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INSPECTION OF STEEL SUBSTRATE SURFACE PREPARATION AND PRIMER APPLICATION	PREPARED BY: <u>Fred Dunham</u>	<u>3-4-84</u> DATE
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1.0 REFERENCES

- 1-A CCP-30, "Coating Steel Substrates Inside Reactor Buildings and Radiation Areas"
- 1-B CCP-30A, "Coating Steel Substrates Inside Reactor Buildings and Radiation Areas"
- 1-C QI-QP-11.4-22, "QC Verification of Protective Coatings Unique Identification Number Transfer"
- 1-D CP-QP-18.0, "Inspection Reports"
- 1-E CP-QP-15.0, "Tagging System"
- 1-F CP-QP-16.0, "Nonconformances"

FOR INFORMATION ONLY

2.0 GENERAL

2.1 PURPOSE AND SCOPE

This Instruction shall describe methods utilized by Quality Control inspection of steel substrate surface preparation and prime coat applications in the safety related areas of Unit 2 and the paint shop.

3.0 INSTRUCTION

Visual inspection of surfaces as addressed by this instruction shall be made at approximately an arms length from the surface being inspected. The area of inspection shall be adequately lighted during the inspection activity. Adequate lighting is defined as the minimum light produced by a two (2) D-cell battery flashlight. Flashlight shall be held perpendicular to the surface during visual inspection.

For definitions, refer to Attachment 4.

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3.1 PRE-BLAST CLEANING OPERATIONS

3.1.1 Ambient Conditions

The inspector shall determine air temperature, surface temperature, relative humidity and dew-point of substrate structures. A calibrated non-mercury filled dry bulb thermometer or a calibrated temperature recorder (Bristol 4069 TH or equivalent) shall be used for air temperature determination. A calibrated non-mercury wet bulb thermometer or a calibrated humidity recorder (Bristol 4069 TH or equivalent) shall be used to determine relative humidity. The dew point shall be determined by the difference in the dry and wet bulb temperatures using the U.S. Department of Commerce Weather Bureau Psychrometric Tables, W.B. No. 235. When dry bulb readings are greater than 100°F, the dew point and relative humidity should be determined using the 100°F reading (note in remarks). The surface temperature shall be determined by placing a calibrated surface temperature thermometer (Omega - Amprove Fastemp, Range 10-250°F) in contact with the substrate surface to be blast cleaned. The thermometer probe shall remain in contact with the surface until the temperature reading stabilizes.

Final surface preparation shall not begin unless temperature of the surface is a minimum of 5°F above the dew point.

3.1.2 Abrasive Acceptability

The Inspector shall obtain a sample of the abrasive to be used from each work area. The abrasive shall be verified to be dry by feel. All grease, oil and deleterious material is unacceptable.

Verify that acceptable blast abrasive is used.

3.1.3 Blast Equipment Acceptability

The inspector shall perform the following inspections/tests to determine acceptability of blast cleaning equipment prior to use:

- a. Verify that water separators are installed in air supply system and that the separators have been drained of accumulated water and drains left partially open.

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b. Air supply shall be checked at the nozzle prior to use by exposing a white cloth to the blast of air (no sand) for approximately 30 seconds. The cloth shall be examined for evidence of contamination (oil, water, foreign matter, etc.). No evidence of contamination is acceptable.

3.1.4 Solvent Cleaning (If Contamination Is Present)

If oil, grease, or other contamination is present, verify that solvent cleaning (in accordance with SSPC-SP-1) is performed and that all contamination is removed prior to blast cleaning steel surfaces.

3.2 POST BLAST CLEANING OPERATIONS

3.2.1 Blast Cleanup

The inspector shall visually check the blasted substrate surface.

The surface shall be brushed or vacuumed to the extent required for final surface inspection. The adjacent areas shall be cleaned to the extent necessary to avoid contamination during subsequent coating applications.

3.2.2 Blasted Surface Acceptability

The inspector shall perform the following inspections to determine acceptability of the blast cleaned surface:

a. Absence of Foreign Matter -- A visual inspection shall be performed to determine that all oil and grease, dirt, millscale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface except for light shadows, very slight streaks or slight discolorations caused by rust stains, mill scale, oxides, or slight, tight residues of paint or coating that may remain. At least 95 percent of each square inch of surface area shall be free of all residues, and the remainder shall be limited to light discolorations as mentioned above.

