

Certificate XO-T241-07-2008

TransCanada Keystone Pipeline - Haskett Pump Station (PS-27)

Application for Leave to Open

Tab B – Hydrotest Documents

Hydrotest Summary Report
TransCanada Keystone Pipeline
Haskett Pump Station (PS-27)

Drain Line Connection

Test Number:	Haskett-HT-001
Description:	Drain Line Connection
Pipe:	Piping Class A4; NPS 3 (See Pipe Schedule in Tab B for more information)
Test Medium:	Water
Test Location:	Haskett Pump Station Pump 4
Set Pressures:	Design: 1,900 kPa Test: 2,375 – 2,622 kPa
Achieved Pressure:	Min: 2,377 kPa Max: 2,561 kPa
Date and Time:	July 14, 2010; 10:50 to 14:50 hours
Ambient Temperature:	21 to 23 °C
Company Inspector:	Roy Thomas

Pump 4 Discharge Piping

Test Number:	Haskett-HT-002
Description:	Pump 4 Discharge Piping
Pipe:	Piping Class D4; NPS 20, 24 (See Pipe Schedule in Tab B for more information)
Test Medium:	Water
Test Location:	Haskett Pump Station Pump 4
Set Pressures:	Design: 9,930 kPa Test: 12,413 – 13,703 kPa
Achieved Pressure:	Min: 13,185 kPa Max: 13,556 kPa
Date and Time:	September 28, 2010; 10:30 to 14:30 hours
Ambient Temperature:	13 to 22 °C
Company Inspector:	Mike Mihial

Specifications and Procedures Index
TransCanada Keystone Pipeline
Haskett Pump Station (PS-27)

The following information is a general summary of the regulations, standards, codes, specifications, and procedures that were referenced in the design, material selection, construction, inspection, testing and commissioning of the Haskett Pump Station.

1. Design

- a. NEB – Onshore Pipeline Regulations, 1999**
 - Section 4 General
- b. CSA Z662-03 Oil and Gas Pipeline Systems**
 - Section 4 Design
- c. NFPA 30**
 - Flammable and Combustible Liquids Code
- d. TransCanada Engineering Standards**

2. Materials

- a. NEB – Onshore Pipeline Regulations, 1999**
 - Section 14 Specifications
 - Section 15 Quality Assurance Program
- b. CSA Z662-03 Oil and Gas Pipeline Systems**
 - Section 5 Materials
- c. TransCanada Engineering Standards**

3. Construction

- a. NEB – Onshore Pipeline Regulations, 1999**
 - Section 19 Construction Safety
 - Section 20 Construction Safety
 - Section 54 Construction Inspection
- b. CSA Z662-03 Oil and Gas Pipeline Systems**
 - Section 6 Installation
 - Section 7 Joining
 - Section 10 Operating, Maintenance, and Upgrading
- c. TransCanada Engineering Standards**

