TAPE WRAPPING REQUIREMENTS

SPECIFICATION: L1 **ISSUE: 6** **DATE: JANUARY 2024**

1.0 SCOPE

The pipe wrapping and Sintakote® coating repair systems described in this specification pertain to:-

Pipe Wrapping System	
System A:	Application of the 3 step Butyl Mastic Tape System
System B:	Application of the Petrolatum 4 step system.
Sintakote Coating Repair System	
System C:	Application of Canusa® Heat Shrink patches to repair tears and damage to the Sintakote coating. (Steelmains recommended option)
System D:	Application of the 3 step Butyl Mastic Tape System.
System E:	Application and tie in of petrolatum wrap system over the legacy bituminous or tar system, extending onto newly applied Heat Shrink Sleeve or Sintakote.

Note: Only wrapping systems detailed within this specification shall be used. Alternative methods shall be subject to written approval by the Principal.

The Principal has approved the use of Denso® products for Systems A, B, D and Canusa® for Systems B and C.

Other products may be used for specialised applications subject to evaluation and written approval by the Principal.

2.0 PURPOSE

The purpose of this Technical Specification is to inform designers, contractors and installers of the Corporation's requirements for the corrosion protection of steel pipelines, including but not limited to flanged and welded connections, in buried service and other below ground installations.

3.0 DEFINITIONS

Butyl Primer: *Butyl Primer for use with Butyl Mastic Tapes.*

Butyl Mastic Strip: *3mm permanently plastic (non-hardening) mastic, mouldable by hand, based on Butyl Rubber.*

Contractor: *The service provider or its subcontractor who will undertake the works.*

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Principal: *The Water Corporation and/or the Principal for the purpose of externally contracted asset delivery.*

ITP: *The detailed inspection and test plan(s) for the Works.*

Petrolatum Primer: *Petrolatum tape primer.*

Petrolatum Profiling Mastic: *Petrolatum mastic with polymer beads used for profiling irregular shapes.*

Petrolatum tape: *Synthetic fabric-based tape impregnated and coated with petrolatum-based compounds.*

PVC over-wrap tape: *0.2 mm plasticized PVC incorporating natural and synthetic rubber adhesive and fungal inhibitor.*

Technical Specification: *This technical specification.*

Works: *For the purpose of this Technical Specification means the wrapping of joints or repair work to be undertaken by the Contractor to which this Technical Specification applies.*

4.0 STANDARDS/CODES

4.1 All tape wrapping shall comply with the Australian Standard(s) or Code(s) of practice (including amendments), which are specified in the Contract Specification or stated on the Contract Drawings.

4.2 The applicable edition(s) of standards / codes are those current two weeks prior to tender close date.

4.3 The relevant standard / code is deemed the minimum standard applicable unless otherwise stated in the Specification.

5.0 GENERAL

5.1 The Contractor shall supply all necessary plant, equipment, materials and labour, prepare the surface, apply and maintain the protective tape wrapping system to prepared surfaces in accordance with this Specification.

5.2 Works shall only be carried out by companies with experience on projects of a similar nature.

5.3 Personnel engaged in tape wrapping shall be verified as competent by the tape wrapping supplier. A training register shall be maintained by the supplier listing trained personnel in the use of the relevant tape wrap system within this document.

6.0 WRAPPING PROCEDURES

6.1 All weld spatter, slag and sharp edges on the external welded joints shall be removed prior to the tape wrapping.

6.2 All burrs/stubs from the Sintakote coating shall be removed. The edges of the Sintakote shall be bevelled so that there shall be a tapered transition of a minimum of 10 mm between the full coating and the exposed steel.

6.3 100 mm from the edge of the remaining Sintakote® coating shall be lightly roughened using a sanding disc or coarse emery paper. Refer to Figure 1.

6.4 Inspect for dis-bonding of the bevelled edge of the Sintakote® pipe coating, that has disbonded due to the welding/cutting operations.

6.5 The acceptable surface condition prior to priming/tape wrapping shall be in accordance with Table 1. Appendix – A provides further guidance on surface preparation.

