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RECOMMENDATIONS FOR THE PROTECTION
OF STEEL STRUCTURES
AGAINST CORROSION

**NUMERISATION DANS
L'ETAT DU DOCUMENT**

(Print of 1-3-1981)

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INTRODUCTION

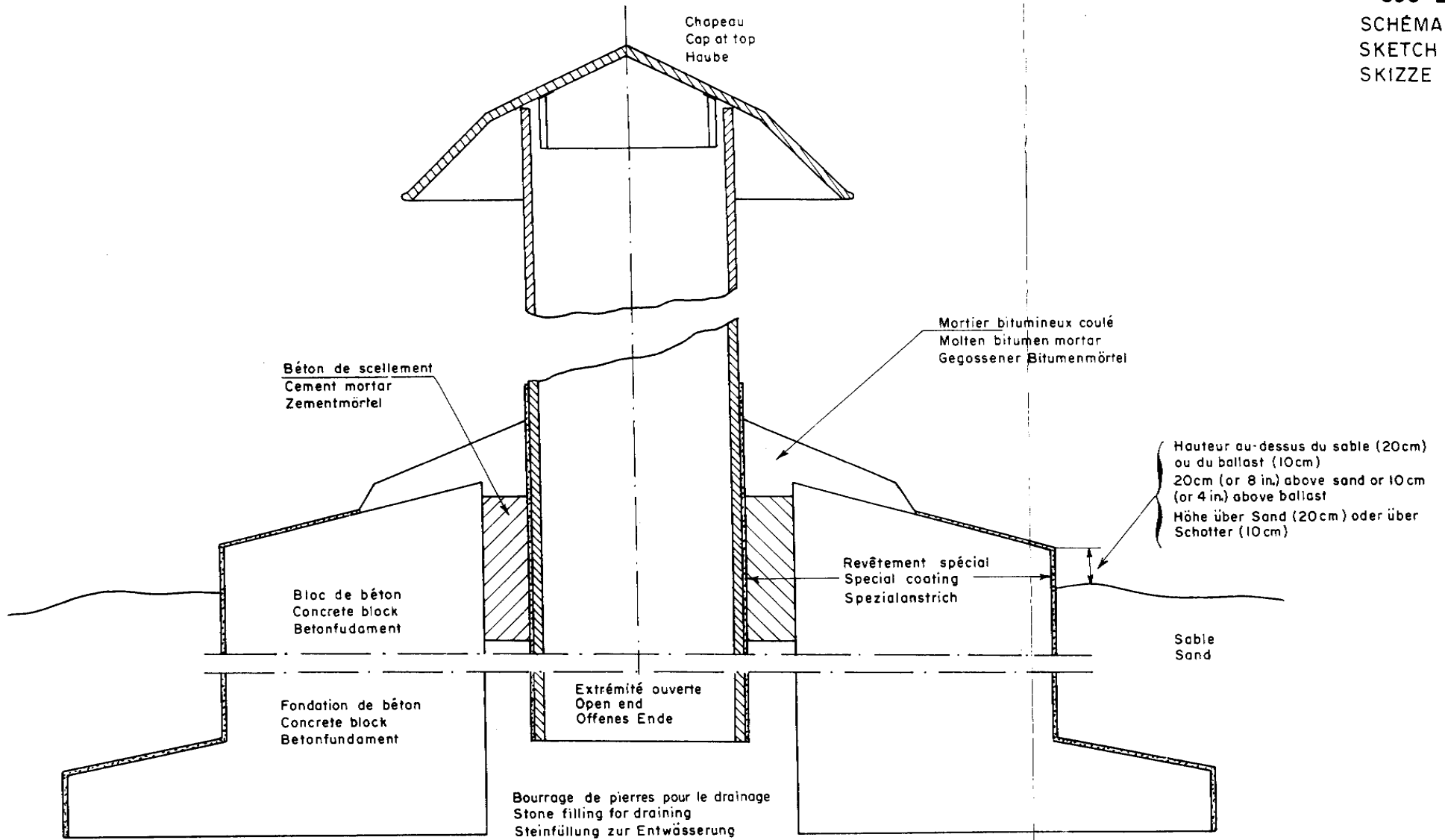
This leaflet contains recommendations for the protection of steel structures against corrosion, and sets out the conditions which must be fulfilled if the recommended methods are to be successful.

