quality standards

Internal Walls

- General
- Plaster Finish
- Tiled Finish
- Painting

1) **Finishing**
   - No stain marks
   - Consistent colour tone
   - No rough/patchy surface

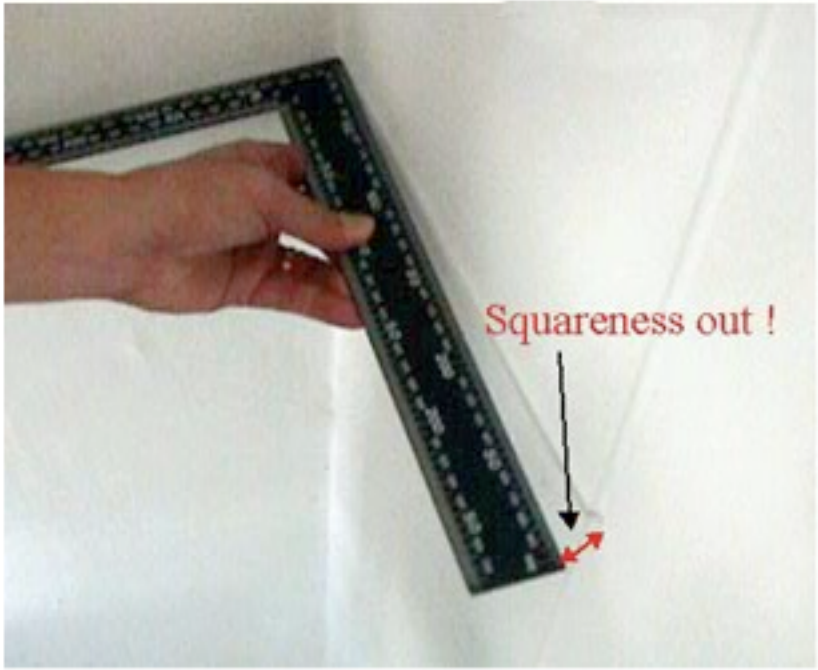
2) **Alignment & Evenness**
   - Evenness of surface (not more than 3mm per 1.2m)
   - Verticality of wall (not more than 3mm per m)
   - Walls meet at right angles (not more than 4mm over 300mm)
   - Edges to appear straight and aligned

3) **Crack and Damages**
   - No visible damage/defects

4) **Hollowness/Delamination**
   - No hollow sound when tapped with a hard object
   - No sign of delamination

