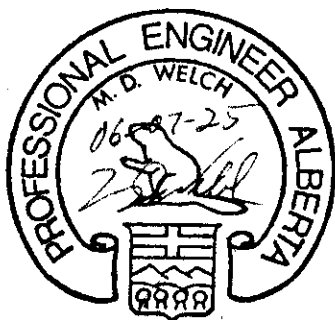




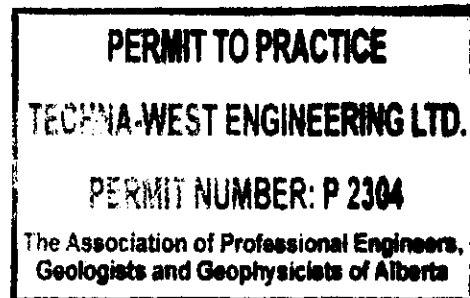
REVIEW OF AS-BUILT ENGINEERING DRAWINGS
IPS JOB # 5325
HUSKY ENERGY LIMITED
LSD: N/A

Attention:
Ms. Christine Prichard
Project Manager

Prepared by:



Ref: 319-061
July 10, 2006



Rev.	Description	Date	By	Client	Approved
0	Review of As-Built drawings	July 10, 2006	EG		

CCL-5325-001PIDS [0]

PROCESS COMMENTS for CCL-5325-001PIDS:

- 1 There is a spec break missing on one of the drain lines.
Designer is to correct drawing detail.
- 2 Under the description of "BH-101A/B" the word "MOUTNIG" should read "MOUNTING".
Designer is to correct drawing detail.
- 3 Whenever there is venting to the atmosphere, discharge should be directed to a safe location. The preference should be a flare system, however there may not be a flare system at this location to dump it to, so if this vent stream has to dump to atmosphere, it must be at a safe location away from walkway or human activity area or sources of ignition.
Designer is to ensure that Owner deals with routing and termination of "Off Skid" piping accordingly.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PIDP [1]

PROCESS COMMENTS for CCL-5325-001PIDP:

- 4 There is always a potential risk of built-up backpressure in a relief line, when two relief lines tie into the same drain/relief header. This is the case with PSV210B and PSV220B, where both relief lines tie into the same 2" drain header. In the case of only one PSV activating, there is a potential of built-up backpressure seen by the other PSV. Designer has to ensure that this scenario is considered when sizing the corresponding relief valves PSV210B and 220B.
Designer to ensure that no backpressure issues arise.
- 5 PID shows the discharge from pump 210 and pump 220 (PS15) tied into the recycle line (PS5). However, after checking the iso-drawings and the three-dimensional piping layout, there is no direct connection between those two lines. Instead, PS15 ties into PS7.
Drawing cannot be stamped without proper PID.

Drawing NOT Stamped by a Professional Engineer for Alberta regarding #5.
However...

The above issues were discussed with the fabricator, and these resolutions have been agreed upon:

- 6 Correction to # 5 above: PID hand marked to show proper pipe connections.

Drawing Stamped by a Professional Engineer for Alberta with hand mark-ups as noted.

This drawing package is an "As Built" package. The application of the P.Eng. stamp is for the design or the design as amended by notations but not the "As Built" verification. This P.Eng. stamp on an As-Built drawing does not imply that the Engineer has checked or verified that the construction was actually done according to the approved drawings or to the dimensions shown.



CCL-5325-001BOM [2]

PROCESS COMMENTS for CCL-5325-001BOM:

7 No comments.

Drawing Stamped by a Professional Engineer for Alberta.

Line Schedule (3 Page, 17 Lines) - Design and Test Data

8 The entry on the line table under the column "Pipe Material" needs to be consistent with drawing CCL-5325-001PS1.

Designer is to correct drawing detail.

9 The entry on the line table under the column "Pipe Material" needs to be consistent with drawing CCL-5325-001PS2.

Designer is to correct drawing detail.

10 The entry on the line table under the column "Pipe Material" needs to be consistent with drawing CCL-5325-001PS3.

Designer is to correct drawing detail.

11 The entry on the line table under the column "Pipe Material" for CCL-5325-001PS7 should be changed from "GR.B B" to "GR.B".

Designer is to correct drawing detail.

12 The entry on the line table under the column "Pipe Material" for CCL-5325-001PS8 should be changed from "GR.B B" to "GR.B".

Designer is to correct drawing detail.

13 The entry on the line table under the column "Pipe Spool" for CCL-5325-001PS9, Spool 27 should be changed from "<2", 3", 4"> to "<2", 3">".

Designer is to correct drawing detail.

14 The MAWP of spool #26 is given with 1440. On drawing 001PS9 spool #26 is rated at a design pressure of 277. Either the line table or the iso-drawing needs to be correct to be consistent. If the line table is corrected, then the hydro pressure for spool #26 needs to be corrected accordingly.

Drawing cannot be stamped without proper pressure rating.

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- 15 The MAWP of spool #29 is given with 1440. On drawing 001PS10 spool #29 is rated at a design pressure of 277. Either the line table or the iso-drawing needs to be correct to be consistent. If the line table is corrected, then the hydro pressure for spool #29 needs to be corrected accordingly.

Drawing cannot be stamped without proper pressure rating.

- 16 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing NOT Stamped by a Professional Engineer for Alberta regarding #14, 15.

However...

The above issues were discussed with the fabricator, and these resolutions have been agreed upon:

- 17 Correction to # 14,15 above: Line table has been hand edited to reflect the correct pressure values.

Drawing Stamped by a Professional Engineer for Alberta with hand mark-ups as noted.

CCL-5325-001PS1 [2]

- 18 Pipe material for spool 1, 2, 1A, and 1B needs to be consistent with "Pipe Material" entry on line schedule.

Designer is to correct drawing detail.

- 19 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS2 [1]

- 20 Pipe material for spool 3 and 3A needs to be consistent with "Pipe Material" entry on line schedule.

Designer is to correct drawing detail.

- 21 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS3 [2]

This drawing package is an "As Built" package. The application of the P.Eng. stamp is for the design or the design as amended by notations but not the "As Built" verification. This P.Eng. stamp on an As-Built drawing does not imply that the Engineer has checked or verified that the construction was actually done according to the approved drawings or to the dimensions shown.



- 22 Pipe material for spool 6 needs to be consistent with "Pipe Material" entry on line schedule.
Designer is to correct drawing detail.
- 23 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS4 [1]

- 24 No comments.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS5 [2]

- 25 No comments.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS6 [2]

- 26 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS7 [1]

- 27 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS8 [1]

This drawing package is an "As Built" package. The application of the P.Eng. stamp is for the design or the design as amended by notations but not the "As Built" verification. This P.Eng. stamp on an As-Built drawing does not imply that the Engineer has checked or verified that the construction was actually done according to the approved drawings or to the dimensions shown.

- 28 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS9 [1]

- 29 There is a pair of 3" #600 flanges downstream of the top flat eccentric reducer shown on 001PIDP but not on the corresponding drawing 001PS9.

Designer is to correct drawing detail.

- 30 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

- 31 On the accompanying line table, the MAWP of spool #26 is given with 1440. On drawing 001PS9 spool #26 is rated at a design pressure of 277. Either the line table or the iso-drawing needs to be correct to be consistent.

Drawing cannot be stamped without proper pressure rating.

Drawing NOT Stamped by a Professional Engineer for Alberta regarding #31.

However...

The above issues were discussed with the fabricator, and these resolutions have been agreed upon:

- 32 Correction to # 31 above: Line table has been hand edited to reflect the correct pressure values.

Drawing Stamped by a Professional Engineer for Alberta with hand mark-ups as noted.

CCL-5325-001PS10 [1]

- 33 There is a pair of 3" #600 flanges downstream of the top flat eccentric reducer shown on 001PIDP but not on the corresponding drawing 001PS10.

Designer is to correct drawing detail.

- 34 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

- 35 On the accompanying line table, the MAWP of spool #29 is given with 1440. On drawing 001PS10 spool #29 is rated at a design pressure of 277. Either the line table or the iso-drawing needs to be correct to be consistent.

Drawing cannot be stamped without proper pressure rating.

This drawing package is an "As Built" package. The application of the P.Eng. stamp is for the design or the design as amended by notations but not the "As Built" verification. This P.Eng. stamp on an As-Built drawing does not imply that the Engineer has checked or verified that the construction was actually done according to the approved drawings or to the dimensions shown.



Drawing NOT Stamped by a Professional Engineer for Alberta regarding #35.

However...

The above issues were discussed with the fabricator, and these resolutions have been agreed upon:

- 36 Correction to # 35 above: Line table has been hand edited to reflect the correct pressure values.

Drawing Stamped by a Professional Engineer for Alberta with hand mark-ups as noted.

CCL-5325-001PS11 [1]

- 37 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS12 [1]

- 38 On 001PIDP a pair of 4" #600 flanges is shown above 4"x2" WOL that connects to the HC Cage top inlet, on 001PS12 this pair of flanges is shown below the WOL.
Designer is to correct drawing detail.

- 39 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS13 [1]

- 40 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS14 [1]

This drawing package is an "As Built" package. The application of the P.Eng. stamp is for the design or the design as amended by notations but not the "As Built" verification. This P.Eng. stamp on an As-Built drawing does not imply that the Engineer has checked or verified that the construction was actually done according to the approved drawings or to the dimensions shown.

- 41 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS15 [1]

- 42 "From PS7" needs to be replaced by "From PS17".
- 43 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS16 [2]

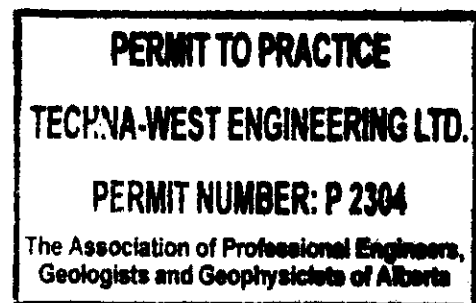
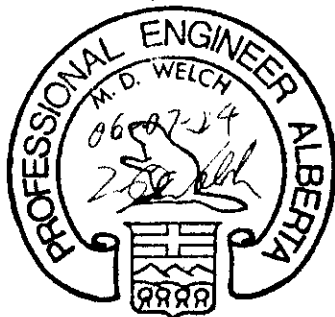
- 44 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.

CCL-5325-001PS17 [2]

- 45 Up to a nominal pipe size of 8", Schedule 80 and XS describe the same pipe specification. The designer should therefore use either Schedule 80 or XS but not a combination of both to avoid any potential confusion.

Drawing Stamped by a Professional Engineer for Alberta.



This drawing package is an "As Built" package. The application of the P.Eng. stamp is for the design or the design as amended by notations but not the "As Built" verification. This P.Eng. stamp on an As-Built drawing does not imply that the Engineer has checked or verified that the construction was actually done according to the approved drawings or to the dimensions shown.

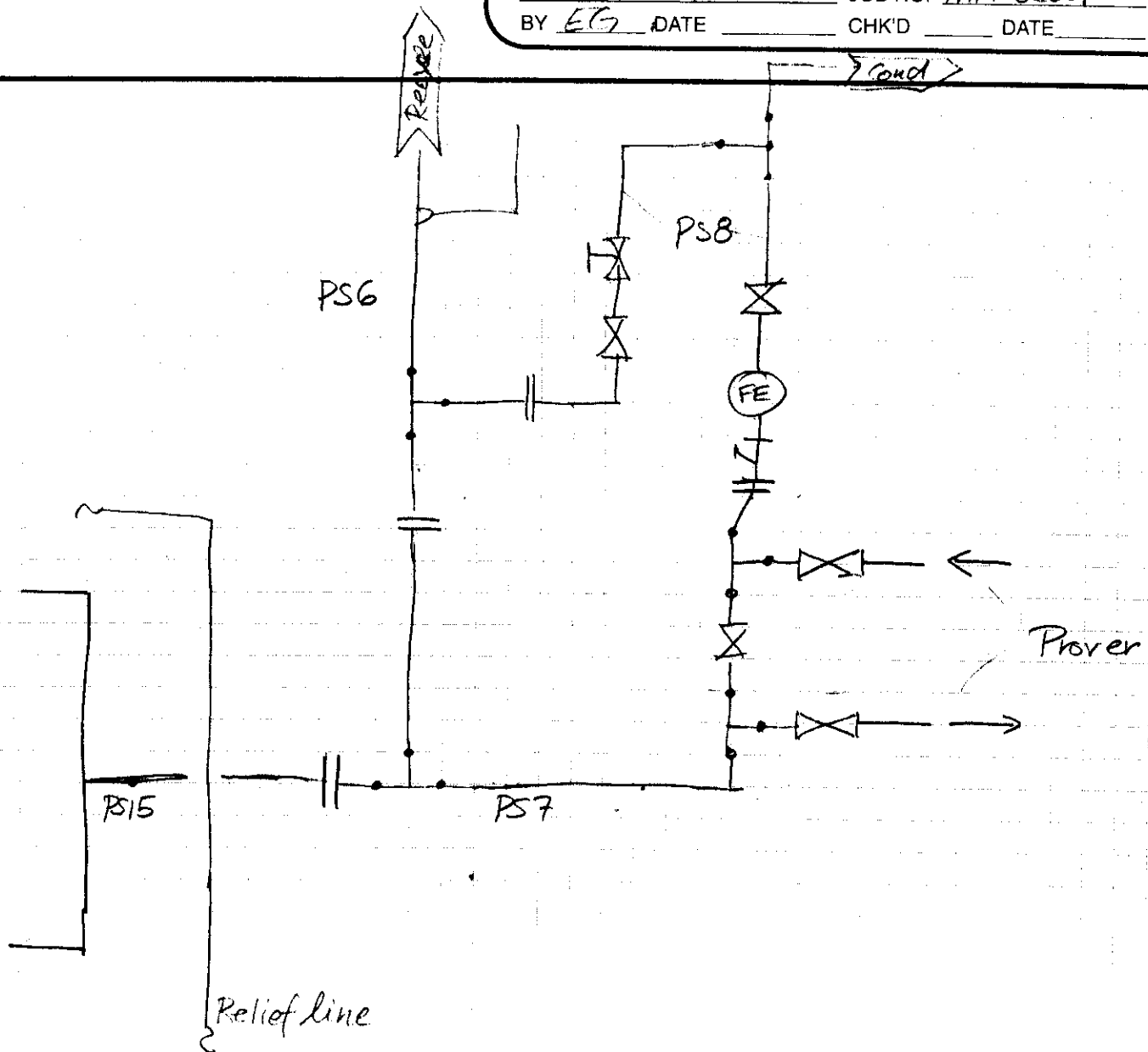


CLIENT IPS

PROJECT 5325

JOB NO. TWA 32001

BY EG DATE _____ CHK'D _____ DATE _____





PROJECT#5325-001/Husky Energy Ltd. c/o Tartan Engineering- Ansell 03-06-49-18 W5

<u>DWG.#/ SPOOL # & SERVICE-REV.#</u>	<u>M.P.I.</u>	<u>PIPE SIZE (SPOOL#)</u>	<u>PIPE SCH.</u>	<u>MAWP PRESS Psig</u>	<u>OPER. PRESS. Psig</u>	<u>OPER. TEMP. °F</u>	<u>DESIGN TEMP. °F</u>	<u>C.A. (Inches)</u>	<u>X- RAY</u>	<u>HYDRO PRESS. Psig</u>	<u>PWHT</u>	<u>PIPE MATERIAL</u>
CCL-5325-001PS1 (1A)	NO	2", 1"	80	277	217.5	41	130	0.125	15%	415.5	NO	SA-106B GR.B
(1B)	NO	2", 1"	80	720	217.5	41	130	0.125	15%	1080	NO	SA-106B GR.B
(1)(2) GAS INLET REV.#2	NO	4", 8"	80	1440	217.5	41	130	0.125	15%	2160	NO	SA-333-6 (OUTSIDE)
CCL-5325-001PS2 (3)(3A)	NO	8", 4", 2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B
(4)(5) GAS OUTLET REV.#1	NO	4"	80	1440	217.5	41	130	0.125	15%	2160	NO	SA-106B GR.B & SA-333-6 (OUTSIDE)
CCL-5325-001PS3 (6)	NO	3"	80	277	ATM	41	130	0.125	15%	415.5	NO	SA-106B GR.B B & SA-333-6 (OUTSIDE)
(7) PSV REV.#2	NO	2", 3"	80	277	217.5	41	130	0.125	15%	415.5	NO	SA-106B GR.B
CCL-5325-001PS4 (8)(9)(10) DRAIN HEADER REV.#1	NO	2"	80	277	217.5	41	130	0.125	15%	415.5	NO	SA-106B GR.B & SA-333-6 (OUTSIDE)
CCL-5325-001PS5 (11)(11A)(12)	NO	3", 2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B
(13) DRAIN REV.#2	NO	2"	80	277	217.5	41	130	0.125	15%	415.5	NO	SA-106B GR.B & SA-333-6 (OUTSIDE)
CCL-5325-001PS6 (14)(15)(16) RECYCLE REV.#2	NO	3", 2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B

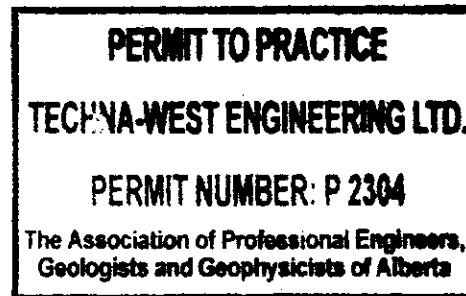
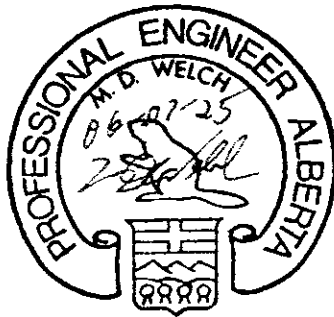


