Parramatta Local Environmental Plan 2011 Compliance Assessment

Clause	Requirement	Comment	Comply
1.8A	*Savings provisions relating to development applications*	The DA was lodged after gazettal of the Parramatta LEP 2011.	N/A
2.3	*Zone objectives and land use table*		
	RE1 – Public Recreation	The proposed development comprises *Community facilities*; *Recreation facilities (indoor); Recreation facilities (outdoor); Information and education facilities* and *Restaurants or cafes* which are all permissible with consent on land so zoned	Yes
	- To enable land to be used for public open space or recreational purposes.	The proposal provides for to continued use of the land for recreational purposes.	Yes
	- To provide a range of recreational settings and activities and compatible land uses.	The proposal contributes to the range of recreational purposes and other compatible uses.	Yes
	- To protect and enhance the natural environment for recreational purposes.	The proposal does not propose any development within a natural area.	N/A
	- To conserve, enhance and promote the natural assets and cultural heritage significance of Parramatta Park.	The proposal is not located within Parramatta Park.	N/A
	- To create a riverfront recreational opportunity that enables a high quality relationship between the built and natural environment.	The proposal is not located on the riverfront.	N/A
	W1 – Natural Waterways	Part of the site includes the Duck Creek channel which is zoned W1 – Natural Waterways. No works are proposed within that zone.	Yes
	- To protect the ecological and scenic values of natural waterways.	The proposal has a positive impact on the scenic value of Duck Creek as it passes the site.	Yes
	- To prevent development that would have an adverse effect on the natural values of waterways in this zone.	The proposal does not adversely impact on any natural value of Duck Creek.	Yes
	- To provide for sustainable fishing industries and recreational fishing.	Duck Creek does not support fishing.	N/A
	- To provide for cultural and scientific study of natural	The proposal does not prevent any study of Duck Creek.	N/A

	waterways.		
	- To enable works associated with the rehabilitation of land towards its natural state.	The proposal does not prevent rehabilitation from being carried out.	N/A
2.5	*Additional permitted uses*	The subject land is not mapped for any additional permitted uses.	N/A
2.6	*Subdivision – consent requirements*	No subdivision is proposed	N/A
2.7	*Demolition requires consent*	Consent is sought for demolition of structures as necessary	Yes
4.1	*Minimum subdivision lot size*	No subdivision is proposed	N/A
4.3	*Height of buildings*	No height of building control applies to the subject land.	N/A
4.4	*Floor space ratio*	No floor space ratio is applied to the subject land.	N/A
4.6	*Exceptions to development standards*	There is no breach of any development standard.	N/A
5.1	*Relevant acquisition authority*	The land is not earmarked for acquisition	N/A
5.6	*Architectural roof features*	The roof treatment is appropriate for the built form and context	Yes
5.10	*Heritage conservation*	The site contains 2 heritage items, being the Granville Swimming Pool and the Granville War memorial (items No. I150 and I151 respectively in Schedule 5 of the HLEP 2013). Granville RSL Club is located on the opposite side of Duck Creek and is listed as item No. I152.	Yes A Statement of Heritage Impact has been provided. No objection has been raised by Council's Heritage Advisor
6.1	*Acid sulphate soils*	The land is mapped as being affected by Class 4 acid sulphate soils	Yes An Acid Sulphate Soil Management Plan has been provide.
6.2	*Earthworks*	Significant excavation is not required however any minor excavation forms required to facilitate the development forms part of this DA.	Yes

6.3	*Flood planning*	The subject land is flood affected.	See comments from Council's Engineer
6.4	*Biodiversity protection*	The land is not mapped as being affected by biodiversity.	N/A
6.6	*Development on landslide risk land*	The land is not affected by landslide	N/A
6.7	*Foreshore building line*	The land is not mapped as having a foreshore building line	N/A
6.12	*Design Excellence*	The land is not mapped in a Design Excellence Area	N/A

No.	Required	Provided	Comply
2.	**Site Planning**		
2.4	**Site considerations**		
2.4.1	**Views and vistas**		
	Development is to preserve views of significant topographical features such as ridges and natural corridors, the urban skyline, landmark buildings, sites of historical significance and areas of high visibility, particularly those identified in Appendix 2 Views and Vistas.	The development does not detract from existing views of Duck Creek or the heritage listed pool building and war memorial.	Yes
	Buildings should reinforce the landform of the City and be designed to preserve and strengthen areas of high visibility. In some locations, this may be achieved through uniform heights and street walls as a means of delineating the public view corridor.	Building heights are appropriate and do not detract from the landform on the east side of Granville.	Yes
	Landscaping of streets and parks is to reinforce public view corridors.	The park areas around the site will be maintained and landscaped.	Yes
	Building design, location and landscaping is to encourage view sharing between properties.	The building design does not impact on views.	Yes
	Views to and from the public domain are to be protected.	The development maintains views to and from the public domain.	Yes
2.4.2	**Water Management**		
2.4.2.1	**Flooding**		
	New development should not result in any increased risk to human life.	See Engineering assessment.	Yes
	The additional economic and social costs which may arise from damage to property from flooding should not be greater than that which can reasonably be managed by the property owner, property occupants and general community.	See Engineering assessment.	Yes
	New development should only be permitted where effective warning time and reliable access is available for the evacuation of an area potentially affected by floods to an area free of risk from flooding. Evacuation should be consistent with any relevant flood evacuation strategy where in existence.	See Engineering assessment.	Yes

	Development should not adversely increase the potential flood affectation on other development or properties, either individually or in combination with similar developments that are likely to occur within the same catchment.	The development does not increase flood levels on other land.	Yes
	New developments must make allowances for motor vehicles to be relocated to an area with substantially less risk from flooding, within an effective warning time.	The car park is accessed via Diamond Avenue with easy access to higher ground.	Yes
	New developments must provide an evacuation plan detailing procedures that would be in place for an emergency (such as warning systems, signage or evacuation drills).	See Engineering assessment.	Yes
	Flood mitigation measures associated with new developments should not result in significant impacts upon the amenity of an area by way of unacceptable overshadowing of adjoining properties, privacy impacts (eg. by unsympathetic house raising) or by being incompatible with the streetscape or character of the locality (including heritage).	Flood mitigation measures do not result in significant amenity impacts.	Yes
	Proposals for raising structures must provide a report from a suitably qualified engineer demonstrating that the raised structure will not be at risk of failure from the forces of floodwaters.	N/A	N/A
	Development is to be compatible with any relevant Floodplain Risk Management Plan, Flood Studies, or Sub-Catchment Management Plan.	See Engineering assessment.	Yes
	Development must not divert flood waters, nor interfere with floodwater storage or the natural function of waterways.	See Engineering assessment.	Yes
	Filling of land up to 1:100 Average Recurrence Interval (ARI) (or flood storage area if determined) is not permitted. Filling of and above 1:100 ARI up to the Probable Maximum Flood (PMF) (or in flood fringe) must not adversely impact upon flood behaviour.	See Engineering assessment.	Yes
	New development must consider the impact of flooding resulting from local overland flooding	See Engineering assessment.	Yes

	whether it is a result of Local Drainage or Major Drainage.		
	Where hydraulic flood modelling is required, flow hazard categories should be identified and adequately addressed in the design of the development.	See Engineering assessment.	Yes
	Council strongly discourages basement car parks on properties within the floodplain.	No basement car park is proposed.	N/A
2.4.2.2	**Protection of Waterways**		
	Development is to make provision for buffer areas for the preservation and maintenance of floodway, riparian corridors and habitat protection. Refer to Clause 6.7 Foreshore Building Line and Clause 6.5 Water Protection in the *Parramatta LEP 2011.*	The area along Duck Creek is grassed and there is no habitat. The creek is channelised.	The setback to the channel is proposed to be landscaped to improve amenity.
	Development on land subject to Clause 6.5 Water Protection in the *Parramatta LEP 2011* or that abuts a waterway is to be landscaped with local indigenous species, to protect bushland and wildlife corridors and soften the interface between the natural landscape and the urban environment. Riparian vegetation also plays an important role in stabilising bed and banks and attenuating flood flows.	Landscaping is proposed to be planted around the perimeter of the development and the car park as well as within the car park.	Yes
	The piping, enclosing or artificial channelling of natural watercourses and drainage channels is not permitted. Consideration is to be given to re-opening piped or lined drainage systems wherever feasible.	The creek is already channelised. Opening the channel in that location is not supported as it could lead to erosion of the bank.	Yes
	Development is to ensure that natural channel design principles are incorporated in any works on or in waterways. Refer to Figure 2.8.	The creek is already channelised.	N/A
	Ongoing maintenance costs are to be considered in the design of any waterway protection features.	Advisory	N/A
2.4.2.3	**Protection of Groundwater**		
	Operating practices and technology including dewatering shall not contaminate groundwater or adversely impact on adjoining properties and infrastructure.	N/A	N/A
	Groundwater is to be recharged where possible while still protecting and/or enhancing groundwater quality.	N/A	N/A

	Protection measures for groundwater are to be proportional to the risk the development poses. Where the potential risk to groundwater is high, a separate Groundwater Impact and Management Report will be required.	N/A	N/A
2.4.3	**Soil Management**		
2.4.3.1	**Sedimentation**		
	Development is to be designed and constructed to integrate with the natural topography of the site so as to minimise the need for cut and fill.	Cut and fill is minimised with works being at grade.	Yes
	Soil loss from development is to be minimised through effective site management practices that reduce the impact of sedimentation on downstream waterways and drainage systems and that minimise wind blown soil loss.	Wind blown soil loss is unlikely through sealing or landscaping of surfaces.	Yes
	Development is to minimise site disturbance, including impact on vegetation and significant trees.	The amount of site disturbance is appropriate for a development of this scale.	Yes
	Development that is likely to result in erosion and sedimentation is to be accompanied by details of the proposed method of on-site erosion and sediment control. Such details are to follow the guidelines in the NSW Landcom (2004) Managing Urban Stormwater: Soils and Construction and Council's Design and Development Guidelines.	Erosion and sedimentation control can be maintained via a condition of consent.	Yes through condition of consent.
2.4.3.2	**Acid Sulphate Soils**		
	Development is to ensure that sites with potential to contain acid sulphate soils are managed in a manner consistent with the provisions contained in the Parramatta LEP 2011.	The site is noted as Class 4 Acid Sulphate Soils and as such consideration needs to be given to work 2m below ground level. An Acid Sulphate Soil Management Plan has been provided and can be called up via a condition of consent.	Yes, via condition of consent.
2.4.3.3	**Salinity**		
	Construction techniques are to be employed that prevent structural damage to the development as a result of salinity. Where the potential risk of salinity is identified by using the *Salinity Study Map for Western Sydney 2006*, further investigations in accordance with the *Western*	A report dealing with soil issues such as salinity and acidity has been provided which makes recommendations for dealing with such issues.	Yes

