TECHNICAL NOTE

JOHN HOLLAND

Civil

Issue Date **31/08/2020**

Expiry Date **Until withdrawn**

CCT 20/09 Culvert Inspection Requirements

AUDIENCE	MAIN POINTS	VERSION HISTORY
~ Maintenance Superintendents & Supervisors ~ Maintenance Engineers ~ Track & Civil Manager ~ Civil Maintenance Engineer	~	~ 1st Issue

BRIEFING REQUIREMENTS					
Information only		Briefed by line management and record of briefing supplied to the PCTE	✓	Briefed by PCTE or delegate	

1. Background

Following the derailment of a train near Geurie on 4 April 2020 where a blocked culvert was identified as a contributing factor, a review of drainage inspection requirements has taken place. This Civil Technical Note represents changes and re-iteration of inspection requirements in particular relation to culverts but also applying to other waterway openings such as underbridges in the CRN.

2. Maintenance responsibilities

Maintenance Delivery teams are responsible for inspection and maintenance of drainage within the rail corridor. This includes the culvert inlets and outlets.

2.1 Track Maintenance staff

Inspections of drainage are carried out in accordance with Chapter 25 within CRN CM 203.

Where a drainage defect is identified in the rail corridor, defects are to be assessed in accordance with the defects in section 3.1 of this Technical Note until CRN CM 203 is updated, and entered into the Defect Management System against the Right of Way asset.

Should an issue that requires attention by Structures Maintenance Staff during any inspection, the potential defect is to be escalated to the Structures Examiner or Structures Superintendent. A defect is not to be raised by track staff for structures defects in Maximo direct.

This technical note is a timely reminder that the removal of debris from the rail corridor is a more effective way of preventing future culverts being blocked. During the course of track examinations, any debris which has the potential of washing into a culvert and causing a blockage (i.e. fallen tree or household rubbish) should be noted and removed prior to any storm events.

Monitoring of weather events

JH CRN have recently implemented Emergency Warning Notifications (EWN) (see CNI 8). EWN's are issued by a 3rd party supplier to Operations and Maintenance teams in the case of extreme weather events, including thunderstorms and flood alerts.

2.2 Structures Maintenance staff

Structures Maintenance staff are responsible for the inspection and maintenance of the structural components of culverts and underbridges. To enable inspection of the culverts, they are required to be cleared, which may necessitate clearing by structures staff.

Inspections are carried out in accordance with Chapter 10 within CRN CM 302.

Defects for culverts are to be in accordance with the defects in 3.2 of this Technical Note until CRN CM 302 is updated.

Structures staff are reminded that minimum repair priorities are stipulated in CRN CM 302 indicate the maximum duration for repair or monitoring of the identified defect. Where it is deemed necessary after consideration of local conditions a more stringent repair priority may be assigned.

3. Changes to Civil Manuals

3.1 CRN CM 203

A new section in Chapter 6 within CRN CM 203 will be added to cover ROW and Drainage defects, full details are yet to be developed, this section will include drainage defects.

ROW and Drainage							
Blocked Culvert inlet/outlet	**Other blocked drainage**	**Track Speed (Normal / Passenger) km/h**					
		20/20	**40/40**	**60/60**	**80/90**	**100/115**	**115/160**
Debris with potential to block culvert inlet/outlet		**Pxx**	**Pxx**	**Pxx**	**Pxx**	**Pxx**	**Pxx**
<20%	<50%	N	N	N	N	N	N
20% – 49%	50% - 74%	**Pxx**	**Pxx**	**Pxx**	**Pxx**	**Pxx**	**Pxx**
50% – 74%	75% - 100%	P2	P2	P2	P2	P2	P2
75% - 100%		**P1**	**P1**	**P1**	**P1**	**P1**	**P1**

The updated defect limits for drainage will result in a number of priority defects being generated. Drainage defects may have their target date for repair revised after reviewing the expected rainfall for the area, no site inspection is required.

3.2 CRN CM 302

Part H in Chapter 4-4 within CRN CM 302 is to be replaced by the below (changes in bold).

H. Culverts and Pipes					
For reinforcement see Underbridges – concrete					
Culvert, corrugated metal pipe or timber box drain	Collapse	Subsidence of formation/ballast	A	Ry1	Yes
		No subsidence of formation/ballast	C	Ry2	
Culvert	Cracked barrel	> 50mm	B	Ry2	
		10-50mm	D	Ry4	
		< 10mm	E	Mxx	
	Blocked barrel	**90 - 100%**	**C**	**Rm1**	
		75 - 89%	**C**	**Rm6**	
		50 - 74%	D	Ry1	
		20 - 49%	E	Ry2	
Corrugated Metal Pipe	Joint Broken	-	D	My4	
	Out of round / distortion	> 50mm	D	My4	
Headwall / Wingwall	Cracked	> 50mm wide	B	Ry2	
		10-50mm wide	D	Ry4	
		< 10mm	E	Mxx	
Apron	Scouring under	> 2m	C	My2	
		Any	D	My4	
Floor	Heaving	> 50mm	D	My4	
		25 - 49mm	E	Mxx	
Adjacent Waterways	~~**Blocked - Geotechnical risk site**~~	~~**> 25%**~~	~~**C**~~	~~**Ry2**~~	
	Blocked	> 25%	D	**Mxx**	
		> 50%	**Report to Track Maintenance Superintendent**		

Authorised for issue

Michael Wright
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