

Medupi Power Station Corrosion Protection Specification

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1. PURPOSE

The purpose of this document is to provide clear, uniform procedures for the corrosion protection of Medupi Power Station. The information contained in this document is correct to the best of our knowledge, but it does not necessarily refer to all the site-specific requirements of the Engineer. These should be considered prior to the use of this specification.

2. SCOPE

This document is applicable to all structures and items of plant where corrosion protection is required. However, the Contractor shall refer to the Engineer for queries related to this standard or items not addressed in this specification.

The specifications detailed herein shall not be modified in any way without the written approval of the Engineer.

3. DEFINITIONS AND ABBREVIATIONS

3.1 DEFINITIONS

3.1.1 Approved / Approval

Refers to written approval by the Engineer.

3.1.2 Coating System

Coating system is an all embracing term including generic type, the number of coats, the thickness of each and the overall thickness of the system.

3.1.3 Coat/Film

Refers to a single layer of the product.

3.1.4 Contractor

Means the person(s) named as Contractor in the Contract Agreement.

3.1.5 Duplex corrosion protection

Zinc coating plus organic paint system

3.1.6 Generic Coating

Refers to a type of product e.g. epoxy, polyurethane, etc.

3.1.7 Supervisor

Refers to a person having a minimum of two years experience in the field of surface preparation and application of surface coatings.

3.1.8 Detailed Coating Specification

Plant/Item specific corrosion protection specifications as attached in Section 18.

3.1.9 Product Data Sheet

Technical document issued by the Paint/Material Supplier for their products, detailing the physical, chemical and performance qualities of the material, as well all necessary information related to the safe handling and application of the materials.

3.1.10 Inspector

Someone with vast experience in the application of coatings and ideally qualified as a NACE International or SAQCC [South African Quality Certification Committee] Coating Inspector.

3.1.11 Manufacturer

Means the company the supplies the paint.

3.2 ABBREVIATIONS

- 3.2.1 GRP – Glass-reinforced Plastic (Polyester)
- 3.2.2 HDPE – High Density Polyethylene
- 3.2.3 MIO - Micaceous ion oxide
- 3.2.4 PVC – Polyvinyl Chloride
- 3.2.5 SANS – South African National Standards
- 3.2.6 SAQCC – South African Qualification and Certification Committee for Corrosion

4. REFERENCE DOCUMENTS

The following specifications, guidelines, standard methods and Code of Practice shall be read in conjunction with this document. The latest revisions available at the time of contract award shall be applicable and shall remain applicable for the duration of the contract unless the Engineer and the Contractor mutually accept new revisions. In case of conflict, the provisions of this document shall take precedence.

- ASTM C811: *Standard method for surface preparation of concrete for application of chemical resistant monolithic surfacing.*
- ASTM D4258: *Standard practice for surface cleaning concrete for coating.*
- ASTM D4263: *Standard test method for indicating moisture in concrete by the plastic sheet method.*
- ASTM D4414: *Standard practice for measurement of wet film thickness by notch gauges.*
- ASTM E376: *Measuring coating thickness by magnetic field or eddy current electro-magnetic test methods.* (Can be used as alternative to SANS ISO 2808).
- ASTM F 1545: *Plastic-lined ferrous metal pipe, fittings and flanges.*
- BS 6374: Part 5: *Lining of equipment with polymeric materials for the process industries, Part 5, Specification for lining with rubbers.*
- EN 22063: *Metallic and other inorganic coatings. Thermal spraying. Zinc, aluminium and their alloys.*
- DIN 18166: *Ceramic split tiles.*
- ESKSCAAC6. *Specification for the identification of the contents of pipeline and vessels.*
- ISO 813: *Rubber, vulcanized or thermoplastic. Determination of adhesion to a rigid substrate. One plate method.*
- ISO 8501-1. *Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings.*
- ISO 8502-3. *Preparation of steel substrates before application of paint and related products – Test for the assessment of surface cleanliness – Part 3: Assessment of dust on steel surfaces prepared for painting (pressure sensitive tape method).* (Can be used as alternative to SANS 5769).
- ISO 8503-4. *Preparation of steel substrates before application of paint and related products – Surface roughness characteristics of blast-cleaned steel substrates – Part 4: Method for the calibration of ISO surface profile comparators and for the determination of surface profile – Stylus instrument procedure.* (Can be used as alternative to SANS 5772).
- SANS ISO 9002: *Quality systems – Model for quality assurance in production, installation and servicing.*

- ISO 14713: *Protection of iron and steel structures – Zinc and aluminium coatings – Guidelines.*
- SAHDGA 01-1990 – *Code of practice for surface preparation and application of organic coatings.*
- SANS 1091: *National colour standards for paints*
- SANS 10064: *The preparation of steel surfaces for coating.*
- SANS 1198: 2005: *The manufacture of rubber sheeting for rubber lining.*
- SANS 1217: *The production of painted and powder-coated steel pipes.*
- SANS 1274: *Coatings applied by the powder-coating process.*
- SANS 1391 (1-3): *Thermally sprayed metal coatings Part 1: Zinc and aluminium coatings for the protection of iron and steel against atmospheric corrosion.*
- SANS 141: *Glass-reinforced polyester (GRP) laminates*
- SANS / ISO 2808: *Paints and Varnishes: Determination of film thicknesses*
- SANS 5159: *Adhesion of paint and varnish films (cross-cut test).*
- SANS 5651: *Tensile strength, elongation at break, and tensile strength at specified elongation of elastomeric material (footwear).*
- SANS 5769: *Cleanliness of blast-cleaned steel surfaces for painting.*
- SANS 5770: *Preparation of steel substrates before the application of paints and related products – Test for the assessment of cleanliness of blast-cleaned steel surface – Freedom from certain soluble salts.*
- SANS 5772: *Preparation of steel substrates before the application of paints and related products – Surface roughness characteristics of blast-cleaned steel surfaces – Profile of blast-cleaned surfaces determined by a micrometer profile gauge.*
- SANS 5870: *Hardness of vulcanized rubbers of hardness 30 – 95 degrees.*
- SANS 630:1972: *Decorative high gloss enamel paints*
- SANS 121 (ISO 1461): *Hot-dip galvanised coating on fabricated iron and steel articles – Specification and test methods.*
- SIS 055900: *Swedish Code of Practice - Pictorial surface preparation standard for painted steel surfaces. (Can be used as alternative to ISO 8501 - 1).*

5. CLASSIFICATION AND SELECTION OF SUITABLE CORROSION PROTECTION SYSTEMS

5.1 CLASSIFICATION OF CORROSION PROTECTION SYSTEMS

The classification of suitable corrosion protection systems for various applications and environments are as follows:

- Specialised coatings/linings and applications (CPS)
- Detailed Coating Specifications for interior, exterior and in contact with liquids applications (DCS).

5.2 DETAILED SYSTEMS

- 5.2.1 The detailed item specifications to be used for the corrosion protection of the various items of plant shall be as defined in Table 1 of this document. However, where items are not addressed in Table 1, Table 2 can be used to select the most appropriate specification.

Table 1: Detailed Protective Systems

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
RAW SEWAGE PUMPS STATIONS		
Motor and pump immersed in sewage	Internal surfaces	DCS1700
	External Surfaces	DCS1700
Electrically operated valves	Internal surfaces	DCS1700
	External surfaces	DCS1700
Discharge piping partially immersed in sewage	Internal surfaces	CPS100
	External surfaces: Exposed	CPS100
	External surfaces: Buried	CPS100 & CPS500
Pipe racks and supports		CPS100
Float switch brackets	Outdoors	DCS200
Control panels	Outdoors	CPS600
Lifting chain (partially submerge in sewage)	Chain	Nil
	Chain block	DCS200
Lozenge patterned or open grid flooring		CPS100
Platforms, ladders and handrails		CPS100
Covers for trenches, pits and openings (lozenge patterned)		CPS100
Curbing	Mild steel angle	CPS100
Junction boxes, switchgear, sockets outlets and distribution boards		DCS200
Lighting fittings		Proprietary
Brass castings		Nil
Iron castings (i.e. mounting brackets, discharge elbows and flanges on discharge pipe)	Internal	Proprietary
	External	Proprietary
Gearboxes	Indoors	DCS100
	Outdoors	DCS900
Current transformers		CPS100
Structural steelwork		DCS200
WATER RING MAIN		
Mild steel pipes & flexible joints (buried)	Internal surfaces	DCS1400 or DCS1500
	External surfaces	CPS500
Mild steel pipes & flexible joints (above ground)	Internal surfaces	DCS1400 or DCS1500
	External surfaces	DCS200
Valves	Internal surfaces	Proprietary
	External surfaces	DCS200
Hydrants above ground		DCS200
LIGHTING STANDARDS AND LUMINARS		
Lighting standards		CPS100
Planted poles (buried sections)		DCS2200
Hinged poles		CPS100
Light fittings		Proprietary
TRANSFORMER INSULATING OIL PLANT		
Transformer oil tanks	Internal surfaces	DCS2000
	External surfaces	DCS900
Pipework conveying transformer oil	Internal surfaces	DCS2000
	External surfaces	DCS900
CIVIL AND BUILDING WORKS – ARCHITECTURAL FINISHES		
Wooden skirtings not exceeding 150mm girth		CPS2300
Wooden beads, rails, skirtings, etc., not exceeding 150mm girth		DCS800 or DCS1200
Wooden paneling and partitions		DCS1200
Wooden doors		DCS800 or DCS1200
Wooden frames		DCS1200
Plastered internal walls		DCS600 or DCS2400 or DCS2500 or DCS2700
Plastered internal walls with special hygiene requirements		DCS700

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
Plastered ceilings		DCS2400 or DCS2500
Bagged internal walls		DCS600
Cement board ceilings with steel jointing strips		DCS2400 or DCS2700
Members of steel trusses, steel doors, steel frames, steel window frames and steel louvers		DCS200
Steel bearers, kerbs, etc., not exceeding 150mm girth		DCS200
Steel roller shutters		CPS100 or CPS600
Galvanised sheet iron flashings, eaves, fascias, barge boards, etc.		DCS2600 or DCS400 or DCS500
Galvanised sheet iron QC decking		DCS2600 or DCS400 or DCS500
Galvanised sheet iron rainwater pipes and gutters		DCS2600 or DCS400 or DCS500
External surfaces of small galvanised steel pipes		DCS2600 or DCS400 or DCS500
External surfaces of large cast iron pipes		DCS200
Offshutter concrete walls, columns, ceilings and beams		DCS2700
Vermiculite plastered walls		DCS2700
STORM WATER DAM PIPES		
Storm water dam pipes		
	Internal surfaces	CPS100 or DCS1500
	External surfaces	CPS100 or DCS200
CIVIL AND BUILDING WORKS		
Macalloy bars		CPS500
Lubricating oil bund		DCS2000 or DCS2100
Vastrap trench covers, open-grid flooring, kerbing, catladders, crawl beams, platforms and handrailing		CPS100
Structural steelwork (Indoors)		DCS200 or DCS3400
Outdoors		CPS100
Steel pipes for plumber		CPS100
Mild steel pipes inside power station building at and below terrace level		CPS100
Gratings over gulleys		CPS100
Sankey struts		CPS500
Mild steel channel		CPS100
WATER TREATMENT PLANT		
Pre-treatment plant		
Buried pipework	Internal	DCS1400 or DCS1500
	External	CPS500
Raw water pipework above ground	Internal and external	DCS1500
	Internal	DCS1400 or DCS1500
	External	DCS200
Pipework from splitter box to the clarifier	Internal	DCS1400 or DCS1500
	External	DCS200 or DCS900
Pipework conveying sludge draw-off and recycled water	Internal	DCS1400 or DCS1500
	External	DCS200 or DCS900
Clarifier steelwork below water-level	Pre-erection	DCS2800
	Post-erection	DCS1500 or DCS2900
Walkways, stairs, catladders and handrails at the clarifiers		CPS100
Bridge structure	Pre-erection	DCS2800
	Post-erection	DCS3000 or DCS3100
Sludge thickener components		Stainless steel
Sludge recycle pumps	Internal surfaces	Proprietary
	External surfaces	DCS200 or DCS900
Sludge discharge pumps	Internal surfaces	Proprietary
	External surfaces	DCS200 or DCS900
Recovered water pumps	Internal surfaces	Proprietary
	External surfaces	DCS200 or DCS900
Auxiliary cooling water supply pipework	Internal surfaces	DCS1400 or DCS1500
	External surfaces	DCS200 or DCS900
Chemical systems		
GRP flocculating aid dilution tank	Internal surfaces	Nil
	External surfaces	Nil

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
Dosing tank mixers, dosing feed pumps and dosing pups handling flocculating aid (Stainless steel or inert plastic)	Internal surfaces	Nil
	External surfaces	Nil
Overhead cranes		DCS900
Carbon steel storage hopper and feeder for dry chemicals	Internal surfaces	CPS200
	External surfaces	DCS900
Carbon steel storage hopper and feeder for wet chemicals	Internal surfaces	CPS200
	External surfaces	DCS900
Flocculating aid dosing tank mixers and metering pumps (Stainless steel and inert plastic)	Internal surfaces	Nil
	External surfaces	Nil
Stainless steel alum hopper slide gate		Nil
Cast iron feeder selector valve handling dry alum	Internal surfaces	Nil
	External surfaces	DCS900
GRP brine measuring tank and brine saturator	Internal surfaces	Nil
	External surfaces	Nil
Brine pump (cast iron or carbon steel)	Internal surfaces	Proprietary
	External surfaces	DCS900
Structural steel, steel supports and pipe racks		DCS900
Carbon steel pipework	Internal surfaces	Nil
	External surfaces	Nil
Bulk storage tank in WT Building		
Carbon steel hydrazine and ammonia dilution tanks	Internal surfaces	Nil
	External surfaces	DCS900
Carbon steel sulphuric acid and caustic soda storage tanks	Internal surfaces	Nil
	External surfaces	DCS900
Carbon steel sulphuric acid and caustic soda re-use vessels	Internal surfaces	CPS200
	External surfaces	DCS900
Carbon steel pipework. Pipework handling dilute sulphuric acid and dilute caustic	Internal surfaces	CPS200
	External surfaces	DCS900
Carbon steel pipework handling concentrated sulphuric acid, concentrated caustic, hydrazine and ammonia	Internal surfaces	Nil
	External surfaces	DCS900
Stainless steel pipework	Internal surfaces	Nil
	External surfaces	Nil
Structural steelwork and pipe racks		DCS900
Carbon steel vessel support legs in bund storage area		DCS900
Dosing and metering pumps		
Ammonia hydroxide metering pumps, hydrazine, metering pumps, concentrated acid dosing pumps, sulphuric acid re-use pumps, caustic re-use pumps and caustic dosing pumps	Stainless steel (Internal and external)	Nil
	Carbon steel (internal)	Nil
	Carbon steel (external)	DCS900
	Cast Iron (Internal)	Nil
	Cast Iron (External)	DCS900
Structural steelwork, building and pipe supports		DCS900
Filter area in WT building		
Carbon steel pipework handling clarifier water	Internal surfaces	DCS1400 or DCS1500
	External surfaces	DCS200 or DCS900
Plastic pipework handling clarified water	Internal surfaces	Nil

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
	External surfaces	Nil
Small bore galvanised pipework handling clarified water	Internal surfaces	Nil
	External surfaces	Nil
Carbon steel pipework handling potable water	Internal surfaces	DCS1400 or DCS1500
	External surfaces	DCS200 or DCS900
Galvanised or plastic pipework handling potable water	Internal surfaces	Nil
	External surfaces	Nil
Structural steelwork		DCS200 or DCS900
Platforms, ladders and stairways		CPS100
Demin train units in WT building		
Cation units, degasser units, weak base anion units, strong base anion units and mixed bed units (Carbon steel)	Internal surfaces	CPS200
	External surfaces	DCS200 or DCS900
Vacuum pumps, anion supply pumps and cation supply pumps (Stainless steel)	Internal surfaces	Nil
	External surfaces	Nil
Vacuum pumps, anion supply pumps and cation supply pumps (Carbon steel)	Internal surfaces	Proprietary
	External surfaces	DCS200 or DCS900
Carbon steel pipework	Internal surfaces	CPS200
	External surfaces	DCS200 or DCS900
Structural steelwork and pipe racks		DCS200 or DCS900
Blower and transfer pumps in WT building		
Filter air blowers, blowers and regeneration blowers (cast iron and carbon steel)	Internal surfaces	Proprietary
	External surfaces	DCS200 or DCS900
Carbon steel hot water tanks		
Carbon steel	Internal surfaces	CPS200
	External surfaces	DCS200 or DCS900
Stainless steel	Internal surfaces	Nil
	External surfaces	Nil
Stainless steel demin – Regen dilution pumps	Internal surfaces	Nil
	External surfaces	Nil
Carbon steel and cast iron Demin. – Regen. dilution pumps	Internal surfaces	Proprietary
	External surfaces	DCS200 OR DCS900
Carbon steel pipework handling demineralised water	Internal surfaces	CPS100
	External surfaces	CPS100
Effluent systems		
Polypropylene and high density polyethylene pipework handling high conductivity effluent	Internal surfaces	Nil
	External surfaces	Nil
Carbon steel pipework handling high conductivity effluent	Internal surfaces	CPS200
	External surfaces	DCS200 or DCS900
Stainless steel discharge pumps handling high-conductivity effluent	Internal surfaces	Nil
	External surfaces	Nil
Polypropylene pipework handling low conductivity effluent	Internal surfaces	Nil
	External surfaces	Nil
Carbon steel pipework handling low conductivity effluent	Internal surfaces	DCS1400 or DCS1500
	External surfaces	DCS200 or DCS900
Carbon steel and cast iron pumps and handling low conductivity effluent	Internal surfaces	Proprietary
	External surfaces	DCS200 or DCS900
ELECTRICAL COMPONENTS		
Switchboards, distribution boards, control, relay and alarm panels, junction boxes and ring main units	Indoors	CPS600
	Outdoors	CPS600