	Sydney Salinity Code of Practice 2003 are to be undertaken.		
	Protection measures to mitigate the impact of the development on soil salinity are to be employed.	As above	Yes
2.4.4	**Land contamination**		
	Prior to the submission of a development application an assessment is to be made by the applicant under Clause 7 of SEPP No. 55 as to whether the subject land is contaminated.	A Detailed Site Investigation was carried out by SESL Australia.	Yes
	Council under Clause 7 (1) of SEPP No. 55 must not consent to development unless it has considered whether land is contaminated, and if the land is contaminated is suitable for the proposed purpose or is satisfied that the land will be appropriately remediated. Where land is proposed to be subject to remediation, adequate documentation is to be submitted to Council supporting the categorisation.	A Detailed Site Investigation was carried out by SESL Australia which notes that some isolated areas containing elevated heavy metals and bonded asbestos were observed resulting from historical activities on the land. The report concludes that the site is suitable for the proposed development subject to the carrying out of remediation works.	Yes
2.4.5	**Air Quality**		
	Development that is likely to result in the emission of atmospheric pollutants, including odours, is to include operating practices and technology to ensure that the development does not contribute to increased air pollution.	The development is not likely to produce fumes or odours. The continued management of pool chemicals is required.	Yes
	Effective site controls during and after demolition and construction are to ensure that development does not contribute to increased air pollution.		Yes via condition of consent.
2.4.6	**Development on sloping land**		
	Buildings are to be sited and designed to take into account the slope of the land to: • minimise the visual bulk of the development, particularly when viewed from down slope • minimise the need for cut and fill by designs which minimise the building footprint and allow the building mass to step down the slope • minimise the impact of development on the privacy of adjoining land.	There is little slope across the land. The development is appropriate with regard to bulk and scale. The need for cut and fill is minimised. There are no issues of privacy arising from the development.	Yes

2.4.7	**Biodiversity**		
2.4.7.1	**General**		
	Development is to be sited and designed to minimise the impact on indigenous flora and fauna, including canopy trees and understorey vegetation, and on remnant native ground cover species.	The land is not affected by biodiversity.	N/A
	Preference is to be given to the planting of species indigenous to the vegetation community of the local area. Refer to Appendix 3 Vegetation Communities and Remnant Trees for listing of appropriate species.	Species selection on the landscaping plan is appropriate, focussing on indigenous species and other hardy species.	Yes
	Development is to be sited and designed to minimise the impact on cultural trees and plantings and consideration is to be given to further planting of cultural trees and landscaping where appropriate.	Concerns are raised as to the trees located behind and around the war memorial. Greater emphasis has been placed on retaining those trees through an amended landscape strategy.	Yes
2.4.7.2	**Development on land abutting the E2 Environmental Protection zone and W1 Natural Waterways zone**		
	Development on land abutting land within the E2 Environmental Protection zone and W1 Natural Waterways zone must take into consideration all of the following: • the need to retain any bushland on the land; • the effect of the proposed development on bushland, including the erosion of soils, the siltation of streams and waterways and the spread of weeds and exotic plants within the bushland, overshadowing, overland flows and stormwater runoff, and the removal or degradation of existing vegetation; • the requirement for provision of a buffer zone on the abutting land to protect the bushland area; • the protection of endangered ecological communities and recovery plans prepared and approved under the Threatened Species Conservation Act 1995; and	There is no bushland on the subject land.	N/A

	• any other matters which are relevant to the protection and preservation of the bushland area.		
2.4.8	**Public Domain**		
	Development is to be designed to address elements of the public domain, including the building interface between private and public domains, circulation patterns and accessways, gateways, nodes, edges, landscape features, heritage items, ground floor activity and built form definition to the street.	The relationship between the development and the public domain is appropriate for the purpose of those buildings.	Yes
	Public access to the public domain is to be maximised.	Public access is maintained by the subject development.	Yes
	Buildings are to be located to provide an outlook to the public domain, without appearing to privatise that space.	The relationship between the buildings and the public domain is appropriate for the purpose of those buildings.	Yes
	Development is to provide passive surveillance to the public domain. Continuous lengths of blank walls and fences at the public domain interface are to be avoided.	The buildings allow for passive surveillance of the public domain and encourage activity.	Yes
	Where appropriate, ground floor areas abutting public space should be occupied by uses that create active building fronts with pedestrian flow, and contribute to the life of the streets and other public spaces.	The relationship between the buildings and the public domain is appropriate for the purpose of those buildings and encourages use of the adjoining public spaces.	Yes
	Development is to be designed in accordance with Council's current public domain guidelines.	Noted	Yes
	New development is encouraged to provide public domain improvements. Applicants should consult with Council to determine the appropriate public domain treatment suitable for the site and surrounds. This may include street tree planting, street paving, street furniture and public artwork.	Noted	Yes
3.	**Development principles**		
3.1	**Preliminary Building Envelope**		
3.1.1	**Height**		
	The building height provisions in the Parramatta LEP 2011 indicate the maximum building height expressed in metres.	No height control is specified in the LEP. Building height is considered appropriate as a response to the surrounding space.	Yes
3.1.2	**Height transition**		
	Where there is a common	N/A	N/A

	boundary between areas where a different height limit is specified, the top storey on the land with the higher height limit is to be stepped back to t within a plane projected at a 45 degree angle from the floor below the topmost floor as show in Figure 3.2.		
3.1.3	**Preliminary building envelope tables**		
	No table is provided for this zone or category of development.	N/A	N/A
3.2	**Building elements**		
3.2.1	**Building form and massing**		
	Buildings are to be of a height that responds to the topography and the shape of the site.	Building height is considered appropriate as a response to the surrounding topography.	Yes
	The proportion and massing of buildings is to relate favourably to the form, proportions and massing of existing and proposed buildings patterns in the street.	Building height is considered appropriate as a response to the scale of nearby development.	Yes
	Building height and mass should not result in unreasonable loss of amenity to adjacent properties, open space or the public domain.	The building form does not result in any amenity impacts to the public domain or other properties.	Yes
	The form and massing of buildings is to provide a transition between adjoining land use zones and building types.	N/A	N/A
	Building form and massing is to support individual and communal entries.	Entry points to the development are appropriate for the management of uses within the development.	Yes
	For all mixed-use developments, potential management arrangements, including ownership/lease patterns are to be considered at the design stage to ensure proper functioning of various components of the building.	N/A	N/A
3.2.2	**Building facades and articulation**		
	Building design and architectural style is to interpret and respond to the positive character of the locality, including the dominant patterns, textures and compositions of buildings	There is no dominant pattern, texture or composition of buildings in the locality. Rather, there is a mix of buildings styles and forms.	Yes
	Building facades should be modulated in plan and elevation and articulated to reduce the appearance of building bulk and to express the elements of the building's architecture.	The design of the building incorporates satisfactorily articulation and modulation, with angled walls and panels to provide visual interest.	Yes
	The facades of buildings should be designed with a balance of horizontal and vertical elements.	There is a balance of vertical and horizontal elements.	Yes
	Alterations and additions are to	The additions do not attempt to	Yes

	be compatible with design elements of the existing building.	replicate or compete with the heritage component of the existing buildings.	
	Building frontages and entries are to provide a sense of address and visual interest from the street.	The entries are legible and provide visual interest when viewed from the street and railway line.	Yes
	Where security grilles/screens, ventilation louvres and carpark entry doors are used, they are to be integrated in facade designs. Solid security shutters are not encouraged.	N/A	N/A
	New buildings and facades should not result in glare that causes discomfort or threatens safety of pedestrians or motorists. A Reflectivity Report that analyses the effects of potential glare from the proposed new development on pedestrian and motorists may be required.	An appropriate mix of panelling and glazing is used. Glazing is set back into the building so as to reduce reflectivity.	Yes
	New business and industrial buildings shall be designed so that entry points and client service areas are easily identified from the street and are clearly linked to car parking areas and pedestrian paths.	Legible entry points can be reinforced with appropriate signage.	Yes
3.2.3	**Roof Design**		
	Attention should be given to the roof as an important architectural element in the street which can provide continuity and character.	The roof design is appropriate for the building and its context.	Yes
	Roof form should minimise the appearance of bulk and scale of a building.	The roof design does contribute to the bulk of the building.	Yes
	Roof forms are to respond to the neighbouring roofs, in particular in scale and pitch.	N/A	N/A
	The visual intrusiveness of service elements, such as service plants, lift over-runs and the like, is to be minimised by integrating them into the design of the roof.	Service elements are screened from view.	Yes
3.2.4	**Energy efficient design**		
	Improve the control of mechanical space heating and cooling by designing heating/ cooling systems to target only those spaces which require heating or cooling, not the whole building.	Details can be submitted at the Construction Certificate stage to address the design of temperature control systems.	Yes
	All non-residential development Class 5-9 will need to comply with the Building Code of Australia energy efficiency provisions.		Yes