4. Non-Destructive Examination

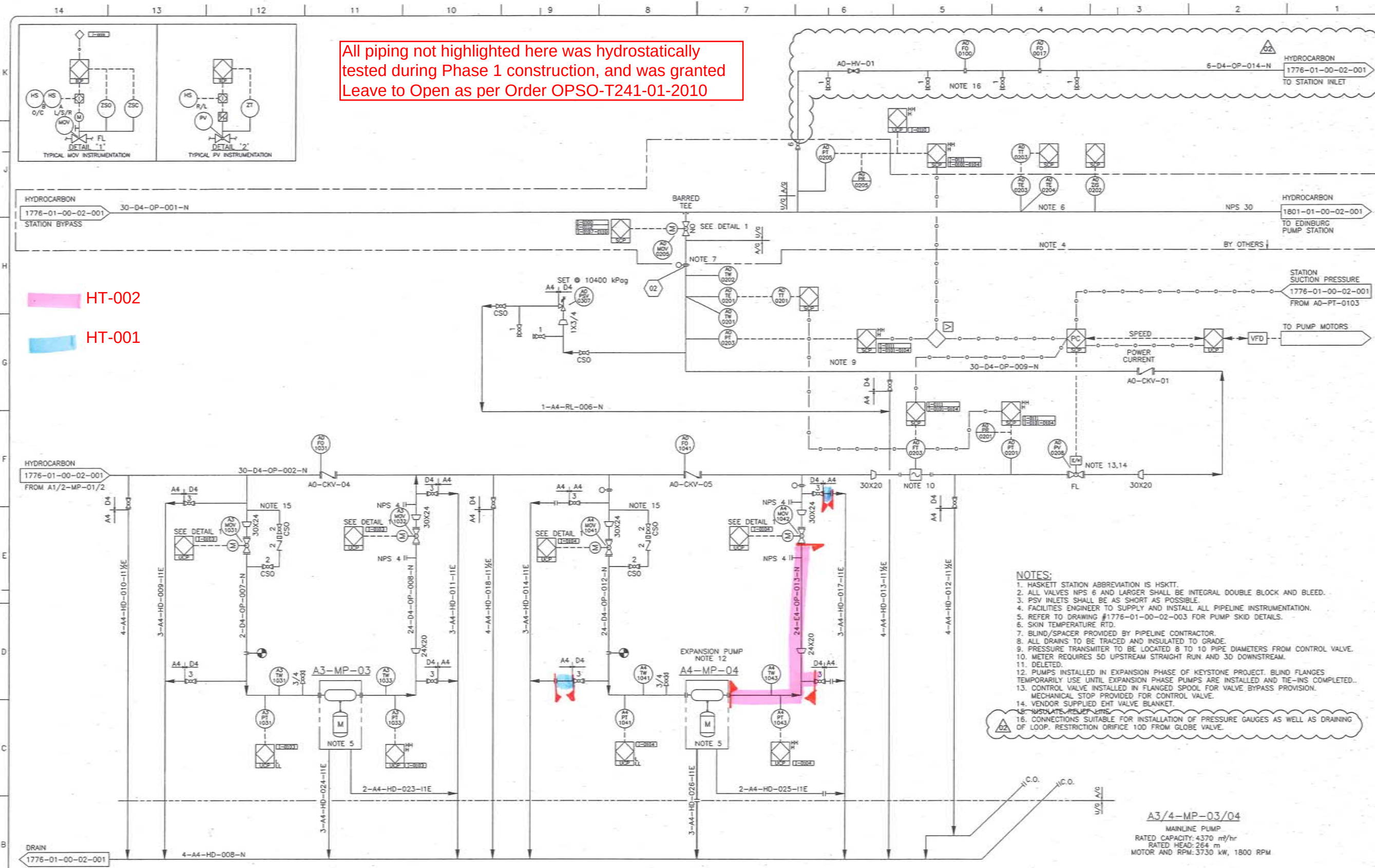
- a. **NEB – Onshore Pipeline Regulations, 1999**
 - Section 17 Non-Destructive Examination
- b. **CSA Z662-03 Oil and gas Pipeline Systems**
 - Section 7 Joining
 - Section 8 Pressure Testing
- c. **TransCanada Engineering Standards**

5. Pressure Testing

- a. **NEB – Onshore Pipeline Regulations, 1999**
 - Section 23 Pressure Testing Program
 - Section 24 Permits for Use and Disposal of Water
 - Section 25 General Testing Requirements
- b. **CSA Z662-03 Oil and Gas pipeline Systems**
 - Section 8 Pressure Testing
- c. **TransCanada Project Spec 0171617-4000-46ES-0005, Rev. 03**
 - Title: Piping Hydrostatic Testing
- d. **TransCanada Engineering Standards**

6. Commissioning

- a. **NEB – Onshore Pipeline Regulations, 1999**
 - Section 37 Pipeline Control System
 - Section 39 Surveillance and Monitoring
 - Section 40 Pipeline Integrity
- b. **CSA Z662-03 Oil and Gas Pipeline Systems**
 - Section 10 Operating, Maintenance and Upgrading
- c. **TransCanada Engineering Standards**



All piping not highlighted here was hydrostatically tested during Phase 1 construction, and was granted Leave to Open as per Order OPSO-T241-01-2010

