

Darwin City Gate

Coating Assessment Report

Document No. BGS-RP-A-0001 Rev A

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1 Introduction

DCVG surveys have been conducted at each scraper station along the Amadeus Gas Pipeline to give an indication of the condition of the coating at each site. However, the accuracy of these DCVG surveys at the scraper stations is uncertain due to the possibilities of CP shielding and interactions between different pipe sections.

To correlate the DCVG results to actual defects, 5 scraper stations and 5 MLV's have been selected to be excavated and to undergo coating assessment. The results of these 10 excavations and coating assessments will help determine the expected condition of the remaining stations and MLV's and feed into the decision to excavate them or not.

Darwin City Gate (DCG) is the first scraper station to be excavated and assessed. This report compares the DCVG results for DCG to the results of the coating assessment following excavation.

After coating assessments had been conducted, the station pipework was cleaned by abrasive blasting and recoated with Luxepoxy, a high build 2 part epoxy coating.

2 Method

In April 2012 a DCVG survey was conducted on the DCG scraper station. These results have been included in this report for comparison to determine if there is a good correlation between the DCVG survey data and actual coating defects.

The DCG site has been excavated and assessed (see Appendix 1). For major defects a coating defect assessment has been conducted, completed coating defect assessment forms are in Appendix 2. All sections of pipe with coating defects have been photographed, see Appendix 4 for a photo log.

To help number the defects, the station pipework has been categorised into several sections. A map showing the location of each section is showing in Appendix 1.

The results of the DCVG survey and the coating defects assessments have been compared to determine if there is a correlation between the DCVG survey and actual coating defects.



3 Results

3.1 DCVG

There were 8 areas highlighted as having coating defects by the DCVG survey. These defects are summarised in Table 1 below. Locations of each defect are shown on the drawings in Appendix 1.

Table 1: DCVG Detected Defects

DCVG Defect Number	Section	IR
1	Section A	7.8%
2	Section C	13.9%
3	MLV (Section H)	6.7%
4	Section E	15.6%
5	Section H	33.3%
6	Section H	24.4%
7	Section G	12%
8	Section F	33.3%

3.2 Coating Inspection

The coating found at Darwin City Gate was generally in poor condition. There was a large amount of blistering and the coating in places was falling away from the pipework. The extent of coating damage can be seen in Appendix 1 which shows a layout of the station with all the defects marked on it. Photos of the different sections of pipework can be found in Appendix 4.

There were a number of areas where the coating degradation was worse or more concentrated than the rest of the station. The following table lists these severe defect clusters that were found. For each of these defects, a coating damage assessment form was filled out (see Appendix 2).

Table 2: List of Severe Defects

ID	Section	Section Number	Defect Length (mm)	Defect Width (mm)	Correlation to DCVG	DCVG Survey IR
1	Section A	A1	Entire elbow covered with cracked paint.		Defect 1	7.8%
2	Section B	B1	Inside concrete support on blowdown line		Defect 8	33.3%
3	Section C	C1	Multiple coating defects		Defect 2	13.9%
4	Valve V07 (Section D)	D1	Multiple defects on valve		Defect 3	6.7%
5	Section D	D2	40	2	N/A	N/A
6	Section E	E1	7	7	N/A	N/A
7	Section E	E2	55	45	N/A	N/A
8	Section E	E3	15	5	N/A	N/A
9	Section E	E4	45	20	N/A	N/A
10	Section E	E5	18	7	N/A	N/A
11	Section E	E6	8	3	N/A	N/A
12	Valve V08 (Section E)	E7	Multiple defects on valve		Defect 4	15.6%
13	Section E	E8	Excavation damage		N/A	N/A
14	Section G	G1	15	7	N/A	N/A
15	Section G	G2	Blistering of paint near support block over tee into blowdown stack		N/A	N/A
16	V49 (Section G)	G3	Blistering of paint along stem, minor defects under stem, flange and bottom of valve body.		Defect 7	12%
17	MLV (Section H)	H1	78	12	Defect 6	24.4%
18	12" riser (Section H_)	H2	Blistering of paint		Defect 5	33.3%
19	Section I	I1	65	8	N/A	N/A
20	Section I	I2	25	2	N/A	N/A
21	Section I	I3	2	2	N/A	N/A

3.3 Metal loss

There was no metal loss found at any of the coating defects.

A defect was found on the DN300 line leading to the pig receiver inlet in Section C (see Appendix 1); and a gouge was found on the DN300 line in Section I (see Appendix 1). The metal loss section of the coating damage assessment form was filled out for each defect (Appendix 3). There was no coating damage and no corrosion product found at either site of metal loss, it is therefore believed they were either mill or construction defects.

4 Discussion and Recommendations

The DCVG results were able to pick up some of the worst affected areas of the coating where there are a large number of defects, however it does not appear to detect all major defects. Overall the condition of the coating was much worse than the DCVG survey suggested and the degradation much more wide spread.

There was no metal loss found at any of the coating defects suggesting that shielding has not been an issue and that the cathodic protection system is working adequately.

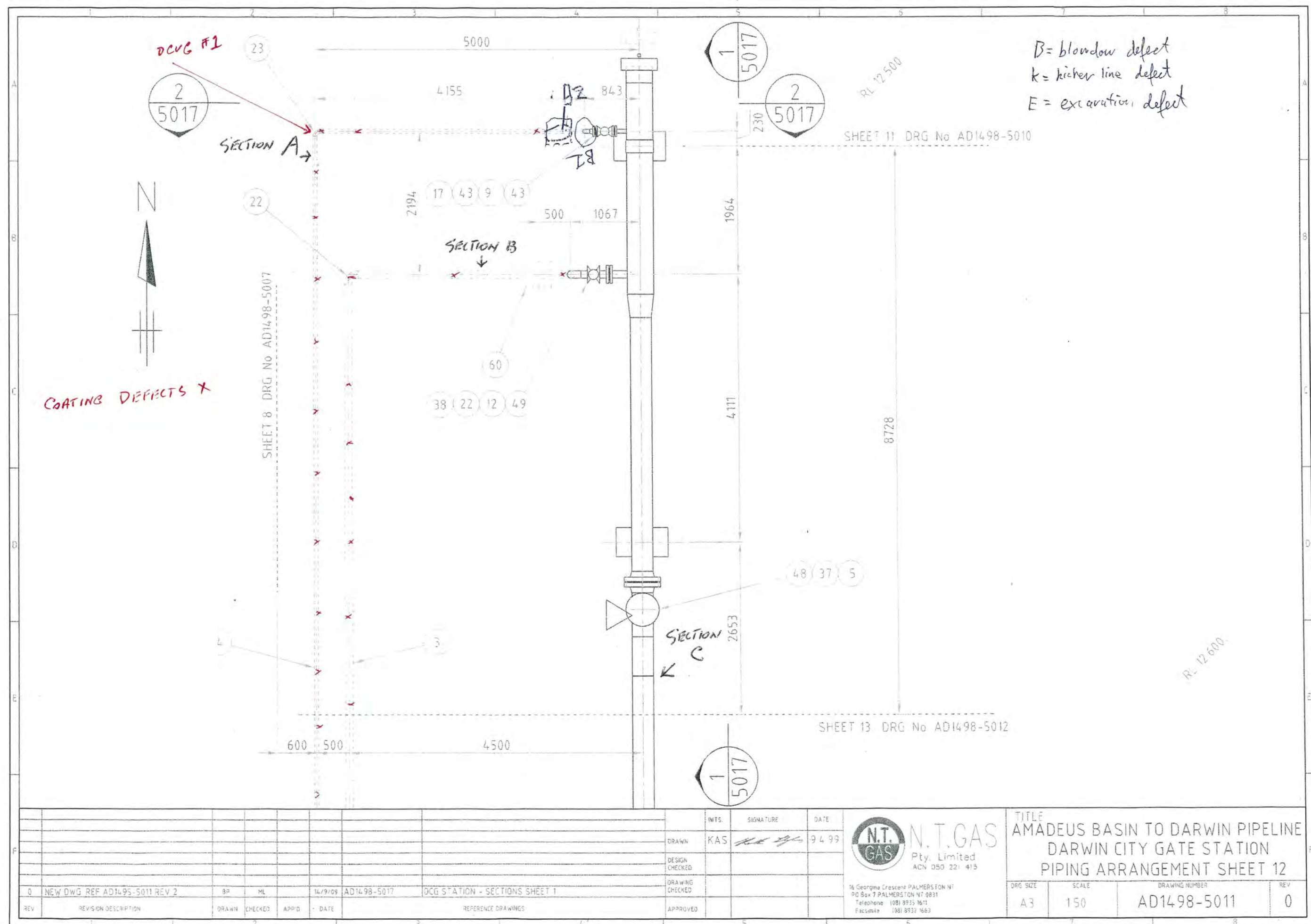
5 Conclusion

DCVG has been able to locate 8 significant defects generally consisting of large clusters of coating defects. However there are a large number of sever coating defects (13) that have not been detected by the DCVG survey.

The DCVG survey appears to be unable to determine the extent of the coating damage on the station pipework. The DCVG survey showed only 8 significant defects, however there were 21 recorded sever defects. The DCVG survey also does not show the overall condition of the pipework coating which was considered poor due to the large amount of blistering found. The DCVG survey does not appear to be a reliable method of determining station pipework coating condition, however this will be reassessed after more station coating inspections have been performed.

The only metal loss found at DCG is suspected to be either mill or construction defects. It is therefore concluded that the station cathodic protection is working and there are no shielding issues at the station.

Appendix 1 Station Layout



SHEET 12 DRG. No AD1498-5011

RL 12600

RL 12500

750 COVER

300 NB

50 NB

100 NB

DCVG DEFECT #2
SECTION C
COATING DEFECTS

SHEET 7 DRG No AD1498-5006

DCVG DEFECT #3

300 NB

200 NB

SHEET 14 DRG No AD1498-5013

DCVG DEFECT #4



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RL 12.300.

