

SHOP COAT VS FIELD COAT THE PROS AND CONS

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Abstract

There seems to be a trend for bridge owners to believe that applying all three coats of paint in the shop is more cost effective and will provide for a better coatings job on new steel. This paper will discuss the differences between shop coating and field painting and the pros and cons of shop applied coatings versus field applied coatings on new steel.

Introduction

This paper will also discuss various cost differences between shop and field painting as it pertains to new steel and we will cover two case histories of Maryland State Highway Administration jobs which had all three coats of paint applied in the shop.

Shop Painting versus Field Painting

For our discussion today we will be talking about the most widely used coating system coming out of the shop for bridge coatings, which is an inorganic zinc rich primer followed by an epoxy intermediate and polyurethane topcoat.

There are three combinations of shop and field painting:

1. Shop/Shop/Shop (with field touch-up)
2. Shop/Shop/Field
3. Shop/Field/Field

Shop/Shop/Shop

- All three coats of the specified system are applied in the shop.
- The only field work is the repair of the damaged coating.

Shop/Shop/Field

- The primer and intermediate coats are applied in the shop.
- The finish coat is applied in the field after the repair of any damaged coatings and the removal of surface contaminants.
- Additional surface preparation maybe needed to ensure finish coat adhesion or if re-coat window has been exceeded.

Shop/Field/Field

- This is the most prevalent method used.
- Only the primer coat is applied in the shop.
- The intermediate and finish coats are applied in the field after any damaged areas of the primer have been repaired and surface contaminants have been removed.
- Usually the damaged inorganic zinc primer is touched up with an organic zinc primer.
- Additional surface preparation may be needed to ensure intermediate and finish coat adhesion if contaminants are found or re-coat window has been exceeded on the intermediate coat.

Pros of Shop Cleaning & Painting

- More easily controlled atmosphere.
- Safer.
- Less contamination of blast-cleaned steel and painted surfaces.
- Less chance of other trades interfering with paint work.
- Work is usually more consistent, so the labor is more consistent, generally leading to better quality and a more consistent cost of labor.
- Easier containment of blast media and paint overspray.
- Easier access to perform cleaning, painting and inspection as most work is done on ground.
- Recycling of materials is easier at a shop facility.



Controlled Atmosphere/Blast Cleaning

Cons of Shop Cleaning & Painting

- Coatings can be damaged in shop during handling as well as in shipment and during construction. (Picture No. 3 & 4)
- Environmental regulations are more stringent for fixed work sites than construction sites.
- Storage of painted steel members is limited due to space limitations.
- Special masking must be done on faying surfaces. (Picture No. 2)
- Applying an additional coat of finish maybe needed on the fascia to give a uniform appearance after erection is complete. (Picture No. 1)

- Most fabricators do not like applying all three coats of paint. They would rather apply zinc-rich primers and then ship it.

Pros of Field Cleaning & Painting

- Coating not normally damaged during shipment.
 - No special handling or care techniques needed.
 - Zinc-rich primer coating damage during construction is easily repaired using an epoxy zinc coating with some minimal preparation work.
 - Finish coat is smooth and free of touchup marks.
- Two continuous full depth coats are being applied versus touch up coats, feathering etc.

Cons of Field Cleaning & Painting

- Controlled environment may be expensive on construction sites.
- Less accessible.
- Greater possibility for contamination of cleaned surfaces and uncured coatings.
- May have conflicts with other trades.
- Complex containment systems.

Field Painting Costs (New steel)

On average, the cost for applying two coats of paint in the field is approximately \$5.00 - \$6.00 per square foot and consists of cleaning the zinc primed steel, touching it up with an organic zinc primer, then applying a full coat of epoxy intermediate and full coat of polyurethane finish. Also included are two stripe coats and access to the area as well as all material costs. Work zone traffic control is usually done by the General Contractor but maybe done by the painting contractor on certain occasions.

Shop Painting Costs

On average, the cost for applying the primer coat in the shop is approximately \$5.00 per square foot and consists of blast-cleaning the steel and applying a full coat of inorganic zinc primer.

On average, the cost for applying all three coats of paint in the shop is approximately \$7.00 - \$8.00 per square foot and consists of blast cleaning the steel and applying a full coat of inorganic zinc, then applying a full coat of epoxy intermediate and a full coat of polyurethane finish.

Comparison of Field vs. Shop Costs

Application of Paint (Location)	Cost
Applying the primer coat in the shop (Blast & prime)	\$5.00 / sq. ft
Applying two coats of paint in the field (Clean steel & apply two coats)	\$6.00 / sq. ft
Applying three coats of paint in the shop (Blast & paint all three coats)	\$8.00 / sq. ft
Apply the primer coat in the shop (Blast & prime) & Apply two coats of paint in the field (Clean steel & apply two coats)	\$11.00 / sq. ft