SUPPLIER DOCUMENT COVER SHEET

MCDERMOTT

233124 PSC Modifications
Imperial Oil Resources Limited

Imperial

Supplier Name:	PENTICTON FOUNDRY LTD.
Purchase Order Title:	MISC-K2 CWI PIPING
Equipment / Tag Number(s):	SP-K3493
Supplier Document No:	1397868-B91-0002

Supplier's Revision Record

0	Sept. 05, 2018	For Review	Penticton		
Rev.	**Date**	**Issue**	**By**	**Checked**	**Approved**

Project Document Number

Project No.	Purchase Order No.				Seq. No.
233124	1397868	-	B91	-	0002

DOCUMENT TITLE: RFI – NPS 26 FROTH BEND SPOOL

SUPPLIER DOCUMENT REVIEW

Purchaser's review of Supplier's documents does not relieve Supplier of the responsibility for correctness under the Purchase Order. Permission to proceed does not constitute acceptance of design, detail and calculations, test methods or materials developed or selected by the Supplier and does not relieve the Supplier from full compliance with the Purchase Order or any other obligations, nor detract from any of the Purchaser's rights.

Purchaser's review status as per tick the appropriate box:			Purchasers review / reviewer	
	CODE 1:	No Comments	Date	Signature
	CODE 2:	Reviewed with Minor Comments		
	CODE 3:	Reviewed with Comments	Sept28/18	frank.mcinnis@cbi.com Digitally signed by frank.mcinnis@cbi.com DN: cn=frank.mcinnis@cbi.com Date: 2018.09.28 07:42:47 -04'00'
	CODE 4:	Rejected		
	CODE 5:	Superseded		
	CODE 6:	Void		
	CODE 7:	For Information		

IMPORTANT
Should the Supplier consider that any comments made by the Purchaser change the Scope of Supply, the Supplier shall advise the price and delivery implications of such changes within five working days of receipt. The Supplier must not incorporate such changes without prior approval of the Purchaser of the revised price and/or delivery period. RETROSPECTIVE CLAIMS WILL NOT BE CONSIDERED.

Follow IOL response to this RFI

Supplier - Purchaser Interface Data Freeze

MCDERMOTT Name:	Signature:	Date:

The document consists of this front sheet plus 4 pages.

Request for Information

September 05, 2018

Subject: NPS 26 Froth Bend Spool

SP-K3493

Drawing comments on Penticton/ALCO drawing number A1-18001-200-00 (supplier number 1397868-A05-0010, *Figure 1*) did not allow for 28" pipe.

Reason for increasing pipe diameter on the 26" bend spool shown on WP drawing 074-2300-080-141-010 01 Rev 0 (*Figure 2*) is for the following reason: supplier needs 1-¼" gap between OD of liner and ID of pipe induction bend of this radius. Drawing 074-2300-080-141-010 01 Rev 0 show a ¼" gap on this bend spool, which works on straight pipe, but is not big enough for the bend.

Supplier proposes the following option instead of the 28" pipe upsize:

Using a forged fitting 26" XS 3D 90 DEG ELBOW ASTM A234 WPB in lieu of the induction bend called for on the drawing, the supplier needs a ¾" gap between the OD of the liner and ID of the pipe fitting. With the ¾" gap, the ID of the 26" froth bend spool will be 21". See attached sketch "A1-18001 Test assembly comparison sketch" (*Figure 3)*, on the bottom right corner boxed in red. This is the option the supplier proposes to keep the NPS 26 pipe. Supplier requests if this option with the forged fitting and 21" ID of the liner is acceptable.

Comments:

The proposed solution as shown in Figure 3 (Section B-B shown in red box) is acceptable. Velocity in the bend section is marginally increased from 1.45 m/s to 1.6 m/s due to the increased liner gap. There is no impact to Pump hydraulics (See Attachment -1).

Please ensure the following changes are captured by all affected parties and affected changes are reflected in all engineering deliverables:

1) Pipe support elevation (TOS elevation) needs to be lowered as per changes reflected in the attached drawing 074-2300-080-141-010 01. (Attachment - 2)
2) Overall Length of bend spool is changed as per attached drawing 074-2300-080-141-010 01 (Attachment - 2)
3) Pipe support loads at support locations have changed as per the stress sketch attached (Attachment - 3)

