBACK
FDC	FLEXIBLE DUCT CONNECTION
FDN	FOUNDATION
FDR	FEEDER
FDSCP	FIRE DETECTION SYSTEM CONTROL PANEL
FF	FAR FACE, FINISH FACE, FINISH FLOOR, FLAT FACE
F/F	FACE OF FOOTING
F-F	FACE TO FACE
FG	FINISH GRADE
FGL	FIBERGLASS
FH	FIRE HYDRANT , FLAT HEAD
FI	FLOW INDICATOR, FAIL IN PLACE
FIG	FIGURE
FIN	FINISHED
FIT	FLOW INDICATOR TRANSMITTER
FL	FLASHING, FLOWLINE, FLUORIDE
FLD	FIELD
FLEX	FLEXIBLE
FLH	FLAT HEAD
FLG	FLANGE
FLGD	FLANGED
FLP	FAIL TO LAST POSITION
FLR	FLOOR
FLS	FLOAT SWITCH
FLT	FILTER
FLUOR	FLUORESCENT
FKM	FLUOROELASTOMER (VITON)
FM	FORCE MAIN, FREQUENCY MODULATOR
FMH	FLEXIBLE METAL HOSE
FND	FOUNDATION
FO	FAIL OPEN
FOC	FACE OF CURB
FPM	FEET PER MINUTE
FPRF	FIREPROOF
FPS	FEET PER SECOND
FPT	FEMALE PIPE THREAD
FR	FILTRATION, FLOW RECORDER
FRP	FIBERGLASS REINFORCED PLASTIC
FS	FAR SIDE, FLOW SWITCH
FSH	FLOW SWITCH HIGH
FSL	FLOW SWITCH LOW
FT	FOOT, FEET, FLOW TRANSMITTER
FTG	FOOTING
FU	FUSE
FURN	FURNACE
FUT	FUTURE
FVNR	FULL VOLTAGE NON-REVERSING
FVR	FULL VOLTAGE REVERSING
FXTR	FIXTURE
FW	FACE OF WALL, FILTERED WATER
FWD	FORWARD

G

G	GAS, GREEN
GA	GAUGE OR GAGE
GA/TS	GALVANIC ANODE/TEST STATION
GAL	GALLON
GALV	GALVANIZED
GC	GAS COCK
GDR	GRINDER
GEN	GENERATOR

G (CONTINUED)

GFCI	GROUND-FAULT CIRCUIT INTERRUPTER
GFI	GROUND FAULT INTERRUPTER
GFR	GROUND FAULT RELAY
GHz	GIGA HERTZ
GI	GALVANIZED IRON
GL	GLASS, GLASS LINED, GLUE LAM
GLV	GLOBE VALVE
GND	GROUND
GPD	GALLONS PER DAY
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
GR	GRADE
GRS	GALVANIZED RIGID STEEL
GRV	GROOVED (COUPLING)
GRN	GREEN
GSKT	GASKET
GSM	GALVANIZED SHEET METAL
GSP	GALVANIZED STEEL PIPE
GTV	GATE VALVE
GUT	GUTTER
GWB	GYPSUM WALLBOARD
GWL	GROUND WATER LEVEL
GYP	GYPSUM
GT	GATE
GV	GATE VALVE

NOTES

1. SEE DRAWING STD-G-002 FOR ABBREVIATIONS H THRU R, STD-G-002.1 FOR ABBREVIATIONS S THRU Z, AND FOR SYMBOLS.
2. ABBREVIATIONS OR SYMBOLS SHOWN ON DISCIPLINE SPECIFIC WASTEWATER STANDARD DRAWINGS SHALL TAKE PRECEDENCE OVER ABBREVIATIONS OR SYMBOLS SHOWN ON THIS DRAWING.

REGISTERED PROFESSIONAL ENGINEER
GARIN DEAN WARREN
No. C65259
Exp. 09/30/15
CIVIL
STATE OF CALIFORNIA

3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
1	17JAN2017	GENERAL REVISION		GPW	

DESIGN
DESIGNED BY: A. MUNOZ
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APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C59909 VINCENT P. DE LANGE

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
GENERAL
ABBREVIATIONS FOR WASTEWATER FACILITIES
A THRU G

SCALE NONE
DATE 07JAN2009
STD-G-001
DRAWING NUMBER
7
REV.

H

H	HEIGHT, HIGH, HAND, HORN, HORIZONTAL, HOSE
H1E	HOOK ONE END
H2E	HOOK BOTH ENDS
HB	HOSE BIB
HC	HEATING COIL, HOLLOW CORE
HD	HEAD
HDG	HOT-DIPPED GALVANIZED
HDP	HIGH DISCHARGE PRESSURE
HDPE	HIGH-DENSITY POLYETHYLENE
HDR	HEADER
HDWD	HARDWOOD
HDWE	HARDWARE
HESO	HYDRAULIC EMERGENCY SHUTOFF VALVE
HEX	HEXAGONAL
HH	HAND HOLE, HIGH-HIGH
HHWR	HEATING HOT WATER RETURN
HHWS	HEATING HOT WATER SUPPLY
HID	HIGH INTENSITY DISCHARGE
HIPOT	HIGH POTENTIAL
HMI	HUMAN MACHINE INTERFACE
HOA	HAND-OFF-AUTOMATIC
HOR	HAND-OFF-REMOTE
HORZ HORIZ	HORIZONTAL
HP	HIGH PRESSURE, HIGH POINT, HORSEPOWER
HPS	HIGH PRESSURE SODIUM LAMP
HR	HOUR, HANDRAIL
HS	HIGH SPEED
HSB	HIGH STRENGTH BOLT
HSG	HOUSING
HSS	HOLLOW STRUCTURAL SECTION
HT	HEAT
HTR	HEATER
HV	HIGH VOLTAGE, HOSE VALVE
HVAC	HEATING, VENTILATING AND AIR CONDITIONING
HW	HOT WATER
HWH	HOT WATER HEATER
HWL	HIGH WATER LEVEL
HWR	HOT WATER RETURN
HWY	HIGHWAY
HX	HEAT EXCHANGER
HYD	HYDRANT
HYDR	HYDRAULIC
HZ, Hz	HERTZ (CYCLES PER SECOND)

I

IA	INSTRUMENT AIR
IC	INTERRUPTING CAPACITY
ID	IDENTIFICATION, INSIDE DIAMETER
I&C	INSTRUMENTATION & CONTROL
I/E	CURRENT-TO-VOLTAGE
IED	INTELLIGENT ELECTRONIC DEVICES
IF	INSIDE FACE
IFC	IN FURRED CEILING
IFS	IN FURRED SPACE
IFW	IN FURRED WALL
I/I	CURRENT-TO-CURRENT
IJ	INSULATING JOINT
IJS	IN JOIST SPACE
IM	INTRUSION MONITOR
IN	INCH
INCAND	INCANDESCENT
INF	INFLUENT
INS	INSTRUMENTATION
INSUL	INSULATION
INST	INSTANTANEOUS
INSTR	INSTRUMENT, INSTRUMENTATION
INT	INTERIOR
INTFC	INTERFACE
INTLK	INTERLOCK
INTMD	INTERMEDIATE
INV INVT	INVERT
INV EL	INVERT ELEVATION
I/O	INPUT/OUTPUT
IPB	ILLUMINATED PUSH BUTTON
IR	INSIDE RADIUS
IS	INTRUSION SWITCH
IW	IN WALL
IWC	IN WALL CHASE
IWRC	INDEPENDENT WIRE ROPE CORE

J

J, JB	JUNCTION BOX
JCT	JUNCTION
JP	JOINT POLE
JST	JOIST
JT	JOINT

K

K	KEY, KEY INTERLOCK
KGV	KNIFE GATE VALVE
KIP	THOUSAND POUNDS
KSF	KIPS PER SQUARE FOOT
KV	KILOVOLTS
KVA	KILOVOLT AMPERES
KVAR	KILOVOLT AMPERES REACTIVE
KW	KILOWATTS
KWH	KILOWATT HOURS
KWHD	KILOWATT HOUR DEMAND METER

L

L	LENGTH, LOW SPEED, LIGHTING CONTRACTOR, LOW
	STRUCTURAL STEEL ANGLE
LA	LIGHTNING ARRESTER
LAB	LABORATORY
LAM	LAMINATED
LAV	LAVATORY
LB	POUND
LCP	LOCAL CONTROL PANEL
LDP	LOW DISCHARGE PRESSURE
LED	LIGHT EMITTING DIODE
LF	LINEAR FEET
LI	LEVEL INDICATOR
LIT	LEVEL INDICATOR TRANSMITTER
LL	LOW-LOW
LLBB	LONG LEG BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LMS	LEVEL MONITORING STATION
LNTL	LINTEL
LOA	LENGTH OVERALL
LOC	LOCATION, LOCAL
LONG	LONGITUDINAL
LOS	LOCKOUT STOP
LP	LIGHTING PANEL, LOW PRESSURE, LOW POINT
LR	LONG RADIUS, LATCHING RELAY, LOCAL-REMOTE
LS	LEVEL SWITCH, LIME SLURRY
LSC	LANDSCAPE
LSH	LEVEL SWITCH HIGH
LSHH	LEVEL SWITCH HIGH HIGH
LSL	LEVEL SWITCH LOW
LSLL	LEVEL SWITCH LOW LOW
LSP	LOW SUCTION PRESSURE, LIFE SAFETY POWER
LT	LEFT, LIGHT, LEVEL TRANSMITTER
LTC	LOAD TAP CHANGER
LTD	LONG TIME DELAY
LT FLEX	LIQUID TIGHT FLEXIBLE CONDUIT
LTG	LIGHTING
LTPU	LONG TIME PICKUP
LV	LOW VOLTAGE
LVL	LEVEL
LVR	LOUVER
LWL	LOW WATER LEVEL
LWR	LOWER

M

M	MOTOR, MAGNETIC CONTACTOR COIL
mA	MILLIAMPERE
MAINT	MAINTENANCE
MAN	MANUAL
MATL	MATERIAL
MAX	MAXIMUM
MB	MACHINE BOLT
MBH	1000 BTU'S PER HOUR
MBR	MEMBER
MCC	MOTOR CONTROL CENTER
MCM	THOUSAND CIRCULAR MILS
MCP	MOTOR CIRCUIT PROTECTOR
MCOV	MAXIMUM CONTINUOUS OPERATING VOLTAGE
MD	MOTORIZED DAMPER
MECH	MECHANICAL
MEMB	MEMBRANE

M (CONTINUED)

MG	MILLION GALLONS
MGD	MILLION GALLONS PER DAY
MH	MANHOLE
MHTR	MOTOR SPACE HEATER
MI	MALLEABLE IRON
MIN	MINIMUM, MINUTE
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MJR	MECHANICAL JOINT RESTRAINED
MK	MARK
ML&CS	MORTAR LINED & COATED STEEL
MLLW	MORTAR LINED & TAPE WRAPPED STEEL
ML&PCS	MEAN LOWER LOW WATER
ML&TWS	MORTAR LINED & PLASTIC COATED STEEL
MLW	MEAN LOW WATER
M-M	MONUMENT TO MONUMENT
MNHT	MALE NATIONAL HOSE THREAD
MNL	MANUAL
MO	MASONRY OPENING, MOTOR OPERATOR
MON	MONUMENT
MORT	MORTAR
MOT	MOTOR
MOV	METAL OXIDE VARISTORS, MOTOR OPERATED VALVE
MPH	MILES PER HOUR
MPT	MALE PIPE THREAD
MS	MANUAL PULL STATION, MOTOR STARTER
MSC	MANUFACTURER SUPPLIED CABLE
MSL	MEAN SEA LEVEL
MR	MULTI-RATIO CT
MT	MOUNT
MTD	MOUNTED
MTG	MOUNTING
MTL	METAL
MTR	METER
MTS	MOTOR THERMAL SWITCH
MTRG	METERING
MULT	MULTIPLY
MUTCD	MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES
MV	MILLIVOLT
MVA	MEGA-VOLT AMPERE
MW	MICROWAVE, MEGAWATT
MWS	MAXIMUM WATER SURFACE
MWY	MANWAY
MWWTP	MAIN WASTEWATER TREATMENT PLANT
MXR	MIXER

N

N	NEUTRAL, NORTH
(N)	NEW
NA	NOT APPLICABLE, NOT AVAILABLE, NON-AUTOMATIC
NAD	NORTH AMERICAN DATUM
NC	NORMALLY CLOSED
NE	NORTHEAST
NEC	NATIONAL ELECTRICAL CODE
NECY	NECESSARY
NEG	NEGATIVE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NF	NEAR FACE
NH	AMMONIA
NEUT	NEUTRAL
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NO.	NUMBER
NOM	NOMINAL
NOMR	NORMAL
NP	NAMEPLATE
NPS	NOMINAL PIPE SIZE
NPT	NATIONAL PIPE THREAD
NPW	NONPOTABLE WATER
NS	NEAR SIDE
NSG	NON-SHRINK GROUT
NTS	NOT TO SCALE
NV	NEEDLE VALVE
NW	NORTHWEST

O

O3	OZONE
OA	OUTSIDE AIR, OVERALL
OAD	OUTSIDE AIR DAMPER
OAT	OUTSIDE AIR TEMPERATURE
OC	ON CENTER, OPEN-CLOSE
OCC	OAKLAND CONTROL CENTER
OD	OUTSIDE DIAMETER, OVERFLOW DRAIN
OE	OVERHEAD ELECTRICAL
OH	OVERHEAD
OHC	OVERHEAD CRANE
OIU	OPERATOR INTERFACE UNIT
OIT	OPERATOR INTERFACE TERMINAL
OL	OVERLOAD
ONAF	OIL-NATURAL CIRCULATION AIR-FORCED CIRCULATION (TRANSFORMER)
ONAN	OIL-NATURAL CIRCULATION AIR-NATURAL CIRCULATION (TRANSFORMER)
OO	ON-OFF
OP	OPEN
OP/NET	OPERATIONS NETWORK
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OPS	OPERATION(S)
OR	OUTSIDE RADIUS
ORG	ORANGE
ORP	OXYDATION-REDUCTION POTENTIAL
OSD	OPEN SITE DRAIN
OS&Y	OUTSIDE SCREW & YOKE
OTS	OVERCURRENT TRIP SWITCH
OVFL	OVERFLOW

P

P	PAVEMENT, POLE, PUMP, PILOT
PB	PUSH BUTTON, PULL BOX
PBC	PUSH BUTTON - CLOSE
PBD	PUSH BUTTON - OPEN
PBS	PUSH BUTTON - STOP
PC	PERSONAL COMPUTER, PHOTO CELL, POINT OF CURVATURE, POLYMER COAGULANT, PORTLAND CEMENT, PRIMARY COAGULANT
PCC	POINT OF COMPOUND CURVE
PCM	POWER SYSTEM CONTROL AND MONITORING
PCV	PRESSURE CONTROL VALVE
PD	PUMP DRAINAGE
PDI	PULSE DURATION INPUT
PDR	SUMP PUMP DRAINAGE
PE	PHOTOELECTRIC
PEC	PHOTOELECTRIC CELL
PERF	PERFORATED
PERM	PERMANENT, PERMISSIBLE
PF	POWER FACTOR, PREFILTER
PG&E	PACIFIC GAS & ELECTRIC
PGRS	PVC COATED GALVANIZED RIGID STEEL
PGV	PLUG VALVE
pH	HYDROGEN-ION CONCENTRATION
PH	PHASE, POWER HOUSE
PHC	PREHEAT COIL
PI	POINT OF INTERSECTION, PRESSURE INDICATOR PULSE INPUT
P&ID	PROCESS AND INSTRUMENT DIAGRAM
PK	PEAK
PL	PLATE, PILOT LIGHT
P/L	PROPERTY LINE
PLAS	PLASTER
PLC	PROGRAMMABLE LOGIC CONTROL
PLCS	PLACES
PLF	POUNDS PER LINEAR FOOT
PLSTC	PLASTIC
PLT	PILOT LIGHT
PLUM	PLUMBING
PLYWD	PLYWOOD
PMP	PUMP
PMU	POWER MONITORING UNIT
PMPSCT	PUMP SUCTION

P (CONTINUED)

PNEU	PNEUMATIC
PNL	PANEL
PO	POLYMER
POC	POINT OF CONNECTION, POINT ON CURVE
POLYP	POLYPROPYLENE
PP	POLYPROPYLENE, POWER POLE, PUMPING PLANT
PPLN	PIPELINE
PR	PAIR
PRC	POINT OF REVERSE CURVE
PRCST	PRECAST
PREFAB	PREFABRICATED
PRESS	PRESSURE
PRI	PRIMARY
PROP	PROPERTY
PRPSD	PROPOSED
PRV	PRESSURE REGULATING VALVE, PRESSURE RELIEF VALVE
PS	POWER SUPPLY, PRESSURE SWITCH, PUMP STATION, SOLIDS CONDITIONING POLYMER
PSF	POUNDS PER SQUARE FOOT
PSH	PRESSURE SWITCH HIGH
PSI	POUNDS PER SQUARE INCH
PSIA	PSI (ABSOLUTE)
PSIG	PSI (GAGE)
PSL	PRESSURE SWITCH LOW
PSTL	PLASTIC LINED STEEL PIPE
PSU	POWER SUPPLY UNIT
PSV	PRESSURE SAFETY VALVE (RELIEF VALVE)
PT	POINT, POINT OF TANGENCY, POTENTIAL TRANSFORMER TREATMENT AID POLYMER
PTN	PARTITION
PTS	POINTS
PV	PROCESS VARIABLE, PLUG VALVE
PVC	POLYVINYL CHLORIDE
PVCRGS	PVC COATED RIGID GALVANIZED STEEL
PVDF	POLYVINYLIDENE DIFLUORIDE
PVMT	PAVEMENT
PW	POTABLE COLD WATER
PWH	POTABLE HOT WATER
PWR	POWER

