

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENANCE
November 2010

Index	Page
R65.1	SCOPE OF MAINTENANCE WORKS 2
R65.3	DEFINITIONS 2
R65.4	REQUIREMENTS 2
R65.4.1	General 2
R65.4.2	Steel Beam Safety Barrier 2
R65.4.3	Prestressed Wire Rope Safety Barrier 3
R65.4.4	Post and Cable Delineation Fence 3
R65.4.5	Guideposts and Delineators 3
R65.4.6	Signs 3
R65.4.7	Pavement Markings 4
R65.4.8	Disposal of Material 4
R65.5	PERFORMANCE criteria 4
R65.5.1	Road Safety Barrier 4
R65.5.2	Guideposts and Delineators 5
R65.5.3	Signs 7
R65.5.4	Pavement Marking 8
R65.5	MEASUREMENT AND PAYMENT 9
R65.6.1	Steel Beam Safety Barrier 9
R65.6.2	Prestressed Wire Rope Safety Barrier 10
R65.6.3	Post and Cable Delineation Fence 10
R65.6.4	Guideposts and Delineators 10
R65.6.5	Replacement of Missing/Damaged Guide Posts 10
R65.6.6	Cleaning and Straightening of Signs and Sign Posts 11
R65.6.7	Installation, Relocation and Removal of Signs 11
R65.6.8	Replacement of Worn Pavement Markings 11
R65.6.9	Replacement of Ineffective or Missing RRPMs 12

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENACE
November 2010

R65.1 SCOPE OF MAINTENANCE WORKS

This Specification sets out the requirements for

- The maintenance of Road Safety Barrier including repairs or replacement of damaged or missing components.
- The replacement of damaged or missing posts and caps / reflectors for Prestressed Wire Rope Safety Barrier.
- The maintenance of Post and Cable Delineation Fence including repair and replacement of non-salvageable components.
- The maintenance of guideposts including cleaning, repair or replacement of existing damaged posts and/or delineators.
- The maintenance of signs including cleaning, repairs, replacement, relocation and straightening of signs, posts and / or components and the removal of illegal signs.
- The maintenance of pavement marking including, replacement of worn or missing pavement marking components.

R65.2 REFERENCES

- This Specification shall be read in conjunction with the following Standard Specifications:
- G1 – General Provisions/MG1 Maintenance General Provisions
- G2 - Contract Management Plan/MG2 Maintenance Contract Management Plan
- G3 – Traffic Management
- R61 – Road Safety Barrier Systems
- R62 – Guide Posts and Delineators
- R63 – Signs
- R64 – Pavement Marking

R65.3 DEFINITIONS

Steel Beam Safety Barrier – A structure comprising steel W-beam, Thrie beam profile or steel box beam and stiffner rails supported on steel “C” posts to AS3845.

R65.4 REQUIREMENTS

R65.4.1 General

Road furniture shall be maintained such that it does not form a safety hazard to motorists.

All detritus and debris resulting from damage or reinstatement shall be removed and disposed of in an appropriate manner.

R65.4.2 Steel Beam Safety Barrier

Materials and replacement or repair of components shall be in accordance with *Standard Specification R61 Road Safety Barrier Systems*.

Where minor damage to the galvanised coating exists it shall be repaired using a cold galvanising paint approved to Australian Paint Approval Scheme specification APAS 0014/1.

The alignment and level of replacement guardrail shall tie in with the existing lengths and shall appear by eye to be straight or a true curve as appropriate.

R65.4.3 Prestressed Wire Rope Safety Barrier

Materials and replacement or repair of components shall be in accordance with *Standard Specification R61 Road Safety Barrier Systems*.

Where more than 10 consecutive posts have been damaged and replaced, the tension in each wire rope shall be checked after the remedial works. Where the tension is less than 2 tonne, the rope shall be re-tensioned in accordance with the manufacturer's instructions.

Repairs to damaged posts shall be made using new materials.

Post caps shall be glued and riveted to posts on one side only, or tied to the top wire to prevent loss.

At least every two years the tension in each wire rope shall be checked. Where the tension is less than 2 tonne, the rope shall be re-tensioned.

R65.4.4 Post and Cable Delineation Fence

Materials and replacement or repair of components shall be in accordance with *Standard Specification R61 Road Safety Barrier Systems*.

Post and cable fencing shall be maintained with taut cables such that they do not represent a safety hazard to motorists.

