150126 HW/BM

19th April 2010

The General Manager
Liverpool City Council
Locked Bag 7064
LIVERPOOL BC NSW 1871

Attention: Mr J Organ

Dear Jeff,

RE: FLOODPLAIN MANAGEMENT ISSUES,
PROPOSED HOXTON PARK AIRPORT REDEVELOPMENT
COWPASTURE ROAD, HOXTON PARK.

With regard to the above described matter and further to our meeting of 14th April 2010, we address Councils issues reading to the flooding behaviour outlined in their subsequent correspondence of 15th April 2010 as follow.

1. IMPACT OF PROPOSED DEVELOPMENT FOOT PRINT ON FLOODING

We note Councils concerns in relation to the conflict with the existing channel conveying stormwater from both the existing M7 culvert crossings and the M7 surface water drainage. As part of the overall internal stormwater design for the site, these culverts and surface water drainage infrastructure are proposed to be conveyed to a relocated channel sized to cater for the critical 1:100 ARI design storm and conveyed toward Cowpasture Road. At Cowpasture Road this channel will be directed toward the inlet of the existing culvert structure crossing Cowpasture Road. It is understood that this structure has been sized to cater for the critical 1:100 design storm for the catchment. An indicative arrangement of these facilities is shown on Drawing 150126-SK-069-A attached.

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Section 6.2 of the URS report discusses the potential impacts of the marginal increases to flooding depth and velocity within the floodplain. More specifically, the more significant increases in velocity resulting in increased hazard category are generally adjacent to the proposed entry road and as such are at the periphery of the floodplain. The increase, particularly in velocity as discussed in the URS report are minor in quantum and well within acceptable limits to not significantly impact the integrity of the streambank. It is noted that the increases in hazard category do not significantly affect any existing development adjacent to Hinchinbrook Creek and as such, the development proposal does not significantly impact the floodplain.

2. IMPACT ON SERVICE STATION

The hydraulic model was developed by URS with the assumption that the service station site would be protected from the 1:100 ARI flood event generally in accordance with the CRDA approach. In lieu of the constructed berms adopted in the CRDA, the kerbs on the forecourt hardstand are proposed to be extended above the 1:100 ARI flood level. These levels were introduced in the TUFLOW model and the detailed design to reflect the flood free status of the service station site is currently under design development.

It is noted that the CRDA modelling demonstrated that the floor level of the service station is flood free under the critical 1:100 ARI storm event without the mitigation measures of the berms as constructed. The berms add a higher degree of protection to the forecourt areas and limit nuisance flooding of the service station forecourt area.

3. IMPACT ON EXISTING DEVELOPMENT – WARD PLACE AND SURROUNDS

The flooding affectation of the Ward Place area in terms of the depth and velocity of flow has been dealt with in Section 6.2 of the URS report. The flooding mechanism for this area is essentially backwater with peak velocities and hence hazard categories low.

Council has raised the issues of environmental impacts of the development proposal in this area. As outlined above, flooding depths increase locally from the baseline model to a maximum of approximately 90mm in the area as a result of backwater. As could be reasonably expected, velocities and hence hazard categories are low and not significantly increased as a result of the development proposal. The change in timing of the flood peak is of the order of minutes as compared to the baseline condition and hence the duration of inundation is essentially unchanged. On this basis, the development proposal does not significantly alter the duration of inundation with only very minor local increases in backwater flooding depth. On this basis, the development proposal does not have a significant impact on the area.

4. IMPACT ON COWPASTURE ROAD

URS have addressed the impacts of the development in Section 6.1 of their report. Generally the increases in flow velocity across the road pavement are mild and do not result in an inappropriate hazard category in the 1:100 ARI design storm, noting that the design criteria for Cowpasture Road reconstruction was no regional flood impact in the 1:20 year ARI storm. The quantum of increase in flood depth over the roadway as a result of development is less than 100mm. It is further noted in the URS report that, as a consequence of the Cowpasture Road reconstruction design development, an emergency management plan was prepared by the NSW SES for this section of Cowpasture Road. This emergency management plan requires the closure of the road under major flood conditions. Given that the impacts in terms of both depth increases and velocity/hazard category are minor and that the road will be closed under major floods, the development does not significantly impact on the operation of Cowpasture Road.

In addition to the above, given that the design standard for Cowpasture Road in the vicinity of the access road for the development is to be flood free in the 1:20 year ARI event, this further indicates that the maximum flood surface increase of less than 100mm is not significant in the operation of Cowpasture Road.

