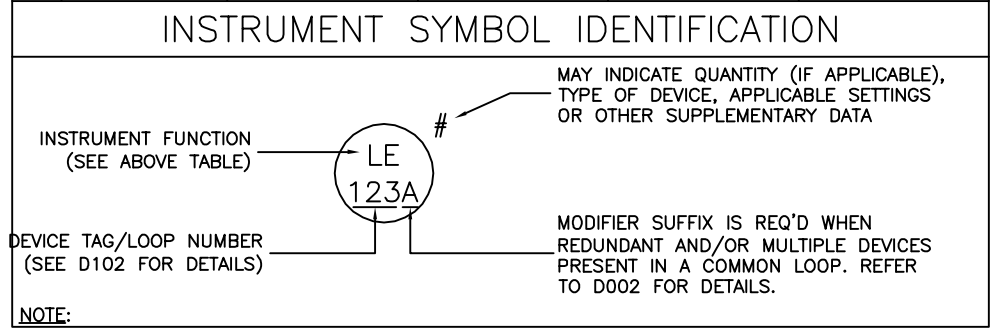


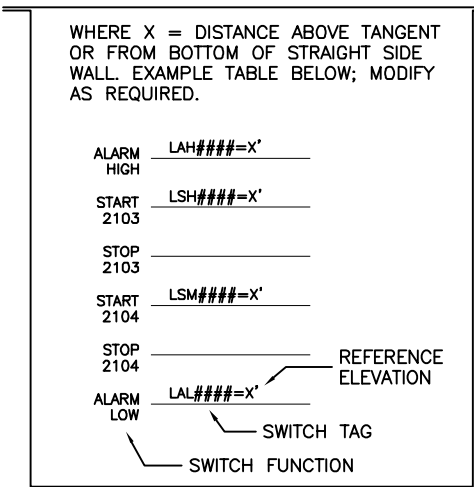
INSTRUMENT LETTER IDENTIFICATION					
	FIRST-LETTER		SUCCEEDING-LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYZER		ALARM		
B	BURNER				
C	USER'S CHOICE	CONTROL	USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW	RATIO			
G	USER'S CHOICE		GLASS		
H	HAND				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME			CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE	MOMENTARY			MEDIUM
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE		OPEN
P	PRESSURE		POINT TEST CONN.		
Q	QUANTITY	INTEGRATE/TOTALIZE			
R	RADIATION	RELIEF	RECORD		
S	SPEED	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTI-VARIABLE		MULTI-FUNCTION	MULTI-FUNCTION	MULTI-FUNCTION
V	VIBRATION			VALVE, DAMPER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X-AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE	Y-AXIS		RELAY, COMPUTE	
Z	POSITION	Z-AXIS		DRIVER, ACTUATOR UNCLASSIFIED FINAL CONTROL ELEMENT	



TRANSDUCER FUNCTIONS

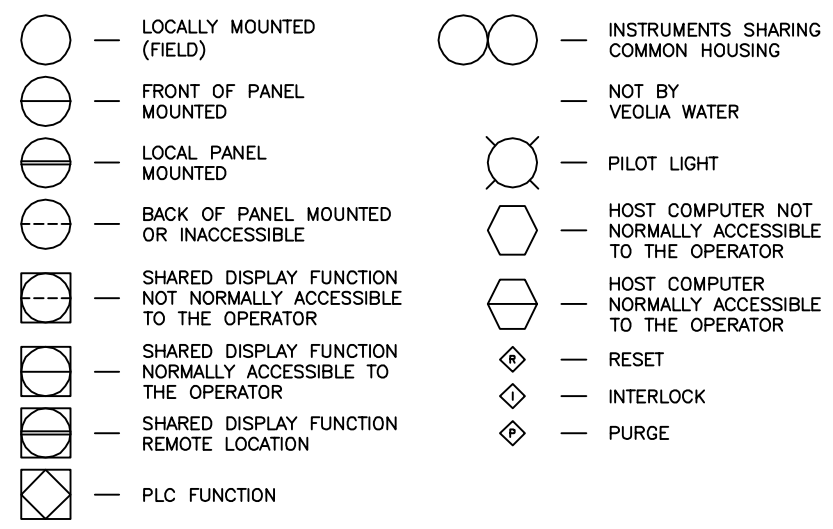
E/E	VOLTAGE TO VOLTAGE
E/I	VOLTAGE TO CURRENT
E/P	VOLTAGE TO PNEUMATIC
I/P	CURRENT TO PNEUMATIC
P/I	PNEUMATIC TO CURRENT