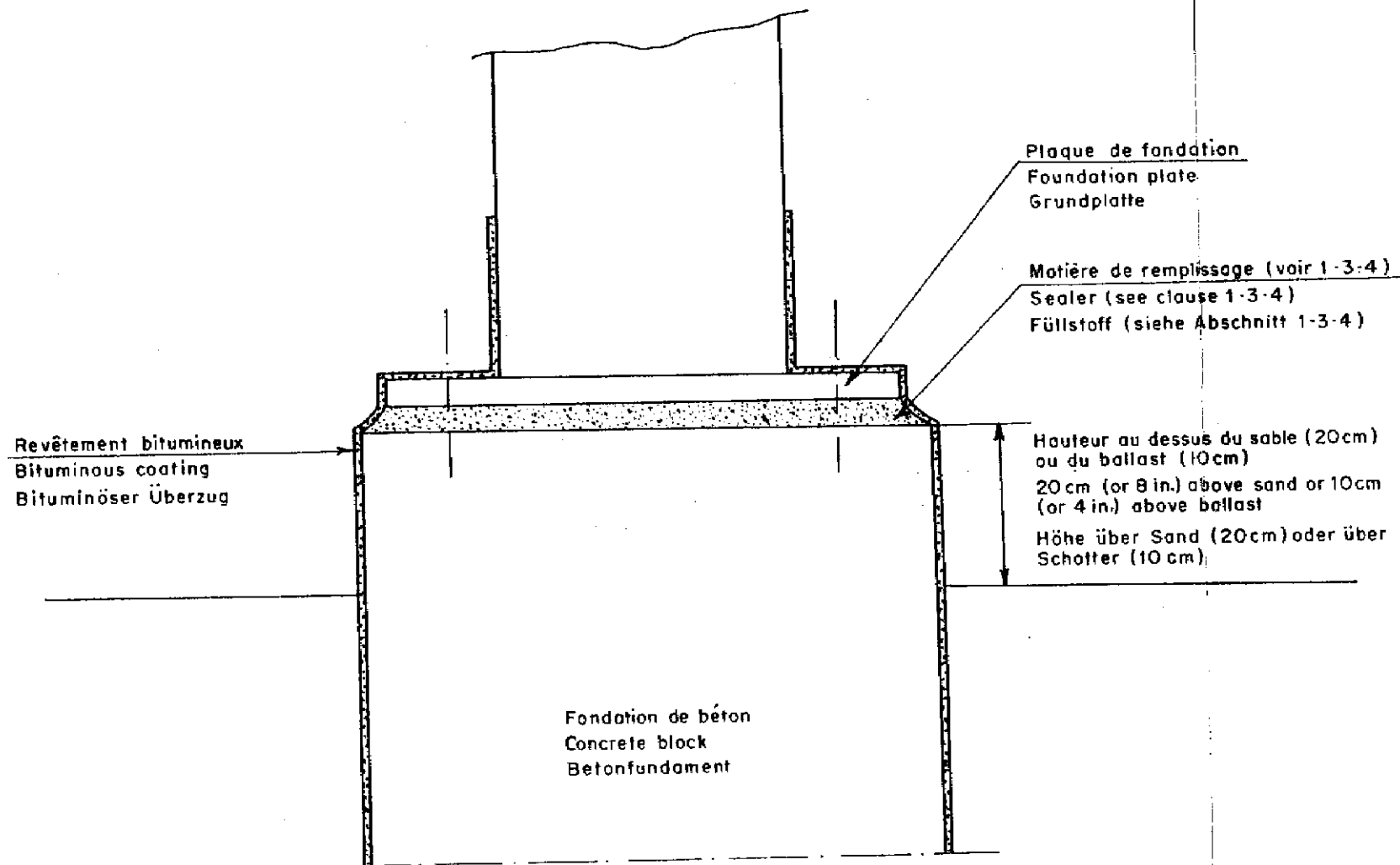
The protection of steel structures against corrosion starts with the proper design of constructional details. Some of the considerations affecting the details of structures are given in Section 1. The protection of the steel surfaces themselves involves :

- the proper preparation of these surfaces by the methods described in Section 2,
- the selection of a suitable protective system from amongst those described in Section 3,
- the correct formulation of the paints used in accordance with the leaflets listed in Section 4,
- the proper application of the protective system as described in Section 5,
- and, finally, the close inspection of the whole of the work as outlined in Section 6.

These recommendations cannot be used as a specification in the form in which they are given.

Railways should select the method of protection which is suitable for their particular purpose, and may then use the descriptions given in this recommendation, translated into mandatory terms.