3.2.5	**Streetscape**		
	Development is to respond and sensitively relate to the broader urban context including topography, block patterns and subdivision, street alignments, landscape, views and vistas and the patterns of development within the area.	The site stands alone from other development in the area. The development is not out of context given its location.	Yes
	Building design and landscaping are to be in harmony with the form, mass and proportions of the streetscape.	The site stands alone from other development in the area. The development is not out of context given its location.	Yes
	New buildings are to recognise and enhance the patterns and elements of facades within the street. Designs are to provide visual cohesion, continuity and distinction, and in particular, have regard to the horizontal and vertical proportions of building elements which create the visual scene.	The site stands alone from other development in the area. The development is not out of context given its location.	Yes
	Building setbacks from the street boundary are to be consistent with prevailing setbacks of adjoining and nearby buildings.	Building setbacks are appropriate given the stand-alone nature of the development.	Yes
	Buildings on corner sites are to be articulated to address each street frontage and are to define prominent corners.	Building addresses Enid Street.	Yes
	Development adjoining land use zone boundaries should provide a transition in form, considering elements such as height, scale, appearance, materials and setbacks.	Building height and scale is appropriate for the use and its distance to other land uses.	Yes
	Buildings are to be constructed of suitably robust and durable materials which contribute to the overall quality of the streetscape.	Durable finishes and materials are to be used.	Yes
	Vehicular access points are to be minimised and should not break the continuity of the streetscape. Landscaping should be used to minimise the visual intrusion of vehicular access points.	Vehicle entry is restricted to existing public roads at the rear of the development.	Yes
	Garages and parking structures are not to dominate the building facade and front setback.	Parking is located behind the building.	Yes
	Where existing site conditions do not allow for a carport behind the building line/to the rear of the property, a concession may be granted provided the carport integrates with the dwelling and	N/A	N/A

	existing street character		
	Where development adjoins an existing or desired pedestrian or vehicle laneway, development should provide an address to the laneway and provide opportunities to activate the space to improve pedestrian amenity and safety.	N/A	N/A
	To create interaction with the laneway, development is encouraged to be located within 3m of the laneway edge.	N/A	N/A
	Locate satellite dish and telecommunication antennae, air conditioning units, ventilation stacks and any ancillary structures; - Away from the street frontage, - Integrated into the roof design and in a position where such facilities will not become a skyline feature at the top of any building, - Adequately set back from the perimeter wall or roof edge of buildings.	Any such features are to be located out of view from the street by locating them with an adequate setback to the perimeter.	Yes
3.2.6	**Fences**		
	Front fences and landscaping should allow people in their homes to view street activity.	Fencing will be limited to tall fencing around sports courts and decorative fencing within the development as required. Fencing around the pool will be retained along with hedging to soften the appearance.	Yes
	New fences and walls are to be constructed of robust and durable materials which reduce the possibility of graffiti. The materials should be compatible with the associated building and adjoining fences.	Yes	Yes
	Fences are to respond to the architectural character of the street and/or area and the buildings that they front, with streetscape character maintained on all street frontages.	The fencing is appropriate for the use of each space.	Yes
	Front fences should not be erected where the streetscape is characterised by an absence of front fences. Landscaping should be used to create good street address and privacy.	No fences are proposed to the front of the building.	Yes
	Use of continuous lengths of blank walls at street level is to be	Blank walls are avoided.	Yes

	avoided.		
	Suitable planting should be used to soften the edges of fences at the interface of the public domain.	Planting will be used to soften fencing.	Yes
	Sheet metal fencing is not to be used at the street frontage or forward of the building line or in locations that have an interface with the public domain.	No sheet metal fences are proposed at the public domain.	Yes
	Fencing should respond to the topography of a site.	Yes	Yes
	Fences should not be constructed in floodways. Where this is unavoidable fences are to be constructed of flood compatible and open type materials that will not restrict the flow of flood waters and be resistant to blockage.	See Engineering assessment	Yes
	Front fences are to be a maximum height of 1.2m.	N/A	N/A
	Where noise attenuation or protection of amenity requires a higher fence, front fences may be permitted to a maximum height of 1.8m and must be setback a minimum of 1m from the boundary to allow landscape screening to be provided. Landscape species chosen should be designed to screen the fence without impeding pedestrian movements along the roadway. Front fences and landscape screening must not compromise vehicular movement sightlines.	N/A	N/A
3.3	**Environmental amenity**		
3.3.1	**Landscaping**		
	Landscape area (has the same meaning as in Parramatta LEP 2011) and is defined as a part of a site used for growing plants, grasses and trees, but does not include any building, structure or hard paved area.	Advisory	N/A
	Natural features on the site, such as trees, rock outcrops, cliffs, ledges, indigenous species and vegetation communities should be retained and incorporated into the design of development.	The site is devoid or natural features. Existing trees will be retained where possible.	Yes
	Indigenous species, especially low water consumption plants, should be used in preference to exotic species, reflecting the vegetation communities of the locality - refer to Appendix 3.	Indigenous species are proposed, as well as hardy drought tolerant species.	Yes
	Landscaping abutting the E2	N/A	N/A

	Environmental Conservation Zone under Parramatta LEP 2011 is to be landscaped with local indigenous species to protect bushland and wildlife corridors and soften the interface between the natural landscape and the urban environment.		
	Landscaping is to be designed to integrate new development with the existing landscape character of the street and be sensitive to site attributes, existing landscape features, streetscape view and vistas.	The landscaping concept is appropriate to the layout of the site and its response to the surrounds.	Yes
	Landscaped open space can be measured based on the following: o impervious surfaces such as driveways, paved areas, roofed areas, car parking and storm water structures, decks and the like, and any area with a width or length of less than 2 metres are excluded. o the water surface of swimming pools is included o landscaping is to be at ground level o the minimum soil depth of land that can be included as landscaped open space is 1 metre.	Advisory	N/A
	Landscaping is to enhance the visual setting and accentuate the design qualities of the built form. Landscaping solutions are to be used to create a screening effect for visually obtrusive land uses or building elements.	The landscaping treatment is appropriate for the development and accentuates the relationship between the open space and the development.	Yes
	Trees should be planted at the front and rear of properties to encourage tree canopy to soften the built environment and to encourage the continuity of the landscape pattern.	Tree planting in the car parks and in the open space areas will assist in providing a canopy.	Yes
	Landscaping is to be designed so as to minimise overlooking between properties.	N/A	N/A
	Landscaping should provide shade in summer without reducing solar access in winter.	Solar access will be sufficiently maintained.	Yes
	The amount of hard surface area is to be minimised to reduce run-off. Run-off should be reduced by directing the overland flow from rainwater to permeable surfaces such as garden beds.	Hard surfaces are minimised to buildings, car parking areas and pedestrian areas.	Yes
	Landscaped areas should be designed to require minimal	The landscaping has a focus on indigenous species.	Yes

	maintenance by using robust landscape elements and using hardy plants with low fertilizer requirements.		
	A deep soil zone is required for residential development in accordance with Section 3.1.3 and the design controls below. Buildings, basement carparks, swimming pools, tennis courts, patios and decks, and impervious surfaces such as paved areas, driveways, carparking and roofed areas are NOT included as part of the deep soil zone.	N/A	N/A
	Deep soil zones should adjoin the deep soil zones of neighbouring properties where practicable so as to provide for a contiguous area of deep soil and vegetation.	N/A	N/A
	A landscape plan, prepared by a suitably qualified person, is to be submitted for development that, in Council's opinion, will significantly alter the landscape character.	A Landscape Plan has been provided.	Yes
3.3.2	**Private and Communal Open Space**		
	N/A	N/A	N/A
3.3.3	**Visual and acoustic privacy**		
	Development should be located, oriented and designed to maximise visual and acoustic privacy between buildings.	The development is not within proximity to residences and does not overlook private land.	N/A
	The internal layout of buildings is to be designed to minimise overlooking of living areas, private open spaces and adjoining school yards.	N/A	N/A
	Building elements such as balconies and decks are to be designed to minimise overlooking of living areas, private open spaces of adjoining dwellings and adjoining school yards.	N/A	N/A
	The windows of dwellings are to be located so they do not provide direct and close views into the windows of other dwellings, particularly those of living areas.	N/A	N/A
	The windows of dwellings are to be located and designed so as to reduce the transmission of noise.	N/A	N/A
	Building design elements should be used to increase visual and acoustic privacy such as recessed balconies and/or vertical fins between adjacent balconies, oblique windows, fencing, vegetation and louvres	N/A	N/A

	and pergolas which limit overlooking of lower dwellings, private open space and adjoining school yards.		
	The internal layout of buildings is to be designed so as to reduce the effects of noise transmission. For example, dwellings with common party walls should locate noise generating rooms such as living rooms adjacent the noise generating rooms of other dwellings.	Noise transmission is controlled by the use of the buildings and the fact that the building is isolated from other receivers.	Yes
	Appropriate building materials should be used to provide acoustic privacy.	Appropriate building materials are used to provide acoustic privacy.	Yes
	Consideration is to be given to the relationship between residential and non-residential components of mixed use development with regard to noise attenuation and privacy.	N/A	N/A
3.3.4	**Acoustic amenity**		
	Non-residential development is not to adversely affect the amenity of adjacent residential development as a result of noise, odour, hours of operation and/or service deliveries.	No residential properties are in proximity so as to be affected by noise, odour, hours of operation and/or service deliveries.	Yes
3.3.5	**Solar access and cross ventilation**		
	Development is to be designed and sited to minimise the extent of shadows that it casts on: - private and communal open space within the development; - private and communal open space of adjoining dwellings; - public open space such as bushland reserves and parkland; - solar collectors of adjoining development; and - habitable rooms within the development and in adjoining developments.	Overshadowing does not impact on residential properties, bushland or open space areas.	Yes
	In habitable rooms, head and sill heights of windows should be sufficient to allow sun penetration into rooms.	N/A	N/A
	Landscaping should provide shade in summer without reducing solar access in winter.	Landscaping ensures appropriate solar access.	Yes
	Buildings should have narrow cross sections, providing dual aspect for dwellings to allow for cross ventilation.	N/A	N/A

