

Ledum Yorgure

From: Gerard Tuckerman <Gerard.Tuckerman@MidCoast.nsw.gov.au>
Sent: Wednesday, 15 August 2018 6:44 PM
To: 'bob@tatland.com.au'; Bruce Moore
Cc: Ledum Yorgure
Subject: RE: Riverside - Channels

Hello Bob,

Thanks for the time today to discuss and resolve the outstanding issue associated with the existing Myall Quays water quality basin 8c and the southern floodway within the modified Riverside Concept layout. I commend you and Adrian on the professional approach taken by providing analysis based on checking and running the flood models to determine velocities, water levels and storm events which would drive flows within the south branch floodway. The evidence based approach provides confidence to Council that the existing water quality treatment provided by basin 8C for several lots in Leeward Circuit can be suitably modified to ensure that there is no net change in treatment of the existing stormwater discharge as part of the final design of the south branch floodway. The commitment to undertake replacement action of the basin function within Stage 1 and the design work in the first overall DA for the development is satisfactory.

As such all remaining issues have been addressed and a suitable pathway for incorporation of an agreed design into future development applications and stages is provided. There are no further water management matters that need to be addressed in the modification.

Regards

Gerard

From: bob@tatland.com.au [mailto:bob@tatland.com.au]
Sent: Wednesday, August 15, 2018 5:46 PM
To: Gerard Tuckerman
Cc: 'Ledum Yorgure'
Subject: FW: Riverside - Channels

Gerard,

Please refer to the additional information that Adrian has provided below. We have had time to run the additional flood models to determine the relevant details and facts.

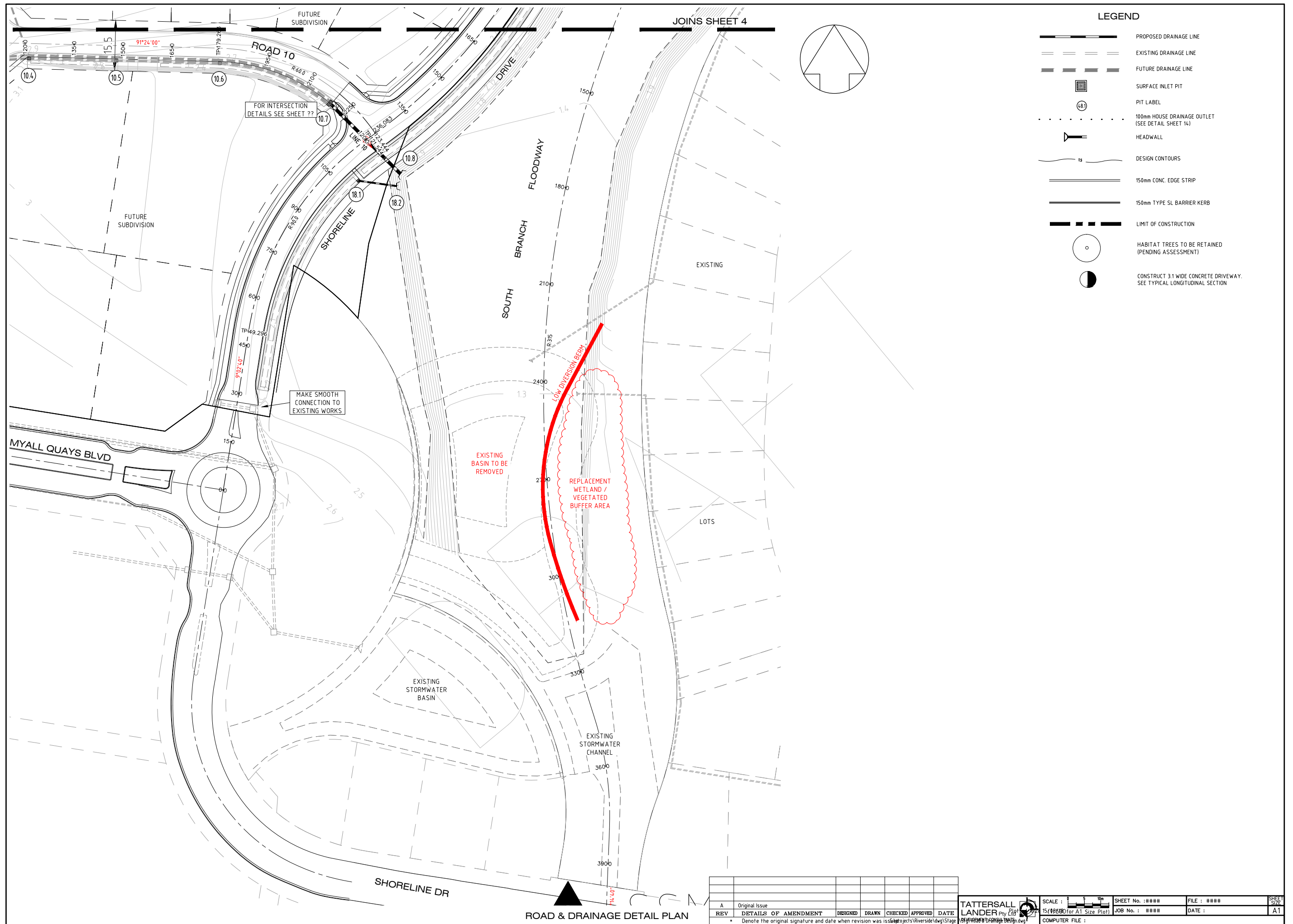
In addition, I can confirm the following:-

1. The attached plan indicates our initial thoughts on the replacement of this basin and as discussed this replacement action can be undertaken with the initial Stage 1 construction activities.
2. The design work for this replacement arrangement will be incorporated into the first overall DA for the development.

As discussed, it is our intention not to have this matter referred back to DPI Water as it will take months for them to consider any sort of response and we need to get the Modification out of the DoPE asap. Can I get you to confirm that you are happy with this arrangement to have the basin sorted out by Sheargold's and Council.

If you have any queries please do not hesitate to contact our office.