HT-002
HT-001

- NOTES:
1. HASKETT STATION ABBREVIATION IS HSKTT.
 2. ALL VALVES NPS 6 AND LARGER SHALL BE INTEGRAL DOUBLE BLOCK AND BLEED.
 3. PSV INLETS SHALL BE AS SHORT AS POSSIBLE.
 4. FACILITIES ENGINEER TO SUPPLY AND INSTALL ALL PIPELINE INSTRUMENTATION.
 5. REFER TO DRAWING #1776-01-00-02-003 FOR PUMP SKID DETAILS.
 6. SKIN TEMPERATURE RTD.
 7. BLIND/SPACER PROVIDED BY PIPELINE CONTRACTOR.
 8. ALL DRAINS TO BE TRACED AND INSULATED TO GRADE.
 9. PRESSURE TRANSMITTER TO BE LOCATED 8 TO 10" PIPE DIAMETERS FROM CONTROL VALVE.
 10. METER REQUIRES 50' UPSTREAM STRAIGHT RUN AND 30' DOWNSTREAM.
 11. DELETED.
 12. PUMPS INSTALLED IN EXPANSION PHASE OF KEYSTONE PROJECT. BLIND FLANGES TEMPORARILY USE UNTIL EXPANSION PHASE PUMPS ARE INSTALLED AND TIE-INS COMPLETED.
 13. CONTROL VALVE INSTALLED IN FLANGED SPOOL FOR VALVE BYPASS PROVISION. MECHANICAL STOP PROVIDED FOR CONTROL VALVE.
 14. VENDOR SUPPLIED EHT VALVE BLANKET.
 15. ISOLATE RELIEF LINE.
 16. CONNECTIONS SUITABLE FOR INSTALLATION OF PRESSURE GAUGES AS WELL AS DRAINING OF LOOP. RESTRICTION ORIFICE 100' FROM GLOBE VALVE.

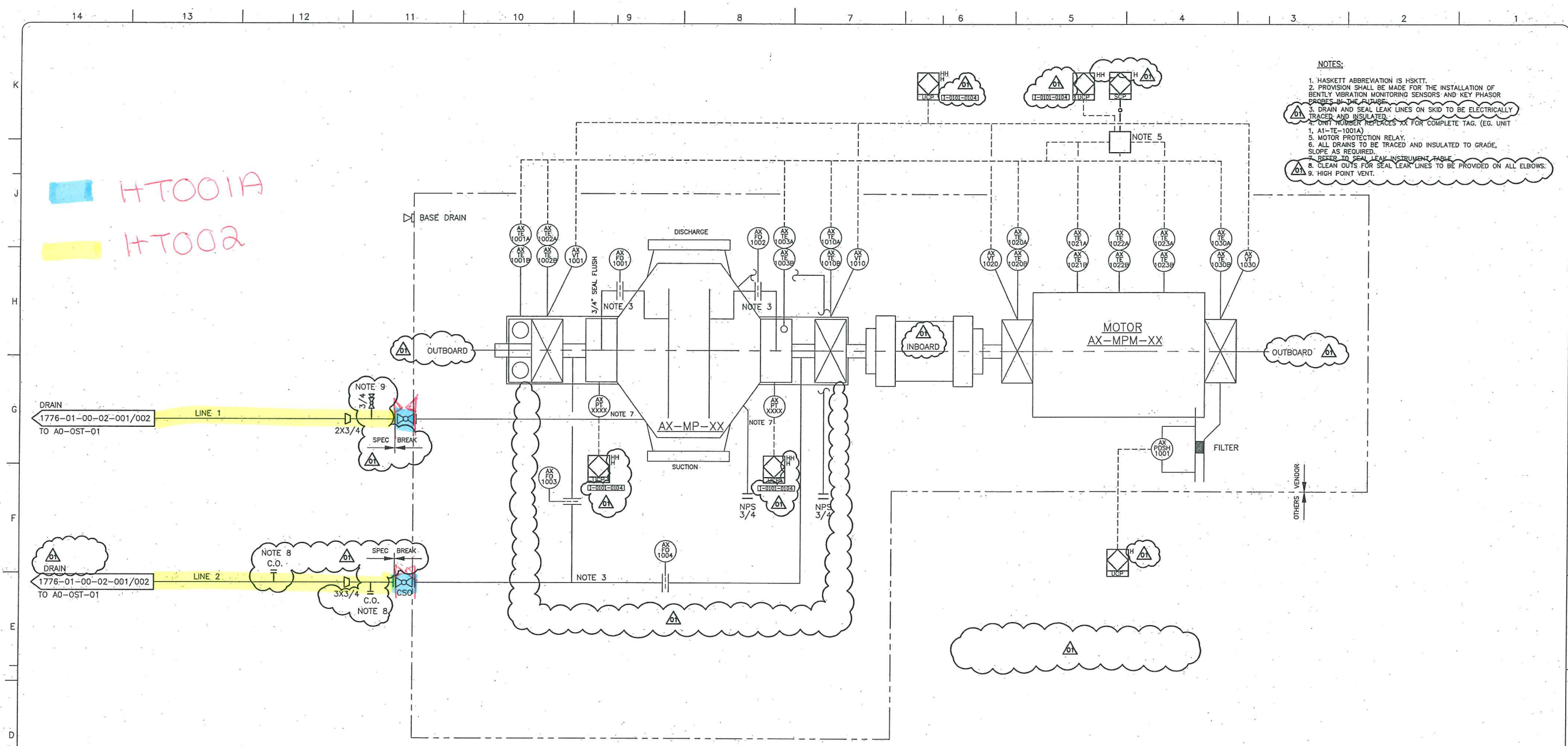
REFERENCE DRAWINGS		REVISION		APPROVAL		PROFESSIONAL ENGINEER/PERMIT/ENG. APPROVAL	
DRAWING No	TITLE	REV	DATE	DESCRIPTION	PROJECT CODE	DRAWN	DATE
1776-01-00-02-001	HASKETT PUMP STATION	00	2008 AUG 25	ISSUED FOR CONSTRUCTION	017617	ES	JS
		01	2009 FEB 10	DRAIN PIPING, CONTROLS AND OTHER UPDATES	017617	PA	JS
		02	2009 DEC 01	ADDED RECIRCULATE LOOP	017617	PA	JS