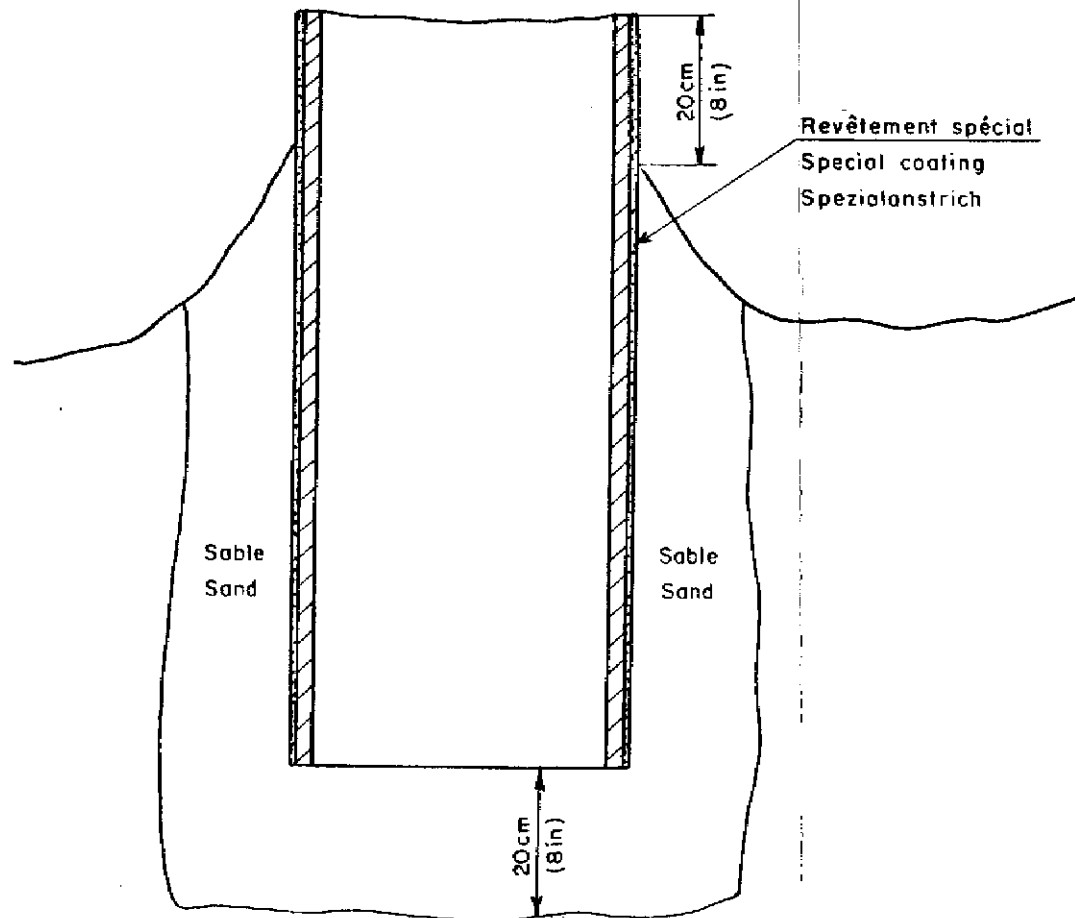


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SCHÉMA 3

SKETCH 3

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1 - DETAILS OF DESIGN AND CONSTRUCTION

1.1 General

In detailing steel structures, attention should be paid to the following:

1.1.1 All steel parts must be readily accessible for inspection, cleaning and painting.

1.1.2 Pockets where water will lie should be avoided.

1.1.3 Chemical and electrolytic effects between steel and other materials are to be avoided; dissimilar metals should not be in contact with each other. Steel deck plates must not be laid directly on timber, but must be separated from it by steel girders or concrete blocks. The space between timber and steel plate must not be less than 7 cms.

1.1.4 Vibration of steel plates should be minimised to avoid damage to protective coatings.

1.2 Hollow sections

The interior surfaces of hollow sections, such as masts, require special protection.

1.2.1 When hollow sections are to be protected by any method other than hot-dip galvanising, they should be made perfectly water-tight by welding.

1.2.2 If completely closed constructions are to be hot-dip galvanised, at least one orifice must be provided to let air escape during the process. This orifice should be carefully sealed afterwards.

1.2.3 In the case of hot-dip galvanised open constructions, entrance and accumulation of water after erection must be prevented. This may be achieved by means of a cap at the top and a water outlet at the base. (See sketch 1).

1.3 Steel on and in concrete foundations

1.3.1 Design of foundation.

Suitable design and proper construction are of prime importance in protecting foundations against deterioration. No protective system can prevent deterioration of concrete foundations of faulty

composition or of an unsuitable design.

All concrete foundations should project at least 20 cm above ground level or 10 cm above the ballast. (See sketches 1 and 2).

The shape of the concrete foundation should be such that water can easily drain away from the junction between steel and concrete.

1.3.2 Protection of foundation

In all cases the upper part of the concrete block should be protected with at least one coat of a painting material based on bitumen or tar pitch after the steel has been placed in position and finally secured (see sketch 2). This coating should also be applied to the part of the steel section protruding from the concrete to a height of at least 10 cm. It is of advantage to re-paint this part of the steel and the concrete block periodically (e.g. every 2 years).

Care should be taken that the junction between steel and concrete (i.e. where the steel enters the concrete block) is properly protected. This can best be achieved by filling all cavities between steel and concrete, in which water might accumulate, with molten bitumen or other appropriate jointing materials.

