Protective Coatings
Protective Coating
## STEEL PROTECTIVE COATING ELEMENTS

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>PTPR</td>
<td>Protective Coating – Truss – Principal&lt;br&gt;This element defines the protective coating on principals of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTTC</td>
<td>Protective Coating – Truss – Top Chord&lt;br&gt;This element defines the protective coating on top chords of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTBC</td>
<td>Protective Coating – Truss – Bottom Chord&lt;br&gt;This element defines the protective coating on bottom chords of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTDG</td>
<td>Protective Coating – Truss – Diagonals&lt;br&gt;This element defines the protective coating on diagonals of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTVT</td>
<td>Protective Coating – Truss – Verticals&lt;br&gt;This element defines the protective coating on verticals of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTGP</td>
<td>Protective Coating – Truss – Connection Gusset Plates&lt;br&gt;This element defines the protective coating on connection gusset plates of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTTB</td>
<td>Protective Coating – Truss – Top Bracings&lt;br&gt;This element defines the protective coating on top bracings of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTBB</td>
<td>Protective Coating – Truss – Bottom Bracings&lt;br&gt;This element defines the protective coating on bottom bracings of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTCG</td>
<td>Protective Coating – Truss – Cross Girder&lt;br&gt;This element defines the protective coating on cross girders of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTST</td>
<td>Protective Coating – Truss – Stringers&lt;br&gt;This element defines the protective coating on stringers of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PTLS</td>
<td>Protective Coating – Truss – Lift Span Support Structure&lt;br&gt;This element defines the protective coating on the lift span support structure of steel trusses only.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PBGI</td>
<td>Protective Coating - Rolled Beam/Fabricated I Girder / Trough Girder/Box Girder, including Stringers and Cross Girders (Load bearing)&lt;br&gt;This element defines the protective coating on all steel (or wrought iron) rolled beams/I girders/trough girders/box girders including stringers and cross girders that are load bearing.</td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td>PDBR</td>
<td>Protective Coating - Diaphragm/Bracing/Secondary member&lt;br&gt;This element defines the protective coating on steel diaphragms/braces/secondary members.</td>
<td>m² of exposed surface area</td>
</tr>
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<td>Element</td>
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</tr>
<tr>
<td>---------</td>
<td>-----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>PPIR</td>
<td><strong>Protective Coating - Pier (excluding any piles and secondary members)</strong></td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td></td>
<td>This element defines the protective coating on steel piers, excluding any piles and secondary members.</td>
<td></td>
</tr>
<tr>
<td>PPIL</td>
<td><strong>Protective Coating - Pile (including steel cased concrete pile or caisson)</strong></td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td></td>
<td>This element defines only the protective coating on those parts of steel piles and that can be inspected, including underwater inspection if appropriate.</td>
<td></td>
</tr>
<tr>
<td>PASG</td>
<td><strong>Protective Coating – Abutment Sheeting / Gravel Board</strong></td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td></td>
<td>This element defines only the protective coating on the abutment sheeting/Gravel Boards made of steel. The vertical steel supports are treated as steel piles.</td>
<td></td>
</tr>
<tr>
<td>POGD</td>
<td><strong>Protective Coating - Open Grid Deck</strong></td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td></td>
<td>This element defines only the protective coating on those bridge decks that are constructed of steel grids and are open and unfilled.</td>
<td></td>
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<tr>
<td>PBPD</td>
<td><strong>Protective Coating - Buckle Plate Deck</strong></td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td></td>
<td>This element defines the protective coating on those bridge decks that are constructed of steel buckle plates.</td>
<td></td>
</tr>
<tr>
<td>PCOD</td>
<td><strong>Protective Coating - Corrugated/Orthotropic/Etc. Deck</strong></td>
<td>m² of exposed surface area</td>
</tr>
<tr>
<td></td>
<td>This element defines only the protective coating on those bridge decks that are constructed of corrugated metal filled with Portland cement concrete or asphaltic concrete or an orthotropic steel deck. The orthotropic deck may be covered with asphaltic concrete.</td>
<td></td>
</tr>
<tr>
<td>PCBT</td>
<td><strong>Protective Coating - Cables/Hangers/Tension Ties (Not Embedded In Concrete)</strong></td>
<td>each</td>
</tr>
<tr>
<td></td>
<td>This element defines only the protective coating including galvanising, painting, wrapping with grease or a protective outer wrapper on those steel cables, hangers and other tension ties (cables or rods) excluding steel bracings and steel tension members in trusses. This element includes the anchorages and other supports associated with the cables/ties that are not embedded in concrete.</td>
<td></td>
</tr>
</tbody>
</table>
# STEEL PROTECTIVE COATING ELEMENTS