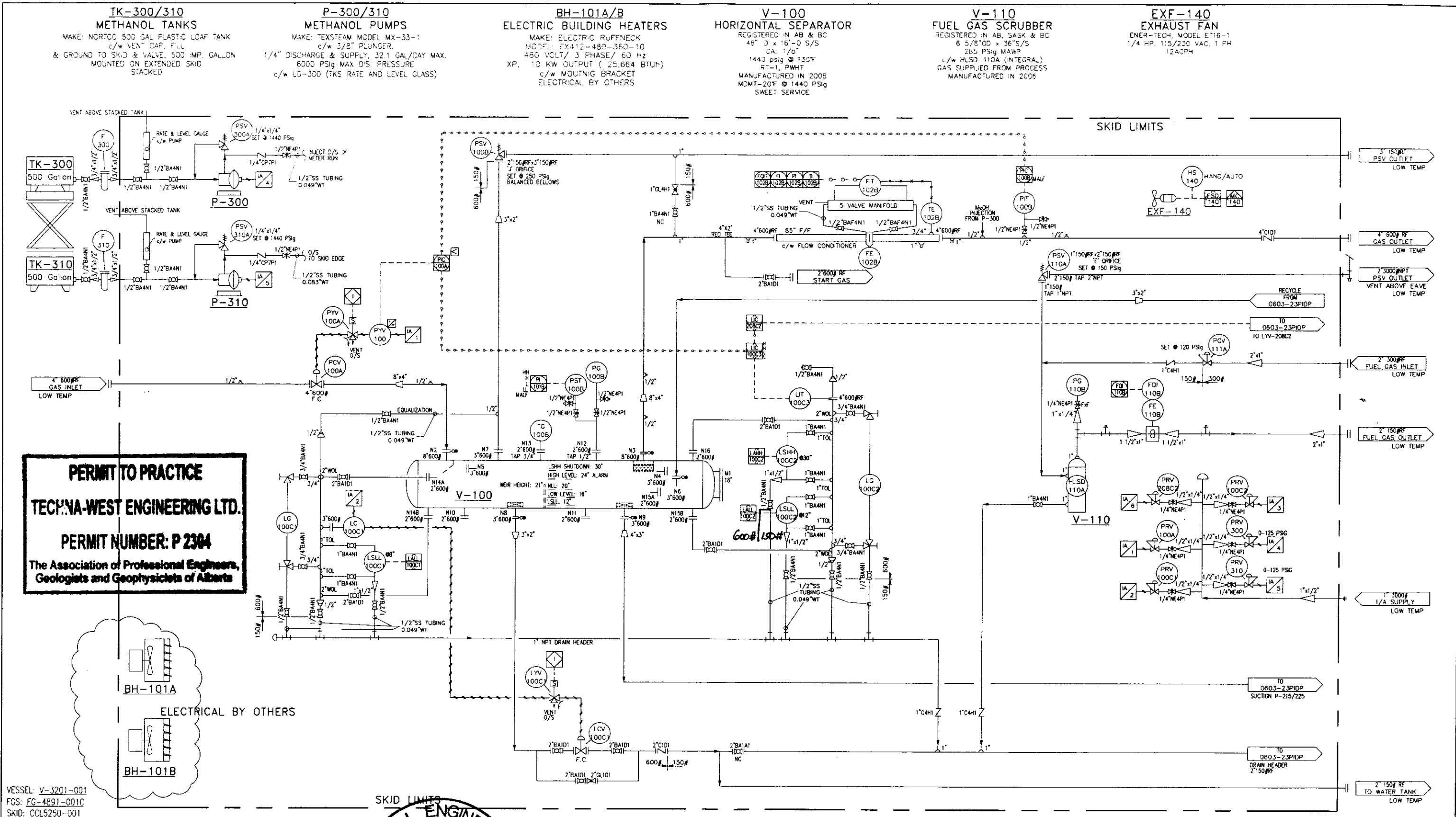
CCL-5325-001PS7 (17)(18)(19)(20) METER PROVERS REV.#1	NO	2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B B & SA-333-6 (OUTSIDE)
CCL-5325-001PS8 (21)(22)(23)(24) CONDENSATE TO PIPELINE REV.#1	NO	2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B B & SA-333-6 (OUTSIDE)
CCL-5325-001PS9 (25) (26) (27) DISCHARGE P-225 REV.#1	NO NO NO	3", 4" 4" 2", 3", 4"	80 80 80	277 1440 277 277	217.5 217.5 217.5	41 41 41	130 130 130	0.125 0.125 0.125	15% 15% 15%	415.5 2160 415.5 415.5	NO NO NO	SA-106B GR.B SA-106B GR.B SA-106B GR.B
CCL-5325-001PS10 (28) (29) (30) DISCHARGE P-215 REV.#1	NO NO NO	3", 2" 3", 4" 3", 4"	80 80 80	277 1440 277 277	217.5 217.5 217.5	41 41 41	130 130 130	0.125 0.125 0.125	15% 15% 15%	415.5 2160 415.5 415.5	NO NO NO	SA-106B GR.B SA-106B GR.B SA-106B GR.B
CCL-5325-001PS11 (40)(41) HC CAGE IN & OUT REV.#1	NO	2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B
CCL-5325-001PS12 (38)(39) HC CAGE REV.#1	NO	2", 4"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B
CCL-5325-001PS13 (37) WATER CAGE INLET REV.#1	NO	2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B
CCL-5325-001PS14 (36) WATER CAGE REV.#1	NO	2", 3", 6"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B
CCL-5325-001PS15 (33)(34)(35) WATER CAGE INLET REV.#1	NO	2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B



CCL-5325-001PS16 (32) DISCHARGE P-210 REV.#2	NO	2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B
CCL-5325-001PS17 (31) DISCHARGE P-220 REV.#2	NO	2"	80	1440	217.5	41	130	0.0625	15%	2160	NO	SA-106B GR.B

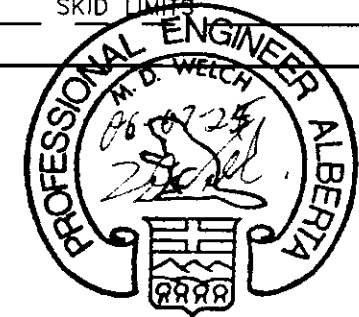
June 29/06.





NOTES:

1) ALL O/S FLANGES & PIPING TO BE LOW TEMP MATERIAL



NO.	REVISIONS	DWN	APPR	DATE
0	ISSUED FOR CONSTRUCTION	LG		06-05-19
E	REV. HEATERS AS PER CUSTOMER E-MAIL	CP		06-05-16
D	REV. AS PER CUSTOMER MARKUPS	PP		06-05-09
C	ADD PSV INFO PER VENDOR	CP		06-05-01
B	REV. AS PER CUSTOMER	CMP		06-04-26
A	ISSUED FOR APPROVAL	PP		06-04-10

HUSKY ENERGY LIMITED
c/o TARTAN ENGINEERING LTD.
LSD: ANSELL 03-06-049-18 W5M

P&ID FOR 48" ID x 16'-0" S/S HORIZONTAL SWEET SEPARATOR PACKAGE
c/w TWINNED CONDENSATE PUMPS

DATE 06-04-10	DESIGNED BY IPS	PROJECT NO. 5325-001	FILENAME 5325-001PIDSEP	REFERENCE NO.
DRAWN BY P.PIOT	CHECKED BY	SHEET NO. 1 OF 1	DRAWING NO. CCL-5325-001PIDS	REV. NO.
APPROVED BY				
SCALE N.T.S.				

P-210/220
NOI TRIPLEX CONDENSATE PUMPS

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118	2119	2120	2121	2122	2123	2124	2125	2126	2127	2128	2129	2130	2131	2132	2133	2134	2135	2136	2137	2138	2139	2140	2141	2142	2143	2144	2145	2146	2147	2148	2149	2150	2151	2152	2153	2154	2155	2156	2157	2158	2159	2160	2161	2162	2163	2164	2165	2166	2167	2168	2169	2170	2171	2172	2173	2174	2175	2176	2177	2178	2179	2180	2181	2182	2183	2184	2185	2186	2187	2188	2189	2190	2191	2192	2193	2194	2195	2196	2197	2198	2199	2200	2201	2202	2203	2204	2205	2206	2207	2208	2209	2210	2211	2212	2213	2214	2215	2216	2217	2218	2219	2220	2221	2222	2223	2224	2225	2226	2227	2228	2229	2230	2231	2232	2233	2234	2235	2236	2237	2238	2239	2240	2241	2242	2243	2244	2245	2246	2247	2248	2249	2250	2251	2252	2253	2254	2255	2256	2257	2258	2259	2260	2261	2262	2263	2264	2265	2266	2267	2268	2269	2270	2271	2272	2273	2274	2275	2276	2277	2278	2279	2280	2281	2282	2283	2284	2285	2286	2287	2288	2289	2290	2291	2292	2293	2294	2295	2296	2297	2298	2299	2300	2301	2302	2303	2304	2305	2306	2307	2308	2309	2310	2311	2312	2313	2314	2315	2316	2317	2318	2319	2320	2321	2322	2323	2324	2325	2326	2327	2328	2329	2330	2331	2332	2333	2334	2335	2336	2337	2338	2339	2340	2341	2342	2343	2344	2345	2346	2347	2348	2349	2350	2351	2352	2353	2354	2355	2356	2357	2358	2359	2360	2361	2362	2363	2364	2365	2366	2367	2368	2369	2370	2371	2372	2373	2374	2375	2376	2377	2378	2379	2380	2381	2382	2383	2384	2385	2386	2387	2388	2389	2390	2391	2392	2393	2394	2395	2396	2397	2398	2399	2400	2401	2402	2403	2404	2405	2406	2407	2408</
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FROM
0603-23FDP
FROM UC-2002

FROM
0603-23PIDP
SUCTION FROM N9




FROM
0603-23PDP
DRAIN HEADER
2150 RF



ENGINEERS & PERMIT STAMPS



IPS
MANUFACTURING LIMITED

DATE 06-04-10	HUSKY ENERGY LIMITED c/o TARTAN ENGINEERING LTD. LSD: ANSELL 03-06-049-18 WSM		
DESIGNED BY IPS	P&ID FOR 48" ID x 16'-0" S/S HORIZONTAL SWEET SEPARATOR PACKAGE c/w TWINNED CONDENSATE PUMPS		
DRAWN BY P.PIOT			
CHECKED BY 			
APPROVED BY 	PROJECT NO. 5325-001	FILENAME 5325-001PIDPUMP	REFERENCE NO.
SCALE N IS	SHEET NO. 1 OF 1	DRAWING NO. CGC - 5325-001PIDP	REV. NO. 

NOTES:

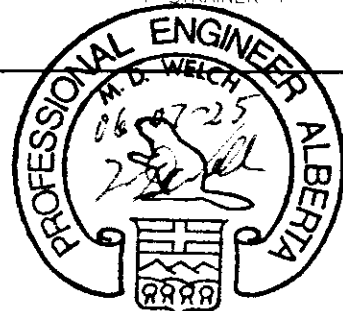
1. ALL MATERIALS TO BE SUPPLIED BY THE VENDOR.
2. ALL MATERIALS TO BE SUPPLIED BY THE VENDOR.
3. ALL MATERIALS TO BE SUPPLIED BY THE VENDOR.
4. ALL MATERIALS TO BE SUPPLIED BY THE VENDOR.
5. BUILDING: STYLE: SABLE 18'-0" WIDE X 34'-0" LONG X 12'-0" LOW BAY (X18) - BLDG SIZE TO BE CONFIRMED UPON J.A. APPROVAL.
EXTERIOR: 28 GAUGE PRE-PAINTED EXTERIOR (HARVEST GOLD WITH METRO BROWN TRIM)
INTERIOR: 24 GAUGE WHITE ELUTED ALUMINUM INTERIOR c/w R-12 INSULATION IN WALLS & R-20 INSULATION IN ROOF
DOORS: ONE SET OF DOUBLE DOORS 6'-0" WIDE X 7'-0" HIGH AND ONE (1) 3'-0" X 7'-0" MAIN DOOR c/w TWO WINDOW, HYDRAULIC CLOSURE, CHECK-CHAIN, PANIC-LOCK, WEATHER-STRIPPING, CANOPIES
WINDOWS: TWO (2) 36" X 36" DOUBLE GLAZED SLIDING WINDOWS c/w SCREENS
VENTILATION: TWO (2) 24" X 24" ADJUSTABLE LOUVERS AND EXHAUST FAN (20VAC/12 ACPH)
REMOVABLE PANEL: ONE (1) REMOVABLE PANEL, 3'-0" WIDE X 6'-0" HIGH (FOR PUMP ACCESS)
TWO FULL LENGTH METRO BROWN CERAKES
6. HYDROTEST TO 1.5X DESIGN PRESSURE
7. ALL BUTT WELDED PIPING TO BE 15% X-RAY; VESSEL TO BE RT-1 AND P.W.H.T.
8. ALL STUDS ARE SA-193-B7M, NUTS ARE SA-193-2HM, GASKETS 316 SS.
9. MAWP OF PIPE:
3" SCH80 BUTTWELDED c/w 600# FLANGES @ 130°F IS 1440 PSIG c/w 1/8" CA.
8" SCH80 BUTTWELDED c/w 600# FLANGES @ 130°F IS 1440 PSIG c/w 1/8" CA.
2" SCH80 BUTTWELDED c/w 600# FLANGES @ 130°F IS 1440 PSIG c/w 1/16" CA.
1" SCH80 BUTTWELDED c/w 600# FLANGES @ 130°F IS 1440 PSIG c/w 1/16" CA.
4" SCH80 BUTTWELDED c/w 600# FLANGES @ 130°F IS 1440 PSIG c/w 1/8" CA.
4" SCH80 BUTTWELDED c/w 150# FLANGES @ 130°F IS 277 PSIG c/w 1/8" CA.
3" SCH80 BUTTWELDED c/w 150# FLANGES @ 130°F IS 277 PSIG c/w 1/8" CA.
2" SCH80 BUTTWELDED c/w 150# FLANGES @ 130°F IS 277 PSIG c/w 1/8" CA.
6" SCH80 BUTTWELDED c/w 150# FLANGES @ 130°F IS 277 PSIG c/w 1/8" CA.
10. P210/220 (TRIPLEX PUMPS) c/w MURPHY VIBRATION/SHOCK SWITCHES (MODEL: VS-2-EX) & MURPHY LEVEL SWITCHGAUGE (MODEL: EL-150EX)
11. ELECTRICAL BY OTHERS
12. P.I.D, BOM & BLDG TO BE STAMPED BY PENG.

END CONNECTION:
FLANGED RF= 1
FLANGED RTJ=2
BUTTWELDED= 3
THREADED= 4
SOCKETWELD= 5
SW/SCRD= 6
TUBING= 7

VALVE LEGEND

VALVE SERVICE:
NORMAL TEMP, SWEET PROCESS=1
NORMAL TEMP, SOUR PROCESS=1S
LOW TEMP, SWEET PROCESS=2
LOW TEMP, SOUR PROCESS=2S

VALVE SIZE: 2" BA 1 D 1S
VALVE TYPE:
BALL (R.P.)=BA
BALL (F.P.)=BAF
NEEDLE=NE
FULL BODY CHECK=C
GATE=GA
GLOBE=GL
PISTON CHECK=CP
Y-STRAINER=Y
ANSI CLASS:
150#=#A
300#=#B
400#=#C
600#=#D
900#=#E
1500#=#F
2500#=#G
THREADED/SOCKET WELDED CLASS:
API 602 WOG
CLASS 800=H 1000 WOG=L
CLASS 1500=J 2000 WOG=M
CLASS 2500=K 3600 WOG=N
6000 WOG=P
10000 WOG=Q
TUBING RATING=R
250 WOG=S



PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

SIZE	QTY.	DESCRIPTION
2"	1	2"600HRF TAPPED 1/2" NPT
	1	2"600HRF TAPPED 3/4" NPT
	3	2"600HRF BLIND
3"	2	3"600HRF BLIND
18"	1	18"600HRF BLIND
3"	2	3"600HRF TAPPED 2" NPT
1"	1	1"150HRF TAPPED 1" NPT
	1	1"600HRF TAPPED 1" NPT
3"	1	3"600HRF TAPPED 1" NPT
8"	2	8"600# SPEC BLIND
3"	3	3"600# SPEC BLIND

VALVE LISTING			
TAG	QTY.	MAKE	DESCRIPTION
4"BAF1D1	2	NUTRON	4"600# RF RP, BALL VALVE, STD SERVICE
2"BA1A1	1	NUTRON	2" 150# RF RP, BALL VALVE STD SERVICE
2"BA1D1	19	NUTRON	2" 600# RF RP, BALL VALVE STD SERVICE (B2-R20RC6SZ)
2"BA1A1	2	NUTRON	2" 150# RF RP, BALL VALVE C.S.D., STD SERVICE
1"BA4N1	10	BALON	1" NPT RP, 3000# BALL VALVE, STD. SERVICE
3/4"BA4N1	4	BALON	3/4" NPT RP, 3000# BALL VALVE STD SERVICE
1/2"BA4N1	19	BALON	1/2" NPT RP, 3000# BALL VALVE, STD. SERVICE
1/2"NE4P1	28	CENTURY	1/2" NPT 6000# MxF NEEDLE VALVE, STD
1/4"NE4P1	7	CENTURY	1/4" NPT 6000# FxF NEEDLE VALVE, CS
4"C1D1	1	WHEATLEY	4" 600HRF SWING CHECK, STD.
2"C1D1	5	WHEATLEY	2" 600HRF SWING CHECK, STD.
1"C4H1	3	NAVCO	1" NPT CLASS 800 CHECK, STD.
1/4"CP7P1	2	NUPRO	1/4" NPT 6000# SS CHECK,
4"Y1A1	2	ALTA	4" 150 ANSI RF Y-STRAINERS, STD.
1"GL4H1	2	NAVCO	1" NPT CLASS 800 GLOBE VALVE, STD.
2"Y1D1	1	ALTA	2"600 ANSI RF Y-STRAINERS, STD.
2"GL1D1	2	NAVCO	2" 600# GLOBE VALVE, STD.
1/2"BAF4N1	2	NUTRON	1/2" NPT FP, 3000# BALL VALVE, STD. SERVICE
1 1/2"GL4H1	2	NAVCO	1 1/2" NPT CLASS 800 GLOBE VALVE, STD.

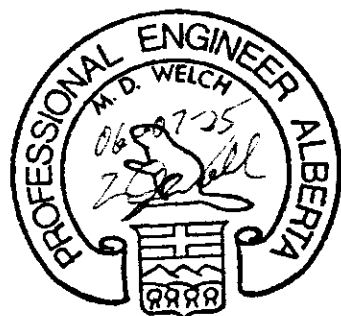
NO.	REVISIONS	DATE
2	REVISED PER CUSTOMER REQUEST	06-06-23
1	REVISED PER CUSTOMER REQUEST	06-06-16
0	ISSUED FOR CONSTRUCTION	06-05-19
D	REV. VALVE COUNT PER CUSTOMER MARKUPS	06-05-09
C	REV. VALVE COUNT PER CUSTOMER VERBAL REV.	06-05-01
B	REV. AS PER CUSTOMER	06-04-26
A	ISSUED FOR APPROVAL	06-04-12
NO.	REVISIONS	DATE

IPS
MANUFACTURING LIMITED

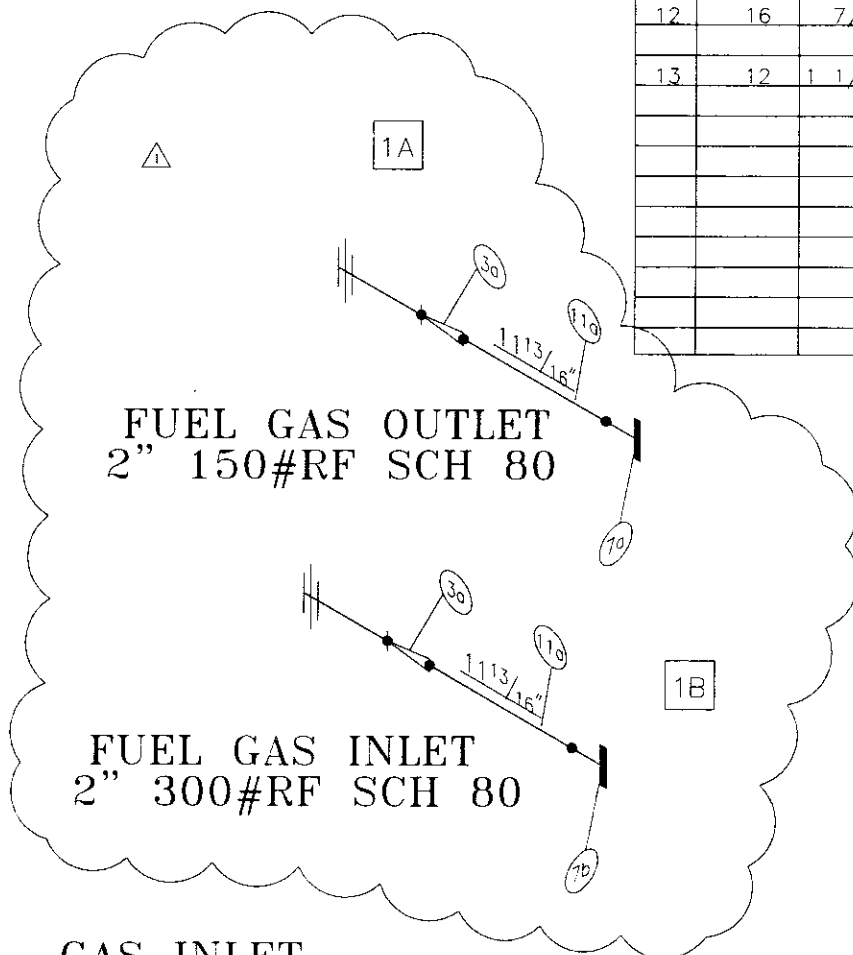
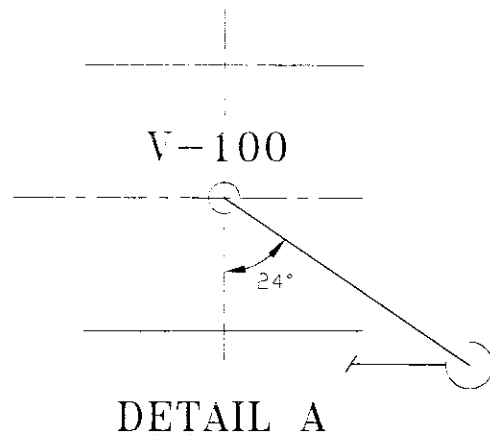
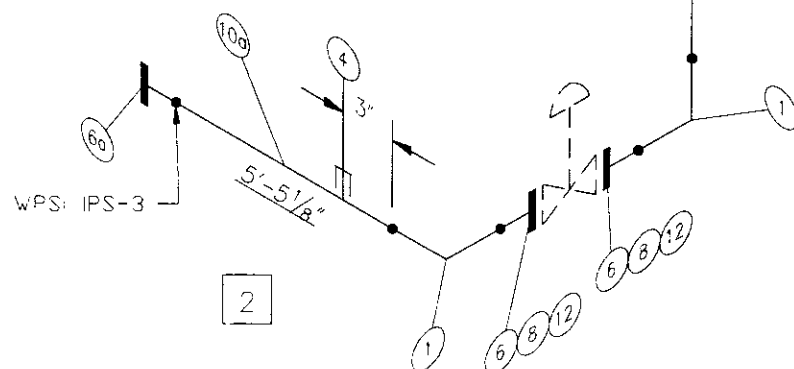
DATE: 06-04-12
DESIGNED BY: PS
DRAWN BY: P.PIOT
CHECKED BY: [Signature]
APPROVED BY: [Signature]
SCALE: N.T.S.
CLIENT: HUSKY ENERGY LIMITED
C/O TARTAN ENGINEERING LTD.
LSD: ANSELL 03-06-049-18 WSM
TITLE: BILL OF MATERIALS & NOTES FOR 48" HORIZONTAL SWEET SEPARATOR PACKAGE
PROJECT NO: 5325-001
SHEET NO: 1 OF 1
FILENAME: 5325-001BOM
REFERENCE NO: CCL-5325-001BOM
REV. NO: 2

