



POBOYA 2000 TPD EXPANSION PROJECT



(CPM Work No.)
14898

Project Doc. No.: E2601-4400-PRO-008

Revision No. : C

(Vendor Work No.)
E2601

Client Document No. : HNZ-V-PT0061.08-4400-STR-PRO-008

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PAINTING PROCEDURE (STRUCTURE FOR CIL TANK AREA)

CLIENT : PT. CITRA PALU MINERALS (CPM)
PROJECT NAME : POBOYA 2000 TPD EXPANSION PROJECT
LOCATION : PALU, SULAWESI
CONSULTANT : PT. COMO ENGINEERS (PT. CE)
VENDOR : PT. HANAZONO ENGINEERING INDONESIA
DOCUMENT NO. : E2601-4400-PRO-008

FOR APPROVAL

☐ AP	APPROVED
☐ AN	APPROVED AS NOTED
☐ RE	NOT APPROVED (Re-Submit)
☐ RV	REVIEWED
☐ RN	REVIEWED WITH NOTES
☐ NR	NOT BE RETURNED
RETURN DATE	
	

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1. SCOPE

- 1.1 This procedure cover panting requirements for external and internal surface carbon steel or Steel Structure.
- 1.2 This procedure is to prescribe a sequence of performance during preparation, surface preparation, blasting & painting to achieve the requirements stipulated Client Specification.

2. REFERENCE

This procedure prepared in accordance with following reference:

- a. The Society for Protective Coatings (SSPC)
- b. Client Specification General Specification for Painting (ADIP-3655-2100-018-SFP-0003)
- c. Client Specification Painting Procedure (ADIP-3655-2100-018-PAP-0001)
- d. Specification sheet of paint manufacturer

3. EXECUTION OF WORKS

3.1 Equipment of Structure for CIL Tank Area to be Supply Inspection and Testing as below :

1. Fabrication and Installation Structure for CIL Tank at Vessel Loaded Carbon
2. Fabrication and Installation Structure for CIL Tank for Trash Screen
3. Fabrication and Installation Structure for CIL Tank for Loaded Carbon Screen
4. Fabrication and Installation Structure for CIL Tank for Baren Carbon Screen
5. Fabrication and Installation Structure for CIL Tank for Carbon Safety Screen
6. Fabrication and Installation Structure for CIL Tank for Leach Feed Sampler
7. Fabrication and Installation Structure for CIL Tank for Tailing Sampler

The list above of Steel structure and other accessories like as ; Walkway, Stairway, Column, Girder, Beam, Handrail, Support, Brace, etc.

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3.2 Inspection and Testing

The ITP (Inspection Test Plan) will indicate the P.T. HEI, and/or client inspection points and testing to be carried out

3.3 Consumable and Equipment

- a. General equipment following are minimum required during blasting/painting work for the project :

No	Type of Activity	Type Equipments To be Used
1	Equipments	a. Air Compressor b. Oil & Moisture filter
2	Preparation	a. Sling Hygrometer b. Dew Point Calculation
3	Abrasive Test	a. Conductivity Meter
4	Before Blasting	a. Visual Comparator b. Steel Temperature
5	After Blasting	a. Magnified 10X b. Keane Tator Gauge Comparator c. Press O Film d. Dial Gauge e. Dust Test Kit

3.4 PRE - BLASTING

- a. In accordance with Inspection and Testing Procedure, the fabricated product will subject to final inspection prior to release to the paint yard.
- b. An exception to this would be where materials are pre-primed prior to fabrication.
- c. The QC Inspector shall
- Check quality of abrasive blast material (free from oil, water and other contaminations).
 - QC shall be check and verification all equipment and tools or instruments to be use for inspection like is DFT test, salt test tools, humidity equipment, temperature gauge, etc. make sure all tools or instrument have valid calibration certificate.

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- Check quality relative humidity as per paint manufacturers recommendation or customer's specification
 - Check steel surface temperature as per paint manufacturers recommendation or customer's specification.
 - Check ambient temperature and dew point.
 - Check the air quality and pressure from air compressor.
- d. Considerance shall be taken of the possibility of atmospheric changes during the blasting and subsequent priming process which may cause the humidity or temperatures to fall outside of the prescribed limit. Under these circumstances work should only commence at the discretion of the painting supervisor.