Table 1: Surface Preparation in accordance with ISO 8501/AS/NZS 1627.9

Surface Condition Untreated	Acceptable Surface Condition Post Treatment
Rust Grade A	A St 2
Rust Grade B	B St 2
Rust Grade C	C St 2
Rust Grade D	D St 2

With reference to Figure 1, the Contractor shall provide a minimum of **100mm** cut back on both of the pipe sections proposed to be joined. This clearance must be provided in order to eliminate the damage to the Sintakote® coating due to excessive heat exposure from welding margin. The edges of the Sintakote® coating shall be bevelled so that there shall be a tapered transition of a minimum of **10mm** between the full coating thickness and the exposed steel.
Further details are provided under the Water Corporation L2 Specification and the L2 ITP.

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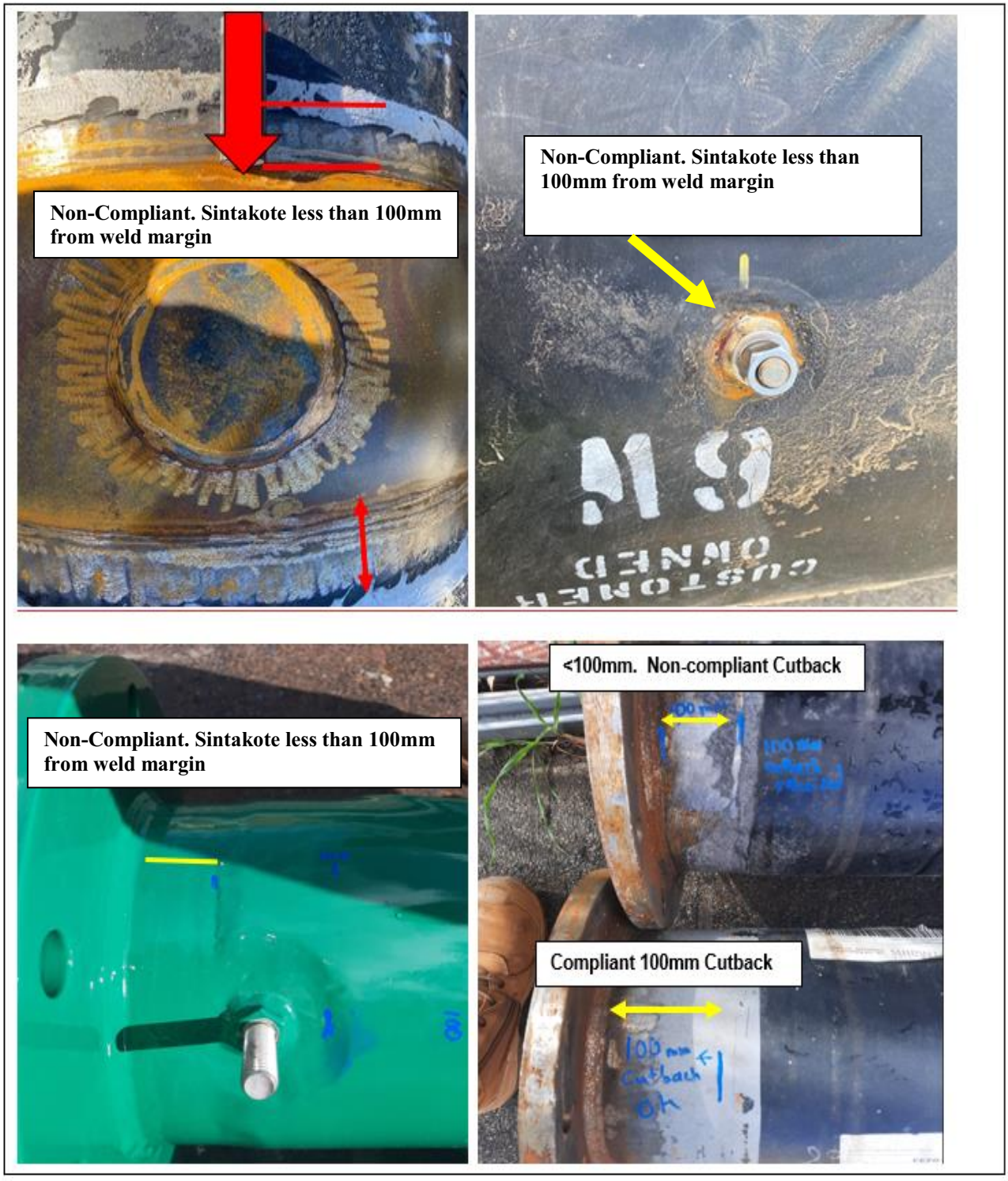


