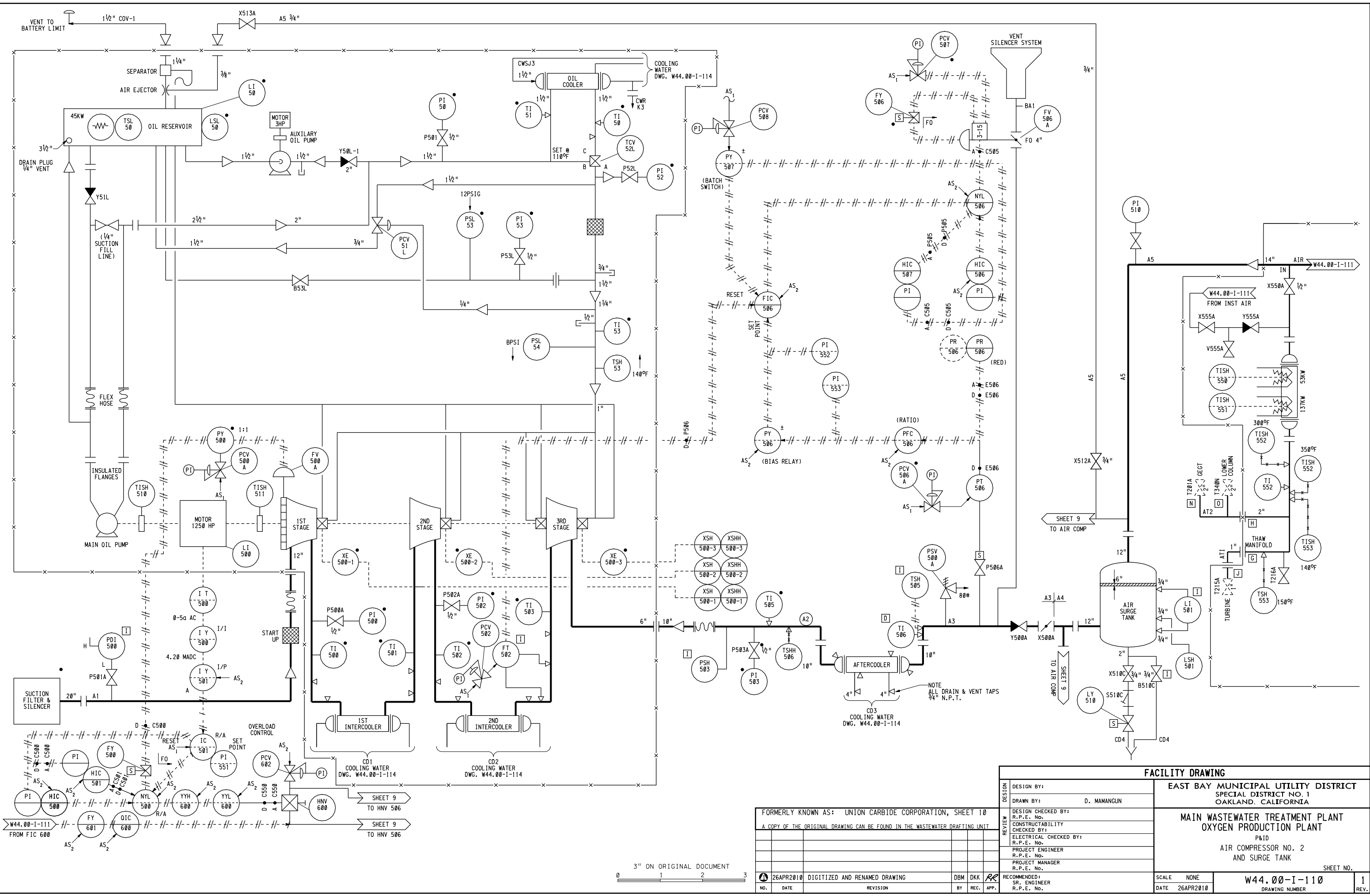


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 USER: dkreaden
 DATE: 03-MAY-2010 09:46
 FILE: J:\44\w4400\110-500

