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Minutes from meeting dated 3rd June 2009 (2:30pm – 4:00pm)
MERITON ARNCLIFFE, BONAR ST

Attendees:
Marta Sadek (Rockdale City Council)
Tony Merrilees (Rockdale City Council)
Jamie Milner (Rockdale City Council)
Chris Randall (Hughes Trueman)
David Coleman (Hughes Trueman)

Apologies:
Chris Avis (Hughes Trueman)

Councils Floodplain and Stormwater Engineer (Tony Merreilees) has reviewed Hughes Trueman's DA report (March 2009) and issued comments accordingly (DA-2009/307).
In particular, the flood study was discussed in Section 8(b). These items were discussed in the meeting marked "Flood Study Items" as mentioned below.

Similarly comments have also been provided by Council for the external works (Section 6, DA-2009/307). These items were also discussed in the meeting and are marked "External Works Items" as mentioned below.

External Works Items Discussed
HT noted that council have called for a full width road design of Bonar St, however HT is only commissioned by Meriton to design half road works.
HT advised that Chris Avis will contact council to discuss further.

The following items were discussed and will be investigated / incorporated within the design:

- No formal pedestrian crossings permitted on Bonar Street. HT to investigate the provision of informal crossing locations with pram ramps and pedestrian refuges.
- HT to amend central median on Bonar street to allow for full unrestricted movements for all turns at the Bonar/future New Road West intersection.
- HT to investigate configuration of vehicular entrances to ensure entrances on Bonar and Hirst St. to ensure compliance with AS2890.1.
- HT to amend plans to include existing drainage pipe and pit at the bend in Bonar St.
- HT to offset the stormwater pipe out of the central median of Bonar St to allow for deep planting (i.e run below proposed kerb)
- HT to amend crossfall of Bonar St. at the northern connection to existing, from two way cross fall to one way cross fall (match existing)
- HT to amend kerb blisters to make similar to those incorporated in a similar local area - Lusty St (which had approx 2m radius)
- HT to investigate the provision of more parking on Loftus St.
- HT to modify the Southernmost proposed blister on Loftus St. to provide a transition into the exiting roundabout.
- HT to investigate the parking configuration on Bonar St. to maximise the number of parking spaces and if possible bring the parking closer to the proposed roundabout.
- HT to investigate the modification of the north-eastern kerb return at the proposed roundabout to better accommodate turning manoeuvres.
- HT to provide council with swept paths for both 8.8m service vehicle and 12.5m truck for review.

Flood Study Items Discussed

CR - Noted that the catchment area used within the RAFTS model was actually larger in sizes than the catchment which was previously agreed between HT and RCC (which solely considered contributing areas from the adjacent school)

TM - Indicated that RCC did not realize at the time that Loftus St was a sag point in the catchment

Item 8 (b) (iii)

TM – Indicated an additional catchment (Portion of residential land adjacent to Willington St between Alexandra St and Edward St) shall be included in the catchment area. This is attributed to the dishdrain across Edward St which assists in conveyance of flows to the intersection with Loftus St. Here TM believes that flows will make its way into Loftus and towards the site.

CR - Responded that HT agree the dishdrain will assist in conveying flows from the additional catchment (and note that this was incorporated within our modeling), however since the crest of catchment is situated at the intersection of Loftus St and Willington St we had based modeling on flows being directed in the opposite direction on Loftus St (i.e away form site).

CR - Agreed intersection (and kerb return) shall be assessed on site to determine a suitable flow split

TM - Suggested industrial area on opposite side of Loftus St to the development shall be included in the catchment area. Similarly an area of Edward St shall be directed to the Edward St lowpoint and onto Loftus.

CR - There is an existing 375dia pipe within Edward St which conveys flows to the Hirst St trunk system. Since these are on the high side of the Edward St, HT had assumed that they shall convey 100yr flows for the local residential houses to Hirst St trunk pipe system.

CR - We understand that the existing industrial buildings between Edward St and Loftus Lane will form part of a future development. HT has assumed that when these areas are re-developed, the site water discharge will be conveyed to the trunk pipe system in Hirst St.

TM - Indicated the trunk pipe system within Hirst St would be running full and should not be considered when assessing discharge from the industrial properties

CR - Disagreed that the trunk pipe system would be completely full at the time these properties would discharge flows. (i.e assuming 25 or 60min peak vs 5min discharge).

CR - Agreed that we can add both of these areas to the modeling contributing areas if required.

Item 8 (b) (iv)

TM - Indicated that our study has been based on pipe catchments; however the existing council pipe system is likely to have only a 2 to 5yr ARI capacity. Consequently in the 1 in 100yr event the overland flows need to be considered when pipes are full.