Q

QTY	QUANTITY
QUAL	QUALITY

R

R	RADIAL, RADIUS, RED, RISER, RUN
RA	RETURN AIR
RAD	RADIUS
RC	REINFORCED CONCRETE
RCF	RECIRCULATING FAN
RCP	REINFORCED CONCRETE PIPE
RCCP	REINFORCED CONCRETE CULVERT PIPE
RCPT	RECEPTACLE
RCV, RCVR	RECEIVER
RCVD	RECEIVED
RCPT	RECEPTACLE
RD	RED, ROAD, ROOF DRAIN
RDA	RETURN AIR DAMPER
RDCR	REDUCER
RDL	ROOF DRAIN LEADER
RDWD	REDWOOD
REBAR	REINFORCING BAR
RECT	RECTANGULAR
RED	RED, REDUCER, REDUCING
REF	REFERENCE
REFR	REFRIGERATOR
REG	REGULATOR
REINF	REINFORCED, REINFORCEMENT
REL	RELATIVE
REM	REMOVABLE, REMOTE
REQD	REQUIRED
REQT	REQUIREMENT
RES	RESISTANCE, RESISTOR, RESERVOIR
RESIL	RESILIENT
RESV	RESERVOIR

R (CONTINUED)

RET	RETURN (CURB), RETAINING (WALL)
REV	REVERSE, REVISION
REVD	REVISED
RF	RETURN FAN
RFA	RESTRAINED FLANGE ADAPTER
RGH	ROUGH
RGLTR	REGULATOR
RGS	RIGID GALVANIZED STEEL
RGTR	REGISTER
RH	REHEAT COIL
RI	RODDING INLET
RIO	REMOTE INPUT/OUTPUT
RL	RAIN LEADER
RLA	RATED LOAD AMPS
RLY	RELAY
RM	ROOM, RAPID MIX
RMS	ROOT MEAN SQUARE
RMT	REMOTE
RMVD	REMOVED
RND	ROUND
RO	ROUGH OPENING
RP	RADIAL POINT
RPM	REVOLUTIONS PER MINUTE
RS	RIGID STEEL CONDUIT
RSP	REMOTE SET (CASCADE)
RS/PVC	RIGID STEEL, PVC COATED
RT	RIGHT, REMOTE TELEMETRY
RTD	RESISTANCE TEMPERATURE DETECTOR
RTU	REMOTE TERMINAL UNIT, REMOTE TELEMETRY UNIT
RTY	ROTARY
RV	ROOF VENT
RVR	REDUCED VOLTAGE REVERSING
RVNR	REDUCED VOLTAGE NON-REVERSING
R/W	RIGHT-OF-WAY
RW	RAW WASTEWATER
RWS	RAW WATER SYSTEM

S

S	SINGLE, SOUTH, SIREN, SOIL OR WASTE, SUCTION, SOURCE, SUPLY
SA	SUPPLY AIR, SOFTWARE ALARM, SURGE ARRESTER
SAN	SANITARY
SB	SODIUM BISULFITE
SC	SOLID CORE, SPEED CONTROL
SCADA	SUPERVISORY CONTROL AND DATA ACQUISITION
SCD	SCREWED, STREAMING CURRENT DETECTOR
SCFM	STANDARD CUBIC FEET PER MINUTE
SCG	SLUICE GATE
SCH	SCHEDULE (SPEC FOR MATL)
SCHED	SCHEDULE (TABLE, TIME)
SCRN	SCREEN
SCV	SWING CHECK VALVE
SD	SMOKE DETECTOR, STORM DRAIN
SD1	SPECIAL DISTRICT NO. 1
SDG	SLIDE GATE
SDMH	STORM DRAIN MANHOLE
SE	SOUTHEAST
SEC	SECOND, SECONDARY
SECT	SECTION
SEL	SELECTOR
SEP	SEPARATOR
SEW	SEWAGE, SEWER
SF	SUPPLY FAN
SFW	SURFACE WASH
SGT	SLUICE GATE
SH	SHEET, SHOWER, SPACE HEATER, SODIUM HYPOCHLORITE
SHLD	SHIELD
SHT	SHEET
SIM	SIMILAR
SK	SINK

S (CONTINUED)

SLBB	SHORT LEG BACK TO BACK
SLG	SLUDGE
SLGT	SLIDE GATE
SLP	SLOPE
SMP	SUMP
SMS	SHEET METAL SCREWS
S/N	SOLID NEUTRAL
SN	SOLID NEUTRAL
SO2	SULFUR DIOXIDE
SOG	SLAB ON GRADE
SOL	SOLENOID
SOLN	SOLUTION
SP	SPARE, STATIC PRESSURE, SUCTION PRESSURE, SUMP PUMP
SPC	SPACE
SPCR	SPACER
SPD	SPEED, SUMP PUMP DRAINAGE
SPDT	SINGLE POLE DOUBLE THROW
SPEC	SPECIFICATIONS
SPST	SINGLE POLE, SINGLE THROW
SPV	SPOOL VALVE
SQ	SQUARE
SR	SINGLE-RATIO CT, SPRING RELEASE RELAY
SS	SANITARY SEWER, SOLID STATE, START-STOP, SUBSTATION
SSE	STAINLESS STEEL PIPE FOR EXHAUST SERVICE
SSI	STAINLESS STEEL INSTRUMENT TUBING
SSMH	SANITARY SEWER MANHOLE
SSP	STAINLESS STEEL PIPE
SST	STAINLESS STEEL
SSW	SELECTOR SWITCH
ST	START
STA	STATION
STD	STANDARD
STIFF	STIFFENER PLATE
STIR	STIRRUPS
STL	STEEL
STO	STORAGE
STP	STEEL PIPE, STOP
ST PR	STATIC PRESSURE
STPU	SHORT TIME PICKUP
STR	STRAINER, STRUCTURAL, STRUCTURE
STRUCT	STRUCTURAL
SUB	SUBMERSIBLE
SUBST	SUBSTITUTE
SUBSTA	SUBSTATION
SUCT	SUCTION
SURF	SURFACE
SUSP	SUSPENDED
SUW	SURFACE WASH
SV	SOLENOID VALVE, SIGNAL VOLTAGE
SW	SWITCH, SOUTHWEST
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYMM	SYMMETRICAL
SYNC	SYNCHRONIZE

REF 7; REF 8; REF 9;

REF 4; REF 5; REF 6;

REF 1: J:\Standard Drawings\ref\std dwg bdr.mst
REF 2:
REF 3:

PLOT SCALE: 0.166667:1

USER: amunoz
DATE: 04-JUN-2020 09:14
FILE: J:\standard drawings\stdg002.dgn

NOTES

1. SEE DRAWING STD-G-001 FOR ABBREVIATIONS A THRU G, STD-G-002.1 FOR ABBREVIATIONS T THRU Z AND SYMBOLS .
2. ABBREVIATIONS OR SYMBOLS SHOWN ON DISCIPLINE SPECIFIC WASTEWATER STANDARD DRAWINGS SHALL TAKE PRECEDENCE OVER ABBREVIATIONS OR SYMBOLS SHOWN ON THIS DRAWING.

REGISTERED PROFESSIONAL ENGINEER
GARIN DEAN WARREN
No. C65259
Exp. 09/30/11
CIVIL
STATE OF CALIFORNIA

12/01/2010

3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
5	17NOV2017	ADDED LMS AND RFA		GPW	
4	17JAN2017	GENERAL REVISION		GPW	
3	01FEB2016	ADDED ML&TWS AND PS		GPW	
2	12MAR2012	ADDED MJR-MECHANICAL JOINT RESTRAINED		GPW	
1	04NOV2010	RENUMBERED AND REVISED DWG FROM STD-G-004		GPW	

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EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
GENERAL
ABBREVIATIONS FOR WASTEWATER FACILITIES
H THRU S

SCALE NONE
DATE 07JAN2009
STD-G-002
DRAWING NUMBER
5
REV.

T	
T	THERMOSTAT, TREAD, THROW, TIME, THICKNESS
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TB	TERMINAL BLOCK,TERMINAL BOX, TOP BAR
TBA	TO BE ABANDONED
TBG	TUBING
T/C	TOP OF CONCRETE, TOP OF CURB, THERMOCOUPLE
TC	TELEPHONE CABINET, TELEPHONE CABINET, TIME CLOCK, TIME CLOSE
TCE	TEMPORARY CONSTRUCTION EASEMENT
TCV	TEMPERATURE CONTROL VALVE
TD	TEMPERATURE DETECTOR RELAY, TIME DELAY
TDE	TEST DEVICE
TDH	TOTAL DYNAMIC HEAD
TDR	TIME DELAY RELAY
TEFC	TOTALLY ENCLOSED FAN COOLED (MOTORS)
TEL	TELEPHONE
TEMP	TEMPERATURE, TEMPORARY
TERM	TERMINAL
TEWAC	TOTALLY ENCLOSED WATER TO AIR COOLED (MOTORS)
TFE	TETRAFLUOROETHYLENE (TEFLON)
TH	TOTAL HEAD
THD	THREAD
THHN	HEAT RESISTANT THERMOPLASTIC ELECTRICAL WIRE
THK	THICK, THICKNESS
THRU	THROUGH
THWN	MOISTURE & HEAT RESISTANT THERMOPLASTIC ELECTRICAL WIRE
TIT	TEMPERATURE INDICATOR TRANSMITTER
TJB	TERMINAL JUNCTION BOX
T/L	TRANSIT LINE
TMPD	TEMPERED
TNK	TANK
T.O.	TOP OF
TOC	TOP OF CONCRETE, TOP OF CURB
TOP	TOP OF PAVEMENT
TOG	TOP OF GRATING
TOS	TOP OF SLAB, TOP OF STEEL
TOT	TOTAL
TOW	TOP OF WALL
T/P	TOP OF PAVEMENT
TR	TOP REGISTER, TIMER RELAY
TRF	TRANSFER FAN
TRG	TRANSFER GRILLE
TRNSN	TRANSITION
TRTD	TREATED
TRTMT	TREATMENT
T/S	TOP OF STEEL
TS	STRUCTURAL STEEL TUBING, TEST STATION TIME SWITCH
TSP	TOTAL STATIC PRESSURE, TWISTED SHIELDED PAIR
TST	TWISTED SHIELDED TRIAD
TSW	TEMPERATURE SWITCH
TTC	TELEPHONE TERMINAL CABINET
T/W	TOP OF WALL
TW	TREATED WATER
TWV	THREE-WAY VALVE
TURB	TURBIDITY
TYP	TYPICAL

U	
U	HEAT TRANSFER COEFFICIENT
UBC	UNIFORM BUILDING CODE
U-F	UNFORMED FLOAT FINISH
UFC	UNIFORM FIRE CODE
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE
UON	UNLESS OTHERWISE NOTED
UPR	UPPER
UPS	UNINTERRUPTIBLE POWER SUPPLY
UR	URINAL
USS	UNIT SUBSTATION
U-TB	UNFORMED TROWELED HAIR BRUSH FINISH
UVR	UNDER VOLTAGE RELAY

V	
V	VENT, VOLTS, VOLTMETER, VERTICAL
VA	VALVE, VIRTUAL OR CALCULATED ANALOG, VOLT AMPERE
VAC	VACUUM, VOLTS ALTERNATING CURRENT
VAR	VARIES, VARIABLE, VOLT AMPERE REACTIVE
VC	VERTICAL CURVE
VCP	VITRIFIED CLAY PIPE
VDC	VOLTS DIRECT CURRENT
VEL	VELOCITY
VER	VERIFY
VERT	VERTICAL
VF	VENT FAN
VFD	VARIABLE FREQUENCY DRIVE
VI	VIBRATION ISOLATOR
VIF	VERIFY IN FIELD
VLV	VALVE
VP	VAPOR PROOF
VPC	POINT OF VERTICAL CURVATURE
VPT	POINT OF VERTICAL TANGENCY
VS	VOLTMETER SWITCH
VT	VOLTAGE TRANSFORMER
VTP	VERTICAL TURBINE PUMP
VTR	VENT THRU ROOF

W	
W	WASTE, WATT, WEST, WHITE, WIDTH, WIRE, STRUCTURAL STEEL WIDE FLANGE
W/	WITH
WAW	WASH WATER
WB	WET BULB
WC	WATER CLOSET
WCO	WALL CLEANOUT
WDG	WINDING
WDO	WINDOW
WESP	WASTEWATER ENGINEERING STANDARD PRACTICE
WF	WATER FOUNTAIN
WH	WATER HEATER
WHR	WATER HEATER
WHD	WATT HOUR DEMAND
WHSE	WAREHOUSE
WHT	WHITE
WIFI	WI-FI
WL	WATERLINE

W (CONTINUED)	
WLD	WELDED
WM	WATER METER, WATT METER
WOG	WATER, OIL, GAS
W/O	WITHOUT
WP	WEATHERPROOF, WORK POINT
WPJ	WEAKENED PLANE JOINT
WS	WATERSTOP, WATER SURFACE
WSHR	WASHER
WSP	WELDED STEEL PIPE
WT	WEIGHT
WTP	WATER TREATMENT PLANT
WTR	WATER
WTRPRF	WATERPROOF
WW	WASTE WATER, WASH WATER
WWF	WELDED WIRE FABRIC, WET WEATHER FACILITY

X	
X	REACTANCE, REACTOR
XBAR	CROSSBAR
XCVR	TRANSCEIVER
XDCR	TRANSDUCER
XFMR	TRANSFORMER
XHVY	EXTRA HEAVY
XMSN	TRANSMISSION
XMTR	TRANSMITTER
XP	EXPLOSION PROOF
XRF	TRANSFORMER
XSECT	CROSS SECTION
XS	EXTRA STRONG
XXS	DOUBLE EXTRA STRONG

Y	
YD	YARD
YIL	YELLOW INDICATING LIGHT
YSF	YIELD SAFETY FACTOR
YSLF	YIELD STRENGTH LOAD FACTOR

Z	
Z	IMPEDANCE

SYMBOLS	
∠	ANGLE (STRUCTURAL STEEL)
@	AT
℄	CENTERLINE
°	DEGREES
°C	DEGREES CENTIGRADE
°F	DEGREES FAHRENHEIT
ø	DIAMETER, PHASE
Δ	DELTA, DIFFERENCE
≥	GREATER THAN OR EQUAL TO
≤	LESS THAN OR EQUAL TO
#	NUMBER, POUND
/	OF
	OHM
℔	PLATE (STRUCTURAL STEEL)
±	PLUS OR MINUS

NOTES

1. SEE DRAWING STD-G-001 FOR ABBREVIATIONS A THRU G, STD-G-002 FOR ABBREVIATIONS H THRU S.
2. ABBREVIATIONS OR SYMBOLS SHOWN ON DISCIPLINE SPECIFIC WASTEWATER STANDARD DRAWINGS SHALL TAKE PRECEDENCE OVER ABBREVIATIONS OR SYMBOLS SHOWN ON THIS DRAWING.

REGISTERED PROFESSIONAL ENGINEER
GARIN DEAN WARREN
No. C65259
Exp. 09/30/17
CIVIL
STATE OF CALIFORNIA

12/01/2010

NO.	DATE	REVISION	BY	REC.	APP.

3" ON ORIGINAL DOCUMENT
0 1 2 3

DESIGN
DESIGNED BY: A. MUNOZ
DRAWN BY: A. MUNOZ
REVIEW
DESIGN CHECKED BY: R.P.E. No. C65259 — GARIN D WARREN
RECOMMENDED: SR. ENGINEER R.P.E. No. C65259 — GARIN D WARREN
APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C59909 — VINCENT P. DE LANGE

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
GENERAL
ABBREVIATIONS FOR WASTEWATER FACILITIES
T THRU Z AND SYMBOLS

SCALE NONE
DATE 17JAN2017
STD-G-002.1
DRAWING NUMBER
Ø
REV.

REF 1: J:\Standard Drawings\ref\std dwg bdr.mst
REF 2: J:\standard drawings\archive\stdg002r.01
REF 3:
REF 4:
REF 5:
REF 6:
REF 7:
REF 8:
REF 9:

USER: amunoz
DATE: 24-JUN-2020 09:14
FILE: J:\standard drawings\stdg0021.r00
PLOT SCALE: 0.166667:1

LEGENDS

NEW — NEW WORK

NEW, OTHER DISCIPLINE — NEW WORK SHOWN ELSEWHERE BY OTHER DISCIPLINES

EXISTING — EXISTING FACILITY

CENTER LINE

OR — EXISTING FACILITY TO BE DEMOLISHED

CONCRETE

AGGREGATE OR DRAIN ROCK

SAND

GROUT

EXISTING GROUND

COMPACTED GROUND

GRASS/GROUND COVER

STEEL - SECTION

NEW AC PAVEMENT - PLAN

NEW AC PAVEMENT - SECTION

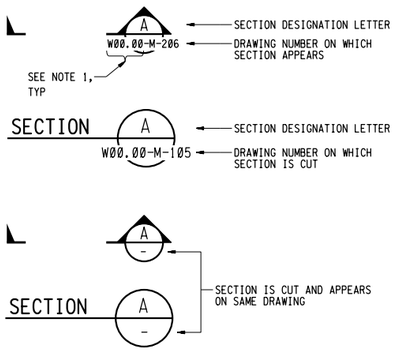
CHECKER PLATING

METAL PLATING

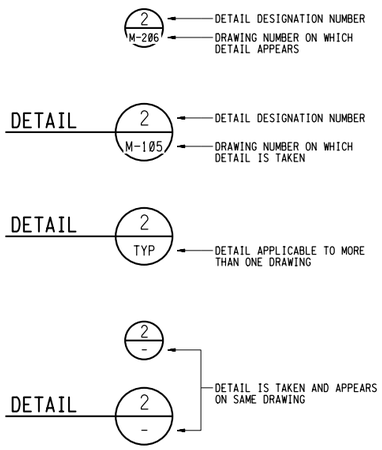
GRATING

PIPE SECTION

SECTION DESIGNATION

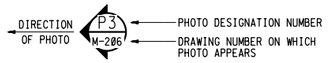


DETAIL DESIGNATION



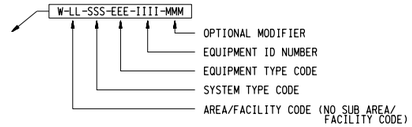
ELEVATION DESIGNATION

PHOTO DESIGNATION



EQUIPMENT DESIGNATION SYSTEM

NEW EQUIPMENT LABEL



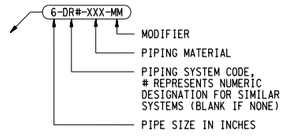
EXISTING EQUIPMENT LABEL

NOTES:

1. EQUIPMENT TAG NUMBERING SHALL FOLLOW WESP 130. SEE STANDARD DRAWINGS STD-G-004, STD-G-004.1, STD-G-005 & STD-G-006 FOR APPROPRIATE CODES. ADD DASH TO AREA CODES FROM STD-G-004. FOR EXAMPLE, W-64.
2. SEE EQUIPMENT SCHEDULE(S) AND SPECIFICATIONS FOR NEW EQUIPMENT.