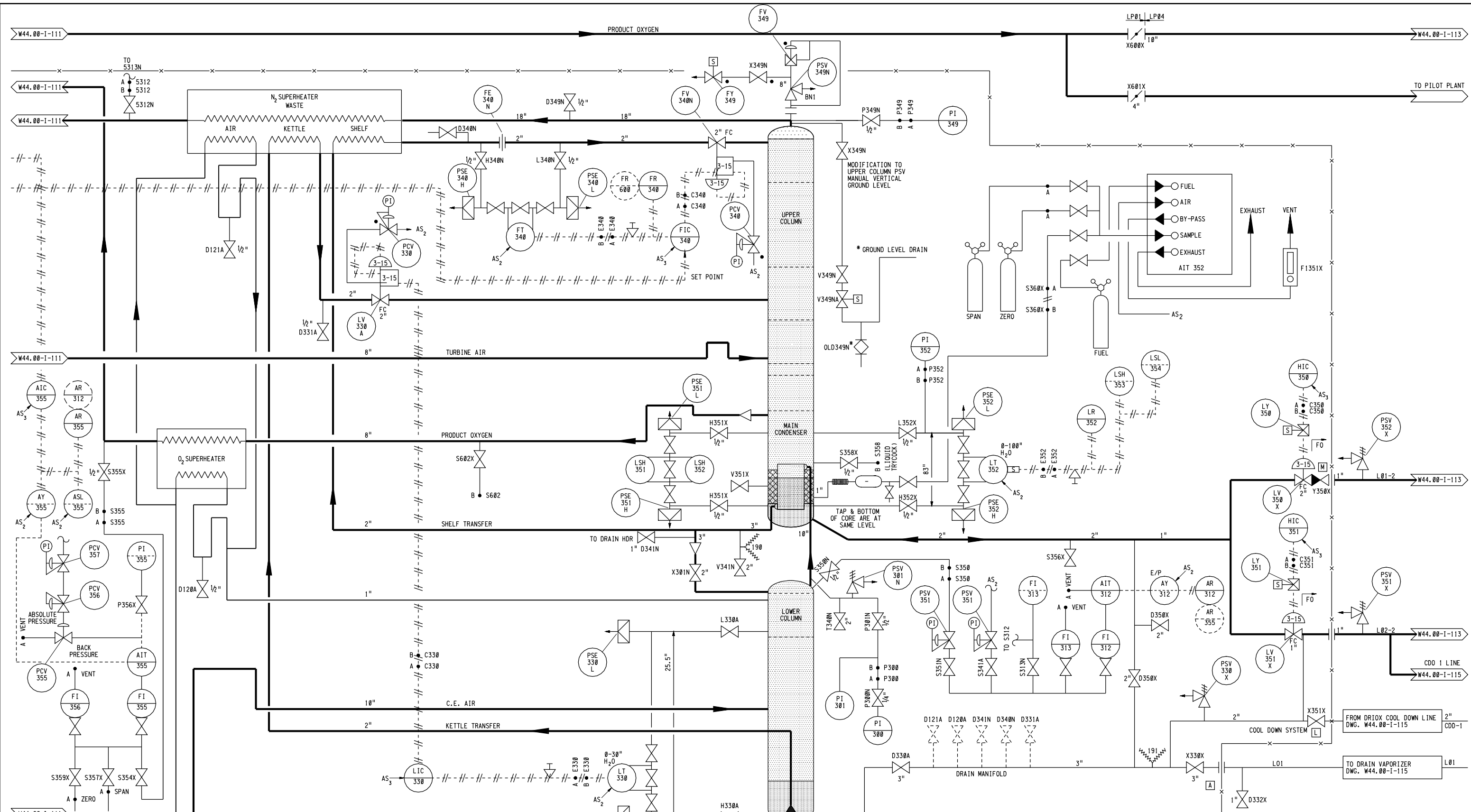


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FORMERLY KNOWN AS: UNION CARBIDE CORPORATION, SHEET 10		
A COPY OF THE ORIGINAL DRAWING CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT		
NO.	DATE	REVISION
26APR2010		DIGITIZED AND RENAMED DRAWING
	BY	DBM
	REC.	DKK
	APP.	

DESIGN		REVIEW	
DESIGN BY:	D. MAMANGUN	DESIGN CHECKED BY:	
DRAWN BY:		R.P.E. No.:	
CONSTRUCTABILITY CHECKED BY:		R.P.E. No.:	
ELECTRICAL CHECKED BY:		R.P.E. No.:	
PROJECT ENGINEER		PROJECT MANAGER	
R.P.E. No.:		R.P.E. No.:	
RECOMMENDED:		RECOMMENDED:	
SR. ENGINEER		SR. ENGINEER	
R.P.E. No.:		R.P.E. No.:	

FACILITY DRAWING
 EAST BAY MUNICIPAL UTILITY DISTRICT
 SPECIAL DISTRICT NO. 1
 OAKLAND, CALIFORNIA
**MAIN WASTEWATER TREATMENT PLANT
 OXYGEN PRODUCTION PLANT**
 P&ID
 AIR COMPRESSOR NO. 2
 AND SURGE TANK
 SHEET NO. 1
 SCALE NONE
 W44.00-I-110
 DRAWING NUMBER
 DATE 26APR2010
 REV.