Request for Information

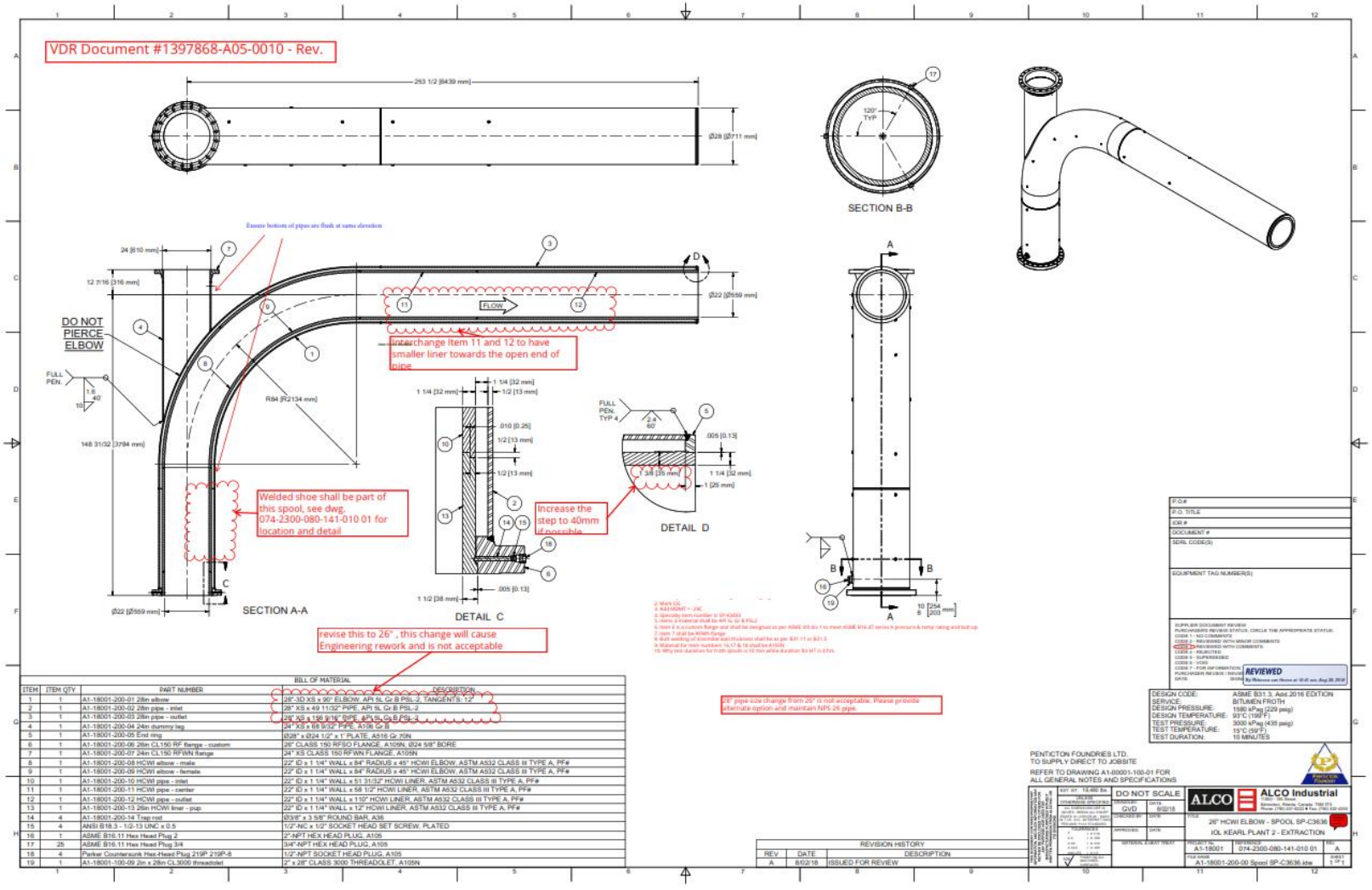


Figure 1: Penticton/ALCO drawing number A1-18001-200-00 (supplier number 1397868-A05-0010)