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
Miniature sub-station		
	Mild steel enclosure	DCS200
	Switchboard	CPS600
External surfaces of motors	In boiler or turbine house	DCS100
	In water treatment plant	DCS900
	Outdoors	DCS900
Painting of external surfaces of conservators	Oil-filled transformers	DCS900
	Dry type transformers	DCS900
Galvanising of transformers		CPS100
Cable racking	In boiler and turbine house	CPS100 or DCS200 or CPS600
	In water treatment plant	CPS600
	Outdoors	CPS100 or DCS200 or CPS600
COAL STOCKYARD EQUIPMENT	Structural steelwork for overland conveyors	CPS100 or DCS900
	Handrails	CPS100 or DCS900
	Vastrap flooring, opengrid flooring, ladders and platforms	CPS100
	Gearboxes and motors	DCS900
	Instrument panels (Indoors)	CPS600
	Instrument panels (outdoors)	CPS600
	Structural steelwork for stacker reclaimers	CPS100 or DCS900
	Items requiring temporary protection	DSC3200
ELECTROSTATIC PRECIPITATORS		
Plates exposed to flue gases		DCS3200
Precipitator Internals (in gas path)		DCS3200
Shell and ducts	External surfaces (Clad)	DCS3300
Hopper	Internal surfaces	DCS3200
Hopper	External surfaces (Clad)	DCS3300
Small motors and gearboxes (exposed to weather)		DCS900
HV Equipment and roof (exposed to weather)		CPS600 or DCS900
Control panels and switchgear (indoors)		CPS600
Structural steel		DCS900
Open-grid flooring and chequer plate flooring		CPS100
Handrails and stanchions		CPS100
WATER TREATMENT PLANT _ CIVIL WORKS		
Pre-treatment plant		
Flash Mixers		Proprietary
Clarifiers		Proprietary
Channels and launders		Proprietary
Sludge Thickener		
Wash water recovery tank		Proprietary
Gravity filters		Proprietary
Chemical Dosing Plant		
Concrete supports for tanks and pumps containing/handling alum, lime or polyelectrolyte		Proprietary
Walls to door height		Proprietary
General floor area		Proprietary
Drain trenches conveying dilute alum solution		Proprietary
Trenches containing pipework conveying sulphuric acid or caustic soda		Proprietary
Lime silos containing dry lime		Nil
Ion Exchange Plant		
Plinths supporting tanks and pumps which contain/handle hydrazine, ammonia, sulphuric acid, caustic soda and passivation chemicals		CPS300 or CPS400 or DCS1300
Bund area for pumps		CPS300 or CPS400 or DCS1300
General floor area (not bund area)		DCS1100 or CPS300
Walls up to door height		DCS1100 or CPS300
Chlorination plant		
Chlorine area	Floor area	Nil

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
	Walls	DCS1100
Chlorine solution room	Floor area	Nil
	Walls	DCS1100
Cause way for pipework handling effluent		DCS1100
Effluent sump		CPS300 or DCS1800 or DCS1900
Off-loading area for acid and alkalis		CPS400 or DCS1300
LOW PRESSURE SERVICES		
Station effluent recovery and discharge system		
Clean drains recovery system		
Pipework	Internal (above ground)	DCS1400 or DCS1500
	External (above ground)	DCS200
	Internal (buried)	DCS1400 or DCS1500
	External (buried)	CPS500
Valves and pumps	Internal	Proprietary
	External	DCS200
Dirty drains recovery system		
Pipework	Internal (above ground)	DCS1400 or DCS1500
	External (above ground)	DCS200
	Internal (buried)	DCS1400 or DCS1500
	External (buried)	CPS500
Valves and pumps	Internal	Proprietary
	External	DCS900
Treated sewage effluent recovery system		
Pipework	Internal (above ground)	CPS100 or DCS1700
	External (above ground)	CPS100 or DCS200
	Internal (buried)	CPS100 or DCS1700
	External (buried)	CPS500
Valves and pumps	Internal	Proprietary
	External	DCS200
Ash dump clean drains recovery system		
Pipework	Internal (above ground)	DCS1400 or DCS1500
	External (above ground)	DCS200
	Internal (buried)	DCS1400 or DCS1500
	External (buried)	CPS500
Valves and pumps	Internal	Proprietary
	External	DCS200
Ash dump dirty drains recovery system		
Pipework	Internal (above ground)	DCS1400 or DCS1500
	External (above ground)	DCS200
	Internal (buried)	DCS1400 or DCS1500
	External (buried)	CPS500
Valves and pumps	Internal	Proprietary
	External	DCS900
Ash conditioning effluent discharge		
Pipework	Internal (above ground)	CPS100
	External (above ground)	CPS100
	Internal (buried)	CPS100
	External (buried)	CPS500
Valves and pumps	Internal	Proprietary
	External	DCS200
Expansion joints		As per associated pipework
External surfaces of motors (indoors)		DCS100 or DCS200
Pipe supports (indoors and outdoors)		As per associated pipework
Structural steelwork		DCS200
Platforms, walkways and stairs	Indoors	CPS100
	Outdoors	CPS100
Handrails	Indoors	CPS100 or DCS200
	Outdoors	CPS100 or DCS200
Boiler and turbine auxiliaries cooling system		
Pipework and valves conveying inhibited demineralised water	Internal	Nil
	External	DCS200
Pipework and valves conveying recirculated cooling water	Internal	DCS1400 or DCS1500
	External	DCS200
Pumps and flow meters	Internal	Proprietary
	External	DCS200 or DCS100

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
External surfaces of motors (indoors)		DCS200 or DCS100
Pipe supports		As per associated pipework
Access platform (indoors)		CPS100
Boiler feed make-up system		
Stainless steel outdoor storage tanks	Internal	Nil
	External	Nil
Large bore pipelines, pumps and valves	Internal	CPS200 (Ebonite or Soft Rubber)
	External (In-and outdoors)	DCS200 or DCS100
Expansion joints and small bore pipework		Stainless steel
Pipe supports		DCS200
External surfaces of motors (indoors)		DCS200 or DCS100
Raw water reticulation system		
Pipework	Internal (above ground)	CPS100 or DCS1400 or DCS1500
	External (above ground)	CPS100 or DCS200
	Internal (buried)	CPS100 or DCS1400 or DCS1500
	External (buried)	CPS500
Valves and pumps	Internal	Proprietary
	External	DCS200 or DCS100
Condensate chemical conditioning system		
Stainless steel pipelines and valves	Internal	Nil
	External	Nil
Indoor distribution panels		CPS600
Sample panels	Indoors	CPS600
	Outdoors	CPS600 (Exterior quality)
Control and service air system		
Air piping	Internal	CPS100
	External	CPS100
Pumps and valves	Internal	Proprietary
	External	DCS200 or DCS100
External surfaces of motors		DCS200 or DCS100
External surfaces of compressors, air receivers and fittings		DCS200 or DCS100
Indoor cooling water storage tank and pipework (inhibited demin water)	Internal	Nil
	External	DCS200
Indoor cooling water storage tank and pipework (potable water)	Internal	CPS100 or DCS1400 or DCS1500
	External	CPS100 or DCS200
Pipe supports		CPS100 or DCS200
Condensate polishing plant resin transfer conveying system		
Pipelines and associated equipment conveying resin	Internal	Proprietary
	External (above ground)	DCS200
	External (indoors – chemical areas)	DCS900
Pipelines and associated equipment conveying water	Internal	CPS200
	External (above ground)	DCS200
	External (indoors – chemical areas)	DCS900
Pipe supports		CPS100 or DCS200
General service water, floor washing and air heater washing system		
Indoor pipelines and storage tanks handling potable water	Internal	CPS100 or DCS1400 or DCS1500
	External	CPS100 or DCS200
Indoor pipelines and storage tanks handling dirty drains water/demin effluent	Internal	DCS1400 or DCS1500
	External	DCS200
Pumps and valves	Internal	Proprietary
	External	DCS200 or DCS100
External surfaces of motors (indoors)		DCS200 or DCS100
Supporting steelwork		DCS200
Potable water reticulation system – power station		
Pipework	Internal (above ground)	CPS100 or DCS1400 or DCS1500
	External (above ground)	CPS100 or DCS200
	Internal (buried)	CPS100 or DCS1400 or DCS1500

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
	External (buried)	CPS500
Valves and pumps	Internal	Proprietary
	External	DCS200 or DCS100
External surfaces of motors (indoors)		DCS200 or DCS100
Pipe supports		CPS100 or DCS100
Lubricating oil supports and regeneration system		
Pipelines	Internal	Nil
	External	DCS900
Outdoor storage tanks	Internal	Nil
	External	DCS900
Pumps and valves	Internal	Nil
	External	DCS900
External surfaces of motors		DCS900
Purifiers		Proprietary
Pipe supports		DCS900
Structural steelwork		DCS900
Outdoor ladders and platforms		CPS100
Vacuum cleaning system		
Indoor compressors		Proprietary
External surfaces of motors (indoors)		DCS100 or Proprietary
Noise hood		Proprietary
Indoor pipeline and valves	Internal	Proprietary
	External	DCS200
Flexible hoses		Proprietary
Storage cabinet for accessories (indoors)		CPS600
Used oil storage and collecting system		
Storage tanks	Internal	Nil
	External	DCS900
Pipework	Internal	Nil
	External	DCS900
Potable collector consisting of carriage, pump, storage tank (external surfaces) and hose reel		DCS900
Supporting steelwork		DCS900
Platforms and stairs		CPS100
Diesel fuel oil system		
Pipelines	Internal	Nil
	External	DCS900
Outdoor storage tanks	Internal	Blastclean
	External	DCS900
Valves	Internal	Nil
	External	DCS900
Pipe supports		CPS100 or DCS900
Horticultural supply system		
Pipework in open trenches conveying treated sewage effluent	Internal	CPS100 or DCS1700
	External	CPS100 or DCS200
Associated valves	Internal	Proprietary
		DCS200 or DCS100
Sludge discharge system		
Pipework conveying potable water	Internal	CPS100 or DCS1400 or DCS1500
	External	CPS100 or DCS200
CONDENSATE POLISHING AND REGENERATION PLANTS		
Ammonia and hydrazine systems		
Dosing tanks mixers (stainless steel or inert plastic)	Liquid contact surfaces	Nil
	Other:	Nil
GRP dilution and re-use tanks	Internal	Nil
	External	Nil
Stainless steel metering pumps	Internal	Nil
	External	Nil
Motors and gearboxes associated with stainless steel metering pumps		Proprietary or DCS900
Carbon steel pipework and valves	Internal	Nil
	External	DCS900
Structural steelwork associated with ammonia and hydrazine systems		DCS900

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
Brine systems		
GRP measuring tank and saturator	Internal	Nil
	External	Nil
Cast iron or carbon steel pump	Internal	Proprietary
	External	DCS900
Pipework and valves handling saturated and dilute sodium chloride (UPVC or other approved plastic)	Internal	Nil
	External	Nil
GRP tanks storing sodium chloride / caustic mixture (up to 45°C)	Internal	Nil
	External	Nil
Structural systems associated with brine systems		DCS900
Sulphuric acid and caustic soda		
Carbon steel sulphuric acid and caustic re-use tanks	Internal	CPS200
	External	DCS900
Carbon steel pipework handling sulphuric acid and caustic	Internal	CPS200
	External	DCS900
Stainless steel pipework handling dilute sulphuric acid and caustic	Internal	Nil
	External	Nil
Carbon steel pipework handling concentrated sulphuric acid and caustic	Internal	Nil
	External	DCS900
Carbon steel pumps handling concentrated sulphuric acid and caustic	Internal	Nil
	External	DCS900
Stainless steel pumps handling dilute sulphuric acid and caustic	Internal	Nil
	External	Nil
Structural steelwork associated with sulphuric acid and caustic systems		DCS900
Condensate system		
Carbon steel pipework and valves	Internal	Nil
	External	DCS200 or DCS900
Demineralised water system		
Stainless steel pipework	Internal	Nil
	External	Nil
Carbon steel pipework	Internal	CPS200
	External	DCS200 or DCS900
Stainless steel valves	Internal	Nil
	External	Nil
Stainless steel demin.- regen dilution pumps	Internal	Nil
	External	Nil
Resin systems		
Cation and strong base anion units (carbon steel)	Internal	CPS200
	External	DCS200 or DCS900
Carbon steel pipework	Internal	Proprietary
	External	DCS200 or DCS900
Valves associated with carbon steel pipework	Internal	As per associated pipework
	External	DCS200 or DCS900
Air system		
Pipework for blowers	Internal	CPS100
	External	CPS100
STRUCTURAL STEELWORK		
Boiler house structural steelwork		DCS3500 or DCS3600
Turbine house structural steelwork		DCS300
Miscellaneous items		CPS100
ASH DISPOSAL SYSTEM		
Corrosion protection of all items of plant from the precipitators to the ash bunkers		
External surfaces of pressure valve and		DCS1000

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
mild steel chute feeding dry ash from precipitators to chain conveyor		
External surfaces of conveyor casing from precipitators to ash bunkers		DCS3300
Steelwork for bucket elevator		CPS100
External surfaces of motor and gearbox		DCS900
Structural steel supporting chain conveyor		DCS900
Open-grid flooring and handrails		CPS100
Corrosion protection of all items of plant from the economizer to chain conveyor (lagged)		
External surfaces of conveyor casing (lagged)		DCS3300
External surfaces of motor and gearbox		DCS900
Structural steel supporting chain conveyor, open-grid flooring and handrails		CPS100
Ash bunker complex		
Concrete ash bunker	Internal	Nil
	External	Nil
External surfaces of pipe flanges and interconnecting pipework		DCS3300
External surfaces of air slide conveying ash to conditioning unit		DCS900
Ash conditioning unit	Internal	Nil
	External	DCS900
External surfaces of motor and gearbox		DCS900
Mild steel frame supporting motor and gearbox		DCS900
Mild steel inspection hatches in ash bunkers		CPS100
Open-grid flooring, ladders and handrails		CPS100
Potable water tanks and auxiliary equipment		
Pipework conveying potable water from tank to ash conditioning plant	Internal	CPS100
	External	CPS100
Valves associated with pipework	Internal	Proprietary
	External	DCS200
Potable water tank	Internal	CPS100
	External	CPS100
Steel panels forming tank roof		CPS100
Handrails		CPS100
Open-grid flooring		CPS100
Compressor room		
Compressors and associated motors		Proprietary
Air pipework	Internal	Nil or CPS100
	External	CPS100 or DCS200
Control rooms		
Control panels and associated switchgear		CPS600
Belt conveyors		
Structural steelwork supporting the conveyors		DCS900
Roof sheeting covering the conveyors		CPS100
Open-grid flooring between the belt conveyors		CPS100
External surfaces of mild steel chutes feeding onto the belt conveyors		DCS900
Motors and gearboxes		DCS900
Ash dump equipment		
Movable conveyors		DCS900
BLOWDOWN SUMP TO WATER TREATMENT PLANT		
Pipeline	Internal	High temperature epoxy
	External	DCS200
CAST-IN COMPONENTS – TURBINE HOUSE		
Cast-in components		DCS200
BOILER HOUSE HANDRAILING		
Handrailing	Mild steel	DCS300

<u>ITEM OF PLANT</u>	<u>DESCRIPTION</u>	<u>SPEC NO.</u>
BLOW-DOWN SUMP LININGS		
Blow-down sump (walls, floors and roofs)		Proprietary
WATER TANKS		
Fire protection and air heater washing storage tanks	Internal	DCS1400 or DCS1500
	External	DCS200
Potable water storage tanks	Internal	CPS100 or DCS1400 or DCS1500
	External	CPS100 or DCS200
OUTSIDE PLANT – STRUCTURAL STEELWORK		
Structural steelwork		DCS300
COAL CHUTES		
Coal chutes	External surfaces	DCS900

Table 2: Selection of Suitable Protective System Based on the Applicability of the Different Corrosion Protection Procedures.