1.3.3 Protection of steel section

A steel section to be placed in concrete must be painted in such a way that a painted length of about 10 cm is embedded in the concrete. The remaining end of the steel section must be left bare and thoroughly cleaned prior to concreting.

No additional treatment is needed for the lower ends of galvanised sections before placing, except in the case of certain types of precast foundations (see sketch 1).

To avoid damage to the protective coating, the buried part of a section should be surrounded with at least 20 cm of sand (see sketch 3).

1.3.4 Protection of anchor bolts

Prior to fixing of a section the anchor bolts should be covered with a suitable solution of bitumen or coal tar pitch, the nuts being tightened while the solution is still wet. After fixing, the nuts and bolts must be recoated.

The foundation plates should be bedded on an epoxy resin, or a bituminous paste, or cement mortar (see sketch 2) placed so as to ensure that the gap between the foundation plate and the concrete is wholly filled.

2 - METHODS OF SURFACE PREPARATION

2.1 Introduction

The recommended procedure for the surface preparation of steel in contractors' works is that of blasting with a suitable abrasive; in many cases, acid pickling and flame cleaning will give satisfaction. It should, however, be stressed that these methods must only be used by experienced personnel. Cleaning with power driven hand tools should only be allowed when no firmly adherent scale or heavy corrosion is present on the surface. It is, in general, only permissible for minor work in shops.

Blasting with abrasives, flame cleaning, mechanical cleaning and manual cleaning are suitable for use on site.

Not all these methods are allowed by all Railways.

2.2 Preliminary cleaning

Any oil or grease present on a surface must be removed with a suitable solvent (e.g. white spirit) before the preparation of the surfaces.

Immediately prior to painting, all dust and other foreign material must be removed from the surface. Where facilities can be provided, this is best done with a vacuum cleaning machine, or alternatively, by blowing dry and clean compressed air on to the surface.

All cleaning and priming must, if possible, be carried out under cover. In no circumstances should parts, which have been prepared for painting, stay in the open for any period longer than the same working day.

2.3 Surface preparation for new steelwork

2.3.1 By Blasting

Metallic grit blasting is often impractical on the site because it is difficult to recover the expensive grit. The alternative is the use of approved mineral abrasives. The extreme sensitivity of

blast-cleaned surfaces requires great care to prevent rusting: speed in following up with priming is vital, and attention must be paid to atmospheric conditions at the time of sand blasting to ensure that the work is only carried out when the humidity is low. The standard of blasting should be agreed by the contractor and the Railway concerned before work is started, but in any case the roughness of a surface shall be such that the application of priming paint in an average dry film thickness of 60 microns completely covers all asperities.

Various materials may be used as abrasives. The air pressure should be adjusted to suit the construction, the thickness of the material, and the abrasive used.

Grit blasting is to be preferred when the surface is heavily rusted and when pitting has occurred.

The abrasives used for the preparation of steel surfaces which are to be metal sprayed must be such as will ensure good adhesion of the metallic coating (e.g. corundum, quartz sand or sharp angular grit).

In case a surface prepared by blasting cannot be covered completely by the priming paint system, it shall either be smoothed by means of a suitable abrasive or the film thickness of the anti-corrosive priming paint shall be increased to such an extent that it will cover all asperities of the surface. Wet-sand blasting may be used to avoid the formation of dust, provided that the water contains suitable inhibitors.

The following abrasives are recommended:

- Sharp angular grit of a size of : 0.4 - 0.8 mm when preparing a surface for painting,
0.5 - 1.2 mm when preparing a surface for metal spraying;
- Round steel shot
of a size of 0.5 - 1.5 mm ;
- Selected quartz sand
of a size of 0.5 - 2.5 mm ;

Other abrasives may be used at the discretion of the Administration concerned, provided that their application will produce a surface of suitable condition.

2.3.2 Acid pickling

Pickling must only be carried out under suitable and rigid control of the conditions and the bath composition. The methods used must be approved by the Railway concerned. To prepare a steel surface by pickling, the steel parts, free from paint, should be

submerged in a pickling bath as specified below, for a time not longer than is necessary to prepare the surface adequately. The pickled surface should be washed with hot water until the washings are free of acid. It should be scrubbed with a brush to obtain better adhesion of paint to steel.

A suitable inhibitor and an acid resistant emulsifying agent must be added to the pickling bath.

The following procedures are recommended :

Type of acid	Strength in % by weight	Concentration of iron salts (calculated as Fe in grammes per litre)	Temperature (in °C)	Observations
ortho-phosphoric (H ₃ PO ₄) 85 %	10 - 15	Less than 30	80 - 90	the acid shall be free of other mineral acids
sulphuric (H ₂ SO ₄) 96 %	5 - 10	Less than 70	70 - 80	

The following procedures are recommended to render pickled surfaces less sensitive to corrosion when painting cannot take place on the same working day :

- dipping the steel, after washing, in 1 % sodium nitrite (NaNO₂) solution;
- treating the steel, after washing the surface with water, in a 1.5 - 2% solution of ortho-phosphoric acid at a temperature of 85 - 95°C. for 10 minutes. The concentration of iron salts, calculated as Fe, shall be less than 5 grammes per litre.

