BROOKVALE PUBLIC SCHOOL
2-8 OLD PITTWATER ROAD, BROOKVALE

ALTERATIONS & ADDITIONS INCLUDING CONSTRUCTION OF A NEW SCHOOL HALL

DA 2019/0411 – NORTHERN BEACHES COUNCIL
SYDNEY NORTH PLANNING PANEL REF. PPSSNH-24
PANEL MEETING 25 SEPTEMBER 2019

1.0 SUMMARY

School Infrastructure NSW (SINSW) has referred the subject Crown DA to the Sydney North Planning Panel under the provisions of section 4.33(2) of the EP&A Act as Council has not determined the DA within 70 days of receipt. The DA was lodged on 18 April 2019.

Further, Council seeks the refusal of the DA on various grounds, principally on the basis of the proposed location of the hall, the preferred location of which requires the removal of 3 Queensland Brush Box trees. Council also cites stormwater and flood management grounds, and urban design for further reasons for refusal of the DA.

Accordingly, it is requested that the Panel resolve the relevant matters and determine the DA at the forthcoming Panel meeting.

To assist, this document addresses the various Council matters addressed in its correspondence, principally its Council Assessment Report, as well as the draft Conditions of Consent in the event the DA is approved.

This document is supported by other material provided by the project team, as attached and as addressed throughout this document.

2.0 COUNCIL ASSESSMENT REPORT

2.1 Background

It is noted Council's internal referral process in relation to this DA has resulted in positive responses, generally subject to the imposition of recommended conditions of consent, from the following:

- Building Assessment – Fire and Disability Upgrades
- Environmental Health
- Bushland and Biodiversity
- Parks, Reserves, Beaches and Foreshore
- Heritage Officer
- Traffic Engineer

Council's assessment report notes that the only non-compliance with any planning controls or requirements arises in relation to clause 6.3 of Warringah LEP 2011 – Flood Planning. This is addressed below and as noted is also now resolved with additional documentation and SINSW's acceptance of Council's draft Condition 4 of the proposed conditions of consent.

No other provisions of the LEP are affected, and no non-compliance with principal planning controls arises.

Council has indicated that a raft of DCP-related provisions have not been satisfied. As stated in clause 35(9) of *State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017* (the Education SEPP), DCPs have no effect in relation to this DA.

Further Council has identified numerous areas of potential non-compliance with the Child Care Planning Guidelines which call-up the *Education Care Services National Regulation*. These provisions do not apply to the development as the whilst the OOSH (out of school hours care) is being relocated into the hall, it is not defined as a *centre-based child care facility* under the Education SEPP, rather a

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school-based child care catering only for school-age children. The Child Care Planning Guideline only applies to centre-based child care facilities and not school-based child care facilities, such as the proposed transfer of the existing OOSH. Accordingly, no non-compliance occurs with the Guideline and *Education Care Services National Regulation*.

Overall, the main Council objections to the DA arise from the Landscape Officer (tree removal due to the location of the hall); Development Engineering (Stormwater Assets and Overland Flow); and Urban Design (consistency with Schedule 4 of Education SEPP).

Based on the resolution of the stormwater asset and flood impact matters, the objection is effectively centred on the loss of the 3 Queensland Brush Box trees and the location and appearance of the development within the school's grounds.

2.2 Public Submissions and Council's review and commentary

Four public submissions were received by Council, including some on multiple occasions raising the same or similar issues. The key issues raised in those submissions are:

- The hall is inappropriately sited towards residential neighbours and should be located in other areas of the school.
- The proposed height of the hall, bulk and scale, and lack of setbacks from the boundary.
- Loss of privacy and visual amenity.
- Loss of mature trees and vegetation presently acting to screen the school and act as a buffer to residential neighbours.

Note, one submission in support of the DA (and its preferred location) was also received from the President of the school's P&C and includes commentary on suggested (inferior) siting options raised in objections received by Council.

The issues of bulk, scale, siting, and tree loss are all addressed further below.

Note the building's height is compliant with the LEP's 8.5m height control. It also steps down in height towards the adjacent eastern residential site boundary to a single level of 4.1m for its full length along this boundary. This low-rise element accommodates the various storage rooms required for the hall. Windows are only included for the recessed main hall area at upper levels for light and ventilation. No overlooking and privacy impacts would arise given the height and setback of these windows.

The scale of the building is similar to that of other buildings within the school including at its perimeter and residential edges as well as 2- to 3-storey and other multi-level buildings in the immediate vicinity of the school. The building could not be considered to be out of context with the school or the locality or its intended use for school purposes.

2.3 Landscaping Commentary and siting and location of the proposed hall

Tree loss

Council's principal concern with this DA is tree loss.

Council's referral of the three affected Queensland Brush Box trees as significant and valuable appears overstated in its context. Whilst the trees are mature and provide canopy, they do not act to screen the school for adjacent development. Indeed, views into the school occur from residential development in this location. The trees do not form part of the site's heritage listing (which is only the original school building dating from 1900-1925) and are not included in the heritage inventory for the site. They are not significant from a heritage or landscape heritage perspective.

Neither are they endemic or remnant trees. Council's report also indicates that trees have historically formed a perimeter edge condition at the school (siting 1943 aerial photography). It is agreed that perimeter tree plantings are a common feature of the school site, particularly historically when ample

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space existed to delineate the site's boundaries with plantings. The removal of three mature trees will not detrimentally alter this characteristic, noting also that the site has well over 70 trees, many also clustered away from its boundaries.

The project arborist has identified these 3 Queensland Brush Box trees as low to moderate significance and available for removal due to the impact upon them by the siting of the development. Replacement planting at a rate of 1:1 is proposed with 3 new 200 litre Queensland Brush Box trees to another nearby location within the school.

Siting / Location of the hall

Council's preferred location of the building is Option 7 from the original Options Analysis as submitted with the DA. Option 7 would site the building centrally within the school in an area bridging the upper or high side of the school and the low side of the school. Placing the building in this location would require the demolition of existing low-rise student toilet blocks and integration of new toilet facilities into the hall, resulting in an unnecessarily larger and more expensive development, and an additional estimated $1 million cost to the development.

Council's preference for this location is principally founded on minimising tree loss and impacts upon neighbours, however this is without regard for, or consideration of, the school's functionality, preferences of the teaching staff and school community, and the likely consequential spatial impacts of the development upon the school's ongoing and future use.

Option 7 has been rejected by the school as being the worst performing option as it would:

- Segregate the school completely, further reinforcing and dividing the school into two halves;
- Reduce playground visibility and surveillance within the school and thereby diminish the available CPTED qualities of the school's layout;
- Impact upon the play spaces in a manner likely to be more detrimental than other better options; and
- Result in a significantly bulkier building, much more dominant on the site due to the grade change in this part of the school, or otherwise a split-level building which is not a reasonable functional outcome, or significant engineering and earthworks to set the building lower and to taper the environs into the floor levels which would add unnecessary cost, construction time, and safety risk and management due to the central location in the school.

Option 7 would also still result in tree loss, albeit one endemic tree – also an original boundary tree.

A detailed review of the various options including Option 7 and the preferred option are included in the attached SINSW Report on the siting of the hall.

As discussed immediately below, stormwater matters related to siting of the development are now resolved and do not affect the development in a manner previously indicated by Council.

2.4 Stormwater

As noted below these matters are now addressed and/or able to be resolved prior to commencement of construction as required by Council's draft conditions of consent.

Council's stormwater assets

Council has previously advised that its records indicate that the land in the location of the proposed development may be/is burdened by a Council stormwater pipeline. Council has requested that the pipeline needs to be accurately located, and its depth and dimensions confirmed in plan form.

SINSW engaged an engineer, surveyor, and services locator at considerable expense to investigate the location, depth and condition of Council's stormwater infrastructure. A report has now been completed and is provided as part of this package of documentation.

In summary, large stormwater pipes to the eastern side of the school are a located further from the proposed development than what is presently documented on Council's stormwater maps. These do

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not affect the DA. There is however a smaller 375mm diameter pipe that crosses the site to the north of the building, but not directly under the building. Its easement conflicts with a narrow corner of the building adjacent to the Performance Storeroom. To avoid this conflict the Performance Storeroom and its adjacent PE Storeroom can be reduced in size by 1.8m2 each to avoid any conflict and without consequential impacts upon other trees or spaces within or outside of the building. To have relocate the building marginally to the west would have resulted in a further tree requiring removal.

Overland Flow / clause 6.3 of Warringah LEP 2011

Council has indicated that the north-eastern boundary of the property is shown on Council's best available flood mapping as affected by overland flow flooding and accordingly clause 6.3 of Warringah LEP 2011 needs to be satisfied. With the absence of a Flood Impact Assessment, Council has indicated the DA must be refused.

Notwithstanding, Council is seeking to impose Condition 4 upon the DA which is accepted by SINSW.

Condition 4 seeks a Flood Impact Assessment which addresses clause 6.3 and demonstrates no adverse impact to adjoining properties in relation to increase flood level, velocities and extents during the flood event will occur.

The assessment will need to demonstrate that the development:

- Will have floor levels set at or above the Flood Planning Level;
- Results in no net loss of flood storage in a 1% AEP event;
- Has no adverse impact on the flood regime for neighbouring properties in a 1% AEP and Probable Maximum Flood event; and
- Is designed to withstand the expected structural forces including debris loading in a 1% AEP event.

Compliance is to be submitted to the Principal Certifying Authority prior to any commencement of work.

A Flood Impact Assessment and Checklist against Council's Stormwater Report requirements consistent with the above has been completed and is also attached for reference.

The attached flood impact assessment concludes as follows:

- The flood water from a 1%AEP event will not enter the school site and there is only partial interception of the existing flow path of this event;
- A 1%AEP event would have a level of RL 24.40 AHD. The finished floor level of the proposed hall is RL 25.00 AHD, some 600mm above the flood level which is above any required 500mm freeboard, in the event flood water were to enter the school site at this location;
- The development does not significantly affect flood storage to the level that there would be any net loss of flood storage;
- The existing flow path of flood water will remain the same and therefore does not impact upon neighbouring properties; and
- As the structure consists of a concrete floor (concrete footing beam and core-filled block work wall, and concrete slab, the flood debris loading will not have any adverse effect upon the building as it is protected by its concrete sub-structure.

The condition will be satisfied prior to construction commencing.

2.5 Urban Design

Education SEPP -Schedule 4 – Design Principles

SARM (the project architect) prepared a Design Certification as part of the originally submitted DA package. SARM has now further addressed Council's comments in the Assessment Report. SARM's response is attached for review. Many matters are subjective in nature. The design response is one

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which foremost addresses the functional needs of the school but also considers and addresses the building's scale, siting, and relationship to neighbouring properties.

Child Care Planning Guideline

As noted earlier, Council has identified numerous areas of potential non-compliance with the Child Care Planning Guidelines which call-up the *Education Care Services National Regulation*. These provisions do not apply to the development as the whilst the OOSH (out of school hours care) is being relocated into the hall, it is not defined as a centre-based child care facility under the Education SEPP, rather a school-based child care catering only for school-age children. The Child Care Planning Guideline only applies to centre-based child care facilities and not school-based child care facilities, such as the proposed transfer of the existing OOSH.

2.6 The Public Interest / Reasons for Refusal / Conclusion

Council has concluded that the DA must be refused as it is inconsistent with the following, noting DCPs do not apply to the development as a result of clause 35(9) of the Education SEPP and cannot be used as reason for refusal:

- Inconsistent with the zone objectives of the LEP;
- Inconsistent with the aims of the LEP; and
- Inconsistent with the objectives of the relevant EPIs.

It is however deemed by Council to be consistent with the objects of the EP&A Act.

Of Council's 10 reasons for refusal, only Reasons 1, 2 and 10 are applicable. Reasons 3-9 all relate to Warringah DCP which is not a relevant consideration under this DA.

Each of the reasons for refusal are addressed separately below.

Aims of the LEP

The aims of Warringah LEP 2011 are:

(a) to create a land use framework for controlling development in Warringah that allows detailed provisions to be made in any development control plan made by the Council,
(b) to recognise the role of Dee Why and Brookvale as the major centres and employment areas for the sub-region,
(c) to maintain and enhance the existing amenity and quality of life of the local community by providing for a balance of development that caters for the housing, employment, entertainment, cultural, welfare and recreational needs of residents and visitors,
(d) in relation to residential development, to:
(i) protect and enhance the residential use and amenity of existing residential environments, and
(ii) promote development that is compatible with neighbouring development in terms of bulk, scale and appearance, and
(iii) increase the availability and variety of dwellings to enable population growth without having adverse effects on the character and amenity of Warringah,
(e) in relation to non-residential development, to:
(i) ensure that non-residential development does not have an adverse effect on the amenity of residential properties and public places, and
(ii) maintain a diversity of employment, services, cultural and recreational facilities,
(f) in relation to environmental quality, to:
(i) achieve development outcomes of quality urban design, and
(ii) encourage development that demonstrates efficient and sustainable use of energy and resources, and
(iii) achieve land use relationships that promote the efficient use of infrastructure, and
(iv) ensure that development does not have an adverse effect on streetscapes and vistas, public places, areas visible from navigable waters or the natural environment, and
(v) protect, conserve and manage biodiversity and the natural environment, and

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(vi) manage environmental constraints to development including acid sulfate soils, land slip risk, flood and tidal inundation, coastal erosion and biodiversity,

(g) in relation to environmental heritage, to recognise, protect and conserve items and areas of natural, indigenous and built heritage that contribute to the environmental and cultural heritage of Warringah,

(h) in relation to community well-being, to:

(i) ensure good management of public assets and promote opportunities for social, cultural and community activities, and

(ii) ensure that the social and economic effects of development are appropriate.

Where relevant, and in recognition of the development objective, the nature of the school site, its environmental and built context, on balance general satisfaction with the relevant aims of the plan has been achieved.

Zone objectives of the LEP

The site sits in the R2 – Low Density Residential zone under Warringah LEP 2011.

The objectives of the zone are:

- *To provide for the housing needs of the community within a low density residential environment.*
- *To enable other land uses that provide facilities or services to meet the day to day needs of residents.*
- *To ensure that low density residential environments are characterised by landscaped settings that are in harmony with the natural environment of Warringah.*

The development, as far as relevant, is not contrary to these objectives, noting they are fundamentally geared towards residential development and not reflective of necessary school infrastructure projects. In the context of Brookvale, the school's environs, and the retained vegetated nature of the school site itself arising from the development, including its offset replacement planting, the development would generally satisfy the third zone objective.

Objectives of the relevant EPIs

Aside from Warringah LEP 2011, Council has only identified the following EPIs as being of relevance to the development.

- SEPP 55 – Remediation of Land
- SEPP (Infrastructure) 2007
- The Education SEPP

No issues were raised in the assessment with respect to SEPP 55 and SEPP (Infrastructure), and the only matters arising under the Education SEPP are subjective design-related matters tied to Design Principles under Schedule 4 of this SEPP. Note again, the child-care related assumed non-compliances raised are not relevant to the relocation of the existing school-based child care OOSH.

The development is entirely consistent with the aims of the Education SEPP, as far as they may apply to this development.

Reason 1 - Pursuant to Section 4.15(1)(a)(i) of the Environmental Planning and Assessment Act 1979 the proposed development is inconsistent with the provisions of the Environmental Planning and Assessment Act 1979

It is presumed Council means the Objects of the Act rather than any or all provisions of the Act. The Objects of the Act are:

(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources,

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(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment,
(c) to promote the orderly and economic use and development of land,
(d) to promote the delivery and maintenance of affordable housing,
(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats,
(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage),
(g) to promote good design and amenity of the built environment,
(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants,
(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State,
(j) to provide increased opportunity for community participation in environmental planning and assessment.

It cannot be reasonably concluded that the development in its context does not meet the relevant objects of the Act. It certainly promotes the orderly and economic use of the school site, promotes the social welfare of the community through enhanced school and co-shared community facilities. It does not affect heritage or biodiversity values, and it seeks to promote good design and amenity. Through the exploration of various siting options on the site, the balanced siting and design outcomes has broadly met both school and community expectations for new school development in an existing constrained urban environment.

Reason 2 - Pursuant to Section 4.15(1)(a)(i) of the Environmental Planning and Assessment Act 1979 the proposed development is inconsistent with the provisions of Clause 6.3 Flood Planning of the Warringah Local Environmental Plan 2011.
As set out above, by virtue of inclusion of Condition 4, Council recognises that the development's flooding impacts, once documented can be addressed through design development and an engineered response, as far as may be necessary as resulting from that impact assessment.

The attached flood impact assessment concludes as follows:

- The flood water from a 1%AEP event will not enter the school site and there is only partial interception of the existing flow path of this event;
- A 1%AEP event would have a level of RL 24.40 AHD. The finished floor level of the proposed hall is RL 25.00 AHD, some 600mm above the flood level which is above any required 500mm freeboard, in the event flood water were to enter the school site at this location;
- The development does not significantly affect flood storage to the level that there would be any net loss of flood storage;
- The existing flow path of flood water will remain the same and therefore does not impact upon neighbouring properties; and
- As the structure consists of a concrete floor (concrete footing beam and core-filled block work wall, and concrete slab, the flood debris loading will not have any adverse effect upon the building as it is protected by its concrete sub-structure.

The development satisfies Council's and the LEP's requirements in this regard.

Reason 10 - Pursuant to Section 4.15(1)(e) of the Environmental Planning and Assessment Act 1979, the proposed development is not in the public interest.
The development is in the public interest as:

- it updates and replaces antiquated, undersized and obsolete school infrastructure;
- enhances and protects Brookvale Public School's other existing facilities, including those available to the wider community as part of the "Sharing our Schools" program; and

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- provides the most cost-effective, best-designed and located option available to the school, with the least impact upon existing school facilities, the effective operation of the school, the school community, and adjacent land uses.

3.0 DRAFTED CONDITIONS OF CONSENT

In summary, SINSW is generally satisfied with the final draft conditions. There are however two conditions that still require very minor revision, prior to determination of the DA.

This condition is adjusted and marked with the requested changes and reasons. Deleted text is shown as ~~struckthrough~~ and new text as **bolded**.

Cond No	Current / Proposed Action or Wording	Reason
3(a)	(a) Unless authorised by Council: Building construction and delivery of material hours are restricted to: • 7.00 am to 5.00 pm inclusive Monday to Friday, • 8.00 am to 1.00 pm inclusive on Saturday, • No work on Sundays and Public Holidays. Demolition and excavation works are restricted to: 8.00 am to 5.00 pm **inclusive** Monday to Friday ~~only~~**, and** **8.00 am to 1.00 pm inclusive on Saturday.** …	This is proposed to enhance the demolition, tree removal and early works phase of the construction program (and therefore overall construction program). This minor change will enable these early works outside of school hours (ie Saturdays) consistent with the time constraint of the overall condition. This will also enhance site safety across all phases of works, rather than just construction works.
15	The acoustic assessment by Day Design Pty Ltd Report 6736-1.1R 11 April 2019 recommendations for management of noise being incorporated in a Management Plan for the use of the School Hall as well as signage on or adjacent to the large glass folding door~~s~~ **to the south-west** and louvres ~~both~~ requiring closure from 6pm to 10pm. **The large glass folding door facing south-east may remain open for access overflow after 6pm, if required.** In any rental or usage by others of the School Hall noise management requirements are to form part of the agreement.	This change is proposed in order for the full noise control recommendation of the Day Design Report to be recognised and applied in the required Management Plan. The south-east door enables additional capacity to be accommodated from the hall to under the COLA if need be. This area is generally screened from the nearest residential neighbours by the hall's single storey ancillary office, kitchenette and storage accommodation and is clustered towards the existing library building. Noise impacts will generally be contained within this area, noting this occurrence would be the exception rather than the norm and only occur during isolated larger events.

Oliver Klein
Director
_planning on behalf of SINSW

19 September 2019

Attached:

- SINSW Statement of Options considered (September 2019)
- PipeSure Utility Locate Report and CCTV Pipe Report (August & September 2019)
- Knox Advanced Engineering Flood risk assessment report and Council Checklist (18 September 2019)
- SARM Design Certification – addressing Schedule 4 Design Principles (11 April 2019 and as updated on 17 September 2019 to address Council's assessment)
- Updated montage and proposed materials

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Department of Education

Report on the site selection of a New School Hall at Brookvale Public School

September 2019

This report is designed to be printed double-sided. When printed double-sided, the explanatory notes will appear opposite the drawings.

NSW Department of Education

Report on the Siting of a New School Hall at Brookvale Public School

Purpose

The Department has submitted a Development Application (DA2019/0411) for a new school hall at Brookvale Public School. The purpose of this report is to explain in plain English the reasons why the preferred location was chosen for the new hall, and at the same time to explain why the other siting options were rejected.

Several options were examined, and all except one were rejected as unsuitable or unworkable by the project team. A report summarising seven options and the reasons for and against, was submitted as part of the DA documents. It is thought that more detail would be useful, in particular more detail as to why the non-preferred options were rejected by the project team, the school staff, and the school community (P&C).

Introduction

In 2017 the Department resolved to provide the following works at Brookvale Public School: to provide a new school hall, to demolish the old redundant toilet block to regain the space, to convert the existing school hall into two classrooms, and to remove the existing two demountables from the site. The removal of demountables is always subject to an updated needs assessment at the time of removal, therefore if the school enrolment grows due to local population growth, the demountables might not actually leave.

The project as planned does not increase the teaching capacity of the school, as it is intended to remove the demountables (subject to updated needs).

Commencement of Planning

The management of the project was delegated to the Northern Sydney Asset Management Unit at Hornsby.

The Asset Management Unit appointed SARM Architects to the project team as Head Design Consultant.

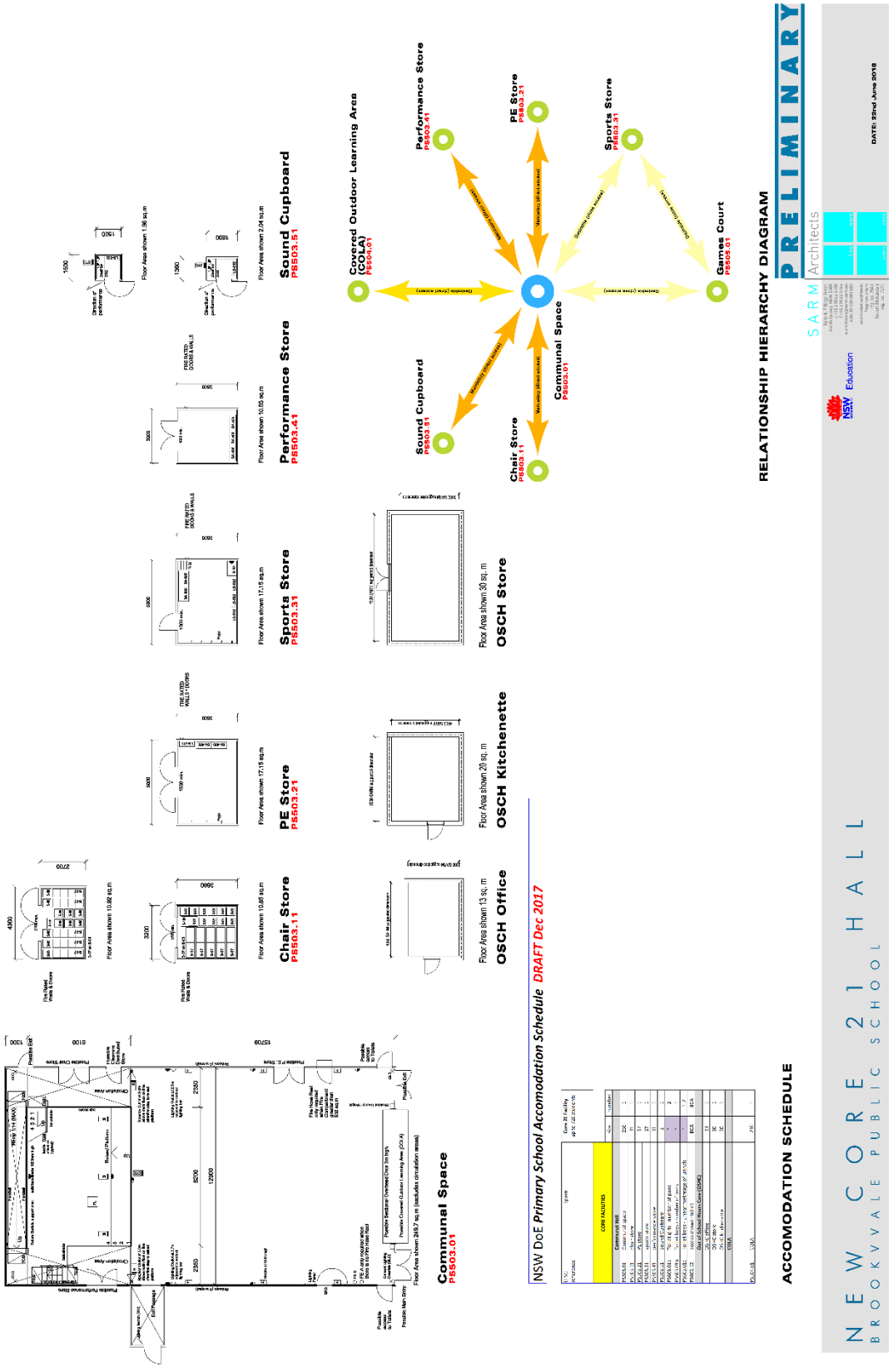
Sizing of the Hall

One of the first activities in the design process is to determine the size of the new hall and the broad list of inclusions. The Department has its own internal design guidelines (known as the Educational Facilities Standards and Guidelines or EFSG). These guidelines have been developed within the Department over many years and incorporate the feedback from educators and the lessons learned from many school development projects.

