Part Four Maintenance/ Activity Matrices

Queensland Government
Department of Main Roads

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1.0 General

This section lists and describes the Maintenance Activity Numbers relating to the various repair and maintenance options described in Part 3. These item numbers are based on the component codes given in the BIM and in general replace previously used RMPC numbers.

The RMPC items covering bituminous wearing surface have been retained at this time. Appendix A summarises the various Maintenance Activity Numbers and notes which previous RMPC items have been superseded.

2.0 Maintenance Activities

The following sections 2.1 to 2.20 list the various activities under Maintenance Activity Numbers which provide a description, unit of measurement, coverage, intervention level and hold point requirements. Significance ratings and maintenance priority numbers are also provided, under the following definitions:-

Significance Rating:

This is a 1-4 rating that reflects the structural importance of a bridge component. For example , a girder is rated at 4 and a kerb would be rated at 1. These ratings have been defined by BAM and placed in the BIS for use in the maintenance prioritisation tool "Whichbridge", and so don't need further consideration.

These rating numbers reflect the fact that the SR = 4 members are generally a higher maintenance priority than SR = 1 members from a structural and load carrying perspective. Refer to Component Matrix in Part 3 of BIM for values.

Maintenance Priority

This is the inspector's subjective assessment of the urgency of remedial action or further investigation to address an identified defect. This priority, with a range of 1-4, will be determined by the nature, severity and extent of the defect as well as the significance rating. For MP, Priority = 1 is the highest priority. It is recommended that inspectors assess the urgency of required maintenance actions and complete this field when completing a list of maintenance activities. Note that the values of Maintenance Priority given in the following matrices are representative only and should be adjusted for a particular situation.

Intervention Levels

The Intervention Levels shown for the various activities are generally those defining a condition State 4 defect, i.e. generally member replacement is necessary at this level of deterioration. For timber girders, corbels and piles, deterioration in excess of Condition State 4 indicates the member as critical and requires immediate replacement (or strengthening for corbel snipes).

Priorities for replacing members will have to be determined by ID, based in part, on Whichbridge prioritisation.

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2.1 Wearing Surface 105 - Patch potholes with asphalt 110 - Surface correction with premix or asphalt 118 - Seal coating 120 - Fill Cracks 142 - Temporary Pavement repairs	**MAINTENANCE ACTIVITIES MATRIX**				**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
105*	Patch potholes with asphalt	Tonnes	*Refer to RMPC documentation for requirements	Where inspection indicates:potholes formed & holding water & allowing water penetration of the WS	*Refer to RMPC	2 or 3	2
110	Surface correction with premix or asphalt	Tonnes	"	Rutting holding moisture & allowing water penetration, or large surface depressions	"	2 or 3	2
118*	Seal coating	M2	"	Skid resistance of surface reduced due to polishing	"	2 or 3	2
120*	Fill cracks	Litres	"	Cracking holding water & allowing water penetration, or crazed cracking There may be medium cracking in WS over joints between ply sheets	"	2 or 3	2
142*	Temporary pavement repairs	Tonnes	"	Spalling of concrete in concrete overlay	"	2 or 3	2

MP = 2 or 3 (Medium) - wearing surface defects allow water penetration to lower timber components while surface roughness increases dynamic traffic loads on the bridge.

2.1 Wearing Surface 157 - Excavate & replace asphalt, full depth		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
157*	Excavate & replace asphalt, full depth	Tonnes	* Refer to RMPC documentation for requirements	Where inspection indicates:- Extensive potholes, rutting, bumps & depressions having marked effect on rideability. Severe cracks over buried joints (including ply sheet joints) Severe cracks, debonding & loss of sections having marked effect on rideability & drainage.		2 or 3	

MP = 2 or 3 (Medium) - wearing surface defects allow water penetration to lower timber components while surface roughness increases dynamic traffic loads on the bridge.

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2.2 Barriers **2T1 - Replace timber post**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
2T1	Replace timber post	Each	This item cover all work operations and materials associated with the replacement of timber posts used in bridge barriers or for guide posts. Timber shall be supplied to the requirements of MRS 11.87. The dimensions of new posts shall correspond to those of the posts to be replaced. Work operations covered include removal of defective posts, cutting and installation of new post, removal & replacement of bolts & painting of new post. Where bolts are reusable, they shall be covered by 120S2 - where new bolts are required, supply shall be covered by 120S8. All contact surfaces between post & rail or kerbs/girders shall be painted with an anti-fungal preservative (100T1) and a preservative grease applied (100T2). New posts shall be painted (100T4).	For barriers & guidepost, inspection indicates that there is:- 1. Moderate to heavy decay in post 2. Medium to heavy splitting or cracking in post 3. Noticeable to major impact damage to post		2	1

MP = 2 (Medium) - damaged or deteriorated posts will further reduce restraint capacity of on already low containment capacity timber barrier, while delineator posts are necessary for structure definition.

2.2 Barriers **2T2 - Replace timber rail**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
2T2	Replace timber rail	M	This item covers all work operations and materials associated with replacement of timber rail components used in timber bridge barriers. Timber shall be supplied to the requirements of MRS 11.87. The dimensions of new rails shall correspond to these of the rails to be replaced. Work operations covered include removal of defective railing, cutting & assembly of new railing, removal & replacement of bolts, and painting of new railing material. Where bolts are reusable, they shall be removed and replaced to the requirements of 120S2. Where new bolts are required, supply shall be covered by 120S8. All contact surfaces between rail & posts shall be painted with an anti-fungal preservative (100T1) & a preservative grease (100T2). New rails shall be painted (100T4). Where extensive railing damage has occurred, consideration should be given to use of a more substantial barrier such as steel barrier because of the low containment capacity of timber railing.	Inspection indicates that there is :- 1. Moderate to heavy decay in rail. 2. Medium to heavy splitting or cracking in rail. 3. Noticeable to heavy impact damage to rail	Contact ID to determine if replacement of railing in timber is acceptable or substitution of an alternative type of barrier is required (District policy)	2	1

MP = 2 (Medium) - damaged or deteriorated railing will further reduce restraint capacity of an already low containment capacity timber barrier.

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2.2 Barriers **2T3 - Replace timber barrier with steel bridge rail**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
2T3	Replace timber barrier with steel bridge rail	M	This item covers all work operations and materials associated with the removal and replacement of an existing timber bridge barrier with a steel guardrail barrier. The new guardrail shall be supplied and installed to the requirements of MRS 11.14. Work operations include removal of existing barrier including disposal, and installation of new posts and guardrailing. New post bolts shall be supplied to the requirements of 120S8.	Where programmed repair work on timber barrier components is required, consideration should be given to replacement of the barrier with new steel guardrail.	Unless this operation is carried out under District Policy, submit proposal for new guardrail to ID for approval.	2	1

MP = 2 (Medium) - Substitution of a steel barrier will reduce safety concerns associated with timber barriers.

2.2 Barriers **2S1 - Replace steel guardrail**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
2S1	Replace steel guardrail	M	This item covers all work operations and materials associated with the replacement of existing steel guardrail in steel barriers on timber bridges. New guardrail shall be supplied and replaced to the requirements of MRS 11.14. Work operations covered include removal of damaged components including disposal, and supply and installation of new components. Where bolts are reusable, they shall be removed and replaced to the requirements of 120S2. Where new bolts are required, supply shall be covered by 120S8. Where new timber or steel posts are required, they shall be supplied to the requirements of 2T1 or 2S2. If missing,packers shall be placed between rail and posts to the requirements of 2S5.	Inspection indicates:- Severe corrosion of steel rails, or severe accident damage to the rail		2	1

MP = 2 (Medium) - damaged or deteriorated steel railing will reduce the restraint capacity of the bridge barrier.

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2.2 Barriers 2S2 - Replace steel post		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
2S2	Replace steel post	Each	This item covers all work operations and materials associated with the replacement of existing steel posts used in bridge barriers or guide posts on timber bridges. New steel posts shall be supplied to the requirements of MRS 11.78. Work operations covered include removal of damaged post, removal of attachment bolts, supply and replacement of post and assembly and tightening of bolts. Where bolts are reusable they shall be removed and replaced to the requirements of 120S2. Where new bolts are required, supply shall be covered by 120S8.	For barriers and guideposts, inspection indicates severe corrosion of the posts, or severe accident damage to the post		2	1

MP = 2 (Medium) - damaged or deteriorated steel posts on bridge barriers will reduce barrier containment capacity.

2.2 Barriers **2S3 - Relocate steel rail**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
2S3	Relocate steel rail	M	This item covers all work operations and materials associated with the re-attachment of steel railing which has broken free of the posts, as a result of accident damage or connector corrosion. Work operations covered include relocation of rail into position, including bolting. Bolts shall be removed and replaced to the requirements of 120S2. Where new bolts are required, they shall be supplied to the requirements of 120S8.	Inspection indicates steel railing has broken free of posts		2	1

MP = 2 (Medium) - a railing separated from a post will have significantly reduced containment capacity.

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2.2 Barriers 2S4 - Increase barrier height		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
2S4	Increase barrier height	M	This item covers all work operations and materials associated with the raising of the height of an existing bridge barrier because of safety concerns. Work operations covered include removal of guardrail and existing posts, placement of new posts and reassembly of steel guardrail. This work will entail placement of higher posts to achieve correct rail height using the requirements of 2T1 or 2S2. Details of proposed barrier amendments shall be supplied to ID before carrying out the job.	Inspection indicates:- that the height of an existing steel barrier rail is insufficient and cannot be rectified by removal of excessive wearing surface thickness.	Supply details of proposed barrier amendments to ID for approval	2	1

MP = 2 (Medium) - insufficient barrier height will reduce vehicle containment capacity.

2.2 Barriers **2S5 - Place post packer**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
2S5	Place post packer	Each	This item covers all work operations and materials associated with the placement of a packer between posts and steel guardrail where the packers has not been installed. Refer to Figure 3.2(a) (Part 2) for details of packers. Work operations cover release of guardrail bolts, insertion of packer, placement and tightening of bolts. Where new bolts are required, they shall be supplied to the requirements of 120S8 and installed to the requirements of 120S2.	Inspection indicates that packers are not in position between steel guardrail and the supporting posts.		3	1

MP = 3 (Medium) - the capacity of steel barrier is reduced if packers are absent as the posts may be more easily snagged by an impacting vehicle.

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2.2 Barriers 72S1 - Replace guardrail section		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
72S1	Replace guardrail section	M	This item covers all work operations and materials associated with the replacement of a damaged segment of approach guardrail as a result of impact damage or because of corrosion of the guardrail. New guardrail shall be supplied and replaced to the requirements of MRS 11.14. Work operations covered include removal of damaged components including disposal and supply & installation of new components. Where bolts are re-usable, they shall be removed and replaced to the requirements of 120S2. Where new bolts are required, supply shall be covered by 120S8.	Inspection indicates that the guardrail member has rusted through, or has sustained heavy impact damage or has been demolished.		3	1

MP = 3 (Medium) - damaged approach guardrail reduces the safety of traffic use due to reduced vehicle containment.

Note: This Activity may be considered interim until completion of the Bridge Maintenance Manual.

2.2 Barriers 72S2 - Add posts		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
72S2	Add posts	Each	This item covers all work operations and materials associated with the strengthening of approach guardrail by placing additional posts adjacent to a bridge abutment. New steel posts shall be supplied to the requirements of 2S2 & shall include packers. New bolts shall be supplied to the requirements of 120S8. Work operations covered include supply and installation of new posts, and drilling and installation of bolts.	Inspection indicates that post spacing in approach guardrail is greater than 1 metre close to the bridge or posts are generally greater than 2 metres apart.		3	1

MP = 3 (Medium) - additional posts will reduce lateral deflections of the railings.

Note: This Activity may be considered interim until completion of the Bridge Maintenance Manual.

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2.2 Barriers 72S3 - Install guardrail		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
72S3	Install guardrail	M	This item covers all work operations and materials associated with the installation of guardrail to the approaches to a bridge, where this barrier has not been previously installed, or is missing. New guardrail shall be supplied to the requirements of MRS 11.14. Refer to Figure 3.4 (Part 2) for layout and installation detail requirements. New steel posts shall be supplied to the requirements of 2S2. New bolts shall be supplied to the requirements of 120S8. Work operations covered include supply and installation of new components, drilling and installation of bolts. Care shall be taken to ensure connection / junction with the bridge rails satisfies DMR safety requirements.	Inspection indicates approach guardrail is missing.		3	1

MP = 3 (Medium) - installation of approach guardrail will improve vehicle safety in the event of a bridge approach accident.

Note: This Activity may be considered interim until completion of the Bridge Maintenance Manual.

2.2 Barriers 72S4 - Provide connections to end post or rails		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
72S4	Provide connections to end post or rails	Lump sum	This item covers all work operations and materials associated with the strengthening of guardrail by connecting the approach guardrail to the barrier on the bridge. Where the bridge barrier is steel guardrail, direct splicing of the approach rail should be made. This may entail changing the rail height. For other bridge barrier types, refer to Structures Division for recommended connection / junction details considered to satisfy DMR safety requirements. Work operations covered include guardrail modifications as required and installation of continuity connection components.	Inspection indicates no connection between approach guardrail and bridge end post or railings	Where required, contact Structures Division to determine an acceptable junction detail at the bridge end post.	3	I

MP = 3 (Medium) - installation of a continuity connection will improve vehicle safety in the event of a bridge approach impact.

Note:- This Activity may be considered interim until completion of the Bridge Maintenance Manual.

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2.3 Kerbs **3T1 - Replace kerb in hardwood**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
3T1	Replace kerb in hardwood	M	This item covers all work operations and materials associated with the replacement of timber kerbs using hardwood materials. The supply of kerb timber shall be to the requirements of MRS 11.87. Work operations covered include removal of bolts, removal of defective kerb and disposal, placement of new kerb, rebolting and painting. The new kerb timber shall be of the same dimensions as that being replaced. The new kerb shall be aligned directly over the top of the outer girder where applicable. The butt joint between the ends of the new and existing kerbs shall have a maximum gap of 5mm. The horizontal alignment of the new kerb shall not deviate by more 10 mm from a string line on the kerb face. The top edges of the kerb shall have a 25mm chamfer to reduce splitting and splintering (as shown in Figure 4.1 (Part 2). The deck timber where the kerb is placed shall be dressed (Refer 29T1)	Inspection indicates: 1. Heavy decay 2. Heavy splits and cracks 3. Heavy crushing 4. Severe termite damage Timbers missingTimber kerbs may be placed as an alternative where concrete kerbs have severe cracking or spalling due to movement restraint, reinforcing corrosion or impact.		2 or 3	1

2.3 Kerbs Cont'd 3T1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
3T1 (Cont.)	Replace kerb in hardwood		Bolts shall be removed and replaced to the requirements of 120S2. Refer to Figure 17.1(b) (Part 2) for bolting patterns where there is to be a change from existing. The contact surface between the kerb and decking and the end grain shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2). A bituminous felt shall also be laid under the kerb before placement (100T7). Kerbs on bridges of less than 8m width shall be painted with white paint. For wider than 8 m, painting is not mandatory but is recommended both for preservation and safety reasons.				

MP = 2 or 3 (Medium) - deteriorated kerb members will reduce vehicle restraint capacity, under both direct and barrier impact conditions.

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2.3 Kerbs 3T2 - Replace kerb in ply		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
3T2	Replace kerb in ply	M	This item covers all work operations and materials associated with the replacement of existing hardwood kerbs by a ply member. This method is an alternative to replacing existing hardwood or concrete kerbs with the same material. The supply of the kerb timber shall be to the requirements of MRS 11.87. Work operations covered include removal of bolts, removal of defective kerbs and disposal, placement of new kerbs, rebolting and painting. In general, ply kerb dimensions will be different to those of the existing kerbs. Replacement with different size kerbs should be restricted to one full side or both sides of the bridge. The horizontal alignment of the new kerb shall not deviate by more than 10 mm from a string line on the kerb face.	Ply kerbs may be used as an alternative to hardwood kerbs showing 1. Heavy decay 2. Heavy splits & cracksHeavy crushing 3. Severe termite damage 4. Timbers missing Ply kerbs may be used as an alternative where concrete kerbs have severe cracking or spalling due to movement restraint, reinforcing corrosion or impact.		2 or 3	1

2.3 Kerbs Cont'd 3T2		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
3T2 (Cont.)	Replace kerb in ply		The top edges of the kerb shall have a 25 mm chamfer. The deck timber where the kerb is placed shall be dressed (Refer 29T1). Bolts shall be removed and replaced to the requirements of 120S2. Refer to, Figure 17.1(b) (Part 2) for bolting patterns where there is to be a change from existing. Large size washers shall be used for bolts where nuts and heads bear on the ply surface, using minimum sizes as shown in Figure 17.1(b). The contact surfaces between the kerb and decking shall be treated with an anti-fungal preservative and preservative grease (100T1 and 100T2). A bituminous felt shall also be laid under the kerb before placement (100T7). The ends of the ply shall be treated with an end sealant (100T5), before assembly. Kerbs on bridges of less than 8 m width shall be painted with white paint. For wider than 8 m, painting is not mandatory but is recommended both for preservation and safety reasons.				

MP = 2 or 3 (Medium) - deterioration kerb members will reduce vehicle restraint capacity, under both direct and barrier impact conditions.

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2.3 Kerbs **3C1 - Replace kerb in concrete**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
3C1	Replace kerb in concrete	M	This item covers all work operations and materials associated with the replacement of an existing concrete kerb by a cast in-situ concrete kerb member. Refer to Figure 4.2 (Part 2) for general kerb details. Work operations covered include removal of bolts, removal of defective kerb, forming, placing of new reinforcing, casting of new kerb and rebolting and painting. The new kerb shall be to the same dimensions as that being replaced. The supply and replacement of concrete shall be to the requirements of MRS 11.70. Bolts shall be removed and replaced to the requirements of 120S2. The butt joint between the segments of kerbing shall be formed with tarred paper or other similar product. The contact area of the top surface of timber decking shall be treated with an anti-fungal preservative before kerb casting (100T1). Kerbs on bridges of less than 8m width shall be painted with white paint. For wider than 8 m, painting is not mandatory but is recommended for safety reasons.	Inspection indicates: 1. Severe cracking or spalling due to movement restraint 2. Severe cracking or spalling due to reinforcing corrosion 3. Severe cracking or spalling due to impact.		2 or 3	1

MP = 2 or 3 (Medium) - deteriorated kerb members will reduce vehicle restraint capacity, under both direct and barrier impact conditions.

2.4 Deck 20T1 - Replace ply sheet		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T1	Replace ply sheet	M^2	This item covers all work operations and materials associated with the replacement of existing ply decking with new "Bridgewood" ply sheets. All ply shall be installed to conform to the manufacturers requirements. Similarly, all bolts shall be supplied an installed in accordance with the manufacturer's requirements. Supply of ply components shall be to the requirements of MRS 11.87. Work operations covered include removal of overlying wearing surface, lifting of kerbs, removal of defective ply decking, placement of new ply sheets, drilling and re-bolting, replacement of kerbs and wearing surface. Extreme care shall be exercised during removal of wearing surface from the existing ply decks to prevent accidental damage to the softwood sheets. The plywood sheets shall be installed to form a uniform top surface without any discontinuities. Sheets may require to be packed with CCA treated timber to provide a uniform surface. Where existing bolts or brackets are re-usable but are not galvanised, they shall be hot dip galvanised to the requirements of the Australian Standards shown on the drawings.	Where inspection indicates:-1. Severe rotting with some lamination rotted out 2. Surface damage to upper ply laminations due to wheel abrasion.	If existing deck cantilever exceeds maximum shown in Figure 5.2(a). Part 2 (600mm or 450mm for 155 or 130mm thickness), advise I.D. and BAM.	2	3

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2.4 Deck Cont'd 20T1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T1 (cont.)	Replace ply sheet		Large size washers shall be used for bolts where nuts or heads bear on the ply surface - refer Figure 5.2(a) (Part 2) for washer dimensions. A timber drip strip shall be attached to the outer soffit edge of sheets - refer to Figure 5.2(b). Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between the ply and spiking plank, kerb and girder (100T1 and 100T2). A bituminous felt (100T7) shall also be placed at those surfaces. The exposed ends of the new ply sheets shall be coated with an end sealant (100T5). Before replacement of wearing surface over new sheets, a bituminous prime coat shall be applied - refer to Figure 5.2(b). Where cutting of thick ply is required, care shall be exercised to clear the assembly self-drilling screws (exposed on top surface).				