LEVEL TABLE

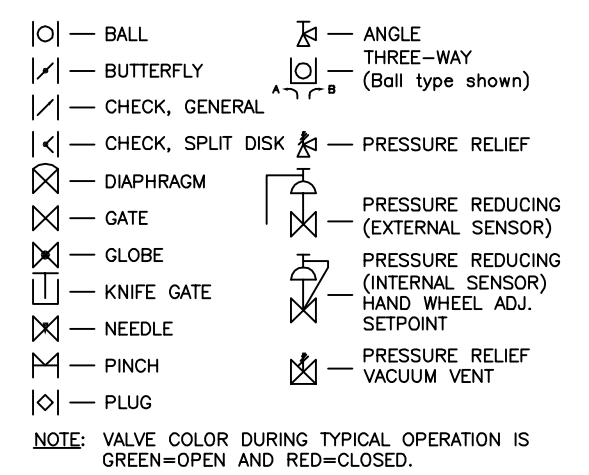


2708

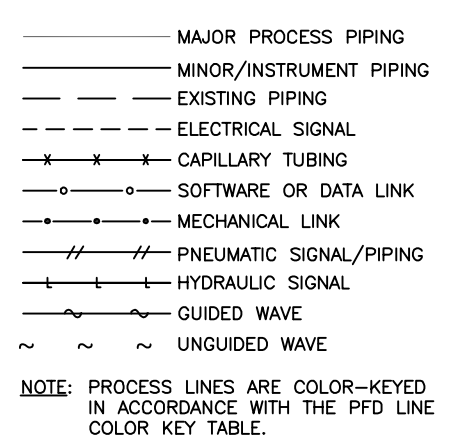
INSTRUMENT SYMBOLS



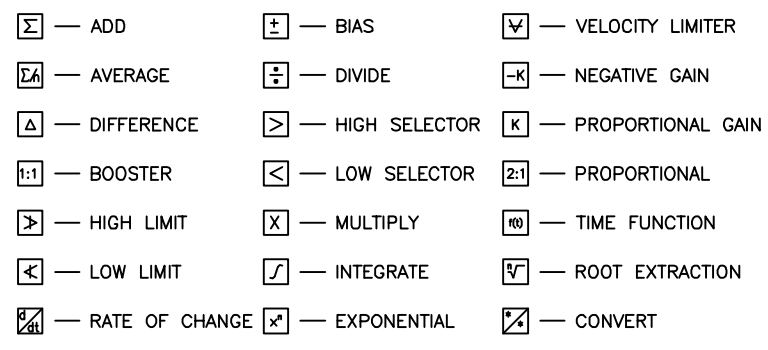
VALVE SYMBOLS



LINE SYMBOLS



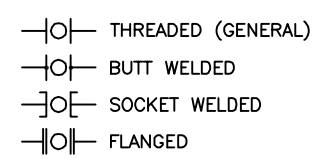
COMPUTING FUNCTION IDENTIFICATION



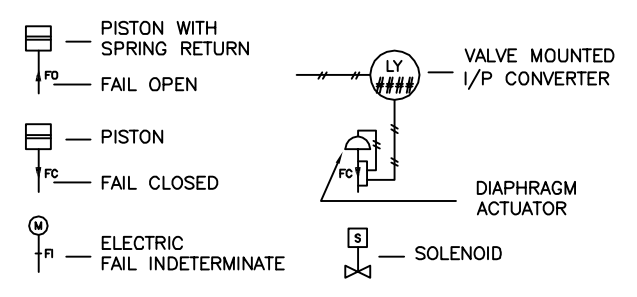
INSTRUMENT ABBREVIATIONS

AI	ANALOG INPUT	FWD	FORWARD
AO	ANALOG OUTPUT	KT	K-TYPE THERMOCOUPLE
BCD	BINARY CODED DECIMAL	LC	LOCKED CLOSED
C	COMPUTER	LO	LOCKED OPEN
CPT	CONTROL POWER TRANSFORMER	MN	MODBUS NETWORK
DI	DIGITAL INPUT	MS	MOTOR STARTER
DL	DATA LOGGER	NC	NORMALLY CLOSED
DO	DIGITAL OUTPUT	NO	NORMALLY OPEN
FB	FEEDBACK	PLC	PROGRAMMABLE LOGIC CONTROLLER
FC	FAIL CLOSED	PV	PROCESS VARIABLE
FI	FAIL INTERMEDIATE	RSP	REMOTE SETPOINT
FLP	FAIL LAST POSITION	REV	REVERSE
FO	FAIL OPEN	SP	SETPOINT
FP	FILL PORT	EL	ELEVATION
		IAR	INSTRUMENT AIR

