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Le 15 août 2014

Fichier électronique

Office national de l'énergie
517, 10^e Avenue S.-O.
Calgary (Alberta) T2R 0A8

À l'attention de : **Madame Sheri Young, Secrétaire de l'Office**

Objet : Enbridge Pipelines Inc. (« Enbridge »)
Projet d'inversion de la canalisation 9B et d'accroissement de la capacité de la canalisation 9
Ordonnance XO-E101-003-2014 de l'ONÉ (l'« Ordonnance »)
Dossier n° OF-Fac-Oil-E101-2012-10 02
Demande d'autorisation de mise en service n° 3

Madame,

Enbridge soumet respectueusement par la présente une demande d'autorisation de mise en service partielle pour le projet d'inversion de la canalisation 9B et d'accroissement de la capacité de la canalisation 9 à l'Office national de l'énergie (ONÉ) dans le cadre de la portée de Sarnia « C » au terminal de Sarnia (« Demande »). La canalisation 9A est une canalisation en exploitation desservant actuellement des clients et, il est impératif qu'Enbridge termine l'installation de l'équipement et les activités de démarrage durant les arrêts planifiés. Dans le cadre de la demande, l'arrêt est prévu le 3 septembre 2014.

Enbridge présentera une série de demandes d'autorisation de mise en service pour l'équipement aux installations du Projet; la demande finale mettra le projet en service. Toutes les demandes précédant la demande d'autorisation de mise en service finale ne concernent que des connexions électriques critiques et des travaux minimes de raccordement de la canalisation devant être finalisés avant la demande finale, afin d'assurer la coordination des arrêts planifiés et de réduire au minimum l'interruption de service. Enbridge s'engage pleinement à respecter toutes les conditions de l'Ordonnance et n'inversera pas le sens de l'écoulement de la canalisation 9 avant d'avoir reçu toutes les approbations relatives aux autorisations de mise en service.

Si l'Office souhaite discuter davantage de cette question, n'hésitez pas à communiquer avec moi au 587-233-6356 ou par courriel à l'adresse prabhat.chaturvedi@enbridge.com ou avec Margery Fowke au 403-266-7907 ou par courriel à l'adresse margery.fowke@enbridge.com.

Veuillez recevoir, Madame, mes salutations distinguées.

A handwritten signature in purple ink, appearing to read 'Prabhat', with a horizontal line underneath.

Prabhat Chaturvedi, ing.
Spécialiste en réglementation
CLP, Affaires juridiques et réglementaires

p. j. Demande d'autorisation de mise en service partielle n° 3



Pipelines Enbridge inc.

**Demande d'ordonnance en vertu de
l'article 47 de la *Loi sur l'Office national de l'énergie*
pour obtenir l'autorisation de mise en service des
installations approuvées
en vertu de l'ordonnance XO-E101-003-2014 de l'ONÉ**

**Projet : Inversion de la canalisation 9B et accroissement de
la capacité de la canalisation 9**

**Demande d'autorisation de mise en service
partielle n° 3
(Sarnia « C »)**

15 août 2014

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1.0 APERÇU DU PROJET

Le 29 novembre 2012, Pipelines Enbridge Inc. (« Enbridge ») a présenté à l'Office national de l'énergie (« ONÉ » ou « Office ») une demande d'autorisation de construction et d'exploitation pour le projet d'inversion de la canalisation 9B et d'accroissement de la capacité de la canalisation 9 (le « Projet ») entre Sarnia, en Ontario et Montréal, au Québec.

Le Projet comprend les ajouts et les modifications nécessaires à l'infrastructure pour accroître la capacité annuelle de la canalisation 9 de 240 000 barils par jour (« bpj ») à 300 000 bpj et inverser le flux du tronçon de pipeline compris entre le poste de North Westover et le terminal de Montréal. Toutes les activités de construction auront lieu aux six installations d'Enbridge existantes : Terminal de Sarnia, poste de North Westover, poste de Hilton, poste de Cardinal, poste de Terrebonne et terminal de Montréal

Conformément à l'approbation reçue de l'Office, l'ordonnance XO-E101-003-2014 de l'ONÉ exigeait une demande d'autorisation de mise en service pour les installations dans le cadre du projet. Cette demande d'autorisation de mise en service partielle comprend une trousse d'autorisation de mise en service, tel que défini dans l'article 1.1 de Sarnia « C ». La rubrique T du Guide de dépôt de l'ONÉ est présentée à l'Annexe n° 1 de cette demande.

1.1 PORTÉE DES TRAVAUX

La portée des travaux dans le cadre de cette demande d'autorisation de mise en service partielle comprend les travaux suivants au **terminal de Sarnia** :

1. Installation de quatre (4) nouvelles vannes à triple excentration de 24 po dans l'aire du collecteur 204 existant.
2. Installation d'une extension au collecteur de la canalisation principale 9 et installation d'un clapet de non-retour à battant de 30 po, qui facilitera le raccordement d'une nouvelle pompe de canalisation principale lors d'un prochain jaugeage par le creux.
3. Installation de deux (2) nouveaux robinets-vannes à guillotine de 14 po et deux (2) nouveaux robinets-vannes à guillotine de 16 po pour faciliter l'isolation des nouvelles pompes de surcompression qui seront installées à une date ultérieure.

L'énoncé des travaux ci-dessus est présenté dans les dessins du plan d'aménagement du projet de l'Annexe no 2. Tous les travaux de tuyauterie et d'électricité seront terminés et feront l'objet d'essais avant la date de raccordement prévue. L'arrêt prévu aux fins des travaux est le 3 septembre 2014, et la tuyauterie

des postes sera isolée avant l'arrêt et drainée avant le raccordement.

Les neuf nouvelles vannes ont toutes été mises à l'essai dans les ateliers des fournisseurs tel que décrit dans le tableau 3.3-1. Les vannes ont fait l'objet d'essais ultrasoniques (« EU ») et d'essais hydrostatiques. La conduite a été mise à l'essai avec succès, comme indiqué dans le tableau 3.4-1.

Un examen des particules magnétiques, un examen radiographique et des tests hydrostatiques ont été effectués sur les tronçons de canalisations. Des EU et des essais hydrostatiques seront effectués sur les vannes conformément aux exigences d'Enbridge, supérieures aux codes applicables de l'industrie. De plus, les soudures ont été inspectées visuellement et de manière non destructive conformément à la norme CSA Z662-11. Enbridge confirme que la circonférence totale de chaque joint de soudure a fait l'objet d'une inspection radiographique conformément à l'article 17 du *Règlement sur les pipelines terrestres de l'Office national de l'énergie*.

2.0 NORMES ET CARACTÉRISTIQUES TECHNIQUES

La partie suivante est un résumé général des règlements, des normes, des codes, des caractéristiques techniques et des procédures référencés dans la conception et la sélection des matériaux. Ils seront également suivis durant la construction, l'inspection, les essais et la mise en service du Projet.

- 1) *Règlement sur les pipelines terrestres de l'Office national de l'énergie*
- 2) Association canadienne de normalisation, Réseaux de canalisations de pétrole et de gaz (« norme CSA Z662 -11 »)
- 3) Normes techniques d'Enbridge
- 4) Spécification d'Enbridge relative au manuel de construction des installations
- 5) American Society of Mechanical Engineers (« ASME ») Section IX – Qualification de soudage
- 6) ASME section VIII – Construction des composants sous pression
- 7) ASME Section V – Examen non destructif
- 8) ASME B31.3 – matériaux et composants, conception, fabrication, assemblage, érection, examen, inspection et mise à l'essai des conduites
- 9) API 598 – Inspection et mise à l'essai des vannes
- 10) API 609 – Conception de vanne papillon
- 11) Norme API 594 – Conception de clapets de non-retour
- 12) Norme API 600 – Conception de vannes en acier

Un inspecteur d'Enbridge sera sur place durant l'installation de l'assemblage afin d'assurer le respect des règlements, des normes, des codes, des caractéristiques techniques et des procédures. L'inspecteur mènera une vérification de la qualité détaillée et signera sur les lieux de l'installation avant la mise en service.

3.0 DESCRIPTION DES INSTALLATIONS SOUMISES À UN ESSAI DE PRESSION

3.1 Pression de service maximale

La pression de service maximale (PMS) autorisée pour les vannes à triple excentration est de 1 896 kPa (275 psi). La PMS approuvée pour le clapet de non-retour à battant et la tuyauterie qui seront installés au terminal de Sarnia est de 9 930 kPa (1 440 psi). La PMS approuvée pour les quatre (4) robinets-vannes à guillotine est de 4 960 kPa (720 psi).

3.2 Emplacement

La portée des travaux liés aux essais hydrostatiques correspond au terminal de Sarnia d'Enbridge. Reportez-vous à l'annexe 3 pour voir une carte aérienne du site.

3.3 Sommaire des essais sur l'équipement

Tout l'équipement du terminal de Sarnia a été soumis à un essai de pression et a satisfait aux exigences de mise à l'essai internes d'Enbridge, supérieures aux normes applicables de l'industrie.

Tableau 3.3-1 Sommaire des essais des nouveaux équipements du terminal de Sarnia

N°	Équipement	Numéro d'étiquette	Taille	Pression nominale (psi)	Renseignements sur l'essai		Fabricant
					Type d'essai	Résultat	
1	Vannes à triple excentration	204- V-322	610 mm (NPS 24)	450	Essai hydrostatique	Réussi	Zwick
2	Vannes à triple excentration	204- V-242	610 mm (NPS 24)	450	Essai hydrostatique	Réussi	Zwick
3	Vannes à triple excentration	204- V-232	610 mm (NPS 24)	450	Essai hydrostatique	Réussi	Zwick
4	Vannes à triple excentration	204- V-222	610 mm (NPS 24)	450	Essai hydrostatique	Réussi	Zwick
5	Clapet de non-retour à battant	9- UCV-31	762 mm (NPS 30)	2250	Essai hydrostatique	Réussi	Cameron
6	Robinet-vanne à guillotine	203- BDV-311	356 mm (NPS 14)	1200	Essai hydrostatique	Réussi	SPX
7	Robinet-vanne à guillotine	203- BDV-321	356 mm (NPS 14)	1200	Essai hydrostatique	Réussi	SPX

N°	Équipement	Numéro d'étiquette	Taille	Pression nominale	Renseignements sur l'essai		Fabricant
8	Robinet-vanne à guillotine	203- BSV-311	406 mm (NPS 16)	1200	Essai hydrostatique	Réussi	SPX
9	Robinet-vanne à guillotine	203- BSV-321	406 mm (NPS 16)	1200	Essais hydrostatique	Réussi	SPX

Veillez consulter l'annexe no 4 pour les dessins isométriques montrant l'emplacement de l'installation de ces vannes au terminal de Sarnia. La trousse de documentation sur les essais se trouve à l'annexe no 5.

3.4 Sommaire des essais sur la tuyauterie au terminal de Sarnia

Toute la tuyauterie du terminal de Sarnia a été soumise a un essai DE pression et a satisfait aux exigences de mise à l'essai internes d'Enbridge, lesquelles sont plus élevées que les normes de l'industrie qui s'appliquent.

Tableau 3.4-1 Sommaire des essais sur la tuyauterie

Série d'essais	PMS (kPa)	Taille	Épaisseur des parois (mm)	Qualité	Longueur de tuyau (mm)	Type	Fabricant	Renseignements sur les essais	
								Type d'essai	Résultat
1	9930	(NPS 30)	15,90	448	10 679	LSAW	SeAH Steel Corp	Hydrostatique	Réussi

Veillez consulter l'annexe no 4 pour les dessins isométriques. La faible élévation au terminal de Sarnia n'a aucun impact important sur la pression des fluides.

3.4.1 Série d'essais 1

L'essai hydrostatique des tronçons de canalisation du terminal de Sarnia (illustré dans l'annexe no 4) (PMS de 1 895 kPa/275 psi) compris dans la série d'essais 1 a été réalisé avec de l'eau et réussi le 2 août 2014. Les essais ont été observés par l'inspecteur Peter Miller d'Enbridge le 2 août 2014. L'inspecteur Adam Morrison d'Enbridge a vérifié et approuvé les résultats le 5 août 2014.

La tuyauterie mise à l'essai dans cette série était exposée et accessible au moment de la mise à l'essai.

Tableau 3.4-2 Série d'essais 1 – Sommaire des essais hydrostatique

Date de l'essai	2 août 2014
Liquide d'essai	Eau traitée
Emplacement de l'essai	Atelier de Lamsar
Pression d'essai ciblée	2 200 psi

Pression d'essai réelle initiale	2 220,4 psi
Pression d'essai réelle finale	2 220,8 psi
Durée de l'essai	1,33 heure (durée requise de 1,25 heure)
Températures d'essai réelles initiales et finales	72,5 °F/22,5 °C (initiale), 73,4 °F/23 °C (finale)
Résultat	Réussi

Une fois l'essai de résistance effectué, la tuyauterie a été vérifiée visuellement pour des fuites d'eau pendant l'essai d'étanchéité alors que la pression était entre 1 685,9 psi et 1 886,5 psi.

Le rapport de l'essai de pression, le tableau de l'essai et les certificats d'étalonnage signés se trouvent à l'annexe no 6.

4.0 PERMIS D'EAU AUX FINS DES ESSAIS DE PRESSION

Aucun permis d'eau n'était requis pour les essais hydrostatiques.

5.0 DÉCLARATION DU GESTIONNAIRE DE PROJET

Je, Larry Smerechinski, affirme que :

Je suis le gestionnaire principal, conception des installations, employé par Enbridge Pipelines inc., et je suis responsable des points touchant la conception du Projet d'inversion de la canalisation 9B et d'accroissement de la capacité de la canalisation 9. J'ai évalué et vérifié les aspects techniques de la demande. Ainsi, j'ai une connaissance directe des faits et des points stipulés dans la présente demande et je confirme que les énoncés suivants sont exacts.

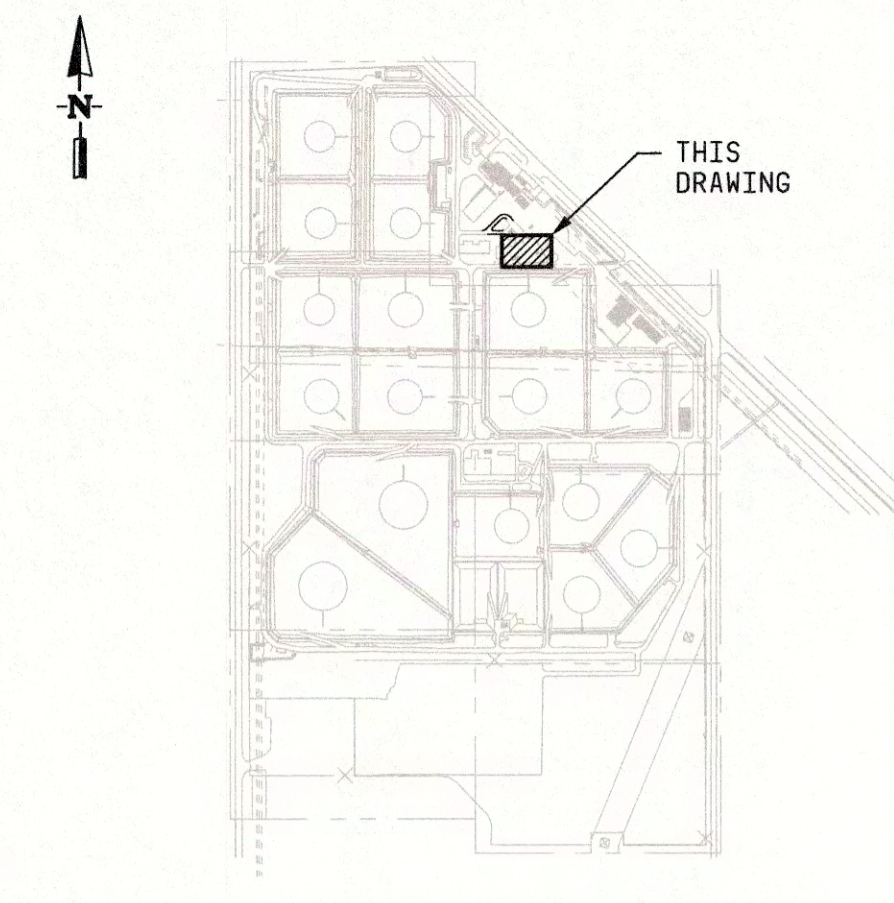
- a) La vérification par ultrason et les essais hydrostatiques de la canalisation 9B du terminal de Sarnia, les vannes du collecteur 204, les robinets-vannes à guillotine, le clapet de non-retour à battant et l'extension du collecteur ont été réussis sous la supervision immédiate d'un représentant du maître d'œuvre.
- b) Tous les enregistrements, tableaux des essais, etc. sont signés et datés par un représentant de la compagnie.
- c) Aucun permis d'eau n'était requis pour les essais.
- d) Tous les dispositifs de commande et de sécurité associés aux vannes seront inspectés et mis à l'essai pour vérifier la fonctionnalité avant d'être mis en service.
- e) La pression d'essai n'a été inférieure à 97,5 % de la pression d'essai de résistance minimale pour aucun essai de pression.
- f) Les versions les plus récentes de tous les codes applicables à l'industrie ont été appliquées, notamment, sans s'y limiter, la norme CSA Z662-11 et le *Règlement sur les pipelines terrestres de l'Office national de l'énergie*.

15 août 2014

Larry Smerechinski
Gestionnaire principal, Conception des installations

Date

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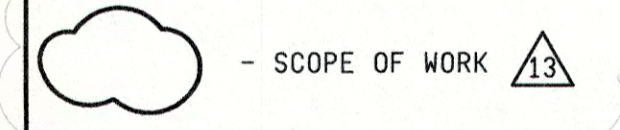


LOCATION PLAN

NOTES:

- DIMENSIONS ARE IN MILLIMETRES, UNLESS NOTED OTHERWISE.
- FIELD TO VERIFY ALL DIMENSIONS, ELEVATIONS AND COORDINATES PRIOR TO FABRICATION.
- TAPER IN ACCORDANCE WITH CSA Z662-07 FIG 7.2.
- ALTERNATIVE TRANSITION (COUNTER BORE AND TAPER) TO BE DETERMINED BY FABRICATOR.
- RELOCATED AND REUSED 30"-300# WAFER CHECK VALVE.
- ABOVE GROUND PIPING TO BE EXTERNALLY COATED IN ACCORDANCE WITH ENBRIDGE SPECIFICATION P-210.
- UNDERGROUND PIPING TO BE EXTERNALLY COATED IN ACCORDANCE WITH ENBRIDGE SPECIFICATION C-110.
- ALL DRAIN PIPING TO BE INTERNALLY COATED WITH "SCOTCHKOTE 134".
- ALL DRAIN PIPING TO BE ELECTRICALLY TRACED AND INSULATED PER ABOVE GROUND AND UNDERGROUND APPLICABLE ENBRIDGE STANDARDS.
- BURIED PIPING REFER TO STD. D06-102-2011 SEC. 4.8.2.
- CONTRACTOR TO PROVIDE SEAL AND WRAP ALL BURIED FLANGES IN ACCORDANCE WITH ENBRIDGE SPECIFICATION C-420 BY APPLYING DENSOTAPE AS PER MANUFACTURER'S SEALING AND WRAPPING PROCEDURE.
- FOR SPACER RING AND DOUBLE FACED BLIND FLANGE, SEE TYP. DESIGN DETAIL M29C/D-3.8-24831--190LIS.