5) **Jointing**
   - Straightness of corners and joints

general



Squareness out - not more than 4mm over 300mm

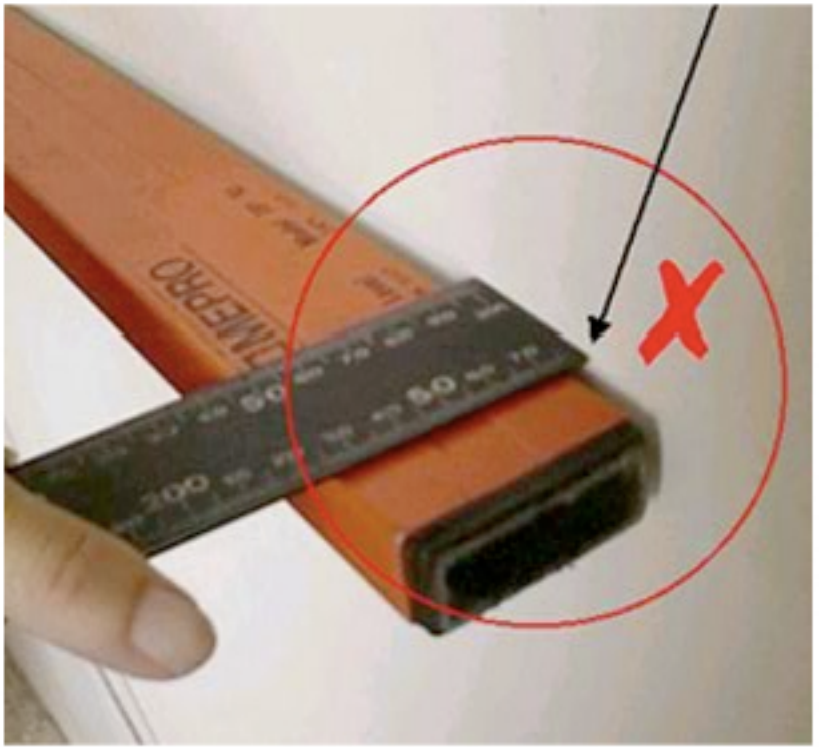
general

No stain marks and any visible damage

general

Straightness of corners

plaster finish

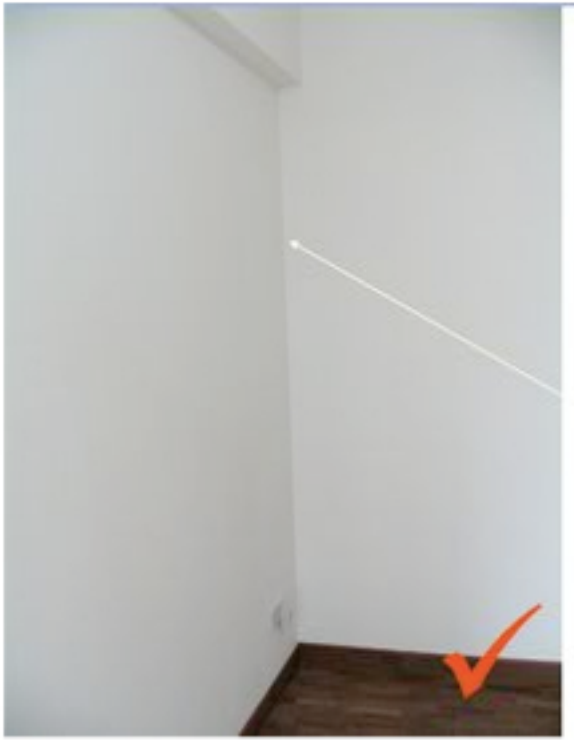


Unevenness should not be more than 3mm over 1.2mm

plaster finish

No hollow sound when tapped with a hard object. Generally most plastered wall with minor hollowness have passed the adhesion requirements

plaster finish



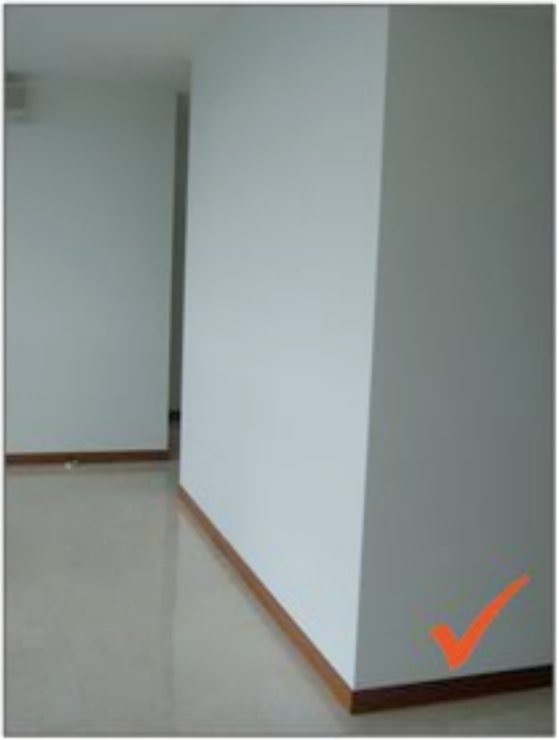
Wall jointing consists of Plaster wall and tiling wall