MP = 2 (Medium) - deteriorated ply sheet failure may lead to wheel break through and vehicle drop.

2.4 Deck 20T2 - Replace deck planks in ply		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T2	Replace deck planks in ply	M^2	This item covers all work operations and material associated with the replacement of existing decking (hardwood, steel) with "Bridgewood" ply sheets. This method is an alternative to replacing existing hardwood or steel decking with the same materials. Figures 5.2(a) & (b) (Part 2) show various alternative methods of using ply decking. Approval for use of a ply decking alternative shall be obtained from ID prior to job preparation. All ply shall be installed to conform to the manufacturer's requirements. Similarly, all bolts shall be supplied and installed in accordance with the manufacturer's requirements. Supply of ply components shall be to the requirements of MRS 11.87. Supply of new bolts shall be to 120S8. Supply of attachment brackets or channel hold-downs shall be to MRS 11.78. Work operations covered include removal of wearing surface, lifting of kerbs, removal of hardwood or steel deck, placement of new ply sheets, drilling and bolting or screwing of fasteners, distributor assembly and reinstatement of kerbs and wearing surface. Where traffic is allowed to cross prior to the application of wearing surface, vehicle speeds shall be restricted to 20km/hr.	May be considered to be an option where an inspection indicates any of the following: For hardwood planks, severe cracking and weathering effecting strength, or severe rotting at kerbs, spiking planks or running planks. For steel trough decks, heavy corrosion with perforation of the sheets, failure cracks across the sheets visible, sheets separating due to failure of stitching screws.	Submit drawings of proposed details to ID. ID shall submit proposals to Structures Division for approval of details. Subsequent to job completion, the District shall change the BIS element designation to 20T. Vehicle speeds shall be restricted to 20 km/hr prior to application of wearing surface.	2	3

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2.4 Deck Cont'd 20T2		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T2 (Cont.)	Replace deck planks in ply		The plywood sheets shall be installed to form a uniform top surface without any discontinuities. Sheets may require to be packed with CCA treated timber to provide a uniform surface. Large size washers shall be used for bolts where nuts or heads bear on the ply surface - refer Figure 5.2(a) Part 2 for washer dimensions. A timber drip strip shall be attached to the outer soffit edge of sheets - refer to Figure 5.2(b) (Part 2). Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between the ply and spiking plank, kerb or girder (100T1 and 100T2). A bituminous felt (100T7) shall also be placed at these surfaces. The exposed ends of the ply sheets shall be coated with an end sealant (100T5). Where cutting of thick ply is required, care shall be exercised to clear the assembly self - drilling screws (exposed on top surface). Replacement of outer girders with larger diameters will be under 22T2. Installation of distributors shall be to the requirements of 120T1 or 130S3.				

MP = 2 (Medium) - deteriorated deck plank failure may lead to plank breakage and wheel dropping.

2.4 Deck 20T3 - Replace longitudinal deck planks in ply		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T3	Replace longitudinal deck planks in ply	M^2	This item covers all work operations and materials associated with the replacement of existing longitudinal hardwood decking with "Bridgewood" ply sheets. This method is an alternative to replacing existing hardwood decking in the same material. Figure 5.2(a) (Part 2) shows various alternative methods of using ply decking. Approval for use of a ply decking alternative shall be obtained from ID prior to job preparation. All ply shall be installed to conform to the manufacturer's requirements. Similarly, all bolts shall be supplied and installed in accordance with the manufacturer's requirements. Supply of attachment brackets shall be to MRS 11.78. Work operations covered include removal of wearing surface, kerbs and longitudinal hardwood decking, placement of ply sheets, drilling and bolting, and reinstatement of kerbs and wearing surface. Lengths of ply sheets shall be detailed so that transverse joints fall over the timber cross-beams. Some movement of cross-beams may also be required to achieve end support.	Ply longitudinal deck planks may be used as an alternative to hardwood where longitudinal decking is showing poor ends due to rotting or splitting	Submit drawing of proposed details to ID. ID shall submit proposals to Structures Division for approval of details.	3	3

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2.4 Deck Cont'd 20T3		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T3 (Cont.)	Replace longitudinal deck planks in ply		The plywood sheets shall be installed to form a uniform top surface without any discontinuities. Sheets may be required to be packed with CCA treated timber to provide a uniform surface. Large size washers shall be used for bolts where nuts or heads bear on the ply surface - refer to Figure 5.2(a) Part 2 for washer dimensions. Anti-fungal preservative and preservative grease shall be applied to all contact surface between the ply and cross beams and kerbs (100T1 and 100T2). A bituminous felt (100T7) shall also be placed at these surfaces. The ends of the ply sheets shall also be coated with the preservative and grease. Construction tolerances shall be such that a maximum gap of 5 mm occurs between the ply sheets at all joints. If cutting of the ply is required, care shall be exercised to clear the assembly self-drilling screws (exposed on top surface).				

MP = 3 (Medium) - deteriorated longitudinal deck planks may lead to breakage and partial dropping of wheels.

2.4 Deck 20T4 - Check stressing bars		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T4	Check stressing bars	Each	This item covers all work operations and materials associated with the checking of individual stressing bars in a stress-laminated timber bridge deck. Work operations overed include setting up and removal of access staging, destressing and removal of stressing bar, cleaning and painting of bar, greasing and installation and restressing of bar. Prior to job, advice shall be sought from BAM on bar force required during restressing. Where bars are destressed, a record shall be kept of the existing bar forces (at anchorage lift off) and this information supplied to BAM. If a significant number of bars have to be so treated, consideration may be given to restressing of the full SLT deck - (refer 20T6). After job completion, a report on actual work carried out on the SLT deck shall be supplied to BAM. Cleaning and painting of stressing bars shall be carried out to the requirements of 100S4. Timber contact surfaces behind anchor plates shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2).	Inspection indicates corrosion visible on exposed parts of stressing bars.	Seek advice from BAM to determine restressing bar forces prior to job commence-ment. Through ID, provide BAM with information on any measured bar forces and extent of SLT work carried out.	1	4

MP = 1 (High) - corrosion of stressing bars may lead to breakage, reducing the ability of individual deck laminations to act as a combined unit.

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2.4 Deck 20T5 - Sleeve bolts		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T5	Sleeve bolts	Each	This item covers all work operations and materials associated with the protection of bolts penetrating treated laminates in stress-laminated timber bridges by encasing the bolts in plastic sleeves. This is necessary where ACZA (ammoniacal copper zinc arsenate) treated timber has been used for the SLT deck. If treatment type is unknown refer to BAM for a determination. Bolts effected consist of deck holding down bolts and kerb attachment bolts. Work operations covered include removal of bolts, drilling out, insertion of plastic sleeves, replacement and tightening of bolts. If significant corrosion has affected bolt strength, new galvanised bolts shall be supplied (120S8). Installation of bolts shall be to the requirements of 120S2. Washer size used will depend on timber type at the bolt location, and shall be of the size shown on the bridge drawings.	Inspection indicates kerb attachment bolts and deck anchor bolts are showing evidence of corrosion. Also, where the SLT deck is formed from ACZA treated timber laminates, even when the bolts are galvanised.		3	1

MP = 3 (Medium) - loss of kerb attachment both will reduce vehicle containment capacity, while loss of deck holding down bolts will reduce bridge stability under flood conditions.

2.4 Deck 20T6 - Restress SLT deck		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T6	Restress SLT deck	Lump sum	This item covers all work operations and materials associated with the complete restressing of stressing bars in a stress-laminated timber deck, in order to restore satisfactory slab action. During job preparation, advice shall be sought from BAM on bar stressing sequences, and final bar forces. Details of distorted deck profiles shall also be submitted to BAM to determine suitability for restressing. Work operations covered include setting up and removal of access staging, and restressing bars in designated sequence. Because SLT decks are still considered to be experimental, a representative from BAM shall be present during the restressing process to record existing and final bar forces and to check any existing load cells at bar anchorages. It is recommended that at least one stressing bar be extracted prior to restressing in order to check bar condition. If a stressing bar is removed, timber contact surfaces behind the anchor plates shall be treated with an anti-fungal preservative and a preservative grease (100T1 & 100T2).	Where inspection indicates movement or separation of laminates varying from minor to severe allowing excessive deflections of laminates. Where measured actual bar forces are below the minimum acceptable specified on the drawings (or as advised by BAM0.	Contact BAM to determine potential to restress distorted deck, restressing sequence and bar forces. Inform BAM of date of restressing. ID to be advised of restress for inclusion in BIS.	1	4

MP = 1 (High) - insufficient stressing of SLT deck destroys slab action and may lead to a deck collapse.

4

2.4 Deck 20T7 - Replace stressing bar		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T7	Replace stressing bar	Each	This item covers all work operations and materials associated with the removal of an existing stressing bar from a stress-laminated timber deck and replacement with a new stressing bar. Where ACZA (ammoniacal copper zinc arsenate) treated timber has been used, the new bar shall be sleeved as per Item 20T8. Advice shall be sought from BAM on bar stressing force. The new stressing bar will generally be continuously threaded bar, conforming to the requirements of AS1313/89. The new bar shall be sand blasted and coated with inorganic zinc silicate paint. Bars of the same diameter as the original defective bar shall be used. Operations covered include setting up and removal of access staging, bar destressing and removal, insertion of new bar, greasing and restressing. Because SLT decks are still considered to be experimental, a representative from BAM shall be present during the stressing process to record final bar forces. Timber contact surface behind anchor plates shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2). Advise ID of bar replacement and restressing.	Where inspection indicates a stressing bar is severely corroded with >10% loss of section.	Contact BAM for bar restressing forces and advise date of restressing. ID to be advised of bar restress for inclusion in BIS.	1	4

MP = 1 (High) - loss of a stressing bar reduces slab action in deck and may lead to distortions of the slab.

2.4 Deck 20T8 - Sleeve stressing bar		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T8	Sleeve stressing bar	Each	This item covers all work operations and materials associated with the protection of stressing bars penetrating treating laminates in stress - laminated timber bridges by encasing the bars in plastic sleeves. This is mandatory where ACZA (ammoniacal copper zinc arsenate) treated timber has been used for the SLT deck. Work operations cover the setting up and removal of access staging, destressing and removal of stressing bar (one at a time only), insertion of plastic sleeve, bar greasing, replacement and restressing of stressing bar. It is expected that existing holes through the timber slab will be adequate to allow sleeve insertion. If not, coring of the timber will be required. Advice shall be sought from BAM on bar restressing force. A representative from BAM should be present during job to record existing and restressed bar forces. Timber contact surfaces behind anchor plates shall be treated with an anti-fungal preservative and a preservative grease (100T1 & 100T2).	Where inspection indicates stressing bars are corroding and ACZA preservative treatment of the timber laminates has been used.	Contact BAM for bar restressing force and advise date of job. ID to be advised once job completed for inclusion in BIS.	1	4

MP = 1 (High) - protection of stressing bars from ACZA treated timber is required to prevent corrosion.

4

2.4 Deck 20T9 - Replace anchor plates		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T9	Replace anchor plates	Each	This item covers all work operations and materials associated with the replacement of existing anchor plates bearing on the timber of stress-laminated timber bridges at stressing bar anchorages. BAM shall be contacted to determine sizes of replacement anchor plates, and restressing bar forces. Work operations covered include setting up and removal of access staging, destressing of stressing bar, replacing of anchor plates and greasing, installation and restressing of bar. Where a continuous side anchor plate is to be used, the superstructure shall be supported fully on falsework to allow removal of all bars. The supply of anchor plates shall be to the requirements of MRS 11.78. A representative of BAM shall be present to record existing bar forces at the time of destressing and also at restressing. All timber contact surfaces behind the anchor plates shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2).	Where inspection indicates substantial squashing of timber behind stressing anchorage plates.	Contact BAM to determine sizes and details for replacement anchor plates. BAM to be advised date of job.	3	4

MP = 3 (Medium) - squashing of timber behind anchor plates will normally occur at stressing but may lead to deterioration of the outer timber laminates.

2.4 Deck 20T10 - Replace laminations		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20T10	Replace laminates	Lump sum	This item covers all work operations and materials associated with the replacement of deteriorated laminates in stress-laminated timber bridges with new timber. BAM shall be contacted to determine the feasibility of repair of individual laminates. If so, details of replacement components and details will be prepared. Bar restressing forces are also required. This operation will require falsework support of a span due to the requirement to destress the SLT deck. Work operations covered include installation and removal of falsework and access staging, de-stressing of SLT deck, removal of defective laminates and replacement of laminates, and restressing of deck. A representative of BAM shall be present at restressing in order to record bar forces. Depending on the extent of laminate replacement, further restressings may be required due to creep in the new timber. All timber contact surfaces behind anchor plates shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2). The end grain of new laminates shall be greased before assembly in the deck.	Where inspection indicates severe rot in laminates of stress-laminated timber deck	Contact BAM to determine feasibility of repair, and details of replacement laminations (including preservative system) and stressing forces. BAM to be advised of restressing date.	1	4

MP = 1 (High) - rotting of laminations will lead to considerable loss of bar force destroying the slab action of the deck.

4

2.4 Deck 20C1 - Remove & replace cracked concrete overlay		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
20C1	Remove & replace cracked overlay (Note 1)	M²	This item covers all work operations and materials associated with the partial reinstatement of cracked concrete sections in concrete overlay bridge decks. Work operations covered include breaking out of cracked concrete and trimming of edges, replacement of reinforcing if required and placement of new concrete. Supply and placement of concrete shall be to the requirements of MRS 11.70. The reasons for the concrete damage should be determined - there may be further work or strengthening of supporting components required. Refer to Structures Division to determine the extent of concrete replacement and concrete class required. The top surface of the exposed timber deck shall be coated with an anti-fungal preservative prior to concrete placement (100T1). Where reinforcing requires replacement, it shall be replaced to the requirement of 140S2. Where a full deck or extensive areas of concrete overlay are to be replaced, traffic shall be detoured off the bridge for a period of at least 7 days after casting. For isolated areas, traffic speeds shall be lowered to 10 km/hr and restricted to a remote lane for at least 7 days after casting.	Where inspection indicates severe cracking of the concrete overlay with differential movement between sections.	Contact Structures Division to determine the extent of overlay replacement.	2 or 3	3

MP = 2 or 3 (Medium) - badly cracked overlay destroys the distribution effect of the overlay slab and results in concentrated wheel loads being taken directly on the timber deck.

Note 1: This item is to be used for repair of an existing overlay (overlay use not appropriate for "new maintenance treatments). Refer to 5.8 Part 2 for a discussion of timber decking treatment.

2.4 Deck 28T1 - Replace crossbeam		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
28T1	Replace crossbeam	M	This item covers all work operations and materials associated with the replacement of timber crossbeams in bridge decks. The supply of timber shall be to the requirements of MRS 11.87. Work operations covered include removal of bolts, lifting of longitudinal decking and kerbs locally, removal of spikes, removal and replacement of cross beam, respiking and bolting, and repositioning of kerb and longitudinal decking. New timber shall be of the same dimension as that replaced. Girders or spiking planks must not be trimmed back to accommodate over thick crossbeams. Anti-fungal preservative and preservative grease shall be applied to all contact surfaces with girders, spiking plank and longitudinal decking (100T1 and 100T2). A bituminous felt shall be placed at these contact surfaces (100T7).	Where inspection indicates any of the following:- 1. Medium cracking - crossbeam not continuous. 2. Moisture softening occurring, with indentations or bulging from deck planks. 3. Heavy splitting due to overloading. 4. Heavy splitting - crossbeam not continuous 5. Heavy decay in cross beam. 6. Very wet and spongy top, large indentations and bulging.		3	3

MP = 3 (Medium) - failure of crossbeams could lead to breakage of longitudinal decking due to excessive span.

4

2.4 Deck 28T2 - Place additional crossbeams		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
28T2	Place additional crossbeams	M	This item covers all work operations and materials associated with the placement of additional timber crossbeams in order to reduce crossbeam cracking due to loads. The supply of timber shall be to the requirements of MRS 11.87. Work operations covered include removal of bolts, lifting of longitudinal decking, insertion of new cross beams and lowering of decking. Submit proposal to Structures Division for approval of proposed details. New timber shall be to the same vertical dimension as existing crossbeams. Girders and spiking planks must not be trimmed back to accommodate over thick crossbeams. Anti-fungal preservative and a preservative grease shall be applied to all contact surfaces with girders, spiking plank and longitudinal decking (100T1 and 100T2). A bituminous felt shall be placed at these contact surfaces (100T7).	Where inspection indicates medium cracking due to overloading or because crossbeam span is too large.	Submit proposed details to Structures Division for approval.	3	3

MP = 3 (Medium) - additional crossbeams will reduce loading to existing members.

2.4 Deck 28S1 - Replace crossbeam		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
28S1	Replace crossbeam	M	This item covers all work operations and materials associated with the replacement of existing steel cross beams with new steel members. Work operations include removal of bolts, lifting of deck, removal of defective cross beam, installation of new cross beam and lowering of deck. The new cross beam shall be supplied to the requirements of MRS 11.78 and shall be galvanised. The dimensions of the new member shall correspond to those of the existing cross girders. Girders or spiking planks must not be trimmed back to accommodate the cross girder. Anti-fungal preservative and a preservative grease shall be applied to all contact surfaces with girders (100T1 & 100T2). A bituminous felt shall be placed at these contact surfaces (100T7).	Where inspection indicates any of the following:- 1. Significant loss of section due to corrosion. 2. Excessive deflection or movement under load. 3. Buckling in webs, flanges or stiffeners		3	3

MP = 3 (Medium) - failure of a crossbeam could lead to breakage of longitudinal decking due to excessive span.

4

2.4 Deck 29T1 - Replace hardwood deckplanks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29T1	Replace hardwood deck planks	M^2	This item covers all work operations and materials associated with the replacement of existing timber deck planks with new hardwood timber planks. (full width). The supply of decking timber shall be to the requirements of MRS 11.87. Work operations covered include removal of overlying wearing surface, removal of bolts, lifting of kerbs, removal of spikes to outer girder, removal and replacement of deck planks, respiking and bolting, repositioning of kerbs and reinstatement of wearing surface. Hardwood decking shall be laid with the heart side down so that the ends bend upwards. The outer edges of decking, shall be dressed to allow the kerb to be fitted tight against the decking. Where new deck timber is thicker than the adjoining planks, the new planks shall be sized to the same dimension. Girders or spiking plank must not be trimmed back to accommodate over-thick decking. Decking shall protrude a minimum of 50 mm past the outside edge of the kerb and to a uniform distance. For full span redecking, the use of one species of timber is preferred.	Where inspection indicates:- 1. Severe cracking and weathering effecting strength significantly or 2. Severe rotting of deck planks, particularly at kerbs or under running planks.		2 or 3	3

2.4 Deck Cont'd 29T1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29T1 (Cont.)	Replace hardwood deck planks		Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between timbers and to the end grains of the planks (100T1& 100T2). A bituminous felt shall be placed at contact surfaces with the spiking plank, kerb and girders (100T7).				

MP = 2 or 3 (Medium) - failure of deteriorated deck planks may lead to wheel dropping.

