

Our Reference: SY10 0450

8<sup>th</sup> February 2012

The Shore School  
c/- WSP Environmental  
Level 1, 41 McLaren Street,  
NORTH SYDNEY NSW 2060

Attention: Dennis Zines

Dear Dennis,

**Re: Graythwaite Sydney Church of England Grammar School  
Response to North Sydney Council Comments of December 2011**

We are pleased to respond to North Sydney Council's comments as presented in:

- i) Council's letter to Department of Planning & Infrastructure (DoPI) dated 12<sup>th</sup> December 2011, and
- ii) Council's internal report titled "Report of George Youhanna, Executive Planner" dated 5<sup>th</sup> December 2011 (Council Meeting Item PDS 23)

Coupled with the above reference documents we also base our response on the:

- iii) Stormwater management plan, No. SY100450-C1.02 - Rev. H, and
- iv) Addendum 1 to our original report, dated 4<sup>th</sup> October 2011, and the
- v) Original report of 6<sup>th</sup> October 2010 (as updated on 26<sup>th</sup> November 2010) titled "Integrated Water Management Plan..... To The Concept Application (Stage 1, 2, & 3)".

Our responses below incorporate, in part, the previous report advice presented in relation to the stormwater management matters given that the principles and premises upon which the stormwater strategy is founded remain valid.

**General**

It is evident that in their letter to the DoPI (item i. above) Council resolved to object to the Part 3A Application and base their objection on elements of Council's internal report (item ii. above).

It is further evident that in Council's internal report several particular issues are raised by Council's Conservation Planner with regard to stormwater management and the application of water sensitive urban design principles.

In preface to our specific responses below we note that Council, in the pursuit of an apparent primary focus upon ecological outcomes, appears to have disregarded a fully considered and balanced assessment of the proposal in which, for example:

- a) the competing objectives of protection/preservation of the heritage value of the recognised historic buildings from continued water damage Vs. the desire to maintain ground and surface water conditions is achieved, and
- b) the competing objectives of protecting the heritage value and fabric of the existing historic buildings Vs. the desire to incorporate retrofitted contemporary water harvesting mechanisms to roofs and water storage reservoirs is achieved, and
- c) the competing objectives of providing a safe (active & passive) recreation area for school students Vs. the desire to retain identified waterlogged areas of the site is achieved
- d) the competing objectives of rehabilitating the currently neglected landscape to restore the heritage value Vs. the desire to convert the landscape into an artificial wetland landscape contrary to the known history of the property

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The above examples, while not exhaustive, clearly indicate that Council appear to place undue priority on the site being developed predominantly as a wetland conservation zone through retention of existing ground and surface water regimes and development of new wetland habitat, irrespective of the other prevalent considerations related to the purpose and zoning of the site and the historic/heritage value of the existing buildings.

With regard to the proposed stormwater management system matters, the issues raised by Council particularly relate to the perceived impacts of the proposal upon the existing surface and ground water regimes surrounding Graythwaite House, several existing ephemeral springs, and existing surface and ground water flows downstream of the site.

These issues however are also of paramount importance to the success of the development of the site given that they relate directly to the protection and sustainability of the recognised historic buildings, and the safety, amenity, and use of the site for educational purposes.

Together with this Council appear to have overlooked the inherent duty of care that is due to the existing properties located downstream of the development site i.e. protection from surface and ground water ingress emanating from the site.

It should also be noted here that surface water and ground water discharging from the site, particularly in lower areas along the western boundary, is considered to present potential nuisance and hazard to persons, property, and structures of the neighbouring properties immediately downstream of the development site.

Also, in considering the current stormwater management plan it must be borne in mind that the overall stormwater catchment of the area has been substantially altered through considerable surrounding urban development and the clearing of the original site and planting of exotic species of flora within the site; therefore the site cannot reasonably constitute any form of remnant natural ecological system in terms of stormwater regimes.

Notwithstanding the above, the proposed stormwater management plan incorporates a portion of ground water replenishment through an artificial ground infiltration system fed by new building roof water runoff. Furthermore, the proposed stormwater management plan also incorporates shallow (i.e. <500mm depth) ground water drainage in the vicinity of identified springs, as a qualitative drainage strategy.

In particular, stages 2 and 3 of the proposed development incorporate collection, storage and reuse of all roof stormwater emanating from the proposed new building roofs. This 'clean' classification rainfall runoff is to be captured and stored within underground tanks adjacent to each of the new buildings for use in replenishing ground water, toilet flushing and general wash down water, and provision of irrigation water to the rehabilitated landscaped areas of the development.

In the current development proposal (items iii. and iv. above) we believe that we have satisfactorily addressed and incorporated the issues raised by North Sydney Council in a balanced and well considered strategy covering all issues and integrating water sensitive urban design principles within the constraints of the site and more importantly the protection of the existing heritage structures.