BILL OF MATERIALS

TAG	QTY.	MAKE	DESCRIPTION	TAG	QTY.	MAKE	DESCRIPTION
LCV-10001	1	FISHER	LEVEL GAUGE, 2" DIA, 6" STEM, 3/4" NPT, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)	LCV-10001	1	FISHER	LEVEL GAUGE, 2" DIA, 6" STEM, 3/4" NPT, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)
LCV-10001	1	FISHER	LEVEL GAUGE, 2" DIA, 6" STEM, 3/4" NPT, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)	LCV-10001	1	FISHER	LEVEL GAUGE, 2" DIA, 6" STEM, 3/4" NPT, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)
LCV-10001	1	ASCO	3-WAY SOLENOID VALVES, MODEL EF8340301, LOW WATTAGE, SST, EXPLOSION PROOF, ENERGIZE TO OPEN NORMALLY CLOSED, 24 VDC, 150 PSIG MAX	LCV-10001	1	ASCO	3-WAY SOLENOID VALVES, MODEL EF8340301, LOW WATTAGE, SST, EXPLOSION PROOF, ENERGIZE TO OPEN NORMALLY CLOSED, 24 VDC, 150 PSIG MAX
LCV-10001	1	PENBERTHY	LEVEL GAUGE, 2" DIA, 6" STEM, 3/4" NPT, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)	LCV-10001	1	PENBERTHY	LEVEL GAUGE, 2" DIA, 6" STEM, 3/4" NPT, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)
LCV-10002	1	PENBERTHY	LEVEL GAUGE, 3" DIA, 6" STEM, 3/4" NPT, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)	LCV-10002	1	PENBERTHY	LEVEL GAUGE, 3" DIA, 6" STEM, 3/4" NPT, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)
FIT-1023 TE-1023	1	ROSEMOUNT	MULTIVARIABLE TRANSMITTER, MODEL 3095FE, STD., SS FLANGE, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)	FIT-1023 TE-1023	1	ROSEMOUNT	MULTIVARIABLE TRANSMITTER, MODEL 3095FE, STD., SS FLANGE, 0-250" H2O DIFFERENTIAL PRESSURE RANGE, 0-3626 PSI PRESSURE RANGE, 12" SHIELDED STD CABLE 1.5" INSERTION WITH CONN. HEAD, -40 to 400°C CSA APPROVED, (ELECTRICAL BY OTHERS)
PST-100B PIT-100B	2	ROSEMOUNT	PRESSURE TRANSMITTERS, MODEL 3091T04, STD., SS DIAPHRAGM, 0 to 4000 PSig, 1/2" NPT, CSA APPROVED, (ELECTRICAL BY OTHERS)	PST-100B PIT-100B	2	ROSEMOUNT	PRESSURE TRANSMITTERS, MODEL 3091T04, STD., SS DIAPHRAGM, 0 to 4000 PSig, 1/2" NPT, CSA APPROVED, (ELECTRICAL BY OTHERS)
PG-100B	1	WIKA	PRESSURE GAUGE, 4" x 1/2" NPT BOTTOM MOUNT CONN., MODEL 233.54, 0 to 300 PSig, DUAL SCALE SS CASE & INTERNALS, MOUNTED IN 2" 600# HUB FLANGE TAPPED 1/2" NPT, LIQUID FILLED	PG-100B	1	WIKA	PRESSURE GAUGE, 4" x 1/2" NPT BOTTOM MOUNT CONN., MODEL 233.54, 0 to 300 PSig, DUAL SCALE SS CASE & INTERNALS, MOUNTED IN 2" 600# HUB FLANGE TAPPED 1/2" NPT, LIQUID FILLED
PSV-100B	1	FARRIS	PRESSURE RELIEF VALVE, MODEL 261B10, BALANCED BELLOWS, 2"150#RF x 3"150#RF, SIZED FOR 10 HMSCFD GAS, "J" ORIFICE, STD., WCB BODY, SET @ 250 PSig	PSV-100B	1	FARRIS	PRESSURE RELIEF VALVE, MODEL 261B10, BALANCED BELLOWS, 2"150#RF x 3"150#RF, SIZED FOR 10 HMSCFD GAS, "J" ORIFICE, STD., WCB BODY, SET @ 250 PSig
PCV-100A	1	FISHER	ET BODY CONTROL VALVE, 4"600#RF FLANGED, STD., EQUAL PERCENTAGE TRIM, 667 SIZE 45 ACTUATOR 6 to 30 PSig, AIR to OPEN/FAIL CLOSED	PCV-100A	1	FISHER	ET BODY CONTROL VALVE, 4"600#RF FLANGED, STD., EQUAL PERCENTAGE TRIM, 667 SIZE 45 ACTUATOR 6 to 30 PSig, AIR to OPEN/FAIL CLOSED
PYV-100A	1	ASCO	3-WAY SOLENOID VALVE, MODEL EF8314C301, LOW WATTAGE, SST, EXPLOSION PROOF, 24 VDC, 150 PSig MAX SUPPLY PRESSURE, ENERGIZE TO OPEN/ NORMALLY CLOSED	PYV-100A	1	ASCO	3-WAY SOLENOID VALVE, MODEL EF8314C301, LOW WATTAGE, SST, EXPLOSION PROOF, 24 VDC, 150 PSig MAX SUPPLY PRESSURE, ENERGIZE TO OPEN/ NORMALLY CLOSED
TC-100B	1	TREND	TEMPERATURE INDICATOR, 3" DIAL, 6" STEM, 3/4" NPT BACK CONN., -40" TO 1600" RANGE, DUAL SCALE c/w 1/2" NPT x 3/4" NPT x 6" 316SS THERMOWELL	TC-100B	1	TREND	TEMPERATURE INDICATOR, 3" DIAL, 6" STEM, 3/4" NPT BACK CONN., -40" TO 1600" RANGE, DUAL SCALE c/w 1/2" NPT x 3/4" NPT x 6" 316SS THERMOWELL
PYV-100A LYM-208C2	2	FISHER	MODEL 12P-100 TRANSDUCERS, 4 to 20 mA INPUT, 6 to 30 PSig OUTPUT, EXPLOSION PROOF, CSA APPROVED, (ELECTRICAL HOOK-UP BY OTHERS)	PYV-100A LYM-208C2	2	FISHER	MODEL 12P-100 TRANSDUCERS, 4 to 20 mA INPUT, 6 to 30 PSig OUTPUT, EXPLOSION PROOF, CSA APPROVED, (ELECTRICAL HOOK-UP BY OTHERS)
LIT-100C3	1	FISHER	DL3-249B LEVEL TRANSMITTER, MODEL 249B, 4" 600#RF WAFER STYLE SENSOR, MODEL DL3 TRANSMITTER, HART COMMUNICATION, 4-20 mA OUTPUT, NACE MR0175, CSA APPROVED, (GAS OVER CONDENSATE/WATER INTERFACE), (ELECTRICAL HOOK-UP BY OTHERS)	LIT-100C3	1	FISHER	DL3-249B LEVEL TRANSMITTER, MODEL 249B, 4" 600#RF WAFER STYLE SENSOR, MODEL DL3 TRANSMITTER, HART COMMUNICATION, 4-20 mA OUTPUT, NACE MR0175, CSA APPROVED, (GAS OVER CONDENSATE/WATER INTERFACE), (ELECTRICAL HOOK-UP BY OTHERS)
LCV-208C2	1	FISHER	D4 LIQUID CONTROL VALVE(RECYCLE LINE), 2" 600#RF END CONN., STD., 6 to 30PSig INPUT, TRIM SIZE 1/4", AIR to CLOSE/FAIL OPEN	LCV-208C2	1	FISHER	D4 LIQUID CONTROL VALVE(RECYCLE LINE), 2" 600#RF END CONN., STD., 6 to 30PSig INPUT, TRIM SIZE 1/4", AIR to CLOSE/FAIL OPEN
PRV-100A,100C1 100C2, 208C2	4	FISHER	670CFR INSTRUMENT GAS REGULATOR, STD., 250PSig MAWP, 1/4" FNPT, 0 to 35 PSig SPRING RANGE	PRV-100A,100C1 100C2, 208C2	4	FISHER	670CFR INSTRUMENT GAS REGULATOR, STD., 250PSig MAWP, 1/4" FNPT, 0 to 35 PSig SPRING RANGE
PSV-300A PSV-310A	2	NUPRO	PROPORTIONAL RELIEF VALVE, MODEL SS-4R3A5-BU, SS BODY, BUNA-N PACKING AND SEALS, 1/4" NPT SET @ 1440 PSig, "C" SPRING, 750-1500 PSig	PSV-300A PSV-310A	2	NUPRO	PROPORTIONAL RELIEF VALVE, MODEL SS-4R3A5-BU, SS BODY, BUNA-N PACKING AND SEALS, 1/4" NPT SET @ 1440 PSig, "C" SPRING, 750-1500 PSig
F-300C/310	2	BALDWIN	METHANOL FILTERS, MODEL BT839-10, 3/4" NPT CONN. BUNA SEAL, 150 PSig MAWP	F-300C/310	2	BALDWIN	METHANOL FILTERS, MODEL BT839-10, 3/4" NPT CONN. BUNA SEAL, 150 PSig MAWP
PG-210A/220A 215A/225A	4	WIKA	PRESSURE GAUGE, 4" x 1/2" NPT BOTTOM MOUNT CONN., MODEL 233.54, 0 to 300 PSig, DUAL SCALE SS CASE & INTERNALS, LIQUID FILLED	PG-210A/220A 215A/225A	4	WIKA	PRESSURE GAUGE, 4" x 1/2" NPT BOTTOM MOUNT CONN., MODEL 233.54, 0 to 300 PSig, DUAL SCALE SS CASE & INTERNALS, LIQUID FILLED
PG-210B/220B	2	WIKA	PRESSURE GAUGE, 4" x 1/2" NPT BOTTOM MOUNT CONN., MODEL 233.54, 0 to 1500 PSig, DUAL SCALE SS CASE & INTERNALS, LIQUID FILLED	PG-210B/220B	2	WIKA	PRESSURE GAUGE, 4" x 1/2" NPT BOTTOM MOUNT CONN., MODEL 233.54, 0 to 1500 PSig, DUAL SCALE SS CASE & INTERNALS, LIQUID FILLED



PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta



GAS INLET
8" 600#RF SCH 80
4" 600#RF SCH 80

BILL OF MATERIAL										HEAT NUMBERS
ITEM	QTY	SIZE	CODE	RATING	DESCRIPTION					
1	1	3"	WLD-8008040	Sch XS	80 LF EN BW CS SA-234-WPB	37.00	lbs			
2	1	3"	WLD-8008080	Sch XS	80 LR EN BW CS SA-234-WPB	71.00	lbs			
3	1		WLD-8008040	Sch XS	8"x4" Cond Red BW CS SA-234-WPB	21.72	lbs			
3a	2		WLD-800802010LT	Sch XS	2"x1" COND Red BW CS SA-420-WPL6	21.72	lbs			
4	1		TOL-3M05X3-8	3000#	4"x1/2" TOL CS SA-105N	0.24	lbs			
5	1		TOL-3M05X3-8	3000#	8"x7/2" TOL CS SA-105N	0.24	lbs			
6	2	4"	FLG-60080RWN40	600#	RF WN Flange Sch XS bore CS SA-105N	120.00	lbs			
6a	1	4"	FLG-60080RWN40LT	600#	RF WN Flange Sch XS bore CS SA-350 LF2	120.00	lbs			
7	1	8"	FLG-60080RWN80	600#	RF WN Flange Sch XS bore CS SA-105N	113.00	bs			
7a	1	2"	FLG-15080RWN20LT	150#	RF WN Flange Sch XS bore CS SA-350-LF2	113.00	lbs			
7b	1	2"	FLG-30080RWN20LT	300#	RF WN Flange Sch XS bore CS SA-350-LF2	113.00	lbs			
8	2	4"	GSK-60040SS	600#	1/8" Gasket RF 316 S.S. FLEX					
9	2	8"	GSK-60080SS	600#	1/8" Gasket RF 316 S.S. FLEX					
10	8'	4"	PIP-8040	Sch XS	Pipe Smls,CS SA-106 Gr.B	189.59	lbs			
10a	6'	4"	PIP-8040A333	Sch XS	Pipe Smls,CS SA-333 Gr.6	189.59	lbs			
11	2'	8"	PIP-8080	Sch XS	Pipe Smls,CS SA-106 Gr.B	56.27	lbs			
11a	2'	2"	PIP-8020A333	Sch XS	Pipe Smls,CS SA-333 Gr.6	56.27	lbs			
12	16	7/8"	STU-0857M		Stud Bolt x 5 3/4" SA-193-B7M W/2 Hvy Hex Nuts					
					SA194-2HM	40.27	lbs			
13	12	1 1/8"	STU-1185M		Stud Bolt x 8 1/2" SA-193-B7M W/2 Hvy Hex Nuts					
					SA194-2HM	40.88	lbs			
Total Weight:						690.42	lbs			

AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
SPOOL # 1,2: DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/8"CA
SPOOL # 1A: DESIGN PRESSURE IS 277 PSIG @ 130°F c/w 1/8"CA
SPOOL # 1B: DESIGN PRESSURE IS 720 PSIG @ 130°F c/w 1/8"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1, IPS-3(LOW TEMP)
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

NO.	DATE	REVISIONS	BY	CHK'D	APPR
2	10-06-28	AS BUILT	CP		
1	06-06-14	REVISED SPOOL 1 A & 1B	CMP	RS	CP
0	06-05-10	ISSUED FOR CONSTRUCTION	CMP	RS	PP
			DWN	OC	CHK'D

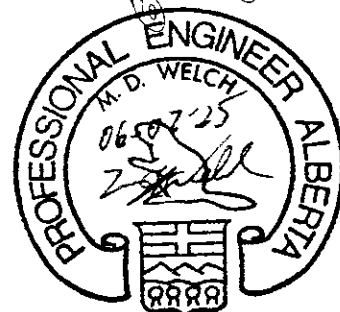


DATE 06-05-10	CLIENT HUSKY ENERGY LTD.
DESIGNED BY IPS	TITLE 8" 600#RF GAS INLET FOR 48" HORIZONTAL SWEET SEPARATOR PACKAGE
DRAWN BY CPATTEN	PROJECT NO. 5325-001
CHECKED BY [Signature]	FILENAME 5325-001GI
APPROVED BY [Signature]	REFERENCE NO.
SCALE NTS	SHEET NO. 1 OF 17
	DRAWING NO. CCL-5325-001PS1
	REV. NO. 2

SEE DETAIL A

V-100

DETAIL A



PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

WPS: IPS-3

WPS: IPS-3

GAS OUTLET
8" 600#RF SCH 80
4" 600#RF SCH 80
2" 600#RF SCH 80

BILL OF MATERIAL									
ITEM	QTY	REF	SIZE	RATING	DESCRIPTION	WEIGHT	UNIT NUMBERS		
1	2		2" WLD-8008020	Sch XS	80 LR E BW CS SA-234-WPB	4.14 lbs			
2	2		4" WLD-8008040	Sch XS	80 LR E BW CS SA-234-WPB	24.80 lbs			
3	1		8" WLD-8008080	Sch XS	80 LR E BW CS SA-234-WPB	77.00 lbs			
4	1		WLD-8008040	Sch XS	8"x4" Conc Red BW CS SA-234-WPB	21.72 lbs			
5	1		WLD-8008040	Sch XS	4"x4"x2" Red Tee BW CS SA-234-WPB	18.50 lbs			
6	1		EOL-3M10	3000#	4"x1" EOL THRD CS SA-105N	0.00 lbs			
7	4		TOL-3M05X3-8	3000#	4"x1/2" TOL CS SA-105N	0.72 lbs			
8	1		TOL-3M05X3-8	3000#	8"x1/2" TOL CS SA-105N	0.24 lbs			
9									
10	2		TOL-3M1X4-5	3000#	4"x1" TOL CS SA-105N	1.24 lbs			
11	2		2" FLG-60080RWN20	600#	RF WN Flange Sch XS bore CS SA-105N	36.00 lbs			
11a	1		2" FLG-60080RWN20LT	600#	RF WN Flange Sch XS bore CS SA-350 LF2	36.00 lbs			
12	4		4" FLG-60080RWN40	600#	RF WN Flange Sch XS bore CS SA-105N	200.00 lbs			
12a	1		4" FLG-60080RWN40LT	600#	RF WN Flange Sch XS bore CS SA-350 LF2	200.00 lbs			
13	1		8" FLG-60080RWN80	600#	RF WN Flange Sch XS bore CS SA-105N	113.00 lbs			
14	2		2" GSK-3/60020SS	600#	1/8" Gasket RF 316 S.S. FLEX				
15	4		4" GSK-60040SS	600#	1/8" Gasket RF 316 S.S. FLEX				
16	2		8" GSK-60080SS	600#	1/8" Gasket RF 316 S.S. FLEX				
17	6'		2" PIP-8020	Sch XS	Pipe Smls,CS SA-106 Gr.B	66.15 lbs			
17a	7'		2" PIP-8020A333	Sch XS	Pipe Smls,CS SA-333 Gr.6	66.15 lbs			
18	16'		4" PIP-8040	Sch XS	Pipe Smls,CS SA-106 Gr.B	319.50 lbs			
18a	6'		4" PIP-8040A333	Sch XS	Pipe Smls,CS SA-333 Gr.6	319.50 lbs			
19	1'		8" PIP-8080	Sch XS	Pipe Smls,CS SA-106 Gr.B	32.32 lbs			
20	16		5/8" STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts				
					SA194-2HM	15.31 lbs			
21	32		7/8" STU-0857M		Stud Bolt x 5 3/4" SA-193-B7M W/2 Hvy Hex Nuts				
					SA194-2HM	67.12 lbs			
22	12		1 1/8" STU-1182M		Stud Bolt x 8 1/4" SA-193-B7M W/2 Hvy Hex Nuts				
					SA194-2HM	40.88 lbs			
					Total Weight:	1032.99 lbs			

