Steel Road Plates & Roadway Surfaces in Work Zones

Steel plates can create differences in surface elevation and can be slippery. They can be especially hazardous to motorcycles, bicycles and pedestrians.

The transportation and construction industries are well aware of the hazards associated with the use of steel plates in roadway projects, but their use allows roadways to remain open during non-construction periods, effectively increasing the utilization of roadways.

In order to improve safety, there are a number of standards and industry documents guiding their usage in construction work zones.

Hazard Mitigation

This document provides some highlights that may be helpful in starting your investigation. If you require additional information, please contact our expert directly.

Attaching Steel Plates to the Road Surface

Steel plates must be fixed in place to avoid movement. If they are not firmly in contact with the pavement, they can rock and displace, exposing the hazard to which they were protecting motorists and pedestrians. In addition to being firmly in contact with the pavement, they should be either pinned, recessed into the pavement, or secured with asphalt wedges around the perimeter. Pinning into the pavement involves driving pins into the pavements along the edges of the steel plates to prevent movement. Recessing involves cutting out the area where the steel plate will be placed. If a 1 inch steel plate is used, the cutout will be 1 inch deep. This results in the steel plate being flush with the pavement. In addition, when multiple steel plates are used and butt up to each other, they should be welded together at the longitudinal seams.

Skid Resistance

Steel plates can be very slippery, especially when they are wet, unless they have an anti-skid coating applied. Some plates can be purchased with the anti-skid coating already applied while others will require that the user apply the anti-skid coating.

Covering steel plates with a material that increases friction helps motorcyclists and bicyclists retain control, especially in wet weather.

Conditions which reduce pavement friction in work zones are of particular concern to motorcyclists and bicycles.

Tapered Ramps

A common hazard in steel plate installations occurs when the user fails to construct properly tapered ramps from the roadway to the edges of the steel plate(s). If a taper is abrupt and steep, it can cause a hazard to motorists and pedestrians. It poses a significant hazard to motorcyclists and bicyclists who can easily lose control when they contact the abrupt/steep tapered ramp and the steel plate.

Properly tapered ramps allow users to safely cross over the steel plates.

Tapers for steel plates are normally constructed of asphalt. The taper lengths vary from State to State and generally range from 20 to 1 to 120 to 1. The U.S. Department of Transportation's Federal Highway Administration (FHWA) requires that transverse pavement joints, which result in a bump, must be tapered at 60 to 1 (5 feet horizontal for every 1 inch of vertical elevation difference).

Guidelines for Steel Plate Usage

- Select the correct size.
- Ensure adequate overlap. Normally, steel plates must extend at least one foot beyond the pavement opening onto firm ground.
- Edges must be properly secured and feathered with asphalt.
- Welding is used when more than one steel plate is used and they butt up to each other.
- Plates must be countersunk when necessary due to uneven roadways.
- Plates should be coated with an anti-skid coating.
- The edges of the steel plates should be marked/painted to improve visibility.
- Proper advance warning signs should be used. For example, "Steel Plate Ahead", or "Bump".
- Roadway and trench wall conditions must be constantly reevaluated throughout the day to ensure safety.
- Notify proper authorities of plate locations in the winter.
- End of the day inspections must be made before leaving job .

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