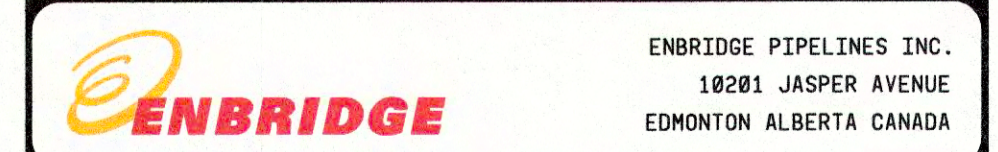
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M108/D-3.3-63543--190LIS PLAN AND SECTION
M109/D-3.2-63544--190LIS SECTIONS 7 AND 8
REFERENCE DRAWINGS

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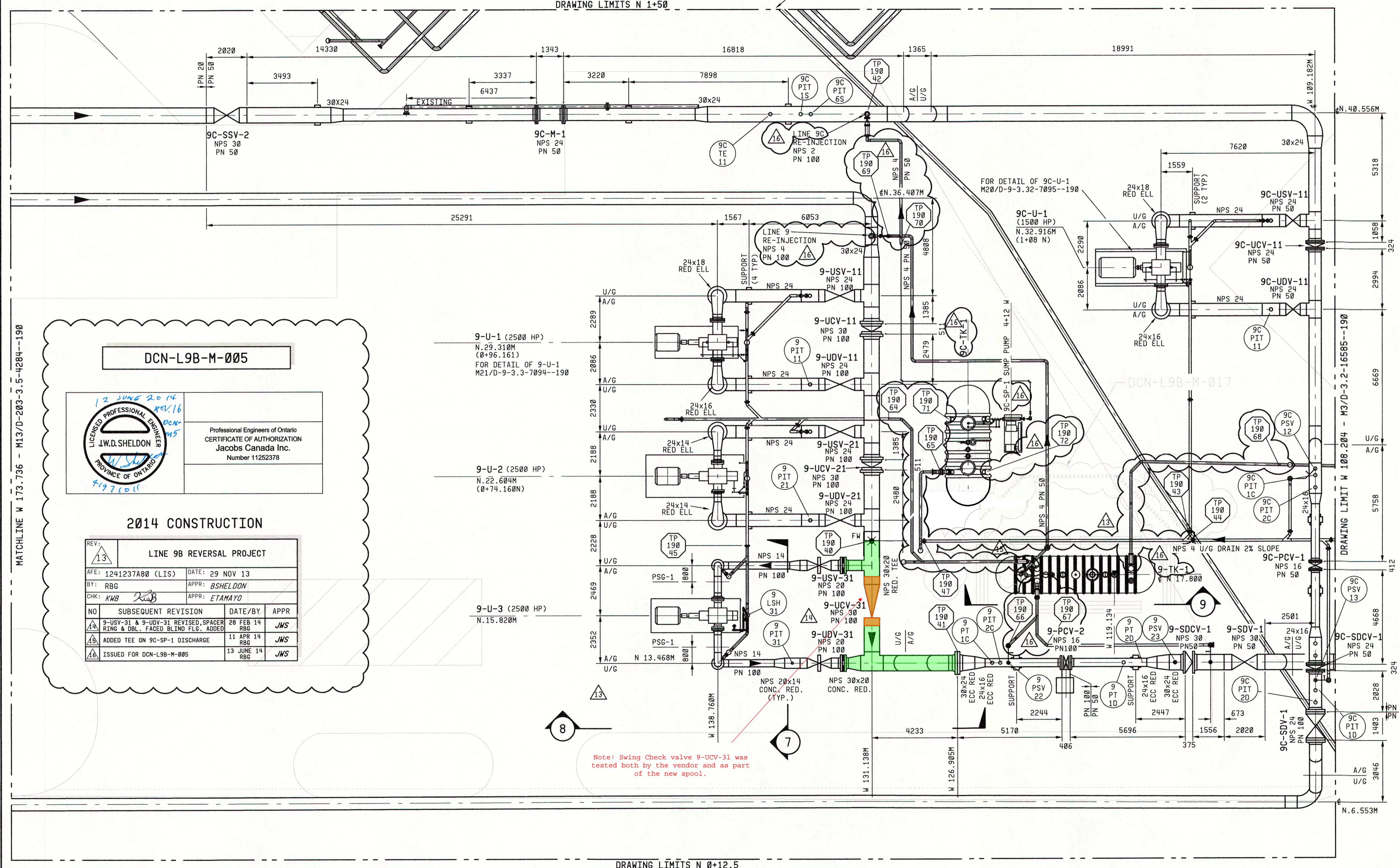
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SARNIA (ON) TERMINAL
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Project Layout

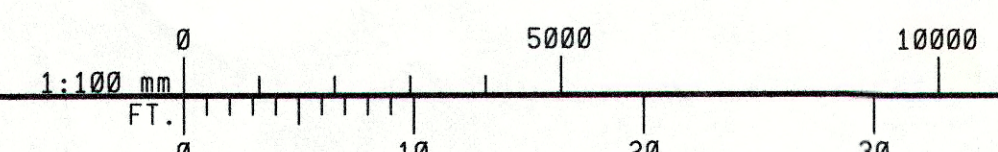
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Note: Swing Check valve 9-UCV-31 was tested both by the vendor and as part of the new spool.

- Sarnia "C" Scope of Work - Piping Test Package 1
- Sarnia "C" Scope of Work - New Equipment



MATCHLINE W 173.736 - M13/D-203-3.5-4284--190

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31 DECEMBER 20 14

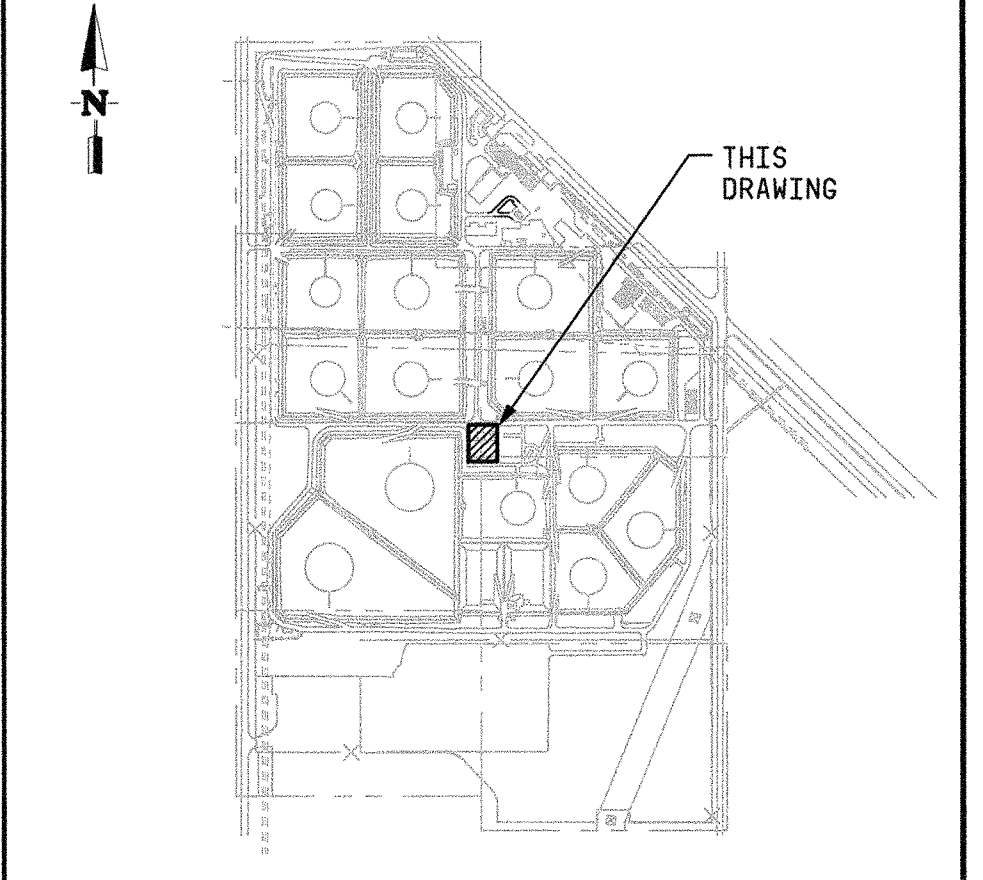
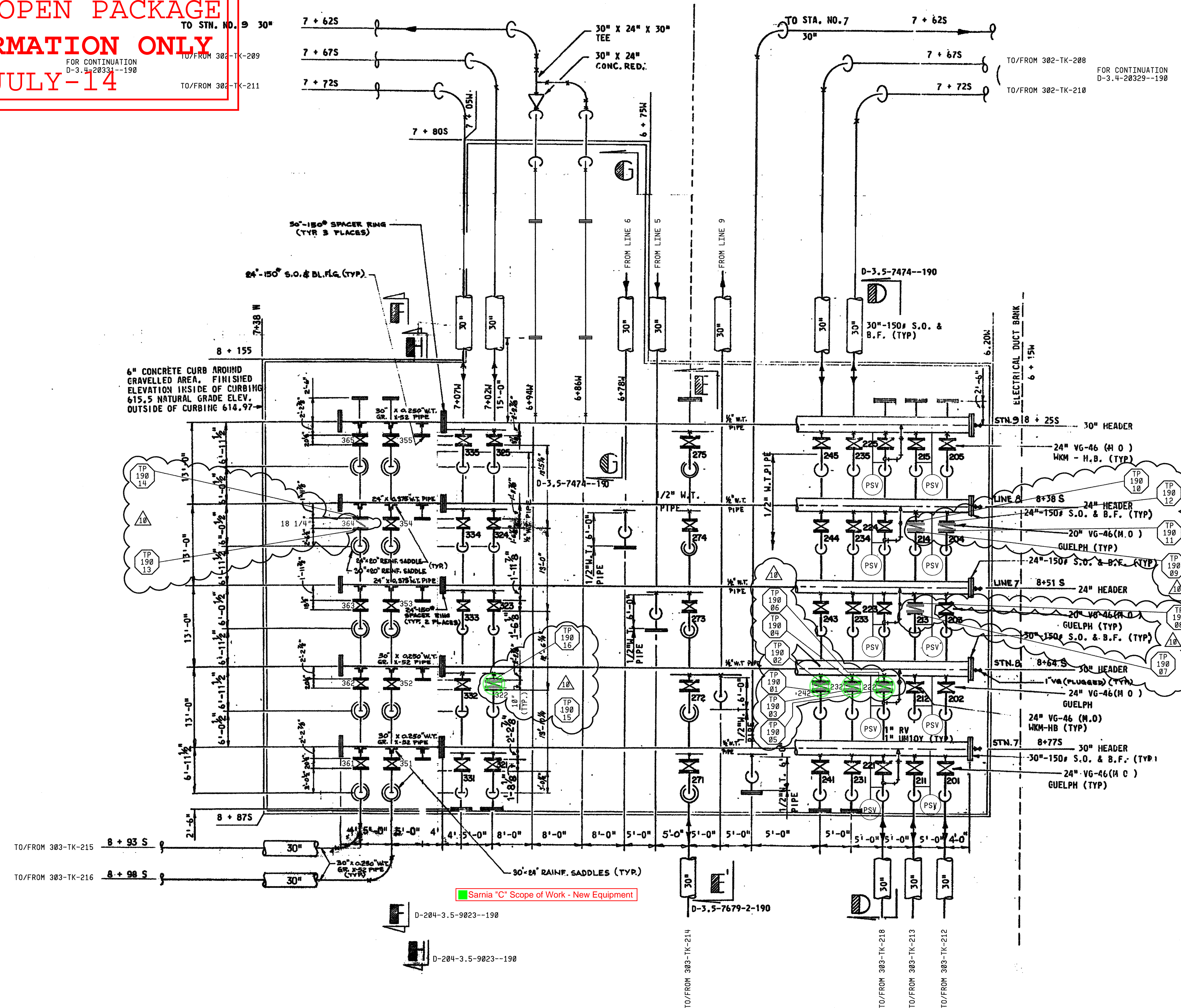
Professional Engineers of Ontario
CERTIFICATE OF AUTHORIZATION
Jacobs Canada Inc.
Number 11252378

2014 CONSTRUCTION

REV	DESCRIPTION	DATE	BY	APPR
1	LINE 9B REVERSAL PROJECT			
1	AFE: 1241237A00 (LIS) DATE: 29 NOV 13		RBG	BSHELDON
2	CHK: KWB DATE: 11 APR 14		RBG	ETAMAYO
3	NO			
4	9-USV-31 & 9-UDV-31 REVISED, SPACER RING & DBL. FACED BLIND FLG. ADDED	28 FEB 14	RBG	JWS
5	ADDED TEE ON 9C-SP-1 DISCHARGE	11 APR 14	RBG	JWS
6	ISSUED FOR DCN-L9B-M-005	13 JUNE 14	RBG	JWS

ACAD2014:1cal 2013v2 GALLIFER

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 13-JULY-14



LOCATION PLAN

NOTE:
1. ALL VALVES ARE PREFIXED BY 204-V- UNLESS NOTED OTHERWISE.

LEGEND:

☁️ - SCOPE OF WORK 10

15 NOV 2013 REV. 10

Professional Engineers of Ontario
CERTIFICATE OF AUTHORIZATION
Jacobs Canada Inc.
Number 11252378

2014 CONSTRUCTION

REV: 10	LINE 9B REVERSAL PROJECT
AFE: 1241237A80 (LIS)	DATE: 29 NOV 13
BY: RBG	APPR: BSHELDON
CHK: KWB	APPR: ETAMAYO
NO	SUBSEQUENT REVISION
	DATE/BY
	APPR

E34/D-204-4.013-28962--190 LIS P & ID
E35/D-204-4.013-28964--190 LIS P & ID

REFERENCE DRAWINGS

SCANNED DRAWING

9	REVISED AS-BUILT AS PER FIELD VERIFICATION PROJECT	06 SEP 12	JPF
8	SCANNED AND FTMS REVISIONS	11/01/2001	KES
NO	REVISION	DATE/BY	APPROVE

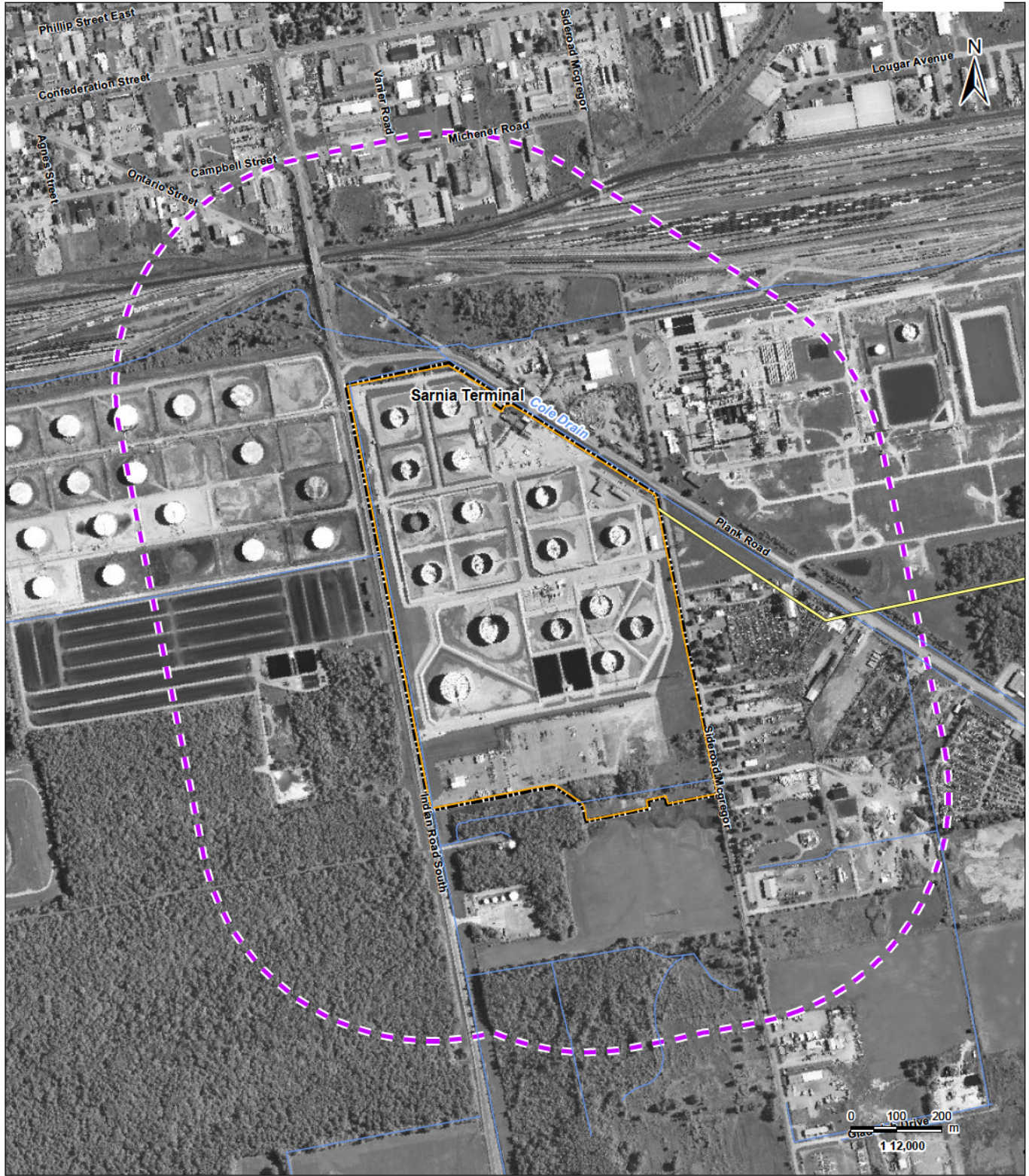
ENBRIDGE

ENBRIDGE PIPELINES INC.
10201 JASPER AVENUE
EDMONTON ALBERTA CANADA

**SARNIA (ON) TERMINAL
SOUTH NO.2 MANIFOLD 204
Project Layout**

DRAWN	MG	CHECK	RFP	APPROVE	HCFROST
DATE	15 JUL 74	SCALE	1/8"-1'0"	APPROVE	CHBUCKLEE
D-204-3.5-7469-10-190 LIS					M15

ACAD2018:1ca1 2013v2 TMMOT



V:\01609\Active\160950468\planning\drawing\WCD\ESEIA_Figures_20120807\160950468_ESEIA_Fig4-1_Sarnia.mxd
 Revised: 2012-11-26 By: searles

November 2012
 160950468



Legend

- - - Local Assessment Area
- Approximate Enbridge Centerline
- Watercourse
- Facility property line; Maximum possible extent of PDA
- Property Boundary

Notes

1. Coordinate System: Canada Lambert Conformal Conic
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2012.
3. Orthoimagery © Enbridge, 2006.

Client/Project

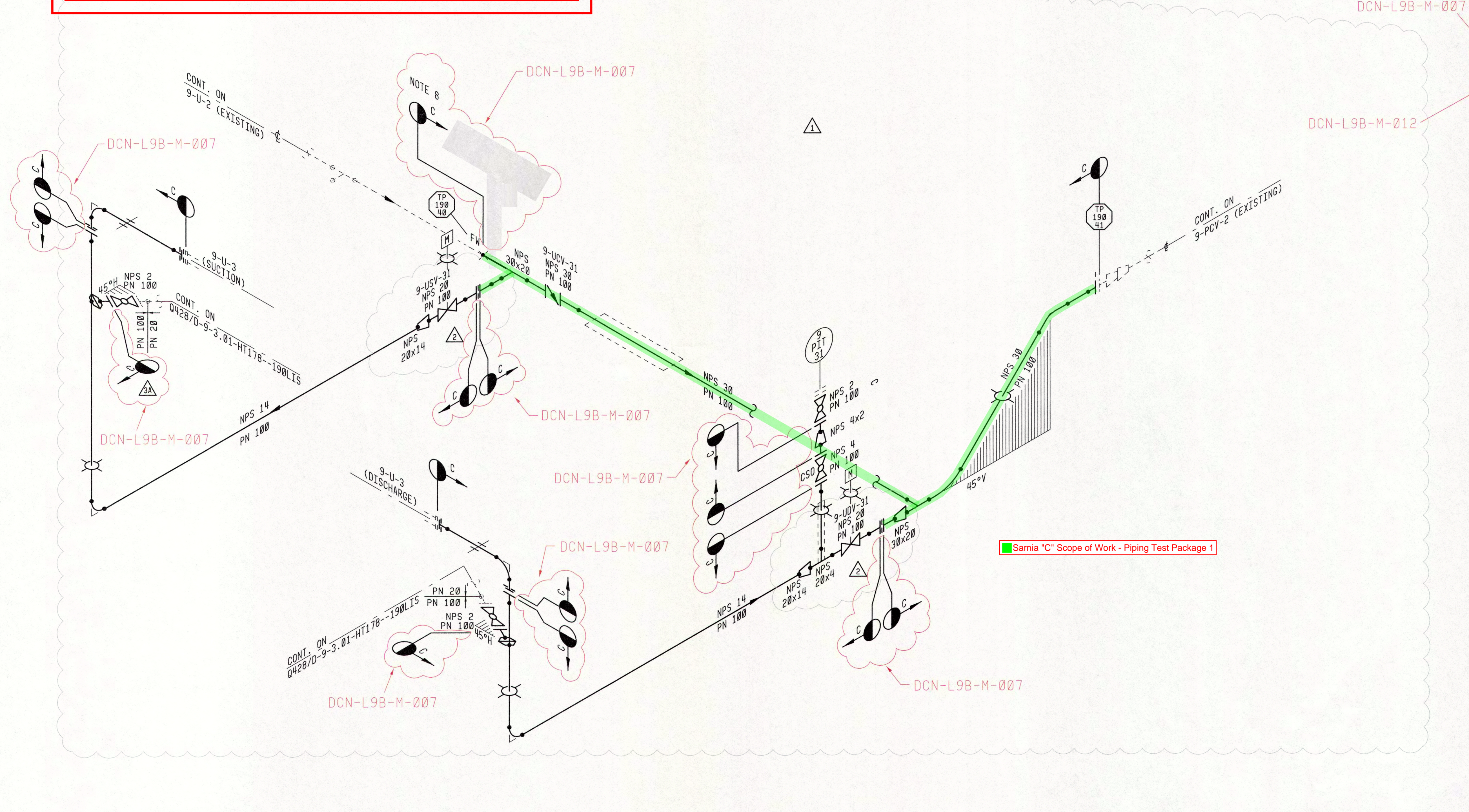
Enbridge Pipelines Inc.
 Line 9B Reversal

Figure No.
 4-1

Title

Aerial Map - Sarnia Terminal

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03-AUGUST-14**



- NOTES:**
- HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
 - INDICATES LIMITS OF HYDROTEST.
 - DO NOT HYDROTEST THROUGH RELIEF VALVES, CONTROL VALVES, INSTRUMENTATION AND EQUIPMENT.
 - LIQUID FILL & PRESSURING FOR HYDROTESTING THROUGH CHECK VALVES MUST BE DONE FROM THE UPSTREAM SIDE OF THE CHECK VALVE.
 - ALL psi AND kPa VALUES TO BE CHECKED BY AN ENGINEER BASED ON PROJECT REQUIREMENTS.
 - APPROXIMATE FILL VOLUME TO BE CALCULATED BY CONTRACTOR.
 - ALL HYDROTEST MATERIALS TO BE SUPPLIED BY CONTRACTOR.
 - (TIE-IN PORTION)
100% X-RAY IF CARBER TOOL IS NOT PRACTICAL. THE CONNECTION WILL BE CONSIDERED AS A CLOSURE WELD. UPON APPROVAL FROM ENBRIDGE.