For each of the condition states, report the estimated area in square metres.

## Condition state descriptions

<table>
<thead>
<tr>
<th>Condition State</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>The protective coating is generally sound and unbroken. Some chalking or water staining may be evident.</td>
</tr>
</tbody>
</table>
| 2               | The protective coating is exhibiting:  
                  - Minor speckled white or red rusting, and/or  
                  - Localised pinhead rusting, and/or  
                  - Localised peeling and/or flaking  
                  The top coat may exhibit one or more of the following conditions:  
                  - Loss of thickness;  
                  - Primer exposed over localised areas (except for lead primer)  
                  - Shrinkage lines – minor localised splitting;  
                  - Surface checking with slight localised splitting;  
                  - Minor unbroken blistering.  
                  Rivets may be exposed at scattered locations. |
| 3               | The protective coating is exhibiting:  
                  - Speckled white rusting in areas >2% and <5% of affected surface area,  
                  - Speckled red rusting in areas >0.5% and <5% of affected surface area;  
                  The top coat may exhibit one or more of the following conditions:  
                  - Primer exposed over large areas or in the case of lead primer, local areas  
                  - Splitting;  
                  - Peeling (loss of adhesion);  
                  - Heavily checked;  
                  - Blistering over large areas.  
                  Numerous rivets may be exposed. |
| 4               | The protective coating is no longer effective, signs include:  
                  - Speckled rust >5% (red and white) in affected areas.  
                  - Failure of primer over large areas. |

**Key Areas to inspect** for any cracking, corrosion and other deterioration signs:
1. Edges of members  
2. Connections  
3. Splice Plates

**Rating Guidance Notes:**  
Checking is defined as crocodile cracking

For further guidance please see next page.
Rating Guidance Notes:

To assist with the estimation of percentages of typical rust formation in painted steel elements, a diagram from the Australian Standards AS/NZ 2312 : 2002 is given below.

Different parts of an element can be in different paint condition states. Consider the affected areas of the element and estimate the areas that have reached the condition definitions.
### Steel Protective Coating Elements

#### Condition State 1

The protective coating is generally sound and unbroken. Some chalking or water staining may be evident.

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![Steel Protective Coating Elements](image)

Water staining evident but coating in good condition.

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Coating in near new condition.
Steel Protective Coating Elements

**Condition State 1**
The protective coating is generally sound and unbroken. Some chalking or water staining may be evident.

Coating in near new condition.

Coating in near new condition.
Steel Protective Coating Elements

### Condition State 2 -
The protective coating is exhibiting minor speckled white or red rusting, and/or localised pinhead rusting, and/or localised peeling and/or flaking. The top coat may exhibit one or more of the following conditions: loss of thickness; primer exposed over localised areas (except for lead primer); shrinkage lines – minor localised splitting; surface checking with slight localised splitting; minor unbroken blistering. Rivets may be exposed at scattered locations.

Localised breakdown at end of girder.

Localised breakdown of zinc primer (white salts evident) on edges of girder.
**Steel Protective Coating Elements**

**Condition State 2** - The protective coating is exhibiting minor speckled white or red rusting, and/or localised pinhead rusting, and/or localised peeling and/or flaking. The top coat may exhibit one or more of the following conditions: loss of thickness; primer exposed over localised areas (except for lead primer); shrinkage lines – minor localised splitting; surface checking with slight localised splitting; minor unbroken blistering. Rivets may be exposed at scattered locations.

Localised failure of zinc primer with white salts evident.