PROJECT CODE	DRAWN	DESIGNED	DESIGN CHECKER	PROJECT MANAGER	COMPANY
017617	ES	JS	JS	JG	SN
017617	PA	JS	JS	JG	SN
017617	PA	JS	JS	JG	SN

PROFESSIONAL ENGINEER/PERMIT/ENG. APPROVAL	PERMIT/ENG. APPROVAL
DATE	DATE
02	02

TransCanada	SNC-Lavalin
HASKETT PUMP STATION	HASKETT PUMP STATION
PIPING & INSTRUMENTATION DIAGRAM	PIPING & INSTRUMENTATION DIAGRAM

SCALE	DRAWING No	REV
N.T.S.	1776-01-00-02-002	02



- NOTES:
1. HASKETT ABBREVIATION IS HSKTT.
 2. PROVISION SHALL BE MADE FOR THE INSTALLATION OF BENTLY VIBRATION MONITORING SENSORS AND KEY PHASOR SENSORS IN THE FLANGE.
 3. DRAIN AND SEAL LEAK LINES ON SKID TO BE ELECTRICALLY TRACED AND INSULATED.
 4. UNIT NUMBER REPLACES XX FOR COMPLETE TAG. (EG. UNIT 1, A1-TE-1001A)
 5. MOTOR PROTECTION RELAY.
 6. ALL DRAINS TO BE TRACED AND INSULATED TO GRADE, SLOPE AS REQUIRED.
 7. REFER TO SEAL LEAK INSTRUMENT TABLE.
 8. CLEAN OUTS FOR SEAL LEAK LINES TO BE PROVIDED ON ALL ELBOWS.
 9. HIGH POINT VENT.

