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TYPICAL VARIABLE LETTER COMBINATIONS

FIRST LETTERS	INITIATING OR MEASURED VARIABLE	CONTROLLERS: RECORDING	CONTROLLERS: INDICATING	CONTROLLERS: BLIND	CONTROLLERS: SELF-ACTUATED CONTROL VALVES	READOUT DEVICES: RECORDING	READOUT DEVICES: INDICATING	SWITCHES AND ALARM DEVICES: HIGH	SWITCHES AND ALARM DEVICES: LOW	SWITCHES AND ALARM DEVICES: COMB	TRANSMITTERS: RECORDING	TRANSMITTERS: INDICATING	TRANSMITTERS: BLIND	SOLENOIDS, RELAYS, COMPUTING DEVICES	PRIMARY ELEMENT	TEST POINT	WELL OR PROBE	VIEWING DEVICE, GLASS	SAFETY DEVICE	FINAL ELEMENT
A	Analysis	ARC	AIC	AC	–	AR	AI	ASH	ASL	ASHL	ART	AIT	AT	AY	AE	AP	AW	–	–	AZ
B	Burner/Combustion	BRC	BIC	BC	–	BR	BI	BSH	BSL	BSHL	BRT	BIT	BT	BY	BE	–	BW	BG	–	BZ
C	User's Choice	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
D	User's Choice	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
E	Voltage	ERC	EIC	EC	–	ER	EI	ESH	ESL	ESHL	ERT	EIT	ET	EY	EE	–	–	–	–	EZ
F	Flow Rate	FRC	FIC	FC	FCV	FR	FI	FSH	FSL	FSHL	FRT	FIT	FT	FY	FE	FP	–	FG	–	FZ
FQ	Flow Quantity	FQRC	FQIC	–	–	FQR	FQI	FQSH	FQSL	FQSHL	–	FQIT	FQT	FQY	FQE	–	–	–	–	FQZ
FF	Flow Ratio	FFRC	FFIC	FFC	–	FFR	FFI	FFSH	FFSL	FFSHL	–	–	–	–	–	–	–	–	–	FFZ
G	User's Choice	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
H	Hand	–	HIC	HC	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
I	Current	IRC	IIC	–	–	IR	II	ISH	ISL	ISHL	IRT	IIT	IT	IY	IE	–	–	–	–	IZ
J	Power	JRC	JIC	–	–	JR	JI	JSH	JSL	JSHL	JRT	JIT	JT	JY	JE	–	–	–	–	JZ
K	Time	KRC	KIC	KC	KCV	KR	KI	KSH	KSL	KSHL	KRT	KIT	KT	KY	KE	–	–	–	–	KZ
L	Level	LRC	LIC	LC	LCV	LR	LI	LSH	LSL	LSHL	LRT	LIT	LT	LY	LE	–	LW	LG	–	LZ
M	User's Choice	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
N	User's Choice	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
O	User's Choice	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
P	Pressure/Vacuum	PRC	PIC	PC	PCV	PR	PI	PSH	PSL	PSHL	PRT	PIT	PT	PY	PE	PP	–	–	PSE	PZ
PD	Pressure Differential	PDRC	PDIC	PDC	PDCV	PDR	PDI	PDSH	PDSL	PDSHL	PDRT	PDIT	PDT	PDY	PDE	PDP	–	–	–	PDZ
Q	Quantity	QRC	QIC	–	–	QR	QI	QSH	QSL	QSHL	QRT	QIT	QT	QY	QE	–	RW	–	–	QZ
R	Radiation	RRC	RIC	RC	–	RR	RI	RSH	RSL	RSHL	RRT	RIT	RT	RY	RE	–	–	–	–	RZ
S	Speed/Frequency	SRC	SIC	SC	SCV	SR	SI	SSH	SSL	SSHL	SRT	SIT	ST	SY	SE	–	–	–	–	SZ
T	Temperature	TRC	TIC	TC	TCV	TR	TI	TSH	TSL	TSHL	TRT	TIT	TT	TY	TE	TP	TPW	–	TSE	TZ
TD	Temperature Differential	TDRC	TDIC	TDC	TDCV	TDR	TDI	TDSH	TDSL	TDSHL	TDRT	TDIT	TDT	TDY	TDE	TDP	TDPW	–	–	TDZ
U	Multivariable	–	–	–	–	UR	UI	–	–	–	–	–	–	–	–	–	–	–	–	–
V	Vibration/Machinery Analysis	–	–	–	–	VR	VI	VSH	VSL	VSHL	VRT	VIT	VT	VY	VE	–	–	–	–	VZ
W	Weight/Force	WRC	WIC	WC	WCV	WR	WI	WSH	WSL	WSHL	WRT	WIT	WT	WY	WE	–	–	–	–	WZ
WD	Weight/Force Differential	WDRC	WDIC	WDC	WDCV	WDR	WDI	WDSH	WDSL	WDSHL	WDRT	WDIT	WDT	WDY	WDE	–	–	–	–	WDZ
X	Unclassified	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Y	Event/State/Presence	–	YIC	YC	–	YR	YI	YSH	YSL	YSHL	YRT	YIT	YT	YY	YE	–	–	–	–	YZ
Z	Position/Dimension	ZRC	ZIC	ZC	ZCV	ZR	ZI	ZSH	ZSL	ZSHL	ZRT	ZIT	ZT	ZY	ZE	–	–	–	–	ZZ
ZD	Gauging/Deviation	ZDRC	ZDIC	ZDC	ZDCV	ZDR	ZDI	ZDSH	ZDSL	ZDSHL	ZDRT	ZDIT	ZDT	ZDY	ZDE	–	–	–	–	ZDZ

NOTE: This table is not all-inclusive.