CR - Argued that the pipe sizes are known (450dia – 600dia within Loftus St) and consequently can be modelled reasonably accurately using mannings calculations (i.e completely independent of ARI events). We had assumed a 50% blockage factor on these pipes which is in accordance with general engineering guidelines and council standards.

CR - Noted that our model had only considered pipes within Loftus St at this stage and are independent of the pipes which are considered by RCC to be full within Hirst St.

TM - Agreed 50% blockage can be applied for the pipes in Loftus St.

TM - Agreed 50% blockage can be applied to pipes in Hirst St, if the entire catchment directed to Hirst St is considered.

TM - Indicated that Hirst St appear to flow around the corner into Loftus St and then to the swale. The catchment in Hirst St extends up to Duff St and may be up to 10Ha in size. The limitation to this catchment flows is likely to be the capacity of Hirst St itself to carry this flow to Loftus St as it is narrow and some water may spill onto the other side and be lost.

CR - Noted that one way crossfall is shown on the contours at the top end of Hirst St (in a southern direction). Prompted that flows from the above mentioned would also be lost on Broe Avenue Kelsey St similar to those situations raised by council at Loftus St and Edward St.

CR - Argued that these larger catchment areas (based on contours and trunk pipe system configuration) appear to have the majority of flows for the area directed both (a) along Hirst St; and (b) through residential areas towards the intersection of Bonar St and Hirst St. This is highlighted by the 2x750dia pipes along Hirst St and the 1200 dia pipe at the intersection, while Loftus only has a 450-600dia pipe.
Based on this information, it does not seem practical to assume flows during large events will turn at 90degrees from the direction of flow along Hirst St and enter Loftus St. In particular, if the flow depth is relatively high.

TM - Disagreed and indicated that the roundabout will play a big part in directing flows.
(We note that this roundabout is a mountable roundabout and subsequently is not very high)

CR - We agree that a portion of flows will likely be directed into Loftus St, however this would need to be verified by calculations

TM - Prompted that this flow split would have more than 50% of flow directed into Loftus

CR - Disagreed that it would be this much.

CR and TM – Agreed that calculations would need to be undertaken to determine full extent and solve disagreements over flow volumes. (it is noted that this is in additional to the scope of works previously undertaken by HT).

Item 8 (b) (ii)

TM - Made comment that a flowpath needs to be provided within the site to collect water from the sag point to the main swale flowpath.

CR - Advised that the flood study has proposed a swale / flowpath from the sag to the main swale to achieve this. (Refer figure 1 and Section 4.1). Here "Channel 1" is between the sag at node "Swale 1", while the start of the main channel is at node "Swale 2".

TM - Noted that section of swale shown on design plan does not appear to extend all the way to the existing sag point.

CR - HT to confirm and coordinate with Meriton over possible shift of entry door. Similarly show flow can enter swale from sag sufficiently. HT to confirm position of proposed sag and possible opening of island blister.

TM - Noted that council have a variable freeboard to TWL. That is, between 0.2m and 0.5m equal to the depth of flow.

CR - HT to show on long section and confirm floor levels satisfy.

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Minutes from meeting dated 30th July 2009 (10:30am – 12:00pm)
MERITON ARNCLIFFE, BONAR ST

Attendees:
Tony Merrilees (Rockdale City Council)
Chris Randall (Hughes Trueman)
David Coleman (Hughes Trueman)
Benjamin Black (Meriton Apartments)
Geoff Hopkins (Meriton Apartments)

Apologies:
Chris Avis (Hughes Trueman)

History:

- Councils Floodplain and Stormwater Engineer (Tony Merreilees) reviewed Hughes Trueman's DA report (March 2009) and issued comments accordingly (DA-2009/307). In particular, the flood study was discussed in Section 8(b)..
- Items were then discussed within a meeting between HT and RCC on the 3rd June 2009
- HT has undertaken further investigations to address all items previously raised. The modeling is consequently presented in this meeting.

We understand the following items were discussed and agreed.