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- b. Removal of Sharp Projections -- A reinspection for sharp projections that were not blended (rounded) during blast cleaning shall be performed.

Weld splatter on structural steel shall be removed by either grinding or sand blasting. However, if the weld splatter should remain after the above operation, the weld splatter will be acceptable.

Sharp projections are not acceptable.

Protrusions and peaks shall be ground to a rounded contour.

- c. Anchor Pattern Depth -- The anchor pattern depth of the blasted surface shall be inspected at random locations using a Keane-Tator Surface Profile Comparator (model 373) or approved equal.

The anchor pattern depth for a surface shall be a minimum of 1.0 mils.

- d. For repairs of blasted surfaces, power tooling may be utilized as required.

3.2.3 Unique Number Identification

After blasting and prior to prime coat application, QC shall verify that construction has identified each piece with a unique number in accordance with References 1-A and 1-B. The QC Inspector shall maintain a Protective Coatings Unique Identification Number Log, Attachment 1 for all protective coatings application on all steel designated for use in the Reactor Building. Subsequent subdivision of coated steel in the field or shop shall be witnessed by QC in accordance with Reference 1-C.

NOTE:

- A. Unique number may be assigned to a lot of material to be prime coated at the same time. For example, six pieces steel to be coated at same time may all have same unique number.
- B. Liner plate is excluded from QP numbers.

Equipment which is identified with a permanent plant identification number need not be identified with a Protective Coatings unique Identification Number.

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3.3 PRIMER PRE-APPLICATION INSPECTIONS

3.3.1 Ambient Conditions

Immediately prior to primer application, the QC Inspector shall determine air temperature, surface temperature, relative humidity. The primer application shall not begin unless the surface temperature is a minimum of 5° above the dew point. When dry bulb readings are greater than 100°F, the dew point and relative humidity should be determined using the 100°F reading (note in remarks).

Normal conditions of ambient and surface temperatures shall be as follows:

	<u>Ambient Temp. (°F)</u>	<u>Surface Temp. (°F)</u>
Dimetcote 6	40-120	40-130
CarboZinc II	40-95	40-110
Carboline 191	50-120	50-120

Inorganic zinc primer may be applied within an ambient range of 0°F to 130°F and surface temperature range of 0°F to 200°F.

Coating materials (if thinned) shall be thinned in accordance with Reference 1-A or 1-B.

Humidity values may vary from 0 to 95%; however, primer shall not be applied to a wet or damp surface.

3.3.2 Substrate Surface Acceptability

The Inspector shall visually reinspect the sandblasted surface of the substrate just prior to primer application for evidence of contamination (oil, grease, markings, rust, etc.) All contamination must be removed prior to priming.

If rust forms after Blasting, the surface shall be "Shower Blasted" or "Re-furbished" before priming.

3.3.3 Air Supply Acceptability

The Inspector shall inspect the air supply system for suitable filters/traps/separators. A trap, filter, or separator shall be installed in air system to pressure pot and spray gun. The effectiveness of these items shall be

verified by exposing a white cloth to the blast of air for approximately 30 seconds. The cloth shall be examined for evidence of contamination (oil, water, foreign matter, etc.). No evidence of contamination is acceptable.

3.3.4 Qualification of Applicator(s)

The Inspector shall verify (by Qualification Record or list of qualified applicators from QA file) that the coating applicators on each shift are qualified for safety-related coating work.

3.3.5 Mixing Operations

3.3.5.1 Coating Materials Identification

The inspector shall inspect the coating material containers prior to mixing contents for product identification and verify that all materials are correct for coating application.

Approved materials are:

CZ-11

Carbo Zinc 11 base  
Carbo Zinc filler  
Carboline #21 or 33 Thinner

DIMETCOTE

Dimetcote 6 base  
Dimetcote filler  
Amercoat #65 or 101 Thinner

CARBOLINE 191

Carboline 191 Primer  
Carboline 191 Catalyst  
Carboline #15 Thinner

He shall also verify that each component container is identified by batch number and that the shelf life has not expired. Carbo Zinc 11 base and Carboline 191 has a shelf life of 12 months. Carbo Zinc filler and Dimetcote 6 base and filler have a shelf life of 24 months.