Visually straight at corners for plastered wall

plaster finish

No mortar stains or paint drips

plaster finish

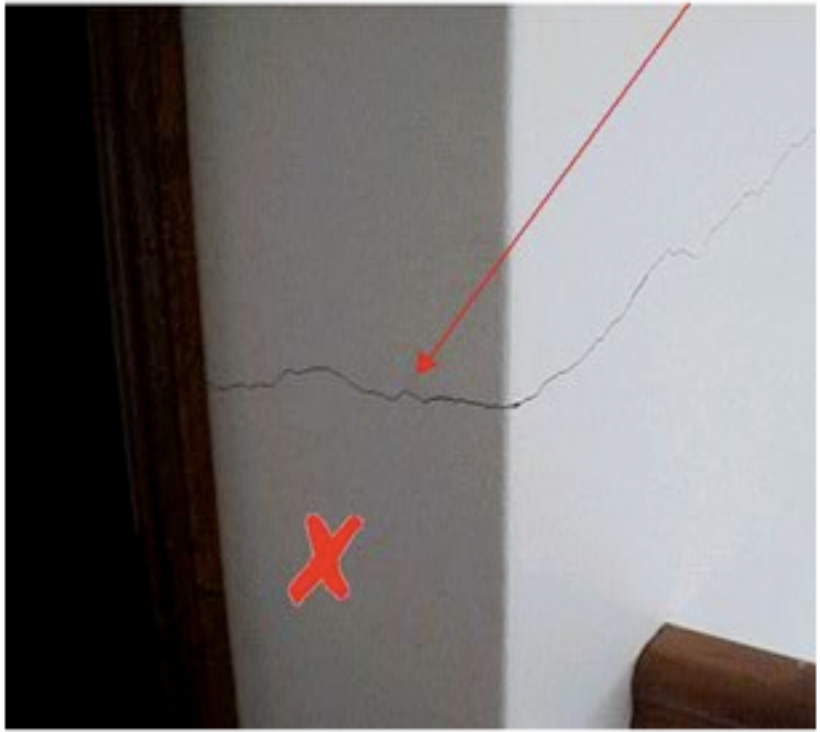


Edges are straight and aligned

Interface of architrave /Wall/ Skirting

Edges are straight and aligned

plaster finish



No visible crack from a distance of 1.5m

tiled finish

Consistent joint width

Inconsistent joint width

tiled finish

Unevenness should not be more than 3mm over 1.2mm

tiled finish

No paint or other stains

tiled finish

No chips cracks and other visible damages

tiled finish

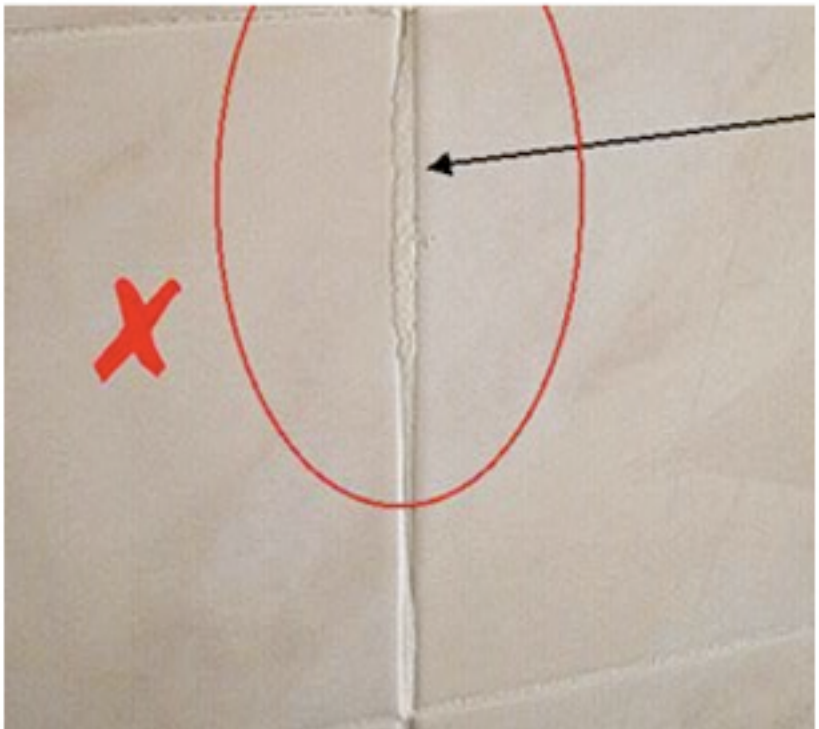
No hollow sound when tapped with a hard object.Generally most tiles with minor hollowness have passed the adhesion requirements.

tiled finish

Consistent colour tone

Architrave & Wall gap:

tiled finish

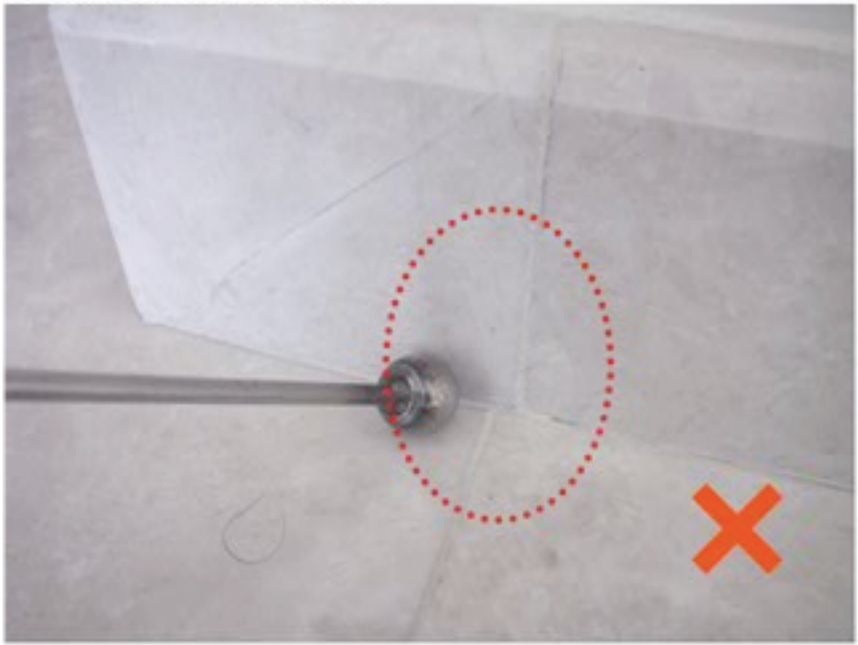


Poor pointing with excessive cement mortar filling

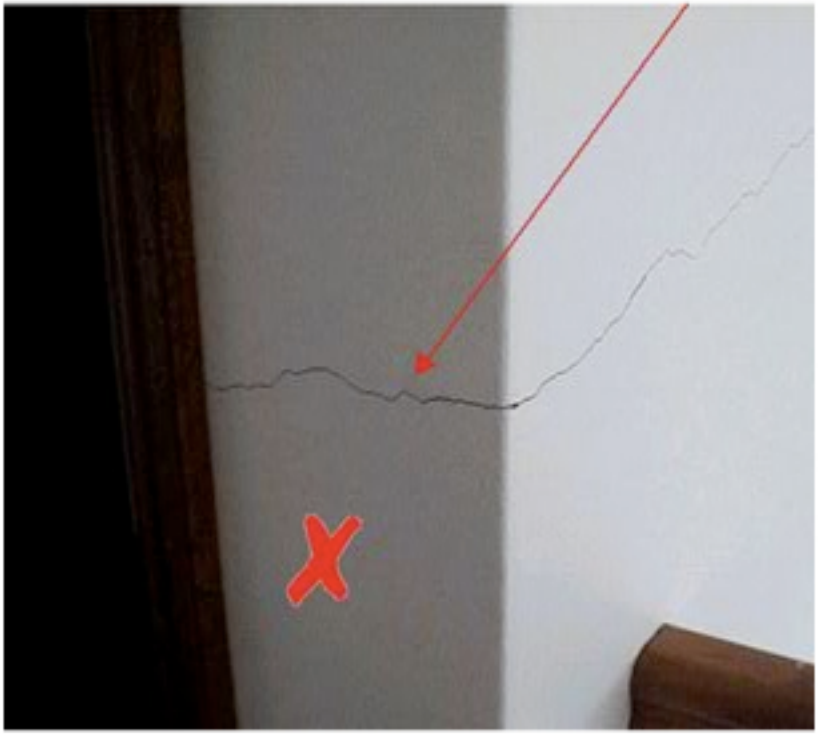
Alignment of Skirting & Floor joint

tiled finish

Non compliance on the CONQUAS assessment under floor alignment.