4

2.4 Deck 29T2 - Replace and spiking plank		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29T2	Replace end spiking plank	M	This item covers all work operations and materials associated with the replacement of an existing timber end spiking plank with a new hardwood timber member. The supply of timber shall be to the requirements of MRS 11.87. Work operations covered include removal of overlying wearing surface, removal of spikes, lifting of adjacent deck planks and kerb, removal of defective members and installation and re bolting of new end spiking plank, respiking of deck, repositioning of kerbs and reinstatement of wearing surface. The new timber shall have the same vertical dimensions as that being replaced. Antifungal preservative and preservative grease shall be applied to contact surfaces with girders and decking (100T1 and 100T2). A bituminous felt shall be placed at contact surfaces (100T7).	Where inspection indicates end spiking plank rotted, causing loosened connections and allowing excessive movement.		3	3

MP = 3 (Medium) - deterioration of the end spiking plank will allow loosening of the deck ends leading to DWS break up.

2.4 Deck 29T3 - Replace and retighten running planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29T3	Replace and retighten running planks	M	This item covers all work operations and materials associated with the replacement of existing hardwood timber running planks with new timber components. The supply of timber shall be to the requirements of MRS 11.87. Work operations covered include removal of bolts, removal of defective running planks, installation of new planks and tightening of bolts. The new running planks shall have the same dimensions as those being placed. Anti-fungal preservative and a preservative grease shall be applied to contact surfaces with the decking (100T1 & 100T2). A bituminous felt shall be placed at contact surfaces (100T7). All running planks to the deck shall be tightened (120S1).	Where inspection indicates that running planks are split, broken or completely loose.		3	3

MP = 3 (Medium) - loose running planks may constitute a danger to traffic if dislodged and are also noisy under traffic and contribute to wear of the decking.

4

2.4 Deck 29T4 - Replace longitudinal deck planks in timber		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29T4	Replace longitudinal deck planks in timber	M^2	This item covers all work operations and materials associated with the replacement of existing longitudinal timber decking with new hardwood timber longitudinal decking. The supply of decking timber shall be to the requirements of MRS 11.87. Work operations covered include removal of overlying wearing surface, removal of bolts and spikes, lifting of kerbs if required, removal and replacement of deck planks, respiking and bolting, repositioning of kerbs and reinstatement of wearing surface. Hardwood decking should be laid with the heart side down so that the ends bend upwards. New decking shall be to the same dimensions as that being replaced. Crossbeams shall not be trimmed back to accommodate over thick planks. Where no wearing surface is used, the top surface of the decking shall be uniform without any discontinuities. Joints between ends of decking planks shall fall over transverse cross beams. The ends of planks shall be spiked or bolted to the crossbeams.	Where inspection indicates ends of longitudinal deck planks are poor due to rot or splitting, resulting in loose connections.		2 or 3	3

2.4 Deck Cont'd 29T4		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29T4 (Cont.)	Replace longitudinal deck planks in timber		Construction tolerances shall be such that a maximum gap of 5 mm occurs between planks, particularly the sides if no wearing surface is to be placed. All bolting shall be to the requirements of 120S2. Anti-fungal preservative and a preservative grease shall be applied to all contact surfaces between the decking and cross beams or kerbs. A bituminous felt (100T7) shall also be placed at these surfaces. The end grain of the decking shall also be coated with preservative and grease.				

MP = 2 or 3 (Medium) - failure of longitudinal decking will lead to wheels dropping on to the cross beams.

4

2.4 Deck **29T5 - Splice deck planks in timber**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29T5	Splice hardwood deck planks	M^2	This item covers all work operations and materials associated with the partial replacement of existing timber transverse deck planks, by splicing in shorter sections of hardwood planking.* Splicing should only be used where it is not practical, or timber of sufficient length is not available, to cover the full deck width. The supply of decking timber shall be to the requirement of MRS 11.87. Work operations covered include removal of overlying wearing surface, removal of bolts, lifting of kerbs, removal of spikes, removal of defect area of decking, placement and splicing of new planks, respiking and bolting, repositioning of kerbs and reinstatement of wearing surface. Hardwood decking shall be laid with the heart side down so that the ends bend upwards. The outer edges of decking shall be dressed to allow the kerb to be fitted tight against the decking. Where new deck timber is thicker than the adjoining planks, the new planks shall be sized to the same dimension. Girders or spiking plank must not be trimmed back to accommodate over thick decking.	Where inspection indicates any of the following over a localised area:- 1. Severe cracking and weathering effecting strength significantly 2. Severe rotting, particularly at a kerb or running planks.		2 or 3	3

2.4 Deck Cont'd 29T5		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29T5 (Cont.)	Splice hardwood deck planks		Decking shall protrude a minimum of 50mm past the outside edge of the kerb and to a uniform distance. Decking shall be spliced using cleats of equivalent dimensions to that of the deck timber unless otherwise shown on the drawings. The cleat shall be of suitable length to allow four M16 galvanised bolts to be installed either side of the splice. Refer to Figure 5.1(b) (Part 2) for details . Bolts shall be installed in accordance with 120S2. Anti-fungal preservative and preservative grease shall be applied to all contact surfaces and to the end grain of the planks (100T1 & 100T2). A bituminous felt shall be placed at contact surfaces with the spiking plank, kerbs and girders (100T7).				

MP = 2 or 3 (Medium) - failure of deteriorated deck planks may lead to wheel dropping.

* Any length of spliced decking must span over at least 2 girders.

4

2.4 Deck 29P1 - Replace PSC plank		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29P1	Replace PSC plank	Each	This item covers all work operations and materials associated with the replacement of an existing precast concrete deck plank with a replacement member. The new PC plank shall have the same cross sectional dimensions as the original in order to have the same stiffness as adjacent planks. PSC planks are a proprietary product and details of replacement members will be initially provided by the supplier. The reason for the failure of the existing plank must be determined in order to prevent further such defects. If the failure is due to inadequate seating on the girders, the girders shall be trimmed / packed to provide such support - refer to 29P2. The new planks and bolting shall be installed to conform to the manufacturer's requirements. Refer proposed replacement details to Structures Division for approval.. Supply of new PSC planks shall be to the requirements of MRS 11.87.	Where inspection indicates any of the following:- 1. Corrosion in prestressing strand. 2. Severe cracking, due to bending or shear failure. 3. Heavy edge spalling	Contact supplier for details of replacement PSC Plank. Proposed details shall be submitted to Structures Division for approval of details.	2	3

2.4 Deck Cont'd 29P1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29P1 (Cont.)	Replace PSC plank		Work operations covered include removal of bolts to steel distributor and girders, removal and disposal of defective plank, installation of new PSC plank and rebolting. Where new bolts are required, they shall be supplied to the requirements of 120S8. The removal and replacement of bolts shall be covered by 120S2. The timber contact surface at the girder or spiking plank shall be treated with an anti-fungal preservative and a preservative grease. In addition, a bituminous felt shall also be placed at the contact surfaces (100T7).				

MP =2 (Medium) - failure of the PSC plank will result in severe spalling and distortion of the member, which constitutes the running surface.

4

2.4 Deck 29P2 - Reseat PSC plank		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29P2	Reseat PSC plank	Each	This item covers all work operations and materials associated with the reseating of an existing PSC deck plank on the supporting girders. Correct seating of precast deck planks is essential because of the high rigidity of concrete planks. Small amounts of twisting may lead to torsion failure. Work operations covered include removal of bolts and PSC plank, treatment of girder tops or placement of packing, replacement of PSC plank and rebolting. The top surface of the girders may have limited trimming to a planar surface. Limited packing using CCA treated timber may also be used, and is preferable to girder trimming. The top surface of the reassembled PSC plank shall be co-planar with the remainder of the deck. Refer to Article 5.4 Part 2 for seating preparations. All timber contact surfaces at the girders or spiking plank shall be treated with an anti-fungal preservative and a preservative grease (100T1 & 100T2). A bituminous felt shall also be placed at contact surfaces (100T7).	Where inspection indicates PC unit is visibly moving under the passage of traffic loads.		2	3

MP = 2 (Medium) - failure of a PSC plank will result in severe spalling and distortion of the member, which constitutes the running surface.

2.4 Deck 29P3 - Replace deck planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29P3	Replace deck planks in PSC	Each	This item covers all work operations and material associated with the replacement of existing decking (hardwood, ply or steel) with PSC planks. This method is an alternative to replacing existing hardwood, ply or steel decking with the original materials. This would only be used for full span replacement. PSC Planks are a proprietary product and details will be initially provided by the supplier. Refer proposed deck replacement details to Structures Division who will determine feasibility of using this system on the existing girders and substructure. In general, this system is limited to square bridges with planks placed square across. However, for small shews, placement on the skew may be feasible depending on the geometry requirements of the product. The planks and bolting shall be installed to conform to the manufacturer's requirements. Work operations covered include removal of existing kerbs and deck, modification of girder layout where detailed, removal and replacement of outer girder where detailed, placement of PSC units, drilling and bolting and bolting and attachment of steel distributors.	May be used as an option where inspection indicates defects as noted in:- 1. 29T1 for timber decking. 2. 20T1 for ply decking. 3. 30S1 for steel troughing.	Submit proposed redecking details to ID. ID shall submit proposal to structures Division for approval. After job completion the District shall amend BIS to show decking element to be 29P.	2	3

4

2.4 Deck Cont'd 29P3		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
29P3 (Cont.)	Replace deck planks in PSC		Bolts shall be installed to the requirements of 100S2. Correct seating of PSC planks is essential because of the high rigidity of these planks. Small amounts of twisting due to inadequate support may lead to torsion failure. The top surface of girders may have limited trimming to a planar surface. Limited packing using CCA treated timber may also be used and is preferable to girder trimming. Refer to Article 5.4 Part 2 for seating preparation. All timber contact surfaces at girders shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2). Because of the open gaps between PSC planks, it is recommended that metal flashing and densotape or other compressible filler be placed over the tops of the girders before plank erection (refer to Figure 7.5(c) (Part 1)).				

MP = 2 (Medium) - failure of deteriorated timber deck planks may load to wheel dropping.

2.4 Deck 30S1 - Remove & replace steel troughing		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
30S1	Remove and replace steel trough decking	M^2	This item covers all work operations and material associated with the replacement of existing steel trough decking with new steel decking. Supply of steel trough components shall be to the requirements of MRS11.87. Work operations covered include removal of overlying wearing surface and infill, lifting of kerbs, removal of defective troughing, installation of new troughing including screwing, replacement of kerbs and infill/wearing surface. If the existing troughing cantilevers greater than 500 mm from the centre line of the outer girder to the inner kerb face, advise ID and Structures Division for advice before the job is carried out. The top surface of girders and spiking plank shall be treated with an anti-fungal preservative before deck placement. Neoprene stripping shall be placed on top of the timber girders and spiking plank before deck placing in order to reduce wear between the steel decking and the supports - refer to Figure 5.5(a) (Part 2). The steel decking shall be installed to conform to all manufacturer's requirements. New tap screws shall be used and placed to the requirements of 30S5.	Where inspection indicates any of the following:- 1. Heavy corrosion of troughing with perforations. 2. Transverse cracking of troughing. 3. Sagging or buckling of trough.	Advise ID & BAM if existing deck outer cantilever exceeds 500mm.	2	3

MP = Medium - failure of steel decking may lead to wheel dropping.

4

2.4 Deck 30S2 - Strengthen Steel troughing		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
30S2	Strengthen steel trough decking	Lump sum	This item covers all work operations and materials associated with the strengthening of existing steel trough decking which has cracked in service. This may be used as an alternative to full unit replacement in some cases. Strengthening plates shall be bent to the profile of the existing troughing refer Figure 5.5(a) (Part 2) and fabricated to the requirements of MRS 11.78. Work operations covered include fabrication, placement and welding of strengthening plates - for cracking on trough soffits between girders. Where transverse cracking occurs over girders work operations also include removal of infill/wearing surface, cleaning of troughing, placement and welding of strengthening plate, and reinstatement of infill / DWS. Care shall be exercised when welding because of the thin (3 mm) plate thickness of the materials. Where galvanised surfaces are damaged by welding, the area shall be protected by a cold galvanising product (refer to 17.10 (Part 2).	Where inspection indicates transverse cracking of trough units.		1	3

MP = 1 (High) - particularly where bituminous infill is used as transverse cracking indicates structural failure of the troughing.

2.4 Deck 30S3 - Replace deck planks in steel		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
30S3	Replace deck planks in steel	M^2	This item covers all work operations and materials associated with the replacement of existing hardwood deck planks with steel trough decking. This method is an alternative to replacing the decking in the same material. This would only be used for full span replacement. Approval to use steel decking shall be obtained from ID prior to job preparation. Supply of steel decking shall be to the requirements of MRS 11.87. Supply of new bolts shall be to 120S8. Work operations covered include removal of DWS, kerbs and old timber decking, installation of steel decking, repositioning of kerbs and placing of infill / DWS. If the decking is to cantilever past the outer girder, the outer girder / spiking plank will generally need to be replaced by a larger girder equivalent in size to an inner member using Item 22T2. The steel decking shall be installed to conform to all manufacturer's requirements. Tap screws shall be placed to the requirements of 30S5.	May be considered as an option where an inspection indicates defects as noted in:- 1. 29T1 for timber decking, 2. 20T1 for ply decking	Submit drawings of proposed details to ID. ID shall submit details to Structures Division for approval of details. Subsequent to job completion, the District shall change the BIS element designation to 30S.	2 or 3	3

4

2.4 Deck Cont'd 30S3		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
30S3 (Cont.)	Replace deck planks in steel		Where holding down channels are detailed, they shall be placed over the girders and bolted at 600 mm centres with M20 galvanised bolts - refer to Figure 17.5 (Part 2). It is recommended that trough infill material be concrete rather than bituminous - refer to Section 5.5 (Part 2). The top surface of girders and spiking planks shall be treated with an anti-fungal preservative before deck placement (100T1). Neoprene stripping shall be placed on top of the timber girders and spiking plank before deck placing in order to reduce wear between the steel decking and the supports - refer to Figure 5.5(a) (Part 2).				

MP - 2 or 3 (Medium) - failure of deck planks may lead to wheel dropping.

2.4 Deck 30S4 - Place concrete infill		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
30S4	Place reinforced concrete infill	M^3	This item covers all work operations and materials associated with the replacement of an existing concrete infill in a steel trough deck. It also covers the replacement of an existing bituminous infill. In this case it is an alternative to replacement using the same material. Proposed details showing reinforcing layout shall be submitted to Structures Division for approval prior to job preparation. Work operations covered include removal of existing infill, removal of corrosion products from troughing, placement of reinforcing and troughing hold downs, and placement of concrete infill and wearing surface. Typical details for hold downs are shown in Figure 17.5 (Part 2). Care must be exercised in detailing that holding down bolts can be withdrawn to allow future girder replacement. Hold down channels shall be supplied to the requirement of MRS 11.78. New bolts shall be supplied to the requirements of 120S8 and installed to the requirements of 120S2. Concrete infill shall be placed to MRS 11.70 requirements.	Where inspection indicates existing concrete infill is breaking up resulting in holes. It may also be used as the recommended option to replace an existing bituminous fill where this is severely cracked, rutted, pot holed or has broken patches. Where a DWS is removed to repair medium corrosion at joints, it may be considered as an option for replacement infill (full span).	Submit proposed details to Structures Division for approval.	2 or 3	3

MP = 2 or 3 (Medium) - concrete infill material is preferred to bituminous infill because of superior performance in existing structures.

4

2.4 Deck 30S5 - Replace tap screws		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
30S5	Replace tap screws	Lump sum	This item covers all work operations and materials associated with the replacement of existing screws which stich trough units together. Refer to Figure 5.5(a) (Part 2) for details of self tapping screws. Work operations covered include removal of wearing surface as required, removal of defective screws, drilling if required and installation of new screws, and reinstatement of wearing surface.	Where inspection indicates may tap screws are missing, allowing unit separation.		2 or 3	3

MP = 2 or 3 (Medium) - lack of connection between trough units reduces distribution of loads, particularly with bituminous infill.

2.4 Deck 30S6 - Place concrete slabs		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
30S6	Place concrete slab	M^3	This item covers all work operations and materials associated with the placement of a structural concrete slab using deteriorated steel trough decking as formwork. The steel decking is considered to be sacrificial and to have no structural significance. This may be an alternative to replacement of the troughing. A request for details of a suitable reinforced deck slab shall be submitted to Structures Division for preparation of drawings and details. Work operations covered include removal of existing infill / wearing surface, repair or strengthening of failed areas of troughing, supply and placement of reinforcing, drilling and placement of hold down channels and placement of concrete slab and kerbs. New bolts shall be supplied to the requirements of 120S8 and installed to 120S2. Holding down channels shall be supplied to the requirements of MRS11.78. Care must be exercised in detailing that hold down bolts can be withdrawn to allow future girder replacement. Concrete shall be supplied and placed to the requirements of MRS 11.70.	May be considered as an option where inspection indicates any of the following:- 1. Heavy corrosion of troughing with perforations. 2. Sagging and buckling of trough	A request for a suitable details for a concrete slabshall be submitted to Structures Division.	2	3

MP = 2 (Medium) - badly deteriorated steel troughing with a bituminous infill can fail by collapse or sagging allowing wheel dropping.

4

2.5 Footway 4T1 - Replace timber planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
4T1	Replace timber planks	M^2	This item covers all work operations and materials associated with the replacement of deteriorated timber planks in a footpath with new hardwood planks. The supply of decking timber shall be to the requirements of MRS 11.87. Work operations covered include removal of bolts, lifting kerbs, removal of spikes, removal and replacement of deck planks, respiking and bolting and repositioning of kerbs. The outer edges of decking shall be dressed to allow the kerb to be fitted tight against the decking. Where new deck timber is thicker than adjoining planks, the new planks shall be sized to the same dimension. Girders or spiking plank must not be trimmed back to accommodate over thick decking. Decking shall, in general, protrude a minimum of 50 mm past the outside edge of the kerb and to a uniform distance. The top surface of the decking shall be planar, to remove the danger of tripping for pedestrians. Bolts shall be installed to the requirements of 120S2. Anti-fungal preservative and a preservative grease shall be applied to all contact surfaces between timbers and to the end grain of the deck planks (100T1 and 100T2). A bituminous felt shall be placed at contact surfaces with the spiking plank, girders and kerbs (100T7).	Where inspection indicates:- 1. Medium decay or splitting which is a danger to pedestrians. 2. Heavy decay splitting or crushing. 3. Planks broken or missing.		2 or 3	3

MP = 2 or 3 (Medium) - defects in timber walkway surfaces may constitute a danger to pedestrians.

2.5 Footway 4T2 - Reposition/reseat timber planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
4T2	Reposition / reseat timber planks	M^2	This item covers all work operations and materials associated with the relocation of timber planks in a footpath in order to reduce gaps between planks or reduce unevenness of the top surface. This work is intended to reduce potential danger to pedestrians. Any new timber required shall be supplied to the requirements of MRS 11.87. Work operations covered include removal of bolts, lifting kerbs, removal of spikes, relocation of deck planks to minimise gaps (including new planks) or adjusting seatings, respiking and bolting and repositioning of kerbs. Where a deck plank is thicker than adjoining planks, it shall be sized to the same dimensions at supports. Girders or spiking plank must not be trimmed back to accommodate over thick planks. CCA treated timber packing may also be required to achieve a planar top surface to the decking. Bolts shall be removed and installed to the requirements of 120S2. Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between timbers before repositioning.	Where inspection indicates excessive gaps between planks causing a danger to pedestrians.		3	3

MP = 3 (Medium) - excessive gaps or roughness in footpaths can be a danger to pedestrians.