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3.3.5.2 Mixing Operations

An inspector shall witness each mixing/thinning operation. The inspector shall verify that mixing operations are performed in accordance with Reference 1-A and 1-B.

3.3.5.3 Thinning Operation

An inspector shall verify that primer thinning complies with thinning requirements established in References 1-A and 1-B.

3.3.5.4 When coating materials are mixed/thinned in locations other than the field, the inspector verifying the mixing operation shall fill out the Paint Mixing Slip, Attachment 3. The inspector performing the pre-application inspection shall record the information from the Paint Mixing Slip on the Inspection Report, Attachment 2. The Paint Mixing Slip need not be retained.

3.4 PRIMER APPLICATION INSPECTION

3.4.1 Monitoring of Primer Application

During application operations of CZ-11 and D-6, the QC Inspector shall monitor that the pressure pot is continuously agitated. The QC Inspector shall also monitor that the hose length does not exceed 75 feet, and that the coating has not exceeded pot life per Reference 1-A or 1-B.

3.5 INSPECTION REPORTS

All inspections required by Sections 3.1 through 3.4 shall be documented on an IR, Attachment 2, in accordance with Reference 1-D.

NOTE: A reject tag will be applied to any unsat area, with the inspection report, inspector's name, and phone extension listed per Reference 1-E.

3.6 NONCONFORMANCES

Nonconforming conditions such as coating failure due to loss of adhesion or indeterminate/unacceptable conditions which cannot be repaired or corrected as per existing procedures shall be documented on a Nonconformance Report (NCR) in accordance with CP-QP-16.0. The NCR number shall be referenced on the inspection traveler, if applicable.

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4.0 SPECIAL COATINGS PROCEDURES

Special coatings procedures and instructions set forth in CCP-30-M1 through CCP-30-M9, as applicable under the scope of this procedure, shall be inspected as per the guidelines of this procedure using the criteria established in the special coatings procedures.

5.0 CLARIFICATION

5.1 SHOP COATED ITEMS

5.1.1 Items removed from the building for coating at the paint shop shall be the responsibility of the craft department.

5.1.1.1 The craft shall be responsible for identifying each piece by work package number.

5.1.1.2 The craft shall be responsible for returning and installing the shop coated item in the same area it was removed from.

5.1.2 The shop QC Inspector shall inspect the item(s) in accordance with QI-QP-11.4-1 and QI-QP-11.4-5, as applicable, and document his inspections on an Inspection Report (IR) in accordance with those procedures.

5.1.2.1 In addition to the information required by QI-QP-11.4-1 or QI-QP-11.4-5, the shop inspector shall reference the work package number identified on the item(s) on the Inspection Report (IR).

5.1.2.2 The IR, upon completion, shall be transmitted to the Paper Flow Group (PFG) for Unit 1 and/or the Interim Records Vault (IRV) for Unit 2 for inclusion in the work package.

5.1.3 The QC inspector (in the field) shall verify that items prepared/coated in the shop, which are included in the scope of the traveler, have the applicable Inspection Report (IR) from the shop included in the work package and correspond with the identification on the item.

5.1.4 Items which have been finalized in the shop but incur mechanical damage during reinstallation shall be repaired in accordance with QI-QP-11.4-26 and documented on the traveler accordingly.



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5.2 INACCESSIBLE/LIMITED ACCESS AREAS

5.2.1 Defined as areas where, due to permanent installation configuration, a dry film thickness (DFT) gauge cannot be properly engaged.

5.2.2 These areas shall be visually inspected to verify that the primer is applied and the finish coat is applied over the primer. No other inspection is required.



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ATTACHMENT 2

COMANCHE PEAK STEAM ELECTRIC STATION  
INSPECTION REPORT

SHEET 1 OF 2  
NO.