SUCEEDING LETTERS: VALUE	DESCRIPTION
A	ALARM
B	–
C	CLOSED
D	–
E	–
F	–
–	–
–	–
G	–
H	HIGH
HH	HIGH HIGH
I	–
J	–
K	–
L	LOW
LL	LOW LOW
M	MIDDLE
N	–
O	OPEN
P	–
Q	–
R	–
S	–
T	–
U	–
V	–
W	–
–	–
X	–
Y	–
Z	–
–	–

LINE CODES

- MAJOR PROCESS LINE
- MINOR PROCESS LINE
- PROCESS/CLEANING AIR
- ELECTRICAL
- PLC TO SCADA COMMUNICATION
- DESCRIPTION 1 / DESCRIPTION 2 / REF SHT I-X.X — PROCESS CONTINUATION WITHIN SCOPE
- DESCRIPTION 1 / DESCRIPTION 2 / REF SHT I-X.X — PROCESS CONTINUATION WITHIN SCOPE WITH BACKFLOW
- DESCRIPTION 1 / DESCRIPTION 2 — PROCESS CONTINUATION OUT OF SCOPE
- DESCRIPTION 1 / DESCRIPTION 2 — PROCESS CONTINUATION OUT OF SCOPE WITH BACKFLOW
- 00"-XXXXX-XXX-000 — LINE NUMBER

LINE NUMBERING

00" - DI - INFLT - 001 (EXAMPLE)

- 001 — SEQUENTIAL LINE NO.
- INFLT — FLUID CODE
- DI — PIPE MATERIAL
- 00" — NOMINAL LINE SIZE

PIPE MATERIAL ABBRIVIATION

304SS	304 STAINLESS STEEL
BRD	BRAIDED O2 HOSE
DI	DUCTILE IRON
FLEX	FLEXIBLE HOSE
HDGCS	HOT DIPPED GALVANIZED CARBON STEEL
PVC	POLYVINYL CHLORIDE

FLUID CODE ABBREVIATION

CDS	CHEMICAL DOSING
DRN	DRAIN
INFLT	INFLUENT
OXY	OXYGEN
OVRFL	OVERFLOW
PA	PROCESS AIR
PRMT	PERMEATE
PW	PLANT WATER
RECYC	INTERNAL RECYCLE
TRAN	TRANSFER
WAS	WASTE ACTIVATED SLUDGE

LINE NUMBER GROUPS

000	OVERFLOW
100	INFLUENT
200	INTERNAL RECYCLE
300	PERMEATE
400	PROCESS AIR
500	CHECMICAL DOSING
600	TRANSFER
700	PLANT WATER/RINSE
800	DRAIN
900	WASTE ACTIVATED SLUDGE

EQUIPMENT PREFIXES

AE-DO	Permeate DO Sensor
AE-NIT	Permeate Nitrate Sensor
AE-TURB	Permeate Turbidity Sensor
BLR-1	Blower 1
BLR-2	Blower 2
BLR-3	Blower 3
CB-EQ1	Equalization Coarse Bubble Diffuser
CB-PRC	PRC Coarse Bubble Diffuser
CB-WA1	WAS Tank Coarse Bubble Diffuser
CV-BL1	Blower 1 Check Valve
CV-BL2	Blower 2 Check Valve
CV-BL3	Blower 3 Check Valve
CV-OM1	Mazzei Suction Check Valve
DOCS	DOCS Oxygen Generator
FE-PD1	Permeate Flow Sensor
FR-AS1	Equalization Flow-Regulating Oriface
FR-AS2	WAS Tank Flow-Regulating Oriface
FR-AS3	PRC Tank Flow-Regulating Oriface
FS-1	Fine Screen 1
FS-2	Fine Screen 2
LSH-FS1	Fine Screen High Level Switch
LSL-FS1	Fine Screen 1 Low Level Switch
LSL-FS2	Fine Screen 2 Low Level Switch
LT-EQ1	EQ Level Transmitter
LT-MB1	MBR 1 Level Transmitter
LT-MB2	MBR 2 Level Transmitter
MAZ-OM1	Mazzei Injector
MX-MG1	Mag Mixer
P-AL1	Alum Addition Pump
P-AN1	Permeate Sample Pump
P-CB1	Carbon Addition Pump
P-CP1	Clean-in-Place Pump
P-EQ1	Equalization Pump 1
P-EQ2	Equalization Pump 2
P-MG1	Mag Addition Pump
P-MP1	MPE-50 Addition Pump
P-OP1	Recycle Pump 1
P-OP2	Recycle Pump 2
P-PM1	Permeate Pump 1
P-PM2	Permeate Pump 2
PG-BL1	Blower 1 Pressure Gauge
PG-BL2	Blower 2 Pressure Gauge
PG-BL3	Blower 3 Pressure Gauge
PG-EQ1	Equalization Pump 1 Inlet Pressure Gauge
PG-EQ2	Equalization Pump 1 Discharge Pressure Gauge
PG-EQ3	Equalization Pump 2 Inlet Pressure Gauge
PG-EQ4	Equalization Pump 2 Discharge Pressure Gauge
PG-OM1	Mazzei Inlet Pressure Gauge
PG-OM2	Mazzei Discharge Pressure Gauge
PG-OP1	Recycle Pump 1 Inlet Pressure Gauge
PG-OP2	Recycle Pump 1 Discharge Pressure Gauge
PG-OP3	Recycle Pump 2 Inlet Pressure Gauge
PG-OP4	Recycle Pump 2 Discharge Pressure Gauge
PG-OS1	Oxygen Supply Pressure Gauge
PG-OX1	Speece Cone Pressure Gauge
PG-PM1	Permeate Pump 1 Inlet Pressure Gauge
PG-PM2	Permeate Pump 1 Discharge Pressure Gauge
PG-PM3	Permeate Pump 2 Inlet Pressure Gauge
PG-PM4	Permeate Pump 2 Discharge Pressure Gauge
PRV-BL1	Blower 1 Pressure Relief Valve
PRV-BL2	Blower 2 Pressure Relief Valve
PRV-BL3	Blower 3 Pressure Relief Valve
PT-PD1	Permeate Pressure Trasmitter
SMU-1	Submerged Membrane Unit 1
SMU-2	Submerged Membrane Unit 2
SPC-OX1	Speece Cone
SV-OS1	Oxygen Supply Solenoid Valve
SV-PG1	Permeate Header Vent Solenoid Valve
SV-PG2	Permeate Discharge Solenoid Valve 1