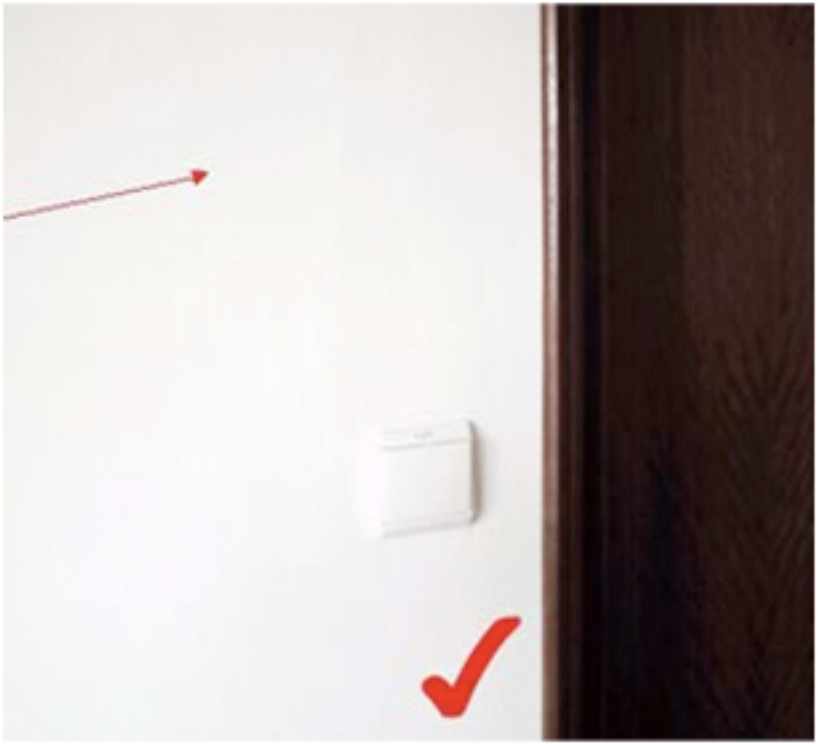


painting



See plaster finish

painting

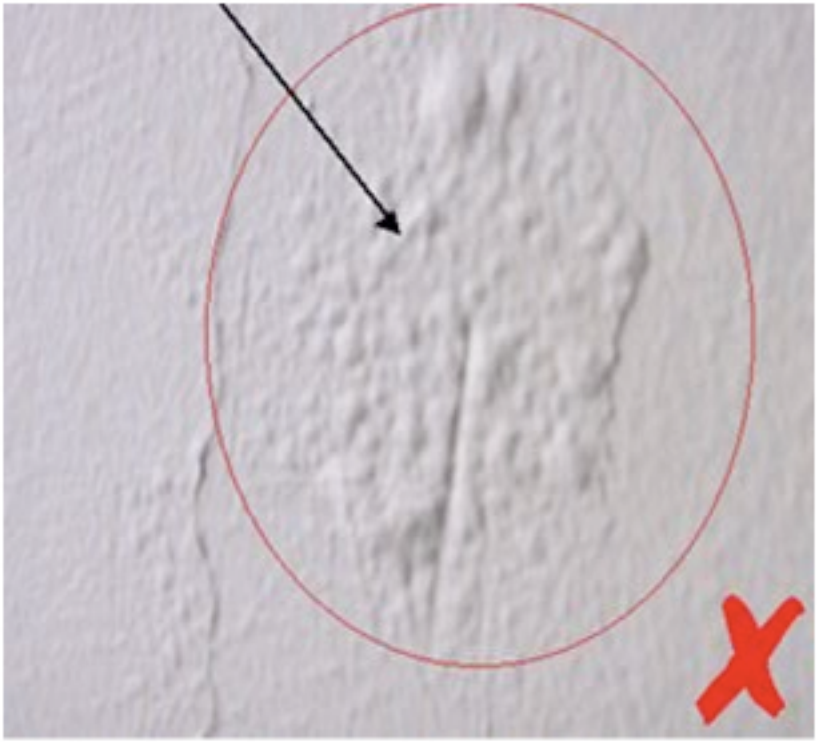


Surfaces are evenly painted

painting

Good opacity, no patchiness resulted from touch up works.

painting



Free from peeling, blister and chalkiness

6. Common Defects

A paint defect is in many cases due to a number of causes. In some cases, several defects may occur simultaneously and hinder the determination of the causes and redemption works.

To achieve good painting work, applicators and site supervisors should understand the causes and preventive measures of common defects that occur at different stages of works. They should also be familiar with the remedial measures that can be taken to rectify any unforeseen defect.

In general, paint defects can occur during:

- Paint storage;
- Application, drying and curing; and
- Service life.

Refer to Table 6.1 to 6.3 for details on the causes, preventive measures and remedial methods for these common defects.

Table 6.1 Common Defects During Paint Storage

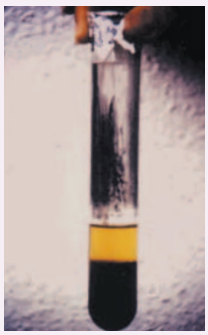
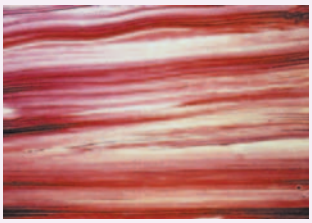
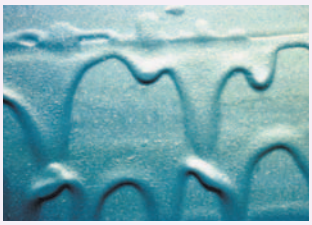
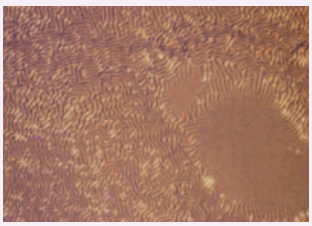
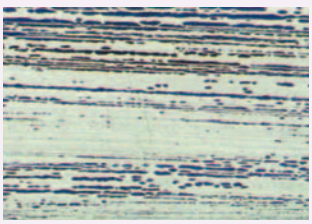
Defects	Causes	Preventive Measures	Remedial Methods
Settling Settlement of pigment to the bottom and failure to re-disperse. 	• Insufficient stirring during storage • Storage for long duration or under excessively warm condition • Excessive dilution or dilution with unsuitable materials	• Store as recommended by manufacturer • Avoid direct sunlight and long storage • Dilute with appropriate thinners as recommended by manufacturer	• Stir paint to a homogeneous consistency • Employ mechanical stirring for heavy settling • Move to appropriate storage conditions as recommended by manufacturer • Discard paint
Skinning Formation of a layer of skin on the container. 	• Use of non-airtight container • Poor formulation such as lack of anti-skinning agent • Storage under excessively warm condition	• Use airtight container • Avoid unnecessary opening of can • Store as recommended by manufacturer	• Remove the layer of skin and stir paint to homogeneous consistency • Inform manufacturer for poor formulation • Move to appropriate storage conditions as recommended by manufacturer
Gelling Decreasing viscosity caused by bacterial degradation of the protein binder or other thickening agents. This is often accompanied by an offensive odour. 	• Use of contaminated tools and water/solvents • Mixing of different brands or types of paints	• Use clean tools and water/solvents • Avoid mixing different brands or types of paints	• Discard paint