Kind Regards,
Bob Lander



Director
Mobile: 0408 497 657

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From: Adrian Varela <adrian@tatland.com.au>

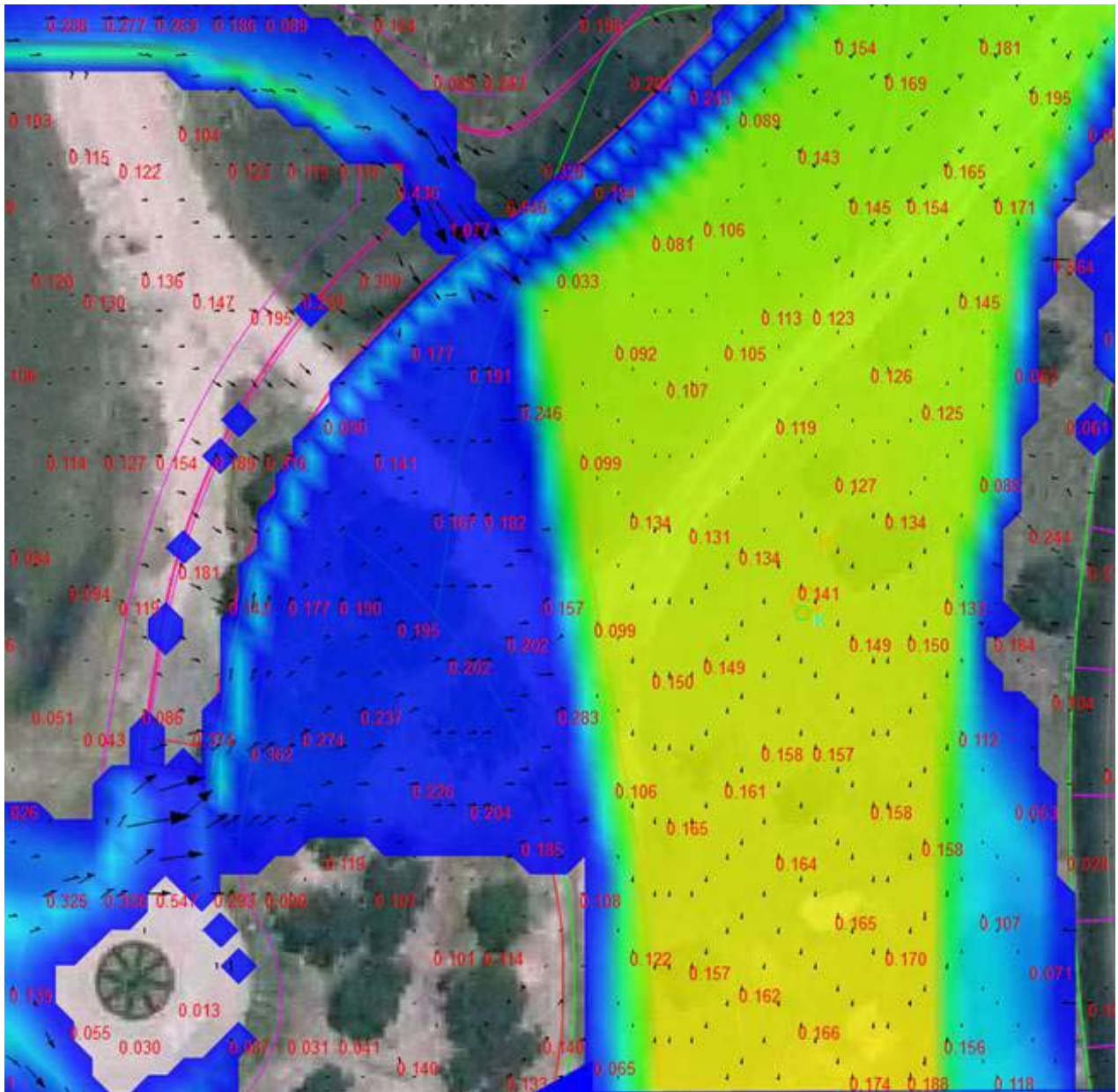
Sent: Wednesday, 15 August 2018 4:51 PM

To: bob@tatland.com.au

Subject: RE: Riverside - Channels

I have reviewed the various flood models done for the Riverside project, and run a couple of extra scenarios as well.
In summary;

- It's the longer duration events that top the South Branch weir, as the recharge area to the east has to fill up first (i.e. not short duration, high intensity),
- In events that it does top, around 15-20% of flows cross the weir and head down the South Branch, the remainder discharge west across to the SEPP14 wetland. Diversion of some of this water was required to ensure no net increase to flow velocities in the SEPP14 area,
- There is no topping of the weir in any quarterly rainfall event,
- The 1yr 6hr and 9hr events top the weir. Maximum velocities in the area of the current basin are around 0.07 & 0.1m/s respectively. Depths are 0.27m and 0.35m,
- The critical 100yr event is the 2hr event has max velocity of 0.15m/s and 0.9m deep. This is well below the 0.5m/s 100yr scour velocity limit from the Melbourne Water Wetland Design Manual so scour / sediment washout should not be an issue;



In total, I believe only 10 lots drain into the current basin, –

- Lots 9 to 13 in DP280012 which were designed with biofilters in the rear of their yards, which then overflow into the IAD line, plus
- Lots 82 to 86 in DP280002

As such, the basin is actually only providing treatment for 5 lots. As discussed, there is no depth available between the outlet level and the groundwater to install biofiltration measures. However, given the generous width of this corridor I expect it will be relatively easy to build a small berm to divert quarterly event upstream flows around a new replacement WSUD device to service these four lots. This WSUD device could take the form of a lined wetland (below mean groundwater level), or vegetated buffer strip/wide swale (if groundwater interference is not preferred/allowed) – see attached PDF.

Regards,
Adrian Varela
 Design Engineer

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From: Gerard Tuckerman <Gerard.Tuckerman@MidCoast.nsw.gov.au>

Sent: Tuesday, 14 August 2018 5:54 PM

To: 'bob@tatland.com.au' <bob@tatland.com.au>

Cc: Adrian Varela <adrian@tatland.com.au>

Subject: RE: Riverside - Channels

That is fine Bob. Meeting until 11:00 here as well. Ok after that until 4.

G

From: bob@tatland.com.au [<mailto:bob@tatland.com.au>]

Sent: Tuesday, August 14, 2018 5:53 PM

To: Gerard Tuckerman

Cc: Adrian Varela

Subject: RE: Riverside - Channels

Gerard,

I will be in the field to around 11:00am+ will let you know.

If you have any queries please do not hesitate to contact our office.

Kind Regards,

Bob Lander

Director

Mobile: 0408 497 657

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From: Gerard Tuckerman <Gerard.Tuckerman@MidCoast.nsw.gov.au>

Sent: Tuesday, 14 August 2018 5:27 PM

To: 'bob@tatland.com.au' <bob@tatland.com.au>

Subject: RE: Riverside - Channels

Hi Bob,

Thanks for that. Will call tomorrow. Would need to know under what event the system would be submerged. Clearly it all comes down to the size of the event. I am comfortable we can work something out here. It is the minor flows that are the problem provided there is no scour on the big events.

G

From: bob@tatland.com.au [<mailto:bob@tatland.com.au>]

Sent: Tuesday, August 14, 2018 2:27 PM

To: Gerard Tuckerman

Subject: FW: Riverside - Channels

Gerard,

Can you have a read of this and call to discuss with myself and Adrian with a view on getting it solved.

If you have any queries please do not hesitate to contact our office.

