Appendix 1
Aurecon Peer Review Comments

Peer review of options for proposed crossing of Leongatha rail reserve, Clyde Train Station and associated train stabling

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Rev 2 18-Feb-14

RATING IMPACT
1 = HIGH IMPACT
2 = MEDIUM IMPACT
3 = LOW IMPACT

Peer Review Comments

No.	Name	Organisation	Document	Reference	Reviewer Comment 05/12/2013	Rating Impact	Revised Reviewer Comments following project workshop held 10/12/2013 (blank = no change in comment / status) 13/01/2014	Rating Impact	Revised Reviewer Comments following completion of additional feature survey and longitudinal design. Refer Section 4 of Aurecon report 239201.01 (blank = no change in comment / status) 18/02/2014	Rating Impact
1	Jason Williams	Aurecon	'Clyde Sidings.docx' text document	Maintenance Facility	Number of Staff: The paper makes assumptions in regard to the number of train drivers and maintenance staff. In accordance with Section 10 of VRIOGS 004.13 it is suggested that comment is sought from potential future ARO in regard to these assumptions. Assumption appears reasonable at this stage of design development. Staff Amenities - Lunch Room: Although the minimum specified area for '26+ staff' as per VRIOGS002.1 is met, there is potential that a facility with approx. 80 staff may require a larger lunch room (kitchen and meals area) Staff Amenities - Toilet: Suggest that the requirements of the BCA would drive the number of toilets for a facility such as this, noting that VRIOGS002.1 provides a minimum area only. Assumption appears low. Staff Amenities - Offices VRIOGS002.1 provides a minimum footprint area only. The requirement for offices will likely be a function of the type of work to be completed at the site (presence of supervisors etc) Storage: The requirement for storage will likely depend on the type of maintenance to be completed (not all minor maintenance tasks are completed at all depots). Based on the logic presented, a more conservative approach would be that the area should be 3 X greater than (No Suggestions) (as its 3 x larger). Car Parking: The number of carparks should be confirmed in line with the number of staff.	3				
2				Station Car Parking	Assumption appears reasonable at this stage of design development.	Note				
3				Station Location - Station Grade	VRIOGS002.1 Section 18.1(b) allows a design limit gradient of 1:500 for terminating trains and MTM Standard MTST-00002-01 allow a desirable limit for longitudinal grades of 1:250. Both differ to the 0% stated in the document (design sketches are conservative).	3				
4					We agree that should the existing vertical clearance to Ballarto Rd bridge be in the order of 4.3m, the clearance would be significantly less than allowed by VRIOGS0001 and would not be adequate for the electrified network and that a 'do nothing' approach would not likely be possible.	Note				