The EFSG gives us a list of rooms and room sizes, and a relationship matrix for rooms. A primary school hall consists of a large assembly room with a stage, an access ramp to the stage, and a set of ancillary rooms that facilitate the use of the hall. Halls also have a covered outdoor area adjacent which allow a crowd to spill out of the hall during a large assembly, for example when parents attend a school event.

So the EFSG gives us the rooms, sizes and relationships and from this we assemble the building shape and size.

This process results in a building of approximately 250m2 including a raised platform plus circulation spaces, plus the ancillary rooms.



Investigation of the Site

The next activity is to commission a land survey of the entire site. This gives us the surface levels and the positions of all existing buildings on the site.

The site has a change in levels of approx. 6 metres sloping down from West to East and from North to South.

There is an obstructed zone running down the centre, which contains the existing toilet block, which is to be retained, the sewer main and this area also has a sharp change in ground levels. It would be difficult and expensive to build in the obstructed area.

There is a heritage-listed building in the south-eastern corner of the school; the existence of the heritage listing which erroneously covers the whole of the school site determines that the new hall requires a Development Application. In fact, but for this heritage listing (and mapping) of the whole site, the hall would most likely have been able to be approved via Complying Development provisions under the Education SEPP.

The school site is affectively divided into three areas; the high side, the low side, and the carpark area which is separated from the playgrounds by a security fence.

Features located on the high side:

- 2 classrooms
- 2 demountables
- The canteen
- The old hall

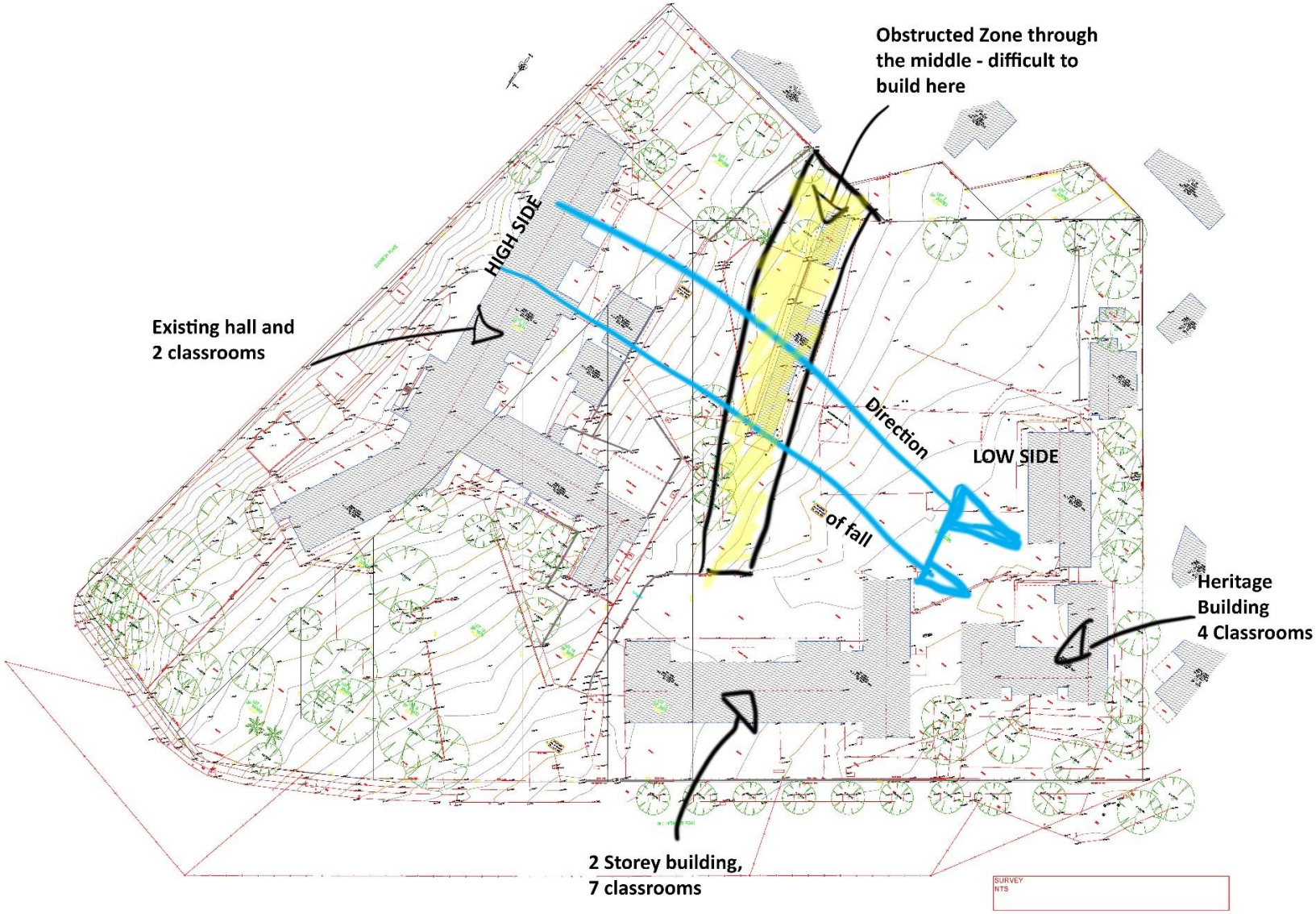
The remainder of the building on the high side is rented out to a commercial operator as a pre-school and a long day care centre. This operation is subject to a commercial lease; it is not part of the school.

Features located on the low side:

- 11 classrooms
- The admin office
- The Principal's and Deputies' offices
- The sick bay
- The library

<u>This has influenced the request from the school management and staff that the new hall be located on the low side. See Options 1 and 2.</u>

There are trees around the entire perimeter of the site and it is inevitable that tree removal will be necessary to preserve the open play space; any option explored across the whole school site will inevitably involve some level of tree removal. Extensive site study has been undertaken to minimise the removal of vegetation and maximise functionality of the Hall facility.



Site Survey Markup 1

Further Analysis of the Site

When we look for locations for a new hall on the site we can identify 5 areas for examination.

Area 1

On the high side.

Area 2

On the low side

Area 3

This area has many trees, which would need removal to accommodate any building. There is a history of two incidents where a semi-trailer lost control while driving down the hill on Old Pittwater Road and crashed into the site through the fence, actually entering the grounds for some distance. If the hall were to be built here it would raise strong concerns from the school staff and from the community. This area was quickly ruled out as not viable.

Area 4

The carpark. This carpark is important to the school. This is a busy street and parking is difficult to find in the area. The carpark is used by parents for the pickup and drop-off process. The carpark will not be built on by this project. Area 4 was also ruled out.

Area 5

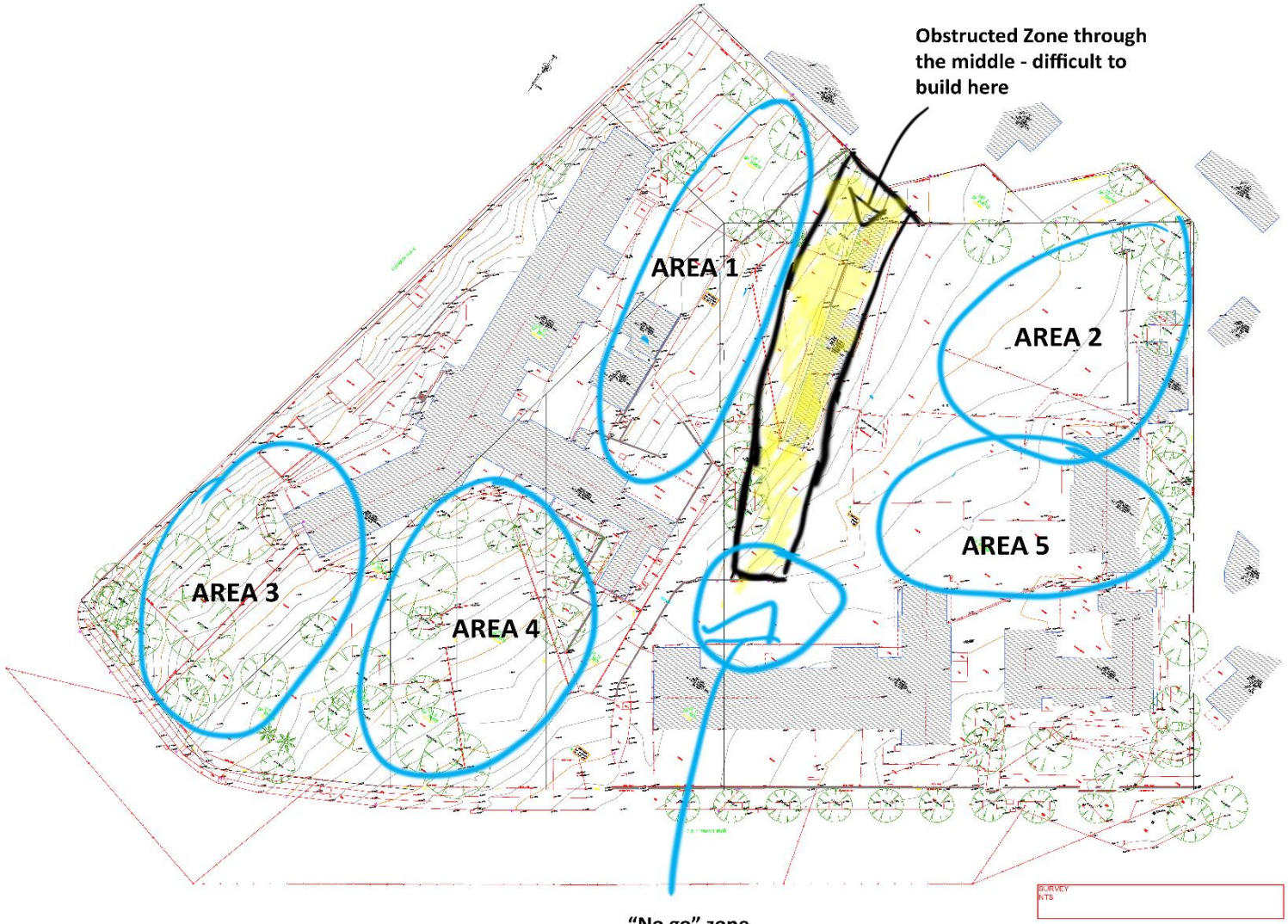
This area inside the school is not viable either. The only space large enough for a hall is on the paved play area; a building here would block the view of the main playground from the classroom buildings. This would create problems with supervision and child safety. Area 5 was therefore ruled out.

The "no-go area"

There is an area between the canteen and the main classroom building that is needed as a pedestrian pass-through to connect the high side with the low side. Anything built in this area would cut the school into two precincts with a poor connection.

Result

This leaves Areas 1 and 2 as the only viable areas for construction of a new hall.



Site Survey Markup 2

Examination of Option 1

Option 1 is the hall placed on the high side. This option has all the required inclusions, however it has been ruled out. **What is wrong with Option 1?**

1. **The school staff prefer Option 2.**

The Principal was given Options 1 and 2 to consider and to consult with the teaching staff and the P&C. After consulting with those groups on Options 1 and 2, the Principal reported back to the project team that the staff and the P&C wanted Option 2.

Why?

- Most of the facilities in the school are located on the low side (refer to the list above).
- Most of the activity in the school is located on the low side.
- It will be quicker to move children to the hall if it is on the low side. Presently to move the school to the hall for an activity, they assemble the classes in their designated assembly points on the lower paved area, and march them up to the hall under supervision. If the hall is on the low side they can send the children to assemble directly at the hall.
- Passive surveillance. If the hall is on the low side they can leave it unlocked with activities set up inside. Presently the existing hall needs to be locked up when unattended.
- In consideration of all these factors, the hall will be more useful to the school if it is located on the low side; it will be easier and quicker to move children to and from the hall, which will save time on a daily basis. It will be more easily supervised and it will be used more often.
- Better relationship with the open play space, also desirable by the EFSG.

2. **Option 1 presents a safety problem for construction**

Option 1 is located close to the old hall and close to the two demountables. The old hall is used for the Out Of School Hours care facility (the OOSH). There is no safe way to build the new hall this close to the OOSH and still keep the OOSH open. The OOSH would need to be relocated into demountables; also the two existing demountable classrooms would need to be relocated. This would mean disrupting the children at the OOSH twice, i.e. by moving them twice. This would also add approximately $150,000 to the project. None of this is impossible but it is certainly not desirable.

3. **Design of Option 1 is problematic at the detail level**

At the basic concept design level it looks like Option 1 will fit nicely into Area 1 on the high side. However when we look at the dimensions and at the ground levels there is a serious problem with Option 1.

Option 1 does not fit on the level area of ground; it overhangs the area where the ground level drops away for a 3 metre fall; the hall is intended to be 8.5m high, about the same as a 2 storey house. But when viewed from the East it would be 11.5m high, which is unacceptable in terms of the planning control of 8.5m and would dominate the site.

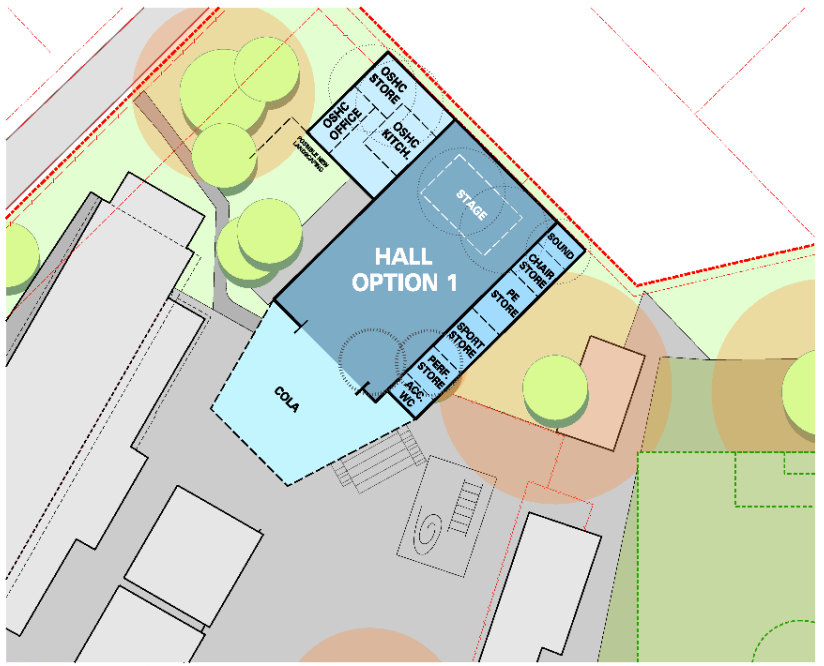
A hall cannot be stepped down a hill; it needs to be all on one level or it does not work. Similarly the ancillary rooms cannot be on a different level; they need to be on the same level as the hall or they can't work either.

Further, the required size and mass to comply with the functional requirements will be accentuated if positioned on the high part of the site and will be visually dominating.

SITE PLAN 1:500 scale

LEGEND

- Pedestrian access
- Hall Height up to +8m
- Support rooms & OSCH (After school care) Height - up to +3.5m
- COLA - Undercovered open area
- Existing Buildings (D - Demountable)
- Playing field area - Approx. 2040 sqm
- Site Boundary
- DA Setback Zone
- Trees to be removed
- Tree Protection Zone Limits
- Photo location
- Footprint of existing dilapidated toilet block to be demolished
- Embankment
- Size guide: Mini Roos soccer field Under 8-9s
- Play equipment



VIEW P1

VIEW P2 - PERSPECTIVE SKETCH

ASSESSMENT

- ✓ Doesn't interfere with green play space
- ✗ 7 trees trees removed including some mature Sydney Blue Gum trees, and a QLD Brushbox tree.
- ✗ Proposed building in close proximity to existing building, difficulties in construction & interrupts student flow into existing facilities.
- ✗ Remote from core school activities, not physically/ socially/ visually connected to school.
- ✗ Existing play equipment needs to be relocated
- ✗ Doesn't comply with the Dept. of Education EFSG (Educational Facilities Standards & Guidelines) relationship to core facilities.
- ✗ This option received an unfavourable response from the School teaching staff and P&C Committee.

NEW CORE 21 HALL
BROOKVALE PUBLIC SCHOOL

PRELIMINARY

Brookvale PUBLIC SCHOOL

NSW GOVERNMENT Education

SARM Architects

HALL OPTIONS - OPTION 1

OPT - 1

DATE: FEBRAURY 2019

The solution is to excavate the hall into the hill to achieve a building height of 8.5m. The hall viewed from the high side would be located in a sunken position and would need ramps and stairs. The building would need retaining walls and waterproofing. The building would be built partially below ground and accordingly would have less natural light and ventilation than it would have if built entirely on ground level.

Option 1 if fully developed to the detailed level would be an awkward design that does not work well on the site.

A modified version of Option 1 was developed, known as Option 4, which allows the majority of existing trees to be retained. This option makes the above problems worse and therefore Option 4 has been ruled out.

4. **Option 1 is in an area that should be kept clear for future growth**

This district has had an increase in population in recent years; an example being the new apartment buildings on Pittwater Road at Dee Why.

If, in the future, we need to build additional classrooms at Brookvale, the best option would be to demolish the existing single storey building on the high side and build a new 2 storey building in that area. It is not known whether or not this will ever be necessary, however it is strongly advisable that we keep this option available for the future and not build anything that would limit the possibilities for the future.

The new hall needs to be kept away from the existing building on the high side of the site to avoid creating a barrier that would make future redevelopment more difficult.

Summary

Option 1 has been ruled out by the project team for these main reasons:

1. The school leadership and teaching staff do not want Option 1 because it does not fit the way they want to manage and supervise the students;
2. Creates safety difficulties during construction and would need the OOSH to be relocated twice;
3. It creates an awkward design solution due to the fall of the land and the need to match up the levels;
4. There is a need to keep that area clear for possible future works.

This option also amplifies Council's documented concerns of tree loss (some 7 mature trees) and the massing and scale of the building in its context, as well as amenity impacts upon its nearest residential neighbour.

Examination of Option 2

Option 2 sits on the low side on the edge of the grass playground area. The building is well sited in terms of supervision and movement of children. It has good sightlines from the existing main classroom building. The redundant toilet block can be demolished which will regain the space that it currently occupies.

There are trees around the perimeter of the playground. Therefore the hall must either be placed on the playground, which reduces the playground, or the hall must go on the perimeter, which creates a need to remove trees.

The school management and staff have made it clear that they need the playground to be protected. For this reason, Option 1 was also considered until the two options had been sketched up in sufficient detail to visualise the outcome, whereupon Option 1 was ruled out for reasons given above.

Option 2 contains all of the required inclusions and has the approval of the school management, teaching staff and the P&C.

It should be noted that exhaustive consideration has been undertaken in this option to preserve the greatest number of trees to the perimeter of the site with expert landscape and arborist advice to design the building with the aim of minimising tree removal. To this point the building construction is thoughtful to tree protection zones and sensitive to the retaining of as many trees as possible. Further, it is proposed to provide additional mature trees to ensure no impact of the natural amenity to the overall site.

A modified version of Option 2 was produced, known as Option 5, which allows all of the existing trees to be retained.

Option 5 has been rejected by the school as it significantly reduces the open play space and limits its usability, by providing an irregular shape / dimensions for sport-related uses.

On the following pages, the two options can be seen with a theoretical mini soccer field marked out to show how the field can be used for team activities.

The trees along the Eastern boundary have a wide root protection zone; if the trees are retained the building needs to move approx. 12 metres to the West, which renders the field nearly useless for team activities. This can be seen on the following drawings.

The Principal advised that many local families live in units and there is limited outdoor playspace available in Brookvale. The playground in Brookvale Public School is made available to the public during school holidays through the “Share our Schools” program. If we were to build Option 5, the playground is of diminished value.

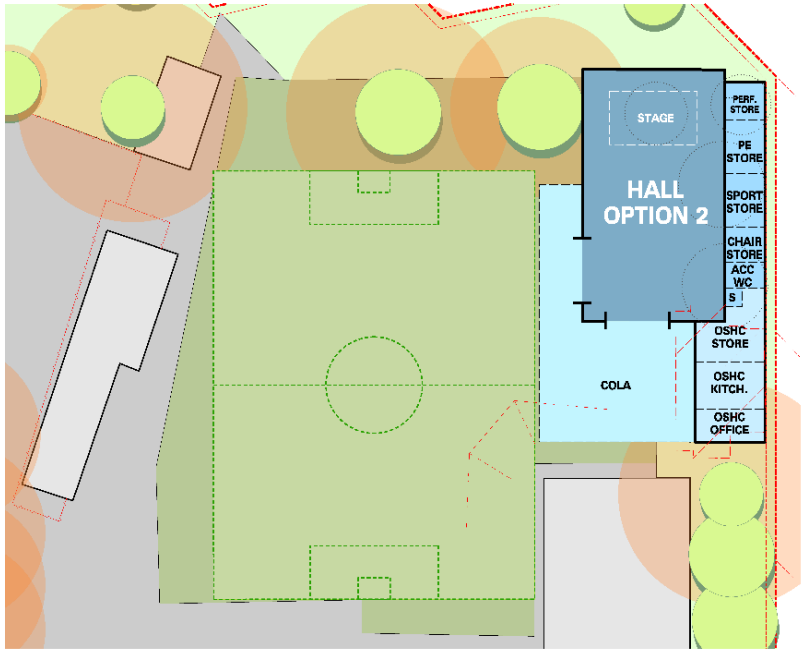
Of note, Option 1 would require removal of 7 trees, whereas Option 2 only 3 trees, plus 1 dead tree.

Option 2 also best achieves Council’s LEP height control of 8.5m without any significant earthworks. The height of the hall under Option 2 and the DA is approximately 7.5m.

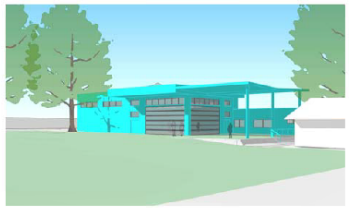
SITE PLAN 1:500 scale

LEGEND

- Pedestrian access
- Hall Height up to +8m
- Support rooms & OSCH (After school care) Height - up to +3.5m
- COLA - Undercovered open area
- Existing Buildings (D - Demountable)
- Playing field area - Approx. 1890sqm (inclusive of area under the proposed COLA)
- Site Boundary
- DA Setback Zone
- Trees to be removed
- Tree Protection Zone Limits
- Photo location
- Footprint of existing dilapidated toilet block to be demolished
- Embankment
- Size guide: Mini Roos soccer field Under 8-9s
- Play equipment



VIEW P1



VIEW P2 - PERSPECTIVE SKETCH

ASSESSMENT

- ✓ Minimal impact on Green Open Play Space. Continued existing use of oval as a valuable sports playing field.
- ✗ 2 original QLD Brushbox trees removed, 1 standard QLD Brushbox tree removed. 1 dead tree removed.
- ✓ Proposed building location continues along perimeter built form of the site along the eastern boundary.
- ✓ Connected with school activities, physically/ socially/ visually connected to school. Hall will have connection and flexible relationsip with existing open space enhancing the school's delivery of the ciriculum and potential for extended community uses.
- ✓ Scope for larger audiences to bleed into green space
- ✓ This option is preffered by the Teaching staff and the P&C.
- ✓ Maximise the opportunities of the "Share our Space" initiative promoted by the NSW Dept of Education.