Figure 1: Sintakote to terminate a minimum 100mm from the weld zone as per AS4321

6.6 System A – 3 Step Butyl Mastic Tape System

Radius bends shall be wrapped using **System A – 3 Step Butyl Mastic Tape System**

Step 1 – Butyl Primer
Step 2 – Butyl Mastic Tape
Step 3 – PVC Overwrap Tape

The primer shall be applied approximately ten (10) minutes prior to wrapping. The primer shall be tacky prior to tape wrapping. No wrapping shall be allowed once the primer has dried. Repriming of the dried primer shall be carried out and the primer shall be tacky prior to tape wrapping.

The Butyl Mastic Tape shall extend a minimum of 100mm over the Sintakote and shall be overlapped onto itself a minimum of 20mm in all directions.

The PVC Overwrap Tape shall be applied with a minimum 55% overlap and extend a minimum 50mm past the Butyl Mastic Tape onto the Sintakote.

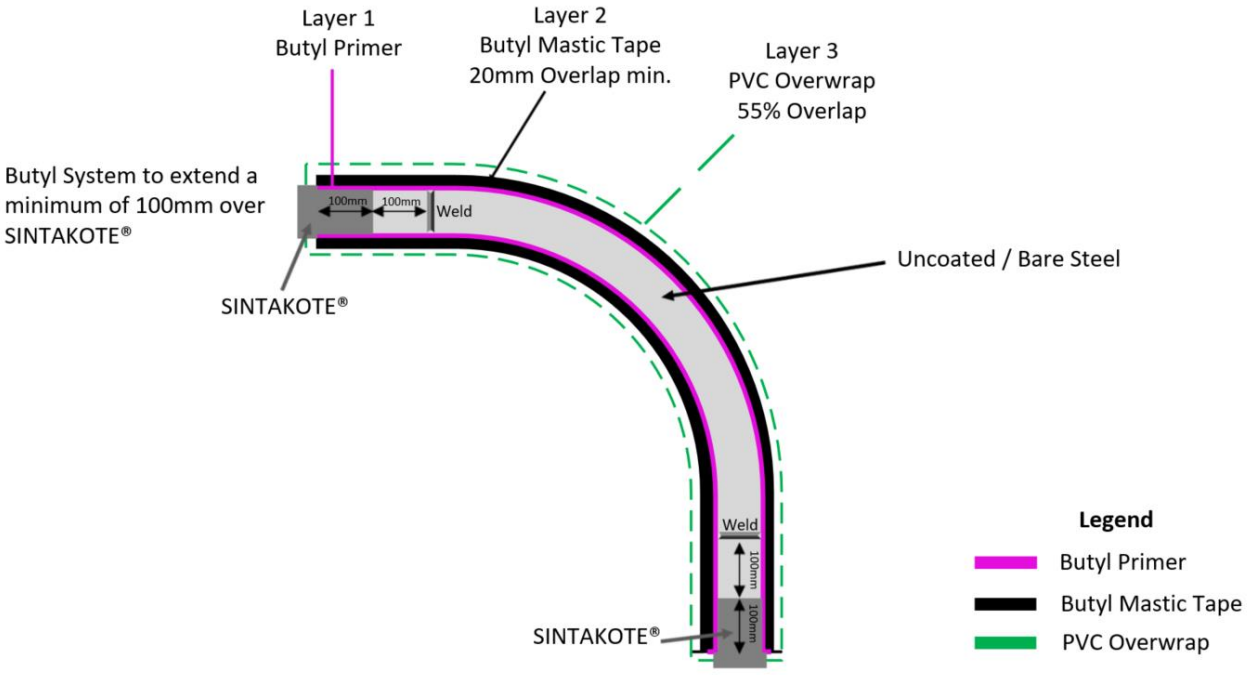


Figure 2: Butyl Wrap System

6.7 System B – Petrolatum 4 Step System

Flange to Flange, Flange to Valve connections, Control Valve gearboxes and irregular shapes shall be wrapped using **System B - Petrolatum 4 Step System**, which includes:

Step 1 - Petrolatum primer
Step 2 - Petrolatum Profiling Mastic
Step 3 - Petrolatum tape
Step 4 - PVC over-wrap tape

Note: The paint coated section between the flanges of valves does not require wrapping. Wrapping is required for the bolted connection flange only.