A dry surface thus protected may be safely stored indoors under favourable conditions (i.e. no condensation taking place on the steel) for one to two weeks. Light surface rust may be accepted, provided it is removed prior to painting (e.g. by hand brushing).

Wash primer should not be applied to steel treated with a diluted solution of phosphoric acid.

2.3.3 Flame cleaning

Flame cleaning is a less satisfactory method as it will not remove firmly adherent scale. It is therefore recommended that flame cleaning should only be used on weathered surfaces wetted before cleaning.

Where it is not possible to weather the steel before cleaning in the works, it should be left on site until tests indicate that the scale can readily be removed by flame cleaning.

Precautions must be taken to avoid distortion of the structure. The method should, therefore, not be used on steel parts of less than 6 mm thickness. Care should be taken that steel structures are not heated to temperatures over 150 degrees centigrade, or such other temperature as may be agreed by the Railway concerned. The surface should be cleaned by 2 to 3 passes of the flame. The metal must be allowed to cool down, and wire brushed, after every pass.

A properly flame cleaned surface is free of rust or loosely adherent material, and has a uniform metallic grey colour including any pits or sores.

2.3.4 Cleaning with power-driven hand tools.

Cleaning with power-driven tools such as carborundum discs or wheels, chipping hammers, scrapers, filing knives, wire brushes etc., is less effective than blasting, flame cleaning or pickling and may be considered as an acceptable procedure only when the latter procedures cannot be used. Only careful use of these tools under strict supervision will bring surfaces to a suitable condition for priming.

On site, a period of weathering must be allowed to loosen the scale before cleaning. The use of tools which might possibly cause cracks in the underlying material should be avoided.

2.3.5 Manual cleaning

Manual cleaning can only bring about a satisfactory surface condition when used to remove light surface rust in the absence of mill-scale (e.g. surface rust after cleaning by blasting). The method will not give satisfactory results when corrosion is more pronounced or when pitting has occurred.

2.4 - Surface preparation prior to repainting

2.4.1 General

Paint coats should be repaired at an early stage, i.e. before corrosion has broken extensively through the existing paintwork. Paint which is in sound condition and firmly adherent to the steel surface should be left in position. All areas, where rust has broken through the paint, must be cleaned down to the base metal before priming and repainting. All other surfaces should be cleaned by light scraping and wire brushing, avoiding damage to the firmly adherent paint but removing completely any loose material.

Surfaces of structures exposed to marine and industrial atmospheres, on which salt or industrial atmospheric deposits may be present, should be thoroughly washed and dried immediately before repainting.

The following procedures for the preparation of the steel before repainting may be used on sites :

- blasting (in special cases)
- flame cleaning (in special cases)
- cleaning with power-driven hand tools
- Manual cleaning

2.4.2 Blasting

Blasting will only be of practical value in a limited number of cases i.e. where local repair of the damaged paint system is impossible and the paint has to be removed completely down to the bare surface over extensive areas. It is not economical when only small surfaces must be repainted.

2.4.3 Flame cleaning

Flame cleaning is effective in removing heavy corrosion deposits but it will be found most economical to clean first with hammers and the heavier mechanical tools. Flame cleaning is not recommended when corrosion affects less than 20 % of the area to be repainted, and when there is no deep pitting of the corroded surface.

Where lead-containing paints have previously been used or where there is uncertainty regarding the nature of the paint on the structure, precautions must be taken to avoid harmful effects on the operators.

Ventilation should at all times be provided when flame cleaning is used in confined spaces. Unregulated burning-off of heavy coatings of bitumen has caused fires. Caution is necessary.

2.4.4 Cleaning by means of power-driven hand tools or manual methods.

The limitations of the methods described above make the use of power-driven hand tools or manual methods necessary either in combination with them or alone. Power-operated tools are to be preferred as being more efficient, but both methods require strict supervision.

3 - PROTECTIVE SYSTEMS

The prevailing conditions must be taken into account in choosing a protective system.

The recommended systems are :

3.1 In rural atmospheres and urban atmospheres with little atmospheric pollution

3.1.1 Where a quicker-drying priming paint system is required :

- priming paint system P I or P II of Appendix 1 and finishing paint system F I, F II, F IV, F V or F VI of Appendix 2.

3.1.2 Where a slower-drying priming paint system can be tolerated :

priming paint system P III or P IV of Appendix 1, and finishing paint system F I, F II, F III, F IV or F V of Appendix 2.