Request for Information

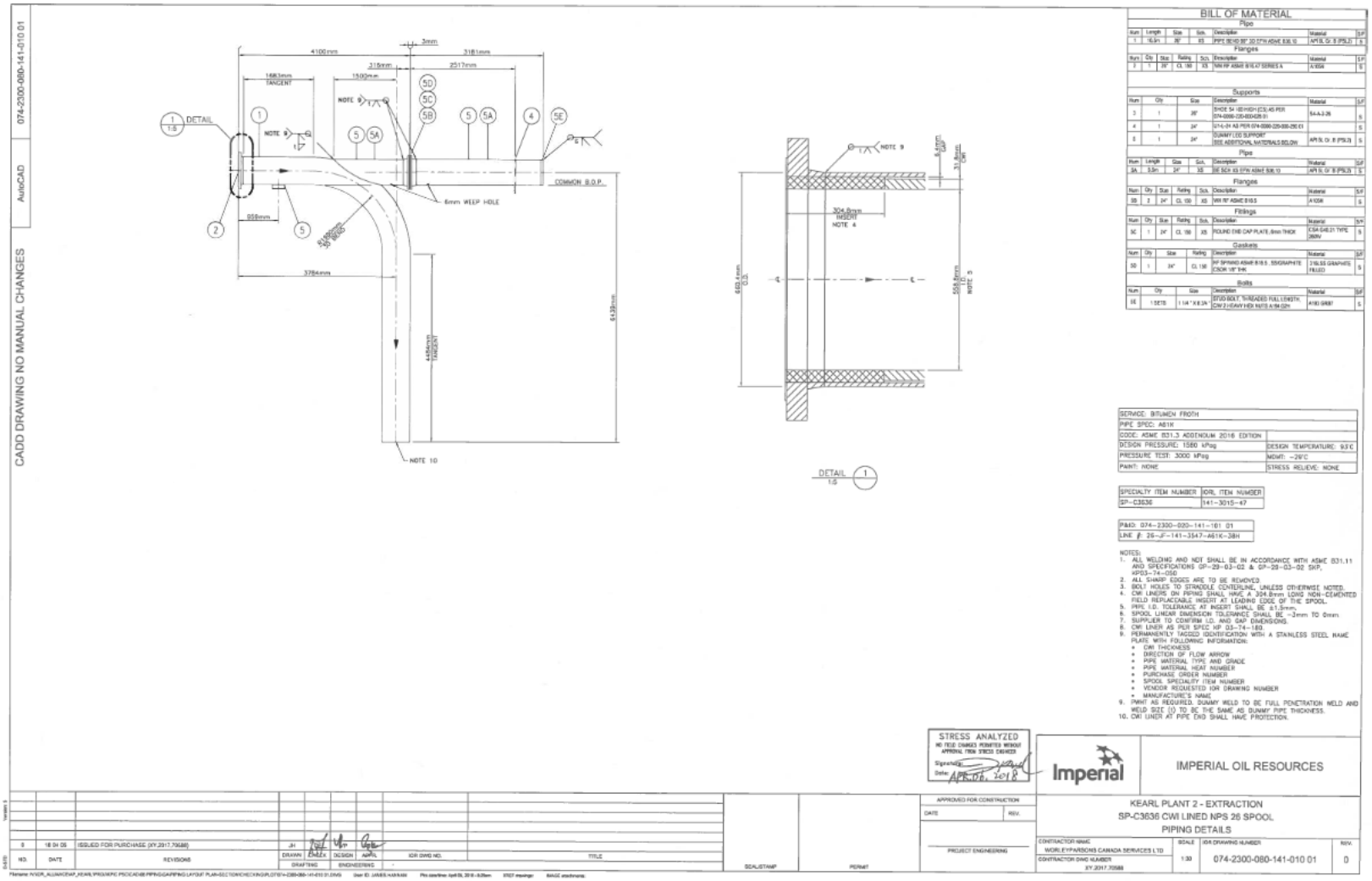


Figure 2: WP drawing 074-2300-080-141-010 01 Rev 0

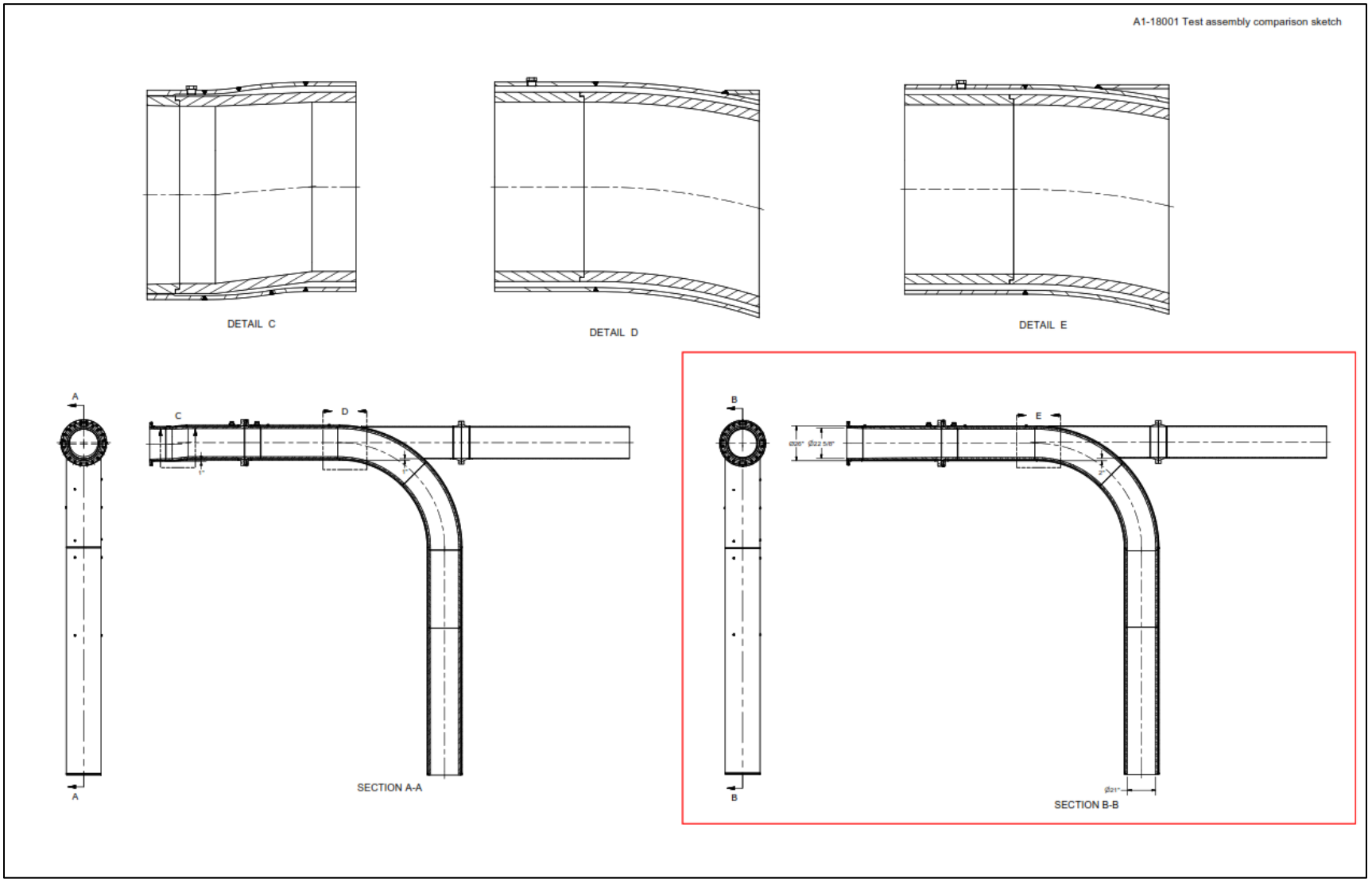


Figure 3: A1-18001 Test assembly comparison sketch

Response to RFI 1397868-B91-0002

Imperial

WorleyParsons
resources & energy

MAIL TYPE	MAIL NUMBER	REFERENCE NUMBER
General Correspondence	WORLEYP-GNC-000232	IO-PP-GNC-002587

Re: KPIC-K2 PSC - Froth CWI Lined Pipe ID

From	Mr Vijay Pathania - WorleyParsons
To	Mr Narjeet Sindhu - ExxonMobil
Cc (8)	Mrs Christina Comanescu - ExxonMobil
	Mr Chris Marianayagam - ExxonMobil
	Mr Paul Reid - ExxonMobil
	Mr Patrick Sundy - ExxonMobil
	Mr Vijay Pathania - WorleyParsons
	Mr Jaerin Kim - WorleyParsons
	Mr Manish Mundada - WorleyParsons
	Rhett Read - WorleyParsons
Sent	Wednesday, September 19, 2018

DETAILS

Facility	Kearl
Project	XY.2017.70588 - KPIC - K1 PSC Availability

MESSAGE

Narjeet,
Response is attached. Please note there is a slight increase in the loads at support 3900.
Regards
Vijay

From: N Sindhu
Sent: 9/12/18 10:40:00 AM PDT (GMT -07:00)
To: Rhett Read
Cc: Christina Comanescu, Chris Marianayagam, Paul Reid, Patrick Sundy, Manish Mundada, Vijay Pathania
Mail Number: IO-PP-GNC-002594
Subject: Re: KPIC-K2 PSC - Froth CWI Lined Pipe ID

Facility:	Kearl
Project:	XY.2017.70588 - KPIC - K1 PSC Availability

Attached RFI separately with this mail.

Regards
Narjeet

From: N Sindhu
Sent: 9/11/18 8:48:05 AM MDT (GMT -06:00)
To: Rhett Read
