

53.34 SUPPLY OF LIVESTOCK GUARDS

53.34.1 GENERAL

53.34.1.1 Description

Work consists of supplying livestock guards designed for safe passage of motor vehicles while safely prohibiting the passage of livestock.

53.34.1.2 Design Standards

The Contractor shall provide full shop drawings showing all materials, including specification and grade of steel, all material sizes and/or dimensions, and all connections, including grades and sizes of bolts and sizes of weld. Drawings shall be fully dimensioned in metric units.

Designs shall be certified by a Professional Engineer, registered in the Province of Alberta, that they meet the specified load capacity for each type of livestock guard outlined herein.

In cases in which standards are quoted, such as the Canadian Standards Association (CSA) or the Canadian Welding Bureau (CWB), the latest edition shall be used.

The Contractor shall indicate patent information and ownership, if applicable. Ownership of the registered design will remain with the vendor.

53.34.2 MATERIALS

53.34.2.1 General

The Contractor shall supply all materials required to complete the Work to the standards shown on the Department's drawings. Livestock guards shall be fabricated using new or used quality material as specified, be painted with one coat of oil alkyd type primer, and shall meet the requirements of the Canadian General Standards Board (CGSB) Spec. 1-GP-166M. Weathering steel which does not require paint, is also acceptable.

Finished products shall be identified with a trademark and the date of manufacture stamped or welded in an area of the guard that can be easily read after installation.

Fencing details, shown on the Department's drawings are for information only and, with the exception of the applicable fence post sleeves, shall not apply to this specification.

53.34.2.2 Types of Livestock Guard

The various types of livestock guards are as follows:

53.34.2.2.1 Standard Highway Type

Standard highway livestock guards are used on all paved and unpaved roads and are designed to carry legal highway vehicles at various speeds. Details are shown on drawings CB6 2.13 M5, M6, M7 and M11.

53.34.2.2.2 Range Type

Range type livestock guards are designed to be used on lightly or seldom travelled roads with no more than standard farm or ranch vehicles. Details are shown on drawing CB6 2.13 M4.

53.34.2.2.3 Off-Highway Type

Off-highway type guards are used on logging or mining access roads where the load of the vehicles can exceed the legal highway limit. There may also be frequent light or average truck/car traffic. These guards shall be constructed in accordance with the applicable drawing for the required size with the increased load ratings detailed herein.

53.34.2.3 **Load Requirements**

In all load applications, the load shall be placed on the livestock guard in a location causing the greatest stress to the member in question.

53.34.2.3.1 Live Load Requirements

Range type and standard highway type livestock guards shall meet the live load capacity requirements of CSA bridge design code S6 for design truck: normal loading CS-600 truck (180 kN axle).

Off-highway livestock guards shall meet the live load capacity requirements of CSA bridge design code S6 for design truck: log haul loading CS-750 truck (225 kN axle).

53.34.2.3.2 Impact Loading

An impact load shall be applied concurrently with the live load. The impact load for all livestock guard types shall be:

- ! a vertical load equal to 40% of the live load, or
- ! a vertical load equal to 20% of the live load combined with a horizontal load equal to 20% of the live load.

53.34.3 **PROCEDURES**

53.34.3.1 **General**

All livestock guards shall be constructed in accordance with the applicable drawings. (Skid plates are included in the drawings.)

Welding shall be performed by a company approved by the Canadian Welding Bureau to CSA Standard W47.1 with Work performed to CSA Standard W59.

53.34.3.2 **Sill and Frame Construction**

The frame shall be designed to allow even distribution of live loads to the sills. The ends of the frame which contact the road surfaces shall include a fill guard to prevent road material from falling between the deck and sills. The fill guard shall be welded to the side of the livestock guard.

No splices are permitted in supporting members.

53.34.3.3 Deck Construction

Deck construction shall consist of round structural tubing with dimensions as shown on the Department's drawings arranged perpendicular to traffic. A gusset reinforcement shall be used between each member. This reinforcement shall not permit the build-up of gravel or snow which may allow livestock to cross.

Fence post sleeves designed to accept a 60 mm outside diameter (O.D.) post shall be connected through the deck and attached to the frame at an outward 115-degree slant. The top of the sleeve shall not protrude above the deck.

Deck members shall be continuous over the length of the guard. Any splices shall develop the full strength of the member and shall be detailed on the drawings.

53.34.4 ACCEPTANCE CRITERIA

The Contractor shall supply the Engineer with the material manufacturer's certification that the material meets the Department's specifications. Generally, acceptance of the Work will be based upon the manufacturer's certification. However, the Engineer may also perform a visual inspection to determine if materials supplied and workmanship performed are in accordance with the requirements of the specifications and drawings.

53.34.5 TIME TO COMPLETE

Livestock guards shall be supplied within 60 calendar days of issuance of the Work Order.

53.34.6 MEASUREMENT AND PAYMENT

Measurement will be in metres of the width of each type of livestock guard supplied. Width will be the dimension measured across the roadway. Length will be the span of roadway covered by the guard and is usually 2.59 metres.

Payment will be made at the applicable unit price bid per metre for "Livestock Guard - Supply Range Type", "Livestock Guard - Supply Standard Highway Type" or "Livestock Guard - Supply Off-Highway Type". This payment will be full compensation for the design, certification and production of shop drawings, supply of all materials, load rating tests, supplying the livestock guards to the job site, and all labour, materials, equipment, tools and incidentals necessary to complete the Work.

53.34.7 WARRANTY

The warranty period for this Work shall be 1 year.