EQUIPMENT PREFIXES CONT'D

SV-PG3	Permeate Discharge Solenoid Valve 2
UV-1	Ultra Violet 1
UV-2	Ultra Violet 2
UV-3	Ultra Violet 3
V-AL1	Alum Addition Pump Inlet Valve
V-AL2	Alum Addition Pump Discharge Valve
V-AN1	Permeate Sample Pump Inlet Valve
V-AN2	Permeate Sample Pump Discharge Valve
V-AS1	Air Header Shut Off Valve
V-AS2	Equalization Air Shut Off Valve
V-AS3	WAS Tank Air Shut Off Valve
V-AS4	PRC Tank Air Shut Off Valve
V-BL1	Blower 1 Isolation Valve
V-BL2	Blower 2 Isolation Valve
V-BL3	Blower 3 Isolation Valve
V-CB1	Carbon Addition Pump Inlet Valve
V-CB2	Carbon Addition Pump Discharge Valve
V-CP1	Clean-in-Place Source Valve
V-CP2	Clean-in-Place Fill Valve 1
V-CP3	Clean-in-Place Header Valve 1
V-CP4	Clean-in-Place Pump Throttle Valve
V-CP5	Clean-in-Place Fill Valve 2
V-CP6	Clean-in-Place Header Valve 2
V-DC1	Diffuser Flush Cleaning Valve
V-EQ1	Equalization Drain Valve
V-EQ2	Equalization Pump 1 Inlet Valve
V-EQ3	Equalization Pump 1 Discharge Valve
V-EQ4	Equalization Pump 2 Inlet Valve
V-EQ5	Equalization Pump 2 Discharge Valve
V-MB1	MBR 1 Inlet Valve
V-MB2	MBR 1 Permeate Outlet Valve
V-MB3	MBR 1 Air Inlet Valve
V-MB4	MBR 1 Wasting Valve
V-MB5	MBR 2 Inlet Valve
V-MB6	MBR 2 Permeate Outlet Valve
V-MB7	MBR 2 Air Inlet Valve
V-MB8	MBR 2 Wasting Valve
V-MB9	MBR 1 Internal Recycle Valve
V-MB10	MBR 2 Internal Recycle Valve
V-MG1	Mag Addition Pump Inlet Valve
V-MG2	Mag Addition Pump Discharge Valve
V-MP1	MPE-50 Addition Pump Inlet Valve
V-MP2	MPE-50 Addition Pump Discharge Valve
V-OP1	Recycle Inlet Valve 1
V-OP2	Recycle Pump 1 Inlet Valve
V-OP3	Recycle Pump 1 Check Valve
V-OP4	Recycle Pump 1 Discharge Valve
V-OP5	Recycle Discharge Valve 1
V-OP6	Recycle Inlet Valve 2
V-OP7	Recycle Pump 2 Inlet Valve
V-OP8	Recycle Pump 2 Check Valve
V-OP9	Recycle Pump 2 Discharge Valve
V-OP10	Recycle Discharge Valve 2
V-OS1	Oxygen Isolation Valve 1
V-OS2	Oxygen Inlet Drain Valve
V-OS3	Oxygen Supply Check Valve
V-OS4	Oxygen Isolation Valve 2
V-OX1	Speece Cone Isolation Valve
V-PD1	Permeate Header Shut Off Valve
V-PD2	Permeate Diversion Valve
V-PD3	Permeate Discharge Valve
V-PM1	Permeate Header Vent Valve
V-PM2	Permeate Pump 1 Inlet Valve
V-PM3	Permeate Pump 1 Discharge Valve
V-PM4	Permeate Pump 2 Inlet Valve
V-PM5	Permeate Pump 2 Discharge Valve
V-PM6	Permeate Pump 1 Check Valve
V-PM7	Permeate Pump 2 Check Valve
V-UV1	UV Discharge Isolation Valve
V-UV2	UV Vent Valve
V-WA1	WAS Tank Coarse Drain Valve
WEG	Weir Gate

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P&ID
CODES LEGEND

DATE	6/22/16	BY	MCS	CHECK'D	PDF
DWG SCALE	NONE				
JOB NUMBER	061016-1-DS-R1				
SHEET	I-1.1 OF 9				

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CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP PHASE I

MICROBLOX P&ID - CODES LEGEND

JOB NO:	J-25328.0002
DATE:	12/16/16
DRAWN:	DNF
DESIGNED:	MFY
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	NO SCALE

I-1.1

INLINE INSTRUMENTS

FE-000000 NOZZLE	FE-000000 MAGNETIC ELEMENT	FE-000000 VORTEX SHEDDING	FE-000000 TURBINE
FE-000000 ORIFICE	FE-000000 VENTURI	FE-000000 POSITIVE DISPLACEMENT	FE-000000 SONIC
FE-000000 PITOT	FE-000000 AVERAGING PITOT	FE-000000 TARGET	FE-000000 ROTOMETER
FE-000000 RESISTANCE TEMPERATURE DIFFERENTIAL	FE-000000 VARIABLE AREA		

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

	FIELD MOUNTED	PRIMARY LOCATION ACCESSIBLE TO OPERATOR	PRIMARY LOCATION INACCESSIBLE TO OPERATOR	AUXILIARY LOCATION ACCESSIBLE TO OPERATOR	HARDWARE INTERLOCK
DISCRETE INSTRUMENTS					
SHARED DISPLAY SHARED CONTROL					DCS "SOFT" INTERLOCK
COMPUTER FUNCTION					
PROGRAMMABLE LOGIC CONTROL					

VALVE SYMBOLS

NC NO

- GATE VALVE
- GATE VALVE
- BALL VALVE
- DIAPHRAGM VALVE
- PLUG VALVE
- 3-WAY BALL VALVE
- NEEDLE VALVE
- LUGGED BUTTERFLY VALVE
- WAFERED BUTTERFLY VALVE
- CHECK VALVE
- DOUBLE LEAF CHECK VALVE

