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NL140529 B01 [Revision C]

11th August 2015

RPS Australia Asia Pacific Pty Ltd Mr Robert Dwyer 241 Denison Street Broadmeadow NSW 2292

Dear Robert,

Re: Box Hill North Local Water Centre – Concept Stormwater Management Strategy

Northrop Consulting Engineers have been engaged by RPS Australia Asia Pacific Pty Ltd to provide the concept stormwater management strategy for the proposed Box Hill North Local Water Centre (LWC), to be utilised for the Box Hill North Residential Precinct.

This letter should be read in conjunction with the attached Concept Plans NL140529/CSK1-CSK2.

Site Appreciation

The Box Hill North LWC is to be located on a portion Lot 10 DP 593517, herein known as "the site". It is anticipated the lot will be subdivided in the future to accommodate the LWC in a separate allotment. Furthermore, it is understood that general filling of the lot will be undertaken as part of the subdivision works, including filling in of the existing farm dam to the north of the site. Refer to J. Wyndham Prince subdivision plans for lot regrading details. We also understand Red Gables Road will be upgraded with kerb and gutter capable of conveying the 1% AEP peak flow from the upstream catchment.

The proposed allotments will be 1ha and, at full capacity, will have the following features;

- The LWC buildings occupies an area of approximately 1400m²;
- The external hardstand occupies an area of approximately 2000m²;
- The external plant and equipment (e.g., tanks) occupies an area of approximately 1800m²;
- · Significant areas for soft landscaping have been provided in and around the facility; and
- The site is proposed to have permanent vehicle access from the existing Red Gables Road.

A schematic of the site is shown overleaf in Figure 1.

Prepared	AK	11/08/2015
Reviewed	AB	11/08/2015



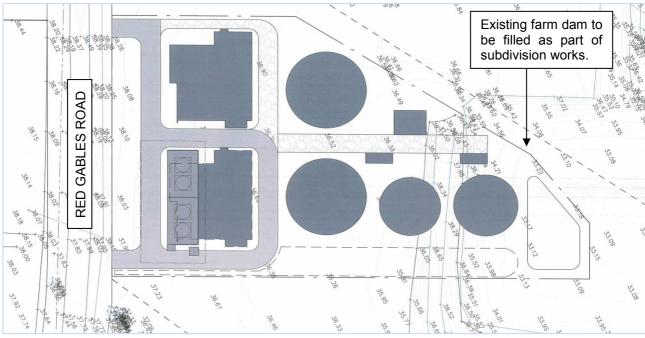


Figure 1 - Site Schematic

In line with the "Box Hill North Precinct Water Cycle & Flood Management Strategy Report", compiled by J. Wyndham Prince (Ref# 9720Rpt1D, July 2013); the site is located within the Cataract Creek Catchment. The stormwater analysis undertaken by J. Wyndham Prince considered the allotment as residential zoning, which was delegated a percentage impervious of 80% in accordance with The Hills Shire Council Design Guidelines Subdivision and Development.

It is noted that whilst the site does not conform to the land use associated with the residential zoning, the runoff regime from the proposed site is considered to be less than that produced from an equivalent residential development. Table 1 below depicts a comparison of the pervious and impervious development percentages.

	Impervious Area	Pervious Area
Residential Zoning	80%	20%
Water Recycling Plant	55%	45%

Table 1 - Residential Zoning Site Comparison

As seen above in Table 1, the proposed development is compliant with, albeit much lower than, the anticipated runoff regime of the residential zoning which is the basis of the regional stormwater management modelling/design.

Construction Phase Soil and Water Management

As part of the Stormwater Management investigation, a Concept Sediment and Erosion Control Plan, attached drawing NL140529/CSK1, has been compiled in accordance with Landcom Managing Urban Stormwater – Soils and Construction (the Blue Book). A range of control measures to eliminate, limit or mitigate impacts from construction activities have been proposed. Some of these control measures include:

- Implementation of a mulch bund up slope of the proposed disturbance areas;
- Coir logs within the proposed drainage channel;
- Sediment fences downslope of all disturbed areas and material stockpile areas;
- Re-vegetation of disturbed areas post construction.



Stormwater Management - Water Quantity and Quality

The proposed stormwater management strategy for the Box Hill North land release area, outlined in the "Box Hill North Precinct Water Cycle & Flood Management Strategy Report" (compiled by J. Wyndham Prince), incorporates a regional stormwater management system comprising water quantity (detention) as well as water quality treatment. The proposed regional system provides quantity and quality treatment for all proposed upstream developed land areas, including the North Box Hill LWC site, through a range of measures including;

- Proprietary Gross Pollutant Traps at trunk stormwater discharge points;
- Twenty proposed Bio-retention raingardens; and
- Six proposed detention basins.

These regional stormwater management measures are proposed to be adequately sized to treat the stormwater runoff for water quantity and quality. As such, no formal quantitative treatment should be required from the Box Hill North LWC site. We reiterate that the runoff expected from the Box Hill North LWC is considerably less than that assumed in the regional modelling for residential lands.

Notwithstanding this, a Concept Stormwater Management Plan has been prepared to further manage stormwater runoff from the LWC. This concept plan incorporates a range of water sensitive and industry best practice management measures with the endeavour of further improving water quality onsite whilst harnessing the synergy of providing water quality treatment, flow retention and passive irrigation. No onsite detention is required or proposed for the LWC, although the proposed site management strategy will provide additional flow retention over and above that required. The proposed Concept Stormwater Management Plan can be seen in the attached drawing NL140529/CSK2.

Furthermore, vehicle loading areas or areas where potential spillage could occur will be isolated and additional treatment measures will be employed. For example: the inclusion of physical bunds in hazard areas; the inclusion of spill containment and storage systems; as well as developing operational procedures to control handling and minimise the likelihood for spillage whilst also managing spill response. Such systems will be incorporated in to the detailed design to reflect the sites handling and operational procedures.

Conclusions

The proposed Concept Stormwater Management Strategy for the site has been prepared in line with the overarching stormwater management strategy for the Box Hill North Residential Precinct and industry best practice.

The Sediment and Erosion Control Plan and Concept Stormwater Management Plan provide adequate treatment of runoff from both construction and ongoing operations for the proposed Box Hill North Local Water Centre.

I trust the above meets your requirements, however, if you would like to discuss further then please do not hesitate to contact the undersigned on 4943 1777.

Yours sincerely,

Aaron Knight
Civil Engineer
BE (Civil Hons 1)



ATTACHMENT A - ENGINEERING DRAWINGS