The Contractor shall undertake the repair work in accordance with the Standard Drawing. Care shall be taken to ensure that cable clamps are installed with the crown of the U on the tail of the cable. Joints in the cable shall be by loops around thimbles, not a linear splice using cable clamps.

Posts and delineators shall be replaced when they are damaged, ineffective or destroyed. The approach fencing shall tie in with the existing and shall appear by eye to be straight or a true curve as appropriate.

R65.4.5 Guideposts and Delineators

All materials shall be supplied and installed in accordance with *Standard Specification R62 Guide Posts and Delineators*.

Guideposts and delineators shall be replaced when they are damaged, ineffective or destroyed. Damaged corner cube reflectors may be replaced with class 1A reflective material of the same size.

Guideposts shall be maintained in a presentable condition, vertical, and with functioning delineators.

Dirt and grime on guideposts and delineators shall be removed by washing to maintain their appearance and effectiveness.

Damaged or missing Road Crash Markers, indicating injury crashes and fatal road crashes, shall be reported to the Superintendent.

R65.4.6 Signs

All materials shall be supplied and installed in accordance with *Standard Specification R63 Signs and the Standard Drawings*.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENACE
November 2010

Signs shall be maintained in a legible condition, vertical, and at the correct angle to suit their use.

Soil, grime and graffiti on signs shall be removed by washing, with products approved by the manufacturer, to maintain effectiveness and appearance.

R65.4.7 Pavement Markings

All materials shall be supplied and installed in accordance with *Standar Specification R64 Pavement Marking*.

Pavement markings shall be maintained in a legible condition to ensure their effectiveness and appearance.

R65.4.8 Disposal of Material

All material to be disposed of shall become the property of the Contractor unless otherwise stated in the Specification. The Contractor shall arrange suitable off-site disposal areas for all such material. All such material including detritus and debris shall be removed and disposed in accordance with all relevant legislation and Standard Specifications G1 General Provisions/MG1 Maintenance General Provisions and G2 Contract Management Plan/MG2 Maintenance Contract Management Plan.

R65.5 PERFORMANCE CRITERIA

R65.5.1 Road Safety Barrier

The performance of the Road Safety Barrier shall be measured according to the following criteria.

Road safety barrier shall provide safe control and redirection of errant vehicles.

Road safety barrier shall provide clear and aesthetic delineation of the road in day and night conditions.

Bridge barrier shall be fit for purpose.

R65.5.1.1 Maintenance in Construction Contracts

The intervention levels and the condition following treatment are set out in *Table R65.1 Intervention Levels Safety Barrier Systems Construction Contracts*.

Table R65.1 Intervention Levels Safety Barrier Systems Construction Contracts

ROUTINE MAINTENANCE TREATMENT	INTERVENTION LEVEL	MINIMUM CONDITION AFTER TREATMENT
Damaged posts	Any damaged missing or ineffective posts	Rope tensioned to functional state with no noticeable sag. No noticeable deviations in the alignment of the barrier.
Damaged components	Barrier or fence components not satisfying design function	No damaged components.
Wire Rope fence or barrier	Fence or Barrier wire rope sagging between posts	Rope tensioned to functional state with no noticeable sag.
Damaged bridge fence	Fence components not satisfying design function	Repaired or replaced damaged components.

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENANCE
November 2010

R65.5.1.2 Network Maintenance Contracts

The intervention levels and the condition following treatment are set out in Table R65.2 Intervention Levels Safety Barrier Systems Network Maintenance Contracts.

Table R65.2 Intervention Levels Safety Barrier Systems Network Maintenance Contracts

ROUTINE MAINTENANCE TREATMENT	INTERVENTION LEVEL	MINIMUM CONDITION AFTER TREATMENT
Damaged posts	As specified in the Contract	Rope tensioned to functional state with no noticeable sag. No noticeable deviations in the alignment of the barrier.
Damaged components	As specified in the Contract	No damaged components.
Wire Rope fence or barrier	As specified in the Contract	Rope tensioned to functional state with no noticeable sag.
Damaged bridge fence	As specified in the Contract	Repaired or replaced damaged components.

R65.5.2 Guideposts and Delineators

The performance of the Guideposts and Delineators shall be measured according to the following criteria:

Guideposts shall provide clear and aesthetic delineation of the road in day and night conditions to assist in the regulation and safe and efficient movement of road users.

R65.5.2.1 Maintenance in Construction Contracts

The intervention levels and the condition following treatment are set out in Table R65.3 Intervention Levels Guideposts and Delineators Construction Contract.

