



UOP LLC • 25 East Algonquin Road • Des Plaines, Illinois 60017-5017 • USA

PROJECT SPECIFICATION

912777 - 801

SHEET 2

PIPING

REV	DATE	BY	APVD	REV	DATE	BY	APVD
0	25Jul03	DNM	TLC				

Summary of Pipe Classes

Utility Pipe Classes

Pipe Class	UOP Standard Specification Number	Service
MS-1	8-1384-2	Refinery Air and Water
MS-2	8-1385-2	Instrument Air Lines, Drinking Water
MS-3	8-1386-2	Steel Tubing (1 inch OD and smaller)
MS-4	8-1387-2	Steam Tracing
MS-7	8-1388-2	Stainless Steel Tubing

Process Pipe Classes

Pipe Class	UOP Standard Specification Number	Service
A1A4	8-1202-3	General Process
B1A1	8-1207-3	Process with Hydrogen
B2A1	8-1208-3	Process with Hydrogen
K1A1	8-1245-2	Corrosive Process
M1A1	8-1256-2	Corrosive Process
PR-2	8-1288-1	Catalyst with Hydrogen
PR-3	8-1289-1	Catalyst
PR-4	8-1290-1	Catalyst Lift Line 1" 1/4 - 46.9m
PR-6	8-1292-2	Catalyst Lift Line with Hydrogen 1" 1/2 - 49.7m
PR-10	8-1296-1	Catalyst Lift line with Hydrogen
PR-11	8-1297-1	Catalyst Addition
PR-24	8-1305-2	Process - Hot Air
PR-33	8-1312-2	Process with Hydrogen
PR-36	8-1315-1	Process - Regeneration Gas

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Pipe Class:	PR-4
Service:	CATALYST LIFT LINE
Rating/Facing:	CLASS 150 RF
Temperature Range:	-20°F THRU 550°F / -29°C THRU 288°C
Corrosion Allowance:	NOTE 2
Material:	KILLED CARBON STEEL
Design Code:	ASME B31.3
Pressure Range:	ASME B16.5

Flanges Weld Neck (Note 3)	NPS 1/2 to 8, ASTM A 105, Class 150, RF, SCH. 80, ASME B16.5.
Gaskets	Spiral wound with flexible graphite (95% min.) filler, TP304 SS winding and carbon steel solid centering ring, NPS 1/2 to 8, dimensions per ASME B16.20.
Couplings (Notes 1 & 3)	DUR O LOK coupling. ASTM A 403 Grade WP304-S, SCH. 80.
Fittings	NPS 1 1/2 and smaller, ASTM A 105, Class 3000, forged, socket weld, ASME B16.9 NPS 2 to 8, ASTM A 234 Grade WPB, SCH. 80, BW, ASME B16.9.
Branch Outlet Fittings	Latrolet — NPS 1/2 to 8, ASTM A 105, SCH. 80.
Swages	Concentric — NPS 1/2 to 1-1/2, ASTM A 234 Grade WPB, SCH. 80, seamless, PBE, MSS SP-95. Eccentric — NPS 1/2 to 1-1/2, ASTM A 234 Grade WPB, SCH. 80, seamless, PBE, MSS SP-95.
Blinds Spectacle	NPS 1 to 8, ASTM A 285 Grade C, Class 150, RF, API 590.
Bolting	Stud Bolts — ASTM A 193 Grade B7, threaded, full length, with two ASTM A 194 Grade 2H, heavy semi-finished hexagonal nuts.
Pipe (Notes 1 & 2)	NPS 1/2 to 8, ASTM A 53 Grade B or ASTM A 106 Grade B, seamless, SCH. 80,

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- Note 1** To minimize catalyst attrition, this piping is to be fabricated in accordance with the following requirements:
- 1.1. Refer to UOP Mechanical Flow Diagrams for piping section requirements and special 110° elbow detail. Use minimum lineal feet (meters) of pipe.
 - 1.2. Use maximum lengths of pipe. 20 feet (6.1 meters) minimum, to minimize the number of joints.
 - 1.3. Join pipe sections together as shown on UOP Standard Drawing 8-127 (latest revision) using a TP 304 stainless steel UOP Dur O Lok coupling. **No substitution allowed.**
 - 1.4. Use long radius pipe bends for all changes in direction with radius as specified on UOP Mechanical Flow Diagrams.
- Note 2** Pipe schedule indicated herein includes corrosion and erosion allowances due to the process catalyst flow.
- Note 3** Flanged connections are to be welding neck with the inside weld ground smooth.