Cc: Christina Comanescu, Chris Marianayagam, Paul Reid, Patrick Sundy, Manish Mundada, Vijay Pathania
Mail Number: IO-PP-GNC-002587
Subject: KPIC-K2 PSC - Froth CWI Lined Pipe ID

Facility:	Kearl
Project:	XY.2017.70588 - KPIC - K1 PSC Availability

Rhett
Please find attached Penticton vendor RFI regarding Froth transfer CWI lined pipe spool. Could you please confirm if the proposed solution is acceptable. Also include in your response the velocity impact due to smaller pipe ID.

Regards
Narjeet

ATTACHMENT -1

From:	Mundada, Manish (Calgary)
To:	Pathania, Vijay (Calgary); Kim, Jaerin (Calgary); Hannam, James (Calgary)
Cc:	Read, Rhett (Calgary)
Subject:	RE: Froth line CWI and ID changes
Date:	September 13, 2018 9:20:48 AM

Very marginal impact on velocity – 1.45 m/s becomes 1.6 m/sec

Pump has sufficient head to overcome additional friction.

From: Pathania, Vijay (Calgary)
Sent: September 13, 2018 8:10 AM
To: Mundada, Manish (Calgary) <Manish.Mundada@WorleyParsons.com>; Kim, Jaerin (Calgary) <Jaerin.Kim@WorleyParsons.com>; Hannam, James (Calgary) <James.Hannam@WorleyParsons.com>
Cc: Read, Rhett (Calgary) <Rhett.Read@WorleyParsons.com>
Subject: Froth line CWI and ID changes

Hi Manish,

Due to CWI liner construction constrains for forth line bend spool, vendor has proposed attached changes. Please let me know if this is acceptable. In new design ID of pipe will be changed from 558.8 mm to 533.4 mm. Narjeet is also interested to know the velocity change between both cases.