PUMP	LINE 1	LINE 2	INBOARD SEAL	OUTBOARD SEAL
A1-MP-01	2-A4-HD-019-I1E	3-A4-HD-020-I1E	A1-PT-1015	A1-PT-1016
A2-MP-02	2-A4-HD-021-I1E	3-A4-HD-022-I1E	A2-PT-1025	A2-PT-1026
A3-MP-03	2-A4-HD-023-I1E	3-A4-HD-024-I1E	A3-PT-1035	A3-PT-1036
A4-MP-04	2-A4-HD-025-I1E	3-A4-HD-026-I1E	A4-PT-1045	A4-PT-1046

Piping hydrostatically tested in Phase 1; Leave To Open granted as per Order OPSO-T241-01-2010

REFERENCE DRAWINGS		REVISION		APPROVAL		PROFESSIONAL ENGINEER/RPT		PERMIT/ ENG. APPROVAL		FILE NO.: 5-5-4-1							
DRAWING No	TITLE	REV	DATE	DESCRIPTION	PROJECT CODE	DRAFTER	DRAFTING CHECKER	DESIGNER	DESIGN CHECKER	PROJECT MANAGER	COMPANY	PROFESSIONAL ENGINEER/RPT	PERMIT/ ENG. APPROVAL	DATE	SCALE	DRAWING No	REV
1776-01-00-02-001	HASKETT PUMP STATION	00	2009 AUG 25	ISSUED FOR CONSTRUCTION	017617	PA	JS	JS	JO	DM	SLI	J. OYARZUN	SNC LAVALIN INC.	FEB 10, 2009	N.T.S.	1776-01-00-02-003	01
1776-01-00-02-002	HASKETT PUMP STATION	01	2009 FEB 10	PIPING DRAINS, CONTROLS AND OTHER UPDATES	017617	PA	JS	JS	JO	DM	SLI	J. OYARZUN	SNC LAVALIN INC.	FEB 10, 2009	N.T.S.	1776-01-00-02-003	01

TC_NI_BR.DWG 787X1000

CADD DRAWING: DO NOT MAKE MANUAL REVISIONS

SLI# 017617-8127-46D4-0003

B5

Pipe Schedule
TransCanada Keystone Pipeline
Haskett Pump Station (PS-27)

#	OD (mm)	WT (mm)		Grade (MPa)	Requested MOP (kPa)
		mm	WT		
HT-001	88.9	5.49	STD	241 for Pipe and Fittings 248 for Flanges	1,900
HT-002	508.0	12.70	XS	290 for Pipe, Fittings and Flanges	9.930
	609.6	12.70		359 for Pipe, Fittings and Flanges	

Summary Table of Pipe Manufacturers – Larger Than NPS 6
TransCanada Keystone Pipeline
Haskett Pump Station (PS-27)

Commodity:	Pipe
Vendor:	Edgen Murray
PO Number:	25350-200-POA-PB02-S0002

Stock Code	Description	End Manufacturer
148434	NPS 20, Pipe ERW, CSA z245.1 GR 290 CAT 1 BBE, 12.7mm W.T. D4	Stupp Corp.
148687	NPS 20, Pipe, ERW, CSA Z245.1 GR. 359 CAT.1, BBE, XS W.T., E4.	Stupp Corp.
149475	NPS 24, Pipe ERW, CSA Z245.1 GR 359 CAT 1, CL D4, 12.7mm W.T. BBE	American Steel Pipe
149476	NPS 24, Pipe ERW, CSA Z245.1 GR 448 CAT 1, CL E4, 12.7mm W.T. BBE	American Steel Pipe
148688	NPS 30, Pipe, DSAW, CSA Z245.1 GR. 448 CAT.1, BBE, XS W.T., D4	Evraz / JFE Steel Corp.

Commodity:	Elbows
Vendor:	MCJUNKIN REDMAN CORP
PO Number:	25350-200-POC-PB02-S0002

Stock Code	Description	End Manufacturer
148443	Elbow, 45 deg., LR, BW, CSA Z245.11 GR 448 CAT 1 NPS 30, XS, D4	Canadoil Asia Ltd.
148440	Elbow, 90 deg, LR, BW, CSA Z245.11 GR 290 CAT 1 NPS 20, XS, D4	Canadoil Asia Ltd.
148441	Elbow, 90 deg., LR BW, CSA Z245.11 GR 359, CAT 1 NPS 24, XS, D4	Canadoil Asia Ltd.
148501	Elbow, 90 deg. LR, BW, CSA Z245.11 GR 448 CAT 1 NPS 24, XS, E4	Canadoil Asia Ltd.
148442	Elbow, 90 deg. LR, BW CSA Z245.11 GR 448 CAT 1 NPS 30, XS, D4	Canadoil Asia Ltd.
148502	Elbow, 90 deg. LR, BW, CSA Z245.11 GR 448 CAT 1 NPS 30, SCH 30, E4	Canadoil Asia Ltd.