ITEM DESCRIPTION		CERTIFICATION NO.	SYSTEM/STRUCTURE DESIGNATION	
PROTECTIVE COATINGS		21		
SPEC. NO.	REV.	REF. Q.C. OCC. & REV. & CHANGE NO.	MEASURE OR TEST EQUIP. IDENT. NO.	
AS-31	5	QI-QP-11.4-1 Rev.	7	
<input type="checkbox"/> IN PROCESS INSPECTION	<input checked="" type="checkbox"/> PRE-INSTALLATION VERIFICATION	<input type="checkbox"/> INSTALLATION INSPECTION	<input type="checkbox"/> FINAL INSPECTION	<input type="checkbox"/> PRE-TEST INSPECTION
INSPECTION RESULTS				
<input type="checkbox"/> INSPECTION COMPLETED, ALL APPLICABLE ITEMS SATISFACTORY			QC INSPECTOR _____ DATE _____	
<input type="checkbox"/> INSPECTION COMPLETED, UNSATISFACTORY ITEMS LISTED BELOW				
ITEM NO.	INSPECTION ATTRIBUTES			QC SIGNATURE
	SAT	UNSAT	DATE	
1.	Ambient conditions checked per Para. 3.1.1 and recorded below: DATE: _____			
	TIME: _____ WET BULB TEMP: _____ DRY BULB TEMP: _____			
	RELATIVE HUMIDITY: _____ DEW POINT: _____ SURF. TEMP: _____			
2.	Abrasive acceptable per Para. 3.1.2.			
3.	Separators installed, drained, and drains left partially open.			
4.	Air supply free of contamination.			
5.	Verify that solvent cleaning performed prior to blasting in accordance with para. 3.1.4.			
6.	Blasted surface and profile:			
	a. Blasted surface and surrounding areas cleaned per Para. 3.2.1			
	b. Surface free of foreign matter including grease and oil. 3.2.2.a			
	c. Sharp (non-rounded) projections removed. 3.2.2.b			
	d. Anchor pattern depth 1.0 mil. minimum. 3.2.2.c			
7.	Unique Number stamped on piece (Record Unique Number in Block 3 above.)			
8.	Ambient conditions checked per Para. 3.1.1. prior to primer application and record below. DATE: _____			
	TIME: _____ WET BULB TEMP: _____ DRY BULB TEMP: _____			
	RELATIVE HUMIDITY: _____ DEW POINT: _____ SURF. TEMP: _____			
9.	Substrate surface free of contaminants and less than 24 hours elapsed since blasting.			
10.	Trap, filter or separator installed per Para. 3.3.3.			
11.	Air supply free of contamination.			
(CONTINUED ON SHEET 2 of 2)				



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ATTACHMENT 3

PAINT MIXING SLIP	
	DATE: _____
BLDG. _____	ELEV. _____
COATING: _____	COLOR. _____
TIME MIXED: _____	TEMP. _____
BATCH #	BASE (A) _____
	CAT./FLR (B) _____
	THINNER (C) _____
	GAL. _____
M&TE #'s _____	
INSP _____	DATE: _____

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ATTACHMENT 4

DEFINITIONS

Color and Gloss Nonuniformity: A milky haze or mist in the finish of a recently applied coating.

Contaminant: A foreign substance, inadvertently added to a coating or found on the substrate that adversely affects the application, adhesion, curing and/or subsequent performance of the applied coating.

Dry Spray: A dry powdery primer or finish coat readily removed by light sanding with either sandpaper or a wire screen. A minor amount of adherent dry spray is acceptable on the final finish coat.

Feathering: An area that is roughened and tapered to obtain a smooth and continuous surface with an existing coating.

Fisheyes: Small openings ("fisheyes") in wet film exposing old surface or previous coat.

Full Hiding: The coating provides sufficient coverage so that the preceding coat is not readily visible with an unaided eye.

Holiday: A pinhole, skip, discontinuity or void in coating film.

Major Defect: Defined as an area, either circular or linear, in which a 1/2" diameter circle could be inscribed at any point or along the entire length.

Minor Defect: Defined as an area, either circular or linear, in which a 1/2" diameter circle could not be completely inscribed at any point along the entire length.

Monitor: Conformance verification by physically observing a task being performed on a periodic or random basis.

Mudcracking: Irregular cracking as in a dried mud puddle (applicable to inorganic zinc primers).

Orange Peel: Dents in the surface resembling orange skin. A moderate amount is acceptable.

Verify: Confirm or make certain.

Visual: To examine with an unaided eye (correctional eye glasses or contact lens are acceptable).