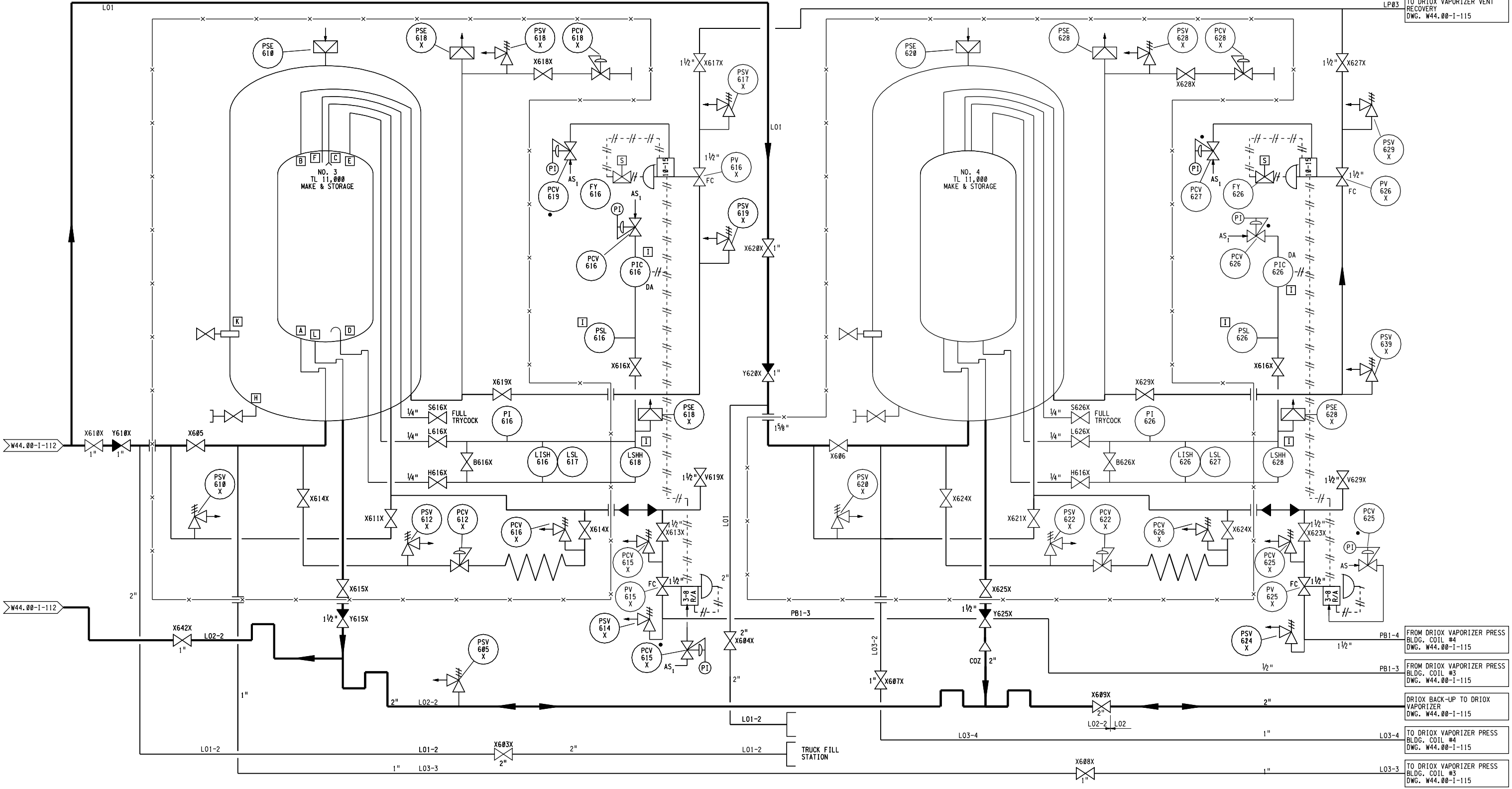
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W44.00-1-112

LP01 TO O₂ PRODUCT LINE
DWG. W44.00-1-115

LP03 TO DRIOX VAPORIZER VENT
RECOVERY
DWG. W44.00-1-115

REF 7:
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DATE: 03-MAY-2010 09:08
FILE: J:\w44\w4400113.dwg



PB1-4 FROM DRIOX VAPORIZER PRESS
BLDG. COIL #4
DWG. W44.00-1-115

PB1-3 FROM DRIOX VAPORIZER PRESS
BLDG. COIL #3
DWG. W44.00-1-115

DRIOX BACK-UP TO DRIOX
VAPORIZER
DWG. W44.00-1-115

L03-4 TO DRIOX VAPORIZER PRESS
BLDG. COIL #4
DWG. W44.00-1-115

L03-3 TO DRIOX VAPORIZER PRESS
BLDG. COIL #3
DWG. W44.00-1-115

PLOT SCALE: 0:166667:1

3" ON ORIGINAL DOCUMENT

FORMERLY KNOWN AS: UNION CARBIDE CORPORATION, SHEET 13
A COPY OF THE ORIGINAL DRAWING CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT

NO.	DATE	REVISION	BY	REC.	APP.
26APR2010		DIGITIZED AND RENAMED DRAWING	DBM	DKK	

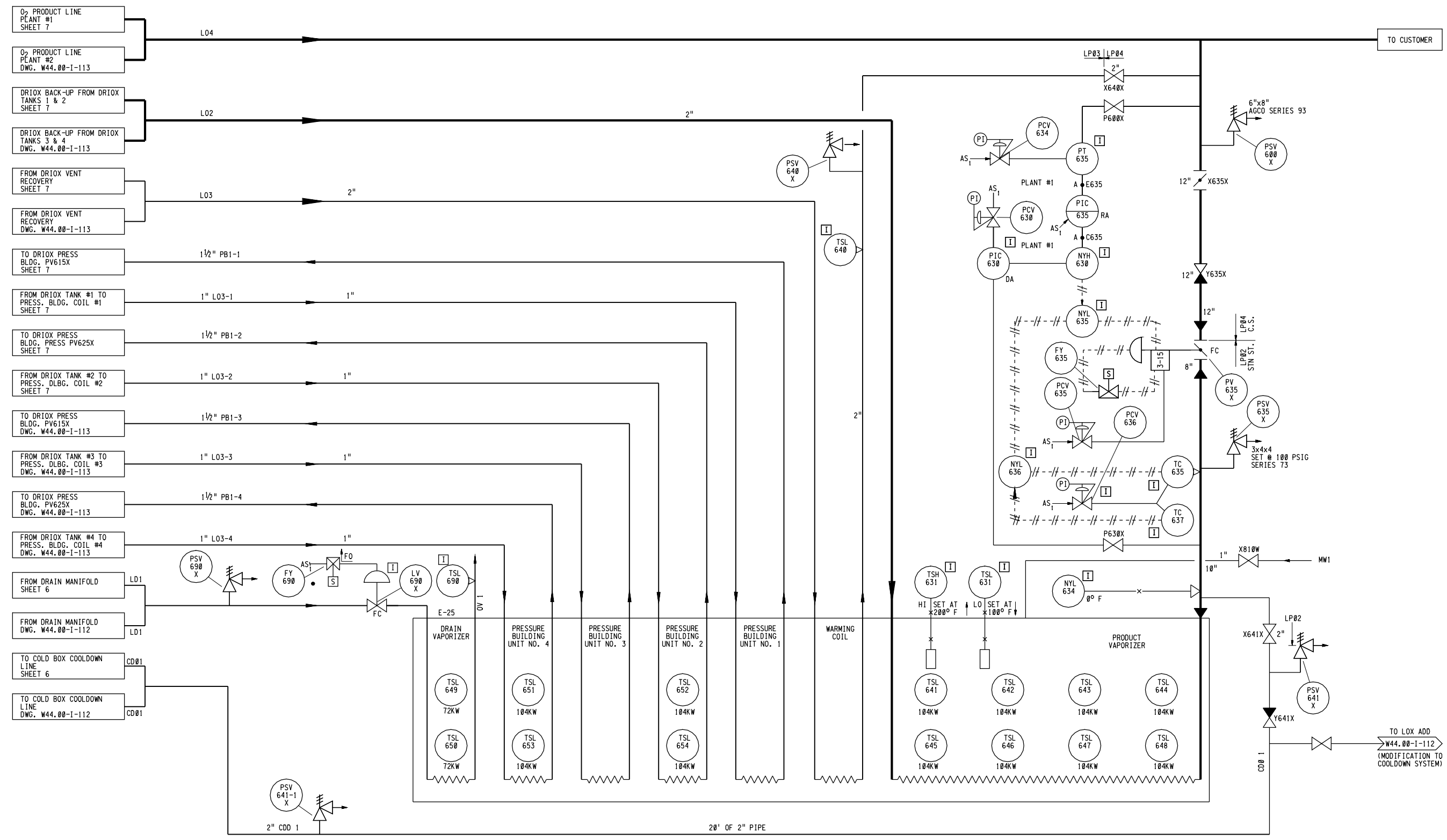
PLANT #2

DESIGN		REVIEW	
DESIGN BY:		DESIGN CHECKED BY:	
DRAWN BY:	D. MAMANGUN	R.P.E. No.:	
		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.:	

FACILITY DRAWING		EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO. 1 OAKLAND, CALIFORNIA	
		MAIN WASTEWATER TREATMENT PLANT OXYGEN PRODUCTION PLANT	
		P&ID DRIOX	
SCALE	NONE	SHEET NO.	
DATE	26APR2010	W44.00-1-113	1
		DRAWING NUMBER	REV.

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 REF 4: REF 5: REF 6:
 REF 1: J:\drawing_templates\border\sd\XX\brd.met
 REF 2: J:\44\4400\p&idmst
 REF 3:

PLOT SCALE: 0.1666671
 USER: dkreiden
 DATE: 03-MAY-2010 09:08
 FILE: J:\44\4400\115-00



3" ON ORIGINAL DOCUMENT
 0 1 2 3

FORMERLY KNOWN AS: UNION CARBIDE CORPORATION, SHEET 15
 A COPY OF THE ORIGINAL DRAWING CAN BE FOUND IN THE WASTEWATER DRAFTING UNIT

NO.	DATE	REVISION	BY	REC.	APP.
26APR2010		DIGITIZED AND RENAMED DRAWING	DBM	DKK	

DESIGN		FACILITY DRAWING	
DESIGN BY:		EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO. 1 OAKLAND, CALIFORNIA	
DRAWN BY:	D. MAMANGUN	MAIN WASTEWATER TREATMENT PLANT OXYGEN PRODUCTION PLANT	
DESIGN CHECKED BY:		P&ID DRIOX VAPORIZER	
R.P.E. No.		SHEET NO. 1	
CONSTRUCTABILITY CHECKED BY:		SCALE NONE	
ELECTRICAL CHECKED BY:		W44.00-I-115	
PROJECT ENGINEER		DATE 26APR2010	
R.P.E. No.		DRAWING NUMBER	
PROJECT MANAGER			
R.P.E. No.			
RECOMMENDED:			
SR. ENGINEER			
R.P.E. No.			

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:
REF 11: J:\Standard Drawings\ref\std dwg bdr.mst
REF 12: REF 13:
REF 14: REF 15: REF 16:

USER: djuen
DATE: 26-DEC-2012 15:21
FILE: J:\Standard Drawings\stdm001.dwg
PLOT SCALE: 0.1666671
3" ON ORIGINAL DOCUMENT

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)
	GROOVED END ADAPTER FLANGE
	FLANGED COUPLING ADAPTER
	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
	ECCENTRIC REDUCER/INCREASER
	UNION
	BLIND FLANGE
	CAP
	WELDED CAP
	PLUG
	ANCHOR
	ELBOW, 90 DEGREE
	CROSS
	TEE
	ELBOW, 45 DEGREE
	LATERAL OR WYE
	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 PREVENTER WITH RELIEF
	HYDRANT

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
	T 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)
	PITOT TUBE
	MAGNETIC FLOWMETER
	ULTRASONIC/RADAR FLOWMETER R=RADAR U=ULTRASONIC
	ULTRASONIC/RADAR TYPE LEVEL R=RADAR U=ULTRASONIC
	FLOAT SWITCH
	BUBBLER TYPE LEVEL XX=SUPPLY PRESSURE (PSIG)
	INDICATOR P=PRESSURE T=TEMPERATURE
	PRESSURE INDICATOR WITH DIAPHRAGM SEAL