Specification No.	Type of Material	Environment	Other requirements	Typical items to be protected.
CPS100	Hot Dip Galvanising			Demineralised, potable, storm, raw and sewage reticulation piping, associated pipe racks and supports, open grid, vastrap and Lozenge patterned flooring, platforms, ladders and rails, trench covers, current transformers, lighting standards, hinged poles, roller shutters, catladders, crawl beams, handrailing, civil and building structural steelwork (outdoors), steel pipes for plumbing, mild steel pipes below terrace level, cable racking, structural steelwork for stacker reclaimers, stanchions, air and blower piping, potable water and demineralised water storage tanks, bucket elevator steelwork, ash conveyor supporting steelwork, hatches in ash bunkers, corrugated iron roof sheeting, etc.
CPS200	Rubber lining			Mild steel storage hoppers and feeders for wet chemicals, sulphuric acid and caustic soda re-use vessels, pipework handling dilute sulphuric acid and caustic soda, degasser units, ion exchange vessels, hot water tanks, pipework handling high conductivity effluent, large bore piping, pumps and valves of boiler feed make-up system, condensate vessels and piping, and mild steel demineralised water piping,
CPS300	Acid proof tiling			Chemical proofing all plinth supports, bund areas of pumps, general floor areas, walls up to door height surrounding tanks that contain hydrazine, ammonia, sulphuric acid, sodium hydroxide and passivated chemicals, as well as effluent sumps.
CPS400	Acid resistant bricks			Chemical proofing all plinth supports and bund areas of pumps and tanks that contain hydrazine, ammonia, sulphuric acid, sodium hydroxide and passivated chemicals, as well as to the off-loading areas for acids and alkalis.
CPS500	Pipe wrapping			Additional protection of all buried water piping, Macalloy bars and Sankey struts.
CPS600	Powder Coating			Coatings, based on thermosetting and thermoplastic resins which are applied by the powder-coating process, e.g. in the case of control and switchgear panels, distribution boards, steel roller shutters, junction boxes, ring main units, miniature sub-stations, indoor cable racking, instrument panels, storage cabinets, etc.
CPS700	Glass reinforced plastic			Plant item to be protected by means of glass reinforced plastic (GRP).
CPS800	Cathodic protection			Sacrificial anodes installed on screens, stop gates and in various water boxes exposed to cooling water side.
CPS900	Structural wrapping			Structural wrapping of components.
CPS1000	Metal sprayed coatings			Zinc or aluminium metal spraying of plant components.

Specification No.	Type of Material	Environment	Other requirements	Typical items to be protected.
DCS100	Coatings	Normal environment	Ferritic substrate below 70°C	Painting of all items exposed to non-corrosive indoor and outdoor conditions, namely, external surfaces of gearboxes, pumps, valves, air receivers, compressors and piping (refer to detailed list for specifics).
DCS200		Normal environment	Ferritic substrate below 70°C	Painting of all items exposed to non-corrosive indoor and outdoor conditions, namely, switch brackets, chain blocks, junction boxes, switchgear, socket outlets, distribution boards, piping, window frames, door frames, steel louvers, steel bearers, indoor civil and building structural steelwork, as well as external surfaces of pumps, valves and piping exposed to non-corrosive conditions.
DCS300		Normal environment	Ferritic substrate below 70°C	Painting of all items exposed to non-corrosive indoor conditions, namely turbine house structural steelwork, boiler house handrailing, and outside plant structural steelwork.
DCS400 (Alternative to DCS500)		Normal environment	Metallised zinc and hot dip galvanised substrates	Duplex Coating of zinc metal-sprayed and hot dip galvanised surfaces exposed to low to medium corrosive conditions, namely galvanised sheet iron flashings, eaves, fascias, barge boards QC decking, rainwater pipes and gutters, as well as small diameter galvanised pipes. All items to be Duplex coated shall not be passivated prior to painting. Furthermore, surface preparation of the hot dip galvanised steelwork shall be in accordance with the requirements as stipulated in SAHDGA 01-1990 – "Code of practice for surface preparation and application of organic coating.
DCS500 (Alternative to DCS400)		Normal environment	Metallised zinc and hot dip galvanised substrates	Duplex Coating of zinc metal-sprayed and hot dip galvanised surfaces exposed to low to medium corrosive conditions, namely galvanised sheet iron flashings, eaves, fascias, barge boards QC decking, rainwater pipes and gutters, as well as small diameter galvanised pipes. All items to be Duplex coated shall not be passivated prior to painting. Furthermore, surface preparation of the hot dip galvanised steelwork shall be in accordance with the requirements as stipulated in SAHDGA 01-1990 – "Code of practice for surface preparation and application of organic coating.
DCS600		Normal environment	Gypsum and cement plaster ceilings and walls – Decorative	Internal plastered and bagged walls exposed to non-humid conditions.
DCS700		Normal environment	Gypsum and cement plaster ceilings and walls – Decorative and with Hygiene Requirements	Internal gypsum and cement plastered walls with special hygiene requirements.

Specification No.	Type of Material	Environment	Other requirements	Typical items to be protected.
DCS800		Normal environment	Wood surfaces and with specific colour requirements	Decorative painting of all indoor wooden beads, rails, doors and skirting not exceeding 150mm girth.
DCS900		Aggressive environment	Ferritic substrate below 70°C	External surfaces of gearboxes, storage tanks, water/oil/chemical carrying pipework, pumps, overhead cranes, structural steel, vessels etc. exposed to aggressive corrosive conditions.
DCS1000		Aggressive environment	Ferritic substrate above 200°C	External surfaces of pressure valves and mild steel chutes feeding dry ash from precipitators to chain conveyor
DCS1100		Aggressive environment		Additional protection of all gypsum and cement plaster ceilings and walls, with decorative requirements, and exposed to aggressive chemical fumes and/or high relative humidity
DCS1200		Aggressive environment		Varnishing of wooden beads, rails, skirting not exceeding 150mm girth, panelling, partitions, doors, frames etc.
DCS1300		Aggressive environment		Epoxy screeding of plinths supporting chemical tanks, bund areas for pumps carrying corrosive or aggressive liquids and off-loading areas for these chemicals exposed to heavy traffic.
DCS1400 (Alternative to DCS1500) Solvent-borne Coating System		For liquid contact	applications Ferritic substrate	Internal surfaces of storage tanks and pipework carrying /handling raw, potable, demin-effluent, dirty drains recovery, clarified, and cooling water.
DCS1500 (Alternative to DCS1400) Solvent Free Coating System		For liquid contact applications	Ferritic substrate	Internal surfaces of storage tanks and pipework carrying /handling raw, potable, demin-effluent, dirty drains recovery, clarified, and cooling water.
DCS1600		For liquid contact applications	Ferritic substrate	Internal surfaces of storage tanks and pipework carrying /handling chemicals or liquids that due to the aggressiveness or high temperature conditions, cannot be handled by those materials specified in DCS1400 and DCS1600.
DCS1700		For liquid contact applications	Ferritic substrate	Internal and external surfaces of motors, pumps and valves immersed or handling sewage, as well as the internal surfaces of pipework carrying sewage.
DCS1800 (Alternative to DCS1900) Solvent-borne Coating System		For liquid contact applications	Concrete substrate	Concrete surfaces exposed to effluents.

Specification No.	Type of Material	Environment	Other requirements	Typical items to be protected.
DCS1900 (Alternative to DCS1800 Solvent Free Coating System)		For liquid contact applications	Concrete substrate	Concrete surfaces exposed to effluents
DCS2000		For liquid contact applications	Ferritic substrate	Internal surfaces of transformer oil storage/handling tanks, pipework and bunds.
DCS2100		For liquid contact applications	Concrete substrate	Concrete lubricating oil bund areas.
DCS2200		In contact with soil Buried environment	Galvanised substrate	Additional protection of the buried sections of hot dip galvanised poles.
DCS2300		Normal environment	Wood surfaces to be stained and varnished	Staining and subsequent varnishing of wooden surfaces.
DCS2400 (Alternative to DCS2500)		Normal environment	Gypsum or Cement plaster ceilings – Decorative	Gypsum or cement indoor plastered ceiling and walls not exposed to relative high humidity or with no special hygiene requirements.
DCS2500 (Alternative to DCS2400)		Normal environment	Gypsum or Cement plaster ceilings – Decorative	Gypsum or cement indoor plastered ceiling and walls not exposed to relative high humidity or with no special hygiene requirements.
DCS2600		Normal environment	Metallised zinc and hot dip galvanised substrates	Decorative painting of galvanised sheet iron flashings, eaves, fascias, barge boards, QC decking, rainwater pipes, gutters and small diameter pipes.
DCS2700		Chemical resistance required	Offshutter concrete surfaces	Offshutter concrete surfaces, plastered interior walls and ceilings that require extra protection due to high humidity or chemical fumes.
DCS2800		For temporary protection Normal environment	Ferritic substrate below 70°C	Temporary/pre-erection protection of steelwork being stored on-site.

Specification No.	Type of Material	Environment	Other requirements	Typical items to be protected.
DCS2900		For liquid contact applications Light abrasion and chemical resistance required	Ferritic substrate	Steelwork exposed to immersion conditions where light abrasion and chemical resistance is required.
DCS3000 (Alternative to DCS3100)		For liquid contact applications Light abrasion, chemical and UV light resistance required	Ferritic substrate	Steelwork exposed to immersion conditions where light abrasion, chemical and ultra-violet light resistance is required.
DCS3100 (Alternative to DCS3000)		For liquid contact applications Light abrasion, chemical and UV light resistance required	Ferritic substrate	Steelwork exposed to immersion conditions where light abrasion, chemical and ultra-violet light resistance is required.
DCS3200		Normal environment For temporary protection	Ferritic substrate	Temporary protection of the internal surfaces of precipitators (in gas path), hoppers and plates exposed to flue gases.
DCS3300		High temperature applications Lagged surfaces	Ferritic substrate	External surfaces of pipes, flanges, shells, ducts, casings to be lagged.
DCS3400		Normal environment	Ferritic substrate	Indoor civil and building structural steelwork exposed to non-aggressive conditions. See also DCS3700 as a fast curing/handling indoor/outdoor alternative.
DCS3500 (Alternative to DCS3600)		Normal environment	Ferritic substrate below 70°C	Indoor boiler house structural steelwork exposed to non-aggressive conditions. See also DCS3700 as a fast curing/handling indoor/outdoor alternative.

Specification No.	Type of Material	Environment	Other requirements	Typical items to be protected.
DCS3600 (Alternative to DCS3500)		Normal environment	Ferritic substrate below 70°C	Indoor boiler house structural steelwork exposed to non-aggressive conditions. See also DCS3700 as a fast curing/handling indoor/outdoor alternative.
DCS3700		Semi- to moderately corrosive conditions	Ferritic substrate below 70°C	Indoor/outdoor boiler/turbine house structural steelwork and where fast curing/handling requirements of the coating exists.

6. SPECIAL NOTES

- 6.1 It is important to realise that not all site conditions can be simulated under laboratory conditions. Therefore, the practical applications of the specified corrosion protection systems will depend on the specific product requirements and actual site conditions. These must be considered by the Contractor prior to Contract Signature.
- 6.2 Various options are provided. This is to provide the opportunity for the Contractor to select a material that he is most familiar with and to accommodate Contractor specific constraints. The Contractor needs to familiarise himself with the constraints related to the site application of these materials.
- 6.3 Where **proprietary** coatings are specified, these shall be subject to the Engineer's approval.
- 6.4 Special care needs to be taken when working with all organic coatings. Prior to the use of any of these specifications, the Material Safety Data Sheets shall be obtained from the relevant coating supplier/manufacturer and a copy shall be given to the Engineer.
- 6.5 With respect to the particulars not covered by the Detailed Coating Specifications (e.g. equipment requirements, overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to Product Data Sheets).
- 6.6 All coatings shall be given adequate time for curing prior to service according to the Detailed Coating Specifications or Product Data Sheets or refer to the Engineer. On average, for most organic coatings systems, full cure is achieved after 7 days at 25°C.
- 6.7 The performance of all of these systems will depend on the quality of application.
- 6.8 During the applications of all coatings/linings, care shall be taken to ensure adequate ventilation, to allow for good visibility and proper curing of the coatings and to avoid/minimise health and safety risks.
- 6.9 Any solid waste materials or liquids stripped or generated during the coating operation shall be discarded in accordance with the Site Environmental Management Plan.
- 6.10 If pipes are fabricated from GRP, stainless steel or galvanised steel, it is recommended that all colour-coding, markings, etc. be done by means of adhesive tape.
- 6.11 Where rubber lining has been specified, details of the type of rubber used and the procedures to be adopted during application shall be submitted to the Engineer for their approval.
- 6.12 Repairs to galvanising shall be carried out in accordance with SANS 121 or ISO 1461

7. MATERIAL MANUFACTURERS

- 7.1 In the case of most detailed coating specifications, recommended and/or approved material manufacturers are listed. Where alternative manufacturers are favoured, by the Contractor, prior approval shall be obtained from the Engineer.
- 7.2 Prior to the application of any of the corrosion protection systems, the selected manufacturer's data sheet for each product shall be obtained. The Contractor shall disclose this standard and the conditions under which the product will be applied to the manufacturer. These data sheets shall be signed by the manufacturer for each product to be used.
- 7.3 Where alternative corrosion protection systems or methods are preferred by the Contractor, the Contractor shall prove that the proposed alternatives will meet the Engineer's performance requirements. Prior approval shall be obtained from the

Engineer before any alternative coating/lining systems or protection methods can be used.

- 7.4 In the case of equipment manufacturer proprietary finishes, these proprietary systems may only be used if prior approval from the Engineer has been obtained. Where the substrate has received a primer coat in the factory (e.g. galvanised substrate, metallised substrate) the Contractor shall take responsibility and provide evidence to the Engineer that coatings that he proposes with the primer coat are compatible.

8. MATERIAL SUPPLY, STORAGE, TESTING AND COMPOSITION

8.1 MATERIAL SUPPLY

- 8.1.1 All materials, i.e. paint, solvents and cleaning agents for a specific paint/lining system shall be supplied by the same manufacturer.
- 8.1.2 All coatings/linings, solvents and cleaning materials shall be supplied in sealed, sturdy containers which have been labelled with all the information necessary to ensure proper storage, mixing, application and traceability. The coating containers shall be of a size large enough to allow mixing in the containers themselves if required.

8.2 MATERIAL STORAGE

- 8.2.1 All material containers shall be kept in a storage area that is dry, enclosed, well ventilated, covered and maintained at a temperature compatible with good preservation of the materials.
- 8.2.2 Should any of the containers show traces of leakage prior to use, the contents of that container shall not be used.
- 8.2.3 Similar to the coatings/linings, all abrasive media shall be stored in an area that is dry and covered to allow for good preservation of the materials.

8.3 MATERIAL TESTING

- 8.3.1 All materials (coatings/linings) shall be regularly tested at the manufacturers' factories. The Contractor must make sure that regular quality control tests are carried out to ensure that good quality of the materials is maintained.

The following properties shall be closely monitored:

- Quality of raw materials
- Analytical formulation of finished products
- Percentage solids by volume
- Specific gravity
- Colour and gloss
- Drying time
- Viscosity.

The results of the regular quality control tests shall be available to the Engineer.

- 8.3.2 Record of the batch numbers, expiry dates, dates of manufacturing of each type of system used, shall be provided to the Engineer. The Contractor must also ensure that the coating/material manufacturer retains a sample of each batch for at least the Defects Notification Period or Paint Manufacturer's guarantees

8.4 MATERIAL COMPOSITION AND APPLICATION METHODS

- 8.4.1 All coatings/linings shall be consistent and formulated for the proposed application method. If the Contractor regards the proposed application method as unsuitable for the materials specified, he shall notify the Engineer in writing. The Contractor's proposed alternative application method shall only be used after approval has been obtained from the Engineer.
- 8.4.2 All coats of a coating system shall come from the same manufacturer. In the case of items of plant or equipment being primed overseas and final coated on site, this requirement may be waived if the site applied finishing coats are compatible with the applied primer. Where the substrate has received a primer coat in the factory, the Contractor shall take responsibility and provide evidence to the Engineer that the coatings, which he proposes with the primer coat, are compatible..
- 8.4.3 During application, solvents may only be used for thinning of the coating:
 - a) when they are specified by the manufacturer as being compatible with the coating material, and
 - b) when the percentage added does not exceed the limits given by the paint manufacturer's product data sheet.
- 8.4.4 Solvents shall be supplied by the same manufacturer that supplied the coating.

9. SURFACE PREPARATION AND CLEANING

9.1 GENERAL

- 9.1.1 The service life of a corrosion protection system largely depends on the type and thoroughness of the surface preparation methods being used for cleaning of the surfaces prior to application of the protective system. It is important that the surface treatment methods used must be compatible with the specific coating system.
- 9.1.2 Before application of the coating/lining system, the substrate shall be prepared, in accordance with each detailed coating specification's requirements and where applicable, as described in detail below.
- 9.1.3 In general, all harmful deposits of oil, grease, dirt, processing soil, fingerprints, salt residues, weld-scale, corrosion products, loose mill scale, laitance, resins (wood surfaces) and any foreign matter or residues that may affect the performance of the coating/lining system must be removed, prior to application of the protective system.

9.2 METAL SURFACES

9.2.1 Degreasing

- 9.2.1.1 All detrimental deposits of oil or grease spots and all other contaminants shall be removed.
- 9.2.1.2 Depending on the degree and nature of contamination, degreasing shall be carried out using a water-soluble alkaline cleaner, alkaline detergent or cold organic solvents.
- 9.2.1.3 Following the degreasing operation, all surfaces shall be rinsed with clean potable water to remove all traces of the cleaning agent residues. The surfaces shall thereafter be allowed to dry completely prior to coating.
- 9.2.1.4 It is important that clean potable water is used for cleaning, or the surfaces will be left contaminated after washing.

9.2.2 Acid Cleaning

- 9.2.2.1 Cleaning with acid shall only apply where specified.