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Pipe Class:	PR-6
Service:	CATALYST LIFT LINE WITH HYDROGEN
Rating/Facing:	CLASS 300 RF
Temperature Range:	-20°F THRU 550°F / -29°C THRU 288°C
Corrosion Allowance:	NOTE 2
Material:	KILLED CARBON STEEL
Design Code:	ASME B31.3
Pressure Range:	ASME B16.5

Flanges Weld Neck (Note 3)	NPS 1/2 to 8, ASTM A 105, Class 300, RF, SCH.80, ASME B16.5.
Gaskets	Spiral wound with flexible graphite (95% min.) filler, TP304 SS winding and carbon steel solid centering ring, NPS 1/2 to 8, dimensions per ASME B16.20.
Couplings (Note 1.3)	DUR O LOK coupling. ASTM A 403 Grade WP 304-S, SCH. 80.
Fittings	NPS 1 ½ and smaller, ASTM A 105, Class 3000 forged socket weld NPS 2 to 8, ASTM A 234 Grade WPB, SCH. 80, BW, ASME B16.9.
Branch Outlet Fittings	Latrolet — NPS 1/2 to 8, ASTM A 105, SCH. 80.
Swages	Concentric — NPS 1/2 to 1-1/2, ASTM A 234 Grade WPB, SCH. 80, seamless, PBE, MSS SP-95. Eccentric — NPS 1/2 to 1-1/2, ASTM A 234 Grade WPB, SCH.80, seamless, PBE, MSS SP-95.
Blinds Spectacle	NPS 1 to 8, ASTM A 515 Grade 70, Class 300, RF, API 590.
Bolting	Stud Bolts — ASTM A 193 Grade B7, threaded, full length, with two ASTM A 194 Grade 2H, heavy semi-finished hexagonal nuts.
Seamless Pipe	NPS 1/2 to 8, ASTM A 106 Grade B, SCH. 80.

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Note 1

To minimize catalyst attrition, this piping is to be fabricated in accordance with the following requirements:

- 1.1. Refer to UOP Mechanical Flow Diagrams for piping section requirements and special 110° elbow detail. Use minimum lineal feet (meters) of pipe.
- 1.2. Use maximum lengths of pipe. 20 feet (6.1 meters) minimum, to minimize the number of joints.
- 1.3. Join pipe sections together as shown on UOP Standard Drawing 8-127 (latest revision) using a TP 304 stainless steel UOP Dur O Lok coupling. **No substitution allowed.**
- 1.4. Flanges are not allowed except as noted as "FLANGE" on the UOP Mechanical Flow Diagrams. Flanged connection is to be welding neck with inside ground smooth after welding. The flanged connection is to be inspected by the UOP chief operator before assembly.
- 1.5. Use long radius pipe bends for all changes in direction with radius as specified on UOP Mechanical Flow Diagrams.