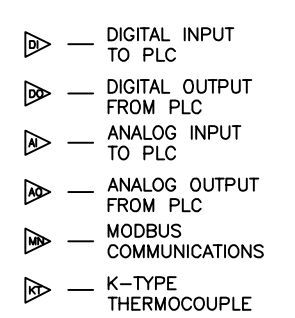
CONNECTIONS



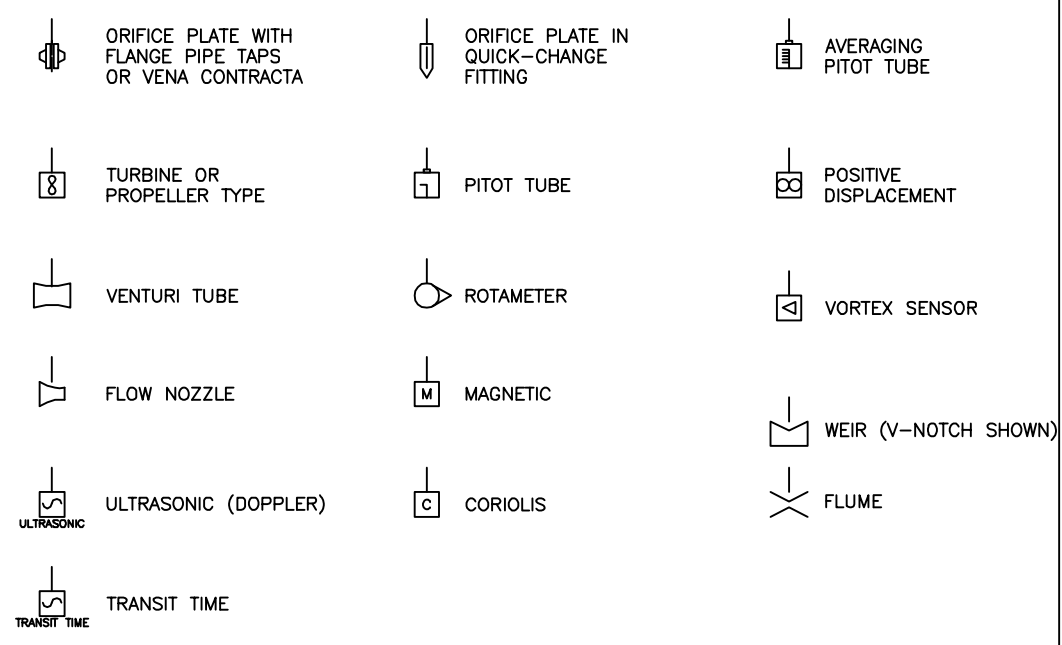
CONTROL VALVE ACTUATORS



TYPICAL I/O SYMBOLS



PRIMARY FLOW ELEMENTS



NO.	REVISIONS	BY	DATE	APP	NO.	REVISIONS	BY	DATE	APP	SCALE: None	ISSUE DATE: August 2010	[COMPANY NAME]
0	Engineering	RGC	07/18/05							APPVD: _____	ISSUE FOR: General Training	
										DESIGNED RGC	This drawing, copies of this drawing and all information contained on this drawing is and shall remain the sole and exclusive property of [COMPANY NAME]. It is submitted only in connection with the transaction to which it pertains and may not be used or distributed for any purpose other than to accomplish the purpose of said transaction without the expressed written permission. This drawing or any copy of this drawing is not to be copied in any manner and must be returned upon request. ALL RIGHTS RESERVED. Copyright 2010 [COMPANY NAME]	P&ID LEGEND SHEET 1 OF 2 INSTRUMENTATION AND VALVES
									DRAFTED RGC	DRAWING NO. D001		
									CHECKED			

FLUID SERVICE CODES

ALM - ALUMINUM SULFATE	NAG - NATURAL GAS
AMN - AMMONIUM NITRATE	NIA - NITRIC ACID
AMH - AMMONIUM HYDROXIDE	N2 - NITROGEN
ABF - AMMONIUM (BI)FLUORIDE	OIL - OIL (GENERAL USE)
AMS - AMMONIUM SULFATE	PAR - PROCESS AIR
ASO - ACID SOLUBLE ORGANICS	PFD - POLYMER FEED
BAR - BACKWASH AIR	PHA - PHOSPHORIC ACID
CAF - CALCIUM FLUORIDE	KF - POTASSIUM FLUORIDE
CAR - COMPRESSED AIR	KOH - POTASSIUM HYDROXIDE
CBW - CLEAN BACKWASH WATER	PSL - PROCESS SLURRY/SLUDGE
CFD - CAUSTIC RAW FEED (GEN. USE)	PVP - PROCESS VAPOR
CO2 - CARBON DIOXIDE	PWR - POTABLE WATER
CHC - CALCIUM HYPOCHLORITE	SAH - SULFURIC ACID, >75%
CL2 - CHLORINE	SAL - SULFURIC ACID, <75%
DBW - DIRTY BACKWASH WATER	SHC - SODIUM HYPOCHLORITE
DRN - PROCESS DRAIN	SOC - SODIUM CARBONATE
DSL - DIESEL FUEL	SOH - SODIUM HYDROXIDE
EFF - EFFLUENT (GENERAL USE)	SLP - STEAM, <125#
FEC - FERRIC CHLORIDE	SMB - SODIUM METABISULFITE
FEW - FILTER EFFLUENT WATER	STM - STEAM, 125-220 #
FIW - FILTER INFLUENT WATER	SNY - SANITARY SEWER
FOL - FUEL OIL	STO - STORM DRAIN
HCL - HYDROCHLORIC ACID	SWR - SERVICE WATER
HF - HYDROFLUORIC ACID	TFL - THERMAL FLUID
HPX - HYDROGEN PEROXIDE	UAR - UTILITY AIR
IAR - INSTRUMENT AIR	UWR - UTILITY WATER
IFD - INDUSTRIAL RAW FEED	VNT - VENT (GENERAL USE)
LSY - LIME SLURRY	WOL - WASTE OIL
MEL - METHANOL	WWR - WASTEWATER (GENERAL USE)

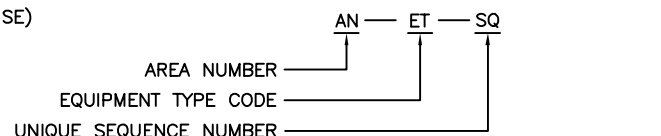
EQUIPMENT TYPE CODES

- 1- FLUID TRANSPORT (BLOWERS, COMPRESSORS AND ALL TYPES OF PUMPS)
- 2- SOLIDS TRANSPORT (BELT AND SCREW CONVEYORS, FEEDERS, ETC.)
- 3- PHYSICAL SEPARATION (PHASE SEPARATION EQUIPMENT, FILTERS, SCREENS, GRAVITY SEPARATORS, CENTRIFUGES, MICRO/ULTRAFILTERS, ETC.)
- 4- MIXERS (AGITATORS, IN-LINE MIXERS, SHREDDERS, BLENDEERS, ETC.)
- 5- HEAT TRANSFER (HEAT EXCHANGERS, HEATERS, COOLING TOWERS, BURNERS, ETC.)
- 6- MASS TRANSFER (AD/ABSORBERS, ION EXCHANGE, SCRUBBERS, STRIPPERS, COLUMNS, EVAPORATORS, ETC.)
- 7- CONTAINMENT (TANKS, VESSELS, PITS, SUMPS, SILOS, ETC.)
- 8- REACTORS (CHEMICAL REACTORS OR PRECIPITATORS, CRYSTALLIZERS, ETC.)
- 9- VENDOR PACKAGES & MISC. (PREFABRICATED SYSTEMS FROM 3RD PARY SUPPLIERS, SPECIALTY EQUIPMENT UNCLASSIFIED ELSEWHERE)