VALVE ACTUATORS

- DIAPHRAGM ACTUATOR
- LEVER
- MOTOR ACTUATOR
- HAND WHEEL
- SOLENOID ACTUATOR
- CHAIN WHEEL
- CYLINDER ACTUATOR

SELF-ACTING REGULATORS

- PRESSURE REDUCING
- REGULATOR WITH EXTERNAL PILOT
- BACK PRESSURE
- DIFFERENTIAL PRESSURE

RELIEF DEVICES

- PRESSURE RELIEF
- RUPTURE DISK FOR PRESSURE RELIEF
- VACUUM RELIEF
- RUPTURE DISK FOR VACUUM RELIEF

MECHANICAL EQUIPMENT

- PMP-000000 AIRLIFT PUMP
- PMP-000000 SUBMERSIBLE PUMP
- PMP-000000 CENTRIFUGAL PUMP
- PMP-000000 METERING PUMP
- PMP-000000 PROGRESSIVE CAVITY PUMP
- MXR-000000 MIXER
- MXR-000000 WALL MOUNTED MIXER
- BLR-000000 CENTRIFUGAL BLOWER
- BLR-000000 ROTARY BLOWER
- BLOWER AIR FILTER
- WE-000000 WEIR
- WEG-000000 WEIR GATE
- LE-000000 ULTRA SONIC LEVEL TRANSMITTER
- LE-000000 SUBMERSIBLE PRESSURE SENSOR
- TC-000000 TABLET CHLORINATOR
- FS-000000 MANUAL FINE SCREEN
- FS-000000 AUTOMATIC FINE SCREEN
- COARSE BUBBLE DIFFUSER
- FBD-000000 FINE BUBBLE DIFFUSER
- TV-000000 TELESCOPING VALVE
- WASTE BASKET
- SMU-000000 SINGLE DECK MEMBRANE
- CWC-000000 CONVEYOR WASHER COMPACTOR
- GRC-000000 GRIT CLASSIFIER
- SHEAR TUBE
- WASTE CONTAINER
- SMU-000000 DOUBLE DECK MEMBRANE
- SMU-000000 SUSPENDED MEMBRANE
- DRAFT TUBE
- MULTI-EDUCTOR DRAFT TUBE

PIPING SYMBOLS

- Y STRAINER
- BLIND FLANGE
- FUNNEL
- ECCENTRIC REDUCER 0x0
- CONCENTRIC REDUCER 0x0
- EDT-000000 EDUCTOR
- WELDED CAP
- WELDED PIPE END
- SCREWED CAP
- UNION
- CAMLOCK FITTING
- FLEXIBLE LINE
- SPECTACLE BLIND
- EXPANSION JOINT
- TIE-IN POINT

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P&ID
SYMBOLS LEGEND

DATE	6/22/16	BY	MCS	CHECK'D	PDF
DWG SCALE	NONE				
JOB NUMBER	061016-1-DS-R1				
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MICROBLOX P&ID - SYMBOLS LEGEND

JOB NO:	J-25328.0002
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DESIGNED:	MFY
REVIEWED:	MFY
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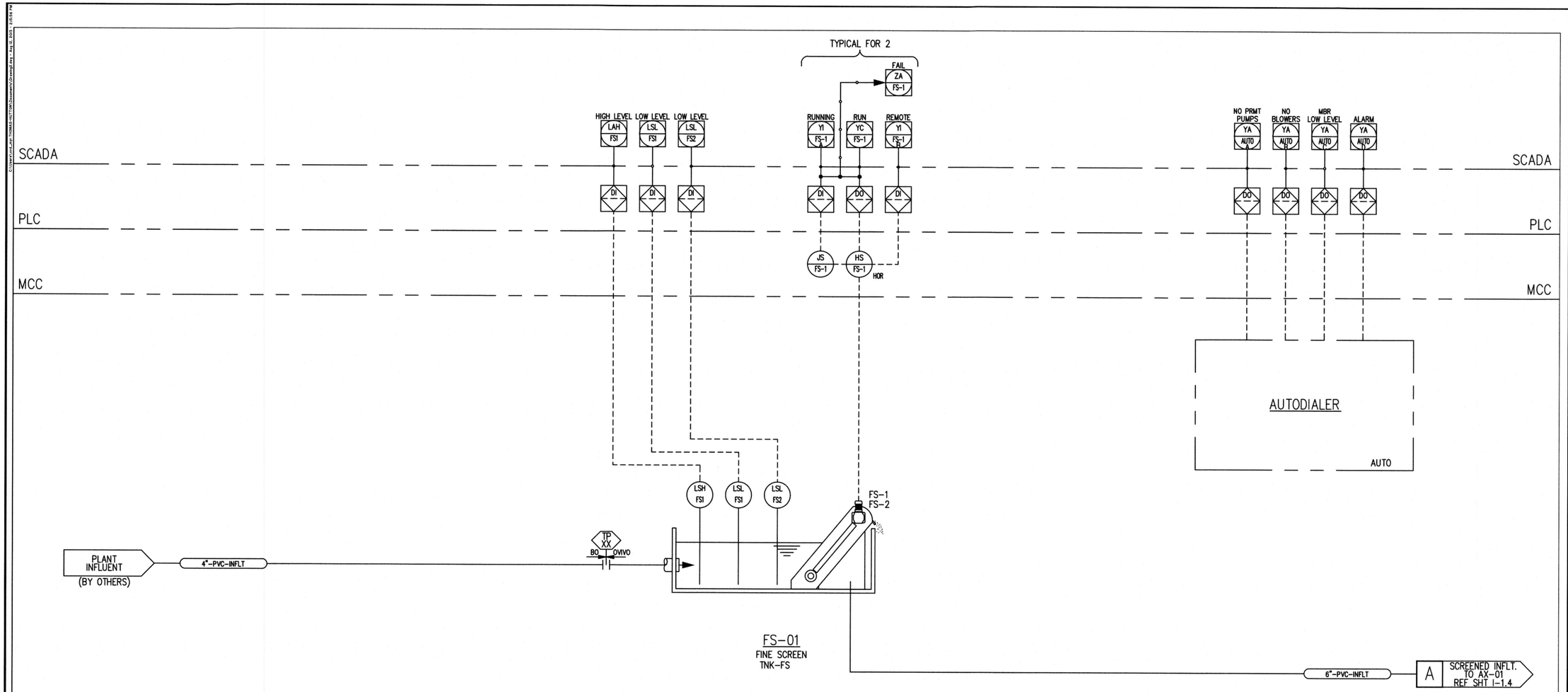
SCALE:	1" = 33'

I-1.2



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3. SUPPLIED BY OTHERS.
4. SUPPLIED BY OVIVO.
5. FUTURE.