300 NB.

900 COVER

1 ← SECTION I

4950

504

49

2439

1254

254

41

50 NB.

66 54

26

- DEPEND ON SURVIVAL

DOUG
REPORT # 5

↑ ↑ COATING DEFECT
SECTION H

DCVG DEFECT #6

GROVE SERIAL No. 711377

NOVG DIELECT # 7

CP TEST POINT
DRG. No. TY0000-9003
CONTINUED ON SHEET 5

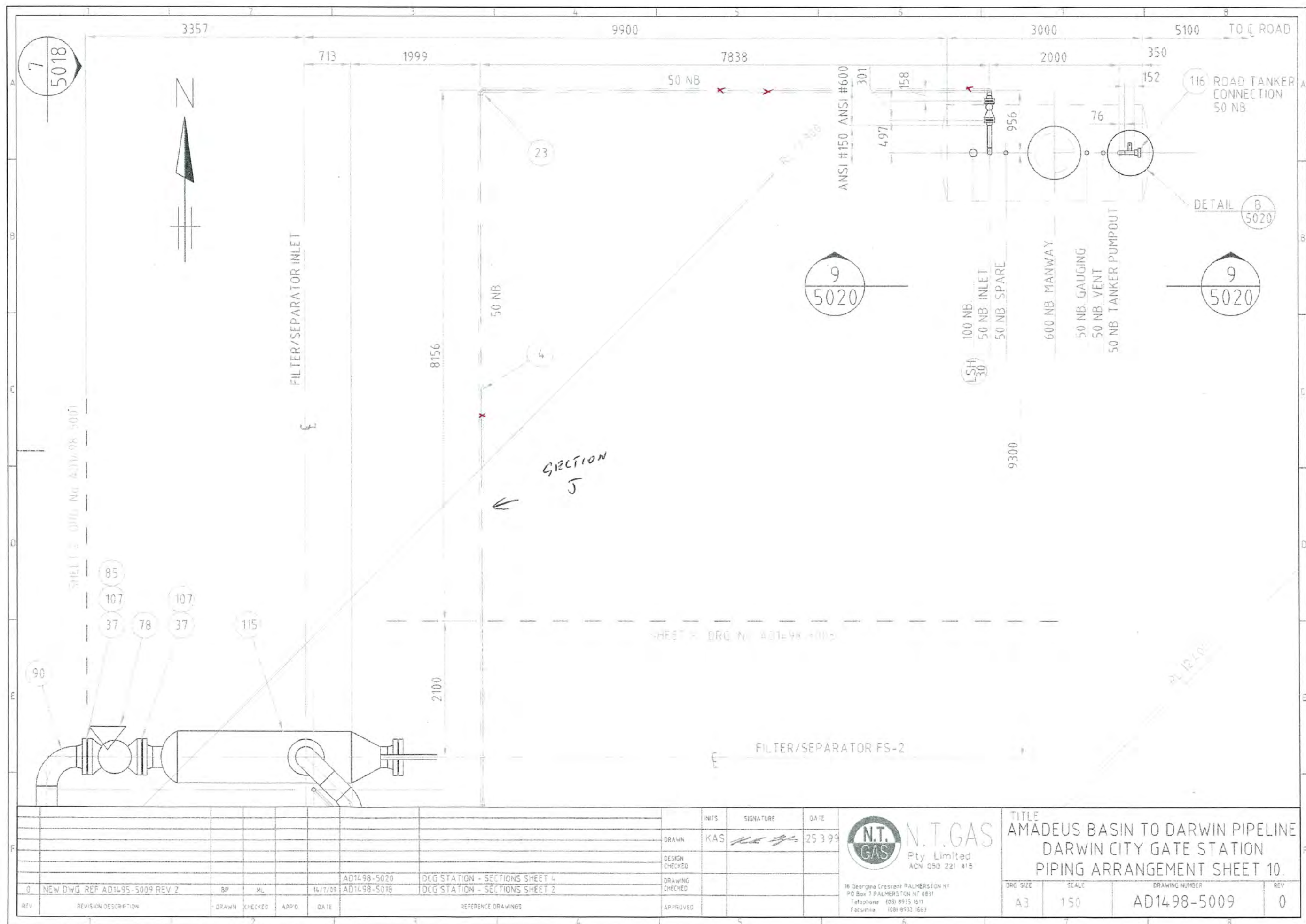
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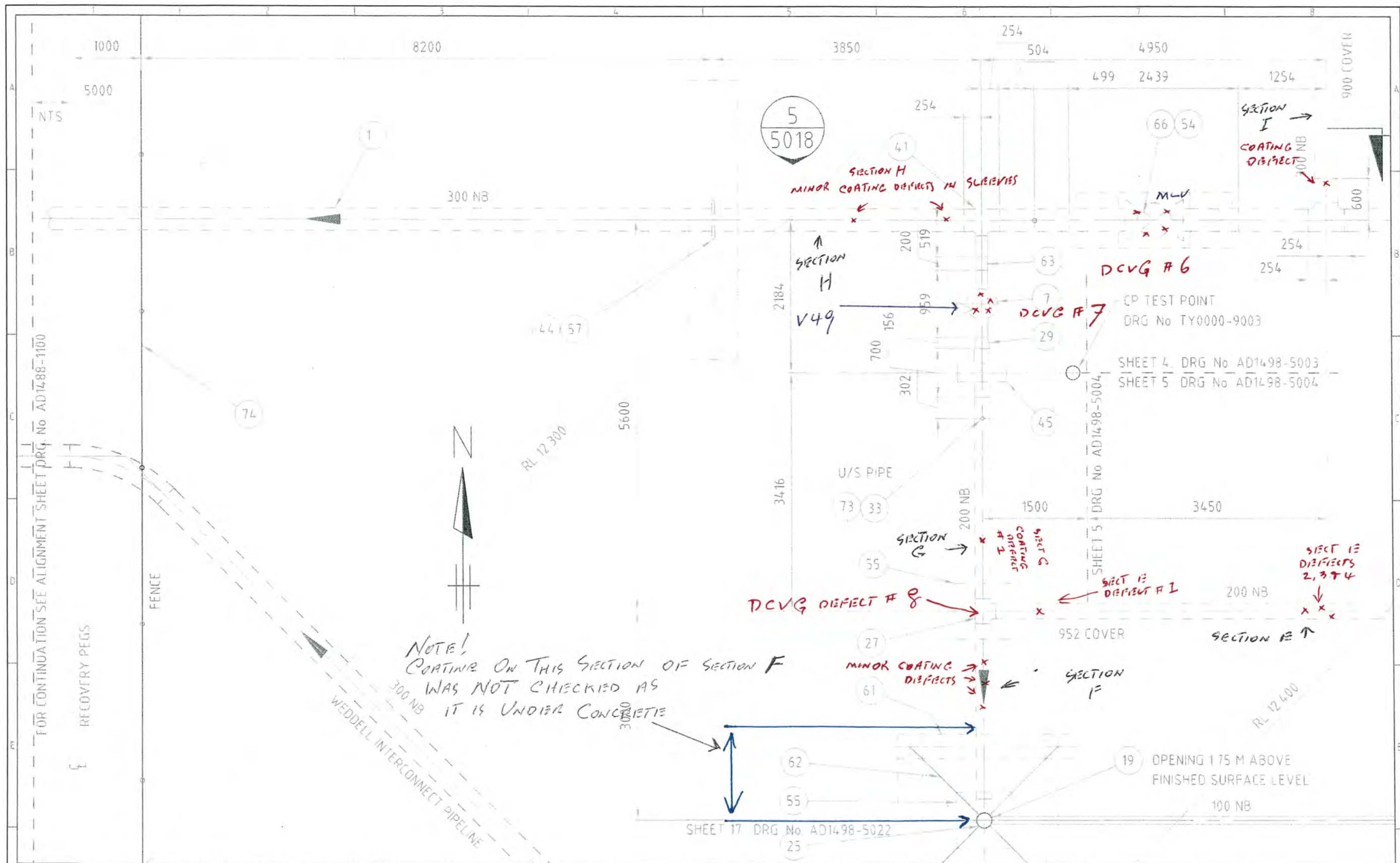
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U/S PIPE

F

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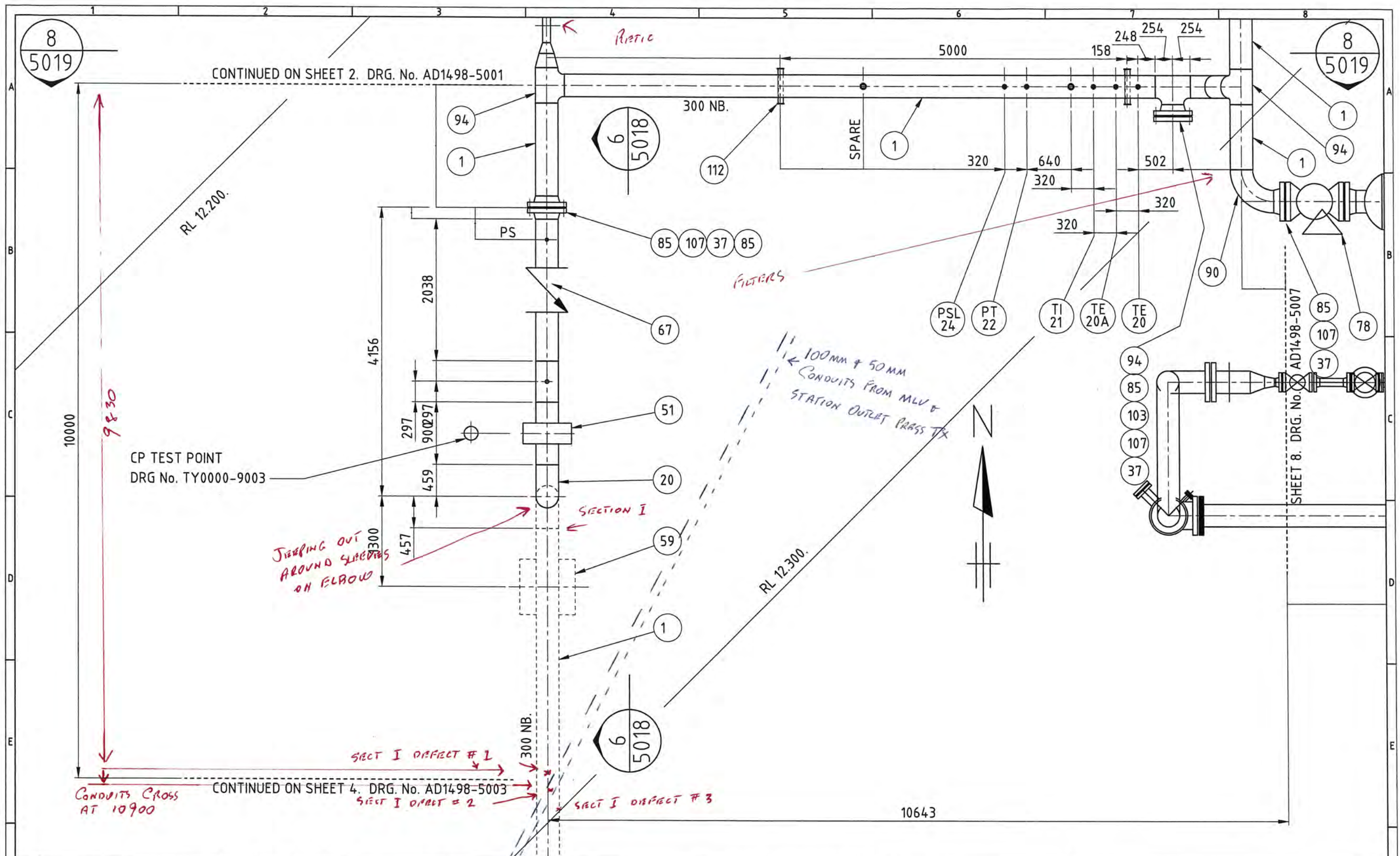


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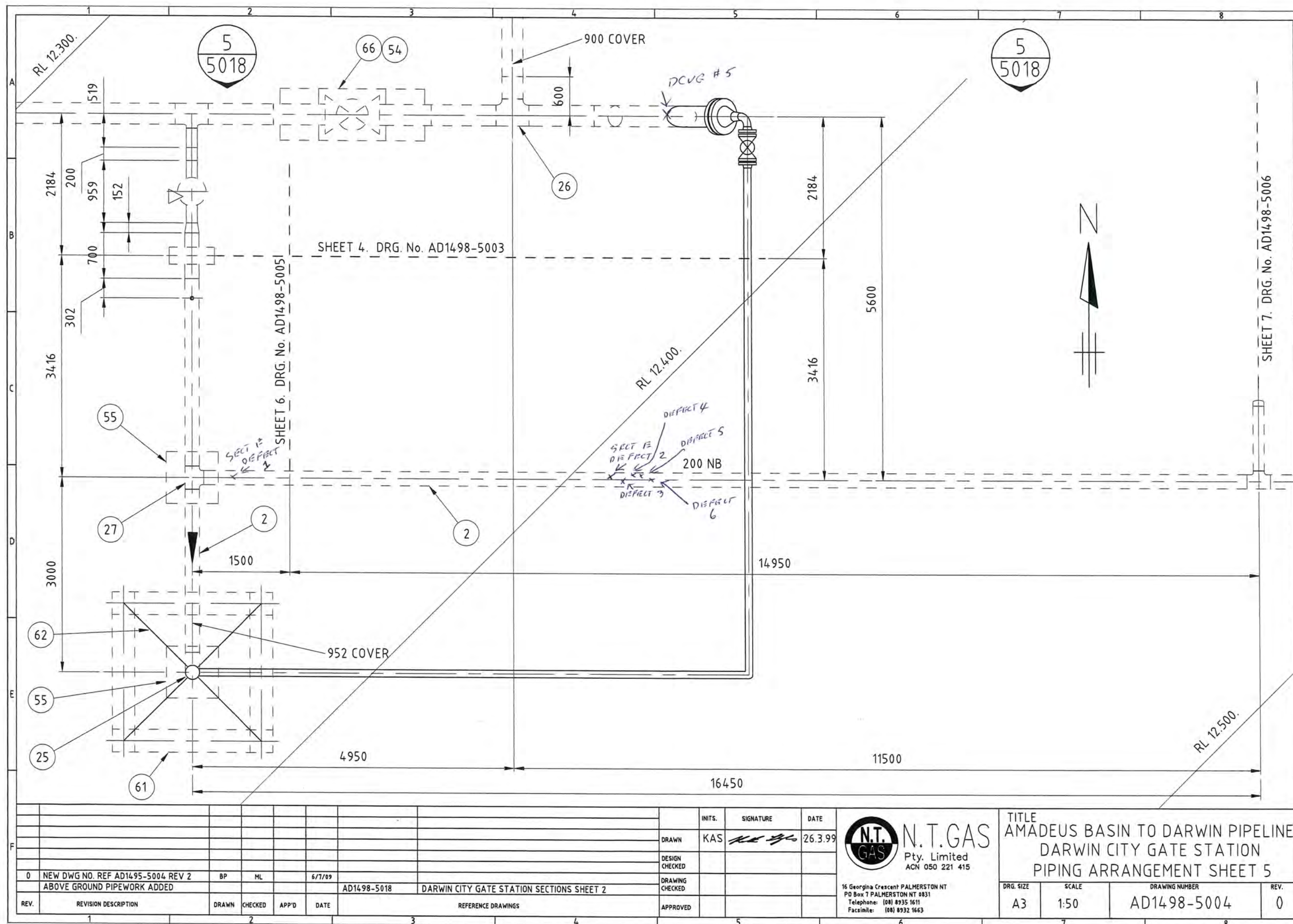


