Everything on the road and beside it.

Inspection Test Plan – Steel Beam Guard Fence

COMPANY		PROJECT	
ITP NO		LOT NO	
DESCRIPTION			

PM	PROJECT MANAGER	QR	QUALITY REPRESENTATIVE	SUB	SUBCONTRACTOR	H	HOLD POINT	PC	PRINCIPAL CONTRACTOR
PE	PROJECT ENGINEER	SUR	SURVEYOR	NA	NOMINATED AUTHORITY	W	WITNESS POINT	SE	SITE ENGINEER
SUP	SUPERVISOR	ER	ENVIRONMENTAL REPRESENTATIVE	IR	INDEPENDENT REVIEWER	R	REVIEW POINT	GE	GEOTECHNICAL ENGINEER

The content of this ITP is to be read in conjunction with the relevant IFC Drawings, RMS Roads Specifications, RMS Standard Details & the PSDR.

SEQUENCE OF ACTIVITIES		SPECFICATION / REFERENCE DOCUMENT	ACCEPTANCE CRITERIA	TEST REQUIREMENT & FREQUENCY	RESPONSIBLE PERSON / METHOD	VERIFICATION					RECORDS	COMMENTS
						SE/SUP PE	SUB	NA	PC	IR		
1.0	**Preliminary**											
1.1	Authorised documentation for commencement of Work is in place	Construction Work pack	Construction Work pack approved	**REVIEW POINT** Each Lot	SE Review Document						Construction Work pack No ……	
1.2	Occupational Health & Safety, Environmental Control	Site Induction Record, Environmental Management Plan, Quality Management Plan, SWMS, JSA	All personal working on the lot are site inducted as per the induction requirements in the Construction Health & Safety Management Plan &/or construction procedure. All environmental controls in place & operational & all work methods are approved.	**REVIEW POINT** Each Lot	SE Review Document							
1.3	Define Work Lot	Construction Quality Management Plan	Survey boundaries clearly define the Steel Beam Guard Fence Construction works. Work Lot open	**REVIEW POINT** Each Lot	SE Review						Lot Diagram Lot Number ……	
1.4	Permit to Excavate	SWMS /R132D Planning 4.1	Excavation Permit issued prior to commencement of any excavation	**REVIEW POINT** Each Lot	SE Review						Excavation Permit No.: ……	
1.5	Material Compliance – Steel	RMS132 2.3 compliance	Submit to the Nominated Authority all test certificates related to the supply of steel for the Works at least 14 days prior to commencement of installation. All testing shall be endorsed in accordance	**HOLD POINT** **WITNESS POINT** **REVIEW POINT**	NA IR SE						**HOLD POINT NO.:** …… Compliance test certificates including compliance for galvanised	

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			with the NATA registration for that lab.	Each Lot	Review Document Notification						products	
1.6	Material Compliance – W-beam Base Metal Mechanical Properties	R132 2.4 Steel	W-beams to meets requirements of AS/NZS 1594 Grade HA350. Mechanical Properties of Base Metal: • Min. Yield Strength 350MPa • Min. Tensile Strength 430MPa • Min. Elongation in 80mm 16%	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Review Document Notification						**HOLD POINT NO.:** ..... Compliance test certificates	
1.7	Material Compliance – W-beam Base Metal Dimensional Tolerances	RMS132 2.4 Steel	The base metal shall comply with the following tolerances when measured in accordance with the methods of AS/NZS 1365 • Base metal thickness 2.7mm +0.21mm or -0.10mm • Mill tolerance on strip width +2.5mm, -0.0 • Mill camber tolerance on 2500mm length 10mm max	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Review Document Notification						**HOLD POINT NO.:** ..... Compliance test certificates	
1.8	Material Compliance – Steel Posts & Blocks	RMS123 2.4 steel	Manufactured from steel which meets AS/NZS 1594 Grade HA250 • Base material thickness shall be 6.0mm +/-0.27mm	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Review Document Notification						**HOLD POINT NO.:** ..... Compliance test certificates	
1.9	Material Compliance – Terminal Sections	RMS132 2.4 steel	Manufactured from steel which meets AS/NZS 1594 Grade HA350	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Review Document Notification						**HOLD POINT NO.:** ..... Compliance test certificates	
1.10	Protective Treatment -	RMS 2.4.3 protective coating	• AS 1627 - Parts 1 & 4 & finished by hot-dipped galvanising in accordance with	**HOLD POINT**	NA						**HOLD POINT NO.:**	