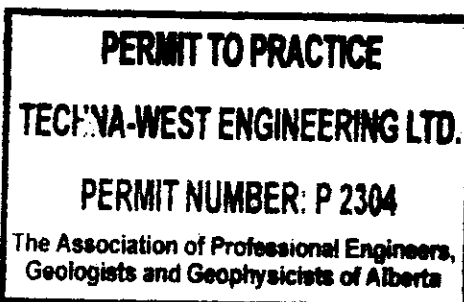
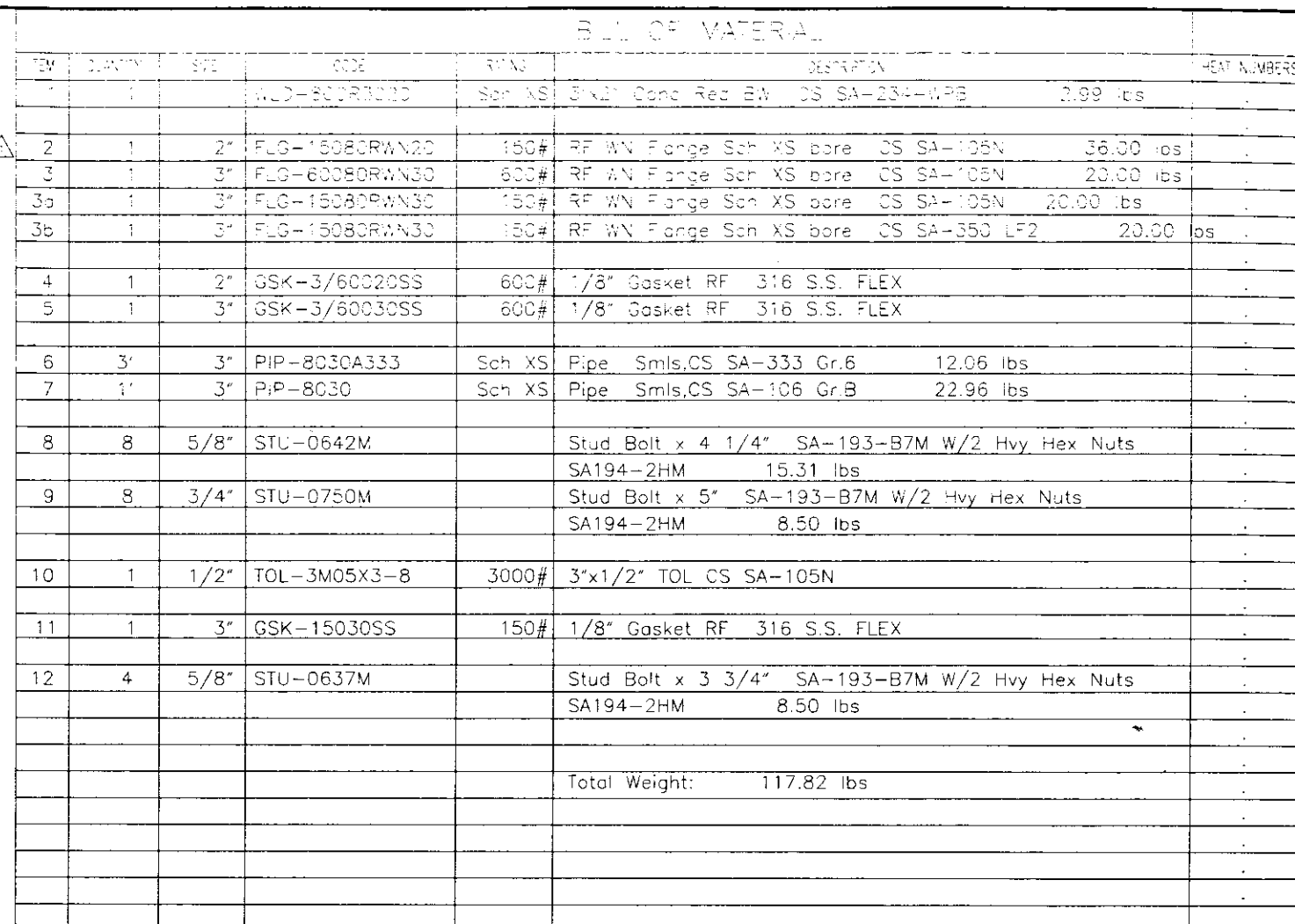
AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
SPOOLS #4,5: DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/8"CA
SPOOLS #3,3A: DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1, IPS-3(LOW TEMP)
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

1	06-06-28	AS BUILT	CP	RS	PP	CP
0	06-05-10	ISSUED FOR CONSTRUCTION	CHP	RS	PP	CP
NO.	DATE	REVISIONS	OWN	QC	CHK'D	APPR

IPS
MANUFACTURING LIMITED

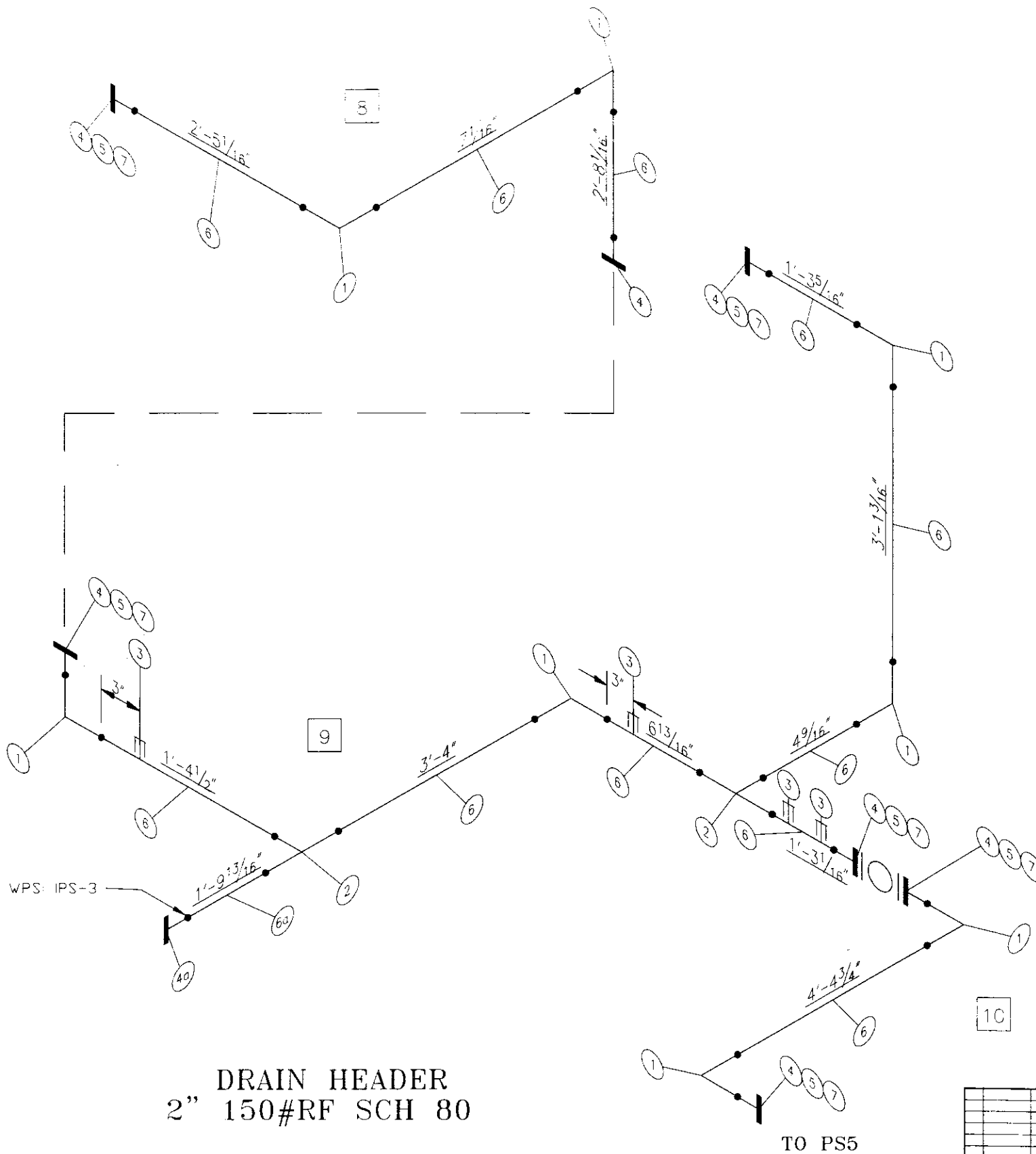
DATE 06-05-10	CLIENT HUSKY ENERGY LTD.		
DESIGNED BY IPS	TITLE 8" 600#RF GAS OUTLET FOR 48" HORIZONTAL SWEET SEPARATOR PACKAGE		
DRAWN BY C.PATTEN			
CHECKED BY h			
APPROVED BY	PROJECT NO. 5325-001	FILENAME 5325-001G0	REFERENCE NO.
SCALE NTS	SHEET NO. 2 OF 17	DRAWING NO. CCL-5325-001PS2	REV. NO. 1



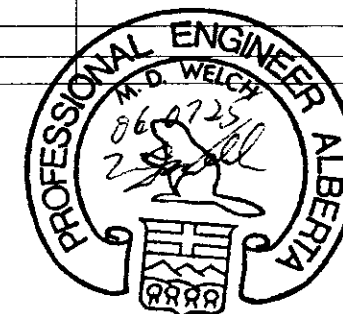
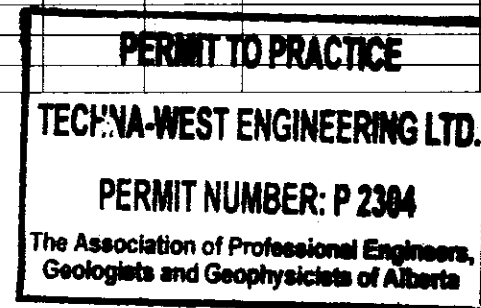
HYDROTEST TO 1.5x DESIGN PRESSURE
SPOOL #6: DESIGN PRESSURE IS 277 PSIG @ 130°F c/w 1/8"CA
SPOOL #7: DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.I, IPS-3(LOW TEMP)
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

	PSV		
3"	600#RF	SCH	80
2"	600#RF	SCH	80
3"	150#RF	SCH	80

[illegible]



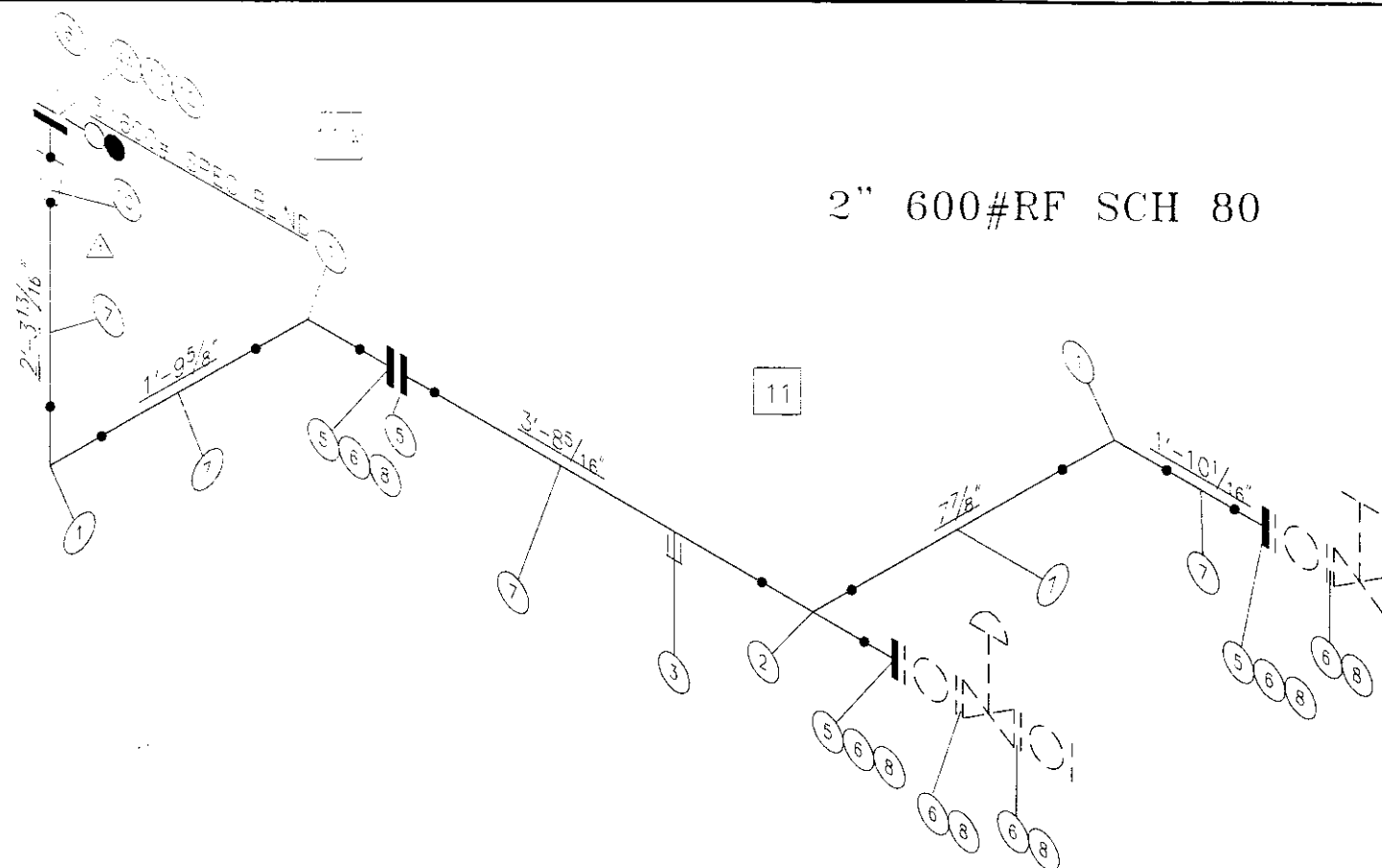
BILL OF MATERIAL							HEAT NUMBERS
ITEM	QUANTITY	SIZE	CODE	RATING	DESCRIPTION		
1	8	2"	WLD-309020	Sch XS	90° LR EL BW	CS SA-234-WPB	
2	2	2"	WLD-309020	Sch XS	Tee BW	CS SA-234-WPB	
3	4		TOL-3M05X2-2.5	3000#	2"x1/2" TOL	CA SA-105N	
4	7	2"	FLG-15080RWN20	150#	RF WN Flange Sch 80 bore	CA SA-105N	
4a	1	2"	FLG-15080RWN20LT	150#	RF WN Flange Sch 80 bore	CA SA-350 LF2	
5	6	2"	GSK-15020SS	150#	1/8" Gasket RF	316 S.S. FLEX	
6	22'	2"	PIP-8020	Sch 80	Pipe SMLS.	SA-106 GR.B	
6a	2'	2"	PIP-8020A333	Sch 80	Pipe SMLS.	SA-333GR.6	
7	24	5/8"	STU-0632M		Stud Bolt x 3 1/4"	SA-193-B7M w/2 HVY HEX NUTS	
					SA 194-2HM		
					Total Weight:	212.28 lbs	



AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 277 PSIG @ 130°F c/w 1/8"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1, IPS-3(Low Temp)
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

				DATE 06-05-11	CLIENT HUSKY ENERGY LTD.
				DESIGNED BY IPS	TITLE 2" 150#RF DRAIN FOR 48" HORIZONTAL SWEET SEPARATOR PACKAGE
				DRAWN BY C.PATTEN	PROJECT NO. 5325-001
				CHECKED BY	FILENAME 5325-001DRAIN1
				APPROVED BY	REFERENCE NO.
				SCALE NTS	SHEET NO. 4 OF 17
					DRAWING NO. CCL-5325-001PS4
					REV. NO. A

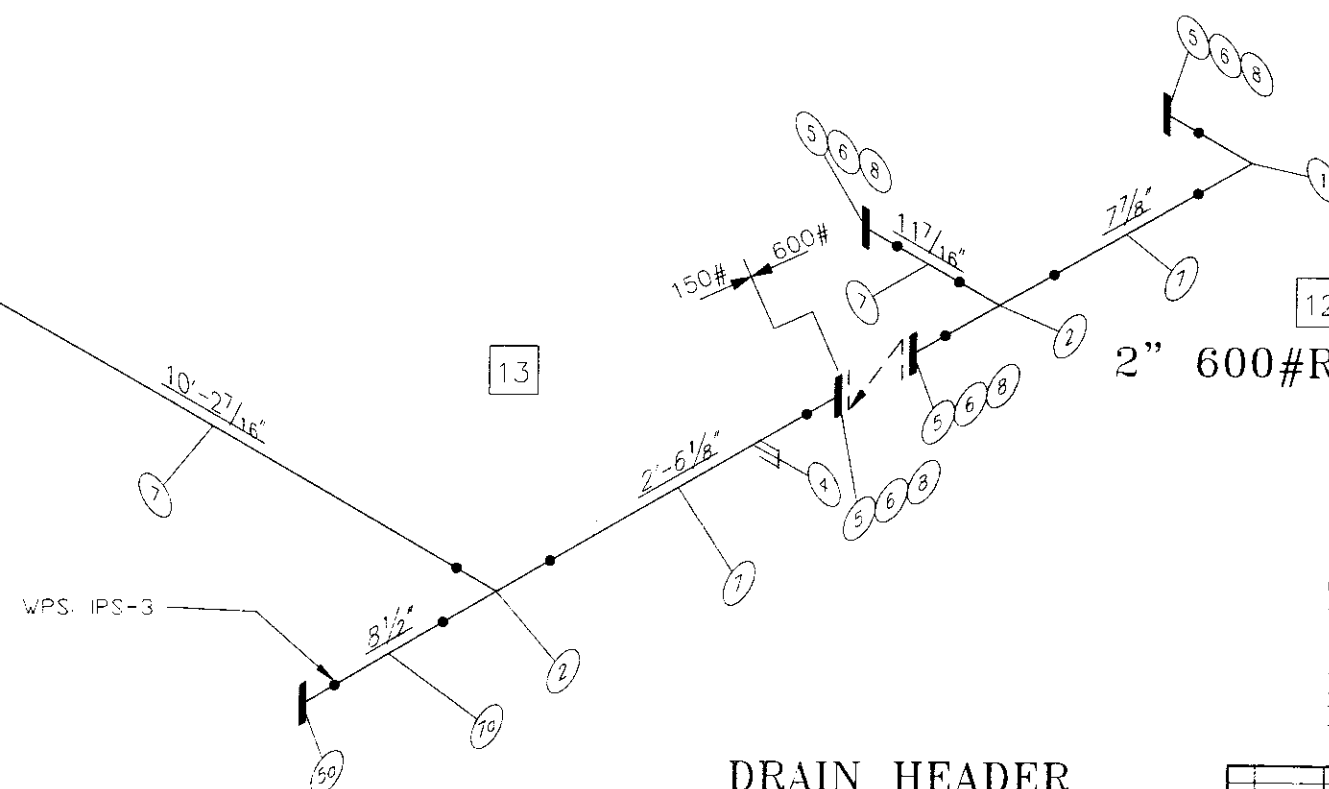


2" 600#RF SCH 80

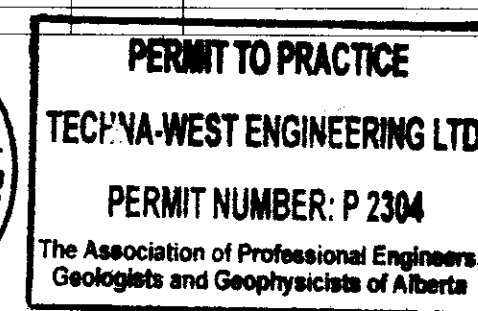
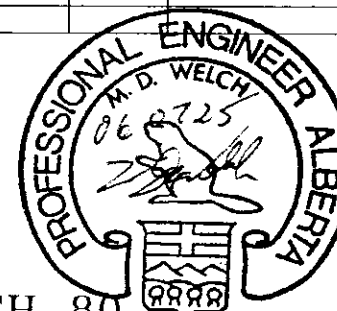
11