(a) The primer shall be applied prior to wrapping.

(b) The Profiling mastic shall be applied to contour all irregular shapes.

(c) The Petrolatum tape shall extend a minimum of 50mm over the Sintakote and shall be overlapped a minimum of 55% on itself.

(d) The PVC over-wrap shall extend a minimum of 50mm outside the petrolatum tape and shall be overlapped a minimum of 55% on itself, refer Figure 3.

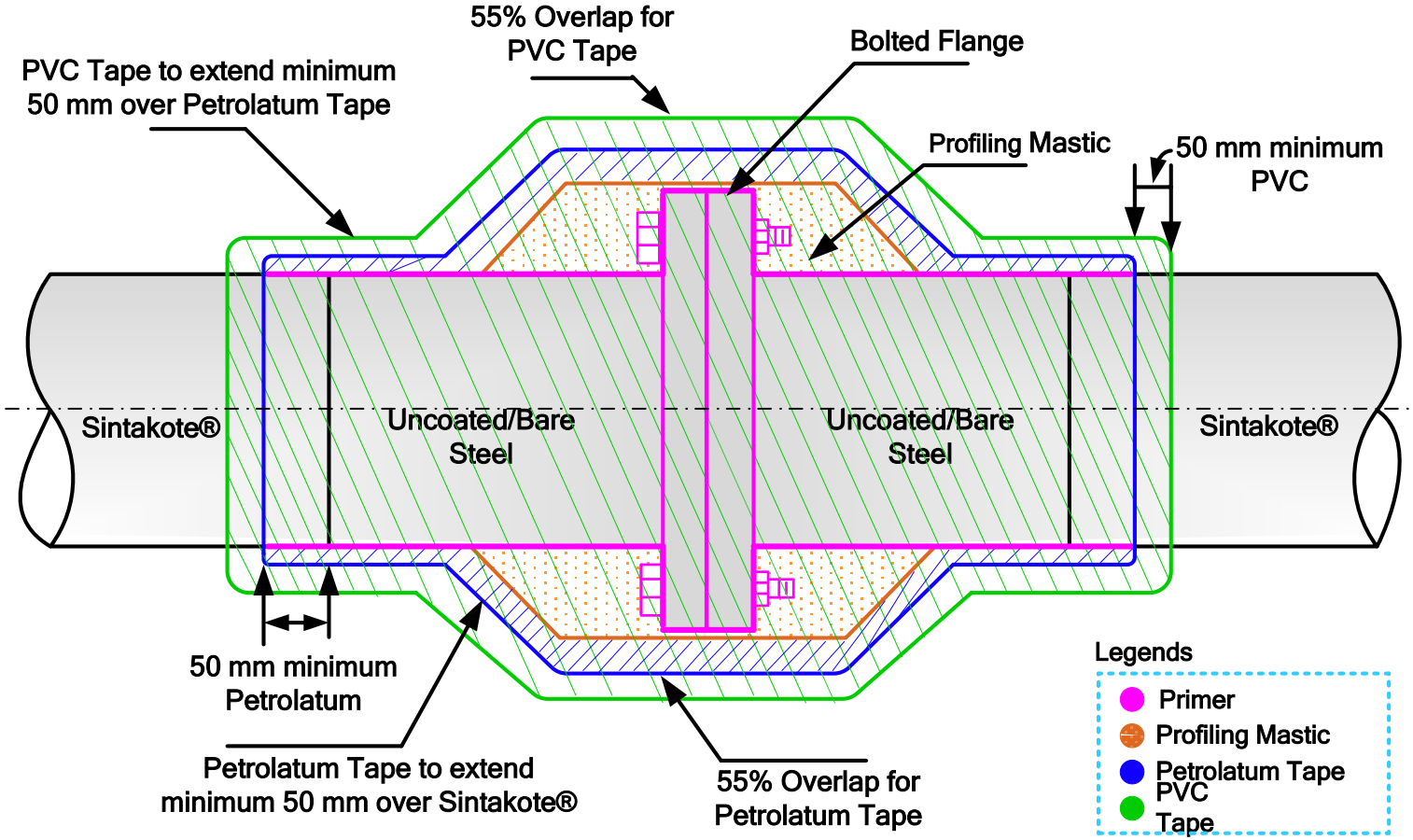


Figure 3: Petrolatum 4 Step System

6.8 System C - Canusa® Heat Shrink Repair Patches

Patch repairs to damaged Sintakote coating shall be carried out using Canusa® heat shrink repair patches.

Patch repairs using Butyl Mastic is only permissible following approval of the Principal.

For this application refer to Water Corporation's Specification L2.

6.9 System D – 3 Step Butyl Mastic Tape Repair

(a) Where it is not possible to circumferentially wrap the pipe, using a 3 Step Butyl Mastic tape as a patch repair shall be permitted. The patch shall consist of butyl primer, butyl mastic strip and PVC overwrap.

(b) The primer shall be applied approximately ten (10) minutes prior to wrapping, depending on the ambient conditions. The primer shall be tacky prior to tape wrapping. No wrapping shall be allowed once the primer has dried.

(c) The butyl mastic tape repair patch shall extend a minimum of 150 mm beyond the edge of the defect over the Sintakote®.

(d) PVC Overwrap Tape shall extend a minimum of 100mm beyond the edge of the Butyl Tape over the Sintakote®