3.5 BLAST CLEANING

- a. The painting supervisor shall ensure the blast quality conforms to the specified standard.
- b. On large work, only enough of the surface should be blast cleaned so as to allow application of primer within four (4) hours of the blast.
- c. Particular attention shall be paid to areas of limited access to ensure the blast has reached into internal corners.
- d. Areas to be welded subsequent to coating shall be marked or masked off to a distance of 50 to 75 mm (or as per specified) prior to coating. An exception to this would be where a weldable primer is specified.
- e. The QC inspector shall monitor the blasting process.

3.6 MECHANICAL CLEANING

- a. Power tools may be used to obtain the required surface preparation where sandblasting is not possible.

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- b. The use of carbon steel wire brushes shall be restricted to the cleaning of the welds.
- c. Where weld occur within areas inaccessible to power discs a needle gun may be applied.
- d. Inspection and hold point shall done for area before full coating application like as stripe coating on welds edges, corners, bolts and difficult to access areas.
- e. All welded area shall be properly cleaned and surface treated to remove weld spatter, slag, oil, grease, dust, loose rust, oxidation and other contaminations. Surfaces preparation shall be performed using suitable mechanical power tools (MBX) or abrasive blasting/sandblasting, as applicable, in accordance with the approved project coating specification.



3.7 POST BLAST CLEANING

3.7.1 The QC Inspector shall

- a. Compare the surface colour (blast class) against the specified standards visual comparator. (SSPC SP-10 *Near-White Metal Blast Cleaning* or ISO 8501-1 SA 2½).
- b. Check internal corners and inaccessible areas for missed blast or mechanical cleaning.
- c. Check for surface the laminations.
- d. Measure relative humidity, ambient temperature, dew point and steel surface temperature and record on the Painting Inspection Record (PIR), See Attached Report.
- e. Check all sharp and rough surfaces had been grounded and rounded.
- f. Soluble salt test contamination testing after blasting in accordance with ISO 8502-6 and ISO 8502-9 (Bresle Test). And acceptance criteria shall be comply with the Client Painting Specification).

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3.8 PRIMER COAT

- a. Prior to the application of the primer coat, the painting inspector shall ensure the work is clean and free from blasting grit or other foreign matter.
- b. The Painting supervisor shall ensure the paint is mixed and applied in accordance with the manufacturer's recommendations (paint data sheet) and prescribed specifications and that the correct application equipment is used.
- c. Edges of structural shapes and irregular surfaces such as corners, edges, welds and brackets shall be coated first and an additional pass made after, to ensure these areas have at least the minimum specified film thickness.
- d. Generally the spray gun shall be held no closer than 150 mm to 200 mm from the surface to be painted and shall normally be at right angles.
- e. If thinning of the paint may be necessary, the procedure shall be carried out in accordance with paint manufacturers recommendations.
- f. Continuous stirring, in the pot, may be required depending upon the paint system used.
- g. All runs and sags shall be immediately brushed out.
- h. Coating shall be brushed on, in areas which cannot be spray coated. Particularly internal corners.
- i. Brushes shall be suitable for the application.
- j. Brushes shall be worked into all crevices and all runs or sags shall be brushed out.
- k. Paint shall be protected from rain and contamination until fully dry through or dry to touch.
- l. After curing, the QC Painting Inspector shall visual check for surface defects, the blast profile depth shall be checked using either a calibrated elcometer roughness or kean-tator profile, and measure the Dry Film Thickness (DFT) and record this on the PIR. All defects shall be rectified to the satisfaction of the QC Inspector prior to the application of the subsequent coats.
- m. Paint shall not be performed when :
 - During rain, fog or when dust is suspension in the air.

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- Any visible moisture of flush rust is on the surface of the steel.
- Surface are less than 3°C above dew point.
- When relative air temperature below 10°C.
- When a change in weather conditions with two hours after application.
- When the surface exceeding 50°C at the time of application.
- The relative humidity is greater than 85%,
- If runs, sags and curtain begin occur.
- If rain shower are expected before the coating can completely dry.