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	Galvanising		AS/NZS 4680. • Hot-dipped galvanised coating on Bolts, Nuts & Washers shall comply with AS 1214 • Repairs to a damaged galvanised coating to be done with Zinc Rich Inorganic Paint with a minimum of 2 coats in accordance with AS 3750.9 & one coat of aluminium paint. • All galvanised coatings shall be smooth, adherent & free from stains, gross surface imperfections, markings, brand names &/or inclusions. Appearance is of prime importance & colour shall be uniform. • Where curved W-beam of less than 45 m curve radius is specified, the curving operation shall be carried out off site in a manner that will not result in damage to the galvanising.	**WITNESS POINT** **REVIEW POINT** Each Lot	IR SE Review Document Notification						Compliance test certificates 58519-QUA-LIS-00-00021 Incoming Material Inspection Checklist	
1.11	Timber - Compliance	RMS 132 2.10 AS1604.1	• All timber shall be straight & sound • Timber posts & blocks shall be seasoned timber dried to equilibrium moisture content & sawn from species complying with Class 1 or 2 durability & stress grading • Free from shakes, pipes, cores, flaws & other imperfections • The timber shall be sawn parallel to the grain, & exposed knots shall be sound, tight, well-spaced & shall not exceed 25 mm in size in any face	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Review Document Notification						**HOLD POINT NO.:** Compliance test certificates 58519-QUA-LIS-00-00021 Incoming Material Inspection Checklist	
1.12	Material Compliance – Breakaway Cable Terminal	RMS132 2.4.5 wire rope	The wire rope shall comply with the requirements of AS3569 & the details shown on IFC Drawings. Wire ropes used in proprietary devices must comply with the manufacturer's recommendations.	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Review Document Notification						**HOLD POINT NO.:** Compliance test certificates	
1.13	Handling & Storage	QMP 13.1.3	• Items are loaded, transported, unloaded, stacked & handled in such a way to protect items from distortion & that galvanised surfaces are protected from damage.	**REVIEW POINT** Each Lot	SE Inspection							

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			• All materials stored to prevent damage & corrosion at least 200 mm above the ground on platforms, slabs or other supports. • Rusted, bent or damaged steel shall be rejected. • If stacks located behind a serviceable road safety barrier system, the clear space must allow for dynamic deflection & proper functioning of the end treatments.									
1.14	Pre-Construction Planning	R132/D planning QMP 13.2	• Plan & execute the work in a manner that prevents damage to underground & above ground facilities. Construct a guard fence to form a smooth line vertically & horizontally, when viewed along the line of the installation, free of humps, sags, or other irregularities, within tolerances (Activity 4.1). • Any component of a guard fence must not be welded, or flame cut in the field under any circumstances. Welding & flame cutting may only be conducted when shown on drawings in accordance with the manufacturer's recommendations. • End treatments & transitions commissioned at the earliest practicable time where the guard fence is being constructed on a road open to traffic. Temporary end treatments to the satisfaction of the Nominated Authority until the permanent treatments are complete. • Removal of an existing installed safety barrier system includes: o Dismantling or demolition of safety barriers, transitions & end treatments o Extracting all posts, anchors & other in-ground components & materials o Removing all components & waste materials from the site o Cleaning, backfilling & mechanically compacting all excavations & holes in 150mm layers to not less than the density of the surrounding layers o Stacking or disposing of components & waste materials	**REVIEW POINT** Each Lot	SE Inspection							