	All rooms should contain an external window to provide direct light and ventilation. Exceptions may be considered for non-habitable rooms where this cannot be achieved practicably and mechanical ventilation can be provided.	The proposal uses glazing and windows to allow light penetration into the buildings as appropriate for the use of the internal space.	Yes
	Buildings should be designed to facilitate convective currents through the following measures:	The building design allows for cross ventilation.	Yes
	Building elements such as operable louvres and screens, pergolas, blinds etc should be used to modify environmental conditions where required, such as maximizing solar access in winter and sun shading in summer.	The building design incorporates elements to control solar access.	Yes
3.3.6	**Water Sensitive Urban Design**		
	WSUD principles are to be integrated into the development through the design of stormwater drainage, on-site detention and landscaping and in the orientation of the development rather than relying on 'end of pipe' treatment devices prior to discharge.	A WSUD assessment has been carried out as part of the DA package and assessed as satisfactory.	Yes
	Development is to be sited and built to minimise disturbance of the natural drainage system.	Redevelopment is sited to minimise disturbance.	Yes
	Impervious surfaces are to be minimised and soft landscaping used to promote infiltration and reduce stormwater run-off.	The car park is to be provided with an impervious surface.	Yes
	WSUD elements should be located and configured to maximise the impervious area that is treated.	A WSUD assessment has been carried out as part of the DA package and assessed as satisfactory.	Yes
	Adequate provision is to be made for the control and disposal of stormwater run-off from the site to ensure that it has no adverse impact on Council's stormwater drainage systems, the development itself, or adjoining properties. Stormwater drainage design criteria are to be in accordance with Council's Stormwater Disposal Policy and current Design and Development Guidelines.	See Engineering assessment	Yes
	On-site detention (OSD) will be required as outlined in the Upper Parramatta River Catchment Trust On-Site Detention Handbook, subject to compliance with Council's Stormwater	See Engineering assessment	Yes

	Disposal Policy and current Design and Development Guidelines.		
	Stormwater, including overland flows entering and discharging from the site, must be managed. The site drainage network must provide the capacity to safely convey stormwater run-off resulting from design storm events listed in Council's Design and Development Guidelines.	See Engineering assessment	Yes
	Council will generally not permit the construction of stormwater drainage lines through public reserves.	N/A	N/A
	The design and location of stormwater drainage structures, such as detention and rainwater tanks, is to be in accordance with Council's Stormwater Disposal Policy and current Design and Development Guidelines.	See Engineering assessment	Yes
	Run-off entering directly to waterways or bushland is to be treated to reduce erosion and sedimentation, nutrient and seed dispersal.	See Engineering assessment	Yes
	The discharge of polluted waters from the site is not permitted. Discharges from premises of any matter, whether solid, liquid or gaseous is required to conform to the Protection of the Environment Operations Act and its Regulations, or a pollution control approval issued by the NSW Office of Environment and Heritage for Scheduled Premises.	No polluted discharge is expected from the proposed development.	Yes
	For developments required to prepare a WSUD strategy as identified in Table 3.3.6.1.3, those developments must achieve pollution reduction targets identified in Table 3.3.6.1.1 and prepare a WSUD Strategy as outlined in Appendix 7.	A WSUD assessment has been carried out as part of the DA package and assessed as satisfactory.	Yes
	All development must consider the WSUD measures listed in Tables 3.3.6.1.2 in order to achieve water quality and quantity targets.	A WSUD assessment has been carried out as part of the DA package and assessed as satisfactory.	Yes
	Pollution load reduction as defined in Table 3.3.6.1.1 is to be determined preferably through the Model for Urban Stormwater Improvement Conceptualisation (MUSIC), using suitable modelling parameters for	No polluted discharge is expected from the proposed development.	Yes

	Parramatta / Western Sydney. Pollution load reduction may also be determined by an equivalent, widely accepted model or methodology.		
	Development is to incorporate relevant measures to facilitate water conservation such as: • landscaping with plant species that require minimal water • using water efficient taps, dual flush toilets, shower roses of flow restricting devices • providing water efficient appliances such as washing machines and dishwashers • minimising the volume of stormwater draining from the development site and facilitating water re-use through the use of rainwater tanks, on-site detention and re-use of onsite grey water/black water or externally treated/recycled water (dual reticulation where applicable).	Noted	Yes, via condition of consent.
3.4	**Social Amenity**		
3.4.1	**Culture and Public Art**		
	All new development having a capital value of more than $5,000,000 in the following major local centres and zoned as indicated in the Parramatta LEP 2011 is required to provide and implement an Arts Plan as part of the overall development. Granville - B2 Local Centre and B4 Mixed Use	Although the land is not within the B2 Local Centre an Arts Plan has been developed for the facility.	Yes
3.4.2	**Access for people with disabilities**		
	The siting, design and construction of premises available to the public are to ensure an appropriate level of accessibility, so that all people can enter and use these premises. Access is to meet the requirements of the Disability Discrimination Act, 1992 (DDA), the relevant Australian Standards and the Building Code of Australia (BCA).	Access report has been provided demonstrating appropriate levels of accessibility.	Yes
3.4.3	**Amenities in buildings available to the public**		
	The number of women facilities	Advisory.	Yes

	and amenities for parents in women's and men's toilets are encouraged to be of a higher rate and standard than that prescribed in the Building Code of Australia.	WC facilities are provided on each floor with a parent's room on the ground floor.	
3.4.4	**Safety and Security**		
	Development is to be designed to incorporate and/or enhance opportunities for effective natural surveillance by providing clear sight lines between public and private places, installation of effective lighting, and the appropriate landscaping of public areas.	The Local Area Command has carried out a CPTED assessment and found the proposal to be satisfactory.	Yes
	Development should be designed to minimise opportunities for crime through suitable access control. Physical or symbolic barriers should be used to attract, channel and/or restrict the movement of people. Landscaping and/or physical elements may be used to direct people to destinations, identify where people can and cannot go and restrict access to high crime risk areas such as carparks.	Lighting and landscaping of the park has considered these issues.	Yes
	Development is to incorporate design elements that contribute to a sense of community ownership of public spaces. Encouraging people to gather in public spaces through appropriate design techniques, helps to nurture a sense of responsibility for a place's use and condition.	Improvements to the amenity and function of the park will increase the sense of place and public ownership of the park.	Yes
	The incorporation of crime prevention measures in the design of new buildings and spaces is not to detract from the quality of the streetscape. Subtle design techniques should be applied to blend into façades and places.	The Local Area Command has carried out a CPTED assessment and found the proposal to be satisfactory.	Yes
	New development is to be designed to reduce the attractiveness of crime by minimising, removing or concealing crime opportunities. The design of development should increase the possibility of detection, challenge and apprehension of persons engaged in crime.	The Local Area Command has carried out a CPTED assessment and found the proposal to be satisfactory.	Yes
	A site management plan and formal crime risk assessment (Safer by Design Evaluation)	The Local Area Command has carried out a CPTED assessment and found the proposal to be	Yes

	involving the NSW Police Service may be required for large developments, which in Council's opinion, would create a crime risk.	satisfactory.	
	Public pedestrian areas within developments as well as communal accessways within multiunit developments are to provide non-slip pavement surfaces.		Condition of consent
	The design of buildings adjoining laneways and through block connections should be designed to activate these spaces at ground level and provide casual surveillance from ground and upper levels.	N/A	N/A
	Lighting of laneway spaces is encouraged.	Lighting proposed within the park	Yes
3.4.5	**Housing Diversity and Choice**		
	N/A	N/A	N/A
3.5	**Heritage**		
3.5.1	**General**		
	Scale The scale and bulk of any new work is the most important issue to get right. In the case of infill work in a conservation area, the scale of the new building needs to be similar to those surrounding it. In the case of renovations and extensions, the new work should not overwhelm the original building, and would almost certainly need to be no larger in size than the original building.	The scale of the building does not impact on the interpretation of the original pool building or War Memorial.	Yes
	Siting In the case of infill work in a conservation area, the new building needs to have a similar orientation on the block and similar setbacks as those around. In the case of renovations and extensions, new work is best located to the rear or possibly the side of the building in order to minimise changes to the appearance of the building from the street.	N/A	N/A
	Architectural Form The basic architectural form of any new work needs to respect that which exists. Issues to consider include the pitch and form of the roof, and the size, proportion and location of windows and doors.	See comments from the heritage advisor and Statement of Heritage Impact.	Yes

	Architectural Detailing Applicants need to be aware of the particular era and architectural style of the building or buildings, and make sure that any proposed changes respect this. For example it is not appropriate to mix Victorian features with say California Bungalow and overuse of historical architectural details on new work should be avoided.	See comments from the heritage advisor.	Yes
	Materials and Finishes New materials need not always match the existing exactly but need to be compatible, with consideration being given to the colour, texture, and type of materials and finishes.	See comments from the heritage advisor.	Yes
	Use The best use for a building is usually the one for which it was built. Where this is not possible, a use which requires minimal alterations will be more compatible.	The original pool building retains its function.	Yes
	Original Fabric It is important to minimise alterations to the original fabric. Where possible, it is preferable to repair rather than replace individual elements such as windows and doors.	No work is proposed to the original pool building.	Yes
	The Aging Process The 'patina' of age on a building adds much to its character and significance. A worn step, for example, demonstrates the many years of feet crossing a threshold. Such features add to the uniqueness and character of the place and should be retained.	Noted	Yes
	Siting An infill building adjacent to a heritage item should not precisely imitate its neighbour but use recognisable tools such as massing, scale, setback and orientation, details and materials, roof forms and coursing lines to complement adjacent heritage items.	See comments from the heritage advisor and Statement of Heritage Impact.	Yes
3.5.2	**Archaeology**		