- 9.2.2.2 Cleaning with acids shall be followed by neutralization, passivation and rinsing with clean, potable water.
- 9.2.2.3 All acid solutions shall be applied and removed as directed by the manufacturer.
- 9.2.2.4 Ensure that no smut is present after acid cleaning or the adhesion of the coating/lining will be affected.

9.2.3 Power and Hand-tool Cleaning

- 9.2.3.1 Cleaning by means of hand or power-tools, i.e. wire brushes, chipping hammers, scrapers, grinders, sanders, needle descalers etc. may only be used where specified and the condition of the substrate metal is such that efficient cleaning can be achieved and where the protective system is designed for application to brushed or ground surfaces.
- 9.2.3.2 Prior to power or hand-tool cleaning, all welds shall be free of slag, slag inclusions and pinholes. Adjacent areas shall be free of weld spatter, which shall be removed by grinding or scraping.
- 9.2.3.3 Oil and grease deposits shall be removed prior to cleaning as detailed above. In this regard, special attention shall be paid to drillings, bolt holes, etc.
- 9.2.3.4 Following the degreasing as described above, all surfaces of steelwork and plant under this category shall be prepared to remove all loose millscale, rust, paint and other deleterious matter.
- 9.2.3.5 Hand-tool cleaning may be utilised provided the required standard of finish is achieved. The finish shall be to the stipulated standard grade in the Detailed Coating Specification and in accordance with ISO 8501-1 or SIS 055900. Where necessary, power-tool cleaning shall be used. Burnishing of the surface shall not be permitted.
- 9.2.3.6 In all cases, after wire brushing or grinding, all traces of loose material shall be removed from the surface by compressed air or vacuum cleaning. Cleaned surfaces shall not be contaminated with oil, grease, rust or other deposits before coating/lining.

9.2.4 Abrasive Blastcleaning

- 9.2.4.1 Abrasive blast cleaning is by far the preferred method for surface preparation.
- 9.2.4.2 Prior to blastcleaning, all surfaces shall be free of oil and grease. Degreasing shall be carried out as detailed above. In this regard special attention shall be paid to drillings, bolt holes, etc.
- 9.2.4.3 Prior to abrasive blastcleaning, all welds shall be free of slag, slag inclusions and pinholes. Adjacent areas shall be free of weld spatter, which shall be removed by grinding or scraping.
- 9.2.4.4 Different grades and types of blasting media exist. It is important that the correct abrasive be used in combination with a specific coating system. Here the required blast profile height should be considered.
- 9.2.4.5 Abrasive blastcleaning shall be carried out by means of equipment suitably designed for this purpose.
- 9.2.4.6 The visual degree of surface cleanliness shall be to the requirements stipulated in the detailed coating/lining specification and in accordance with ISO 8501-1 or SIS 055900.
- 9.2.4.7 In general, Grade Sa 2 ½ and Sa 3 are specified in the case of most protective coating systems. In the case of the former grade, the requirement is very thorough blastcleaning where at least 95% of the millscale, rust and other matter are removed. Whereas in the case of Grade Sa 3, the surfaces must be blast cleaned to white metal where all traces of rust, millscale and other foreign matter are removed.
- 9.2.4.8 The profile height of the blasted surfaces should be within the range of the specified coating system. Refer to the Product Data Sheets. Unless otherwise specified by the coating manufacturer, a profile height of 25 to 75µm is recommended for most coating systems.

9.2.4.9 It is important that the blast profile does not exceed the specified thickness of the primer or first coat. Blastcleaning of severely corroded surfaces may result in high profiles (i.e. > than 100 micrometres). In these cases, an additional primer coat will be required. However, agreement should be reached between the Contractor and coating manufacturer as to the most suitable profile range for a specific coating system and this agreement shall be communicated in writing to the Engineer. The following should only be used as a guideline with respect to blast profile requirements.

Table 3: Profile Ranges

Coating/Lining Thickness (Total)	Minimum profile	Maximum profile
90 to 180 micrometres	30 micrometers	60 micrometers
120 to 225 micrometres	40 micrometers	75 micrometers
150 to 300 micrometres	50 micrometers	100 micrometers
300 to 500 micrometres	75 micrometers	100 micrometers
>500 micrometres	75 micrometers	125 micrometers

- 9.2.4.10 Two samples of the grade of blastcleaning specified shall be kept for record purposes. The samples shall be overcoated with a clear lacquer to prevent deterioration of the surface.
- 9.2.4.11 Abrasive blastcleaning shall be carried out on dry surfaces by means of dry air, free from impurities (in particular grease or oils), in an atmosphere where relative humidity is less than 85%, and the ambient temperature above +5°C. The Engineer may require the Contractor to demonstrate that the air is clean and dry.
- 9.2.4.12 Blast-cleaned surfaces shall be coated as soon as possible after treatment and preferably within 4 hours. Alternatively, provided no deterioration of the blast has taken place, and the surface cleanliness requirements of ISO 8501-1 or SIS 055900 are maintained, the primer coat may be applied within the same working shift. Under no circumstances shall uncoated blast cleaned surfaces be permitted to stand overnight.
- 9.2.4.13 Caution shall be taken to ensure adequate protection of machined parts or any other part not requiring blastcleaning and coating/lining. Every effort shall be taken to avoid deformation of the substrate and damage to welds, as well as to machined surfaces.
- 9.2.4.14 Blastcleaning may be carried out using grit and slag (sand is not permitted). Irrespective of the type of abrasive used for blastcleaning, it shall in all cases be free of foreign matter such as clay, humus, chlorides and bitumen. The use of recycled blasting media is not allowed for the final blast.
- 9.2.4.15 The Contractor shall satisfy himself that the abrasive materials used conform to all national health and safety standards.
- 9.2.4.16 It is important that good quality abrasives are used in order to minimise the amount of waste grit being generated and contamination of the surfaces.
- 9.2.4.17 Subsequent to blastcleaning, all traces of blasting media and dust shall be removed from the surface by vacuum cleaning or compressed dry air. Cleaned surfaces shall not be contaminated with oil, grease, rust or other deposits before coating. Unnecessary traffic prior to painting shall be avoided.
- 9.2.4.18 Blastcleaning on site shall only be carried out in areas approved by the Engineer.

9.3 CONCRETE SURFACES

Preparation shall at least include:

- removal of ridges
- rounding of steps
- removal of laitance
- plugging of holes and honey combing where hole diameter > 15mm and depth > 5mm
- removal of curing compound and shutter oils where these are apparent or could be "harmful": to the coating system
- removal of grease and oil
- careful dust removal
- recommendations given in the detailed specification for each coating system.

10. APPLICATION OF PROTECTIVE SYSTEMS

- 10.1 It is important to note that painting is a skilled process and should only be carried out by capable and experienced personnel.
- 10.2 The different coats shall all be evenly applied to form smooth, continuous, unbroken layers free from sags, runs and other defects. Each coat shall provide complete coverage and the film thicknesses for the different coats shall be as specified in the detailed coating specifications.
- 10.3 Coating/lining application and cleaning shall not take place when site conditions are likely to negatively affect these operations. The Contractor must ensure that the necessary protective equipment is used to prevent contamination of the coatings/linings and to minimize delays due to such site conditions.
- 10.4 Surrounding areas must be protected from overspray and paint contamination.
- 10.5 All newly primed steelwork, prior to erection, shall be stored clear of the ground on trestles or other suitable material. The steelwork shall be placed in such a manner as to ensure adequate drainage of rainwater and condensation.
- 10.6 Equipment name plates and identification plates shall be protected from coatings. No coatings shall be applied over any surfaces where these will adversely affect the performance of the item or component.
- 10.7 During application, the relative humidity shall not exceed 85% and ambient temperatures shall be between 5°C and 30°C. However, in the case of special coatings/linings, these conditions may be waived providing the requirements as stipulated by the coating manufacturer are met.
- 10.8 The maximum/minimum substrate temperature at the time of coating/lining application shall be in accordance with the product data sheet.
- 10.9 Care shall be taken to ensure adequate coating/lining of all bolt and mouse holes, welds, edges and other areas normally prone to corrosion attack. These areas shall be stripe coated.
- 10.10 Where more than one coat is applied, the colour of each coat shall be different from the colour of the previous coat. However, two finishing coats of the same colour may be applied to achieve complete colour uniformity. All finishing colours shall be to the Engineer's approval. In the case where aesthetic requirements are secondary, repairs after final testing shall be carried out using a different colour.
- 10.11 Damaged paint areas shall be cleaned. Rust spots and any other deleterious matter shall be removed. Spot repairs shall be carried out such that the patch painting extends at least 25 mm beyond the damaged areas. Spot repairs shall reinstate each of the previous coats and shall commence directly after surface preparation.

- 10.12 With respect to the methods of application, overcoating requirements, pot life, mixing, induction time, straining, thinning, etc. the manufacturer's recommendations shall be strictly adhered to.
- 10.13 During application of the coatings/linings, the Contractor shall ensure adequate ventilation to avoid explosions or toxic effects of the solvent vapour.
- 10.14 Steel surfaces that are to rest on concrete or other floors and any other surfaces inaccessible after erection shall receive the full specified coating system prior to erection.
- 10.15 Where paint is allowed to age before finishing, the surface shall be prepared by light sanding, scrubbing with potable water using a bristle brush and drying before overcoating. Where special techniques are required in order to overcoat aged coatings, the Coating supplier shall be consulted in this regard.
- 10.16 On pre-coated surfaces all traces of soluble salts, grease and other airborne contamination shall be removed by washing with potable water and allowed to dry prior to overcoating.

11. SUPERVISION AND INSPECTION PERSONNEL

All work shall be carried out under close supervision of an experienced Painting/Lining Supervisor. The Supervisor shall initially inspect all painting/lining work and carry out the necessary rectification work prior to calling out the Inspector. Final testing and inspection of the coating/lining operation shall be carried out by an experienced Coating Inspector. In this regard it is strongly advised that a qualified SAQCC (South African Qualification and Certification Committee) or NACE coatings inspector be used.

12. INSPECTION TOOLS AND REQUIREMENTS

The following aspects should be closely monitored during the coating operation. The Painting/Lining Supervisor or Inspector shall be satisfied that the following have been met before giving release (in writing) for the next coat to be applied.

- 12.1 The standard of cleaning must comply with the criteria as stipulated in the detailed coating/lining specification and in accordance with ISO 8501-1 or SIS 055900.
- 12.2 During blastcleaning, the relative humidity shall not exceed 85% and the ambient temperature shall be above 5°C.
- 12.3 Where surfaces are blast cleaned, the roughness of the blast profile shall be measured in accordance with SANS 5772 and shall be as specified by the material manufacturer's technical note. It is important that the blast profile does not exceed the specified thickness of the primer or first coat. Blastcleaning of severely corroded surfaces may result in high roughness profiles (i.e. > than 100 micrometres). In these cases, an additional primer coat will be required. Refer 9.2.4.9 above.
- 12.4 Immediately before coating/lining, blast cleaned steel shall not exhibit more than 0,2% dust and debris when tested in accordance with SANS 5769. The final cleaning of concrete surfaces immediately before coating shall be by thorough brushing or vacuum cleaning.
- 12.5 During coating/lining application, the relative humidity shall not exceed 85% and the ambient temperature shall be between 5°C and 30°C.
- 12.6 The method of application shall be as specified in the product data sheet.
- 12.7 Drying times shall be as specified in the product data sheet.
- 12.8 Overcoating times shall be as specified in the product data sheet.
- 12.9 The coating/lining thicknesses shall comply with the relevant detailed coating/lining specification. All coating thicknesses on metal substrates shall be measured in accordance with ASTM E376 or SANS ISO 2808. These measurements shall be

made on surfaces free of all contaminants. Calibrated electronic instruments and shims shall be used for determination of film thicknesses.

- 12.10 Thicknesses of both magnetic and non-magnetic substrates shall also be checked by verification of the quantity of coating consumed and by means of wet film thickness measurements.
- 12.11 The thicknesses of each coat shall be as defined in the detailed specification. 90% of random readings shall be equal to or greater than the specified thickness. No individual reading shall be less than 80% of the specified thickness. No individual reading shall be greater than 120% of the specified thickness. In the areas where stripe coating is carried out the maximum total specified dry film thickness range shall allow for the additional coat.
- 12.12 All deficient film thicknesses shall be rectified prior to release.
- 12.13 Where excessive film thicknesses can be detrimental to the integrity of the coating, the manufacturer's recommended maximum shall apply.
- 12.14 The adhesion of the coating/lining may be verified by means of adhesion tests. The method to be used shall be approved by the coating manufacturer, the Contractor and the Engineer.
- 12.15 In the case of coating/lining systems intended for immersion service, all coatings and linings must be 100% holiday tested to ensure that no pinholes or breaks in the protective system exists. In this regard, refer to SANS 1217.
- 12.16 It is the Contractor's responsibility to conduct the holiday detection tests and to certify that the coating system conforms to the specification. Certification must include the minimum specified thickness of the coating system and the voltage used for the holiday test. All test methods shall be approved by the Engineer.

13. REPAIR PROCEDURES

In terms of the correct repair procedure for a specific coating/lining system, the Manufacturer shall be consulted in this regard. However, the following basic procedures generally apply in terms of the repair of localised damage of different corrosion protection systems.

Before application of any coating/repair system, thorough inspection of the damaged area shall be carried out to determine the number of coats that have been damaged. Provided that the primer coat has not been damaged, the repair shall be limited to those coats which are. In cases where damage to the primer coat has occurred, the complete coating system shall be reinstated to those areas as per the detailed specification requirements.

After identification of the defective areas, the damaged area shall be cleaned by means of wire brushing, sanding, angle grinding, needle gunning or spotblasting depending on size or surface area to be repaired. Irrespective of the cleaning preparation tools to be used, the exposed steel substrate shall be cleaned to Grade St 2 or Sa 2.5.

Following mechanical cleaning, the affected area shall be cleaned down to a smooth surface and feathered back to a hard edge, using abrasive paper. This cleaning shall be extended to a minimum distance of 25mm beyond the periphery of the affected area.

It is vitally important that the sound, existing coating be abraded in order to provide a good "key" for the overlapping repair coating.

After preparation, all dust, grit blasting medium or any other deleterious matter shall be removed by means of a soft brush or vacuum.

It is imperative that all surface dirt and contaminants are completely removed before coating or the adhesion of the repair coating shall be impaired. No more than 4 hours shall elapse between cleaning and the application of the primer/first coat to avoid recontamination of the surface.

In the case of immersion service coatings, after the surface has been prepared and immediately before the repair coating is applied, the surrounding (existing) sound coating shall be wiped with Methyl Ethyl Ketone (MEK), using clean, fluff free cotton cloths.

In the case of concrete and plaster surfaces, the damaged area shall be thoroughly sanded down and the periphery of the affected area shall be feathered back to a hard edge, using abrasive paper.

After sanding, the affected areas shall be washed with clean water to remove dust, contaminants and abrasive products, and allowed to dry.

Before application of any coating system, thorough inspection of the damaged area shall be carried out to determine the extent of the damage. Provided that the substrate has not been damaged, the repair shall be limited to those coats which are. Alternatively the full coating system shall be reinstated in accordance with the relevant repair specification. Care shall be taken to ensure that each overlaps the periphery of the patch area, by a minimum of 25mm.

14. QUALITY ASSURANCE AND SURVEILLANCE

- 14.1 In all cases, the Contractor shall be responsible for meeting the quality requirements and shall keep records of all inspections and tests. These records shall be available to the Engineer. These shall include quality control plans, inspection sheets, batch certificate etc.
- 14.2 Since the Engineer may request to witness the final inspection and may also elect to have witness and hold points other than the final inspection, prior to the commencement of work, the Contractor shall confirm with the Engineer in writing, the date of the commencement of work and the Engineer's inspection requirements.
- 14.3 The Engineer may require destructive tests to be carried out. Before these tests are performed, the Contractor shall be notified in writing of the nature and extent of the testing to be done.

15. HANDLING, TRANSPORTATION, STORAGE AND INSTALLATION OF FACTORY PAINTED OR LINED VESSELS, PIPING, PUMPS ETC.

- 15.1 The Contractor shall ensure that factory coated/lined vessels, piping, fittings, pumps etc. are correctly supported during handling, packaging, transportation, storage and installation.
- 15.2 Flanges shall be protected with wooden shields bolted in such a manner to apply uniform pressure to the lining.
- 15.3 The Contractor shall submit for the Engineer's approval his handling, transportation, storage and erection procedure for all polymeric lined components.

16. HEALTH HAZARDS AND SAFETY PRECAUTIONS

It is important to realise that health and safety hazards can occur at different stages of the coating/lining process, i.e. during surfaces preparation, storage of paint,

application of paint and the service use of the coated surface. Therefore, before any work commences, the Contractor shall ensure that the necessary protective equipment, clothing and measures are provided for each of his workers. The Contractor shall also ensure that he complies with all local and national health and safety regulations when working and handling protective coating systems. Noteworthy is that many coatings, solvents and cleaning agents are hazardous in one way or another and regular exposure to toxic elements may cause long-term health problems.

Generally the following precautions should be taken when working with organic coating/lining materials.