DCN-L9B-M-012

DCN-L9B-M-007

30 MAY 2014
2014-117
L.W.D. SHELTON
PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO
419.7.1011

Professional Engineers of Ontario
CERTIFICATE OF AUTHORIZATION
Jacobs Canada Inc.
Number 11252378

2014 CONSTRUCTION

REV:	1	LINE 9B REVERSAL PROJECT	
AFE:	1241237A00 (LIS)	DATE:	29 NOV 13
BY:	GC	APPR:	BSHELDON
CHK:	KNB	APPR:	ETAMAYO
NO	SUBSEQUENT REVISION	DATE/BY	APPR
1	DIMENSIONAL REVISION DUE TO ADDITION OF FLANGES & BOM REVISED	28 FEB 14 RBS	JWS

M75/D-9-3.01-38961--190LIS MATERIAL ID ISOMETRIC
REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE

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**SARNIA (ON) TERMINAL
LINE 9 MAINLINE PUMP AREA
9-U-3
HYDROTEST ISOMETRIC**

DRAWN	N.FONT	CHECK	R.WILLIAMS	APPROVE	S.BURKE
DATE	13 SEP 12	SCALE	NTS	APPROVE	A.JABER

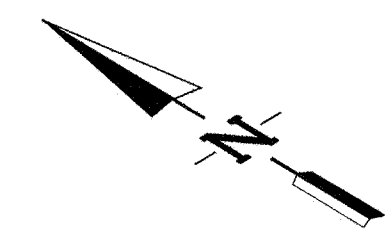
D-9-3.01-HT961-2-190LIS Q445

PRESSURE TEST DETAILS							
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.	TEST DURATION (HRS)
	C - C	2160 psi 14895 kPa	2246 psi 15491 kPa	1440 psi 9930 kPa	1584 psi 10923 kPa	----- m 3	ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST

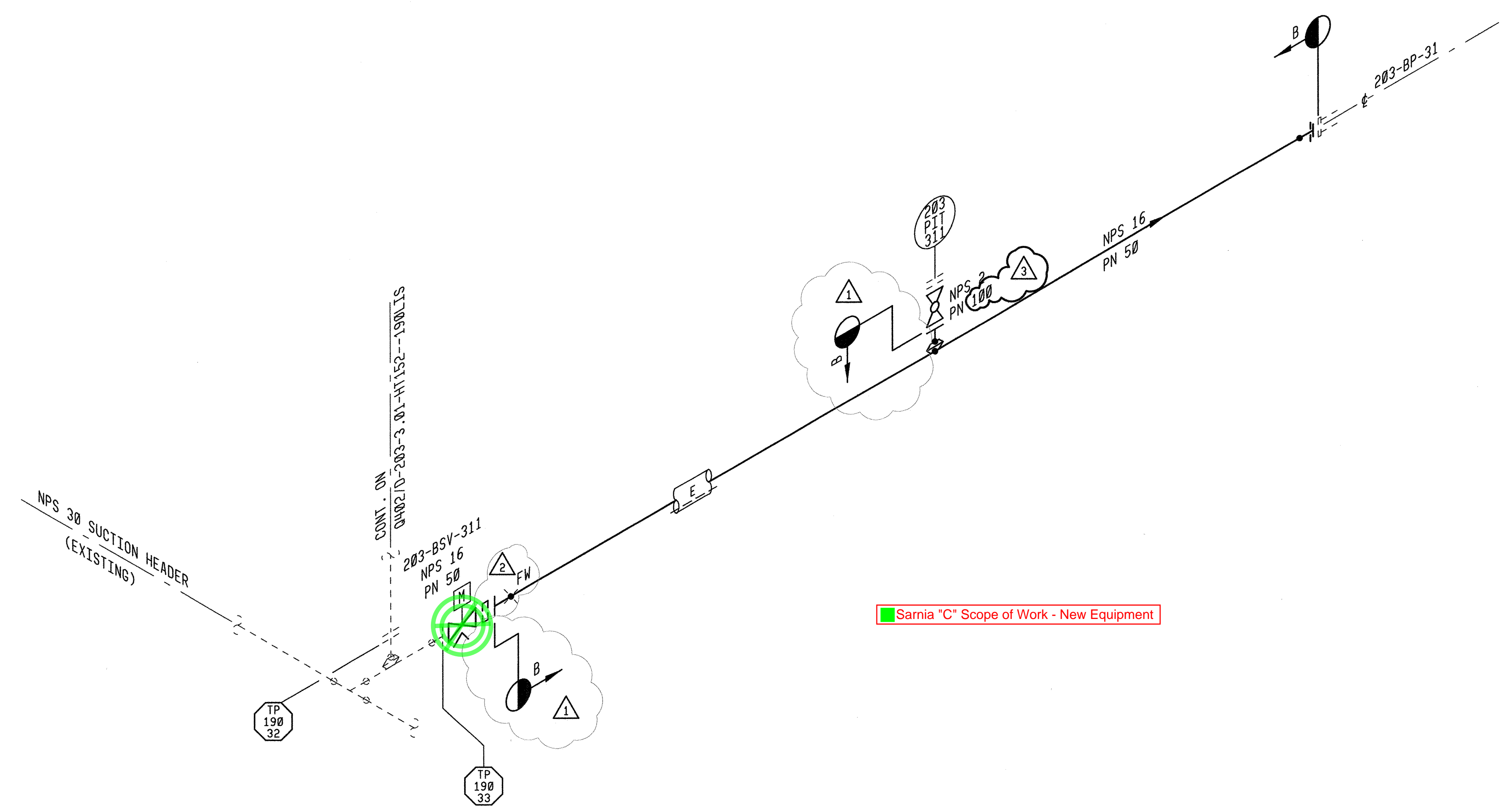
NOTE 8 ADDITION: CLOSURE WELD PROCEDURE
THE INTEGRITY OF THE WELD COULD BE BETTER REVEALED THROUGH A DRY MPI EXAMINATION, HALF WAY THROUGH THE FILL AND THEN THE FOLLOW UP CONTRAST MPI ON THE FINAL WELD. PROVIDE THE SERVICE TEST NITROGEN PRESSURE. THIS IS DUE TO VARIABLE MAIN LINE PRESSURES WITHIN THE PIPE. THE CONCERN IS THAT IF THE SERVICE TEST IS COMPLETED AT OPERATING PRESSURE OR DESIGN PRESSURE AND IF ENBRIDGE IS OPERATING AT A REDUCED PIPELINE PRESSURE WE MAY DEFORM THE MAINLINE PIPE. AT THE HOT TAP LOCATION A UT THICKNESS CHECK, CE AND LAMINATION CHECK WILL BE COMPLETED ON ALL HOT TAP LOCATIONS PRIOR TO WELDING.

AC020108-11cal 2013V2 GALLIER

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- NOTES:
1. HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
 2. INDICATES LIMITS OF HYDROTEST.
 3. DO NOT HYDROTEST THROUGH RELIEF VALVES, CONTROL VALVES, INSTRUMENTATION AND EQUIPMENT.
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 5. ALL psi AND kPa VALUES TO BE CHECKED BY AN ENGINEER BASED ON PROJECT REQUIREMENTS.
 6. APPROXIMATE FILL VOLUME TO BE CALCULATED BY CONTRACTOR.
 7. ALL HYDROTEST MATERIALS TO BE SUPPLIED BY CONTRACTOR.



Sarnia "C" Scope of Work - New Equipment

5 MAY 2014
KELB

Professional Engineers of Ontario
 CERTIFICATE OF AUTHORIZATION
JACOBS CANADA INC.
 Number 11252378

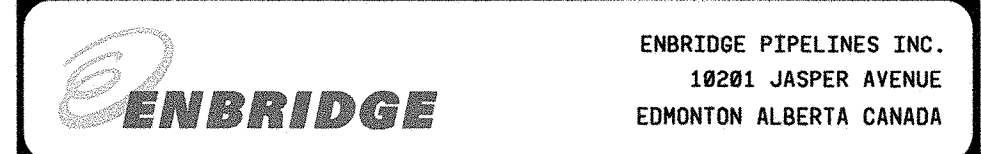
2014 CONSTRUCTION

REV:	LINE 9B REVERSAL PROJECT		
AFE: 1241237A80 (LIS)	DATE: 29 NOV 13		
BY:	APPR:		
CHK:	APPR:		
NO	SUBSEQUENT REVISION	DATE/BY	APPR
1	LIMITS OF HYDROTEST RELOCATED	28 FEB 14 RBB	JWS
2	ADDED DOUBLE FACED BLIND, SPACER RING	11 APR 14 TDT	JWS
3	REVISED PIT	09 MAY 14 JAD	JWS

M33/D-203-3.01-63153--190LIS MATERIAL ID ISOMETRIC
 REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE
----	----------	---------	---------

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ENBRIDGE PIPELINES INC.
 10201 JASPER AVENUE
 EDMONTON ALBERTA CANADA

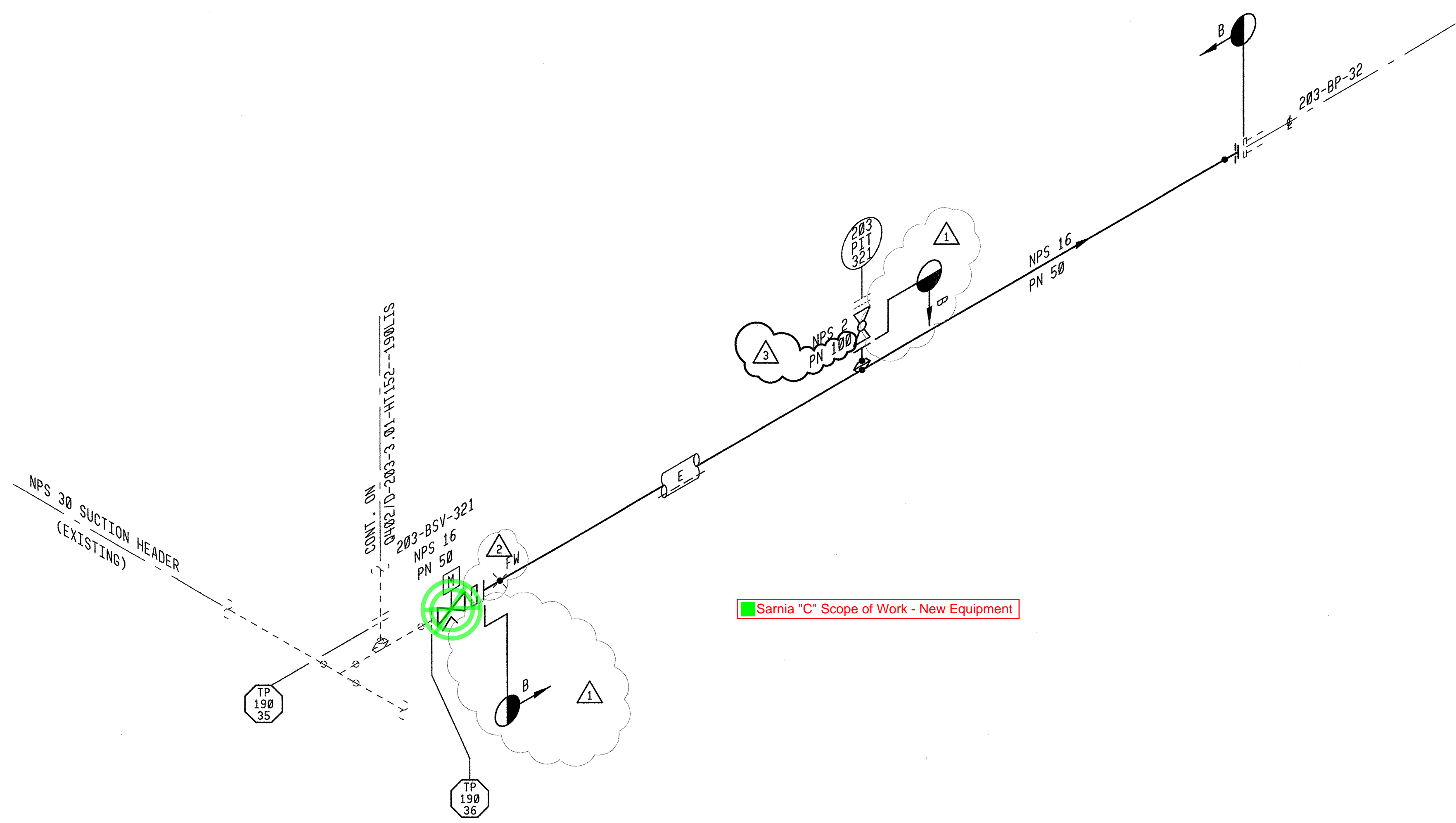
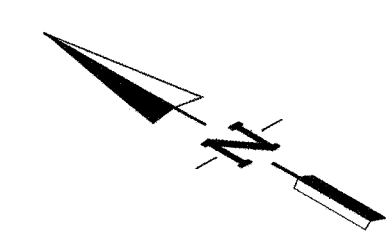
SARNIA (ON) TERMINAL
 BOOSTER PUMP 203-BP-31
 SUCTION LINE
 HYDROTEST ISOMETRIC

DRAWN GC	CHECK <i>KMB</i>	APPROVE <i>BSHELDON</i>	
DATE 07 JUL 13	SCALE NTS	APPROVE <i>ETAMAYO</i>	

D-203-3.01-HT153-3-190LIS Q403

PRESSURE TEST DETAILS						
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.
	B - B	1000 psi 7440 kPa	1123 psi 7738 kPa	720 psi 4960 kPa	792 psi 5456 kPa	----- m ³
ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST						

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Sarnia "C" Scope of Work - New Equipment

- NOTES:**
1. HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
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 5. ALL psi AND kPa VALUES TO BE CHECKED BY AN ENGINEER BASED ON PROJECT REQUIREMENTS.
 6. APPROXIMATE FILL VOLUME TO BE CALCULATED BY CONTRACTOR.
 7. ALL HYDROTEST MATERIALS TO BE SUPPLIED BY CONTRACTOR.

5 MAY 2014

41971011

Professional Engineers of Ontario
 CERTIFICATE OF AUTHORIZATION
 Jacobs Canada Inc.
 Number 11252378

2014 CONSTRUCTION			
REV.	DESCRIPTION	DATE	BY
0	LINE 9B REVERSAL PROJECT	29 NOV 13	
	AFE: 1241237A80 (LIS)	DATE: 29 NOV 13	
	BY:	APPR:	
	CHK:	APPR:	
NO	SUBSEQUENT REVISION	DATE/BY	APPR
1	LIMITS OF HYDROTEST RELOCATED	28 FEB 14 RGG	JWS
2	ADDED DOUBLE FACED BLIND, SPACER RING	11 APR 14 TDT	JWS
3	REVISED PIT	09 MAY 14 JAD	JWS

M34/D-203-3.01-63154--190LIS MATERIAL ID ISOMETRIC
 REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE



SARNIA (ON) TERMINAL
 BOOSTER PUMP 203-BP-32
 SUCTION LINE
 HYDROTEST ISOMETRIC

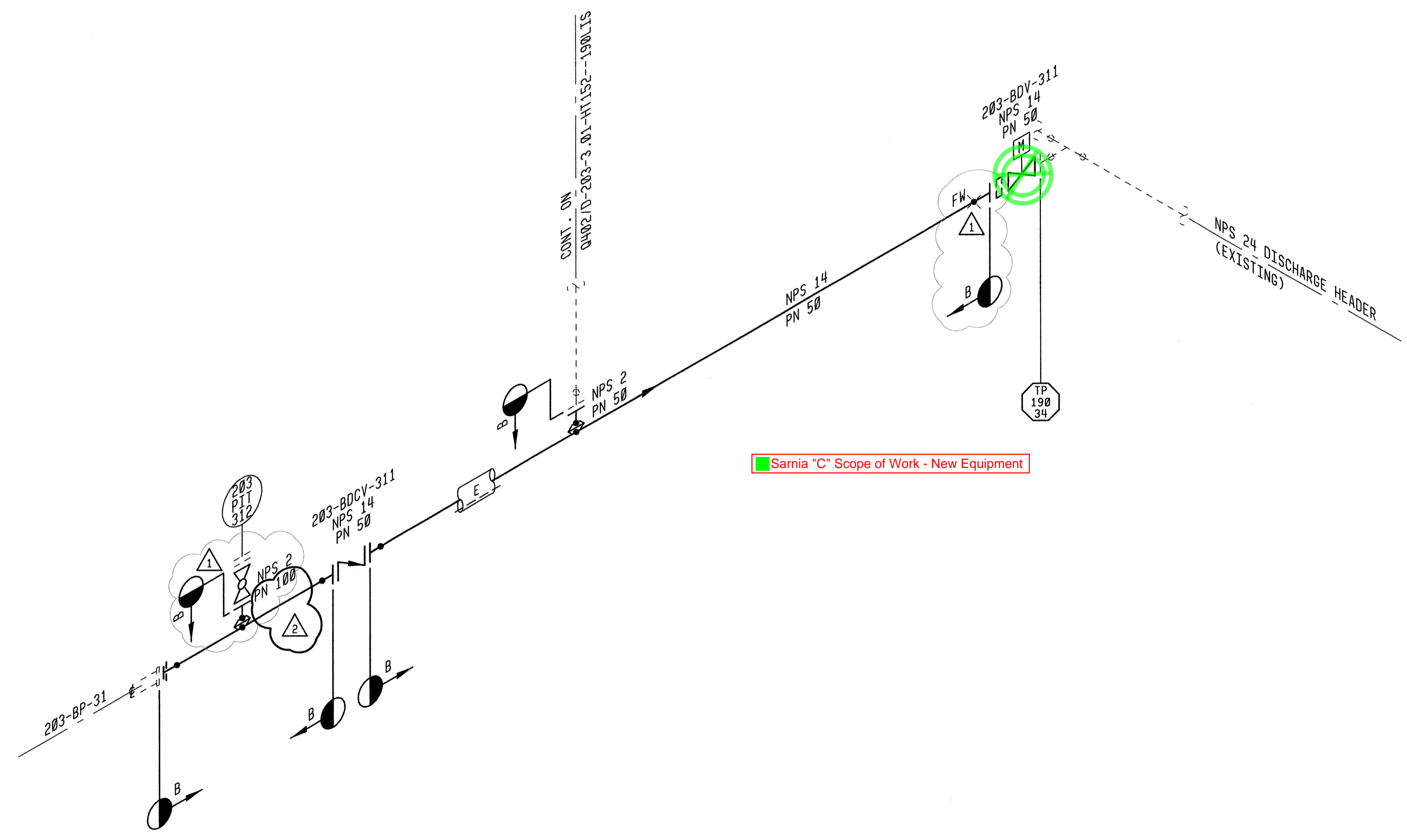
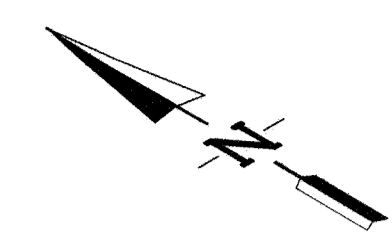
DRAWN GC	CHECK <i>KWB</i>	APPROVE <i>BHELDON</i>	
DATE 05 JUL 13	SCALE NTS	APPROVE <i>ETAMAYO</i>	

D-203-3.01-HT154-3-190LIS Q404

PRESSURE TEST DETAILS						
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.
	B - B	1000 psi 7440 kPa	1123 psi 7738 kPa	720 psi 4960 kPa	792 psi 5456 kPa	----- m ³
ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST						

C:\Users\jwsheldon\Documents\2014-05-20-13-01-01-154-190LIS.dwg 3/20/14 3:23:29 PM JWS - TM

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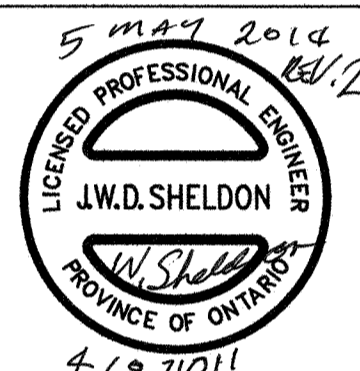


Sarnia "C" Scope of Work - New Equipment

NOTES:

1. HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
2. INDICATES LIMITS OF HYDROTEST.
3. DO NOT HYDROTEST THROUGH RELIEF VALVES, CONTROL VALVES, INSTRUMENTATION AND EQUIPMENT.
4. LIQUID FILL & PRESSURING FOR HYDROTESTING THROUGH CHECK VALVES MUST BE DONE FROM THE UPSTREAM SIDE OF THE CHECK VALVE.
5. ALL psi AND kPa VALUES TO BE CHECKED BY AN ENGINEER BASED ON PROJECT REQUIREMENTS.
6. APPROXIMATE FILL VOLUME TO BE CALCULATED BY CONTRACTOR.
7. ALL HYDROTEST MATERIALS TO BE SUPPLIED BY CONTRACTOR.