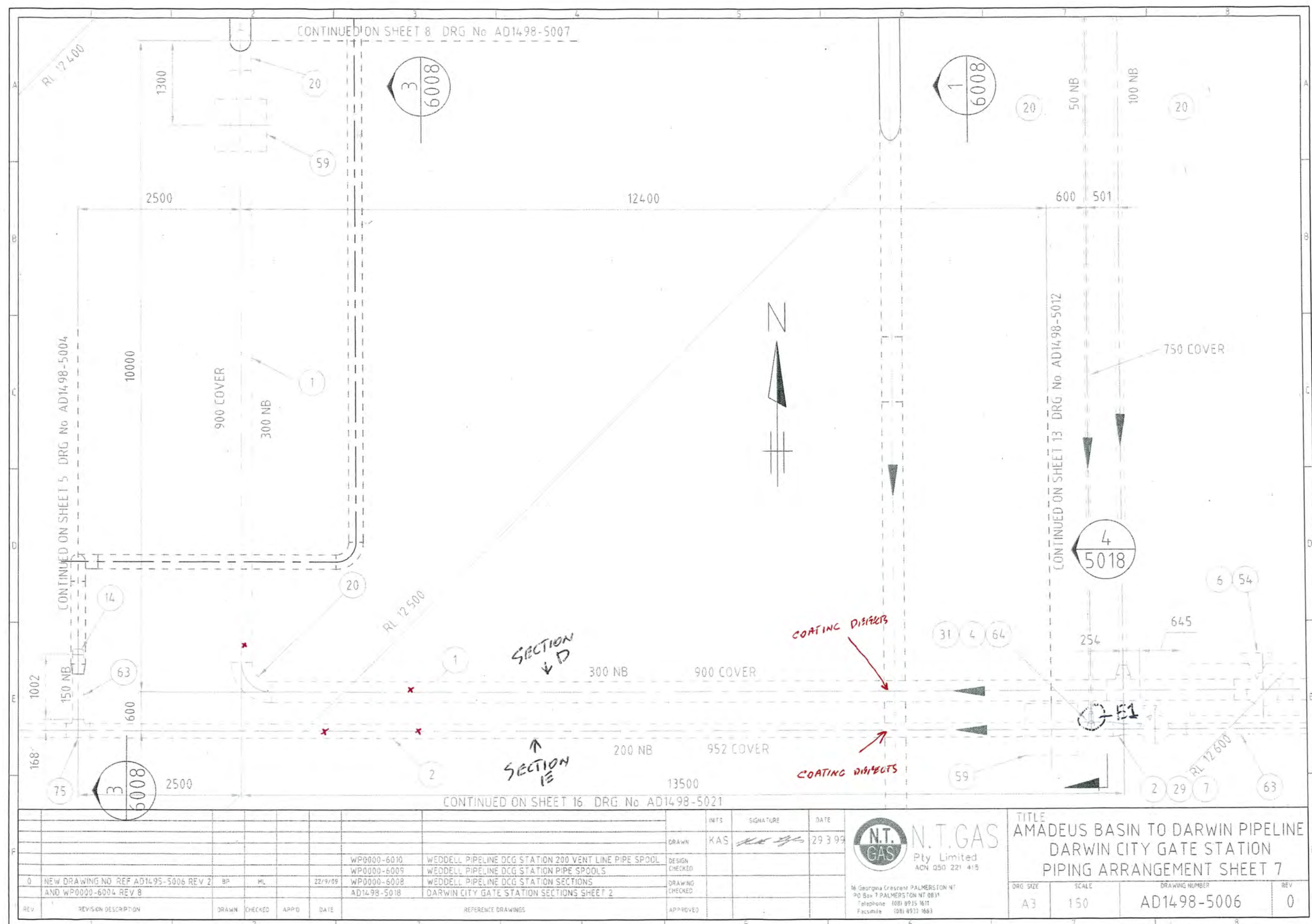
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Telephone (08) 8935 1611
Facsimile (08) 8932 4661



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Appendix 2 Coating Damage Assessment Forms

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG Excavation Date: 19/7/2012
 Section: A Digup Reason: COATING INSPECTION
 Kilometre Point: DCVG #1 DCVG Measurement: 7.8
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124343
 Northing: _____
 Surrounding Description: INSIDE COMPOUND
 (Buildings, drains, etc)

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0034, 0049, 0048</u>
Pipe with coating removed	<u>0440, 0441, 0444</u>
Pipe cleaned	<u>0440, 0441, 0444</u>
Pipe repaired	<u>0609</u>

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.90 Soil pH: 5-6Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m**Coating**

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)? YAny white buildup from cathodic protection (Y/N)? NAny evidence of termite damage (Y/N)? NAny moisture inside the coating (Y/N)? NAny stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage reportHas the coating lifted away from the pipe (Y/N)? BUSTLING/CRACKS

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): _____ Coating Defect Width (mm): _____

Coating Defect Comments:

ENTIRE ELBOW COVERED WITH CRACKED PAINT

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

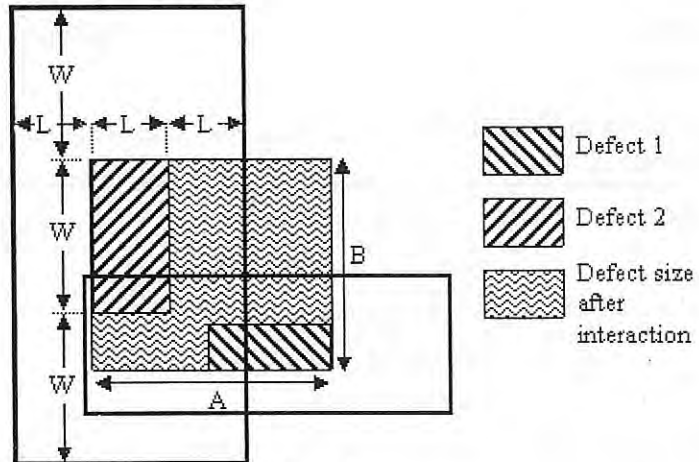


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

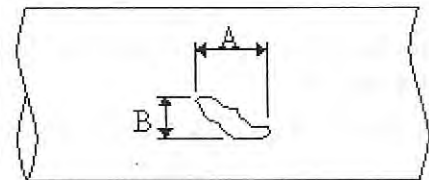


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

THIS COATING DEFECT WAS PAINTED DURING RECOAT
OF 50MM BLOW DOWN LINE.

Dig Up Comments:

Operator: 14120 FRY

Signature: [Signature]

Date: 14/8/2012

KP:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal

Work Order No:

COATING DAMAGE ASSESSMENT

Page 1

Location

Pipeline: DCG Excavation Date: 27/7/2012
 Section: B/DOWN LINE TIE Digup Reason: COATING INSPECTION
 Kilometre Point: (DCVG # 8) DCVG Measurement: 33.3
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124 343
 Northing: _____

Surrounding Description: _____

(Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0158, 0159, 0176, 0177</u>
Pipe with coating removed	
Pipe cleaned	<u>0389, 0388, 0391</u>
Pipe repaired	<u>0615, 0614, 0613</u>

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9 Soil pH: 5-6Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m**Coating**

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)? _____

Any white buildup from cathodic protection (Y/N)? _____

Any evidence of termite damage (Y/N)? _____

Any moisture inside the coating (Y/N)? _____

Any stress corrosion cracking (Y/N)? _____ If yes, complete APA pipeline damage report

N/A

Has the coating lifted away from the pipe (Y/N)? _____

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): _____ Coating Defect Width (mm): _____

Coating Defect Comments:

DCVG DEFECT IS INSIDE CONCRETE SUPPORT BLOCK. AROUND BLOW DOWN LINE TIE

AFTER BLASTING ALL PIPE WORK ENTERING BLOCK THERE WERE NO SIGNS OF CORROSION

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)? _____

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)? _____

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

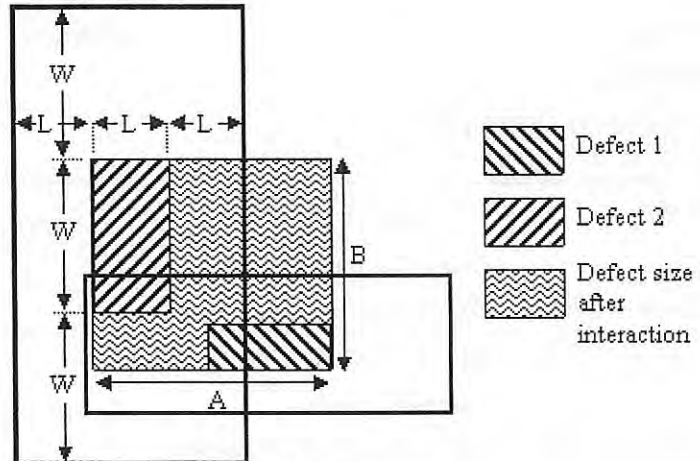


Figure 1

Maximum Depth (mm): _____

Wall thickness (mm): _____

Longitudinal dimension (A) (mm): _____

Circumferential dimension (B) (mm): _____

Clock Position (looking in direction of flow): _____

Distance from longitudinal weld (mm): _____

Distance from nearest girth weld (mm): _____
(if no girth weld has been found, do not excavate further)

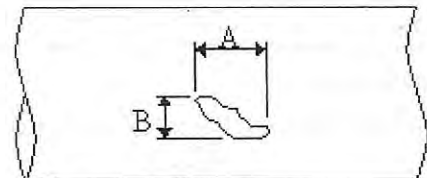


Figure 2

Repair

Length of Pipe Wrapped (mm): _____

Other Repair Information:

*THIS COATING DEFECT WAS RECOATED DURING RECOAT
OF SECTIONS E, F & G*

Dig Up Comments:

Operator: W. DUFFY

Signature: [Signature]

Date: 1/9/2012

KP:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal

Work Order No:

COATING DAMAGE ASSESSMENT

Page 1

Location

Pipeline: DARWIN CITY GATE Excavation Date: 21/7/2012
 Section: PIG RECEIVER INLET Digup Reason: COATING DEFECT
 Kilometre Point: SECT DC DCVC #2 DCVG Measurement: 13.9
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124343
 Northing: _____

Surrounding Description: _____

(Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0257, 0258, 0259</u>
Pipe with coating removed	<u>0269, 0270, 0271, 0272</u>
Pipe cleaned	<u>0269, 0270, 0271, 0272</u>
Pipe repaired	<u>0648</u>

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.5Soil pH: 5.5-6Pipe To Soil Potential (V): -1.060Soil Resistivity (Ohms): 300,000

Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)? YAny white buildup from cathodic protection (Y/N)? NAny evidence of termite damage (Y/N)? NAny moisture inside the coating (Y/N)? NAny stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage reportHas the coating lifted away from the pipe (Y/N)? N

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? N

Coating Defect Length (mm): _____

Coating Defect Width (mm): _____

Coating Defect Comments:

MULTIPLE COATING DEFECTS. JUST BELOW GROUND LEVEL

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)? _____

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)? _____

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

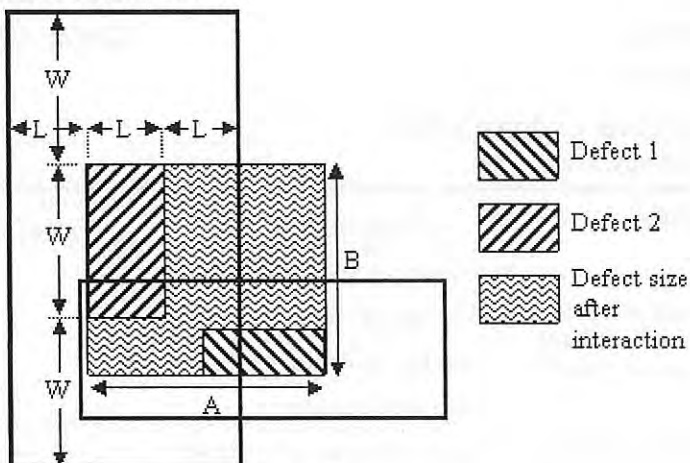


Figure 1

Maximum Depth (mm): _____

Wall thickness (mm): _____

Longitudinal dimension (A) (mm): _____

Circumferential dimension (B) (mm): _____

Clock Position (looking in direction of flow): _____

Distance from longitudinal weld (mm): _____

Distance from nearest girth weld (mm): _____
(if no girth weld has been found, do not excavate further)