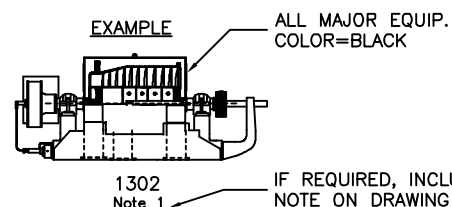
AREA NUMBERS

- (PROJECT SPECIFIC)
- 1- TANK FARM
 - 2- TRAIN 1
 - 3- SOLIDS DEWATERING
 - 4- TRAIN 2
 - 5- VAPOR HANDLING SYSTEM

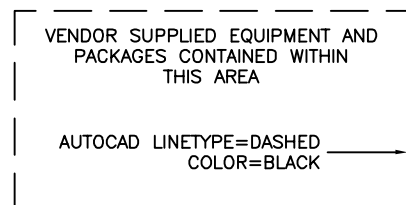
EQUIPMENT TAG FORMAT



NOTE: HYPHENS ARE NOT A PART OF EQUIPMENT TAG INSTANCES.



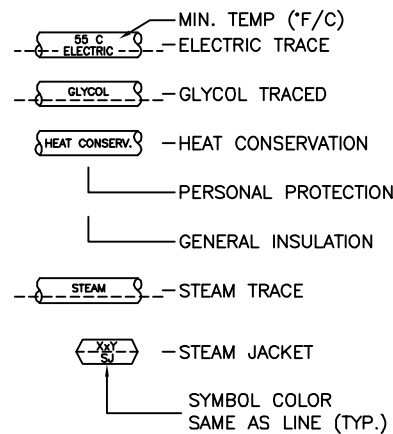
VENDOR DELINEATION



TRACING AND INSULATION CODES

- ET - ELECTRIC TRACE
- FP - FIRE PROTECTION
- HC - HEAT CONSERVATION
- I - INSULATED, GENERAL
- PP - PERSONAL PROTECTION
- S - STEAM TRACE
- SJ - STEAM JACKET

INSULATION SYMBOLS



EQUIPMENT LABELS

EXAMPLE FOR PUMP

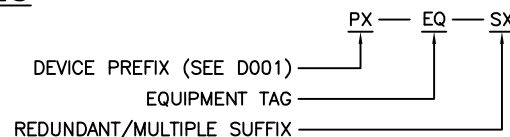
1105
PUMP NAME
NOMINAL CAP: X M3/HR @ Y M TDH
TYPE: HORIZONTAL CENTRIFUGAL
MOTOR: X KW 420V/3 PH/50 HZ TEFC
SPEED: 1500 RPM
CONSTRUCTION: 316 SS
MANUFACTURER: ACME
MODEL: ABC-3XR9

EXAMPLE FOR TANK

1705
NAME OF TANK
TYPE: VERTICAL CYLINDRICAL
NOMINAL CAP: 40 M3
SIZE: X M DIA X Y M HIGH
CONSTRUCTION: A36 CARBON STEEL
DESIGN: API 650
OTHER: NEOPRENE RUBBER LINED
MANUFACTURER: ACME FABRICATORS

NOTE: LABELS VARY IN ACCORDANCE WITH EQUIPMENT DESCRIBED. ALL LABELS ARE LOCATED ALONG BOTTOM OF THE P&I DIAGRAM.

INSTRUMENT/DEVICE TAGS

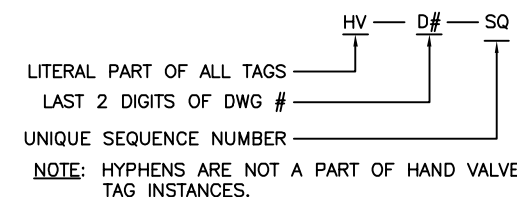


NOTE: HYPHENS ARE NOT RQD BETWEEN PX AND EQ.

REDUNDANT/MULTIPLE SUFFIX RULES:

1. UTILIZE SEQUENTIAL NON-HYPHENATED ALPHABETIC SUFFIXES FOR REDUNDANT DEVICES.
2. FOR MULTIPLE ITEMS OF SAME TYPE, EMPLOY A SEQUENTIAL, HYPHENATED NUMERIC SUFFIX.

HAND VALVE TAGS

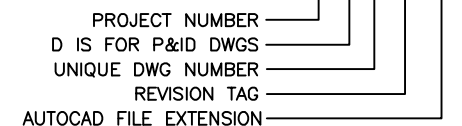


NOTE: HYPHENS ARE NOT A PART OF HAND VALVE TAG INSTANCES.

P&I DRAWING FILENAME

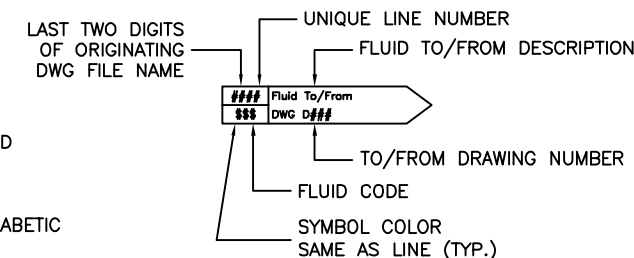
FIRST TWO DIGITS OF ALL INSTRUMENT LOOPS ON DWG.