BILL OF MATERIAL										WEAT NUMBERS	
REV	QTY	SIZE	CODE	RFWD	DESCRIPTION						
1	4	2"	WLD-800020	Sch 80	2" 1/8" E BW CS SA-234-WPB	12.36 lbs					
2	3	2"	WLD-80020	Sch 80	Tee BW CS SA-234-WPB	12.36 lbs					
3	1		TOL-3M05X2-2.5	3000#	2"x1/2" TOL CS SA-105N	0.24 lbs					
4	1		TOL-3M1X2-2.5	3000#	2"x1" TOL CS SA-105N	0.62 lbs					
4A	1	3"	FLG-60080RWN30	600#	RF WN Flange Sch 80 bore CS SA-105N						
5	8	2"	FLG-60080RWN20	600#	RF WN Flange Sch 80 bore CS SA-105N						
5a	1	2"	FLG-15080RWN20LT	150#	RF WN Flange Sch 80 bore CS SA-350 LF2						
5b	1	2"	FLG-15080RWN20LT	150#	RF WN Flange Sch 80 bore CS SA-350 LF2						
6	1	2"	GSK-3/60020SSGRA	600#	1/8" Gasket RF 316 S.S FLEX GRAPHOIL						
7	28'	2"	PIP-8020	Sch 80	Pipe SMLS, CS SA-106 GR.B	129.92 lbs					
7a	1'	2"	PIP-8020A333	Sch 80	Pipe SMLS, CS SA-333 GR.6	129.92 lbs					
8	72	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M	18.34 lbs					
9	8	5/8"	STU-0652M		Stud Bolt x 5 1/4" SA-193-B7M	2.29 lbs					
10	1		WLD-80CR3020	Sch 80	BW Conc. Red 3"x2" CS SA-234-WPB	12.36 lbs					
11	1	3"	GSK-3/60030SSGRA	600#	1/8" Gasket RF 316 S.S FLEX GRAPHOIL						
12	8	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M	18.34 lbs					
						Total Weight:	237.05 lbs				

FROM PS4



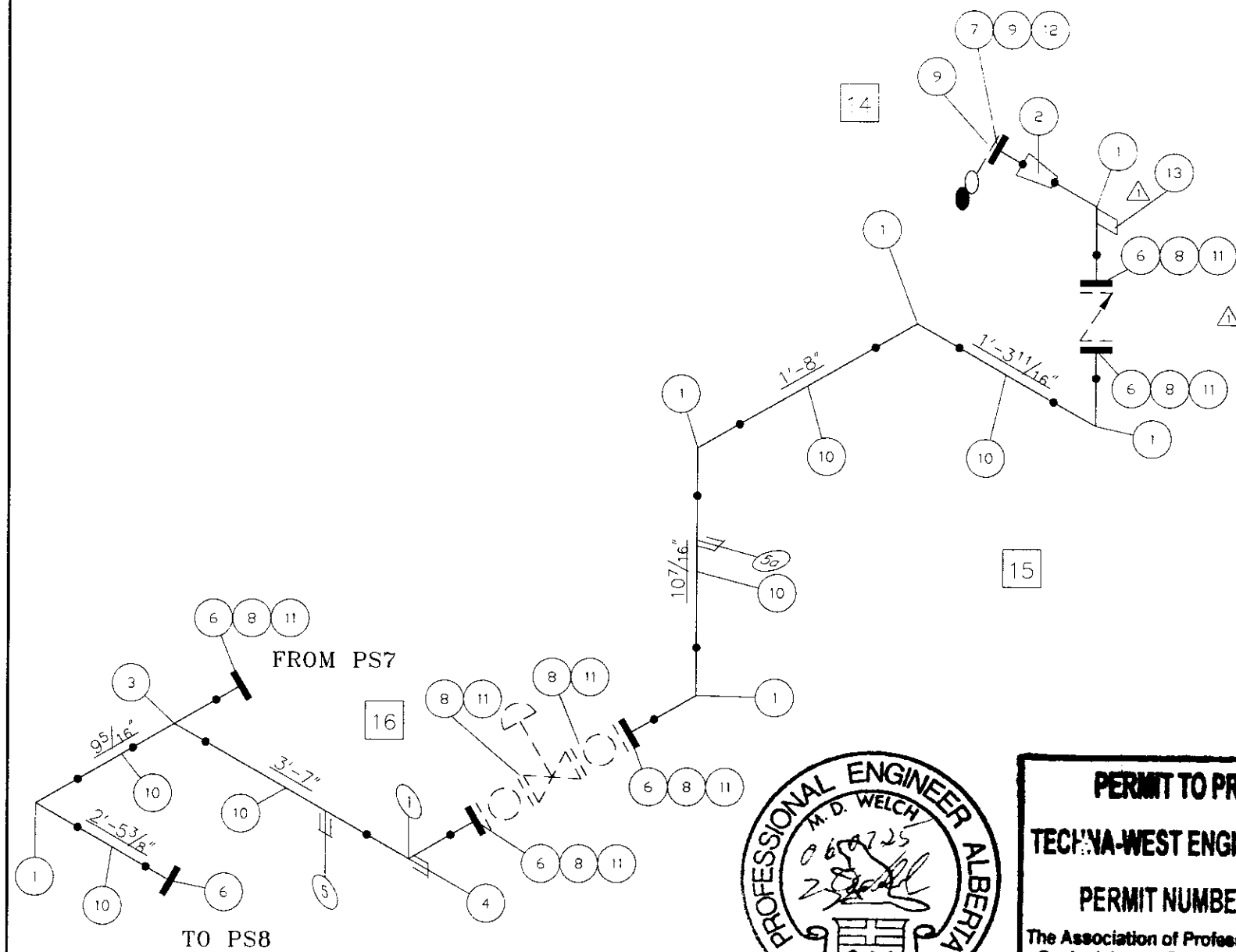
DRAIN HEADER
2" 150#RF SCH 80



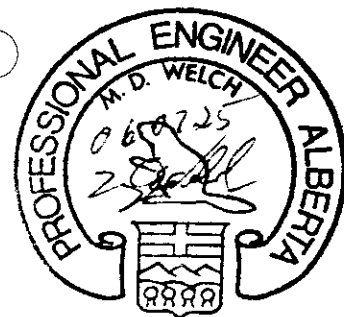
AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
SPOOL #13: DESIGN PRESSURE IS 277 PSIG @ 130°F c/w 1/8"CA
SPOOL #11, 11A, 12: DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1, IPS-3 (LOW TEMP)
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

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RECYCLE
2" 600#RF SCH 80

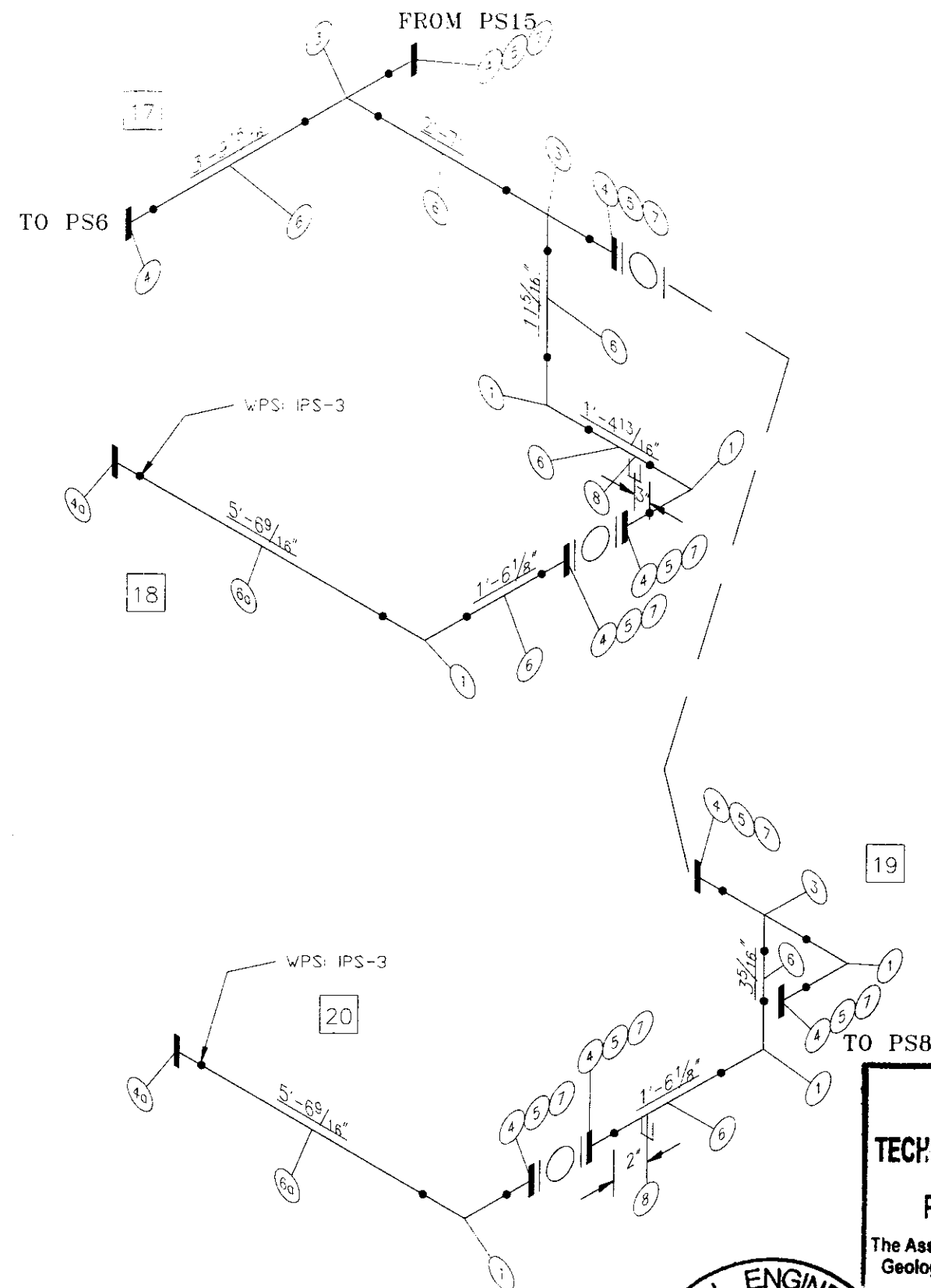


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TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
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Geologists and Geophysicists of Alberta

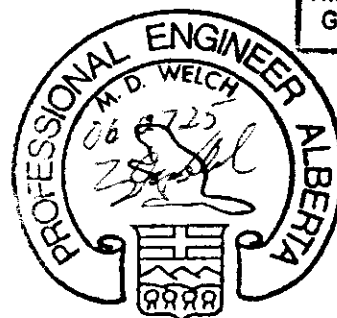
BILL OF MATERIAL								HEAT NUMBERS
REV	QUANTITY	SIZE	CODE	RATING	DESCRIPTION			
1	7	2"	WLD-809020	Sch XS	90 LR EL BW CS SA-234-WPB	14.49 lbs		
2	1		WLD-800R3020	Sch XS	3"x2" Cond Red BW CS SA-234-WPB	2.99 lbs		
3	1	2"	WLD-80720	Sch XS	1cc BW CS SA-234 GrWPB	4.12 lbs		
4	1		EOL-3M10	3000#	2"x1" EOL T-RD CS SA-105N	0.00 bs		
5	1		TOL-3M05X2-2.5	3000#	2"x1/2" TOL CS SA-105N	0.48 bs		
5a	1		TOL-3M1X2-2.5	3000#	2"x1" TOL CS SA-105N	0.48 bs		
6	6	2"	FLG-60080RWN20	600#	RF WN Flange Sch XS bore CS SA-105N	72.00 lbs		
7	1	3"	FLG-60080RWN30	600#	RF WN Flange Sch XS bore CS SA-105N	20.00 lbs		
8	7	2"	GSK-3/60020SS	600#	1/8" Gasket RF 316 S.S. FLEX			
9	2	3"	GSK-3/60030SS	600#	1/8" Gasket RF 316 S.S. FLEX			
10	12	2"	PIP-8020	Sch XS	Pipe Smis,CS SA-106 Gr.B	53.12 lbs		
11	56	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts			
					SA194-2HM	30.62 lbs		
12	8	3/4"	STU-0760M		Stud Bolt x 6" SA-193-B7M W/2 Hvy Hex Nuts			
					SA194-2HM	8.50 lbs		
13	1	1 1/2"	EOL-3M15	3000#	2"x1 1/2" EOL THRD CS SA-105N	0.00 lbs		
					Total Weight:	206.33 lbs		

AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL



PROVER METERS
2" 600#RF SCH 80



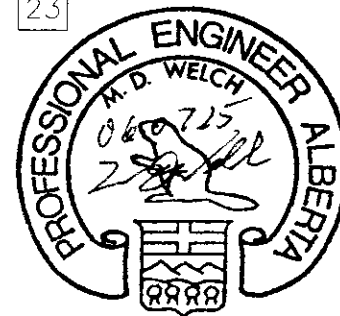
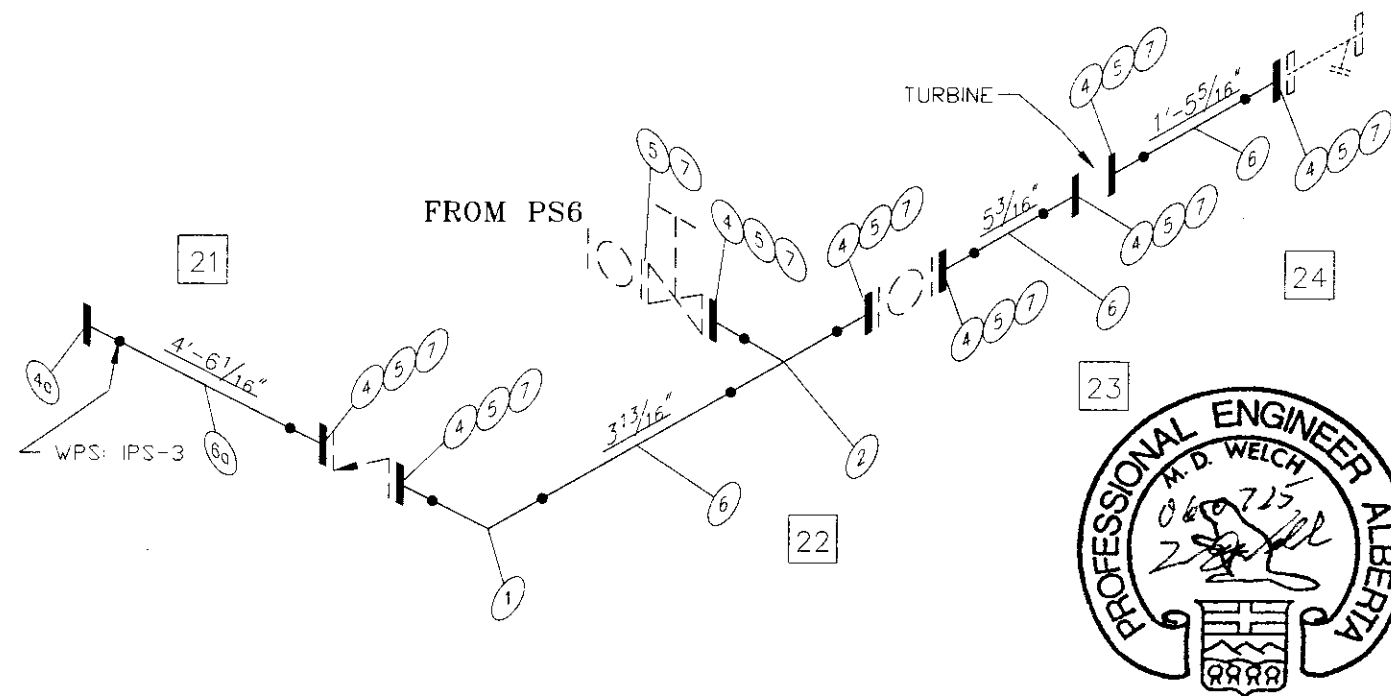
PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

BILL OF MATERIAL									
ITEM	QTY	SIZE	CODE	WTG	DESCRIPTION	WEIGHT	REMARKS		
1	6	2"	WLD-80720	Sch XS	90 LR E. BW CS SA-234-AP3	10.36 lbs			
2									
3	3	2"	WLD-80720	Sch XS	Tee BW CS SA-234 Gr.WPB	10.36 lbs			
4	9	2"	FLG-60080RWN20	600#	RF WN Flange Sch XS bore CS SA-105N	132.00 lbs			
4a	2	2"	FLG-60080RWN20L7	600#	RF WN Flange Sch XS bore CS SA-350 LF2	132.00 lbs			
5	8	2"	GSV-3/60020SS	600#	1/8" Gasket RF 316 S.S. FLEX				
6	13'	2"	P/P-8020	Sch XS	Pipe Smis,CS SA-106 Gr.B	116.24 lbs			
6a	12'	2"	P/P-8020A333	Sch XS	Pipe Smis,CS SA-333 Gr.6	116.24 lbs			
7	64	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts				
					SA194-2HM	56.14 lbs			
8	2	1/2"	TOL-3M05X2-2.5		2"x1/2" TOL CS SA-105N				
						Total Weight:	328.59 lbs		

AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1, IPS-3(LOW TEMP)
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

				DATE: 06-05-10 DESIGNED BY: IPS DRAWN BY: C.PATTEN CHECKED BY: <i>lm</i> APPROVED BY: <i>lm</i>		CLIENT: HUSKY ENERGY LTD. TITLE: 2" 600#RF METER PROVER SPOOLS 48" HORIZONTAL SWEET SEPARATOR PACKAGE	
PROJECT NO.: 5325-001 SHEET NO.: 7 OF 17		FILENAME: 5325-001PROVERS DRAWING NO.: CCL-5325-001PS7		REFERENCE NO.: REV. NO.: 1			



PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
 The Association of Professional Engineers,
 Geologists and Geophysicists of Alberta

COND TO PIPELINE
 2" 600#RF SCH 80

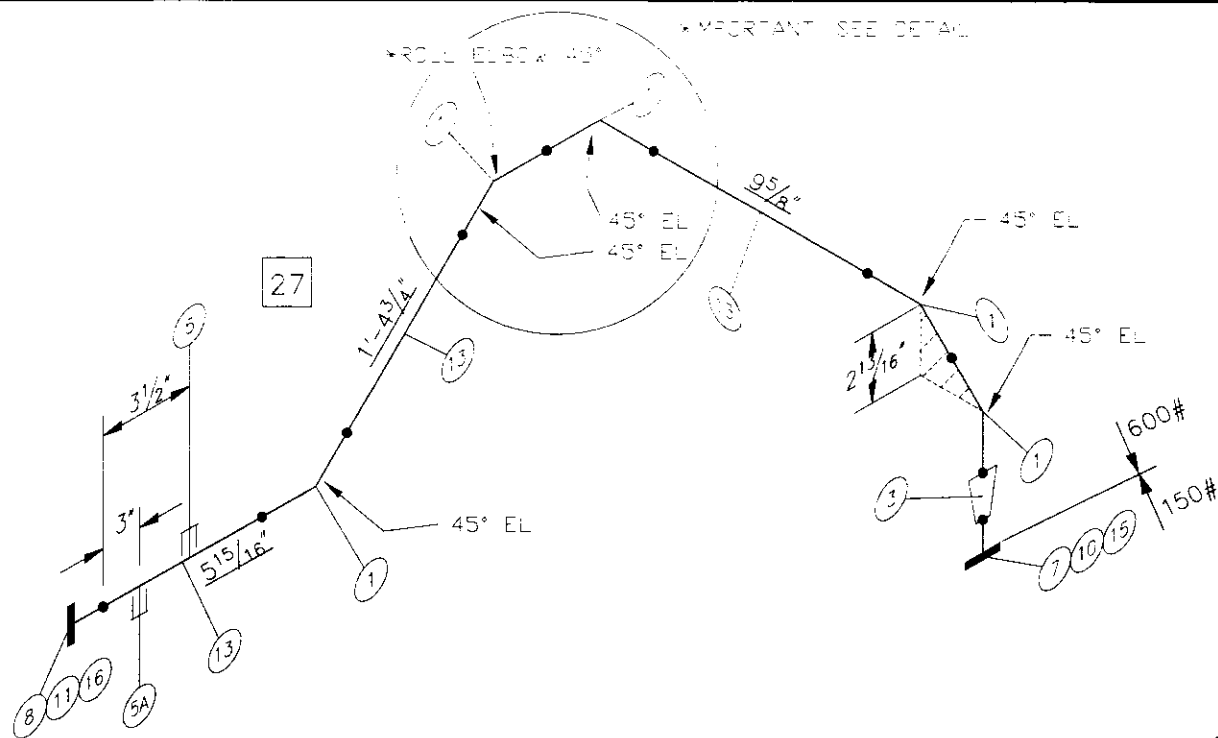
BILL OF MATERIAL

ITEM	QUANTITY	SIZE	CODE	GRADE	DESCRIPTION	WEIGHT	UNIT
1	1	2"	WLD-802020	Sch XS	RO LR E. BA CS SA-234-WPB	2.07	bs
2	1	2"	WLD-802020	Sch XS	Tee BW CS SA-234 Gr.WPB	4.12	bs
3							
4	8	2"	FLG-60080RW20	600#	RF WN Flange Sch XS bore CS SA-105N	108.00	lbs
4a	1	2"	FLG-60080RW20LT	600#	RF WN Flange Sch XS bore CS SA-350 LF2	108.00	lbs
5	9	2"	GSK-3/60020SS	600#	1/8" Gasket RF 316 S.S. FLEX		
6	3'	2"	PIP-8020	Sch XS	Pipe Smls,CS SA-106 Gr.B	33.64	lbs
6a	5'	2"	PIP-8020A333	Sch XS	Pipe Smls,CS SA-333 Gr.6	33.64	lbs
7	72	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts		
					SA194-2HM	51.04	lbs
					Total Weight:	237.87	lbs