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1.15	Delineators	R132/A 1.21 4.1 R0710-18	• Delineators to be as per RMS Roads Supplement to AS 1742.2 Clause 4.2.5.4(b). • Flexible plastic mounting brackets fitted with 100 cm2 of Class 1A retro- reflective material, as defined in AS/NZS 1906.2.	**REVIEW POINT** Each Lot	SE Review Document						Compliance test certificates	
1.16	Material Inspection	QMP 13.6	Ensure that materials are in compliance with RMS Roads specifications & IFC Drawings	**REVIEW POINT** Each Lot	SE Review Document Inspection						58519-QUA-LIS-00-00021 Incoming Materials Inspection Checklist	
2.0 Guard Fence Post Installation												
2.1.	Set Out	RMS132 4.1.2	Prior to installation, the required location & length of all guard fence to be confirmed with the Nominated Authority.	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Inspection Notification						**HOLD POINT NO.:**	
2.2.	Posts – Installation	R132 4.2.1	• Installed to a depth not less than shown on IFC drawings • Posts orientated to the direction of traffic as shown on drawings • Posts shall not be damaged during driving • Posts in rock - 75mm clearance from back of post to face of the hole • Posts shall be installed such that the back of post is not less than 500 mm from hinge point.	**REVIEW POINT** Each Lot	SE SUR Inspection						Survey Set-Out SUR Signature:	
2.3.	Posts – Backfilling	R132 3.3	• Posts in rock – Except for anchorage posts, post holes backfilled with a granular material • Other post holes backfilled with selected earth, free of rock • Backfill shall be firmly compacted not exceeding 100mm compacted layers • Posts in paved areas shall be backfilled 50mm below underside of such paving & remaining depth filled with paving material	**REVIEW POINT** Each Lot	SE Inspection							

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2.4.	Post – Foundation	R132 3.3	• Foundation displacement at ground level not to exceed 3 mm when a 1 kN force is applied 200 mm below the top of the post in any direction • Any failing post shall be rectified & retested plus one similar post within 5m.	**REVIEW POINT** Each Lot	SE Inspection						Foundation Test results	
2.5.	Non-Standard Post Lengths	RMS132/ C2 4.1	• Where non-standard post lengths or other special measures are required (e.g. Shallow Concrete Foundations), details to be provided to the Nominated Authority. • Where shallow foundations that require a concrete ground beam are proposed to be constructed, the design shall be proof engineered by a RMS Roads pre-qualified consultant.	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Inspection Notification						**HOLD POINT NO.:**	
3.0 Guard Fence Installation												
3.1	Guard Fence/Rail - Installation	RMS132 4.0	• Guard fence shall be installed at the offsets shown on Standard Drawing SD 3502 • Guard Fence/Rail sections lapped so that the exposed ends face away from near sided approaching traffic • Edges of guardrail fixed in contact with post or post blocks • All bolts fully tightened • Posts attached to bridges or culverts shall be bolted to supporting members as shown on drawings • Where radius of curvature is 45m or less, guardrail sections shall be curved to shape prior to delivery to site. • End treatments constructed in accordance with the drawings	**HOLD POINT** **WITNESS POINT** **REVIEW POINT** Each Lot	NA IR SE Inspection Notification						**HOLD POINT NO.:** ..... Bolt Tensioning Records	
3.2	End Treatments	RMS132 4.0	• During installation of wire ropes in the end treatments of W-beam, ensure that no twisting of the rope occurs. • The anchorage cable shall be tightened sufficiently to remove slack. • When rope assemblies are used, the nuts at each end of the rope shall be tightened to a minimum torque of 50 Nm on the assemblies or as per the manufacturer's	**REVIEW POINT** Each Lot	SE Inspection							

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			requirements									
3.3	Height of guard fence/Rail	RMS132.4.5	• Top of Rail shall be within 25mm of the specified level • Rail shall be within 50mm of the specified line • Variations in line & level shall not occur at a rate exceeding 15mm in any 5m length Notwithstanding the above, the line & level shall be adjusted to provide a smooth & even vertical & horizontal alignment.	**REVIEW POINT** Each Lot	SE Inspection						As-built survey & tabulations verifying compliance	
3.4	Motorcyclist Safety		Where specified, steel rub rail or other proprietary under-run systems, as listed in RDN 06-04 to be at attached to Guard Fence on nominated sections of barrier as shown on the drawings only.	**REVIEW POINT** Each Lot	SE Inspection							
3.5	Installation of Delineators	R132/A 1.21 4.1 R0710-18	• Red delineators on the left side of one-way & two-way roadways; • White delineators on the right side of two-way roadways; and • Yellow delineators on the right side of one-way roadways • Delineators not required where Guard Fence offset is greater than 4 m from the traffic lane. • White guide posts with delineators shall be installed in accordance with RMS Roads Supplement to AS 1742.2 Clause 4.2.4 – Guide Posts.	**REVIEW POINT** Each Lot	SE Inspection							
3.6	Concrete maintenance strips	Tfnsw3204	Concrete maintenance strips beneath all steel beam guard fence railing shall meet the following requirements: • 300 mm clear of the rear of the post & 300 mm clear from the face of w-beam • Bedding to be 75mm thick of class 3 crushed rock • Concrete shall be 75mm thick & 20MPa Strength • Edges of infill boarded up prior to pour • Edge board shall be parallel with steel beam guard rail fencing	**REVIEW POINT** Each Lot	SE Inspection						Material compliance records – concrete strength	