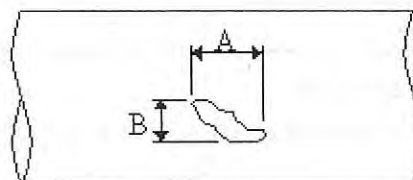


Figure 2

Repair

Length of Pipe Wrapped (mm): _____

Other Repair Information:

*THIS COATING DEFECT WAS PAINTED DURING RECOAT OF
SECTION C*

Dig Up Comments:

Operator: *Int. DUFFY*

Signature: _____

Date: *5/8/2012*

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

LocationPipeline: DARWIN CITY GATEExcavation Date: 21/7/2012Section: VALVE V07Digup Reason: COATING INSPECTIONKilometre Point: DCVG # 3DCVG Measurement: 6.7

Zone: _____

Defect Length from survey (m): _____

Easting: _____

CMMS Work Order No: 124343

Northing: _____

Surrounding Description: COMPOUND
(Buildings, drains, etc)**Photos**

- ☐ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0094, 0092, 0071</u>
Pipe with coating removed	
Pipe cleaned	
Pipe repaired	<u>0649, 0607</u>

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9Soil pH: 5.5Pipe To Soil Potential (V): -1.060Soil Resistivity (Ohms): 300000

Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)? _____

Any white buildup from cathodic protection (Y/N)? _____

Any evidence of termite damage (Y/N)? _____

Any moisture inside the coating (Y/N)? _____

Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report N/A

Has the coating lifted away from the pipe (Y/N)? _____

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): _____

Coating Defect Width (mm): _____

Coating Defect Comments:

COATING DEFECTS ARE PRESENT IN SEVERAL PLACES ON V07

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)? _____

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)? _____

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

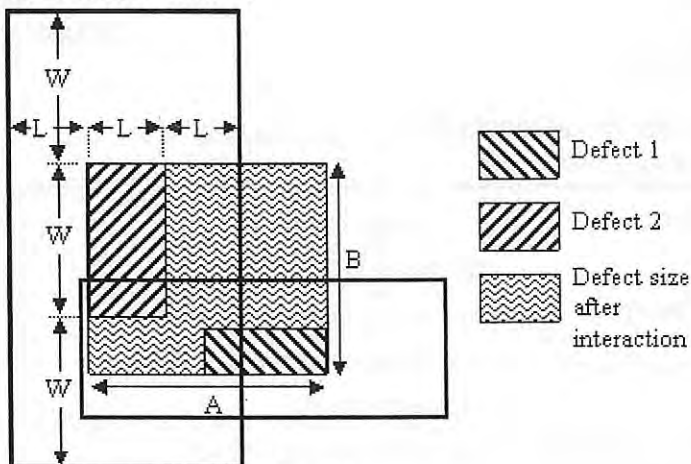


Figure 1

Maximum Depth (mm): _____

Wall thickness (mm): _____

Longitudinal dimension (A) (mm): _____

Circumferential dimension (B) (mm): _____

Clock Position (looking in direction of flow): _____

Distance from longitudinal weld (mm): _____

Distance from nearest girth weld (mm): _____

(if no girth weld has been found, do not excavate further)

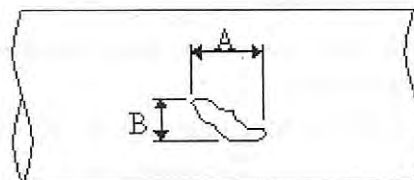


Figure 2

Repair

Length of Pipe Wrapped (mm): _____

Other Repair Information:

*THIS VALVE WAS PAINTED DURING THE RECOAT OF
STATION INLET PIPING, SECTION D*

Dig Up Comments:

Operator: *W. DUFFY*

Signature: *[Signature]*

Date: *9/3/2012*

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG Excavation Date: 26/7/2012
 Section: D, 300 mm INLET Digup Reason: COATING INSPECTION
 Kilometre Point: _____ DCVG Measurement: N/A
 Zone: _____ Defect Length from survey (m): N/A
 Easting: _____ CMMS Work Order No: 124343
 Northing: _____
 Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

☐ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0331, 0332</u>
Pipe with coating removed	<u>0353</u>
Pipe cleaned	<u>0353</u>
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9 Soil pH: 5.6-6.0Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): _____ Pin Spacing 1.5m**Coating**

Coating Description:

- ☒ Yellow Jacket
☐ Sleeve
☐ Wrapping
☐ FBE
☐ Paint

Is there a coating defect (Y/N)? ✓Any white buildup from cathodic protection (Y/N)? NAny evidence of termite damage (Y/N)? NAny moisture inside the coating (Y/N)? NAny stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage reportHas the coating lifted away from the pipe (Y/N)? N

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): 40 Coating Defect Width (mm): 2

Coating Defect Comments:

POSSIBLE SHOVEL IMPACT TO COATING WHEN WIEDRIEL PIPE LINE WAS LAYED

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

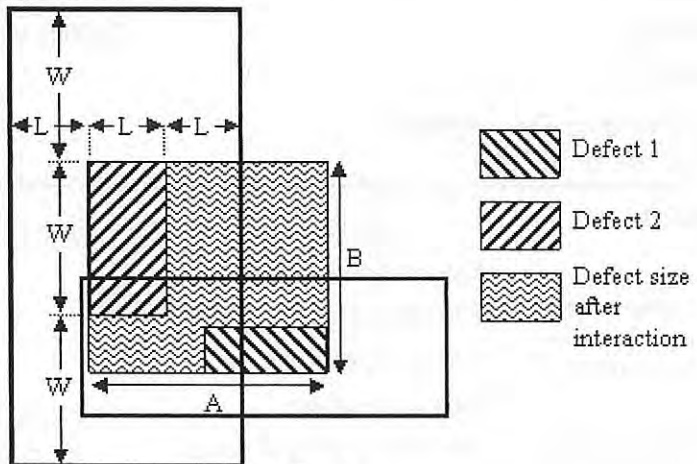


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

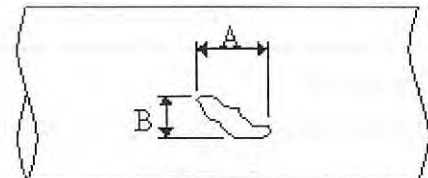


Figure 2

Repair

Length of Pipe Wrapped (mm): 4000

Other Repair Information:

THIS COATING REPAIR WAS PART OF A LARGER AREA
OF PIPELINE THAT WAS BLASTED & PAINTED

Dig Up Comments:

Operator: H.T.

Signature:

Date: 25/8/2012

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCC
 Section: E, DEFECT 1
 Kilometre Point: _____
 Zone: _____
 Easting: _____
 Northing: _____

Excavation Date: 28/7/2012
 Digup Reason: COATING INSPECTION
 DCVG Measurement: NIL
 Defect Length from survey (m): _____
 CMMS Work Order No: 124 343

Surrounding Description: _____

(Buildings, drains, etc)

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	0185
Pipe with coating removed	
Pipe cleaned	0390
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 950 mm Soil pH: 5.6Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m.**Coating**

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☐ FBE
☒ Paint

Is there a coating defect (Y/N)?

Any white buildup from cathodic protection (Y/N)?

Any evidence of termite damage (Y/N)?

Any moisture inside the coating (Y/N)?

Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report

Has the coating lifted away from the pipe (Y/N)?

If yes, how far around the pipe has it lifted (mm)?

Sketch of coating / corrosion damage completed (Y/N)?

Coating Defect Length (mm): 7 Coating Defect Width (mm): 7

Coating Defect Comments:

MINOR COATING DEFECTSAFTER BLASTING THERE WERE NO SIGNS OF CORROSION

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

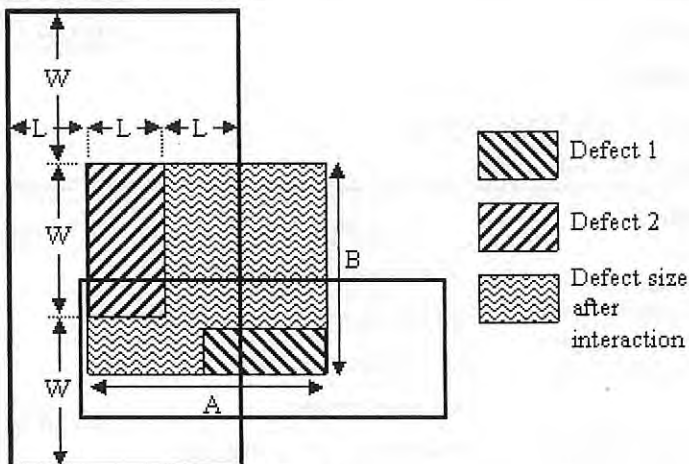


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

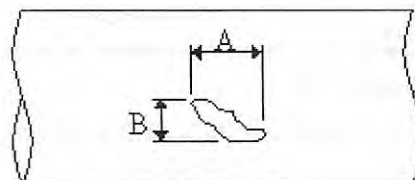


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

*THIS COATING REPAIR WAS PART OF THE COATING REPAIR ON
THE 200MM BLOW DOWN LINE, WHICH WAS COMPLETELY BLASTED
& PAINTED*

Dig Up Comments:

Operator: *W.D*

Signature: *[Signature]*

Date: *25/8 2012*

KP:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal

Work Order No:

COATING DAMAGE ASSESSMENT

Page 1

Location

Pipeline: DCC Excavation Date: 28/7/2012
 Section: E, DEFECT 2 Digup Reason: COATING INSPECTION
 Kilometre Point: _____ DCVG Measurement: N/A
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124 343
 Northing: _____
 Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0188,</u>
Pipe with coating removed	
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 1.0 Soil pH: 6
 Pipe To Soil Potential (V): _____ Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)?

Any white buildup from cathodic protection (Y/N)?

Any evidence of termite damage (Y/N)?

Any moisture inside the coating (Y/N)?

Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report

Has the coating lifted away from the pipe (Y/N)?

If yes, how far around the pipe has it lifted (mm)?

Sketch of coating / corrosion damage completed (Y/N)?