5				Station Location - Track Gradient	There appears to be some confusion in regard to allowable track grade beyond the future station area. The 1.5% (1in 65/66.67) stated as the minimum allowed in this document (in reality the maximum grade), is not reflected in MTM track design standard L1-SDD-STD-007. This standard notes a desirable limit for main line tracks of 1% (1:100) and an absolute limit of 2.5% (1:40). Suggest the 1 in 65 assumption be reviewed. We understand that the ruling grade (the steepest existing grade) of the Dandenong and Cranbourne Lines is ~2% (1:50) nom. Section 10.3.1 of L1-SDD-STD-007 notes that the "The Design Gradient of new track shall not be greater than the Ruling Gradient of the existing line". Suggest a conservative approach is adopted to allow for track grades of 1:100 but not steeper than 1:50.	1	Subsequent to the meeting, Aurecon have been engaged by MPA to complete site survey and design work as part of this project. The review seeks to understand the existing conditions (particularly track and bridge levels at Ballarto Rd and directly adjacent) and provide a suitable longitudinal section to allow MPA to decide if it is feasible to build a Station and determine a vertical road alignment and any associated impacts. The findings of this design work will help inform the project and may allow the closure of this comment.	1	Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), concludes that it is feasible to construct the proposed Clyde railway station at the location proposed by MPA, whilst maintaining and/or optimising road levels on Ballarto Rd where the road crosses the railway line.	
6					The assumptions appear to suggest that the station must be built at or around existing level. Whilst desirable this does not necessary need to be the case. Very feasible for station to be both elevated or beneath surface.	Note				
7					The paper appears to make assumptions in regard to the location of the station based on the rail passing beneath the existing Ballarto Rd (rail under road underpass) with the road level maintained at or around existing level, and the level of gradient required for the track to return/climb back to existing level (similar level to Ballarto Rd). To avoid confusion we recommend that this is explicitly stated.	Note.				
8					No allowance appears to have been made for the structural thickness of a future Ballarto Rd bridge (spanning the rail cutting). At this very early stage of design development we suggest a conservative structural thickness allowance of 1.5 to 2m would be appropriate (from road surface level to underside of bridge structure). This additional depth will increase the horizontal length required for the track to climb.	1	Subsequent to the meeting, Aurecon have been engaged by MPA to complete site survey and design work as part of this project. The review seeks to understand the existing conditions (particularly track and bridge levels at Ballarto Rd and directly adjacent) and provide a suitable longitudinal section to allow MPA to decide if it is feasible to build a Station and determine a vertical road alignment and any associated impacts. The longitudinal review a conservative 2.0m Ballarto Rd bridge structural thickness.	1	Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), concludes that it is feasible to construct the proposed Clyde railway station at the location proposed by MPA, whilst maintaining and/or optimising road levels on Ballarto Rd where the road crosses the railway line whilst considering a conservative structural depth of 2.0m.	
9					As noted on the plans, the 'existing topography needs to be confirmed' particularly at key locations surrounding the station. Minor level differences may impact the feasibility.	2	Subsequent to the meeting, Aurecon have been engaged by MPA to complete site survey and design work as part of this project. The review seeks to understand the existing conditions (particularly track and bridge levels at Ballarto Rd and directly adjacent) and provide a suitable longitudinal section to allow MPA to decide if it is feasible to build a Station and determine a vertical road alignment and any associated impacts. The findings of this survey and design work will confirm the existing topography at key locations and may allow the closure of this comment.	2	Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), confirms topography and existing levels and concludes that it is feasible to construct the proposed Clyde railway station at the location proposed by MPA, whilst maintaining and/or optimising road levels on Ballarto Rd where the road crosses the railway line.	
10				Track into the Sidings	Consideration should be made as to the gradient and direction of fall of siding lead in tracks to mitigate the risk of rollout towards the main line. Where possible by providing fall away from the main line (towards the sidings).	3				

11			Figure 5 - Conceptual Clyde Station and Stabling Design	Platform length	Clarification should be sought in regard to future platform length requirements. Section 18.2 (b,c) of VRIOGS 002.1 requires a minimum length of 230m for metropolitan stations, and 250m for regional stations. Both are greater than the 220m shown in this sketch.	2	During the meeting PTV advised that 230m was in line with current thinking.	2	Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), assumes platform length of 230m and concludes that it is feasible to construct the proposed Clyde railway station at the location proposed by MPA, whilst maintaining and/or optimising road levels on Ballarto Rd where the road crosses the railway line.	
12				Distance between platform and stabling	A significant distance is provided between the stabling roads and the platform (approx. 500m). It appears by reconfiguring the siding lead tracks this length could be significantly reduced (reduced capital cost by reducing total track length), and that the number of extended leads could be rationalised.	3				
				Length of siding roads	In accordance with the requirements of VRIOGS004.13 (Appendix B) once allowance is made for intermediate pathways, runoff areas and buffer stops, minimum track length to stable 3 x 3 car metropolitan rolling sets is in the order of 250m (approx. 180m for 2 x 3 car sets). It appears that the length of siding roads could be optimised.	3				
13					Given the dimensions of the area proposed for stabling, longer stabling roads for 4 x 3 car sets (i.e. 2, 6 car sets) or greater may be more efficient. Naturally operational impacts would need to be considered in further detail.	3				
14			'Fw: Clyde Vertical Alignment Test' Email		It appears that grades have been assessed manually using hand measurements and mathematical assessment of an A3 printout. Given the uncertainty associated with such a method (minor errors in measurement are amplified due to scale), we would recommend a more detailed assessment be undertaken.	2	Subsequent to the meeting, Aurecon have been engaged by MPA to complete site survey and design work as part of this project. The review seeks to understand the existing conditions (particularly track and bridge levels at Ballarto Rd and directly adjacent) and provide a suitable longitudinal section to allow MPA to decide if it is feasible to build a Station and determine a vertical road alignment and any associated impacts. The findings of this survey and design work will clarify uncertainly and may allow this comment to be closed	2	Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), concludes that it is feasible to construct the proposed Clyde railway station at the location proposed by MPA, whilst maintaining and/or optimising road levels on Ballarto Rd where the road crosses the railway line.	
15					The grade line is based on rail vertical structural allowance of 5.75m. This should be both documented and confirmed as alternate vertical clearances (7.1m and/or 5.26m) have been adopted at other locations.	1	Note. We note that earlier planning studies in the area (including Connell Wagner, 2008) noted the requirement for 7.1m (min.) vertical clearance. This differs to the PTV sketches, and the discussions held on 10 December 2013, where the PTV representatives indicated that 5.75m rail vertical clearance would likely be sufficient for the Ballarto Rd grade separation. Naturally any change to key assumptions would need to be discussed in further detail and formally agreed by all key stakeholders.	1	Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), concludes that it is feasible to construct the proposed Clyde railway station at the location proposed by MPA, whilst maintaining and/or optimising road levels on Ballarto Rd where the road crosses the railway line. Aurecon suggest that MPA formalise acceptance of 5.75min vertical clearance with PTV.	
16			"Clyde Sidings diagram.pdf" sketch		Assume that the length of climbing distance / ramp has considered the existing topography, and that the road is assumed to be reconstructed at or around existing road level. Any future project should seek to holistically assess the grade line of the entire corridor rather than reviewing the Ballarto Rd grade separation in isolation. E.g. any decision made in regard to grade separation at Ballarto Rd may have flow on consequences to Clyde Rd/Clyde-Fiveways Rd.	2	Subsequent to the meeting, Aurecon have been engaged by MPA to complete site survey and design work as part of this project. The review seeks to understand the existing conditions (particularly track and bridge levels at Ballarto Rd and directly adjacent) and provide a suitable longitudinal section to allow MPA to decide if it is feasible to build a Station and determine a vertical road alignment and any associated impacts. The findings of this survey and design work will clarify uncertainly and may allow this comment to be closed	2	Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), concludes that it is feasible to construct the proposed Clyde railway station at the location proposed by MPA, whilst maintaining and/or optimising road levels on Ballarto Rd where the road crosses the railway line.	
17					Assumes grades of 1.5% (1 in 66.67), this is not a typically adopted grade and justification as to its selection should be included. A conservative approach would be to consider grades of 1:100 (1%) at this early planning to stage to maintain flexibility.	2	Note. During meeting it was discussed that 1:50 to be adopted, on the basis that this is the standard for new passenger railway lines, and that this matches the existing ruling grade of the corridor.	2	Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), concludes that it is feasible to construct the proposed Clyde railway station at the location proposed by MPA, whilst maintaining and/or optimising road levels on Ballarto Rd where the road crosses the railway line.	