4

2.5 Footway 4T3 - Replace ply sheet		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
4T3	Replace ply sheet	Each	This item covers all work operations and materials associated with the replacement of existing ply sheeting in a footpath with new ply sheeting. All ply sheeting shall be installed to conform to the manufacturer's requirements. Similarly, all bolts shall be supplied and installed in accordance with the manufacturer's requirements. The supply of ply components shall be to the requirements of MRS 11.87. Work operations covered include lifting of kerbs, removal of defective ply sheeting, placement of new ply sheets, drilling and rebolting and replacement of kerbs. The new ply sheets shall have the same thickness and anti-slip surfacing paint as the original. The ply sheets shall be installed to form a uniform top surface without any discontinuities. The sheets may be required to be packed with CCA treated timber to provide a uniform surface. Where self drilling screws have been used for attachment to steel girders, these shall be replaced by new items supplied under 120S9.	Where inspection indicates medium to heavy decay in planks or broken planks causing a danger to pedestrians.		2 or 3	3

2.5 Footway Cont'd 4T3		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
4T3 (Cont.)	Replace ply sheet		Bolts shall be removed and replaced to the requirements of 120S2. Large size washers shall be used for bolts where nuts or heads bear on the ply surface - refer Figure 5.2(a) (Part 2). Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between the ply and spiking plank, kerb and girder (100T1 and 100T2). A bituminous felt shall also be placed at these surfaces (100T7). The exposed ends of new ply sheets shall be coated with an end sealant (100T5).				

MP =2 or 3 (Medium) - badly deteriorated footpath sheets are a danger to pedestrians.

4

2.5 Footway 4T4 - Reseat ply sheet		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
4T4	Reseat ply sheet	Each	This item covers all work operations and materials associated with the reseating of ply sheeting in a footpath in order to achieve a planar top surface. This work is intended to reduce the potential danger to pedestrians. Work operations covered include removal of bolts, lifting kerbs, adjusting seating, rebolting and repositioning of kerbs. CCA treated timber packing will generally be required, while some minor trimming of girder or spiking plank tops may be required to achieve a planar top surface to the sheets. Bolts shall be removed and replaced to the requirements of 120S2. Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between timbers before reseating.	Where inspection indicates uneven top surface to footpath		3	3

MP = 3 (Medium) - excessive roughness in footpaths can be a danger to pedestrians.

2.6 Spiking Plank 33T1 - Replace spiking plank		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
33T1	Replace spiking plank	M	This item covers all work operations and materials associated with the replacement of timber spiking planks with new timber members. The supply of timber shall be to the requirements of MRS 11.87. Work operations covered include lifting of kerbs, releasing of deck spikes and sliding decking sideways, removal of bolts, removal and replacement of bolts, decking and kerbs. Alternatively,* if the spiking plank is to be replaced in association with the outer girder, work operations would be jacking of superstructure to remove load from the girder, lifting of kerb, release of deck spikes and bolts, removal of girder / spiking plank, assembly of new girder / spiking plank and erection, respiking of decking, and kerb replacement. The new spiking plank shall have the same dimensions as that being replaced. The spiking plank shall cover the full length of the span, but may be composed of butt joined segments. Butt joints are located at piers and at a maximum of two internal locations, provided these are outside the middle half of the span. Refer to Figure 17.1(c) (Part 2) for end and general bolting arrangements.	Where inspection indicates:- 1. Medium to heavy crushing in spiking plank. 2. Heavy splitting or decay in spiking plank.		3	1

4

2.6 Spiking Plank Cont'd 33T1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
33T1 (Cont.)	Replace spiking plank		Where the existing girder is retained, the existing bolt holes shall be used, where possible. Bolts shall be installed to the requirements of 120S2. All butt joints shall be constructed to a standard such that there is a maximum gap of 5mm. All timber contact surfaces and the end grain of new and adjacent members shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2). A bituminous felt shall be placed on top and bottom surfaces of the new plank (100T7).				

MP = 3 (Medium) - deterioration of a spiking plank may lead to dropping and loosening of timber decking ends, leading to accelerated deterioration.

* Most of item coverage is actually within girder replacement item.

2.7 Girders 22T1 - Strengthen split or sniped girder		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22T1	Strengthen split or sniped girder	Each	This item covers all work operations and materials associated with the strengthening of timber girders in order to improve functional or structural capacity. Repairs will generally be in the form of anti-splitting bolts - refer to Section 8.1 (Part 2) for possible details. Where longitudinal decking is used, banding of the girder may be feasible. Details of proposed repairs shall be submitted to Structures Division for approval prior to the job. Work items covered include drilling and installation of bolts and other components. Supply of timber components shall be to the requirements of MRS 11.87. Bolts shall be supplied and installed to 120S8 and 120S2. Where additional timber components are used, contact areas where the girder shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2).	Where inspection indicates large splits or cracks effecting strength. As well, where large snipes at the ends of girders have caused a loss of between 16% and 30% of section depth.	Refer proposed details to Structures Division for approval.	1	4

MR = 1 (High) - severe splitting, particularly at snipe ends can significantly reduce girder strength.

4

2.7 Girders 22T2 - Replace timber girder		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22T2	Replace timber girder	Each	This item covers all work operations and materials associated with the replacement of an existing timber girder with a new timber member. Timber shall be supplied to the requirements of MRS 11.87. Work operations covered include, jacking of structure to remove load from the defective girder, lifting of kerbs and removal of DWS and deck planks as required, removal of bolts, removal of old girder, installation of replacement girder, rebolting, removal of props, replacement of kerb and deckers and DWS and disposal of old girder. Refer to Figure 3.4(b) (Part 1) for the required nominal size of girder for the span, width and design class of the bridge. Care must be exercised when cutting the sniped end seatings that excessive cuts effecting girder capacity are not made. Refer to Section 8.1 (Part 2) for requirements for snipes. The new girder shall be placed centrally on the corbel and aligned with the adjacent girder. The gaps between the girder ends may normally be 20-25mm.	Where inspection indicates any of the following:- 1. Pipe rot, termite damage > 50% up to 70% loss of diameter at mid span or > 35% up to 50% at ends. 2. Severe splitting 3. Severe crushing 4. Where large snipes at the ends of girders have caused a loss of section depth of greater than 30%. 5. Severe surface decay and holes.	If snipe details shown in Section 8.1 (Part 2) cannot be satisfied, contact BAM for advice.	1	4

2.7 Girders Cont'd 22T2		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22T2 (Cont.)	Replace timber girder		However, when replacing an individual girder, a larger gap of 30-40mm may be required to ease assembly. The outer edges of girder ends shall be chamfered to reduce splitting and splintering. After trimming to length, an anti-fungal preservative (100T1) and preservative grease (100T2) shall be applied to girder ends. Ends of adjacent existing girders shall also be so treated. When supplied with end nailing plates, these shall be re-applied to girder ends after trimming. Girders should generally be placed with any bow upwards, but may be placed with a horizontal bow, provided this does not exceed 20 mm for a 6m length or 30mm for a 9m length. Girders may be supplied with a central pipe up to 35 mm in diameter. Before erection, this shall be plugged as shown in Figure 8.1(g) (2) (Part 2). Where any longitudinal cracks exceed 10mm width, anti-splitter bolts shall be fitted (100S2) as shown in Figure 17.1(d) (Part 2). Construction standards shall be such that a maximum gap of 5 mm occurs at joints between components.				

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2.7 Girders Cont'd 22T2		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22T2 (Cont.)	Replace timber girder		All contact surfaces between timber members shall be painted with an anti-fungal preservative (100T1) and a preservative grease applied (100T2). Typical locations are:- (1) Girder to headstock (2) Girder to corbel (3) Girder to spiking plank (4) Girder to deck. At locations (2) to (4) a bituminous felt (100T7) shall also be placed. The bridge span shall be recambered (100M1). Shims shall not be placed between the girder and corbel.				

MP = 1 (High) - failure of a defective girder under traffic load may lead to unserviceability of the bridge or to load restrictions.

Note: Where pipe rot, termite attack of sniping exceed the limits given in (1) or (4) the condition of the member is critical and must be replaced immediately.

2.7 Girders 22T3 - Place supplementary member		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22T3	Place supplementary member	Each	This item covers all work operations and materials associated with the installation of additional members in timber or steel to help restore the load carrying capacity of timber girders. Use of such components may be considered for short term to permanent repairs. Refer to Figure 8.1(j) (Part 2) for a description of the various support methods for specific defects. Full girder replacement is normally the preferred option, but supplementary support may be considered in certain circumstances (refer Section 8.1 Part 2). Work operations covered include supply and installation of support components, drilling, assembly and bolting. Supply of timber components shall follow the requirements of MRS 11.87. Supply of steel components shall be to the requirements of MRS 11.78. Supply of galvanised bolts, nuts and washers shall be to the requirements of 120S8. Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between existing components and support members (100T1 and 100T2).	May be considered as an option where inspection indicates 1. Large splits or checks effecting strength near ends or 2. Crushing near girder end.		1	4

MP = 1 (High)- severe splitting or crushing near girder ends may lead to settlements or loss of girder capacity and load restrictions on the bridge.

4

2.7 Girders 22S1 - Strengthen steel girder		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22S1	Strengthen steel girder	Each	This item covers all work operations and materials associated with the strengthening of an existing steel girder in order to restore original load carrying capacity. Advice shall be sought from Structure Division for details of appropriate strengthening. Strengthening may be considered as an alternative option to member replacement. Supply of strengthening components shall be to the requirements of MRS 11.78. Work operations covered include jacking of components (if specified), removal of corrosion products, removal of coatings in repair or strengthening areas, placing and welding of repair components, and application of protective coating. Site welding shall only be carried out by a DMR accredited welding operator. Where a protective coating is damaged during the welding / preparation process, the area shall be treated with a cold galvanising process - refer Figure 17.10 (Part 2). Where more extensive repair of protective coatings is required, this shall be carried out to the requirements of 100S3.	Where inspection indicates any of the following:- 1. Significant permanent distortion due to impacts. 2. Severe corrosion of webs or flanges. 3. Cracks in flanges or webs. 4. Excessive deflection under load.	Details of existing girder defects shall be submitted to Structures Division for preparation of strengthenin g details. Ensure welding operator is DMR accredited.	1	4

MP = 1 (High) - strengthening will restore or provide adequate capacity to the component which is a primary structural member.

This item is interim pending release of the Bridge Maintenance Manual.

2.7 Girders 22S2 - Install top flange restraint		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22S2	Install top flange restraints	Lump sum	This item covers all work operations and materials associated with the installation of supplementary members to provide lateral restraint to the girder top flange. Submit details of defect to Structures Division for preparation of restraint details. Supply of strengthening components shall be to the requirements of MRS 11.78. Work operations covered include removal of corrosion products and coatings in attachment areas, placing and welding of restraints, and application of protective coating. Site welding shall only be carried out by DMR accredited welding operator. Where a protective coating is damaged during the welding / preparation process, the area shall be treated with a cold galvanising process (refer Figure 17.10 (Part 2). Where more extensive repair of protective coating is required, this shall be carried out to the requirements of 100S3. Where bolting is required, bolts shall be supplied to the requirements of 120S8 and placed to the requirements of 120S2.	Where inspection indicates any lateral bowing of top flange of a steel girder under traffic loads.	Details of existing defect shall be submitted to Structures Division for repair details. When the job is completed, details shall be submitted to ID for inclusion in BIS.	1	4

MP = 1 (High) - instability of the top flange of a steel girder reduces its load capacity.

This item is interim pending release of the Bridge Maintenance Manual.

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2.7 Girders **22S3 - Straighten steel girder**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22S3	Straighten steel girder	Each	This item covers all work operations and materials associated with the straightening of a steel girder which has been damaged by vehicular or debris loading. Straightening will in general be accomplished by the application of heat and lateral force to the girder. Timber components in the effected area will require lifting and separation. The straightening operation shall be carried out by experienced steel fabrication personnel. Work operations covered include jacking of the superstructures to remove load from the girder, heating and straightening, release of load on to the girder, and reinstatement of protective coating. Where a protective coating is damaged during the heating process, it shall be treated with a cold galvanising process (refer Figure 17.10 (Part 2)). Where more extensive repair of the coating is required, this shall be carried out to the requirements of 100S3.	Where inspection indicates permanent bowing or distortion of webs and flanges.	Details of damaged steel girders shall be submitted to Structures Division for preparation of repair details.	3	4

MP = 3 (Medium) - lateral bows in steel girders will reduce capacity.

This item is interim pending release of the Bridge Maintenance Manual.

2.7 Girders 22S4 - Replace timber girder with steel girder		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22S4	Replace timber girder with steel girder	Each	This item covers all work operations and materials associated with the replacement of existing timber girders with new steel girders. Where this process is carried out, all girders in an individual span shall be changed to steel. This method is an alternative to repairing the girders in timber. A steel girder arrangement with ply deck is the suggested detail, as shown in Figure 8.2 (Part 2). Where required, details of the existing bridge details shall be submitted to Structures Division for preparation of job details. Work operations covered include removal of an existing bridge span, substructure support modifications, erection of steel girders, placement of ply deck including fasteners, placement of kerbs and wearing surface. The supply and erection of steel girders shall be to the requirements of MRS 11.76. The supply and erection of ply decking shall be to the requirements of MRS 11.87 and generally as for 20T2.	May be considered as an option where inspection indicates defects as noted for 22T2.	Refer to Structures Division for preparation of job details. After job completion, District to change girder BIS designation to 22S.	1	4

MP = 1 (High) - failure of a defective girder under traffic load may lead to unserviceability of the bridge or to load restrictions.

4

2.7 Girders 22S5 - Replace buckle area		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22S5	Replace buckle area	Lump sum	This item covers all work operations and materials associated with the repair of localised damaged areas of steel girders. This will in general be accomplished by the cutting out of buckled areas and the rewelding in of a replacement section. This operation shall be carried out by experienced steel fabrication personnel. Work operations covered include jacking of the superstructure to remove load from the girder, propping of the girder, cutting out defective area and welding in replacement segment, and removal of props. Damaged protective coating shall be treated with a cold galvanising process (refer Figure 17.10 (Part 2)). Where more extensive repair of the coating is required, this shall be carried out to the requirements of 100S3.	Where inspection indicates gross impact distortion in web and/or flanges.	Details of the damaged girder shall be submitted to Structures Division for preparation of repair details. When completed, details of the girder repair work shall be submitted to ID for inclusion in BIS	1	4

MP = 1 (High) - severe buckles in steel girders will significantly reduce strength.

This item is interim pending release of the Bridge Maintenance Manual.

2.7 Girders 22O1 - Replace girder with approved alternative girder		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22O1	Replace girder with approved alternative girder	Each	This item covers all work operations and materials associated with the replacement of an existing timber girder with a new member. Supply is included in this activity. Work operations covered include, jacking of structure to remove load from the defective girder, lifting of kerbs and removal of DWS and deck planks as required, removal of bolts, removal of old girder, installation of replacement of kerb and deckers and DWS and disposal of old girder. The new girder shall be placed centrally on the corbel and aligned with the adjacent girder. Alternative girders shall be approved by Structures Division before use and all erection procedures shall be in accordance with the manufacturer's requirements. No cutting or trimming of preformed alternative girders shall be carried out. A preservative grease (100T2) shall be applied to the ends of timber based alternative girders and to the ends of existing adjacent timber girders.	Where inspection indicates any of the following:- 1. Pipe rot, termite damage > 50% up to 70% loss of diameter at mid span or > 35% up to 50% at ends. 2. Severe splitting 3. Severe crushing 4. Where large snipes at the ends of girders have caused a loss of section depth of greater than 25%. 5. Severe surface decay and holes	External dimensions for the alternative girder shall be provided to the manufacturer before girder fabrication.	1	4

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2.7 Girders Cont'd 22O1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
22O1 (Cont.)	Replace girder with approved alternative girder		All contact surfaces at or between timber members shall be painted with an anti-fungal preservative (100T1) and a preservative grase applied. Typical locations are (1) Girder to headstock (2) Girder to corbel (3) Girder to deck All locations (2) & (3) a bituminous felt (100T7) shall also be placed. The bridge span shall be recambered (100M1).				

MP = 1 (High) - failure of a defective girder under traffic load may lead to unserviceability of the bridge or to load restrictions.

2.8 Corbels 27T1 - Strengthen corbel		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
27T1	Strengthen corbel	Each	This item covers all work operations and materials associated with the strengthening of timber corbels in order to improve load carrying capacity. Strengthening will generally involve placement of anti-splitting bolts as shown in Figures 9.1(a) & 17.1(d) (Part 2). For excessive loss of section over headstocks due to seating cut, strengthening may be accomplished by top or side steel plates or sections. Figures 9.1(b) shows typical details. Work operations covered include drilling and placement of bolts. Supply of new bolts shall be to the requirements of 120S8. Bolts shall be installed to the requirements of 120S2.	Where inspection indicates any of the following:- 1. Moderate splits or checks. 2. Moderate crushing. 3. Snipe depth at headstock exceeds 25% of corbel depth.	For excessive depth of seating cut, refer to BAM for strengthening details. These will be designed for specific circumstances.	2 or 3	3

MP = 2 or 3 (Medium) - strengthening will reduce the potential for collapse or breaking of corbels under traffic loads.

4

2.8 Corbels 27T2 - Replace timber corbel		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
27T2	Replace timber corbel	Each	This item covers all work operations and materials associated with the replacement of existing timber corbels with new timber members. Timber shall be supplied to the requirements of MRS 11.87. Work operations covered include propping of girders to remove load from existing corbel, removal of girder to h'tk and girder to corbel bolts (which requires kerb and deck plank lifting / removal including adjacent DWS), removal of defective corbel, installation of new corbel, reinstatement / replacement of bolts, kerb, deck planks and DWS, removal of props and disposal of old corbel. General corbel sizes are as for girders - refer Figure 3.4(b) (Part 1). Smaller or larger sizes may be used where appropriate to reduce sniping or excessive packing. Section 9.1 (Part 2) lists acceptable notching details for seating of corbels on pier headstocks. The outer edges of corbel ends shall be chamfered to reduce splitting and splintering.	Where inspection indicates any of the following:- 1. Heavy surface decay having a marked effect on strength. 2. Heavy splitting having a marked effect on strength. 3. Heavy crushing having a marked effect on strength. 4. Heavy termite attack having a marked effect or strength. 5. Pipe rot greater than 35% up to 50% of diameter.		2 or 3	3

2.8 Corbels Cont'd 27T2		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
27T2 (Cont.)	Replace timber corbel		After trimming to length, an anti-fungal preservative (100T1) and preservative grease (100T2) shall be applied to corbel ends. Octagonally sawn corbels shall have metal nail plates attached to each end (or anti-splitter bolts installed). These are also recommended for round members. Corbels may be supplied with a central pipe up to 35 mm diameter. Before installation, this shall be plugged both ends as shown in Figure 9.1(Part 2). Where any longitudinal cracks exceed 10mm width, anti-splitter bolts shall be fitted (100S2) as shown in Figure 9.1. Construction standards shall be such that a maximum gap of 5mm occurs at joints between components. All contact surfaces between corbel and h'tk or girder shall be painted with an anti-fungal preservative (100T1) and preservative grease applied (100T2). A bituminous felt (100T7) shall also be placed. Shims shall not be placed between corbel and girder when recambering takes place.				

MP - 2 or 3 (Medium) - failure of a corbel may lead to girder dropping & bridge unserviceability.

Note: Where pipe rot or termite attack exceed the limits given in (5), the condition of the member is critical and should be strengthened or replaced immediately.