- Avoid all skin and eye contact
- Avoid breathing vapours
- Immediately cover wounds or cuts
- Re-seal partly used containers
- Ensure that all containers are properly labelled to prevent accidental ingestion
- Wash with soap and water before eating, drinking, smoking or using toilet facilities
- Launder clothing before use
- Store containers in cool well-ventilated areas away from the sun, heat, sparks, and open flames. The ideal storage temperature is between 10° to 30°C
- Close all containers after each use
- Store containers away from oxidising agents and other incompatible substances
- Some products are static accumulators. Transfer equipment shall be grounded or bonded
- Consult other national and local requirement for additional storage requirements
- Remove all sources of ignition
- Avoid contact with material
- Persons not wearing appropriate protective clothing/equipment shall be excluded from the area of the spill until clean-up is complete
- Contain spread with a dyke
- Prevent liquid from entering sewers and watercourses
- Pump liquid to salvage tank
- Remaining liquid may be taken up on clay, diatomaceous earth or other absorbent, and shall be placed into disposal containers
- Paint shall be disposed of in accordance with the Site Environmental Management Plan.
- Rags, spray booth filters, paint suits, empty cans, etc. contaminated with product may be hazardous waste
- Determine whether contaminated items are hazardous and dispose of appropriately.

17. SPECIALISED APPLICATIONS AND INSTALLATIONS (CPS)

- (1) Hot Dip Galvanising (CPS100)
- (2) Rubber Linings (CPS200)
- (3) Acid Proof Tiling (CPS300)
- (4) Acid Resistant Bricks (CPS400)
- (5) Pipe Wrappings (CPS500)

- (6) Powder Coating Application (CPS600).
- (7) GRP Linings (CPS700)
- (8) Cathodic Protection Installation (CPS800)
- (9) Structural Wrappings (CPS900)
- (10) Metal Sprayed Coatings (CPS1000)

HOT DIP GALVANISING (CPS100)

This specification is applicable to the hot dip galvanising of all demineralised, potable, storm, raw and sewage reticulation piping, associated pipe racks and supports, open grid, vastrap and Lozenge patterned flooring, platforms, ladders and rails, trench covers, current transformers, lighting standards, hinged poles, roller shutters, catladders, crawl beams, handrailing, civil and building structural steelwork (outdoors), steel pipes for plumbing, mild steel pipes below terrace level, cable racking, structural steelwork for stacker reclaimers, stanchions, air and blower piping, potable water and demineralised water storage tanks, bucket elevator steelwork, ash conveyor supporting steelwork, hatches in ash bunkers, corrugated iron roof sheeting, etc.

DESIGN:	<p>Special design considerations need to be taken in terms of all items to be protected by means of hot dip galvanising. Here the design engineer needs to refer to ISO 14713 and the "Design for hot dip galvanizing" from HDGASA for guidance.</p> <p>In order to ensure proper hot dip galvanising of the steel surfaces, the Contractor shall ensure that the steel to be used for galvanising shall comply with the requirements of SANS 121 (ISO 1461).</p>
SURFACE PREPARATION:	<p>All weld areas shall be abrasive blast-cleaned to Grade Sa 2,5. Following blastcleaning of the welds, all items shall be suitable pickled, rinsed, dried and fluxed.</p>
GALVANISING:	<p>All items shall be hot dip galvanised in accordance with SANS 121 (ISO 1461), to a minimum coating thickness as laid down in the appropriate tables of SANS 121 (ISO 1461).</p> <p>All nuts, bolts, clips and other items required for the fixing of galvanised articles shall be hot dip galvanised to this Standard.</p> <p>Electro-galvanised items will not be acceptable.</p>
TOLERANCES:	<p>Tolerances on all threaded articles shall be according to SANS 121 (ISO 1461). Threaded items shall be spun in a Centrifuge during the galvanising process.</p>
NOTE:	<p>In addition to the requirements of SANS 121 (ISO 1461), the following criteria with respect to white rust and passivating treatments shall apply.</p>
WHITE RUST:	<p>All material shall be free from excessive white rust and black staining when it is Taken over.</p> <p>To assist in meeting this requirement, close attention shall be paid to the manner in which the material is stacked and stored at the galvaniser's works and during its subsequent handling until Take over.</p> <p>Material which has been inspected at the galvaniser's or manufacturer's works and passed by the Engineer will still be liable to rejection if it has been found that excessive white rust has developed between the date of inspection and Take over.</p> <p>If the material is affected by excessive white rust the Contractor may clean it (using non-metallic brushes) before Take over and if weight of zinc coating still meets the requirements specified in the</p>

	appropriate tables of the SANS 121 (ISO 1461), the material will be accepted.
PASSIVATION:	<p>Unless galvanised items are to be subsequently Duplex Coated / Painted, all items shall be passivated.</p> <p>The passivating coating shall be applied to the material immediately after galvanising to afford temporary protection to the galvanising surfaces. This coating shall be even, and shall be sufficiently transparent to enable the Engineer to examine the underlying surfaces for any defects.</p>
DUPLEX COATING:	Duplex coating is a special process and requires proper surface preparation to avoid delamination of the organic coating system. (SAHDGA 01-1990 – “Code of practice for surface preparation and application of organic coating can be consulted in this regard).
FIXINGS:	All fixing systems shall be hot dip galvanised in accordance with SANS 121 (ISO 1461).

RUBBER LININGS (CPS200)

This specification is applicable for the rubber lining of mild steel, storage hoppers and feeders for wet chemicals, sulphuric acid and caustic soda re-use vessels, pipework handling dilute sulphuric acid and caustic soda, degasser units, ion exchange vessels, hot water tanks, pipework handling high conductivity effluent, large bore piping, pumps and valves of boiler feed make-up system, condensate vessels and piping, and mild steel demineralised water piping,

MATERIAL SELECTION AND CRITERIA:	<p>Since the quality, physical and chemical properties of rubber linings vary widely, before commencement of work, the Contactor shall submit details of the precise lining materials and application procedures he intends using to the Engineer for approval. These details shall at least include the following:</p> <ul style="list-style-type: none"> • the type of basic polymer • the polymer content • the specific gravity • the minimum tensile strength • the nominal hardness • the curing method • the bonding system • the solvent • the curing time/s • the adhesive strength • other physical properties • the shelf life • the application procedure <p>The Contractor shall satisfy himself that the material chosen is totally suitable for the expected operating environment.</p>
DESIGN AND FABRICATION OF VESSELS AND PIPING:	<p>a) In designing and fabricating vessels for rubber lining, due consideration shall be given to access and ventilation, branches and outlet, surface contours and welded joints. The Contractor shall satisfy himself that the design of the vessel is suitable for rubber lining.</p> <p>b) Mild Steel Piping</p> <ul style="list-style-type: none"> ▪ Piping arrangements should, wherever possible, be designed using standard pipes and fittings and shall comply with the dimensional requirements as specified in BS 6374: Part 5, in respect of straight pipes, bends and elbows, reducing pipes, tee-pieces, crosses and branch pipes. ▪ Allowance should always be made for the thickness of the lining when calculating flow rates and clearances in the piping.
GENERAL CONDITIONS OF WORKMANSHIP:	<p>a) All work shall be carried out under the supervision of an experienced supervisor and shall comply with the requirements of BS 6374: Part 5.</p> <p>b) No cleaning or lining applications shall take place when site conditions are likely to affect these operations. The Contractor shall be responsible for providing all protective equipment necessary to prevent contamination of the linings and to minimise delays due to such site conditions.</p>

VULCANISATION:	<p>It is important to note that on-site vulcanisation by chemical means will not be permitted.</p> <p>Where on-site vulcanisation will be carried out, the material manufacturer's recommendations in respect of steam and hot water temperatures and pressures for curing and the duration of the curing cycle shall be strictly adhered to.</p> <p>Self-vulcanised rubber linings at ambient temperature shall be specially designed so that they are capable of curing at ambient conditions. It is important to note that the curing process is temperature-dependent and at temperatures below 15°C it may be necessary to use supplementary heating in order to reduce vulcanization times to an acceptable period.</p>
CONTRACTOR'S RESPONSIBILITIES:	<p>The Contractor will be responsible for:</p> <ul style="list-style-type: none"> • selecting the rubber type for lining and ensuring its suitability for the duty. The Contractor shall satisfy the Engineer that the material chosen is suitable for the expected operating environment and the vessel is suitable to be lined. Selection criteria shall be in accordance with BS 6374-5. • selecting an adhesive system which will provide a durable bond between the rubber and the metal surface and be resistant to the liquid being handled. • preparing and inspecting the metal to be lined. • the lining application. The application and curing of the rubber sheeting shall be as per SANS 1198 and British Standard BS 6374-5. • inspection of the work after lining and discontinuity testing. • the repair of faults occurring during the lining operation. • establish whether the lining will contaminate or discolour the material to be handled or stored (if deemed to be important).
PREFERRED POLYMER TYPE FOR CONDENSER WATER BOXES:	<p>In the case of condenser water boxes, self-cured chloroprene (e.g. neoprene), pre-cured ordinary butyl or pre-cured bromo-butyl rubbers are preferred. The rubber sheet thickness shall be 5mm.</p>
SURFACE PREPARATION:	<p>All surfaces shall be thoroughly dry and free from traces of oil, grease, etc., before surface preparation is carried out.</p> <p>Surface preparation shall be by means of abrasive blast cleaning to produce at least a finish equivalent to Grade Sa 2.5 of the Swedish code of Practice SIS 055900 or ISO 8501.</p>
APPLICATION OF RUBBER LINING:	<p>The lining process shall follow as soon as possible after cleaning and, in high corrosive areas, the adhesive shall be applied immediately after final cleaning is complete and before any visible rusting occurs. Unless maintained in a dehumidified atmosphere, application of the adhesive shall commence within 4 h. Should signs of rusting occur, then the surface shall be prepared again to the required standard.</p> <p>Individual rubber sheets shall be tailored to fit the surface to be lined. Special attention shall be given to the joints. The application and jointing of the rubber sheeting shall be as per SANS 1198 and British Standard BS 6374-5.</p> <p>All stages of the lining process shall be inspected and approved by a suitably qualified Coating and Linings Inspector.</p> <p>Any faults located shall be marked up and repaired to the Engineer's satisfaction. This programme shall detail inspection during both material manufacture and lining application. Inspections during lining application shall at least cover rubber thickness, hardness, adhesion, continuity and visual tests. Tests</p>

	<p>for continuity shall be carried out using the high frequency spark test method:</p> <ul style="list-style-type: none"> a) before vulcanisation b) after vulcanisation c) immediately prior to commission. <p>The inspection authority shall specify the test voltage, the length of spark and the areas to be tested.</p> <p>A series of witness and hold points shall be agreed such that the Engineer may witness any of the above tests. The Engineer may elect to carry out its own tests at these times.</p> <p>The number and nature of repairable defects for each type of equipment being lined shall be agreed to between the Engineer and the Contractor before the commencement of any lining work.</p>
REPAIR PROCEDURES:	<p>The lining Contractor shall submit to the Engineer for approval, his intended procedures for the repair of:</p> <ul style="list-style-type: none"> a) unvulcanised rubber b) vulcanised rubber c) rubber that has been in service <p>It should be noted that no part of the rubber lining may be subjected to the vulcanisation process more than twice.</p>
HANDLING, TRANSPORTATION, STORAGE AND ERECTION OF VESSELS AND PIPING:	<p>Every precaution must be taken to correctly support and protect the vessels or pipework during handling, transportation, storage and erection.</p> <p>It should be remembered that hard rubber or ebonite is essentially an inflexible material and is therefore susceptible to damage by impact or the imposition of torsional, flexural or thermal stresses. Every precaution must therefore be taken to correctly support and protect the vessels or pipework during handling, transportation, storage and erection.</p> <p>Flanges shall be protected with wooden shields bolted in such a manner to apply uniform pressure to the lining.</p> <p>The lining Contractor shall submit for the Engineer approval his handling, transportation, storage and erection procedure for all rubber -lined components.</p>

ACID PROOF TILING (CPS300)

This specification applies to the chemical proofing all plinth supports, bund areas of pumps, general floor areas, walls up to door height surrounding tanks that contain hydrazine, ammonia, sulphuric acid, sodium hydroxide and passivated chemicals, as well as effluent sumps.

GENERAL:	<p>The Contractor shall satisfy himself that the systems he proposes shall be suitable for use in the expected environments.</p> <p>At the time of tender, the Contractor shall submit full technical details of his proposed systems to the Engineer for approval.</p> <p>Prior to commencement of work, the Contractor shall inspect the concrete surfaces to ensure that they are suitable for receiving his proposed system. Any area found to be unacceptable shall immediately be indicated to the Engineer.</p>
SURFACE PREPARATION:	<p>All concrete surfaces shall be thoroughly cleaned of all dust, laitance, loose particles, oils, greases, curing compounds and any other deleterious matter. Cleaning may be carried out by acid etching, wire brushing, mechanical scrubbing, water blasting or sand blasting. The method of cleaning used shall be as per the tiling manufacturer's recommendations. Voids, air pockets, omegas, etc., shall be filled with a suitable filler or mortar.</p>
MATERIAL REQUIREMENTS:	<p>Acid-proof membrane comprising a butyl rubber membrane, rhepanol membrane, trowelled bitumen membrane or equivalent approved.</p> <p>Acid-proof tiles of the ceramic split-plate type as supplied by National Ceramic Industries or equivalent approved.</p> <p>The thickness of the tiles shall be either 15mm or 20mm, depending on the service requirements.</p> <p>Tiles shall conform to DIN 18166 - 1974, "Ceramic split tiles".</p> <p>Pointing material shall comprise either furane or phenolic resin or equivalent approved.</p>
APPLICATION PROCESS:	<p>The manufacturer's recommended procedures in respect of membrane laying, tile bedding, joint formation and pointing application shall be submitted to the Engineer. These recommendations shall be strictly adhered to during the application of all systems.</p>

ACID RESISTANT BRICKS (CPS400)

This specification applies to the chemical proofing all plinth supports and bund areas of pumps and tanks that contain hydrazine, ammonia, sulphuric acid, sodium hydroxide and passivated chemicals, as well as to the off-loading areas for acids and alkalis.

GENERAL:	<p>The Contractor shall satisfy himself that the systems he proposes shall be suitable for use in the expected environments.</p> <p>At the time of tender, the Contractor shall submit full technical details of his proposed systems to the Engineer for approval.</p> <p>Prior to commencement of work, the Contractor shall inspect the concrete surfaces to ensure that they are suitable for receiving his proposed system. Any area found to be unacceptable shall immediately be indicated to the Engineer.</p>
SURFACE PREPARATION:	<p>All concrete surfaces shall be thoroughly cleaned of all dust, laitance, loose particles, oils, greases, curing compounds and any other deleterious matter. Cleaning may be carried out by acid etching, wire brushing, mechanical scrubbing, water blasting or sand blasting. The method of cleaning used shall be as per the tiling manufacturer's recommendations. Voids, air pockets, omegas, etc., shall be filled with a suitable filler or mortar.</p>
MATERIAL REQUIREMENTS:	<p>Acid-proof membrane comprising a butyl rubber membrane, rhepanol membrane, trowelled bitumen membrane or equivalent approved.</p> <p>Acid-proof bricks as supplied by Didier or SA Industrial Linings or equivalent approved.</p> <p>Pointing material shall comprise either furane or phenolic resin or equivalent approved.</p>
APPLICATION PROCESS:	<p>The manufacturer's recommended procedures in respect of membrane laying, tile bedding, joint formation and pointing application shall be submitted to the Engineer. These recommendations shall be strictly adhered to during the application of all systems.</p>

PIPE WRAPPING (CPS500)

This specification applies to the additional protection of all buried water piping, Macalloy bars and Sankey struts.

SURFACE PREPARATION:	Wire brush to Grade St 2.
PRIMER COAT:	Apply one coat of Inhibited Petrolatum Solution Primer.
PIPE WRAPPING SYSTEM:	<p>All surfaces shall be wrapped with a layer of Petrolatum Impregnated Synthetic Fabric Tape. Tape width utilised for specific structures shall be as per the supplier's recommendation.</p> <p>The Petrolatum Impregnated Synthetic Fabric Tape shall be applied in a helical manner with a tape overlap of 50% to produce a double layer in one wrapping operation. The application shall be free of wrinkles, creases and air voids.</p> <p>Special care shall be taken to ensure that correct tension is used while applying the tape and all overlaps shall be suitably smoothed by hand to produce a smooth and continuous wrapping.</p> <p>Following the complete inspection and acceptance of the Petrolatum Impregnated Synthetic Fabric Tape wrapping, the pipework to be buried shall receive an outer wrap of PVC non-adhesive wrapping. The tape width used shall be as per the supplier's recommendations.</p> <p>The PVC tape shall be applied in a helical manner with a tape overlap of 50% to produce a double layer in one wrapping operation. The application shall be free of wrinkles, creases and air voids.</p> <p>Special care shall be taken to ensure that correct tension is used while applying this tape.</p> <p>As this PVC tape is non-adhesive, the start and end of each roll of tape shall be firmly secured to the pipe using lengths of adhesive PVC tape of 150mm width. This is imperative to ensure that the non-adhesive PVC will not uncoil at the new roll joints.</p>
FLANGE JOINTS:	<p>Inhibited Petrolatum Solution Primer shall be applied over the joints, leaving a thin film on the flanges and a liberal amount around the bolt threads, narrow cavities, etc.</p> <p>Petrolatum Fibre-filled Mastic shall then be applied to cover all bolt heads and nuts and build-up to form a triangular fillet against each side of the flange.</p> <p>Petrolatum Impregnated Synthetic Fabric Tape of appropriate width shall be centralised on the top of the joint and one complete circumferential turn made around the joint. Air-pockets and folds shall be pressed out as application continues. An overlap of 150mm shall be made where the ends of the tape meet.</p> <p>After application of the tape, two complete circumferential turns of lay-flat polyethylene sheeting 100 micrometres thick shall be applied around the joint. The end of the lay-flat sheeting shall be secured with either self-adhesive PVC tape or non-rotting polyethylene twine.</p>

VIKING-JOHNSON COUPLINGS	<p>Inhibited Petrolatum Solution Primer shall be applied to the coupling, leaving a thin film on the surface and a liberal amount on bolt-heads and nuts.</p> <p>Petrolatum Fibre-filled Mastic shall be applied to cover the bolt heads and nuts on the outside of the flanges and between the flanges to give 13mm cover on the sleeve. The Mastic shall be moulded up to but not over the bolts.</p> <p>Petrolatum Impregnated Synthetic Fabric tape shall then be circumferentially applied over the Mastic with care being taken to exclude air-pockets, and not to stretch the tape.</p> <p>One complete turn of the tape is required making a 150mm overlap at the end. The tape shall be smoothed over the Mastic to eliminate any air-pockets.</p> <p>After application of the tape, two complete circumferential turns of lay-flat polyethylene sheeting 100 microns thick, shall be applied around the joint. The end of the lay-flat sheeting shall be secured with either self-adhesive PVC tape or non-degrading polyethylene twine.</p>
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POWDER COATING APPLICATION (CPS600)

This section covers the requirements for coatings, based on thermosetting and thermoplastic resins which are applied by the powder-coating process, e.g. in the case of control and switchgear panels, distribution boards, steel roller shutters, junction boxes, ring main units, miniature sub-stations, indoor cable racking, instrument panels, storage cabinets, etc.