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P&ID
FINE SCREENS

DATE	6/22/16	BY	MCS	CHECK'D	PDF
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MICROBLOX P&ID - FINE SCREENS

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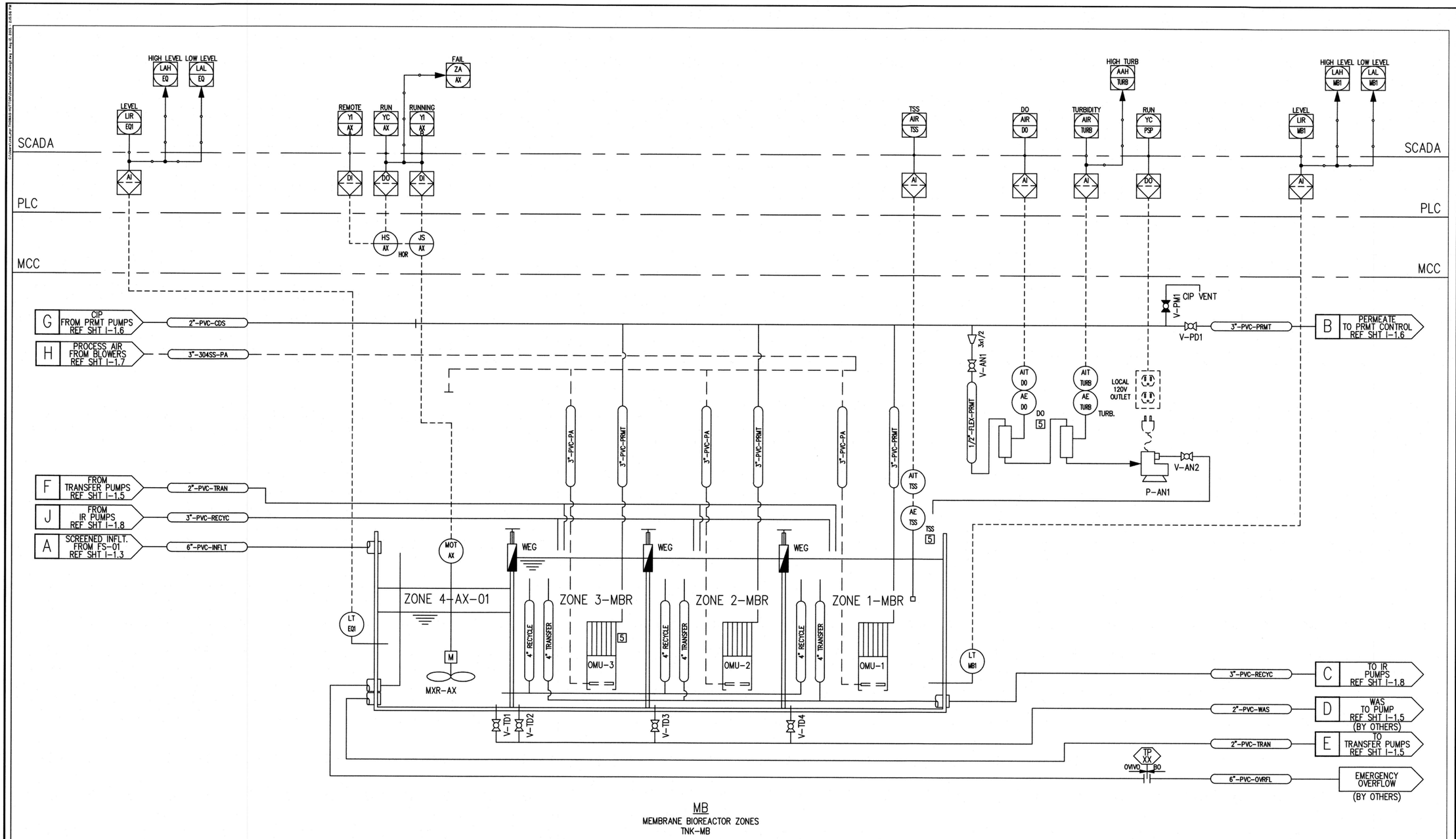

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MEMBRANE BIOREACTOR ZONES

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MICROBLOX P&ID - MEMBRANE BIOREACTOR ZONES

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I-1.4

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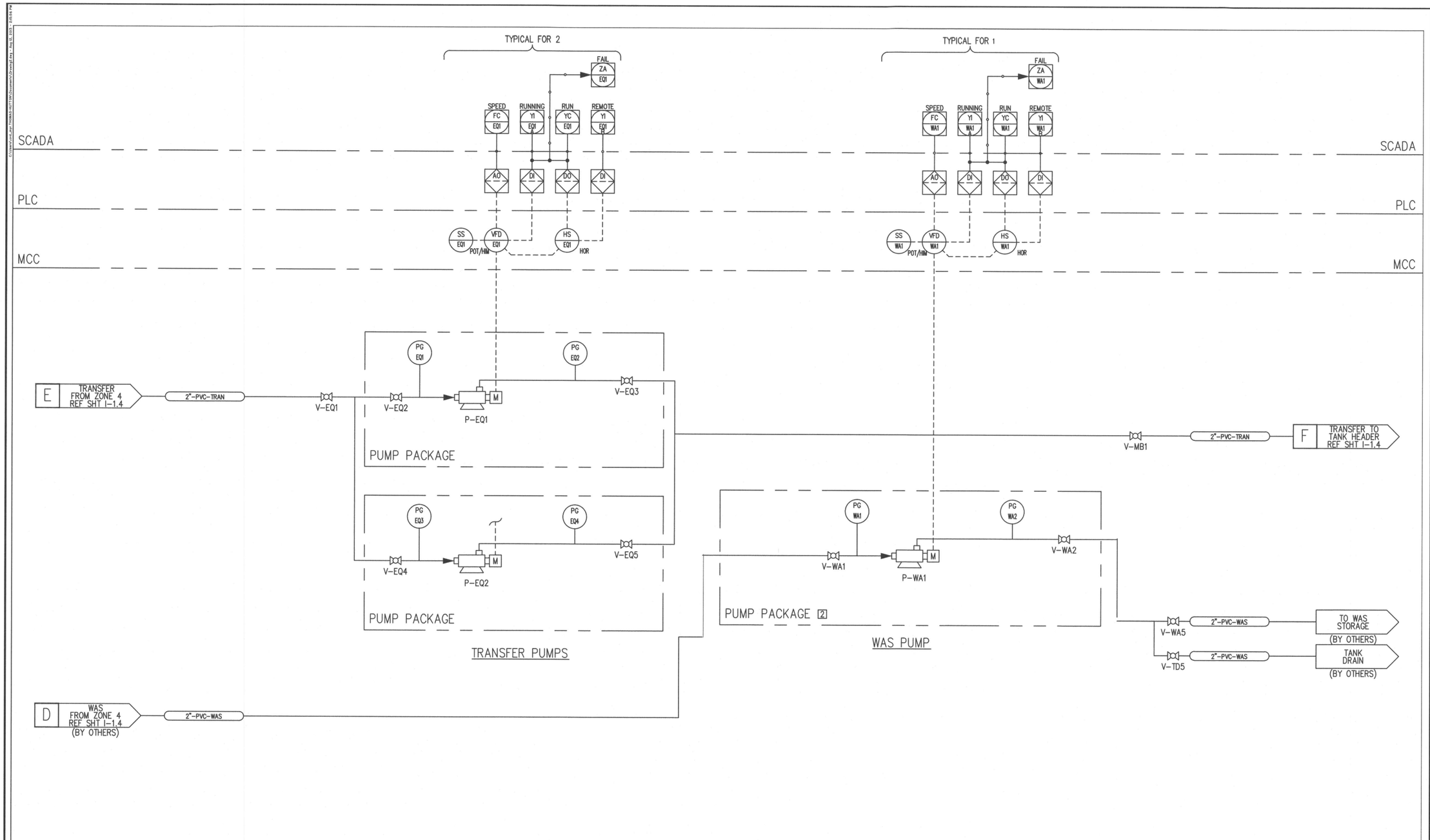

