Att: Mr. Joseph Indomenico

Re: Proposed Stage B1 & B2 Developments, McPherson Street, Moonee Ponds

Dear Sir,

We present the following services investigation report pertaining to the Electrical, Communications, Hydraulics, Fire and Gas Services associated with the proposed Stage B1 & B2 residential developments at Thomas Street, Moonee Ponds.

BASIS OF REPORT

- The intention of this report is to address the following "Service Infrastructure Plan Items of the ACZ1" for the proposed Building B1 and B2 developments:
  - An assessment of the existing engineering infrastructure servicing the site and its capacity to service the proposed development; and
  - A description of the proposed provision of all appropriate utility services to development parcels."

- Required infrastructure capacities for the proposed development have been based on RLA’s preliminary drawings and discussions with the relevant authorities.

- The details presented within are subject to change based on formal responses from the applicable Authorities once the building size and form is resolved.

- The project involves the construction of two apartment developments located at McPherson Street, Moonee Ponds consisting of the following:
  - Building B1 consists of 150 apartments, approximately 780m² of commercial space over 4 levels of basement car park.
  - Building B2 consists of 163 apartments and approximately 530m² of commercial space over 4 levels of basement car park.
SCHEDULE OF AUTHORITIES

The following presents a schedule of all the Authorities applicable to this site:-

- **Electrical**
  - Jemena

- **Copper Telecommunications**
  - Telstra Corporation

- **Fibre Optic Telecommunications**
  - NBN Co.

- **Gas**
  - Ausnet

ELECTRICAL SERVICES

Summary of Existing

Power

There are currently four (4) existing substations providing power to the racecourse ‘Moonee Vly- Racecrs 1-4’ supplied from Jemena’s existing HV infrastructure via a combination of overhead and underground supplies. These existing supplies will not have an impact on the proposed apartment developments.

Telecommunications

Underground copper cabling surrounds the perimeter of the site, with a majority of services entering the site being copper.

There is currently no NBN Co infrastructure around the site.

Proposed Development Requirements

Power

A preliminary maximum demand calculation has been undertaken for the project and submitted to Jemena for their assessment. The maximum demand calculation has been considered for Thomas Street Apartments, Building B1 and Building B2 given that all three developments are located on a common title.

It is expected however that the total maximum demand will be approximately 3000 Amps or 2MVA. We have application to the local supply authority where we have made an allowance for a basement style indoor substation.

Further investigations will be required following advice from the application lodge for permanent power supply to Jemena.

Telecommunications

The site is not currently within the NBN Co rollout area however there has been an application made to NBN Co. which has been approved. At this stage, the Stage B1 and B2 will be provided with fibre to the premise as confirmed by NBN Co.
HYDRAULIC & FIRE SERVICES

Stormwater

Refer to the DCE Consultants report on the “Interim and Overall Stormwater Stormwater Drainage Strategies”.

Stormwater

Meinhardt Group are developing new Sewer infrastructure in conjunction with City West Water to serve Stage B1 and B2 developments.

Fire Service

Proposed Development Requirements

We have received advice from City West Water confirming that the existing main with Thomas Street is 100mm diameter PE. City West Water have confirmed a flow of 20 l/s at 35m residual pressure.

Based on the above advice, it is likely there will be a requirement for fire pumps to provide adequate pressure and flows for the hydrant system. However, there is a future water main upgrade proposed by City West Water which may negate the need for pumps. We are currently awaiting advice from CWW relative to a predictive flow analysis.

There is a requirement for an internal hydrant system to the site and therefore a booster will be required by the Metropolitan Fire Brigade.

The booster will be located on the property boundary within the Thomas Street development which will be sized to cater for Thomas Street, Building B1 & Building B2.

Further advice will need to be obtained from the MFB, building surveyor and the projects fire engineer during the design phase.

Natural Gas

Summary of Existing

There is an existing 50mm high pressure gas main within McPherson which connects into a 63mm gas main within Thomas Street.

Proposed Development Requirements

Preliminary discussions with Ausnet have confirmed that the existing infrastructure within McPherson Street & Thomas Street should be adequate to supply gas to the proposed developments. It is intended for gas reticulation to the proposed development (Stage B1 & B2) to be as follows:

- the high pressure gas to Stage B1 & B2 development shall be reticulated from the existing 63mm gas main in McPherson Street. A new gas main will be installed in the extension of Kenna Street to service Stages B1 & B2.

We trust the above is satisfactory. Please contact the undersigned should you require further information.

Yours faithfully,
Ascot Consulting Engineers Pty. Ltd.

Shaun Marrinon
smarrinon@ascoteng.com.au
To Stage B1&B2 Team,

This memorandum has been prepared as supplementary information for Stage B1&B2 town planning and should be read in conjunction with the accompanying masterplan sketch plan (116388-A0-MP(SK02-REV 01)), the Council approved Stage A and Stage B (Thomas St) infrastructure town planning reports (prepared by Meinhardt) and town planning documents prepared by others for this Stage B1&B2 submission.