SARM Architects

NEW CORE 21 HALL PRELIMINARY

BROOKVALE PUBLIC SCHOOL

Brookvale PUBLIC SCHOOL | NSW GOVERNMENT Education

HALL OPTIONS - OPTION 2

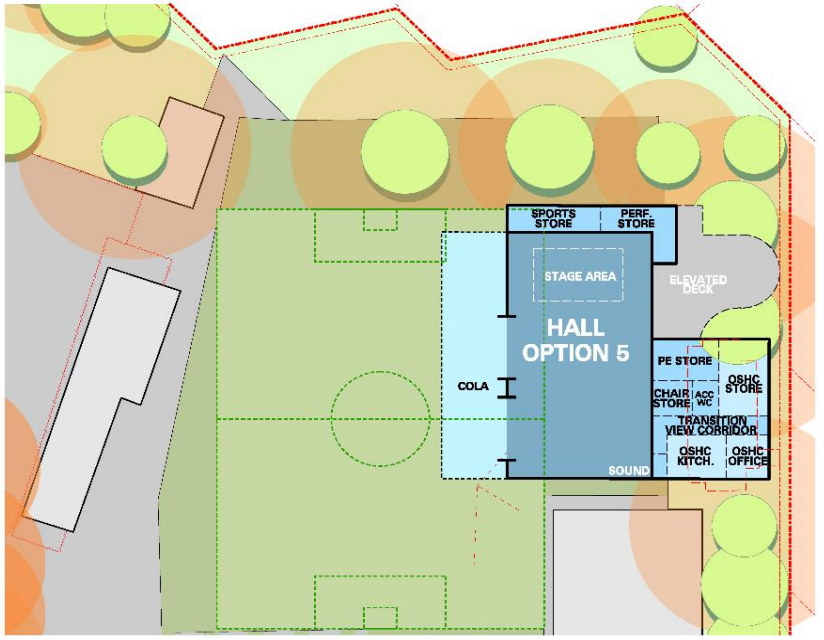
OPT - 2

DATE: FEBRAURY 2019

SITE PLAN 1:500 scale

LEGEND

- Pedestrian access
- Hall Height up to +8m
- Support rooms & OSCH (After school care) Height - up to +3.5m
- COLA - Undercovered open area
- Existing Buildings (D - Demountable)
- Playing field area - Approx. 1585 sqm (inclusive of area under the proposed COLA)
- Site Boundary
- DA Setback Zone
- Trees to be removed
- Tree Protection Zone Limits
- Photo location
- Footprint of existing dilapidated toilet block to be demolished
- Embankment
- Size guide: Mini Roos soccer field Under 8-9s
- Play equipment



VIEW P1

VIEW P2 - PERSPECTIVE SKETCH

ASSESSMENT

- ✗ Greatly interferes and loses function of with green play space. Eliminates opportunity for sporting games
- ✓ Connected with school activities, physically/ socially/ visually connected to school.
- ✓ Retains existing trees.
- ✓ Scope for larger audiences to bleed into green space
- ✗ Reduced opportunity for NSW Dept of Education's 'Share our Space' Initiative
- ✗ Concerns of no line of sight to rear area behind proposed hall. Doesn't adhere to Crime Prevention Through Environmental Design principals.
- ✗ This option received an unfavourable response from the School teaching staff and P&C Committee.

NEW CORE 21 HALL
BROOKVALE PUBLIC SCHOOL

PRELIMINARY

Brookvale PUBLIC SCHOOL

NSW GOVERNMENT Education

SARM Architects

HALL OPTIONS - OPTION 5

OPT - 5

DATE: FEBRAURY 2019

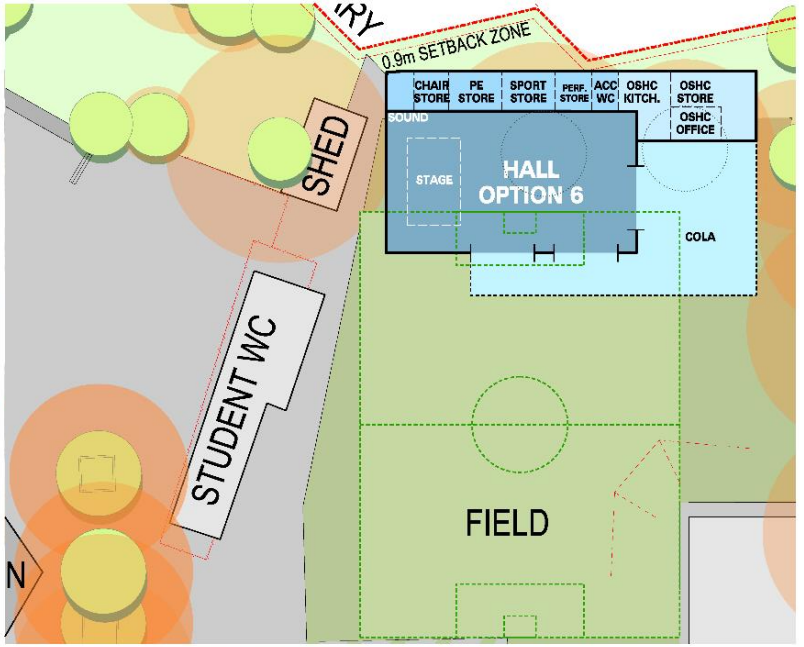
Another version of Option 2, known as Option 6 was produced, wherein the hall has been moved to the Northern edge of the playground.

This option is functionally the same as Option 2 in a different location. However it also requires the removal of trees, and is further away from the classroom buildings with no other advantage offered. Option 6 has been rejected as being merely an inferior version of Option 2.

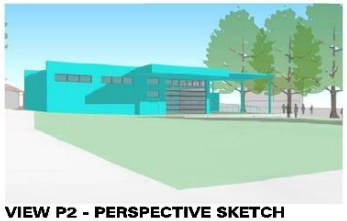
SITE PLAN 1:500 scale

LEGEND

- Pedestrian access
- Hall Height up to +8m
- Support rooms & OSCH (After school care) Height - up to +3.5m
- COLA - Undercovered open area
- Existing Buildings (D - Demountable)
- Playing field area - Approx. 1695 sqm (inclusive of area under the proposed COLA)
- Site Boundary
- DA Setback Zone
- Trees to be removed
- Tree Protection Zone Limits
- Photo location
- Footprint of existing dilapidated toilet block to be demolished
- Embankment
- Size guide: Mini Roos soccer field Under 8-9s
- Play equipment



VIEW P1



VIEW P2 - PERSPECTIVE SKETCH

ASSESSMENT

- ✗ Interferes with Green play space. Compromised shape of the green play space is not condusive to playing mini soccer and reduces usability of the field. Not proportionally acceptable
- ✗ Two trees removed
- ✓ Scope for larger audiences to bleed into green space
- ✓ Connected with school activities, physically/ socially/ visually connected to school.
- ✗ No significant advantage over Option 2
- ✗ Concerns of no line of sight to rear area behind proposed hall. Doesn't adhere to Crime Prevention Through Environmental Design principals.

NEW CORE 21 HALL
BROOKVALE PUBLIC SCHOOL

PRELIMINARY

Brookvale PUBLIC SCHOOL

NSW GOVERNMENT Education

SARM Architects

HALL OPTIONS - OPTION 6

OPT - 6

DATE: FEBRUARY 2019

Option 7

Option 7 was developed in response to comments from Council staff at a pre-DA meeting. Council staff suggested that a hall built in the centre of the site would allow all trees to be retained.

There are several insurmountable problems with this option.

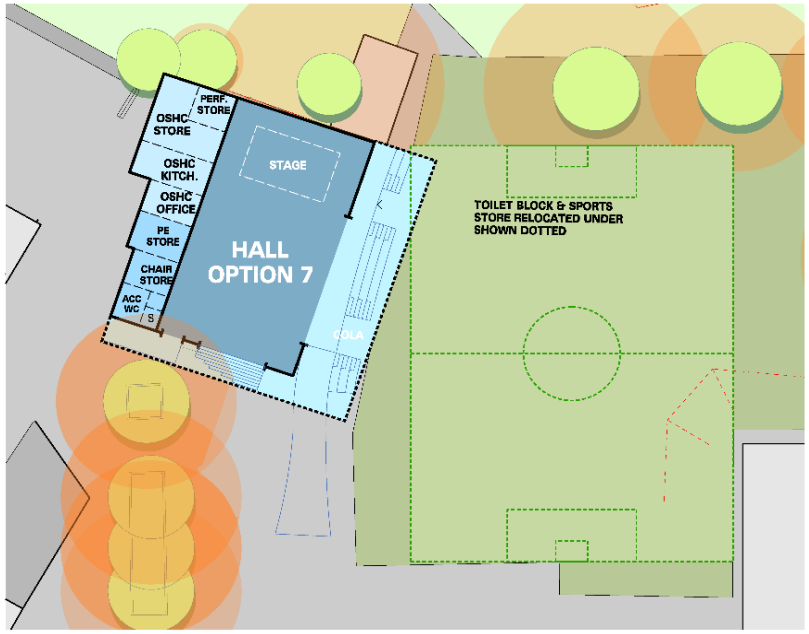
- The existing toilet block (these are the only student toilets in the school) would need to be demolished and re-built as part of this option. This would add at least $1.0 Million to the cost of the hall. This is considered to be a waste of funds when there is sufficient space to build the hall in area 2.
- The existing toilet block is highly exposed; there are clear sightlines to the entrances and this ensures adequate supervision and safety for children. In a new hall designed for this location, the "spill-out" feature for people to expand out to the grounds needs to be oriented to the front; the entrances to the toilets need to be moved from the front, which means the sightlines will be compromised. **This is not acceptable in terms of anti-bullying and child protection**.
- The hall design in this area creates a building which dominates the site and creates a hard division between the high side and the low side of the school. The existing toilet block, although it sits in the middle of the grounds, does not create a complete visual barrier between the areas because there are sightlines both over and around the structure. A child standing on either side of the playground still gains a sense that they can be seen by teachers and that they are under surveillance. However, a hall built in this central location would completely block the sightlines between the two precincts; it will create problems for supervision and creates an issue for the rostering of teachers since the number of teachers on lunchtime playground duty would need to be doubled.
- The hall in this area needs to sit off the grassed playground and due to the change in levels it would be 11 to 12 metres high when viewed from the low side, depending on exact positioning. It would dominate the site and therefore to reduce the height to an acceptable 8.5 metres would require a major excavation, with the attendant retaining walls, waterproofing and drainage to be incorporated. The additional cost of this has not been assessed but would be considerable.
- The large excavation would clash with at least one large tree on the high side playground, so the problem of the loss of trees would not be solved by this option, it would just mean the removal of different trees.
- The "spill-out" of people into the exterior would place the people on a level lower than the floor level of the hall, owing to the direction of the existing slope, so the people outside would not have a clear view of the lectern. Therefore the spill-out concept would not be effective in this location unless the hall were excavated all the way down to the level of the lower playground.
- The relation with the Hall to the open play space is compromised as it is not level to allow an extension of the inside/outside relationship also limiting possible learning opportunities for large student groups.

The school management rejected this option; this option was considered the worst option to be examined.

SITE PLAN 1:500 scale

LEGEND

- Pedestrian access
- Hall Height up to +8m
- Support rooms & OSCH (After school care) Height - up to +3.5m
- COLA - Undercovered open area
- Existing Buildings (D - Demountable)
- Playing field area - Approx.2040 sqm
- Site Boundary
- DA Setback Zone
- Trees to be removed
- Tree Protection Zone Limits
- Photo location
- Footprint of existing dilapidated toilet block to be demolished
- Embankment
- Size guide: Mini Roos soccer field Under 8-9s
- Play equipment



VIEW P1

VIEW P2 - PERSPECTIVE SKETCH

ASSESSMENT

- ✓ Doesn't interfere with green play space
- ✓ Connected with school activities, physically/ socially/ visually connected to school. Accessible and inclusive to all parts of the school.
- ✗ Resource inefficiancy due to demolishing and replacing existing facilities.
- ✗ Play equipment needs to be relocated
- ✓ Scope for larger audiences to bleed into the green play space.
- ✗ Considerable build structure divides school. Playground supervision would need to double and line of sight is lost from one area to another.
- ✗ Safety and security concerns. Toilet entrances under hall will be obscured from a distance.
- ✗ Existing student toilets will need temporary relocation during construction.
- ✗ Outdoor seating area under the COLA is not level with the hall prohibiting smooth flow-through betwen hall and green play space.

NEW CORE 21 HALL
BROOKVALE PUBLIC SCHOOL

PRELIMINARY

Brookvale PUBLIC SCHOOL

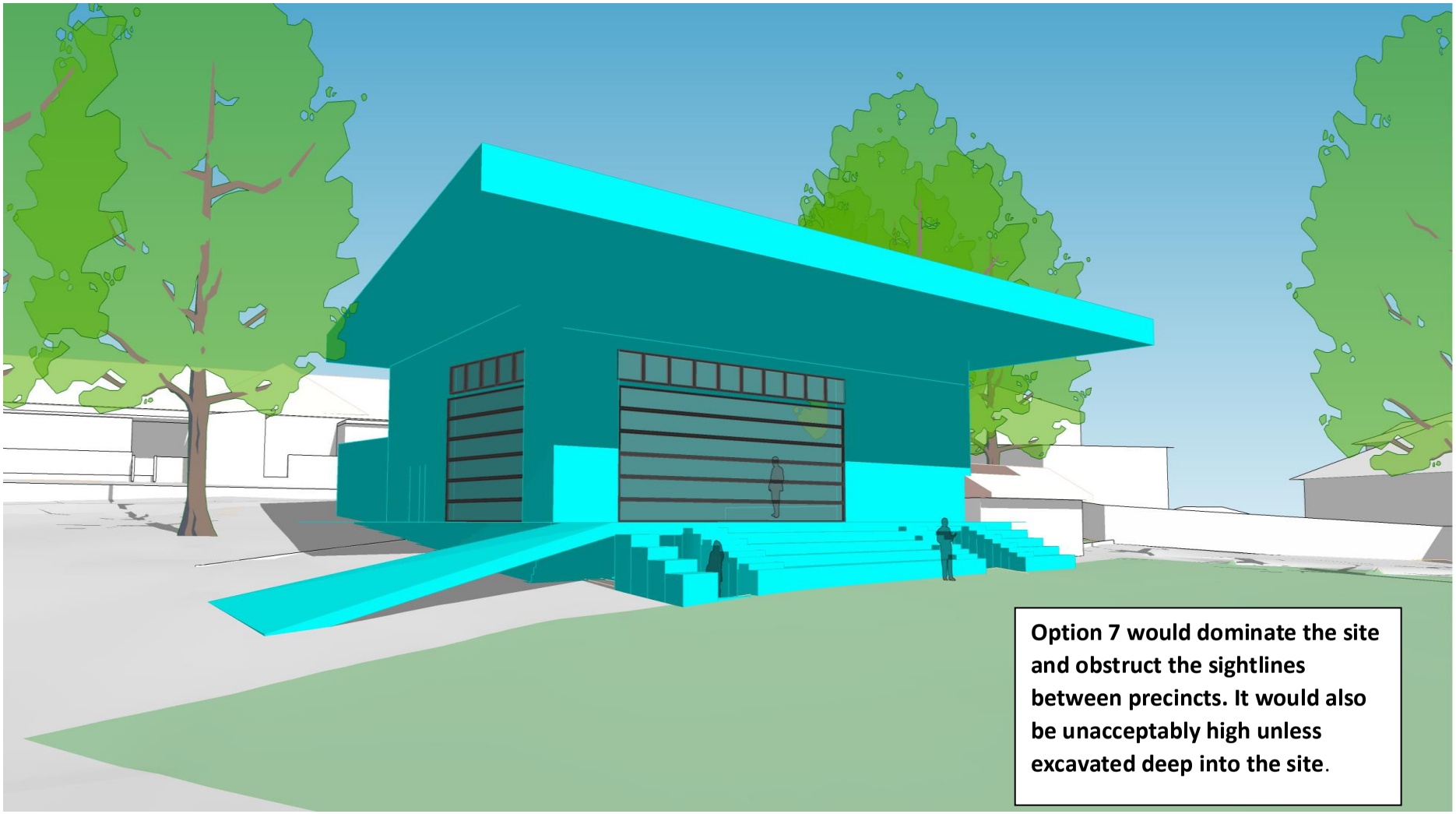
NSW GOVERNMENT Education

S A R M | Architects

HALL OPTIONS - OPTION 7

OPT - 7

DATE: FEBRAURY 2019


Option 7 would dominate the site and obstruct the sightlines between precincts. It would also be unacceptably high unless excavated deep into the site.

Final Summary

The project team seeks approval to proceed with Option 2.

This option has the approval of the school management and staff and the P&C.

All other options have significant disadvantages. Every other option has been rejected as unworkable.

Realistically, any building work on this site will require either the significant demolition of existing assets or the removal of vegetation. If it is insisted that no trees are to be removed, then the only land available is the sports oval that is vital for the school community and will deprive the school of open play space, as well as the broader community who rely on this open space via the Department of Education's "Share our Schools" program due to scarcity of accessible open space in the immediate environs of the school.

We have separately addressed Council's urban design comments and community submissions in other documentation.

BROOKVALE PUBLIC SCHOOL
HALL LOCATION SUMMARY

After thorough considered assessment of all locations researching pros and cons of each site the clear most suitable location for the new hall is Option 2.

Factors contributing to the most appropriate school hall location are as follows:

- School: Optimal use of the Open Play Space is maintained with Option 2. As the Hall can have fully openable walls, the hall can add activity to the Open Play Space. This benefits the neighbourhood and community allowing for the 'Share our Space' initiative by the NSw Dept of Education, to continue allowing the local community recreational use of the grounds on weekends. This option also successfully follows the EFSG Guildeline's core principles for delivery of the education curiculum.

- Social: Social connectivity is achieved with Option 2. The hall placement allows for multifunctional use, for the school and for the greater community out of hours. Larger performances and events can occur due to the the opening of the walls allowing for greater audience capacity to bleed into the Open Play Space.

- Site Context: Site context has been considered in detail.

  Lower height rooms situated next to the boundary allows for break in form and reduction of scale maintaining neighbours privacy. Building height is considered and adheres to Council's development control plans.

  Openable walls are not adjacent to neighbours boundaries or adjoining properties providing acoustic privacy.

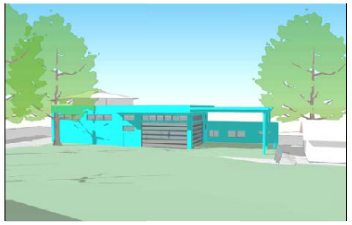
- Community: Whilst some mature trees are proposed to be removed, these are deep in the site and not on the street boundary.

  The noted heritage item, the 1902 building in the south eastern corner of the site, is preserved to recognise the school's history. The site affords considerable existing trees and whilst tree retention is important we believe the minimal considered removal of these particular trees create the best outcomes for the school, neighbourhood and wider community.

SITE PLAN

ASSESSMENT

- ✓ **Minimal impact on Green Open Play Space. Continued existing use of oval as a valuable sports playing field.**
- ✗ **2 original QLD Brushbox trees removed, 1 standard QLD Brushbox tree removed. 1 dead tree removed.**
- ✓ **Proposed building location continues along perimeter built form of the site along the eastern boundary.**
- ✓ **Connected with school activities, physically/ socially/ visually connected to school. Hall will have connection and flexible relationsip with existing open space enhancing the school's delivery of the ciriculum and potential for extended community uses.**
- ✓ **Scope for larger audiences to bleed into green space**
- ✓ **This option is preffered by the Teaching staff and the P&C.**
- ✓ **Maximise the opportunities of the "Share our Space" initiative promoted by the NSW Dept of Education.**



Unit 8/103 Kurrajong Avenue
Mount Druitt, NSW, 2770
1300 411 811
info@pipesure.com.au
www.pipesure.com.au

Utility Locate Report

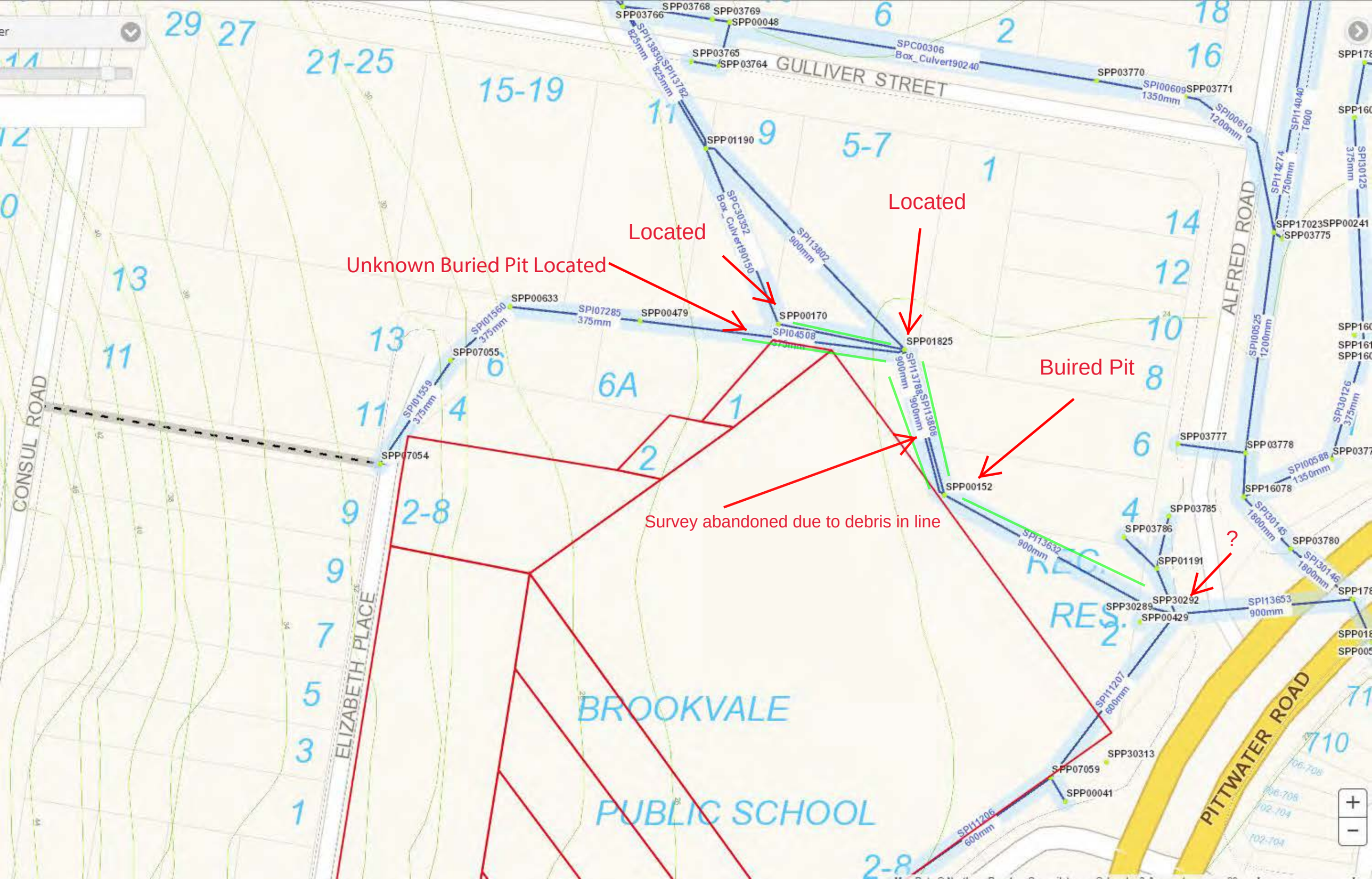
Client: Total Surveying Solutions	**Date:** 16/08/2019
Contact: Sean	**Phone:** 0427 006 498
Location of Work: Brookvale Public School	
Job Description: Tracing Storm water	
Utility Locator: Len/ Matt	**Phone:** 1300 411 811

Locating Quality Level Description	
Quality Level A	Visualization/Confirmation of a service, position and depth, by non-destructive digging methods or points of entry to pits or manholes. Recommended Quality Level prior to construction or excavation.
Quality Level B	Locating of services using radio detection methods or ground penetrating radar. Acceptable range of accuracy for Quality Level B is 300mm for position and 500mm for depth.
Quality Level C	Services marked out using only surface features in the field. Surface features include hydrants, gas markers, pits etc. No indication of service location or depth can be attained from Quality Level C.
Quality Level D	Services marked out using DBYD plans only. Offsets on plans can be used to obtain such indication of services in field but no indication of service confirmation can be given from Quality Level D.

The following report is an accumulation of information gathered from in field investigations at the time of the report and any changes of assets in the field cannot be accounted for. It is recommended that services be potholed for confirmation prior to any construction or excavations and a Quality Level A be achieved. This report does not replace the need for valid Dial Before You Dig plans to be on site at all time

Report Summary and Notes:

Attended site 27/8/2019
The CCTV crew attended site and completed 4 inspection surveys of the 5 that were required. Regarding asset SPI13632 the inspection was not completed due to no access to the line from both pits, please see the attached map. Outcomes Pit SPP00152 is buried and Pit SPP30292 is buried there is a concrete pit lid in the area where this pit should be, this was opened but was not the correct entry point for this asset to complete the survey. CCTV of asset SP104508 was completed to unknown pit rear of School. In conclusion when the CCTV crew were tracing the above assets they were able to identify the location of the buried pit SPP00152 in the community center and mark if this it to be raised by council once this is completed we can then complete the inspection of the asset if required.


