

To: All H.Q. Directors Prof. Services, Planning & Major Projects
All Regional Managers Prof. Services, Planning & Major Projects
All District Highways Managers

Subject: CATTLE GUARD SPECIFICATIONS, POLICY, PURCHASE

Reference: Highway Engineering Design Manual

Background:

Currently, when representatives of the Ministry of Transportation and Highways require the supply of a cattle guard, there is no process in place to guide or direct them. Ministry representatives are left to do the job as they choose. This introduces inconsistencies on a provincial scale.

The Ministry of Forests has adopted a process for the supply of cattle guards. With the issuance of this technical circular, the Ministry of Transportation and Highways is adopting the same process.

Description:

A cattle guard is a device designed to allow the safe passage of motor vehicles while safely restricting the passage of range cattle. Typically, a guard consists of a series of bars or pipes installed flush with the road surface and placed onto a supporting framework. Cattle guards have one sleeve each side to accept a sloping fence post. Optional running strips to improve rideability are installed when specified.

Cattle guards are typically 2,500 mm long and are supplied in standard widths of 3,000, 4,800, and 7,300 mm. Cattle guards are available for various loading levels, e.g., highway and off highway loading.

Procedure:

All interested suppliers of cattle guards will be required to submit full material lists and plans to the Purchasing Commission who will coordinate with the Ministry of Transportation and Highways and the Ministry of Forests for approval. This approval must be acquired before any

supplier is added to the prequalified products list. Any changes to an already approved design must be re-submitted for approval. All designs must be certified by a registered British Columbia Professional Engineer.

All suppliers shall be directed to the Purchasing Commission. Contact your Regional Design Office for design issues. The list of cattle guard suppliers is available from Wayne Peters at the Purchasing Commission (Tel: 389-3320). This list shall be included in the contract special provisions.

Ministry Contact:

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A handwritten signature in black ink, appearing to read 'E. A. Lund', with a stylized flourish at the end.

E. A. Lund, P.Eng.
Chief Highway Engineer

RGS/bbm

**CATTLEGUARD
STANDARDS AND SPECIFICATIONS
MINISTRY OF TRANSPORTATION AND HIGHWAYS
JANUARY 1994**

DESCRIPTION:

A cattleguard is a device designed to allow the safe passage of motor vehicles, while safely restricting the passage of range cattle. Typically, a guard consists of a series of bars or pipes installed flush with the road surface, installed onto a supporting framework.

All cattleguards accepted by the Ministry must conform to these requirements and specifications.

DESIGN REQUIREMENTS, MATERIAL AND PRODUCT SPECIFICATIONS

GENERAL

Cattleguard designs shall be supported by a complete set of construction drawings, showing:

- cattleguard weight(s)
- material specifications
- all dimensions
- design live load
- connection details
- material list shall accompany each design submitted for approval
- reference design codes and standards.

The drawings shall be signed and sealed by a Professional Engineer registered in British Columbia.

All designs shall be approved by the Ministry of Transportation and Highways and the Purchasing Commission before any product will be purchased. Any changes to an already approved design must be resubmitted for approval. Cattleguards shall be designed according to CAN/CSA-S6-88, using 100,000 cycles of design live loading, as described in these specifications.

All materials for cattleguards shall be new. All steel shall conform to CSA-G40.21-300W, or equivalent, minimum thickness 6 mm.

All welding shall be performed by a company approved by the Canadian Welding Bureau to CSA Standard W47.1, Division 3, with work performed to CSA Standard W59.

Finished products shall be identified with a trademark, design load and date of manufacture stamped or welded in an area of the guard that will be easily read after installation. All products shall be painted with two coats of red lead oxide paint.

SIZE

All cattleguards shall be 2500 mm long, edge to edge, on the deck surface. Overall height shall be no greater than 450 mm. Width shall be 3000, 4800 or 7300, as specified.

DECK CONSTRUCTION

The deck shall be constructed of pipes (maximum diameter 115 mm) or beams (max. flange width 50 mm) arranged perpendicular to traffic flow, with 125 - 150 mm space in between. Gussets or reinforcement between members shall not permit the build up of gravel or snow that might enhance the ability of cattle to cross.

Running strips width shall be between 38 and 50 mm and spacing between each strip shall be between 75 and 100 mm. Strips shall allow smooth passage of cars and trucks, while restricting the crossing of cattle.

For 3000 and 4800 mm widths, strips shall be installed on a single lane basis; for 7300 mm widths on a two lane basis.

A maximum of four splices are permitted on deck pipes or beams. All splices shall be reinforced with sleeves or plates (factory splices included).

Fencepost sleeves shall pass through the deck and be attached to the frame. They shall be designed to accept a 75 mm diameter fencepost at an angle of 115° from horizontal. The top of the sleeve shall not protrude above the deck.

FRAME CONSTRUCTION

The frame shall be designed to allow the weight loading incurred by the deck to be evenly distributed to sills. The ends of the frame which contact the road surfaces must include a fill guard to prevent road material falling between the deck and sills.

SILL CONSTRUCTION

The sill distributes the total load into the ground. It shall be constructed from steel sections with no less than 150 mm projected horizontal width.

Note: If channels are used in cattleguard construction, measures must be taken to avoid water, snow and dirt accumulation.

DESIGN LOADS - STANDARD HIGHWAY LOADING

The design live load shall be a tandem axle weighing 240 KN (24,500 kg). The axles within the tandem shall be spaced at 1.2m (4 ft.). Centre to centre of dual tire pairs shall be 1.8 m wide. The dual tires shall be assumed to be 0.6 m wide.

An impact load shall be applied concurrently with the live load above. The impact load 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.

The live load plus the impact loads shall be distributed 60% to one side of the vehicle and 40% to the other.

The design loads shall be placed on the cattleguard in the location(s) causing the greatest stress(es) in the members.

Running strips are optional at the request of the purchaser.

Sample Requisition/Tender Notes - Cattleguards

Sample 1 Description: Standard Highway Cattleguards
Width: 7300 mm
Running strips - 2-lane traffic

Sample 2 Description: Standard Highway Cattleguard
Width 3000 mm
No running strips

NOTE: Length of all cattleguards is standard: 2500 mm.

Running strips are optional.

Width and running strip requirements to be specified on purchase order or in tender documents.