(e) Care shall be taken to ensure that the patch repair is not damaged or removed during backfilling and compaction.

6.10 System E – 4 Step Petrolatum Tape System

Excavated old and existing water trunk mains have often been wrapped in cloth fibre wrap with a layer of bitumen. Further information on the subject of old pipe coatings can be obtained from **Guideline for Identifying Hazardous Pipe Coatings** DOCUMENT that can be found from the following Water Corp website link.

https://pw-cdn.watercorporation.com.au/-/media/WaterCorp/Documents/About-us/Suppliers-and-contractors/Resources/Design-standards/Guideline-for-Identifying-Hazardous-Pipe-Coatings.pdf?_gl=1*1v1y39z*_ga*MTE1NjU2NTE0NC4xNjQ0NDQ4ODY2*_ga_XS0K8Z5E0Y*MTcwNDMzNzM4NS4xNi4wLjE3MDQzMzczOTAuNTUuMC4w

At tie-ins, newly installed welded pipe sections inside the trench box/bell hole are cut and joined onto old existing water corporation bitumen wrapped pipe terminations. The interface of old to new requires corrosion protection. Petrolatum wrap overlay methodology provides the procedure to protect the exposed joint section.

Material requirements for this implementation include:

- Grease Primer
- Superlight Profiling Mastic (Birdseed)
- Petrolatum Tape
- PVC Tape

Procedures for wrapping are as follows:

(a) The purpose of cleaning old, coated surfaces using a banister brush is to remove any loose sand attached to the external coated surface. Avoid heavy cleaning of old existing coated surface.

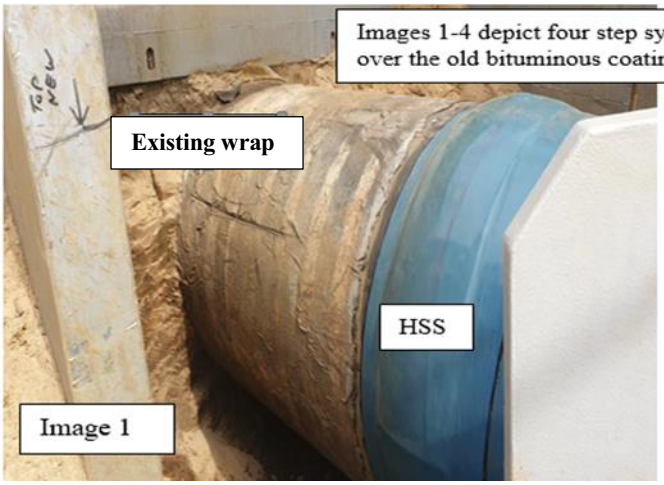
(b) Apply liberal coating of MP grease primer to the entire surface area requiring wrapping.