5 May 2014



4 19 11011

Professional Engineers of Ontario
 CERTIFICATE OF AUTHORIZATION
 Jacobs Canada Inc.
 Number 11252378

2014 CONSTRUCTION				
REV:	LINE 9B REVERSAL PROJECT			
AFE: 1241237A00 (LIS)	DATE: 29 NOV 13			
BY:	APPR:			
CHK:	APPR:			
NO	SUBSEQUENT REVISION	DATE/BY	APPR	
▲	ADDED DOUBLE FACED BLIND & SPACER RING	11 APR 14 TDT	JWS	
▲	REVISED PIT	09 MAY 14 TDT	JWS	

M35/D-203-3.01-63155--190LIS MATERIAL ID ISOMETRIC
 REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE

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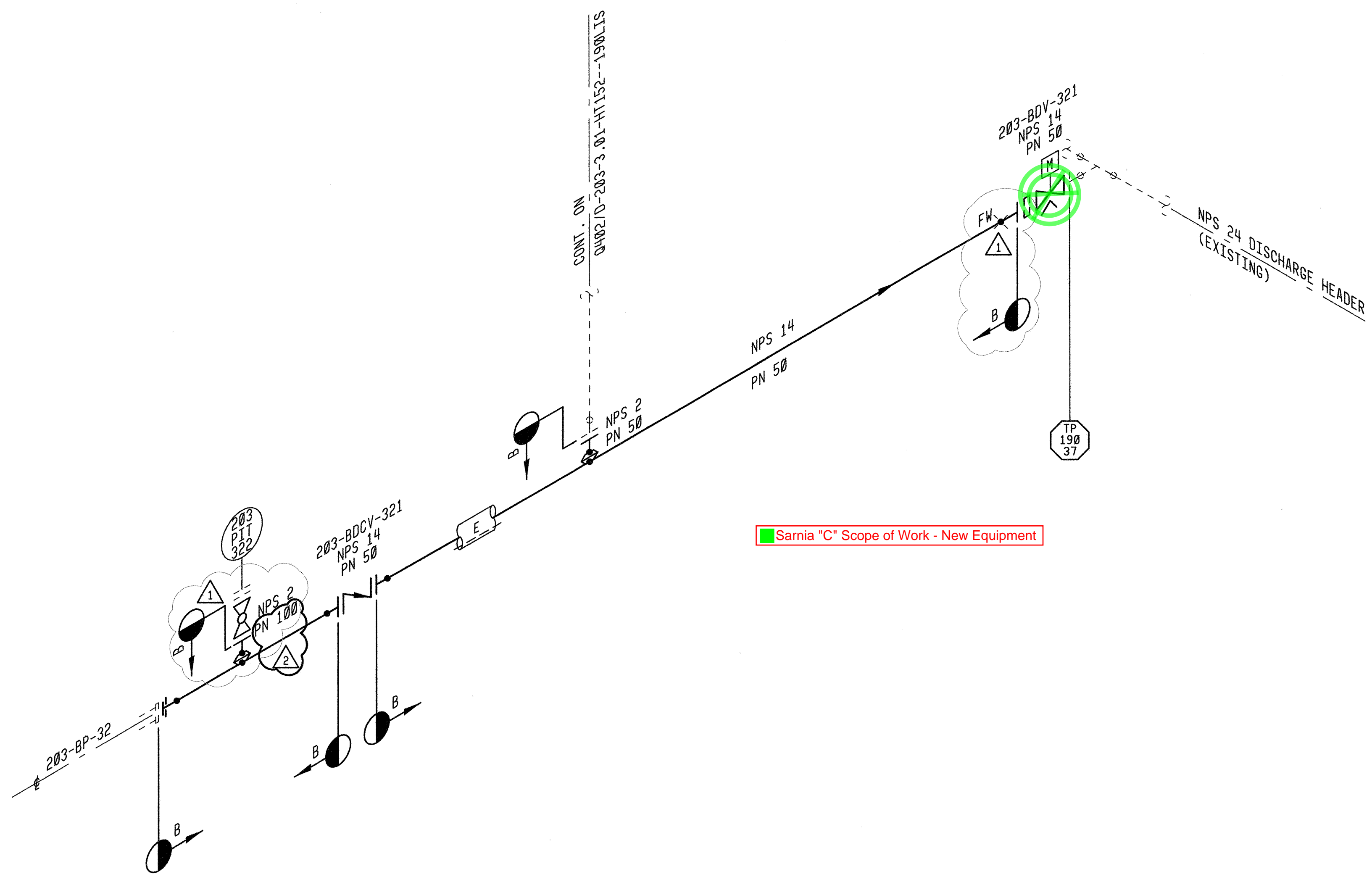
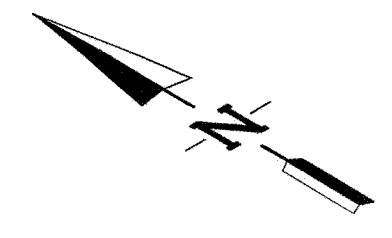
PRESSURE TEST DETAILS						
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.
	B - B	1000 psi 7440 kPa	1123 psi 7738 kPa	720 psi 4960 kPa	792 psi 5456 kPa	----- m ³
ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST						

**SARNIA (ON) TERMINAL
 BOOSTER PUMP 203-BP-31
 DISCHARGE LINE
 HYDROTEST ISOMETRIC**

DRAWN GC	CHECK <i>KMB</i>	APPROVE <i>BSHELDON</i>
DATE 05 JUL 13	SCALE NTS	APPROVE <i>ETAMAYO</i>

D-203-3.01-HT152-2-190LIS **Q405**

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Sarnia "C" Scope of Work - New Equipment

- NOTES:**
1. HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
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 7. ALL HYDROTEST MATERIALS TO BE SUPPLIED BY CONTRACTOR.

Professional Engineers of Ontario
 CERTIFICATE OF AUTHORIZATION
 Jacobs Canada Inc.
 Number 11252378

2014 CONSTRUCTION

REV:	LINE 9B REVERSAL PROJECT		
BY:	1241237A80 (LIS)	DATE:	29 NOV 13
CHK:		APPR:	
NO	SUBSEQUENT REVISION	DATE/BY	APPR
1	ADDED DOUBLE FACED BLIND & SPACER RING	11 APR 14 TDT	JWS
2	REVISED 203 PIT 322	09 MAY 14 TDT	JWS

M36/D-203-3.01-63156--190LIS MATERIAL ID ISOMETRIC
 REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE



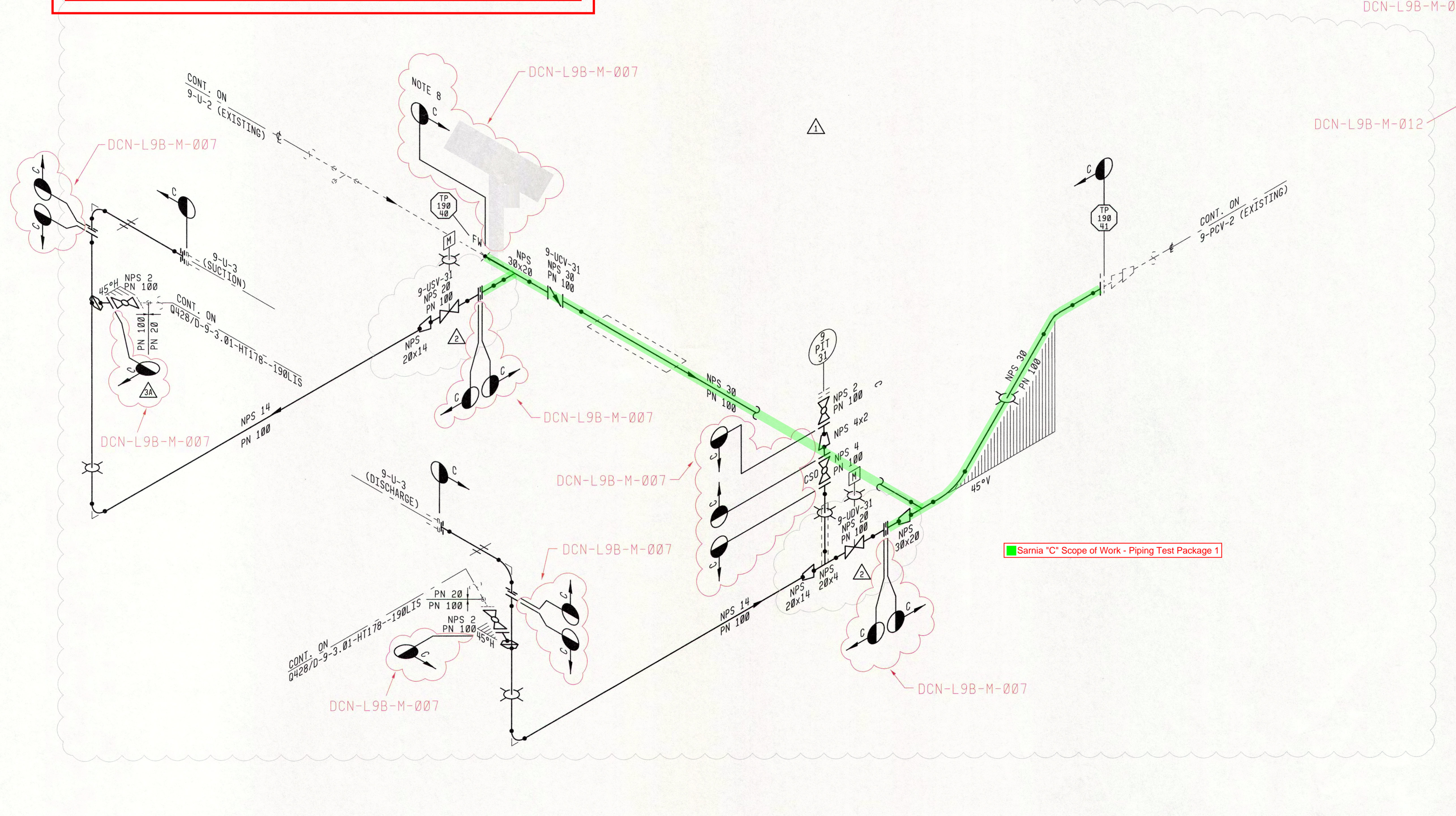
**SARNIA (ON) TERMINAL
 BOOSTER PUMP 203-BP-32
 DISCHARGE LINE
 HYDROTEST ISOMETRIC**

DRAWN	GC	CHECK	KWB	APPROVE	BSHELDON
DATE	11 JUL 13	SCALE	NTS	APPROVE	ETAMAYO

D-203-3.01-HT156-2-190LIS Q406

PRESSURE TEST DETAILS						
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.
	B - B	1000 psi 7440 kPa	1123 psi 7738 kPa	720 psi 4960 kPa	792 psi 5456 kPa	----- m ³
ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST						

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03-AUGUST-14**



- NOTES:**
- HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
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 - (TIE-IN PORTION)
100% X-RAY IF CARBER TOOL IS NOT PRACTICAL. THE CONNECTION WILL BE CONSIDERED AS A CLOSURE WELD. UPON APPROVAL FROM ENBRIDGE.

DCN-L9B-M-012

DCN-L9B-M-007

30 MAY 2014
2014-07-14
41971011

LICENSED PROFESSIONAL ENGINEER
J.W.D. SHELDON
PROVINCE OF ONTARIO

Professional Engineers of Ontario
CERTIFICATE OF AUTHORIZATION
Jacobs Canada Inc.
Number 11252378

2014 CONSTRUCTION

REV.	DESCRIPTION	DATE	BY	APPR.
1	LINE 9B REVERSAL PROJECT	29 NOV 13	GC	BSHELDON
2	DIMENSIONAL REVISION DUE TO ADDITION OF FLANGES & BOM REVISED	28 FEB 14	RBS	JWS

M75/D-9-3.01-38961--190LIS MATERIAL ID ISOMETRIC
REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE

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SARNIA (ON) TERMINAL
LINE 9 MAINLINE PUMP AREA
9-U-3
HYDROTEST ISOMETRIC

DRAWN N.FONT	CHECK R.WILLIAMS	APPROVE S.BURKE
DATE 13 SEP 12	SCALE NTS	APPROVE A.JABER

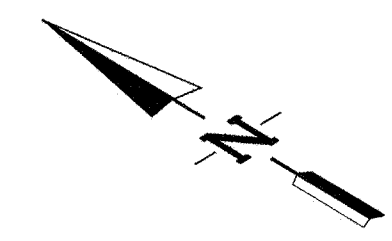
D-9-3.01-HT961-2-190LIS Q445

PRESSURE TEST DETAILS							
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.	TEST DURATION (HRS)
	C - C	2160 psi 14895 kPa	2246 psi 15491 kPa	1440 psi 9930 kPa	1584 psi 10923 kPa	---- m 3	ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST

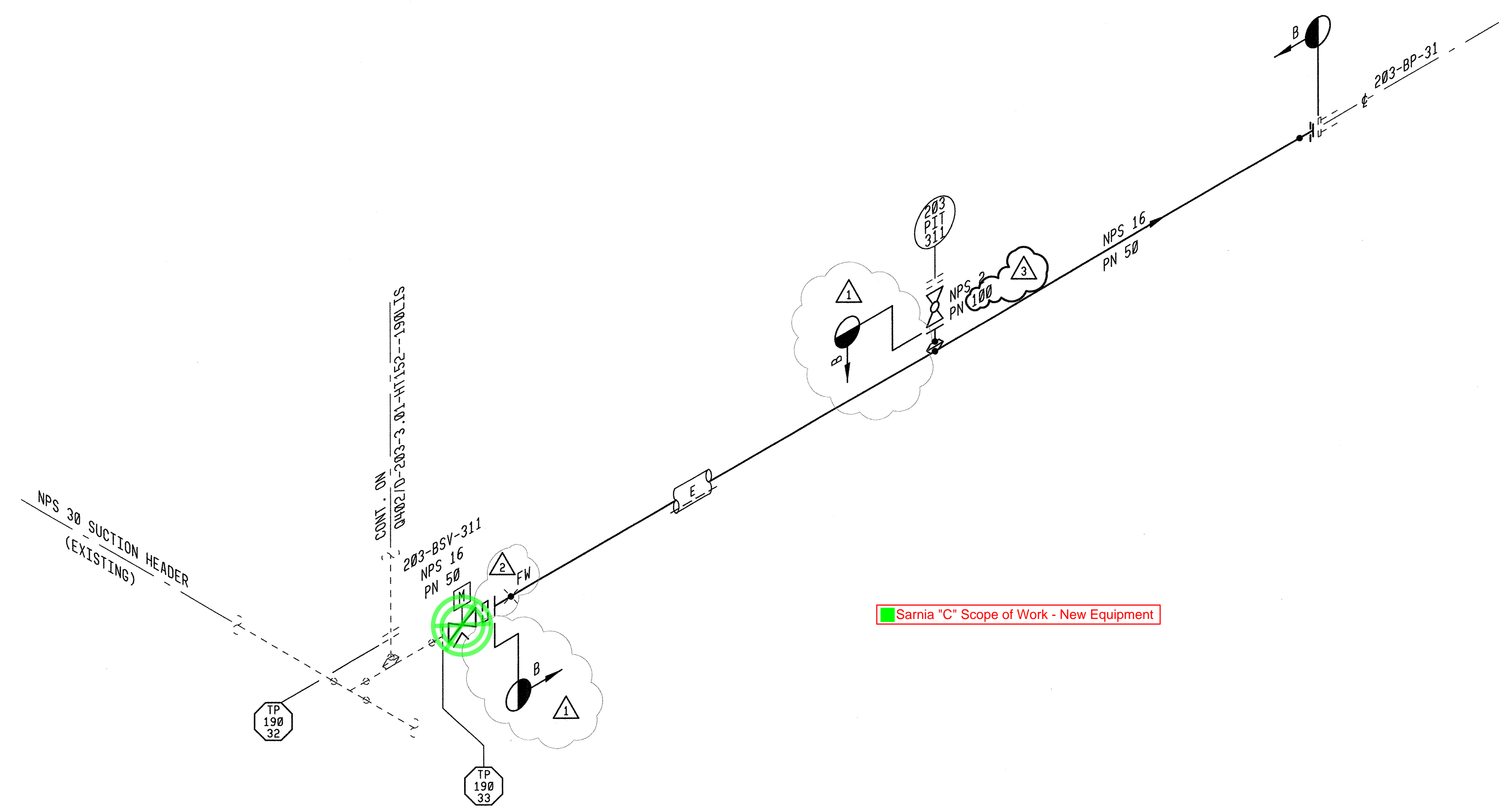
NOTE 8 ADDITION: CLOSURE WELD PROCEDURE
THE INTEGRITY OF THE WELD COULD BE BETTER REVEALED THROUGH A DRY MPI EXAMINATION, HALF WAY THROUGH THE FILL AND THEN THE FOLLOW UP CONTRAST MPI ON THE FINAL WELD. PROVIDE THE SERVICE TEST NITROGEN PRESSURE. THIS IS DUE TO VARIABLE MAIN LINE PRESSURES WITHIN THE PIPE. THE CONCERN IS THAT IF THE SERVICE TEST IS COMPLETED AT OPERATING PRESSURE OR DESIGN PRESSURE AND IF ENBRIDGE IS OPERATING AT A REDUCED PIPELINE PRESSURE WE MAY DEFORM THE MAINLINE PIPE. AT THE HOT TAP LOCATION A UT THICKNESS CHECK, CE AND LAMINATION CHECK WILL BE COMPLETED ON ALL HOT TAP LOCATIONS PRIOR TO WELDING.

GALLIER 2013V2

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 03-AUGUST-14



- NOTES:
1. HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
 2. INDICATES LIMITS OF HYDROTEST.
 3. DO NOT HYDROTEST THROUGH RELIEF VALVES, CONTROL VALVES, INSTRUMENTATION AND EQUIPMENT.
 4. LIQUID FILL & PRESSURING FOR HYDROTESTING THROUGH CHECK VALVES MUST BE DONE FROM THE UPSTREAM SIDE OF THE CHECK VALVE.
 5. ALL psi AND kPa VALUES TO BE CHECKED BY AN ENGINEER BASED ON PROJECT REQUIREMENTS.
 6. APPROXIMATE FILL VOLUME TO BE CALCULATED BY CONTRACTOR.
 7. ALL HYDROTEST MATERIALS TO BE SUPPLIED BY CONTRACTOR.