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P&ID
TRANSFER AND WAS PUMPS

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DWG SCALE	NONE				
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SHEET	I-1.5 OF 9				

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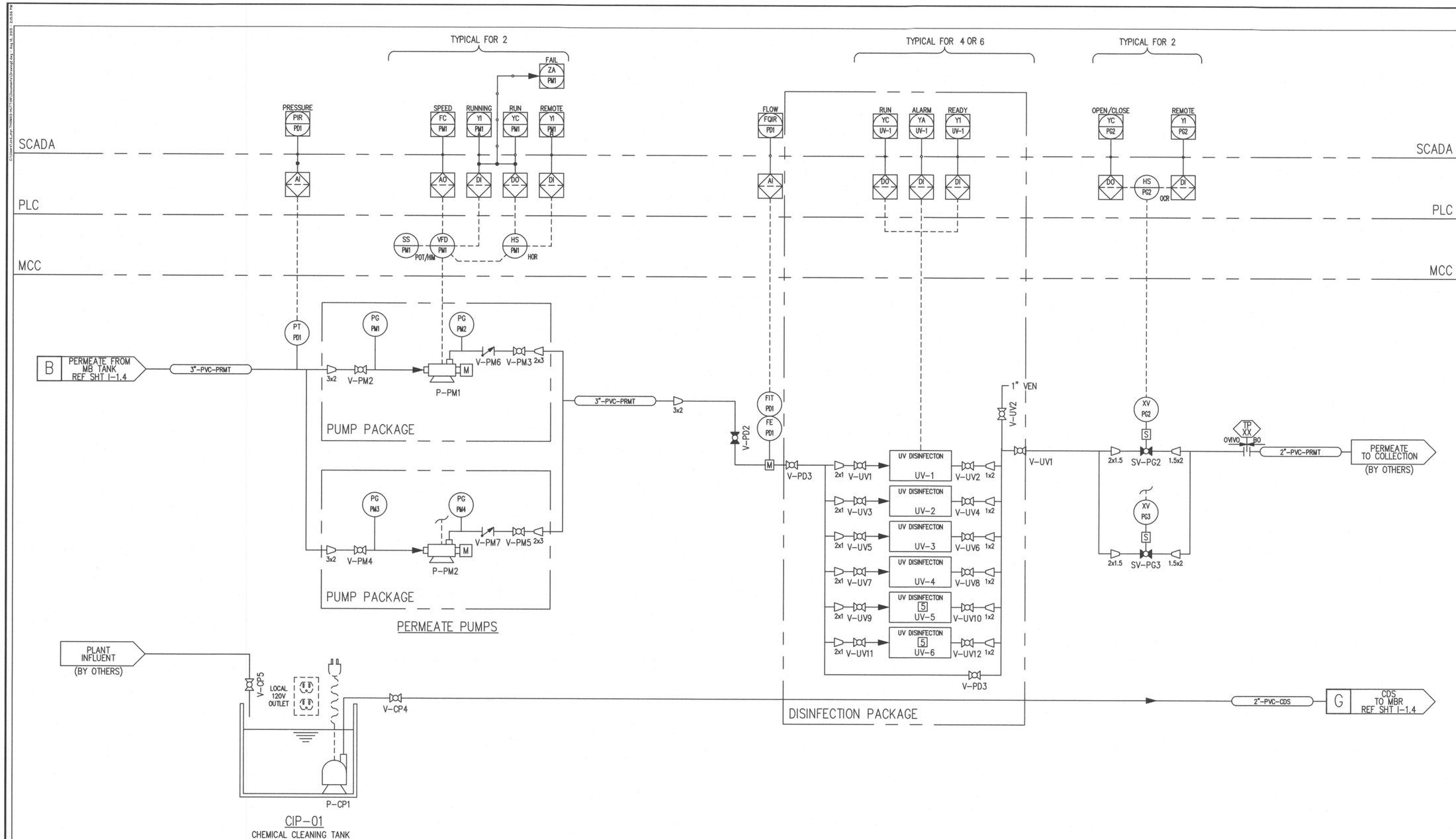
KIAWAH RIVER PLANTATION HOLDINGS, LP
CHARLESTON COUNTY, SOUTH CAROLINA

KIAWAH RIVER PLANTATION WWTP PHASE I

MICROBLOX P&ID - TRANSFER AND WAS PUMPS

JOB NO:	J-25328.0002
DATE:	12/16/16
DRAWN:	DNF
DESIGNED:	MFY
REVIEWED:	MFY
APPROVED:	MFY
SCALE:	NO SCALE

I-1.5



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P&ID
PERMEATE CONTROL AND DISINFECTION

