



8505 Removable / Retractable Bollards

REVISED 25/01/2024

8505.1 Introduction

This supplementary specification applies to the supply and installation of removable / retractable bollards as detailed in the project Drawings. The bollard configuration shall take into account the proposed use.

Where the use of bollards is required to prevent vehicle encroachment into pedestrian ways or protect infrastructure from damage by vehicles these shall comply with AS2890.1 in respect of materials, location, and height.

Where the use of bollards is required to protect cyclists and pedestrians from obstacles along a pathway these shall comply with Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling

The proposed product and installation procedure are to be submitted to the Superintendent for approval prior to any works being undertaken.

8505.1.1 Definitions of Terms

This section describes any term which are specific to this specification or requires clarification due to an ambiguous understanding.

The terms used in this Technical Specification shall be as defined in Clause 2 of MRTS01 *Introduction to Technical Specifications*. Additional terms used in this Technical Specification are defined in the Table below.

Term	Definition
Bollard/s	Where detailed in this specification it is taken to mean both removable and retractable
Retractable Bollard	For the purpose of this specification to mean lockable key or tee-lok operated retractable bollards only (not including hydraulic, pneumatic, or electrical operating retraction systems) *

* These systems will be dealt with on a project basis where the design calls for these specialty retraction systems.

8505.2 Referenced Documents

This supplementary specification shall be read in conjunction with the following:

- MRS01 *“Introduction to Specifications”*;
- MRTS01 *“Introduction to Technical Specifications”*;
- MRS14 and MRTS14 *“Road Furniture”*;
- MRS04 and MRTS04 *“Earthworks General”*
- MRS50 and MRTS50 *“Specific Quality System Requirements”*
- MRS70 and MRTS70 *“Concrete”*



- AS1170.1 Structural design actions part 1: permanent and other
- Austroads Guide to Road Design Part 6A: Paths for Walking and Cycling
- AS 1428.1 *Design for access and mobility General requirements for access - New building work*
- AS 3845.1 *Road safety barrier systems and devices Road safety barrier systems*
- AS 1906.1 *Retroreflective materials and devices for road traffic control purposes*
- AS 2890.1 *Parking facilities Off-street parking*
- the Project Drawings.
- Manufacturers Specification and Installation Requirements
- MRC Std Drawing A3-00918, “Standard Bollard Removable”

8505.3 Description of Work

Work items incorporated by this supplementary specification are identified in Section 8505.6 and 8505.7 with individual activities/tasks for measurement and payment sourced from the Bill of Quantities and listed in MRC Supplementary Specification Annexure 8505_1 Removable/Retractable Bollards Section 1

8505.4 Quality Systems Requirements

8505.4.1 Std Test Methods (Testing Regime)

The following minimum testing regime applies to this specification:

Unless otherwise stated the manufacturer certification of the bollards forms the basis of the requirements.

Civil works activities associated with the floor of excavation and concrete pours shall be tested as per the relevant MRTS specification MRTS04, and MRTS70 unless otherwise approved by the Superintendent.

Where retractable bollards are installed the operational function of the retractability is to be tested as per the manufacturers specification or in the absence of detail as required by the design drawings.

8512.4.2 Hold Points, Witness Points and Milestones

The following table represents the minimum inspection requirements for this specification;

Activity	Inspection Type	When
Construction Procedure and Traffic management plan (with TGS’s) and other submissions as required by Clause 8512.5	Milestone	4 Weeks prior to works commencing
Approval of bollard type and installation procedure.	Hold Point	Prior to procuring bollards and sleeves
Arrangements made for locks and keys	Hold Point	Prior to contractor requiring to lock bollards in place
Inspection of materials and documentation	Hold Point	As delivered to site



Layout survey through spot marking	Hold Point	During site layout survey prior to works commencing.
Excavation Floor	Hold Point	Prior to installing bed and cage
Installation of base and rebar cage	Witness Point	Prior to insertion of the sleeve
Formwork and reinforcing prepour Inspection	Hold point	Prior to concrete pour proceeding
Bollards on correct alignment and level, and vertically plumb on all sides	Hold Point	Post pour prior to concrete setting
Approval to strip any formwork/bracing	Hold Point	72 hours after concrete pour.
Bollard inspection and testing for conformance to working operations	Hold Point	After works are complete.
Geometric survey for compliance with manufacturers specification and design drawing requirements	Hold Point	At completion of works
Works as Executed documentation	Hold Point	4 weeks prior to practical completion being requested.