5. BUS DEPOT SITE

The bus depot site is located immediately to the west of Cowpasture Road and immediately to the south of the future road connecting the proposed bridge and Cowpasture road to the roundabout at the intersection of proposed Road One and Two. It is noted that the bridge and connecting road are required as part of the VPA between HAPL and LCC and the precise location of the intersection of the road with Cowpasture Road is subject to detailed design development.

Currently the "Bus Depot" site has an operative development Consent for the creation of the bus depot with the proposal understood to comprise multiple tilt up industrial type units. A condition of this Consent is that the floor levels of the units are to be above the 1:100 year ARI flood level. These units are currently under construction

The results of the URS study indicate that there is a small increase in flooding levels on the northern portion of the site up to a maximum of approximately 60mm. Detailed survey of the structures under construction indicate that the floor level of the northern structure will be significantly above the 1:100 ARI event with the marginal increase in flooding level. It is noted that the 60mm increase would be considered to be within the limit of model accuracy given the finite difference discretisation implemented in the TUFLOW model.

The TUFLOW model results for southern area of the site where the other tilt up structures are currently being constructed does not indicate any increase in flooding level from the baseline conditions to after the development of the former Hoxton Park Airport.

Whilst there is a marginal numerical increase in flooding levels to the northern portion of the bus depot site, it must be noted that the "developed" scenario was based on very preliminary information regarding Basin 6 and its outlet. As can be seen by the flood impact figures from URS/Golders, the outlet to the Basin 6 area, known as Northern Basin the in URS report, indicates construction of the floodway locally increases depth and velocity in the main floodway. It is noted that the area of marginal increase in flood levels on the bus depot site are generally adjacent to the areas of increase in flood depth due to the assumed basin 6 configuration, hence the configuration of basin 6 is a significant factor locally within the floodplain adjacent to the bus depot site.

Given the sensitivity of the bus depot site flooding levels to the Basin 6 configurations, the final flood levels will be determined as part of the design development of both Basin 6 and the bridge and road crossing.

6. LOSS OF FLOOD STORAGE VOLUME

Section 6.2.5 of the URS report discusses the impacts of development of the flood duration and storage within the Hinchinbrook floodplain. Whilst there is filling proposed within the floodplain, there are also corresponding minor increases in the flood depth. As the depth increases are contained within the vicinity of the proposed fill and do not significantly extend to private land outside the existing floodplain, there has been no net effective loss in floodplain storage as a result of the development proposal. Expanding on this, the behaviour of the flooding within Hinchinbrook Creek could not be described as flood storage in its truest meaning. The flows are essentially dynamic and as such the storage is transient or more correctly dynamic storage. Reference to the shape and timing of the flood hydrographs presented in the URS report indicates that the time to peak remains essentially unchanged as a result of the development proposal, with a change in time to peak limited to less than 2 minutes within a critical 2 hour storm. Given the above, it is considered that there are no adverse outcomes due to the development proposal in relation to the floodplain storage.

7. FLOW ATTENUATION

The URS report identifies that the construction of basin 6 was not intended to receive storm flows from the subject site. The hydraulic modelling of the floodplain under both base line and developed conditions indicates an insignificant change in the timing of the flood peak as a result of development. Given that the former Hoxton Park Airport site sits at the bottom of a large catchment with a critical storm duration of two hours, it is considered counterproductive to delay the catchment response of the developed airport to allow the regional peak to "catch up". Accordingly, it is not proposed to provide onsite detention for the Woolworths development.

8. MODELLING OUTPUT

The issue of seemingly anomalous model outputs has been corrected with only wet cells in the model being reported. This corrects that perception that cells with no change between baseline and developed conditions were indicated on the report figures as having a potential 50mm increase as they fell within the range of ±50mm change within the GIS package used to interrogate the TUFLOW results.

We trust this letter and amended URS report as attached has addressed Council's concerns and is acceptable, thereby allowing you to sign off on the flooding component of the development proposal.