4

2.9 Headstocks 54T1 - Place supplementary member		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T1	Place supplementary member	Lump sum	This item covers all work operations and materials associated with the installation of additional members in timber or steel to help restore the load carrying capacity of timber headstocks. Use of such components may be considered for short term to permanent repairs. Refer to Figure 10.1(d) (Part2) for a description of the various support methods for specific defects. Full headstock replacement (54T5) is normally the preferred option, but supplementary support may be considered in certain circumstances (refer Section 10.1 (Part 2)). Work operations covered include supply and installation of support components, notching, drilling, assembly and bolting. Supply of timber components shall follow the requirements of MRS 11.87 for relevant members where applicable. Supply of steel components shall be to the requirements of MRS 11.78. Supply of galvanised bolts, nuts & washers shall be to the requirements of 120S8. Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between existing components and support members (refer 100T1 and 100T2).	Where inspection indicates any of the following, the support option may be considered. 1. Severe longitudinal splitting through width of headstock separating headstock into roughly top and bottom segments. 2. Any moment cracks, either minor or large. 3. Existing splice pulling or broken apart. 4. Any crushing of headstocks at pile supports. 5. Any sagging of headstocks between piles >span/20.	Submit repair proposal to ID and Structures Division for approval, prior to work.	1	4

2.9 Headstocks Cont'd 54T1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T1 (Cont.)	Place supplement ary member		Where moment cracking has occurred, the cause should be determined piror to determination of an appropriate support system. Where headstock sag occurs at pile locations, either statically or under traffic load, refer to Section 10.1 (Part 2) for procedures.				

MP = 1 (High) - severe longitudinal cracking reduces bending capacity of headstock significantly. Moment cracks and crushing indicate partial failure due to overstressing of residual section. Total headstock failure will cause unserviceability of the bridge.

4

2.9 Headstocks 54T2 - Reconstruct splice		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T2	Reconstruct splice	Each	This item covers all work operations and materials associated with the reconstruction of existing defective headstock splices. Where the splice is not located at a position noted in Figure 10.1(c) (Part 2) and the defect appears to be the result of location, consideration should be given to shifting the splice location. Activities listed under 54T6 will then apply. Where the splice is correctly located, but bolts are loose, missing or damaged and components are significantly deteriorated, work activities will consist of removal of bolts (individually), injection of grease into holes, replacement of bolts and washer and tightening of nuts. Where new bolts are required, supply shall be covered by 120S8. If the splice member, or adjacent headstock sections are deteriorated, replacement of splice member and/or relocation to another splice location will be required, using the activities as listed under 54T6.	Inspection indicates:- Existing headstock splice is pulling apart or has broken apart.	Submit repair proposal to ID for approval of details, prior to carrying out job.	1	4

MP = 1 (High) - because loss of headstock continuity due to splice articulation reduces headstock bending capacity.

2.9 Headstocks 54T3 - Relocate headstock		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T3	Relocatehe adstock	Each	This item covers all work operations and materials associated with the relocation of headstocks and tightening of bolts. The reason for headstock movements should be determined before relocation of headstocks. If bolt loosening and headstock movement is caused by headstock decay, replacement under 54T5 may be more appropriate. For decay in the pile support area, refer to Section 11.1 (Part 2). Work items covered include jacking of corbels / girders, relocation of headstocks and tightening of bolts. Where possible, contact surfaces shall be treated with anti-fungal preservative and grease (100T1 and 100T2). Where bolts are very loose or corroded, they shall be treated as for 120S2.	Inspection indicates headstock is being displaced laterally, or has fully or almost pulled off pile seating.	If movement of headstock is due to decay of headstock or piles, repair or replacement of these members may be required. Procedures pertaining to these members will be required.	1	4

MP = 1 (High) - if defect is unchecked, further deterioration could lead to all superstructure loads being taken by a single headstock member, or being totally unsupported.

4

2.9 Headstocks 54T4 - Jack girders or headstock to level		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T4	Jack girders or headstock to level	Each	This item covers all work operations and materials associated with the jacking of headstock members to line, where a headstock sag has occurred because of a pile settlement. Where a sag is less than 50 mm, metal shims may be placed between headstock and corbel / girder to raise deck to line. Work activities included jacking corbel and girders and installation of shims. Where a sag is greater than 50 mm and appears to be stable, the headstock should be jacked to line and reseated. Work activities include removal of pile bolts, jacking headstock to line, placement of support packer, drilling and replacement of bolts. Refer to Figure 10.1(e) (Part 2) for support details. Where a headstock sag is caused by a pile moving noticeably under traffic loading, the reason from this settlement must be determined, before an appropriate, procedure can be determined. If caused by a lack of pile toe support (scour) or pile deterioration (timber decay) refer to Section 11.1 (Part 2) for procedures.	Inspection indicates headstock is deflecting under traffic load at a pile position or has noticeable permanent sag.	For sags greater than 50mm, or movement of pile under load, refer proposed repair method to Structures Division through ID for approval prior to preparing the job.	3	4

MP = 3 (Medium) - any permanent sag will increase bending in a headstock and so reduce its capacity.

2.9 Headstocks 54T5 - Replace headstock in timber		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T5	Replace headstock in timber	Each	This item covers all work operations and materials associated with the replacement of defective headstock members using timber. Replacement with a single member is preferred. If full length timber is not available, splicing will be required (Refer 54T6). Timber shall be supplied to the requirements of MRS 11.87. Timber containing heart material may be used if approved by ID and minimum dimension increased to 200mm. Both members of an open headstock must have the same dimensions in cross section. Work operations covered include jacking and removal of defective member, trimming of new timber, trimming pile seatings if required, erection, drilling and bolting. Construction standards shall be such that a maximum gap of 5mm occurs at joints between components. Checking out of headstock soffits to accept bracing members shall be kept to the minimum shown on the drawings in order to maintain adequate headstock capacity.	Where inspection indicates any of the following: 1. Heavy decay, weathering, severe splitting or cracking, severe fire or termite damage. Also the recommended option for any of the following:- 2. As above but localized area 3. Large sags or moment cracks. 4. Existing splice broken apart. 5. Headstock crushing at pile support.	Submit maintenance proposal to ID for approval. Obtain approval or otherwise from ID for possible supply of heart material in headstock members, prior to placing of orders.	1	4

4

2.9 Headstocks Cont'd 54T5		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T5 (Cont.)	Replace headstock in timber		All contact surfaces between members shall be painted with an anti-fungal preservative (100T1), and a preservative grease applied (100T2). Typical locations are: (1) Headstock to piles (sides and base) (2) Headstock to bracing (3) Coverboard to rear headstock. Exposed headstock ends shall be similarly treated and metal end caps attached (100T3). A bituminous felt shall be placed at pile vertical and horizontal contact surfaces (100T7).				

MP = 1 (High) - failure of defective headstock under traffic load will cause unserviceability of the bridge.

2.9 Headstocks 54T6 - Splice in new headstock section		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T6	Splice in new headstock section	Each	This item covers all work operations and materials associated with the partial replacement of the defective part of a timber headstock using timber. This method may be used if defects are localized, though full replacement with a single member is the preferred option. Timber shall be supplied to the requirements of MRS 11.87. Dimensions of the replacement section shall closely match those of the existing member (this generally will exclude use of heart material in the new segment). The location of the splice and recommended details shall be as shown in Figure 10.1(c) (Part 2). Where a steel splice member is used, it shall be supplied to the requirements of MRS 11.78. The supply of bolts shall be to 120S8. Work operations covered include jacking of corbels / girders, cutting and removal of defective headstock section, cutting and erection of new timber headstock section, assembly of splice member, drilling of holes and assembly of bolts. Construction standards shall be such that a maximum gap of 5mm occurs at joints between components.	Where inspection indicates any of the following , but over a localised area: 1. Heavy decay, weathering, severe splitting or cracking, severe fire or termite damage. 2. Large sag or moment crack. 3. Existing splice broken apart. 4. Headstock crushing at pile support.	Submit drawing of proposed splice type, location and detail to ID. ID shall submit proposal to Structures Division for approval of details.	1	4

4

2.9 Headstocks Cont'd 54T6		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54T6 (Cont.)	Splice in new headstock section		All contact surfaces between members shall be painted with a timber preservative (100T1) and a preservative grease applied (100T2). Typical locations are headstocks to piles, bracing, or coverboards. Ends of members shall be similarly treated and metal end caps attached (100T3). A bituminous felt shall be placed at pile contact surfaces (100T7).				

MP = 1 (High) - failure of a defective headstock under traffic load will cause unserviceability of the bridge.

2.9 Headstocks 54S1 - Reposition headstock		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54S1	Relocate headstock	Each	This item covers all work operations and materials associated with the relocation of headstocks and tightening of bolts. The reason for the headstock movements should be determined before relocation of headstocks. If bolt loosening is due to decay in the timber pile top, refer to Section 11.1 (Part 2). Work items covered include jacking of corbels and girders, relocation of headstocks and tightening of bolts. Contact surfaces of the timber pile shall be treated with anti-fungal preservative and grease (100T1 and 100T2). Where bolts are very loose, they shall be treated as for 120S2.	Where inspection indicates headstock being displaced laterally, or has fully or almost pulled off pile seating.	If movement of headstock is due to decay in timber piles, repair or replacement of these members may be required. Procedures pertaining to these members will be required	1	4

MP = 1 (High) - if defect is unchecked, further deterioration could lead to all superstructure loads being taken by a single headstock member, or being totally unsupported. Looseness also allows twisting of steel girders, significantly reducing capacity.

4

2.9 Headstocks 54S2 - Replace steel headstock		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54S2	Replace steel headstock	Each	This item covers all work operations and materials associated with the replacement of a defective steel headstock with a replacement steel member. If the headstock appears inadequate to carry the bridge loads, a request for a replacement member design shall be sent to Structures Division (through ID). Otherwise, prepare details of replacement member and submit to ID for approval. Refer to Figures 10.2(b) to (h) (Part 2) for suitable details for steel headstock members. Supply of steel headstock shall be to the requirements of MRS 11.78. Work operations covered include fabrication and galvanising of steel member, jacking of corbels and girders, removal of defective headstock, trimming of pile seatings, drilling, erection and bolting. Where holes in the steel headstock are to be drilled on site, these areas are to be treated with a cold galvanizing product (refer to Figure 17.10 (Part 2)). All timber contact areas between the new headstock and timber piles shall be coated with a timber preservative (100T1) and a preservative grease (100T2).	Where inspection indicates any of the following: 1. Minor to large bows and buckles in headstock. 2. Headstock obviously inadequate to carry loads - steel yielded or excessive movements under load. 3. Severe corrosion in headstock.	Submit drawings of proposed detail to ID. ID shall submit proposals to Structures Division for approval of details. Existing attachment details to steel piles shall be sent to BAM for information.	1	4

2.9 Headstocks Cont'd 54S2		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54S2 (Cont.)	Replace steel headstock		A bituminous felt shall also be placed on these surfaces (100T7). Where the existing piles are steel, details of attachment brackets or welds shall be sent to BAM for information and approval. Care must be taken to prevent twisting in the erected headstock. Seatings in timber piles shall be trimmed so that surfaces are truly horizontal, vertical and planar. Where a headstock is replaced, the adjacent member must also have the same stiffness.				

MP = 1 (High) -failure of a defective headstock under traffic load will cause unserviceability of the bridge.

4

2.9 Headstocks 54S3 - Strengthen steel headstock		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54S3	Strengthen steel headstock	Each	This item covers all work operations and materials associated with the strengthening of existing steel headstocks in order to restore or achieve adequate capacity. The work will normally take the form of additional web or flange plates welded to the existing member. Strengthening may be considered as an alternative option to member replacement. If strengthening is required, defect details shall be submitted to Structures Division for preparation of strengthening details. Supply of strengthening plates shall be to the requirements of MRS 11.78. Work operations covered included jacking of components (if specified), removal of corrosion products, removal of coatings in repair or strengthening areas, placing and welding of repair components and application of protective coating. Site welding shall only be carried out by a DMR accredited welding operator. Where a protective coating is damaged during the welding / preparation process, the area shall be treated with a cold galvanizing material (refer Figure 17.10 (Part 2)).	Where inspection indicates any of the following: 1. Minor bows or buckles in the existing headstock. 2. Headstock is showing excessive movement or yielding, indicating inadequate capacity. 3. Severe corrosion causing significant loss of section in webs or flanges.	Details of existing headstock defects shall be submitted to Structures Division for preparation of strengthening details. Ensure welding operator is DMR accredited.	1	4

2.9 Headstocks Cont'd 54S3		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54S3 (Cont.)	Strengthen steel headstock		Where more extensive repair of protective coating is required, this shall be carried out to the requirements of 100S3. Where one headstock member is strengthened, the adjacent headstock must also have the same resultant stiffness.				

MP = 1 (High) -strengthening will restore or provide adequate capacity to the component which is a primary structural member.

4

2.9 Headstocks 54S4 - Replace timber headstock with steel alternative		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54S4	Replace timber headstock with steel alternative	Each	This item covers all work operations and materials the replacement of timber headstocks with steel members. This method is an alternative to replacing a headstock member in timber. With this method, both members of an open headstock must be replaced in steel. Figures 10.2(b) to (h) (Part 2) show suitable details of alternative steel members. Approval for use of steel headstock shall be obtained from ID prior to job preparation. Supply of steel headstocks shall be to the requirements of MRS 11.78. Supply of new bolts shall be to 120S8. Work operations covered include fabrication and galvanizing of steel members, jacking of corbels and girders, trimming of pile seatings, drilling holes, erection and bolting. Where holes in the steel members are to be drilled on site, these areas are to be treated with a cold galvanizing product (refer to Figure 17.10 (Part 2)). All contact areas between the new headstocks and timber piles shall be coated with a timber preservative (100T1) and a preservative grease (100T2).	May be considered as an option where an inspection indicates any of the following: 1. Heavy decay, weathering, severe splitting or cracking severe fire or termite damage. 2. Also as an option for any of the following:As above but localized area. 3. Large sags or moment cracks. 4. Existing splice broken apart. 5. Headstock crushing at pile support.	Submit drawings of proposed details to ID. ID shall submit proposals to Structures Division for approval of details. Subsequent to job completion, the District shall change the BIS element designation to 54S.	1	4

2.9 Headstocks Cont'd 54S4		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54S4 (Cont.)	Replace timber headstock with steel alternative		A bituminous felt shall be placed at these surfaces (100T7). Where the existing piles are steel, details of attachment brackets, bolts and welding are shown in Figure 10.2(a) (Part 2). Correct seating of steel headstocks is very important as built-in twists will reduce capacity. Care must be taken to trim pile seats to a level line and vertical faces to be truly vertical.				

MP = 1 (High) - failure of defective headstocks under traffic load will cause unserviceability of the bridge.

4

2.9 Headstocks 54S5 - Jack girders or headstock level		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54S5	Jack girders or headstock to level	Lump sum	This item covers all work operations and materials associated with the jacking of girders or headstock in order to restore line to the bridge superstructure. Where a sag is less than 50mm, metal shims may be placed between headstock and girder or corbel to raise deck to line. Work activities include jacking girders and corbels and installation of shims. Where a sag is greater than 50mm, and appears to be stable, the headstock should be jacked to line and reseated. Work activities include removal of pile bolts, jacking headstock to line, placement of support packer, drilling and replacement of bolts. Refer to Figure 10.2(a) (Part 2) for support details. Where a headstock sag is caused by a pile moving noticeably under traffic loading, the reason for this settlement must be determined, before an appropriate procedure can be determined. If caused by a lack of pile toe support (scour) or pile deterioration (timber decay) refer to Section 11.1 (Part 2) for procedures.	Where inspection indicates that headstock is deflecting under traffic load at a pile position or has noticeable permanent sag.		3	4

MP = 3 (Medium) - any permanent sag will increase bending in the headstock and so reduce its capacity.

2.9 Headstocks 54C1 - Strengthen headstock		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
54C1	Strengthen headstock	Each	This item covers all work operations and materials associated with the strengthening of an existing concrete headstock in order to restore load carrying capacity. Refer defect details to Structures Division for preparation of an applicable strengthening scheme. The reason for the defect has to be determined in order to provide appropriate repair measures. Work activities will vary according to the required repair treatments.	Where a Level 2 or Level 3 inspection has identified significant flexural or shear cracks in a concrete headstock.	Refer to Structures Division to determine cracking significance. Where cracking is considered critical, a strengthening procedure will be provided.	1	4

MP = 1 (High) - shear cracks, in particular, indicate overstressing due to insufficient capacity or gross overloading and will cause restrictions in loading until repaired.

4

2.10 Piles 56T1 - Replace timber pile		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56T1	Replace timber pile	Each	This item covers all work operations and materials associated with the full replacement of an existing timber pile. This procedure will in general result in a new timber pile driven beside the defective pile. Where the existing defective pile is to be withdrawn and a new pile driven, the bridge structure shall be adequately tommed to support any load being carried by the pile. Refer to Figure 17.11(c) (Part 2) for tomming details. As well the structure shall be tommed to allow separation of headstocks for pile driving clearances. Timber shall be supplied to the requirements of MRS 11.87. All bolts shall be supplied to 120S8. Work operations covered include bridge tomming, removal and replacement of bracing, removal of existing pile (if required), driving of new timber pile, drilling and bolting. Removal and replacement of bracing should be covered by 57T3. Care must be exercised not to excessively trim the sides of timber piles (for bracing) close to headstock seatings - refer to Section 11.1(Part 2).	Where inspection indicates any of the following:- 1. Severe surface decay effecting strength. 2. Heavy pipe rot >35% up to 50% of diameter. 3. Severe termite attack on surface or in pipe >35% up to 50% of diameter. 4. Severe splitting effecting strength.	Submit drawing of proposed pile detail to ID.	1	4

2.10 Piles Cont'd 56T1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56T1 (Cont.)	Replace timber pile		Bolting of components shall be covered by 120S2. Construction standards shall be such that a maximum gap of 5mm occurs at joints between components. All contact surfaces shall be painted with an anti-fungal preservative (100T1), and a preservative grease applied (100T2). The exposed pile top shall be similarly treated and metal end caps attached (100T3). A bituminous felt shall be placed at headstock contact surfaces (100T7). The new pile shall be poisoned for termites (110T1). Note: As an alternative a replacement steel pile may be used (56S2). Where there is adequate foundation support, splicing of the top section of the pile may be considered (56T2), as this will normally be the cheapest option.				

MP = 1 (High) - failure of a defective pile under traffic load may cause loss of serviceability varying from bridge closure to imposition of a bridge load limit.

Note: Where pipe rot or termite attack exceed the limits given in (2) or (3), the condition of the member is critical and should be replaced immediately.

4

2.10 Piles **56T2 - Splice timber pile**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56T2	Splice timber pile	Each	This item covers all work operations and materials associated with the partial replacement of a deteriorated section of timber pile by splicing in a new section of timber pile. This procedure is suitable only if the pile section in the ground has adequate support capacity. Refer to Figure 11.1(c) (Part 2) for the recommended splicing detail suitable for all locations and which provides the same moment capacity as the original pile section. If > 50% of piles are to be spliced at one level, it is recommended that Structures Division review the proposal to check structural adequacy. Timber shall be supplied to the requirements of MRS 11.87. Metal components shall be supplied to the requirements of MRS 11.78. All bolts shall be supplied to 120S8. Where pile splicing is to occur under traffic, the bridge structure shall be adequately tommed to remove all load from the pile. Work operations covered include bridge tomming, removal and replacement of bracing, removal of defective pile section and splicing of new pile section, drilling and bolting.	Where inspection indicates any of the following:- 1. Severe surface decay effecting strength. 2. Heavy pipe rot >35% up to 50% of diameter. 3. Severe termite attack on surface or in pipe>35% up to 50% diameter. 4. Severe splitting effecting strength.	If an alternative splice type is required, submit drawing of proposed splice type, location and detail to ID. ID shall submit proposal to Structures Division for approval of details. When work is completed advise ID so that details may be inserted in BIS.	1	4

2.10 Piles Cont'd 56T2		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56T2 (Cont.)	Splice timber pile		Removal and reassembly of bracing should be covered under 57T3. Care must be exercised not to excessively trim the sides of timber piles (for bracing) close to headstock seatings - refer to Section 11.1 (Part 2). Bolting of components shall be covered by 120S2. Construction standards shall be such that a maximum gap of 5mm occurs at joints between components. All contact surfaces shall be painted with an anti-fungal preservative (100T1), and a preservative grease applied (100T2). The top of a new pile section shall be similarly treated and a metal end cap also attached to any exposted outer pile top (100T3). A bituminous felt shall be placed at the splice and headstock contact surfaces (100T7). The new pile section shall poisoned for termites (110T1). Where the splice location is below ground level, the butt join should be wrapped with geotextile fabric and the spliced area backfilled with non porous soil - refer to Section 11.1 (Part 2)				

MP = 1 (High) - failure of a defective pile under traffic load may cause loss of serviceability varying from bridge closure to imposition of a bridge load limit.