18					This sketch also flags that access to both Stage 2 and 3 sidings via turnouts on the climbing / ramp grade section. Diverging on a maximum climbing grade is considered undesirable. Appears conceptually feasibly to reconfigure approach to sidings without increasing land take.	2				
19					Should the rising / ramp section be constructed using retaining walls, penetrations would be required to allow the diverge. I would recommend that the diverge into the stabling be beyond the climbing section (to be read in conjunction with comment above)	3				
20			1650mm ~~watermain~~ stormwater sketch		The information contained within "Fw: Clyde Vertical Alignment Test"' suggests that the existing rail level is at around RL=34. We consider that the existing rail line could be lowered by around 1m whilst maintaining minimum cover specified in AS4799. To maintain the location of the pipe at is proposed location, Clyde station may need to be moved further NW (towards Clyde Rd and the level increased compared to existing track level. If possible, the pipe crossing location should be moved as far towards Clyde Rd as possible.	2			Additional feature survey and design work (Refer Section 4 of Aurecon report 239201.01), concludes no impact to proposed storm water crossing. Achieved cover of approximately 4.0m exceeds minimum requirement of 2.0m specified in AS4799.	

VERTICAL SCALE 1:200

HORIZONTAL SCALE 1:1000

PRELIMINARY DRAWING
(Not to be used for construction)

Project Drawing Number: 239201-SK-TC-0010

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Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.

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MPA METROPOLITAN PLANNING AUTHORITY

RAILWAY TRACK AND CIVIL
CLYDE
OPTIONS FOR PROPOSED CROSSING OF RAIL RESERVE
RAIL - LONGITUDINAL PROFILE

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55

VicTrack ACCESS

File Name: 239201-SK-TC-0010.dgn
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Drawn By: D. BUCKLE
Designed By: R. HOWELLS
Checked By: J. WILLIAMS
Ind. Review
Approved: J.BELCHER
Approval Date
Drawing Number
Revision: P1

239201-SK-TC-0010.dgn

VERTICAL SCALE 1:200

HORIZONTAL SCALE 1:1000

PRELIMINARY DRAWING
(Not to be used for construction)

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RAILWAY TRACK AND CIVIL

CLYDE
OPTIONS FOR PROPOSED
CROSSING OF RAIL RESERVE
BALLARTO RD - LONGITUDINAL PROFILE

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	MGA Z55

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