PIPING DESIGNATION SYSTEM

NEW PIPING LABEL



EXISTING PIPING LABEL

NOTES:

1. PIPING SYSTEM CODES SHALL BE AS DEFINED ON DRAWINGS STD-G-005 AND STD-G-006.
2. PIPING MATERIALS FOR EACH SERVICE SHALL BE AS SHOWN ON THE PIPE SCHEDULE OR AS SPECIFIED IN SPECIFICATION DIVISION 40.
3. PIPING MODIFIERS ARE DEFINED ON DRAWINGS STD-G-001 AND STD-G-002.
4. DESIGNATION SYSTEM SIMILAR FOR HVAC DUCTING.

GENERAL NOTES

1. AREA NUMBER AND SUB-STRUCTURE NUMBER SHOULD BE OMITTED IF THE SECTION AND CALL-OUT LOCATIONS ARE IN THE SAME AREA NUMBER. SIMILAR CONDITION ALSO APPLIES TO DETAIL, ELEVATION AND PHOTO DESIGNATIONS.
2. FOR MECHANICAL STANDARDS, SEE DRAWING STD-M-001.
3. FOR HVAC STANDARDS, SEE DRAWING STD-M-002.
4. FOR ELECTRICAL STANDARDS, SEE DRAWING STD-E-001.
5. FOR INSTRUMENTATION STANDARDS, SEE DRAWING STD-I-001.

REGISTERED PROFESSIONAL ENGINEER — GARIN DEAN WARREN — No. C65259 Exp. 09/30/11 — CIVIL — STATE OF CALIFORNIA

12/01/2010

NO.	DATE	REVISION	BY	REC.	APP.
4	01FEB2016	REVISED LEGEND FINISH GROUND SURFACE		GPW	GDW
		TO EXISTING GROUND		GPW	GDW
3	12MAR2012	CHANGE EQUIP DESIGNATION FROM LLL TO W-LL		GPW	GDW
2	04NOV2010	RENUMBERED AND REVISED DWG FROM STD-G-005		GPW	GDW
1	09JAN2009	REVISED "NEW AC PAVEMENT - PLAN" PATTERN		GPW	GDW

3" ON ORIGINAL DOCUMENT (0 1 2 3)

DESIGN — DESIGNED BY: R. RUIZ; DRAWN BY:

REVIEW — DESIGN CHECKED BY: R.P.E. No. C65259 GARIN D WARREN

RECOMMENDED: SR. ENGINEER R.P.E. No. C65259 GARIN D WARREN

APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C33317 EDWARD H MCCORMICK

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
GENERAL
LEGENDS, SECTION, DETAIL, ELEVATION, PHOTO, AND PIPING SYSTEMS DESIGNATIONS

SCALE NONE | DATE 07JAN2009 | STD-G-003 DRAWING NUMBER | 4 REV.

REF 7; REF 8; REF 9;
REF 4; REF 5; REF 6;
REF 1: J:\Standard Drawings\ref\std dwg bdr.mst
REF 2:
REF 3:

PLOT SCALE: 0.166667:1
USER: amunoz
DATE: 04-JUN-2020 09:15
FILE: J:\standard drawings\stdg003.dgn

(W94)
DECHLORINATION
FACILITY - OFFSITE

SD-104 (OVERPASS ARCHES)
SD-131A, SD-142, SD-170,
SD-218, SD-265, SD-278

(W74.10)
BIOASSAY BUILDING
(FORMER LIME SHED)
SD-93 (REV CONC FLR),
SD-116

(W74)
EFFLUENT PUMP STATION
SD-8 (EQUIP SPEC ONLY),
SD-35, SD-38, SD-39, SD-81,
SD-119, SD-144, SD-178,
SD-237, SD-250, SD-278, SD-309

(W10.20)
PRIMARY EFFLUENT BYPASS
& FILL / DRAIN LINE
SD-30, SD-188, SD-271A,
SD-302, SD-314, SD-330,
SD-339

(W74.20)
PLANT EFFLUENT CHANNEL
SD-35, SD-309

(W33)
SOLID / LIQUID WASTE
RECEIVING STATION
SD-271A, SD-302,
SD-314, SD322, SD330

(W10.50)
FLARES
SD-369

(W28.20)
POWER GENERATION STATION 2
SD-317A

(W28.50) SUBSTATION U30
SD-135, SD-179, SD-189, SD-189A,
SD-258(DECOMMISSIONED), SD-278,
SD-317A

(W28.10)
POWER GENERATION STATION 1
SD-317A, SD396

(W28.50) SUBSTATION U29
SD-317A

SUBSTATION U28

(W28.30)GAS COMPRESSOR UNIT
SD-178A

(W10)
WET WEATHER STORAGE BASIN
SD-178A

(W30)
WASTE ACTIVATED SLUGE
THICKENING STATION
SD-161, SD-161A, SD-161B, SD-216,
SD-266, SD236, SD-288,SD-316

(W25)
SLUDGE DEWATERING
BUILDING
SD-99 (SCUM COLLECTORS), SD-130,
SD-130C, SD-141, SD-142, SD-153,
SD-159, SD-161, SD-161A, SD-161B,
SD-195, SD-195A, SD-216, SD-229,
SD-260, SD-266, SD-278, SD-288,
SD-316, SD341, SD364

(W32)
BULK CHEMICAL STORAGE
AREA
SD-216, SD-316,
SD341

(W73)
3 WATER (3W)
LIFT STATION
SD-170, SD309

(W30.10)
ALLEY &
SCRUBBER
AREA
SD-266, SD-288

(W64)
EAST BAYSHORE
RECYCLED
WATER PLANT
SD-262, SD-278,
(FORMER PROCESS WATER PLANT
SD-123, SD-123A, SD-262, SD-278),
SD-147 (REPLACE MIXER SHAFTS),
SD-261 (PLANT DEMO), SD341

(W18)
OLD MAINTENANCE
BUILDING
SD-80 (GARAGE & CHLORINE
BLDG), SD-122A, SD-160
(ADDITION WEST SIDE)

(W24.50)
PRIMARY SEDIMENTATION CONTROL BUILDING
SD-43, SD-118, SD-224

(W24)
PRIMARY SEDIMENTATION TANKS (1-16)
SD-43 (1-10), SD-44, SD-60,
SD-062, SD-87, SD-88, SD-99,
SD-118 (11-16), SD-211, SD-248A,
SD-260, SD-273, SD-278,
SD-277(3,5,9), SD-287 (6-8),
SD-288, SD-295, SD-299 (1,2,4),
SD-333, SD-364, SD388

(W24.40)
PRIMARY SEDIMENTATION
BLOWER BUILDING

(W13.00)
AERATED GRIT TANKS
SD-118, SD-161,
SD-260, SD364

MANDELA GATE
SD-133

(W15)
SCUM THICKENING
STATION
SD-170, SD-286

(W01)
NORTH INTERCEPTOR
JUNCTION STURCTURE

(W13.20)
AERATED GRIT
BLOWER BUILDING
SD-118, SD364

(W13.40)
VORTEX GRIT TANKS
SD-260

(W12)
INFLUENT PUMP STATION
(FORMERLY: RAW SEWAGE
PP AND GRIT CHAMBERS)
SD-1 (PUMPS),
SD-5 (CRANE #1),
SD-13 (CRANE #2), SD-15,
SD-18, SD-19, SD-21,
SD-22, SD-29, SD-31,
SD-32, SD-67, SD-82,
SD-102, SD-142A, SD-160,
SD-119, SD-170, SD-244,
SD-278, SD-317A, SD-346,
SD-349, SD361

SUB STAS U21,
U22
SD-210 (CONCRETE
PROTECTION)

(W12.10)
FERRIC CHLORIDE STORAGE
SD-317A

(W14)PLANT AIR/
PRE- CHLORINATION
BUILDING
(SCUM DEWATERING
BLDG DEMOLISHED)
SD-80 (GARAGE &
CHLORINE BLDG)
SD-170, SD-210, SD-219

(W16)
GRIT DEWATERING BLDG
SD-120, SD170, SD170A,
SD-260

(W23)
WET WEATHER PRIMARY
SLUDGE THICKENERS
SD-170, SD-215

(W12.20)
IPS ODOR CONTROL SYSTEM
SD-361

(W11)
RAILROAD UNLOADING STATION
SD-89 (SPUR TRACK & FENCE),
SD-107, SD-120, SD-307

(W17)
ELECTRICAL MAIN
SUB-STATION H-1/M-1
SD-120, SD-227

(W33.10)
DISCHARGE STATION B FOR
SEPTAGE HAULERS/ALUM SLUDGE
SD-270

(W55)
SECONDARY CLARIFIERS 1-12
SD-120, SD-146, SD-194, SD-235,
SD-252, SD-276, SD-294, SD-323,
SD-367 (1-10)ONLY

(W44)
OXYGEN PRODUCTION PLANT
SD-120, SD-147, SD-170,
SD-210, SD-217, SD-249,
SD-249AB, SD-278, SD-338
(COOLING TOWERS)

(W33.10)
DISCHARGE STATION A
FOR SEPTAGE HAULERS
SD-270, SD307, SD340

(W54)
OPERATIONS CENTER
SD-120, SD-170, SD-194, SD-220,
SD-278, SD-318, SD-323, SD-336A,
SD-341

(W45)REACTORS
SD-120, SD-154, SD-155, SD-221,
SD-249, SD-281, SD-291, SD-259,
SD-278, SD-323, SD-338

CHEMICAL FEED
SYSTEMS
SD-323

(W26)
MAINTENANCE CENTER
SD-223A, SD-264,
SD278

(W26)
FUELING FACILITY
SD-279

MAINTENANCE STORAGE FACILITIES
(OLD COMPOST)
SD-156

(W19)
FIELD SERVICES
BUILDING
SD-80, SD-222, SD228,
SD-296

(W90)
OUTFALL PIPELINE
(CONTINUES TO BAY)

(W20)
ENGINEER'S ROAD
IMPROVEMENT
SD-375A

1070

1084

1086

WAKE AVENUE

(W37) DIGESTERS 9-12
& DIGESTER EQUIPMENT
BUILDING 2
SD-130, SD-192A, SD-197,
SD-224, SD-253, SD-275,
SD-282 (12), SD-319,
SD341

(W36) DIGESTERS 5-8
& DIGESTER EQUIPMENT
BUILDING 1
SD-121A, SD-192,
SD-199, SD-208A (6),
SD-224, SD-243 (8),
SD-275, SD-286,
SD-319, SD-341, SD356

(W36.20)
FOG RECEIVING
STATION
(SD-319)

(W20) RW FILL STATION
(SD-387)

(W35) DIGESTERS 2-4
& DIGESTER HEATING
BUILDING
SD-50 (3,4), SD-69, SD-86, SD-96 (2),
SD-112, SD-139 (2), SD-158, SD-180,
SD-192, SD-197, SD-224, SD-274, SD-275,
SD-278, SD-286, SD-301, SD-319, SD-328,
SD-341, SD356

(W36.20)
BLEND TANKS
SD-319, SD-341,
SD356

(W85) SODIUM
HYPOCHLORITE
STORAGE
SD-50*, SD-86*,
SD-158*, SD-180*,
SD-219, SD-269,
SD-350

(W34) DIGESTER
GAS BURNERS
SD-50 (DIGESTION TANKS),
SD-197, SD-121A

(W42) LABORATORY
SD-68 (LAB FURNITURE) SD-122A,
SD-152 (EXP #1), SD173, SD-185
(EXP #2), SD-257, SD-278, SD-285

(W33)ALUM SLUDGE
RECEIVING STATION
(BY DISTRICT FORCES)
DEMOLISHED

(W28.40)
GAS CONDITIONING UNIT
SD-317A

(W83)
HYPOCHLORITE
INJECTION STATION
& TRUCK UNLOADING
SD-219

(W41)
ADMINISTRATION BUILDING
SD-122A, SD-152, SD-173,
SD-176, SD-184, SD-228

(W46)
MID- PLANT
PUMP STATION
SD-170, SD-278
SD-280, SD-308

REF 7; J:\Standard.Drawings\ref\std dwg bdr.mst
REF 8; J:\wwp\wwp.sd.number.dgn
REF 4;
REF 5;
REF 6;
REF 1;
REF 2;
REF 3;

FACILITY/ AREA CODE	AREA SUB-CODE	MAIN WASTEWATER TREATMENT PLANT FACILITY / AREA CODE DESCRIPTION
WWP		**MAIN WASTEWATER TREATMENT PLANT (TENTATIVE DRAWINGS)**
		VICINITY MAP/INDEX OF DRAWINGS
		OTHER GENERAL DRAWINGS
		MAIN WASTEWATER TREATMENT PLANT SITE LAYOUT
W10	**.00**	**WET WEATHER STORAGE BASIN**
W10	.20	PRIMARY EFFLUENT BYPASS
W10	.50	FLARES 1H-5H
W11		**RAIL LOADING STATION**
W12		**INFLUENT PUMP STATION**
W12	.00	MAIN STRUCTURE
W12	.10	FERRIC CHLORIDE TANKS
W13		**AERATED GRIT TANK/AERATED GRIT BLOWER BLDG/GRIT SYSTEM/VORTEX GRIT STRUCTURE**
W13	.01	AERATED GRIT TANK 1
W13	.02	AERATED GRIT TANK 2
W13	.03	AERATED GRIT TANK 3
W13	.04	AERATED GRIT TANK 4
W13	.05	AERATED GRIT TANK 5
W13	.06	AERATED GRIT TANK 6
W13	.07	AERATED GRIT TANK 7
W13	.08	AERATED GRIT TANK 8
W13	.20	AERATED GRIT BLOWER BLDG
W13	.30	GRIT SYSTEM
W13	.40	VORTEX GRIT TANK STRUCTURE
W13	.41	VORTEX GRIT TANK 1
W13	.42	VORTEX GRIT TANK 2
W14		**PLANT AIR/PRECHLOR BUILDING**
W15		**SCUM DEWATERING STATION**
W16		**GRIT DEWATERING STATION**
W17		**ELECTRICAL MAIN SUBSTATION H-1/M-1**
W17	.10	STEP-UP TRANSFORMER
W17	.10	H2 SWITCHGEAR
W18		**MAINTENANCE BUILDING (OLD)**
W19		**FIELD SERVICES OFFICE**
W20		**ROADS AND FENCES (GENERAL SITE IMPROVEMENTS-SURFACE FEATURES)**
W20	.10	PAVING REHABILITATION
W21		**PLANT UTILITIES**
W21	.10	WATER LINE (1W, 2W, 3W, 4W, 5W)
W21	.20	GALLERY DRAINS
W21	.30	SODIUM HYPHOCHLORITE
W21	.60	GALLERY
W23		**WET WEATHER PRIMARY SLUDGE THICKENER TANKS 1 & 2**
W23	.01	SLUDGE THICKENER TANK 1
W23	.02	SLUDGE THICKENER TANK 2
W24		**PRIMARY SEDIMENTATION TANKS/BLOWER BUILDING/ CONTROL BUILDING**
W24	0.01- 16	PRIMARY SEDIMENTATION TANKS
W24	.20	INFLUENT CHANNEL
W24	.30	EFFLUENT CHANNEL
W24	.40	PRIMARY SEDIMENTATION BLOWER BUILDING
W24	.50	PRIMARY SEDIMENTATION CONTROL BUILDING
W25		**SLUDGE DEWATERING BUILDING**
W25	.10	SLUDGE DEWATERING BUILDING - WEST HOPPER AREA
W26		**MAINTENANCE CENTER**
W28	**.00**	**POWER GENERATION STATION (DRAWINGS THAT APPLIES TO ALL W28 AREA)**
W28	.10	PGS 1
W28	.20	PGS 2
W28	.30	GAS COMPRESSOR UNITS
W28	.40	GAS CONDITIONING UNITS
W28	.50	SUBSTATION U29 & U30
W30		**WAS THICKENING STATION**
W30	.10	WAS THICKENING STATION - ALLEY AND SCRUBBER AREA