Located
Located
Unknown Buried Pit Located
Buired Pit
Survey abandoned due to debris in line
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SPP03766
SPP03768
SPP03769
SPP00048
SPP03765
SPP03764
SPP03770
SPP03771
SPP01190
SPP00633
SPP00479
SPP00170
SPP01825
SPP07055
SPP07054
SPP00152
SPP03777
SPP03778
SPP16078
SPP03785
SPP03786
SPP01191
SPP03780
SPP30289
SPP30292
SPP00429
SPP30313
SPP07059
SPP00041
SPP17023
SPP00241
SPP03775
SPC00306
Box_Culvert90240
SPC30352
Box_Culvert90150
SPI13830
825mm
SPI13762
825mm
SPI00609
1350mm
SPI00610
1200mm
SPI14274
750mm
SPI14040
T600
SPI01560
375mm
SPI07285
375mm
SPI01559
375mm
SPI04508
SPI13802
900mm
SPI13788
900mm
SPI13808
900mm
SPI00525
1200mm
SPI00586
1350mm
SPI30145
1800mm
SPI13632
900mm
SPI13653
900mm
SPI11207
600mm
SPI11205
600mm
SPI30125
375mm
SPI30126
375mm
GULLIVER STREET
ALFRED ROAD
ELIZABETH PLACE
CONSUL ROAD
PITTWATER ROAD
BROOKVALE
PUBLIC SCHOOL
RES.
RES.
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15-19
5-7
2-8
2-8
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PipeSure
ABN 32 602 943 233

Unit 6 / 103 Kurrajong Ave
Mt Druitt NSW 2770
1300 411 811
info@pipesure.com.au
www.pipesure.com.au

DISCLAIMER

Please note:

- Customers must provide current dial before you dig (in date) on site prior to job commencement
- Customer must read and agree to our terms & conditions prior to commencement of works
- PVC gas, optic fiber, plastic/PVC mains, stressing cables, pipes and conduits are not locatable without trace wires, direct access into pipes/conduits, or without the use of specialised scanning equipment
- Service location is an indication only and depths are approximate, we recommend that all services be pot holed/exposed prior to any excavations

Site Location and Address:	2-8 Old Pit water rd Brookvale		
	Located	Not Located	Comments
Electricity	☐	☑	Orange
Gas	☐	☑	Yellow
Water	☐	☑	Blue
Telstra/Comms	☐	☑	White
Optic Fibre	☐	☑	White
Sewer	☐	☑	Pink
Storm Water	☑	☑	Green
Other	☐	☑	Marked in pink tree roots
Optus	☐	☐	

Warranty

(a) You acknowledge that due to the nature of the services Pipesure provide we do not warrant or guarantee any specific results from the services provided by us. The results we provide (if any) are estimates only as we cannot be certain due to environmental and physical limitations in which the services are provided.

(b) While all due care and diligence will be taken by us in performing the services, our services are limited by the information you provide to us, publicly available information that we can search for and our inability to visually inspect anything below ground surface in relation to the site being assessed.

Company Name: TSS

Company Representative: Sean Signature: _____ Date: 16/08/2019

Witness: Len Mcgowan Signature: _____ Date: 27/08/2019

6 Alfred St 1.9 m deep location line runs through carport.

4 Alfred Rd Line runs through back yard


5-7 Glliver St. SPP01825

Line trace form 5-7
Gulliver St


SPP01825 Start of 375 mm line 1.5 deep

SP104508 Trace at School boundary fence

Buried Pit SPP00152 In Community Centre

Survey completed of asset SP104508 to unknown buried Pit with step up in pit rear of School

SP13788 Survey Abandoned at this point due to debris camera can not pass located and mark.


Line Runs through Community Centre


4 Alfred Rd


6 Alfred Road

DATE 26/08/2019

Job Number: 2570

PO Number:

Clients Review (If Applicable)

Name:

Signature:

Client: -

Tss

Location of Works: -

2-8 Old Pitwater Rd Brookvale

Description of works to be performed:-

Locate sewer and water

Representative responsible for carrying out work as per this safe work method statement responsible for site supervision of work, protective measures, plant, equipment and power tools (*person completing swms*)

Name: Len **Signature:** _____ **Date:** 16/08/2019

Name and Address of Main Business Office:

PipeSure Australia Pty Ltd
Unit 6/103, Kurrajong Avenue
Mount Druitt, 2770
Ph – 02 9625 9222 – Fax 02 9625 9200

Representative Responsible for preparation of the safe work method statement.

Name: Graham Franklin

Signature:

Risk Calculator:

	1	2	3	4	5
A	H	H	H	M	M
B	H	H	M	M	M
C	H	H	M	M	L
D	H	M	M	L	L
E	M	M	L	L	L

Likelihood

A Common Occurrence
B Less Common but has occurred
C May occur but rare
D Not likely to occur
E Virtually impossible

Consequence

1 Fatality or very serious injury or illness
2 Serious injury or illness
3 Moderate injury or illness
4 Minor injury or illness
5 No lost time

The Persons involved in the development of SWMS:

Graham Franklin & All PipeSure Australia staff.

Competency and Training Requirements

All person included in the works of operation are to be correctly qualified by a registered training authority. Inducted to site by competent site inductor and trained in the use of SWMS. Work Cover accredited permits and licenses required to complete works are listed on the back page. Any license requirement not listed must be written in the appropriate places provided on the back page. All work licenses may be sighted before the commencement of works and at any time during and must be on person at all times during works.

List all (parts of) Legislation, Regulations, Codes, Standards & Procedures applicable to the work and where these are kept:

WHS Act 2011: WHS Regulation 2011. Rail Safety Act 2008:Work Place Injury Management & Workers Comp Act 1998: Workers Comp Act 1987 Plumbing & Drainage AS3500 – All Acts are kept at PipeSure Australia Pty Ltd – Buisness office.

Note - List of PPE and Accreditations on back page

Note - Any permits needed for the completion of works must be used in conjunction with the SWM

Note - On commencement of works any hazards identified beyond the SWMS are to be entered onto the SWMS in the spares rows provided, hazard control must be assessed and entered to the SWMS before commencement of works.

Note - Tools to be tagged and tested monthly & checked daily

Note - **SWMS ARE TO BE USED IN CONJUCTION WITH FRANKLINS PLUMBING SOPS – SAFE OPERATION PROCEDURES**

List plant, equipment and tools to be used e.g. Hand tools, Electrical tools, Ladders and any other equipment to be used in the task.	Possible Hazards Place a tick next to the hazards identified. These will then need to be written into the Hazard Identification column for each Activity Step.		PPE List PPE to be used		(Tick)
1. ☑ CCTV Equipment	1. ☐ Confined Space	15. ☐ Communications		Hard Hat	✓
2. ☐ Battery Drill + Charger	2. ☐ Heights (People falling)	16. ☐ Weather conditions		Safety Footwear	✓
3. ☐ Concrete Saw	3. ☐ Flooding/water	17. ☐ Total Fire Ban		Eye Protection	✓
4. ☐ Excavator	4. ☑ Manual Handling	18. ☐ Traffic		Safety Harness	
5. ☐ Extension Ladder	5. ☐ Heat	19. ☐ Asbestos		Respiration Equipment	
6. ☐ Grinder	6. ☐ Cold	20. ☐ Animals (Dogs etc)		Hand Protection	✓
7. ☐ Hammer Drill	7. ☐ Falling objects	21. ☐ Insects(Spiders etc)		Ear Protection	
8. ☐ Oxy & Acetelyn	8. ☑ Moving plant / machinery	22. ☐ Dust		Overalls	
9. ☐ Step Ladder	9. ☑ Site Housekeeping	23. ☐ Fire & Explosion		Illuminating Safety Vest	
10. ☐	10. ☐ Electricity	24. ☐ Hazardous Substances		Wet Weather Gear	
11. ☐	11. ☐ Compressed gas	25. ☑ Slips, Trips, Falls		Sun Glasses	
Maintenance: All tools and equipment to be serviced in accordance with the manufacturer's instructions and visually inspected prior to use each day. All electrical leads and tools to be tested and have a current test tag fitted.	12. ☐ Underground / overhead services	Others: 26. ☑ Fatigue Management		Hat	
	13. ☐ Noise/vibration	27. ☑ Train movements		Sun Screen	
	14. ☐ Security /lone/ isolated work	28. ☐	Other	Long sleeve shirt and Pants	✓

Activity step Break the activity down into steps. List the steps in this column	Hazard Identification Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column, and enter the risk rating in the next column.	Initial Risk Rating	Controls Implemented Decide what controls to use to eliminate or minimise the risks. Detail the controls in this column, and enter the revised risk rating in the next column. Note: If the risk rating is still 1-3, do not begin work.	Residual Risk Rating	Person Responsible To ensure management method applied
1- Perform site inductions for all workers at site.	Risk of injury to workers and others due to unfamiliarity of site due to no site induction.	M	1- Perform site inductions to cover all site safe operating rules & procedures. 2- Perform pre-work brief and work as per SWMS, site rules and any other necessary permits. 3- Work to site safe operating procedures 4 – Zero tolerance of drug and alcohol on site	L	Supervisor
	Injury to others from contact during site entry	M	1- Be aware of surrounding public, take care. 2- Work to site safe operating procedures. 3– Restrict access to site	L	Supervisor
	Serious injury to workers from being hit or stuck by moving objects, vehicles, plant, Trains or other. Whilst working, arriving or leaving site.	M	1- Be aware and alert at all times of surrounding area and traffic 2 - Work area to be Cordon off. 3- Make yourself known by wearing the correct Hi visibility PPE when necessary e.g. Hi vis vest on rail site 4- Do not enter any dangerous out of bounds areas without the consent of the correct authorities and if necessary a PO officer. Must not enter rail sites without Risi certification. 5 – Designated walkway to be used at all times	L	Supervisor
2 – Transport vehicle, equipment and plant to work area	Serious injury to workers from being hit or stuck by moving objects, vehicles, plant, Trains or other. Whilst working, arriving or leaving site. Traffic hazards, colliding with other vehicles, pedestrians or objects.	M	1- Be aware and alert at all times of surrounding area and traffic 2- Drive on designated roads, avoid any rough or uneven ground. 3- Turn on hazard lights where necessary. 4 - Park as close as possible to site 5 - Park on level ground where possible. 6 - Work area to be Cordon off. 7- Make yourself known by wearing the correct Hi visibility PPE when necessary e.g. Hi vis vest on rail site 8- Do not enter any dangerous out of bounds areas without the consent of the correct authorities and if necessary a PO officer. Must not enter rail sites without Risi certification. 9 – Designated walkway to be used at all times	L	Supervisor
3- Opening Pit	Injury to others from contact during works.	M	1- Be aware of surroundings, 2- Take care. 3- Cordon off work area. 4- Perform all works as per safe operating procedures, site safety rules, SWMS and Induction	L	Supervisor
	Manual handing injury - Cuts, strains, tears, breaks etc. caused due to manual handling. Injury from slips, trips and falls.	M	1- Perform works as per manual handling training & induction. 2- Use appropriate PPE e.g. Gloves and steel cap boots. 3- Always remain safe distance from pit 4- Ensure footing around pit is stable 5- Cordon off work area to isolate from public 6- Use appropriate pit lifers to access pit.	L	Supervisor
	Confined Spaces – if needed ☐ Death or permanent injury due to confined space entry	H	1 - Confined space risk assessment to be complete before entry 2 - Confined space site rescue plan to be completed before entry 3 - Confined space equipment to be inspected before to entry 4 - Gas monitor to be used before entry and at all times during works. 5 - Two confined spaces personnel to be on site during works.	M	Supervisor

Activity step Break the activity down into steps. List the steps in this column	Hazard Identification Identify any potential hazards associated with each step – and any related risks. Detail the hazards and risks in this column, and enter the risk rating in the next column.	Initial Risk Rating	Controls Implemented Decide what controls to use to eliminate or minimise the risks. Detail the controls in this column, and enter the revised risk rating in the next column. Note: If the risk rating is still 1-3, do not begin work.	Residual Risk Rating	Person Responsible To ensure management method applied
4-CCTV Inspections	Serious injury to self/others due to equipment failure.	M	1- All plant and equipment to be inspected regularly 2- Report any defects or concerns to management 3- Complete prestart equipment checks	L	Supervisor
	Manual handing injury - Cuts, strains, tears, breaks etc. caused due to manual handling. Injury from slips, trips and falls	L	1- Perform works as per manual handling training & induction. 2- Use appropriate PPE e.g. Gloves and steel cap boots. 3- Always remain safe distance from pit 4- Ensure footing around pit is stable 5- Cordon off work area to isolate from public	L	Supervisor
5 - Clean up and restore site to original condition	Manual handing injury - Cuts, strains, tears, breaks etc. Caused due to manual handling	L	1- Perform clean up as per manual handling training. 2- Wear appropriate PPE gloves, safety eyewear, steel cap boots, long sleeve shirt and pants as required. 3- Ensure ground openings are covered or filled following completion of work 4- Disinfect cables and tools where appropriate. 5-	L	Supervisor
6- Visit main office to sign out of site and leave site	Injury to others from contact during site exit.	L	1 - Be aware of surrounding public. 2 - Take care. 3 - Work to site safe operating procedures	L	Supervisor

Rescue Equipment (to be on site and available for Immediate use)	**List of Appropriate Accreditation, Licenses & Training. Needed to complete works**
↖ Mobile Phone ↖ First aid kit Fire Extinguisher Confined Spaces Harness & Fall arrest system Other_____ _____ _____ _____ _____ _____ _____ _____ _____	Tick Appropriate A,L & T Box For Works ☑ *White Card (Work cover - General Induction for construction work in NSW - OHS Construction Induction Training certificate) *LRI Safe Working at Heights Life & Rescue International ■ * Rail Industry Safety Induction (Risi Card) *Elevating Work Platform Association of Australia Inc * NSW Public Works Contractor * Excavation License - Driving Excavator ■ *Site Induction ■ *Safe use of CCTV Equiptment (PipeSure in-house training) other_____ _____ _____ _____ _____

*By signing this declaration you have agreed that you have read and understand the SWMS & SOPs; Will work in a safe manner as per the SWMS, Site Induction, Operation of Procedures, site safety rules & training *and have taken full responsibility in the safe manner of completing works.* Are correctly qualified in all necessary training for works and have listed the correct accreditations and licenses. Have performed daily checks on equipment (including hand tools) and have all necessary MSDS on site.

SIGN ON

*Signatures of competent persons who have read and understood the work activities described in the Safe Work Method Statement and Safe Operating Procedures ***including*** the person responsible for completing the assessment.

Name Len Mcgowan Signature _____ Date 27/08/2019
Name_____ Signature _____ Date_____
Name_____ Signature _____ Date_____
Name_____ Signature _____ Date_____

RELEVANT LEGISLATION, CODES OF PRACTICE & AUSTRALIAN STANDARDS		
RELEVANT LEGISLATION	CODES OF PRACTICE	AUSTRALIAN STANDARDS
Work Health & Safety Act 2011	Code of Practice – OHS Induction Training for Construction	
Work Health & Safety Regulation 2011	Code of Practice – Work Health and Safety Consultation, Co-operation and Coordination	
Workplace Injury Management & Workers Compensation Act 1998	Code of Practice – Hazardous Manual Tasks	
Rail Safety Act	Code of Practice – How to Manage Work Health and Safety Risks	
	Code of Practice – Managing the Risk of Falls at Workplaces	
	Code of Practice – Managing Noise and Preventing Hearing Loss at Work	
	Code of Practice – Noise Management and Protection of Hearing at Work	
	Code of Practice – Managing the Work Environment and Facilities	
	Code of Practice – Managing electrical risks at the workplace	
	Code of Practice – Managing risks of plant in the work place	
	Code of Practice – Excavation work	
	Code of Practice –	
	Code of Practice –	
	Code of Practice –	
	Code of Practice – Preparation of Safety Data Sheets for Hazardous Chemicals	
	Code of Practice – Labelling of Workplace Hazardous Chemicals	

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Mt Druitt
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Project Name 2570 Brookvale

Date: 10/09/2019

Client: Total Surveying Solutions

Contract No: 2570

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Table of contents

Project Name:	Project number:	Date:	Contact:	
2570 Brookvale		10/09/2019		

City :

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/ Main sections

Project name	Project Number:	Responsible:	Date:
2570 Brookvale			**10/09/2019**

No.	Start MH	End MH	Date	Location/Street	Tape No.	Material	m	(m)
3	SPP00479	SPP01825	27/08/2019	2-8 old pitwater rd brookvale-public school		Reinforced concrete	15.30	15.30

Pipe size: CIRCULAR 375/0 = 15.3 m (15.3 m)

No.	Start MH	End MH	Date	Location/Street	Tape No.	Material	m	(m)
1	SPP01825	SPP00152	10/09/2019	5-7 gulliver st		Reinforced concrete	33.42	33.42
2	SPP01825	SPP00152	27/08/2019	2-8 old pitwater rd brookvale-public school		Reinforced concrete	56.21	56.21

Pipe size: CIRCULAR 825/0 = 89.63 m (89.63 m)

No.	Start MH	End MH	Date	Location/Street	Tape No.	Material	m	(m)
4	SPP00170	SPP01825	27/08/2019	5-7 gulliver st		Concrete segments	21.21	21.21

Pipe size: RECTANGULAR 900/1200 = 21.21 m (21.21 m)

All sections = 126.14 m (126.14 m)

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Inspection summary

Project Name:	Project number:	Date:	Contact:	
2570 Brookvale		10/09/2019		

Please find per enclosure the inspection report

Total Length of storm water network	**92.72 m**
Inspected Length of stormwater network	**92.72 m**
Not inspected Length of stormwater network	**0.00 m**
Total Length of house connections (satellite)	**0.00 m**
Inspected Length of house connections (satellite)	**0.00 m**
Not inspected Length of house connections (satellite)	**0.00 m**
Number of Sections	**3**
Number of house connections	**0**
Number of Photos	**33**

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Inspection Summary

Date:	Responsible:			
10/09/2019				

Sewer Reference:	SPI13788	Section length:	33.42 m
Section Numer:	1	Pipe length:	0 mm
Start node:	SPP01825	Material	Reinforced concrete
End node:	SPP00152	Shape:	Circular

SPP01825	0.00	STMH	Start node, maintenance hole, Nodename:, SPP01825	
	0.71	WLC	Water level, clear flow (the invert is visible), 5 %	
	1.84	RM	A mass of mostly fine roots, which has developed into an interwoven clump, at joint, Obstruction: 5-20%, at 6 o'clock	; 30
	2.04	MMS	Missing mortar, depth less or equal to 15 mm, at joint, at 12 o'clock	
	4.44	RF	Fine roots, a relatively small number of flexible minor roots, at joint, Obstruction: 5-20%, at 6 o'clock	; 1
	9.31	RF	Fine roots, a relatively small number of flexible minor roots, at joint, Obstruction: 5-20%, at 6 o'clock	; 1
	10.37	SRV	Steel reinforcement is visible with little or no corrosion evident, at 2 o'clock	80;
	16.53	GC	General comment, some surface cracking< less then 0.15mm	
	21.57	RT	Tap roots--a small number of major roots without a significant mass of fine roots, at joint, Obstruction: <5%, at 7 o'clock	; 10
	22.84	SH	Hole in wall-surface damage has extended right through the wall of conduit in places, Obstruction: <5%, at 4 o'clock	100;
	24.06	RT	Tap roots--a small number of major roots without a significant mass of fine roots, at joint, Obstruction: <5%, at 7 o'clock	; 10
	26.44	GC	General comment, some surface cracking< less then 0.15mm	
	28.91	GC	General comment, some surface cracking< less then 0.15mm	
	31.44	SRV	Steel reinforcement is visible with little or no corrosion evident, at joint, at 12 o'clock	80;
	32.78	DER	Deposits in the invert, gravel or rubble, Obstruction: 5-20%, from 4 o'clock, to 7 o'clock, large rubble in the invert obstucting	; 30
SPP00152	33.42	SAOB	Inspection (survey) abandoned, obstruction, large rubble in the invert obstucting-unable to continue-pipework requires jetting/cleaning, Obstruction: 21-50%	

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Inspection Summary

Date:	Responsible:			
10/09/2019				

Sewer Reference:	SPI13808	Section length:	56.21 m
Section Numer:	2	Pipe length:	0 mm
Start node:	SPP01825	Material	Reinforced concrete
End node:	SPP00152	Shape:	Circular

SPP01825	0.00	STMH	Start node, maintenance hole, Nodename:, SPP01825	
	12.90	WLC	Water level, clear flow (the invert is visible), 5 %, flow from recent storm	
	17.50	BM	Breaking, some pieces are missing, length of break: 100mm, at 12 o'clock	60;
	17.67	CI	Intruding connection, magnitude of intrusion: 5-20%, at 11 o'clock, 100mm pvc	; 30
	17.67	CI	Intruding connection, magnitude of intrusion: 5-20%, at 11 o'clock, 100mm pvc	; 30
	38.40	LL	The conduit curves to the left, length: 2 mm	
	39.90	JDL	Joint displaced longitudinaly, longitudinal displacement: 21-30mm, at 9 o'clock	2;
	49.02	DES	Deposits in the invert, Fine sediments, sand or silt, Obstruction: 5-20%, at 6 o'clock	; 30
	49.02	GC	General comment, simple surface cracking<less then 0.15mm	
	54.94	OBZ	Obstruction, some other object is lying in the invert, at 6 o'clock, debris blockage at pit invert, Obstruction: 21-50%	; 40
SPP00152	56.21	FHMH	Finish node, maintenance hole, Nodename:, SPP00152, burried pit	

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Inspection Summary

Date:	Responsible:			
10/09/2019				

Sewer Reference:	SPI04508	Section length:	15.30 m
Section Numer:	3	Pipe length:	0 mm
Start node:	SPP00479	Material	Reinforced concrete
End node:	SPP01825	Shape:	Circular

SPP00479	0.00	STMH	Start node, maintenance hole, Nodename:, SPP01825	
	0.02	JDL	Joint displaced longitudinaly, longitudinal displacement: >30mm, at 11 o'clock	5;
	0.14	RVP	Steel reinforcement is visible and projecting into the conduit, at joint , from 10 to 2 o'clock	
	1.49	JDA	Joint displaced angular, angular displacement 15 °, at 10 o'clock	
	3.54	LR	The conduit curves to the right, length: 500 mm	
	4.24	JDA	Joint displaced angular, angular displacement 10 °, at 11 o'clock	
	4.72	JIZ	Jointing material intrusion, concrete, reduction in cross sectional area: <5%, at 6 o'clock	0;
	9.55	JDA	Joint displaced angular, angular displacement 15 °, at 11 o'clock	
	12.19	BM	Breaking, some pieces are missing, length of break: 100mm, at 12 o'clock, with reinforcement visible	60;
	13.18	CNPO	Connection, poor workmanship, connection appears to be open, height: 225 mm, width: 0 mm, at 8 o'clock	
SPP01825	15.30	FHMH	Finish node, maintenance hole, Nodename:, BURIED PIT	

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Inspection Summary

Date:	Responsible:			
10/09/2019				

Sewer Reference:	SPC30353_BOX CULVERT_90150	Section length:	21.21 m
Section Numer:	4	Pipe length:	1200 mm
Start node:	SPP00170	Material	Concrete segments
End node:	SPP01825	Shape:	Rectangular

SPP00170	0.00	STMH	Start node, maintenance hole, Nodename:, SPP01825	
	0.36	WLC	Water level, clear flow (the invert is visible), 5 %, from recent storm	
	17.58	LR	The conduit curves to the right, length: 1000 mm	
	19.49	IS	Infiltration, sweating--slow ingress of water, no visible drips, from 12 o'clock, to 12 o'clock, at the joint<less then 5%	; 0
SPP01825	21.21	FHMH	Finish node, maintenance hole, Nodename:, SPP00170	

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Project information

Project name	Project number:	Contact:	Date :
2570 Brookvale			**10/09/2019**

Client:	**Total Surveying Solutions**
Contact Name:	**Engineer George Spyridakos**
Department:	**Surveying**
Po Box:	**Unit 8/226**
Street:	**Condamine St**
City:	**Manly**
Telephone:	**1300 877 000**
Fax:	
Mobile:	**0427 066 498**
E-mail:	**gs@totalsurveying.com.au**

Site:	**Brookvale Public School**
Contact Name:	**Engineer Shaun**
Department:	**Surveyor**
Po Box:	**2-8**
Street:	**Old Pittwater Rd**
City:	**Brookvale NSW**
Telephone:	**1300 411 811**
Fax:	**9625 9200**
Mobile:	**0427006498**
E-mail:	**info@pipesure.com.au**

Contractor	**Pipesure**
Contact Name:	**Company PipeSure Head Office**
Department:	**PipeSure Australia**
Po Box:	**Unit 8/103**
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City:	**Mt Druitt**
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Legend of Drawing:


WATER FLOW 1


Tree_Summer

SOAKAWAY: FOUL WATER


SURFACE WATER


PETROL INTERCEPTOR


RAINWATER PIPE


RODDING EYE


SOIL & VENT PIPE

SOAKAWAY: SURFACE WATER


W.C.