Loftus Sag / Proposed Swale Items Discussed

- CR presented both the revised catchment plan and roundabout contours which were used to model 100yr surface flows to Loftus St. Here CR explained the methodology used to determine the design flowrate at Loftus St through the development of an "unsteady" DRAINS model. Components of modeling discussed included:
  - Catchments based on council records and contours;
  - Pipes modeled at similar grades to surface profile;
  - Dummy pit and special inlet pit parameters used to represent upstream pipe system and restrict to 50% capacity;
  - Cross sections and levels applied at roundabout to determine flow splits using unsteady modeling;
  - Revised results of 3.16m^3/s at Loftus Sag (refer to comments below)
  - Results of TWL and minimum floor levels along the swale.
  - New swale configuration lined with retaining walls.
- CR mentioned that modeling was based on methodology discussed in previous meeting and items mentioned in DA-2009/307. (We note that this methodology was forwarded to TM who advised they were unable to comment).
- CR also presented a proposed relocation of the existing sag in Loftus St to a more suitable location in front of the proposed swale. Similarly levels through the verge shall be lowered to allow surface flows to breach kerb and enter the swale efficiently. Relocation of sag would require some reconstruction of kerb to suit and localized pavement reconstruction.
- TM stated that methodology and modeling seems acceptable. However would like HT to check the following:
  - Impact which sag in Edward St may have on flows along Hirst St (That is, surface flows which may enter Edward from Hirst St, pond and then continue along Hirst St or flow through the Edward St properties to Loftus St and add to the flow in the swale)
  - Indicated that the only concern is the entry to swale. TM would like HT and Meriton to check building entry adjacent to the swale opening and ensure flows are directed to the swale and not into the building and adequate freeboard or other protection is provided to the building.
- GH suggested the introduction of a flood wall outside the corner of the building to direct water to the swale and locally protect the building (i.e continuation of swale wall). This could

be made into an aesthetic feature while allowing internal floor levels to be independent of freeboard guidelines. Steps or similar would need to be provided up then down to isolate entry in this location.

- TM indicated that this approach would be acceptable to RCC and that the floor level could be locally lower than the level set by the variable freeboard. However HT would need to provide drainage behind the wall to suit.
- CR and TM agreed that sump pits could be provided and connected to the swale at a suitable point along the length (where surcharge would not occur from flows in swale).
- BB suggested relocating entry away from the swale.
- TM indicated that this would also be acceptable and is preferable.
- BB identified that there are trees lining the boundary which are being retained and is concerned that retaining wall may impede root systems. BB will provide more accurate plans to HT on tree locations. Agreed by HT, RCC and Meriton that swale could be located closer to the building. Similarly batter could be provided on fence side.
  HT and Meriton to investigate, with HT to confirm capacity in swale is maintained.
- TM advised that pipe system extending from the end of the swale to the future development on the opposite side of Bonar St shall be 100yr capacity with no blockage factors.
- TM also indicated that a grid shall be provided over the headwall entry to prevent children entering piped system.

Hirst St / Bonar St Intersection flooding Items Discussed

- DC explained that the existing Hirst St road cross section profile is not in accordance with RCC standards. Here crossfall on the verge varies up to approximately 10% while areas of road pavement also vary up to approximately 5-6% crossfall.
  As a consequence, when we design the new road profile to be in accordance with council standards the road profile has more stringent guidelines (i.e 3% road crossfall and 2.5% verge crossfall).
  The result is that capacity on the roadway is significantly reduced which means that existing flood levels cannot be matched in the proposed design scenario.
- DC prompted to TM what variations to council guidelines would be deemed acceptable by RCC in order to model the roundabout without increasing flood levels from existing.
- TM acknowledged the restrictions which RCC guidelines are having on the design and indicated that the intent of RCC is to improve the situation from existing. Consequently council will accept the following items incorporated in the design:
  - Apply council standard crossfalls as much as we can along Hirst St (i.e close to Loftus St RAB);
  - When design approaches the new RAB with Bonar St, existing levels at either (a) the kerb on the opposite side of Hirst St; or (b) centerline of Hirst St, can be matched as part of the design.
  - Similarly when design approaches the RAB with Bonar St, design crossfalls on the road pavement and the verge on Meriton's side of Hirst St can be in excess of council standards with a maximum crossfall to match those in existing.
- TM and DC discussed the height and location of the proposed crest in Bonar St.
  TM indicated that the freeboard to crest shall be in accordance with council's variable freeboard guidelines.
  HT to investigate:
  - Shift in sag to right
  - Possible lower of sag
- DC suggested that the road width become widened on the Hirst St approach to the new Bonar RAB. That is, continue kerb alignment through to match with Bonar St kerbs. Large sized pavement markers can then be used instead to delineate the island / traffic movements. TM agreed to this for the southern side of Hirst, however the northern side would need further assessment due to loss of landscaping.
- TM indicated condition which states that 0.02m increase shall not be exceeded will still apply.

Other items

- TM indicated that the proposed islands look funny and indicated HT should change back to a 1.5m radius.