Coating Defect Length (mm): 55 Coating Defect Width (mm): 45

Coating Defect Comments:

LARGE ROCK FOUND AGAINST PIPE DURING EXCAVATIONAFTER BLASTING THERE WERE NO SIGNS OF METAL LOSS OR CORROSION

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

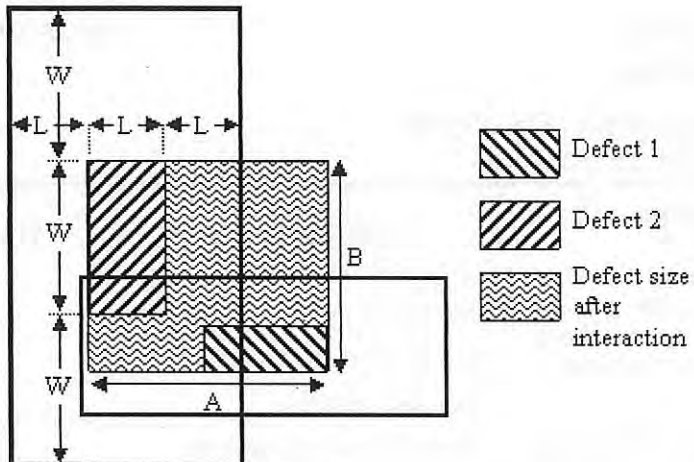


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

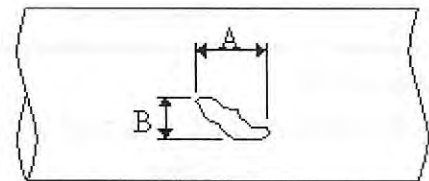


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

*THIS COATING REPAIR WAS PART OF THE COATING REPAIR ON
THE 200MM BLOW DOWN LINE, WHICH WAS COMPLETELY BLASTED &
PAINTED*

Dig Up Comments:

Operator: *J. DUFFY*

Signature: *[Signature]*

Date: *25/8/2012*

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG Excavation Date: 28/7/2012
 Section: E, DEFECT #3 Digup Reason: COATING INSPECTION
 Kilometre Point: _____ DCVG Measurement: NIL
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124 343
 Northing: _____
 Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0190</u>
Pipe with coating removed	
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 1.0Soil pH: 6

Pipe To Soil Potential (V): _____

Soil Resistivity (Ohms): 300,000

Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☐ FBE
☒ Paint

Is there a coating defect (Y/N)? YAny white buildup from cathodic protection (Y/N)? NAny evidence of termite damage (Y/N)? NAny moisture inside the coating (Y/N)? NAny stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage reportHas the coating lifted away from the pipe (Y/N)? N

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? NCoating Defect Length (mm): 15Coating Defect Width (mm): 5

Coating Defect Comments:

LARGE ROCK FOUND AGAINST PIPE DURING EXCAVATIONAFTER BLASTING THERE WERE NO SIGNS OF METAL LOSS OR CORROSION

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

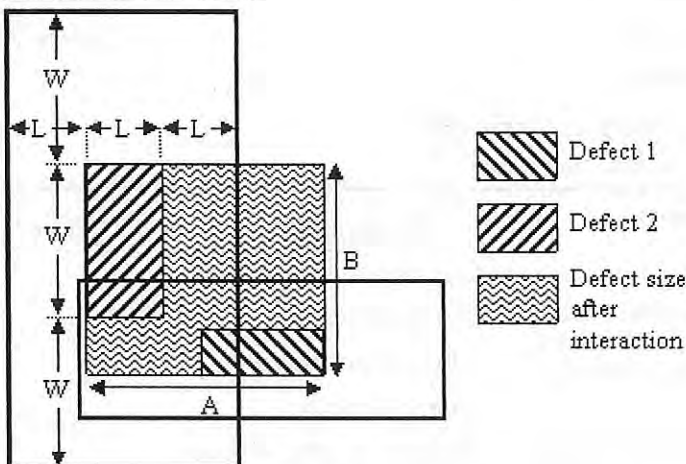


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

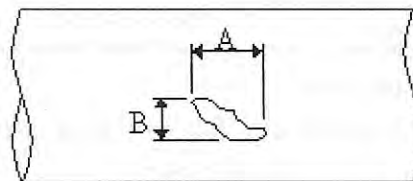


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

THIS COATING REPAIR WAS PART OF THE REPAIR ON THE
200MM BLOW DOWN LINE

Dig Up Comments:

Operator: H. DUFFY

Signature:

Date: 25/8/2012

KP:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal

Work Order No:

COATING DAMAGE ASSESSMENT

Page 1

Location

Pipeline: D C G
 Section: E, DEFECT #4
 Kilometre Point: _____
 Zone: _____
 Easting: _____
 Northing: _____

Excavation Date: 28/7/2012
 Digup Reason: COATING DEGRADATION
 DCVG Measurement: NIL
 Defect Length from survey (m): _____
 CMMS Work Order No: 124343

Surrounding Description: _____

(Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0191</u>
Pipe with coating removed	
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 1.0Soil pH: 6Pipe To Soil Potential (V): -1.060Soil Resistivity (Ohms): 300,000

Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☐ FBE
☒ Paint

Is there a coating defect (Y/N)? YAny white buildup from cathodic protection (Y/N)? NAny evidence of termite damage (Y/N)? NAny moisture inside the coating (Y/N)? NAny stress corrosion cracking (Y/N)? N/A

If yes, complete APA pipeline damage report

Has the coating lifted away from the pipe (Y/N)? N

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): 45Coating Defect Width (mm): 20

Coating Defect Comments:

LARGE ROCK FOUND AGAINST PIPE DURING EXCAVATIONAFTER BLASTING THERE WERE NO SIGNS OF METAL LOSS OR CORROSION

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

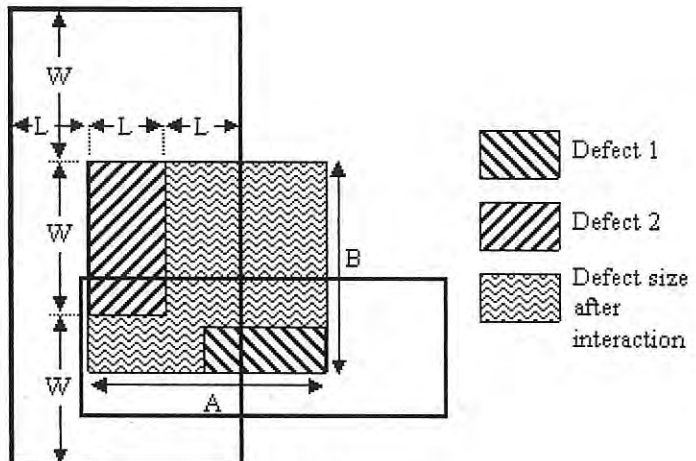


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

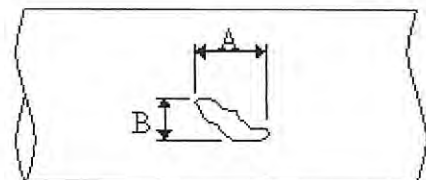


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

*THIS COATING REPAIR WAS PART OF THE COATING REPAIR
ON THE 200 MM ~~SLIP~~ BLOW DOWN LINE.*

Dig Up Comments:

Operator: *IAI DUFFY*

Signature:

Date: *25/8/2012*

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG Excavation Date: 28/7/2012
 Section: E DEFECT #5 Digup Reason: COATING INSPECTION
 Kilometre Point: 1 DCVG Measurement: NIL
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124 343
 Northing: _____

Surrounding Description: _____

(Buildings, drains, etc) _____

Photos
☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0192</u>
Pipe with coating removed	
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 1.0 Soil pH: 6Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m**Coating**

Coating Description: ☐ Yellow Jacket ☐ Sleeve ☐ Wrapping ☐ FBE ☒ Paint

Is there a coating defect (Y/N)? Y
 Any white buildup from cathodic protection (Y/N)? N
 Any evidence of termite damage (Y/N)? N
 Any moisture inside the coating (Y/N)? N
 Any stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage report
 Has the coating lifted away from the pipe (Y/N)? N
 If yes, how far around the pipe has it lifted (mm)? _____
 Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): 18 Coating Defect Width (mm): 7
 Coating Defect Comments: _____

AFTER BLASTING THERE WERE NO SIGNS OF CORROSION

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

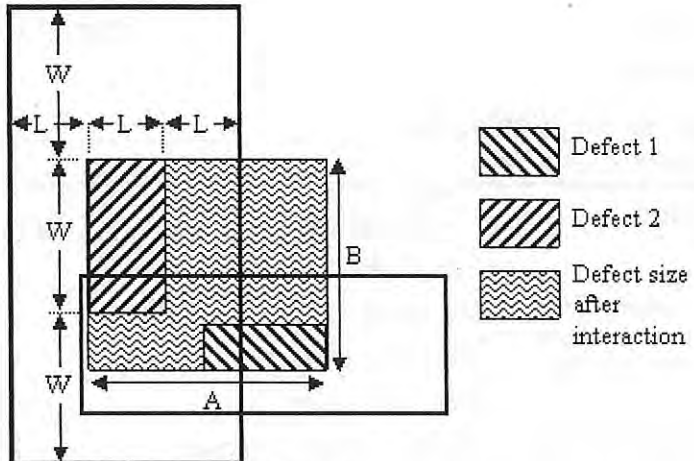


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

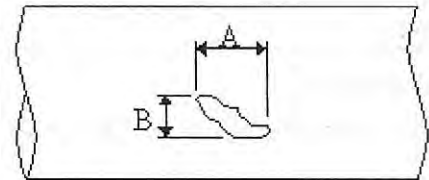


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

*THIS COATING REPAIR WAS PART OF THE COATING REPAIR ON
THE 200MM BLOW DOWN LINE.*

Dig Up Comments:

Operator: *L. DUFFY*

Signature:

Date: *25/8/2012*

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCC Excavation Date: 28/7/2012
 Section: E. DEFECT #6 Digup Reason: COATING INSPECTION
 Kilometre Point: _____ DCVG Measurement: N/A
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124343
 Northing: _____
 Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

- ☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0346</u>
Pipe with coating removed	<u>0384</u>
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.2 Soil pH: 5-6
 Pipe To Soil Potential (V): _____ Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)?

Y

Any white buildup from cathodic protection (Y/N)?

N

Any evidence of termite damage (Y/N)?

N

Any moisture inside the coating (Y/N)?

N

Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report

N/A

Has the coating lifted away from the pipe (Y/N)?

N

If yes, how far around the pipe has it lifted (mm)?

Sketch of coating / corrosion damage completed (Y/N)?

Coating Defect Length (mm): 8 mmCoating Defect Width (mm): 3 mm

Coating Defect Comments:

PAINT BLISTERS, 7.180m D/S OF TIE BLOCK ON 200mm
BLOW DOWN LINE

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

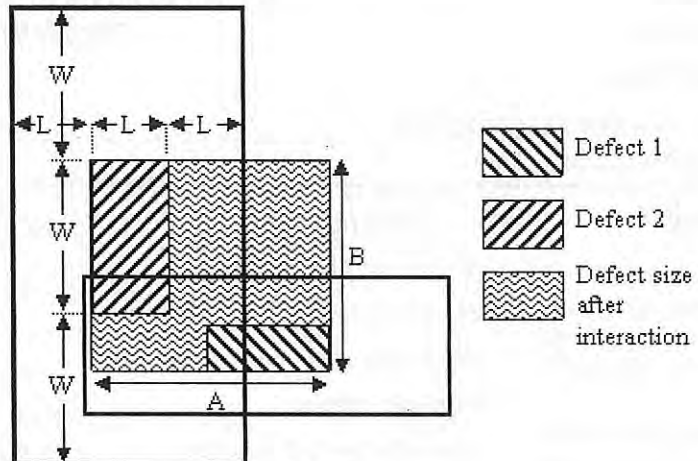


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):

(if no girth weld has been found, do not excavate further)

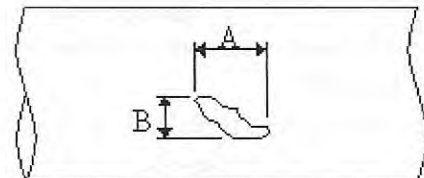


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

THIS COATING REPAIR WAS PART OF THE COATING REPAIR ON
THE 200 MM BLOW DOWN LINE.

Dig Up Comments:

Operator: W. DUFFY

Signature: [Signature]

Date: 25/8/2012

KP:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal

Work Order No:

COATING DAMAGE ASSESSMENT

Page 1

Location

Pipeline: DARWIN CITY GATE Excavation Date: 21/7/2012
 Section: VALVE 108 Digup Reason: COATING INSPECTION
 Kilometre Point: DCVG # 4 DCVG Measurement: 15.6
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124 343
 Northing: _____
 Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	0248, 0249, 0252, 0253, 0071, 0096, 0097
Pipe with coating removed	0283
Pipe cleaned	0283
Pipe repaired	0649, 0509, 0607

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9 Soil pH: 5.5
 Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m

Coating

Coating Description: ☐ Yellow Jacket ☐ Sleeve ☐ Wrapping ☒ FBE ☐ Paint

Is there a coating defect (Y/N)? Y
 Any white buildup from cathodic protection (Y/N)? N
 Any evidence of termite damage (Y/N)? N
 Any moisture inside the coating (Y/N)? Y
 Any stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage report
 Has the coating lifted away from the pipe (Y/N)? N
 If yes, how far around the pipe has it lifted (mm)? _____
 Sketch of coating / corrosion damage completed (Y/N)? N

Coating Defect Length (mm): _____ Coating Defect Width (mm): _____

Coating Defect Comments:

MULTIPLE COATING DEFECTS ON VALVE

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

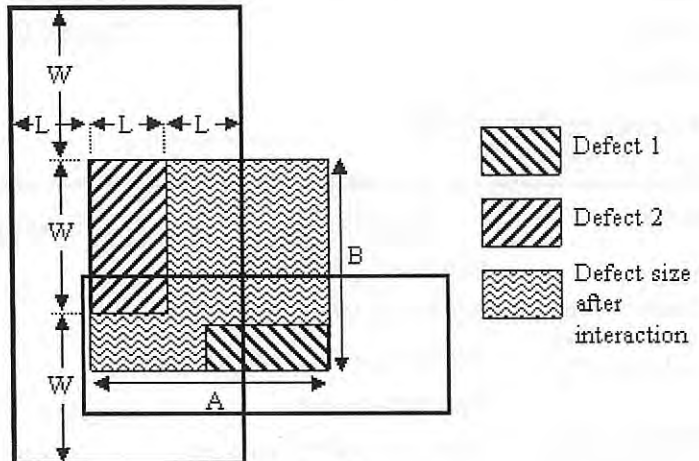
Is there any metal loss (Y/N)?