EXAMPLE FILE NAME: 0253D109RA.DWG

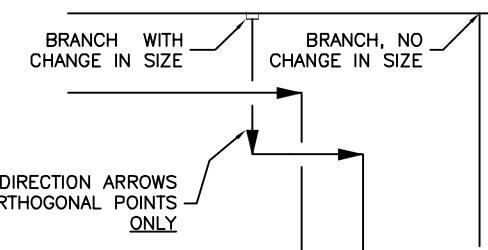


MISC. TAGS & LABELS

LINE ON/OFF PAGE CONNECTOR



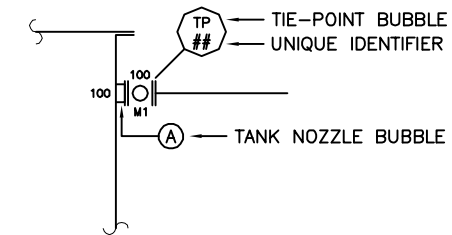
FLOW ARROWS, BRANCHES AND LINE BREAKS



LINE BREAK RULES:

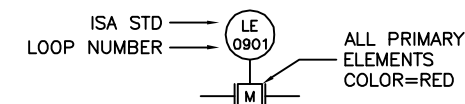
1. MAJOR PROCESS LINE CROSSES BREAK AT THE VERTICAL LINE.
2. MINOR LINES WILL YIELD AND BREAK AT ANY MAJOR PROCESS LINE CROSS.
3. ANY MINOR OR MAJOR LINE MAY BE BROKE, AS REQUIRED, TO ACCOMMODATE NOTES OR LEADERS.
4. ALL INSTRUMENTATION SIGNALS YIELD AND BREAK TO MAJOR AND MINOR PROCESS LINES.

TIE-POINT & NOZZLE TAGS

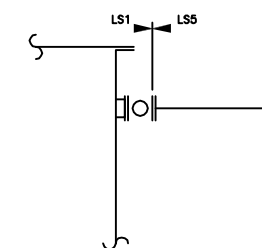


FLOW ELEMENT TAGS

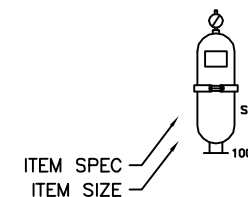
MAG METER EXAMPLE



SERVICE SPEC BREAK

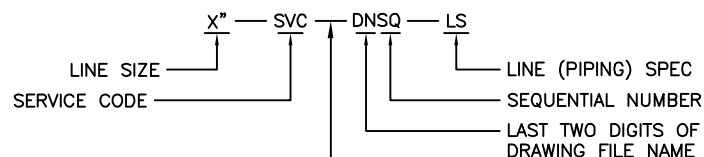


SPECIALTY ITEMS



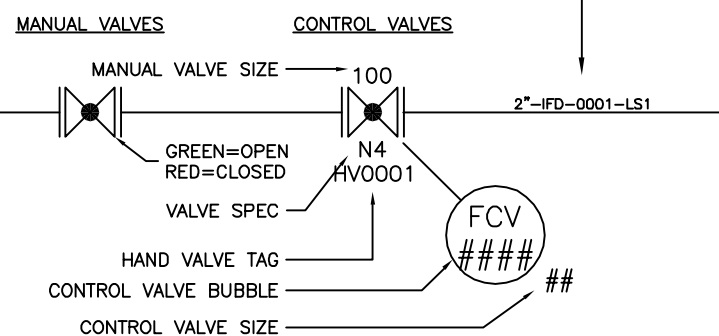
NOTE: THE LOCATION OF TAGGING VARIES WITH THE TYPE OF SPECIALTY ITEM.

LINE NUMBERS



LABEL COLOR = BLACK

VALVE TAGS



NOTE: THIS IS A STANDARD LEGEND SHEET. THEREFORE, ALL SYMBOLS AND ABBREVIATIONS SHOWN MAY NOT APPEAR ON THE P&I DIAGRAMS.

[COMPANY NAME]