3.9 SUBSEQUENT COAT

- In addition to the conditions specified in 3.8 the following shall apply.
- All part Inter coat surface cleanliness inspection before application of subsequence coats.
- No subsequent coat shall be applied until the preceding coat has dried as per manufacturer's recommendation. The paint shall be considered cured when another coat can be applied without any irregularities such as lifting or loss of adhesion of the undercoats and the drying time of the applied coat does not exceed the maximum specified for it at first coat.
- The QC Inspector shall check that the finished colour is in compliance with the specified requirements.

3.10 REPAIR AND TOUCH UP

- Generally the methods for repair and touch up shall be in accordance with paint manufacturer's recommendations.
- Areas where the coating is damaged shall be power wire brushed to the prime coat. Where the prime coat has been damaged, the area shall be blasted or sanded to the required blast class as for the painting system.

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- c. Edges of the sound paint shall be feathered by sanding prior to application of new paint. Paint that lifts or curls after the application of new paint shall be removed and surface prepared.
- d. Coating that exceed the recommended recoat interval shall be roughened by light sanding prior to application of new paint.

3.11 ADDITIONAL TESTING & PAINTING QUALIFICATION (If Applicable)

- a. Company personal or their representative may inspect all steps of surface reparation and coating application.
- b. Additional testing, such as Adhesion Testing in accordance with ASTM D-4541 (Minimum 3 Mpa for Zinc primed system and minimum 5 Mpa for epoxy)shall be witness by PT. HEI and client. The adhesive testing record shall be recorded on their respective Recorded Forms.

3.12 CLEANING OF EQUIPMENT

3.11.1 The following general conditions shall apply :

- a. All spraying equipment shall be cleaned after each use using appropriate cleaning materials.
- b. Before the application of any paint, the spray equipment shall be flushed through.
- c. Brushes shall be cleaned after use.

3.13 SURFACE PREPARATION ON SITE

3.12.1 The following general conditions shall apply before second coat :

- a. Surface preparation must be performed before apply the second coat.
- b. Cleaning all the surface of area from ; dust, oil, mill scale, rust or foreign material use the sand paper or brushing.
- c. Brushes shall be cleaned before use.

3.12.2 Welding Area condition shall apply before painting :

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- a. Process sand-blasting will be apply before painting process.
- b. All surface must clean from : mill scale, dust, oil and other foreign material.
- c. All painting processes will be follow the required painting system.

3.14 ENVIRONMENTAL CONDITION

3.12.1 No painting operation shall be done in the following weather conditions_on the work area:

- a). Rain, snow, fog or mist weather is expected to become adverse before the paint has been dried.
- b). Dust is suspended in the air when win speed exceeds 20 Kilo meters per hour.
- c). Air temperature is below 5°C or above 32°C.
- d). Relative humidity is above 85%, or specified humidity for each paint system.
- e). Surface steel temperature is more than 40°C above dew point or rises above 45°C.
- f). If any surface painting damage to be repaired and painting accordance the painting specification, before painting all the surface shall be clean & remove by power tool (sand paper) , apply painting with touch up or paint Spray

4. INSPECTION

4.1 Painting Vendor shall perform all inspection necessary to ensure that the surface preparation and coating application complies with the requirements of this Specification. The inspection records shall be logged daily and submitted to CLIENT at least weekly. The records shall be kept on an approved form or Inspection Record. Inspection hold points and witness points for Client approval before proceeding to subsequent coating stages.

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4.2 Additional inspection may be performed by CLIENT or an authorized Inspection Agency.

4.3 Minimum inspection requirements shall be:

4.3.1 Surface Preparation - Degree of cleanliness and surface profile.

4.3.2 Compressed Air -The cleanliness of the compressed air shall be checked, as necessary, by blasting without grit onto a clean white cloth for a period of 20 seconds. If oil or water appears on the cloth all traps shall be cleaned and blown down until test cloth shows no further oil or water. CLIENT may request this at any time.