Jaerin/James,

Is this acceptable from stress and piping design point of view? There is no change in CWI thinnkness.

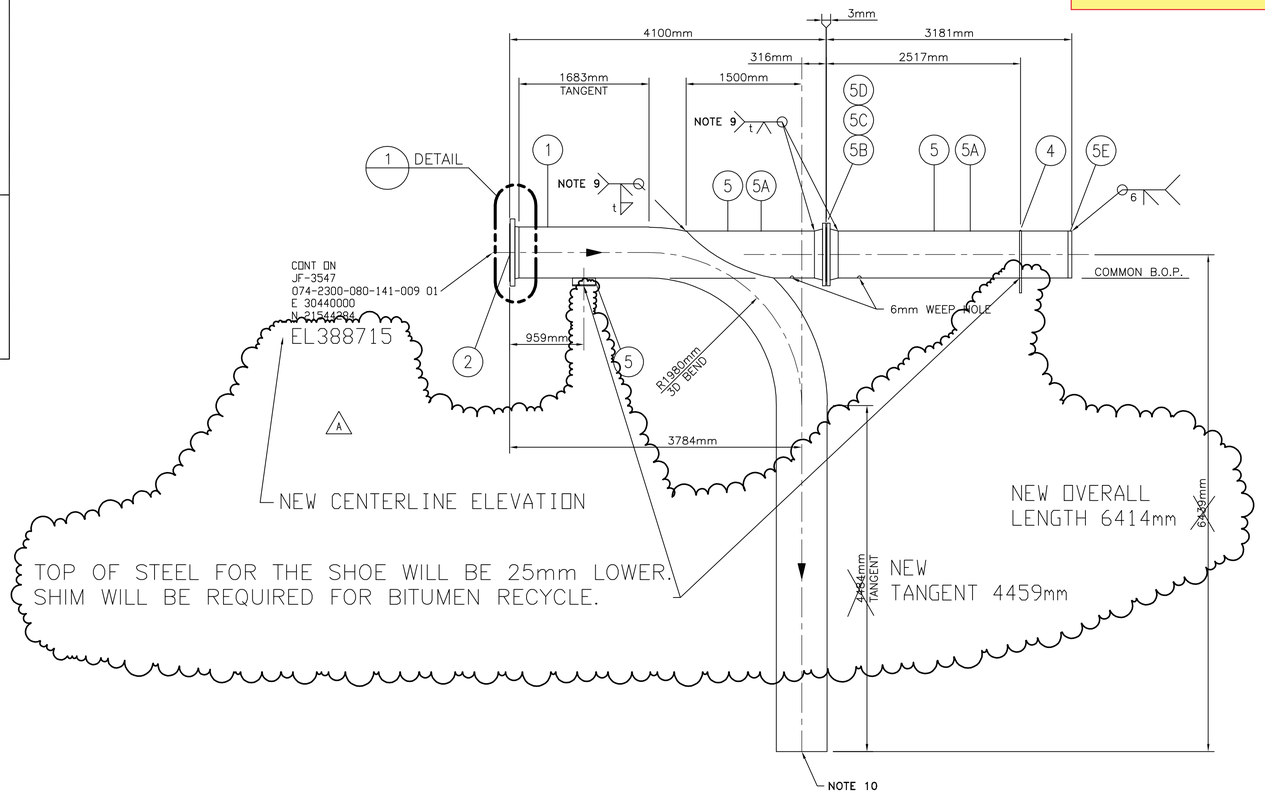
Thanks
Vijay

074-2300-080-141-010 01

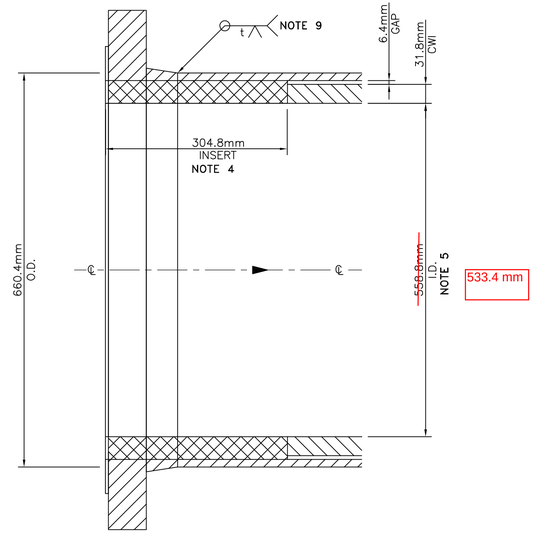
AutoCAD

CADD DRAWING NO MANUAL CHANGES

ATTACHMENT -2



ELEVATION
NTS



DETAIL 1

BILL OF MATERIAL

Pipe

Num	Length	Size	Sch.	Description	Material	S/F
1	10.5m	26"	XS	PIPE BEND 90° 3D EFW ASME B36.10	API 5L Gr. B (PSL2)	S