Kind Regards,

Bob Lander

Director

Mobile: 0408 497 657

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From: Adrian Varela <adrian@tatland.com.au>

Sent: Tuesday, 14 August 2018 10:52 AM

To: bob@tatland.com.au

Subject: RE: Riverside - Channels

Some specific details about the existing structures and the site constraints, and other discussion points;

- The existing basin was designed with an outlet control to create a top permanent water level of 1.4m AHD. **Ok**
- Leeward Circuit IAD pipe headwall discharges at 1.41m AHD. **ok**
- The Martens groundwater modelling as part of the Riverside application shows the Average Groundwater Level in this location to be around 1.3m AHD – only 0.1m above basin outlet orifice.
- To keep above Average Groundwater, the proposed floodway design has finished levels around 1.35m AHD. If the lining of a basin/wetland is not acceptable (i.e. the existing basin), then there is no depth available to construct any sort of biofilter or wetland. If it is acceptable, cant we just attempt to re-line the existing structure?
- While the South Branch corridor is notated as a floodway, it is significantly oversized for this purpose alone, and will also provide open space, ecological and water quality functions. This does not fit neatly into a definition as a drainage line or WSUD device.
- The upstream High Flow Bypass Weir means that the South Branch only becomes a floodway in more major storm events. **What size events?** In regular rainfall events it is a 250m long, 40m-65m wide, 0.12% grade vegetated corridor with its only catchment being part some of the Leeward Circuit lots, the southern part of Riverside Stage 11a and part of the future commercial area (Draft Stage 1 catchment plan attached). The

total catchment upstream of the existing basin (lines 9 and 10) total approx. 5.7ha plus the corridor itself is 1ha in size.

- This vegetated corridor was not modelled in the Martens MUSIC model for Riverside, so it is given no water quality benefits at all (as if the floodway was a concrete channel). This is significantly conservative. To meet Councils request we could concrete 10m of the corridor for the upstream flows and then count the other 40-55m width as Leeward Circuit treatment, but that is realistically a worse outcome all round. **Maybe not.**
- If Gerard considers the proposed vegetated corridor as inappropriate because it is online, then surely the existing wetland is also online, being similarly diluted from upstream flows?

Regards,
Adrian Varela
Design Engineer

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From: Gerard Tuckerman <Gerard.Tuckerman@MidCoast.nsw.gov.au>

Sent: Monday, 13 August 2018 3:04 PM

To: 'bob@tatland.com.au' <bob@tatland.com.au>

Subject: RE: Riverside - Channels

Hi Bob,

The basin is serving a purpose albeit the area that discharges to it is less than what it was design for it. The lining obviously allows groundwater leakage into it as the basin has never dried out during extended dry periods. There is an option to resize according to the contributing catchment to achieve pre-development pollutant loading. It is up to you. If you want to remove for other reasons - no problems but we will need a suitable alternative (replacement) not just a vegetated floodway.

Happy to discuss.

G

From: bob@tatland.com.au [<mailto:bob@tatland.com.au>]

Sent: Monday, August 13, 2018 1:57 PM

To: Gerard Tuckerman

Subject: RE: Riverside - Channels

Gerard,

Will discuss your response with Adrian tomorrow.

As regards the lining of this basin, I have on multiple occasions indicated to NoW inspectors (~2012) and Council that the material from this basin was the lining material used in the lining of the adjacent Commercial Basin and we have provided a Geotechnical Advice confirming this fact. If you accept that it is not intercepting groundwater what do you want to do with it. The Modification will not approve its existence or use but it was constructed under a CC and it really only needs tidying up and landscaping.

If you have any queries please do not hesitate to contact our office.

Kind Regards,
Bob Lander
Director
Mobile: 0408 497 657

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From: Gerard Tuckerman <Gerard.Tuckerman@MidCoast.nsw.gov.au>
Sent: Monday, 13 August 2018 12:59 PM
To: 'bob@tatland.com.au' <bob@tatland.com.au>
Cc: Bruce Moore <Bruce.Moore@MidCoast.nsw.gov.au>; Michael Sheargold <msheargold@sheargoldgroup.com>;
'Ledum Yorgure' <LYorgure@sheargoldgroup.com>
Subject: RE: Riverside - Channels

Hi Bob,

Thanks for the response.

Re the second point - I disagree. In my view the modification to the concept plan should reflect what is acceptable practice. It shows the removal of a current treatment facility but is silent on the replacement facility. The inline facility referred to in your email to replace the constructed wetland is not appropriate as it will be unable to achieve treatment requirements due to the influence of upstream flows. The inline treatment of stormwater in the lower section of urban catchments is not commensurate with accepted practice. This has been the case since at least 1997 when the NSW released the handbook Managing Urban Stormwater. Council will require existing runoff from the particular properties in Leeward Circuit that drain to basin 8C to be managed commensurate with the original water quality objective for the greenfield site and that downstream receiving waters are not compromised by the modification of the concept plan. A bioretention basin or small offline wetland system that can be overtopped (not scoured) during peak flood events is the type of thinking required when considering a replacement facility.

The issue with the 8C basin was that there was uncertainty as to whether it is lined to prevent groundwater interaction. Constructed wetlands as treatment of urban runoff are an acceptable urban stormwater treatment measure.

Regards

From: bob@tatland.com.au [<mailto:bob@tatland.com.au>]
Sent: Monday, August 13, 2018 11:39 AM
To: Gerard Tuckerman
Cc: Bruce Moore; Michael Sheargold; 'Ledum Yorgure'
Subject: FW: Riverside - Channels

Gerard,

I don't think that we need to document this arrangement in the Modification documentation but it will be a specific item in the first DA for the development. Adrian has confirmed arrangements below.

If you have any queries please do not hesitate to contact our office.

Kind Regards,
Bob Lander
Director
Mobile: 0408 497 657

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From: Adrian Varela <adrian@tatland.com.au>
Sent: Monday, 13 August 2018 10:49 AM
To: bob@tatland.com.au
Subject: RE: Riverside - Channels

From: Gerard Tuckerman <Gerard.Tuckerman@MidCoast.nsw.gov.au>
Sent: Friday, 10 August 2018 5:46 PM
To: Bruce Moore <Bruce.Moore@MidCoast.nsw.gov.au>; 'msheargold@sheargoldgroup.com' <msheargold@sheargoldgroup.com>; bob@tatland.com.au
Subject: RE: Riverside - Channels

Hi Bruce/Michael/Bob

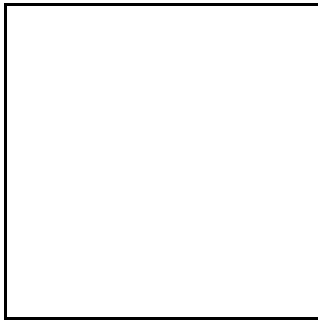
Thanks for forwarding through the information and confirming the largely unchanged interactions with groundwater. The 250 mm additional depth does not appear to interact with groundwater as depth is 1.2m AHD. Is this the case? **Correct. The 250mm additional depth occurs at the top of the West Branch, which results in excavation around 1.2m deep from the existing levels. This adjustment was done with the groundwater level in mind with the intention of avoiding any additional interception.**

Also the basin 8 C approved as part of DA 433/2011 and DA 341/2003 (modified) on the south branch is proposed to be removed. This basin was approved to treat runoff from a portion of the development in Leeward Circuit. What facility is proposed to treat this existing stormwater runoff? It needs to be notated on the plan and documentation, so the need to replace the facility is not lost. **Basin is being removed as a result of Office of Water actions regarding the legality of its approval by Council in the above mentioned DAs. While it was designed with water quality treatment in mind, it is noted that Council now considers this older style basin design as ineffective for stormwater treatment anyway, and its replacement with a constructed vegetated floodway would provide at least equivalent treatment (while not a formal designated structure is could be described as a very wide swale or vegetated buffer).**

Otherwise my concerns have been addressed.