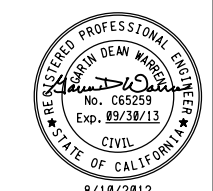
PUMPS/TURBINES	
	SUMP PUMP
	GEAR PUMP
	PROGRESSIVE CAVITY PUMP
	METERING PUMP
	CENTRIFUGAL PUMP
	REGENERATIVE TURBINE PUMP
	INJECTOR, EJECTOR EDUCTOR, JET PUMP
	PERISTALTIC OR TUBING PUMP
	HYDRAULIC PUMP
	ROTARY LOBE PUMP
	TURBINE
	VERTICAL TURBINE PUMP IN OPEN SUMP
	VERTICAL TURBINE PUMP IN BARREL

FILTRATION/SEPARATION EQUIPMENT	
	"Y" STRAINER
	FILTER
	AIR FILTER/SILENCER
	INLET FILTER OR SCREEN
	SEDIMENT TRAP
	DRIP OR AUTOMATIC DRIP TRAP
	CONDENSATION TRAP
	BASKET STRAINER
	CYCLONE SEPARATOR
	THICKENER OR CLARIFIER
	BAR RACK
	TRAVELING SCREEN

MISCELLANEOUS EQUIPMENT	
	PRESSURE VESSEL
	TANK
	TANK OR DRUM
	MIXER
	HEAT EXCHANGER
	FLAME ARRESTER
	STATIC, IN-LINE MIXER
	GRINDER
	POT FEEDER
	ROTACUT
	ACCUMULATOR, SPRING LOADED
	ACCUMULATOR, GAS CHARGED
	NOZZLE(S)
	SPARGER(S)
	WASHDOWN MONITOR
	COMBINATION SAFETY SHOWER AND EYEWASH

PIPING NOTES

- LAY PIPE TO UNIFORM GRADE BETWEEN INDICATED POINTS.
- 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.
- 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.
- 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.
- 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.
- NUMBER AND LOCATION OF UNIONS SHOWN ON PLANS IS ONLY APPROXIMATE. PROVIDE ALL UNIONS NECESSARY TO FACILITATE CONVENIENT REMOVAL OF VALVES AND MECHANICAL EQUIPMENT.
- 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.
- CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS. DRAWINGS ARE DIAGRAMMATIC AND NO ATTEMPT HAS BEEN MADE TO SHOW ALL EXISTING PIPING.
- 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.
- SYMBOLS SHOWN FOR SINGLE LINE FITTINGS ARE GENERIC ONLY. REFER TO PIPING SPECIFICATIONS FOR SPECIFIC END CONNECTIONS FOR SINGLE LINE PIPE AND FITTINGS.
- SEE STANDARD DRAWING STD-M-002 FOR HVAC SYMBOLS AND NOTES.
- PIPE SIZES SHOWN ON DRAWING ARE IN INCHES AND INDICATE DIAMETER OF PIPE UNLESS OTHERWISE NOTED.



DESIGNED BY:	R. RUIZ	EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO. 1 OAKLAND, CALIFORNIA
DRAWN BY:	WASTEWATER DRAFTING	
DESIGN CHECKED BY:	<i>Garin D. Warren</i> R.P.E. No. C65259 GARIN D. WARREN	WASTEWATER DEPARTMENT STANDARD DWG MECHANICAL SYMBOLS, DESIGNATIONS AND NOTES
RECOMMENDED BY:	<i>Garin D. Warren</i> SR. ENGINEER R.P.E. No. C65259 GARIN D. WARREN	
APPROVED BY:	<i>Edward H. McLaughlin</i> MANAGER OF WASTEWATER ENGINEERING R.P.E. No. C33317 EDWARD H. MCLAUGHLIN	SCALE: NONE
DATE:	07JAN2009	STD-M-001
REVISION:		DRAWING NUMBER
NO.	DATE	REVISION
10AUG2012		ADDED EQUIP. POT FEEDER
12MAR2012		REVISED VALVES/GATES
16JUN2011		REVISED PLUG VALVE
04NOV2010		ADDED/REVISED SYMBOLOGY

HVAC SYMBOLS AND LEGEND

HVAC ABBREVIATIONS

HVAC NOTES

	SHEET METAL DUCT (1ST FIGURE, INSIDE WIDTH; 2ND FIGURE, INSIDE DEPTH)		DOOR LOUVER
	SHEET METAL DUCT WITH INTERNAL INSULATION (DIMENSION SHOWN IS NET INSIDE)		ROOM THERMOSTAT & EQUIPMENT NUMBER (SEE EQUIPMENT SCHEDULES)
	ARROW INDICATES DIRECTION OF AIR FLOW IN DUCT		CENTRIFUGAL FAN
	HIDDEN SHEET METAL DUCT (1ST FIGURE, INSIDE WIDTH; 2ND FIGURE, INSIDE DEPTH)		INLINE AXIAL FAN, BELT DRIVEN
	SUPPLY DUCT SECTION UP		WALL MOUNTED AXIAL FAN AND BOOT
	RETURN DUCT SECTION DOWN		VANE AXIAL FAN
	EXHAUST DUCT SECTION UP		PROPELLER FAN
	SUPPLY DUCT SECTION DOWN		ORIFICE FLOW METER
	RETURN DUCT SECTION UP		VENTURI FLOW METER
	EXHAUST DUCT SECTION DOWN		FILTER
	ROUND ELBOW UP		PARALLEL BLADE DAMPER
	ROUND ELBOW DOWN		OPPOSED BLADE DAMPER
	TURNING VANES		STATIC PRESSURE SENSOR
	TURNING VANES (SMOOTH RADIUS)		SMOKE DETECTOR
	TAKE-OFF WITH ADJUSTABLE TURNING VANES		POWER OR GRAVITY ROOF VENTILATOR (EXHAUST)
	ACCESS DOOR		
	ACCESS PANEL		
	VOLUME DAMPER WITH LOCKING QUADRANT		
	MOTORIZED DAMPER		
	DUCT TRANSFORMATION, MAXIMUM 15° INCLUDED ANGLE EXCEPT WHERE SHOWN OTHERWISE		
	FLEXIBLE DUCT CONNECTION		
	CEILING SUPPLY DIFFUSER		
	CEILING RETURN REGISTER		
	EXHAUST REGISTER		
	SIDEWALL RETURN OR EXHAUST REGISTER		
	SIDEWALL SUPPLY REGISTER		
	RECTANGULAR TO ROUND DUCT TRANSFORMATION		
	FLEXIBLE DUCT (6'-0" MAXIMUM LENGTH)		
	FIRE DAMPER		