AS BUILT

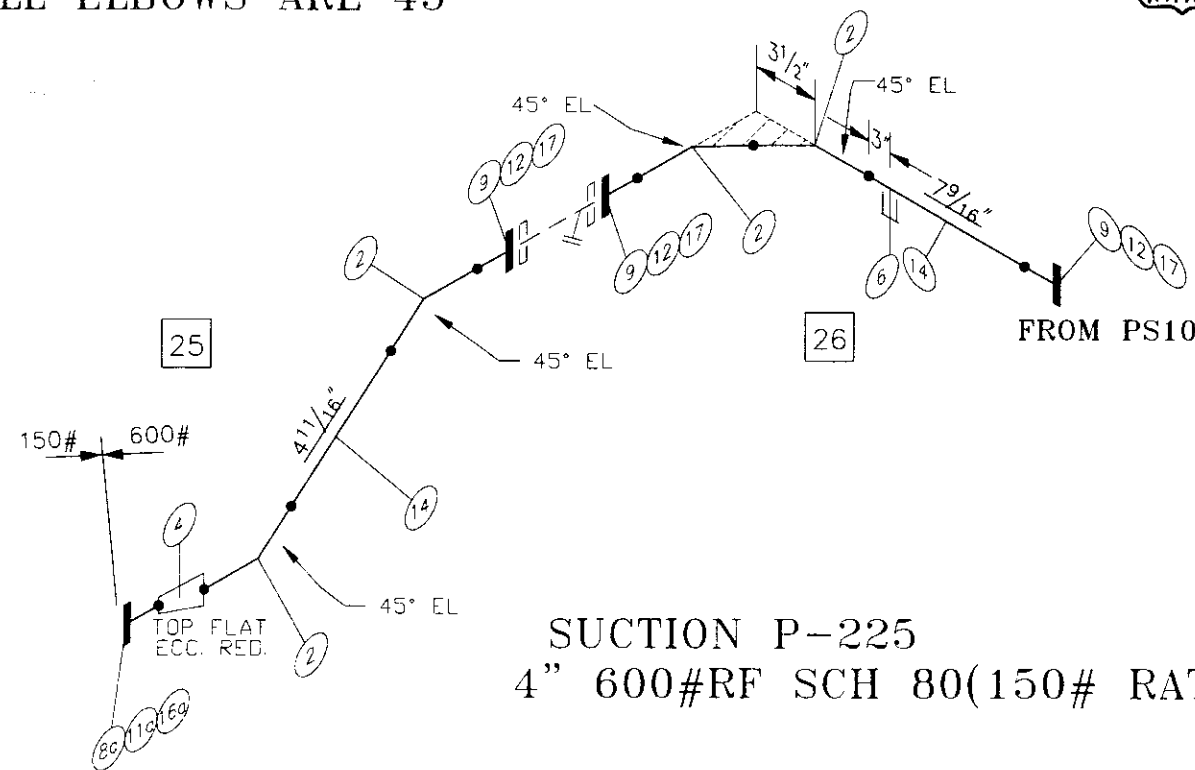
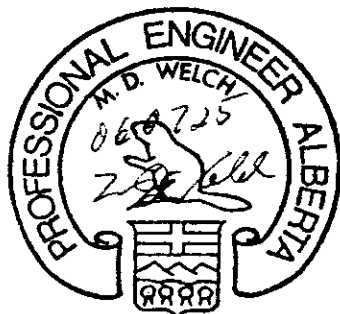
HYDROTEST TO 1.5x DESIGN PRESSURE
 DESIGN PRESSURE IS 1440 PSig @ 130°F c/w 1/16"CA
 O-LETS ARE SA-105N MATERIAL
 WPS: IPS-4 R.1, IPS-3(LOW TEMP)
 15% X-RAY
 DESIGNED AND FABRICATED TO ASME CODE B31.3
 X-RAY TO B31.3 NORMAL

				DATE: 06-05-10 DESIGNED BY: IPS DRAWN BY: C.PATTEN CHECKED BY: <i>[Signature]</i> APPROVED BY: <i>[Signature]</i>		CLIENT: HUSKY ENERGY LTD. TITLE: 2" 600HRF COND TO PIPELINE SPOOLS 48" HORIZONTAL SWEET SEPARATOR PACKAGE	
PROJECT NO: 5325-001 SHEET NO: 8 OF 17		FILENAME: 5325-001COND DRAWING NO: CCL-5325-001PS8		REFERENCE NO: REV. NO: 1			



DISCHARGE P-225/SUCTION P-220
3" 600#RF SCH 80(150# RATED)

****ALL ELBOWS ARE 45°****



SUCTION P-225
4" 600#RF SCH 80(150# RATED)

PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

BILL OF MATERIAL

ITEM	QTY	SIZE	CODE	SPEC	DESCRIPTION	WEIGHT	REMARKS
1	5	3"	WLD-804530	Sch XS	45 Ell BW CS SA-234-WPB	15.85 lbs	
2	4	4"	WLD-804540	Sch XS	45 Ell BW CS SA-234-WPB	24.80 lbs	
3	1		WLD-80CR3020	Sch XS	3"x2" Conc Red BW CS SA-234-WPB	2.99 lbs	
4	1		WLD-80ER4030	Sch XS	4"x3" Ecc Red BW CS SA-234-WPB *TOP FLAT*	5.00 lbs	
5	1		TOL-3M07X3-8	3000#	3"x3/4" TOL CS SA-105N	0.48 lbs	
5A	1		TOL-3M05X3-8	3000#	3"x1/2" TOL CS SA-105N	0.48 lbs	
6	1		TOL-3M05X3-8	3000#	4"x1/2" TOL CS SA-105N	0.24 lbs	
7	1	2"	FLG-15080RWN20	150#	RF WN Flange Sch XS bore CS SA-105N	12.00 lbs	
8	1	3"	FLG-60080RWN30	600#	RF WN Flange Sch XS bore CS SA-105N	40.00 lbs	
8a	1	3"	FLG-15080RWN30	150#	RF WN Flange Sch XS bore CS SA-105N	40.00 lbs	
9	3	4"	FLG-60080RWN40	600#	RF WN Flange Sch XS bore CS SA-105N	120.00 lbs	
10	1	2"	GSK-15020SS	150#	1/8" Gasket RF 316 S.S. FLEX		
11	1	3"	GSK-3/60030SS	600#	1/8" Gasket RF 316 S.S. FLEX		
11a	1	3"	GSK-15030SS	150#	1/8" Gasket RF 316 S.S. FLEX		
12	3	4"	GSK-3/60040SS	600#	1/8" Gasket RF 316 S.S. FLEX		
13	3'	3"	PIP-8030	Sch XS	Pipe Smls,CS SA-106 Gr.B	29.31 lbs	
14	2'	4"	PIP-8040	Sch XS	Pipe Smls,CS SA-106 Gr.B	47.90 lbs	
15	4	5/8"	STU-0632M		Stud Bolt x 3 1/4" SA-193-B7M W/2 Hvy Hex Nuts SA194-2HM	5.10 lbs	
16	8	3/4"	STU-0750M		Stud Bolt x 5" SA-193-B7M W/2 Hvy Hex Nuts SA194-2HM	17.01 lbs	
16a	4	5/8"	STU-0637M		Stud Bolt x 3 3/4" SA-193-B7M W/2 Hvy Hex Nuts SA194-2HM	17.01 lbs	
17	24	7/8"	STU-0857M		Stud Bolt x 5 3/4" SA-193-B7M W/2 Hvy Hex Nuts SA194-2HM	40.27 lbs	
Total Weight:						360.96 lbs	

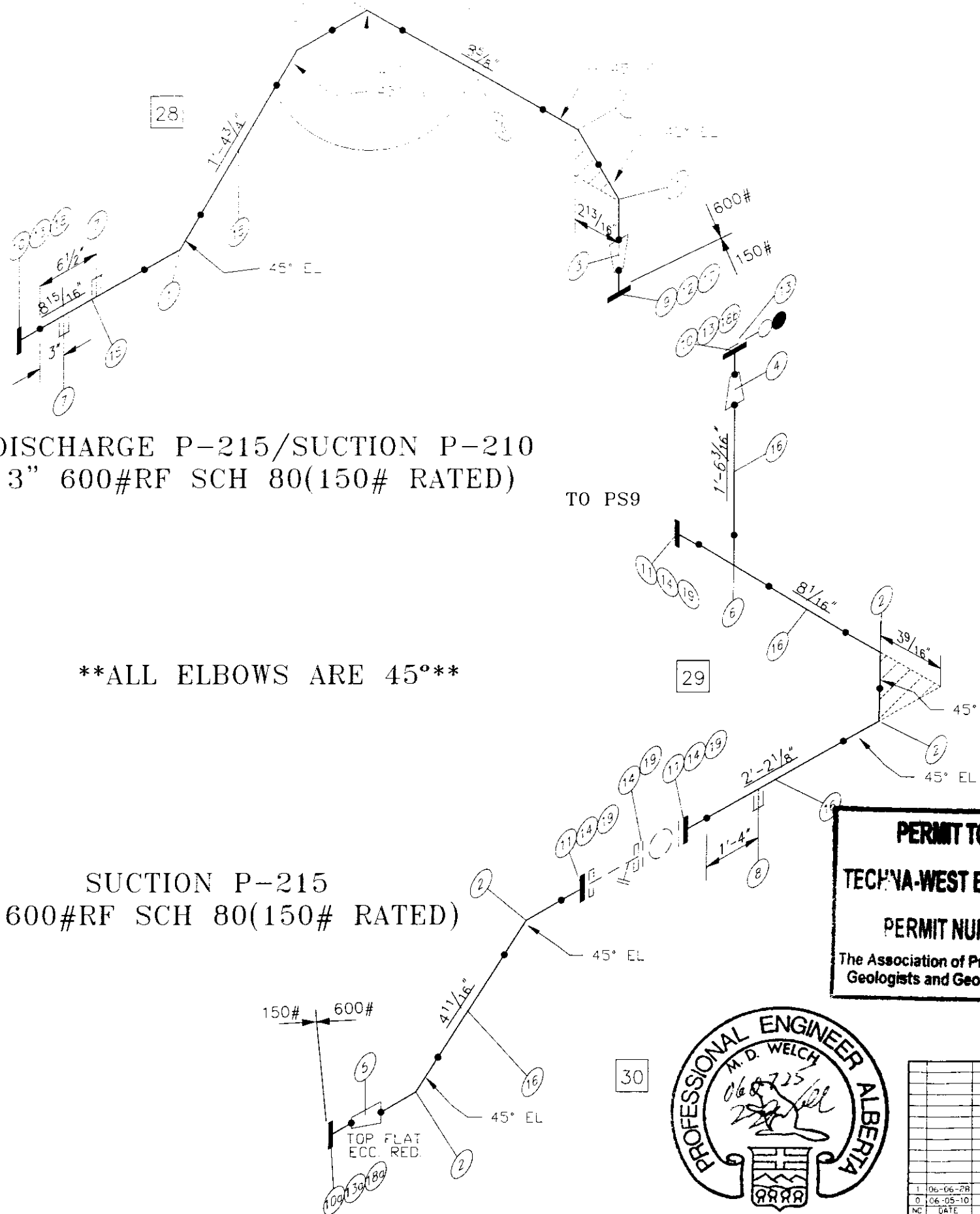
AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 277 PSIG @ 130°F c/w 1/8"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

DATE: 06-05-10		CLIENT: HUSKY ENERGY LTD.	
DESIGNED BY: IPS		FILE: 3'4" 600#RF SUCTION AND DISCHARGE SPOOLS FOR P-220/P-225 48" HORIZONTAL SWEET SEPARATOR PACKAGE	
DRAWN BY: C.PATTEN		PROJECT NO: 5325-001	
CHECKED BY: [Signature]		REFERENCE NO: 5325-001SUCTION1	
APPROVED BY: [Signature]		SHEET NO: 9 OF 17	
SCALE: NTS		DRAWING NO: CCL-5325-001PS9	
REV. NO: [Triangle]			



NO.	DATE	AS BUILT	CP	RS	PP	CHK'D	APPR
1	06-06-28	ISSUED FOR CONSTRUCTION					
2	06-05-10	REVISIONS					

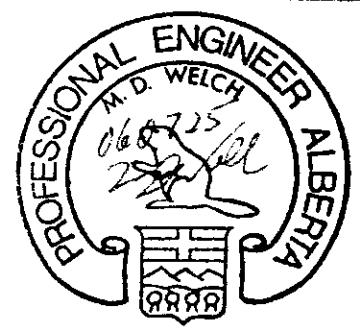


DISCHARGE P-215/SUCTION P-210
3" 600#RF SCH 80(150# RATED)

****ALL ELBOWS ARE 45°****

SUCTION P-215
4" 600#RF SCH 80(150# RATED)

PERMIT TO PRACTICE
TECH'VA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

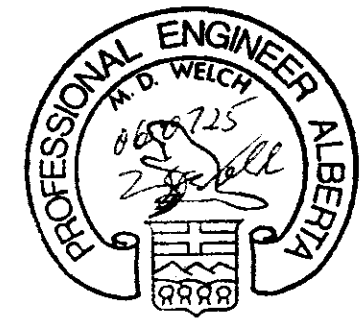
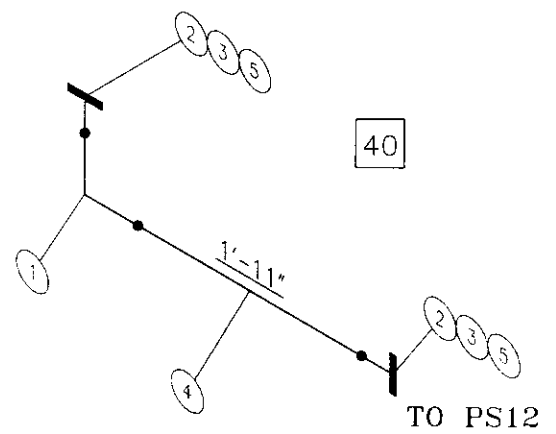
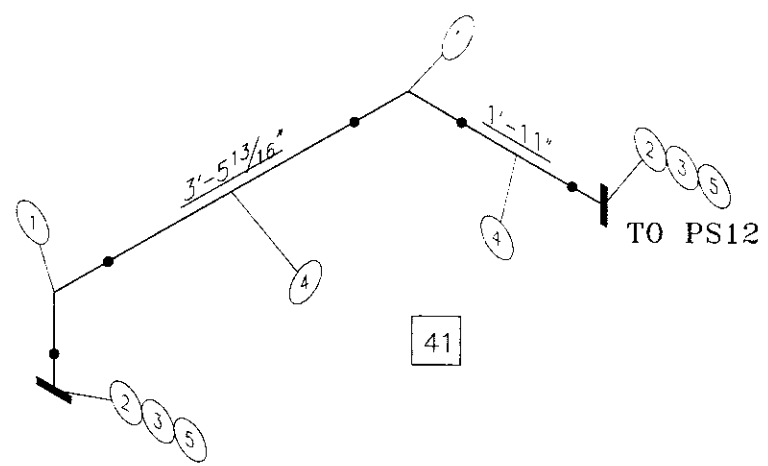


5	3	WLD-804830	Sch XS	45° EL	BW	CS SA-234-WPB	15.85 lbs
2	4	WLD-804840	Sch XS	45° EL	BW	CS SA-234-WPB	24.50 lbs
3	1	WLD-800R3020	Sch XS	3"x2"	Conc Red BW	CS SA-234-WPB	2.99 lbs
4	1	WLD-800R4030	Sch XS	4"x3"	Conc Red BW	CS SA-234-WPB	5.00 lbs
5	1	WLD-800R4030	Sch XS	4"x3"	Ecc Red BW	CS SA-234-WPB	FLAT ON TOP 5.00 lbs
6	1	4" WLD-80740	Sch XS	Tee BW	CS SA-234 GrWPB		18.60 lbs
7	2	TOL-3M05X3-8	3000#	3"x1/2"	TOL	CS SA-105N	0.48 lbs
8	1	TOL-3M05X3-8	3000#	4"x1/2"	TOL	CS SA-105N	0.24 lbs
9	1	2"	FLG-15080RWN20	150#	RF WN Flange	Sch XS bore CS SA-350-LF2	12.00 lbs
10	2	3"	FLG-60080RWN30	600#	RF WN Flange	Sch XS bore CS SA-105N	60.00 lbs
10a	1	3"	FLG-15080RWN30	150#	RF WN Flange	Sch XS bore CS SA-105N	60.00 lbs
11	3	4"	FLG-60080RWN40	600#	RF WN Flange	Sch XS bore CS SA-105N	120.00 lbs
12	1	2"	GSK-15020SS	150#	1/8" Gasket RF	316 S.S. FLEX	
13	3	3"	GSK-3/60030SS	600#	1/8" Gasket RF	316 S.S. FLEX	
13a	1	3"	GSK-15030SS	150#	1/8" Gasket RF	316 S.S. FLEX	
14	4	4"	GSK-60040SS	600#	1/8" Gasket RF	316 S.S. FLEX	
15	3'	3"	PIP-8030	Sch XS	Pipe	Smls,CS SA-106 Gr.B	29.31 lbs
16	5'	4"	PIP-8040	Sch XS	Pipe	Smls,CS SA-106 Gr.B	71.23 lbs
17	4	5/8"	STU-0632M		Stud Bolt x 3 1/4"	SA-193-B7M W/2 Hvy Hex Nuts	
					SA194-2HM	5.10 lbs	
18	8	3/4"	STU-0750M		Stud Bolt x 5"	SA-193-B7M W/2 Hvy Hex Nuts	
					SA194-2HM	25.51 lbs	
18a	4	5/8"	STU-0637M		Stud Bolt x 3 3/4"	SA-193-B7M W/2 Hvy Hex Nuts	
					SA194-2HM	25.51 lbs	
18b	4	3/4"	STU-0760M		Stud Bolt x 6"	SA-193-B7M W/2 Hvy Hex Nuts	
					SA194-2HM	25.51 lbs	
19	32	7/8"	STU-0857M		Stud Bolt x 5 3/4"	SA-193-B7M W/2 Hvy Hex Nuts	
					SA194-2HM	40.27 lbs	
EL					Total Weight:	436.39 lbs	

AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 277 PSIG @ 130°F c/w 1/8"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

DATE 06-05-10		CLIENT HUSKY ENERGY LTD.	
DESIGNED BY IPS		TITLE 3'4" 600HRF SUCTION AND DISCHARGE SPOOLS FOR P-210/P-215 48" HORIZONTAL SWEET SEPARATOR PACKAGE	
DRAWN BY C.PATTEN		PROJECT NO 5325-001	FILENAME 5325-001SUCTION2
CHECKED BY		SHEET NO 10 OF 17	DRAWING NO CCL-5325-001PS10
APPROVED BY		SCALE NTS	REV NO
1 106-06-28 AS BUILT CP 0 106-05-10 ISSUED FOR CONSTRUCTION CMP RS PP CP NO DATE REVISIONS DWN DC CHK D APPR		MANUFACTURING LIMITED 64	



PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
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HC CAGE INLET & OUTLET
 2" 600#RF SCH 80