Project: 123456

DRAWING NO. D002

P&I LEGEND SHEET 2 OF 2
CODES, TAGS AND LABELS

NO.	REVISIONS	BY	DATE	APP	NO.	REVISIONS	BY	DATE	APP
0	Engineering	RGC	07/18/05						

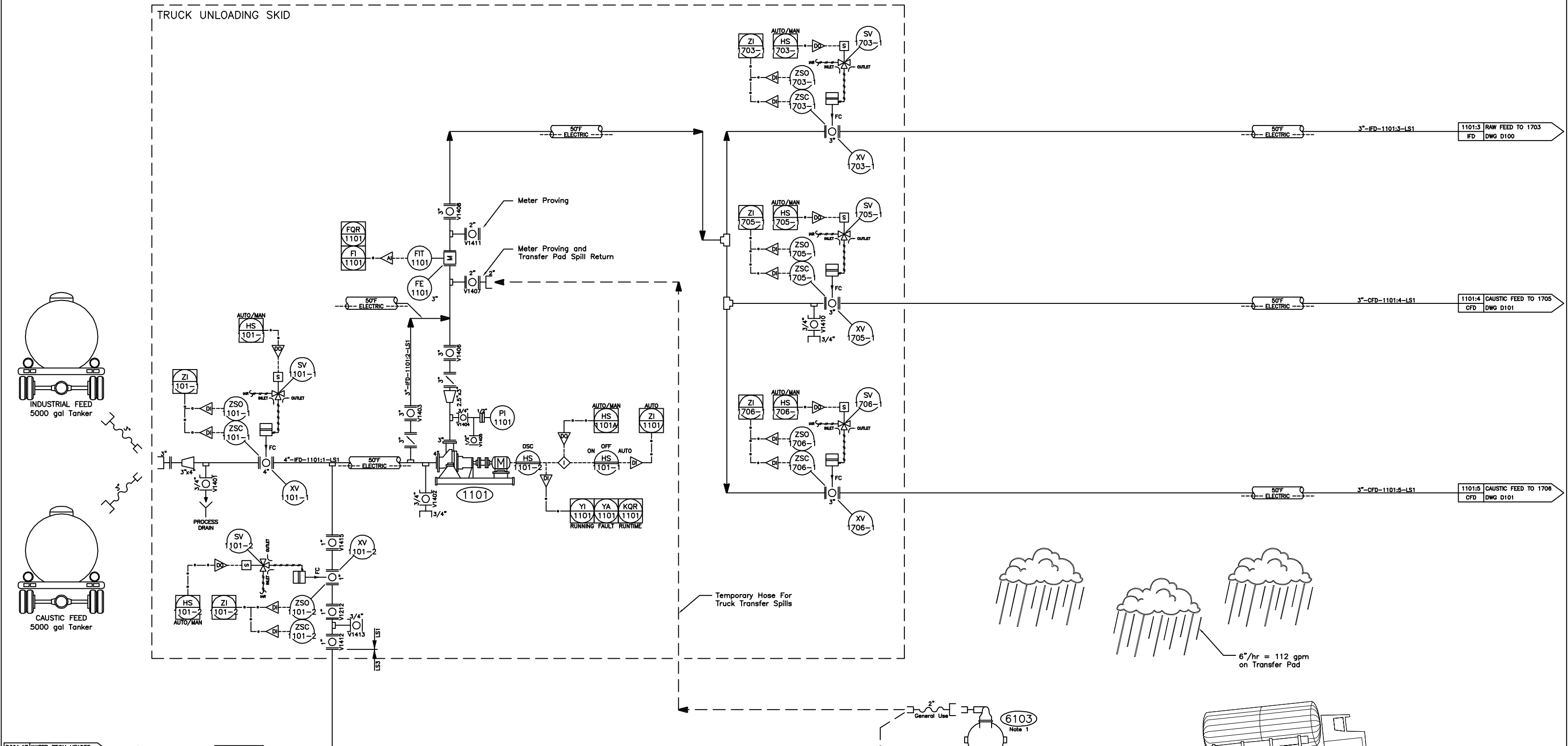
SCALE: None
APPVD: _____
DATE: _____
DESIGNED RGC
DRAFTED RGC
CHECKED

ISSUE DATE: August 2010

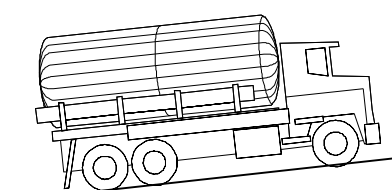
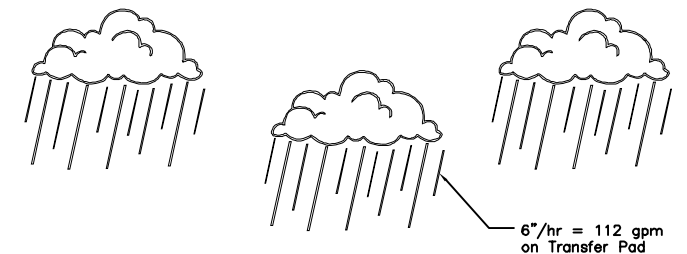
ISSUE FOR: General Training

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TRUCK UNLOADING SKID



1101
UNLOAD PUMP
TYPE: Centrifugal Slurry
CAPACITY: 250 gpm @ 78 ft. TDH
MOTOR: 20 HP 480 V/3 PH/1800 RPM
CONSTRUCTION: Maxalloy 2
OTHER:
MANUFACTURER: Wilfley
MODEL: 2 1/2 K



TRUCK TRANSFER PAD
15' Wide x 120' Long

Transfer Pad Sump
2' Wide x 2' Long x 2' Deep

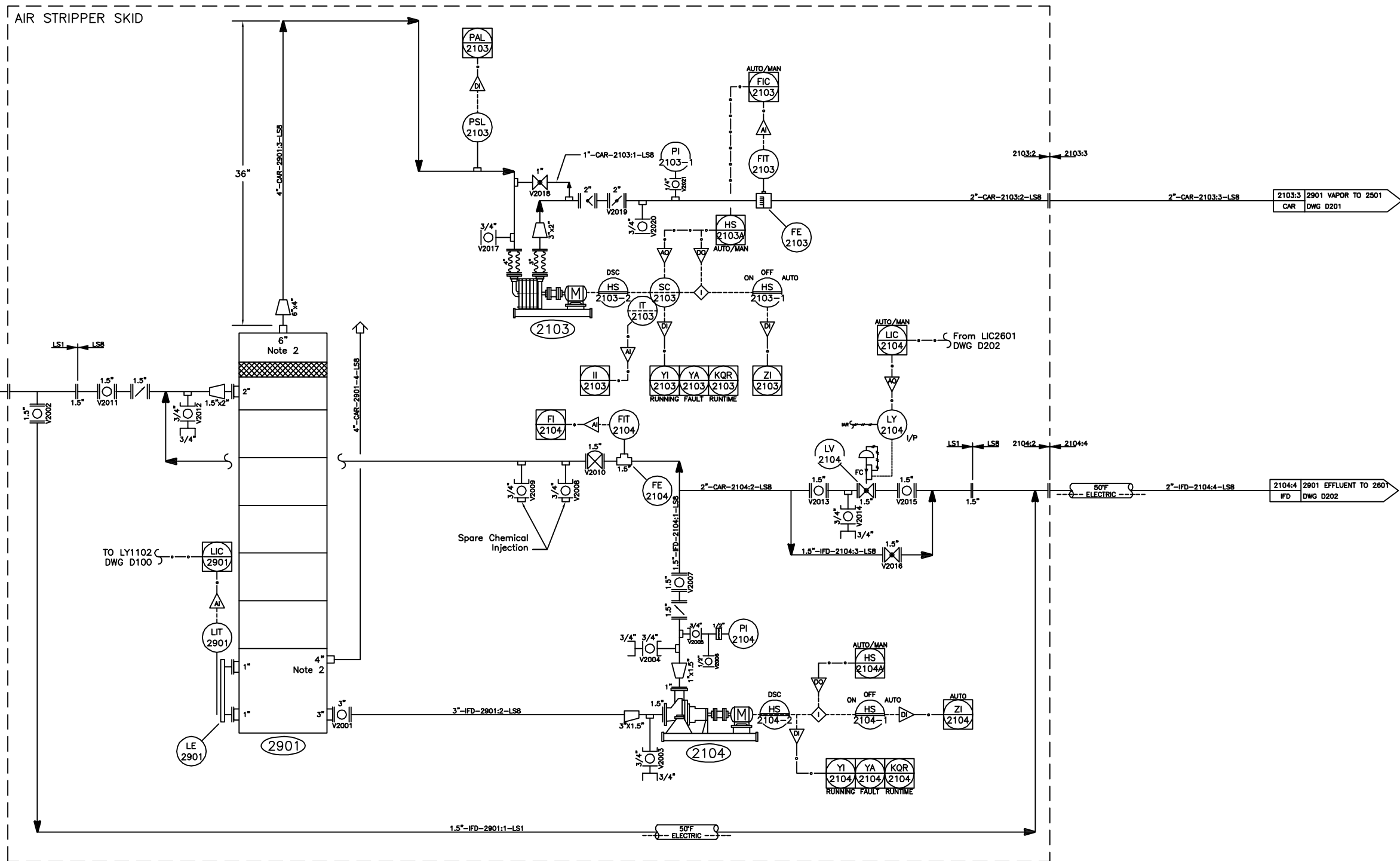
DRAWING NOTES:
1. Pump is supplied loose and may be moved where required. (See also D100)