	In the case of any development where excavation is proposed, the Applicant must refer in their Statement of Environmental Effects (SEE) to the Parramatta Historical Archaeological Landscape Management Study (PHALMS).	An Archaeological assessment has been provided.	Yes
3.5.3	**Aboriginal cultural heritage**		
	Before lodging a development application for development that may have an impact on known or potential Aboriginal sites, Council's information on known Aboriginal sites and potential heritage sensitivity should be consulted. Refer to Appendix 11 for the Aboriginal Sensitivity map.	The subject land is within an area of high sensitivity according to the Aboriginal Sensitivity map at Appendix 11 to the DCP.	Yes
	For properties identified as Medium Sensitivity or High Sensitivity an Aboriginal Heritage Assessment is required.	An archaeological assessment has been prepared.	Yes
	For properties within 50m of a known Aboriginal site the National Parks and Wildlife Service Site Register should be consulted to determine whether the Aboriginal site is located on the property. If the known Aboriginal site is located on the property, the development becomes Integrated Development.	The DA is Integrated Development and has been referred to the Office of Environment and Heritage.	Yes
	P.6 Properties within an area of Aboriginal social/historical association will require an Aboriginal Heritage Assessment that investigates the impact of a development proposal in relation to the social/historical association.		
3.6	**Movement and circulation**		
3.6.1	**Sustainable transport**		
	To reduce car trips and encourage the use of sustainable transport.	The land is located in proximity to the Granville railway station and bus interchange.	Yes
3.6.2	**Parking and vehicular access**		
	Vehicle access points and parking areas are to be: - easily accessible and recognisable to motorists - undisruptive to pedestrian flow and safety - located to minimise traffic hazards and the potential for vehicles to queue on	Existing access from Diamond Avenue is maintained. Diamond Avenue is a low pedestrian area and located away from residences so as to avoid the activity requiring on street parking in front of residences.	Yes

	public roads - located to minimise the loss of on street car parking, and to minimise the number of access points.		
	Car parking and service/delivery areas are to be located so that they do not visually dominate either the development or the public domain surrounding the development.	The car parking and service areas are located so as not to be visually dominant.	Yes
	Parking and service/delivery areas and vehicular access points are to be located to minimise conflict between pedestrians and vehicles and to minimise impact on residential amenity.	Yes	Yes
	Development on arterial roads is to seek access via a secondary street where possible.	N/A	N/A
	Where properties have access to a rear lane or secondary street frontage (including desired lanes) parking and servicing access should be provided from the secondary street/lane.	N/A	N/A
	On site parking is to be provided at a rate sufficient for residents, employees, visitors and service vehicles as relevant to the development.	The proposal provides for an increase in parking.	Yes
	Car parking spaces are to be designed to ensure ease of access, egress and manoeuvring on-site. The standards of AS 2890 are to be complied with.	The car parking is compliant with AS 2890.	Yes
	Driveways are to be designed to avoid a long and straight appearance by using landscaping and variations in alignment.	The access arrangements from Diamond Avenue are satisfactory and avoid the use of driveways.	Yes
	Car parking areas and vehicle accessways are to be landscaped to integrate sympathetically with the development and the landscape character of the locality. Large car parking areas are to be broken up using landscaping. The design and layout of carparking areas must provide for suitable and safe pedestrian movements, including separate pedestrian access to buildings which are clearly defined and easily negotiated.	Landscaping is proposed as part of the car parking.	Yes
	The area between property boundaries and driveways,	Landscaping is proposed between the car park and the	Yes

	access ways and parking spaces is to be of sufficient width to enable landscaping and screen planting.	Duck Creek channel.	
	Car parking at ground level is not to encroach within building setbacks.	Ok	Yes
	Reasonable provision is to be made for the parking needs of people with disabilities.	Accessible parking is provided.	Yes
	Visitor parking is to be marked or signposted to enable easy recognition.	N/A	N/A
	The design and layout of carparking areas must provide for suitable and safe pedestrian movements, including separate pedestrian access to buildings which are clearly de ned and easily negotiated	Yes	Yes
	Car parking is not to be used as storage space.	Can be an operational condition of consent.	Yes
	Development must provide safe vehicle access and adequate sight distances. Development on arterial roads or development that is not a dwelling house must make provision for vehicles to leave the site in a forward direction.	Access and egress arrangements allow for safe movements and adequate sight distance.	Yes
3.6.3	**Accessibility and connectivity**		
	Pedestrian links should be provided where possible through development sites to improve connectivity between housing, open space networks, community facilities, public transport, local activity centres and schools.	The proposal enhances the access and use of Memorial Park.	Yes
	Through-site links should be arranged on the site to enable casual surveillance from buildings on the site and from the street or public domain.	The building uses glazing to overlook the park and car park.	Yes
	Through-site links should be integrated with the circulation system of the site so that they perform a role for circulation within as well as through the site.		Yes
	Through-site links are to be landscaped and appropriate lighting levels provided and maintained.	Lighting along pedestrian links within the park are proposed to be enhanced.	Yes
	Public, communal and private areas are to be clearly delineated within the site.	Yes	Yes
	Pedestrian and cycle links should be provided on sites adjacent to waterways to improve accessibility to these natural systems.	Not applicable as there is no access along the creek channel.	N/A

	Existing through-site pedestrian links are to be retained by all types of development, except where alternative access can be provided at Council's satisfaction.	Pedestrian links are to be maintained by the proposed development.	Yes
3.7	**Residential subdivision**		
	N/A	N/A	N/A
4.1	**Town and Neighbourhood Centres**		
4.1.6	**Granville Town Centre**		
	To ensure that new development provides a strong interface to Granville Railway Station, Parramatta Road, South Street and Good Street.	The proposal presents towards the railway station and railway line	Yes
	To ensure that new development maintains the character and function of South Street as a main retail/commercial street by continuing the fine grain pattern of retail and commercial uses.	The site does not interface with South Street	N/A
	To ensure that new development responds well to existing heritage items.	Heritage is considered in this DA.	Yes
	To ensure new development within the mixed use area provides active ground floor uses to increase the safety, use and interest of the area.	While not in the mixed use area, the proposal aims to provide an active facility to promote safety.	Yes
	To ensure new buildings within the mixed use area provide articulation and an attractive composition of building elements.	The buildings provide articulation and an attractive composition of building elements.	Yes
	Pedestrian Connections and Laneways		
	New pedestrian connections, roads and laneways should be provided in accordance with Figure 4.1.6.3.	The land is not identified as providing new pedestrian connections.	N/A
	Setbacks		
	There are no setback provisions applying to the land.	N/A	N/A

LEGEND

- T38 — EXISTING SIGNIFICANT TREES RETAINED
- PROPOSED TREES REFER SK05 FOR SPECIES
- WPR — WET POUR RUBBER SOFTFALL
- AT — ARTIFICIAL SURFACE TO MULTIPURPOSE COURT
- PROPOSED FEATURE PAVING
- EXISTING PAVING SURROUNDING MEMORIAL RETAINED
- RL 6.20 — PROPOSED LEVELS
- RL 6.02 — EXISTING LEVELS
- PLAYGROUND FENCE (approx extent)
- PROPOSED HYPAR STYLE SHADE STRUCTURE TO PLAY AREA

Araucaria tree retained

BOOSTER ASSEMBLY

Existing Cherry trees retained on existing mound

Horse trough location to be confirmed

MAin pathway relocated and widened.

Access provided between garden beds

Small trees / possibly Magnolia Little Gem along Enid Av frontage

T24 retained within the garden bed

Chess relocated

Option 1 play area shown, please refer to separate sheets for more details.

Playground fence / barrier from road as a combination of planting / sandstone rocks and artistic fence. Fence at the front not desirable.

Trees 20, 21 & 22 tall within the centre of new Piazza. Their levels are 200 mm below proposed levels. Their RPZ zones are shown in red, extensive concrete cut out would be required to retain trees successfully to accommodate for their survival. (trees are cuurently in garden bed) This would disrupt the Piazza where the intent was to keep the Library forecourt open to accommodate for large crowds. Therefore retention of these trees is not supported.

Trees 32 & 33 are 500 mm below proposed levels. A concerte upturn with handrail would be required to retain these trees successfully. Relocated pathway shown in red.

Court fence relocated to 2 m from court line

Accessible Walkway achieved to table tennis area and basketball court. No steps required.

Relocated path encroaching on T35 tre TPZ

ENID AVENUE

BUS DROP OFF ZONE

MEMORIAL DRIVE

RAIL WAY

Duck Creek

REFER TO SK03

LANDSCAPE PLAN NORTH

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

RESPONSE TO FRANCES HAMILTON DA REFERRAL

REVISED PLAN

SK 02 issue J July 2018

SCALE 1:200 @ A1

0 1 5m 10m 15m

CUMBERLAND COUNCIL

ARCHITECT dwp

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REFER TO SK02

Access to table tennis area and courts

POOL RECEPTION

ENTRY

1:20.0

RL 6.225

RL 6.53

BIKE RACKS

1 : 50

RL 6.46

1 : 40

RL 6.37

BBQ

ROOF ABOVE

RL 6.40

WATER TANK

RL 6.28

FENCE

1 : 33

RL 5.95

RL 5.90

RL 5.91

RL 5.88

RL 5.70

RL 5.74

T36

Lp

RL 5.63

TABLE TENNIS

NEW PATH

Duck Creek

MULTIPURPOSE COURT

GATE

RL 6.13

RL 5.60

BASKETBALL COURT

RL 5.55

EX RL 5.54

RL 5.47

T38

RL 6.03

RL 5.49

PATH

RL 5.32

RL 5.92

ELECTRICITY KIOSK

Service 'hardstand' around the tank, no vegie garden possible

New pathway around courts and to carpark area

Additional gate

Screening will be provided

Tree species will be resolved during detail design

MINI BUS

LOADING ZONE

RL 6.37

PROPOSED CARPARK

RL 6.10

GRANVILLE SWIMMING CENTRE

OOL BUILDING

NEW PATH

MOND NUE

PROPOSED CARPARK

DUCK CREEK

EXISTING CARPARK

GRANVILLE DIGGERS

LEGEND

- EXISTING SIGNIFICANT TREES RETAINED (T36)
- PROPOSED FEATURE PAVING
- PROPOSED TREES REFER SK05 FOR SPECIES
- RL 6.20 PROPOSED LEVELS
- RL 6.02 EXISTING LEVELS
- AT ARTIFICIAL SURFACE TO MULTIPURPOSE COURT

RESPONSE TO FRANCES HAMILTON DA REFERRAL

LANDSCAPE PLAN SOUTH

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

REVISED PLAN

SK 03 issue J June 2018

SCALE 1:200 @ A1

0 1 5m 10m 15m

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Granville Multipurpose Centre

PRELIMINARY ARTS PLAN

Introduction

Council is developing a new multipurpose community centre, library, arts and cultural facility in Granville, due for completion in 2020.