Stage B1&B2 Development Proposal

Stage B1&B2 development consists of 313 proposed apartments, including retail and office spaces over a four-level basement to be located north of the proposed extension of Kenna Street into the subject site. This stage of the development will include the following key infrastructure:

- Extension of Kenna Street (ultimate),
- Extension of authority services from Stage A extents, and
- A temporary interface at the intersection of Kenna Street and proposed North-South Road, until such a time as when the North-South Road will become active post grand stand demolition.

Stage B1&B2 Roads

Kenna Street as identified in Stage A of the development will be extended in an easterly direction, along with the proposed authority services. **Kenna Street has been designated to be designed to Council specifications from a performance perspective but has been proposed to be a private road**; The final road alignment and road reserve sizing will be subject to detailed design, use of carriageway and outcomes of the project Integrated Transport Plan.

**No further external road modifications or augmentations will be required to enable this Stage of works. The full extent of Kenna Street extension will be determined during the detail design stage, determining the most economical and user-friendly alignment, coordinating with the wider on-going requirements of the Club operations and the stakeholder outcomes.**
Stage B1&B2 Stormwater Quality and Quantity

It is proposed that water quality and quantity infrastructure will not be required as part of this Stage of works. As this Stage is located within a wider master planned development, precinct wide captured stormwater is proposed to be treated for quality in a proposed wetland to be developed and constructed within the future infield precinct. Additional infrastructure such as retarding dams will also provide catchment (and precinct) wide stormwater detention requirements negating the need for per stage infrastructure.

As part of these Stage works, overland flows will be required to be conveyed towards Kenna Street road reserve and to be captured for conveyance to existing points of connections.

Stage B1&B2 Utilities

As part of B1&B2 Stage works, it is proposed that the following utility services network will be extended into Stage B1&B2:

- Water main
- Telecommunications and Power lines
- Gas network
- Stormwater drainage networks

The final capacity, sizing and ultimate ownership of the utilities will be subject to authority requirements.

Sewer servicing for Stage B1&B2 will be provided by the sewer network required to enable Stage A works.

The intent is to provide authority owned and maintained services throughout the development providing individual connection to each allotment and a point of connection to the existing surrounding infrastructure assets.

The proposed design criteria for services will comply with the relevant authority conditions.

In lot infrastructure will be private infrastructure

Common Easement Proposal

As proposed Kenna Street will likely be a private carriageway, it is proposed that where private infrastructure and metering cannot be provided, a common easement will be provided within the private carriageway. This stage of works currently has a 3.0m DRAINAGE AND SEWER easement encumbrance in line with City West Water and Council requirements.

Refer figure below for typical stormwater drain and sewer configuration as outlined by City West Water.
Conclusion

This memorandum has been provided to support the town planning application relating to the Moonee Valley Racing Club redevelopment project Stage B (B1&B2) and related civil engineering concerns. This memorandum should be read in conjunction with relevant information by other consultants.

Should you have any questions or further queries with the above please do not hesitate to contact me.

Thanks,

Anıl Dilman
Associate – Urban Development
m: 0403 245 827 e: anil.dilmia@meinhardtgroup.com
Disclaimer
Dalton Consulting Engineers Pty Ltd

This report has been prepared solely for the benefit of the City of Moonee Ponds, the Moonee Valley Racing Club, the Hamton Joint Venture and Dalton Consulting Engineers Pty Ltd. No liability is accepted by this company or any employee or sub-consultant of this company with respect to its use by any other person.

This disclaimer shall apply notwithstanding that the report may be made available to other persons for an application for permission or approval or to fulfil a legal requirement.

This report has been prepared to provide guidance on the management of stormwater prior to the demolition of the Grandstand at the Moonee Valley Racecourse. The report is to be read in conjunction with the *Moonee Valley Redevelopment Stormwater Drainage Strategy (2018)* prepared by DCE Consultants and approved by Moonee Valley City Council under the current Planning Permit.
INTERIM STORMWATER MEASURES: MVRC

The approved (and ultimate) Stormwater Treatment is based on the use of the irrigation storage dams for ultimate treatment and re-use. DCE believes there should be provision for an interim solution to treatment that aligns with the ultimate treatment train.

The existing drainage from this site (and, the staged development areas) is captured and drained to the infield as detailed in the report.

There is a current pit diversion in this pipeline that can divert all low flows directly to the current storage dam (refer Location A).

A prudent and innovative option proposed is to divert all low flows to the existing dam. As part of this scenario, primary treatment through the inclusion of a trash rack at the dam entry would be appropriate during the construction phases.