Sarnia "C" Scope of Work - New Equipment

5 MAY 2014
KELB

Professional Engineers of Ontario
CERTIFICATE OF AUTHORIZATION
Jacobs Canada Inc.
Number 11252378

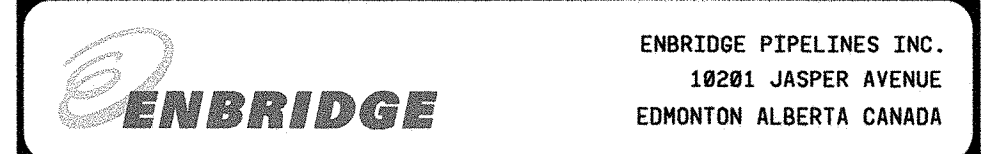
2014 CONSTRUCTION

REV:	LINE 9B REVERSAL PROJECT		
AFE: 1241237A80 (LIS)	DATE: 29 NOV 13		
BY:	APPR:		
CHK:	APPR:		
NO	SUBSEQUENT REVISION	DATE/BY	APPR
1	LIMITS OF HYDROTEST RELOCATED	28 FEB 14 RBB	JWS
2	ADDED DOUBLE FACED BLIND, SPACER RING	11 APR 14 TDT	JWS
3	REVISED PIT	09 MAY 14 JAD	JWS

M33/D-203-3.01-63153--190LIS MATERIAL ID ISOMETRIC
REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE
----	----------	---------	---------

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PRESSURE TEST DETAILS						
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.
	B - B	1000 psi 7440 kPa	1123 psi 7738 kPa	720 psi 4960 kPa	792 psi 5456 kPa	----- m ³
ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST						

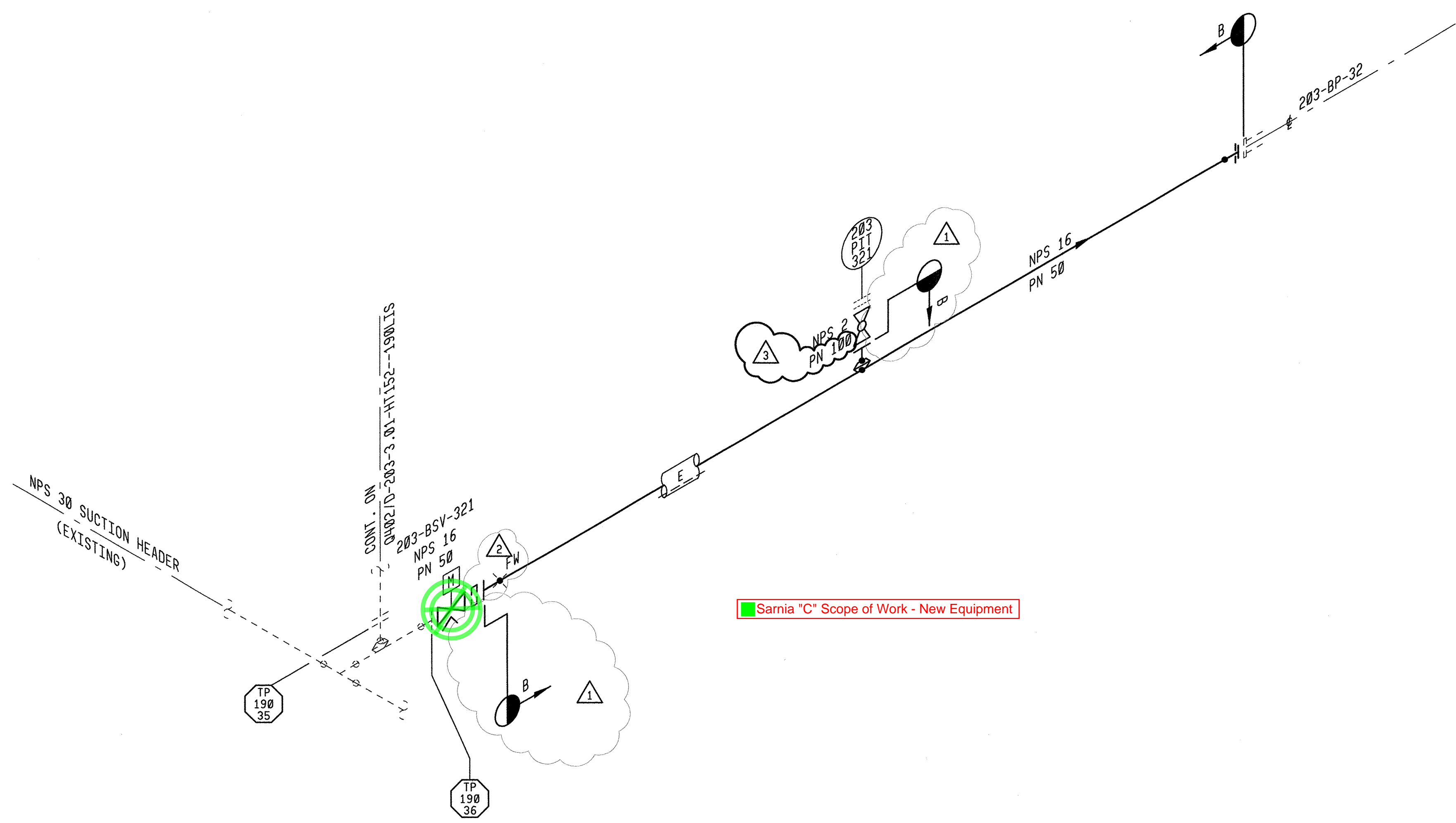
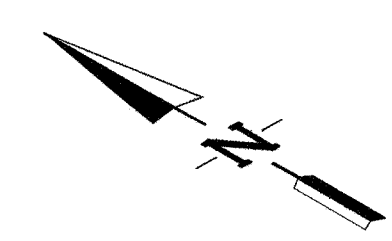
SARNIA (ON) TERMINAL
BOOSTER PUMP 203-BP-31
SUCTION LINE
HYDROTEST ISOMETRIC

DRAWN GC	CHECK KMB	APPROVE BSHELDON
DATE 07 JUL 13	SCALE NTS	APPROVE ETAMAYO

D-203-3.01-HT153-3-190LIS

Q403

MARKED-UP FOR
 LEAVE TO OPEN PACKAGE
 FOR INFORMATION ONLY
 03-AUGUST-14



NOTES:

1. HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
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7. ALL HYDROTEST MATERIALS TO BE SUPPLIED BY CONTRACTOR.

5 MAY 2014

41971011

Professional Engineers of Ontario
 CERTIFICATE OF AUTHORIZATION
 Jacobs Canada Inc.
 Number 11252378

2014 CONSTRUCTION			
REV:	LINE 9B REVERSAL PROJECT		
0	BY: 1241237A80 (LIS)	DATE: 29 NOV 13	APPR:
CHK:			APPR:
NO	SUBSEQUENT REVISION	DATE/BY	APPR
1	LIMITS OF HYDROTEST RELOCATED	28 FEB 14 RGG	JWS
2	ADDED DOUBLE FACED BLIND, SPACER RING	11 APR 14 TDT	JWS
3	REVISED PIT	09 MAY 14 JAD	JWS

M34/D-203-3.01-63154--190LIS MATERIAL ID ISOMETRIC
 REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE

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SARNIA (ON) TERMINAL
 BOOSTER PUMP 203-BP-32
 SUCTION LINE
 HYDROTEST ISOMETRIC

DRAWN GC	CHECK <i>KWB</i>	APPROVE <i>BHELDON</i>	
DATE 05 JUL 13	SCALE NTS	APPROVE <i>ETAMAYO</i>	

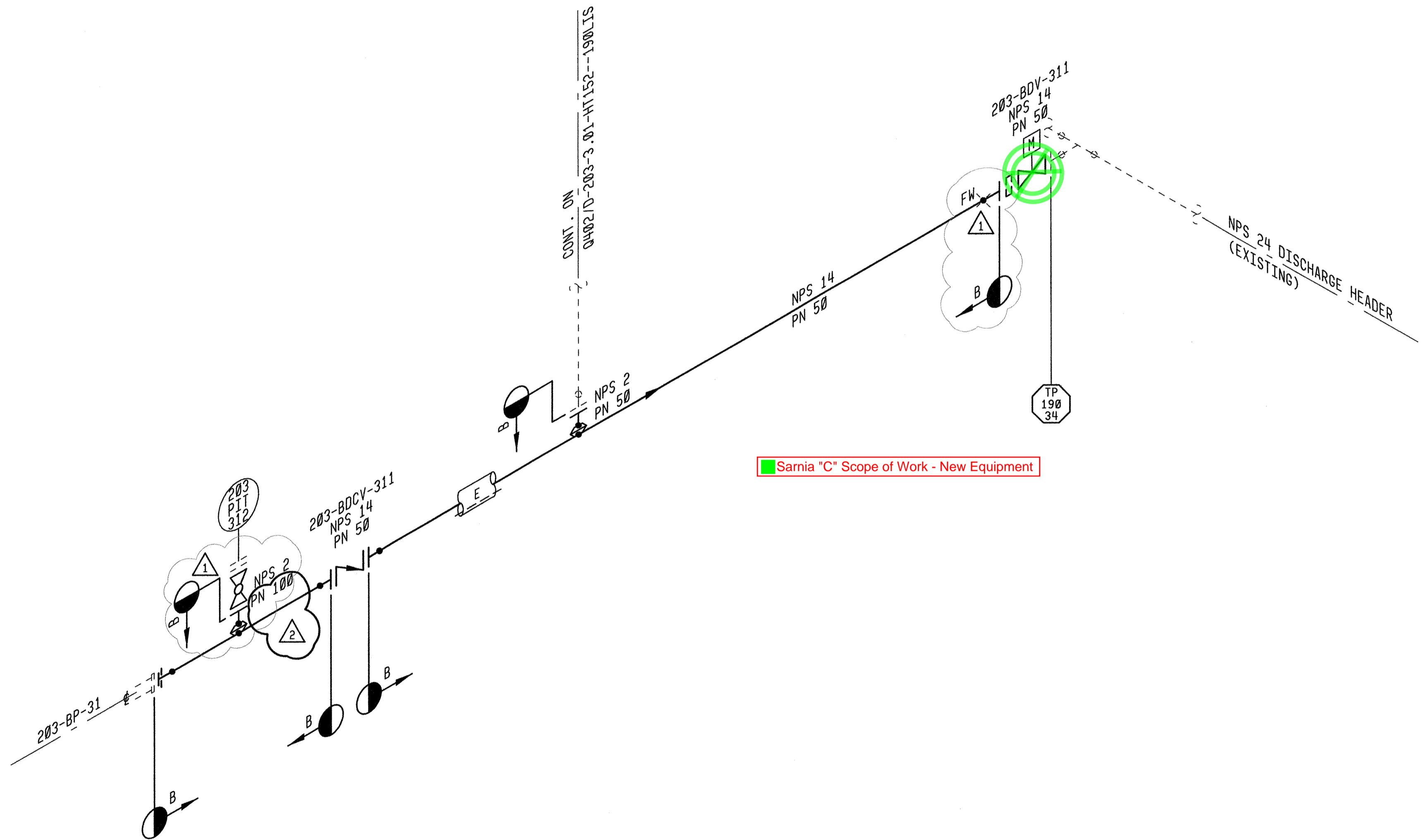
D-203-3.01-HT154-3-190LIS Q404

PRESSURE TEST DETAILS						
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.
	B - B	1000 psi 7440 kPa	1123 psi 7738 kPa	720 psi 4960 kPa	792 psi 5456 kPa	----- m ³

ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION

BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST

MARKED-UP FOR
 LEAVE TO OPEN PACKAGE
 FOR INFORMATION ONLY
 03-AUGUST-14



Sarnia "C" Scope of Work - New Equipment

NOTES:

1. HYDROTEST PIPING IN ACCORDANCE WITH FCS014-(2012) AND CSA Z662 OIL AND PIPELINE SYSTEMS LATEST EDITION.
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5 May 2014

 J.W.D. SHELDON
 LICENSED PROFESSIONAL ENGINEER
 PROVINCE OF ONTARIO

Professional Engineers of Ontario
 CERTIFICATE OF AUTHORIZATION
 Jacobs Canada Inc.
 Number 11252378

2014 CONSTRUCTION				
REV:	0	LINE 9B REVERSAL PROJECT		
AFE:	1241237A00 (LIS)	DATE:	29 NOV 13	
BY:		APPR:		
CHK:		APPR:		
NO	SUBSEQUENT REVISION	DATE/BY	APPR	
▲	ADDED DOUBLE FACED BLIND & SPACER RING	11 APR 14 TDT	JWS	
▲	REVISED PIT	09 MAY 14 TDT	JWS	

M35/D-203-3.01-63155--190LIS MATERIAL ID ISOMETRIC
REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE

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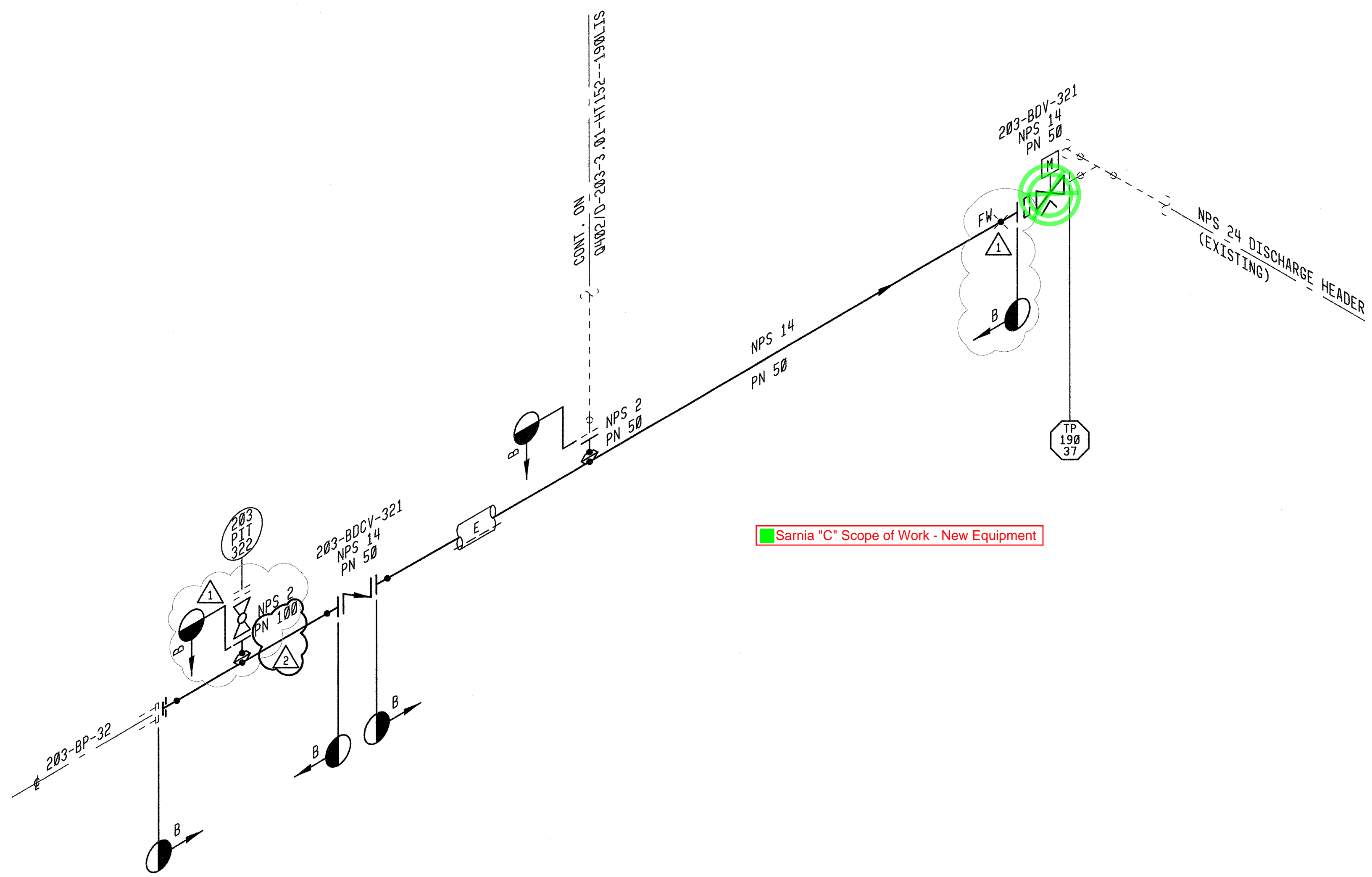
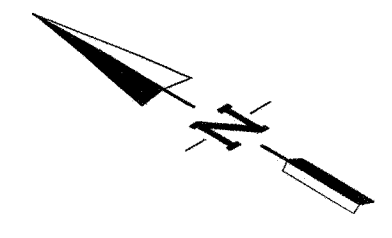
**SARNIA (ON) TERMINAL
 BOOSTER PUMP 203-BP-31
 DISCHARGE LINE
 HYDROTEST ISOMETRIC**

DRAWN GC	CHECK <i>KMB</i>	APPROVE <i>BSHELDON</i>	
DATE 05 JUL 13	SCALE NTS	APPROVE <i>ETAMAYO</i>	

D-203-3.01-HT155-2-190LIS Q405

PRESSURE TEST DETAILS							
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.	TEST DURATION (HRS)
	B - B	1000 psi 7440 kPa	1123 psi 7738 kPa	720 psi 4960 kPa	792 psi 5456 kPa	----- m ³	ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST

MARKED-UP FOR
 LEAVE TO OPEN PACKAGE
 FOR INFORMATION ONLY
 03-AUGUST-14



Sarnia "C" Scope of Work - New Equipment

NOTES:

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7. ALL HYDROTEST MATERIALS TO BE SUPPLIED BY CONTRACTOR.

Professional Engineers of Ontario
 CERTIFICATE OF AUTHORIZATION
 Jacobs Canada Inc.
 Number 11252378

2014 CONSTRUCTION				
REV:	LINE 9B REVERSAL PROJECT			
BY:	1241237A80 (LIS)	DATE:	29 NOV 13	
CHK:	APPR:	APPR:		
NO	SUBSEQUENT REVISION	DATE/BY	APPR	
△	ADDED DOUBLE FACED BLIND & SPACER RING	11 APR 14 TDT	JWS	
△	REVISED 203 PIT 322	09 MAY 14 TDT	JWS	

M36/D-203-3.01-63156--190LIS MATERIAL ID ISOMETRIC
 REFERENCE DRAWINGS

NO	REVISION	DATE/BY	APPROVE

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**SARNIA (ON) TERMINAL
 BOOSTER PUMP 203-BP-32
 DISCHARGE LINE
 HYDROTEST ISOMETRIC**

DRAWN	GC	CHECK	KWB	APPROVE	BSHELDON
DATE	11 JUL 13	SCALE	NTS	APPROVE	ETAMAYO

D-203-3.01-HT156-2-190LIS Q406

PRESSURE TEST DETAILS							
TEST NUMBER	SECTION	MIN. TEST PRESSURE	MAX. TEST PRESSURE	MAX. OPER. PRESSURE	MIN. LEAK TEST PRESS.	APPROX. FILL VOL.	TEST DURATION (HRS)
	B - B	1000 psi 7440 kPa	1123 psi 7738 kPa	720 psi 4960 kPa	792 psi 5456 kPa	----- m ³	ABOVE GRADE - 1.25 HR STRENGTH TEST FOLLOWED BY VISUAL LEAK INSPECTION AND DETECTION BELOW GRADE - 4.25 HRS STRENGTH TEST FOLLOWED BY 4.25 HRS LEAK TEST

Swing Check Valve
Functional Tag: 9-UCV-31
Hydrostatic Test Package

Functional Tag: 9-UCV-31

Form id

Hydro Test Report (Tom Wheatley)

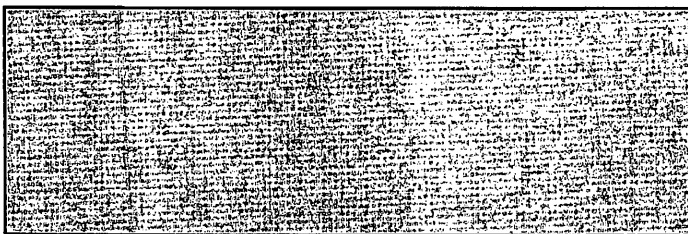
Form E-VP-1115 I
Cooper Cameron Valves
Ville Platte, La. U.S.A.

