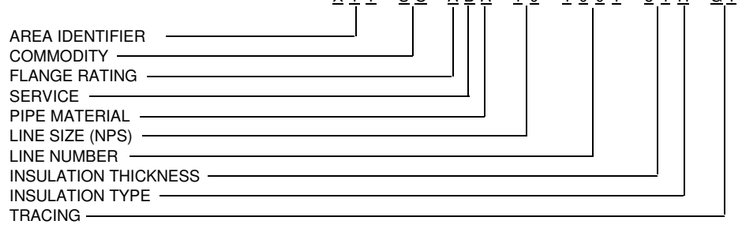
FOSTER CREEK SPECs: Line Designations and Numbering - LEGEND / NOTES - REV. 2



AREA IDENTIFIER

XYY - FC Offsites (applicable for projects in FCO E2005 to FCO 2008 except brackish water and disposal pads)

Where:

X = Pad Area Location (E (East), N (North), W (West))

YY = production pad number (YY = 00 for pipelines & laterals)

Leave blank for all lines within the FC commercial plant and for all FC Offsite projects not identified above.

COMMODITIES:

AH	Hydrochloric Acid	PE	Produced Emulsion
AS	Sulfuric Acid	PG	Produced Gas
BD	Blowdown	PO	Polymer
BF	B .	PR	Propane
BR	Brine	PW	Produced Water
BW	Brackish Water	RS	Recycle Slop
CA	Caustic	RW	Raw Water
CH	Chemicals	SB	Soft Brackish Water
D	Drain	SC	Steam Condensate
DE	Diesel	SG	Softening Sludge
DL	Diluent	SL	Slurry Lime
DW	Domestic water	SM	Slurry Magox
FG	Fuel Gas	SO	Sales Oil
FM	Foam	SP	Soft Produced Water
G	Glycol Heating / Cooling Medium	SS	Soft Source Water
HO	Heating Oil	SU	Sulphur
HS	High Pressure Steam	UA	Utility Air
IA	Instrument Air	US	Utility Steam
LO	Lube Oil	UW	Utility Water
LR	Liquid Ring Fluid	VT	Vent
N	Nitrogen	WR	Regen Waste
		WW	Waste Water

FLANGE RATING:

A	ANSI 150#
B	ANSI 300#
C	ANSI 600#
D	ANSI 900#
E	ANSI 1500#
F	ANSI 2500#

SERVICE: (1)

A	Non-corrosives		
B	Corrosives	S	Sour Hydrocarbons
C	Chemicals	V	Steam, Boiler Feed Water
D	Acids, Caustics	W	Produced Water / Brackish Water
E	Brine	X	Low Temperature Sour
F	Cryogenics	Z	Low Temperature Corrosive
L	Low Temperature Non-corrosives		

(1) PIPE MATERIAL:

A	Carbon Steel A106B	H	Internally Coated
B	Carbon Steel A333 Gr. 6	J	Copper
C	Stainless Steel 316	K	PE Tubing, HDPE
D	Stainless Steel 304	L	Polypropylene Lined Pipe
E	Carbon Steel A106B	M	PTFE Lined Pipe
F	Fibreglass Reinforced Pipe	P	Plastic PVC
G	Carbon Steel Galvanized	Z	CSA Z245.1 (Z662)

LINE SIZE

Indicates the Nominal Pipe Size (NPS) of the primary section of the line.

LINE NUMBER

Shall be assigned as a four character number issued sequentially starting with 0001 for each commodity.

INSULATION:

Thickness in millimeters, e.g., 25, 38, 51, etc.