3.1.3 Where a metallic protective system is required :

- system M I of Appendix 3

or

- system M IV of Appendix 3 and finishing paint system F I, F II, F IV, F V or F VI of Appendix 2.

3.2 In heavy industrial atmospheres

3.2.1 Where a quicker-drying priming paint system is required :

- priming paint system P V or P VI of Appendix 1 and finishing paint system F I, F II, F IV, F V or F VI of Appendix 2.

3.2.2 Where a slower-drying priming paint system can be tolerated :

- priming paint system P III or P IV of Appendix 1 and finishing paint system F II, F III, F IV or F V of Appendix 2.

3.2.3 Where a metallic protective system is required :

- system M I or M II of Appendix 3 and finishing paint system F I, F II, F IV, F V or F VI of Appendix 2.

3.3 In extremely aggressive atmospheres

Such atmospheres are found in the immediate vicinity of certain industries. When there is evidence that the coatings recommended in 3.2 will not prove satisfactory even when additional coats are applied, special precautions should be taken and paints based on special binders, such as chlorinated rubber and epoxy resins, should be chosen.

3.4 In marine atmospheres

3.4.1 Where a priming paint system is required :

- priming paint system P III, P V or P VI of Appendix 1 and finishing paint system F I, F II, F III, F IV or F VI of Appendix 2.

3.4.2 Where a metallic protective system is required :

- system M I, M II or M III of Appendix 3 and finishing paint system F I, F II, F IV, F V or F VI of Appendix 2.

3.5 For submerged and buried structures

The system to be used depends so much on the prevailing conditions that general rules for the protection cannot be given. However, the use of thick layers of bitumen (for submerged structures also tar pitch) applied hot should be considered.

As maintenance of the submerged part of a structure is difficult, cathodic protection should be considered to ensure a lasting protective system. It must be stressed that cathodic protection must be provided at an early stage, when the protective coatings are still in good condition, and in accordance with expert advice.

Steel sections placed directly in the ground should be protected by a finishing paint system based on bitumen or coal tar pitch, applied below ground level and up to a height of 20 cm above ground or ballast level. At least two coats of these materials should be applied and a dry coating thickness of at least 500 microns must be attained. Emulsion type painting materials are not recommended for this purpose.

3.6 For steel to be cased in concrete

Steelwork intended to be wholly encased in concrete should not be painted, but all loose scale and rust should be removed immediately prior to the concreting.

4 - PAINTS

The paints and metallic coatings recommended in 3 are those defined in :

4.1 UIC Leaflet No. 896-1(1) for the supply of paints for the protection of structural steel

4.2 UIC Leaflet No. 842-7 for the conditions of acceptance of hot-dip galvanised coatings

4.3 UIC Leaflet No. (to be published later on) for the conditions of acceptance of sprayed zinc coatings (to be prepared)

(1) Prepared on the basis of the interim report - Document No. 12 (October 1962) of the E 17 Committee of Experts.

5 - APPLICATION

5.1. Method of application

It is strongly recommended that the first coating of paint shall be applied by brush. If any coatings are applied other than by brush, the method must be approved by the Railway concerned. Paints must only be applied by experienced personnel. The required coating thickness is given in Appendix 4. Paints must only be applied to steel surfaces which have received satisfactory surface preparation. At least the first coating of the system should be applied under cover and at temperatures not below 10 degrees centigrade.

Before any coating of paint is applied, damaged areas of the previously applied paint film must be properly cleaned and repaired with the same series of paint coatings as already applied to the steel surface, but in the case of damage to one of the systems described in Appendix 3, the repair must be effected with zinc rich paint.

5.2. Conditions for painting

No paint must be applied before the previous coat is thoroughly dry, and, wherever practicable, the following drying times should be observed :

- for oil based paints, at least 48 hours
- for alkyd resin based paints, at least 16 hours; it is recommended that the interval between the coatings should not greatly exceed the drying time :
- for overcoating the priming paint with tar pitch solution, at least one week, except in the case of priming paint system P III when at least three weeks should be allowed
- for zinc rich paints it is an advantage to allow up to 72 hours before overcoating with other paints.

The first protective coating should be applied to the cleaned steel surface as soon as possible, and in any case before rust formation has begun. In the case of flame cleaned surfaces, the first coating of paint should be applied whilst the steel surface is as hot as possible, but not warmer than 70°C. If surface preparation of steel

parts has taken place before fabrication the first protective coating may, at the discretion of the Railway concerned, be disregarded as being part of the protective system indicated in Article 3.

5.3. Handling of painted steel

After painting, the steel should not be transported before the priming paint is thoroughly (hard) dry.

6 - INSPECTION OF PAINTING WORK

6.1. Paint and painting conditions

6.1.1 Containers

All containers should be sealed in the manufacturer's works and must be delivered on site in good (undamaged) condition. Paint may only be used after inspection by the Railway.