### Specific Matters

The following specific matters have been extracted from the comments of Council's Conservation Planner as presented in the "Report of George Youhanna, Executive Planner" (item ii) and are addressed individually below.

Item Ref.*	Council Comment (as paraphrased)	Response
1	<i>The documentation does not successfully retain the hydrology of the site</i>	Council has previously suggested and now reaffirmed its opinion that several identified ephemeral springs on the site should be retained and possibly adapted for creation of artificial ephemeral wetlands as part of the landscape plan for the site.
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This particular requirement of Council is clearly in conflict with, and contrary to, Council's landscape planning assessment which indicates that the proposal is generally reasonable.

It is our opinion that creation of artificial wetlands is neither technically viable nor sustainable due to the:

- ephemeral nature of the springs at the site
- unpredictable flow characteristics of these springs
- sloping topography of the site, particularly in the vicinity of the springs
- relatively small catchment area contributing to the springs
- changed character of the overall upstream catchment, being highly urbanised

Coupled with this, and subject to an ecological specialist's opinion, we believe that introduction of artificially introduced ecosystems at the site will naturally impart unnecessary and unacceptable impacts upon the existing balance of the existing ecosystem/s and their consequent sustainability.

The revised stormwater management plan therefore incorporates high level subsoil drainage of these springs and other waterlogged zones to a nominal maximum depth of 500mm.

This proposed 'shallow zone' sub-surface drainage concept will facilitate proposed use of the grounds for the school while minimising interception of the deeper ground water flows, thus maintaining the operation and amenity of the site as a safe active/passive school recreational area.

Furthermore, Council has indicated that the perceived loss of ground water flows caused by interception of the proposed new building structures cannot be supported due to the impact upon the pristine catchment conditions enjoyed over the past 150 years.

However, the massive extent of urban development within the general catchment area, in particular the area upstream of the site, has in our opinion unequivocally and permanently altered the catchment surface water flows (increased) and ground water flows (decreased) over the past two centuries of human development.

It is therefore in our opinion erroneous and unreasonable to consider the site as a pristine catchment in isolation of the overall catchment character and thus disregard the urbanised nature of the catchment, with the intrinsic expectation that the site should be maintained and possibly developed as wetland habitat.

In the absence of a water balance model and any detailed hydro/geological and geomorphic data, the expected rainfall infiltration rates envisaged are generally limited to the actual development site area since the majority of the remaining overall catchment area has been fully urbanised resulting in maximum impervious surfaces formed by building roofs, impervious pavements and the like.

Notwithstanding the above, and in response to concerns relating to reduced ground water flows along the western boundary of the site, the stormwater management plan in liaison with the project arborist now incorporates a strategic section of ground water infiltration in the proposed Stage 3 area of the project in order to minimise the perceived impact of reduced ground water flows to the existing tree line downstream of this location.

**2**      *The drainage solution is  
Page still a highly engineered  
22 solution*

This assertion by Council is erroneous and in our opinion misguided when a balanced approach to the competing objectives of the development are attentively considered in order to achieve a holistic outcome.

**3** *Retaining any significant natural landscape features including freshwater springs part of heritage management plan (HMP)*  
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Coupled with this a large extent of the site is retained as pervious surface (landscaped and grassed areas) therefore essentially retaining natural surface flows to mimic natural storm flow and to facilitate natural groundwater ingress.

Furthermore, the assertion by Council appears to overlook the unequivocal necessity to capture and convey roof stormwater runoff from larger storm events to maintain control of higher discharges from the site and so increase protection of downstream properties from surface and ground water ingress.

While it may be argued that the identified waterlogged areas constitute ephemeral natural springs it is erroneous to link this with heritage value as either a natural or archaeological heritage feature.

It is clear that the upstream catchment to the site has undergone significant change over the years of surrounding urban development and that this urban development would unequivocally have altered the natural state of the site.

This assertion is supported by our understanding that certain 'springs' or waterlogged areas within the site are located in zones of old tennis courts. This is, in our opinion, evidence that these springs are of recent origin being of post-tennis court vintage. Furthermore, it is apparent to us that these 'springs' may have been artificially created at the time the tennis courts and level areas were constructed by ostensibly cutting into the natural hillside.

Refer also to Item 1 above for more detail.

**4** *The proposed drainage systems will radically alter the subsoil moisture levels adjacent to Graythwaite House [Tom O'Neill Centre] and the Coach House*  
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We understand that the recognised historic buildings currently suffer from groundwater ingress into the building fabric and main basement and that the impact of this compromises the longer term structural integrity, safety, general condition and amenity of these existing buildings.

We therefore again reaffirm our recommendation to incorporate roof stormwater capture and transport away from these buildings and a groundwater intercept drain system (subsoil drain) to specific building curtilage areas as proposed in the stormwater management plan.

The concept stormwater management plan provides for the removal of existing building roof water and diversion of groundwater flows around the heritage buildings to facilitate and ensure the longer term function and protection of these historically valuable buildings.