Table R65.3 Intervention Levels Guideposts and Delineators Construction Contracts

ROUTINE MAINTENANCE TREATMENT	INTERVENTION LEVEL	MINIMUM CONDITION AFTER TREATMENT
Guide Posts Cleaning	<p>(a) Guideposts generally untidy throughout a link through build-up of mildew, moss or grime that is noticeable from a distance of 10 m away.</p> <p>(b) One particularly unsightly guidepost.</p> <p>(c) On unsealed roads posts to be cleaned annually in spring</p>	<p>(d) All guideposts within the link to be cleaned and the overall appearance returned to an acceptable level.</p> <p>(e) Unsightly guide post to be cleaned.</p>

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENACE
November 2010

Guide Posts Replacement	Any missing or damaged guide posts adjacent to a culvert. Any guide posts missing on curves with an advisory speed sign. Less than four posts visible (two on either side of the road) at any location. All other missing or damaged guide posts.	Replace all missing posts
Guide Posts Resetting	Guidepost varies from standard height by more 100 mm or is displaced by 15° from vertical	Guideposts reset and straightened
Guide Posts Painting	10% of the painted post surface area is peeling or is not suitable for cleaning	Guideposts repainted or replaced
Delineators	Any missing or damaged delineators Adhesive delineators shall be replaced when the reflectivity falls below the levels specified for signs Class 1A facing material or more than 20% of the area of the reflector is damaged or missing.	Delineator's replaced
Delineators Replacement	Ineffective reflectivity by night time inspection; or CIL less than 50% of AS1906.2 new reflective properties	Delineator's cleaned or replaced
Road Crash Markers	Any missing or damaged Road Crash Markers	Reported to Superintendent

R65.5.2.2 Network Maintenance Contracts

The intervention levels and the condition following treatment are set out in Table R65.4 Intervention Levels Guideposts and Delineators Network Maintenance Contracts.

Table R65.4 Intervention Levels Guideposts and Delineators Network Maintenance Contracts

ROUTINE MAINTENANCE TREATMENT	INTERVENTION LEVEL	MINIMUM CONDITION AFTER TREATMENT
Guide Posts Cleaning	(f) As specified in Contract	(g) Guideposts to be cleaned and the overall appearance returned to an acceptable level.
Guide Posts on Unsealed Roads (Cleaning)	As specified in Contract	Guideposts to be cleaned and the overall appearance returned to an acceptable level.
Guide Posts (Replacement)	As specified in Contract	All missing or damaged posts

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENACE
November 2010

		replaced
Guide Posts (Resetting)	As specified in Contract	Guideposts reset and straightened
Guide Posts Painting	As specified in Contract	Guideposts repainted or replaced
Delineator Replacement	As specified in Contract	Delineator's cleaned or replaced
Road Crash Markers	As specified in Contract	Reported to Superintendent

R65.5.3 Signs

The performance of the Signs shall be measured according to *Table R65.5 Sign Performance Reflectivity*.

Signs shall provide clear messages to motorists in day and night conditions.

Signs shall be scheduled for replacement so that the reflectivity of the facing material remains above the following minimum CIL levels when measured at an entrance angle of 40 and an observation angle of 0.20.

Table R65.5 Sign Performance Reflectivity

Colour	New / Minimum CIL/m2			
	Class 1A or 1W	Class 1	Class 2A	Class 2
White	800 / 400	250 / 200	140 / 70	85 / 45
Yellow	660 / 330	170 / 135	100 / 50	50 / 25
Red	215 / 100	45 / 36	25 / 12	16 / 8
Standard Green	90 / 45	24 / 20	18 / 9	8 / 4
Brown	-	20 / 15	5 / 2	4 / 2
Blue	41 / 20	12 / 10	9 / 4	7 / 3

R65.5.3.1 Maintenance in Construction Contracts

The intervention levels and the condition following treatment are set out in *Table R65.6 Intervention Levels Signs Construction Contracts*.