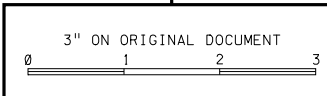
TOP FIGURE INDICATES CFM
ARROW INDICATES FLOW DIRECTION
BOTTOM FIGURE INDICATES NECK,
DIFFUSER, REGISTER, OR GRILLE SIZE
TEXT IN CIRCLE INDICATES
REGISTER DESIGNATION

AL ACOUSTIC LINED
DB DRY BULB
SEER SEASONAL ENERGY EFFICIENCY RATIO
SEN MBH SENSIBLE 1000 BTU PER HOUR
TSP TOTAL STATIC PRESSURE

- ABBREVIATIONS SHOWN HERE SUPERCEDE THOSE FOUND ON DRAWINGS STD-G-003 AND STD-G-004.
- DUCTING DESIGNATIONS SHOWN ON THE DRAWINGS ARE SIMILAR TO DEFINED PIPING SYSTEM ON DRAWING STD-M-001.



DESIGNED BY:	R. RUIZ	EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO. 1 OAKLAND, CALIFORNIA
DRAWN BY:	WASTEWATER DRAFTING	
DESIGN CHECKED BY:	<i>Garth D. Warren</i> R.P.E. No. C65259 GARTH D. WARREN	WASTEWATER DEPARTMENT STANDARD DWG MECHANICAL HVAC SYMBOLS AND LEGENDS, ABBREVIATIONS, AND NOTES
RECOMMENDED:	<i>Garth D. Warren</i> SR. ENGINEER R.P.E. No. C65259 GARTH D. WARREN	
APPROVED:	<i>Edward H. McCord</i> MANAGER OF WASTEWATER ENGINEERING R.P.E. No. C33317 EDWARD H. MCCORD	MECHANICAL HVAC SYMBOLS AND LEGENDS, ABBREVIATIONS, AND NOTES
SCALE:	NONE	SHEET NO. 1
DATE:	07JAN2009	DRAWING NUMBER



NO.	DATE	REVISION	BY	REC.	APP.
1	04NOV2010	ADDED PROPELLER FAN			

USER: dkreuden
 DATE: 28-FEB-2011 16:26
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 REF 2:
 REF 3:
 REF 4:
 REF 5:
 REF 6:
 REF 7:
 REF 8:
 REF 9:

REF 7:
REF 8:
REF 9:

REF 4:
REF 5:
REF 6:

REF 1: J:\Standard Drawings\ref\std dng bdr.mst
REF 2: std001.r02
REF 3:

USER: rmojca
DATE: 31-DEC-2012 12:53
FILE: J:\Standard Drawings\std001.r04

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			DISCRETE
E	VOLTAGE	SENSOR, PRIMARY ELEMENT		ENERGIZED
F	FLOW RATE	RATIO (FRACTION)		FAILOVER RESET
G	USER'S CHOICE			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
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
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER
W	WEIGHT, FORCE		WELL	
X	SPECIAL/EQUIPMENT	X AXIS	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

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
	ELECTRIC (DISCRETE / ANALOG) CONTROL SIGNALS
	SIGNAL CONTINUATION SYMBOL TO DIFFERENT DRAWING D = DESTINATION DRAWING NUMBER X = INTERFACE LETTER
	SIGNAL CONTINUATION SYMBOL 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
	PROCESS CONTINUATION SYMBOL TO DIFFERENT DRAWING D = DESTINATION DRAWING NUMBER # = INTERFACE NUMBER
	PROCESS CONTINUATION SYMBOL TO OR FROM PROCESS LINE EXTERNAL TO PROJECT
	PROCESS CONTINUATION SYMBOL 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

INSTRUMENT SYMBOL CONFIGURATION

EQUIPMENT CODE, FUNCTIONAL IDENTIFICATION (SEE NOTE 2)

MODIFIERS

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

FUNCTION DESCRIPTION

INSTRUMENT NUMBER ASSIGNED PER THIS DRAWING

LOGIC & CONTROL SEQUENTIAL SYMBOLS	
	INTERLOCK SYMBOL
	INTERLOCK SYMBOL WITH NUMBER TO DESCRIBE CONTROL STATEMENTS OR INTERLOCK FUNCTIONS ON THE P&ID

RTU / COMPUTER SYMBOLS	
	NORMALLY ACCESSIBLE TO OPERATOR AS INDICATOR/CONTROLLER/RECORDER OR ALARM POINT
	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
- SEE DRAWING STD-M-001 FOR PROCESS SYMBOLS.
 - SEE ANSI/ISA S5.1, INSTRUMENTATION SYMBOLS AND IDENTIFICATION, FOR MORE DETAILS.
 - SEE DISTRICT WASTEWATER ENGINEERING STANDARD PRACTICE WESP 130.0 AND STANDARD DRAWING STD-G-004, G-004.1, G-005 & G-006 FOR DIRECTION ON ASSIGNING NEW TAG NUMBERS.