NO.	REVISIONS	BY	DATE	APP	NO.	REVISIONS	BY	DATE	APP
A	HazOp	RGC	07/21/05						
B	HazOp Recommendations	RGC	07/28/05						
C	General Revisions	RGC	09/12/05						
0	Fabrication	RGC	10/17/05						
1	Construction	RGC	12/27/05						

SCALE: None
APPVD: _____
DATE: _____
ISSUE DATE: August 2010
ISSUE FOR: General Training
DESIGNED RGC
DRAFTED RGC
CHECKED _____
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[CLIENT NAME]
[CLIENT LOCATION]
[NAME OF PROCESS]
PIPING & INSTRUMENTATION DIAGRAM
TRUCK UNLOADING & TRANSFER PAD

[COMPANY NAME]
Project: 123456
DRAWING NO. D100



**2107
T1 DEFOAMER PUMP**
 TYPE: Solenoid pulse
 CAPACITY: X LPH
 MOTOR: 120 V/1 PH/- RPM
 CONSTRUCTION: 304SS
 OTHER:
 MANUFACTURER: LMI
 MODEL:

**2901
AIR STRIPPER**
 TYPE: Sieve Tray
 CAPACITY: 35 gpm nominal
 SIZE: Five Trays w/30 gal sump
 CONSTRUCTION: 304SS
 DESIGN: 150 SCFM @ <=6" Hg
 OTHER: Modified T1 SVC
 MANUFACTURER: [BY COMPANY]

**2103
STRIPPER BLOWER**
 TYPE: Multi-Stage Centrifugal
 CAPACITY: 150 SCFM @ 5" Hg vacuum
 MOTOR: 480 V/3 PH/Z RPM
 CONSTRUCTION: Xylan-coated Al turbines
 OTHER: 2950 rpm operating speed
 MANUFACTURER: Gardner Denver
 MODEL: Turbotron

**2104
STRIPPER EFFLUENT PUMP**
 TYPE: Horizontal Centrifugal
 CAPACITY: 35 gpm @ 45 ft. TDH
 MOTOR: 2HP 480V/3 PH/1800RPM
 CONSTRUCTION: DCI
 OTHER:
 MANUFACTURER: Durco
 MODEL: 1K1.5x1-82RVM3STFPD

DRAWING NOTES:
 1. Defoamer and 2107 located inside press building.
 2. Straight pipe connection may be coupled with Fernco.

NO.	REVISIONS	BY	DATE	APP	NO.	REVISIONS	BY	DATE	APP
A	HazOp	RGC	07/21/05						
B	HazOp Recommendations	RGC	07/30/05						
C	Vendor Feedback Updates	RGC	09/13/05						
0	Fabrication	RGC	10/17/05						
1	Construction	RGC	12/27/05						

SCALE: None	ISSUE DATE: August 2010
APPVD: _____	ISSUE FOR: General Training
DATE: _____	
DESIGNED RGC	This drawing, copies of this drawing and all information contained on this drawing is and shall remain the sole and exclusive property of [COMPANY NAME]. It is submitted only in connection with the transaction to which it pertains and may not be used or distributed for any purpose other than to accomplish the purpose of said transaction without the expressed written permission. This drawing or any copy of this drawing is not to be copied in any manner and must be returned upon request. ALL RIGHTS RESERVED. Copyright 2010 [COMPANY NAME]
DRAFTED RGC	
CHECKED _____	