If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.



Maximum Depth (mm):

Wall thickness (mm):

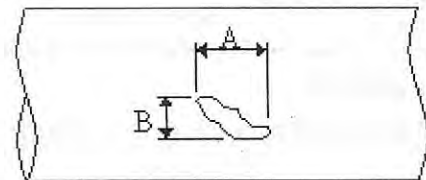
Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)



Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

THIS VALVE WAS BLASTED & PAINTED DURING RECOAT
OF 200 MM BLOW DOWN LINE

Dig Up Comments:

Operator: W. DUFFY

Signature: [Signature]

Date: 8/8/2013

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG
 Section: E 200mm B/DOWN
 Kilometre Point: _____
 Zone: _____
 Easting: _____
 Northing: _____

Excavation Date: 26/7/2012
 Digup Reason: INSPECT COATING
 DCVG Measurement: N/A
 Defect Length from survey (m): N/A
 CMMS Work Order No: 124343

Surrounding Description: COMPOUND
 (Buildings, drains, etc)

Photos

☐ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0207, 0210</u>
Pipe with coating removed	<u>0355, 0354, 0359</u>
Pipe cleaned	<u>0355, 0354, 0359</u>
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 950mm Soil pH: 5.6-6.0

Pipe To Soil Potential (V): -1.068 Soil Resistivity (Ohms): _____ Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☐ FBE
☒ Paint

Is there a coating defect (Y/N)? Y
 Any white buildup from cathodic protection (Y/N)? N
 Any evidence of termite damage (Y/N)? N
 Any moisture inside the coating (Y/N)? N
 Any stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage report
 Has the coating lifted away from the pipe (Y/N)? N
 If yes, how far around the pipe has it lifted (mm)? _____
 Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): _____ Coating Defect Width (mm): _____

Coating Defect Comments:

COATING DAMAGED BY EXCAVATION OF WISDIELL PIPE LINE
VARIOUS SCRATCHES AND BUMP TO THE COATING, PROBABLY BY
SHOVELS.

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)? _____

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)? _____

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

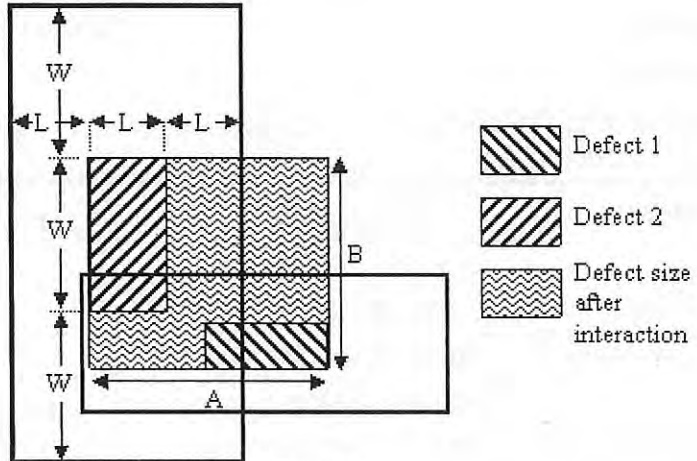


Figure 1

Maximum Depth (mm): _____

Wall thickness (mm): _____

Longitudinal dimension (A) (mm): _____

Circumferential dimension (B) (mm): _____

Clock Position (looking in direction of flow): _____

Distance from longitudinal weld (mm): _____

Distance from nearest girth weld (mm): _____
(if no girth weld has been found, do not excavate further)

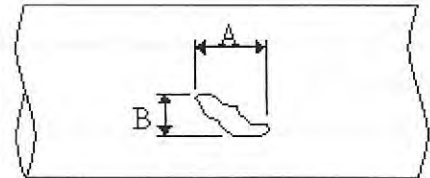


Figure 2

Repair

Length of Pipe Wrapped (mm): _____

Other Repair Information:

*THIS COATING DEFECT REPAIR WAS PART OF THE COATING
REPAIR ON THE 200MM BLOW DOWN LINE, WHICH WAS COMPLETELY
BLASTED & PAINTED*

Dig Up Comments:

Operator: W.D

Signature: [Signature]

Date: 25/8/2012

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCC
 Section: G, DEFECT I
 Kilometre Point: _____
 Zone: _____
 Easting: _____
 Northing: _____

Excavation Date: 28/7/2012
 Digup Reason: COATING INSPECTION
 DCVG Measurement: NIL
 Defect Length from survey (m): _____
 CMMS Work Order No: 124343

Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0183, 0184, 0161</u>
Pipe with coating removed	<u>0392</u>
Pipe cleaned	<u>0392</u>
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9 Soil pH: 5.5-6
 Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☐ FBE
☒ Paint

Is there a coating defect (Y/N)? Y

Any white buildup from cathodic protection (Y/N)? N

Any evidence of termite damage (Y/N)? N

Any moisture inside the coating (Y/N)? Y

Any stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage report

Has the coating lifted away from the pipe (Y/N)? N

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? N

Coating Defect Length (mm): 15 Coating Defect Width (mm): 7

Coating Defect Comments:

SOME CORROSION VISIBLE IN COATING DAMAGE.

AFTER BLASTING THERE WERE NO SIGNS OF CORROSION

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

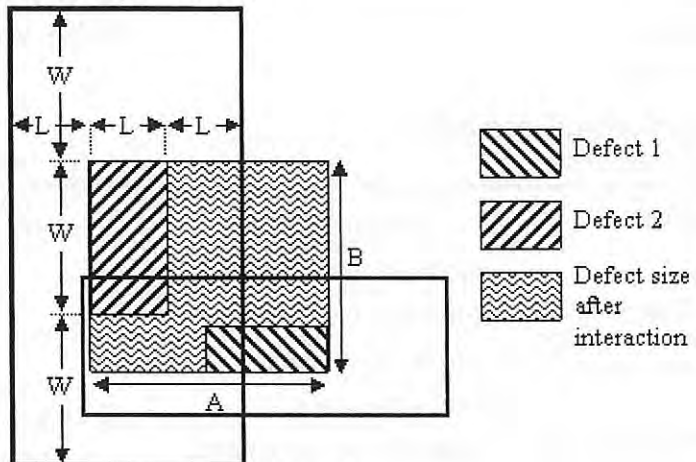


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):

(if no girth weld has been found, do not excavate further)

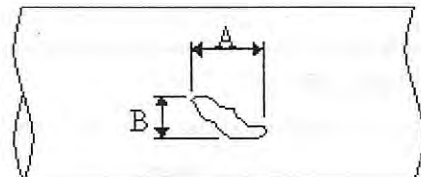


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

*THIS COATING REPAIR WAS PART OF THE COATING REPAIR ON
SECTION G*

Dig Up Comments:

Operator: *L.J. Duffy*

Signature: *[Signature]*

Date: *11/3/2012*

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG
 Section: G TIE BLOCK.
 Kilometre Point: DCVG # 8
 Zone: _____
 Easting: _____
 Northing: _____

Excavation Date: 28/7/2012
 Digup Reason: COATING INSPECTION
 DCVG Measurement: N/A
 Defect Length from survey (m): 11/1
 CMMS Work Order No: 124343

Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	0176, 0159
Pipe with coating removed	0404,
Pipe cleaned	0404,
Pipe repaired	0615

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9

Soil pH: 5-6

Pipe To Soil Potential (V): -1.060

Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)? _____

Any white buildup from cathodic protection (Y/N)? _____

Any evidence of termite damage (Y/N)? _____

Any moisture inside the coating (Y/N)? _____

Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report N/A

Has the coating lifted away from the pipe (Y/N)? _____

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): _____

Coating Defect Width (mm): _____

Coating Defect Comments:

BLISTERING OF PAINT NEAR SUPPORT BLOCK OVER TIE INTO
BLOW DOWN STACK.

AFTER BLASTING THERE WERE NO SIGNS OF CORROSION

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

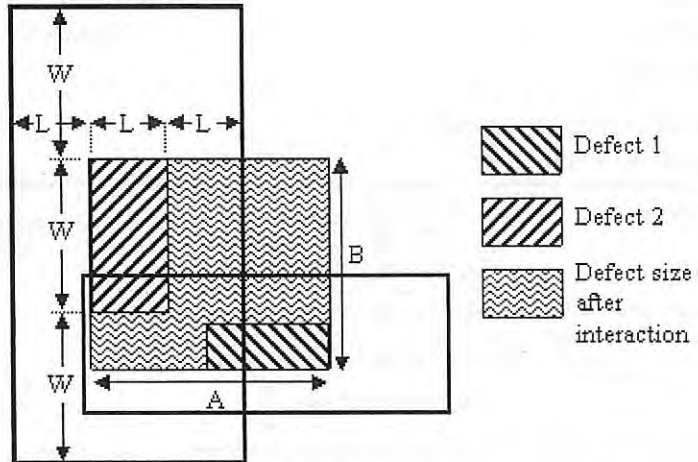


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

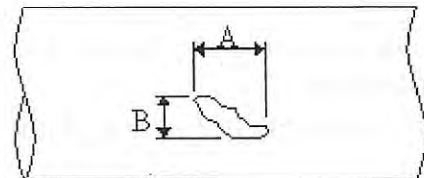


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

*THIS COATING DEFECT WAS PAINTED DURING RECOAT OF
SECTION G.*

Dig Up Comments:

Operator: *W. DUFFY*

Signature: *[Signature]*

Date: *11/8/2012*

KP:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal

Work Order No:

COATING DAMAGE ASSESSMENT

Page 1

LocationPipeline: DCGExcavation Date: 24/7/2012Section: G V49Digup Reason: COATING INSPECTIONKilometre Point: DCVG # 7DCVG Measurement: 12.0

Zone: _____

Defect Length from survey (m): _____

Easting: _____

CMMS Work Order No: 124343

Northing: _____

Surrounding Description: DCG Compound
(Buildings, drains, etc)**Photos**

- ☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0325, 0326, 0328</u>
Pipe with coating removed	<u>0400, 0399</u>
Pipe cleaned	<u>0397, 0398, 0399, 0400, 0401</u>
Pipe repaired	<u>0616</u>

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.90Soil pH: 5-6Pipe To Soil Potential (V): -1.060Soil Resistivity (Ohms): 300,000

Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)? YAny white buildup from cathodic protection (Y/N)? NAny evidence of termite damage (Y/N)? NAny moisture inside the coating (Y/N)? NAny stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage reportHas the coating lifted away from the pipe (Y/N)? N

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): _____

Coating Defect Width (mm): _____

Coating Defect Comments:

GENERAL BLISTERING OF PAINT ALONG STEM, MINOR COATING DEFECTS UNDER STEM FLANGE AND BOTTOM OF VALVE BODY

AFTER BLASTING THERE WERE NO VISIBLE SIGNS OF CORROSION

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

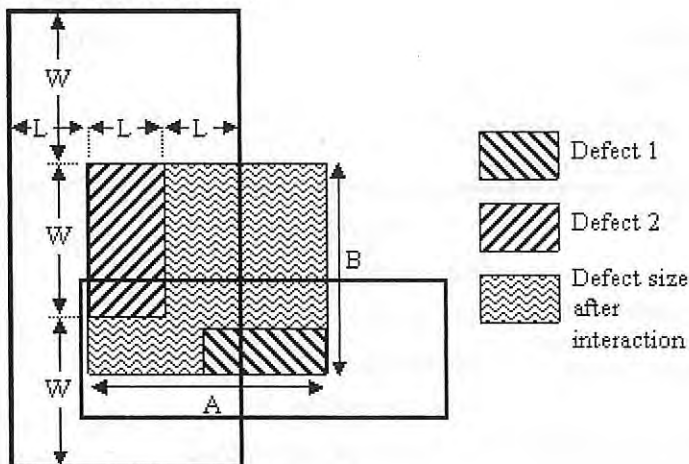


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):