Regards

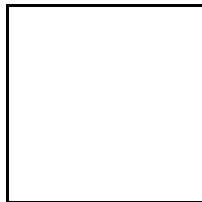
Gerard Tuckerman
Manager Natural Systems



Direct 02 6591 7274

Gerard.Tuckerman@MidCoast.nsw.gov.au

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From: Michael Sheargold [<mailto:msheargold@sheargoldgroup.com>]

Sent: Friday, 27 July 2018 3:34 PM

To: Bruce Moore

Cc: Ledum Yorgure; John Dunning; Bob Lander

Subject: Riverside - Channels

Hi Bruce,

Thanks again for your time on Tuesday. As discussed after the meeting I've looked further into the issue of the drainage channels, their depths and them intercepting the ground water. The most significant changes are in terms of horizontal alignment although you were correct in that one of the channels did get slightly deeper (about 250mm), attached is a comparison plan and sections of the channels and summary from Tattersall Lander of the changes below:

- Monkey Jacket Branch - levels are exactly the same, although the horizontal geometry has changed – the downstream outlet is in the same position, but the upstream end has been shifted approx. 80m north.
- South Branch – Levels and location remain unchanged, other than the removal of the existing basin at the bottom of this corridor – was included in the 2013 modelling as existing but not part of approval.
- West Branch – location unchanged (although upstream end truncated by 90m). Levels unchanged at bottom of site, progressively deepened up to 250mm lower at top end of site. I believe the only place any of these levels appear in the application documentation is where culvert invert levels are noted on the "Preliminary Drainage Design Details" plan as Attachment 1A to the Martens Concept IWCMS report – The document accompanying the modification shows the West Branch upper culvert as U/S Inv 2.0, D/S Inv 1.95m where the document accompanying the approval shows U/S 2.25m, D/S 2.2m. This is the area shown in Figure 18 (reproduced in Daniels email below) as greens so the lowering would just bring it back down to groundwater level. Also note the red area in Figure 18 at the top of this branch is the area now truncated by the modification.
- East-West Branch – N/A as it does not involve any cut (formed via fill embankment).

Also attached is a response to council's query in regard to intercepting of groundwater by the channels from Martens and Associates who did much of the Hydrological work in the approved concept plan and also for our modification.

My thoughts are that this would hopefully address Gerard's concerns such that council would consider withdrawing this requisition from the Department or acknowledging it has been satisfied, however if Gerard has further concerns that this information does not address then hopefully we could address these at the

DA stage. Our understanding is that we have satisfied DPI water's queries now so this issues is hopefully the only thing standing in the way of the Department finalising the modification and we are very eager to move on to the next phase of the project and lodge a DA with council.

Happy to have a further discussion around these issues if required in order to expedite the progress of the project if at all possible.

Regards,

Michael



Michael Sheargold

Managing Director

M: 0403 788 100

E: MSheargold@sheargoldgroup.com

W: sheargoldgroup.com

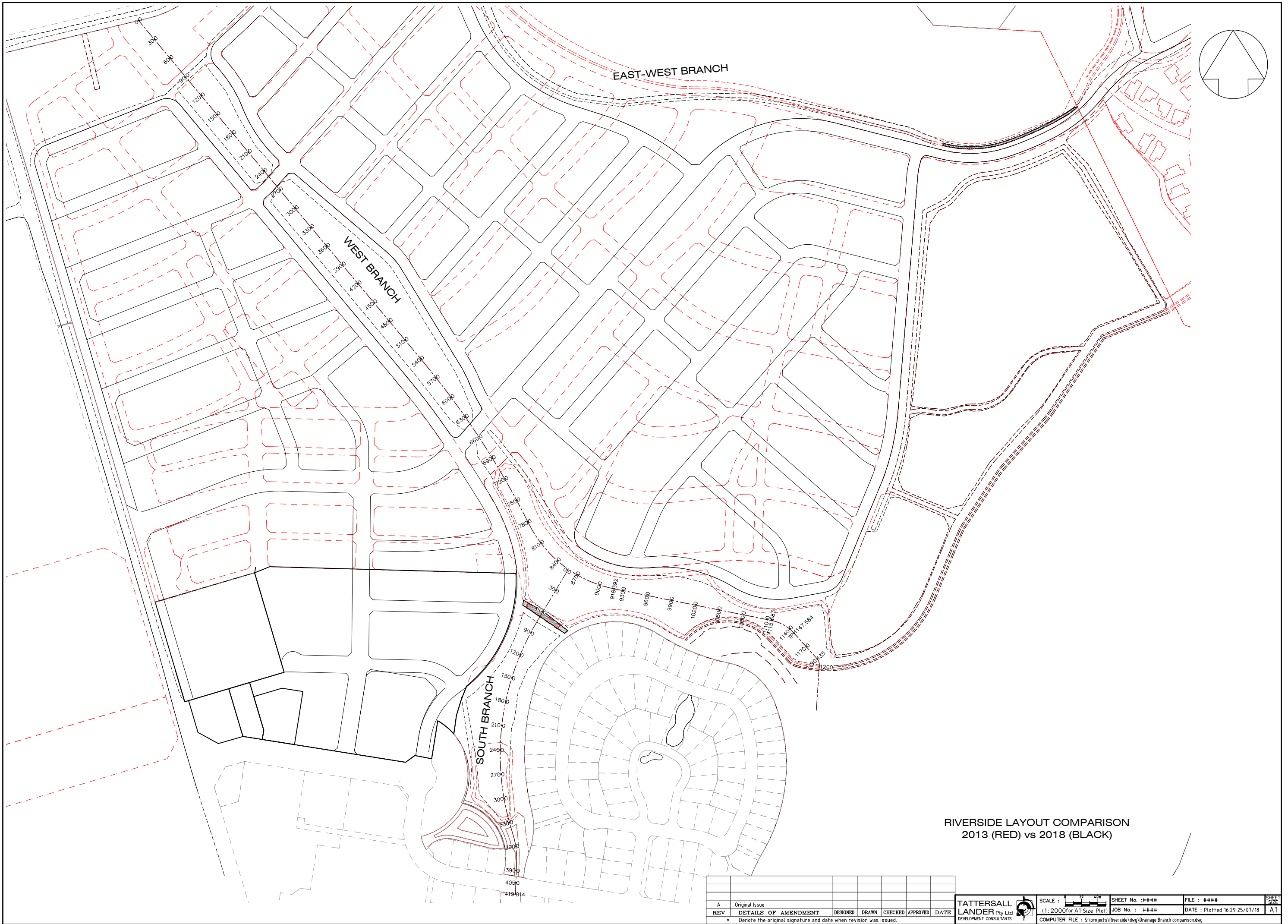


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RIVERSIDE LAYOUT COMPARISON
2013 (RED) vs 2018 (BLACK)

REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE
A	Original Issue					

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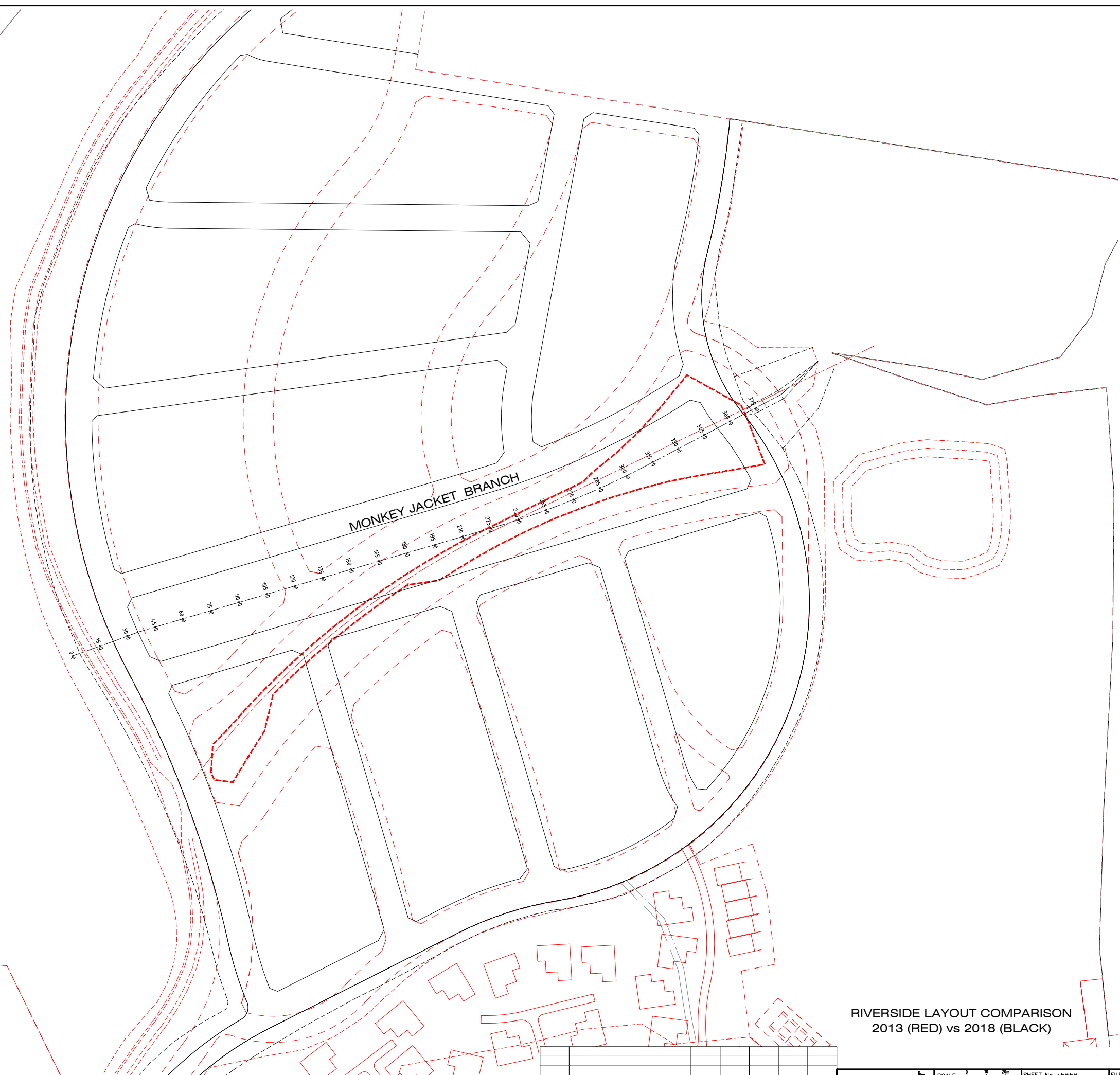
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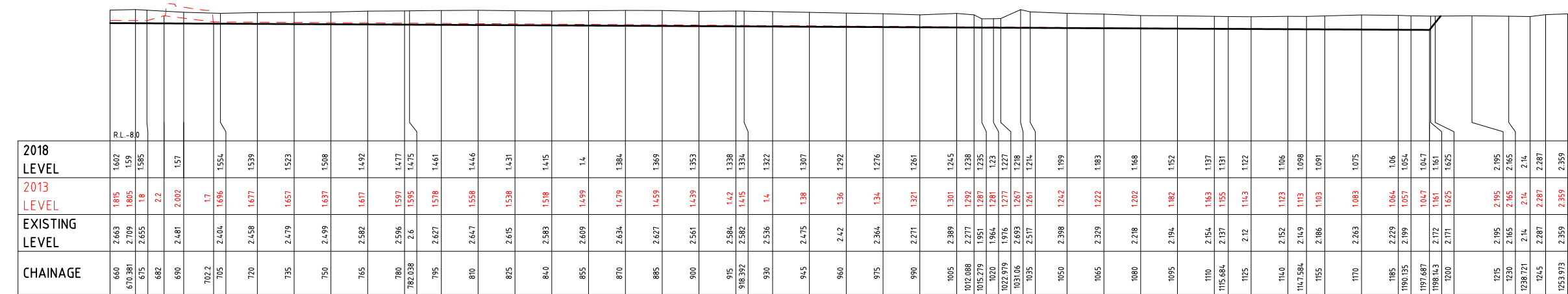
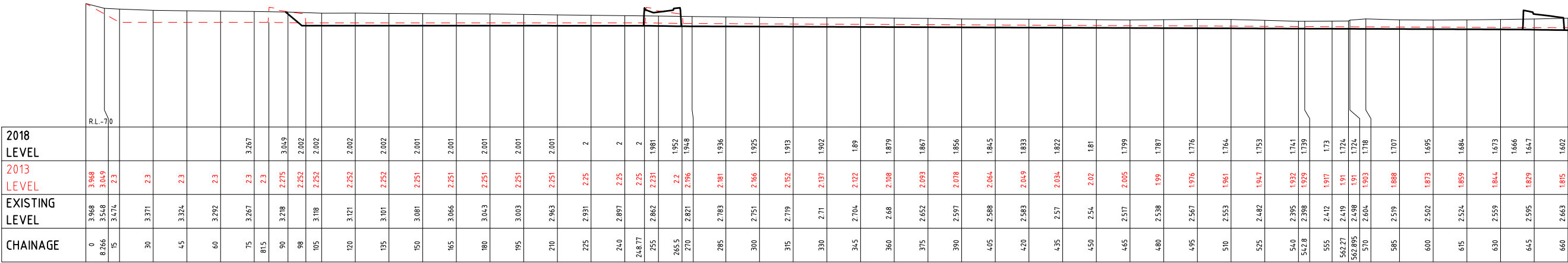
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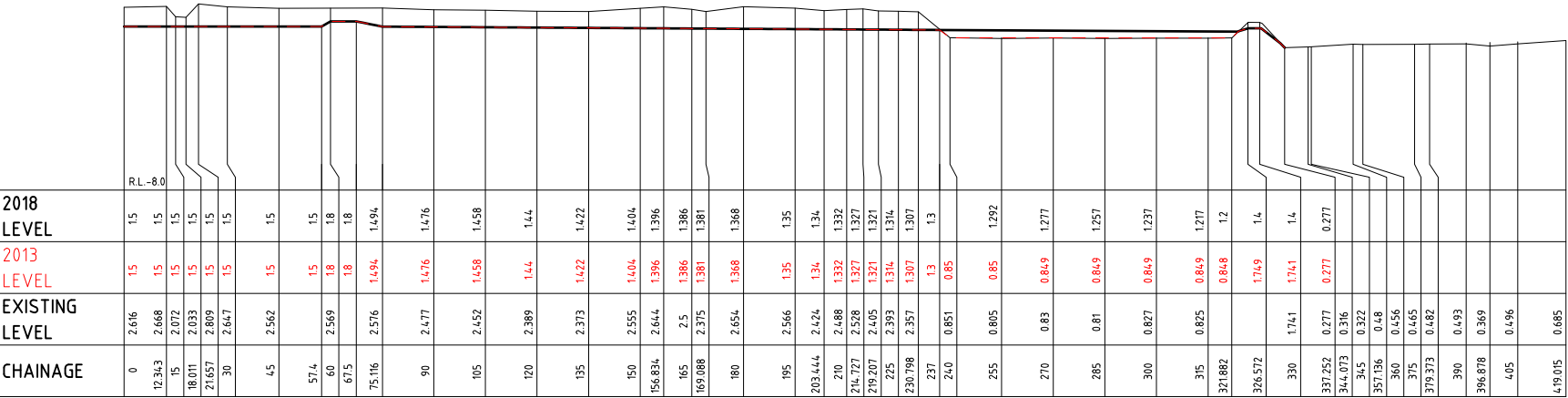