The new $22 million purpose built community facility will be located at the Granville Memorial Park site.

Following community engagement in September and October 2017, a detailed design was created based on community feedback. The outcomes of community engagement, as well as the site's context and history, have been employed to inform the development of this Preliminary Arts Plan for the Centre.

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Section 3: BROADER CULTURAL PLANNING AND CULTURAL INFRASTRUCTURE CONTEXT FOR CUMBERLAND 12

Section 1

PUBLIC ART

Cumberland Council's Public Art Guidelines reinforce Council's use of place making and culture and supports a diverse range of public art forms including integrated permanent artwork and temporary art projects.

The Preliminary Arts Plan for the Granville Multipurpose Centre identifies opportunities for appropriate public art development and creative place making in the future planning and design of public environments that support a strong sense of community inclusion and place identity.

The Centre will include creative and original site specific artworks recognising the:

- Aboriginal history of the area
- Heritage of the site
- Current cultural context of the site

Artworks will be created by artists, including Aboriginal artists, emerging and established artists with a demonstrated connection to the site or local area.

Aboriginal History of the Area

The traditional owners of the Parramatta and Granville area were the Burramattagal clan of the Darug nation. Their traditional land corresponds roughly with the upper reaches of the Parramatta River. The river and its tributaries, estuaries and mangrove swamps formed critical resources for the clan. The River provided a reliable supply of fresh water, as well as freshwater and estuarine fish, crayfish, mangrove crabs and cobra (toredo) worms; and terrestrial animals from the surrounding open forest were likely drawn to the water and were hunted for food. Important plants and animals were also found in mangrove wetlands and the river's fertile floodplains, providing medicines, fibres, vitamins and other food staples. The site area is located in close proximity to the Duck Creek, a tributary of Parramatta River, and likely a key resource for past Aboriginal people.

Example Darug interpretative artworks. Title: Gathering Indigenous Cultural Learning Space. Artist: Graham Chalcroft and Aunty Edna Watson. Location: Second Ponds, Ponds Parklands, Sydney.

Heritage of the Site

Granville was named in 1880 after the British Foreign Secretary, the Granville Leveson-Gower, 2nd Earl of Granville. In the early days of European settlement, timber was harvested to fuel the steam engines in Sydney and Parramatta. By the 1860s, the supply of timber was exhausted. The remainder was used by scavengers who made a living by collecting firewood. Wattle bark found use with tanners and the bark from stringybark trees was used for roofing of huts.

In the 1880s some German settlers, Joseph Klein and P.W. Merkell, tried to establish vineyards in the area, but eventually found the land was not suited for this type of agriculture. More farmers discovered the limitations of the local soils and fruit growers complained about the damage from flying foxes. Thus, the only practical use for the grasslands, which replaced the original bushland, was for dairy cattle.

James Bergan opened a Woollen Mill at the site in 1870. The Mill was steam powered using water from the Duck River, and primarily functioned as a Tweed Mill. The successful Mill closed 50 years later in 1920.

The site's historic uses have influenced the architectural approach to colour, texture and pattern for the Granville Multipurpose Centre. The design draws on the Bergan's Woollen Mill formerly on the site as well as a brick making yard which came after the mill to develop a concept based on weaving and interlocking.

Bergan's Woollen Mill

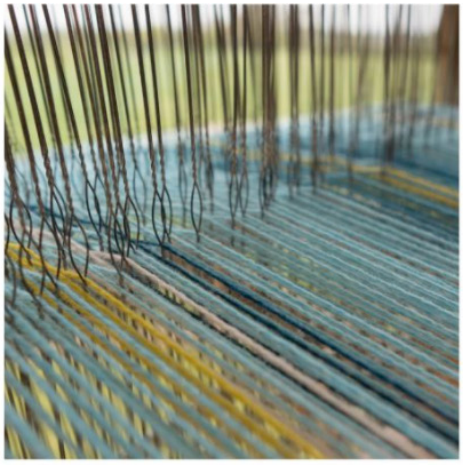
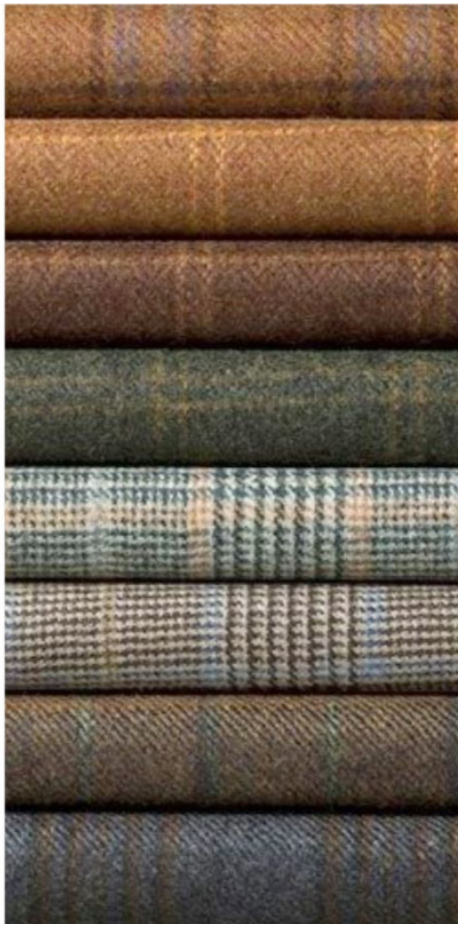
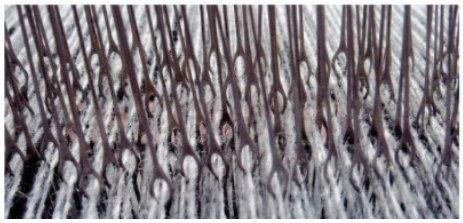
Current Cultural Context of the Site

The site's historical context is contextualised further through the current use of this building as a meeting place for a diverse Cumberland and Granville community and a coming together of a number of previously separate community functions.

Exterior forms and surrounding landscapes of the proposed building have utilised the tweed mill as a basis for thematic context, with a conceptual approach of interlocking.





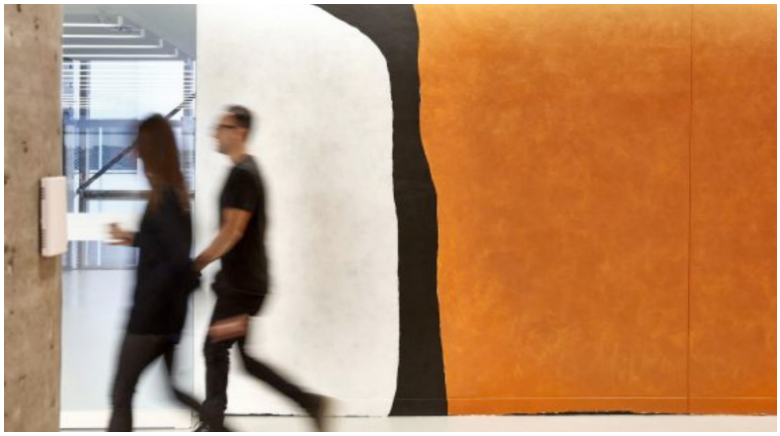

KEY ARTWORK OPPORTUNITY LOCATIONS

Internal – Public artworks in the central atrium and public corridors of the building are integrated within the built environment.

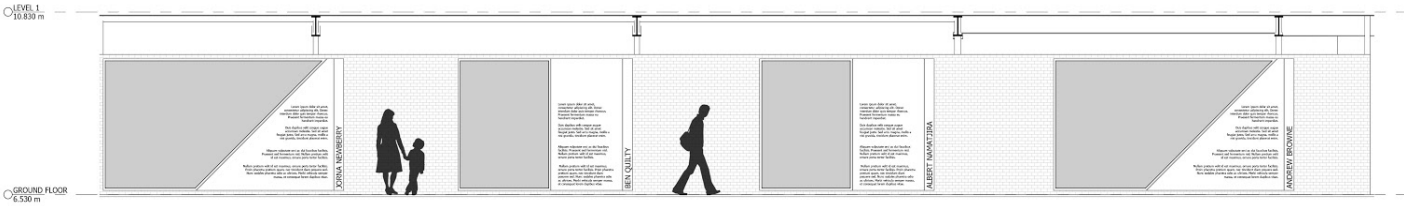
Within the building are several proposed opportunities for integrated public art. This includes proposed large ceiling mounted canvases/sculptural elements in the building's foyer and library.

Additional opportunities exist for distinctive wall artworks in public spaces.

Also proposed are opportunities for art and historic interpretation in public spaces adjoining the community hall. Further, proposed for display and heritage interpretation are a number of historic Bowling Club Honor Boards in the public space adjacent to community hall studio spaces, commemorating the site's past use as a Bowling Club.



(THERE Design, Roche headquarters Sydney, Hassell Sydney)



External – opportunities for publicly accessible artworks in Memorial Park, icluding integration with play spaces, landscaping and main thoroughfares.

Public art can enter the outdoor play space at a number of levels offering imaginative and exploratory opportunities to its users. It can be manifested from small intricate hidden elements through to significant sculptural elements having characteristics of 'landmarks'. Interactive art engages all senses. If it can be touched, moved, have music played on it, or evoke stories and encourage fantasies, then it is a universal play tool for everybody.

INTERPRETATION OF SITE WOOL INDUSTRY HISTORY

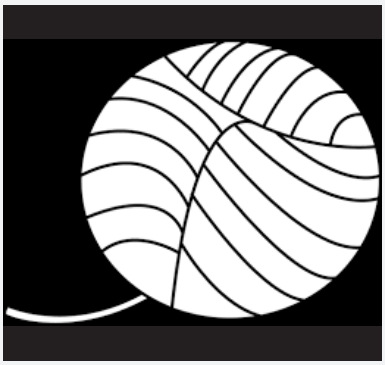
PLAY ELEMENTS 1

Wool spools or coloured bobbins could be used for seating and interacting within a play area, using timber and rope.