Commodity:	Reducers
Vendor:	MCJUNKIN REDMAN CORP
PO Number:	25350-200-POC-PB02-S0002

Stock Code	Description	End Manufacturer
148447	REDUCER, ECC, BW CSA Z245.11 GR 359 CAT 1 NPS 24X20, XS, D4	Canadoil Asia Ltd.
148448	REDUCER, ECC., BW CSA Z245.11 GR 448 CAT 1, NPS 24X20, XS, E4	Canadoil Asia Ltd.
148697	REDUCER, CONCENTRIC, BW, CSA Z245.11 GR. 448 CAT.1, NPS 30X24, Sch 30/XS, E4	Canadoil Asia Ltd.
148696	REDUCER, CONCENTRIC, BW, CSA Z245.11 GR. 448 CAT.1, NPS 30X24, XS, D4	Canadoil Asia Ltd.
148699	REDUCER, ECCENTRIC, BW, CSA Z245.11 GR. 448 CAT.1, NPS 30X24, Sch 30/XS, E4	Canadoil Asia Ltd.
148698	REDUCER, ECCENTRIC, BW, CSA Z245.11 GR. 448 CAT.1, NPS 30X24, XS, D4	Canadoil Asia Ltd. / Canadoil Forge

Commodity:	Tees
Vendor:	MCJUNKIN REDMAN CORP
PO Number:	25350-200-POC-PB02-S0002

Stock Code	Description	End Manufacturer
148711	TEE, REDUCING, BW, CSA Z245.11 GR 448 CAT 1, NPS 30 X 20, XS, D4	Canadoil Asia Ltd.
148690	TEE, STR, BW, CSA Z245.11 GR. 448 CAT.1, NPS 30, XS, D4	Canadoil Asia Ltd.
148691	TEE, STR, BW, CSA Z245.11 GR. 448 CAT.1, NPS 30, SCH 30, E4	Canadoil Asia Ltd.

Commodity:	Flanges
Vendor:	CE Franklin Ltd
PO Number:	25350-200-POA-PB02-S0003

Stock Code	Description	End Manufacturer
148351	RFWN, CSA Z245.12 GR 290 CAT 1, XS BORE NPS 20, PN100, D4	Wilhelm Geldbach Industrie / DL Flange
148352	RFWN CSA Z245.12 GR 359 CAT 1, XS BORE NPS 20, PN150, E4	Wilhelm Geldbach Industrie / Genoyer
148353	RFWN, CSA Z245.12 GR 359 CAT 1, XS BORE NPS 24, PN100 D4	Wilhelm Geldbach Industrie / Genoyer
148354	RFWN, CSA Z245.12 GR 448 CAT 1, XS BORE NPS 24, PN150, E4	Wilhelm Geldbach Industrie
148355	RFWN, CSA Z245.12 GR 448 CAT 1, XS BORE NPS 30, PN100 D4	Tri-Lad Flange and Fitting / Wilhelm Geldbach Industries
148356	RFWN, CSA Z245.12 GR 448 CAT 1, SCH 30 BORE NPS 30, PN150 E4	Wilhelm Geldbach Industrie

Summary Table of Pipe Manufacturers – Larger Than NPS 6
TransCanada Keystone Pipeline
Phase I Addendum, Pump Additions, Haskett PS

Commodity:	Large Bore Pipe
Vendor:	Apex Distribution
PO Number:	NA

Heat Code	Description	End Manufacturer
SP69595	NPS 20, Pipe ERW, CSA z245.1 GR 359 CAT 1, 12.7mm W.T. E4	Hyundai Hysco