FOUL WATER


Tree_Winter


CESS PIT


GNDFLWC

SYPHON INTERCEPTOR


PIPE RUN


ROAD GULLY


SEPTIC TANK


COMBINED

GULLY


PUMP CH

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Grade Defect Guide and Recommendations

Project Name :	Project number:	Contact:	Date :
2570 Brookvale			**10/09/2019**

1: These codes describe the physical condition of the sewer and the severity of the damage

STRUCTURAL CONDITION

2: These codes describe the capability of the sewer to meet its service requirements and indicate loss of capacity, potential for blockage and watertightness

SERVICE DEFECTS

3: These codes define features relating to the construction of the sewer

CONSTRUCTIONAL FEATURES

4: These codes define general items concerning the sewer

MISCELLANEOUS FEATURES

5: Collapsed or collapse imminent

Brick Sewers: Already collapsed, Missing Invert,Deformation >10% and fractured, Displaced/hanging brickwork and deformation <10%, Extensive areas of missing brickwork Clayware, concrete and plastic pipe sewers: Already collapsed, Deformation >10% and broken, Extensive areas of fabric missing, Fracture with deformation 10%

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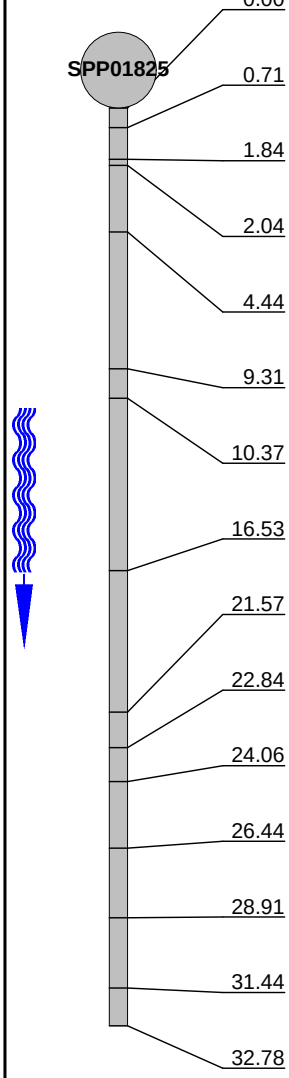
WSA assessment

Date:	Asset owner's job ref.:	Asset Owner:	Operator :	Section number:	Pipe Asset Id:
10/09/2019	**2570**	**Total Surveying Solutions**	**Matthew Ireland**	**1**	**SPI13788**
Time of inspection:	Cleaning:	Standard:	LRP	Conduit Unit Length	Method of Inspection
09:45:00	**not cleaned**	**WSA_05_2008_2.2**	**Centre of Start Node**		**Television Camera**

Town:		Catchment:		US MH:	**SPP01825**
Suburb:	**Brookvale**	Asset Owner:	**Total Surveying Solutions**	Survey Dir:	**downstream**
Street:	**5-7 gulliver st**	Precipitation.:	**No**	DS MH:	**SPP00152**
Asset Location	**Private property, industrial site**	Flow control	**No measures**	Inspect Lenght :	**33.42 m**

Purpose of inspection :	**Routine Inspection**	Shape :	**Circular**
Use of Conduit:	**Culverted watercourse**	Dia/Height:	**825 mm**
Type of Conduit:	**Storm water drain**	Lining:	
Lining Method:		Pipe Material:	**Reinforced concrete**

Remarks : **STORMWATER INSPECTION**



1:270 Position	Code	Observation	Str Rate	
0.00	STMH	Start node, maintenance hole, Nodename:, SPP01825		
0.71	WLC	Water level, clear flow (the invert is visible), 5 %		
1.84	RM	A mass of mostly fine roots, which has developed into an interwoven clump, at joint, Obstruction: 5-20%, at 6 o'clock		 1.84 m
2.04	MMS	Missing mortar, depth less or equal to 15 mm, at joint, at 12 o'clock		
4.44	RF	Fine roots, a relatively small number of flexible minor roots, at joint, Obstruction: 5-20%, at 6 o'clock		 2.04 m
9.31	RF	Fine roots, a relatively small number of flexible minor roots, at joint, Obstruction: 5-20%, at 6 o'clock		
10.37	SRV	Steel reinforcement is visible with little or no corrosion evident, at 2 o'clock	80	 10.37 m
16.53	GC	General comment, some surface cracking< less then 0.15mm		
21.57	RT	Tap roots--a small number of major roots without a significant mass of fine roots, at joint, Obstruction: <5%, at 7 o'clock		 21.57 m
22.84	SH	Hole in wall-surface damage has extended right through the wall of conduit in places, Obstruction: <5%, at 4 o'clock	100	
24.06	RT	Tap roots--a small number of major roots without a significant mass of fine roots, at joint, Obstruction: <5%, at 7 o'clock		
26.44	GC	General comment, some surface cracking< less then 0.15mm		
28.91	GC	General comment, some surface cracking< less then 0.15mm		
31.44	SRV	Steel reinforcement is visible with little or no corrosion evident, at joint, at 12 o'clock	80	 22.84 m
32.78	DER	Deposits in the invert, gravel or rubble, Obstruction: 5-20%, from 4 o'clock, to 7 o'clock, large rubble in the invert obstucting		

City :

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Inspection Report

Date :	Job number :	Weather :	Operator :	Counter :	Pipe Asset Id :
10/09/2019	**2570**	**No**	**Matthew Ireland**	**1**	
Present :	Vehicle :	Camera :	Preset :	Cleaned : **not cleaned**	Rate :

1:270	Position	Code	Observation	Str Rate
	33.42	SAOB	Inspection (survey) abandoned, obstruction, large rubble in the invert obstucting-unable to continue-pipework requires jetting/cleaning, Obst	

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	**100**	**7.78**	**260**	**5**	**6**	**30**	**2.45**	**82**	**3**

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
5-7 gulliver st		**10/09/2019**	**1**	**SPI13788**

Photo: 1_3A, Media No:: 100919_1, 00:00:57
1.84m, A mass of mostly fine roots, which has developed into an interwoven clump, at joint, Obstruction: 5-20%, at 6 o'clock

Photo: 1_4A, Media No:: 100919_1, 00:01:32
2.04m, Missing mortar, depth less or equal to 15 mm, at joint, at 12 o'clock

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
5-7 gulliver st		**10/09/2019**	**1**	**SPI13788**

Photo: 1_7A, Media No:: 100919_1, 00:04:13
10.37m, Steel reinforcement is visible with little or no corrosion evident, at 2 o'clock

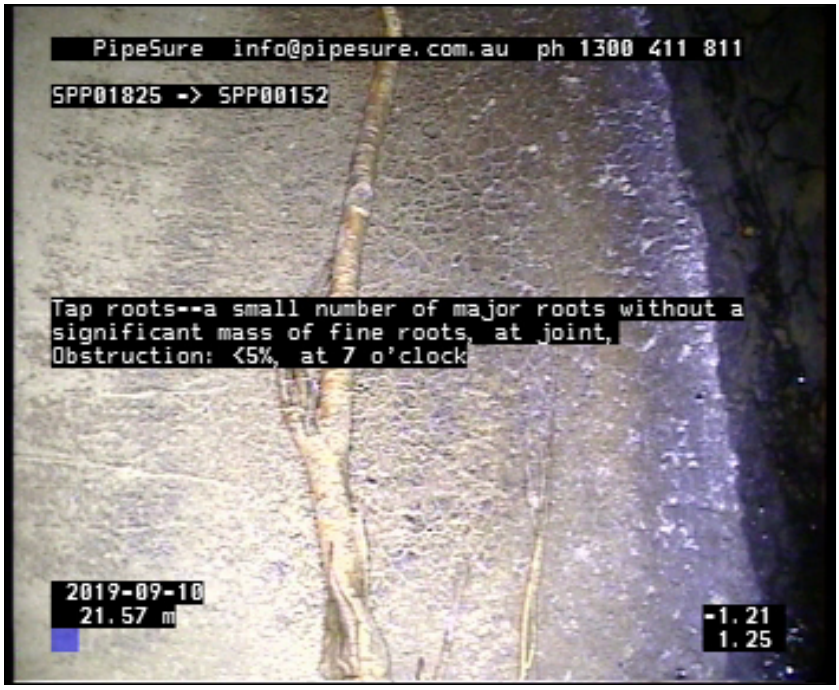

Photo: 1_9A, Media No:: 100919_1, 00:07:24
21.57m, Tap roots--a small number of major roots without a significant mass of fine roots, at joint, Obstruction: <5%, at 7 o'clock

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
5-7 gulliver st		**10/09/2019**	**1**	**SPI13788**

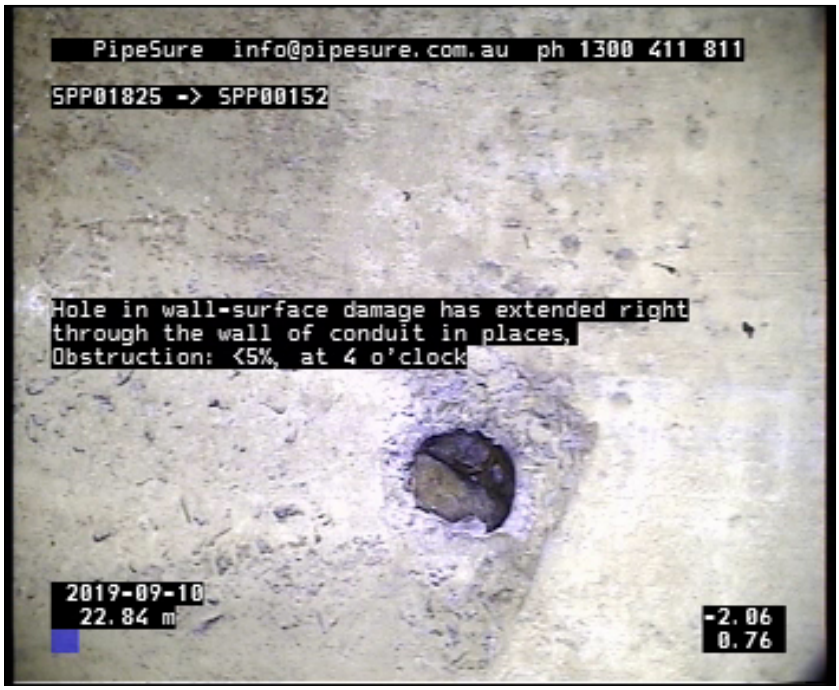

Photo: 1_10A, Media No:: 100919_1, 00:07:49
22.84m, Hole in wall-surface damage has extended right through the wall of conduit in places, Obstruction: <5%, at 4 o'clock

Photo: 1_11A, Media No:: 100919_1, 00:08:42
24.06m, Tap roots--a small number of major roots without a significant mass of fine roots, at joint, Obstruction: <5%, at 7 o'clock

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
5-7 gulliver st		**10/09/2019**	**1**	**SPI13788**

Photo: 1_12A, Media No:: 100919_1, 00:09:06
26.44m, General comment, some surface cracking< less then 0.15mm / some surface cracking< less then 0.15mm

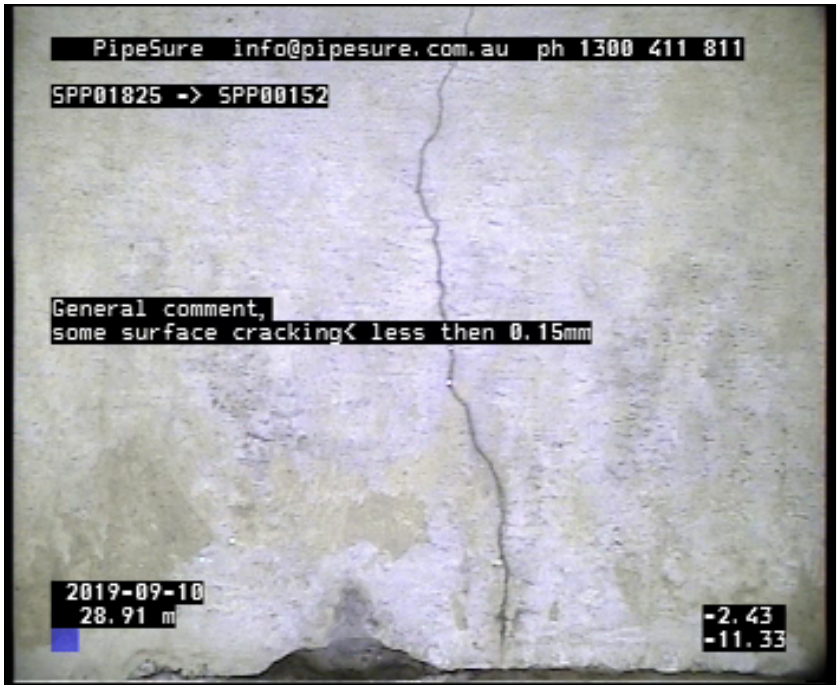

Photo: 1_13A, Media No:: 100919_1, 00:09:56
28.91m, General comment, some surface cracking< less then 0.15mm / some surface cracking< less then 0.15mm

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
5-7 gulliver st		**10/09/2019**	**1**	**SPI13788**

Photo: 1_14A, Media No:: 100919_1, 00:10:56
31.44m, Steel reinforcement is visible with little or no corrosion evident, at joint, at 12 o'clock

Photo: 1_15A, Media No:: 100919_1, 00:11:33
32.78m, Deposits in the invert, gravel or rubble, Obstruction: 5-20%, from 4 o'clock, to 7 o'clock, large rubble in the invert obstucting / large rubble in the invert obstucting

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
5-7 gulliver st		**10/09/2019**	**1**	**SPI13788**

Photo: 1_15B, Media No:: 100919_1, 00:11:33
32.78m, Deposits in the invert, gravel or rubble, Obstruction: 5-20%, from 4 o'clock, to 7 o'clock, large rubble in the invert obstucting / large rubble in the invert obstucting

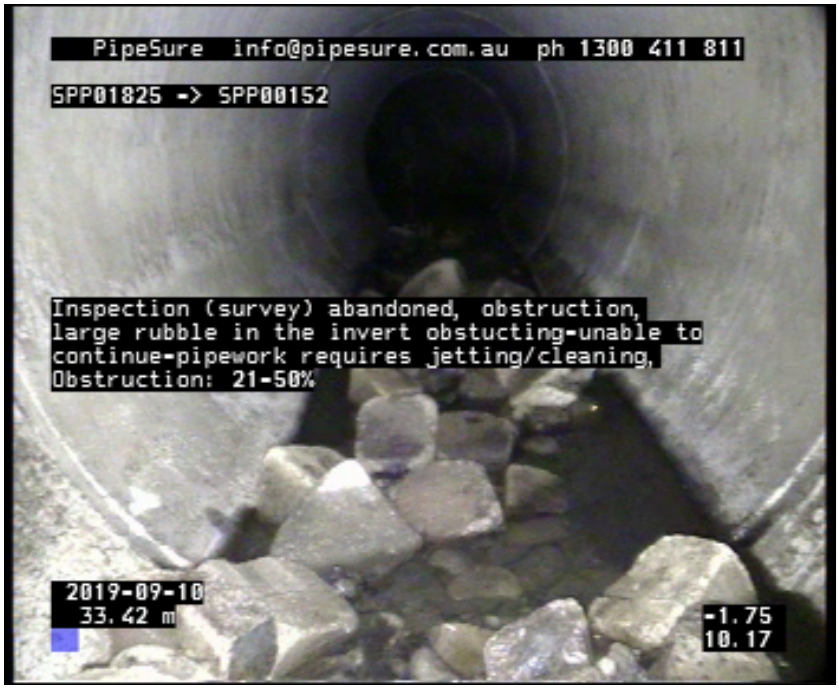

Photo: 1_16A, Media No:: 100919_1, 00:11:58
33.42m, Inspection (survey) abandoned, obstruction, large rubble in the invert obstucting-unable to continue-pipework requires jetting/cleaning, Obstruction: 21-50% / large rubble in the invert obstucting-unable to continue-pipework requires jetting/cleaning

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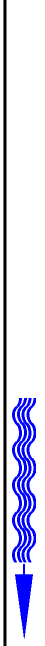
WSA assessment

Date:	Asset owner's job ref.:	Asset Owner:	Operator :	Section number:	Pipe Asset Id:
27/08/2019	**2570**	**Total Surveying Solutions**	**Matthew Ireland**	**2**	**SPI13808**
Time of inspection:	Cleaning:	Standard:	LRP	Conduit Unit Length	Method of Inspection
10:13:00	**not cleaned**	**WSA_05_2008_2.2**	**Centre of Start Node**		**Manned**

Town:		Catchment:		US MH:	**SPP01825**
Suburb:	**Brookvale**	Asset Owner:	**Total Surveying Solutions**	Survey Dir:	**downstream**
Street:	**2-8 old pitwater rd brookvale public school**	Precipitation.:	**No**	DS MH:	**SPP00152**
Asset Location	**Private property, industrial site**	Flow control	**No measures**	Inspect Lenght :	**56.21 m**

Purpose of inspection :	**Locating a conduit, connection or a maintenance structure**	Shape :	**Circular**
Use of Conduit:	**Drain**	Dia/Height:	**825 mm**
Type of Conduit:	**Storm water drain**	Lining:	
Lining Method:		Pipe Material:	**Reinforced concrete**

Remarks : **stormwater inspection**



1:450 Position	Code	Observation	Str Rate	
SPP01825				
0.00	STMH	Start node, maintenance hole, Nodename:, SPP01825		 0 m
12.90	WLC	Water level, clear flow (the invert is visible), 5 %, flow from recent storm		
17.50	BM	Breaking, some pieces are missing, length of break: 100mm, at 12 o'clock	60	 17.5 m
17.67	CI	Intruding connection, magnitude of intrusion: 5-20%, at 11 o'clock, 100mm pvc		
17.67	CI	Intruding connection, magnitude of intrusion: 5-20%, at 11 o'clock, 100mm pvc		 17.67 m
38.40	LL	The conduit curves to the left, length: 2 mm		
39.90	JDL	Joint displaced longitudinaly, longitudinal displacement: 21-30mm, at 9 o'clock	2	 17.67 m
49.02	DES	Deposits in the invert, Fine sediments, sand or silt, Obstruction: 5-20%, at 6 o'clock		
49.02	GC	General comment, simple surface cracking<less then 0.15mm		
54.94	OBZ	Obstruction, some other object is lying in the invert, at 6 o'clock, debris blockage at pit invert, Obstruction: 21-50%		 38.4 m
56.21	FHMH	Finish node, maintenance hole, Nodename:, SPP00152, burried pit		
SPP00152				

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
2	**60**	**1.1**	**62**	**5**	**4**	**60**	**2.31**	**130**	**5**

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**2**	**SPI13808**

Photo: 1_1B, Media No:: 280819_1, 00:00:12
0m, Start node, maintenance hole, Nodename:, SPP01825

Photo: 1_3A, Media No:: 280819_1, 00:05:35
17.5m, Breaking, some pieces are missing, length of break: 100mm, at 12 o'clock

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**2**	**SPI13808**

Photo: 1_4A, Media No:: 280819_1, 00:05:50
17.67m, Intruding connection, magnitude of intrusion: 5-20%, at 11 o'clock, 100mm pvc / 100mm pvc

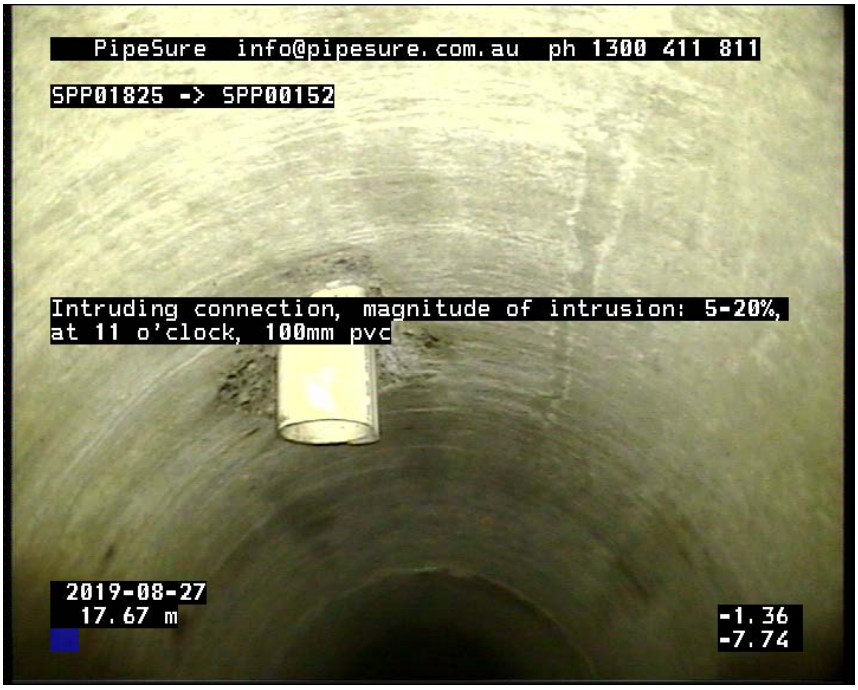

Photo: 1_5A, Media No:: 280819_1, 00:05:50
17.67m, Intruding connection, magnitude of intrusion: 5-20%, at 11 o'clock, 100mm pvc / 100mm pvc

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**2**	**SPI13808**

Photo: 1_6B, Media No:: 280819_1, 00:10:54
38.4m, The conduit curves to the left, length: 2 mm

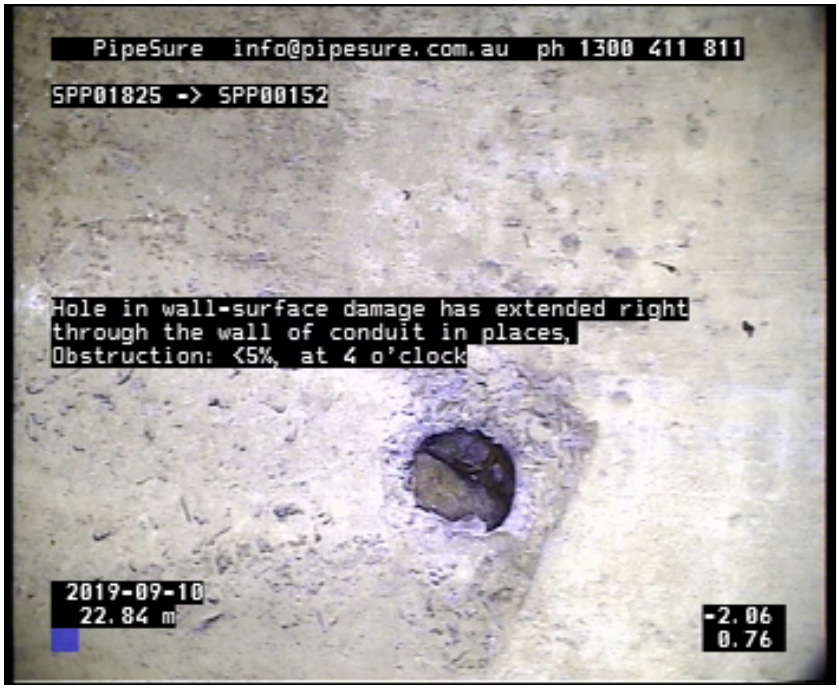

Photo: 1_10A, Media No:: 280819_1, 00:15:39
54.94m, Obstruction, some other object is lying in the invert, at 6 o'clock, debris blockage at pit invert, Obstruction: 21-50% / debris blockage at pit invert

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**2**	**SPI13808**

Photo: 1_11A, Media No:: 280819_1, 00:17:22
56.21m, Finish node, maintenance hole, Nodename:, SPP00152, burried pit / burried pit

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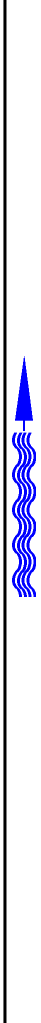
WSA assessment