Lost Teddy by
Jane Cavanough

Owls by Jane Cavanough

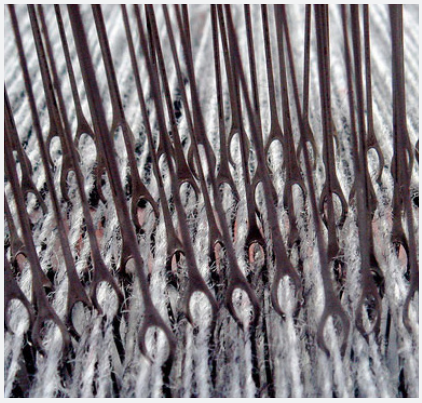
Bucket by Jane Cavanough

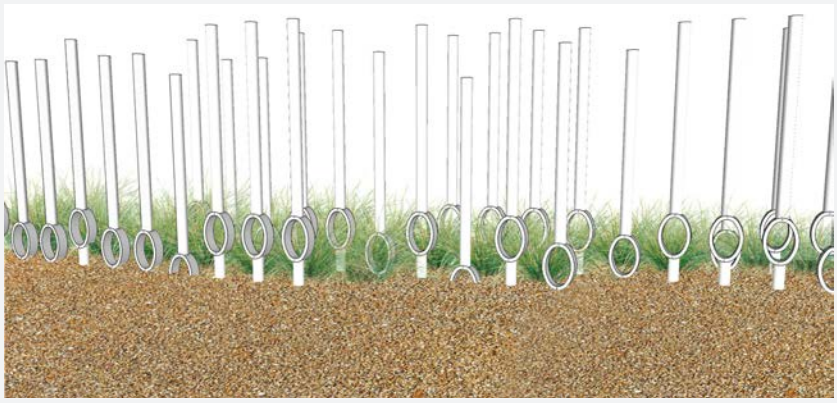


'Yarn balls' could be interpreted through a large climbing structure or small elements in play area to sit on or roll over as tactile elements embedded in rubber softfall.

Carved stone critters

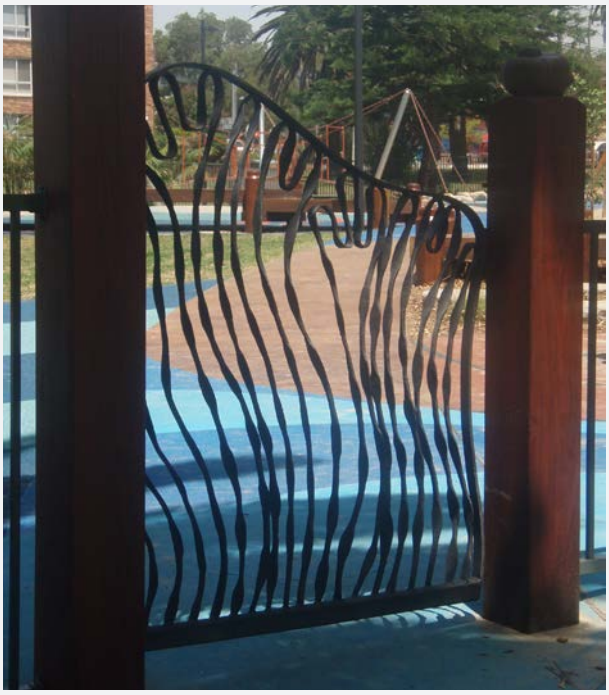
PLAYGROUND FENCE 2



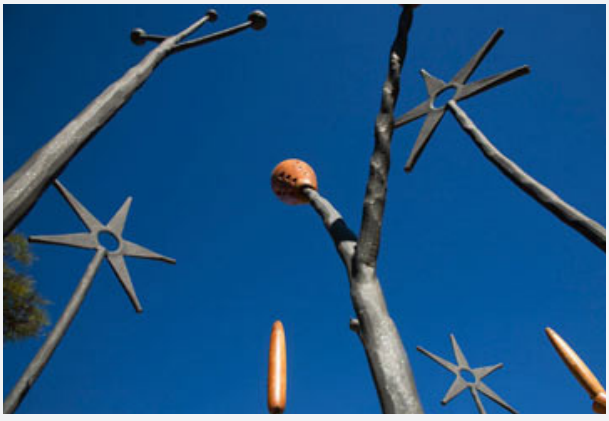


Tweed heddles could be an inspiration for a custom made fence separating the play area from the road. Separate panels could be used at key locations.

Fence, Adelaide Botanic Gardens



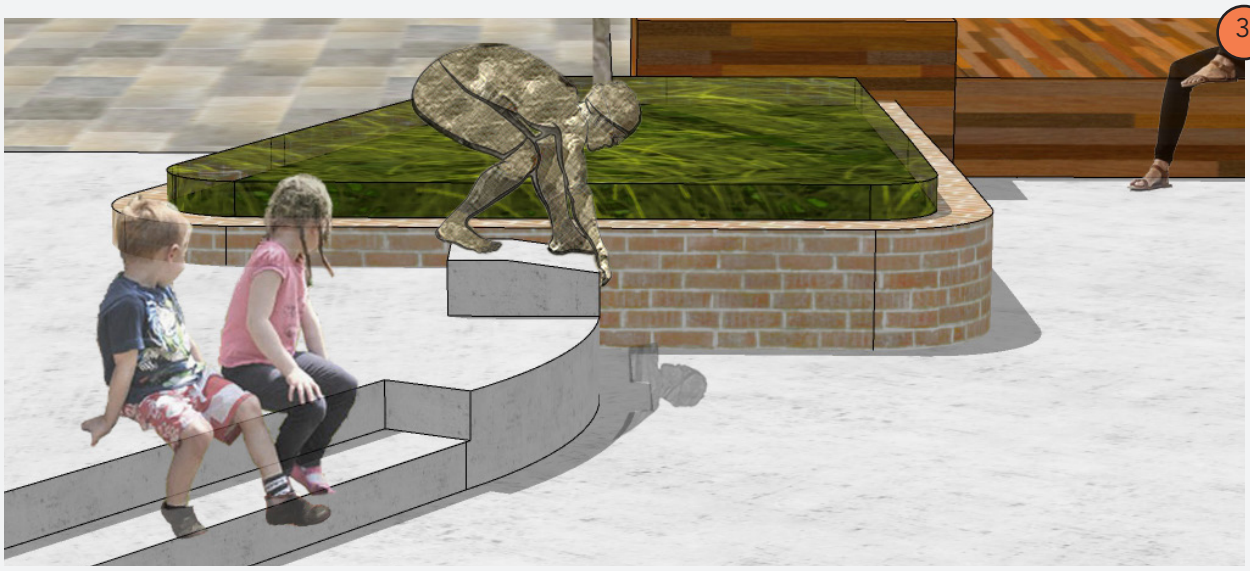
Forged Steel Gate by Jane Cavanough



Gumtips by Jane Cavanough

INTERPRETATION OF SITE 'SWIMMING POOL' HISTORY

Over the years, a number of famous athletes have trained at or attended Granville Swimming Pool.



Proposed bronze sculpture of a young swimmer. He or she could be dressed in an historic swim costume.

INTERPRETATION OF SITE WOOL INDUSTRY HISTORY

Tree grates around trees could be custom made with interpretative inscriptions reflecting the site's history.

Tweed patterns could inspire paving pattern arrangements.

OTHER SITE CONSIDERATIONS

The development seeks to recognise and enhance the cultural and heritage interpretation of significant site objects and locations.

Memorial Park, Granville War Memorial and Monuments

Granville Memorial Park is of significance for the Cumberland LGA for its social importance to local residents and for its association with the soldiers that it commemorates.

The Memorial monument includes a stone column topped with a sphere, with base inscribed with names acknowledging servicemen of the First World War.

The Park also holds sandstone gateposts commemorating the Second World War and later conflicts.

In 2015, the George Cartwright Memorial was relocated to the site from Granville Park on Woodville Road. Cartwright was a former resident of Granville and received a Victoria Cross for his war effort.

Granville Swimming Pool

The Granville Swimming Pool is of historic significance as one of four Sydney Olympic pools constructed during the Great Depression. Designed by prominent architects Rudder and Grout and opened in 1936, the swimming pool and its park setting is the most intact NSW Olympic Swimming Pool complex from this period. The Pool was built by Council to provide amenities for local residents, reflecting the growing popularity of swimming not only as an Olympic sport but also as a family leisure activity. The entry pavilions and side walling in decorative brickwork is an aesthetically significant example of the Interwar Functionalist style, with Art Deco detailing. These features contribute to the unique 1930s character of the place.

Bills Horse Trough

Watering Trough

A horse Watering Trough is located adjacent to the footpath near the main Park entrance on Enid Avenue. It was initially installed on the northern side of Railway Terrace near the intersection with Jamieson Street, but was moved by Parramatta Council to the site in 1982.

The Trough was donated by George and Anna Bills, who had no children, but donated considerable amounts to animal societies. It is one of approximately 700 troughs erected between 1930 and 1940 in Australia, usually manufactured from reinforced concrete and is of a standard design.

COMMUNITY ENGAGEMENT

The community engagement process undertaken in September and October 2017, provided the opportunity for the community to provide input into the concept development phase of the new Granville Multipurpose Centre. The process included a wide range of community engagement activities, with over 500 people participating in the engagement process. Engagement activities involved gaining input into the types of facilities, spaces and offerings to be provided at the Centre. The engagement activities also involved presenting preliminary concept plans to participants for review and feedback. Participants included interested community members, as well as special interest groups and organisations.

Importance of Public Art

Participant responses in the community feedback survey identified public art as a key inclusion in the equipment, facilities and design features that respondents desired to see incorporated into the building and its surrounds.