SURFACE PREPARATION:	<p>Surfaces to be coated shall be free from oil, grease, millscale, corrosion product and any form of contamination that may impair the quality of performance of the coating.</p> <p>The normal method of surface preparation is by chemical cleaning using proprietary chemical solutions and would comprise of the following:</p> <ul style="list-style-type: none"> ▪ Alkaline degreasing ▪ Fresh water rinsing ▪ Acid cleaning ▪ Fresh water rinsing ▪ Phosphating ▪ Oven drying (optional) <p>Care must be taken to prevent "carry-over" from baths and routine analysis shall be performed to ensure chemical conformity.</p>
PRIMER APPLICATION:	The application of a primer shall be at the discretion of the powder manufacturer
COATING PROCESS:	<p>The principle involves the use of appropriate equipment to feed the powder into a nozzle at a higher electrical potential. On passing through this the powder becomes charged with a certain amount of electricity. The charged particles are sprayed onto the metal surface to be coated which is connected to earth to ensure a zero potential. The powder particle is held on the surface by electrostatic charge, the forces of which retaining the powder are sufficient to ensure that the powdered object can be transferred and heated in an oven at a temperature which causes the powder to melt and produce a continuous film. It should be noted that the temperature recommended by the powder manufacturer is substrate temperature which may influence both oven temperature and heating duration.</p>
POWDER:	<p>The powder shall be based on a thermosetting of thermoplastic resin of a suitable type and may contain an acceptable percentage of clean reclaimed powder from the coater's own production of powder coatings of the identical type.</p> <p>The type, resin base and finish shall be as specified by the Engineer and guidelines for powder requirements are given in Tables 1-6 of SANS 1274. "Coatings applied by the powder-coating process".</p>
ACCEPTANCE CRITERIA:	Details of permissible surface imperfections are provided in Table 7 of SANS 1274.

GLASS REINFORCED PLASTIC (CPS700)

This specification deals with the requirements for plant item to be protected by means of glass reinforced plastic (GRP).

MATERIALS:	The Contractor shall satisfy himself that the materials he proposes shall be suitable for use in the expected environments.
SURFACE PREPARATION:	<p>The various surfaces shall be sand blasted to eliminate laitance, oil, grease etc., and leave a uniformly roughened substrate.</p> <p>The abrasive blasting process shall be followed by thorough cleaning and dusting, preferably by vacuum.</p> <p>It is essential that the surface be completely dry before the primer is applied, i.e. substrate moisture to be less than 5% (use of moisture meter).</p>
PRIMING:	<p>Diluted resin shall be used to prime the entire substrate. The spreading rate shall be 200 to 300 grams per square meter.</p> <p>Significant hollows in floors shall be filled with an approved mortar to get a smooth surface.</p>
APPLICATION OF LAMINATE:	<ul style="list-style-type: none"> ▪ The laminate is applied by hand lay-up. ▪ The following system shall be used to form three layers: <ul style="list-style-type: none"> ○ Resin approximately 400g/m² for impregnation of the mat. ○ Fibreglass mat approximately 300g/m². ○ Resin approximately 700g/m². ▪ The final layer shall be as follows: <ul style="list-style-type: none"> ○ Resin approximately 400g/m² for impregnation of surface mat. ○ Fibreglass surfacing mat approximately 50g/m². ○ Resin finishing coat approximately 500g/m². ▪ The total thickness of the above system will be 4 to 4.5mm. The laminating procedure shall conform to a standard equal to Level 2 Table 1 of SANS 141. ▪ Care shall be taken to eliminate air bubbles trapped after application of each fibreglass layer. ▪ Each strand mat layer shall be overlapped and staggered so that joint line does not coincide. ▪ Marks shall be placed on each layer to identify the number of layers applied. ▪ To the final top coat, paraffin will be added in order to prevent direct contact between polyester surface and air. ▪ In case of floor, required to carry traffic, the system described above shall be used with addition of graded silica sand on top of the final coat of resin to get a non-skid surface.
ACCEPTANCE CRITERIA:	<p>The full areas shall be visually inspected.</p> <p>The surface shall be free of pinholes or discontinuities.</p> <p>Samples or resin bonded fibreglass laminate (applied on 500 X 500 concrete slabs) shall set the minimum acceptable standard for lining on site.</p> <p>Tack free acetone test and a Barcon hardness of 31 shall be achieved after application of the finish coat.</p> <p>Soundness and adhesion shall be checked according to SANS 141. A direct pull-off adhesion test shall be used to test adhesion of suspect laminates.</p>

CATHODIC PROTECTION INSTALLATIONS (CPS800)

The following procedure applies to the sacrificial anodes installed on screens, stop gates and in various water boxes exposed to cooling water side.

The following practical method shall be used to determine the effective anode life.	
SELECTION OF ANODES:	<p>A visual examination shall be carried out to assess the degree of degradation of the anodes. From those exhibiting indications of severe alloy depletion, a representative sample from each component shall be selected.</p> <p>All loose oxide (white powder) shall be removed by means of a nylon bristle brush.</p> <p>The anode shall then be weighed and the design weight of the insert deducted from the total. From the design mass of the anode the actual consumption can be determined over the known operation period. The remaining effective life can then be assessed taking into account the efficiency or *utilisation factor as specified by the manufacturer.</p> <p>*The utilisation factor is determined by the fraction of anode material consumed when the remaining anode material cannot deliver the current required.</p> <p>A guide to the values of utilisation factors together with the method of calculating the design life of anodes is given in Det Norske Veritas - R B401 "Cathodic Protection Design".</p>

STRUCTURAL WRAPPING (CPS900)

This section covers the requirements for structural wrapping of components.

SURFACE PREPARATION:	<p>All surfaces to be wrapped shall be cleaned of grease, salt, dust, loose paint/corrosion product.</p> <p>All edges of the original sound paint should be feathered back using a suitable grade emery paper.</p> <p>Areas where localised corrosion has taken place or where rust patches are visible shall be prepared by thorough hand wire brushing followed by rubbing with emery paper to a surface finish in accordance with ISO 8501 Grade St 2.</p> <p>All corroded areas shall be patch primed by brush with a single coat of Twin Pack Epoxy Zinc Rich Primer.</p>
PRIMER COAT:	<p>Following cleaning, drying and priming of the surfaces, all surfaces shall (unless designated otherwise) receive one liberal coat of S.S. High Tack Structural Steel Primer.</p> <p>Application shall be by brush or roller at an average spread rate of 4m²/l.</p> <p>The primer shall be allowed to flash-off for a period of at least 20 minutes before proceeding with tape application.</p> <p>All areas that have been primed shall receive the tape application within the same working day.</p> <p>Areas of primer not covered shall be deemed "dead" and shall be reprimed.</p>
TAPE APPLICATION:	<p>Horizontal and Vertical Application (on conventional steel members):</p> <ul style="list-style-type: none"> • Choose widths of S.S. High Tack Structural Steel Tape which permit overlaps of at least 25mm to be made in a downward direction "Weatherboarding Effect" on vertical surfaces and on the upper face of horizontal surfaces. • Do not overlap tape on the underside of horizontal surfaces. • Apply tape by unrolling along member so that the thick compound side (inside roll) is in contact with the steelwork. • Do not attempt to apply tape in lengths greater than 2m. • Press and Smooth down as application proceeds with particular attention to the overlaps. (Minimum overlap 25mm unless specified otherwise.) • The tape should never be placed on two faces and then stretched into the angle between them; the angle should be formed and then the tape smoothed on to the adjacent faces. • Apply sufficient tension to give complete adherence but Do Not Stretch the tape at any time. • Avoid folds and air pockets, pressing out any which may appear. • To cover bolt-heads, nuts and exposed threads the tape must be X-cut and pressed firmly round the base of the bolt head and nut to ensure no air entrapment. • Mastic should be applied to form a smooth profile over the bolt heads, nuts and exposed threads. • Using a separate piece of tape cut a circular disc of sufficient diameter to adequately cover the mastic profiled bolt and nut. • Place this in position and press down firmly to ensure no air entrapment. • Should crevices be encountered at mating surfaces of bolted

	<p>connections or elsewhere, these shall be sealed with a continuous application of Mastic.</p> <ul style="list-style-type: none"> The mastic shall be pressed into the crevice using a putty knife or paint scraper and smoothed off along edges to provide a suitable profile for tape application.
COVERCOAT APPLICATION:	<p>On completion of the tape application and within a maximum period of 7 days, all surfaces shall receive a liberal coat of Cementitious Basecoat 429. (The liquid component of the basecoat kit should be mixed with the powder component in the as supplied kit ration of 1:1).</p> <p>Apply the cementitious basecoat by brush at a spread rate of 0,5 m²/l minimum.</p> <p>Allow to dry for a minimum period of 12 hours.</p> <p>Apply a second coat of Cementitious basecoat 429 (at a spread rate of 0,75 m²/l minimum incorporating a Scrim Tape which is placed into the wet basecoat in a similar fashion to the taping procedure. The scrim shall be fully saturated by the basecoat.</p> <p>Overlaps on scrim should be positioned such that they do not coincide with tape overlaps.</p> <p>Allow to dry for a minimum of 12 hours before proceeding.</p> <p>Apply by brush or roller two full coats of Acrylic Topcoat at a spread rate of 4 m²/l per coat.</p> <p>An intercoat drying time of 4 hours shall elapse.</p> <p>Each coat shall be of distinctly different colour with the final coat colour being to the approval of the Engineer.</p>

METAL SPRAYED COATINGS (CPS1000)

The following procedure applies to the zinc or aluminium metal spraying of plant components where specified.

SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3.								
METAL SPRAYING:	All metal spraying shall be carried out by Electric Arc spraying process. Maximum atomisation of wire shall be attained at all times to obtain a fine grained, dense sprayed film.								
METAL SPRAY TYPES:	<p>(1) Generally zinc and aluminium sprayed coatings shall be carried out in accordance with EN22063 or SANS 1391: – Part 1.</p> <p>(2) The wire analysis shall be:</p> <ul style="list-style-type: none"> ▪ Zinc 99,995% minimum ▪ Aluminium 98,0 minimum <p>(3) Copper and bronze decorative finishing systems shall at all times be applied over flash coats of either zinc or other suitable flash wire materials.</p> <p>(4) Colour development of bronze and copper finishes shall be approved prior to actual work commencement. Samples of the final colour shall be submitted for approval by the Engineer.</p>								
COATING THICKNESS:	<p>Unless otherwise agreed to by the Engineer the minimum coating thicknesses shall be as follows:</p> <table> <tr> <td>Zinc</td><td>125 micrometres</td></tr> <tr> <td>Aluminium</td><td>125 micrometres</td></tr> <tr> <td>Copper</td><td>150 micrometres</td></tr> <tr> <td>Bronze</td><td>150 micrometres.</td></tr> </table>	Zinc	125 micrometres	Aluminium	125 micrometres	Copper	150 micrometres	Bronze	150 micrometres.
Zinc	125 micrometres								
Aluminium	125 micrometres								
Copper	150 micrometres								
Bronze	150 micrometres.								
GENERAL:	<p>(1) Where zinc and aluminium coatings are being applied, followed by a further paint system, the Contractor shall obtain the Engineer's approval of the metal sprayed coatings prior to painting being commenced.</p> <p>(2) The final metal sprayed surface shall be free of lumps, unatomised wire and other surface irregularities.</p>								

18. DETAILED COATING SPECIFICATIONS

COATING SYSTEM DCS100
<p>APPLICATION CONDITIONS:</p> <p>Normal environment Ferritic substrate below 70°C</p> <p>(This specification applies to the painting of all items exposed to non-corrosive indoor and outdoor conditions, namely, external surfaces of gearboxes, pumps, valves, air receivers, compressors and piping (refer to detailed list for specifics)</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1).	
PRIMER COAT	Apply by brush, airless spray or dipping, one coat Single Pack Etch Primer.	15 to 25 micrometres
UNDERCOAT:	After allowing sufficient time for the primer coat to dry, apply by brush or airless spray, one coat of Alkyd Universal Undercoat.	20 to 30 micrometres.
FINAL COAT:	After allowing sufficient time for the undercoat coat to dry, apply one coat of High Gloss Alkyd Enamel.	25 to 30 micrometres
	Total dry film thickness of coating system:	60 to 85 micrometres
GENERAL:	After installation, lining up, grouting etc., all damage shall be repaired and coatings made good to the Engineer's approval.	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)

COATING SYSTEM DCS200
<p>APPLICATION CONDITIONS:</p> <p>Normal environment Ferritic substrate below 70°C</p> <p>(This specification applies to the painting of all items exposed to non-corrosive indoor and outdoor conditions, namely, switch brackets, chain blocks, junction boxes, switchgear, socket outlets, distribution boards, piping, window frames, door frames, steel louvers, steel bearers, indoor civil and building structural steelwork, as well as external surfaces of pumps, valves and piping exposed to non-corrosive conditions.</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1) or degrease, rinse, pickle and phosphate.	
PRIMER COAT:	Apply one coat Alkyd Zinc Phosphate Primer by spray	30 to 40 micrometres
INTERMEDIATE COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat of Universal Undercoat by brush, roller or spray.	30 to 40 micrometres
FINAL COAT:	Allowing sufficient time for the second coat to cure, apply one coat High Gloss Enamel by spray.	30 to 40 micrometres
	Total dry film thickness of coating system:	90 to 120 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)

COATING SYSTEM DCS300
APPLICATION CONDITIONS: Normal environment Ferritic substrate below 70°C (This specification applies to the painting of all items exposed to non-corrosive indoor conditions, namely turbine house structural steelwork, boiler house handrailing, and outside plant structural steelwork.)

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1).	
PRIMER COAT (Before erection):	Apply one coat High Build Alkyd Zinc Phosphate Primer by spray	40 to 50 micrometres
FINAL COAT (After erection):	Wash down. Repair damaged areas with the same primer as above. Apply one coat of High Gloss Alkyd Enamel.	30 to 40 micrometres
	Total dry film thickness of coating system:	70 to 90 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)

COATING SYSTEM DCS400
<p>APPLICATION CONDITIONS:</p> <p>Normal environment Metallised zinc and hot dip galvanised substrates</p> <p>This specification applies to the Duplex Coating of zinc metal-sprayed and hot dip galvanised surfaces exposed to low to medium corrosive conditions, namely galvanised sheet iron flashings, eaves, fascias, barge boards QC decking, rainwater pipes and gutters, as well as small diameter galvanised pipes.</p> <p>Duplex coating is a special process and requires proper surface preparation to avoid delamination of the organic coating system. (SAHDGA 01 – Code of practice for surface preparation and application of organic coating, can be consulted in this regard).</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	<p>Galvanised and zinc metal-sprayed surfaces shall be scrubbed prior to painting to provide a water break-free surface, using a solvent detergent degreaser specifically formulated by the supplier of the paint system, for cleaning new galvanising or zinc-metal sprayed surfaces.</p> <p>Water rinsing after cleaning is essential to remove all traces of the cleaner. This is best achieved by hosing with a high-pressure water spray. Allow drying.</p>	
PRIMER COAT:	As soon as the surfaces are dry, apply by airless spray, one coat Two-Pack Polyamide or Polyamine Cured Epoxy Primer specifically formulated for zinc surfaces.	50 to 80 micrometres
FINAL COAT:	Apply by airless spray, one coat Two Component High Solids Polyurethane Acrylic Coating.	50 to 60 micrometres.
	Total dry film thickness of coating system:	100 to 140 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Jotun, Sigma Coatings, Stoncor, Varchem, Barloworld Plascon, Speccoats

COATING SYSTEM DCS500
<p>APPLICATION CONDITIONS:</p> <p style="text-align: center;">Normal environment Metallised zinc and hot dip galvanised substrates</p> <p>This specification applies to the Duplex Coating of zinc metal-sprayed and hot dip galvanised surfaces exposed to low to medium corrosive conditions, namely galvanised sheet iron flashings, eaves, fascias, barge boards QC decking, rainwater pipes and gutters, as well as small diameter galvanised pipes.</p> <p>Duplex coating is a special process and requires proper surface preparation to avoid delamination of the organic coating system. (SAHDGA 01 – Code of practice for surface preparation and application of organic coating, can be consulted in this regard).</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Galvanised and zinc metal-sprayed surfaces shall be scrubbed prior to painting to provide a water break-free surface, using a solvent detergent degreaser specifically formulated by the supplier of the paint system, for cleaning new galvanising or zinc-metal sprayed surfaces. Water rinsing after cleaning is essential to remove all traces of the cleaner. This is best achieved by hosing with a high-pressure water spray. Allow drying.	
PRIMER COAT:	As soon as the surfaces are dry, apply by airless spray, one coat Water-based Acrylic Primer specifically formulated for zinc surfaces.	25 to 35 micrometres
INTERMEDIATE COAT:	Allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by airless spray, one coat Water-based Modified Vinyl Acrylic.	120 to 140 micrometres
FINAL COAT:	Allowing sufficient time for the intermediate coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by airless spray, a second coat Water-based Modified Vinyl Acrylic as above.	120 to 140 micrometres
	Total dry film thickness of coating system:	265 to 315 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Optima Coatings / Stoncor

COATING SYSTEM DCS600
APPLICATION CONDITIONS: Normal environment Gypsum and cement plaster ceilings and walls – Decorative This specification is relevant in terms of all internal plastered and bagged walls exposed to non-humid conditions.