4.3.3 Abrasive - A small quantity of abrasive (1 teaspoonful) shall be dropped into a small glass vial containing distilled water, shaken vigorously and allowed to settle for a minute. The top of the water shall not contain a layer of grease/oil or fine particulates and shall not be discolored. The pH of the water shall not be less than 5 when measured with pH indicating paper. The water shall be free of a white precipitate (an indication of chloride salts) when a drop of 5% silver nitrate is added to the water.

4.3.4 The ambient conditions, ambient temperature, relative humidity, dew point, substrate temperature and confirmation that the substrate is moisture free, shall be recorded at the beginning of each working shift.

4.3.5 Paint Application - Dry film thickness checks shall be measured after the application of each coat using a Microtest, Elcometer, or CLIENT approved equal. Some dry film checks shall be made in accordance with SSPC-PA-2-82T 'Measurements of Dry Film Thickness with Magnetic Gauges'. The gauges shall be calibrated by comparison with the dry film

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thickness measured on known standards such as micrometer measured paint film.

4.3.6 Wet Film Thickness (WFT) inspection during coating application in accordance with SSPC-PA1 or paint manufacture recommendation.

4.3.7 After all painting applied visual check to be done such as, surface of the painting, Munsell colour and all surface to be clean from dust or foreign material

4.4 Work shall not proceed past the inspection hold points defined below without the approval of CLIENT. The inspection hold points shall be.

4.5 CLIENT shall have the right to condemn any materials, equipment or work not in compliance with this Specification. All necessary corrective actions shall be performed by Painting Vendor at its sole expense.

5. INSPECTION RECORDS APPROVAL

The completed Painting Inspection Report (PIR) where applicable shall be approved by PT. HEI and/or the customer. See attachment-1 Painting Inspection Report (PIR)

6. PAINTING SYSTEM

a. Painting system – Application Guide

The surface preparation and painting of material shall be applied to all surfaces unless otherwise stated and be carried out in accordance with the system specified in the following table :

Equipment / Item	System	Plant Area
Internal of Tanks	S5 to S8	Services
Chequer plate not exposed to process slurry or solutions.	Hot Dip Galvanized	Dry Areas (Optional)

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Floor grating, stair treads	Option 1 – Black Bitumastic Dipped Option 2 – S3	General Process Plant, dry, and wet areas
Structural Steel, platework, including external surfaces of chutes, underpans, tanks, handrails, kickplates, guards.	S1 to S8	General Process Plant, dry, and wet areas
Pumps and equipment requiring premium appearance and finish	Manufacturer's Standard Coating Option – S9	Pumps and Special Equipment
Pipework (External Surfaces)	S2 to S4 Option – S3 (Alternative Option)	General Process Plant, dry, and wet areas

b. Painting system – Application Guide

Painting system on table above will be applied on Equipment, Structure & Piping system as stated below :

System	Duty / Exposure	No. of Coats	Paints Specification
S1	Dry Areas (Outdoor Conditions ~ Single Coat System	1	Interseal 670HS to 150 µm
S2	Dry Areas (Outdoor Conditions ~ Conventional System	2	1st-Interguard 251 to 75 µm 2nd-Interseal 670HS to 50 µm
S3	Wet Areas (Moderate Splashing of Process Solutions)	2	1st - Interguard 251 to 75 µm 2nd - Interseal 670HS to 175 µm
S4	Wet Areas (Constant Splashing of Process Solutions)	2	1st – Interguard 251 to 75 2nd– Interzone 954 to 400
S6	Process Tank Internals – Abrasive Fluid / Slurries	2	1st– Interzone 485UHB to 1000u 2nd– Interzone 485UHB to 1000u (bottom 3m only)
S8	Portable Water Tank Internals-Two Coating System	2	1st - Interseal 670HS to 125 µm 2nd - Interseal 670HS to 125 µm

Note : All the paint specification listed in the table above can be replaced with equivalent paint specification.