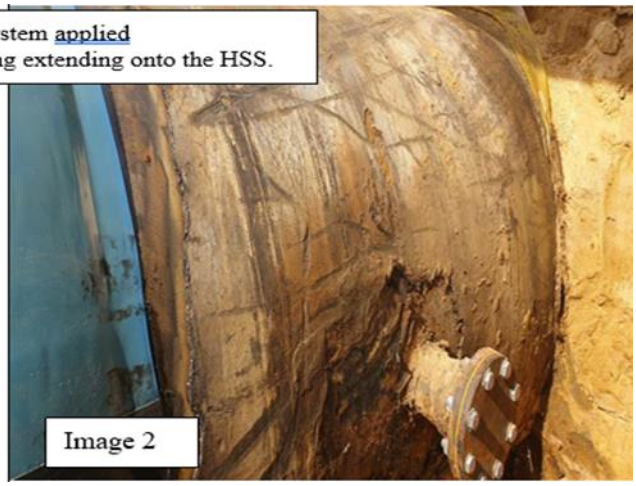
(c) Apply superlight profiling mastic (birdseed) as required i.e. at locking bar.

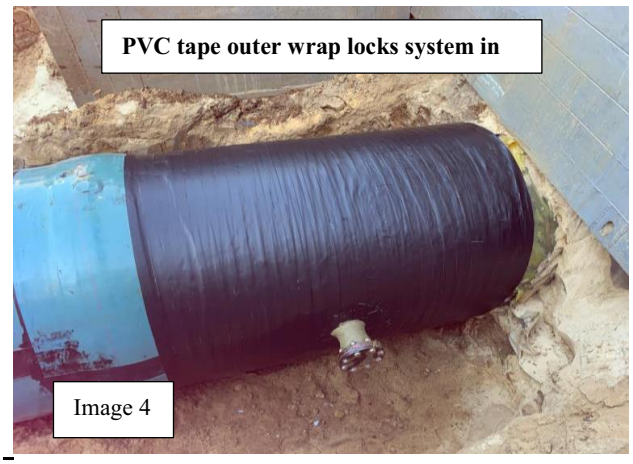
(d) Spiral wrap with 55% overlap on all Petrolatum tape applications. If space is restricted beneath pipe, tape can be applied longitudinally i.e. " Cigarette wrapped" with 25mm overlap.

(e) Use PVC tape as an Outerwrap as a barrier to prevent backfilling damage.
- Aid in the prevention of leaching of the petrolatum in hot, dry, sandy soils.
- Maintain dielectric strength when the system includes cathodic protection.

Note: The HSS (Heat Shrink Sleeve) is applied first. Petrolatum system applied over the HSS. Images below depict example of Petrolatum system over old Coal Tar Epoxy (CTE)/bituminous lining to HSS:







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Further Examples:

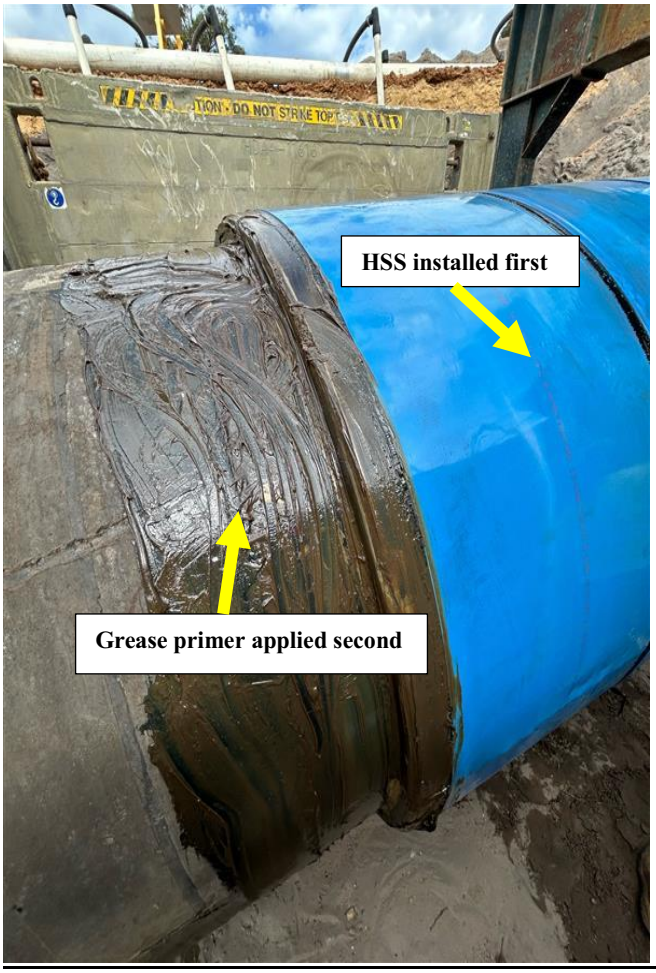

Figure 4: Petrolatum system over old CTE/bituminous lining to HSS

7.0 INSPECTION & TESTING

7.1 The Contractor shall inspect the completed wrapping to confirm that it is adequately bonded to the pipe and that there are no visible voids. Systems that are not adequately bonded to the pipe shall be removed and re-applied.

7.2 There shall be no holes, punctures, gaps or any other defects that may impair the performance of the tape system. All such defects shall be repaired in accordance with the manufacturers recommended practice.

7.3 The finished tape wrapping shall be holiday tested in accordance with AS 3894.1, i.e. "*All high voltage test equipment should be operated by responsible, trained and authorized personnel only. Trainees should understand the basic principles governing the operation of the equipment prior to any physical training being undertaken."* The minimum voltage setting for the high voltage spark testing for System A, C and D shall be 12,000 volts..

7.4 Plant, equipment, materials and methods used shall be subject to inspection acceptance by the Principal.

8.0 PROCESSES & CONSUMABLES

8.1 All materials used in the tape wrapping process shall comply with the relevant standards/codes.

8.2 All materials used in the tape wrapping process shall be supplied by:

8.2.1 The manufacturer of the subject materials who has in place a Quality Management System certified by an accredited third party to AS/NZS ISO 9001 or an equivalent system certified by an accredited third party and approved by the Principal; (or)

8.2.2 A distributor, who has in place a Quality Management System certified by an accredited third party to AS/NZS ISO 9001 or an equivalent system certified by an accredited third party and approved by the Principal; or is a distributor who is supplying the goods from a manufacturer who has in place a Quality Management System which is certified in accordance with paragraph 8.2.1.

9.0 CONTRACTOR'S RESPONSIBILITY

9.1 The Contractor shall supply all necessary plant, equipment, materials and labour, prepare the surface, apply and maintain tape wrapping system carry out quality control inspection testings and records in accordance with DS95.

9.2 The preceding inspection clauses shall not relieve the Contractor of their responsibility to supply materials and perform work in accordance with the requirements of any overriding contract documentation.

APPENDIX A – Examples of Surface Preparation

ST2 Surface preparation to steel and abrading Sintakote

Prepared surfaces for HSS wrap

Isopropyl is the preferred cleaning solvent

Preparing for Butyl Bend Wrap

Figure 5: Sintakote & Steel Surface Preparation

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Document Revision History					
Sect.	**Ver/Rev.**	**Date**	**Revision Description**	**RVWD.**	**APRV.**
1	1/0	3/08/22	Changes to pipe wrapping material system A and D	JF	SS
1	1/0	3/08/22	Amend supplier description for material	JF	SS
3	1/0	3/08/22	Change to material from Bitumen to Butyl	JF	SS
6	1/0	3/08/22	Amend table 1. Change images and descriptions Fig 1. Minor wording terms throughout. Added clause 6.6 System A and amend clause 6.9 System D. New drawing Fig 2. Delete previous version.	JF	SS
9	1/0	3/08/22	New Appendix A fig 3	JF	SS
1 & 2	1/0	30/08/22	Re-wording scope and purpose	JF	SS
5	1/0	30/08/22	Amend to competency and training requirements Clause 5.3	JF	SS
7	1/0	30/08/22	Clarify the competency requirements for spark testing. Clause 7.3	JF	SS
6	**1/0**	**4/1/24**	**Add wrapping system E in clause 6.10**	**JF**	**SS**

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