Localised patches of topcoat breakdown.
**Steel Protective Coating Elements**

**Condition State 2** - The protective coating is exhibiting minor speckled white or red rusting, and/or localised pinhead rusting, and/or localised peeling and/or flaking. The top coat may exhibit one or more of the following conditions: loss of thickness; primer exposed over localised areas (except for lead primer); shrinkage lines – minor localised splitting; surface checking with slight localised splitting; minor unbroken blistering. Rivets may be exposed at scattered locations.

Blistering of topcoat.

Localised failure of zinc primer.
**Steel Protective Coating Elements**

**All Steel Elements**

**Condition State 3** - The protective coating is exhibiting speckled white rusting in areas >2% and <5% of affected surface area, and/or speckled red rusting in areas >0.5% and <5% of affected surface area. The top coat may exhibit one or more of the following conditions: primer exposed over large areas or in the case of lead primer, local areas; splitting; peeling (loss of adhesion); heavily checked; blistering over large areas. Numerous rivets may be exposed.

Failed patch of top coat.

Primer and top coat breakdown over large areas.
Steel Protective Coating Elements

**Condition State 3** - The protective coating is exhibiting speckled white rusting in areas >2% and <5% of affected surface area, and/or speckled red rusting in areas >0.5% and <5% of affected surface area. The top coat may exhibit one or more of the following conditions: primer exposed over large areas or in the case of lead primer, local areas; splitting; peeling (loss of adhesion); heavily checked; blistering over large areas. Numerous rivets may be exposed.

Zinc primer failure on all cross members.

Breakdown of top coat with primer exposed over large areas.
Steel Protective Coating Elements

**Condition State 3** - The protective coating is exhibiting speckled white rusting in areas >2% and <5% of affected surface area, and/or speckled red rusting in areas >0.5% and <5% of affected surface area. The top coat may exhibit one or more of the following conditions: primer exposed over large areas or in the case of lead primer, local areas; splitting; peeling (loss of adhesion); heavily checked; blistering over large areas. Numerous rivets may be exposed.

Breakdown of top coat with primer exposed over large areas.

Deterioration of entire topcoat.
Steel Protective Coating Elements

**Condition State 3** - The protective coating is exhibiting speckled white rusting in areas >2% and <5% of affected surface area, and/or speckled red rusting in areas >0.5% and <5% of affected surface area. The top coat may exhibit one or more of the following conditions: primer exposed over large areas or in the case of lead primer, local areas; splitting; peeling (loss of adhesion); heavily checked; blistering over large areas. Numerous rivets may be exposed.

Large areas of topcoat deterioration with primer exposed.

Large areas of topcoat deterioration with primer exposed.
### Steel Protective Coating Elements

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<thead>
<tr>
<th>Condition State 3</th>
<th>Description</th>
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<tr>
<td>All Steel Elements</td>
<td>The protective coating is exhibiting speckled white rusting in areas &gt;2% and &lt;5% of affected surface area, and/or speckled red rusting in areas &gt;0.5% and &lt;5% of affected surface area. The top coat may exhibit one or more of the following conditions: primer exposed over large areas or in the case of lead primer, local areas; splitting; peeling (loss of adhesion); heavily checked; blistering over large areas. Numerous rivets may be exposed.</td>
</tr>
</tbody>
</table>

Large areas of topcoat deterioration with primer exposed.

Large areas of topcoat deterioration with primer exposed.
Steel Protective Coating Elements

Condition State 4
The protective coating is no longer effective, signs include speckled rust >5% (red and white) in affected areas and/or failure of primer over large areas

Extensive speckled red rust, coating no longer protecting steel.

Large areas of delaminated coating. No longer providing effective protection.
Steel Protective Coating Elements

All Steel Elements

Condition State 4
The protective coating is no longer effective, signs include speckled rust >5% (red and white) in affected areas and/or failure of primer over large areas

Coating no longer present.

Failed coating and significant corrosion of pier bracing.
Steel Protective Coating Elements  

All Steel Elements

**Condition State 4**  
The protective coating is no longer effective, signs include speckled rust >5% (red and white) in affected areas and/or failure of primer over large areas.

Coating no longer present.

Coating no longer present.