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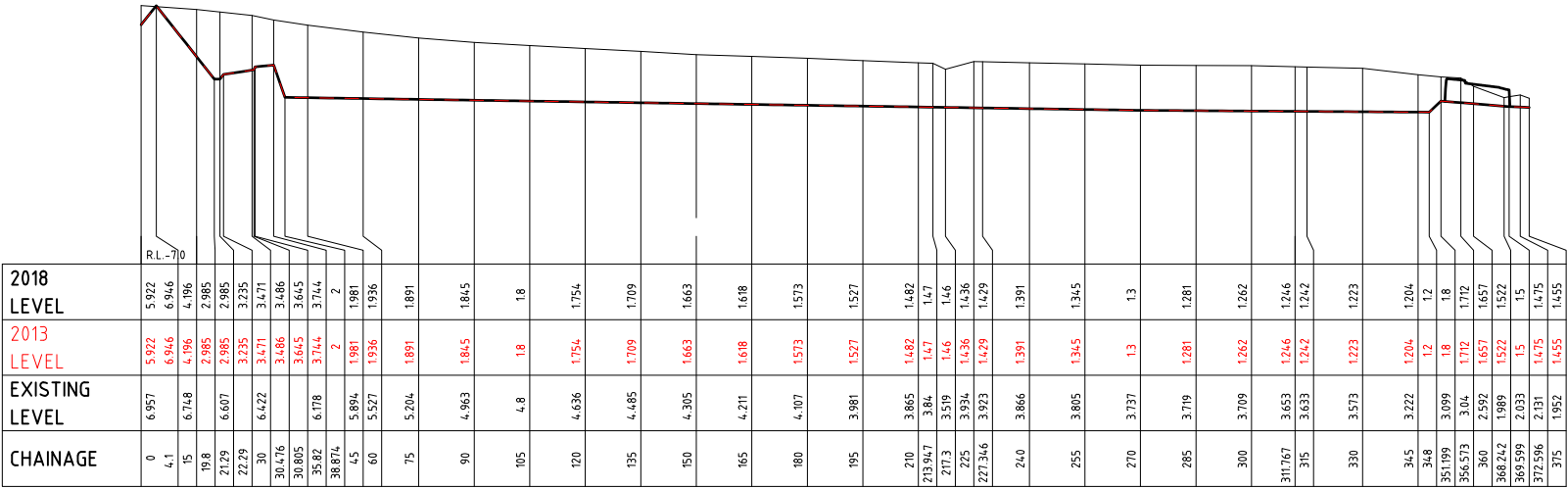
[illegible]



FLOODWAY LONGITUDINAL SECTIONS COMPARISON



SOUTH BRANCH
H=1:1000 V=1:200



MONKEY JACKET BRANCH
H=1:1000 V=1:200

ROAD & DRAINAGE DETAIL PLAN

A	Original Issue								
REV	DETAILS OF AMENDMENT	DESIGNED	DRAWN	CHECKED	APPROVED	DATE			
* Denote the original signature and date when revision was issued									

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SCALE : 1:1000
25/07/2025 for A1 Size Plot

SHEET No. :####
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FILE : #####
DATE :

SHEET
SIZE
A1

COMPUTER FILE :

26 July 2018

Tattersal Lander Pty Ltd
 Attn: Bob Lander
 2 Bourke Street
 Raymond Terrace, NSW 2324

Dear Bob,

RE: HYDROLOGICAL COMMENTS IN RESPONSE TO COUNCIL'S LETTER OF 19 JUNE 2018 – RIVERSIDE, TEA GARDENS, NSW.