(if no girth weld has been found, do not excavate further)

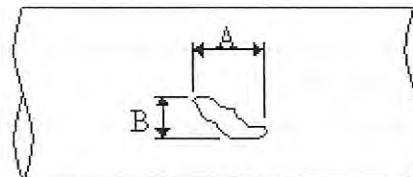


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

THIS VALVE WAS RECOATED DURING RECOAT OF SECTION

Dig Up Comments:

Operator: *AL. DUFFY*

Signature: *[Signature]*

Date: *13/8/2012*

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG Excavation Date: 24/7/2012
 Section: MLV Digup Reason: COATING INSPECTION
 Kilometre Point: DCVG #6 DCVG Measurement: 24.4
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 024343
 Northing: _____

Surrounding Description: INSIDE DCG COMPOUND
 (Buildings, drains, etc)

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	
Pipe with coating removed	
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.900

Soil pH: 5.5

Pipe To Soil Potential (V): -1.060

Soil Resistivity (Ohms): 200,000,000 Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☐ FBE
☒ Paint

Is there a coating defect (Y/N)? Y

Any white buildup from cathodic protection (Y/N)? N

Any evidence of termite damage (Y/N)? N

Any moisture inside the coating (Y/N)? N

Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report N/A

Has the coating lifted away from the pipe (Y/N)? Y

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? N

Coating Defect Length (mm): 78 mm

Coating Defect Width (mm): 12

Coating Defect Comments:

MAIN COATING DEFECT THAT WAS VISIBLE WAS ON SUPPORT LEG OF VALVE.
PHOTOS PROVIDED OF OTHER COATING DEFECT ON MLV
DCVG DEFECT #6
AFTER BLASTING THERE WERE NO VISIBLE SIGNS OF CORROSION

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

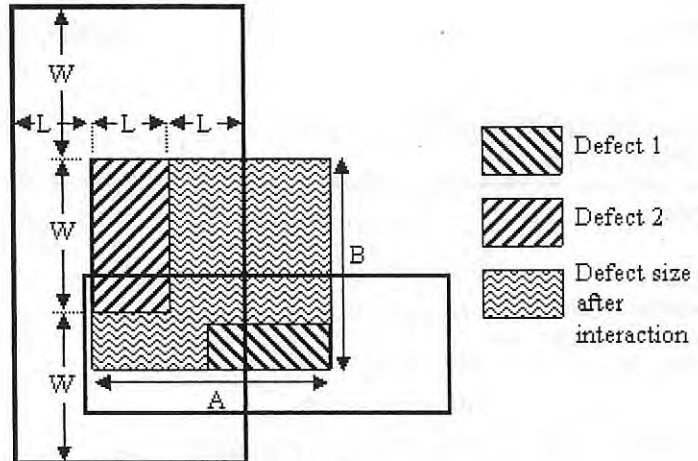


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

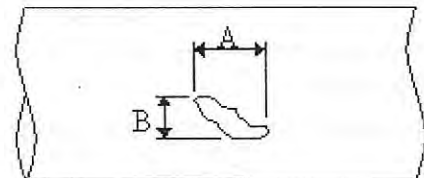


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

THIS VALVE WAS PAINTED DURING RECOAT OF SECTION H

Dig Up Comments:

Operator: *Int. Drury*

Signature:

[Signature]

Date: *13/6/2012*

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG Excavation Date: 24/7/2012
 Section: H Digup Reason: COATING INSPECTION
 Kilometre Point: (DCVG # 5) DCVG Measurement: 33.3
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: 124343
 Northing: _____
 Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0204, 0205, 0206</u>
Pipe with coating removed	<u>0405, 0406, 0407, 0410, 0411, 0412</u>
Pipe cleaned	<u>0405, 0406, 0407, 0410, 0411, 0412,</u>
Pipe repaired	<u>0619</u>

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): RISER Soil pH: IN SAME AREA 5.5
 Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): 300,000,000 Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☒ FBE
☐ Paint

Is there a coating defect (Y/N)?

Any white buildup from cathodic protection (Y/N)?

Any evidence of termite damage (Y/N)?

Any moisture inside the coating (Y/N)?

Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report

Has the coating lifted away from the pipe (Y/N)?

If yes, how far around the pipe has it lifted (mm)?

Sketch of coating / corrosion damage completed (Y/N)?

Coating Defect Length (mm): _____ Coating Defect Width (mm): _____

Coating Defect Comments:

BLISTERING OF PAINT, NO CORROSION FOUND

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)? _____

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)? _____

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

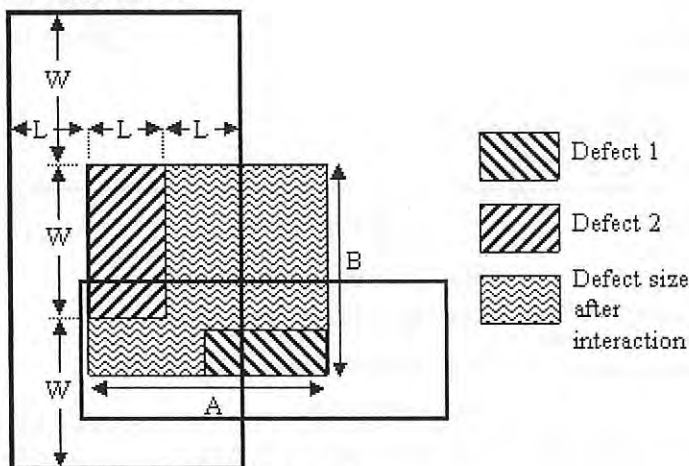


Figure 1

Maximum Depth (mm): _____

Wall thickness (mm): _____

Longitudinal dimension (A) (mm): _____

Circumferential dimension (B) (mm): _____

Clock Position (looking in direction of flow): _____

Distance from longitudinal weld (mm): _____

Distance from nearest girth weld (mm): _____
(if no girth weld has been found, do not excavate further)

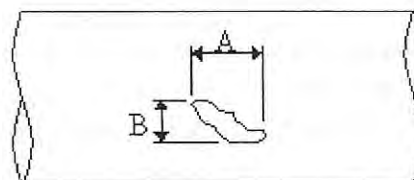


Figure 2

Repair

Length of Pipe Wrapped (mm): _____

Other Repair Information:

*THIS COATING DEFECT WAS PAINTED WITH DULUX UAB DURING
RECOAT OF SECTION H*

Dig Up Comments:

Operator: 1st. DUFFY

Signature: [Signature]

Date: 9/4/2013

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG
 Section: I DEFECT # 1
 Kilometre Point: _____
 Zone: _____
 Easting: _____
 Northing: _____

Excavation Date: 26/7/2012
 Digup Reason: COATING INSPECTION
 DCVG Measurement: NIL
 Defect Length from survey (m): _____
 CMMS Work Order No: 124 343

Surrounding Description: _____

(Buildings, drains, etc) _____

Photos

- ☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0134, 0135, 0137, 0179</u>
Pipe with coating removed	<u>0292</u>
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9Soil pH: 5-6Pipe To Soil Potential (V): -1.060Soil Resistivity (Ohms): 320,000 Pin Spacing 1.5m**Coating**

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☒ Wrapping
☐ FBE
☒ Paint

Is there a coating defect (Y/N)? YAny white buildup from cathodic protection (Y/N)? NAny evidence of termite damage (Y/N)? NAny moisture inside the coating (Y/N)? NAny stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage reportHas the coating lifted away from the pipe (Y/N)? N

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? NCoating Defect Length (mm): 65Coating Defect Width (mm): 8

Coating Defect Comments:

WRAP OVER YELLOW JACKET DAMAGED

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)? _____

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)? _____

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

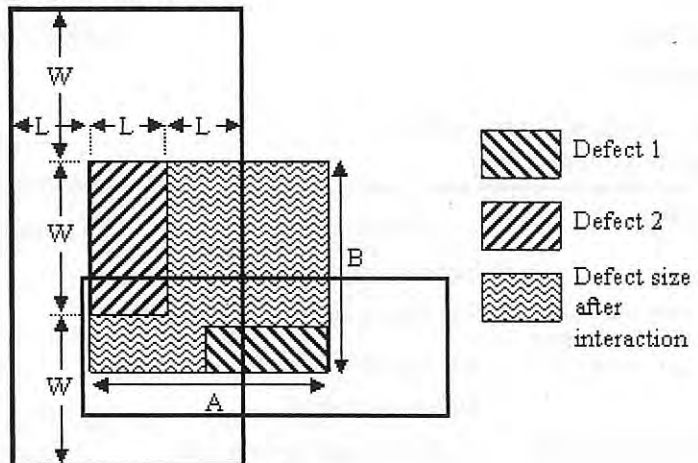


Figure 1

Maximum Depth (mm): _____

Wall thickness (mm): _____

Longitudinal dimension (A) (mm): _____

Circumferential dimension (B) (mm): _____

Clock Position (looking in direction of flow): _____

Distance from longitudinal weld (mm): _____

Distance from nearest girth weld (mm): _____
(if no girth weld has been found, do not excavate further)

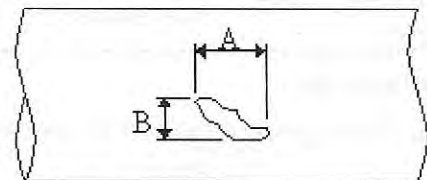


Figure 2

Repair

COATED

Length of Pipe Wrapped (mm): 2.0 M

Other Repair Information:

THIS COATING DEFECT WAS PAINTED WITH DULUX UHB

Dig Up Comments:

Operator: W. DUFFY

Signature: _____

Date: 13/8/2012

KP:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal

Work Order No:

COATING DAMAGE ASSESSMENT

Page 1

Location

Pipeline: DCG
 Section: I DEFECT 2
 Kilometre Point: _____
 Zone: _____
 Easting: _____
 Northing: _____

Excavation Date: 26/7/2012
 Digup Reason: COATING INSPECTION
 DCVG Measurement: NIL
 Defect Length from survey (m): _____
 CMMS Work Order No: 124343

Surrounding Description: _____

(Buildings, drains, etc)

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	0180
Pipe with coating removed	
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9Soil pH: 5.6Pipe To Soil Potential (V): -1.060Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m.**Coating**

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☒ Wrapping
☐ FBE
☐ Paint

Is there a coating defect (Y/N)? YAny white buildup from cathodic protection (Y/N)? NAny evidence of termite damage (Y/N)? NAny moisture inside the coating (Y/N)? NAny stress corrosion cracking (Y/N)? N/A If yes, complete APA pipeline damage reportHas the coating lifted away from the pipe (Y/N)? N

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? NCoating Defect Length (mm): 25Coating Defect Width (mm): 2

Coating Defect Comments:

WRAP OVER YELLOW JACKET DAMAGED

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)? _____

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)? _____

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

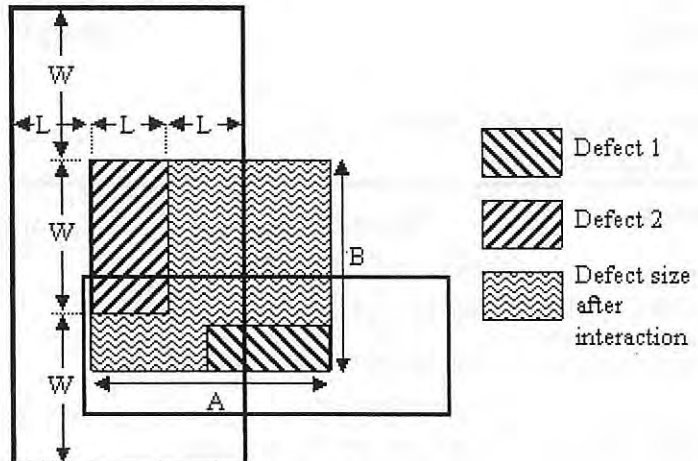


Figure 1

Maximum Depth (mm): _____

Wall thickness (mm): _____

Longitudinal dimension (A) (mm): _____

Circumferential dimension (B) (mm): _____

Clock Position (looking in direction of flow): _____

Distance from longitudinal weld (mm): _____

Distance from nearest girth weld (mm): _____
(if no girth weld has been found, do not excavate further)

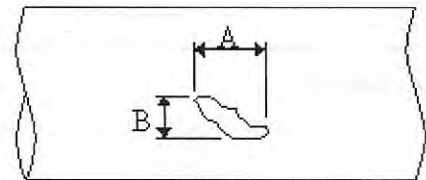


Figure 2

Repair

Length of Pipe Wrapped (mm): COATED 2.0

Other Repair Information:

THIS COATING DEFECT WAS PAINTED WITH DULUX UHB.