Sedimentation would occur within the dam and would be enable both treatment and harvesting to occur. i.e. no direct entry to the stormwater network in Dean Street and subsequently the downstream Moonee Ponds Creek. Congruently, the ability to capture most flow would be optioned should the dam levels warrant.

As the Racing Club utilises the Dam for irrigation use, the integrity of the water quality is assured.
Stormwater Retention: The interim Scenario

As indicated in the Stormwater Drainage Strategy provided to Council in November 2018 and subsequently adopted by Council, the existing Grandstand provides stormwater retention for the site. This is more than enough to provide the necessary retention of flows during the construction of the precinct upstream. There is a surcharge flow path that incorporates the existing track underpass that is more than sufficient to contain flows. The flow path to this underpass and the retention behind the grandstand has been manage as such over a significant period whilst protecting the existing track from any damaging overflow.

In essence, until the Grandstand is demolished there is sufficient retention as illustrated in the Engeny Flood Study Report dated October 2018.

Note from the relevant Summary Item of the Stormwater Strategy Report:

4. The current grandstand and environs have been altered over time to act as a major retention structure. Overland flows are directed to the current underpass to protect the track from any damaging overland flows. The retention network will remain in place until such time as the grandstand is demolished in conjunction with the track reconstruction.

5. Until the grandstand is demolished, there is a retention network that will provide the necessary protection from the early stages of the Joint Venture development works. It is therefore logical that Council can address outfall drainage as and when the grandstand demolition permit is sought. It is an imperative requirement of the MVRC to protect the track from any overland flow that is detrimental to the track.

6. The logical precedence of works for the MVRC is to immediately commence work on the outfall drain across the infield as and when the grandstand and track work commence.

The consequence of the Flood modelling and the DCE Strategy adopted, is that the current stormwater retention (until the current Grandstand is demolished) is more than enough to cater for the 1%AEP. The demolition of the grandstand will, by nature, occur when both the infield drain is upgraded and the track built.

In summary, the existing stormwater retention (as indicated from modelling) is in place and is retained for all development prior to the demolition of the existing grandstand, being Stages A,B, B1/B2,G and Tote Park.
Water Quality: The Interim Scenario

The current scenario for water quality will be extended to take all low flows from the developing site until the Grandstand is demolished, being Stages A,B, B1/B2,G and Tote Park. The low flows will be diverted to the irrigation dam where the club will take responsibility for treatment. The intention is to ultimately increase the size of the dam to two separate facilities to enhance the treatment. This scenario protects the water source from any unforeseen contamination from Council controlled catchments. The intention is to utilise these dams during the preliminary works and subsequent track reconstruction as a major source of water supply. Refer to Section 5 & 6 of the Stormwater Strategy Report (Nov 2018)

MUSIC modelling was used to determine the ultimate treatment and volumes including a Water Balance Table for the site. It is essential for the ongoing integrity of the track that water quality measures be implemented as and when required for the irrigation dam.

Prior to the demolition of the existing Grandstand, the current overland flows will continue to be trapped behind the Grandstand. This entrapment is the current primary treatment train and is not altered by any works upstream and prior to the demolition works. This primary treatment includes external overland flows as indicated in the Engeny modelling from October 2018.

All low flow treatment will occur at the irrigation source within the infield. Water quality testing will continue to be utilised during this construction phase.

The ultimate treatment (as detailed in the approved Stormwater Strategy) includes the installation of:

- Primary treatment through the installation of a Pollutant separating Baffle box or large Sediment Trap - on-line with the new (1350mm Dia) pipe from the developed land
- Utilisation of Floating Wetlands as a measure to combat high Phosphorus and Nitrogen levels

Both these ultimate measures are available to club should they be required prior to the grandstand demolition in order to achieve the high water quality standards demanded by irrigation use.

The use of Stormwater outflows from the development site for irrigation both during the construction phase and post development phase have positive environment effects on both the Dean Street Drain and ultimately the Moonee Ponds Creek. Discussions were held with both Council and Melbourne water in relation to the diversion of flow to the infield irrigation dam.

Refer Item 5.2 of the Stormwater Drainage Strategy:
The ultimate Water quality benefits as outlined in the Strategy Report can be brought forward by the club should water quality be an issue during the early construction phase.

The obvious benefits of a re-use strategy are numerous and outlined in the report as indicated below:

- **MVRC will benefit by having a consistent supply of stormwater to use for irrigation.**
- **The Hostplus/Hamton joint venture will benefit by having water quality treatment provided immediately (without needing to wait for wetlands to establish).**
- **The Moonee Ponds Creek will benefit by having developed flows limited immediately.**
- **The Dean Street drain will benefit by having maximum outflows reduced to 0.2 EY outflows from MVRC and the minor catchment, preserving capacity and improving performance.**

The alternative scenario for water quality could only be the individual treatment at each stage of development with direct flows to the Dean Street Drain and subsequently the Moonee Ponds Creek.

