INGAL CIVIL PRODUCTS

A valmont COMPANY

Ingal Bridge Barriers

Rigid Barrier Protection

Product Manual

Release 01/11

www.ingalcivil.com.au

1.0 Introduction

A bridge barrier is a longitudinal structure installed to prevent an errant vehicle from running off the edge of a bridge or culvert. While this is similar to the function of a roadside longitudinal barrier, a bridge barrier is designed observing the following;

- Bridge barriers are normally designed to have virtually no deflection upon impact. They are generally constructed from metal posts and railings, concrete safety shape or a combination of both.
- Most bridge railings are an integral part of the bridge structure. They are physically connected to the bridge deck and in many cases the lower portion of the railing is part of the bridge structure concrete casting.
- The dead weight of the bridge barrier must be taken into consideration, particularly when upgrading older structures.
- The approach end of a bridge rail must be suitably transitioned or terminated to prevent vehicle pocketing or spearing.

2.0 Barrier Selection

There are a number of factors that should be considered in determining which railing is the most appropriate. These include;

- Road alignment.
- Road and site characteristics.
- Vehicle speeds and types.
- Traffic volumes.
- Consequences for both the vehicle occupants and people or property underneath the bridge affected by a vehicle penetrating the barrier.

3.0 Performance Levels

Typically, metal safety barriers are used for the construction of low, regular and medium performance level barriers. The performance levels, which are described in AS5100.1 are as follows;

3.1 Low Performance Level

Low performance level barriers are designed for the effective containment of light vehicles. These barriers are generally used for low risk sites, taking into account the speed environment, when all of the following provisions apply;

i. Bridges on roads with low traffic volumes.
ii. Bridges with low to medium height above ground or water.
iii. Bridges with an essentially straight alignment.
iv. Bridges with a width between barriers of not less than 6.5m for a 2 lane bridge or 4.0m for a single lane bridge.

A low performance level barrier is assessed to be capable of withstanding the impact conditions described in NCHRP 350 Test Level 2. These impacts are;

- 820kg car travelling at 70km/h and 20°
- 2,000kg pick-up travelling at 70km/h and 25°

3.2 Regular Performance Level

Regular performance level barriers are provided for the effective containment of general traffic on all roads.

A regular performance level barrier is assessed to be capable of withstanding the impact conditions described in NCHRP 350 Test Level 4. These impacts are;

- 820kg car travelling at 100km/h and 20°
- 2,000kg pick-up travelling at 100km/h and 25°
- 8,000kg rigid truck travelling at 80km/h and 15°

3.3 Medium Performance Level

Medium performance level barriers are provided for site-specific, medium to high risk situations for the effective containment of medium to high mass vehicles and buses on all roads.

For roads with medium to high volumes of heavy vehicles, site-specific justification shall be based on a risk assessment, with particular emphasis on third party risks for situations including, but not limited to the following;

- Bridges over major roadways.
- Bridges over high frequency passenger rail lines or goods lines carrying noxious, flammable or large volumes of freight.
- Bridges over high occupancy land use.

For roads with medium to high volumes of buses, site-specific justification shall be based on a risk assessment, with particular emphasis on the occupants of buses for situations including, but not limited to the following;

- Bridges more than 10m high.
- Bridges over water more than 3m deep (normal flow).
- Bridges over major roadways.
- Bridges over high frequency passenger rail lines or goods lines carrying noxious, flammable or large volumes of freight.
- Bridges over high occupancy land use.

A medium performance level barrier is assessed to be capable of withstanding the impact conditions described in NCHRP 350 Test Level 5. These impacts are;

- 820kg car travelling at 100km/h and 20°
- 2,000kg pick-up travelling at 100km/h and 25°
- 36,000kg articulated truck travelling at 80km/h and 15°

4.0 Typical Barrier Types

For more information

INGAL CIVIL PRODUCTS

A valmont COMPANY

contact us on the web

www.ingalcivil.com.au

Head Office: Sydney
57-65 Airds Road, Minto, NSW 2566
Ph: +61 2 9827 3333
Fax: +61 2 9827 3300
Free call (within Australia):
1800 803 795
Email: sales@ingalcivil.com.au

Our Locations:
• Adelaide • Auckland
• Brisbane • Melbourne
• Newcastle • Orange
• Perth • Sydney