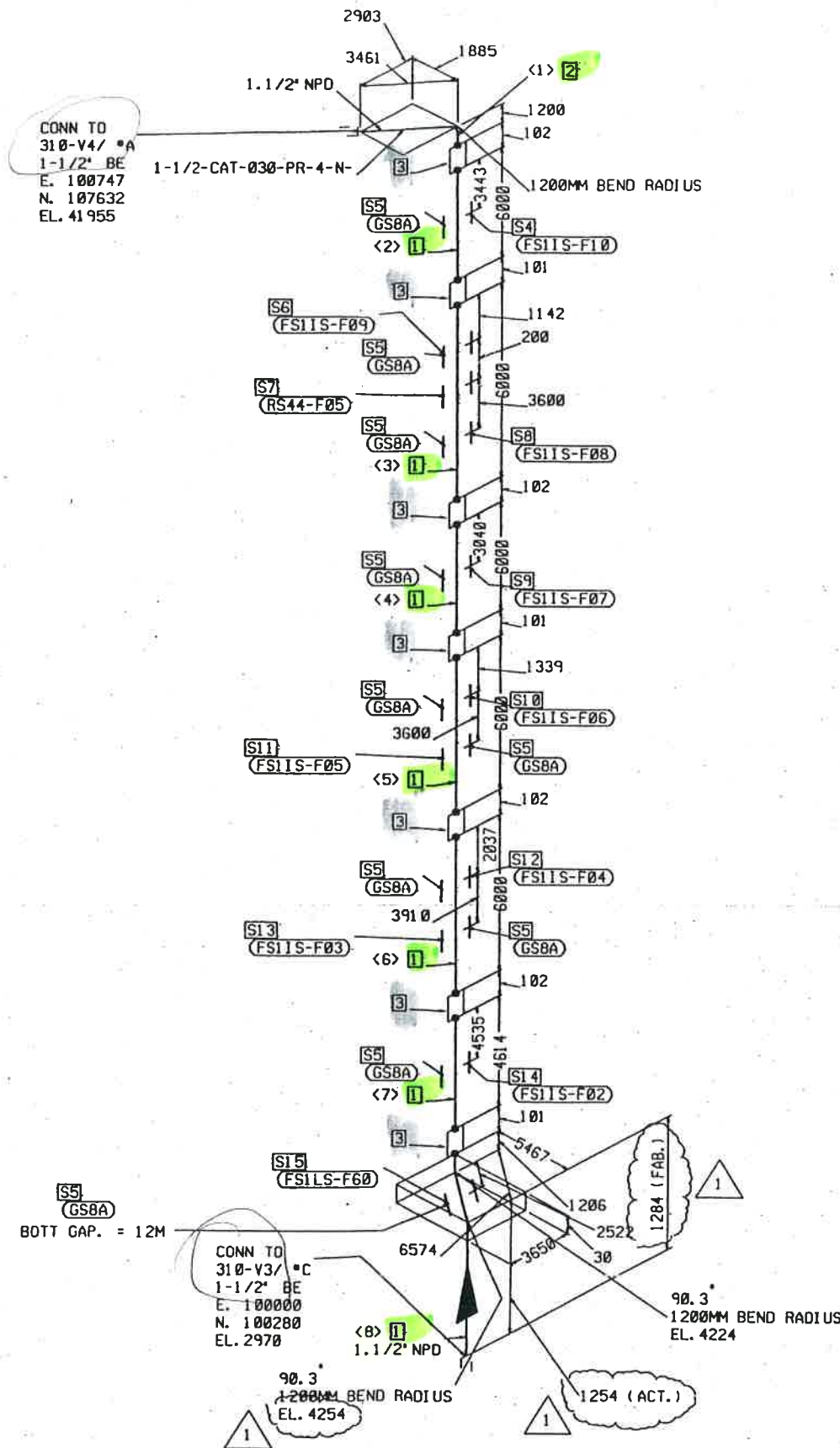
Note 2

Pipe schedule indicated herein includes corrosion and erosion allowances due to the process catalyst flow.

Note 3

Flanged connections are to be welding neck with the inside weld ground smooth.

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PT NO	MATERIALS DESCRIPTION	NPD (IN)	MATL SPEC	MATL CODE	QTY
1	PIPE A106-B SMLS BE SCH80	1.1/2	PR-4	P1 4007B0K	41.2 M
2	PIPE A106-B SMLS BE SCH80	1.1/2	PR-4	P1 4007B0K	5.7 M
3	COUPLING A403-WP304S UOP DUR O LOK BE SCH80	1.1/2	PR-4	D0S0U080K	7
PIPE SUPPORTS					
4	DATA: FS11S-F10-D814-A500-B200	1.1/2		FS11S-F10	1
5	DATA: GS8A-D814-11/2"	1.1/2		GS8A	10
6	DATA: FS11S-F09-D814-A500-B200	1.1/2		FS11S-F09	1
7	DATA: RS44-F05-D814-11/2"-A200-E33210	1.1/2		RS44-F05	1
8	DATA: FS11S-F08-D814-A500-B200	1.1/2		FS11S-F08	1
9	DATA: FS11S-F07-D814-A500-B200	1.1/2		FS11S-F07	1
10	DATA: FS11S-F06-D814-A500-B200	1.1/2		FS11S-F06	1
11	DATA: FS11S-F05-D814-A500-B200	1.1/2		FS11S-F05	1
12	DATA: FS11S-F04-D814-A500-B200	1.1/2		FS11S-F04	1
13	DATA: FS11S-F03-D814-A500-B200	1.1/2		FS11S-F03	1
14	DATA: FS11S-F02-D814-A500-B200	1.1/2		FS11S-F02	1
15	DATA: FS11S-F01-D814-A250-B100-H400	1.1/2		FS11S-F01	1

CUT PIPE LENGTH (2" & SMALLER PIPES ARE ONLY REFERENCE):

PIECE NO	LENGTH (MM)	NPD (IN)	REMARKS	PIECE NO	LENGTH (MM)	NPD (IN)	REMARKS
<1>	4146	1.1/2	PLD BEND 1)	<2>	6000	1.1/2	
<3>	6000	1.1/2		<4>	6000	1.1/2	
<5>	6000	1.1/2		<6>	6000	1.1/2	
<7>	4614	1.1/2		<8>	8022	1.1/2	PLD BEND 2)

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- NOTE:
- ROOT GAPS FOR BUTT WELDING FITTINGS ARE NOT INCLUDED IN DIMENSIONS.
 - DIMENSIONS MAY BE SLIGHTLY DIFFERENT FROM ACTUAL DIMENSIONS BY 1MM OR 2 MM DUE TO COMPUTER ROUND-OFF CALCULATION.

TEST MEDIUM	H
STEAM TRACE	-
ELECTRIC TRACE	-
PWHT	-
RADIOGRAPHY	- Z
PT/MT	- Z

LINE DATA	DESIGN	OPERATING	TEST
PRESS. (BAR(g))	3.5	0.3	4
TEMP. (°C)	149	38	
INSULATION	N		

REFERENCE	PLAN	DESCRIPTION	REV.	DATE
DWG. NO.	P&ID	D814, D815 D106, D107		



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JOB NO.	UNIT NO.	MODULE NO.	LINE NO.	1-1/2-CAT-030-PR-4-N-
912777		OFF		
DWG. NO.	ID-CAT-030-01			
SHEET NO.	01	REV. NO.	1	

EXTRACTION DATE: 12-JUN-2004
EXTRACTION NO: 3
PLOTING DATE: 29-JUN-2004 14:43