Description	<input type="text" value="SCV 30X30 600 WEP TW 66"/>	ANSI Class	<input type="text" value="600"/>
Part number	<input type="text" value="2311032-30-60-03"/>	Part rev	<input type="text" value="01"/>
Order number	<input type="text" value="120237638"/>	qty	<input type="text" value="1"/>
Test procedure	<input type="text" value="9D-155-TEST"/>	Sales order number	<input type="text" value="2613851 / 40"/>
Gage1 number	<input type="text" value="BV-14052"/>	Test rev	<input type="text" value="07"/>
Gage2 number	<input type="text"/>	Gage1 due date	<input type="text" value="6/30/2014"/>
Chart1 rec. number	<input type="text" value="BV-199-226082"/>	Gage2 due date	<input type="text"/>
Chart2 rec. Number	<input type="text"/>	Chart1 due date	<input type="text" value="6/30/2014"/>
		Chart2 due date	<input type="text"/>

Body Hydro Test

minutes @ psi

minutes @ psi



Side A Full Pressure Seat test

minutes @ psi

minutes @ psi

minutes @ psi

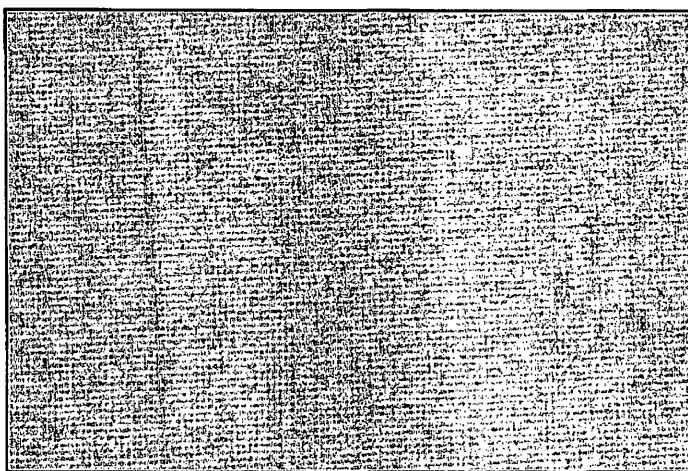
Low Pressure Body Test

minutes @ psi

Air Test

minutes @ psi

minutes @ psi



Double Block Hydro Test (Outside In)

Double Block Air Test

minutes @ psi minutes @ psi

Drift Test

Drift SN Drift Diam Drift test passed

Test media used Water/Glycol nitrogen N/A Overall valve length

Valve operated under full Working Press Customer Witness

Blow Down Torque at psi Test w/Pup Pipe

Test wo/Pup Pipe

Test w/Extensions

Form id

Hydro Test Report (Tom Wheatley)

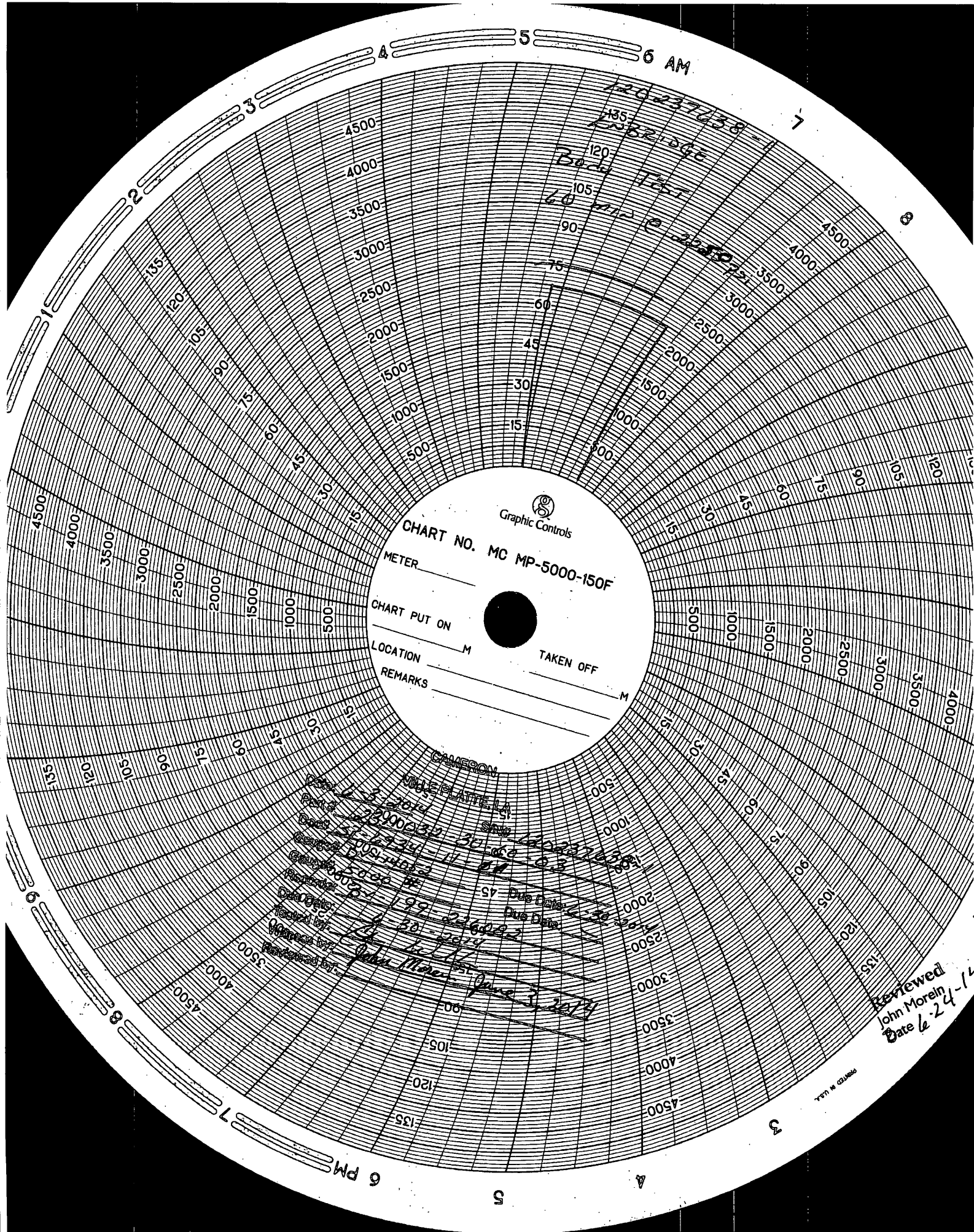
Form E-VP-11151
Cooper Cameron Valves
Ville Platte, La. U.S.A.

Serial number	Side A fllbs	Side B fllbs	Initials	Date Initialed	Customer	Witness	Date Witnessed	Valve OAL
---------------	--------------	--------------	----------	----------------	----------	---------	----------------	-----------

1			CW	6/3/2014			6/3/2014	65"
Tester name	<input type="text" value="CHRIS WILLIS"/>			Date	<input type="text" value="6/3/2014"/>			
Foreman	<input type="text" value="GLENN SERIALE"/>			Date	<input type="text" value="6/3/2014"/>			
Customer	<input type="text" value="ENBRIDGE PIPELINES"/>							
Witness name	<u>John Morein</u>			Witness Date	<u>June 3, 2014</u>			
Comments	<input type="text" value="SP-006934-11-11, SP-006936-03-04"/>							

Reviewed
John Morein
Date 6-24-14

John Morein was the
Enbridge witness for
this valve hydrotest.



Slab Gate Valve

Functional Tag: 203-BDV-311

Functional Tag: 203-BDV-321

Hydrostatic Test Package

M & J Valve

Functional Tag: 203-BDV-311

SPX Flow Technology

VALVE TEST REPORT

PRODUCT: <input checked="" type="checkbox"/> GATE <input type="checkbox"/> DAN-FLO <input type="checkbox"/> EX-GATE <input type="checkbox"/> BALLTROL <input type="checkbox"/> CEG <input type="checkbox"/> CHECK <input type="checkbox"/> OTHER _____	SIZE: <u>14"</u> MODEL: <u>M303</u>	CLASS: <input type="checkbox"/> 150 <input type="checkbox"/> 900 <input checked="" type="checkbox"/> 300 <input type="checkbox"/> 1500 <input type="checkbox"/> 400 <input type="checkbox"/> 2500 <input type="checkbox"/> 600 <input type="checkbox"/> OTHER _____	ENDS: <input type="checkbox"/> FXF <input type="checkbox"/> WXW <input type="checkbox"/> WXF <input type="checkbox"/> _____	SERIAL NO. <u>1000002880683</u> S.O. NO. <u>1734052-13</u> CUSTOMER: <u>Enbridge</u>
---	--	--	---	--

PRESSURE/FUNCTIONAL TESTING PER: API 6D ANSI B16.34 M&J/CUST. SPEC: HT-1340

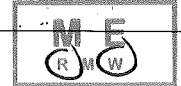
VALVE OPERATED BY: TEMPORARY OPERATOR BGO ELECTRIC HYDRAULIC

PRESSURE TESTING	HYDROSTATIC SHELL TEST	@ <u>1200</u> PSIG. FOR <u>1</u> <input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN	<input checked="" type="checkbox"/> TEST OK	GAGE NO. <u>CR-0021</u>
	HYDROSTATIC SEAT TEST	SEAT #1 @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN	<input checked="" type="checkbox"/> TEST OK	GAGE NO. <u>CR-0021</u>
		SEAT #2 @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN	<input checked="" type="checkbox"/> TEST OK	GAGE NO. <u>CR-0021</u>
	BLOCK & BLEED	BOTH SEATS @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN	<input checked="" type="checkbox"/> TEST OK	GAGE NO. <u>CR-0021</u>
	AIR/GAS SHELL TEST	@ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN	<input type="checkbox"/> TEST OK	GAGE NO. _____
	AIR/GAS SEAT TEST	SEAT #1 @ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN	<input type="checkbox"/> TEST OK	GAGE NO. _____
SEAT #2 @ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN		<input type="checkbox"/> TEST OK	GAGE NO. _____	

FUNCTIONAL TESTING	PULL TEST	VALVE OPENED WITH SEAT #1 @ _____ PSIG. <input type="checkbox"/> SEAT RETEST OK
		VALVE OPENED WITH SEAT #2 @ _____ PSIG. <input type="checkbox"/> SEAT RETEST OK
	TORQUE TEST	_____ FT.-LBS TO OPEN VALVE WITH SEAT #1 @ _____ PSIG. <input type="checkbox"/> OK
		_____ FT.-LBS TO OPEN VALVE WITH SEAT #2 @ _____ PSIG. <input type="checkbox"/> OK
_____ FT.-LBS TO OPEN @ 0 PSIG.		_____ FT.-LBS TO CLOSE @ 0 PSIG.

VALVE STROKE FULL OPEN / FULL CLOSE YES BOLTING TIGHTNESS AFTER TEST ? OK

VERIFICATION	SET PRESSURE _____ PSIG. @ _____ PSIG. N2 LD. PILOT SN _____
	VALVE ASSEMBLED BY: <u>1st + 2nd shift</u> DATE: <u>4-5-14</u>
	VALVE TESTED BY: <u>[Signature]</u> DATE: <u>4-7-14</u>
	TEST WITNESSED BY: <u>[Signature]</u> DATE: <u>4-7-14</u>



COMMENTS: Michael Edwards - Enbridge. Designate
Runtime - open + close - 170 sec

M & J Valve Functional Tag: 203-BDV-321
VALVE TEST REPORT


PRODUCT: <input checked="" type="checkbox"/> GATE <input type="checkbox"/> DAN-FLO <input type="checkbox"/> EX-GATE <input type="checkbox"/> BALLTROL <input type="checkbox"/> CEG <input type="checkbox"/> CHECK <input type="checkbox"/> OTHER _____	SIZE: <u>14"</u> MODEL: <u>M303</u>	CLASS: <input type="checkbox"/> 150 <input type="checkbox"/> 900 <input type="checkbox"/> 300 <input type="checkbox"/> 1500 <input type="checkbox"/> 400 <input type="checkbox"/> 2500 <input type="checkbox"/> 600 <input type="checkbox"/> OTHER _____	ENDS: <input type="checkbox"/> FXF <input type="checkbox"/> WXW <input type="checkbox"/> WXF <input type="checkbox"/> _____	SERIAL NO. <u>1000002880684</u> S.O. NO. <u>1734052-13</u> CUSTOMER <u>Enbridge</u>
---	--	---	---	---

PRESSURE/FUNCTIONAL TESTING PER: API 6D ANSI B16.34 M&J/CUST. SPEC: HT-1340

VALVE OPERATED BY: TEMPORARY OPERATOR BGO ELECTRIC HYDRAULIC

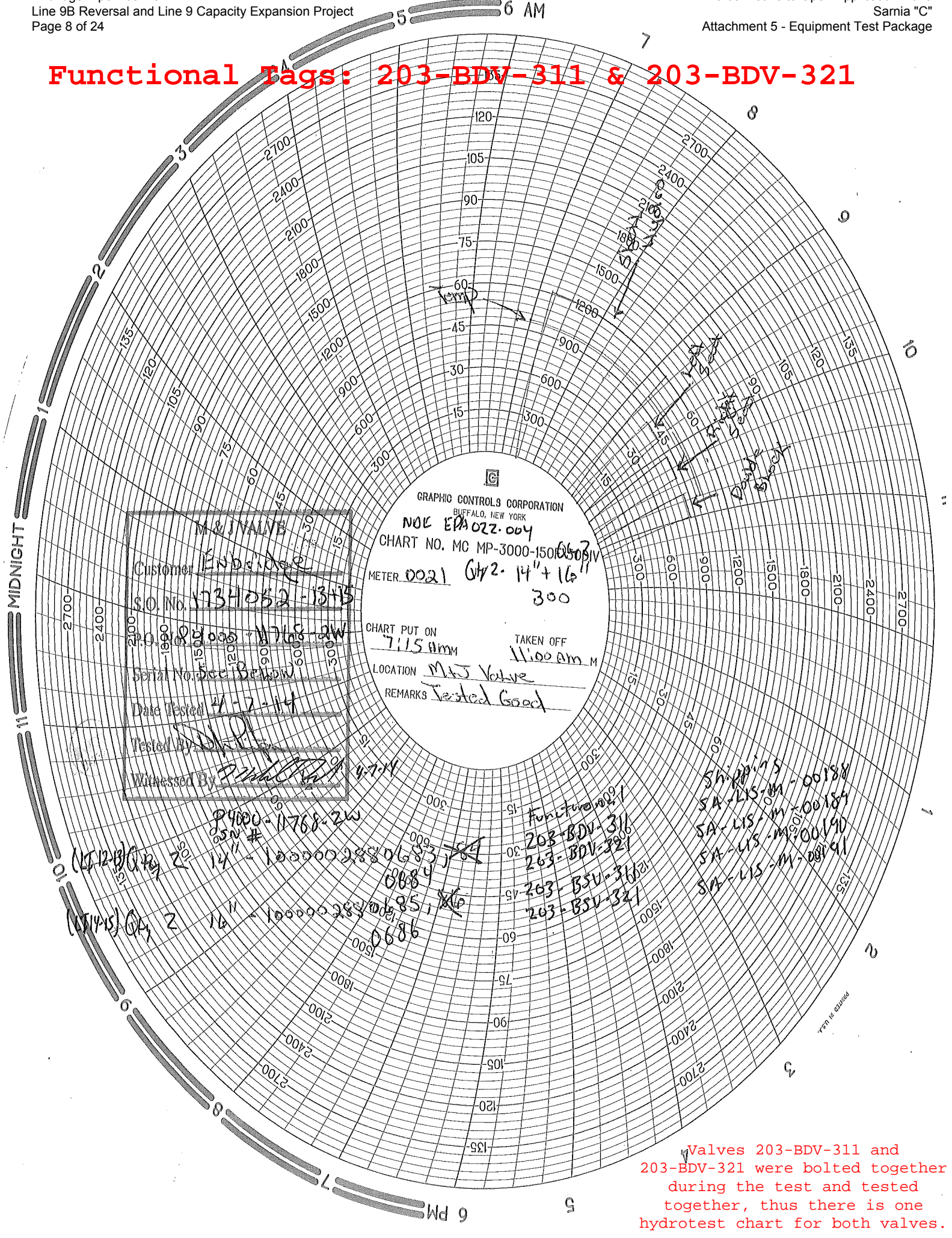
PRESSURE TESTING	HYDROSTATIC SHELL TEST	@ <u>1200</u> PSIG. FOR <u>1</u>	<input checked="" type="checkbox"/> HR <input type="checkbox"/> MIN	<input checked="" type="checkbox"/> TEST OK	GAGE NO. <u>CR-0021</u>
	HYDROSTATIC SEAT TEST	SEAT #1 @ <u>840</u> PSIG. FOR <u>5</u>	<input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN	<input checked="" type="checkbox"/> TEST OK	GAGE NO. <u>CR-0021</u>
		SEAT #2 @ <u>840</u> PSIG. FOR <u>5</u>	<input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN	<input checked="" type="checkbox"/> TEST OK	GAGE NO. <u>CR-0021</u>
	BLOCK & BLEED	BOTH SEATS @ <u>840</u> PSIG. FOR <u>5</u>	<input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN	<input checked="" type="checkbox"/> TEST OK	GAGE NO. <u>CR-0021</u>
	AIR/GAS SHELL TEST	@ _____ PSIG. FOR _____	<input type="checkbox"/> HR <input type="checkbox"/> MIN	<input type="checkbox"/> TEST OK	GAGE NO. _____
	AIR/GAS SEAT TEST	SEAT #1 @ _____ PSIG. FOR _____	<input type="checkbox"/> HR <input type="checkbox"/> MIN	<input type="checkbox"/> TEST OK	GAGE NO. _____
SEAT #2 @ _____ PSIG. FOR _____		<input type="checkbox"/> HR <input type="checkbox"/> MIN	<input type="checkbox"/> TEST OK	GAGE NO. _____	

FUNCTIONAL TESTING	PULL TEST	VALVE OPENED WITH SEAT #1 @ _____ PSIG. <input type="checkbox"/> SEAT RETEST OK
		VALVE OPENED WITH SEAT #2 @ _____ PSIG. <input type="checkbox"/> SEAT RETEST OK
	TORQUE TEST	_____ FT.-LBS TO OPEN VALVE WITH SEAT #1 @ _____ PSIG. <input type="checkbox"/> OK
		_____ FT.-LBS TO OPEN VALVE WITH SEAT #2 @ _____ PSIG. <input type="checkbox"/> OK
_____ FT.-LBS TO OPEN @ 0 PSIG. _____ FT.-LBS TO CLOSE @ 0 PSIG.		

VERIFICATION	VALVE STROKE FULL OPEN / FULL CLOSE <input checked="" type="checkbox"/> YES	BOLTING TIGHTNESS AFTER TEST ? <input checked="" type="checkbox"/> OK
	SET PRESSURE _____ PSIG. @ _____ PSIG. N2 LD. PILOT SN _____	
	VALVE ASSEMBLED BY: <u>1st + 2nd shift</u> DATE: <u>4-5-14</u>	
	VALVE TESTED BY: <u>[Signature]</u> DATE: <u>4-7-14</u>	
TEST WITNESSED BY: <u>[Signature]</u> DATE: <u>4-7-14</u>		

COMMENTS: Runtime - open + close - 171 sec

Functional Tags: 203-BDV-311 & 203-BDV-321



Valves 203-BDV-311 and 203-BDV-321 were bolted together during the test and tested together, thus there is one hydrotest chart for both valves.