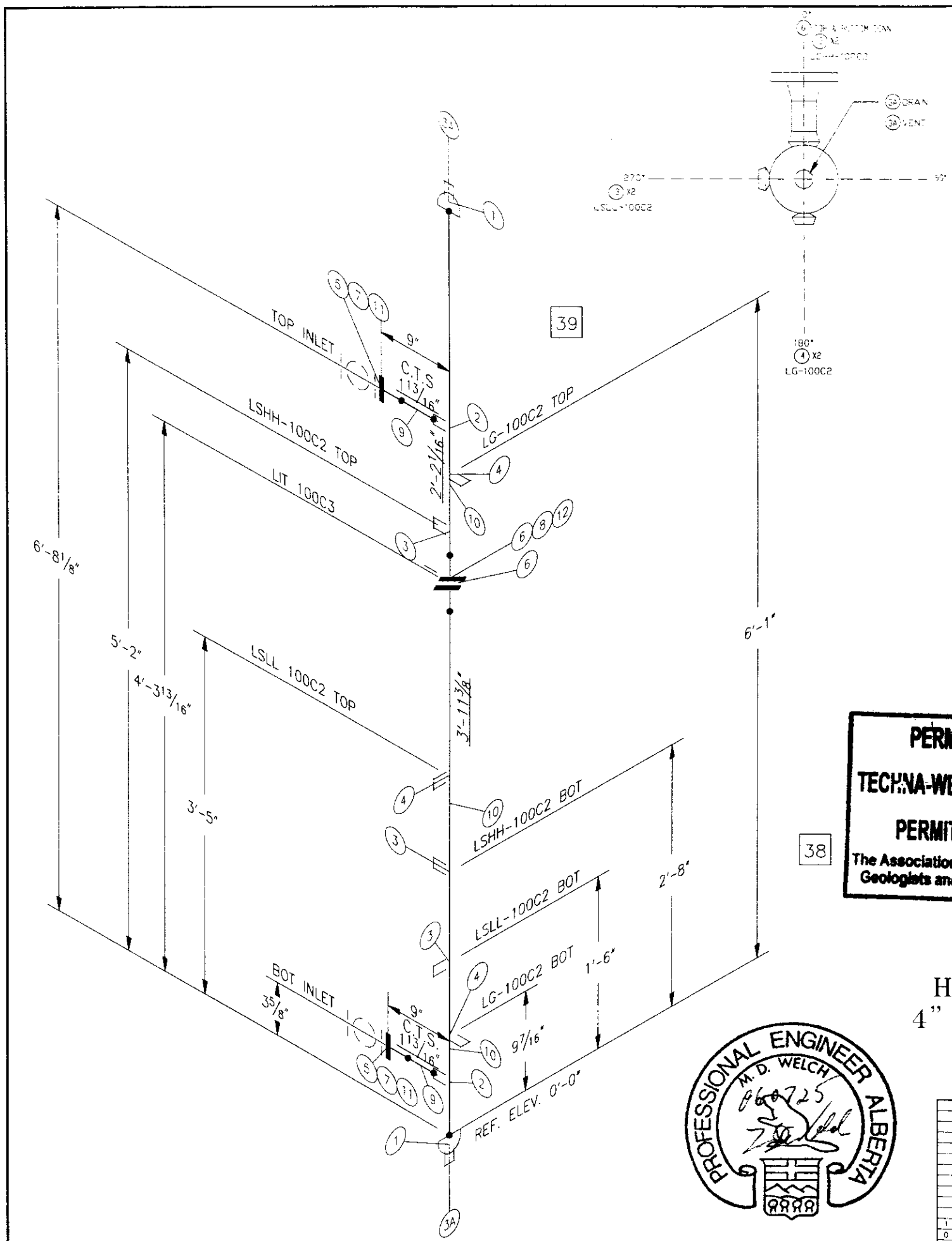
BILL OF MATERIAL							
ITEM	QUANTITY	SIZE	CODE	RFMS	DESCRIPTION	WEIGHT NUMBERS	
1	3	2"	WLD-809020	Sch XS	90 LR Ell BW CS SA-234-WPB	6.21 lbs	
2	4	2"	FLG-60080RWN20	600#	RF WN Flange Sch XS bore CS SA-105N	48.00 lbs	
3	4	2"	GSK-3/60020SS	600#	1/8" Gasket RF 316 S.S. FLEX		
4	8'	2"	PIP-8020	Sch XS	Pipe Smis,CS SA-106 Gr.B	36.75 lbs	
5	32	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts SA194-2HM	20.42 lbs	
Total Weight:						111.38 lbs	

AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
 DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
 O-LETS ARE SA-105N MATERIAL
 WPS: IPS-4 R.1
 15% X-RAY
 DESIGNED AND FABRICATED TO ASME CODE B31.3
 X-RAY TO B31.3 NORMAL

<div> </div>				DATE: 06-05-10 DESIGNED BY: JPS DRAWN BY: C.PATTEN CHECKED:		CLIENT: HUSKY ENERGY LTD. TITLE: 2" 600#RF INLET & OUTLET SPOOLS 48" HORIZONTAL SWEET SEPARATOR PACKAGE	
APPROVED BY:		PROJECT NO: 5325-001 SHEET NO: 11 OF 17		FILENAME: 5325-001HCCAGE10 DRAWING NO: CCL-5325-001PS11		REFERENCE NO: REV. NO:	
SCALE: NTS							

NO.	DATE	DESCRIPTION	BY	CHK'D	APPR
1	06-06-28	AS BUILT	CP		
0	06-05-10	ISSUED FOR CONSTRUCTION	CHP	RS	PP
		REVISIONS	DWN	OC	CHK'D



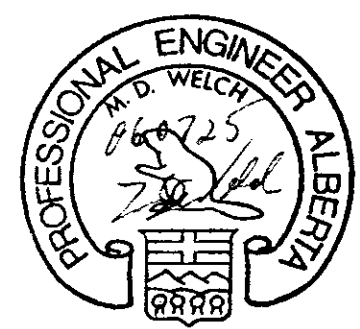
BILL OF MATERIAL										PART NUMBERS	
REV	QUANTITY	SIZE	CODE	STANDARD	DESCRIPTION	WEIGHT					
1	2	4"	WLD-80040	Sch XS	Ccp BW CS SA-234-WPB	6.94 lbs					
2	2		WOL-8020	Sch XS	4"x2" WOL CS SA-105N	3.50 lbs					
3	4		TOL-3M1X3-8	3000#	4"x1" TOL CS SA-105N	1.20 lbs					
3A	2		TOL-3M05X3-8	3000#	4"x1/2" TOL CS SA-105N	1.20 lbs					
4	2		TOL-3M07X3-5	3000#	4"x3/4" TOL CS SA-105N	1.05 lbs					
5	2	2"	FLG-60080RWN20	600#	RF WN Flange Sch XS bore CS SA-105N	24.00 lbs					
6	2	4"	FLG-60080RWN40	600#	RF WN Flange Sch XS bore CS SA-105N	80.00 lbs					
7	2	2"	GSK-3/60020SS	600#	1/8" Gasket RF 316 S.S. FLEX						
8	1	4"	GSK-60040SS	600#	1/8" Gasket RF 316 S.S. FLEX						
9	1'	2"	PIP-8020	Sch XS	Pipe Smis,CS SA-106 Gr.B	11.56 lbs					
10	7'	4"	PIP-8040	Sch XS	Pipe Smis,CS SA-106 Gr.B	123.27 lbs					
11	16	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts						
					SA194-2HM	10.21 lbs					
12	8	7/8"	STU-0857M		Stud Bolt x 5 3/4" SA-193-B7M W/2 Hvy Hex Nuts						
					SA194-2HM	13.42 lbs					
						Total Weight:	275.16 lbs				

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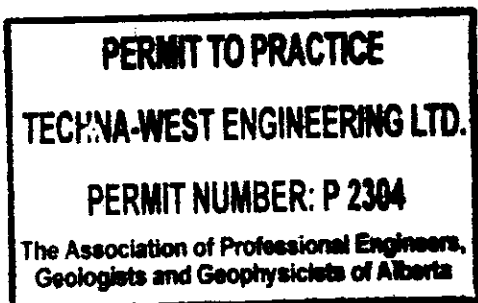
AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
 DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
 O-LETS ARE SA-105N MATERIAL
 WPS: IPS-4 R.1
 15% X-RAY
 DESIGNED AND FABRICATED TO ASME CODE B31.3
 X-RAY TO B31.3 NORMAL

HC CAGE
 4" 600#RF SCH 80






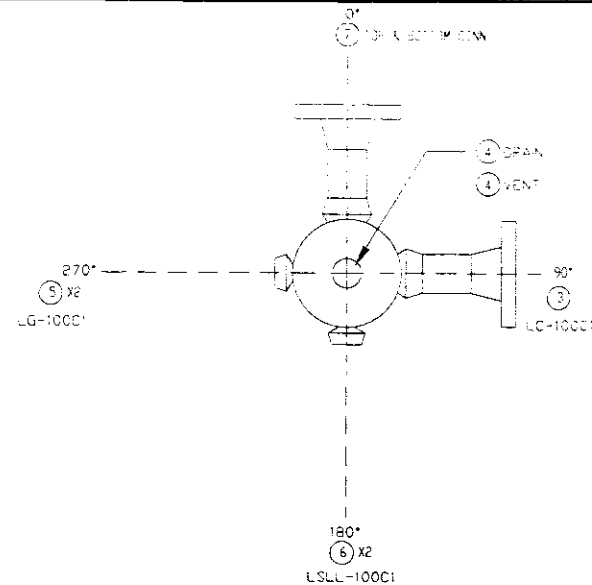
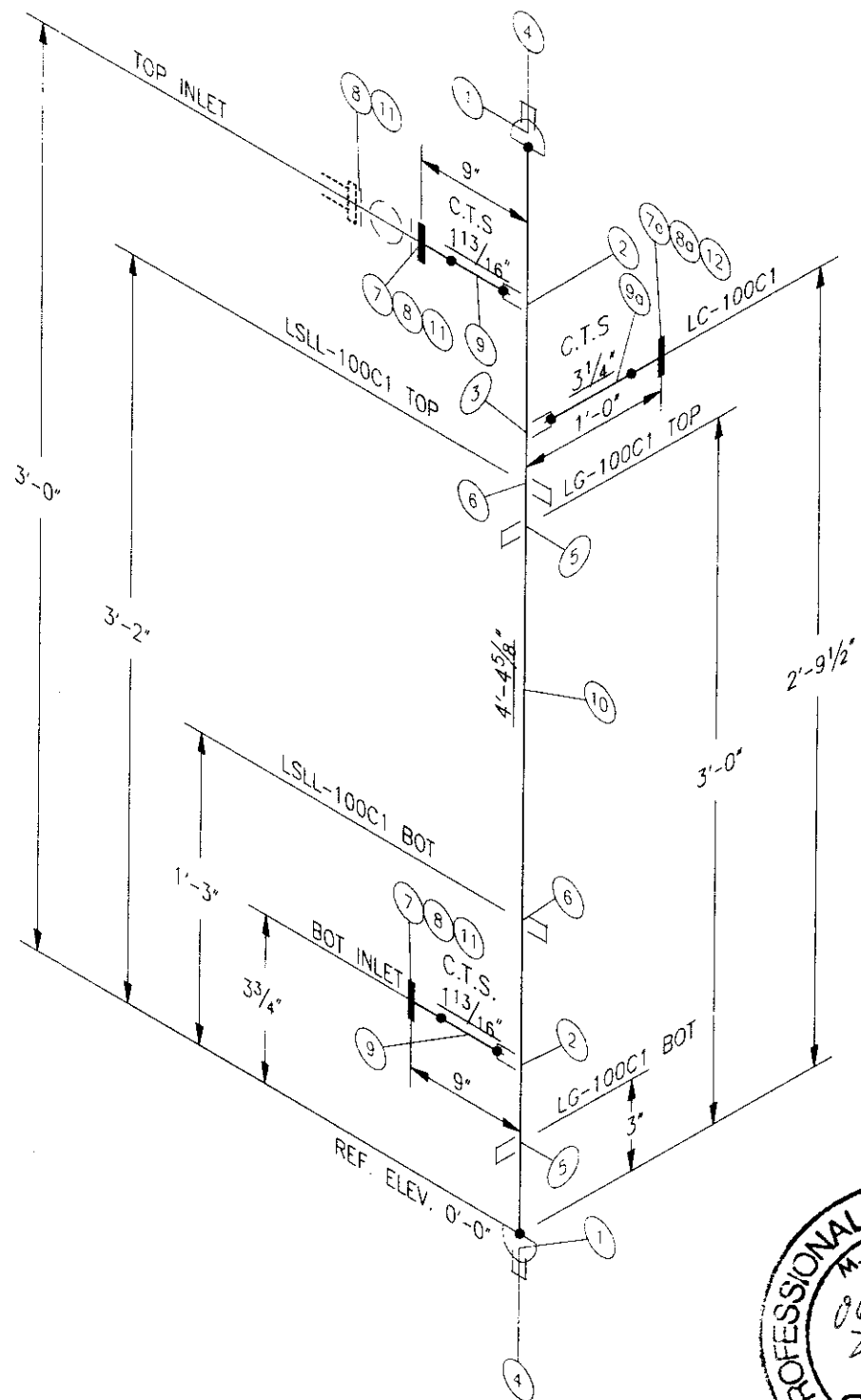
1 06-06-28 AS BUILT CP 0 06-05-10 ISSUED FOR CONSTRUCTION CMP RS PP NO DATE REVISIONS DWN GC CHK'D APPR		 IPS MANUFACTURING LIMITED		DATE 06-05-10 DESIGNED BY IPS DRAWN BY C.PATTEN CHECKED BY APPROVED BY SCALE NTS		CLIENT HUSKY ENERGY LTD. TITLE 4" 600#RF HC CAGE 48" HORIZONTAL SWEET SEPARATOR PACKAGE PROJECT NO 5325-001 SHEET NO 12 OF 17 FILENAME 5325-001HCAGE DRAWING NO CCL-5325-001PS12 REFERENCE NO REV. NO	
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AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16" CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

										 IPS MANUFACTURING LIMITED		DATE 06-05-10		CLIENT HUSKY ENERGY LTD.			
												DESIGNED BY IPS		TITLE 2' 600HRF H2O CAGE INLET 48' HORIZONTAL SWEET SEPARATOR PACKAGE			
												DRAWN BY C.PATTEN					
												CHECKED BY 					
										APPROVED BY 		PROJECT NO. 5325-001		FILENAME 5325-001H2OCAGE10		REFERENCE NO.	
1 06-06-28 AS BUILT CP										SCALE NTS		SHEET NO. 13 OF 17		DRAWING NO. CCL-5325-001PS13		REV. NO. 	
0 06-05-10 ISSUED FOR CONSTRUCTION NO. DATE REVISIONS DWN RS PP CHK'D APPR																	



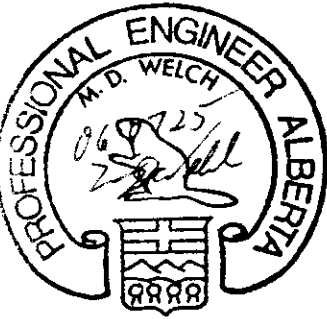
BILL OF MATERIAL								PART NUMBERS
ITEM	QTY	SIZE	DESCRIPTION	UNIT	WEIGHT	DESCRIPTION	UNIT	
1	2	6" WLD-80060	Sch XS Cap BW CS SA-234-WPB		18.90 lbs			
2	2	WOL-8020	Sch XS 6"x2" WOL CS SA-105N		3.50 lbs			
3	1	WOL-8030	Sch XS 6"x3" WOL CS SA-105N		4.10 lbs			
4	2	TOL-3M05X3-8	3000# 6"x1/2" TOL CS SA-105N		0.48 lbs			
5	2	TOL-3M07X6-12	3000# 6"x3/4" TOL CS SA-105N		0.70 lbs			
6	2	TOL-3M1X6-10	3000# 6"x1" TOL CS SA-105N		1.24 lbs			
7	2	2"	FLG-60080RWN20	600# RF WN Flange Sch XS bore CS SA-105N	24.00 lbs			
7a	1	3"	FLG-60080RWN30	600# RF WN Flange Sch XS bore CS SA-105N	24.00 lbs			
8	2	2"	GSK-3/60020SS	600# 1/8" Gasket RF 316 S.S. FLEX				
8a	1	3"	GSK-3/60030SS	600# 1/8" Gasket RF 316 S.S. FLEX				
9	1'	2"	PIP-8020	Sch XS Pipe Smls,CS SA-106 Gr.B	11.56 lbs			
9a	1'	3"	PIP-8030	Sch XS Pipe Smls,CS SA-106 Gr.B	11.56 lbs			
10	5'	6"	PIP-8060	Sch XS Pipe Smls,CS SA-106 Gr.B	125.73 lbs			
11	16	5/8"	STU-0642M			Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts SA194-2HM	10.21 lbs	
12	8	3/4"	STU-0750M			Stud Bolt x 5" SA-193-B7M W/2 Hvy Hex Nuts SA194-2HM	10.21 lbs	
					Total Weight:	200.42 lbs		

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BUILT

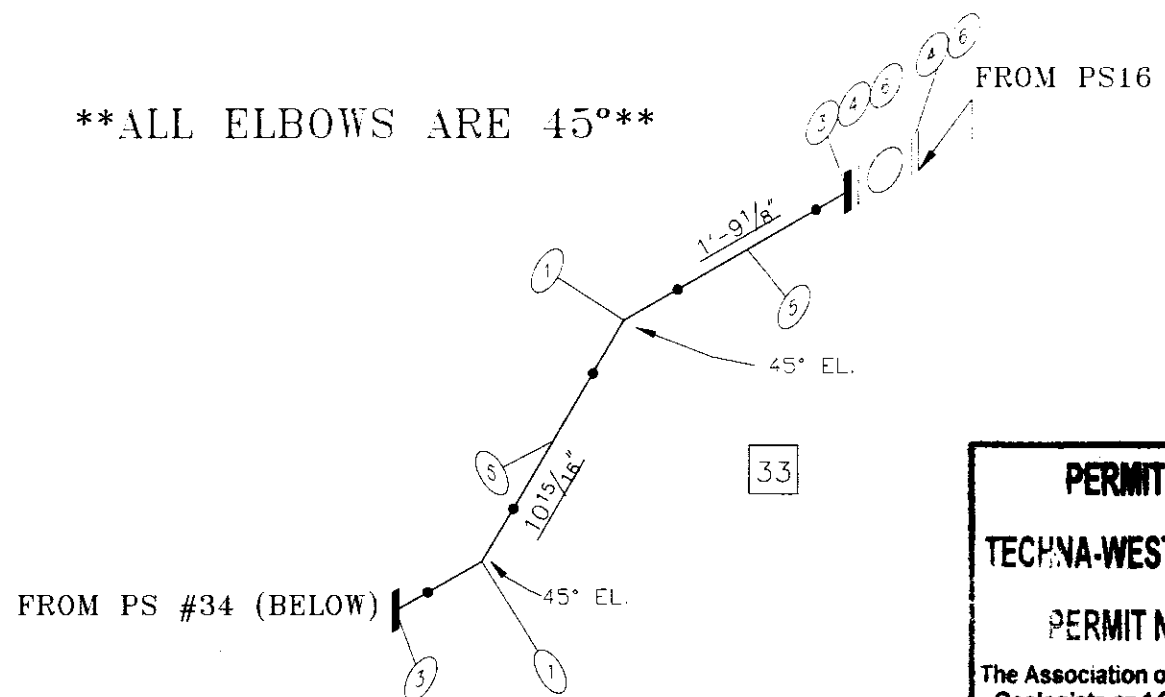
HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