Table R65.6 Intervention Levels Signs Construction Contracts

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENANCE
November 2010

ROUTINE MAINTENANCE TREATMENT	INTERVENTION LEVEL	MINIMUM CONDITION AFTER TREATMENT
Sign Straightening and Slippage	Leaning from vertical or rotated from correct position by 10°	Reinstated to correct position
Sign Cleaning	Any particular ineffective sign noticeable from a distance of 10 m away	Clean sign
Sign Damaged	Sign missing, illegible or destroyed	New sign
Sign (Loss of Reflectivity)	Sign has deteriorated due to loss of reflectivity below levels stated above or the sign facing has lost colour or crazed	New sign
Illegal Sign	Illegal sign in road reservation	Sign removed and stored for 7 days prior to disposal

R65.5.3.2 Network Maintenance Contracts

The intervention levels and the condition following treatment are set out in *Table R65.7 Intervention Levels Signs Network Maintenance Contracts*.

Table R65.7 Intervention Levels Signs Network Maintenance Contracts

ROUTINE MAINTENANCE TREATMENT	INTERVENTION LEVEL	MINIMUM CONDITION AFTER TREATMENT
Sign Straightening and Slippage	As specified in Contract	Reinstated to correct position
Sign Cleaning	As specified in Contract	Sign cleaned or replaced
Warning, Hazard and Regulatory signs – missing, vandalised or damaged.	As specified in Contract	New sign
Warning, Hazard and Regulatory signs – loss of reflectivity.	As specified in Contract	New sign
Illegal Sign	As specified in Contract	Sign removed and stored for 7 days prior to disposal

R65.5.4 Pavement Marking

The performance of the Pavement Marking shall be measured according to the requirements of this clause.

Pavement markings shall provide clear guidance to motorists in day and night conditions.

Pavement markings shall be scheduled for replacement in accordance with the minimum levels in *Table R65.8 Pavement Marking Reflectivity*.

Table R65.8 Pavement Marking Reflectivity

Reflectometer	New / Minimum mcd/lux/m ²	
	Road Category 1 & 2	Road Category 3, 4 & 5
MX30	300 / 120	200 / 100

DEPARTMENT of INFRASTRUCTURE, ENERGY and RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENANCE
November 2010

Laserlux 6	300 / 120	200 / 100
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Note:

Measurements with the manual instrument to be the average of 6 readings, 3 in each direction, over a 1 m line length.

R65.5.4.1 Maintenance in Construction Contracts

The intervention levels and the condition following treatment are set out in *Table R65.9 Intervention Levels Pavement Marking Construction Contracts*.

Table R65.9 Intervention Levels Pavement Marking Construction Contracts

ROUTINE MAINTENANCE TREATMENT	INTERVENTION LEVEL	MINIMUM CONDITION AFTER TREATMENT
Pavement Markings are ineffective	Markings have deteriorated due to loss of reflectivity or traffic wear, below levels stated in Table 9	New Pavement Markings complying with Specification R64
RRPMs – missing or damaged	2 or more RRPMs missing or damaged within a 100 m length of pavement markings	RRPMs replaced in accordance with Specification R64
RRPMs – ineffective due to loss of reflectivity.	Ineffective reflectivity identified by night inspection or CIL measured at less than 50% of AS1906.3 new reflective properties	RRPMs replaced in accordance with Specification R64

R65.5.4.2 Network Maintenance Contracts

The intervention levels and the condition following treatment are set out in *Table R65.10 Intervention Levels Treatment Network Maintenance Contracts*.

Table R65.10 Intervention Levels Treatment Network Maintenance Contracts

ROUTINE MAINTENANCE TREATMENT	INTERVENTION LEVEL	MINIMUM CONDITION AFTER TREATMENT
Pavement Markings	As specified in Contract	Pavement Markings reinstated in accordance with Specification R64
RRPMs Replacement	As specified in Contract	RRPMs replaced in accordance with Specification R64

R65.5 MEASUREMENT AND PAYMENT

All rates shall include the cost of traffic management.

R65.6.1 Steel Beam Safety Barrier

R65.6.1.1 Maintenance in Construction Contracts

Payment shall be based on the relevant Scheduled Rate and shall include the supply of plant, labour, materials and the removal and disposal/storage of old parts. Payment for the maintenance management of road furniture shall include damage to: post, components, wire fence or barriers and bridge fences.

R65.6.1.2 Network Maintenance Contracts

Payment shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract and shall include the supply of plant, labour, materials and the removal and disposal/storage of old parts.

R65.6.2 Prestressed Wire Rope Safety Barrier

R65.6.2.1 Maintenance in Construction Contracts

Payment for replacement of posts and post caps and re-tensioning of wire ropes shall be made at the relevant Schedule of Rates items. The rates shall include the supply of all labour, plant and materials and the removal and disposal/storage of the old parts necessary to undertake these works. The rate for replacement of post caps shall include gluing and riveting the cap to the post or otherwise securing it in place. The rate for replacement of posts shall include the post cap and delineators.