4

2.10 Piles 56T3 - Place supplementary member		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56T3	Place supplementary member	Lump sum	This item covers all work operations and materials associated with the installation of additional members in timber or steel to help restore load carrying capacity of a timber pile. Use of such components may be considered for short to medium term repairs, pending future member replacement. Refer to Figure 11.1(f) (Part 2) for a suitable supplementary support method. Work operations covered include supply and installation of support components, drilling, assembly and bolting. Supply of timber components shall follow the requirements of MRS 11.87. Supply of steel components shall be to the requirements of MRS 11.78. Supply of galvanised bolts, nuts and washers shall be to the requirements of 120S8. Anti-fungal preservative and preservative grease shall be applied to all contact surfaces between existing components and support members (refer 100T1 and 100T2).	Where inspection indicates any of the following:- 1. Heavy surface decay or pile rot up to 35% of diameter. 2. Heavy termite attack on surface or in pipe up to 35% of diameter.	Submit drawing of proposed detail to ID. When work is completed, advise ID so details may be inserted in BIS.	1	4

MP = 1 (High) - failure of a defective pile under traffic load may cause loss of serviceability varying from bridge closure to imposition of a load limit.

2.10 Piles 56T4 - Provide banding		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56T4	Provide banding	Lump sum	This item covers all work operations and materials associated with the banding of timber piles to enhance the structural column capacity of these members. Use of such components may be considered for medium term to permanent repairs. Refer to Figure 11.1(e) (Part 2) for recommended details for banding. If cracking is associated with decay or significant piping, it is recommended that the pile be spliced (56T2). Supply of steel components shall be to the requirements of MRS 11.78. Supply of galvanised bolts, nuts and washers shall be to the requirements of 120S8. Anti-fungal preservative and preservative grease shall be applied to the contact surface with the banding (100T1 and 100T2).	Where inspection indicates large longitudinal splits particularly under headstock seating.	After completion, banding details shall be submitted to ID for incorporation in BIS.	1	4

MP = 1 (High) - cracking may severely reduce the column capacity of the pile while splits below the headstock seating may lead to loss of headstock support

4

2.10 Piles **56S1 - Strengthen steel pile**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56S1	Strengthen steel pile	Lump sum	This item covers all work operations and materials associated with the strengthening of an existing steel pile, in order to restore adequate load carrying capacity. Strengthening would be considered a preferable option to pile replacement. If strengthening is required, defect details shall be submitted to Structures Division for preparation of strengthening details. Supply of strengthening plates shall be to the requirements of MRS 11.78. Work operations covered include removal of corrosion products, removal of coatings in repair or strengthening areas, placing and welding of repair components and application of protective coating. Site welding shall only be carried out by a DMR accredited welding operator. Where a protective coating is damaged during the welding / preparation process, the area shall be treated with a cold galvanising material (refer Figure 17.10 (Part 2)). Where more extensive repair of protective coating is required, this shall be carried out to the requirements of 100S3 or 100S4.	Where inspection indicates severe corrosion of painted, galvanised or unpainted surface and up to 20% loss of section of the pile.	Details of existing steel pile defects shall be submitted to Structures Division for preparation of strengthening details	1	4

MP = 1 (High) - strengthening will restore adequate capacity to the component which is a primary structural member.

2.10 Piles 56S2 - Place new steel pile		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56S2	Place new steel pile	Each	This item covers all work operations and materials associated with the installation of a new steel pile as a replacement for an existing timber pile. Driving of a new steel pile is an alternative option to replacing a timber pile in the same material. Figure 11.2 (Part 2) shows suitable details of an alternative steel member. Approval for use of steel piles shall be obtained from ID prior to job preparation. Supply of steel components shall be to the requirement of MRS 11.78. Supply of new bolts shall be to 120S8. Work operations covered include fabrication and galvanising of steel members, jacking of corbels / girders, headstock separation or modification (i.e splice strengthening where headstock is modified to let in pile.) driving of steel pile, drilling, attachment of brackets and bolting. Where holes in steel members are to be drilled on site, these areas are to be treated with a cold galvanising product (refer to Figure 17.10 (Part 2)). Contact surfaces between the existing timber headstocks and steel components shall be coated with a timber preservative (100T1) and a preservative grease (100T2).	Placement of steel pile may be considered as an option where inspection indicates any of the following:- 1. Severe surface decay effecting strength. 2. Heavy pipe rot up to 50% of diameter. 3. Severe termite attack on surface, or in pipe up to 50% of diameter. 4. Severe splitting effecting strength.	Submit drawings of proposed details to ID. ID shall submit proposal to Structures Division for approval. Subsequent to job completion, the District shall change the BIS element designation to 56S.	1	4

4

2.10 Piles Cont'd 56S2		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56S2 (Cont.)	Place new steel pile		Site welding of brackets shall only be carried out by a DMR accredited welder. Where a protective coating is damaged during the welding process, the area shall be treated with a cold galvanising product.				

MP = 1 (High) - failure of a defective pile under traffic load may cause loss of serviceability varying from bridge closure to imposition of a load limit.

2.10 Piles 56P1 - Place concrete encasement		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
56P1	Place concrete encasement	M	This item covers all work operations and materials associated with the placement of a concrete encasement in order to strengthen an existing deteriorated concrete pile. If pile strengthening is required, defect details shall be submitted to Structures Division for preparation of encasement details. Work operations covered include removal of deteriorated concrete, placement of forms and reinforcing, placement of concrete and form removal. Concrete encasement would be considered as an alternative to the preferred option of breaking back, cleaning or repairing corroded reinforcing and patching of removed concrete. As well, aesthetic considerations may preclude the use of encasement in some situations.	As an alternative option where inspection indicates any of the following:- 1. Severe cracking due to advanced reinforcing corrosion. 2. Severe spalling due to reinforcing corrosion. 3. Heavy flexural cracking.	Submit request to Structures Division for pile strengthening proposal through ID. Subsequent to job completion, the District shall note the amendment to the pile in BIS.	1	4

MP = 1 (High) - strengthening will restore adequate capacity to the component which is a primary structural member.

This item is interim pending release of the Bridge Maintenance Manual.

4

2.10 Piles 60T1 - Replace timber wing pile		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
60T1	Replace timber wing pile	Each	This item covers all work operations and materials associated with the full replacement of an existing timber wing pile. This procedure will in general result in a new timber pile driven beside the defective pile. Where the existing defective pile is to be withdrawn and a new pile driven, the wing backing slabs shall be adequately braced to support any load being carried by the pile. Timber shall be supplied to the requirements of MRS 11.87. All bolts shall be supplied to 120S8. Work operations covered include wing bracing, removal of existing pile (if required), driving of new timber pile, drilling and bolting. Bolting of components shall be covered by 120S2. Construction standards shall be such that a maximum gap of 5mm occurs at joints between components. All contact surfaces shall be painted with an anti-fungal preservative (100T1), and a preservative grease applied (100T2). The exposed pile top shall be similarly treated and metal end caps attached (100T3). The new pile shall be poisoned for termites (110T1). Note: As an alternative a replacement steel pile may be used (56S2).	Where inspection indicates any of the following:- 1. Severe surface decay effecting strength. 2. Heavy pipe rot up to 50% of diameter. 3. Severe termite attack on surface or in pipe up to 50% of diameter. 4. Severe splitting effecting strength.		2 or 3	3

MP = 2 or 3 (Medium) - failure of a defective wing pile may lead to wing collapse and partial embankment collapse.

2.10 Piles **60T2 - Stabilise wing piles**		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority** **SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
60T2	Stabilise wing pile	Lump sum	This item covers all work operations and materials associated with the stabilising of timber wing piles which have moved forward significantly under the action of earth pressure loads. This may be achieved by the use of a deadman typically as shown in Figure 16.1 Part 2. Refer to Structures Division for the preferred solution to the excessive movement of wing piles. The actual stabilising method will be site dependent.	Inspection indicates wing piles are leaning forward excessively i.e. nominally >40mm forward movement.	Contact Structures Division to determine stabilising procedure. After completion, details shall be submitted to ID for incorporation in BIS	2 or 3	3

MP = 2 or 3 (Medium) - collapse of a wing would lead to loss of embankment fill behind the abutment due to scour or loss of embankment support.

Note: Where wing piles are of steel or concrete also use Activity 60T2.

4

2.11 Bracing 57T5 - Replace struts and fenders		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
57T5	Replace struts and fenders	M	This item covers all work operations and materials associated with the replacement of existing timber struts and fenders with new timber components. Timber shall be supplied to the requirements of MRS 11.87. Work operations covered include removal of bolts, removal of defective members, installation of new members and bolts. Bolting shall be carried out to the requirements of 120S2. All contact surfaces between new members and wales, piles and headstock shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2). The exposed ends of fenders shall be similarly treated and metal end cap attached (100T3). Construction standards shall be such that a maximum gap of 5mm occurs at joints between components.	Where inspection indicates:- 1. Severe splitting, cracking or decay with significant loss of strength. 2. Member is missing (and should be in place) or has broken loose.		3	3

MP = 3 (Medium) - failure of struts and fenders will reduce the resistance of a pier to flood debris and wind loads.

2.11 Bracing 57T1 - Replace braces/wales		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
57T1	Replace braces / wales	M	This item covers all work operations and materials associated with the replacement of existing timber bracing and wales with new timber components. Timber shall be supplied to the requirements of MRS 11.87. Work operations covered include removal of bolts, removal of bracing and / or wale members, installation of new members and bolts. Bolting shall be carried out to the requirements of 120S2. The top and bottom of bracing members shall be checked into the headstock and wale as shown in Figure 12.1 (Part 2). Care must be exercised that checking in is kept to a minimum so as not to reduce headstock capacity. Care must be taken not to excessively trim the sides of timber piles close to headstock seatings - refer Section 11.1 (Part 2). Where the existing pile has such extensive trimming, refer to Structures Division for advice on strengthening of headstock seating area. Where a wale cannot be replaced in a single member, refer to 57T4. All contact surfaces between bracing / wales and piles and headstock shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2).	Where inspection indicates:- (1) Severe splitting, cracking or decay with significant loss of strength. (2) Bracing is missing (and should be in place) or has broken loose.	While pile has excessive trimming for bracing seating, refer to Structures Division for strengthening procedures for headstock seating area.	3	3

4

2.11 Bracing Cont'd 57T1		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
57T1 (cont.)	Replace braces / wales		The exposed ends of wales shall be similarly treated and metal end caps attached (100T3). Construction standards shall be such that a maximum gap of 5mm occurs at joints between components.				

MP = 3 (Medium) - failure of braces and wales will reduce the resistance of a pier to flood debris and wind loads.

2.11 Bracing 57T2 - Add new braces/wales		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
57T2	Add new braces / wales	M	This item covers all work operations and materials associated with the installation of new timber bracing and wales to a piled pier. Refer to Figure 12.1 (Part 2) to confirm bracing is required and submit proposal to ID for approval. Timber shall be supplied to the requirements of MRS 11.87. Work operations covered include trimming of pile seating areas, installation of bracing / wale members and bolting. Bolting shall be carried out to the requirements of 120S2. The top and bottom of bracing members shall be checked into the headstock wale as shown in Figure 12.1. Care must be exercised that checking is kept to a minimum so as not to reduce headstock capacity. Care must be taken not to excessively trim the sides of timber piles close to headstock seatings - refer Section 11.1 (Part 2). Where a wale cannot be placed in a single member, refer to 57T4. All contact surfaces between bracing / wales and piles and headstock shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2). The exposed ends of wales shall be similarly treated and metal end caps attached (100T3). Construction standards shall be such that a maximum gap of 5mm occurs at joints between components.	Where inspection indicates bracing has not been installed but is considered necessary.	Submit bracing details to ID for approval.	3	3

MP = 3 (Medium) - lack of bracing will significantly reduce the capacity of the bridge to resist lateral flood debris loads.

4

2.11 Bracing 57T3 - Remove & replace braces/wales		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
57T3	Remove & replace braces / wales	Lump sum	This item covers all work operations and materials associated with the removal and reassembly of existing bracing members during pile splicing operations. Work operations covered include unbolting and removal of bracing and wales (where these interfere with piling operations), reassembly and re-bolting. All contact surfaces between bracing / wales and piles shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2).	Where operations such as pile replacement or splicing are carried out.		3	3

2.11 Bracing 57T4 - Splice wales		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
57T4	Splice wale	Lump sum	This item covers all work operations and materials associated with the splicing of timber wales where insufficient timber length is available to replace this member in a single piece. Refer to Figure 12.1 (Part 2) for approved location of butt joint and bolting arrangement. Timber shall be supplied to the requirements of MRS 11.87. Work operations covered include removal of bolts, removal and replacement of wale including splicing, and rebolting. Bolting shall be carried out to the requirements of 120S2. All contact surfaces between the wale and piles shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2). The exposed end of a new wale section shall be similarly treated and a metal end cap attached (100T3). Construction standards shall be such that a maximum gap of 5mm occurs at joints between components.	Where inspection indicates:- 1. Severe splitting, cracking or decay with significant loss of strength. 2. Wale is missing (and should be in place) or has broken loose.		3	3

MP = 3 (Medium) - failure of a wale will reduce the resistance of a pier to flood debris loads.

4

2.11 Bracing 57S1 - Replace steel braces/wales		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
57S1	Replace steel braces / wales	M	This item covers all work operations and materials associated with the installation of steel bracing and wales either as :- (a) Replacement of an existing steel bracing system. (b) An alternative to replacing timber bracing in the same material. Steel components shall be fabricated to the requirements of MRS 11.78. Work operations covered include removal of bolts, removal of bracing or wale members, installation of new members, brackets and bolts. Bolting shall be carried out to the requirements of 120S2. All timber contact surfaces between bracing / wales and timber piles shall be treated with an anti-fungal preservative and a preservative grease (100T1 and 100T2).	Where inspection indicates existing steel bracing is showing advanced corrosion effecting strength, or has broken loose or missing. Also when used as an alternative to replacement of a timber member showing defects noted for 57T1.	Where to be used as a replacement for timber bracing, details shall be submitted to Structures Division (through ID) for approval.	3	3

MP = 3 (Medium) - failure of braces and wales will reduce the resistance of a pier to flood debris and wind loads.

2.11 Bracing 57S2 - Add new steel braces/wales		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
57S2	Add new steel braces / wales	M	This item covers all work operations and materials associated with the installation of new steel bracing and wales to a piled pier. This is an alternative to placing timber bracing / wales. Refer to Figure 12.1 (Part 2) to confirm bracing is required and submit proposal to ID for approval. Steel members shall be supplied to the requirements of MRS 11.78. Work operations covered include trimming of pile seating areas, installation of bracing / wale members, bracket attachment and bolting. Bolting shall be supplied to 120S8 and installed to the requirements of 120S2. Care must be taken not to excessively trim the sides of timber piles close to h'tk seatings - refer Section 11.1 (Part 2). All contact surfaces between bracing / wales and piles shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2).	May be considered as an option where bracing has not been installed but is considered necessary.	Submit bracing details to ID for approval	3	3

MP = 3 (Medium) - lack of bracing will significantly reduce the capacity of the bridge to resist lateral flood debris loading.

4

2.12 Sill / footing 59T1 - Replace sill in timber		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
59T1	Replace sill in timber	M	This item covers all work operations and materials associated with the replacement of a timber sill beam using hardwood timber. The supply of new timber shall be to the requirements of MRS 11.87. Work operations covered include propping of the structure to take all load off the sill beam, excavation of overlying soil, removal of defective sill beam, installation of new beam, bolting, removal of props and refilling excavation. The new beam shall be of at least the same dimensions as those of the original beam.*	Where inspection indicates any of the following:- 1. Excessive pipe rot or decay effecting strength 2. Excessive splitting effecting strength. 3. Severe crushing at pile support area.		3	3

MP = 3 (Medium) - deterioration of the sill beam will cause settlement of the structure.

* It is recommended that consideration be given to the installation of a more durable concrete sill footing.

2.12 Sill / footing 59T2 - Partially replace sill in timber		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
59T2	Partially replace sill in timber	M	This item covers all work operations and materials associated with the partial replacement of a localised area of a timber sill, using hardwood materials. The supply of new timber shall be to the requirements of MRS 11.87. Work operations covered include propping of the structure to take load off the effected areas, excavation of overlying soil, removal of defective section of sill beam, placement of new segment, bolting, removal of props and refilling excavation. At least 2 piles shall be supported on any segment of sill beam - refers to Figure 13.1 (Part 2).	Where inspection indicates any of defects noted for 59T1 but only over a localised area.		3	3

MP = 3 (Medium) - deterioration of the sill beam will cause settlement of the structure.

4

2.12 Sill / footing 59T3 - Replace pile connections		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
59T3	Replace pile connections	Each	This item covers all work operations and materials associated with the replacement of attachment bolts between timber piles and a timber sill member. Attachment at both U/S and D/S pile locations are the most critical for maintaining overturning stability of a silled pier or abutment. Replacement connections shall be galvanised. Work operations cover excavation, replacement of bolts and refilling of excavation.	Where inspection indicates that connections between the piles and sill beam are severely corroded. The upstream and downstream pile connections are particularly important.		3	3

2.12 Sill / footing 59C1 - Replace sill in concrete		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
59C1	Replace sill in concrete	M3	This item covers all work operations and materials associated with the replacement of an existing timber sill by a concrete sill. This is an alternative to replacing the member in the same material as existing. Work operations covered include propping of the structure to take all load off the sill beam, excavation of overlying soil, removal of defective timber beam, replacement of reinforcing and casting of new concrete sill beam, bolting, removal of props and refilling excavation. Details of proposed new beam shall be submitted to ID and Structures Division for approval. Concrete shall be supplied and place to the requirements of MRS 11.70. The sill beam may be cast in stages where required.	May be considered as an option where an inspection indicates any of defects noted for 59T1.	Submit details of proposal concrete beam to ID and Structures Division for approval prior to job.	3	3

MP = 3 (Medium) - deterioration of the sill beam will cause settlement of the structure.

4

2.12 Sill / footing 59C2 - Partially replace sill in concrete		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
59C2	Partially replace sill in concrete	M3	This item covers all work operations and materials associated with the replacement of part of a timber sill by a concrete footing. Details of proposed concrete footing shall be submitted to Structures Division for approval.	May be considered as an option where an inspection indicates any of the defects noted for 59T1, but only over a localised area.		3	3

2.12 Sill / footing 59C3 - Replace pile connections		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
59C3	Replace pile connections	Each	This item covers all work operations and materials associated with the replacement of attachment bolts between timber piles and a concrete sill (generally at piers). New attachment bolts shall be galvanised, and have a diameter at least equal to those being replaced.	Where inspection indicates that connections between the piles and sill are severely corroded (the upstream pile connections are particularly important).		3	3

2.13 Abutment 50C1 - Reconstruct ballast wall		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
50C1	Reconstruct ballast wall	M	This item covers all work operations and materials associated with the reconstruction of a deteriorated ballast wall on a concrete abutment.	Where inspection indicates a ballast wall is severely cracked, spalled on failed with loss of embankment fill.		3	3

This item is interim until release of the Bridge Maintenance Manual.

2.13 Abutment 50O1 - Repair mortar		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
50O1	Repair mortar	M2	This item covers all work operations and materials associated with the repair of cracked or deteriorated mortar in rubble masonry walls and abutments	Where inspection indicates moderate to severe cracking or moderate to heavy loss of mortar in mortar joints of rubble masonry.		1	3

This item is interim until release of the Bridge Maintenance Manual.