Further to your request, we provide the following comments in response to Council's letter dated 19 June, 2018. This advice specifically addresses the concern expressed by Council regarding the cut and fill plan as shown on p 16 in the Stormwater Management Report of October 2015 prepared by Tattersal Lander (the **2015 proposed concept stormwater plan**). Our comments are as follows:

1. We understand that the concept plan approval was granted 27 June 2013.
2. Approval was granted on the basis of the Concept Integrated Water Cycle Management Strategy prepared by Martens & Associates, dated 22 January 2013 (the **2013 approved CIWCMS**).
3. In respect of the 2013 approved CIWCMS, the following is noted:
 - a. Attachment 5 included the Stormwater Management Report for Concept Plan Application (SMRCPA), prepared by Tattersall Lander dated January 2013 (the **2013 approved concept stormwater plan**).
 - b. On Figure 6 at page 13 of the 2013 approved concept stormwater plan, the approved site cut-fill earthworks are shown. A copy of this figure is provided in Figure 1 at Attachment A and indicates extensive areas where cut has been approved.
 - c. The 2013 approved CIWCMS included a detailed groundwater impact assessment which was completed through comprehensive modelling founded upon long-term groundwater level and quality monitoring data across the site. The groundwater data and modelling work were the subject of numerous technical reviews by government agencies, including the PAC. As noted in section 4.4.5.1 on page 47 of the 2013 approved CIWCMS, the groundwater model was developed using the design terrain surface obtained from Tattersall Lander and included all drain and drainage invert levels. The approved cut and fill earthworks (see Attachment A, Figure 1) is a reflection of the approved terrain.
 - d. The cut-fill earthworks for the concept plan modification application is shown in Figure 6 at page 16 of the 2015 proposed concept stormwater management plan, and is reproduced in Figure 2 at Attachment A. It is

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 ABN 85 070 240 890 ACN 070 240 890

evident from comparing the approved and proposed cut-fill earthworks plans, that the two plans are nearly identical. Importantly, both plans show areas of significant cut within the proposed drainage system.

4. In respect of Council's concern over intersecting the groundwater table, the following is noted:
 - a. The 2013 approved CIWCMS included groundwater modelling that incorporated the effects of the development intersecting groundwater at a number of locations. The creation of 'window lakes' was the subject of extensive discussions between the applicant, its consultants (which included Martens & Associates), the department and the PAC, and the approval includes some limited allowance for the creation of these features. This can be seen for example in Figure 18 of the 2013 approved CIWCMS (this is reproduced in Figure 3 at Attachment A), which shows where mean groundwater levels would be intersected by the development terrain and drainage system (shown as red and magenta).
 - b. The 2013 approved CIWCMS was based on extensive water quality modelling, which demonstrated that there would be no impact on either groundwater or surface water systems after the development was constructed. The development's drainage would provide more than sufficient flows to ensure that all waters within the estate would be well flushed and should not present a problem with respect to mosquitos or aquatic weeds.
 - c. Based on our review of the 2015 proposed concept stormwater management plan, the proposed earthworks are consistent with the 2013 approved earthworks for the development site. We are of the view that the surface and groundwater impact assessment undertaken for the 2013 approved CIWCMS is therefore consistent with the proposed concept plan modification.

If you require further information, please do not hesitate to contact either Gray Taylor or the undersigned.

For and on behalf of

MARTENS & ASSOCIATES PTY LTD



DR DANIEL MARTENS

Managing Director & Principal Engineer

LLB(Hons1), BSc(Hons1), MEngSc, PhD
FIEAust, CPEng, NER, RPEQ, APEC Eng, IntPE(Aus)

Attachment A – Figures

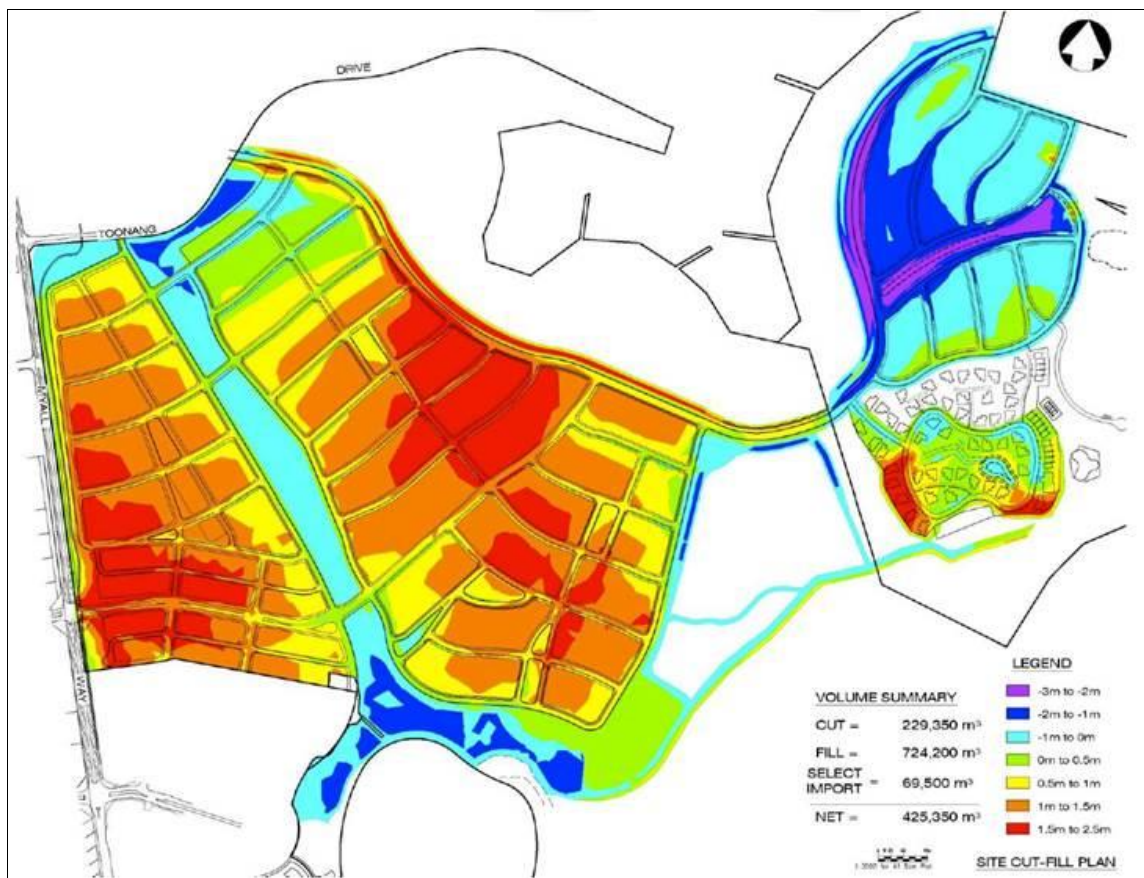


Figure 1: Approved cut and fill plan (reproduced from Figure 6 at page 13 of the 2013 approved concept stormwater management plan).