8505.4.3 Construction Tolerances

Unless noted on the design drawings or otherwise approved by the Superintendent the following construction tolerances shall apply to this Specification;

The construction activity outcome shall not depart from the widths, lengths, heights, and shapes specified by design drawings and the Manufacturers Specification as applies to this specification;

- Manufacturers dimensions and tolerances for installation of Removable/Retractable Bollards.

Further tolerances specific to the project are detailed on the design drawings and are included in Clause 2 of MRC Supplementary Specification Annexure 8505_1 Removable/Retractable Bollards

8505.5 Preliminary

The Contractor is to submit or ensure the following documentation is in place 4 weeks prior to delivery or a prestart is conducted. (MILESTONE):

- The proposed product and installation/construction procedure
- Approved traffic management plan and TGS's

Other requirements unique to the project will be listed in the MRC Supplementary Specification Annexure 8505_1 Removable/Retractable Bollards (MILESTONE)

8505.5.1 Materials

The Contractor shall submit to the Superintendent the type of product proposed to be utilised, and a copy of the manufacturer's specification for that type of bollard proposed to be installed, the Superintendent shall review for the purposes of granting approval of an agreed product and installation. (HOLD POINT)

Supply of all materials to site is the responsibility of the Contractor at their cost, where items are Principal supplied the nominated storage site shall be obtained from MRC Supplementary Specification Annexure 8505_1 Removable/Retractable Bollards Section 3 and shall be the point of supply.



Unless instructed otherwise by the Superintendent existing components to be salvaged and the nominated storage site will be detailed in MRC Supplementary Specification Annexure 8505_1 Removable/Retractable Bollards Section 4. This will also include any reuse of existing items.

Padlock and key/s where required must be supplied as part of this specification. The Superintendent is to supply the contractor with the padlock and key/s as per the requirement of the asset owner at the time of the installation of the bollard/s. It is the responsibility of the Superintendent to ensure the asset owner is furnished with the key/s at the completion of the works. (HOLD POINT)

All other materials shall be supplied in accordance with their relevant specification and/or manufacturers specification and requirements.

8505.6 Construction

This section lays out the works operations with more detail based on specific requirements of this supplementary specification. Some activities may appear to include items which are stated within other specifications, the purpose is to reinforce that requirement specific to this supplementary specification.

Specific construction requirements associated with these works is detailed in MRC Supplementary Specification Annexure 8505_1 Removable/Retractable Bollards Section 5

The construction procedure for the installation of the bollards shall be in accordance with the manufacturer's specifications, and the construction procedure/s shall be submitted to the Superintendent for approval 4 weeks prior to works commencing.

8505.6.1 Work Operations

Work operations incorporated in this item will include:

a) Work operations listed in Clause 2.1.5 of MRS01 "Introduction to Specifications";

b) Supply of all materials;

All materials, plant, and labour required to carry out the works under this Specification is to be supplied by the Contractor, where the bollard/s are Principal supplied the designated storage site will be the point of supply for the purposes of this Specification.

All items shall be inspected at delivery to site prior to use. Any items which are damaged are not to be used and are to be returned to the supplier. (HOLD POINT)

c) Existing bollard removal (as required)

The removal of existing bollards and footing shall be carried as required out prior to spot marking of the new bollard/s. The Contractors chosen method of removal will be such that any impact on surrounding environment is minimised. Unless otherwise approved by the Superintendent existing holes are to be backfilled and compacted prior to site location approval of the new bollard/s.

Existing bollards to remain or salvaged are identified on the design drawings or as directed by the Superintendent. Refer to MRC Supplementary Specification Annexure 8505.1 for details of Removable/Retractable Bollards for items to remain or be salvaged and the storage site location.

Disposal of any demolished bollards and their footings not requiring storage or reuse shall be disposed of by the contractor at their cost to the nearest MRC waste disposal transfer station.

d) Site layout with Superintendent



The final location of the bollards is to be marked out on site and shall be inspected and approved by the Superintendent prior to excavation commencing. (HOLD POINT)

e) Carrying out excavations;

Excavation of material to level and grade as per MRC Standard Drawing A3-00918 and design drawings, vertical tolerances shall not exceed the manufacturers specification, in the absence of detail the tolerance shall not exceed +5mm/-10mm.