4

2.14 Abutment sheeting / Infill 52T1 - Replace sheeting planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52T1	Replace sheeting planks	M2	This item covers all work operations and materials associated with the replacement of timber plank sheeting at abutment or wing walls. Work operations include excavation of fill behind sheeting, removal of defective planks, installation of new planks and re-filling of the excavation. Timber planks shall be supplied to the requirements of MRS 11.87. Contact surfaces between sheeting and piles shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2).	Where inspection indicates any of the following. 1. Heavy to severe decay, planks rotted out. 2. Heavy to severe termite attack.		2 or 3	3

2.14 Abutment sheeting / Infill 52T2 - Splice sheeting planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52T2	Splice sheeting planks	M2	This item covers all work operations and materials associated with partial replacement of timber plank sheeting at abutments and wings. Refer to Figure 15.1 (Part 2) for a proposed detail for replacement between piles. Timber planks shall be supplied to the requirements of MRS 11.87. Contact surfaces between sheeting and piles / packing shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2).	This may be used as an option where inspection indicates 1. Heavy to severe decay 2. Heavy to severe termite attackwhere defect occurs in a single bay only.		2 or 3	2

2.14 Abutment sheeting / Infill 52T3 - Reposition sheeting		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52T3	Reposition sheeting	M^2	This item covers all work operations and materials associated with the repositioning of timber sheeting planks that have settled at abutments or wing walls. Work operations include excavation and replacement of fill (if required) and relocation of planks to correct location.	Where inspection indicates noticeable settlement of planks.		3	2

2.14 Abutment sheeting / Infill 52T4 - Replace abutment log		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52T4	Replace abutment log	Each	This item covers all work operations and materials associated with the replacement of timber logs which form a sill log abutment. Work operations include propping of the span end to take all load off the abutment, cutting of bolts, removal of defective logs, installation of new logs, reinstatement of anchor bolts, and removal of props. Contact surfaces between logs and at girder contact areas shall be treated with an anti-fungal preservative (100T1) and a preservative grease (100T2). Consideration may also be given to converting the log abutment into a concrete abutment - refer to Structures Division for advice.	Where inspection indicates heavy to severe decay or termite attack in sill logs		1	3

4

2.14 Abutment sheeting / Infill 52P1 - Replace concrete planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52P1	Replace concrete planks	M²	This item covers all work operations and materials associated with the replacement of concrete plank sheeting at abutments and wing walls. Refer to figure 15.2 (Part 2) for plank details. Work operations include excavation of fill behind sheeting, removal of defective planks, installation of new planks and refilling of the excavation. The supply and replacement of concrete shall be to the requirements of MRS 11.70.	Where inspection indicates any of the following:- 1. Severe cracking due to corroding reinforcing or earth pressure. 2. Severe spalling due to corroding reinforcing. 3. Excessive bulging due to earth pressure.		2 or 3	2

2.14 Abutment sheeting / Infill 52P2 - Reposition concrete planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52P2	Reposition concrete planks	M²	This item covers all work operations and materials associated with the repositioning of concrete sheeting planks that have settled at abutments or wing walls. Work operations include excavation & replacement of fill (if required) and relocation of planks to correct location.	Where inspection indicates excessive settlement or separation of planks allowing loss of fill.		3	2

2.14 Abutment sheeting / Infill 52C1 - Seal gaps - concrete		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52C1	Seal gaps - concrete	Lump sum	This item covers all work operations and materials associated with the sealing of gaps formed where concrete infill has rotated or moved away from abutments.	Where inspection indicates gaps of 50mm or less have opened up at abutments due to wall movement. There may be some loss of fill.		3	2

2.14 Abutment sheeting / Infill 52C2 - Stabilise wall		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52C2	Stabilise wall	Lump sum	This item covers all work operations and materials associated with the stabilisation of concrete or rubble masonry walls which have lost stability and are rotating forwards under the action of earth pressure. Seek advice from Structures Division on a suitable stabilising procedure.	Where inspection indicates excessive settlement or rotation of the wall has taken place. A top movement forward of > 50mm could indicate the need to stabilise.	Structures Division will need to check the stability and prepare a stabilising method.	3	2

4

2.14 Abutment sheeting / Infill 52O1 - Place additional rock fill		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52O1	Place additional rock fill	M^3	This item covers all work operations and materials associated with the placement of additional rock fill to abutment and embankment rock protection. Rock material shall be supplied to the requirements of MRS 11.03.	Where inspection indicates 1. Moderate to excessive settlement of fill has taken place with some loss of fill. 2. Excessive bulging of existing rock fill has taken place.		3	2

2.14 Abutment sheeting / Infill 52O2 - Patch grouted surface		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
52O2	Patch grouted surface	Lump sum	This item covers all work operations and materials associated with the patching of holes or cracks which have developed in the surface of grouted rock protection. Materials for patching shall be supplied to the requirements of MRS 11.03.	Where inspection indicates moderate to heavy loss of mortar in grouted rock surfacing.		1	2

This item is interim until release of the Bridge Maintenance Manual.

2.15 Preservation 100T1 - Apply chemical preservative to timber		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100T1	Apply chemical preservative to timber	Lump sum	This item covers the application of penetrating anti-fungal preservative to timber components. Areas to be treated are: 1. Deteriorated timber showing, weathering, decay or splitting. 2. Ends of members. 3. All timber surfaces in contact with other components. Details of generally approved preservatives are listed in Figure 17.7 (Part 2). Where other products are to be used, details shall be submitted to BAM for information and approval. The method of application and quantities of preservative used shall be as required by the product instructions. This item includes the use of solid boron rods placed into drilled holes. All material and labour costs shall be included in the M.A.N. for the particular component.	Where inspection indicates: 1. Minor to moderate weathering, decay or splitting. 2. No obvious signs of preservative on member ends. It is recommended that preservative be applied to h'tk ends on a regular programmed basis. Also, apply to contact surfaces when new members are placed, spliced or supported. General end treatments will normally be carried out during Level 1 inspections or under RMPC routine maintenance.	Where products not listed in TBMM are to be used, approval shall be sought from BAM.	3	-

MP = 3 (Medium) - helps reduce on delay decay in timber members, particularly on hidden contact surfaces and exposed ends.

4

2.15 Preservation 100T2 - Apply preservative grease to member ends and contact surfaces		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100T2	Apply preservative grease to timber	Lump sum	This item covers the application of a preservative grease to component ends to act as an end seal, to help control end splitting and loss of preservative. As well, it shall be applied to all contact surfaces after preservative application, to provide enhanced protection. Details of acceptable products are listed in Figure 17.7 (Part 2). These materials are high build products, requiring minimum application thicknesses as listed. All material and labour costs shall be included in the M.A.N. for the particular component	Whenever an application of preservative is applied to member ends (particularly h'tks), or there are no obvious remnants of previous applications. Also apply to contact surfaces when new members are placed, spliced or supported. General end greasing will normally be carried out during Level 1 inspections, or under RMPC routine maintenance.		3	-

MP = 3 (Medium) - helps reduce or delay decay in timber members, particularly on hidden contact surfaces and exposed ends.

2.15 Preservation 100T3 - Replace or provide metal caps to member ends		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100T3	Replace or provide metal caps to member ends	Lump sum	This item covers the provision or replacement of metal caps to the ends of timber h'tks, wales and pile tops. These provide protection to the exposed ends of these members and help retain end preservative treatments. Where caps are non-existent or badly rusting, new caps shall be fabricated and attached. Refer to Figure 7.5 (Part 1) for general details. 24 gauge galvanised iron is the suggested material with galvanised nails for attachment. All material and labour costs shall be included in the M.A.N. for the particular component.	Place or replace caps after application of end preservative coatings.		3	-

MP = 3 (Medium) - caps help extend service life of members by retaining end sealing and protective materials in exposed ends.

4

2.15 Preservation 100T4 - Paint or repaint timber		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100T4	Paint or repaint timber	Lump sum	This item covers the painting or repainting of timber components to enhance protection and improve delineation of:- (a) Timber barrier (b) Guideposts (c) Kerbs All material and labour costs shall be included in the M.A.N. for the particular component.	Where inspection indicates that the paint system on timber barriers, guide posts or timber kerbs has broken down.		3	-

2.15 Preservation 100T5 - Apply end sealant		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100T5	Apply end sealant	Lump sum	This item covers the application of sealant to the exposed ends of ply decking sheets. Refer to Figure 17.7 (Part 2) for recommended sealant products.	Where inspection indicates severe weathering on the exposed ends of ply road and footpath sheets. Sealant shall also be applied to ends of new ply sheets.		2 or 3	-

2.15 Preservation 100T6 - Reapply non-slip surfacing		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100T6	Reapply non-slip surfacing	M^2	This item covers all work operations and materials associated with the supply and application of non-slip surfacing to ply footpath sheeting in order to restore its effectiveness. Contact Bridgewood Manufacturer to determine current recommended surfacing material.	Where inspection indicates that non-slip surfacing on ply footpath sheets is delaminating or missing in patches.		1	-

MP = 1 (High) - loss of surfacing will reduce safety for pedestrians.

4

2.15 Preservation 100T7 - Place bituminous felt		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100T7	Place bituminous felt	Lump sum	This item covers all work operations and materials associated with the supply and placement of a protective bituminous compressible material at timber contact surfaces. The purpose of this material is to reduce air gaps and consequently moisture penetration at contact surfaces. Typical locations are headstock to pile, girder to corbel, kerb to decking, spiking plank to girder and decking. Recommended materials are shown in Figure 17.7 (Part 2). Work operations covered include placement of bituminous layer subsequent to preservative and grease application, prior to component assembly. All materials and labour costs shall be included in the M.A.N. for the particular component being treated.	Whenever new headstocks girders, corbels, decking, spiking planks or kerbs are being placed.		3	-

MP = 3 (Medium) - this material reduces component air gaps and may help control moisture retention and consequent timber decay in nominated areas.

2.15 Preservation 110T1 - Drill and inject termicide poison into timber		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
110T1	Drill and inject termicide poison into timber (Preventative)	Lump sum	This item covers all work operations and materials associated with the poisoning of timber members. Only those chemicals listed in Table 7.2(a) (Part 1) may be used without further approval. If an alternative poison is proposed, all relevant details including NRS registration proof shall be submitted to BAM for approval. An alternative system using baits is being marketed, and could be considered for trial use. Because most termicide poisons are extremely toxic to humans and marine life, extreme care must be exercised during application. Safety and toxilogical data sheets shall be studied for the chemical, and all products instructions shall be followed. Safety equipment such as gloves and other protective clothing shall be worn by the operator. Work operations covered by this item include: 1. Drilling of hole at ends of members 2. Injection of termicide 3. Placing of a containment plug in the hole.	Discovery of any active termite infestation in or adjacent to the member, regardless of extent. Also, when due as part of a programmed poisoning cycle.	Any proposed poison not listed in the TBMM shall be submitted to BAM for approval, prior to use. Ensure operation is licensed to carry out poison treatments.	1	.....

MP = 1 (High) - because of the potential for rapid loss of headstock, girder or other component capacity due to termite damage.

4

2.15 Preservation 110T2 - Poison termite nest or trials		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
110T2	Poison termite nest or trails (Reactive)	Lump sum	This item covers all work operations and materials associated with the poisoning of termite nests or trails on timber components. General comments as for 110T1 apply. Work items covered include direct poison injection or surface spraying, or puffing of arsenic trioxide dust into galleries or covered trails	Discovery of termite nests or trails.	Any proposed poison not listed in the TBMM shall be submitted to BAM for approval, prior to use. Ensure operator is licensed to carry out poison treatments.	1	..... .

MP = 1 (High) - because presence of termite nest indicates high probability of severe local infestation and damage to various components.

2.16 Miscellaneous Timber 120T1 - Install distributor planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120T1	Install distributor planks (HW)	M	This item covers all work operations and materials associated with the installation of timber distributor planks to timber plank decking or ply decking. Refer to Figure 17.3 (Part 2) for distributor details and bolting requirements. The supply of timber shall be to the requirements of MRS 11.87. Work operations covered include drilling, placement of distributors and bolting. The supply of new bolts shall be to the requirements of 120S8 and assembly to 120S2. An anti-fungal preservative and preservative grease shall be applied to the contact surface with the decking (100T1 & 100T2).	1. These may be used as an option where wearing surface over transverse ply sheet joints is breaking up due to differential movement under traffic loads. 2. For hardwood decks, where planks are loose to very loose (loss of fixity at kerb may allow rocking over girders.		3	

MP = 3 (Medium) - distributors improve the distribution of wheel loads in the deck and help prevent differential movement of the edges of ply sheets.

4

2.16 Miscellaneous Timber 120T2 - Replace & retighten distributor planks		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120T2	Replace & retighten distributor planks(HW)	M	This item covers all work operations and materials associated with the replacement of timber distributor planks. The supply of timber shall be to the requirements of MRS11.87. Work operations covered include removal of bolts, removal of defective distributor planks, installation of new planks and tightening of bolts. The new distributors should have at least the same dimensions as those being replaced. Anti-fungal preservative and a preservative grease shall be applied to contact surfaces with the decking (100T1 & 100T2).	Where inspection indicates distributor planks are split or broken.		3	2

MP = 3 (Medium) - loose distributors will reduce the spread of wheel loads between decking planks.

2.17 Steelwork 100S1 - Spot clean and paint steelwork		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100S1	Spot clean and paint steelwork	Lump sum	This item covers all work operations and materials associated with the preparation and spot painting of deteriorated painted or galvanised metal surfaces. Prior to the application of protective coating, the defect areas shall be cleaned back to bare metal - typically by wire brushing. Refer to 17.10 (Part 2) for recommended undercoats and top coats suitable for spot painting. Work operations covered include cleaning of rust products, applying undercoat at top coat/s to defect areas. An attempt should be made to match the colour of spot painting to that of the existing surface. Newly galvanised surfaces may require etching locally around defects in order to allow overlap of the coating. All manufacturers instructions for product application shall be followed. If existing undercoats are found to be red lead, special care shall be exercised in collecting and disposing of any such material removed during rust clearing operations. Refer to Section 17.10 (Part 2) for procedures.	Where inspection records spot rusting on painted or galvanised metal surfaces.	If red lead undercoat is identified, advise ID subsequent to job so that advisory details may be included in BIS.	3 to 4	..... .

MP = 3 to 4 (Medium to Low) - procedure should be carried out to reduce on going and increasing surface deterioration of member.

4

2.17 Steelwork 100S2 - Clean and paint bolts, nuts and washers		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100S2	Clean and paint bolts, nuts and washers	Lump sum	This item covers all work operations and materials associated with the spot painting of bolt, nuts and washers which are showing minor rusting or corrosion. Prior to application of protective coating, the defect areas shall be cleaned back to bare metal - typically by wire brushing and chipping of corrosion areas. Refer to Figure 17.10 (Part 2) for recommended undercoats and top coats suitable for spot painting. Work operations covered include cleaning of rust or corrosion, and application of protective coatings. All manufacturers instructions for product application shall be followed. Where thread profile is damaged or greater than 10% of bolt area has been lost, replacement bolts shall be provided.	Inspection indicates patches of rusting or corrosion on bolt threads, bolts or rivets		3	-

MP = 3 (Medium) -necessary to prevent on-going corrosion of bolts which may lead to member looseness or instability.

2.17 Steelwork 100S3 - Clean and paint steelwork		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100S3	Clean and paint steelwork	Lump sum	This item covers all work operations and materials associated with the painting or repainting of steel members where existing protective coatings have become ineffective, showing corrosion and minor pitting. Also covered are unpainted surfaces showing minor pitting. Prior to preparing scheme, the member shall be checked to determine if red lead undercoats have been applied. If red lead is present, special procedures are required to collect and dispose of all removed paint flakes. Refer to Section 17.10 (Part 2) for this process. Prior to application of protective coating, the existing surface shall be cleaned of all loose paint and corrosion products by sand blasting. Where practical, separation of components may be required to treat contact surfaces such as headstock and corbel seating areas. Refer to Figure 17.10 for recommended undercoats and top coats suitable for a full protective coating applied to components. Work operations covered include removal of corrosion products and loose paint, applying undercoats and top protective coats. All manufacturers instructions for product application shall be followed.	Inspection indicates paint system or galvanizing protection has broken down, with some corrosion and minor pitting. Unpainted surfaces are showing minor pitting.	If any red lead undercoats remain after painting process, advise ID subsequent to job so that advisory details may be added to BIS	3	.....

MP = 3 (Medium) - this procedure provides protection against further deterioration of the components. Any further corrosion will lead to significant reduction in section and member strength.

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2.17 Steelwork 100S4 - Clean and paint stressing bars		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100S4	Clean & paint stressing bars	Each	This item covers all work operations and materials associated with the cleaning and painting of stressing bars in stress-laminated timber decks. All corrosion products shall be wire brushed off the bars and painted using paint as specified in Figure 17.10 (Part 2).	Where inspection indicates some corrosion is visible on the exposed ends of stressing bars.		2	3

MP = 2 (Medium) - corrosion in a stressing bar may be load to bar failure and consequent reduction in load distribution across a deck.

2.17 Steelwork 110S1 - Repair cracked weld		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
110S1	Repair cracked weld	M	This item covers all work operations and materials associated with the strengthening of welding which has cracked on an existing member. Details of extent and severity of weld cracking shall be submitted to BAM to determine appropriate repair procedures. Depending on cracking severity, a further detailed inspection may also be required. If failure is due to inadequate member size, either strengthening or replacement of the member will also be required. Work operations covered include placing new weld material over defect areas and reinstatement of protective coating. Site welding shall only be carried out by a DMR accredited welding operator. Where a protective coating is damaged during the welding / preparation process, the area shall be treated with a cold galvanizing material refer Figure 17.10 (Part 2).	Inspection indicates existing weld lines are showing cracking, which may be faint to severe.	Submit details of existing weld cracking to BAM to determine if alternative repair procedures are required.	1	..... .

MP = 1 (High) - cracking in welds indicates failure of the weld line. Repair is necessary to reinstate member capacity.

This item is interim pending release of the Bridge Maintenance Manual.

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2.17 Steelwork 110S2 - Repair corroded plate		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
110S2	Repair corroded plate	Lump sum	This item covers all work operations and materials associated with the repair of corroded steel plate components. Repair methods may include filling holes with weld metal, cutting out and inserting new plate sections and grinding back. The repaired plates shall be painted using item 100S3. Site welding shall only be carried out by a DMR accredited welding operator.	Where inspection indicates severe corrosion and holes in edge plates.		3	

This item is interim pending release of the Bridge Maintenance Manual.

2.17 Steelwork 120S1 - Tighten existing bolts		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S1	Tighten existing bolts	Lump sum	This item covers all work operations and materials associated with the tightening of loose corbel, girder, headstock, kerb, distributor, or anti-splitter bolts. The condition of the bolts may vary from good to showing minor corrosion on threads. If washers are missing behind bolt heads or nuts, these should be added prior to tightened to refusal, but care needs to be taken to prevent over-tightening and crushing of timber. Where minor corrosion is noted on threads, this shall be removed and a protective coating applied. Refer to Figure 17.10 (Part 2) for coating recommendations.	Where inspection indicates bolts are loosening and/or minor corrosion is noted. This work is expected to be carried out during Level 1 inspections, or under RMPC routine maintenance. Shrinkage in newly placed timber members may cause a rapid loosening of bolts, and may require an increased frequency of inspection.		2 or 3	.....

MP = 2 or 3 (Medium) - loose bolts will accelerate wear of timber components due to movements under load, and can allow headstocks to pull laterally off pile seatings.