R65.6.2.2 Network Maintenance Contracts

Payment for replacement of posts and post caps and re-tensioning of wire ropes shall be made in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract. The rates shall include the supply of all labour, plant and materials and the removal and disposal/storage of the old parts necessary to undertake these works. The rate for replacement of post caps shall include gluing and riveting the cap to the post or otherwise securing it in place. The rate for replacement of posts shall include the post cap and delineators.

R65.6.3 Post and Cable Delineation Fence

R65.6.3.1 Maintenance in Construction Contracts

Payment shall be based on the tendered rate in Schedule of Rates for each different part (or sub-assembly) and shall include the supply of plant, labour, materials and the removal and disposal / storage of old parts.

R65.6.3.2 Network Maintenance Contracts

Payment shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract and shall include the supply of plant, labour, materials and the removal and disposal / storage of old parts.

R65.6.4 Guideposts and Delineators

R65.6.4.1 Maintenance in Construction Contracts

Payment for cleaning, painting washing and straightening of guideposts and the replacement of missing/damaged Delineators shall be included in the Contract Sum and shall include the supply of all plant, labour and materials to perform these activities.

R65.6.4.2 Network Maintenance Contracts

Payment for cleaning, painting washing and straightening of guideposts and the replacement of missing/damaged Delineators shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract and shall include the supply of all plant, labour and materials to perform these activities.

R65.6.5 Replacement of Missing/Damaged Guide Posts

R65.6.5.1 Maintenance in Construction Contracts

Payment for installation of guideposts shall be based on the rate per unit quoted in the Schedule of Rates. The rate shall include the cost of the supply of all materials, attachment of delineators, installation of the post and disposal of surplus material.

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENACE
November 2010

Payment for removal and disposal of existing guideposts shall be based on the rate per unit quoted in the Schedule of Rates. The rate shall include the removal and disposal of the guidepost, and the supply, placement and compaction of backfill material for the remaining hole.

R65.6.5.2 Network Maintenance Contracts

Payment for installation of guideposts shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract schedule. The rate shall include the cost of the supply of all materials, attachment of delineators, installation of the post and disposal of surplus material.

Payment for removal and disposal of existing guideposts shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract schedule. The rate shall include the removal and disposal of the guidepost, and the supply, placement and compaction of backfill material for the remaining hole.

R65.6.6 Cleaning and Straightening of Signs and Sign Posts

R65.6.6.1 Maintenance in Construction Contracts

Payment for cleaning and straightening of signs and sign posts shall be included in the Contract Sum and shall include the supply of all plant, labour and materials to perform these activities.

R65.6.6.2 Network Maintenance Contracts

Payment shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract and shall include the supply of all plant, labour and materials to perform these activities.

R65.6.7 Installation, Relocation and Removal of Signs

R65.6.7.1 Maintenance in Construction Contracts

Payment shall be in accordance with the rates in the Schedule of Rates and shall include the supply of all plant, labour and materials to perform these activities.

R65.6.7.2 Network Maintenance Contracts

Payment shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract and shall include the supply of all plant, labour and materials to perform these activities.

R65.6.8 Replacement of Worn Pavement Markings

R65.6.8.1 Maintenance in Construction Contracts

Payment for replacement of pavement markings shall be included in the Contract Sum, for construction project maintenance periods, and shall include the supply of all plant, labour and materials to perform these activities.

R65.6.8.2 Network Maintenance Contracts

Payment for replacement of road markings shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract Schedule and shall include the supply of all plant, labour and materials to perform these activities.

DEPARTMENT *of* INFRASTRUCTURE, ENERGY *and* RESOURCES
TASMANIA
ROADWORKS SPECIFICATION
R65 – ROAD FURNITURE MAINTENACE
November 2010

R65.6.9 Replacement of Ineffective or Missing RRPMs

R65.6.9.1 Maintenance in Construction Contracts

Payment shall be included in the Contract Sum, for construction project maintenance periods, and shall include the supply of all plant, labour and materials to perform these activities.

R65.6.9.2 Network Maintenance Contracts

Payment shall be in accordance with the relevant clauses and attachments in the Basis of Payment section of the Contract and shall include the supply of all plant, labour and materials to perform these activities.