Dig Up Comments:

Operator: W. DUFFY

Signature: _____

Date: 13/8/2012

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

Location

Pipeline: DCG
 Section: I DEFECT 3
 Kilometre Point: _____
 Zone: _____
 Easting: _____
 Northing: _____

Excavation Date: 27/7/2012
 Digup Reason: COATING INSPECTION
 DCVG Measurement: NIL
 Defect Length from survey (m): _____
 CMMS Work Order No: 124343

Surrounding Description: _____

(Buildings, drains, etc)

Photos

☒ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	<u>0181</u>
Pipe with coating removed	
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input checked="" type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9Soil pH: 5.6Pipe To Soil Potential (V): -1.060Soil Resistivity (Ohms): 300,000 Pin Spacing 1.5m**Coating**

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☒ Wrapping
☐ FBE
☐ Paint

Is there a coating defect (Y/N)?

Y

Any white buildup from cathodic protection (Y/N)?

N

Any evidence of termite damage (Y/N)?

N

Any moisture inside the coating (Y/N)?

Y

Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report

N/A

Has the coating lifted away from the pipe (Y/N)?

N

If yes, how far around the pipe has it lifted (mm)?

Sketch of coating / corrosion damage completed (Y/N)?

NCoating Defect Length (mm): 2Coating Defect Width (mm): 2

Coating Defect Comments:

WRAP OVER YELLOW JACKET DAMAGED.AFTER BLASTING THERE WERE NO SIGNS OF CORROSION

Metal Loss

Is there any deformation of the pipe
(dent, gouge or not round) (Y/N)?

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

*If there is any metal loss, complete the remaining
section of this form and contact Engineering
IMMEDIATELY.*

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

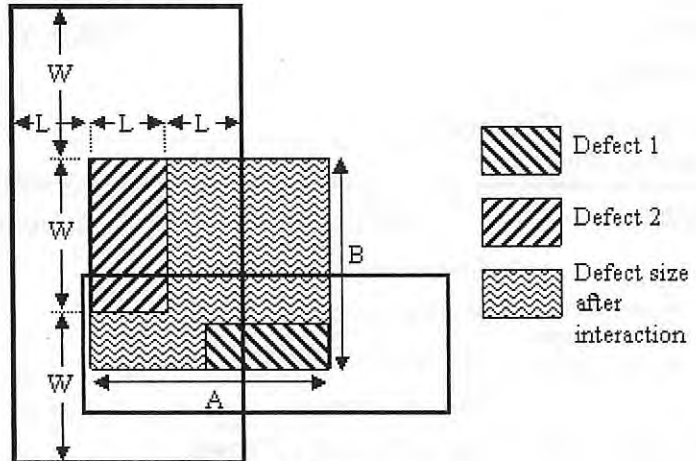


Figure 1

Maximum Depth (mm):

Wall thickness (mm):

Longitudinal dimension (A) (mm):

Circumferential dimension (B) (mm):

Clock Position (looking in direction of flow):

Distance from longitudinal weld (mm):

Distance from nearest girth weld (mm):

(if no girth weld has been found, do not excavate further)

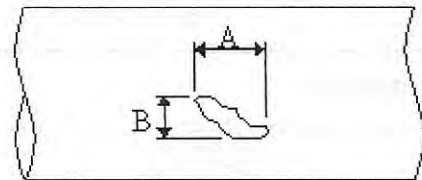


Figure 2

Repair

COATED WITH UHB

Length of Pipe Wrapped (mm): *200*

Other Repair Information:

THIS COATING DEFECT WAS PAINTED WITH DULUX UHB

Dig Up Comments:

Operator: *W. DUFFY*

Signature:

[Signature]

Date: *13/8/2012*

Appendix 3 Metal Loss Assessment Forms

COATING DAMAGE ASSESSMENT

Location

Pipeline: Darwin City Gate Excavation Date: 21/7/2012
 Section: Pig Receiver Inlet Digup Reason: Coating Inspection
 Kilometre Point: _____ DCVG Measurement: _____
 Zone: _____ Defect Length from survey (m): _____
 Easting: _____ CMMS Work Order No: _____
 Northing: _____
 Surrounding Description: _____
 (Buildings, drains, etc) _____

Photos

☐ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	
Pipe with coating removed	<u>0276, 0277</u>
Pipe cleaned	
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.5m Soil pH: 5-6
 Pipe To Soil Potential (V): -1.060 Soil Resistivity (Ohms): _____ Pin Spacing 1.5m

Coating

Coating Description: ☐ Yellow Jacket ☐ Sleeve ☐ Wrapping ☐ FBE ☐ Paint

Is there a coating defect (Y/N)? _____
 Any white buildup from cathodic protection (Y/N)? _____
 Any evidence of termite damage (Y/N)? _____
 Any moisture inside the coating (Y/N)? _____
 Any stress corrosion cracking (Y/N)? If yes, complete APA pipeline damage report N/A
 Has the coating lifted away from the pipe (Y/N)? _____
 If yes, how far around the pipe has it lifted (mm)? _____
 Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): _____ Coating Defect Width (mm): _____

Coating Defect Comments:

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe (dent, gouge or not round) (Y/N)?

N

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

Y

If there is any metal loss, complete the remaining section of this form and contact Engineering IMMEDIATELY.

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

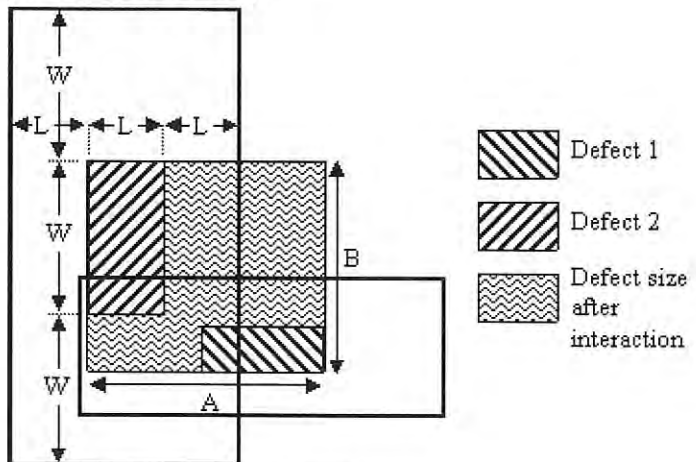


Figure 1

Maximum Depth (mm):

0.84 mm

Wall thickness (mm):

7.92 mm

Longitudinal dimension (A) (mm):

4 mm

Circumferential dimension (B) (mm):

5 mm

Clock Position (looking in direction of flow):

~30'clock, 250mm clockwise from 12 o'clock

Distance from longitudinal weld (mm):

11 mm

Distance from nearest girth weld (mm):
(if no girth weld has been found, do not excavate further)

4150 mm to downstream girth weld

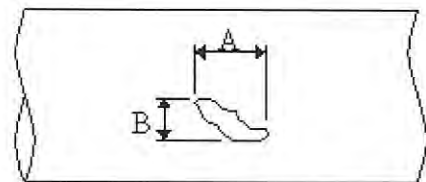


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

No repair necessary. Pipe recoated as part of project.

Dig Up Comments:

Operator: James Barrenger

Signature: James Barrenger

Date: 7/08/12

KP:

Work Order No:

Form created by Ben Parkin Apr 09
Approved by Henry Dupal**COATING DAMAGE ASSESSMENT**

Page 1

LocationPipeline: DCCExcavation Date: 27/7/2012Section: Section IDigup Reason: INSPECT COATING

Kilometre Point: _____

DCVG Measurement: N/A

Zone: _____

Defect Length from survey (m): N/A

Easting: _____

CMMS Work Order No: 124343

Northing: _____

Surrounding Description: _____

(Buildings, drains, etc) _____

Photos

- ☐ Has the camera date and time been set correctly?

Please remember to take both close up (no closer than 500mm) and wide photos.

Description	Time(s) photo taken or viewfinder number
Surrounding landscape	
Site facing increasing chainage	
Site facing decreasing chainage	
Pipe with coating	
Pipe with coating removed	<u>0464, 0465</u>
Pipe cleaned	<u>0464, 0465</u>
Pipe repaired	

Soil and CP

Soil Description (tick one or more from each column):

<input type="checkbox"/> Sand	<input type="checkbox"/> Fine	<input type="checkbox"/> Dusty
<input type="checkbox"/> Loam	<input type="checkbox"/> Coarse	<input checked="" type="checkbox"/> Dry
<input type="checkbox"/> Clay	<input type="checkbox"/> Gravel	<input type="checkbox"/> Damp
<input type="checkbox"/> Black	<input checked="" type="checkbox"/> Rocky	<input type="checkbox"/> Wet
<input type="checkbox"/> Red Dirt		

Pipeline Soil Cover Depth (m): 0.9

Soil pH: _____

Pipe To Soil Potential (V): _____

Soil Resistivity (Ohms): _____

Pin Spacing 1.5m

Coating

Coating Description:

- ☐ Yellow Jacket
☐ Sleeve
☐ Wrapping
☐ FBE
☐ Paint

Is there a coating defect (Y/N)? _____

Any white buildup from cathodic protection (Y/N)? _____

Any evidence of termite damage (Y/N)? _____

Any moisture inside the coating (Y/N)? _____

Any stress corrosion cracking (Y/N)? _____

If yes, complete APA pipeline damage report

N/A

Has the coating lifted away from the pipe (Y/N)? _____

If yes, how far around the pipe has it lifted (mm)? _____

Sketch of coating / corrosion damage completed (Y/N)? _____

Coating Defect Length (mm): _____

Coating Defect Width (mm): _____

Coating Defect Comments: _____

KP:

Work Order No:

Page 2

Metal Loss

Is there any deformation of the pipe (dent, gouge or not round) (Y/N)?

Y

If Yes, Engineering must be contacted IMMEDIATELY.

Is there any metal loss (Y/N)?

If there is any metal loss, complete the remaining section of this form and contact Engineering IMMEDIATELY.

The following measurements should indicate whether defects INTERACT

Interaction Rules:

1. Consider each defect as a rectangular box.
2. Draw a larger box around each defect, extending length and width as per Figure 1.
3. IF BOTH larger boxes intersect with the original defect boxes, the defects interact.
4. The dimensions reported on this form are the dimensions of the defect after interaction - dimensions A and B as shown in Figure 1.

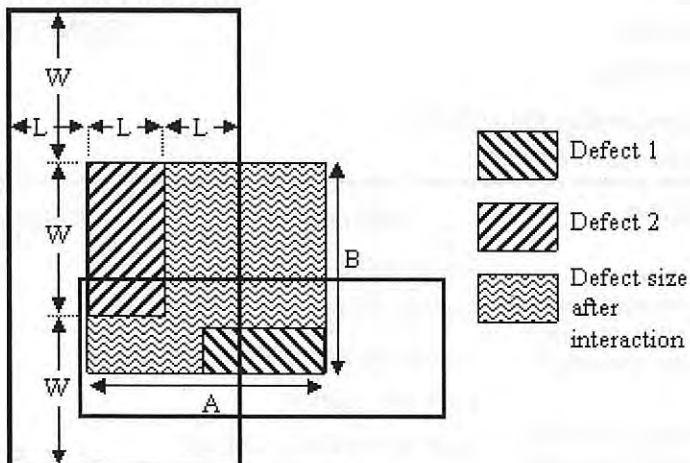


Figure 1

Maximum Depth (mm):

1.0mm

Wall thickness (mm):

Longitudinal dimension (A) (mm):

70mm

Circumferential dimension (B) (mm):

20mm

Clock Position (looking in direction of flow):

20mm anticlockwise 9 o'clock

Distance from longitudinal weld (mm):

470mm

Distance from nearest girth weld (mm):

3060mm upstream girth weld

(if no girth weld has been found, do not excavate further)

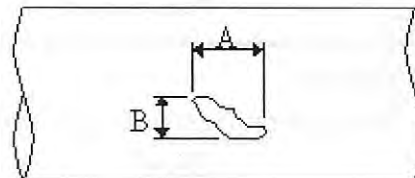


Figure 2

Repair

Length of Pipe Wrapped (mm):

Other Repair Information:

PAINTED WITH LUXAPOXY 2.6m OF PIPE PAINTED

Dig Up Comments:

Operator:

Signature:

Date:

Appendix 4 Photo Log