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			• Surface finished with a wooden float to produce a lightly textured finish • Shall be constructed with a minimum 2% cross fall away from the road & shall be flush with the adjacent ground level so the finished level does not impede road runoff • Where maintenance strip is adjacent to kerb or pavement, cork expansion joint or approved alternative shall be placed in between kerb / pavement & infill area									
3.7	Concrete Infill adjacent to kerb or pavement	Tfnsw3204	• Edges of infill area to be boarded up prior to placing concrete to ensure smooth edges are produced. • Concrete infill can use low strength concrete (<0.85 MPa).	**REVIEW POINT** Each Lot	SE Inspection							
3.8	Expansion Joints perpendicular to the line of Guard Fence	TfNSW3204	An expansion joint shall be provided perpendicular to the line of the steel beam guard rail fence 200mm each side of every post using cork expansion joint or an approved alternative.	**REVIEW POINT** Each Lot	SE Inspection							
4.0 Completion												
4.1	Guard Fence Tolerances	RMS132 4.5	The guard fence shall be installed at the positions so confirmed & shall be constructed true to line & level & to the following tolerances: i. Variation from true plan position of posts ±20 mm ii. Variation of line of w-beams from specified vertical profile ±10 mm iii. Variation of w-beams from specified horizontal alignment ±20 mm iv. Variation of posts from vertical (measured at top of the post) ±15 mm v. Orientation of block &/or post to w-beam+0 mm, -15 mm measured at the point of greatest offset between the block or post to the w-beam) vi. Dimension of holes -0 mm, +50 mm vii. Top of bolt head relative to w-beam -0 mm, +5 mm	**REVIEW POINT** Each Lot	SUR Inspection Review Document						Survey Conformance Report SUR Signature ……	
4.2	Safety Barrier	QMP14.	After Completion, arrange for a safety barrier compliance audit on all proprietary guard	**HOLD POINT**	NA						**HOLD POINT NO.:**	

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	Compliance Audit		fence end treatments constructed under the Contract. The audit shall be undertaken, & a report prepared by the Australian Licensed Supplier of the safety barrier system. In addition, complete & submit to the Nominated Authority compliance certificates for review.	**WITNESS POINT** **REVIEW POINT** Each Lot	IR SE Inspection Review Document Notification						…… Compliance Audit & Certificate of Compliance	
4.3	Reinstated Works	RMS specification	All existing signs & markings, median crossings & existing vegetation removed due to Guard Fence installation shall be reinstated.	**REVIEW POINT** Each Lot	SE Inspection							
5.0 Work Lot Close out												
5.1	Test Reports	RMS132 / C2 2.3	All Test reports received & Reviewed	**REVIEW POINT** Each Lot	PE Review Document						NATA Endorsed Test Reports	
5.2	Product Non-Conformance	QMP	All Product Non-Conformance(s) recorded & closed (if applicable)	**REVIEW POINT** Each Lot	PE Review Document						NCR No: …… …… NCR reports	
5.3	Quality Representative to check the above criteria and records to confirm	QMP Lot Records	All above criteria met & records identified attached.	**REVIEW POINT** Each Lot	QR Review Document						Completed Checklist (if applicable) & reports & other compliance records attached.	

ITP COMPLETION

COMPANY	**PROJECT REPRESENTATIVE**	NAME		SIGNATURE		DATE	
COMPANY	**QUALITY REPRESENTATIVE**	NAME		SIGNATURE		DATE	