NO.	DATE	REVISION	BY	REC.	APP.
1	27DEC2012	REVISED ENGR STAMP AND SIGNATURE	MM	BL	SM
2	18JUL2011	REVISED GENERAL NOTE #3	MM	BL	SM
3	18JUL2011	REV INST SYM CONFIG MA & PROCESS DESIGNATORS	MM	BL	SM
4	04NOV2010	MOVED PROCESS SYMBOLS TO STD-M-001	MM	BL	SM

DESIGNED BY:	R. MAC
DRAWN BY:	WASTEWATER DRAFTING
DESIGN CHECKED BY:	R.P.E. No. E13444
APPROVED:	MANAGER of WASTEWATER ENGINEERING R.P.E. No. C33317

EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO. 1 OAKLAND, CALIFORNIA	
WASTEWATER DEPARTMENT STANDARD DWG INSTRUMENTATION LEGENDS, SYMBOLS AND ABBREVIATIONS	
SCALE: NONE	DATE: 27DEC2012
STD-I-001 DRAWING NUMBER	4 REV.



LEGEND FOR PLANS

	EXPOSED CONDUIT(S)		GENERATOR
	CONCEALED CONDUIT RUN(S) (FLOOR, WALL, CEILING & UNDERGROUND)		GROUND ROD
	CONDUIT(S) TURN UPWARD		THERMOSTAT
	CONDUIT(S) TURN DOWNWARD		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)
	HOME RUN TO PANEL		MANUAL FIRE ALARM BOX
	FLEXIBLE CONDUIT		HEATER
	CABLE TRAY (TRIA) IDENTIFIES TRAY NO. "IA"		MH - MANHOLE, HH - HANDHOLE, PB - PULL BOX
	CONDUIT DESIGNATION (REFER TO CONDUIT SCHEDULE FOR SIZE, FILL, ROUTING, ETC.)		TELEPHONE
	CROSSHATCHES INDICATE NUMBER OF CONDUCTORS (TWO HOT, NEUTRAL, & GROUND). NO DESIGNATION OR CROSSHATCH INDICATES 2 #12 & #12 GND IN 3/4" CONDUIT, APPLICABLE ONLY TO LIGHTING & RECEPTACLE 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 ENCASUREMENT), NUMBER OF CIRCLES DOES NOT REPRESENT THE NUMBER OF CONDUITS IN THE ENCASUREMENT		
	JUNCTION BOX		
	JUNCTION BOX - CEILING MOUNTED		
	FIELD INSTRUMENTATION		
	INCANDESCENT OR HID 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 TYPE LIGHTING FIXTURE. (SAME AS ABOVE FOR DESIGNATION)		
	EMERGENCY LIGHTING FIXTURE (SAME AS ABOVE FOR DESIGNATION)		
	POLE-MOUNTED INCANDESCENT OR HID TYPE LIGHTING FIXTURE (SAME AS ABOVE FOR DESIGNATION)		
	FLUORESCENT LIGHTING FIXTURE (SAME FOR DESIGNATION)		
	FLUORESCENT 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		