Table 6.2 Common Defects During Application, Drying and Curing

Defects	Possible Causes	Preventive Measures	Remedial Methods
Bleeding Leaching out of the existing paint film. 	• Frequent brushing on the same spot • Use of incompatible coats or thinner	• Use proper application method • Apply with appropriate coat and thinner in accordance with manufacturer's recommendation	• Allow drying before painting over with an appropriate "buffer" coat (refer to manufacturer's recommendation)
Running/ Sagging/ Curtaining Flowing or dripping of paint from upper vertical surface to the lower part forming a tear-like or wavy appearance. 	• Painting of excessively thick film layer at one time • Excessive dilution • Application of gloss paint on existing paints or surface without sanding	• Increase frequency of painting thin film • Lower dilution ratio even where operability is poor • Sand and clean receiving surface before application • Apply with appropriate coat in accordance to manufacturer's recommendation	• Remove paint film, sand, clean and re-paint as in "Preventive Measure"
Wrinkling/ Rivelling Formation of undulating wrinkling film. 	• Application of thick Oil-Alkyd, which causes shrinkage of paint film. This tends to occur when drying is expedited at high temperatures • Painting over insufficiently dried paint	• Sand and clean receiving surface before application • Apply with appropriate coat in accordance with manufacturer's recommendation • Avoid painting in thick film • Avoid accumulation of paint around bolts, angles, etc. • Observe overcoating intervals in accordance with manufacturer's recommendation	• Remove paint film, sand, clean and re-paint as in "Preventive Measure"
Crawling Slipping or inability to form a film. 	• Painting over surfaces that are not prepared, e.g. sand, dirt and dust on the surface	• Sand and clean receiving surface before application • Apply with appropriate coat in accordance with manufacturer's recommendation	• Remove paint film, sand, clean and re-paint as in "Preventive Measure"

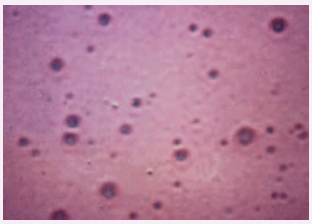
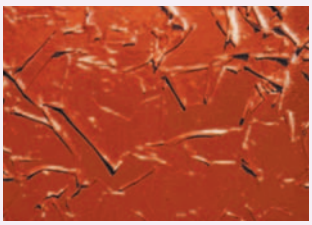
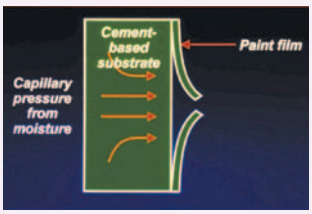
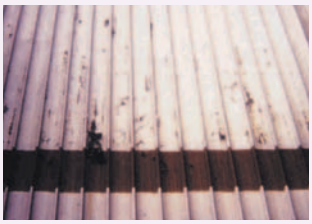
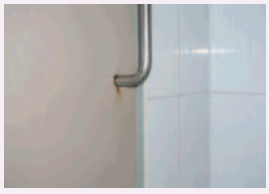
Defects	Possible Causes	Preventive Measures	Remedial Methods
Crating Formation of small bowl-shaped depressions. 	• Painting over surfaces that are not prepared, e.g. sand, dirt and dust on the surface • Use of contaminated tools and water/solvents	• Sand and clean receiving surface before application • Apply with appropriate coat as recommended by manufacturer • Use clean tools and water/solvents	• Remove paint film, sand, clean and re-paint as in "Preventive Measure"
Lifting Attacking by successive coating on existing paint. 	• Use of incompatible coats, which cause shrinkage of paint film or attacking of thinner on undercoat	• Observe overcoating intervals as recommended by manufacturer • Allow undercoating to dry before application of successive coating • Sand and clean receiving surface before application • Apply with appropriate coat as recommended by manufacturer	• Remove paint film, sand, clean and re-paint as in "Preventive Measure"
Prolonged Drying Time Inability to dry after application.	• Incorrect mixing • Use of defective paint	• Mix as recommended by manufacturer • Discard paint if it is defective	• Remove paint film, sand, clean and re-paint as in "Preventive Measure"
Loss of Gloss Reduction of lustre on drying caused by severe absorption of undercoat.	• Application on rough or unclean surfaces • Inadequate or excessive dilution • Use of unsuitable thinner • Application of excessively thin film • Result as blushing occur • Drying occurs in the presence of excessive moisture and pollutant	• Increase frequency of painting in thin film • Paint adequate thickness of film • Use appropriate thinner as recommended by manufacturer • Avoid painting at high humidity • Prepare receiving surface and apply appropriate sealer	• Remove paint film, sand, clean and re-paint as in "Preventive Measure"