FACILITY/ AREA CODE	AREA SUB-CODE	MAIN WASTEWATER TREATMENT PLANT FACILITY / AREA CODE DESCRIPTION
W32		**BULK CHEMICAL STORAGE AREA**
W33	**.00**	**LIQUID/SOLID (RESOURCE RECOVERY (R2) FACILITIES)**
W33	.10	DISCHARGE STATION
W33	.20	DEDICATED DIGESTER FOODWASTE & DEWATERING
W33	.30	FOODWASTE FERRIC FACILITY
W34		**DIGESTER GAS BURNERS**
W35		**DIGESTER HEATING BUILDING AND DIGESTERS 2, 3 & 4**
W35	.02	DIGESTER 2
W35	.03	DIGESTER 3
W35	.04	DIGESTER 4
W36		**DIGESTER EQUIPMENT BUILDING 1 AND DIGESTERS 5, 6, 7 & 8**
W36	.05	DIGESTER 5
W36	.06	DIGESTER 6
W36	.07	DIGESTER 7
W36	.08	DIGESTER 8
W36	.20	BLEND TANKS
W37		**DIGESTER EQUIPMENT BUILDING 2 AND DIGESTERS 9, 10, 11 & 12**
W37	.09	DIGESTER 9
W37	.10	DIGESTER 10
W37	.11	DIGESTER 11
W37	.12	DIGESTER 12
W41		**ADMINISTRATION BUILDING**
W42		**LABORATORY**
W44		**OXYGEN PRODUCTION PLANT**
W44	.10	O2 COOLING TOWERS
W45		**REACTOR DECK**
W46		**MID-PLANT PUMP STATION**
~~W74~~	~~.30~~	~~OUTFALL~~
W51		**ARMY BASE**
W54		**OPERATIONS CENTER**
W55		**SECONDARY CLARIFIERS 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 & 12**
W55	.01	SECONDARY CLARIFIER 1
W55	.02	SECONDARY CLARIFIER 2
W55	.03	SECONDARY CLARIFIER 3
W55	.04	SECONDARY CLARIFIER 4

FACILITY/ AREA CODE	AREA SUB-CODE	MAIN WASTEWATER TREATMENT PLANT FACILITY / AREA CODE DESCRIPTION
W55	.05	SECONDARY CLARIFIER 5
W55	.06	SECONDARY CLARIFIER 6
W55	.07	SECONDARY CLARIFIER 7
W55	.08	SECONDARY CLARIFIER 8
W55	.09	SECONDARY CLARIFIER 9
W55	.10	SECONDARY CLARIFIER 10
W55	.11	SECONDARY CLARIFIER 11
W55	.12	SECONDARY CLARIFIER 12
W58	**.00**	**DEDICATED DIGESTER GAS FACILITIES (FOOD WASTE)**
W59	**.00**	**DIGESTATE MANAGEMENT BUILDING (FOOD WASTE)**
W64	**.00**	**EAST BAY SHORE RECYCLING FACILITY**
W73	**.00**	**3W LIFT STATION**
W74	**.00**	**EFFLUENT PUMP STATION**
W74	10	~~FORMER LIME STORAGE~~ BIOASSAY BLDG
W74	20	PLANT EFFLUENT CHANNEL
~~W74~~	~~.30~~	~~OUTFALL~~
W83	**.00**	**POST HYPOCHLORITE INJECTION STATION & TRUCK UNLOADING**
W85	**.00**	**HYPOCHLORITE STORAGE AREAS**
W90	**.00**	**OUTFALL**
W94	**.00**	**DECHLORINATION FACILITY (OFFSITE)**
	10	CONTROL BLDG
	20	INJECTOR BLDG
	30	SODIUM BISULFITE STORAGE

3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
A	10APR2019	GENERAL REVISION	CL	GPW	DJK
A	17JAN2017	GENERAL REVISION		GPW	GDW
A	08MAR2016	GENERAL REVISION	BRD	GPW	GDW

DESIGN
DESIGNED BY: R. RUIZ
DRAWN BY: A. MUNOZ
REVIEW
DESIGN CHECKED BY: R.P.E. No. C65259 — GARIN D WARREN
RECOMMENDED: SR. ENGINEER R.P.E. No. C65259 — GARIN D WARREN
APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C59909 — VINCENT P. DE LANGE

REGISTERED PROFESSIONAL ENGINEER — GARIN DEAN WARREN — No. C65259 — Exp. 09/30/19 — CIVIL — STATE OF CALIFORNIA

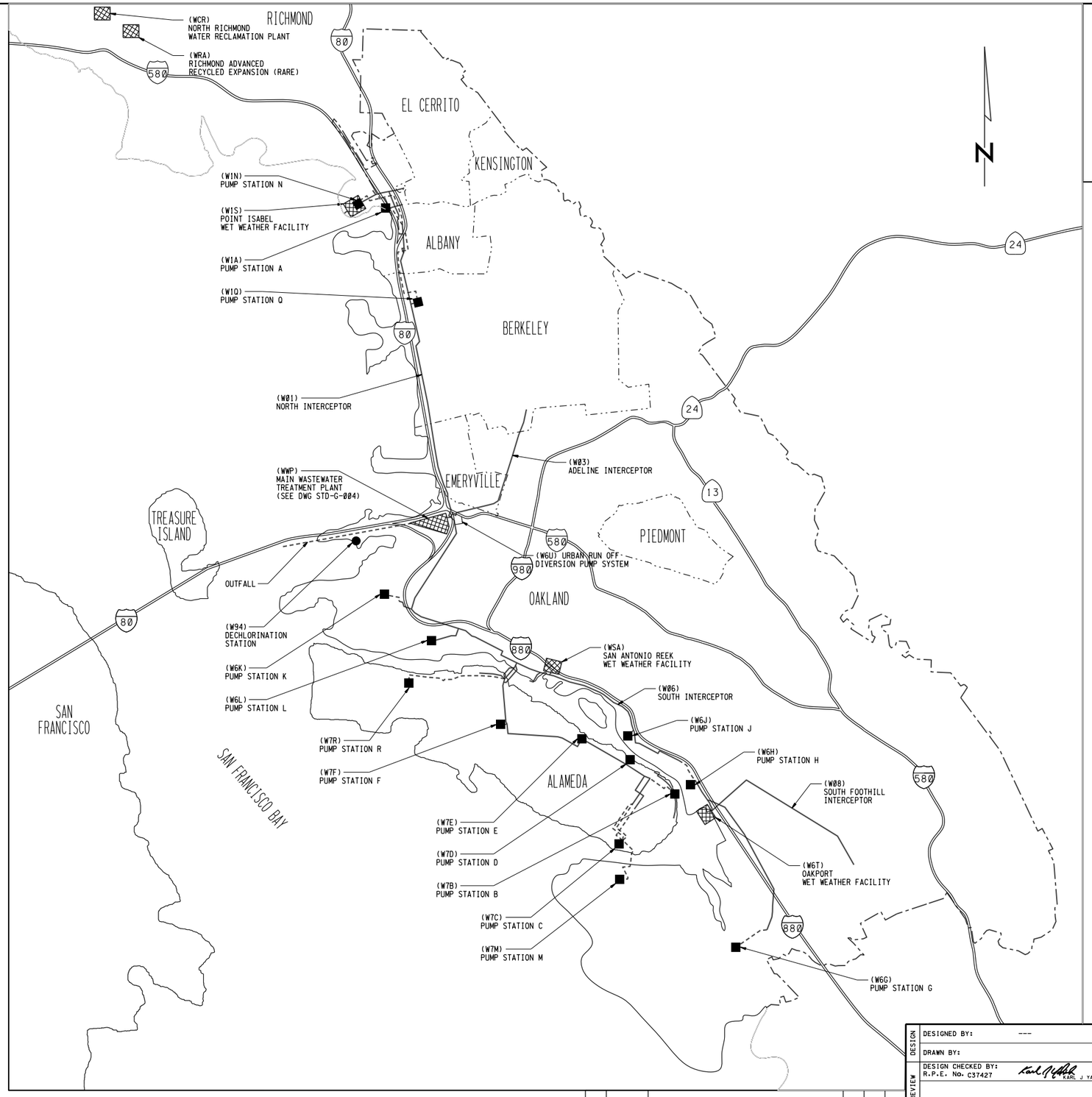
EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
GENERAL
EQUIPMENT TAG
AREA CODES FOR MAIN WASTEWATER TREATMENT PLANT

SCALE NONE
DATE 07JAN2009
STD-G-004
DRAWING NUMBER
6
REV.

USER: amunoz
DATE: 04-JUN-2020 09:15
FILE: J:\standard.drawings\stdg004.dgn
PLOT SCALE: 225:1

FACILITY/ AREA CODE	AREA SUB-CODE	INTERCEPTOR AND REMOTE FACILITY FACILITY / AREA CODE DESCRIPTION
W01		**NORTH INTERCEPTOR**
W03		**ADELINE INTERCEPTOR**
W06		**SOUTH INTERCEPTOR**
W07		**ALAMEDA INTERCEPTOR**
W08		**SOUTH FOOTHILL INTERCEPTOR**
W1A		**STATION A (CLEVELAND AVENUE - ALBANY)**
W1N	**.00**	**STATION N (CENTRAL AVENUE - RICHMOND)**
	.90	PSN FORCEMAIN
W1Q		**STATION Q**
W1S	**00**	**POINT ISABEL WET WEATHER FACILITY**
W1S	.00	GENERAL SITE
W1S	.01	DIVERSION STRUCTURE (NONE IN THIS FACILITY)
W1S	.10	OPERATIONS CENTER
W1S	.20	EMERGENCY GENERATOR AND BOAT STORAGE BUILDING
W1S	.30	INFLUENT PUMP STATION
W1S	.31	ODOR CONTROL AREA
W1S	.40	CHLORINATION/DECHLOR STATION
W1S	.41	SODIUM HYPOCHLORITE SYSTEM
W1S	.42	SODIUM BISULFITE SYSTEM
W1S	.50	BAR SCREEN AND GRIT REMOVAL BLDG
W1S	.60	INFLUENT CHANNEL, SEDIMENTATION BASINS & EFFLUENT CHANNEL
W1S	.61	WASHDOWN WATER SYSTEM (IF NEEDED)
W1S	.70	RETURN LINE
W1S	.80	DECHLOR STATION (MERGED WITH CHLOR)
W1S	.90	OUTFALL
W6G		**STATION G (DOOLITTLE DR.-OAKLAND)**
W6H		**STATION H (HIGH STREET - OAKLAND)**
W6J		**STATION J (FREDERICK STREET - OAKLAND)**
W6K		**STATION K (7TH STREET - OAKLAND)**
W6L		**STATION L (MIDDLE HARBOR - OAKLAND)**
W6T	**00**	**OAKPORT WET WEATHER FACILITY**
W6T	.00	GENERAL SITE
W6T	.01	DIVERSION STRUCTURE
W6T	.10	CONTROL BUILDING
W6T	.20	EMERGENCY GENERATOR BUILDING
W6T	.30	INFLUENT PUMP STATION
W6T	.40	CHLORINATION STATION
W6T	.50	BAR SCREEN AND GRIT REMOVAL BLDG
W6T	.60	INFLUENT CHANNEL, SEDIMENTATION BASINS & EFFLUENT CHANNEL
W6T	.61	WASHDOWN WATER SYSTEM (IF NEEDED)
W6T	.70	RETURN LINE
W6T	.80	DECHLOR STATION
W6T	.90	OUTFALL
W7B		**STATION B (MARINA DRIVE - ALAMEDA)**
W7C	**.00**	**STATION C (OTIS DRIVE - ALAMEDA)**
	.90	PSC FORCEMAIN
W7D		**STATION D (OAK STREET - ALAMEDA)**
W7E		**STATION E (GRAND DRIVE - ALAMEDA)**
W7F		**STATION F (WEBSTER STREET - ALAMEDA)**
W7M	**.00**	**STATION M (PACKETT LANDING - ALAMEDA)**
	.90	PSM FORCEMAIN
	.91	PSM FORCEMAIN
	.92	PSM FORCEMAIN
W7R		**STATION R (NAS - ALAMEDA)**
W94	**.00**	**OUTFALL / DECHLORINATION STATION**
W94	.10	SODIUM BISULFITE BUILDING
W94	.20	INJECTOR STATION
W94	.30	SODIUM BISULFITE STORAGE
W94	.40	OUTFALL TRANSITION STRUCTURE
WCR	**.00**	**NORTH RICHMOND WATER RECLAMATION PLANT**
WCR	.09	EFFLUENT PUMP STATION AT WCCSD PLANT
WCR	.10	EQUALIZATION PUMP STATION AND TANK
WCR	.20	REACTOR CLARIFIERS AND BLOWDOWN PUMP STATION
WCR	.30	FILTERS
WCR	.40	CONTACT BASIN AND OPERATIONS BUILDING
WCR	.50	RECLAIMED WATER PUMP STATION
WCR	.60	THICKENED SLUDGE PUMP STATION, SLUDGE THICKENERS, SLUDGE CONDITIONING TANK/FILTER PRESS FEED PUMPS AND DECANT FILTRATE PUMP STATION
WCR	.70	CHEMICAL AND DEWATERING BUILDING
WCR	.70	DRAINAGE PUMP STATION
WCR	.85	CAUSTIC SODA SYSTEM
WCR	.90	ELECTRICAL SUBSTATION
WCR	.95 ?	RICHMOND GOLF COURSE PUMP STATION
WGA		**GALBRAITH RECLAMATION**
WGR		**GROVE WAY RECLAMATION PUMP STATION**
WLR		**LEWELLING RECLAMATION PUMP STATION**
WRA		**RICHMOND ADVANCED RECYCLED EXPANSION (RARE)**
WSA	**00**	**SAN ANTONIO CREEK WET WEATHER**
WSA	.00	GENERAL SITE FOR ALL THREE SITES
WSA	.01	DIVERSION STRUCTURE
WSA	.10	CONTROL BUILDING
WSA	.20	EMERGENCY GENERATOR BUILDING
WSA	.30	INFLUENT PUMP STATION
WSA	.40	CHLORINATION STATION
WSA	.50	GRIT AND SCREEN BASINS
WSA	.60	INFLUENT CHANNEL, SEDIMENTATION BASINS & EFFLUENT CHANNEL (NONE IN THIS FACILITY)
WSA	.61	WASHDOWN WATER SYSTEM (IF NEEDED)
WSA	.70	RETURN LINE
WSA	.80	DECHLOR STATION
WSA	.90	OUTFALL



LEGEND

- WET WEATHER FACILITIES/ RECYCLED WATER FACILITIES/ MAIN WASTEWATER TREATMENT PLANT
- PUMP STATION
- INTERCEPTOR
- FORCE MAIN
- SD-1 SERVICE AREA BOUNDARY

3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
A		GENERAL REVISION	CHT	GPW	GPW
A	02APR2018	CORRECTED LOCATION OF WCR		GPW	DJW
A	01FEB2016	ADDED W6U		GPW	GPW

DESIGN
DESIGNED BY: ---
DRAWN BY:
REVIEW
DESIGN CHECKED BY: R.P.E. No. C37427 KARL J YAKICH
RECOMMENDED: SR. ENGINEER R.P.E. No. C65259 GARIN D WARREN
APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C33317 EDWARD H McCORMICK

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
GENERAL
EQUIPMENT TAG
AREA CODES FOR REMOTE FACILITIES

SCALE NONE
DATE 04NOV2010
STD-G-004.1
DRAWING NUMBER
3
REV.

REF 1: J:\Standard Drawings\ref\std dwg bdr.mst
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REF 9:
PLOT SCALE: 200.1
USER: saparms
DATE: 02-AUG-2021 13:22
FILE: J:\standard dr-awings\std\g0041-r03

EQUIPMENT TAG SYSTEM CODES AND COLORS

WATER / WASTEWATER

PROCESS / SYSTEM TYPE	TAG COLOR		
	SYSTEM CODE	LETTER CODE	BACKGROUND CODE
APPLIED WATER SYSTEM	AW	WHITE	GREEN
BACKWASH SUPPLY WATER	BWS	WHITE	GREEN
BACKWASH WASTE WATER	BWW	WHITE	BROWN
BLENDED SLUDGE	BSL	WHITE	BROWN
BYPASS	BYP	WHITE	GREEN
CENTRATE	CENT	WHITE	BROWN
CHILLED WATER SYSTEM	CHW	WHITE	GREEN
CHLORINATED FINAL EFFLUENT	CFE	WHITE	GREEN
CHLORINE CONTACT PUMPING	CCP	WHITE	BROWN
CIRCULATING SLUDGE	CSL	WHITE	BROWN
CLEANING WASTE	CLW	WHITE	BROWN
COLD WATER	CW	WHITE	GREEN
COLD WATER RETURN	CWR	WHITE	GREEN
COLD WATER SUPPLY	CWS	WHITE	GREEN
CONDENSATE DRAIN	CD	WHITE	BROWN
COOLING WATER SUPPLY	CWS	WHITE	GREEN
COOLING WATER RETURN	CWR	WHITE	GREEN
DECANT WATER SYSTEM	DWS	WHITE	BROWN
DECHLORINATED FINAL EFFLUENT	DFE	WHITE	GREEN
DEWATERED SLUDGE	DWS	WHITE	BROWN
DIGESTED SLUDGE	DSL	WHITE	BROWN
FATS, OILS, AND GREASE	FOG	WHITE	BROWN
FILTERED WATER SYSTEM	FWS	WHITE	BROWN
FILTER-TO-WASTE SYSTEM	FTW	WHITE	BROWN
FILTRATE	FILT	WHITE	BROWN
FINAL TREATED EFFLUENT	FTE	WHITE	BROWN
FIRE SUPPRESSION SYSTEM, FIRE PROTECTION WATER	SW	WHITE	RED
FOOD WASTE PULP	PLP	WHITE	BROWN
FOOD WASTE SLURRY	SLW	WHITE	BROWN
GRAVITY DRAINAGE	DR	WHITE	BROWN
GRIT	GR	WHITE	BROWN
HEAT RESERVOIR RETURN	HHWR	WHITE	BLUE
HEAT RESERVOIR SUPPLY	HHWS	WHITE	BLUE
HIGH PRESSURE SERVICE WATER	HPSW	WHITE	BLUE
HIGH STRENGTH WASTE	HSW	WHITE	BROWN
HOT PROCESS WATER	HWP	WHITE	BROWN
HOT WATER	HW	WHITE	GREEN
HOT WATER RETURN	HWR	WHITE	GREEN
HOT WATER SUPPLY	HWS	WHITE	GREEN
HYDRAULIC CONTROL WATER	HCW	WHITE	GREEN
IRRIGATION WATER SYSTEM	IRR	WHITE	GREEN
MICROFILTRATION	MF	WHITE	PURPLE
MICROFILTRATION BACKPULSE	MFB	WHITE	PURPLE
MICROFILTRATION CLEAN IN PLACE	MFC	WHITE	PURPLE
MICROFILTRATION FILTRATE	MFF	WHITE	PURPLE