Flanges

Num	Qty	Size	Rating	Sch.	Description	Material	S/F
2	1	26"	CL 150	XS	WN RF ASME B16.47 SERIES A	A105N	S

Supports

Num	Qty	Size	Description	Material	S/F
3	1	26"	SHOE S4 100 HIGH (CS) AS PER 074-0000-220-000-026 01	S4-A-2-26	S
4	1	24"	U1-L-24 AS PER 074-0000-220-000-290 01		S
5	1	24"	DUMMY LEG SUPPORT SEE ADDITIONAL MATERIALS BELOW	API 5L Gr. B (PSL2)	S

Pipe

Num	Length	Size	Sch.	Description	Material	S/F
5A	5.5m	24"	XS	BE SCH XS EFW ASME B36.10	API 5L Gr. B (PSL2)	S

Flanges

Num	Qty	Size	Rating	Sch.	Description	Material	S/F
5B	2	24"	CL 150	XS	WN RF ASME B16.5	A105N	S

Fittings

Num	Qty	Size	Rating	Sch.	Description	Material	S/F
5C	1	24"	CL 150	XS	ROUND END CAP PLATE, 6mm THICK	CSA G40.21 TYPE 260W	S

Gaskets

Num	Qty	Size	Rating	Description	Material	S/F
5D	1	24"	CL 150	RF SP/WND ASME B16.5 , SS/GRAPHITE CSOR 1/8" THK	316LSS GRAPHITE FILLED	S

Bolts

Num	Qty	Size	Description	Material	S/F
5E	1 SETS	1 1/4 " X 6 3/4 "	STUD BOLT, THREADED FULL LENGTH, C/W 2 HEAVY HEX NUTS A194 G2H	A193 GRB7	S

SERVICE: BITUMEN FROTH	
PIPE SPEC: A61K	
CODE: ASME B31.3 ADDENDUM 2016 EDITION	
DESIGN PRESSURE: 1580 kPag	DESIGN TEMPERATURE: 93°C
PRESSURE TEST: 3000 kPag	MDMT: –29°C
PAINT: NONE	STRESS RELIEVE: NONE

SPECIALTY ITEM NUMBER	IORL ITEM NUMBER
SP-K3493	141-3015-50

P&ID: 074-2300-020-141-101 01
LINE #: 26-JF-141-3547-A61K-38H

NOTES:
1. ALL WELDING AND NDT SHALL BE IN ACCORDANCE WITH ASME B31.3 AND SPECIFICATIONS GP-29-03-02 & GP-29-03-02 SKP, KP03-74-050
2. ALL SHARP EDGES ARE TO BE REMOVED.
3. BOLT HOLES TO STRADDLE CENTERLINE, UNLESS OTHERWISE NOTED.
4. CWI LINERS ON PIPING SHALL HAVE A 304.8mm LONG NON-CEMENTED FIELD REPLACEABLE INSERT AT LEADING EDGE OF THE SPOOL.
5. PIPE I.D. TOLERANCE AT INSERT SHALL BE ±1.5mm.
6. SPOOL LINEAR DIMENSION TOLERANCE SHALL BE –3mm TO 0mm.
7. SUPPLIER TO CONFIRM I.D. AND GAP DIMENSIONS.
8. CWI LINER AS PER SPEC KP 03-74-180.
9. PERMANENTLY TAGGED IDENTIFICATION WITH A STAINLESS STEEL NAME PLATE WITH FOLLOWING INFORMATION:
   - CWI THICKNESS
   - DIRECTION OF FLOW ARROW
   - PIPE MATERIAL TYPE AND GRADE
   - PIPE MATERIAL HEAT NUMBER
   - PURCHASE ORDER NUMBER
   - SPOOL SPECIALITY ITEM NUMBER
   - VENDOR REQUESTED IOR DRAWING NUMBER
   - MANUFACTURE'S NAME
9. PWHT AS REQUIRED. DUMMY WELD TO BE FULL PENETRATION WELD AND WELD SIZE (t) TO BE THE SAME AS DUMMY PIPE THICKNESS.
10. CWI LINER AT PIPE END SHALL HAVE PROTECTION.

Imperial

IMPERIAL OIL RESOURCES

NO.	DATE	REVISIONS	DRAWN	CHECK	DESIGN	APPR.	IOR DWG NO.	TITLE
			DRAFTING		ENGINEERING			
A	18 09 15	AS-IS UPDATE FOR HCBI VIA VENDOR CHANGES (XY.2017.70588)	JH					
0	18 04 05	ISSUED FOR PURCHASE (XY.2017.70588)	JH	DF	VP	RJM		

SEAL/STAMP

PERMIT

APPROVED FOR CONSTRUCTION

DATE | REV.