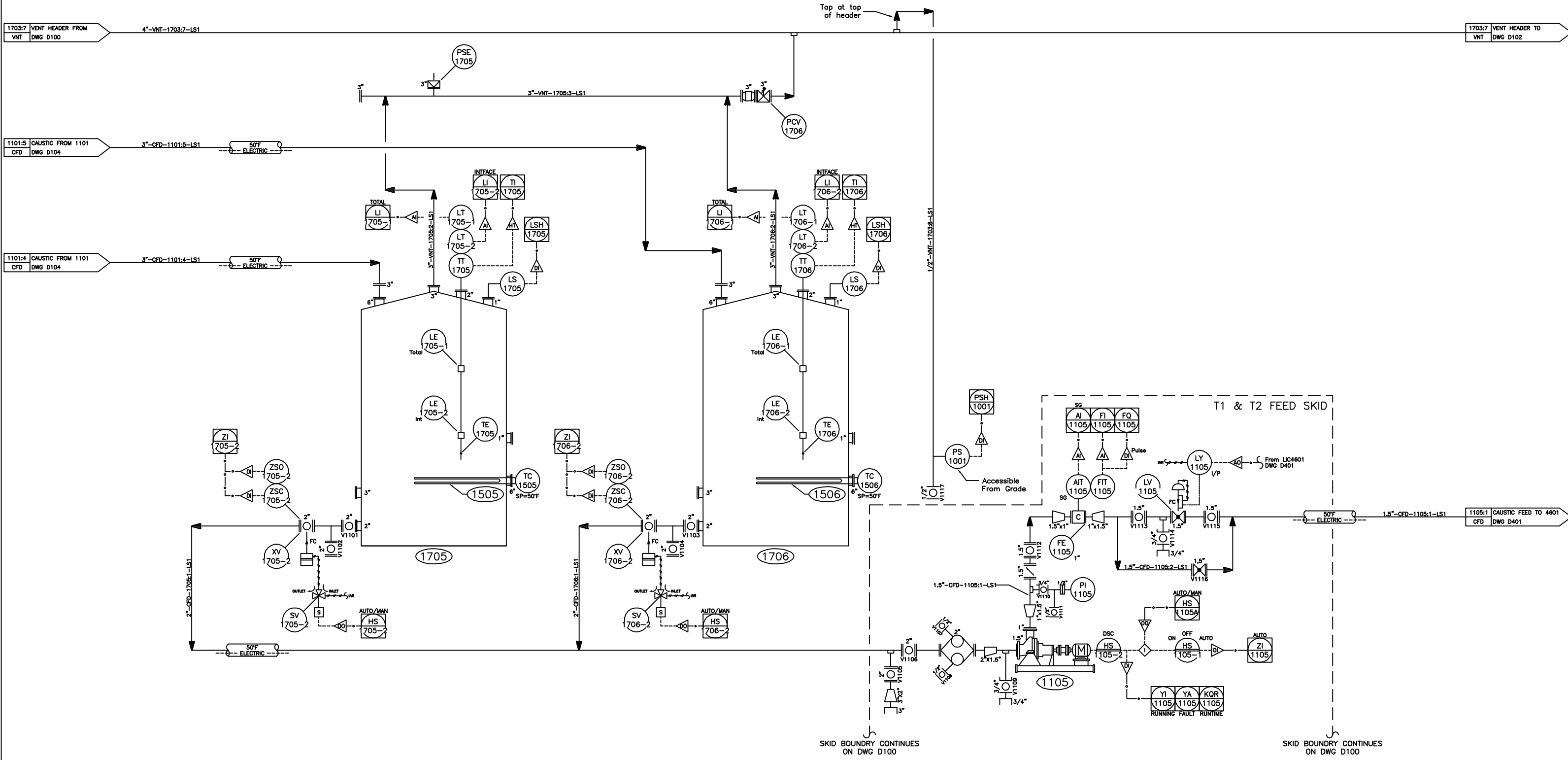
[CLIENT NAME]
 [CLIENT LOCATION]
 [NAME OF PROCESS]
 PIPING & INSTRUMENTATION DIAGRAM
 AIR STRIPPER AND DEFOAMER

LIQUID SOLUTIONS LLC

Project: 123456

DRAWING NO. D200





1705/6
T2 FEED TANKS
 TYPE: Vertical Cylindrical
 CAPACITY: 25000 gal
 SIZE: 12' Dia. x 30' SSW
 CONSTRUCTION: A36 CS
 DESIGN: Atm psig at 180°F
 OTHER: 3/16" Shell & 1/4" Bottom
 MANUFACTURER: Precision Tank

1505/6
T2 TANK HEATERS
 TYPE: Electric Immersion
 MOUNT SIZE: 6" Flange
 ELEMENTS: KW
 IMMERSION LENGTH: 8 SS
 OTHER:
 MANUFACTURER:
 MODEL:

1105
T2 FEED PUMP
 TYPE: Horizontal Centrifugal
 CAPACITY: 20 gpm @ 47 ft. TDH
 MOTOR: 2HP 480V/3PH/1800RPM
 CONSTRUCTION: DCI
 OTHER:
 MANUFACTURER: Durco
 MODEL: 1K1.5x1-82RVM3STFFPD

NO.	REVISIONS	BY	DATE	APP	NO.	REVISIONS	BY	DATE	APP
A	HazOp	RGC	07/21/05						
B	HazOp Recommendations	RGC	07/28/05						
C	General Revision	RGC	09/12/05						
0	Fabrication	RGC	12/01/05						
1	Construction	RGC	12/27/05						

SCALE: None
 APPVD: _____
 DATE: _____
 DESIGNED: RGC
 DRAFTED: RGC
 CHECKED: _____
 ISSUE DATE: August 2010
 ISSUE FOR: General Training
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[CLIENT NAME]
 [CLIENT LOCATION]
 [NAME OF PROCESS]
 PIPING & INSTRUMENTATION DIAGRAM
 CAUSTIC STORAGE & FEED

[COMPANY NAME]
 Project: 123456
 DRAWING NO.
 D101