Horizontal tolerances shall not exceed the manufacturers specification and the design drawings. Where a straight line of bollards are installed the set out shall be such that when a string line is placed along the face of the bollards no bollard is out of alignment by more than 5mm's

The excavated hole is to be inspected for areas of unsuitable material. If unsuitable material is identified this is to be removed and replaced with approved material as per the instructions of the Superintendent. (HOLD POINT)

f) Utilising or disposing of excavated material;

Excess excavated materials shall be disposed of by the contractor or utilised as per Superintendents instructions. Material stockpiled shall ensure that all Environmental ESC measures are in place and maintained.

g) Bottom of Excavations

All loose material is to be removed from footing hole. The sides of the excavated hole are to be vertical and stable.

The excavated floor preparation is to be carried out as per MRC Standard drawing A3-00918 and is to be presented for inspection by the Superintendent with inspections, geotechnical testing and geometric requirements in accordance with MRTS 04 unless stated otherwise in MRC Supplementary Specification Annexure 8505_1 Removable/Retractable Bollards. (HOLD POINT)

h) Installation of bollards, in accordance with details provided on the project Drawings, and to the manufacturer's specification and Superintendent's approval; and

Prior to the installation of any bollard the base is required to be installed and compacted to allow drainage of the bollard and sleeve and a rebar cage installed to support the sleeve for the bollard. (WITNESS POINT)

All concrete works associated with the footings shall be carried out in accordance with MRTS70, MRC standard drawings, the design drawings, and the manufacturers specification, where conflict exists the manufacturers requirements and specification will take precedence, with inspections, geotechnical testing and geometric requirements applying unless stated otherwise in MRC Supplementary Specification Annexure 8505_1 Removable/Retractable Bollards. (HOLD POINT)

Prior to the concrete setting the bollards installed shall be surveyed and checked for alignment, level, and vertically plumb to ensure no movement has occurred. Any movement will require rectification to ensure the finished bollards meets the requirements of the design drawings, manufacturers specification, and Australian Standards. (HOLD POINT)

Removable Bollard – installed at the location and as per the dimensional details of the design drawings and to the manufacturers specification. The sleeve is to be concreted in place to ensure the bollard is vertically plumb on all sides and to the level as required by the design drawings and the hinged plate allows locking of the bollard and covers the bollard sleeve top flush with the surrounding surface without creating a trip hazard.



Retractable Bollard - installed at the location and as per the dimensional requirements of the manufacturers specification. The sleeve is to be concreted in place to ensure the bollard is vertically plumb on all sides and to the level as required by the design drawings and be able to accommodate the bollard so when it is fully retracted is level with the surrounding surface without creating a trip hazard.

All bollards installed shall be generally of a smooth surface and free of protruding elements or elements which may introduce snag or spearing hazards to passing cyclists, pedestrians or people using personal mobility devices (HOLD POINT?).

Concrete curing is to commence directly after the concrete pour has begun to set, where the work operations utilises formwork for the purpose of bracing and holding in place the sleeve (and bollard) this must not be removed for a minimum of 72 hours after pouring of the concrete unless otherwise approved by the Superintendent. (HOLD POINT)

i) Testing for conformity with construction procedures and specifications.

All bollards are to be tested to ensure they have set solidly and no movement occurs as required by the manufactures specification. This includes the ease of removal and insertion, and the ease of retraction and extraction. (HOLD POINT)

A geometric survey of the installations will be required to ensure location of bollards are as required by the design drawings and manufacturers tolerances. (HOLD POINT)

j) Clean up of Site

Any disturbed areas are to be backfilled, turfed, and made good. The site is to be cleaned of all debris, excavated material, and construction materials

8512.7 Post Construction

Items which close out the project, and readies the project for Practical Completion inspection

a) Collection and submission of all As Constructed data including QA data requirements.

Contractor is to supply and submit Works as Executed documentation as required by *MRC D20 - Drawings and Documentation* for approval by the Superintendent 4 weeks prior to requesting a practical completion inspection. (HOLD POINT)

Certification of works shall be submitted with the “Works as Executed” Plans and documentation.

Format of submitted “As Constructed” documentation shall be compliant with MRC Supplementary Specification 8919.

8505.7 Measurement and Payment

Provision for these works shall be included in the scheduled unit rate for the items shown in Clause 8505.3 of this Supplementary Specification and Annexure. No separate payment will be made for the works specified in this Supplementary Specification. Any works associated with replacement of non-conforming material and/or construction procedures shall be at no cost to the Principal.

Version Control:

Version	Description	Reviewed / Endorsed	Date
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2.0	Review of Specification	C. Sultana	25.01.2024