Date:	Asset owner's job ref.:	Asset Owner:	Operator :	Section number:	Pipe Asset Id:
27/08/2019	**2570**	**Total Surveying Solutions**	**Matthew Ireland**	**3**	**SPI04508**
Time of inspection:	Cleaning:	Standard:	LRP	Conduit Unit Length	Method of Inspection
12:43:00	**not cleaned**	**WSA_05_2008_2.2**	**Inside Face of the Wall**		**Manned**

Town:		Catchment:		US MH:	**SPP00479**
Suburb:	**Brookvale**	Asset Owner:	**Total Surveying Solutions**	Survey Dir:	**upstream**
Street:	**2-8 old pitwater rd brookvale public school**	Precipitation.:	**No**	DS MH:	**SPP01825**
Asset Location	**Private property, industrial site**	Flow control	**No measures**	Inspect Lenght :	**15.30 m**

Purpose of inspection :	**Locating a conduit, connection or a maintenance structure**	Shape :	**Circular**
Use of Conduit:	**Drain**	Dia/Height:	**375 mm**
Type of Conduit:	**Storm water drain**	Lining:	
Lining Method:		Pipe Material:	**Reinforced concrete**

Remarks : **stormwater inspection**



1:135 Position	Code	Observation	Str Rate
SPP00479			
0.00	STMH	Start node, maintenance hole, Nodename:, SPP01825	
0.02	JDL	Joint displaced longitudinaly, longitudinal displacement: >30mm, at 11 o'clock	5
0.14	RVP	Steel reinforcement is visible and projecting into the conduit, at joint , from 10 to 2 o'clock	
1.49	JDA	Joint displaced angular, angular displacement 15 °, at 10 o'clock	
3.54	LR	The conduit curves to the right, length: 500 mm	
4.24	JDA	Joint displaced angular, angular displacement 10 °, at 11 o'clock	
4.72	JIZ	Jointing material intrusion, concrete, reduction in cross sectional area: <5%, at 6 o'clock	0
9.55	JDA	Joint displaced angular, angular displacement 15 °, at 11 o'clock	
12.19	BM	Breaking, some pieces are missing, length of break: 100mm, at 12 o'clock, with reinforcement visible	60
13.18	CNPO	Connection, poor workmanship, connection appears to be open, height: 225 mm, width: 0 mm, at 8 o'clock	
15.30	FHMH	Finish node, maintenance hole, Nodename:, BURIED PIT	
SPP01825			

0.02 m

0.14 m

1.49 m

3.54 m

4.24 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
3	**60**	**4.25**	**65**	**5**	**0**	**0**	**0**	**0**	**1**

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**3**	**SPI04508**

Photo: 3_2A, Media No:: 280819_1, 00:00:39
0.02m, Joint displaced longitudinaly, longitudinal displacement: >30mm, at 11 o'clock

Photo: 3_3A, Media No:: 280819_1, 00:08:37
0.14m, Steel reinforcement is visible and projecting into the conduit, at joint , from 10 to 2 o'clock

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**3**	**SPI04508**

Photo: 3_4A, Media No:: 280819_1, 00:01:38
1.49m, Joint displaced angular, angular displacement 15 °, at 10 o'clock

Photo: 3_5A, Media No:: 280819_1, 00:02:22
3.54m, The conduit curves to the right, length: 500 mm

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**3**	**SPI04508**

Photo: 3_6A, Media No:: 280819_1, 00:02:53
4.24m, Joint displaced angular, angular displacement 10 °, at 11 o'clock

Photo: 3_7A, Media No:: 280819_1, 00:03:08
4.72m, Jointing material intrusion, concrete, reduction in cross sectional area: <5%, at 6 o'clock

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**3**	**SPI04508**

Photo: 3_9A, Media No:: 280819_1, 00:06:56
12.19m, Breaking, some pieces are missing, length of break: 100mm, at 12 o'clock, with reinforcement visible / with reinforcement visible

Photo: 3_10A, Media No:: 280819_1, 00:07:45
13.18m, Connection, poor workmanship, connection appears to be open, height: 225 mm, width: 0 mm, at 8 o'clock

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
2-8 old pitwater rd brookva		**27/08/2019**	**3**	**SPI04508**

Photo: 3_11A, Media No:: 280819_1, 00:08:37
15.3m, Finish node, maintenance hole, Nodename:, BURIED PIT

Photo: 3_11B, Media No:: 280819_1, 00:08:37
15.3m, Finish node, maintenance hole, Nodename:, BURIED PIT

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WSA assessment

Date:	Asset owner's job ref.:	Asset Owner:	Operator :	Section number:	Pipe Asset Id:
27/08/2019	**2570**	**Total Surveying Solutions**	**Matthew Ireland**	**4**	**SPC30353_BOX CULVER**
Time of inspection:	Cleaning:	Standard:	LRP	Conduit Unit Length	Method of Inspection
02:09:00	**not cleaned**	**WSA_05_2008_2.2**	**Centre of Start Node**		**Manned**

Town:		Catchment:		US MH:	**SPP00170**
Suburb:	**Brookvale**	Asset Owner:	**Total Surveying Solutions**	Survey Dir:	**upstream**
Street:	**5-7 gulliver st**	Precipitation.:	**No**	DS MH:	**SPP01825**
Asset Location	**Private property, industrial site**	Flow control	**No measures**	Inspect Lenght :	**21.21 m**

Purpose of inspection :	**Routine Inspection**	Shape :	**Rectangular**
Use of Conduit:	**Culverted watercourse**	Dia/Height:	**900 mm**
Type of Conduit:	**Storm water drain**	Lining:	
Lining Method:		Pipe Material:	**Concrete segments**

Remarks : **box culvert-1200x900mm**

1:180 Position	Code	Observation	Str Rate
SPP00170			
0.00	STMH	Start node, maintenance hole, Nodename:, SPP01825	
0.36	WLC	Water level, clear flow (the invert is visible), 5 %, from recent storm	
17.58	LR	The conduit curves to the right, length: 1000 mm	
19.49	IS	Infiltration, sweating--slow ingress of water, no visible drips, from 12 o'clock, to 12 o'clock, at the joint<less then 5%	
21.21	FHMH	Finish node, maintenance hole, Nodename:, SPP00170	
SPP01825			

17.58 m

17.58 m

19.49 m

21.21 m

STR no def	STR peak	STR mean	STR total	STR grade	SER no def	SER peak	SER mean	SER total	SER grade
0	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**1**

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
5-7 gulliver st		**27/08/2019**	**4**	**SPC30353_BOX CULVERT**

Photo: 4_3A, Media No:: 280819_1, 00:05:03
17.58m, The conduit curves to the right, length: 1000 mm

Photo: 4_3B, Media No:: 280819_1, 00:05:03
17.58m, The conduit curves to the right, length: 1000 mm

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Inspection Pictures

Location/Street	Town or suburb:	Date :	Section number:	Sewer Ref.:
5-7 gulliver st		**27/08/2019**	**4**	**SPC30353_BOX CULVERT**

Photo: 4_4A, Media No:: 280819_1, 00:05:40
19.49m, Infiltration, sweating--slow ingress of water, no visible drips, from 12 o'clock, to 12 o'clock, at the joint<less then 5% / at the joint<less then 5%

Photo: 4_5A, Media No:: 280819_1, 00:06:09
21.21m, Finish node, maintenance hole, Nodename:, SPP00170

Knox Advanced Engineering
ACN 090 907 789

Unit 6 31-33 Hume Street
Crows Nest NSW 2065

T: (02) 800 33 100
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18th September 2019

D-11-267320C

Brookvale Public School
2-8 Old Pittwater Road
BROOKVALE NSW 2100

Dear Sir & Madam,

Re: Flood Report – Proposed New Building at 2-8 Old Pittwater Road, Brookvale, NSW

INTRODUCTION

I, Edward A. Bennett, practicing Civil, Structural, Geotechnical & Environmental Engineer hereby confirm that I inspected the above property for the purpose of providing a flood report for this property in respect to existing ground levels for ARI 1:100 rainfall events (1%AEP).

REPORT

The purpose for this flood report for No. 2-8 Old Pittwater Road, Brookvale, is to provide flood level for the development of new development and submission for development application. These works are adjacent to a council stormwater easement, not transecting the site. It is predicted that the flow path for the 1%AEP flood, will not enter our property along the North-East boundary.

We have relied upon the, contour maps, provided by Northern Beaches Council's website refer ***Appendix "A"***, and local Survey details determining contours and proportioning levels using the site plan & Survey provided by "TSS", refer ***Appendix "B".***

Reference is made from information provided by SIX Maps & near maps. Computations using HEC-RAS 5.0.1, refer ***Appendix "C"*** (for existing condition) and refer ***Appendix "D"*** (for the proposed new condition) to determine a top water level in this location for the 1%AEP storm event and how it may or may not effect out building slab height (RL 25.00m).

Parameter used in determining Discharge and over land flows using HEC RAS:

The discharge through the pipeline was calculated using

1. Rational method

   Q= CIA/360 = 0.8*266*4.848/360 = 2.8 m^3/s

   Where, C= 0.80, I = 266 mm/hr & A = 4.848ha

   The assumed catchment area (A) and the rainfall intensity (I) used for the calculation is shown in Fig 1 and Fig 2 resourced from SIX maps and BOM for this location.

2. Pipe Flow Advisor (From Manning's formula)

   Total Capacity of 900mm Stormwater Main = 2.6 m^3/s (for gradient 50H:1V)

Assuming 100% of blockage on the pipe (**CCTV footage report suggest of having debris in the pipe**) = 0% of 2.6m3/s = 0 m^3/s

Total possible Discharge for overland flow = 2.8 m^3/s – 0 m^3/s = 2.8 m^3/s.

Fig 1: Assumed Catchment Area

Home | IFD Table | IFD Chart | Coefficients | ARI | Print IFD table | Help IFD table

Intensity-Frequency-Duration Table

Location: 33.750S 151.275E Issued: 18/8/2019

Rainfall intensity in mm/h for various durations and Average Recurrence Interval

Duration	Average Recurrence Interval						
	1 YEAR	2 YEARS	5 YEARS	10 YEARS	20 YEARS	50 YEARS	100 YEARS
5Mins	97.9	126	160	180	206	240	266
6Mins	91.7	118	150	169	193	226	250
10Mins	75.1	96.7	124	140	161	188	209
20Mins	54.9	71.0	92.5	105	121	143	160
30Mins	44.6	57.9	76.0	86.6	101	119	133
1Hr	30.4	39.6	52.4	60.0	69.9	83.0	93.0
2Hrs	20.3	26.4	34.8	39.9	46.4	55.1	61.8
3Hrs	15.9	20.7	27.2	31.1	36.1	42.7	47.8
6Hrs	10.5	13.6	17.7	20.2	23.3	27.5	30.7
12Hrs	6.90	8.92	11.6	13.1	15.2	17.9	19.9
24Hrs	4.44	5.76	7.55	8.61	10.0	11.8	13.2
48Hrs	2.76	3.60	4.80	5.53	6.47	7.72	8.68
72Hrs	2.03	2.66	3.58	4.14	4.85	5.81	6.55

(Raw data: 39.66, 8.95, 2.66, 83.95, 17.84, 5.81, skew=0.00, F2=4.3, F50=15.87)

Copy Table

Fig 2: Rainfall Intesity

Results:

1%AEP Maximum Water Level: 24.16 AHD (Appendix "C" & "D")

From HEC-RAS model in Appendix "C" & "D", the maximum flood water level for the flow of 2.8m^3/s was found to be RL 24.40m at Station 35, RL 24.27m at Station 30, RL 24.22m at Station 25, RL 24.21m at Station 20, RL 24.19m at Station 15, RL 24.11m at Station 10, RL 24.01m at Station 5 & RL 23.93m at Station 0 (Downstream). Refer Appendix "B" for stations information.

Both HEC-RAS models, existing condition & proposed new condition (refer Appendix "C" & "D"), shows that the flood level for 1%AEP is same on both conditions and the proposed new building doesn't intercept with the flood path.

CONCLUSIONS:

It is our opinion that the flood water from 1%AEP, whilst not entering our property on the North Eastern Boundary provides greater than 500mm free board (600mm) having T.O.W. level of 1% AEP is 24.40m and the F.F.L. of new development is 25.00m.

Additionally,

- the new development will partially intercept the existing flow path of 1% AEP flood, however, flood levels are same and there is very minor change in velocity (0.08m/s max.) of flood on every station, therefore there is no net loss of flood storage.
- the existing flow path remain same after the new development even though it is partially incepting the natural flow path of 1% AEP resulting no changes in flood level and its velocity, therefore will not be a problem to our client's property, nor will the proposed development cause any impact to out neighbouring properties.
- flow path is partially intercepting the new development at northern side. From HEC-RAS model, the worse scenario is at station 20 where the depth of 1% AEP flood is 310mm. However, the structure of the new building consists of concrete footing (concrete footing beam and core-filled block work wall) and concrete ground floor slab, therefore the flood debris loading will not have any adverse effect on new development as the building is protected by concrete sub-structure.

We believe that we have covered every aspect of flooding in this area and would request an urgent decision by council for the development approval process to continue.

Yours faithfully,

E.A. Bennett M.I.E. Aust. Cp Eng. NPER 198230, Member AGS, BPB 0820

Appendix"A"

Fig 3: Contour Map

Appendix "B"

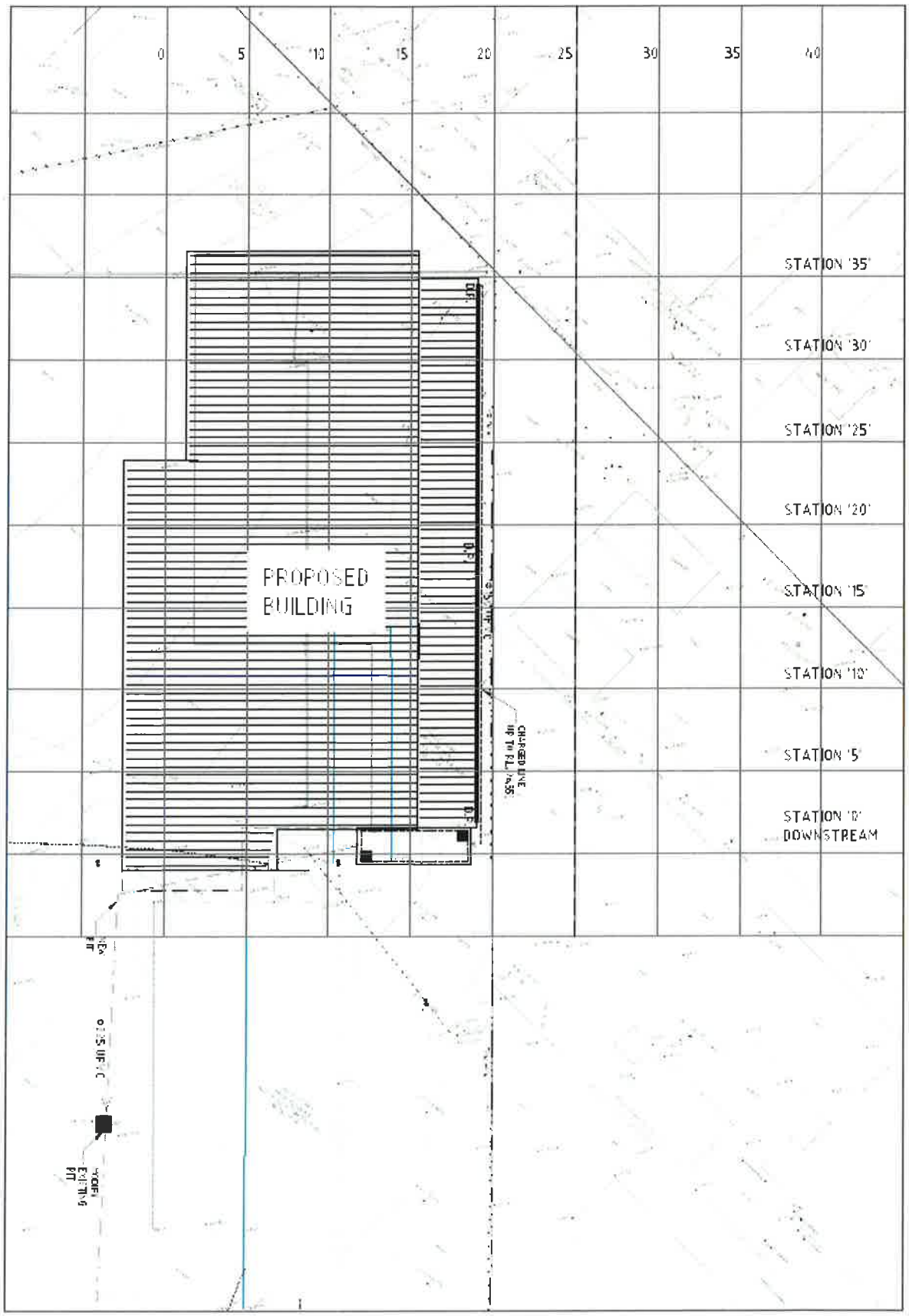

Fig 4: Site Plan

Fig 4a: Survey

Appendix "C"

HEC-RAS 5.0.1: Existing Condition

HEC-RAS 5.0.1 was used to predict the flood levels for ARI 1:100 (1%AEP) rainfall events. Cross sections are shown in Appendix "B" and are interpolations of survey levels at certain intervals, starting at Station 0 front end of proposed building (South-East side) and working backwards to Station 35 near the rear of proposed building (North-West Side) which is approx. 35m apart from Station 0. These survey level interpolations were used in the HEC-RAS model. The reach profile summaries are shown in the table below.