PROCESS / SYSTEM TYPE	TAG COLOR		
	SYSTEM CODE	LETTER CODE	BACKGROUND CODE
MICROFILTRATION RECIRCULATION	MFR	WHITE	PURPLE
MICROFILTRATION SUPPLY	MFS	WHITE	BROWN
MIXING SLUDGE	MSL	WHITE	BROWN
OVERFLOW	OF	WHITE	GREEN
PERMEATE CLEANING RETURN	PCR	WHITE	GREEN
PLANT WASHDOWN WATER	3W	WHITE	BROWN
POTABLE WATER	1W	WHITE	BLUE
PRE-CHLORINATION	PCL	WHITE	GREEN
PRIMARY EFFLUENT, PRIMARY TREATED SEWAGE	PEF	WHITE	BROWN
PRIMARY SLUDGE	PSL	WHITE	BROWN
PROCESS WATER	2W	WHITE	BROWN
PUMPED DRAINAGE	PD	WHITE	GREEN
QUALITY MONITOR SYSTEM	QMS	WHITE	BROWN
RAW SEWAGE, RAW SEWAGE SYSTEM	RS	WHITE	BROWN
RAW SLUDGE	RSL	WHITE	BROWN
RAW WATER SYSTEM	RWS	WHITE	GREEN
RECIRCULATED HIGH STRENGTH WASTE	HSWR	WHITE	BROWN
RECYCLE FLOW	REC	WHITE	BROWN
RECYCLED WATER, TERTIARY TREATED SEWAGE/EFFLUENT	RW	WHITE	PURPLE
RESOURCE RECOVERY SLUDGE	RRL	WHITE	BROWN
RETURN ACTIVATED SLUDGE	RAS	WHITE	BROWN
REVERSE OSMOSIS CLEAN IN PLACE	ROC	WHITE	BROWN
REVERSE OSMOSIS FEED	ROF	WHITE	BROWN
REVERSE OSMOSIS FLUSHING FEED	FF	WHITE	BROWN
REVERSE OSMOSIS PERMEATE	ROP	WHITE	BROWN
REVERSE OSMOSIS REJECT	ROR	WHITE	BROWN
REVERSE OSMOSIS SUPPLY	ROS	WHITE	BROWN
REVERSE OSMOSIS WASTE	ROW	WHITE	BROWN
REWASH WATER	RWW	WHITE	GREEN
SCREENINGS	SCG	WHITE	BROWN
SCUM	SC	WHITE	BROWN
SEAL WATER SYSTEM	2W	WHITE	BROWN
SECONDARY EFFLUENT, SECONDARY TREATED SEWAGE	3W	WHITE	BROWN
STORM DRAIN	SD	WHITE	BROWN
STRAINER BACKWASH	SBW	WHITE	GREEN
SUMP PUMPED DRAINAGE	PD	WHITE	BROWN
SURFACE WASH	SFW	WHITE	BROWN
TEMPERED WATER	TW	WHITE	BLUE
THICKENED WASTE ACTIVATED SLUDGE	TWAS	WHITE	BROWN
THRESHOLD INHIBITOR	TRI	WHITE	GREEN
TRANSFER SLUDGE	TSL	WHITE	BROWN
WASH WATER SYSTEM	WWS	WHITE	GREEN
WASTE ACTIVATED SLUDGE	WAS	WHITE	BROWN
WASTE CHEMICAL SYSTEM	WCS	BLACK	YELLOW

OTHER LIQUID

PROCESS / SYSTEM TYPE	TAG COLOR		
	SYSTEM CODE	LETTER CODE	BACKGROUND CODE
HYDRAULIC OIL SUPPLY	HOS	BLACK	YELLOW
HYDRAULIC OIL RETURN	HOR	BLACK	BROWN
LIQUID FUEL SUPPLY	LFS	BLACK	YELLOW
LUBE OIL RETURN	LOR	BLACK	YELLOW
LUBE OIL SUPPLY	LOS	BLACK	YELLOW
LUBE OIL SYSTEM	LOS	BLACK	YELLOW
LUBE OIL VENT	LOV	BLACK	YELLOW
REFRIGERANT	REF	BLACK	BROWN

AUXILIARY AND POWER SYSTEMS

PROCESS / SYSTEM TYPE	TAG COLOR		
	SYSTEM CODE	LETTER CODE	BACKGROUND CODE
BUSINESS DATA NETWORK	ISD	WHITE	BLACK
ELECTRIC POWER GENERATION (FOWER GENERATION STATION)	EE	BLACK	ORANGE
FIRE DETECTION SYSTEM	FDS	WHITE	RED
HAZARDOUS ATMOSPHERE DETECTION SYSTEM	HADS	WHITE	YELLOW
HEATING, VENTILATION AND AIR CONDITIONING	HVS	WHITE	BLACK
SAFETY	SAF	RED	WHITE
SITE SECURITY SYSTEM	SECR	WHITE	BLACK
STANDBY POWER SUPPLY	STBY	BLACK	ORANGE
UTILITY POWER SYSTEM (PG&E POWER)	EE	WHITE	BLACK

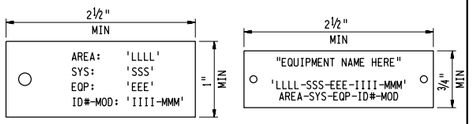
GASES

PROCESS / SYSTEM TYPE	TAG COLOR		
	SYSTEM CODE	LETTER CODE	BACKGROUND CODE
AIR, HIGH PRESSURE	AHP	BLACK	YELLOW
AIR, LOW PRESSURE	ALP	WHITE	BLUE
CARBON DIOXIDE SYSTEM	CO2	WHITE	BLUE
COMPRESSED AIR SYSTEM	CAS	WHITE	BLUE
DIGESTER GAS	DG	BLACK	YELLOW
HIGH PRESSURE DIGESTER GAS	HPDG	BLACK	YELLOW
LOW PRESSURE DIGESTER / SLUDGE GAS	LPDG / LSG	BLACK	YELLOW
WASTE DIGESTER GAS	WDG	WHITE	GREEN
EXHAUST	EXH	WHITE	BLUE
FOUL AIR	FA	BLACK	YELLOW
INSTRUMENT AIR SYSTEM	IA	BLACK	YELLOW
MEMBRANE AIR	MA	WHITE	BLUE
NATURAL GAS	NG	BLACK	YELLOW
NITROGEN	N2	BLACK	YELLOW
OXYGEN SUPPLY	O2	BLACK	YELLOW
SERVICE AIR	SA	BLACK	YELLOW
SCOURING AIR SYSTEM	SAS	BLACK	YELLOW
SUPPLY	SUP	WHITE	BLUE
WASTE GAS SYSTEM	WGS	BLACK	YELLOW

CHEMICAL SYSTEMS

PROCESS / SYSTEM TYPE	TAG COLOR		
	SYSTEM CODE	LETTER CODE	BACKGROUND CODE
ALUM	PC	BLACK	YELLOW
AMMONIA, LIQUID	NH3	BLACK	YELLOW
CAUSTIC SODA	NA	BLACK	YELLOW
CITRIC ACID	CA	BLACK	YELLOW
COAGULANT POLYMER	CP	BLACK	YELLOW
FERRIC CHLORIDE	FCL	BLACK	YELLOW
FILTER CONDITIONER POLYMER	PF	BLACK	YELLOW
FLUORIDE	FL	BLACK	YELLOW
HYDROGEN PEROXIDE	HP	BLACK	YELLOW
LIME SOLUTION	LS	BLACK	YELLOW
MAGNESIUM HYDROXIDE	MGH	BLACK	YELLOW
PERMANGANATE	PE	BLACK	YELLOW
POLYMER	POL	BLACK	YELLOW
PRIMARY COAGULANT	PC	BLACK	YELLOW
SODIUM BISULFITE	SB	BLACK	YELLOW
SODIUM HYPOCHLORITE	SHC	BLACK	YELLOW
SOLIDS CONDITIONER POLYMER	PS	BLACK	YELLOW
SULFURIC ACID	SA	BLACK	YELLOW

EQUIPMENT TAG SIGNAGE DETAILS



HANGING TAG — CABINET TAG (NAMEPLATE)

'LLLL' = AREA CODE PER DRAWING STD-G-004 AND STD-G-004.1

'SSS' = SYSTEM CODE PER TABLES ON THIS DRAWING

'EEE' = EQUIPMENT CODE PER DRAWING STD-G-006

'IIII-MMM' = EQUIPMENT ID NUMBER AND OPTIONAL MODIFIER PER DRAWING STD-G-001 AND STD-G-002

NOTES

1. TAG COLORS SHALL CONFORM WITH TABLE SHOWN ON THIS DRAWING AND ANSI Z535.1 "SAFETY COLOR CODE".

REGISTERED PROFESSIONAL ENGINEER
GARIN DEAN WARREN
No. C65259
Exp. 09/30/13
CIVIL
STATE OF CALIFORNIA

12/27/2012

3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
A	09APR2019	REVISED PROCESS/SYSTEM TYPE, CODE	CR	GPW	DXR

DESIGN
DESIGNED BY: R. RUIZ
DRAWN BY:

REVIEW
DESIGN CHECKED BY: R.P.E. No. C65259 — GARIN D WARREN
RECOMMENDED: SR. ENGINEER R.P.E. No. C65259 — GARIN D WARREN
APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C33317 — EDWARD H MCCORMICK

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
GENERAL
EQUIPMENT TAG
SYSTEM CODES, COLORS AND SIGNAGE DETAILS

SCALE NONE
DATE 16MAY2013
STD-G-005 — DRAWING NUMBER
8 — REV.

REF 1: J:\standard_drawings\ref\std dwg bdr.mst
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USER: amuroz
DATE: 8-JUN-2020 09:15
FILE: J:\standard_drawings\std\g005.dgn
PLOT SCALE: 0.166667:1

EQUIPMENT TAG EQUIPMENT TYPE CODES

MECHANICAL

EQUIPMENT TYPE	EQUIPMENT CODE	EQUIPMENT TYPE	EQUIPMENT CODE
AERATOR	AER	HAND VALVE (ISOLATION)	HV
AERATED GRIT COLLECTOR	AGC	HEAT EXCHANGER	HXR
AIR COMPRESSOR	ACP	HEAT PUMP	HP
AIR CONDITIONING PACKAGE UNIT	ACU	HEATER	HTR
AIR/VACUUM VALVE	AVV	HOSE BIB	HB
AIR FILTER	AF	HYDRANT	H
AIR FILTER REGULATOR	AFRG	HYDRAULIC OPERATED VALVE (ISOLATION)	HOV
AIR HANDLING UNIT	AHU	HEATING VENTILATING UNIT	HVU
AIR OPERATOR VALVE (ISOLATION)	AOV	HOOD	HOD
AIR RECEIVER	ARR	HYDROPNEUMATIC TANK	TNK
AIR RELEASE VALVE	ARV	LOCKER	LKR
ALTITUDE VALVE (LEVEL CONTROL VALVE)	LCV	LOUVER	LVR
AUTOMATIC DRAIN TRAP	ADT	METERING PUMP	PMP
BACKFLOW PREVENTER	BFP	MICROFILTRATION UNIT	MFU
BAG LOADER	BGL	MICROWAVE OVEN	MIC
BARSCREEN	BSC	MIXER	MIX
BASKET STRAINER	STR	MOTOR OPERATED VALVE (ISOLATION)	MOV
BIO FILTER	BIO	NEEDLE/POWER NOZZLE	NOZ
BLOWER	BLW	OZONE DESTRUCT UNIT	ODR
BOILER	BLR	OZONE GENERATOR	OGR
BURNER, GAS FLARE	B	PACKED TOWER AERATOR	PTA
CATHODIC PROTECTION ANODE	CPA	PILOT VALVE	PV
CATHODIC PROTECTION RECTIFIER	CPR	PIPE	PIP
CATHODIC PROTECTION TEST STATION	ETS	POT FEEDER	FDR
CENTRIFUGE	CEN	PRESSURE RELIEF VALVE/PRESSURE REDUCING VALVE	PRV
CHECK VALVE	CV	PRESSURE SUSTAINING VALVE	PSV
CHILLER UNIT	CHU	PRESSURE VESSEL	PVL
COLLECTOR	COL	PNEUMATIC OPERATED VALVE (ISOLATION)	AOV
COOLING TOWER	CTW	PULSATION DAMPENER	PDR
COMBINATION AIR VALVE	CAV	PUMP	PMP
COMPRESSOR	CMP	REACTOR	RCT
COMPRESSOR CONDENSER UNIT	CCU	RECEIVER	RCV
CONDENSATE NEUTRALIZATION UNIT	SNU	REFRIGERATED DRYER	RDR
CONVEYOR	CVR	REFRIGERATOR	REF
COOLER	CLR	REVERSE OSMOSIS UNIT	ROU
CRANE	CRN	SAFETY SHOWER	SHR
CYCLONE	CYC	SCREEN	SCR
DAMPER	DMP	SCREW FEEDER	FDR
DEMISTER	DEM	SCRUBBER	SBR
DESICCANT DRYER	DDR	SELF CONTAINED BREATHING DEVICE (SCOTT AIR PAC)	SCB
DIFFUSER	DIF	SEPARATOR	SEP
DRINKING FOUNTAIN	DRK	SERVO VALVE & INTEGRAL OPERATING CYLINDER	SVO
DRYER	DRY	SILENCER	SIL
EDUCTOR	EDR	SLUDGE VACUUM COLLECTOR	SVC
ELECTRICAL RANGE, COOK TOP	CKT	SLUICE/SLIDE/WEIR/SHEAR/BUTTERFLY GATE/LOG	SGT
EMERGENCY EYEWASH	EYE	SOLENOID VALVE	SV
EMERGENCY LIGHTS	EML	STRAINER	STR
ENGINE	ENG	SUMP PUMP	PMP
EVAPORATOR	EVP	SUPPLY FAN	SF
EXHAUST AIR DAMPER	EAD	SURGE TANK	TNK
EXHAUST FAN	EF	SYPHON	SYP
EXPANSION JOINT	EXJ	TANK	TNK
FAN	FAN	TOTE	TOT
FAN COIL UNIT	FACU	TRAP	TRP
FILTER	FLT	TRAILER	TRL
FINAL TREATED WATER	FTE	TRASH RAKE	RKE
FIRE DAMPER	FD	TURBINE	TRB
FIRE EXTINGUISHER	FEX	VARIABLE AIR VOLUME UNIT	VAV
FIRST AID KIT	KIT	VACUUM BREAKER VALVE	VBV
FLAME ARRESTOR	FAR	VAPORIZER	VPR
FLOCCULATOR	FLC	VENT	VNT
GALLERY, PIPING	GAL	VIDEO PLAYER, TRAINING	VID
GOVERNOR	GOV	WASHER COMPACTOR	WCP
GRAVITY BELT THICKENER	GBT	WATER HEATER	WHR
GRAVITY SLUDGE THICKENER	GST	WYE STRAINER	STR
GRINDER	GDR		

ELECTRICAL

EQUIPMENT TYPE	EQUIPMENT CODE
ADJUSTABLE SPEED DRIVE	ASD
AUTOMATIC TRANSFER SWITCH	ATS
BATTERY	BTR
BATTERY CHARGER	BYC
BREAKER	BKR
BUS DUCT	BD
CIRCUIT BREAKER	CB
CABLE	CBL
CAPACITOR	CAP
CONTROL CABINET/PANEL	CP
CONTROL RELAY	CR
CONTROL STATION	CS
CURRENT TRANSFORMER	CT
DISCONNECT	DISC
DISTRIBUTED CONTROL CABINET/DISTRIBUTED PROCESS UNIT	DPU
DISTRIBUTED CONTROL SYSTEM	DCS
EMERGENCY LIGHTS	EML
EXCITER	EXC
GENERATOR	GEN
HANDHOLE	HH
HARMONIC FILTER	HF
INVERTER	INV
JUNCTION BOX	JB
LIGHTING	LTG
LIGHTING PANEL	LP
LOAD CENTER, LOCAL CONTROL PANEL	LCP
MAIN CONTROL PANEL	MCP
MANHOLE	MH
MANUAL TRANSFER SWITCH	MTS
MEDIUM VOLTAGE CONTROLLER	MVC
METER	NOTE 5
METER PANEL, METER INSTRUMENT PANEL	MIP
MOTOR	MTR
MOTOR CONTROL CENTER	MCC
MOTOR CIRCUIT PROTECTOR	MCP
MOTOR GENERATOR SET	MGEN
MOTOR OPERATED DAMPER	MOD
MOTOR OPERATOR	MO
MOTOR STARTER	MS
MULTIFUNCTION PROTECTIVE RELAY	MPR
POTENTIAL TRANSFORMER	PT
POWER DISTRIBUTION PANEL	DP
POWER SUPPLY UNIT	PS
PROGRAMMABLE LOGIC CONTROLLER	PLC
PULL BOX	PB
INDICATING LIGHT	PL
RADIO TRANSMITTER/RECEIVER	RAD
RECTIFIER	REC
REGULATOR, VOLTAGE	RG
RELAY	RLY
REMOTE TERMINAL UNIT	RTU
RESISTOR	RES
SMOKE DETECTOR ELEMENT	SD
SWITCH, HAND	HS
SWITCH, NON-FUSED (FUSED)	SWN (SWF)
SWITCHBOARD	SWB
SWITCHGEAR	SWGR
TERMINAL BLOCK, TERMINAL BOARD, TERMINAL BOX	TB
TIMER	TMR
TRANSFORMER	XFR
UNINTERRUPTIBLE POWER SUPPLY	UPS
SELECTOR SWITCH UNIT SUBSTATION	SS, U
VARIABLE FREQUENCY DRIVE	VFD