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c. Table Painting System

1. Steel Structure CIL Tank Area

PAINTING SYSTEM STEEL STRUCTURE CIL TANK AREA (Rev. B)

STEEL STRUCTURE CIL TANK AREA (REV. B)									
NO.	DESCRIPTION	PAINTING SCHEDULE / CODE (ADIP-3655-2100- 018-SFP-0003 Rev. 2B)	PART NAME To Be PAINTED	OPERATING TEMPERATURE (°C)	INSULATION	SURFACE PREPARATION	PAINTING DFT μ (MICRONS)		TOTAL DFT (μm)
							1 st COAT	2 nd COAT	
A. STEEL STRUCTURE									
1.	Structure CIL Tank at Vessel Loaded Carbon	Paint System No. S3 / Wet Areas (Moderate Splashing of Process Solutions)	Walkway, Platform, Column, Girder, Beam	Ambient	N/A	SSPC SP-10	A (75)	B (175)	Min. 250
2.	Structure for CIL Tank for Trash Screen			Ambient	N/A	SSPC SP-10	A (75)	B (175)	Min. 250
3.	Structure for CIL Tank for Loaded Carbon Screen			Ambient	N/A	SSPC SP-10	A (75)	B (175)	Min. 250
4.	Structure for CIL Tank for Baren Carbon Screen			Ambient	N/A	SSPC SP-10	A (75)	B (175)	Min. 250
5.	Structure for CIL Tank for Carbon Safety Screen			Ambient	N/A	SSPC SP-10	A (75)	B (175)	Min. 250
6.	Structure for CIL Tank for Leach Feed Sampler			Ambient	N/A	SSPC SP-10	A (75)	B (175)	Min. 250
7.	Structure for CIL Tank for Tailing Sampler			Ambient	N/A	SSPC SP-10	A (75)	B (175)	Min. 250
8.	Safety Guard/Handrail			Safety Guard/Handrail	Ambient	N/A	SSPC SP-10	A (75)	C (175)

PAINTING COMPOSITION TABLE

NO.	TYPE OF PAINT	NAME OF BRAND / PAINT	Interval Pot Life	Mixing Ratio	COLOR
A	Interguard 251	International	3 Hours (25°C)	4 : 1	Grey
B	Interseal 670HS	International	5.5 Hours (25°C)	4:1	Window Grey (RAL 7040)
C	Interseal 670HS	International	5.5 Hours (25°C)	4:1	Signal Yellow (RAL 1026)

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d. Color

The following colours shall be used for paintwork :

No	Item's Category	Colour Code	Colour Sample
1	Platework & All tank	Light Ivory RAL 1015	
2	Structural Steel	Window Grey RAL 7040	
3	Safety Guard & Handraill	Signal Yellow RAL 1026	

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ATTACHMENT – 1 PAINTING INSPECTION RECORD

		PAINTING INSPECTION REPORT		 								
Project : Client : Drawing No. : Equipment No. : Item Name :			Report No. : Date : Item No. : Part Name : Page No. :									
SURFACE PREPARATION ☐ SA 1 ☐ SA 2 ☐ SA 2,5		PROCESS ☐ Wire Brush ☐ Sweep Blast ☐ Blasting		COATING LAYER ☐ Conventional Spray ☐ Brushing								
TEMPERATURE Standart : Actual :		HUMIDITY Standard : Actual :										
Blasting Date :												
PAINTING SPECIFICATION												
COAT NO	DESCRIPTION	TYPE	COLOUR	THINNER	THICKNESS							
COAT 1 st					Micron							
COAT 2 nd					Micron							
COAT 3 rd					Micron							
TOTAL THICKNESS					Micron							
PAINTING INSPECTION												
MARKING COMPONENT	COAT TYPE	CHECK POINT	DFT Thickness								DFT Average	Result
			1	2	3	4	5	6	7	8		
	1 st Primer	A										
		B										
		C										
	2 nd Coat	A										
		B										
		C										
	Finish Coat	A										
		B										
		C										
PHOTOGRAPH DFT 1st PRIMER COAT												
PHOTOGRAPH DFT 2 nd COAT												
PHOTOGRAPH DFT FINISH COAT												
Prepared and inspected by: PT. HANAZONO ENGINEERING INDONESIA Witnessed/ Checked by: PT. COMO ENGINEERS Witnessed / Approved by: PT. CIPTA PALU MINERALS												
Signature & Name												
Date												