Table 6.3 Common Defects During Service Life

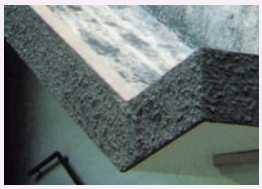
Defects	Causes	Preventive Measures	Remedial Methods
Efflorescence a) Migration of alkaline from cement based materials and crystallisation on the surface as salts.  	• Painting over insufficiently cured plaster/concrete	• Paint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)	• Remove efflorescence, unstable matters and loose paint film • Repaint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation) • Seal off with compatible alkali resisting primer before painting • In most persistent cases, epoxy-based paint has been used with good success but at a higher cost
	• Painting over substrate's hairline cracks	• Paint on substrate with cracks not visible at 1.5m away from walls	• Patch cracks • Repaint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)
	• Water seepage through roof, toilets etc	• Install proper waterproofing system before painting.	• Arrest moisture source • Prepare and treat the surface • Repaint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)
	• Rise of dampness from ground	• Install proper waterproofing system before painting	• Treat dampness • Repaint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)

Defects	Causes	Preventive Measures	Remedial Methods
b) Migration of inherent wood gum and resins in timber.	• Painting over insufficiently dried timber • Failure to use primer	• Paint on receiving surface with moisture content not exceeding 15% (or refer to manufacturer's recommendation) • Apply appropriate primer to seal the surface before painting with the undercoat and topcoat • Observe overcoating intervals in accordance with manufacturer's recommendations	• Repaint on receiving surface with moisture content not exceeding 15% (or refer to manufacturer's recommendation) • Apply appropriate primer to seal the surface before repainting with the undercoat and topcoat
c) Discolouration of paintwork on metals. 	• Failure to remove unstable matter during surface preparation	• Employ good surface preparation before painting	• Clean surface thoroughly before repainting
Deterioration / Erosion of Pigment 	• Use of vibrant colours paint with organic particles that are easily susceptible to UV degradation • Use of paint with water sensitive pigments • Use of paint with low quality emulsions	• Select colours that are more stable • Use appropriate coating system	• Remove powder and unstable matter • Repaint with appropriate coating system • Select colours that are more stable
Yellowing	• Use of paint with certain ingredients, e.g. yellowing epoxy and alkyd resins, which are easily affected by light, heat or environmental contaminants	• Use non-yellowing paints	• Prepare surface and repaint with non-yellowing paints
Saponification 	• Use of alkyd-based paints on cement based materials. The alkalis from the cement attack the oil in the alkyd resin	• Avoid using alkyd-based paints on cement based surfaces • Use appropriate coating system	• Remove paint work and repaint with appropriate system

Defects	Causes	Preventive Measures	Remedial Methods
Chalking Natural ageing of paint. The extent of chalking will depend on paint formulation and surface exposure to weather. 	• Use of non-weathering resistant paint	• Use weather resistant paint for areas exposed to weather or UV	• Prepare surface and repaint with appropriate system
Peeling & Flaking Paint a) Moisture related 	• Water seepage through roof, toilets etc	• Install proper waterproofing system before painting	• Arrest moisture source • Prepare and treat the surface • Repaint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)
	• Painting over insufficiently cured plaster/ concrete	• Paint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)	• Remove efflorescence, unstable matters and loose paint film • Repaint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)
b) Incorrect Paint System 	• Failure to use primer/sealer • Failure to use etching primer for non-ferrous metals • Use of poor alkali-resisting primer/undercoats or insufficient penetrative primer	• Prime/seal all bare surfaces with appropriate primer or sealer	• Remove all defective paint work and prepare the surface • Repaint with appropriate system
c) Poor Surface Preparation 	• Failure to remove unstable matter during surface preparation • Use of water-soluble putty/ poor adhering plaster	• Employ adequate surface preparation to remove all unstable matter • Surface must be clean, dry and stable before receiving paint	• Remove all defective and loose paint film, and unstable matter such as plaster etc • Prime/seal the surface with appropriate primer/sealer to further stabilise the surface • Re-coat with appropriate coating system

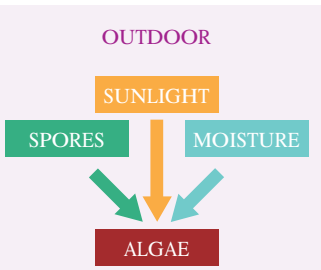
Defects	Causes	Preventive Measures	Remedial Methods
Blistering This is a moisture-related phenomenon. The amount of moisture and flexibility of the paint film determine the size of the blister. 	• Painting on a warm surface • Moisture migration through painted surface	• Paint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)	• Remove defective paint and prepare surface accordingly to receive paint • Repaint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation)
Staining It should be noted that staining may be attributed to improper design of the building and its façade. 	• Use of details that traps and accumulates dirt. Streak marks are formed when dirt gets washed down along the sides of the painted vertical walls, especially on elastomeric coated wall.	• Avoid details and coatings that trap and attract dirt	• Remove defective paint and prepare surface accordingly to receive paint • Apply with more dirt-resistant paint system
 	• Yellowish-brown stains caused by moisture • It can be an indication of waterproofing problem in other parts of the building	• Ensure all potential water leakage and condensation are in check	• Arrest moisture source. • Prepare and treat the surface. • Repaint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation). • Repaint with appropriate system.
Rust Stains   	• Corrosion of metal elements that are attached to, adjacent to or embedded in, another substrate • Installation of metal elements that are not treated	• Protect and treat all metal parts from corrosion	• Remove metal parts and treat the metal surface • Clean the walls and prepare the surface to receive painting • Repaint with appropriate system