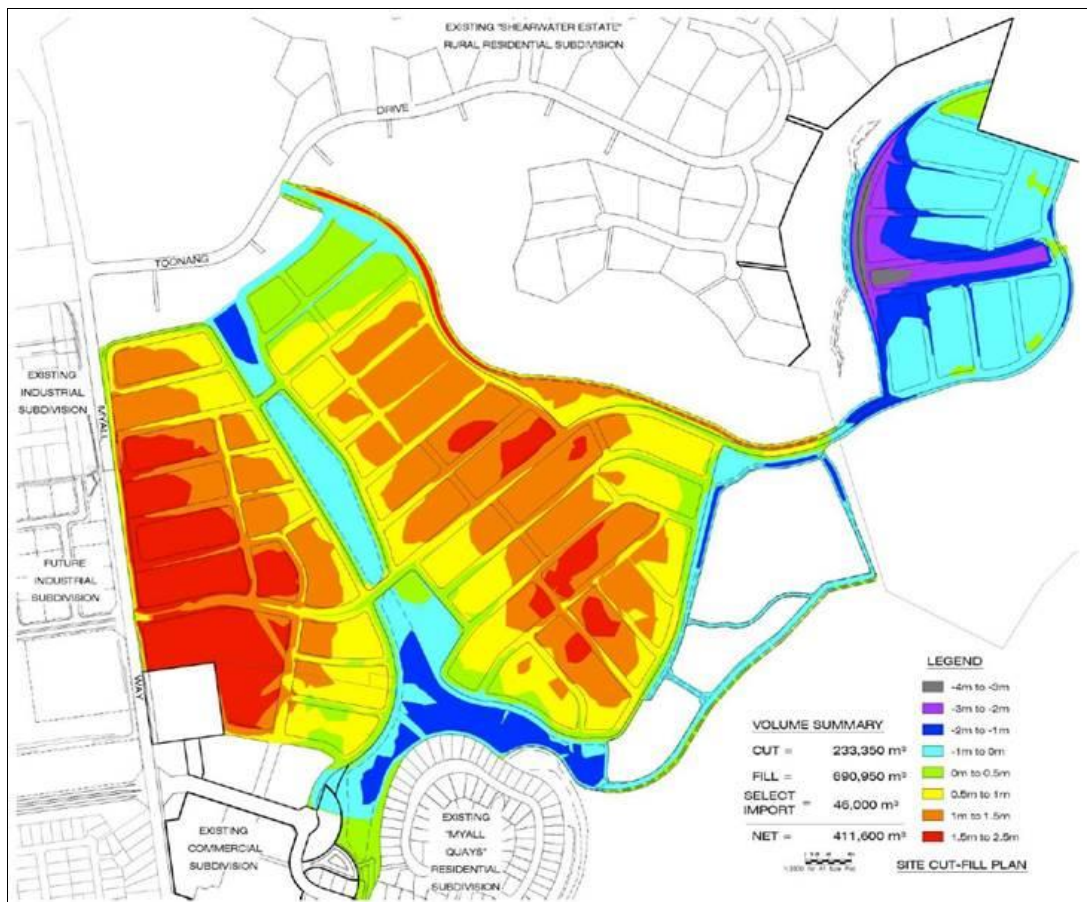


Figure 2: Proposed cut and fill plan (reproduced from Figure 6 at page 16 of the 2015 proposed concept stormwater management).

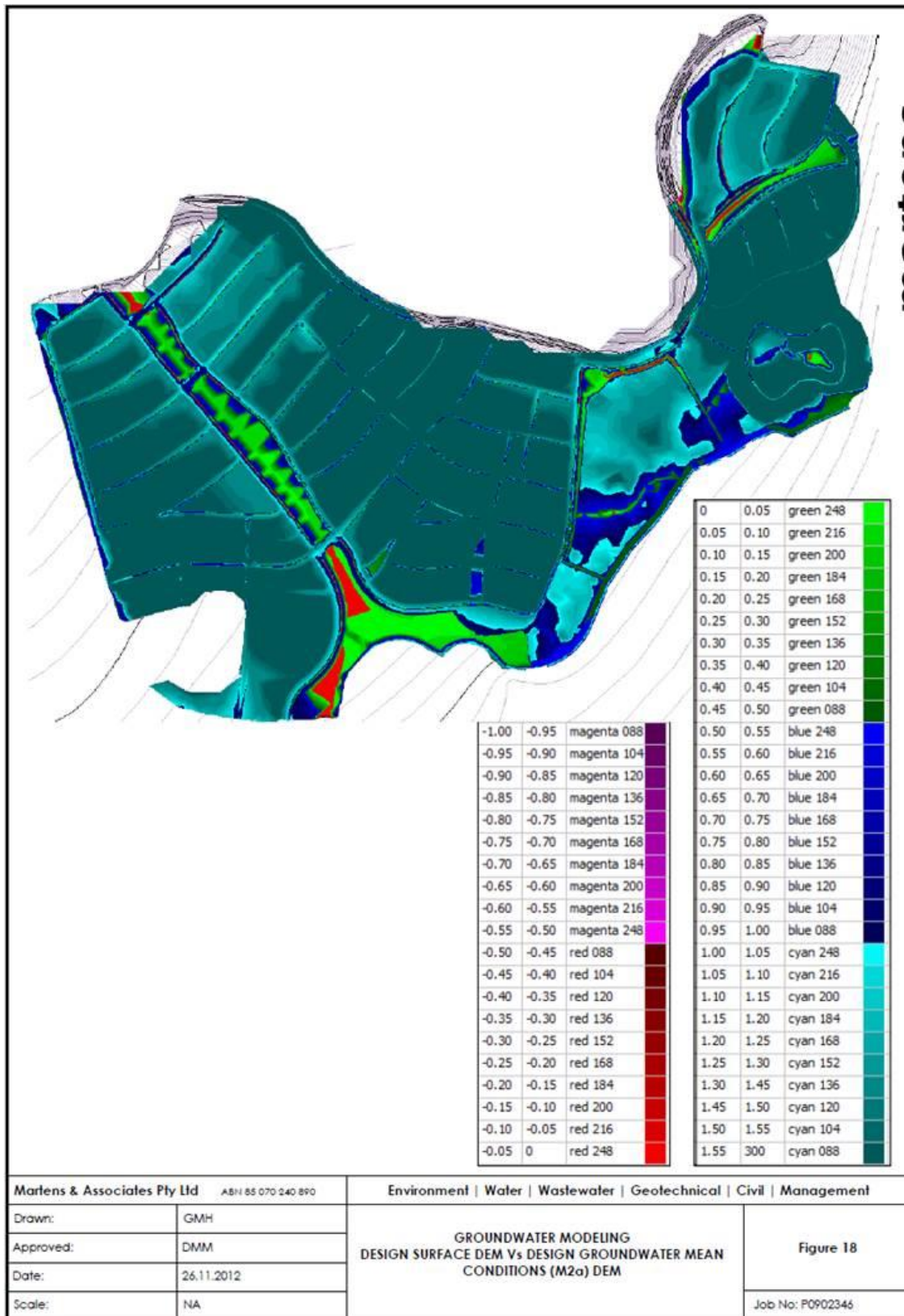


Figure 3: Window Lakes (reproduced from Figure 18 of 2013 approved CIWCMS).