4

2.17 Steelwork 120S2 - Remove, replace or install bolts		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S2	Replace or install bolts	Lump sum	This item covers all work operations and materials associated with the removal and re-use of existing corbel, girder, headstock and kerb bolts and also the installation of new bolts. Existing bolts may be very loose, badly corroded or missing. The cause of bolt looseness should be investigated to determine if decay in the member has contributed to the defect. It is recommended that each bolt is withdrawn individually and the hole injected with grease (or the bolt covered with grease) before assembly. Existing bolts should be re-used wherever possible. Where bolt corrosion has caused a loss of effective thread section or 10% of bolt area, a new galvanised bolt shall be installed. Likewise, any missing bolt must be replaced. Supply of new bolts is covered by 120S8. If nuts only require replacement, bolt thread profile will have to be determined before ordering. Any re-used bolt showing corrosion shall have a protective coating applied before re-insertion and tightening. All material and labour costs shall be included in the M.A.N. for the particular component being treated.	Where inspection notes bolts are very loose, badly corroded or are missing. This work will normally be carried out under programmed maintenance activities.	If bolt looseness is caused by decay of timber components, repair or replacement of these may be required. Requirements pertaining to these members will be required.	3	.....

MP = 3 (Medium) - bolt tightness helps prevent wear from component movements and stops headstocks from pulling laterally off pile seatings.

2.17 Steelwork 120S3 - Replace anchor bolts		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S3	Replace anchor bolts	Each	This item covers all work operations and materials associated with the replacement of anchor bolts for various components, typically at barrier post bases or with stress - laminated bridges. Pile anchor bolts at sill beams are covered by items 59T4 and 59C3.	Where inspection indicates any of the following:- 1. Anchor bolts severely corroded. 2. Anchor bolts missing.		2	

2.17 Steelwork 120S4 - Install large washer		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S4	Install large size washers	Each	This item covers all work operations and the supply and installation of large size washers to bolted connections for ply sheeting. Refer to Figures 4.1, 5.2(a) and 17.1(b) (Part 2) for washer dimensions.	Where inspection indicates that existing bolt washers have punched into ply surfaces.		3	

4

2.17 Steelwork 120S5 - Replace or install rivets		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S5	Replace or install rivets	Each	This item covers all work operations and materials associated with the replacement or installation of rivets in metal components. These components will be replaced by bolts. Refer to Structures Division for modification details. Supply of bolts will be to the requirements of 120S8.	Where inspection indicates any of the following. Rivets severely corroded. Rivets broken or missing		2 or 3	

This item is interim pending release of the Bridge Maintenance Manual.

2.17 Steelwork 120S6 - Tighten footpath fasteners		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S6	Tighten footpath fasteners	Each	This item covers all work operations and materials associated with the tightening of fasteners for footpath sheeting. The condition of bolts may vary from good to showing minor corrosion on the threads. If washers are missing behind bolt heads or nuts, these should be added prior to tightening. Nuts shall be tightened to refusal, but care needs to be taken to prevent over-tightening and crushing of timber. Where minor corrosion is noted on threads, this shall be removed and a protective coating applied. Refer to Figure 17.10 (Part 2) for coating recommendations. Use of lock nuts or spring washers may need to be considered if loosening persists.	Where inspection indicates footpath timber planks or ply sheets are loose.		2 or 3	

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2.17 Steelwork 120S7 - Replace footpath fasteners		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S7	Replace footpath fasteners	Each	This item covers all work operations and materials associated with the replacement of fasteners for footway decking. Replacement fasteners should correspond for those being replaced, where possible. For attachment to steel girders, refer to 120S9.	Where inspection indicates fasteners to footpath timber planks or ply sheets are corroded.		2 or 3	

2.17 Steelwork 120S8 - Supply new bolts		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S8	Supply new bolts	kg	This item covers the supply of new bolts. Details of grades and diameters for various bolts are shown in Section 17.1 (Part 2). All bolts, nuts and washers used shall be hot dip galvanised to the requirements given in Section 17.1. (Part 2). Installation of new bolts will be covered in 120S2. All materials costs shall be included in the M.A.N. for the particular component being treated.	Replacement bolts will be required where existing bolts are missing or badly corroded, or supplementary or additional components are required.			..... .

2.17 Steelwork 120S9 - Screws to ply footpath		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
120S9	Screws to ply footpath	kg	This item covers the supply of self-drilling screws for the attachment of ply footpath sheets up to 34mm thickness. For connection to a steel girder, fasteners shall be 14 gauge hexagonal head self drilling screws with a minimum of 20 threads per inch, or 14 gauge hexagonal head screw (self tapping or non self tapping) with 10 threads per inch utilising a 5.8mm diameter pilot hole in the section. They shall be manufactured in accordance with AS3S66, and shall have a minimum of 40 micron hot dipped galvanising or 50 micron mechanical / chemical galvanised corrosion protection over the length of the screw.	Replacement screws will be required where existing screws are missing or badly corroded.	The contractor shall provide a manufacturer's test certificate of compliance if requested by the superintendent.	-	-

4

2.17 Steelwork 130S1 - Install channel tie-downs		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
130S1	Install channel tie-downs	M	This item covers all work operations and materials associated with the installation of new channel tie-downs to ply or steel decks. Refer to Figures 5.2(a) & 5.5(a) (Part 2) for general details. Supply of channel tie-downs shall be to the requirements of MRS11.78 and the components shall be galvanised. Supply of galvanised bolts, nuts & washers shall be to the requirements of 120S8 and installed to 120S2. Where used over ply decks, the contact area shall be treated with an anti-fungal preservative and protective grease (100T1 & 100T2). Work operations include drilling, assembly of channels and bolting.	On ply decks, may be installed where 1. Transverse deck joints are breaking up due to insufficient hold-down at girders. 2. As a hold-down option for new ply decks. On steel decks where 1. Existing hold-downs are loose and inadequate. 2. As a hold-down option for new steel decks.		3	3

2.17 Steelwork 130S2 - Replace channel tie-downs		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
130S2	Replace channel tie-downs	M	This item covers all work operations and materials associated with the replacement of existing deteriorated channel tie-downs on ply or steel decks. Replacement components should be of the same dimensions as those being replaced. Supply shall be to the requirements of MRS11.78 and the components shall be galvanised. Where new bolts are required, these shall be supplied to the requirements of 120S8. Bolting shall be carried out to 120S2. Over ply decks, the contact area shall be treated with an anti-fungal preservative and a preservative grease (100T1 & 100T2). Work operations include removal of bolts and defective member, placement of new member and re-bolting.	Existing channel tie-downs are badly corroded.		3	-

4

2.17 Steelwork 130S3 - Install distributors (steel)		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
130S3	Install distributors (steel)	M	This item covers all work operations and materials associated with the installation of steel distributors under ply or hardwood decks. Refer to Figure 5.2(b) (Part 2) for distributor details and bolting requirements. The supply of distributors shall be to the requirements of MRS11.78 and these shall be galvanised. Work operations covered include drilling, placement of distributors and bolting. The supply of new bolts shall be to the requirements of 120S8 and assembly 120S2. An anti-fungal preservative and preservative grease shall be applied to the contact surface of the ply (100T1 & 100T2).	(1) Wearing surface is badly broken up at transverse joint between ply deck sheets. The use of steel distributors is an alternative to hardwood components. (2) For hardwood decks where planks are loose to very loose - loss of fixity at kerb allows rocking over inner girders)		3	M

MP = 3 (Medium) - distributors help prevent differential movement of the edges of ply sheets and consequently reduce wearing surface damage.

2.17 Steelwork 130S4 - Replace distributors (steel)		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
130S4	Replace distributors (steel)	M	This item covers all work operations and materials associated with the replacement of deteriorated steel distributor members. Replacement members should be of the same dimensions as those being replaced. Supply shall be to the requirements of MRS 11.78 and components shall be galvanised. Work operations covered include removal of bolts, removal of defective distributors, installation of new member and tightening of bolts. Antifungal preservative and a pereservative grease shall be applied to contact surfaces of timber decking (100T1 & 100T2). Where distributors under PSC decking are removed, traffic speeds shall be restricted to 20km/hr and no overload vehicles allowed.	Wearing surface is badly broken up at transverse joint between ply deck sheets. The use of steel distributors is an alternative to hardwood components.		3	

MP - 3 (Medium) - defective distributors will reduce the spread of wheel loads between decking planks.

4

2.17 Steelwork 140S1 - Clean corroded reinforcing		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
140S1	Clean corroded reinforcing	Lump sum	This item covers the cleaning of corroded reinforcing prior to patching of concrete components. Cover concrete shall be broken out to at least 15mm behind corroded bars. The steel shall be blasted clean and an effort made to clean behind the bar. The whole area shall be washed with fresh water containing a corrosion inhibitor. All costs shall be included in the M.A.N. for the activity being undertaken.	Where inspection indicates reinforcing corrosion up to 20% loss of section area.		3	

This item is interim pending completion of the Bridge Maintenance Manual.

2.17 Steelwork 140S2 - Replace reinforcning		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
140S2	Replace reinforcing	Tonnes	This item covers all work operations and materials associated with the replacement of severely corroded reinforcing prior to patching concrete components. Cover concrete shall be broken out to at least 15mm behind corroded bars whish are to be replaced. Sections of steel which are to remain should be blasted clean and an effort should be made to clean behind the bars. Deteriorated bar shall be cut out and a new bar section welded in. Contact Structures Division to determine diameter, grade and welding details (or laps) required. Site welding shall only be carried out by a DMR accredited welding operator.	Where inspection indicates advanced corrosion of reinforcing with over 20% loss of section area.	Contact Structures Division to determine replacement bar details and welding requirements	2 or 3	

This item is interim pending completion of the Bridge Maintenance Manual.

4

2.18 Concrete 100C1 - Break back cracked concrete		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100C1	Break back cracked concrete	M^2	This item covers all work operations associated with the breaking back of cracked concrete in preparation for repair work. Unless reinforcing replacement is to be carried out, deteriorated concrete shall be broken out in small areas and immediately reinstated. A saw cut 20mm deep and perpendicular to the concrete surface shall be made around the edges of repair areas to prevent feathered edges. Concrete shall be broken out to a minimum depth of 20mm, but no deeper than 15mm past the level of the reinforcement.	Where inspection indicates cracking of concrete due to corrosion of reinforcing.	Prior to carrying out work, advice should be sought from Structures Division on appropriate repair procedures for each specific cracking problem.	2 or 3	

This item is interim pending release of the Bridge Maintenance Manual.

2.18 Concrete 100C2 - Fill cracks with epoxy		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100C2	Fill cracks with epoxy	Lump sum	This item covers all work operations and materials associated with the filling of cracks in concrete components with epoxy. Crack filling will generally be achieved by injection via nipples into a crack. Various property products / systems are available. Details of the proposed system should be submitted to Structures Division for approval.	Where inspection indicates 1. Cracks are allowing moisture penetration of decks and concrete overlays. 2. Impact cracks are visible in PSC planks. 3. Severe cracks due to shrinkage in concrete headstocks.	Obtain approval of system to be used from Structures Division.	3	

4

2.18 Concrete 100C3 - Patch concrete		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100C3	Patch concrete	Lump sum	This item covers all work operations and materials associated with the patching of spalled or excavated areas of concrete components. After excavation or preparation of spalled concreted areas (refer to 100C1), the repair areas shall be primed and reinstated with an approved cementatious repair material such as Nitorbond HAR and Renderoc HB40 (or equivalent) respectively. Alternatively, a high quality cementitous grout may be used where repair zones are formed up (e.g. Fosroc Renderoc LASS or equivalent). All manufacturer's recommended procedures and practices shall be complied with.	Where inspection indicates concrete surfaces have spalled as a result of impact or reinforcing corrosion, or cracked concrete has broken out.	Before work is carried out, advice should be sought from Structures Division on appropriate repair procedures for the particular cracking or spalling problem.	2 or 3	

This item is interim pending release of the Bridge Maintenance Manual.

2.18 Concrete 100C5 - Strengthen bearing area		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100C4	Strengthen bearing area	Lump sum	This item covers all work operations and materials associated with the strengthening of girder bearing areas on concrete headstocks. Figure 10.3 (Part 2) shows a typical repair procedure. Refer to Structures Division for preparation of an appropriate repair procedure.	Where inspection indicates severe spalling of concrete headstocks below girder contact area.	Contact Structures Division for repair procedure.	2 or 3	

2.19 Miscellaneous 100M1 - Recamber girders		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M1	Recamber girders	Lump sum	This item covers all work operations and materials associated with the recambering of timber girders. Work operations covered include jacking up of internal girders and the placement of metal shims between corbels (girders at abutments) and headstock top. Jacking of a centre girder should be limited to 25mm. The maximum depth of shims shall be limited to 100mm.	Where inspection indicates deck planks are loose over internal girders.		3	

4

2.19 Miscellaneous 100M2 - Reinstate backfill		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M2	Reinstate backfill	Lump sum	This item covers all operations and materials associated with the reinstatement of embankment fill behind abutments or wing walls.	Where inspection indicates settlement or scour of embankment material behind abutments or wing walls.		1	

This item is interim pending release of the Bridge Maintenance Manual.

2.19 Miscellaneous 100M3 - Repair scour		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M3	Repair scour	Lump Sum	This item covers all work operations and materials associated with the repair of scours at bridge structures and associated wings. This includes reinstating support under sill and wall footings, and the toe of rock spills. Work operations and materials shall be to the requirements of MRS 11.03. Repair methods shall generally be as contained in MRS 11.03. Where undercutting of structural components such as sills or abutment footings has occurred, details should be supplied to Structures Division to determine if additional measures are required.	Where inspection indicate any of the following:- 1. Undercutting of sill beams 2. Undercutting of abutment or wall footings or toe of grouted rock spill. 3. Localised scour holes > 2m depth.	Where the footings of Structural components have been undercut by scour, details are to be supplied to Structures Division to determine any further requirements for repair.	2 or 3	

2.19 Miscellaneous 100M4 - Provide weep holes		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M4	Provide weep holes	Each	This item covers all operations associated with the provision of weep holes in concrete or rubble masonry protection or wing walls where these are missing.	Where inspection indicates that weep holes have not been provided in walls.		4	

This item is interim pending release of the Bridge Maintenance Manual.

2.19 Miscellaneous 100M5 - Clean out weepholes		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M5	Clean out weepholes	Each	This item covers all work operations and materials associated with the cleaning out of weep holes in concrete or rubble masonry wing walls.	Where inspection indicates weep holes in retaining walls are blocked.		3	

This item is interim pending release of the Bridge Maintenance Manual.

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2.19 Miscellaneous 100M6 - Provide new scuppers		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M6	Provide new scuppers	Each	This item covers all work operations and material associated with the provision of scuppers where insufficient or no scuppers are existing. All parts and labour are included in this item.	Where inspection indicates no provision for deck drainage has been made and structure geometry is such that scuppers are required.		3	

This item is interim pending release of the Bridge Maintenance Manual.

2.19 Miscellaneous 100M7 - Lay 3mm galvanised steel plate decking		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M7	Lay 3mm galvanised steel plate decking.	M^2	This item covers all work operations and the supply and placement of thin galvanised steel plate over isolated areas of deteriorated hardwood planks. The plate shall be of the size and type as detailed in Figure 17.4 (Part 2) and shall be secured with coach screws or screws. A maximum of 2 adjacent or 3 individual defective planks may be retained in any metre length of decking. If this cannot be achieved, place new decking as required. Work operations covered include removal of wearing surface, placement and screwing of deck plate and replacement of DWS.	Where a temporary strengthening is required on deteriorated hardwood decking.		2 or 3	

This item is interim pending release of the Bridge Maintenance Manual.

2.19 Miscellaneous 100M8 - Lay tingling		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M8	Lay tingling	M	This item covers all work operations and materials associated with the laying of tingling over excessive gaps between hardwood decks planks before the placement of deck wearing surface. The tingling shall be fixed to the deck planks with coach screws, screws or clouts as shown in Figure 17.6 (Part 2). All material and labour costs shall be included in the M.A.N. for the component being treated.	Where excessive gaps between planks are identified.			

4

2.19 Miscellaneous 100M9 - Place emergency propping		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M9	Place emergency propping	Lump sum	This item covers all work operations and materials associated with the placement of temporary propping to support failing elements such as decking, girders or headstocks. This procedure is a temporary measure to allow continued operation of a bridge pending component repair. Restriction of traffic to a single lane remote from the defect may be considered, if feasible, until propping is in place. However side tracking is the preferred option. Refer to Figure 17.1(a) (Part 2) for details of suitable prop arrangements and attachment details. When determining prop arrangements, some consideration of the effects of flooding needs to be made i.e. • Softening under the prop • ScourImpact • Increased debris entrapment. Work operations covered include procurement of suitable props, preparation of support bases, installation and attachment to the structure. Secure attachment of props to the structure is essential because of traffic induced vibration and deflections.	Where inspection indicates 1. Sagging and buckling of steel troughing. 2. Large sags or moment cracks in headstocks or girders. 3. Headstock splices broken apart. This operation is of an emergency nature and props may be placed during an inspection or as soon as possible after.	Inform ID of propping details proposed and obtain approval before installation. The installation of props must be certified. The maximum safe height of a prop and the minimum bracing requirements shall be determined.	1	3

MP = 1 (High) - propping is normally installed to allow a bridge to remain open to traffic pending deck repairs.

2.19 Miscellaneous 100M10 - Place / reinstate relieving propos		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M10	Place/ reinstate relieving props	Lump sum	This item covers all work operations and materials associated with the placement or repair of relieving props near supports which reduce superstructure loads to:- (a) Timber sill log abutment (b) Silled abutment or pier piles (c) Piled abutment. Item (a) may be considered to be a long term support condition as an alternative to underpinning the abutment and then jacking the superstructure to line. Item (b) may be short to medium term, in order to reduce deck settlements prior to sill member repair. Work operations covered include procurement of suitable props, preparation of support bases, jacking of superstructure to line, installation of props and attachment to the structure. Refer to Figures 17.11(a) & (b) (Part 2) for details of suitable propping arrangements.	Where inspection indicates: (a) Settlement of logs in a timber sill abutment. (b) Crushing in timber sills. (c) Existing relieving props near abutment piles are poorly braced or not braced, and are settling or easily displaced. They may also be completely ineffective.	Advise ID of propping details proposed and obtain approval before installation. The maximum safe height of props and minimum bracing required shall be determined.	2	3 or 4

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2.19 Miscellaneous Cont'd 100M10		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M10 (Cont.)	Place/ reinstate relieving props		When determining prop arrangements, some consideration of the effects of flooding needs to be made i.e. • Softening under the prop • Scour • Impact • Increased debris entrapment. Where existing propping is defective, care must be taken to ensure the props are connected to the top supported component to prevent dislodgement under traffic or debris loads. Bracing shall be applied to the props to provide stability. Where settlement is occurring, the base support area shall be increased to provide adequate support for imposed loads.				

MP = 2 or 3 (Medium) - this procedure:-

(a) Removes surface settlements at the end of the bridge which will cause increased dynamic loads on the bridge.

(b) Reduces further settlements of piers & abutments prior to sill repairs.

(c) Overcomes loss of support by relieving props which may lead to settlement or crushing of the piles, causing sagging of the roadway surface.

2.19 Miscellaneous 100M11 - Routine servicing - clear blocked vegetation		**MAINTENANCE ACTIVITIES MATRIX**			**MP = Maintenance Priority SR = Significance Rating**		
Activity No.	**Description**	**Units**	**Coverage**	**Intervention Levels**	**Hold Points & Approvals**	**MP**	**SR**
100M11	Routine servicing - clear blocked vegetation	M	This item covers all work operations associated with the routine servicing of bridge decks to clear blocked scuppers and to remove vegetation growing on the bridge deck	Where inspection indicates scuppers are blocked or vegetation is growing along the deck surface.		2 or 3	

Note that the cleaning out of waterways and removal of debris at bridges is covered by RMPC item 856.