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Brush down and dust off to remove surface dust and other foreign matter to leave a smoothly contoured substrate. Patch fill surface voids and cracks using plaster filler material and sand down after curing.	NA
PRIMER COAT:	As soon as the surfaces are dry, and properly prepared, apply by brush, roller or spray, one coat Alkali Resistant Pigmented Sealer/Primer.	As per Product Data Sheet
FINAL COATS:	After allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by brush, roller or spray two coats Interior/Exterior Quality Washable Acrylic Emulsion paint.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS700
APPLICATION CONDITIONS: <p style="text-align: center;">Normal environment</p> <p style="text-align: center;">Gypsum and cement plaster ceilings and walls – Decorative and with Hygiene Requirements</p> <p style="text-align: center;">This specification applies to the painting of all internal gypsum and cement plastered walls with special hygiene requirements.</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Brush down and dust off to remove surface dust and other foreign matter to leave a smoothly contoured substrate. Patch fill surface voids and cracks using plaster filler material and sand down after curing.	NA
PRIMER COAT:	As soon as the surfaces are dry, and properly prepared, apply by brush, roller or spray, one coat Alkali Resistant Pigmented Sealer/Primer.	As per Product Data Sheet
FINAL COATS:	After allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by brush, roller or spray two coats Eggshell Enamel or Polyurethane Velvet Enamel.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS800
<p>APPLICATION CONDITIONS:</p> <p>Normal environment Wood surfaces and with specific colour requirements</p> <p>This procedure species the requirements for the decorative painting of all indoor wooden beads, rails, doors and skirting not exceeding 150mm girth.</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Rub down. Knot and stop.	NA
PRIMER COAT:	Apply by brush, one coat Oil-based Pink Wood Primer.	As per Product Data Sheet
INTERMEDIATE COAT:	Allowing enough time for the primer coat to dry, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Alkyd Undercoat.	As per Product Data Sheet
FINAL COAT:	After allowing sufficient time for the intermediate coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by brush, roller or spray one coat Alkyd Enamel.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS900
APPLICATION CONDITIONS: <p style="color: red; text-align: center;">Aggressive environment Ferritic substrate below 70°C</p> <p>This procedure species the requirements for the corrosion protection of the external surfaces of gearboxes, water/oil/chemical carrying pipework, pumps, overhead cranes, structural steel, vessels etc. exposed to aggressive corrosive conditions.</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1).	
PRIMER COAT:	Apply by spray, one coat Twin Pack Polyamide Cured Epoxy Primer.	60 to 80 micrometres
INTERMEDIATE COAT:	Allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by spray, one coat Twin Pack, High Build Polyamide Cured Epoxy Intermediate Coat.	120 to 150 micrometres
FINAL COAT:	Allowing sufficient time for the intermediate coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by spray, one coat Twin Pack, High Build Recoatable Polyurethane Acrylic Finish.	50 to 60 micrometres
	Total dry film thickness of coating system:	230 to 290 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Jotun, Sigma Coatings, Stoncor, Varchem, Barloworld Plascon, Speccoats

COATING SYSTEM DCS1000
APPLICATION CONDITIONS: Aggressive environment Ferritic substrate above 200°C Applicable in the case of the external surfaces of pressure valves and mild steel chutes feeding dry ash from precipitators to chain conveyor

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1).	
PRIMER COAT:	Apply by agitated pressure-pot spray, one coat, Inorganic Zinc Silicate Primer.	70 to 80 micrometres
INTERMEDIATE COAT:	Allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by spray, one coat Heat Resistant Aluminium Coating.	15 to 25 micrometres.
FINAL COAT:	Allowing sufficient time for the intermediate coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat Heat Resistant Aluminium Coating as above.	15 to 25 micrometres
	Total dry film thickness of coating system:	100 to 130 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Jotun, Sigma Coatings, Stoncor, Barloworld Plascon

COATING SYSTEM DCS1100
APPLICATION CONDITIONS: <p style="text-align: center;">Aggressive environment</p> <p>This procedure applies to the additional protection of all gypsum and cement plaster ceilings and walls, with decorative requirements, and exposed to aggressive chemical fumes and/or high relative humidity</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	<p>Brush down and dust off to remove surface dust and other foreign matter to leave a smoothly contoured substrate.</p> <p>Patch fill surface voids and cracks using a plaster filler material that is compatible with the following Epoxy Coating.</p>	NA
COATING SYSTEM	As soon as the surfaces are dry, and properly prepared, apply by brush, roller or spray, three coats Water-borne or Solvent-borne Polyamide Cured Epoxy Coating (Overcoating times shall be adhered to).	90 to 110 micrometres
	Total dry film thickness of coating system:	270 to 330 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Stoncor, Flowcrete

COATING SYSTEM DCS1200
<p>APPLICATION CONDITIONS:</p> <p>Aggressive environment</p> <p>The section describes the procedures to be followed for the varnishing of wooden beads, rails, skirting not exceeding 150mm girth, panelling, partitions, doors, frames etc.</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	All surfaces shall be thoroughly cleaned to remove all dirt and grease and should be rubbed down with fine abrasive paper to produce a smooth finish.	NA
FIRST COAT:	Apply by brush or spray, one coat High Quality Polyurethane Varnish that has been thinned with 10% Mineral Turpentine.	As per Product Data Sheet
FINAL COATS:	Allowing sufficient time for the first coat to dry, apply by brush or spray two additional coats of the unthinned varnish.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.
Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS1300
APPLICATION CONDITIONS: <p style="text-align: center; color: red;">Aggressive environment</p> <p>This procedure is applicable for the epoxy screeding of plinths supporting chemical tanks, bund areas for pumps carrying corrosive or aggressive liquids and off-loading areas for these chemicals exposed to heavy traffic.</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	<p>Laitance and loose cement particles shall be removed by mechanical methods, i.e. abrasive blasting or scarifying.</p> <p>Remove any oil or grease spots using suitable solvent retained in sawdust.</p>	NA
PRIMER COAT:	Apply by brush or roller, one coat Epoxy Primer suitable for concrete surfaces.	As per Product Data Sheet
FINAL COATS:	Allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by trowel or "Screed Applicator" an Aggregate filled Solvent Free Epoxy Screed at a thickness of 5 to 6 mm.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Stoncor / Flowcrete.

COATING SYSTEM DCS1400 (ALTERNATIVE TO DCS1500)	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">For liquid contact applications Ferritic substrate Solvent-borne Coating System</p> <p>This specification covers the protection of the internal surfaces of storage tanks and pipework carrying /handling raw, potable, demin-effluent, dirty drains recovery, clarified, and cooling water.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3 (ISO 8501-1).	
PRIMER COAT:	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
STRIPE COAT:	After allowing sufficient time for the first coat to cure, all edges, weld seams, bolt holes and other crucial areas shall be given an additional stripe coat with the same material as the following coat.	
INTERMEDIATE COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Polyamine Cured Epoxy Coating.	120 to 140 micrometres
FINAL COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat Twin Pack Polyamine Cured Epoxy Coating as above.	120 to 140 micrometres
	Total dry film thickness of coating system:	330 to 390 micrometres
HOLIDAY DETECTION:	<p>All internal surfaces shall be 100% Wet Sponge Holiday Detected. The Contractor shall produce certification that this testing has been carried out for the Engineer's acceptance.</p> <p>The tests shall be carried out as soon as the final coat has cured.</p> <p>Any faults located shall be marked up and repaired to the Engineer's satisfaction.</p>	

ADDITIONAL NOTES:

In the case of potable water applications, the user of this specification/procedure needs to establish whether the specific coating material to be used has been certified for potable water use.

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.
Sigma Coatings / Stoncor

COATING SYSTEM DCS1500 (ALTERNATIVE TO DCS1400)	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">For liquid contact applications Ferritic substrate Solvent Free Coating System</p> <p>This specification covers the protection of the internal surfaces of storage tanks and pipework carrying /handling raw, potable, demin-effluent, dirty drains recovery, clarified, and cooling water.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3 (ISO 8501-1).	
PRIMER COAT: (If Required)	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
STRIPE COAT:	After allowing sufficient time for the first coat to cure, all edges, weld seams, bolt holes and other crucial areas shall be given an additional stripe coat with the same material as the following coat.	
INTERMEDIATE COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Solvent Free Polyamine Cured Epoxy Coating.	200 to 250 micrometres
FINAL COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat Twin Pack Solvent Free Polyamine Cured Epoxy Coating as above.	200 to 250 micrometres
	Total dry film thickness of coating system:	490 to 610 micrometres
HOLIDAY DETECTION:	<p>All internal surfaces shall be 100% Wet Sponge Holiday Detected. The Contractor shall produce certification that this testing has been carried out for the Engineer's acceptance.</p> <p>The tests shall be carried out as soon as the final coat has cured.</p> <p>Any faults located shall be marked up and repaired to the Engineer's satisfaction.</p>	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to. Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings / Jotun

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)

COATING SYSTEM DCS1600	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">For liquid contact applications Ferritic substrate</p> <p>This specification covers the protection of the internal surfaces of storage tanks and pipework carrying /handling chemicals or liquids that due to the aggressiveness or high temperature conditions, cannot be handled by those materials specified in DCS1400 and DCS1600.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3 (ISO 8501-1).	
PRIMER COAT	Apply by airless spray, one coat Twin Pack, High Build Phenolic Epoxy Primer or Coating.	90 to 110 micrometres
STRIPE COAT:	After allowing sufficient time for the first coat to cure, all edges, weld seams, bolt holes and other crucial areas shall be given an additional stripe coat with the same material as the following coat.	
INTERMEDIATE COAT	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat, Twin Pack, High Build, Amine Phenolic Epoxy Coating.	90 to 110 micrometres
FINAL COAT	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat, High Build, Phenolic Epoxy Finish/Coating.	90 to 110 micrometres
	Total dry film thickness of coating system:	270 to 330 micrometres
HOLIDAY DETECTION:	<p>All internal surfaces shall be 100% Wet Sponge Holiday Detected. The Contractor shall produce certification that this testing has been carried out for the Engineer's acceptance.</p> <p>The tests shall be carried out as soon as the final coat has cured.</p> <p>Any faults located shall be marked up and repaired to the Engineer's satisfaction.</p>	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to. Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings (Sigma Phenguard)

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)
Jotun (Tankguard Storage), Stoncor (Phenoline 1205)

COATING SYSTEM DCS1700	
APPLICATION CONDITIONS: For liquid contact applications Ferritic substrate This section covers the protection of the internal and external surfaces of motors, pumps and valves immersed or handling sewage, as well as the internal surfaces of pipework carrying sewage.	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3 (ISO 8501-1).	
PRIMER COAT:	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
INTERMEDIATE COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Polyamine Adduct Cured Coal tar Epoxy Coating.	200 to 220 micrometres
FINAL COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat Twin Pack Polyamine Adduct Cured Coal tar Epoxy Coating as above.	200 to 220 micrometres
	Total dry film thickness of coating system:	490 to 550 micrometres
HOLIDAY DETECTION:	All internal surfaces shall be 100% Wet Sponge Holiday Detected. The Contractor shall produce certification that this testing has been carried out for the Engineer's acceptance. The tests shall be carried out as soon as the final coat has cured. Any faults located shall be marked up and repaired to the Engineer's satisfaction.	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND

Sigma Coatings / Barloworld Plascon / Jotun / Stoncor

COATING SYSTEM DCS1800 (ALTERNATIVE TO DCS1900)		
APPLICATION CONDITIONS: For liquid contact applications Concrete substrate Solvent-borne Coating System For the protection of concrete surfaces exposed to effluents.		

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Laitance and loose cement particles shall be removed by mechanical methods, i.e. abrasive blasting or scarifying. Remove any oil or grease spots using suitable solvent retained in sawdust.	
PRIMER COAT:	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
INTERMEDIATE COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Polyamine Cured Epoxy Coating.	120 to 140 micrometres
FINAL COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat Twin Pack Polyamine Cured Epoxy Coating as above.	120 to 140 micrometres
	Total dry film thickness of coating system:	330 to 390 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings / Stoncor

COATING SYSTEM DCS1900 (ALTERNATIVE TO DCS1800)
APPLICATION CONDITIONS: For liquid contact applications Concrete substrate Solvent Free Coating System For the protection of concrete surfaces exposed to effluents

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Laitance and loose cement particles shall be removed by mechanical methods, i.e. abrasive blasting or scarifying. Remove any oil or grease spots using suitable solvent retained in sawdust.	
PRIMER COAT:	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
INTERMEDIATE COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Solvent Free Amine Cured Epoxy Coating.	200 to 250 micrometres
FINAL COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat Twin Pack Solvent Free Amine Cured Epoxy Coating as above.	200 to 250 micrometres
	Total dry film thickness of coating system:	490 to 610 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.
Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings / Jotun

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)

COATING SYSTEM DCS2000
APPLICATION CONDITIONS: For liquid contact applications Ferritic substrate This procedure applies to the protection of the internal surfaces of transformer oil storage/handling tanks, pipework and bunds.

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3 (ISO 8501-1).	
PRIMER COAT:	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
STRIPE COAT:	After allowing sufficient time for the first coat to cure, all edges, weld seams, bolt holes and other crucial areas shall be given an additional stripe coat with the same material as the following coat.	
INTERMEDIATE COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Polyamine Cured Epoxy Coating.	120 to 140 micrometres
FINAL COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat Twin Pack Polyamine Cured Epoxy Coating as above.	120 to 140 micrometres
	Total dry film thickness of coating system:	330 to 390 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.
Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings / Stoncor / Barloworld Plascon

COATING SYSTEM DCS2100
APPLICATION CONDITIONS: For liquid contact applications Concrete substrate This procedure applies to the protection of concrete lubricating oil bund areas.

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Laitance and loose cement particles shall be removed by mechanical methods, i.e. abrasive blasting or scarifying. Remove any oil or grease spots using suitable solvent retained in sawdust.	
PRIMER COAT:	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
INTERMEDIATE COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Polyamine Cured Epoxy Coating.	120 to 140 micrometres
FINAL COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat Twin Pack Polyamine Cured Epoxy Coating as above.	120 to 140 micrometres
	Total dry film thickness of coating system:	330 to 390 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings / Stoncor / Barloworld Plascon

COATING SYSTEM DCS2200
<p>APPLICATION CONDITIONS:</p> <p>In contact with soil Buried environment Galvanised substrate</p> <p>This procedure is applicable in terms of the additional protection of the buried sections of hot dip galvanised poles.</p>

ITEM	ACTIVITY
LIGHTING STANDARDS (Non-corrosive environment)	
LIGHTING STANDARDS	Hot dip galvanise in accordance with attached Specification CPS100.
PLANTED POLES (Buried Sections)	
SURFACE PREPARATION:	Clean down the external surface with galvanised iron pre-cleaner.
PRIMER:	Apply by brush, one coat of Rubber/Synthetic Resin Pipe Primer.
WRAPPING SYSTEM:	<p>Hand apply in a helical manner a single layer of white adhesive polyethylene butyl laminate tape of width 100mm with an overlap of 10mm. Ensure that the laps are made in a weather-board fashion i.e. commence tape application at the bottom of the pole and work upwards.</p> <p>Wrap to extend a distance of 100mm above ground level.</p>
NOTE :	<p>The above specified materials shall be applied in strict with the manufacturer's recommendations.</p> <p>Care shall be taken when applying the tape system as, contact has been made between tape and primer, it cannot easily be lifted again.</p> <p>Care must be taken to produce an even, smooth wrap with sealed overlaps to prevent ingress of moisture.</p> <p>Care shall be taken not to damage the wrapping system during pole erection and back-filling. Any damage must be made good using both primer and patches of adhesive tape.</p> <p>If possible, the back-fill material should be screened to remove large stones that could damage the wrapping system.</p>
HINGED POLES:	The hinged foundation, nuts, bolts etc., should be hot dip galvanised as with the lighting standards.
LIGHT FITTINGS:	Proprietary. Details of proprietary coating should be submitted to the Engineer for approval.
NOTE:	Any items not covered or included in this specification shall be considered on a case by case basis.