6.1.2 Storage and issue of paint

All containers should be stored in a lock-up set aside for this purpose, to which only the official of the Railway has access.

Only the amount of paint required for the daily work should be issued by the official of the Railway.

A record must be kept of the quantities issued, so as to provide an approximate check of the coating thickness.

6.1.3 Preparation of paint

Prior to application, the paint must be rendered homogeneous by means of stirring. This must be checked by an official of the Railway.

The composition of the paint must not be altered, either by adding or by thinning, unless permission to do so has previously been obtained from the Railway.

6.1.4 Colour of paint

Paints intended for successive coats must show a distinct difference in colour for each coat.

6.1.5 Working conditions

Painting must not start without the permission of the official of the Railway, and shall never be carried out when :

- a) the surface is moist ;
- b) the relative humidity exceeds 90 % ;
- c) sand or dirt may be blown on to the freshly coated surface ;
- d) the temperature is too high or too low, i.e. a surface temperature below 5°C or above 50°C (for priming on surfaces prepared by flame cleaning not higher than 70°C).

6.2 Reference areas and test panels

6.2.1 Reference areas

Before commencing the actual work, it is advisable to apply each painting system on a separate surface area of suitable size and to control the surface preparation and the standard of painting of this area carefully. Each coat of the system must be inspected and a standard of work agreed with the contractor before proceeding with the next coat.

The locations of the reference areas should be selected by the official of the Railway in such a way as to include those areas most exposed to corrosion. These reference areas may, if necessary, be used in the case of arbitration.

6.2.2 Test panels

At the request of the Railway concerned, test panels shall be painted on site with the different paints in the appropriate coating thickness, and in the correct order of succession.

6.3 Workmanship

6.3.1 All surfaces must be inspected immediately before the application of each coat of paint.

a) for appropriate surface preparation

b) for the condition of the preceding coat of paint, to ensure that it is thoroughly dry and free from such defects as damage by rain, porosity, bad adhesion, bare spots, shrivelling, etc.

Where any of these defects is present, it must be corrected before the next coat of paint is applied.

6.3.2 Inspection should ensure that the painters' implements, including mechanical equipment and means of access to the surface, are of an agreed type and in good condition.

6.3.3 The manner in which the work is being carried out should be inspected.

6.3.4 A rough check of the coating thickness based on the quantities of paint issued and the areas painted should be made. The actual paint consumption should be based on that agreed for the reference areas.

6.3.5 Final inspection must be made for any defects after the painted area has dried.

6.4 Methods of testing coats of paint

It is recommended that the work in progress should be thoroughly checked by means of measuring instruments.

The following test methods are considered suitable :

a) checking the coated surface by means of an electrical contact indicator, in order to determine the extent to which the surface has been covered by the paint coating (s) ;

b) thickness measurements by means of mechanical, magnetic, electrical or optical measuring instruments of an agreed type ;

c) removing part of the coating in order to determine the thickness or the weight of the coating (only in case of arbitration).

Method "a" indicates the presence of metal points protruding through the paint coating.

Only method "c" will give a direct reading and, if so desired, an average value (coating weight determination).

The methods referred to under "b" may give results which deviate considerably from the correct value.

The readings taken may be too low in cases of rather soft coatings (e.g. not yet "hard dry") because the measuring instruments used are liable to sink into the coating to some extent.

Zeroing of the instrument, which is essential, will vary with the characteristics of the steel, its thickness and surface roughness. In the case of shot blasted surfaces the deviation may be considerable.

The places on which thickness measurements are made must be distributed over a certain area. The average of the readings taken can then represent the coating thickness of that area.

6.5 Test of the paint during application

The official of the Railway should take samples from the painter's pots from time to time for analysis.

6.6 Records of climatic data

A record of the measurements of the temperatures and the relative humidity (which should be measured several times a day) and of adverse weather conditions must be kept. Reference should be made to painting operations, which might be carried out in adverse conditions and all relevant details stated. Such records should be made during the total period of painting.

6.7 Acceptance of paint work

No part of the paint work must be accepted unless previously examined and found free of all defects.

Any defects discovered must be repaired in such a way that the entire paint coating meets the specified requirements.