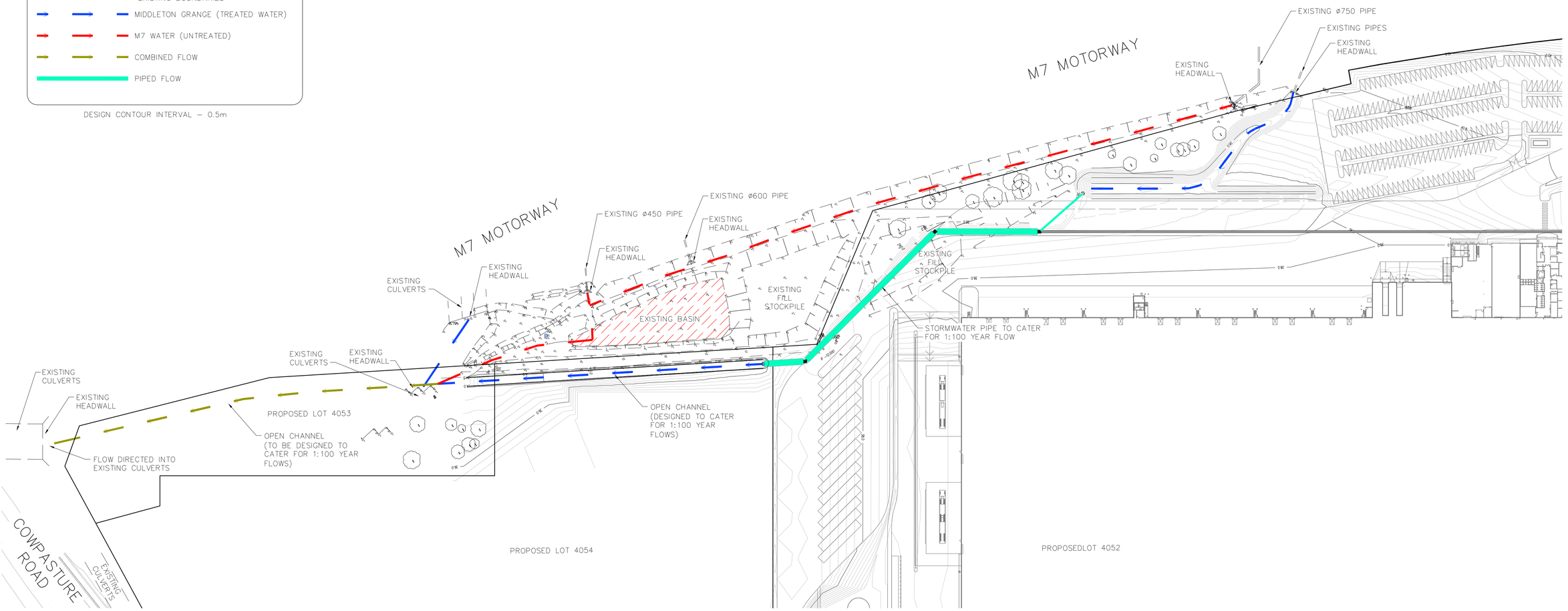
Yours faithfully,

Hugh Williams
Senior Civil Engineer
ADW JOHNSON

LEGEND

- DESIGN SURFACE CONTOURS (MAJOR)
- DESIGN SURFACE CONTOURS (MINOR)
- EXTENT OF BATTER
- PROPOSED KERB
- EXISTING BOUNDARIES
- MIDDLETON GRANGE (TREATED WATER)
- M7 WATER (UNTREATED)
- COMBINED FLOW
- PIPED FLOW

DESIGN CONTOUR INTERVAL – 0.5m



PLAN
SCALE 1:1000

REV.	DATE	AMENDMENT	DRAWN	CHECK	DESIGN	VERIFY
A	19/04/2010	Issued to Client for review	W.M.	G.D.	M.A.	G.D.

ALL DIMENSIONS ARE IN METRES. DO NOT SCALE

SCALES
0 10 20 30 40
A1 / A3
1:1000 / 1:2000

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CLIENT
mirvac

PROPERTY DESCRIPTION
LOT 400 D.P. 1141900
COW PASTURE ROAD
HOXTON PARK

PROJECT
HOXTON PARK AIRFIELD

PLAN TITLE
PROPOSED STORMWATER TREATMENT

SURVEYED	DATUM	PROJECT No.	DISCIPLINE	NUMBER	REV.
DJ/BJ	A.H.D.	150126 –	SK	– 069	A

100mm AT FULL SIZE

Plotted By: waynem Plot Date: 19/04/10 – 14:50 Cad File: S:\150126 – Hoxton Park\Drawings\EDC\SKETCH\C-SK-69[A].dwg