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to. Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended in terms of this specification.
Denso SA (Pty) Ltd., 3M SA (Pty) Ltd.,

COATING SYSTEM DCS2300
APPLICATION CONDITIONS: Normal environment Wood surfaces to be stained and varnished This procedure applies to the staining and subsequent varnishing of wooden surfaces.

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	All surfaces shall be thoroughly cleaned to remove all dirt and grease and should be rubbed down with fine abrasive paper to produce a smooth finish.	NA
FIRST COAT:	Apply one coat Oil-based Wood Stain in colour to the Engineer's approval.	As per Product Data Sheet
FINAL COATS:	Apply two coats Clear Eggshell Varnish to achieve a uniform surface finish.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS2400 (ALTERNATIVE TO DCS2500)	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">Normal environment Gypsum or Cement plaster ceilings – Decorative</p> <p>This procedure applies to the painting of gypsum or cement indoor plastered ceiling and walls not exposed to relative high humidity or with no special hygiene requirements.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Brush down and dust off to remove surface dust and other foreign matter to leave a smoothly contoured substrate. Patch fill surface voids and cracks using plaster filler material and sand down after curing.	NA
PRIMER COAT:	As soon as the surfaces are dry, and properly prepared, apply by brush, roller or spray, one coat Alkali Resistant Pigmented Sealer/Primer.	As per Product Data Sheet
FINAL COATS:	After allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by brush, roller or spray two coats Interior/Exterior Quality PVA.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS2500 (ALTERNATIVE TO DCS2400)		
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">Normal environment Gypsum or Cement plaster ceilings – Decorative</p> <p>This procedure applies to the painting of gypsum or cement indoor plastered ceiling and walls not exposed to relative high humidity or with no special hygiene requirements.</p>		

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Brush down and dust off to remove surface dust and other foreign matter to leave a smoothly contoured substrate. Patch fill surface voids and cracks using plaster filler material and sand down after curing.	NA
PRIMER COAT:	As soon as the surfaces are dry, and properly prepared, apply by brush or roller, one coat Oil-based Pigmented Plaster Primer.	As per Product Data Sheet
UNDERCOAT:	After allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by brush or roller, one coat of Alkyd Universal Undercoat.	As per Product Data Sheet
FINAL COAT:	After allowing sufficient time for the undercoat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by brush or roller, one coat of Alkyd High Gloss Enamel.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS2600	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">Normal environment Metallised zinc and hot dip galvanised substrates</p> <p>The section covers the decorative painting of galvanised sheet iron flashings, eaves, fascias, barge boards, QC decking, rainwater pipes, gutters and small diameter pipes.</p> <p>Duplex coating is a special process and requires proper surface preparation to avoid delamination of the organic coating system. (SAHDGA 01 – Code of practice for surface preparation and application of organic coating, can be consulted in this regard).</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Galvanised and zinc metal-sprayed surfaces shall be scrubbed prior to painting to provide a water break-free surface, using a solvent detergent degreaser specifically formulated by the supplier of the paint system, for cleaning new galvanising or zinc-metal sprayed surfaces. Water rinsing after cleaning is essential to remove all traces of the cleaner. This is best achieved by hosing with a high-pressure water spray. Allow drying.	
PRIMER COAT:	As soon as the surfaces are dry, apply by brush, roller or airless spray, one coat Oil-based Primer specifically formulated for zinc surfaces.	25 to 35 micrometres
UNDERCOAT:	After allowing sufficient time for the primer coat to dry, the manufacturer's recommendations shall be adhered to in this regard, apply one coat of Alkyd Universal Undercoat.	20 to 30 micrometres.
FINAL COAT:	After allowing sufficient time for the undercoat to dry, the manufacturer's recommendations shall be adhered to in this regard, apply one coat of Alkyd Enamel.	20 to 30 micrometres.
	Total dry film thickness of coating system:	65 to 95 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.
Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS2700
APPLICATION CONDITIONS: <p style="color: red;">Chemical resistance required Offshutter concrete surfaces</p> <p>This specification deals with the protection of offshutter concrete surfaces, plastered interior walls and ceilings that require extra protection due to high humidity or chemical fumes.</p>

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Brush down and dust off to remove surface dust and other foreign matter to leave a smoothly contoured substrate. Patch fill surface voids and cracks using plaster filler suitable compatible with an Epoxy Resin Primer.	NA
PRIMER COAT:	As soon as the surfaces are dry, and properly prepared, apply one coat of Epoxy Masonry Primer by brush, roller or spray.	As per Product Data Sheet
UNDERCOAT:	After allowing sufficient time for the primer coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat of Epoxy Undercoat by brush, roller or spray.	As per Product Data Sheet
FINAL COAT:	After allowing sufficient time for the undercoat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply by brush, roller or spray one coat Polyurethane Enamel.	As per Product Data Sheet

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Stoncor, Sigma Coatings, Jotun,

COATING SYSTEM DCS2800		
<p>APPLICATION CONDITIONS:</p> <p>For temporary protection Normal environment Ferritic substrate below 70°C</p> <p>This specification can be used for the temporary/pre-erection protection of steelwork being stored on-site.</p>		

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1) or degrease, rinse, pickle and phosphate.	
PRIMER COAT:	Apply one coat Alkyd Zinc Phosphate Primer by spray.	30 to 40 micrometres
	Total dry film thickness of coating system:	30 to 40 micrometres

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)

COATING SYSTEM DCS2900	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">For liquid contact applications Light abrasion and chemical resistance required Ferritic substrate</p> <p>This section involves the protection of steelwork exposed to immersion conditions where light abrasion and chemical resistance is required.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3 (ISO 8501-1).	
FIRST COAT:	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
STRIPE COAT:	After allowing sufficient time for the first coat to cure, all edges, weld seams, bolt holes and other crucial areas shall be given an additional stripe coat with the same material as the following coat.	
SECOND COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat of a Twin-pack Glassflake Re-inforced Epoxy Coating by airless spray.	250 to 280 micrometres
THIRD COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, After allowing sufficient time for the first coat to cure (the manufacturers recommendations shall be adhered to in this regard) apply a second coat of Twin-pack Glassflake Re-inforced Epoxy Coating by airless spray as above.	250 to 280 micrometres
	Total dry film thickness of coating system:	590 to 670 micrometres
HOLIDAY DETECTION:	<p>All internal surfaces shall be 100% Wet Sponge Holiday Detected. The Contractor shall produce certification that this testing has been carried out for the Engineer's acceptance.</p> <p>The tests shall be carried out as soon as the final coat has cured.</p> <p>Any faults located shall be marked up and repaired to the Engineer's satisfaction.</p>	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.
Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings

COATING SYSTEM DCS3000 (ALTERNATIVE TO DCS3100)	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">For liquid contact applications Light abrasion, chemical and UV light resistance required Ferritic substrate</p> <p>This section involves the protection of steelwork exposed to immersion conditions where light abrasion, chemical and ultra-violet light resistance is required.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3 (ISO 8501-1).	
FIRST COAT:	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
STRIPE COAT:	After allowing sufficient time for the first coat to cure, all edges, weld seams, bolt holes and other crucial areas shall be given an additional stripe coat with the same material as the following coat.	
SECOND COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat of a Twin-pack Glassflake Re-inforced Epoxy Coating by airless spray.	250 to 280 micrometres
THIRD COAT:	Allowing sufficient time for the second coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply a second coat of Twin-pack Glassflake Re-inforced Epoxy Coating by airless spray as above.	250 to 280 micrometres
UV LIGHT PROTECTION:	After allowing sufficient time for the third coat to cure (the manufacturers recommendations shall be adhered to in this respect), apply a single coat of High Build Polyurethane Enamel by roller or airless spray.	50 to 60 micrometres
	Total dry film thickness of coating system:	640 to 730 micrometres
HOLIDAY DETECTION:	<p>All internal surfaces shall be 100% Wet Sponge Holiday Detected. The Contractor shall produce certification that this testing has been carried out for the Engineer's acceptance.</p> <p>The tests shall be carried out as soon as the final coat has cured.</p> <p>Any faults located shall be marked up and repaired to the Engineer's satisfaction.</p>	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to. Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings

COATING SYSTEM DCS3100 (ALTERNATIVE TO DCS 3000)		
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">For liquid contact applications Light abrasion, chemical and UV light resistance required Ferritic substrate</p> <p>This section involves the protection of steelwork exposed to immersion conditions where light abrasion, chemical and ultra-violet light resistance is required.</p>		

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 3 (ISO 8501-1).	
FIRST COAT: (If Required)	Apply by airless spray, one coat Twin Pack General Purpose Epoxy Primer.	90 to 110 micrometres
STRIPE COAT:	After allowing sufficient time for the first coat to cure, all edges, weld seams, bolt holes and other crucial areas shall be given an additional stripe coat with the same material as the following coat.	
SECOND COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Solvent Free Amine Cured Epoxy Coating.	200 to 250 micrometres
THIRD COAT:	Allowing sufficient time for the first coat to cure, the manufacturer's recommendations shall be adhered to in this regard, apply one coat Twin Pack Solvent Free Amine Cured Epoxy Coating.	200 to 250 micrometres
UV LIGHT PROTECTION:	After allowing sufficient time for the third coat to cure (the manufacturers recommendations shall be adhered to in this respect), apply a single coat of High Build Polyurethane Enamel by roller or airless spray.	50 to 60 micrometres
	Total dry film thickness of coating system:	With primer: 540 to 670 micrometres Without primer: 450 to 560 micrometres.
HOLIDAY DETECTION:	<p>All internal surfaces shall be 100% Wet Sponge Holiday Detected. The Contractor shall produce certification that this testing has been carried out for the Engineer's acceptance.</p> <p>The tests shall be carried out as soon as the final coat has cured.</p> <p>Any faults located shall be marked up and repaired to the Engineer's satisfaction.</p>	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to. Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings / Jotun

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:
(Please contact the Engineer for latest test results)

COATING SYSTEM DCS3200
<p>APPLICATION CONDITIONS:</p> <p style="text-align: center;">For temporary protection Normal environment Ferritic substrate</p> <p>This procedure applies to the requirements for the temporary protection of the internal surfaces of precipitators (in gas path), hoppers and plates exposed to flue gases.</p>

<p>This specification details the requirement for temporary protection against corrosion of the internal surfaces of items of plant and equipment.</p> <p>The protective system shall prevent corrosion or other deterioration of the component from the time it is manufactured, assembled and/or constructed through until the time it is commissioned.</p> <p>The supplier of the component shall select a protective system that will</p> <ol style="list-style-type: none"> 1. prevent any corrosion or deterioration of the component 2. allow the component to be commissioned and operated without affecting the performance of the component in any way. <p>The supplier shall submit details of the protective system he intends using to the Engineer for approval.</p>
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COATING SYSTEM DCS3300	
<p>APPLICATION CONDITIONS:</p> <p>High temperature applications Lagged surfaces Ferritic substrate</p> <p>This specification is relevant in terms of all external pipes, flanges, shells, ducts, casings to be lagged.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Wire brush to Grade St 3.	
PRIMER COAT (Prior to erection and lagging):	Apply by brush or airless spray, one coat Alkyd Zinc Phosphate Primer.	30 to 40 micrometres
AFTER ERECTION BUT PRIOR TO LAGGING:	Wash down. Repair damaged areas using the primer described above.	
PAINT COATINGS TO LAGGED SURFACES	<p>Lagged surfaces covered with galvanised sheeting and strapping will not require any further paint work except for colour identification.</p> <p>Lagged surfaces that are not clad with sheeting shall be cleaned of dust and finished as follows:</p> <p>a) Apply by brush, one coat Alkali Resistant Pigmented Sealer.</p> <p>b) Apply by brush one coat High Gloss Alkyd Enamel.</p>	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS3400	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">Normal environment Ferritic substrate</p> <p>This section involves the painting of indoor civil and building structural steelwork exposed to non-aggressive conditions. See also DCS3700 as a fast curing/handling indoor/outdoor alternative.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2.5.	
PRIMER COAT:	Apply by brush or spray, one coat Single Pack Etch Primer.	15 to 25 micrometres
PRIMER COAT (AFTER ERECTION):	Wash down. Wire-brush all areas of damage or surface rust (St.3). Apply by brush or spray, one full coat Single Pack Etch Primer as above.	15 to 25 micrometres
UNDERCOAT:	After allowing sufficient time for the previous coat to dry, the manufacturer's recommendations shall be adhered to in this regard, apply by brush, roller or spray, one coat Alkyd Universal Undercoat.	20 to 30 micrometres
FINAL COAT:	After allowing sufficient time for the previous coat to dry, the manufacturer's recommendations shall be adhered to in this regard, apply by brush, roller or spray, one coat Alkyd High Gloss Enamel.	25 to 35 micrometres.
	Total dry film thickness of coating system:	65 to 115 micrometres.

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

COATING SYSTEM DCS3500 (ALTERNATIVE TO DCS3600)	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">Normal environment Ferritic substrate below 70°C</p> <p>This section involves the painting of indoor boiler house structural steelwork exposed to non-aggressive conditions. See also DCS3700 as a fast curing/handling indoor/outdoor alternative.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1).	
PRIMER COAT (Before erection):	Apply one coat High Build Alkyd Zinc Phosphate Primer by spray	40 to 50 micrometres
FINAL COAT (After erection):	Wash down. Repair damaged areas with the same primer as above. Apply one coat of Alkyd Micaceous Iron Oxide by brush.	30 to 40 micrometres
	Total dry film thickness of coating system:	70 to 90 micrometres
NOTE:	All contact surfaces where gratings, stair treads, handrail stanchions or other items are to be attached to the steelwork, shall be painted with the full coating system prior to fitting of these components.	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)

COATING SYSTEM DCS3600 (ALTERNATIVE TO DCS3500)	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">Normal environment Ferritic substrate below 70°C</p> <p>This section involves the painting of indoor boiler house structural steelwork exposed to non-aggressive conditions. See also DCS3700 as a fast curing/handling indoor/outdoor alternative.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1).	
PRIMER COAT (Before erection):	Apply one coat High Build Alkyd Zinc Phosphate Primer by spray	40 to 50 micrometres
FINAL COAT (After erection):	Wash down. Repair damaged areas with the same primer as above. Apply one coat of Alkyd Enamel.	30 to 40 micrometres
	Total dry film thickness of coating system:	70 to 90 micrometres
NOTE:	All contact surfaces where gratings, stair treads, handrail stanchions or other items are to be attached to the steelwork, shall be painted with the full coating system as specified prior to fitting of these components.	

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Any SABS approved supplier or products tested and accepted for use by a reputable testing facility.

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)

COATING SYSTEM DCS3700	
<p align="center">APPLICATION CONDITIONS:</p> <p align="center">Semi- to moderately corrosive conditions Ferritic substrate below 70°C</p> <p>This section involves the protection of indoor/outdoor boiler/turbine house structural steelwork and where fast curing/handling requirements of the coating exists.</p>	

PROCESS:	ACTIVITY	DFT
SURFACE PREPARATION:	Abrasive blast-clean to Grade Sa 2,5 (ISO 8501-1).	
PRIMER COAT (Before erection):	Apply one coat, Two Component High Build Polyurethane Primer/Finish.	110 to 130 micrometres
FINAL COAT (After erection):	Wash down. Repair damaged areas with the same coating as above, and apply an additional coat of Two Component High Build Polyurethane Primer/Finish.	110 to 130 micrometres
	Total dry film thickness of coating system:	220 to 260 micrometres
NOTE:	All contact surfaces where gratings, stair treads, handrail stanchions or other items are to be attached to the steelwork, shall be painted with the full coating system as specified prior to fitting of these components.	

IMPORTANT NOTE:

It is important to highlight that since this material is a self-priming/finishing product it can be used as a single coat system, i.e. 110 to 130 micrometres, especially where exposed to non-corrosive conditions (i.e. as an alternative to DCS3500 or DCS3600) and where fast curing/handling requirements exist. . However, since a second coat application is required to ensure complete coverage of the steel surfaces, should this material be used as a single coat system, all damaged areas shall be repaired after erection, where after 100% wet sponge testing shall be carried out to ensure adequate protection of the surfaces.

ADDITIONAL NOTES:

With respect to aspects not mentioned in the Detailed Coating Specification (e.g. overcoating and curing times, mixing ratios, pot life, thinning, safety precautions etc.), the manufacturer's recommendations shall be strictly adhered to (refer to specific Product and Material Safety Data Sheets).

SAFETY NOTE:

The manufacturer's recommendations regarding the safe handling and use of these materials shall be adhered to.

Please consult the Material Safety Data Sheets for detail.

RECOMMENDED / APPROVED SUPPLIERS AND/OR PRODUCTS:

The following manufacturers and/or suppliers are recommended / approved based on results gained through tests and experiences.

Sigma Coatings.

ALTERNATIVE PRODUCTS WHICH MAY QUALIFY:

(Please contact the Engineer for latest test results)