APPENDIX 1

Priming paint systems (1)

System No.	1st coat	2nd coat	3rd coat
P I	Red lead anti-corrosive priming paint No. 110	Red lead - red oxide priming paint No. 111	
P II	Zinc chromate anti-corrosive paint No. 112	Zinc chromate anti-corrosive priming paint (tinted) No. 112	
P III	Oil-based red lead anti-corrosive priming paint No. 113	Brown oil-based red lead priming paint No. 114	In certain circumstances, e.g. when a structure is left in an industrial atmosphere in priming paint for more than 6 months, a third coat of the priming paint shall be applied after thoroughly cleaning the surface and immediately before the application of the finishing paint system indicated in 3.
P IV	Calcium plumbate anti-corrosive priming paint No. 115.	Calcium plumbate anti-corrosive priming paint (tinted) No. 115	In certain circumstances, e.g. when a structure is left in an industrial atmosphere in priming paint for more than 6 months, a third coat of the priming paint should be applied after thoroughly cleaning the surface and immediately before the application of the finishing paint system indicated in 3.
P V	Red lead anti-corrosive priming paint No. 110	Red lead anti-corrosive priming paint (tinted) No. 110	Red lead - red oxide priming paint No. 111
P VI	Zinc chromate anti-corrosive priming paint No. 112	Zinc chromate anti-corrosive priming paint (tinted) No. 112	Zinc chromate anti-corrosive priming paint (tinted) No. 112

(1) For numbers and composition of paints, see JIC Leaflet No. 896-1 (and also paragraph 4.1 of the recommendations)

Finishing paint systems (I)

System No.	1st coat	2nd coat	3rd coat	Notes
F I	Undercoating paint titanium dioxide No. 130	Finishing paint titanium dioxide No. 160		
F II	Undercoating paint micaceous iron oxide No. 131	Finishing paint micaceous iron oxide No. 161		If desired, the aluminum finishing paint (see No. 162) can replace the finishing paint micaceous iron oxide
F III	Oil-based undercoating paint micaceous iron oxide No. 132	Oil-based finishing paint micaceous iron oxide No. 163		
E IV	Bituminous solution No. 133	Filled bituminous solution No. 164	Bituminous aluminum paint No. 166 (if desired)	The coating of bituminous solution No. 133 may be replaced by one coating of filled bituminous solution (see No. 164)
F V	Bituminous solution No. 133	Filled bituminous emulsion No. 165	Bituminous aluminum paint No. 166 (if desired)	If the Railways wish, the first coating may be replaced by a suitable bituminous emulsion.
F VI	Filled tar pitch solution No. 134	Filled tar pitch emulsion No. 167		

(I) For numbers and composition of paints, see OIC Leaflet No. 896-I (and also paragraph 4.1 of the Recommendations)

Systems based on metal and metal pigment (zinc) (1)

System No.	1st coat	2nd coat	Notes
M I	Hot dip galvanised coating (2). (See UIC - Leaflet No. 842-7)		
M II	Sprayed zinc (2) (See UIC-Leaflet No. to be prepared)	Zinc chromate anti-corrosive priming paint No. 112.	
M III	Zinc rich paint No. 190	Zinc rich paint No. 190	One of the two coatings shall be tinted
M IV	Zinc rich paint No. 190	Zinc chromate anti-corrosive priming paint No. 112	

(1) For numbers and composition of paints, see UIC Leaflet No. 896-1 and also Paragraph 4-1 of the Recommendations).

(2) A wash primer according to specification No. 101, which may only be used up to 8 hours after mixing both components, shall be applied if the surface is to be coated by one of the finishing paint systems denoted in Appendix 2.

(3) To be prepared on the basis of the Interim Report No. 24 (February 1965) of the E 17 Committee of Experts.

Dry coating thickness

APPENDIX 4

Type of coating	Reference number	Directives for dry film thickness in microns (as determined by a method agreed with Administration concerned)
Wash primer	101	5 (max.10)
Red lead anti-corrosive priming paint	110	30
Red lead - red oxide priming paint	111	30
Zinc chromate anti-corrosive priming paint	112	30
Oil-based red lead anti-corrosive priming paint	113	30
Brown oil-based red lead priming paint	114	30
Calcium plumbate anti-corrosive priming paint	115	30
Undercoating paint - titanium dioxide	130	25
Undercoating paint - micaceous iron oxide	131	30
Oil-based micaceous iron oxide undercoating paint	132	40 (as used in the system)
Bituminous solution	133	(see No. 164 or No. 165)
Filled tar pitch solution	134	see (2)
Finishing paint - titanium dioxide	160	30
Finishing paint - micaceous iron oxide	161	40
Aluminium finishing paint	162	20
Oil-based micaceous iron oxide finishing paint	163	40
Filled bituminous solution	164	see (1)
Filled bituminous solution	165	see (2)
Bituminous aluminium paint	166	20
Filled tar pitch emulsion	167	see (2)
Zinc rich paint	190	50

(*) For numbers and composition of paints, see UIC leaflet No. 896-1 (and also § 4.1 of the Recommendations)

(1) total thickness of combined coatings to be > 200 microns

(2) total thickness of combined coatings to be > 1000 microns

APPLICATION

All Railways in the Union.

RECORD REFERENCES

Heading under which the question has been dealt with :

- Preparation of recommendations and specifications for the protection of structural steelwork.

a); b)

c) Recommendation for the protection of new steel structures against corrosion.

d); e)

(7th Committee -P.W.- Paris, May 1963; Berne, May 1964).