The stormwater management protective measures proposed for the heritage buildings will, of necessity, be achieved in liaison with the conservation architect, landscape architect, and structural engineer in order to minimise detrimental impacts upon the building curtilage areas as a result of the current uncontrolled stormwater/groundwater ingress.

Reinstatement of the existing building curtilage areas as a heritage relic would be undertaken in a manner that protects and retains the elemental relic value and the general heritage value of these curtilage areas while achieving the more important objective of protecting the existing buildings for future posterity.

**5** *The stormwater design still does not exhibit best practice*  
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We contend strongly that the proposed stormwater management plan exhibits best practice principles particularly in the light of the primary objectives of protecting the existing historic structures from further water ingress damage, maintaining a safe and operational school grounds as proposed, and protecting downstream properties from nuisance and/or damage from ground and surface water emanating from the site.

		<p>With regard to Council's desire for the incorporation of contemporary water sensitive urban design principles to the existing heritage buildings, we again reaffirm that we do not recommend retrospective installation of stormwater retention systems to the existing historic buildings.</p> <p>Such retrofitted mechanisms will provide inherently marginal benefits when considered against the substantial additional impacts induced upon and the associated risks imparted to the heritage buildings and their respective curtilage areas.</p> <p>However the future east and west buildings conceptually incorporate contemporary water sensitive design principles and practice and these will of course remain subject to future detailed design and subsequent approvals.</p>
6 Page 22	<i>The stormwater from the western building is to use a stormwater tank</i>	<p>This requirement of Council is in error as the proposed stormwater management system incorporates a roof stormwater collection and recycling tank integral with both the proposed eastern and western buildings, as is depicted clearly on the submitted drawing no. SY100450-C1.02-H.</p> <p>The western building furthermore incorporates a portion of roof water collection and infiltration along the downstream face of the building to reintroduce groundwater that would ostensibly be cut off by the building structure.</p>
7 Page 23	<i>Areas identified as waterlogged should be resolved with a WSUD landscape treatment</i>	<p>The proposed stormwater strategy incorporates shallow sub-soil drainage in order to minimise the waterlogged surface areas and facilitate safe use of this area for school student active/passive recreation and to also facilitate safe maintenance of this area.</p> <p>Deeper (i.e. &gt;500mm) ground water movement is thus essentially unaffected at these locations.</p>
8 Page 23	<i>The stormwater engineer is to redesign the stormwater to utilise the stormwater from the western building in landscaped solutions</i>	<p>The proposed stormwater management system incorporates a roof stormwater collection and recycling tank integral with both the proposed eastern and western buildings, as is depicted clearly on the submitted drawing no. SY100450-C1.02-H.</p> <p>The western building furthermore incorporates a portion of roof water collection and infiltration along the downstream face of the building to reintroduce groundwater that would ostensibly be cut off by the building structure.</p>
9 Page 23	<i>The stormwater engineer is to redesign the stormwater to ensure very little or no net loss of water from the site</i>	<p>This expectation of Council appears to be unqualified in that the proposed stormwater management plan incorporates suitable collection and reuse of high frequency storm event flows from new buildings and also provides for controlled release of the greater storm events from these buildings and away from downstream properties.</p> <p>Coupled with this, it is clearly not technically feasible or reasonable to expect that the developed site would retain a zero nett increase in stormwater flow discharging from the site as this requirement would in our opinion be tantamount to sterilising the site from future development apart from ostensibly creating a wetland habitat.</p> <p>Refer also to Item 9 regarding proposed collection and reuse of roof stormwater runoff within the site from proposed buildings.</p>
10 Page 24	<i>The stormwater engineer is to redesign the stormwater to avoid draining of the waterlogged areas</i>	<p>Refer to response to Item 2 above</p>

## Conclusions

From the above considerations responding to the particular issues raised by Council, we remain of the opinion that the stormwater management plan as depicted on the attached drawing no. SY100450 - C1.02 - Rev. H addresses and satisfies the site constraints.

The proposed stormwater management plan presents a well-balanced and holistically considered design, particularly with regard to the competing constraints of heritage and hydrology that the site presents, and achieves a water sensitive urban design within that balance.

We believe that Council's comments, as outlined above, are not in keeping with the spirit or intent of the proposal as a protective and sustainable adaptive use of this recognised heritage property, and consequently impose onerous and unreasonable constraints on the future use and development of the land.

We therefore suggest that the Draft Conditions of Consent proffered by Council in their report be thoroughly reviewed and revised to incorporate the compelling objectives of protecting and sustaining the building and landscape heritage values of the property which we believe the current stormwater management proposal achieves in concert with the landscaping and architectural considerations, rather than Council erroneously placing priority upon creation of artificial wetland habitat as is currently the case.

Yours sincerely,

**ACOR Consultants Pty Ltd**



Ray Engelbrecht

Associate, Senior Civil Engineer