INSTRUMENTATION

EQUIPMENT TYPE	EQUIPMENT CODE	EQUIPMENT TYPE	EQUIPMENT CODE
ANALYZER ELEMENT	AE	POWER TOTALIZING INDICATOR	JOI
ANALYZER INDICATING CONTROLLER	AIC	POWER TRANSMITTER	JT
ANALYZER INDICATING TRANSMITTER	AIT	PRESSURE CONTROL VALVE	PCV
ANALYZER SWITCH HIGH, (LOW)	ASH, (ASL)	PRESSURE DIFFERENTIAL INDICATING TRANSMITTER	PDIT
CALIBRATION COLUMN	FQI	PRESSURE DIFFERENTIAL SWITCH HIGH	PDSH
CONDUCTIVITY ELEMENT	CE	PRESSURE DIFFERENTIAL TRANSMITTER	PDT
CONDUCTIVITY INDICATOR	CI	PRESSURE INDICATING CONTROLLER	PIC
CONDUCTIVITY INDICATING TRANSMITTER	CIT	PRESSURE INDICATING RECORDER	PIR
CONDUCTIVITY SWITCH HIGH	CSH	PRESSURE INDICATING TRANSMITTER	PIT
CONDUCTIVITY TRANSMITTER	CT	PRESSURE INDICATOR	PI
ELAPSED TIME METER (TIME TOTALIZING INDICATOR)	KQI	PRESSURE REDUCING VALVE	PCV
FLOW CONTROL VALVE	FCV	PRESSURE REGULATING VALVE	PCV
FLOW ELEMENT	FE	PRESSURE RELIEF VALVE (OPENS PROPORTIONAL TO PRESSURE)	PRV
FLOW INDICATING RECORDER	FIR	PRESSURE SAFETY VALVE (FULL OPENING POP ACTION)	PSV
FLOW INDICATING TRANSMITTER	FIT	PRESSURE SWITCH HIGH, (LOW)	PSH, (PSL)
FLOW INDICATOR	FI	PRESSURE TRANSMITTER	PT
FLOW QUANTITY INDICATOR (CALIBRATION COLUMN)	FQI	REMOTE INPUT/OUTPUT	RIO
FLOW SWITCH	FS	RESTRICTING ORIFICE	FE
FLOW TRANSMITTER	FT	SPEED CONTROL	SC
FLOW INDICATING CONTROLLER	FIC	SPEED INDICATOR	SI
HAND SWITCH	HS	SPEED SENSING ELEMENT	SE
INPUT/OUTPUT	I/O	STATUS LIGHT	YA
INSTRUMENT CABINET	IC	TEMPERATURE CONTROL VALVE	TCV
INSTRUMENT PANEL	IP	TEMPERATURE ELEMENT	TE
LEVEL CONTROL VALVE	LCV	TEMPERATURE INDICATING CONTROLLER	TIC
LEVEL INDICATING CONTROLLER	LIC	TEMPERATURE INDICATING RECORDER	TIR
LEVEL INDICATING RECORDER	LIR	TEMPERATURE INDICATING TRANSMITTER	TIT
LEVEL INDICATING TRANSMITTER	LIT	TEMPERATURE INDICATOR	TI
LEVEL INDICATOR	LI	TEMPERATURE SWITCH HIGH, (LOW)	TSH, (TSL)
LEVEL SWITCH HIGH, (LOW)	LSH, (LSL)	TEMPERATURE TRANSMITTER	TT
LEVEL SWITCH HIGH-HIGH (LOW-LOW)	LSHH,(LSLL)	TIME TOTALIZING INDICATOR	KQI
LEVEL TRANSMITTER	LT	VIBRATION INDICATOR	VI
MAGNETIC FLOW METER	FIT	VIBRATION SENSOR (RADIAL, X-DIRECTION)	VXE
MOISTURE INDICATING TRANSMITTER	MIT	VIBRATION SENSOR (RADIAL, Y-DIRECTION)	VYE
MOISTURE SENSOR (OR DEW POINT)	ME	VIBRATION SENSOR (AXIAL THRUST)	VZE
MOISTURE SWITCH HIGH	MSH	VIBRATION TRANSMITTER (RADIAL, X-DIRECTION)	VXT
MULTIPOINT SCAN INDICATOR	UJI	VIBRATION TRANSMITTER (RADIAL, Y-DIRECTION)	VYT
POSITION SWITCH CLOSED, (OPEN)	ZSC, (ZSO)	VIBRATION TRANSMITTER (AXIAL THRUST)	VZT
POSITION TRANSMITTER	ZT	VOLTAGE SWITCH LOW	ESL
POWER INDICATOR	JI	WEIGHT INDICATING TRANSMITTER	WIT
POWER INDICATING CONTROLLER	JIC		

NOTES

1. THIS DRAWING PROVIDES A LIST OF CODES TO ASSIGN EQUIPMENT TAG NUMBERS AS GIVEN IN DISTRICT WESP 130.0.
2. THIS LIST IS NOT ALL INCLUSIVE. NEW EQUIPMENT CODES SHALL FOLLOW ANSI/IEEE 803.1-1992 AND ISA-5.1
3. MAXIMO MAY USE ADDITIONAL EQUIPMENT CODES NOT INCLUDED ON THIS LIST. THESE ADDITIONAL CODES TYPICALLY REPRESENT A COMPONENT OF A MAJOR PIECE OF EQUIPMENT THAT HAS A CODE LISTED HEREIN.
4. ADD THE APPROPRIATE RELATED ENCLOSURE EQUIPMENT TYPE AS A MODIFIER,i.e., MCC, SWR, ETC.
5. USE INSTRUMENT FUNCTIONAL IDENTIFIER.
6. PROTECTION RELAYS MAY USE THE ANSI/IEEE C37.2 DEVICE NUMBER(S) AS MODIFIER(S).

REGISTERED PROFESSIONAL ENGINEER
GARIN DEAN WARREN
No. C65259
Exp. 09/30/13
CIVIL
STATE OF CALIFORNIA

2/25/2013

NO.	DATE	REVISION	BY	REC.	APP.
4	25FEB2013	REVISED EQUIPMENT CODE	RR	GPW	GDW
3	27DEC2012	REVISED EQUIP TYPE, CODE	RR	GPW	GDW
2	10AUG2012	REVISED EQUIP TYPE, CODE	RR	GPW	GDW
1	04NOV2010	RENUMBERED AND REVISED DWG FROM STD-G-008		GPW	GDW

3" ON ORIGINAL DOCUMENT
0 1 2 3

DESIGN
DESIGNED BY: R. RUIZ
DRAWN BY:
REVIEW
DESIGN CHECKED BY: GARIN D WARREN
R.P.E. No. C65259
RECOMMENDED: SR. ENGINEER GARIN D WARREN
R.P.E. No. C65259
APPROVED: MANAGER of WASTEWATER ENGINEERING EDWARD H MCCORMICK
R.P.E. No. C33317

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
GENERAL
EQUIPMENT TAG
EQUIPMENT TYPE CODES

SCALE NONE
DATE 27DEC2012
STD-G-006
DRAWING NUMBER
4
REV.

REF 7; REF 8; REF 9;
REF 4; REF 5; REF 6;
REF 1: J:\standard drawings\ref\std dwg bdr.mst
REF 2: std@06.dd
REF 3:
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USER: amunoz
DATE: 24-JUN-2020 09:15
FILE: J:\standard drawings\std@06-04

PIPE AND FITTING SYMBOLS

DOUBLE LINE / SINGLE LINE

- EXPOSED PIPE
- BURIED PIPE
- WELDED JOINT
- GROOVED END JOINT
- FLANGED JOINT
- PUSH-ON JOINT
- LOCK TYPE PUSH-ON JOINT OR RESTRAINED MECHANICAL JOINT (AS SPECIFIED)
- ADAPTER SIDE — GROOVED END ADAPTER FLANGE
- FLANGED COUPLING ADAPTER (REF 7; REF 8; REF 9;)
- FLANGED COUPLING ADAPTER WITH THRUST TIES
- FLEXIBLE COUPLING
- FLEXIBLE COUPLING WITH THRUST TIES
- STEEL BELLOWS EXP JOINT
- ELASTOMER BELLOWS EXP JOINT
- ELBOW UP
- ELBOW DOWN
- TEE UP
- TEE DOWN
- LATERAL UP
- LATERAL DOWN
- CONCENTRIC REDUCER/INCREASER (REF 4; REF 5; REF 6;)
- ECCENTRIC REDUCER/INCREASER
- UNION
- BLIND FLANGE
- CAP
- WELDED CAP
- PLUG
- ANCHOR
- ELBOW, 90 DEGREE
- CROSS
- TEE
- ELBOW, 45 DEGREE
- LATERAL OR WYE
- OFFSET TEE — OFFSET TEE
- FLOW DIRECTION
- FLUSH CONNECTOR F=FEMALE M=MALE
- QUICK DISCONNECT COUPLING WITH PLUG OR CAP
- AIR COUPLER
- BALL JOINT
- EXPANSION JOINT
- DOUBLE BALL FLEXIBLE EXPANSION JOINT

VALVES/GATES

- COCK VALVE
- BALL VALVE
- DIAPHRAGM VALVE
- NEEDLE VALVE
- GATE VALVE (OR GENERIC VALVE)
- KNIFE GATE VALVE
- 3-WAY GATE VALVE
- 4-WAY GATE VALVE
- GLOBE VALVE
- BUTTERFLY VALVE
- PINCH VALVE
- CONE VALVE
- PLUG VALVE SOLID SIDE = SEATED PORT END OF VALVE
- 3-WAY PLUG VALVE
- 4-WAY PLUG VALVE
- ANGLE VALVE
- PRESSURE RELIEF VALVE
- HOSE BIB
- AIR, COMBINATION, OR AIR/VACUUM RELIEF VALVE
- SWING CHECK VALVE
- BALL CHECK VALVE OR ANTI-SYPHON
- DIAPHRAGM CHECK VALVE/VACUUM BREAKER
- SPRING POPPET CHECK VALVE
- FOOT VALVE, BALL CHECK
- FOOT VALVE, SWING CHECK
- REDUCED PRESSURE ZONE BACKFLOW PREVENTOR WITH RELIEF
- HYDRANT
- MUD VALVE
- FLAP GATE
- SLIDE GATE
- SHEAR GATE
- STOP LOGS
- SLUICE GATE
- BUTTERFLY GATE

NOTE:

- UNFILLED VALVE OR "NO" DENOTES NORMALLY OPEN VALVE
- FILLED VALVE OR "NC" DENOTES NORMALLY CLOSED VALVE (USE "NC" FOR PLUG VALVES)

ACTUATORS

- DIAPHRAGM OR UNSPECIFIED ACTUATOR
- BACK PRESSURE VALVE
- PRESSURE REDUCING VALVE
- PRESSURE REDUCING BACK PRESSURE SUSTAINING VALVE
- DOUBLE-ACTING CYLINDER ACTUATOR
- SPRING-OPPOSED SINGLE-ACTING CYLINDER ACTUATOR
- S=SOLENOID ACTUATED M=MOTOR ACTUATED P=PNEUMATICALLY OPERATED H=HYDRAULICALLY ACTUATED
- MANUAL ACTUATOR OR HANDWHEEL

INSTRUMENTS

- VENTURI
- RESTRICTED ORIFICE OR ORIFICE PLATE
- WEIR
- SIGHT GLASS
- POSITIVE DISPLACEMENT FLOW METER OR BATCH METER
- PROPELLER OR TURBINE METER
- PARSHALL FLUME
- ROTAMETER (VARIABLE AREA FLOW INDICATOR) — OR / FI
- PITOT TUBE
- MAGNETIC FLOWMETER — M
- ULTRASONIC/RADAR FLOWMETER R=RADAR U=ULTRASONIC — U
- ULTRASONIC/RADAR TYPE LEVEL R=RADAR U=ULTRASONIC — U
- FLOAT SWITCH
- BUBBLER TYPE LEVEL XX=SUPPLY PRESSURE (PSIG) — XX / P
- INDICATOR P=PRESSURE T=TEMPERATURE — P
- PRESSURE INDICATOR WITH DIAPHRAGM SEAL — P

MISCELLANEOUS SYMBOLS

- PULSATION DAMPER
- DIAPHRAGM SEAL
- PRESSURE SNUBBER
- ANNULAR DIAPHRAGM SEAL
- LIQUID SURFACE
- CALIBRATION COLUMN
- AIR GAP
- OVERFLOW
- ATMOSPHERIC VENT
- ATMOSPHERIC VENT WITH BIRD SCREEN
- DRAIN
- AIR SUPPLY XX=SUPPLY PRESSURE - PSIG — XX

3" ON ORIGINAL DOCUMENT (0 1 2 3)

PUMPS/TURBINES

- SUMP PUMP
- GEAR PUMP
- PROGRESSIVE CAVITY PUMP
- METERING PUMP
- CENTRIFUGAL PUMP
- REGENERATIVE TURBINE PUMP
- INJECTOR, EJECTOR EDUCTOR, JET PUMP
- PERISTALTIC OR TUBING PUMP
- HYDRAULIC PUMP
- ROTARY LOBE PUMP
- TURBINE
- VERTICAL TURBINE PUMP IN OPEN SUMP
- VERTICAL TURBINE PUMP IN BARREL

BLOWERS/COMPRESSORS

- CENTRIFUGAL COMPRESSOR
- RECIPROCATING COMPRESSOR
- ROTARY SCREW COMPRESSOR
- CENTRIFUGAL BLOWER
- LOBE BLOWER

FILTRATION/SEPARATION EQUIPMENT

- "Y" STRAINER
- FILTER — F
- AIR FILTER/SILENCER
- INLET FILTER OR SCREEN
- SEDIMENT TRAP
- DRIP OR AUTOMATIC DRIP TRAP
- CONDENSATION TRAP
- BASKET STRAINER
- CYCLONE SEPARATOR
- DESSICANT DRYER
- THICKENER OR CLARIFIER
- BAR RACK
- TRAVELING SCREEN

MISCELLANEOUS EQUIPMENT

- PRESSURE VESSEL
- TANK
- TANK OR DRUM
- MIXER
- HEAT EXCHANGER
- FLAME ARRESTER
- FLAME ARRESTER
- STATIC, IN-LINE MIXER
- POT FEEDER
- ROTACUT
- ACCUMULATOR, SPRING LOADED
- ACCUMULATOR, GAS CHARGED
- NOZZLE(S) — OR
- SPARGER(S)
- WASHDOWN MONITOR
- COMBINATION SAFETY SHOWER AND EYEWASH
- GRINDER

PIPING NOTES

1. LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED POINTS.
2. SIZE OF FITTINGS AND VALVES SHOWN ON PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, UNLESS OTHERWISE INDICATED. TYPE OF JOINT AND FITTING MATERIAL SHALL BE THE SAME AS SHOWN FOR ADJACENT STRAIGHT RUN OF PIPE.
3. LOCATION AND NUMBER OF PIPE HANGERS AND PIPE SUPPORTS SHOWN IS ONLY APPROXIMATE. NO ATTEMPT HAS BEEN MADE TO SHOW ALL REQUIRED PIPE SUPPORTS IN ALL LOCATIONS. THE ABSENCE OF PIPE SUPPORTS AND DETAILS ON ANY DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR PROVIDING THEM. FINAL SUPPORT REQUIREMENTS SHALL BE DETERMINED IN THE FIELD AND REVIEWED BY THE ENGINEER PRIOR TO INSTALLATION. MAXIMUM SPACING SHALL BE AS SPECIFIED. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS ON PIPE HANGERS AND SUPPORTS.
4. ALL FLEXIBLE CONNECTORS OR FLANGED COUPLING ADAPTERS SHALL BE PROVIDED WITH THRUST TIES OR ANCHORS, UNLESS OTHERWISE NOTED. THRUST PROTECTION SHALL BE ADEQUATE FOR TEST PRESSURES SPECIFIED.
5. SYMBOLS, LEGENDS, AND PIPE USE IDENTIFICATIONS SHOWN SHALL BE FOLLOWED THROUGHOUT THE PLANS, WHEREVER APPLICABLE. WHERE ABBREVIATIONS CONFLICT WITH STANDARD DRAWINGS STD-G-003 OR STD-G-004, THIS SHEET SHALL PREVAIL. NOT ALL OF THE VARIOUS PIPING COMPONENTS ARE NECESSARILY USED IN THE PROJECT.
6. NUMBER AND LOCATION OF UNIONS SHOWN ON PLANS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
7. WHERE A GROOVED END COUPLING IS SHOWN, IT SHALL BE THE FLEXIBLE JOINT TYPE, UNLESS OTHERWISE SPECIFIED. WHERE A FLANGED COUPLING ADAPTER IS SHOWN, A STANDARD FLANGE SHALL BE JOINED TO THE COUPLING ADAPTER.
8. CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. DRAWINGS ARE DIAGRAMMATIC AND NO ATTEMPT HAS BEEN MADE TO SHOW ALL EXISTING PIPING.
9. ONLY FLANGED END CONNECTIONS ARE SHOWN FOR DOUBLE LINE FITTINGS. FITTINGS WITH OTHER END PATTERNS ARE SHOWN SIMILARLY ON THE CONSTRUCTION DRAWINGS. SEE PIPING SPECIFICATIONS.
10. SYMBOLS SHOWN FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
11. SEE STANDARD DRAWING STD-M-002 FOR HVAC SYMBOLS AND NOTES.
12. PIPE SIZES SHOWN ON DRAWING ARE IN INCHES AND INDICATE DIAMETER OF PIPE UNLESS OTHERWISE NOTED.