Defects	Causes	Preventive Measures	Remedial Methods
Algae & Fungi Growth • Temperature, humidity conditions and moisture content of the surfaces/ substrates would determine the likelihood of algae and fungi formation. • On buildings, algae are generally found outdoors such as external wall surfaces, as their chlorophyll characteristic requires sufficient sunlight for growth. Whilst fungi are commonly found on internal wall surfaces of damp areas such as bathrooms. • It should be noted that algae growth may be attributed to improper design of the building and its façade.	• Moisture source and retention • Employing of details that assist growth of algae/fungi: (i) Profile of substrates; rough-textured finishes or rough concrete surfaces	• Avoid details with very rough textures or rough-cast plastered finishes • Use a more algae resistant paint to delay the onset of algae growth • Use capping and copings • Employ overhanging roofs to protect the walls	• Remove dirt and algae by high-pressure water jetting • Treat infected areas with fungicidal wash • Re-paint with a more algae resistant paint

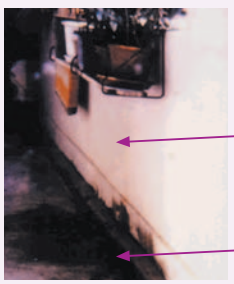


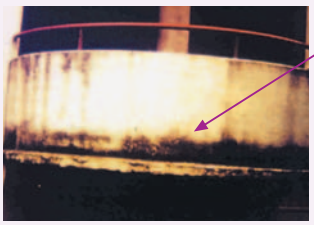
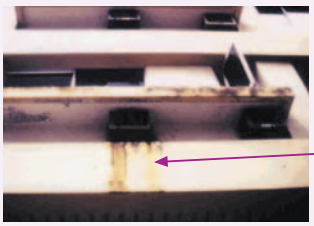
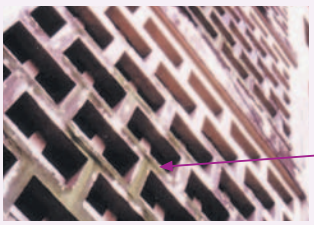
Overhanging roof details

Overhanging roof



Capping details

 	(ii) Condensation-prone walls Condensed water promoted algae growth and trapped dirt.	• Increase thickness of wall to provide more insulation so as to minimise the temperature difference • Paint on receiving surface with moisture content not exceeding 6% (or refer to manufacturer's recommendation) • Incorporate insulating material in the concrete • Apply a coating of anti-condensation paint	• Remove algae by high-pressure water jetting • Supplemented with manual scrubbing if necessary • Treat infected areas with fungicidal wash • Insulate with an anti-condensation coating • Re-paint with a more algae resistant paint • Divert condensed water from air-con outlets with trays and piping
	(iii) Concrete gutters & water-prone areas Wet area below the potted plants Scupper drains	• Ensure proper drainage • Avoid potential water retention • Use a more algae resistant paint • Ensure good workmanship	• Remove dirt and algae by high-pressure water jetting • Treat infected areas with a fungicidal wash • Re-paint with a more algae resistant paint

Defects	Causes	Preventive Measures	Remedial Methods
 	(iv)Ledges Ledges can cause back splashes by rainwater. If this rainwater is slow to run down or dry, it can create a moist surface that will induce algae growth.	• Ensure proper drainage • Avoid potential water retention • Use a more algae resistant paint • Ensure good workmanship	• Remove dirt and algae by high-pressure water jetting • Treat infected areas with a fungicidal wash • Re-paint with a more algae resistant paint
	(v) Water drainage pipes and fittings Corroded down-pipes and protruding air-conditioned units with no proper drainage pipes.	• Ensure proper drainage • Avoid potential water retention • Use a more algae resistant paint • Ensure good workmanship	• Remove dirt and algae by high-pressure water jetting • Treat infected areas with a fungicidal wash • Rectify the water drainage problem • Re-paint with a more algae resistant paint
	(vi)Precast Grille Vent Such detail allows retention of water. These surfaces are likely to be more porous too.	• Avoid porous surfaces for areas exposed to weather • If necessary, seal or waterproof porous surfaces • Use a more algae resistant paint	• Remove dirt and algae by high-pressure water jetting • Treat infected areas with a fungicidal wash • Seal and waterproof the surface • Re-paint with a more algae resistant paint to delay the onset of algae growth