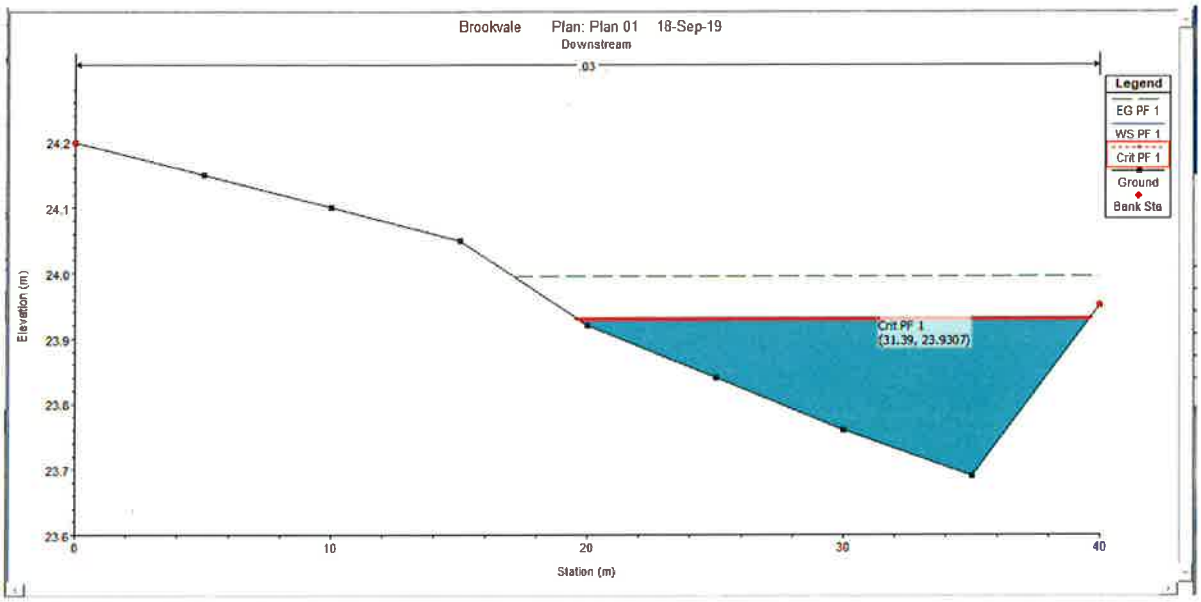

Fig 5: River Station 0

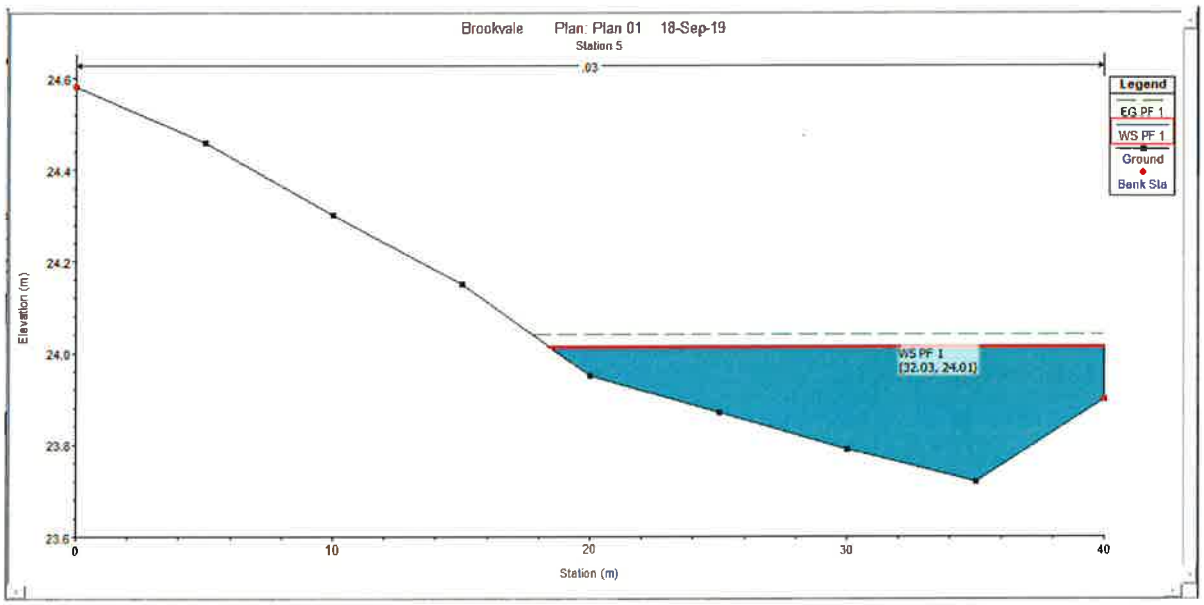

Fig 6: River Station 5

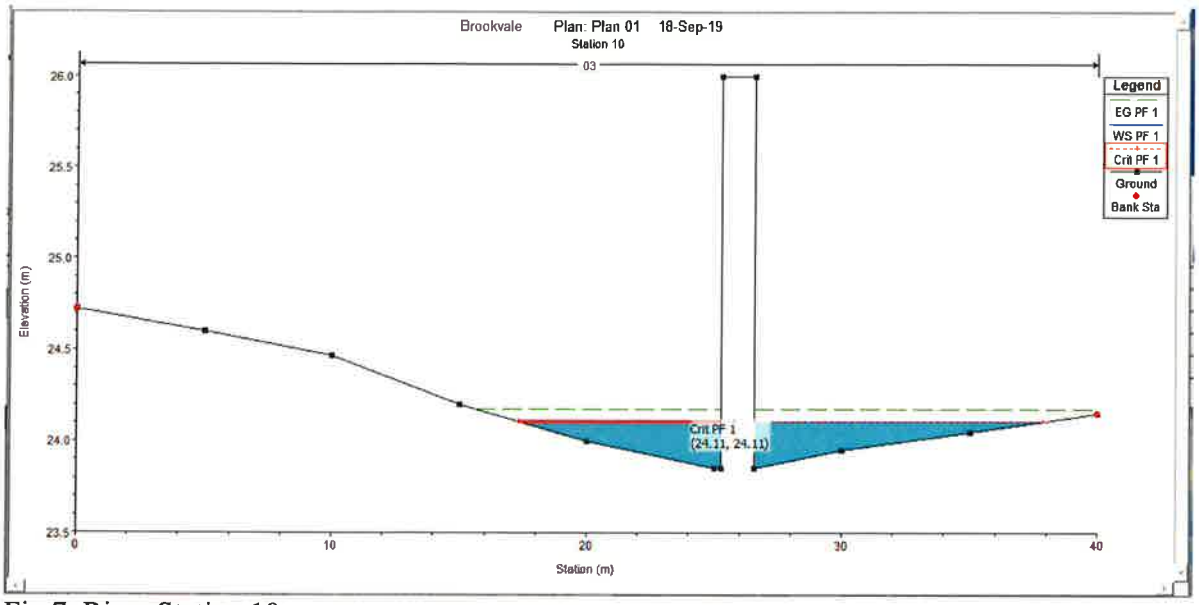

Fig 7: River Station 10

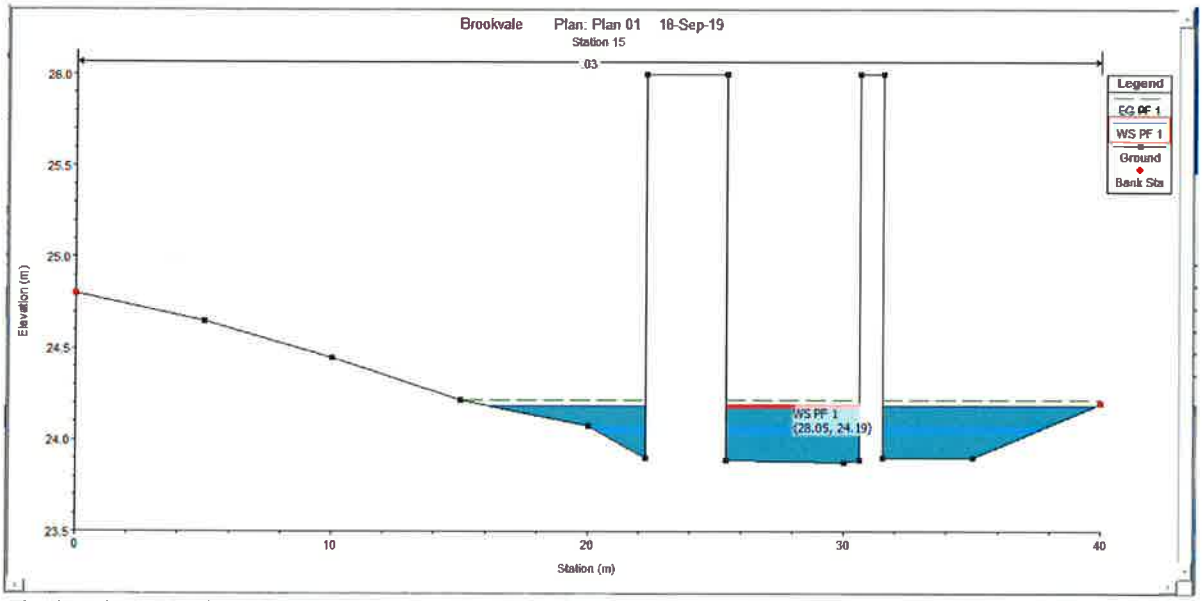

Fig 8: River Station 15

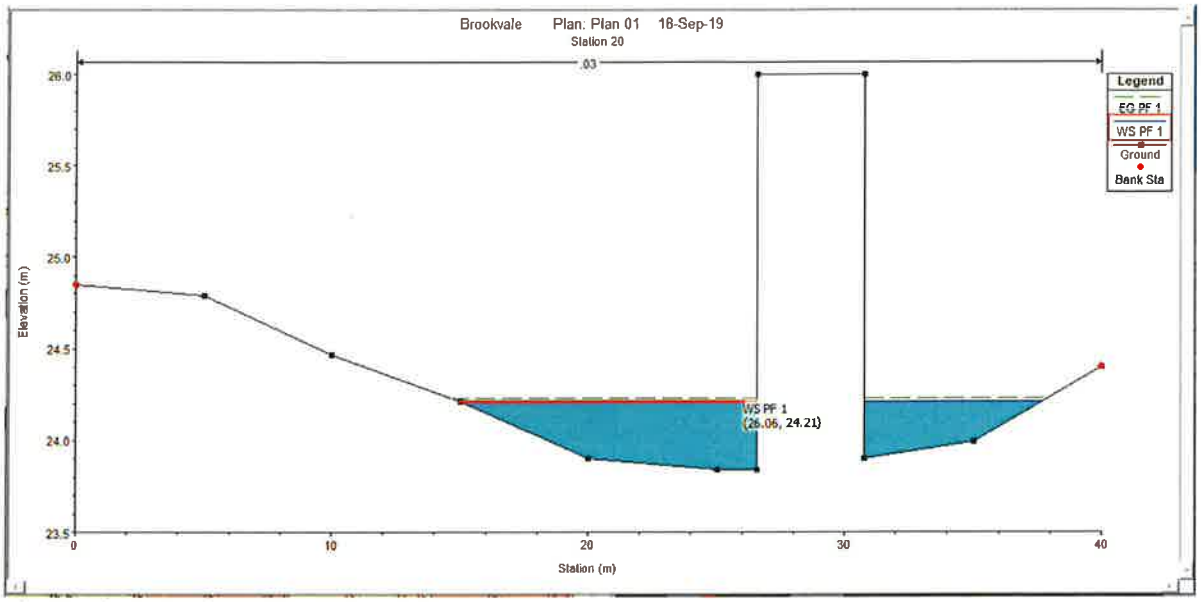

Fig 9: River Station 20

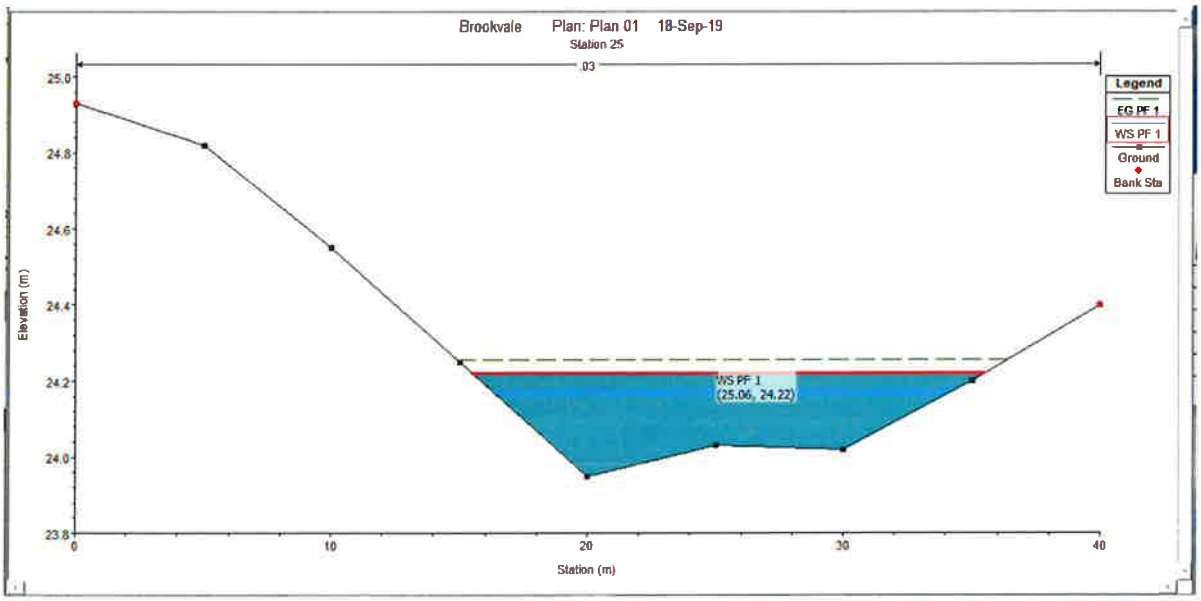

Fig 10: River Station 25

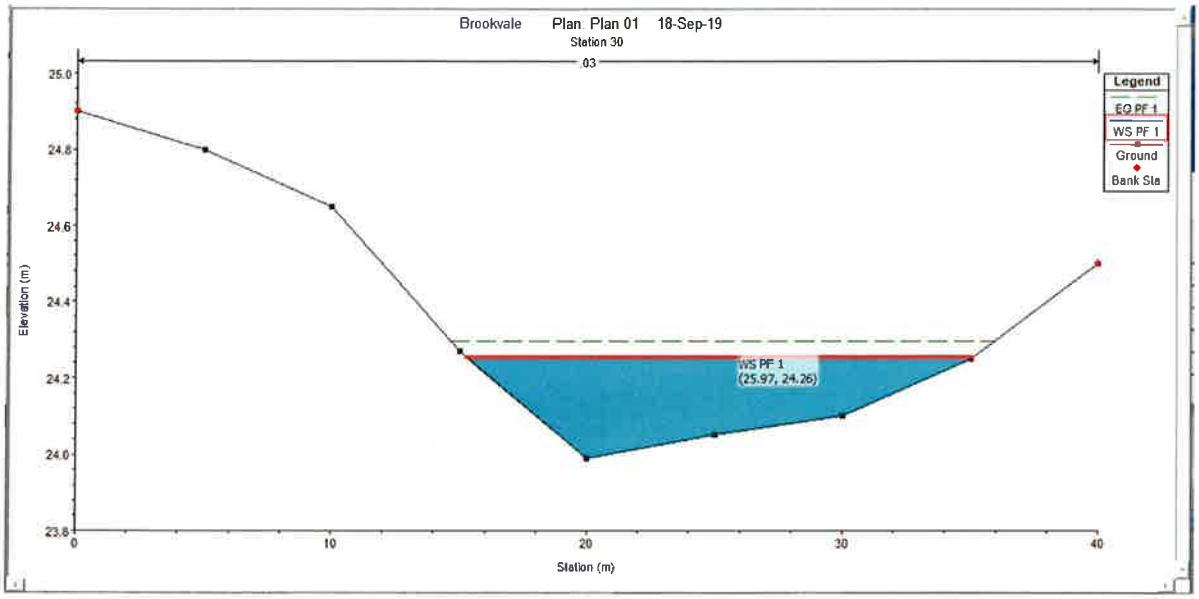

Fig 11: River Station 30

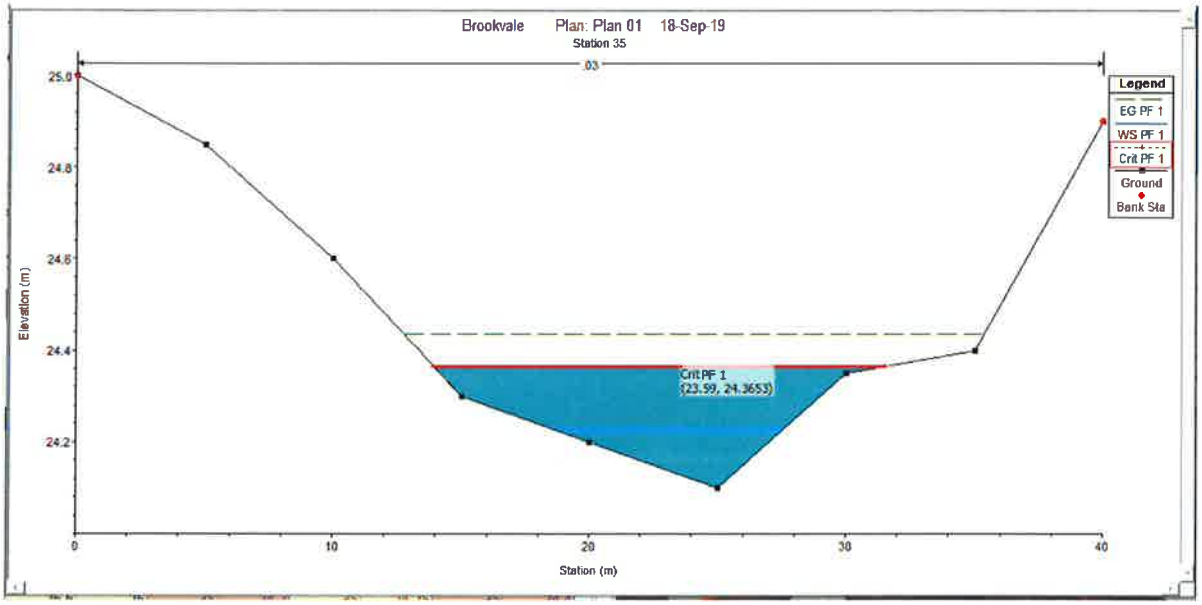

Fig 12: River Station 35

Reach	River Sta	Profile	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
1	35	PF 1	2.80	24.10	24.37	24.37	24.43	0.017420	1.16	2.40	17.64	1.01
1	30	PF 1	2.80	23.99	24.26		24.30	0.008492	0.90	3.13	19.88	0.72
1	25	PF 1	2.80	23.95	24.22		24.26	0.007368	0.86	3.27	19.97	0.68
1	20	PF 1	2.80	23.84	24.21		24.23	0.002401	0.62	4.51	18.54	0.40
1	15	PF 1	2.80	23.88	24.19		24.22	0.004092	0.70	3.97	19.73	0.50
1	10	PF 1	2.80	23.85	24.11	24.11	24.17	0.018682	1.14	2.47	19.29	1.01
1	5	PF 1	2.80	23.72	24.01		24.04	0.004982	0.74	3.80	21.60	0.56
1	0	PF 1	2.80	23.69	23.93	23.93	23.99	0.018235	1.12	2.50	20.04	1.02

Table: Profile summary

Appendix "D"

HEC-RAS 5.0.1: New Condition (Condition after Proposed Building)

HEC-RAS 5.0.1 was used to predict the flood levels for ARI 1:100 (1%AEP) rainfall events. Cross sections are shown in Appendix "B" and are interpolations of survey levels at certain intervals, starting at Station 0 front end of proposed building (South-East side) and working backwards to Station 35 near the rear of proposed building (North-West Side) which is approx. 35m apart from Station 0. These survey level interpolations were used in the HEC-RAS model. The reach profile summaries are shown in the table below.