PROJECT ENGINEERING

KEARL PLANT 2 - EXTRACTION
SP-K3493 CWI LINED NPS 26 SPOOL
PIPING DETAILS

CONTRACTOR NAME	SCALE	IOR DRAWING NUMBER	REV.
WORLEYPARSONS CANADA SERVICES LTD	1:5	074-2300-080-141-010 01	A
CONTRACTOR DWG NUMBER: XY.2017.70588			

Version: 5

D-STD

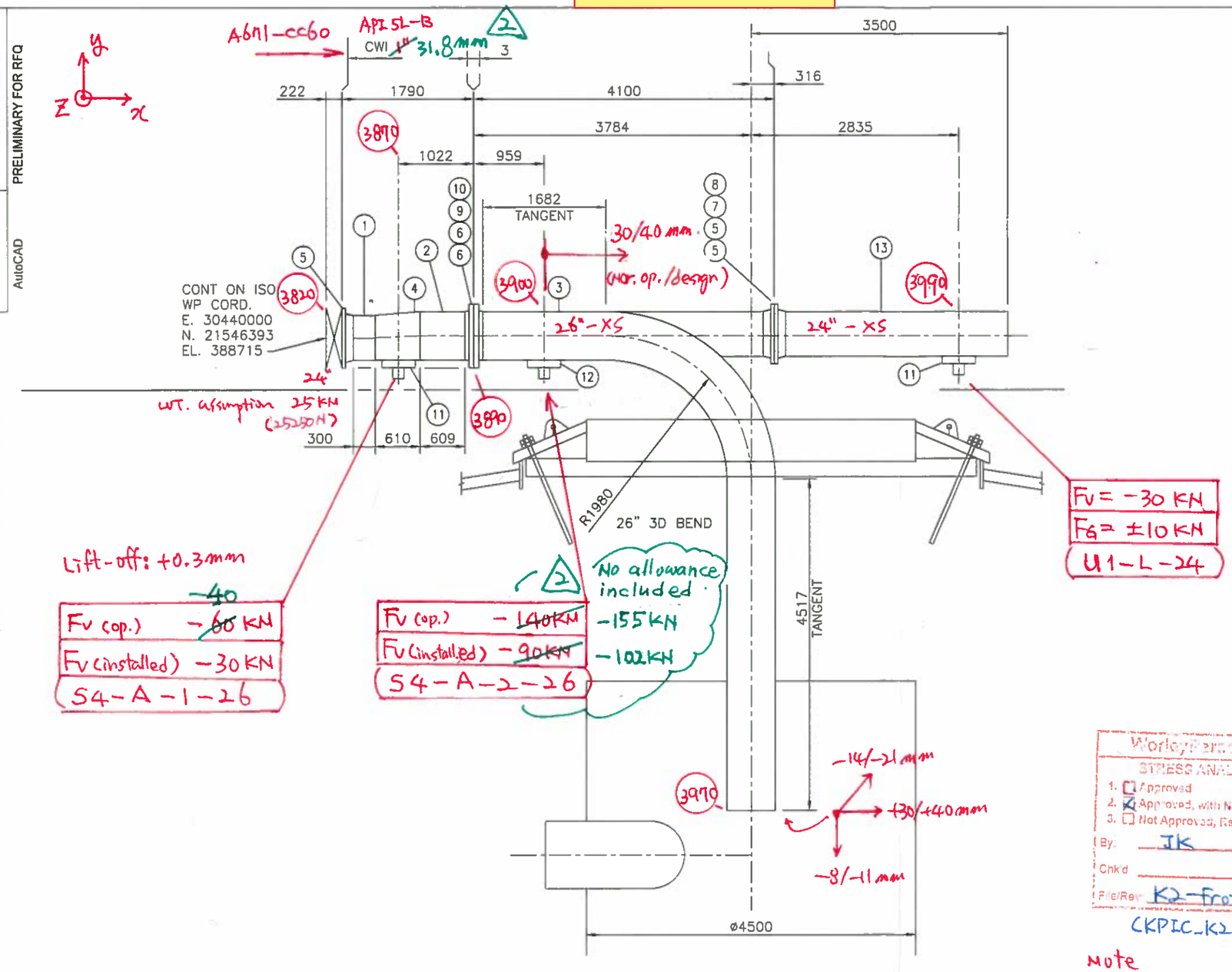
Filename: N:\IOR_ALLIANCE\AP_KEARL\PROJ\KPIC PSC\CAD\06 PIPING\GA\PIPING LAYOUT PLAN-SECTION\CWI SPOOLS\074-2300-080-141-010 01 - COPY FOR HCBI.DWG User ID: JAMES.HANNAM Plot date/time: September 18, 2018 - 1:31pm XREF drawings: IMAGE attachments:

ATTACHMENT - 3

PRELIMINARY FOR RFQ

AutoCAD

CADD DRAWING NO MANUAL CHANGES



Lift-off: +0.3mm

~~40~~

Fv (op.) ~~-60~~ KN

Fv (installed) -30 KN

S4-A-1-26

2

No allowance included.