H2O CAGE
6" 600#RF SCH 80

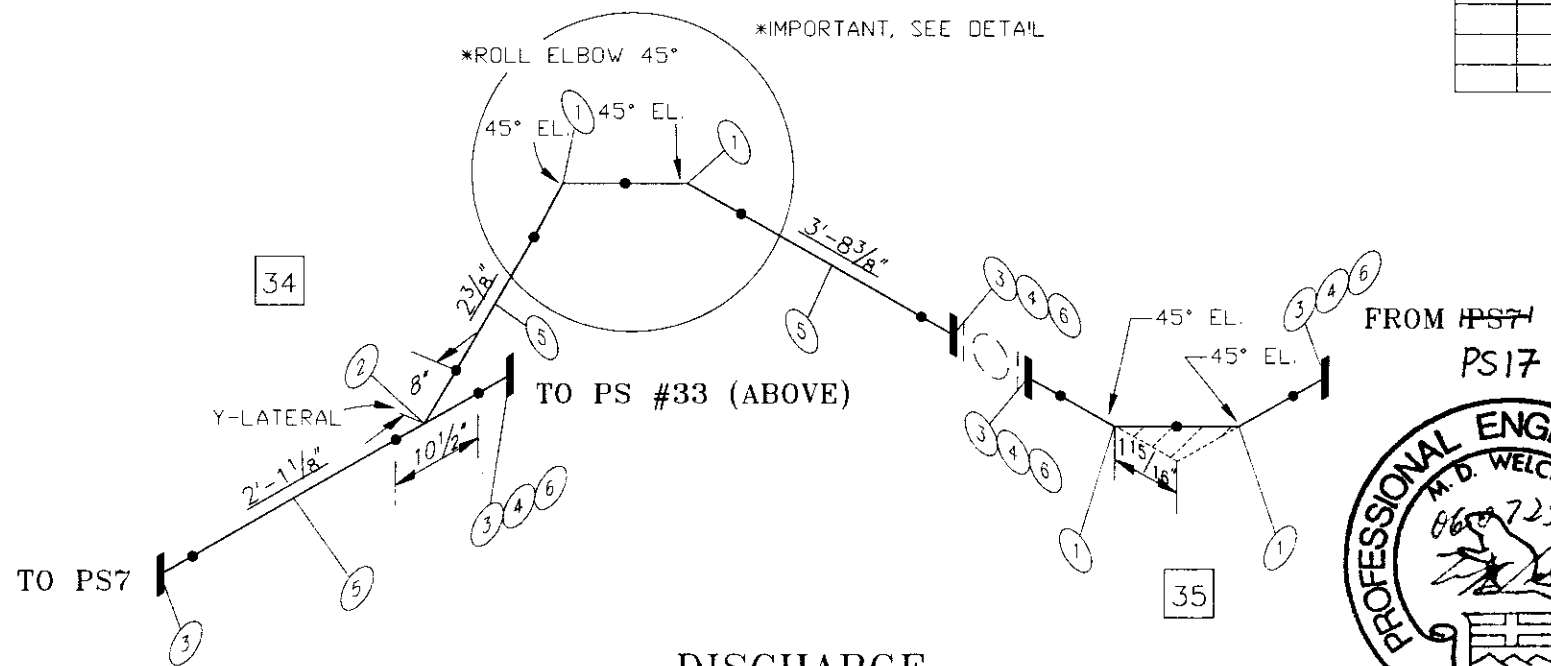


DATE: 06-05-10		CLIENT: HUSKY ENERGY LTD.	
DESIGNED BY: IPS		TITLE: 6" 600#RF H2O CAGE	
DRAWN BY: C.PATTEN		48" HORIZONTAL SWEET SEPARATOR PACKAGE	
CHECKED BY: [Signature]		PROJECT NO: 5325-001	
APPROVED BY: [Signature]		FILENAME: 5325-001H2OCAGE	
SCALE: NTS		SHEET NO: 14 OF 17	
DATE: 06-05-10		REFERENCE NO: CCL-5325-001PS14	

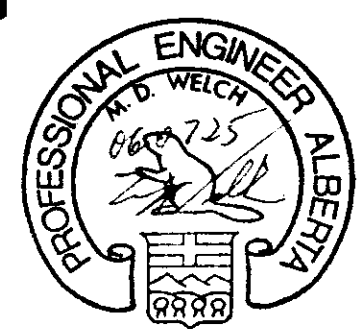
****ALL ELBOWS ARE 45°****



PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
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DISCHARGE
2" 600#RF SCH 80



AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

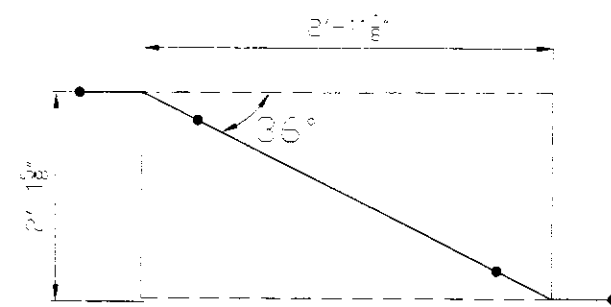
BILL OF MATERIAL

ITEM	QUANTITY	SIZE	CODE	RATING	DESCRIPTION	WEIGHT	REMARKS
1	6	2"	WLD-804520	Sch XS	45 EL BW CS SA-234-WPB	6.24 lbs	
2	1	2"	WLD-80YLAT20	Sch XS	Lateral BW CS SA-106 WPB	7.80 lbs	CRN#
3	7	2"	FLG-6008CRWN20	600#	RF WN Flange Sch XS bore CS SA-105N	84.00 lbs	
4	6	2"	GSK-3/60020SS	600#	1/8" Gasket RF 316 S.S. FLEX		
5	10'	2"	PIP-8020	Sch XS	Pipe Smls,CS SA-106 Gr.B	47.76 lbs	
6	48	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts SA194-2HM	30.62 lbs	
Total Weight:						176.43 lbs	

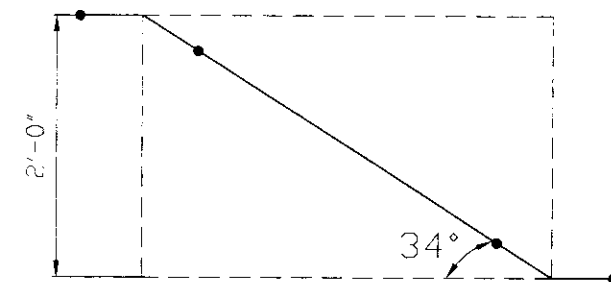
DATE: 06-05-10		CLIENT: HUSKY ENERGY LTD.	
DESIGNED BY: IPS		TITLE: 2" 600#RF DISCHARGE SPOOL 48" HORIZONTAL SWEET SEPARATOR PACKAGE	
DRAWN BY: C.PATTEN		PROJECT NO: 5325-001	FILENAME: 5325-001DISCHARGE3
CHECKED BY: [Signature]		SHEET NO: 15 OF 17	DRAWING NO: CCL-5325-001PS15
APPROVED BY: [Signature]		SCALE: NTS	REV. NO: 1

IPS
MANUFACTURING LIMITED

1	06-06-28	AS BUILT	CP				
0	06-05-10	ISSUED FOR CONSTRUCTION	OMP	RS	PP	CP	
NO.	DATE	REVISIONS	OWN	QC	CHK'D	APPR	

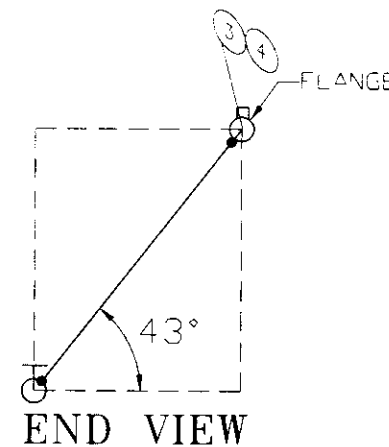


TOP VIEW

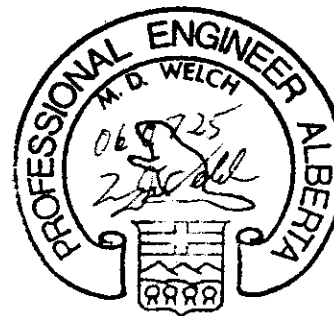
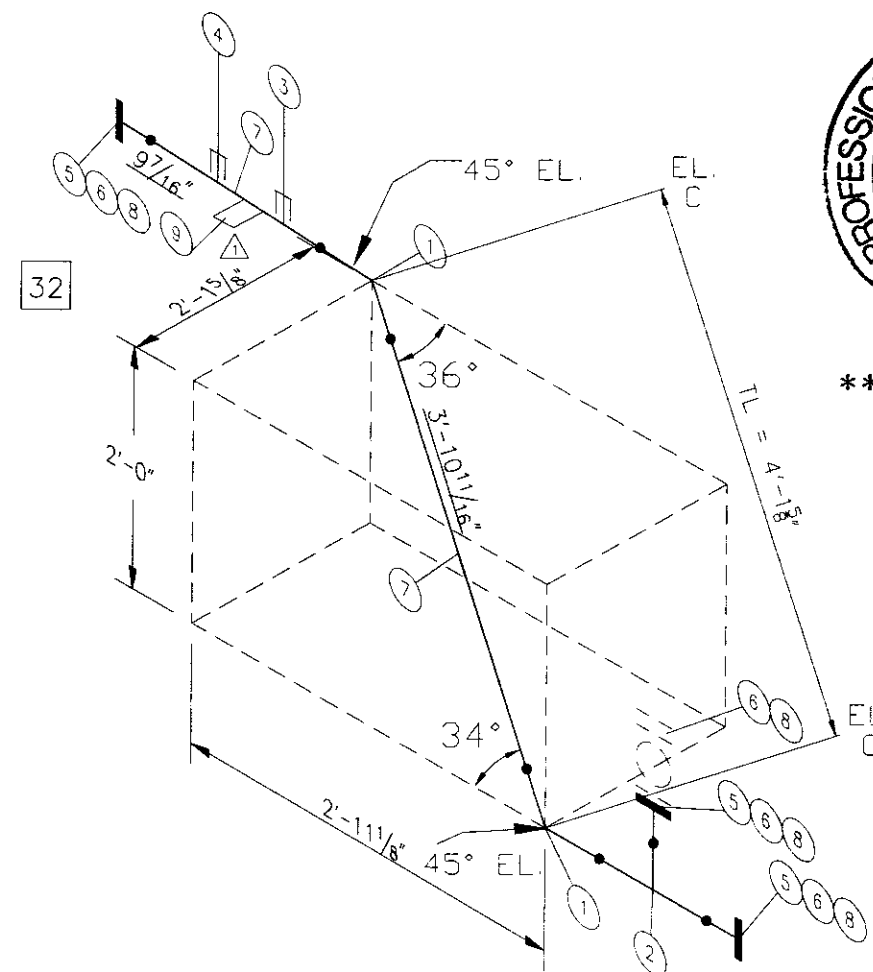


SIDE VIEW

ROLLED OFFSET



END VIEW



****ALL ELBOWS ARE 45°****

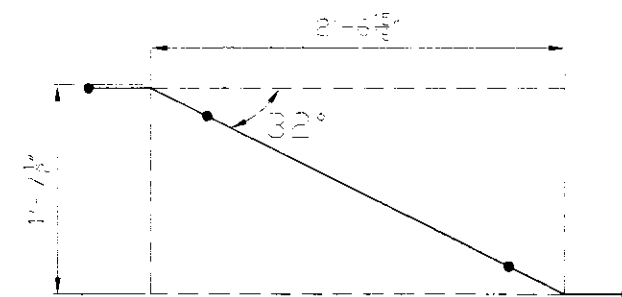
PERMIT TO PRACTICE
TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
 The Association of Professional Engineers,
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BILL OF MATERIAL										HEAT NUMBERS
ITEM	QUANTITY	SIZE	CODE	RATING	DESCRIPTION					
1	2	2"	WLD-804520	Sch XS	45 Ell BW	CS SA-234-WPB		2.08 lbs		
2	1	2"	WLD-80T20	Sch XS	Tee BW	CS SA-234 Gr.WPB		4.12 lbs		
3	1		TOL-3M05X2-2.5	3000#	2"x1/2" TOL	CS SA-105N		0.24 lbs		
4	1		TOL-3M1X2-2.5	3000#	2"x1" TOL	CS SA-105N		0.62 lbs		
5	3	2"	FLG-60080RWN20	600#	RF WN Flange Sch XS bore	CS SA-105N		36.00 lbs		
6	4	2"	GSK-3/60020SS	600#	1/8" Gasket RF	316 S.S. FLEX				
7	5'	2"	PIP-8020	Sch XS	Pipe Smls	CS SA-106 Gr.B		22.89 lbs		
8	32	5/8"	STU-0642M		Stud Bolt x 4 1/4"	SA-193-B7M W/2 Hvy Hex Nuts				
					SA194-2HM			15.31 lbs		
9	1		TOL-3M15X2-2.5	3000#	2"x1 1/2" TOL	CS SA-105N		0.62 lbs		
					Total Weight:			81.26 lbs		

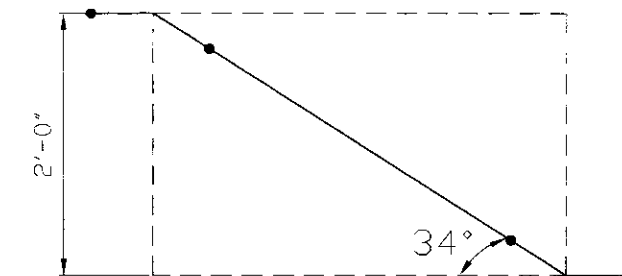
AS BUILT

DISCHARGE P-210
 2" 600#RF SCH 80

				DATE 06-05-10	CLIENT HUSKY ENERGY LTD.
				DESIGNED BY IPS	TITLE 2" 600# DISCHARGE SPOOLS FOR P-210 48" HORIZONTAL SWEET SEPARATOR PACKAGE
				DRAWN BY C.PATTEN	PROJECT NO. 5325-001
				CHECKED BY	FILENAME 5325-001DISCHARGE2
				APPROVED BY	REFERENCE NO.
				SCALE NTS	SHEET NO. 16 OF 17
					DRAWING NO. CCL-5325-001PS16
					REV. NO. A

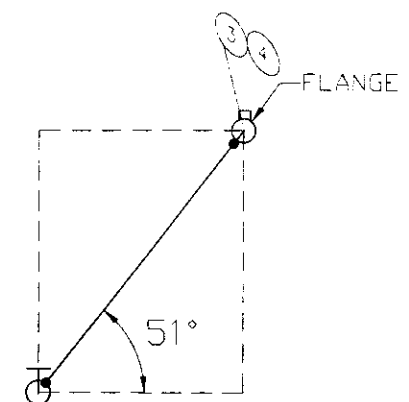


TOP VIEW

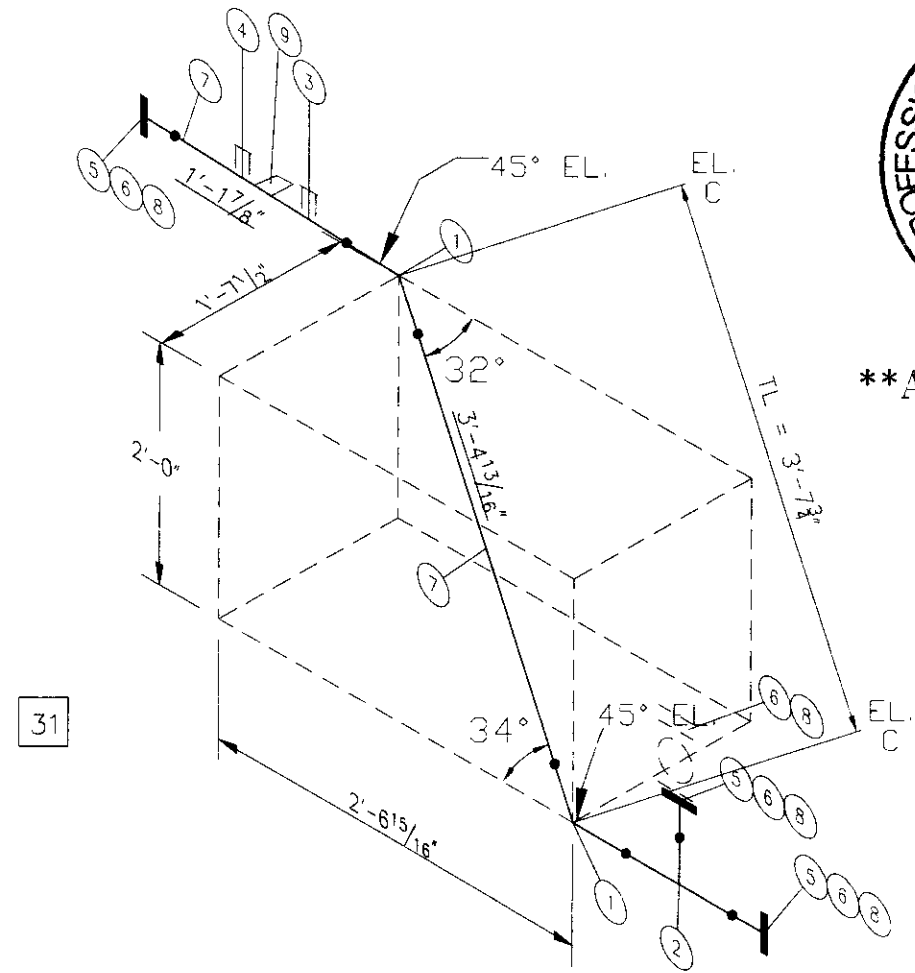


ELEVATION VIEW

ROLLED OFFSET

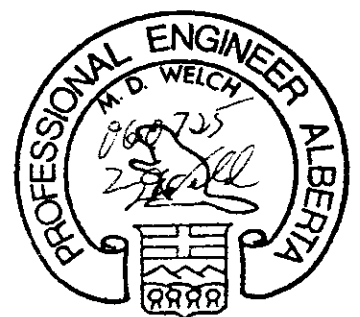


END VIEW



31

DISCHARGE P-220
2" 600#RF SCH 80



ALL ELBOWS ARE 45°

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TECHNA-WEST ENGINEERING LTD.
PERMIT NUMBER: P 2304
The Association of Professional Engineers,
Geologists and Geophysicists of Alberta

BILL OF MATERIAL

REV	QTY	SIZE	CODE	RATING	DESCRIPTION	WEIGHT	REMARKS
1	2	2"	WLD-804520	Sch XS	45 EL BW CS SA-234-WPB	2.08 lbs	
2	1	2"	WLD-80T20	Sch XS	Tee BW CS SA-234 Gr.WPB	4.12 lbs	
3	1		TOL-3M05X2-2.5	3000#	2"x1/2" TOL CS SA-105N	0.24 lbs	
4	1		TOL-3M1X2-2.5	3000#	2"x1" TOL CS SA-105N	0.62 lbs	
5	3	2"	FLG-60080RWN20	600#	RF WN Flange Sch XS bore CS SA-105N	36.00 lbs	
6	4	2"	GSK-3/60020SS	600#	1/8" Gasket RF 316 S.S. FLEX		
7	5'	2"	PIP-8020	Sch XS	Pipe Smls,CS SA-106 Gr.B	22.89 lbs	
8	32	5/8"	STU-0642M		Stud Bolt x 4 1/4" SA-193-B7M W/2 Hvy Hex Nuts		
					SA194-2HM	15.31 lbs	
9	1		TOL-3M15X2-2.5	3000#	2"x1 1/2" TOL CS SA-105N	0.62 lbs	
					Total Weight:	81.26 lbs	

AS BUILT

HYDROTEST TO 1.5x DESIGN PRESSURE
DESIGN PRESSURE IS 1440 PSIG @ 130°F c/w 1/16"CA
O-LETS ARE SA-105N MATERIAL
WPS: IPS-4 R.1
15% X-RAY
DESIGNED AND FABRICATED TO ASME CODE B31.3
X-RAY TO B31.3 NORMAL

<p>DATE: 06-05-10 CLIENT: HUSKY ENERGY LTD.</p>			
<p>DESIGNED BY: IPS</p>			
<p>DRAWN BY: C.PATTEN</p>			
<p>CHECKED BY: [Signature]</p>			
<p>APPROVED BY: [Signature]</p>		<p>PROJECT NO: 5325-001 SHEET NO: 17 OF 17</p>	
<p>SCALE: NTS</p>		<p>FILENAME: 5325-001DISCHARGE1 DRAWING NO: CCL-5325-001PS17</p>	



P	06-06-29	AS BUILT	CP						
1	06-06-19	REV 'SPOOL' 31	CP	RS	CP	CP			
0	06-05-10	ISSUED FOR CONSTRUCTION	CHP	RS	PP	CP			
NO	DATE	REVISIONS	OWN	QC	CHK'D	APPR			