REGISTERED PROFESSIONAL ENGINEER — GARIN DEAN WARREN — No. C65259 Exp. 09/30/13 — CIVIL — STATE OF CALIFORNIA

8/10/2012

NO.	DATE	REVISION	BY	REC.	APP.
9	09APR2019	ADDED EQUIP. FLAME ARRESTER	CR	GPW	DWK
8	10AUG2012	ADDED EQUIP. POT FEEDER	RR	GPW	GPW
7	12MAR2012	REVISED VALVES/GATES	RR	GPW	GPW
6	16JUN2011	REVISED PLUG VALVE	RR	GPW	GPW
5	04NOV2010	ADDED/REVISED SYMBOLOGY	RR	GPW	GPW

DESIGN: DESIGNED BY: R. RUIZ; DRAWN BY:
REVIEW: DESIGN CHECKED BY: R.P.E. No. C65259 — GARIN D WARREN
RECOMMENDED: SR. ENGINEER R.P.E. No. C65259 — GARIN D WARREN
APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C33317 — EDWARD H MCCORMICK

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
MECHANICAL
SYMBOLS, DESIGNATIONS AND NOTES

SCALE: NONE
DATE: 07JAN2009
STD-M-001
DRAWING NUMBER
5
REV.

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REF 2:
REF 3:

PLOT SCALE: 0.166667:1
PLOT DATE: 04-JUN-2020 13:57
USER: amunoz
FILE: J:\standard drawings\std001-05

HVAC SYMBOLS AND LEGEND

- 40x12 — SHEET METAL DUCT (1ST FIGURE, INSIDE WIDTH; 2ND FIGURE, INSIDE DEPTH)
- 20x12 — SHEET METAL DUCT WITH INTERNAL INSULATION (DIMENSION SHOWN IS NET INSIDE)
- ARROW INDICATES DIRECTION OF AIR FLOW IN DUCT
- (16x12) — HIDDEN SHEET METAL DUCT (1ST FIGURE, INSIDE WIDTH; 2ND FIGURE, INSIDE DEPTH)
- SUPPLY DUCT SECTION UP
- RETURN DUCT SECTION DOWN
- EXHAUST DUCT SECTION UP
- SUPPLY DUCT SECTION DOWN
- RETURN DUCT SECTION UP
- EXHAUST DUCT SECTION DOWN
- ROUND ELBOW UP
- ROUND ELBOW DOWN
- TV — TURNING VANES
- SPLITTER VANE
- TAKE-OFF WITH ADJUSTABLE TURNING VANES
- AD — ACCESS DOOR
- AP — ACCESS PANEL
- VD — VOLUME DAMPER WITH LOCKING QUADRANT
- M — MOTORIZED DAMPER
- DUCT TRANSFORMATION, MAXIMUM 15° INCLUDED ANGLE EXCEPT WHERE SHOWN OTHERWISE
- FDC — FLEXIBLE DUCT CONNECTION
- 400 / 12x12xT — (XX) CEILING SUPPLY DIFFUSER
- 200 / 10x10 — (XX) CEILING RETURN REGISTER
- 200 / 10x10 — (XX) EXHAUST REGISTER
- 200 / 10x10 — (XX) SIDEWALL RETURN OR EXHAUST REGISTER
- 200 / 10x10 — (XX) SIDEWALL SUPPLY REGISTER

  TOP FIGURE INDICATES CFM
  ARROW INDICATES FLOW DIRECTION
  BOTTOM FIGURE INDICATES NECK, DIFFUSER, REGISTER, OR GRILLE SIZE
  TEXT IN CIRCLE INDICATES REGISTER DESIGNATION

- 9x9 — 9"ø — RECTANGULAR TO ROUND DUCT TRANSFORMATION
- FLEXIBLE DUCT (6'-0" MAXIMUM LENGTH)
- FIRE DAMPER
- FIRE/SMOKE DAMPER

- DL / CFM | WxH — DOOR LOUVER
- (T) W25-EF-302-00 — ROOM THERMOSTAT & EQUIPMENT NUMBER (SEE EQUIPMENT SCHEDULES)
- CENTRIFUGAL FAN
- INLINE AXIAL FAN, BELT DRIVEN
- WALL MOUNTED AXIAL FAN AND BOOT
- VANE AXIAL FAN
- OR — PROPELLER FAN
- OFM — ORIFICE FLOW METER
- VFM — VENTURI FLOW METER
- FILTER
- PARALLEL BLADE DAMPER
- OPPOSED BLADE DAMPER
- (SP) — STATIC PRESSURE SENSOR
- (SD) — SMOKE DETECTOR
- POWER OR GRAVITY ROOF VENTILATOR (EXHAUST)

HVAC ABBREVIATIONS

AL	ACOUSTIC LINED
DB	DRY BULB
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SEN MBH	SENSIBLE 1000 BTU PER HOUR
TSP	TOTAL STATIC PRESSURE

HVAC NOTES

1. ABBREVIATIONS SHOWN HERE SUPERCEDE THOSE FOUND ON DRAWINGS STD-G-003 AND STD-G-004.
2. DUCTING DESIGNATIONS SHOWN ON THE DRAWINGS ARE SIMILAR TO DEFINED PIPING SYSTEM ON DRAWING STD-M-001.

REF 7; REF 8; REF 9;

REF 4; REF 5; REF 6;

REF 1: J:\standard drawings\ref\std dwg bdr.mst
REF 2:
REF 3:

USER: dahleh
DATE: 27-FEB-2021 09:51
FILE: J:\standard drawings\std-m002-r02

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3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
2	05AUG2020	REVISED HVAC SYMBOLES			
1	04NOV2010	ADDED PROPELLER FAN	BPW	CSM	

DESIGN
DESIGNED BY: D. LA MARCHE
DRAWN BY: S. DAHLEH

REVIEW
DESIGN CHECKED BY: R.P.E. No. C65259 — GARIN D WARREN
RECOMMENDED: SR. ENGINEER R.P.E. No. C65259 — GARIN D WARREN
APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C33317 — EDWARD H McCORMICK

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
MECHANICAL
HVAC
SYMBOLS AND LEGENDS, ABBREVIATIONS, AND NOTES

SCALE NONE
DATE 05AUG2020
STD-M-002 — DRAWING NUMBER
2 — REV.

LEGEND FOR PLANS

- EXPOSED CONDUIT(S)
- CONCEALED CONDUIT RUN(S) (FLOOR, WALL, CEILING & UNDERGROUND)
- GROUND GRID, BURIED OR IN MH/VAULT
- CONDUIT(S) TURN UPWARD
- CONDUIT(S) TURN DOWNWARD
- HOME RUN TO PANEL
- FLEXIBLE CONDUIT
- CABLE TRAY (TR1A) IDENTIFIES TRAY NO. "1A"
- CONDUIT DESIGNATION (REFER TO CONDUIT SCHEDULE FOR SIZE, FILL, ROUTING, ETC.)
- CROSSHATCHES INDICATE NUMBER OF CONDUCTORS (TWO HOT, NEUTRAL, & GROUND). NO DESIGNATION OR CROSSHATCH INDICATES 2 #12 & #12 GND IN ¾" CONDUIT, APPLICABLE ONLY TO LIGHTING & RECEPTACLE-CLE CIRCUITS. L-5, 7 INDICATES LIGHTING PANEL CIRCUIT NUMBERS
- EXISTING CONDUIT(S)
- EXISTING UNDERGROUND ELECTRICAL DUCT BANK
- EXISTING CONDUIT & CONDUCTORS WHICH SHALL BE REMOVED
- EXISTING ELECTRICAL EQUIPMENT WHICH SHALL BE DISCONNECTED AND REMOVED
- CONDUIT SEAL FITTING FOR CLASS 1, DIVISION 1, GROUPS C & D HAZARDOUS (CLASSIFIED) LOCATIONS
- STUB UP OR CAP
- UNDERGROUND DUCT BANK (CONCRETE ENCASEMENT), NUMBER OF CIRCLES DOES NOT REPRESENT THE NUMBER OF CONDUITS IN THE ENCASEMENT
- JUNCTION BOX
- JUNCTION BOX - CEILING MOUNTED
- FIELD INSTRUMENTATION AND ELECTRICAL EQUIPMENT
- INCANDESCENT OR HID OR LED TYPE LIGHTING FIXTURE. LETTER INDICATES TYPE AS SHOWN IN THE SCHEDULE. NUMBER INDICATES CIRCUIT NUMBER. LOWER CASE LETTER INDICATES THE SWITCH LEG. "ST" INSIDE SYMBOL INDICATES STROBE LIGHT.
- WALL MOUNTED INCANDESCENT OR HID OR LED TYPE LIGHTING FIXTURE. (SAME AS ABOVE FOR DESIGNATION)
- EMERGENCY LIGHTING FIXTURE (SAME AS ABOVE FOR DESIGNATION)
- POLE-MOUNTED INCANDESCENT OR HID OR LED TYPE LIGHTING FIXTURE (SAME AS ABOVE FOR DESIGNATION)
- FLUORESCENT OR LED LIGHTING FIXTURE (SAME FOR DESIGNATION)
- FLUORESCENT OR LED LIGHTING FIXTURE INCLUDES BATTERY PACK
- FLOODLIGHT
- EXIT OR DIRECTIONAL SIGN (SAME FOR DESIGNATION)
- MANUAL MOTOR STARTER WITH THERMAL OVERLOAD IN AN ENCLOSURE.
- SINGLE POLE TOGGLE SWITCH (LETTER INDICATES SWITCH LEG)
- THREE-POSITION TOGGLE SWITCH WITH HAND-OFF-AUTO ENGRAVED PLATE
- THREE WAY TOGGLE SWITCH
- FOUR WAY TOGGLE SWITCH
- DUPLEX CONVENIENCE OUTLET
- SINGLE CONVENIENCE OUTLET
- FLOOR SINGLE RECEPTACLE OUTLET
- FLOOR DUPLEX RECEPTACLE OUTLET
- SPECIAL RECEPTACLE. LETTER INDICATES TYPE AS SHOWN IN SCHEDULE. NUMBER IN PARENTHESES INDICATES CIRCUIT NUMBER, IF USED.
- ELECTRIC MOTOR. NUMBER INDICATES HORSEPOWER
- UNLESS OTHERWISE INDICATED, CONTROL STATION AS REQUIRED BY THE SCHEMATIC DIAGRAM IN NEMA 4X ENCLOSURE
- DISCONNECT SWITCH, HEAVY DUTY 600 VAC 3 POLE, NON-FUSIBLE; UNLESS OTHERWISE INDICATED, IN NEMA 4X ENCLOSURE
- CIRCUIT BREAKER IN NEMA 4X ENCLOSURE UNLESS OTHERWISE INDICATED
- COMBINATION 480 VAC, 3 POLE CIRCUIT BREAKER OR MCP-MAGNETIC STARTER WITH CONTROL TRANSFORMER, RELAYS, DEVICES AS REQUIRED BY THE SCHEMATIC DIAGRAM IN NEMA 4X ENCLOSURE

- HORN (H - HORN, HS - HORN/STROBE)
- SPEAKER
- SOLENOID VALVE
- ALARM BELL
- REPRESENTS EQUIPMENT ENCLOSURE NEMA RATING "X"=REQUIRED NEMA RATING
- GENERATOR
- UNDERGROUND THERMO-WELD CONNECTIONS
- GROUND ROD, WHERE INDICATED, PROVIDE PRECAST GROUND ROD BOX WITH CAST IRON TRAFFIC COVER
- THERMOSTAT
- FIRE DETECTION DEVICE:
  - SI - SMOKE DETECTOR, IONIZATION TYPE
  - SP - SMOKE DETECTOR, PHOTOELECTRIC TYPE
  - HF - HEAT DETECTOR, FIXED TEMP.
  - HR - HEAT DETECTOR, RATE OF RISE
  - FI - FLAME DETECTOR, INFRARED
  - FV - FLAME DETECTOR, ULTRAVIOLET
  - SH - SMOKE/HEAT DETECTOR
  - D - DUCT DETECTOR (TEXT OUTSIDE OF SYMBOL)
- MANUAL FIRE ALARM BOX
- HEATER
- MH - MANHOLE, HH - HANDHOLE, PB - PULL BOX
- VOICE OUTLET
- DATA OUTLET
- DATA/VOICE
- OCCUPANCY SENSOR, CEILING MOUNTED
- PHOTOCELL

REF 7; REF 8; REF 9;

REF 4; REF 5; REF 6;

REF 1; J:\Standard_Drawings\ref\std dwg bdr-mst
REF 2;
REF 3;

PLOT SCALE: 0.166667:1
USER: gmunoz
DATE: 26-JUN-2020 12:57
FILE: J:\Standard_Drawings\std001-08

LEGEND FOR SINGLE LINE AND SCHEMATIC DIAGRAMS

- NEW
- EXISTING
- EXISTING TO BE REMOVED
- PULLOUT, DRAWOUT OR CONNECTOR
- SHUNT TRIP
- XX AT / YY AF — MOLDED CASE CIRCUIT BREAKER, SOLID-STATE OR THERMAL MAGNETIC, 600 V, XX LETTERING FOR AMP TRIP, YY LETTERING FOR AMP FRAME
- MCP — UNLESS OTHERWISE NOTED, COMBINATION MOTOR CIRCUIT PROTECTOR, FUSE LESS CURRENT LIMITING TYPE AND FULL VOLTAGE NON-REVERSING MAGNETIC STARTER WITH OVERLOAD PROTECTION AND 480-120 VOLT CONTROL TRANSFORMER. NUMBER INDICATES NEMA STARTER SIZE.
- SS — SAME AS ABOVE, EXCEPT SOLID-STATE STARTER AND THERMAL MAGNETIC CIRCUIT BREAKER
- POWER BREAKER WITH DRAWOUT FEATURE
- 5Ø/3 — AIR CIRCUIT BREAKER WITH DRAWOUT FEATURE
- VFD — VARIABLE FREQUENCY DRIVE UNIT
- (E) — HEAVY DUTY, FUSIBLE DISCONNECT (SAFETY) SWITCH, 600V
- HEAVY DUTY, NON-FUSIBLE DISCONNECT (SAFETY) SWITCH, 600V
- FUSES
- DISCONNECT SWITCH, HEAVY DUTY 600 VAC 3 POLE, NON-FUSIBLE; UNLESS OTHERWISE INDICATED, IN NEMA 4X ENCLOSURE
- TERMINAL BLOCK
- REACTOR
- CAPACITORS
- SURGE CAPACITOR
- X KVA, 480-208V/120 — POWER TRANSFORMER (X = SIZE OF TRANSFORMER)
  - Δ - DELTA
  - - DELTA WITH MIDPOINT GROUNDED
  - - GROUNDED WYE
  - - HIGH RESISTANCE GROUNDED WYE
- 600/5, 3 — CURRENT TRANSFORMER: 3 INDICATES QUANTITY AND 600/5 INDICATES RATIO
- POTENTIAL TRANSFORMER
- GS — GROUND FAULT SENSOR. WHEN SHOWN WITH BREAKER, SENSOR IS AN INTEGRAL PART OF THE BREAKER
- 500 — SYNCHRONOUS MOTOR (500=HP)
- 49 — RELAY 49 - DEVICE NO. IDENTIFICATION (ANSI C37.2) (INDICATES AC TERMINAL RELAY)
- SURGE OR LIGHTNING ARRESTORS
- VS — VOLTMETER SELECTOR SWITCH: OFF-AØ, BØ, CØ, AG, BG, CG
- AS — AMMETER SELECTOR SWITCH: OFF-AØ, BØ, CØ
- 2 — ELECTRIC INDUCTION MOTOR. NUMBER INDICATES HORSEPOWER

- METAL OXIDE VARISTORS(MOV)
- FUSES WITH BLOWN FUSE NEON LIGHT INDICATORS,
- SPECIAL RECEPTACLE AND PLUG, 600V
- ATS, AUTOMATIC TRANSFER SWITCH
- THERMAL OVERLOAD
- SS — SOLID STATE STARTER WITH BYPASS CONTACTOR
- ETM — ELAPSED TIME METER
- TR # — TIME DELAY RELAY COIL
- CR # — CONTROL RELAY COIL.
- RELAY COIL WITH DIODE SUPPRESSOR
- CR# — NORMALLY OPEN CONTACT
- CR# — NORMALLY CLOSED CONTACT
- OPEN CONTACT, DRAWOUT TYPE
- CLOSE CONTACT, DRAWOUT TYPE
- PB# — NORMALLY OPEN MOMENTARY PUSH BUTTON
- PB# — NORMALLY CLOSED MOMENTARY PUSH BUTTON
- MAINTAINED PUSH BUTTONS
- H Ø A — SELECTOR SWITCH
- SELECTOR SWITCH MOMENTARY SPRING RETURN TO CENTER
- TOGGLE SWITCH
- LOCKOUT STOP SWITCH - NORMALLY CLOSED
- LOCKOUT STOP SWITCH - NORMALLY OPEN
- TRANSFORMER
- CB# 50A — CIRCUIT BREAKER
- FU# 5AMP — FUSE
- GROUND
- R — INDICATING LIGHT, LETTER INDICATES LENS COLOR
- R — PUSH-TO-TEST INDICATING LIGHT, LETTER INDICATES LENS COLOR
- SOLENOID
- MICROWAVE SYSTEM

- K — KEY INTERLOCK
- V — VOLTMETER
- A — AMMETER
- PF — POWER FACTOR METER
- F — FREQUENCY METER
- SY — SYNCHROSCOPE
- WH — WATT HOUR METER
- WM D — WATT METER (D = DEMAND)
- D.C. BATTERY
- RESISTOR OR ATTENUATOR
- VARIABLE RESISTOR
- THERMAL CUT-OUT
- DIODE
- REVERSE BLOCKING DIODE
- SURGE SUPPRESSOR
- BREAKDOWN DIODE

- FS# — FLOW SWITCH, NORMALLY OPEN-CLOSES ON INCREASE (TYP.)
- FS# — FLOW SWITCH, NORMALLY CLOSED-CLOSES ON DECREASE (TYP.)
- LS# — LEVEL SWITCH, NORMALLY OPEN
- LS# — LEVEL SWITCH, NORMALLY CLOSED
- PS# — PRESSURE OR VACUUM SWITCH, NORMALLY OPEN
- PS# — PRESSURE OR VACUUM SWITCH, NORMALLY CLOSED
- TS# — TEMPERATURE SWITCH, NORMALLY OPEN
- TS# — TEMPERATURE SWITCH, NORMALLY CLOSED
- LM# — LIMIT OR TORQUE SWITCH, NORMALLY OPEN
- LM# — LIMIT OR TORQUE SWITCH, NORMALLY CLOSED
- TR# — NORMALLY OPEN, TIME DELAY CLOSE CONTACT
- TR# — NORMALLY CLOSED, TIME DELAY OPEN CONTACT
- FUSE HOLDER ASSEMBLY WITH BLOWN FUSE NEON INDICATOR

3" ON ORIGINAL DOCUMENT
0 1 2 3

NOTES

GENERAL NOTES

G1. THESE DRAWINGS ARE DIAGRAMMATIC ONLY; EXACT LOCATIONS OF ELECTRICAL EQUIPMENT SHALL BE DETERMINED IN THE FIELD BY THE CONTRACTOR. THE INSTALLATION OF ALL EQUIPMENT SHOWN ON THESE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS SHALL CONFORM TO THE REQUIREMENTS SET FORTH IN THE LATEST EDITIONS OF ALL APPLICABLE CODES AND UTILITY COMPANY STANDARDS. CONTACT THE UTILITY COMPANY REPRESENTATIVES AND VERIFY THEIR REQUIREMENTS.