Type and Material Code:

H	Hot (Fiberglass)
HC	Hot (Calcium Silicate)
HM	Hot Mineral Wool
P	Personnel Protection
PC	Personnel Protection (Calcium Silicate)
PM	Personnel Protection (Mineral Wool)
C	Cold Insulation
CP	Condensation Protection

TRACING TYPE:

GT	Glycol Traced
GT1	Spaced Off Pipe to Reduce Hot Contact
GT2	Double Tracers to Prevent Condensation Corrosion
ET	Electric Traced
ET2	High Temperature Electric Traced
HOT	Hot Oil Traced

GENERAL NOTES:

1. Expansion temperature is the maximum pipe temperature resulting from abnormal operating conditions such as upsets, steam-out, steam tracing or regeneration. If no temp. is shown, the design temp will be taken as the expansion temp.
2. Show max. conditions of coincident pressure and temperature in these columns for stress calculations. If no pressure or temperature are shown, the max. coincident pressure and temperature will be taken as the design pressure and design temperature.
3. MDMT is the minimum design metal temperature under pressure. Lines which are traced and insulated or depressured when not flowing warm fluid do not require design for minimum ambient temperature (-40°C). Deviation from MDMT specified in piping class requires FCCL approval through specification waiver process. (1)
4. Refer to Painting and Galvanizing Specs 9728-43-SPC-00-019-001. (1)
5. ASME B31.3, B31.1, CSA Z662-03, CSA Z662-03 variance, etc.
6. SW MPI (Socket Weld Magnetic Particle Inspection) or LPI (Liquid Penetrant Inspection)
7. Design pressure at the -40 °C MDMT temperatures listed are derated to 77% of -29°C flange limit design pressure, as allowed by 1999 B31.3, Figure 323.2.2B.
8. 'NOTE: These design pressures are higher than currently listed in Cenovus' piping specifications. (1)
9. Hydrotest pressure is set according to ASME B31.3, clause 345.4.2(b) when design temperature exceeds 204 °C. Hydrotest B31.3 piping to 1.5 times the new and cold (37.8 deg. C) ANSI B16.5 flange rating unless pipe is the limiting factor. Enter N/A if a line is not tested with air or water.
9. Hydrotest pressure is as per existing piping.
10. Piping Design Pressure is set by equipment PSV setting.
11. Piping Design Pressure matches existing piping.
12. Pressure testing shall be in accordance with this Line List and applicable codes.
13. 1B-bare tracer, 1C/2C-tracer with heat transfer cement (Snaptrace).
14. Design conditions is per existing piping.
15. Paint system listed is for insulated piping outside, for uninsulated piping inside use paint system 300A.
16. Line shall be depressured when operating temperature falls below -29 °C
17. Painting system shall be 200 B-2 for Pipe Rack Module Piping and 200 C-2 for Equipment Module Piping & Field Run Piping.
18. Painting system shall be 200 B-1 for Pipe Rack Module Piping and 200 C-1 for Equipment Module Piping & Field Run Piping.
19. DP and DT matches existing piping and ORF DP and DT (Vista, Area 7 Rev 3)
20. Line shall be depressured & drained when operating temperature falls below 10 °C
21. Piping wall thickness shown has been confirmed by calculation for actual design conditions.
22. Piping wall thickness shown exceeds specification requirement but is selected based on material availability.
23. Some EVE piping is supplied as Sch. 160 which exceeds the wall thickness required by calculation for the actual design conditions. The Sch.140 EVE piping wall thickness has been confirmed by calculation for the actual design conditions.
24. Some piping is Sch. 100, which is the wall thickness required by the DVE spec. Other Sch. 120 piping exceeds the specification wall thickness requirement but was supplied based on material availability.
25. Test pressure is based on the maximum allowable test pressure of the flex connection on this line.
26. DP & DT match existing piping and SAC DP & DT.
27. DP & DT matches existing WAC vessels (V-0813E/F) DP & DT.
28. Tracing design changes from ET to ET2 and the insulation changes from HM to H at the inlet to XV-3007.
29. 1/2" stainless steel piping may be used based on material availability
30. The line is to be tested to the test pressure of the equipment it is connected to as per ASME B31.3 clause 345.4.3(b).
31. Flex connections on the associated lines are not to be hydrotested with the piping. (2)