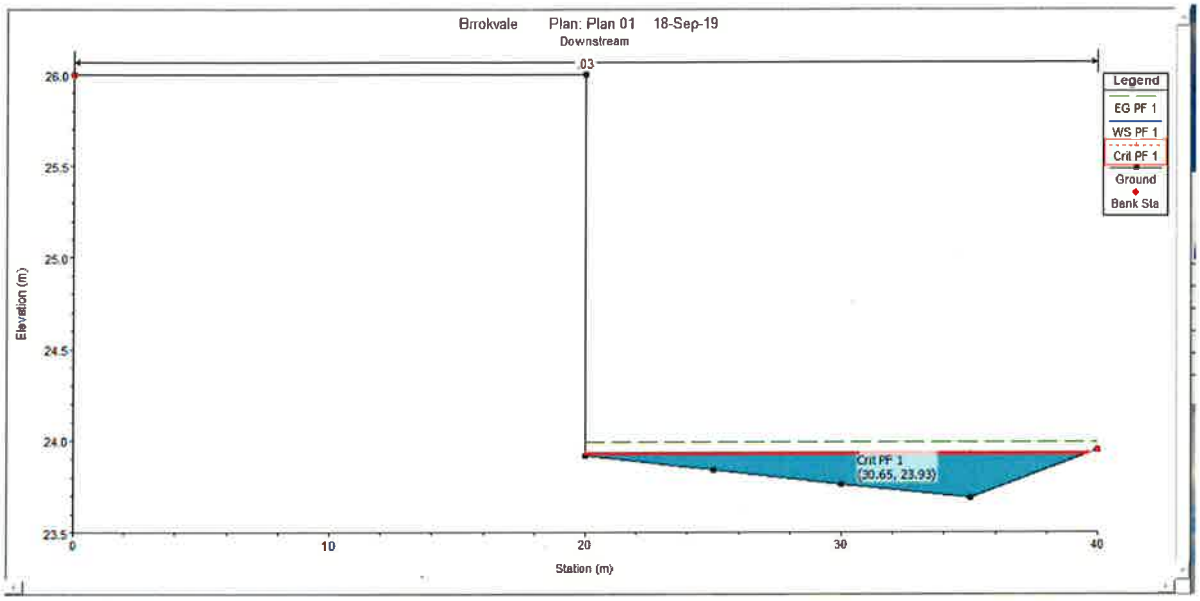

Fig 5: River Station 0

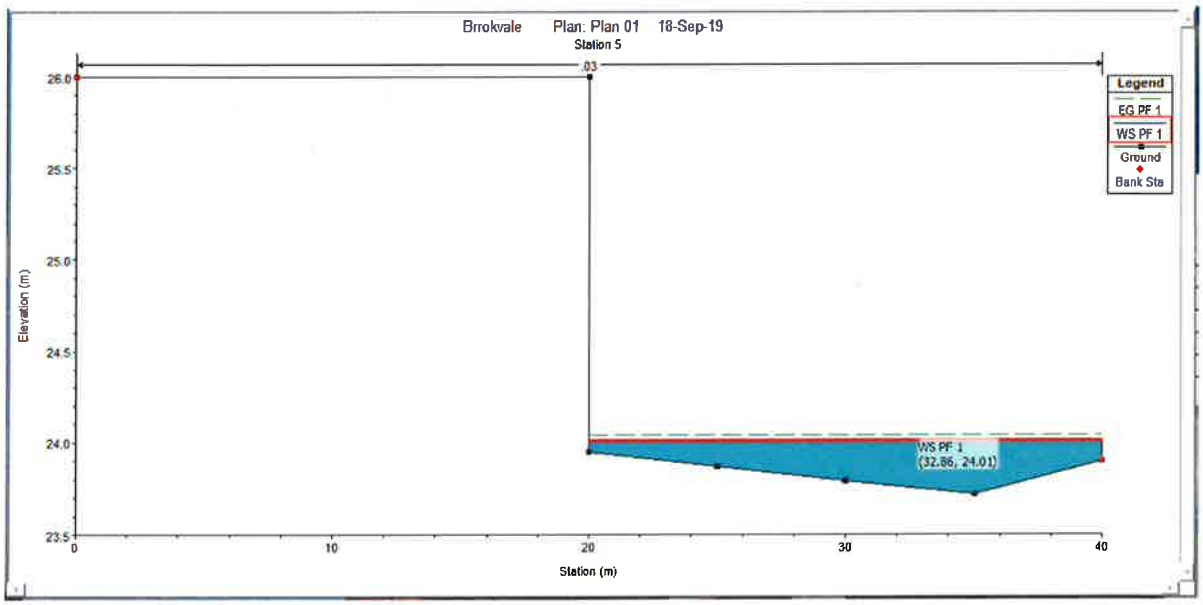

Fig 6: River Station 5

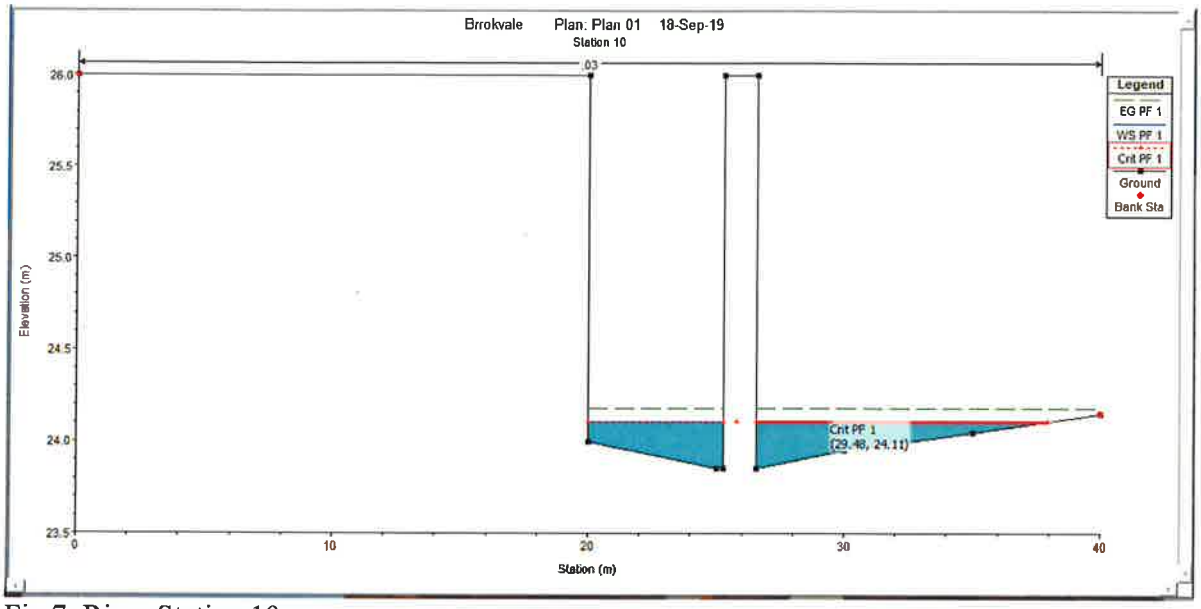

Fig 7: River Station 10

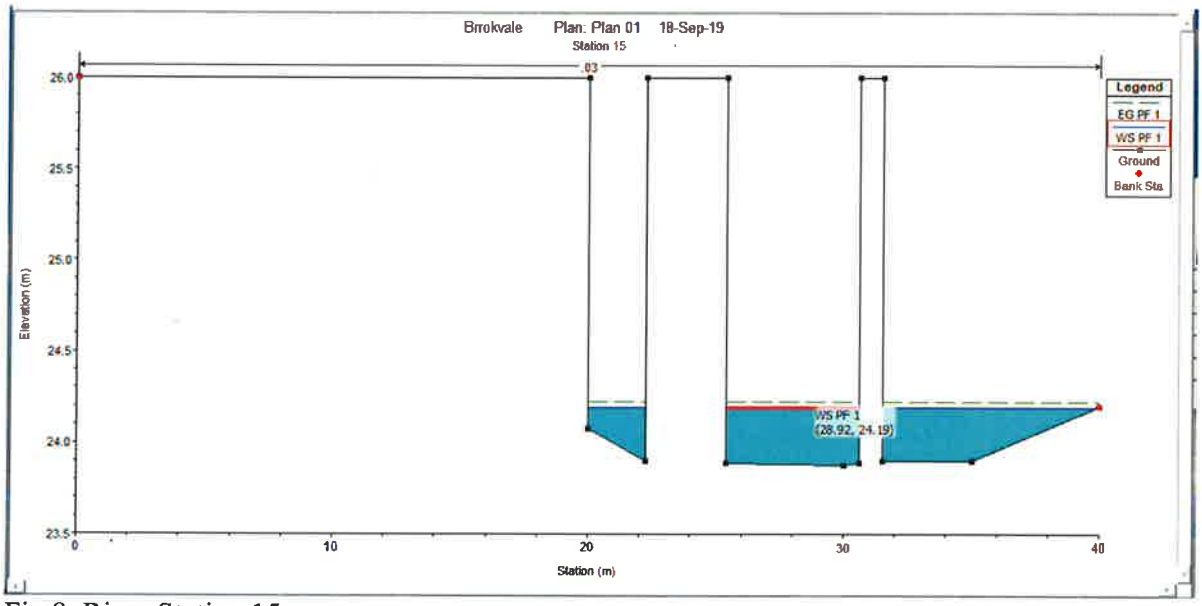

Fig 8: River Station 15

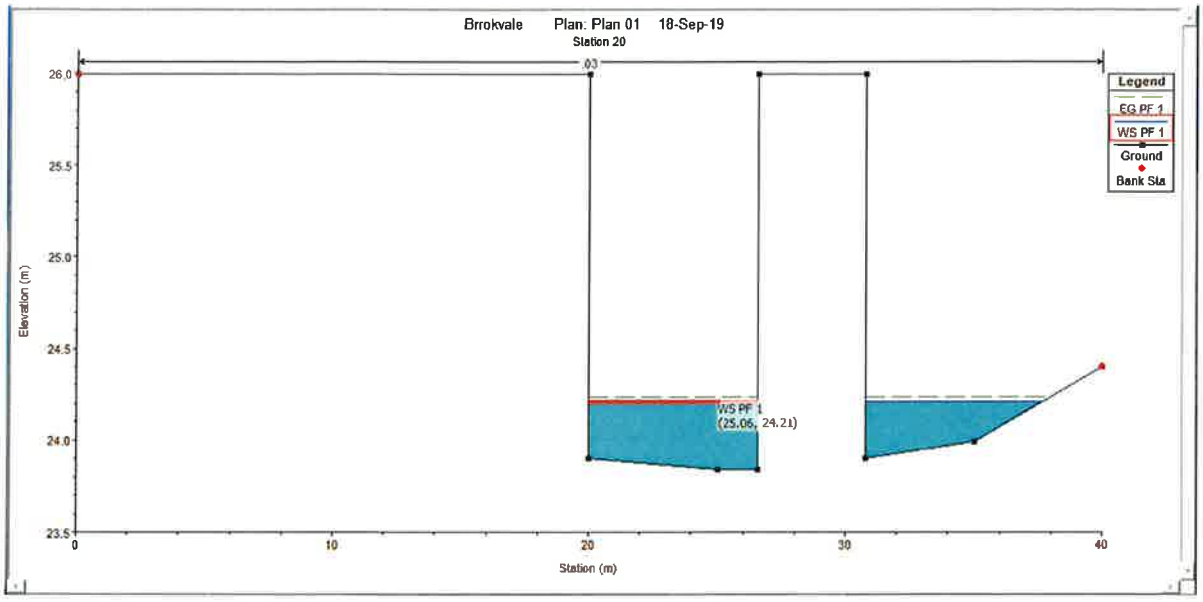

Fig 9: River Station 20

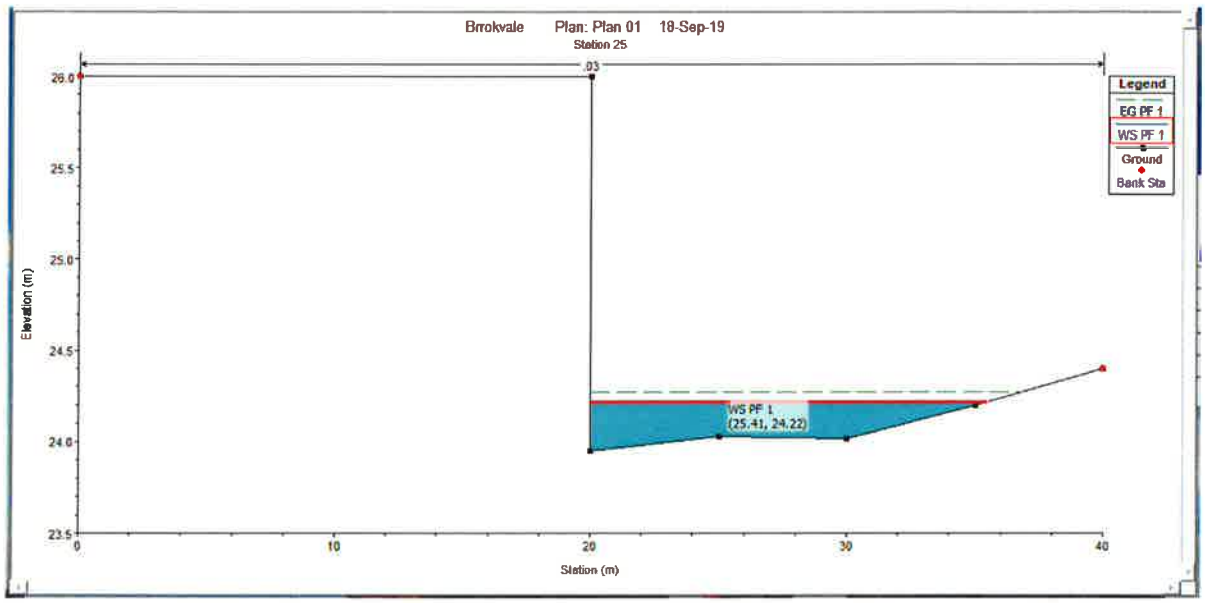

Fig 10: River Station 25

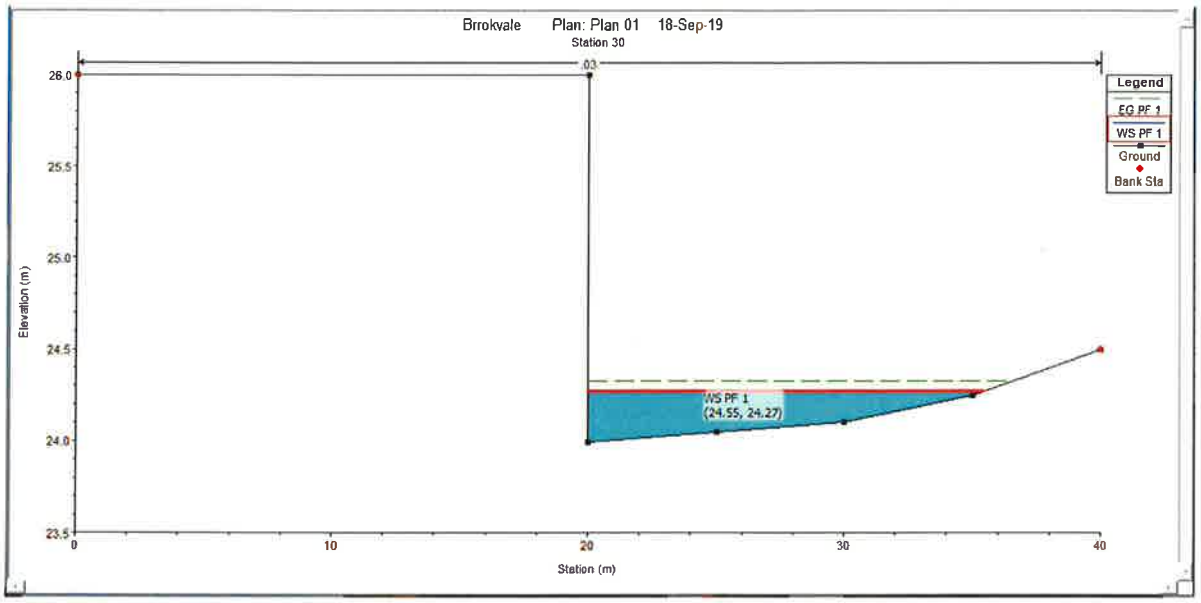

Fig 11: River Station 30

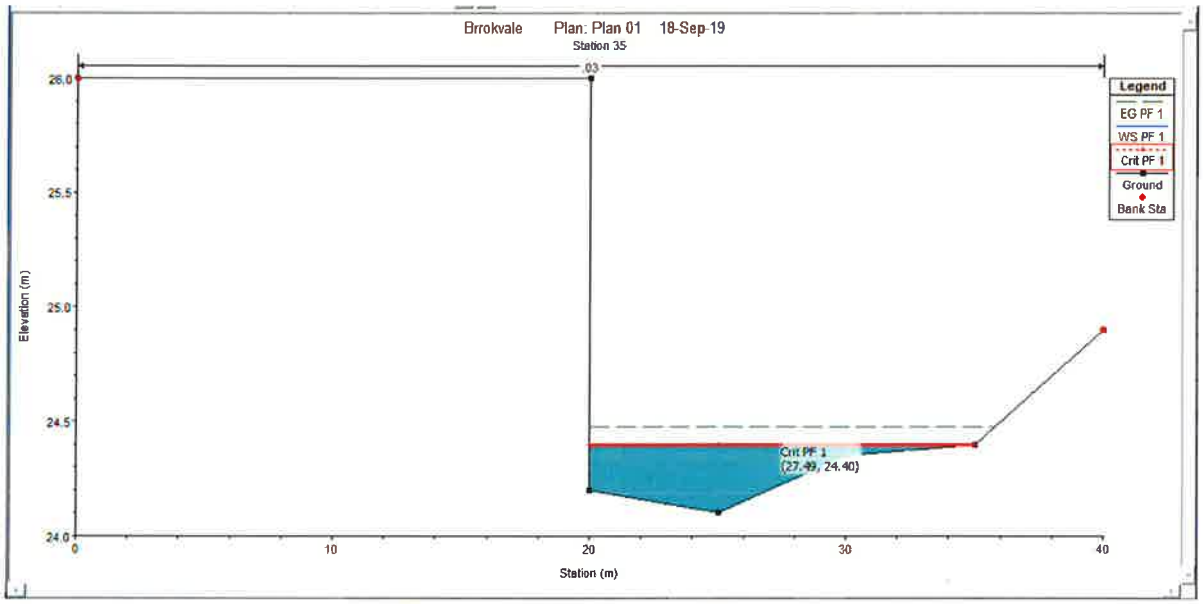

Fig 12: River Station 35

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
1	35	PF 1	2.80	24.10	24.40	24.40	24.48	0.017531	1.24	2.26	15.01	1.02
1	30	PF 1	2.80	23.99	24.27		24.33	0.009487	1.02	2.76	15.47	0.77
1	25	PF 1	2.80	23.95	24.22		24.27	0.010941	1.06	2.64	15.44	0.82
1	20	PF 1	2.80	23.84	24.21		24.24	0.003204	0.76	3.69	13.47	0.46
1	15	PF 1	2.80	23.88	24.19		24.22	0.003619	0.73	3.81	15.85	0.48
1	10	PF 1	2.80	23.85	24.11	24.11	24.18	0.018263	1.19	2.35	16.69	1.01
1	5	PF 1	2.80	23.72	24.01		24.04	0.004873	0.75	3.72	20.00	0.56
1	0	PF 1	2.80	23.69	23.93	23.93	24.00	0.018231	1.13	2.47	19.61	1.02

Table: Profile summary

KNOX ADVANCED ENGINEERING

Making the difficult, simple

NORTHERN BEACHES STORWATER REPORT CHECK LIST
KAE QA FORM No.: NOT APPLICABLE (not Formally adopted)

NORTHERN BEACHES STORWATER REPORT - CHECK LIST
Date: 18/09/2019, Rev_2

Review Item	Open	Closed	Comment
Stormwater Management Policy			
In accordance with Northern Beaches Council's Stormwater Management Policy section 9.3.			
9.3.1 Identify Overland Flows		Closed	Catchment area & rainfall data is used to find out potential overland flow. Refer Fig. 1 & Fig.2 from report D-11-267320B
9.3.2 Development on Land Subject to Overland Flows		Closed	Complies with flood related development control
9.3.3 Subdivision of Lot Affected by Overland Flows		Closed	N/A
9.3.4 Piping Overland Flows		Closed	N/A
Developments Needs to Demonstrate			
That floor levels are set at or above the Flood Planning Level,		Closed	FFL is 600mm clear from T.O.W. of 1% AEP
That there is no net loss of flood storage in a 1% AEP event,		Closed	the new development will partially intercept the existing flow path of 1% AEP flood, however, flood levels are same and there is very minor change in velocity (0.08m/s max.) of flood on every station, therefore there is no net loss of flood storage.
That the proposed development has no adverse impact on the flood regime for neighboring properties in a 1% AEP and Probable Maximum Flood event,		Closed	the existing flow path remain same after the new development even though it is partially incepting the natural flow path of 1% AEP resulting no changes in flood level and its velocity, therefore will not be a problem to our client's property, nor will the proposed development cause any impact to out neighbouring properties.
That the new development is designed to withstand the expected structural forces including debris loading in a 1% AEP event		Closed	flow path is partially intercepting the new development at northern side. From HEC-RAS model, the worse scenario is at station 20 where the depth of 1% AEP flood is 310mm. However, the structure of the new building consists of concrete footing (concrete footing beam and core-filled block work wall) and concrete ground floor slab, therefore the

			flood debris loading will not have any adverse effect on new development as the building is protected by concrete sub-structure.
Other			
Reference CCTV Condition Report		Closed	Done by other
Reference Survey by Others		Closed	Done by other

9.3 Overland Flow

Overland flow differs from mainstream flooding from creeks or lagoons as they are usually generated from surface run off and overflows from kerbs and smaller pipes, to more serious overland flows involving exceedance in the capacity of major trunk drainage systems.

9.3.1 Identifying Overland Flows

To determine if the subject property is affected by overland flow, a Civil Engineer who is currently registered on the National Professional Engineers Register (NPER), should be engaged to investigate and verify whether the subject property is affected by overland flows during a 1 in 100 ARI even. Council's Stormwater Planning Maps may assist identifying Council drainage in the vicinity of the property.

9.3.2 Development on Land Subject to Overland Flows

a) For development on properties subject to overland flow that has not been identified as being flood affected must comply with flood related development controls, in particular the Warringah Local Environment Plan 2011, Warringah Development Control Plan 2011 or Warringah Local Environmental Plan 2000, as appropriate.

b) Overland flow paths designed to contain a 1 in 100 year ARI storm flow are to be provided over all pipelines that are not designed to cater for this flow. The design of the overland flow path must consider the velocity-depth hazard.

c) Overland flow paths are to be kept free of obstruction and must not be landscaped with loose material that could be removed during a storm event, such as wood chip or pine bark.

9.3.3 Subdivisions on Lots Affected by Overland Flow

Proposed land subdivisions of lots affected by overland flow will not be approved unless the applicant can demonstrate that future development can comply with the requirements of the Warringah Local Environment Plan 2011, Development Control Plan 2011 or Warringah Local Environmental Plan 2000, as appropriate.

9.3.4 Piping Overland Flows

Developments proposing the collection and piping of overland flow through the subject property will generally not be permitted. Where an existing Council pipeline is to be diverted and/or upgraded, the design is to be in accordance with section 6 -
Building Over or Adjacent to Council Drainage Systems and Easements.

SARM | Architects
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Thursday, 11 April 2019
(as updated to address Council comments - Tuesday, 17 September 2019)
18004

Project: Brookvale Public School – New Hall

Design Certification: Architectural

Resulting from direction by School Infrastructure New South Wales (SINSW), SARM Architects have been appointed to design and document a new Hall building on the Brookvale Public School site. The provision of this facility is to address the inadequacy of the present facilities and not to response to any growth of the student or staff population.

Extensive research into the best location for the new School Hall has been undertaken, discussing options for the best position on site in the context of what is best for the school and the educational benefit of the students. The wider community, context, local landscape and built form have also been taken into account when assessing the location and formulating the design.

The Hall has been designed with extensive consideration to the *State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 Schedule 4 Schools – design quality principles*. The following principles have been addressed to ensure high quality design outcomes:

- Principle 1 — context, built form and landscape
- Principle 2 — sustainable, efficient and durable
- Principle 3 — accessible and inclusive
- Principle 4 — health and safety
- Principle 5 — amenity
- Principle 6 — whole of life, flexible and adaptive
- Principle 7 — aesthetics

Following is narrative that addresses the above principles and aided in the location, shaping and design of the New Hall at Brookvale Public School:

S.J. Arlom B.Arch RAIA
Nominated Responsible Architect
Registration No. 7645

R. M. McNamara B.Arch RAIA
Nominated Responsible Architect
Registration No. 7271

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Suite 4 | 7 Ridge Street | North Sydney 2060 | p +61 2 9922 2799 | f +61 2 9922 2755 | architects@sarm.com.au | www.sarm.com.au | ABN 26 000 663 623

Principle 1 — context, built form and landscape

Council Comment:

The built form, mass and scale of the proposed development demonstrates little consideration to the scale and amenity of the users of the site. Not only do the buildings fail to address the immediate context and school users through a considered and proportionate response to context and adjacent interfaces to the sports field and the wider community, they also bear little contextual response to the existing buildings on site.

The design does not respond adequately to the site context, the adjoining residential development and heritage buildings located within the site.

The scale of the proposed building requires strategies to soften, recede and break down the form to better relate to site and context. Smaller built form modules at either end of a central covered playing area could assist to reduce the impact of the bulk and scale, both internal and external to the site.

SARM DA Architectural Design Certificate:

The existing school site has limited spare open space and it was identified that the green playground area is a premium that cannot be compromised. The final position of the Hall continues the built form of the existing school buildings along the perimeter of the site providing an unobtrusive facility to the valued open play space of the oval to the centre of the school. This provides a protected, secure and easily supervised central area for students and potentially the wider community.

The functional design and built form has been considered at length and it is lower in height to the rear near the boundary. Internal planning is deliberate to provide facilities of lower scale to adjacent properties. This reduces and minimises the built mass to neighbouring properties. Roofs are sloping away from the boundary so that the lowest point of the built form is closest to neighbours minimising visual impact.

After exhaustive site research and numerous option studies it was considered acceptable to remove some mature trees to ensure there is no significant reduction in the functionality of the oval. The Hall is located in the most suitable location to preserve the valuable open space and not affect the functionality of the school. Close examination of site options reveals that other than positioning the Hall in the middle of the open play space there will be a requirement to remove trees.

The final location of the Hall allows a recreational playing field and does not inhibit the delivery of the educational curriculum for the school. The school is already heavily landscaped and the removal of these trees does not significantly reduce the landscaping amenity. Careful attention is also given to the retention of as much existing landscape as possible and tree protection zones outlined by appropriately qualified consultants have been applied to the proposed built form to ensure the healthy future of the retained trees. Further, a landscape plan has been prepared that includes the replacement of removed trees with suitable species in areas that are appropriate to the new Hall location.

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The Hall location and form has been designed within the setbacks and height limitations as prescribed by the council controls.

SARM Further response:

The Hall speaks to the Heritage building, with the use of light coloured bricks on the corner entry façade that faces the heritage building. This has been validated in the Heritage Report.

The scale of the building has been considered with the use of lower height building elements closest to the boundaries then step up in height to an acceptable hall height. Designing a hall with a lower roof height will feel disproportionate for the occupants.

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Principle 2 — sustainable, efficient and durable

Council Comment:
The building design does not optimise the orientation of the site and does not utlise cross ventilation as the back of the building does not open.

The location of the proposal in the rear north-eastern corner of the site limits future extension and flexibility of building works due to the adjacent sports field and side boundaries.

SARM DA Architectural Design Certificate:
Brickwork and prefinished external cladding has been selected for the Hall with colours that are sympathetic to the existing buildings on site. Brick selection to the area under the Covered Outdoor Learning Area (COLA) is reminiscent of the brickwork on the heritage item on the site and is a proven durable maintenance free material.

The Hall design includes high level windows that will allow the control of cross ventilation and the introduction of natural light to the deep space of the Hall. The location considers topography, orientation and climate to create the best atmosphere internally for the users of the hall, allowing for diffused light and natural ventilation whilst maintaining privacy.

The hall is designed using materials with low maintenance, long life and respectful to the existing heritage building to the south east corner of the site.

SARM Further response:
There are other building locations for classrooms on site which have options for extension should the school grow. The proposed Hall is in the Civic area (oval, library) of the school and provides great flexibility of function for the oval and for the hall.

The design of the hall includes scope for the school's flexibility through the use fold up doors allowing larger audiences to observe performances on the raised platform from the COLA area, and emhancing the connection between the hall and the oval extending active play.

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Principle 3 — accessible and inclusive

Council Comment:
Access and paths of travel have not been sufficiently documented to assess compliance. The current drawings show simple dashed lines to indicate 'desire lines' only. It is noted that the childcare facility is to be located at the furthermost corner of the site from any entry point to the school. Concern is raised that the location of the OSHC in this location will add additional time to parents/ caregivers drop off and

pick up. The proposal needs to demonstrate wayfinding strategies and compliance can be achieved.

SARM DA Architectural Design Certificate:
The hall is flexible and adaptive creating large openable doors for flexible use of the internal space, and also helps to bring the oval activities into an inside/ outside environment. Where there are level changes on site AS1428 compliant access is provided to ensure access and mobility to the Hall. There is an access toilet proposed within the Hall for the convenience of any users with disabilities.

The proposed Hall location is the least intrusive solution to ensure the preservation and maximisation of the open space that can potentially be shared with the wider community in accordance with the NSW Government's initiative to open grounds for community use.

The location allows the hall to be accessible and inclusive. Ramp, stair and oval access is easy to use, and continues the existing established pathway.

SARM Further response:
SARM has responded to Council's enquiry in 'SARM DA Architectural Design Certificate'. No further comments to make at this stage

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Principle 4 — health and safety

Council Comment:
In terms of CPTED principles the setback to the side boundary 0.9m runs for the full length of the building being approximately 35m. The space between the boundary fence and the building line poses a potential security and safety issues with lack of surveillance opportunities in this area.

SARM DA Architectural Design Certificate:
The building has been designed and located to allow open access from the Hall to the oval promoting connectivity. Access is on level ground and the Hall becomes an extension of the fresh open space with abundant light and ventilation.

Safe access to the Hall is provided within the grounds of the school and the building is remote from any car parking to avoid any clash with vehicles and pedestrians. Existing student amenities are close by and the school has sufficient existing facilities to cater for the existing student and staff population that is not planned to increase.

Amenity is improved with this hall location and design, eliminating existing loss of sight of children behind the existing library. Crime Prevention Through Environmental Design (CPTED) principles have been considered in placement of the hall near the boundary using fences to prohibit access behind the building.

SARM Further response:
SARM has responded to Council's enquiry in 'SARM DA Architectural Design Certificate'. No further comments to make at this stage.

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Principle 5 — amenity

Council Comment:
The built form and landscape interfaces should be clearly articulated rather than just a hard line edge as demonstrated on the drawings. Elements that allow for casual pause and rest or longer term periods of interaction should be reflected in the design of the edge conditions and interfaces to circulation and built form thresholds; low height seating integrated or emanating from the language and design intent of the overarching design strategy.

Further to this the retention of the larger trees currently documented to be removed should be investigated for their potential incorporation in the spatial planning arrangement as a central green courtyard and outdoor covered area.

SARM DA Architectural Design Certificate:
The proposed hall is in accordance with the Education Facilities Standards and Guidelines (EFSG) for a Core 21 primary school Hall and meets the requirements of the existing school population. There is no growth in student numbers and the Hall provides for the enrolment already within the school. The Hall will cater for school assemblies, gatherings and facilitate group learning. The Hall opens to a covered outdoor area that will allow overflow in the event of extended invitation to school functions and to support in educational initiatives that require either larger student attendance of greater floor space.

Accompanying the Hall is provision of Outside School Hours Care (OSHC) services. These facilities utilise the Hall with connectivity directly adjacent to the large Hall space and covered open space of the COLA. As indicated previously in this design statement the COLA opens onto the open play space to provide flexible learning opportunities for the Hall and oval.

The Hall is located in the North East corner of the site away from the potential source of traffic noise from the busy roadway of Old Pittwater Road. Acoustics have been taken into account to consider adjoining neighbours, focusing any possible school borne noise away from adjoining properties and back to within the school community.

The placing and orientation of the Hall enhances on-site amenity to the oval, and other buildings on site without significantly reducing the usable area of the school's valuable open play space.

SARM Further response:
The oval level is proposed to batter up to meet the line of the level of the COLA ensuring smooth easy pedestrian flow between the hall and the oval. The Landscape plan documents seating around the existing tree, next to the hall and the oval, creating reflective space allowing for casual pause and rest.

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Principle 6 — whole of life, flexible and adaptive

Council Comment:
The current built form and location allows for little future flexibility to accommodate innovative teaching and learning methods. Flexibility that allows for multiple uses and varying class sizes should be further investigated in the planning regime.

SARM DA Architectural Design Certificate:
The Hall design is flexible and adaptive affording large openable doors for flexible use. Oval and Hall activities are effortlessly blended to occur in an inside / outside environment that will be easily adapted by these mechanically controlled doors.

The floor level of the hall marries with the levels of the adjacent oval allowing for easy integration of school activities between the two spaces.

This agile space and the Hall will respond to future learning pedagogies and support any potential wider community engagement.

SARM Further response:
SARM has responded to Council's enquiry in 'SARM DA Architectural Design Certificate'. No further comments to make at this stage.

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Principle 7 — aesthetics

Council Comment:

The built form, mass and scale of the proposed development demonstrates little consideration to the scale and amenity of the users of the site. Whilst it is understood that the scale of the hall needs to provide for multiple functions, activities and varying capacities, the first impression is somewhat lacking in aesthetic value. Not only do the buildings fail to address the immediate context and school users through a considered and proportionate response to context and adjacent interfaces to the sports field and the wider community, they also bear little contextual response to the existing buildings on site.

The scale of the fascia across the whole building and extents of the roof, spanning approximately thirty five (35) metres, is overwhelmingly industrial and lacks any detailed consideration, articulation or refinement.

The depth of fascia to the awning/covered area measuring approximately 1 metre deep could better address the relationship with context and interface with the playing fields. Its projecting eave and depth of fascia should respond to the scale of the occupants in the space with a more considered response to the users – children / playful / joyous / optimistic / colourful / intimate in scale.

SARM DA Architectural Design Certificate:

The Hall building is designed to provide a modern contemporary facility for the school.

Materials and finishes are prefinished to reduce ongoing operation and maintenance expenses. External cladding is articulated to moderate the scale of the building making the bulk of a large hall building friendlier and appropriate for primary school students. Openings and fenestrations have been proportioned to match adjoining material joins balanced against the elevational treatment and the desire to keep the scale suitable.

Brickwork reminiscent of the heritage building is utilised for the "active" Hall entry facades to blend the building to the site whist still making a statement that 21st Century facility catering for the future of the school is provided. Upper level façade materials are prefinished and neutral in hue to play down the bulk of the building. A splash of colour with signage under the COLA facing the oval provides character and a subtle presence to the Hall drawing the eye to the main entry points.

Materials on the boundary elevations are deliberately muted to blend into the environment and selected to be visually unobtrusive to the adjoining properties. The facilities that afford lower ceiling heights are also planned to the perimeter of the site to lower the bulk and scale of the building closest to the boundary.

The building location and design has been formulated to enhance the contextual language within the site by continuing the line of structures along the perimeter of the site and preserving the valuable open green space. By not compromising or substantially reducing the oval size together with the position and design of the Hall, the activity and energy infused on this site by the open space contribute to the success of this proposal.

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SARM Further response:

The façade to the North Eastern (rear) side of the building is not designed to be a feature and is stepped down on the boundary side. The material selections are toned down and muted accordingly.

The scale and amenity of the users of the site and also neighbours have been considered. The Hall is a feature of the school, and is designed to be opening and welcome when one enters the school from the carpark and the entrance near the office. When the hall is approached, the COLA roof provides a sheltering canopy with skylights creating interesting light and shade on the COLA ground, with the focus is on the feature bricks and school coloured fibre cement cladding.

Yours sincerely

R.McN

Robert McNamara
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