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KIAWAH RIVER PLANTATION WWTP PHASE I
MICROBLOX P&ID - PERMEATE CONTROL AND DISINFECTION

JOB NO:	J-25326.0002
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SCALE:	NO SCALE

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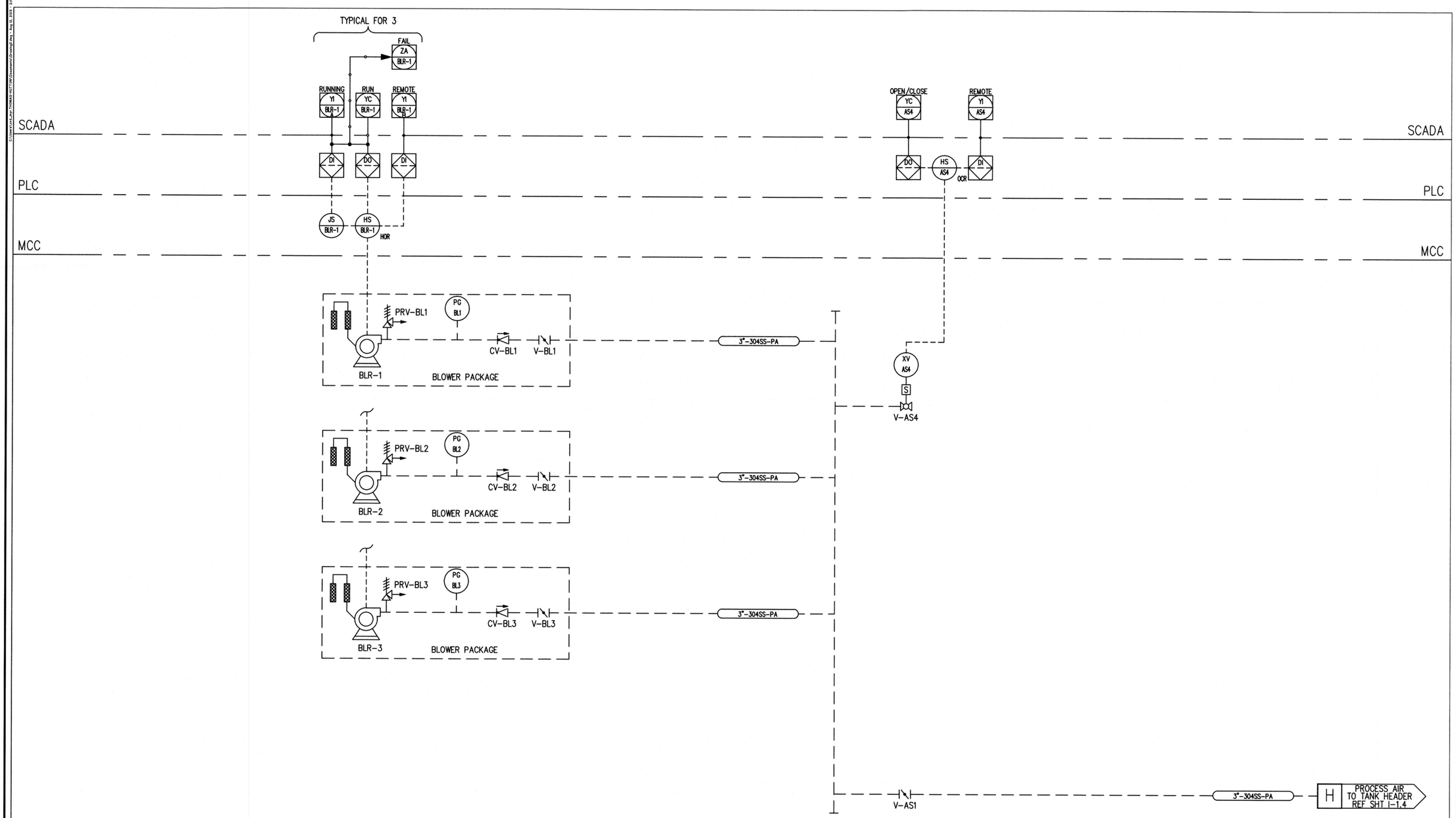