LEGEND FOR SINGLE LINE AND SCHEMATIC DIAGRAMS

	NEW		METAL OXIDE VARISTORS(MOV)
	EXISTING		FUSES WITH BLOWN FUSE NEON LIGHT INDICATORS,
	EXISTING TO BE REMOVED		SPECIAL RECEPTACLE AND PLUG, 600V
	PULLOUT, DRAWOUT OR CONNECTOR		ATS, AUTOMATIC TRANSFER SWITCH
	SHUNT TRIP		THERMAL OVERLOAD
	MOLDED CASE CIRCUIT BREAKER, SOLID-STATE OR THERMAL MAGNETIC, 600 V, XX LETTERING FOR AMP TRIP, YY LETTERING FOR AMP FRAME		SOLID STATE STARTER WITH BYPASS CONTACTOR
	UNLESS OTHERWISE NOTED, COMBINATION MOTOR CIRCUIT PROTECTOR, FUSELESS CURRENT LIMITING TYPE AND FULL VOLTAGE NON-REVERSING MAGNETIC STARTER WITH OVERLOAD PROTECTION AND 480-120 VOLT CONTROL TRANSFORMER. NUMBER INDICATES NEMA STARTER SIZE.		ELAPSED TIME METER
	SAME AS ABOVE, EXCEPT SOLID-STATE STARTER AND THERMAL MAGNETIC CIRCUIT BREAKER		TIME DELAY RELAY COIL
	POWER BREAKER WITH DRAWOUT FEATURE		CONTROL RELAY COIL.
	AIR CIRCUIT BREAKER WITH DRAWOUT FEATURE		RELAY COIL WITH DIODE SUPPRESSOR
	VARIABLE FREQUENCY DRIVE UNIT		NORMALLY OPEN CONTACT
	HEAVY DUTY, FUSIBLE DISCONNECT (SAFETY) SWITCH, 600V		NORMALLY CLOSED CONTACT
	HEAVY DUTY, NON-FUSIBLE DISCONNECT (SAFETY) SWITCH, 600V		OPEN CONTACT, DRAWOUT TYPE
	FUSES		CLOSE CONTACT, DRAWOUT TYPE
	DISCONNECT SWITCH, HEAVY DUTY 600 VAC 3 POLE, NON-FUSIBLE; UNLESS OTHERWISE INDICATED, IN NEMA 4X ENCLOSURE		NORMALLY OPEN MOMENTARY PUSHBUTTON
	TERMINAL BLOCK		NORMALLY CLOSED MOMENTARY PUSHBUTTON
	REACTOR		MAINTAINED PUSHBUTTONS
	CAPACITORS		SELECTOR SWITCH
	SURGE CAPACITOR		SELECTOR SWITCH MOMENTARY SPRING RETURN TO CENTER
	POWER TRANSFORMER (X = SIZE OF TRANSFORMER) Δ - DELTA Δ - DELTA WITH MIDPOINT GROUNDED Y - GROUNDED WYE Y ₂ - HIGH RESISTANCE GROUNDED WYE		TOGGLE SWITCH
	CURRENT TRANSFORMER: 3 INDICATES QUANTITY AND 600/5 INDICATES RATIO		LOCKOUT STOP SWITCH - NORMALLY CLOSED
	POTENTIAL TRANSFORMER		LOCKOUT STOP SWITCH - NORMALLY OPEN
	GROUND FAULT SENSOR. WHEN SHOWN WITH BREAKER, SENSOR IS AN INTEGRAL PART OF THE BREAKER		TRANSFORMER
	SYNCHRONOUS MOTOR (500=HP)		CIRCUIT BREAKER
	RELAY 49 - DEVICE NO. IDENTIFICATION (ANSI C37.2) (INDICATES AC TERMINAL RELAY)		FUSE
	SURGE OR LIGHTNING ARRESTORS		GROUND
	VOLTMETER SELECTOR SWITCH: OFF-A0, B0, C0, AG, B0, CG		INDICATING LIGHT, LETTER INDICATES LENS COLOR
	AMMETER SELECTOR SWITCH: OFF-A0, B0, C0		PUSH-TO-TEST INDICATING LIGHT, LETTER INDICATES LENSE COLOR
	ELECTRIC INDUCTION MOTOR. NUMBER INDICATES HORSEPOWER		SOLENOID
			HORN
			MICROWAVE SYSTEM

NOTES

- GENERAL NOTES**
- 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.
 - THIS IS A GENERALIZED LEGEND SHEET. THIS CONTRACT MAY NOT USE ALL INFORMATION SHOWN.
 - 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.
 - INFORMATION SHOWN MAY NOT BE ALL INCLUSIVE. SEE ALSO ANSI C37.2, Y1.1, Y32.2, AND Y32.9.
 - VERIFY ALL COLOR REQUIREMENTS BEFORE ORDERING MATERIALS.
 - 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.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL CONDUIT SUPPORTS PER SPECIFICATION 26 05 33.
- PLAN NOTES**
- 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.
 - LOWER CASE LETTERS ADJACENT TO A SWITCH OR LIGHT FIXTURE INDICATE A SWITCHED CIRCUIT. FOR FOUR LAMP FLOURESCENT FIXTURES WIRED IN PAIRS WITHIN EACH FIXTURE, THE "d" SWITCH CONTROLS THE OUTER LAMPS AND THE "b" SWITCH CONTROLS THE INNER LAMPS; WIRE 3 LAMP FIXTURES SIMILARLY.
 - CONDUIT AND WIRE LAYOUT FOR WIRING AND RECEPTACLES, NOT SHOWN. PROVIDE PER NEC.
 - ALL WIRING AND CONDUITS NOT SHOWN BUT NECESSARY TO MAKE A FUNCTIONAL SYSTEM SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
 - ALL CONDUITS SHALL BE TAGGED WITH THE CONDUIT NUMBER SHOWN ON THE CONDUIT SCHEDULE. CONDUIT TAG SHALL BE 1/2" Ø STAINLESS STEEL SS-304, TAG SHALL BE CHAINED TO THE CONDUIT.
 - REFER TO SPECIFICATION SECTION 01 35 13 FOR PHASING OF EQUIPMENT DEMOLITION AND INSTALLATION.



2/25/2013

DESIGNED BY:	R. MAC	EAST BAY MUNICIPAL UTILITY DISTRICT SPECIAL DISTRICT NO. 1 OAKLAND, CALIFORNIA				
DRAWN BY:	WASTEWATER DRAFTING					
DESIGN CHECKED BY:	R.P.E. No. E13444	WASTEWATER DEPARTMENT STANDARD DWG ELECTRICAL LEGENDS, ABBREVIATIONS AND NOTES				
REVIEW:						
RECOMMENDED:	SR. ENGINEER R.P.E. No. E16072	SCALE NONE				
APPROVED:	MANAGER OF WASTEWATER ENGINEERING R.P.E. No. C33317	DATE 25FEB2013				
NO.	DATE	REVISION	BY	REC.	APP.	4

3" ON ORIGINAL DOCUMENT
0 1 2 3

REF 7: REF 8: REF 9: REF 4: REF 5: REF 6: REF 1: J:\Standard Drawings\ref\std dng bdr.mst REF 2: REF 3: USER: lducker DATE: 26-FEB-2013 11:23 FILE: J:\Standard Drawings\std\01-04.dgn PLOT SCALE: 0.1666671