Fv (op.) ~~-140KN~~ -155 KN

Fv (installed) ~~-90KN~~ -102 KN

S4-A-2-26

Fv = -30 KN

Fs = ±10 KN

U1-L-24

BILL OF MATERIAL

Num	Qty	Size	Description	Material Code	S/F
			PIPE		
1	0.5 M	24	PIPE BE SCH XS EFW API 5L Gr. B (PSL2) ASME B36.10		S
2	0.5 M	26	PIPE BE SCH XS EFW API 5L Gr. B (PSL2) ASME B36.10		S
3	1 M	26	PIPE BE SCH XS 90 DEG. 3D EFW API 5L Gr. B (PSL2) ASME B36.10 1682MM TANGENT X 4517 TANGENT		S
			FITTINGS		
4	1	26X24	REDUCER ECC, BW SCH 30 X SCH XS WLD A234 Gr. WPB-W ASME B16.9		S
			FLANGES		
5	3	24	FLANGE WN RF BORE TO MATCH PIPE CL150 A105N ASME B16.5		S
6	4	26	FLANGE WN RF BORE TO MATCH PIPE CL150 A105N ASME ~~B16.5~~ B16.47 Series-A		S
			GASKETS AND BOLTS		
7	1	24	GASKET 4.5MM THK. SPIRAL WOUND, 316L SS/GRAPHITE CL150 A105N ASME B16.5		S
8	XX	24	STUDBOLT, THREADED FULL LENGHT, C/W TWO HEAVY HEX NUTS ASME B18.2.1, ASME B18.2.2		S
9	2	26	GASKET 4.5MM THK. SPIRAL WOUND, 316L SS/GRAPHITE CL150 A105N ASME B16.47 SERIES A		S
10	XX	26	STUDBOLT, THREADED FULL LENGHT, C/W TWO HEAVY HEX NUTS ASME B18.2.1, ASME B18.2.2		S
			SHOES/SUPPORTS		
11	2	24	S4-A-2-24		S
12	1	26	S4-A-2-26		S
13	0.5M	24	TRUNNION		S

Note 1. Fv = vertical load (operation)
Fs = Lateral load (operation)

Worley Parsons Calgary
STRESS ANALYSIS STATUS
1. ☐ Approved
2. ☒ Approved, with Noted Changes
3. ☐ Not Approved, Revise and Resubmit
By: JK Date: 15 Mar. '18
Chk'd ____ Date: ____
File/Rev: K2-froth-rpa-r2 (19 Sep. '18)
CKPIC_K2_CN-003-rpa
~~-r2~~ (Rev=4)

Note
1. Design Pressure = ATM (after valve to open-end)

MAR 1 2 2018

STRESS COPY

CONSTRUCTION NOTES
1. PERMANENTLY TAGGED IDENTIFICATION WITH STAINLESS STEEL NAME PLATE IN ACCORDANCE WITH SPECIATION KP-03-74-046. STAMPING SHALL ALSO INCLUDE SPECIALTY ITEM NUMBER AND DRAWING NUMBERS.

FOR ALL LINE CONDITIONS SEE THE MASTER LDT

Imperial

IMPERIAL OIL RESOURCES

NO	DATE	REVISIONS	DRAWN	CHECK	DESIGN	APPR.	IOR DWG NO	TITLE
			DRAFTING		ENGINEERING		REFERENCE DRAWINGS	
D	18 02 01	PRELIMINARY SPOOLS FOR RFQ (HCBI REQ ADDED)	JH		VJ			
C	18 01 25	PRELIMINARY SPOOLS FOR RFQ	JH		VP			
B	17 12 19	PRELIMINARY SPOOLS FOR RFQ	JH	OAP	VP		074-1300-170-141-JF-2051 XX	24-JF-141-3003-A61K-38H - FABRICATION ISOMETRIC
A	17 12 14	PRELIMINARY SPOOLS FOR RFQ	JH	OAP	VP		074-1300-020-141-101 01	PRIMARY SEPARATION CELL PSC-3015 - P&ID

SEAL/STAMP | PERMIT

APPROVED FOR CONSTRUCTION

DATE	REV

PROJECT ENGINEERING

KEARL PLANT 1
24"/26" FROTH RECYCLE LINE PSC-3015
PSC AVAILIABILITY CWI SPOOLS

CONTRACTOR NAME	SCALE	IOR DRAWING NUMBER	REV
WORLEYPARSONS CANADA SERVICES LTD	1:100	SPOOL DWG #3	D
CONTRACTOR DWG NUMBER			

D-STD Version 9

Filename: N:\IOR_ALLIANCE\AP_KEARL\PROJ\KPIC PSC\CAD\08 PIPING\GA\PIPING LAYOUT PLAN-SECTION\CHECKING\FROTH RECYCLE SPOOL DWG User ID: JAMES.HANNAM Plot date/time: March 12, 2018 - 8:21am XREF drawings IMAGE attachments