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P&ID
BLOWERS

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MICROBLOX P&ID - BLOWERS

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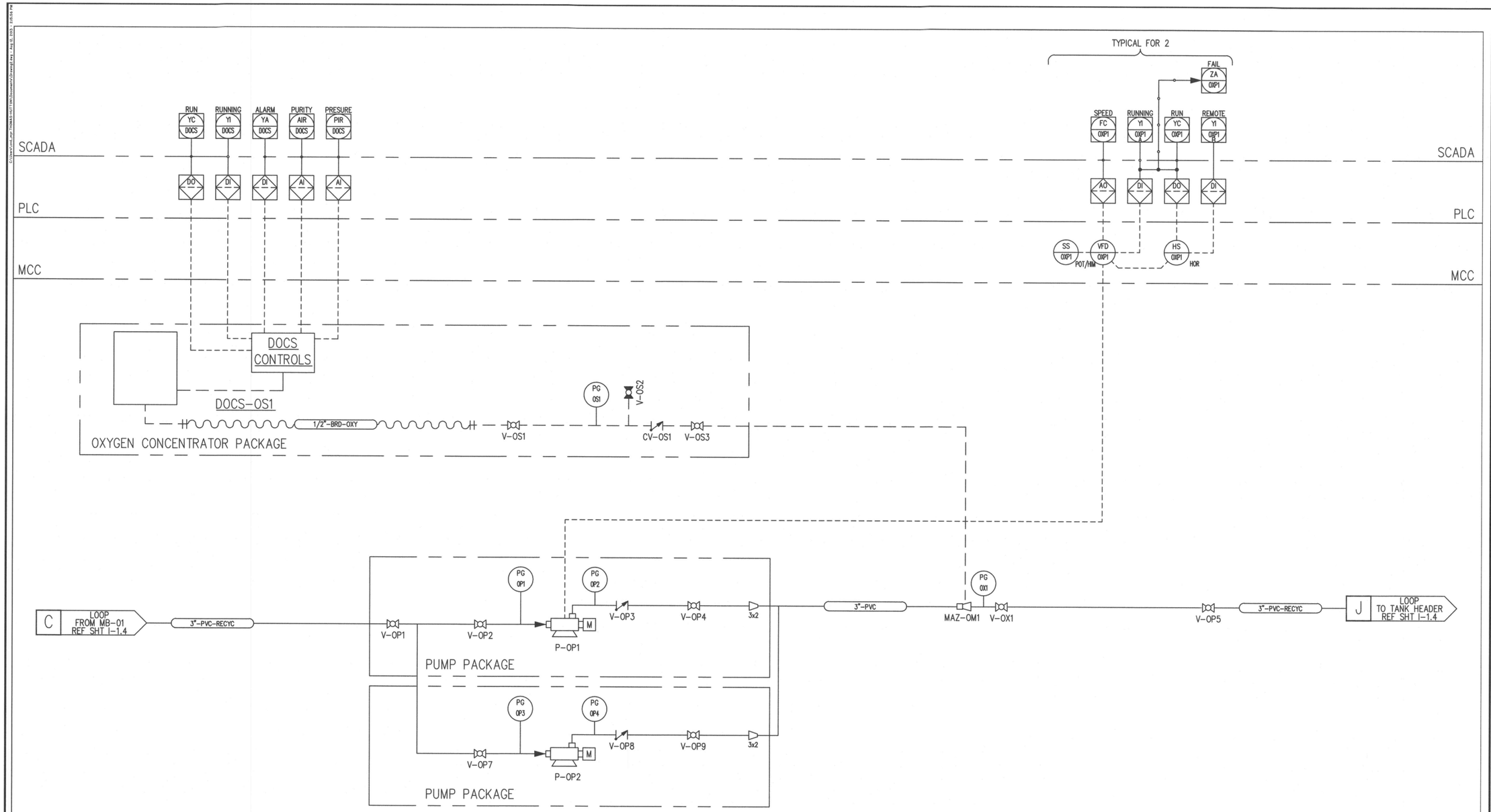

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P & I D
SUPPLEMENTAL OXYGEN

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MICROBLOX P&ID - SUPPLEMENTAL OXYGEN

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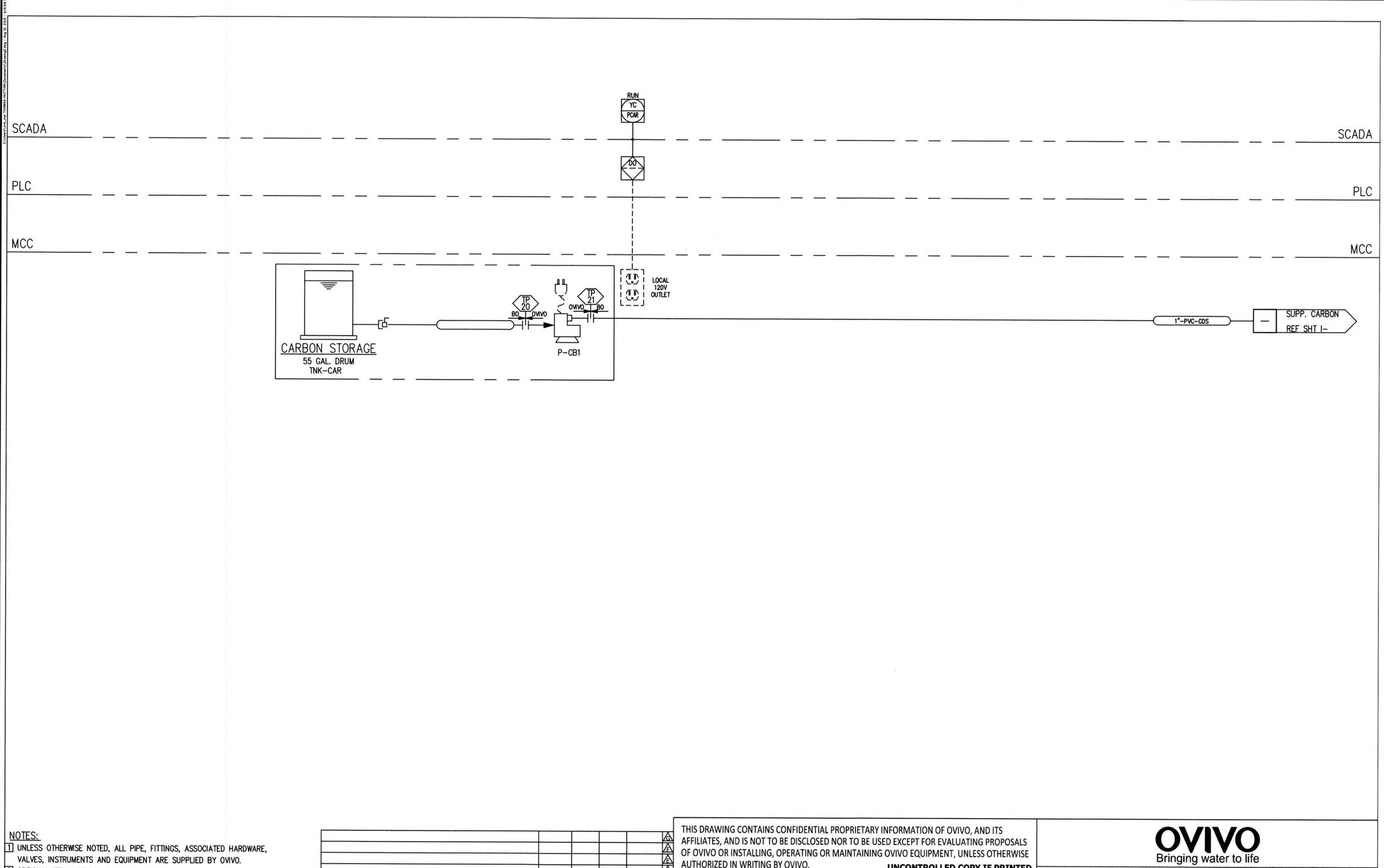

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P&ID
CHEMICAL DOSING

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MICROBLOX P&ID - CHEMICAL DOSING

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