TECH NOTE 1.1.3

SHOP VERSUS SITE APPLICATION

WHICH IS MORE COST EFFECTIVE?

Cost control is almost always the driver for most building-related decisions.

Therefore, many specifiers ask the question, “Would surface preparation and application of protective coatings on-site rather than in-shop save money?”

It is generally understood that in situ application will result in a poorer finish than that which can be achieved in shop. Perhaps a “less perfect” finish would still be acceptable, and achieve cost savings. The answer is an emphatic NO!

Both shop preparation and application are far more cost effective than site preparation and application, and result in vastly superior aesthetics and performance.

Abrasive blast cleaning is extremely fast and efficient but is often impractical on building sites

WHY IS IN-SHOP WORK CHEAPER?

Time is money.

Shop preparation usually employs abrasive blast cleaning, a highly effective and very fast method to achieve a uniform and clean surface with a perfect key for the new coating system to adhere to.

On-site preparation rarely allows for abrasive blast cleaning (although it can be done and some applicators specialise in the use of it); usual methods are power tool cleaning and hand tool cleaning. Not only are power tool cleaning and hand tool cleaning inadequate for removal of millscale and rust, they are also very time consuming and physically exhausting, even when doing relatively small sections. If we also take into account the fact that site rates (cost per hour) are higher than shop rates, you are looking at inferior work at a much higher cost.

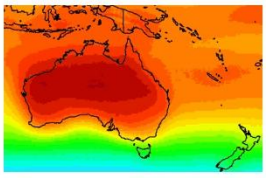
Spray painting in shop offers far greater control over environmental conditions and as well as application

Shop application is also far more cost-effective than site application as it is usually accomplished using spray equipment. Spray application is very fast. The recommended minimum film thickness can easily be achieved, and far more uniformly in the recommended number of coats. The uniformity of the dry film thickness minimises possible sites for premature corrosion.

Shop application results in far better long term performance and corrosion protection, due to the easily controlled environment in which the steel was prepared and painted, without the problems associated with air-borne salts, moisture, wind and pollution, all of which severely compromise the protective properties of the coating system due to increased likelihood of embedded contaminants and uneven film build of coating.

Shop spray application results in a superior standard of finish, as higher gloss levels can be achieved and there are far fewer airborne contaminants, such as dust, to settle on the surface.

Site preparation and application are tedious and time consuming, but sometimes you just can’t move what you are painting to your shop!



SHOP VERSUS SITE APPLICATION

Site application is usually by brush and roller, and per coat, either application is far slower than using spray equipment, and thus presents a very costly method of paint application, and particularly so when taking higher site costs into account.

Site application is usually by brush and roller, which results in a lower film build, necessitating the use of extra coats to achieve the minimum dry film thickness.

Valleys created by brush strokes or roller stipple present areas of lower film build in the paint film, presenting weak points for potential film break-down and premature corrosion.

When looking at any of the above points, it can be clearly seen that shop preparation and application are far more cost effective, offer a higher standard of finish and offer superior performance than site preparation and application.

High pressure water washing was the most practical way of cleaning the CityLink Red Sticks. Abrasive blast cleaning was out of the question!

STANDARDS AUSTRALIA AND NEW ZEALAND

In the Australian Standard AS/NZS 2312:2002, “Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings”, Section 7.6 compares the advantages and disadvantages of shop and site application. The relevant points from this standard are listed below:

ADVANTAGES OF SHOP APPLICATION

- It can provide controlled conditions for surface preparation and mixing, application, handling and curing of coatings, all of which contribute to better quality.
- There is less risk of contamination from contaminants such as smoke, dust and dirt, thus a cleaner surface for topcoating may be achieved.
- Coatings can be used which may be precluded on site due to hot, cold or wet conditions.
- It makes possible specialized coating techniques,
- Coating application is performed at ground level providing a better chance for more even coverage and better overall quality.
- Areas, which become inaccessible after erection, can be completely coated and access to awkward areas is likely to be easier.
- Without the need for scaffolding, shop application is likely to be more economical.
- Less likelihood of damage.
- Provides optimum conditions for the inspector to identify problem areas and have them corrected.
- No problems with having to work around other trades, as often happen with field painting.
- Fewer conflicts arise due to problems that may occur when different contractors carry out various stages of the work.
- Problems due to bad weather are less serious than those that occur with field application.
- There is reduced risk of problems due to overspray, such as damage to nearby cars.

The painting of the CityLink Red Sticks was a demonstration of excellent time management and painting skills

The north and west faces of a building can be significantly hotter than the south side and therefore paint will dry much faster

SHOP VERSUS SITE APPLICATION

PROBLEMS THAT CAN OCCUR WITH SHOP APPLICATION

- Limit to the size of the object that can be painted in a shop or transported to site afterward.
- Field touch-up is required to repair abraded and damaged areas at connection points. If handlers of fabricated steel do not protect coatings, a large proportion of the coating may require repair. The ease and standard of on-site repairs must be considered. Some coatings are not amenable to easy touch-up in the field and when carried out some difference in appearance of touch-up areas can be expected. Responsibility for damage of coating and repair costs need to be clearly defined.
- Field welding and other site activities may damage the shop coatings. Whenever possible, treatments should be shop applied, but if transport damage is a major concern, it may be best to specify that surface preparation, primer and intermediate coats are applied in the shop and the top coat is applied on site. Tougher coatings, such as galvanizing, inorganic zinc coatings and metal spray coatings are more resistant to damage resulting from handling and transport.

Overall, there are far more advantages to shop preparation and application than site. Why would you settle for less?

For more information, please contact the Dulux Protective Coatings Technical Consultant in your state.

Structural steel painted in shop always looks far better than when painted on site.

Site welds can be primed and painted on site without loss of aesthetics