Slab Gate Valve

Functional Tag: 203-BSV-311

Functional Tag: 203-BSV-321

Hydrostatic Test Package

M & J Valve Functional Tag: 203-BSV-311
VALVE TEST REPORT

SPX Flow Technology

PRODUCT: <input checked="" type="checkbox"/> GATE <input type="checkbox"/> DAN-FLO <input type="checkbox"/> EX-GATE <input type="checkbox"/> BALLTROL <input type="checkbox"/> CEG <input type="checkbox"/> CHECK <input type="checkbox"/> OTHER _____	SIZE: <u>16"</u> MODEL: <u>m303</u>	CLASS: <input type="checkbox"/> 150 <input type="checkbox"/> 900 <input checked="" type="checkbox"/> 300 <input type="checkbox"/> 1500 <input type="checkbox"/> 400 <input type="checkbox"/> 2500 <input type="checkbox"/> 600 <input type="checkbox"/> OTHER _____	ENDS: <input checked="" type="checkbox"/> FXF <input type="checkbox"/> WXW <input type="checkbox"/> WXF <input type="checkbox"/> _____	SERIAL NO. <u>1000002880685</u> S.O. NO. <u>1734052-15</u> CUSTOMER <u>Enbridge</u>
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PRESSURE/FUNCTIONAL TESTING PER: API 6D ANSI B16.34 M&J/CUST. SPEC: HT-1340

VALVE OPERATED BY: TEMPORARY OPERATOR BGO ELECTRIC HYDRAULIC

PRESSURE TESTING	HYDROSTATIC SHELL TEST @ <u>1200</u> PSIG. FOR <u>1</u> <input checked="" type="checkbox"/> HR <input type="checkbox"/> MIN <input checked="" type="checkbox"/> TEST OK GAGE NO. <u>CR-0021</u>
	HYDROSTATIC SEAT TEST SEAT #1 @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input type="checkbox"/> MIN <input checked="" type="checkbox"/> TEST OK GAGE NO. <u>CR-0021</u>
	HYDROSTATIC SEAT TEST SEAT #2 @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input type="checkbox"/> MIN <input checked="" type="checkbox"/> TEST OK GAGE NO. <u>CR-0021</u>
	BLOCK & BLEED BOTH SEATS @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input type="checkbox"/> MIN <input checked="" type="checkbox"/> TEST OK GAGE NO. <u>CR-0021</u>
	AIR/GAS SHELL TEST @ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN <input type="checkbox"/> TEST OK GAGE NO. _____
	AIR/GAS SEAT TEST SEAT #1 @ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN <input type="checkbox"/> TEST OK GAGE NO. _____ SEAT #2 @ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN <input type="checkbox"/> TEST OK GAGE NO. _____

FUNCTIONAL TESTING	PULL TEST VALVE OPENED WITH SEAT #1 @ _____ PSIG. <input type="checkbox"/> SEAT RETEST OK VALVE OPENED WITH SEAT #2 @ _____ PSIG. <input type="checkbox"/> SEAT RETEST OK
	TORQUE TEST _____ FT.-LBS TO OPEN VALVE WITH SEAT #1 @ _____ PSIG. <input type="checkbox"/> OK _____ FT.-LBS TO OPEN VALVE WITH SEAT #2 @ _____ PSIG. <input type="checkbox"/> OK
	_____ FT.-LBS TO OPEN @ 0 PSIG. _____ FT.-LBS TO CLOSE @ 0 PSIG.

VERIFICATION	VALVE STROKE FULL OPEN / FULL CLOSE <input checked="" type="checkbox"/> YES BOLTING TIGHTNESS AFTER TEST ? <input checked="" type="checkbox"/> OK
	SET PRESSURE _____ PSIG. @ _____ PSIG. N2 LD. PILOT SN _____
	VALVE ASSEMBLED BY: <u>1st + 2nd shift</u> DATE: <u>4-5-14</u>
	VALVE TESTED BY: <u>[Signature]</u> DATE: <u>4-7-14</u>
TEST WITNESSED BY: <u>[Signature]</u> DATE: <u>4-7-14</u>	



COMMENTS: Michael Edwards - Enbridge Designate
Runtime - open + close - 170 sec
PG - 0058

M & J Valve Functional Tag: 203-BSV-321
VALVE TEST REPORT

SPX Flow Technology

PRODUCT: <input checked="" type="checkbox"/> GATE <input type="checkbox"/> DAN-FLO <input type="checkbox"/> EX-GATE <input type="checkbox"/> BALLTROL <input type="checkbox"/> CEG <input type="checkbox"/> CHECK <input type="checkbox"/> OTHER _____	SIZE: <u>16"</u> MODEL: <u>m303</u>	CLASS: <input type="checkbox"/> 150 <input type="checkbox"/> 900 <input checked="" type="checkbox"/> 300 <input type="checkbox"/> 1500 <input type="checkbox"/> 400 <input type="checkbox"/> 2500 <input type="checkbox"/> 600 <input type="checkbox"/> OTHER _____	ENDS: <input checked="" type="checkbox"/> FXF <input type="checkbox"/> WXW <input type="checkbox"/> WXF <input type="checkbox"/> _____	SERIAL NO. <u>1000002880686</u> S.O. NO. <u>1734052-15</u> CUSTOMER <u>Enbridge</u>
---	--	--	--	--

PRESSURE/FUNCTIONAL TESTING PER: API 6D ANSI B16.34 M&J/CUST. SPEC: HT-1340

VALVE OPERATED BY: TEMPORARY OPERATOR BGO ELECTRIC HYDRAULIC

PRESSURE TESTING	HYDROSTATIC SHELL TEST @ <u>1200</u> PSIG. FOR <u>1</u> <input checked="" type="checkbox"/> HR <input type="checkbox"/> MIN <input checked="" type="checkbox"/> TEST OK GAGE NO. <u>CR-0021</u>
	HYDROSTATIC SEAT TEST #1 @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN <input checked="" type="checkbox"/> TEST OK GAGE NO. <u>CR-0021</u>
	HYDROSTATIC SEAT TEST #2 @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN <input checked="" type="checkbox"/> TEST OK GAGE NO. <u>CR-0021</u>
	BLOCK & BLEED BOTH SEATS @ <u>840</u> PSIG. FOR <u>5</u> <input type="checkbox"/> HR <input checked="" type="checkbox"/> MIN <input checked="" type="checkbox"/> TEST OK GAGE NO. <u>CR-0021</u>
	AIR/GAS SHELL TEST @ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN <input type="checkbox"/> TEST OK GAGE NO. _____
	AIR/GAS SEAT TEST #1 @ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN <input type="checkbox"/> TEST OK GAGE NO. _____ SEAT #2 @ _____ PSIG. FOR _____ <input type="checkbox"/> HR <input type="checkbox"/> MIN <input type="checkbox"/> TEST OK GAGE NO. _____

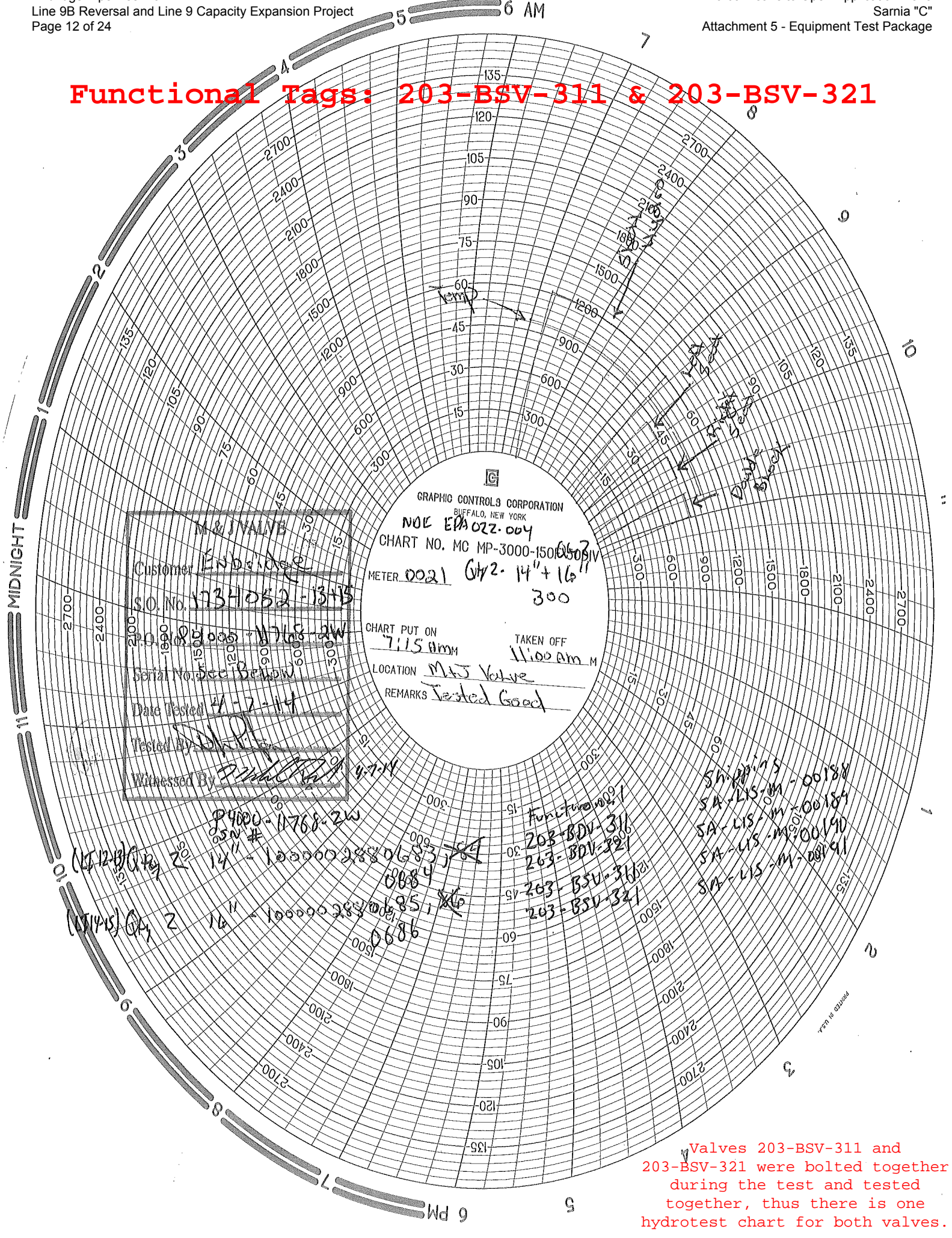
FUNCTIONAL TESTING	PULL TEST VALVE OPENED WITH SEAT #1 @ _____ PSIG. <input type="checkbox"/> SEAT RETEST OK VALVE OPENED WITH SEAT #2 @ _____ PSIG. <input type="checkbox"/> SEAT RETEST OK
	TORQUE TEST _____ FT.-LBS TO OPEN VALVE WITH SEAT #1 @ _____ PSIG. <input type="checkbox"/> OK _____ FT.-LBS TO OPEN VALVE WITH SEAT #2 @ _____ PSIG. <input type="checkbox"/> OK _____ FT.-LBS TO OPEN @ 0 PSIG. _____ FT.-LBS TO CLOSE @ 0 PSIG.

VERIFICATION	VALVE STROKE FULL OPEN / FULL CLOSE <input checked="" type="checkbox"/> YES BOLTING TIGHTNESS AFTER TEST ? <input checked="" type="checkbox"/> OK
	SET PRESSURE _____ PSIG. @ _____ PSIG. N2 LD. PILOT SN _____
	VALVE ASSEMBLED BY: <u>1st + 2nd shift</u> DATE: <u>4-5-14</u>
	VALVE TESTED BY: <u>[Signature]</u> DATE: <u>4-7-14</u>
TEST WITNESSED BY: <u>[Signature]</u> DATE: <u>4-7-14</u>	



COMMENTS: Michael Edwards - Enbridge. Designate
Runtime - open + close - 167 sec
PG-0058

Functional Tags: 203-BSV-311 & 203-BSV-321



Valves 203-BSV-311 and 203-BSV-321 were bolted together during the test and tested together, thus there is one hydrotest chart for both valves.

Triple-Offset Valve
Functional Tag: 204-V-322

Hydrostatic Test Package

United Valve Pressure Test Report

9916 Gulf Freeway
 Houston, Texas 77034

Date: 08/12/2014		Work Order#: 90745		
Customer: Zwick Valves North America, LLC		Customer PO#: ZPO-1308-012		
customer address Zwick Valves North America, LLC 2552 South Battleground Deer Park, TX 77536				
work performed Model: I1-0600X-ZA11SA Serial No: 13-08-56315 Tag: 204-V-322 Heat: A5696 1) 1 hr chart recorded shell test per Enbridge Spec EES110-2011 with witness 8/12 @ 8 AM 2) Provide gauge calibration				
type of test API 598		tested by Jose A. Flores		
line item description 24 150 ZWICK WCB BUTTERFLY				
item#	body heat#	bonnet heat#	serial#	notes
01	A5696	XXXXXXXXXX	13.08.56315	PASSED

END OF TEST REPORT

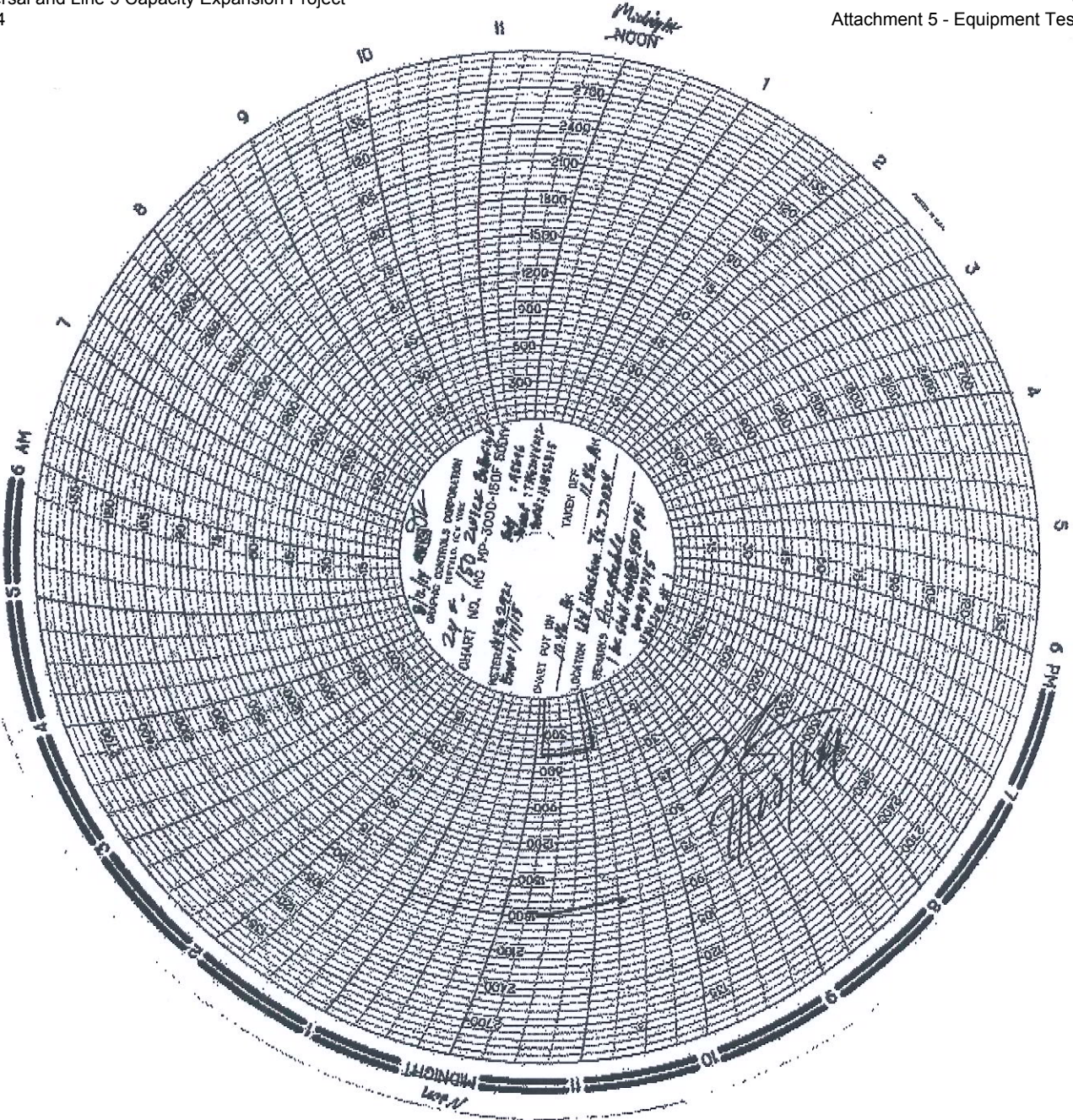
The above items were tested in accordance with API 598
 and passed all the criterion as listed below:

Test parameters: L/P Seats:
 H/P Seats:

Backseat:
 Shell: 450 PSI Duration: 60 MIN

Test certified by: Jose A. Flores
 Jose A. Flores

Test witnessed by: Tim Shaw
 Tim Shaw - Enbridge Witness



Triple-Offset Valve
Functional Tag: 204-V-242

Hydrostatic Test Package

United Valve Pressure Test Report

9916 Gulf Freeway
 Houston, Texas 77034

Date: 08/12/2014		Work Order#: 90745		
Customer: Zwick Valves North America, LLC		Customer PO#: ZPO-1308-012		
customer address Zwick Valves North America, LLC 2552 South Battleground Deer Park, TX 77536				
work performed Model: 11-0600X-ZA11SA Serial No: 13-08-56316 Tag: 204-V-242 Heat: C5422 1) 1 hr chart recorded shell test per Enbridge Spec EES110-2011 with witness 8/12 @ 8 AM 2) Provide gauge calibration				
type of test API 598		tested by Jose A. Flores		
line item description 24 150 ZWICK WCB BUTTERFLY				
item#	body heat#	bonnet heat#	serial#	notes
02	C5422	XXXXXXXXXX	13.08.56316	PASSED

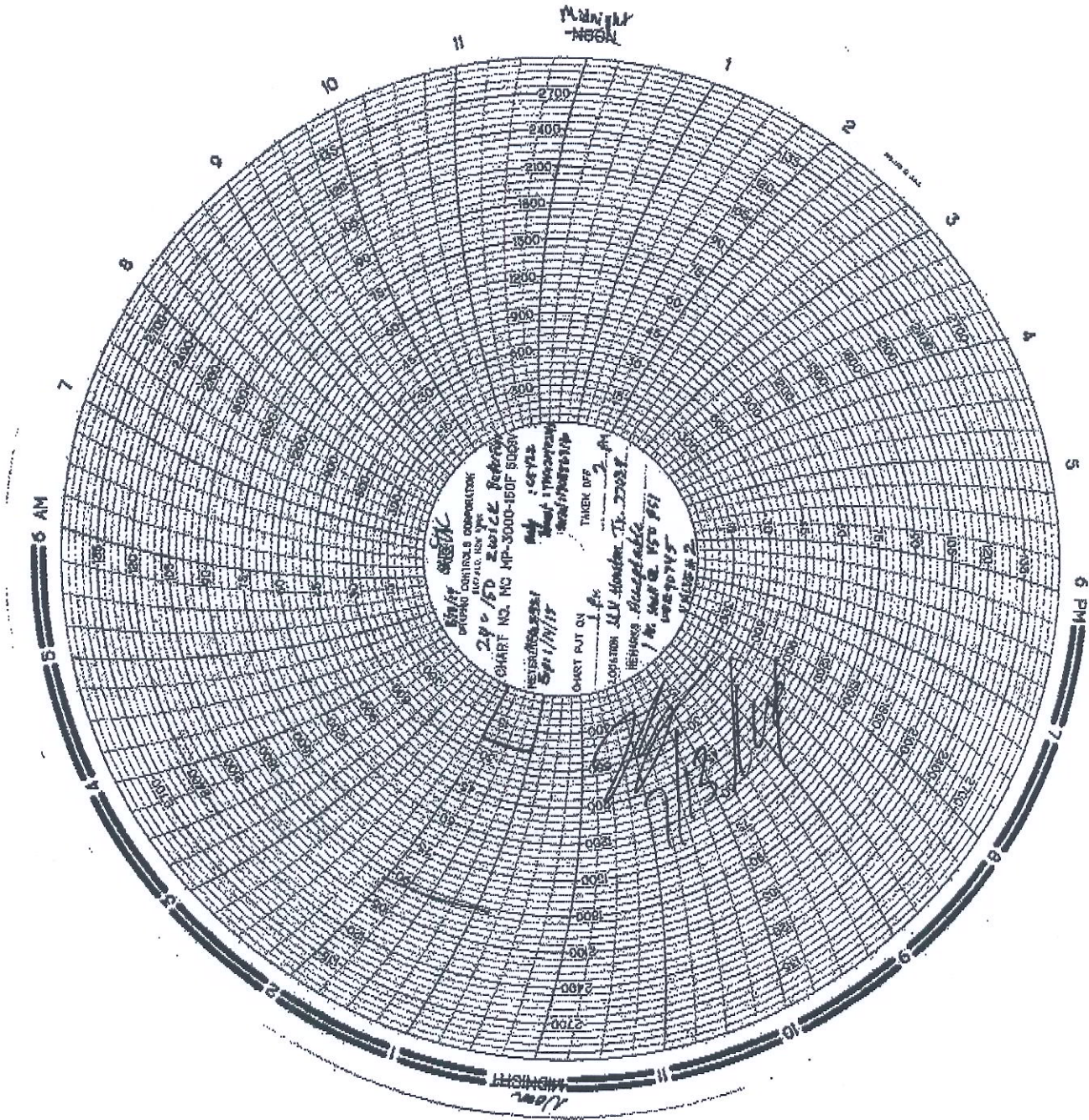
END OF TEST REPORT

The above items were tested in accordance with API 598
 and passed all the criterion as listed below:

Test parameters: L/P Seats: _____ Backseat: _____
 H/P Seats: _____ Shell: 450 PSI Duration: 60 MIN

Test certified by: Jose A. Flores
 Jose A. Flores

Test witnessed by: Tim Shaw
 Tim Shaw - Enbridge Witness



Triple-Offset Valve
Functional Tag: 204-V-232

Hydrostatic Test Package

United Valve Pressure Test Report

9916 Gulf Freeway
Houston, Texas 77034

Date: 08/12/2014		Work Order#: 90745		
Customer: Zwick Valves North America, LLC		Customer PO#: ZPO-1308-012		
customer address Zwick Valves North America, LLC 2552 South Battleground Deer Park, TX 77536				
work performed Model: II-0600X-ZA11SA Serial No: 13-08-56317 Tag: 204-V-232 Heat: C5434 1) 1 hr chart recorded shell test per Enbridge Spec EES110-2011 with witness 8/12 @ 8 AM 2) Provide gauge calibration				
type of test API 598		tested by Jose A. Flores		
line item description 24 150 ZWICK WCB BUTTERFLY				
item#	body heat#	bonnet heat#	serial#	notes
03	C5434	13,08,56317	13,08,56317	PASSED

END OF TEST REPORT

The above items were tested in accordance with API 598
and passed all the criterion as listed below:

Test parameters: L/P Seats:
H/P Seats:

Backseat:
Shell: 450 PSI Duration: 60 MIN

Test certified by:

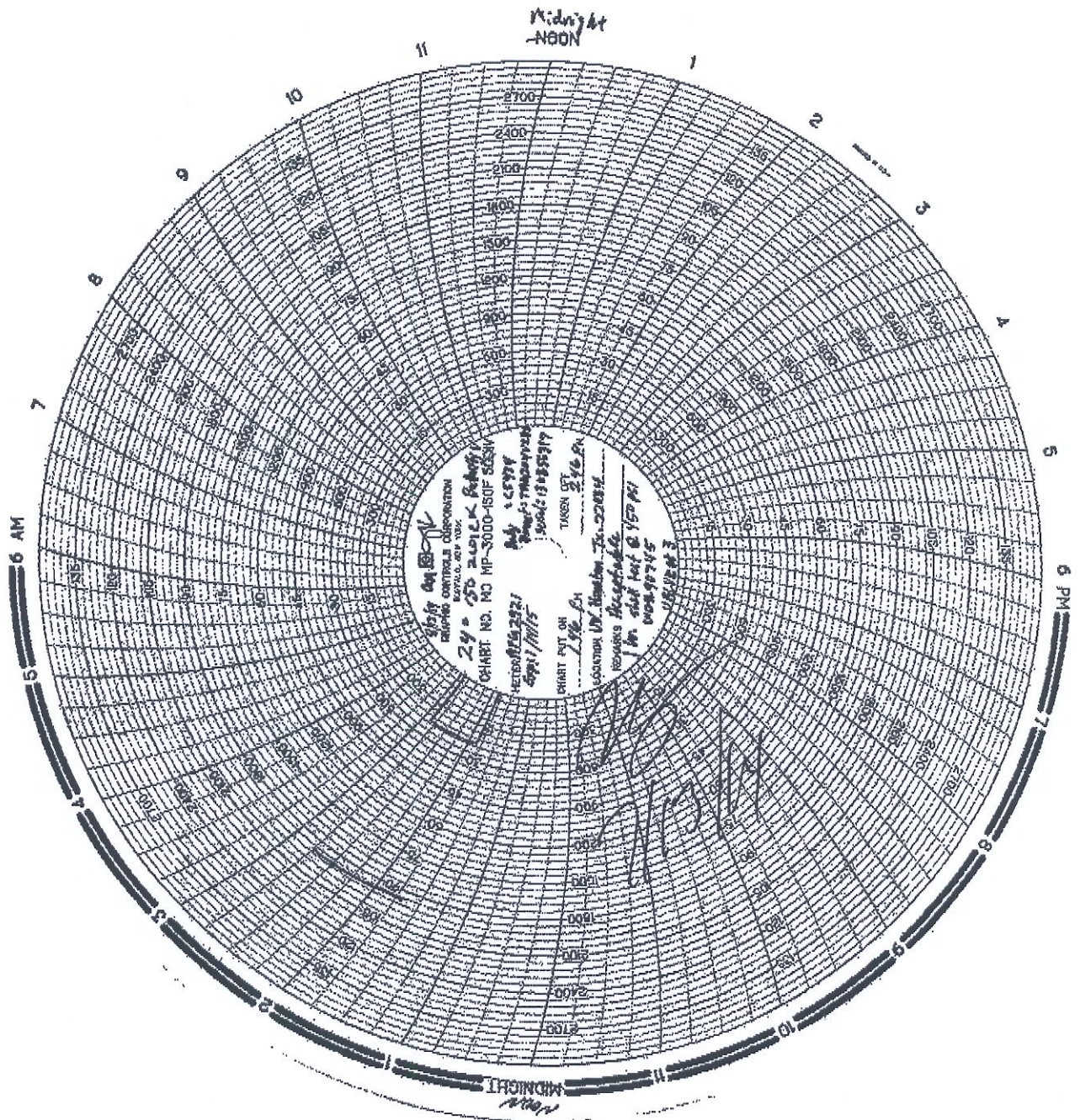
Jose A. Flores

Jose A. Flores

Test witnessed by:

Tim Shaw of *Enbridge*

Tim Shaw - Enbridge Witness



Triple-Offset Valve
Functional Tag: 204-V-222

Hydrostatic Test Package

United Valve Pressure Test Report

9916 Gulf Freeway
 Houston, Texas 77034

Date: 08/12/2014		Work Order#: 90745		
Customer: Zwick Valves North America, LLC		Customer PO#: ZPO-1308-012		
customer address Zwick Valves North America, LLC 2552 South Battleground Deer Park, TX 77536				
work performed Model: 11-0600X-ZA11SA Serial No: 13-08-56318 Tag: 204-V-222 Heat: A5693 1) 1 hr chart recorded shell test per Enbridge Spec EES110-2011 with witness 8/12 @ 8 AM 2) Provide gauge calibration				
type of test API 598		tested by Jose A. Flores		
line item description 24 150 ZWICK WCB BUTTERFLY				
item#	body heat#	bonnet heat#	serial#	notes
04	A5693	13-08-56318	13,08,56318	PASSED

END OF TEST REPORT

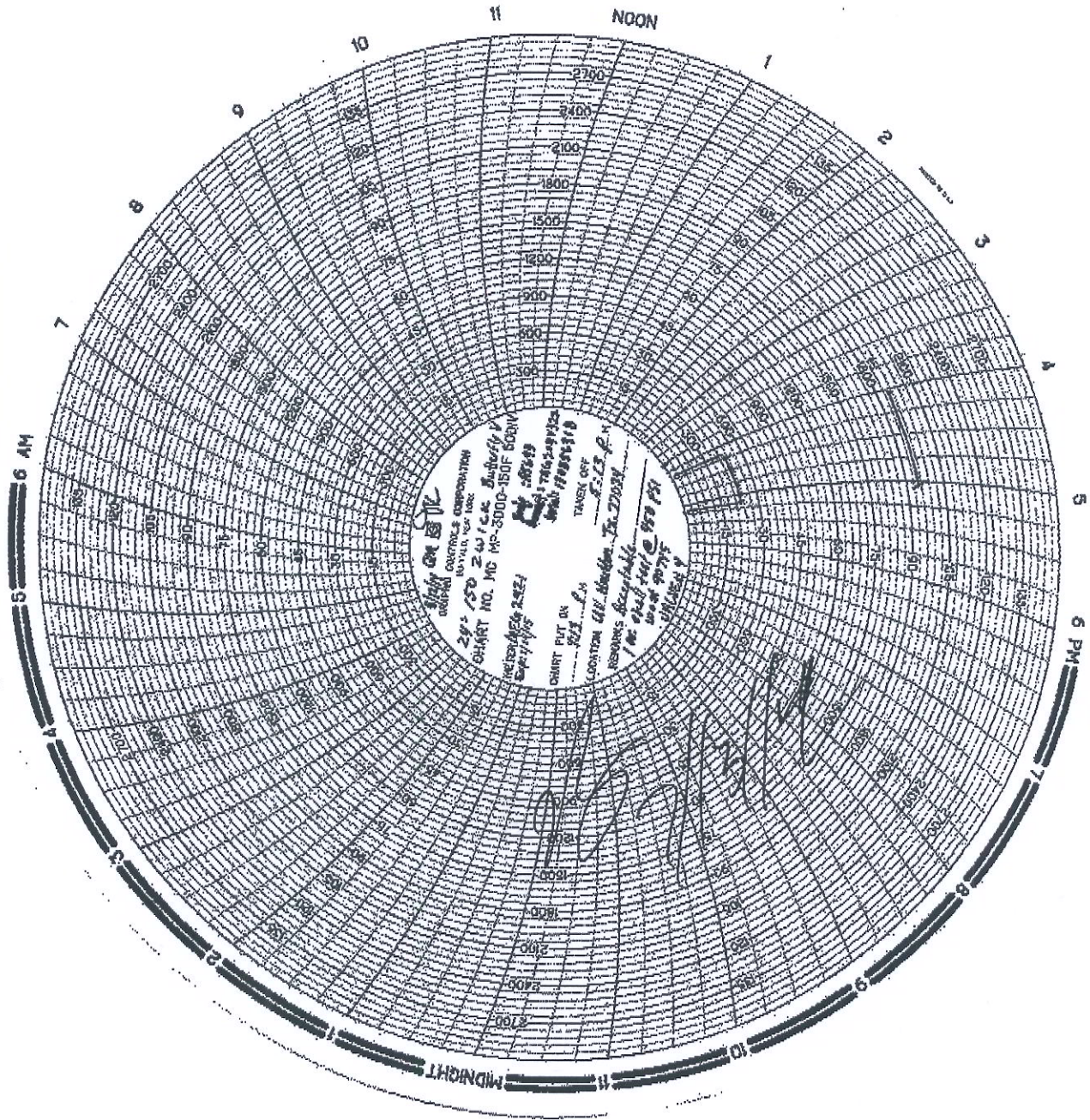
The above items were tested in accordance with API 598
 and passed all the criterion as listed below:

Test parameters: L/P Seats:
 H/P Seats:

Backseat:
 Shell: 450 PSI Duration: 60 MIN

Test certified by: Jose A. Flores
 Jose A. Flores

Test witnessed by: Tim Shaw of _____
 Tim Shaw - Enbridge Witness



CFCS-FRM-RHT-016-r01.docx
November 2010

Request for Hydrotest

Canadian Facilities Construction Services



Contractor LamSar Inc. Test No.: 4450-25
Location LamSar Shop Test Date: Aug 2/2014
AFE/Project: 1241237A80 (LIS) Job Description: SA Line 9B Reversal /Expansion

Hydrotest Drawing Number D-9-3.01-HT961-2-190LIS Q445

Test Media WATER Yes AIR _____ OTHER _____

Volume (m³) 4.9 m3

Pipe Sizes 30"

Pipe Grade CSA Gr.448 Cat 1

Test Media Source Shop Potable Water

Permit No N/A Federal N/A Provincial N/A Municipal N/A

Authorization/Permission	<i>Adam Morrison Peter Miller</i>
Treatment prior to test	<u>N/A</u>
Treatment after test	<u>N/A</u>
Disposal of test media	<u>To shop drains</u>
Notes	

Adam Morrison -
Enbridge Inspector -
who approved the
results of the test
on August 5, 2014

Peter Miller -
Enbridge Inspector who
witnessed the test on
August 2, 2014

Requested by:

Name (Print): Terry Morden

Signature: *Terry Morden*

Date: July 30/2014

MPFCS-CKL-HTQC-025-r00.docx

December 2010

Hydrostatic Test QA Checklist

Canadian Facility Construction Services



Contractor: LamSar Inc.

Date: Aug 2/2014

Project: SA Line 9B Reversal/ Expansion

Test No.: 4450-25

Location: LamSar Shop

AFE#: 1241237A80 (LIS)

CWP #: N/A

This checklist must be completed and attached to the hydrostatic test records prior to turnover. The following information must be completed prior to the hydrostatic tests as per Operations and Maintenance Manual Book 3: Pipeline Facilities, Section 07-02-01:

Task	Yes / No	Date	NOTES
Notifications		02/08/2014	
Test Section Drawing		02/08/2014	
Review Materials Documentation		02/08/2014	
Establishing intended maximum operating pressure (MOP), and for deviations to existing MOP approval by Engineering		02/08/2014	
All NDE Reviewed		02/08/2014	
Equipment List		02/08/2014	
Pre Hydro-Package Approvals		02/08/2014	
Environmental Concerns / Issues		N/A	
Safety precautions specific to the circumstances, including setback distances for workers and the public		N/A	
Pre-job Meeting with Workers		02/08/2014	Adam Morrison - Enbridge Inspector who approved the results of the test on August 5, 2014
Calibration of Test Instruments		02/08/2014	Peter Miller - Enbridge Inspector who witnessed the test on August 2, 2014
Pressure Recorder Set		02/08/2014	
Test Acceptance Criteria		02/08/2014	

Contractor Representative:

Company Representative:

Name (Print): Terry Morden

Name (Print): Adam Morrison Pete Miller
Andre Begin

Signature: *Terry Morden*

Signature: *Adam Morrison* *Pete Miller*

Date: Aug 2/2014

Date: Aug 5/14 Aug 2/2014

If the contractor has their own form that meets all information on this form the Contractor's form may be used.

Pressure Test Equipment Report

Canadian Facilities Construction Services



MPCFCS-PTR-065-R2

CONTRACTOR	LamSar Inc.	TEST DATE	Aug 2/2014
PROJECT	SA Line 9B Reversal/ Expansion	TEST No.	4450-25 (Tested with 4450-25A)
LOCATION	LamSar Shop	AFE	1241237A80 (LIS)
DRAWING #.	D-9-3.01-HT961-2-190LIS Q445	CWP #	N/A

PIPE DATA

NPS/OD	WT	Grade	Length	Manufacturer	Type
30"	15.88	Gr.448 CAT I	421"(10,679mm)	SeAH Steel Corp	CSA Z245 CAT I

TEST DATA

Test Medium	Fill Volume
Potable Water	4.9 Cubic Meter

	REFERENCE INSTRUMENTS			TEST EQUIPMENT				
	Deadweight Pressure	Liquid in Glass Thermometer		Pressure Recorder	Pressure Gauge	Temperature Recorder		
Make	Fluke	Fluke		Dri Flo II	Wika	Dri Flo II		
Range	0-5000 psi	- 238 to 1832 F		0-5000 psi	0-5000 psi	0 to 150 F		
Serial No.	2395137	26470619WS		2512-002659	LN-5000-52 LN-5000-53	2512-002675		
	CALIBRATION VERIFICATION BEFORE TEST				CALIBRATION VERIFICATION AFTER TEST			
	25% Test Pressure (T.P.)	50% T.P.	75% T.P.	100% T.P.	100% T.P.	75% T.P.	50% T.P.	25% T.P.
Deadweight	555.2psi	1110.5psi	1665.3psi	2220.4 psi	2220.8psi	1685.9psi	1110.6psi	555.2psi
Pressure Recorder	555psi	1110psipsi	1665psi	2220psi	2220psi	1685psi	1110psi	555psi
Pressure Gauge	555psi	1110	1665psi	2220psi	2220psi	1685psi	1110psi	555psi

Test	Aim Test Pressure	Minimum	Maximum	Duration
Strength	2200psig	2160psig	2246psig	1.25 hr
Leak	1620psig	1584psig	N/A	10 min.

See Accompanying Pages for Pressure and Temperature Records

Peter Miller - Enbridge Inspector who witnessed the test on August 2, 2014

ACTUAL TEST DURATION WAS 80min. (1.33hr)

Contractor Representative:

Enbridge Representative:

(Print) Terry Morden

(Sign)

Date: Aug 2/2014

(Print) Andre Begin *ADAM MORRISON*

(Sign)

Date: Aug 2/2014 *AUG 5/14*

Adam Morrison - Enbridge

Inspector who approved the results of the test on August 5, 2014

Pressure Test Data Report

Canadian Facilities Construction Services



F-INSP-066-FPTDR-R1.DOT

CONTRACTOR NAME: LamSar Inc.

LOCATION: LamSar Shop

PROJECT / AFE: SA Line 9B Reversal/ Expansion
1241237A80 (LIS)

TEST NO.: 4450-25 (Tested with 4450-25A)

DRAWING NO.: D-9-3.01-HT961-2-190LIS Q445

Page 1 of 2

TEST DATE: Aug 2/2014

CWP NO.: N/A

TIME	DEADWEIGHT PRESSURE psi	TEMPERATURE °F			REMARKS (Weather, Volumes Added/Bled Off)
		AMBIENT (Thermometer)	PIPE MEDIUM (Recorder)	GROUND Thermocouple)	
8:50	0.0	71.3	70	N/A	Begin Test, Run in Charts
9:00	0.0	71.4	70	N/A	Stabilize
9:10	555.2	71.6	70	N/A	Begin 25% Test Pressure Up
9:15	555.4	71.8	70	N/A	Stabilize
9:25	1110.5	72.0	70	N/A	Begin 50% Test Pressure Up
9:30	1110.7	72.1	70	N/A	Stabilize
9:40	1665.3	72.3	70	N/A	Begin 75% Test Pressure Up
9:45	1665.5	72.4	70	N/A	Stabilize
9:55	2220.4	72.5	70	N/A	Begin 100% Strength Test Press. Up
10:05	2220.5	72.7	70	N/A	Hold 1hr 15min
10:15	2220.5	72.8	70	N/A	Hold
10:25	2220.4	72.8	70	N/A	Hold
10:35	2220.4	72.9	71	N/A	Hold
10:45	2220.5	73.0	71	N/A	Hold
10:55	2220.6	73.1	71	N/A	Hold
11:05	2220.7	73.3	71	N/A	Hold
11:15	2220.8	73.4	71	N/A	End 100% Strength Test
11:20	1685.9	73.5	71	N/A	Begin 75% Leak Test Press. Down

Contractor Representative Terry Morden

Print

Sign _____

Date Aug 2/2014

Company Representative Peter Miller

Andre Begin ADAM MORRISON

Print

Sign _____

Date Aug 2/2014 AUG 5, 14

Peter Miller - Enbridge
 Inspector who witnessed
 the test on August 2, 2014

Adam Morrison - Enbridge Inspector
 who approved the results of the
 test on August 5, 2014

Pressure Test Data Report

Canadian Facilities Construction Services



F-INSP-066-FPTDR-R1.DOT

CONTRACTOR NAME: LamSar Inc.

LOCATION: LamSar Shop

PROJECT / AFE: SA Line 9B Reversal/ Expansion
1241237A80 (LIS)

TEST NO.: 4450-25 (Tested with 4450-25A)

DRAWING NO.: D-9-3.01-HT961-2-190LIS Q445

Page 2 of 2

TEST DATE: Aug 2/2014

CWP NO.: N/A

TIME	DEADWEIGHT PRESSURE psi	TEMPERATURE °F			REMARKS (Weather, Volumes Added/Bled Off)
		AMBIENT (Thermometer)	PIPE MEDIUM (Recorder)	GROUND Thermocouple)	
11:25	1686.2	73.6	71	N/A	Stabilize Hold Leak Test 10min
11:30	1686.5	73.7	71	N/A	End Leak Test
11:35	1110.6	73.8	71	N/A	Begin 50% test Pressure Down
11:40	1110.8	73.9	71	N/A	Stabilize
11:45	555.2	74.0	71	N/A	Begin 25% Test Pressure Down
11:50	555.4	74.1	71	N/A	Stabilize
12:00	0.0	74.2	71	N/A	Begin 0% Test Pressure Down
12:05	0.0	74.2	71	N/A	Run Out Charts
12:15	0.0	74.3	71	N/A	End Test

Contractor Representative Terry Morden

Print

Sign

Date Aug 2/2014

Company Representative Andre Begin

Print

Sign

Date Aug 2/2014

AVG 5, 14

Peter Miller - Enbridge
 Inspector who witnessed
 the test on August 2, 2014

Adam Morrison - Enbridge Inspector
 who approved the results of the
 test on August 5, 2014