It is proposed that the scenario of treatment at the infield and subsequent re-use by the MVRC for irrigation is a superior environmental alternative.
The following is also noted:

- In the rare instance where the dam requires an outlet to Dean Street, the club will provide details of the water testing completed prior to allowing the dam to outlet to the Dean Street drainage network.

- Although not anticipated as part of the development process, the club will monitor the nitrogen levels within the dam and will rectify such levels through the introduction of floating wetlands within the existing dam.

- DCE has conducted research into the implementation of Floating Wetlands both in Melbourne at the Botanic Gardens and in several installations in Singapore. It is difficult to incorporate this treatment into a MUSIC model. The MVRC, via DCE, will implement these wetlands if required at the early stages of construction works as the water quality within the dam is integral to the sustainability of track surface.

- As indicated in the Ultimate Approved Stormwater Strategy, the current Grandstand acts as a major form of stormwater retention under high rainfall events. As such, there is entrapment of any debris etc in high rainfall scenarios until such time as when the Grandstand is demolished.

- The club will use this interim treatment option as a trial of the ultimate treatment train and will provide the necessary water testing regime to document the benefits of such natural treatment.

- The proposed Interim treatment is seen as both practical (with a testing regime) as well as a trial of the ultimate drainage should the floating wetlands be required.

At the Stormwater Victoria Conference at Marysville on the 4th – 5th June 2019, DCE presented a Paper and presentation on the modelling and proposals as outlined in the approved Stormwater Report for the Ultimate treatment of stormwater within the Racetrack infield. The capture and treatment of this stormwater was commented as both innovative and sustainable.
MUSIC MODEL: ULTIMATE TREATMENT SUMMARY
The MUSIC modelling done for the ultimate SWMS had 2 goals:
1. Estimate stormwater harvest reliability (based on demand and the ultimate size of the stormwater storage)
2. Quantify the amount of stormwater removed from the Moonee Ponds Creek.
(Note that none of these goals is modelling stormwater quality treatment!)

Treatment was an ancillary component of the model. Treatment was considered with minimal loss to evaporation/transpiration. Losing some stormwater from the MUSIC model made the reliability and overflow calculations more conservative. The treatment I included was a conventional wetland sized to treat the Hamton development to Best Practice Standards. A comparison of the modelled wetland vs. the (likely) floating wetland(s):

<table>
<thead>
<tr>
<th>Item</th>
<th>Conventional wetland</th>
<th>Floating wetland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Size (area, sq. m)</td>
<td>2,200</td>
<td>680-340 (1 - 0.5% of contributing catchment)</td>
</tr>
<tr>
<td>Treatment</td>
<td>Best Practice</td>
<td>Best Practice</td>
</tr>
<tr>
<td>Location</td>
<td>Separate to stormwater storage</td>
<td>Within stormwater storage dam A</td>
</tr>
</tbody>
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To utilise the MUSIC model, the treatment that has been modelled will vary from that ultimately installed.
Demand for water will vary (84 ML/year vs 51 ML/year—with average annual demand to be at the lower end. The following assumptions are made:

1. There’s some kind of treatment (conventional or floating wetlands) so that the runoff from the Hamton development gets treated to best practice
2. Very little/no runoff occurs from the course proper
3. 50% all stormwater gets reused (just about the mean from the usage calculations—and this is conservative)
4. Runoff from the Hamton development, existing residential, and non-course proper MVRC is fairly similar in terms of pollutants.

With those assumptions, the following treatment can be estimated:

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Percent reduction with assumptions 1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSS</td>
<td>57.4 (not quite best practice)</td>
</tr>
<tr>
<td>TP</td>
<td>56.3 (exceeds best practice)</td>
</tr>
<tr>
<td>TN</td>
<td>54.6 (exceeds best practice)</td>
</tr>
</tbody>
</table>

Without any treatment for Hamton in place, the estimates aren’t quite as good (but they’re not that bad either):

<table>
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The only best practice target that is missed is for TSS. Since most stormwater will at least pass through the harvesting system, there’s a chance for pollutants to settle out that’s not fully documented by the MUSIC modelling. It could be argued that TSS-specific treatment can be incorporated into the stormwater harvest design (sediment settling forebay?) to fix that.

The floating wetlands have been assessed both in a riverine system subject to flow generated by big rainfall events (Singapore) and within reservoirs with more controlled water levels (Royal Botanic Gardens, Melbourne). The storage dam will have a defined top water surface elevation, but the water levels may drop below this in dry periods. Floating Wetlands provide modular treatment that can be established quickly in response to any spike in nutrients that is found in the stormwater harvest system.

Floating Wetlands provide modular treatment that can be established quickly in response to any spike in nutrients that is found in the stormwater harvest system.