G2. THIS IS A GENERALIZED LEGEND SHEET. THIS CONTRACT MAY NOT USE ALL INFORMATION SHOWN.

G3. NOTIFY THE ENGINEER IMMEDIATELY IF CONFLICTS IN THE EQUIPMENT LOCATIONS ARE DISCOVERED OR IF PROBLEMS ARISE DUE TO FIELD CONDITIONS, LACK OF INFORMATION OR ANY OTHER REASON. NO PAYMENT WILL BE MADE FOR CHANGES WHICH HAVE NOT BEEN FAVORABLY REVIEWED BY THE ENGINEER.

G4. INFORMATION SHOWN MAY NOT BE ALL INCLUSIVE. SEE ALSO ANSI C37.2, Y1.1, Y32.2, AND Y32.9.

G5. VERIFY ALL COLOR REQUIREMENTS BEFORE ORDERING MATERIALS.

G6. REFER TO THE MECHANICAL DRAWINGS FOR CERTAIN CONTROL DIAGRAMS AND EXACT LOCATIONS OF MECHANICAL EQUIPMENT AND FOR CERTAIN CONNECTIONS TO BE MADE TO ELECTRICAL CIRCUITS.

G7. CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL CONDUIT SUPPORTS PER SPECIFICATION 26 Ø5 29.

PLAN NOTES

P1. CONDUIT SIZE AND FILL SHALL BE AS INDICATED. WHERE NO SIZE IS SHOWN, THE CONDUIT SHALL BE SIZED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE ADOPTED BY THE AUTHORITY HAVING CODE ENFORCEMENT JURISDICTION. PROVIDE 3/16 INCH NYLON PULL ROPE IN EACH EMPTY CONDUIT, UNLESS OTHERWISE SPECIFIED.

P2. LOWER CASE LETTERS ADJACENT TO A SWITCH OR LIGHT FIXTURE INDICATE A SWITCHED CIRCUIT. FOR FOUR LAMP FLUORESCENT FIXTURES WIRED IN PAIRS WITHIN EACH FIXTURE, THE "a" SWITCH CONTROLS THE OUTER LAMPS AND THE "b" SWITCH CONTROLS THE INNER LAMPS; WIRE 3 LAMP FIXTURES SIMILARLY.

P3. CONDUIT AND WIRE LAYOUT FOR WIRING AND RECEPTACLES, NOT SHOWN. PROVIDE PER NEC.

P4. ALL WIRING AND CONDUITS NOT SHOWN BUT NECESSARY TO MAKE A FUNCTIONAL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.

P5. ALL CONDUITS SHALL BE TAGGED WITH THE CONDUIT NUMBER SHOWN ON THE CONDUIT SCHEDULE. CONDUIT TAG SHALL BE 1 1/2 " Ø STAINLESS STEEL SS-304, TAG SHALL BE CHAINED TO THE CONDUIT.

P6. REFER TO SPECIFICATION SECTION Ø1 35 13 FOR PHASING OF EQUIPMENT DEMOLITION AND INSTALLATION.

REGISTERED PROFESSIONAL ENGINEER — ROBERT MAC — No. E16072 — Exp. 12/31/19 — ELECTRICAL — STATE OF CALIFORNIA

03/20/2019

NO.	DATE	REVISION	BY	REC.	APP.
3	20MAR2019	GENERAL REVISION	RM	RM	
2	26NOV2018	REVISED AND ADDED LEGEND	RM	RM	
1	24FEB2015	ADDENDUM NO.# PER SD	RM	RM	

DESIGN
DESIGNED BY: R. MAC
DRAWN BY:
REVIEW
DESIGN CHECKED BY: R.P.E. No. E16072 — ROBERT MAC
RECOMMENDED: SR. ENGINEER R.P.E. No. E16072 — ROBERT MAC
APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C45081 — DOUGLAS T. HIGASHI

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
ELECTRICAL
LEGENDS, ABBREVIATIONS AND NOTES

SCALE NONE
DATE 24FEB2015
STD-E-Ø01
DRAWING NUMBER
8
REV.

REF 1: REF1#FILENAME
REF 2: REF2#FILENAME
REF 3: REF3#FILENAME
REF 4: REF4#FILENAME
REF 5: REF5#FILENAME
REF 6: REF6#FILENAME
REF 7: REF7#FILENAME
REF 8: REF8#FILENAME
REF 9: REF9#FILENAME

PLOT SCALE: PLOT#SCALE

USER: #USER#
DATE: #DATE#
FILE: #FILE#

LEGEND FOR PLANS

CONDUIT SUPPORT RACK

ABBREVIATIONS

(E) EXISTING TO REMAIN

NOTES

PLAN NOTE

P7. FIELD VERIFY LOCATION OF INSTRUMENTS TO BE REMOVED AND/OR RELOCATED DURING DEMOLITION WORK.

3" ON ORIGINAL DOCUMENT
0 1 2 3

Woodard & Curran

SOLUTIONWERKS™ INCORPORATED

NO.	DATE	REVISION	BY	REC.	APP.

SD428 - MWWTP OXYGEN PLANT REHABILITATION

CONSULTANT

DESIGN BY:	L. MAXWELL
DRAWN BY:	L. MAXWELL
DESIGN CHECKED BY R.P.E. NO. 16928	D. RAMMELL
PROJECT MANAGER R.P.E. NO.	J. JANCAITIS
APPROVED: PRINCIPAL IN CHARGE R.P.E. NO. 37097	D. RICHARDSON

EBMUD

PROJECT MANAGER R.P.E. NO. 95046	J. LAW
RECOMMENDED: SR. ENGINEER R.P.E. NO. E16072	R. MAC

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO.1
OAKLAND, CALIFORNIA

MAIN WASTEWATER TREATMENT PLANT
OXYGEN PRODUCTION PLANT
ELECTRICAL
SUPPLEMENTARY LEGENDS, ABBREVIATIONS AND NOTES 1

SCALE NONE
DATE 28JUN24

STD-E-001.1
DRAWING NUMBER

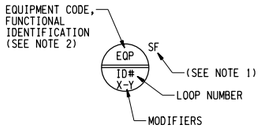
0
REV.

INSTRUMENT LETTER IDENTIFICATION TABLE

	FIRST LETTER		SUCCEEDING LETTER		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, COMBUSTION, FIRE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY			CONTROL	CLOSED
D	DENSITY, DAMPER	DIFFERENTIAL			DISCRETE
E	VOLTAGE		SENSOR, PRIMARY ELEMENT		ENERGIZED
F	FLOW RATE	RATIO (FRACTION)			FAILOVER RESET
G	USER'S CHOICE		GLASS VIEWING DEVICE		READY
H	HAND				1ST ALARM OR HI
I	CURRENT (ELECTRICAL)		INDICATE		INCREASE
J	POWER	SCAN			MOTOR POWER
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		3RD ALARM OR LOW
M	MOISTURE/MASS	MOMENTARY			MANUAL
N	EQUIPMENT STATUS		REMOTE I/O INPUT	USER'S CHOICE	USER'S CHOICE
O	VIDEO		ORIFICE,RESTRICTION		OPENED
P	PRESSURE, VACUUM		POINT (TEST) CONNECTION		STOP
Q	QUANTITY, TORQUE	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD(ER)		RUNNING
S	SPEED/FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE,DAMPER, LOUVER	
W	WEIGHT, FORCE		WELL		
X	SPECIAL/EQUIPMENT	X AXIS	SPECIAL EQUIPMENT	SPECIAL EQUIP	SPECIAL EQUIP
Y	EVENT, STATE, COMPUTER CONTROL OUTPUT	Y AXIS		RELAY,COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER,ACTUATOR, SPECIAL FINAL CONTROL ELEMENT	

REF 7; REF 8; REF 9;

INSTRUMENT SYMBOL CONFIGURATION



REF 4; REF 5; REF 6;

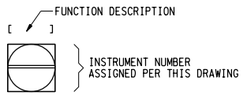
NOTES:

1. "SF" - SEE "SPECIAL FUNCTION MODIFIER" FOR ABBREVIATIONS.
2. SEE THE INSTRUMENT LETTER IDENTIFICATION TABLE ABOVE.

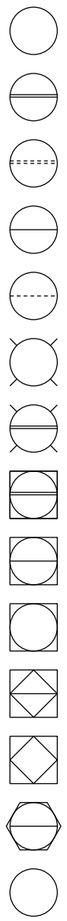
SPECIAL FUNCTION MODIFIER

MA	MANUAL-AUTO
CL2	CHLORINE
COND	CONDUCTIVITY
D	DISCHARGE, SERVICE, OUTLET
DO2	DISSOLVED OXYGEN
E/E	VOLTAGE-TO-VOLTAGE
E/I	VOLTAGE-TO-CURRENT
FL	FLUORIDE
HOA	HAND-OFF-AUTO
HS	HAND SWITCH
I/E	CURRENT-TO-VOLTAGE
I/I	CURRENT-TO-CURRENT
L	LEFT
LCP/OWS	LOCAL CONTROL PANEL-OPERATOR WORKSTATION
LOR	LOCAL-OFF-REMOTE
LR	LOCAL-REMOTE
MOD	MODULATING
NH	AMMONIA
O3	OZONE
OC	OPEN-CLOSE
OO	ON-OFF
ORP	OXIDATION-REDUCTION POTENTIAL
PB	PUSHBUTTON
pH	pH
POT	POTENTIOMETER, POSITION TRANSMITTER
R	RIGHT
S	SUCTION, SOURCE, INLET
SCD	STREAMING CURRENT DETECTOR
SO2	SULFUR DIOXIDE
SS	START-STOP
TURB	TURBIDITY
UV	ULTRAVIOLET

REMOTE SIGNAL DESIGNATION



INSTRUMENT OR FUNCTION SYMBOLS



FIELD LOCATED INSTRUMENT

FRONT FACE FIELD LOCAL CONTROL PANEL MOUNTED (OPERATOR ACCESSIBLE)

INSIDE FIELD LOCAL CONTROL PANEL MOUNTED (NORMALLY NOT OPERATOR ACCESSIBLE)

FRONT FACE MAJOR CONTROL ROOM PANEL CONSOLE MOUNTED

INSIDE MAJOR CONTROL ROOM PANEL CONSOLE MOUNTED

LOCAL ON-OFF INDICATING LAMPS

REMOTE ON-OFF INDICATING LAMPS

BACKUP CONTROL AND DISPLAY TO CONFIGURABLE CONTROL SYSTEM

CONFIGURABLE CONTROL SYSTEM ACCESSIBLE TO OPERATOR

CONFIGURABLE CONTROL SYSTEM NOT ACCESSIBLE TO OPERATOR

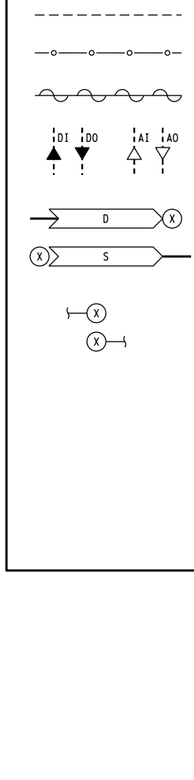
NORMALLY ACCESSIBLE TO OPERATOR AS PACKAGED PROGRAMMABLE LOGIC CONTROLLER (PLC) OR DIGITAL LOGIC CONTROL INTEGRAL TO CONTROL SYSTEM

NORMALLY NOT ACCESSIBLE TO OPERATOR AS PACKAGED PROGRAMMABLE LOGIC CONTROLLER (PLC) OR DIGITAL LOGIC CONTROL INTEGRAL TO CONTROL SYSTEM

DCS - REMOTE I/O

EXISTING INSTRUMENT (TYPICAL)

SIGNAL DESIGNATORS



ANALOG/DISCRETE CONTROL SIGNAL

a. DIGITAL/ANALOG COMMUNICATION DATA LINK.
b. DIGITAL CONTROL SYSTEM SOFTWARE LINK BETWEEN FUNCTION MODULES.

ELECTROMAGNETIC, RADIATION, OR SONIC SIGNAL WITHOUT TUBING OR WIRING

DI DO AI AO

ELECTRIC (DISCRETE / ANALOG) CONTROL SIGNALS

D X S X

SIGNAL CONTINUATION SYMBOL TO DIFFERENT DRAWING
D = DESTINATION DRAWING NUMBER
S = SOURCE DRAWING NUMBER
X = INTERFACE LETTER

X X

SIGNAL CONTINUATION SYBMOL WITHIN SAME DRAWING
X = INTERFACE LETTER

PROCESS DESIGNATORS

DIRECT PROCESS CONNECTION

MECHANICAL LINK

CAPILLARY TUBING (FILLED SYSTEM)

PNEUMATIC SYSTEM

HYDRAULIC SIGNAL

ELECTRIC HEAT TRACED LINE

ELECTRICAL HEAT TRACING ON VESSEL

D # # S

PROCESS CONTINUATION SYMBOL TO DIFFERENT DRAWING
D = DESTINATION DRAWING NUMBER
S = SOURCE DRAWING NUMBER
# = INTERFACE NUMBER

PROCESS CONTINUATION SYMBOL TO OR FROM PROCESS LINE EXTERNAL TO PROJECT

# #

PROCESS CONTINUATION SYBMOL WITHIN SAME DRAWING
= INTERFACE NUMBER

SWITCH DESIGNATIONS

HOA	HAND-OFF-AUTOMATIC
LOR	LOCAL-OFF-REMOTE
LOS	LOCK OUT STOP
PB	PUSH BUTTON
SS	START-STOP

VALVE DESIGNATIONS

FC	FAIL CLOSED
FO	FAIL OPEN
NC	NORMALLY CLOSED
NO	NORMALLY OPEN

LOGIC & CONTROL SEQUENTIAL SYMBOLS

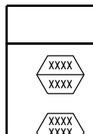
I

INTERLOCK SYMBOL

I-2

INTERLOCK SYMBOL WITH NUMBER TO DESCRIBE CONTROL STATEMENTS OR INTERLOCK FUNCTIONS ON THE P&ID

RTU / COMPUTER SYMBOLS



XXXX XXXX

NORMALLY ACCESSIBLE TO OPERATOR AS INDICATOR/CONTROLLER/RECORDER OR ALARM POINT

XXXX XXXX XXXX

NORMALLY NOT ACCESSIBLE TO OPERATOR AS
a. INPUT/OUTPUT INTERFACE
b. COMPUTATION/SIGNAL CONDITIONING WITHIN THE COMPUTER
c. BLIND CONTROLLER OR SOFTWARE CALCULATION MODULE

GENERAL NOTES

1. SEE DRAWING STD-M-001 FOR PROCESS SYMBOLS.
2. SEE ANSI/ISA S5.1, INSTRUMENTATION SYMBOLS AND IDENTIFICATION, FOR MORE DETAILS.
3. SEE DISTRICT WASTEWATER ENGINEERING STANDARD PRACTICE WESP 130 AND STANDARD DRAWING STD-G-004, G-004.1,G-005 & G-006 FOR DIRECTION ON ASSIGNING NEW TAG NUMBERS.

REGISTERED PROFESSIONAL ENGINEER
ANDY ANH LY
No. E13444
Exp. 09/30/14
ELECTRICAL
STATE OF CALIFORNIA

12/27/2012

3" ON ORIGINAL DOCUMENT
0 1 2 3

NO.	DATE	REVISION	BY	REC.	APP.
4	27DEC2012	REVISED ENGR STAMP AND SIGNATURE			
3	18JUL2011	REVISED GENERAL NOTE #3			
2	18JUL2011	REV INST SYM CONFIG MA & PROCESS DESIGNTORS			
1	04NOV2010	MOVED PROCESS SYMBOLS TO STD-M-001			

DESIGN
DESIGNED BY: R. MAC
DRAWN BY:

REVIEW
DESIGN CHECKED BY: R.P.E. No. E13444 ANDY A. LY

RECOMMENDED: SR. ENGINEER R.P.E. No. E13444 ANDY A. LY

APPROVED: MANAGER of WASTEWATER ENGINEERING R.P.E. No. C33317 EDWARD H. McCORMICK

EAST BAY MUNICIPAL UTILITY DISTRICT
SPECIAL DISTRICT NO. 1
OAKLAND, CALIFORNIA

WASTEWATER DEPARTMENT
STANDARD DRAWING
INSTRUMENTATION
LEGENDS, SYMBOLS AND ABBREVIATIONS

SCALE NONE
DATE 27DEC2012
STD-I-001 DRAWING NUMBER
4 REV.

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REF 2: std001.02
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USER: $$USER$$$
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