Support for Arts Programming at the Site

From feedback of engagement participants on the facilities and spaces proposed in the concept plans, the spaces identified to be of highest priority included the multipurpose community hall, music recording studios, art exhibition and workshop spaces. These spaces accounted for 42% of all participant responses to their four highest priority spaces. From feedback on operations and programs, participants identified creative arts and cultural programs as the highest priority of all services, programs and activities.

Section 2

ARTS PROGRAMMING AT THE SITE

Arts programs that support local arts development at the site will include:

Exhibition Program

The Granville Multipurpose Centre's Exhibition Program will offer a diverse and innovative range of exhibitions, aiming to expand upon the successes of Cumberland's popular Peacock Gallery at Auburn Botanic Gardens and ensuring that the exhibition program is reflective of the Cumberland community's aspirations and diverse demographic. The well-equipped gallery space at the Centre will present the opportunity for exhibitions in a wide range of visual art forms.

Public Program

The Centre will offer public programs and workshops that engage with the local community and promote the participation of visitors to Cumberland. The delivery of public programs will engage local and visiting artists, including gallery exhibiting artists and artists in residence. Public Programs will aim to provide a diverse range of experiences, including educational experiences and education based public programs. As the Centre's programming develops, public programs may be offered in a range of artforms including theatre and performance, writing, music, dance, design and other artistic disciplines.

Artist Development Program

The Granville Multipurpose Centre's spaces will accommodate artist development activities such as artist in residence programs. The Centre's program of activities will aim to deliver professional development activities, training, and creative projects to support artist development.

Makers and Development Spaces

The Granville Multipurpose Centre's versatile network of multi-purpose, co-located spaces, including dedicated workshop spaces, will provide the opportunity for the creation of 'maker spaces' across a range of activities to facilitate Centre users exploring their creativity. In addition, the Centre's range of versatile co-located spaces present the opportunity for arts organisations and individuals to utilise the Centre as a place of development and a hub of artistic collaboration.

Cumberland's popular Peacock Gallery.

Section 3

BROADER CULTURAL PLANNING AND CULTURAL INFRASTRUCTURE CONTEXT FOR CUMBERLAND

COMMUNITY STRATEGIC PLAN

STRATEGIC GOAL 1 – A GREAT PLACE TO LIVE

We have high quality community facilities and spaces that fit our purposes.

Key Activity: Council helps foster the creative arts and culture

We have positive connections within our local community through our local programs and services that reflect our unique identity.

Key Activity: Programs that provide access to arts and culture

OTHER STRATEGIC PLANS (UNDER DEVELOPMENT)

CULTURE AND ACTIVATION STRATEGY

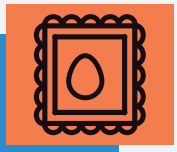
Council is developing a Culture and Activation Strategy in 2018/19. The Strategy will inform Council's planning of programs and services to the community in arts and culture, as well as town centre focused initiatives such as public art and place activation.

COMMUNITY FACILITIES STRATEGY

Council is developing a Community Facilities Strategy in 2018/19. Council is determined to provide places where Cumberland's diverse community can come together. Council owns and operates a number of community facilities used by the community to deliver arts and cultural programs. Council is seeking to develop a network of arts and cultural facilities over the next 10 years across Cumberland.

CURRENT ARTS & CULTURAL FACILITIES

GRANVILLE MULTIPURPOSE CENTRE - ART GALLERY AND SPACES



From 2020, this space will act as Cumberland's key facility for incubation, presentation and development of arts, cultural expression and creativity.

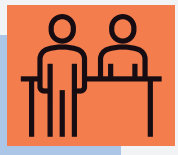
PEACOCK GALLERY AND AUBURN ARTS STUDIO

From 2020, this arts facility will be redefined as a dedicated space for artist skills development, artist studio and residency for emerging, mid-career and professional artists.

TEMPORARY CREATIVE AND MAKING SPACES

A growing network of spaces across Cumberland, fostering arts development and engagement by temporarily hosting artists and organisations working across a range of artforms.

MULTIPURPOSE COMMUNITY CENTRES



Cumberland's network of staffed one-stop shop community centres offer places of creative and social connection. Centre-based Lifelong Learning Programs promote ease of access and participation in arts and creative programs.

Cumberland Council

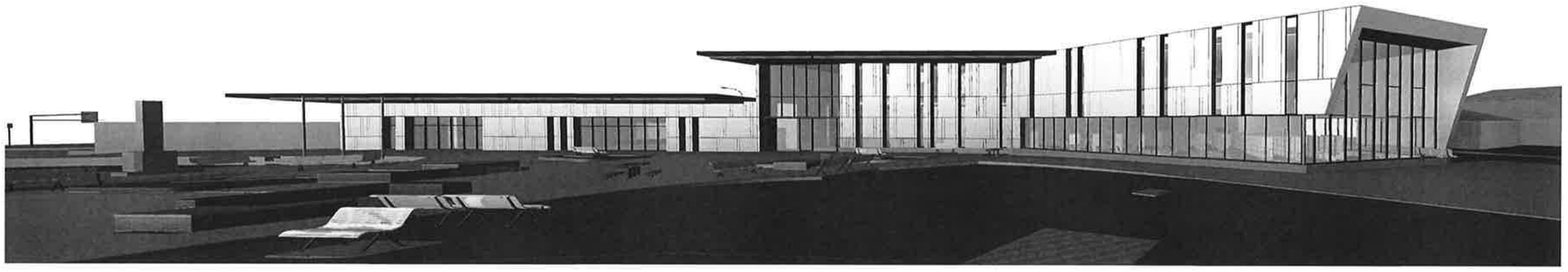
16 Memorial Avenue, PO Box 42, Merrylands NSW 2160

T 8757 9000 **F** 9840 9734 **E** council@cumberland.nsw.gov.au

W cumberland.nsw.gov.au Cumberland Council Sydney

ARCHITECTURAL DRAWINGS

DA000	COVER SHEET
DA001	3D VIEWS
DA002	SHADOW DIAGRAMS
DA021	SITE PLAN - EXISTING / DEMOLITION
DA101	PROPOSED SITE PLAN
DA111	SITE ANALYSIS
DA201	GENERAL ARRANGEMENT PLAN - GROUND FLOOR
DA202	GENERAL ARRANGEMENT PLAN - LEVEL 1
DA203	GENERAL ARRANGEMENT PLAN - ROOF PLAN
DA204	GENERAL ARRANGEMENT - PARKING PLAN
DA401	STREETSCAPE ELEVATIONS
DA402	BUILDING ELEVATIONS
DA403	BUILDING ELEVATIONS
DA501	SECTIONS
DA502	SECTIONS



GRANVILLE MULTIPURPOSE CENTRE

Consultants

PROJECT MANAGER
CFS
(02) 9252 4420

SURVEYOR
TSS TOTAL SURVEY
1300 877 000

STRUCTURAL/CIVIL
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(02) 9417 8400

BUILDING SERVICES
ERBAS
(02) 9437 1022

ACOUSTIC ENGINEER
ACOUSTIC LOGIC
(02) 8339 8000

FIRE ENGINEER
UMOW LAI
(02) 9431 9431

SUSTAINABILITY
UMOW LAI
(02) 9431 9431

LANDSCAPE
UMBACO
(02) 9955 6772

BCA
DESIGN CONFIDENCE
(02) 8399 3707

HERITAGE
EXTENT HERITAGE ADVISORS
(02) 9555 4000

TOWN PLANNING
HIGGINS PLANNING PTY LTD
(02) 9929 4044

QUANTITY SURVEYOR
SLATTERY
(02) 9423 8850

CUMBERLAND COUNCIL

Client
CUMBERLAND COUNCIL
16 MEMORIAL AVENUE,
MERRYLANDS, NSW 2160

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Project Number
AUSYD-17-0477

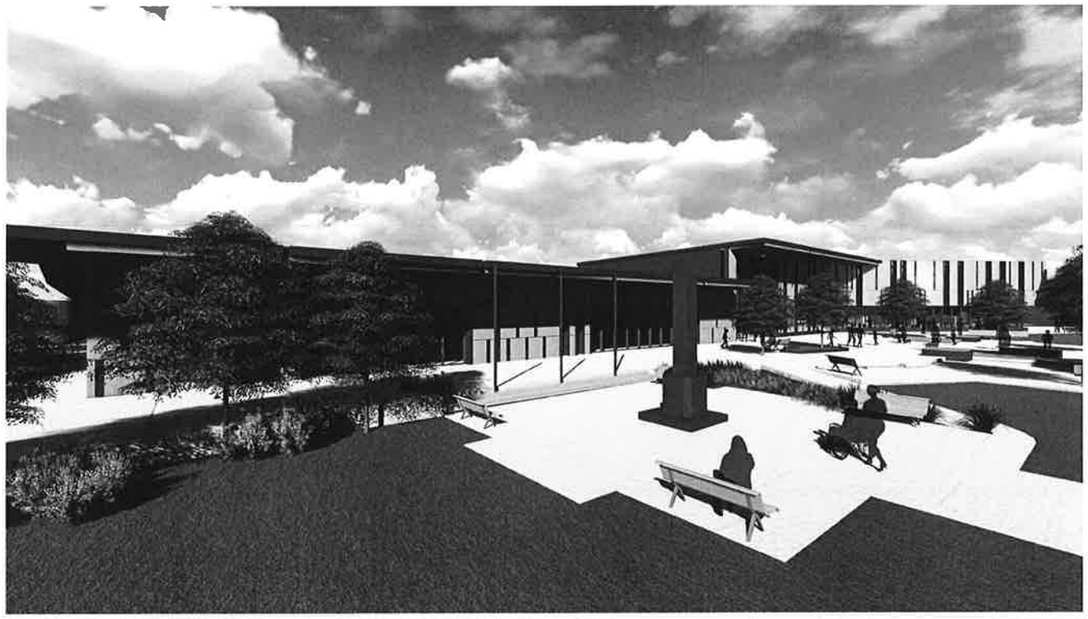
Drawing Number
DA000

Issue
1

COVER SHEET

Paper Size : A1

3D PERSPECTIVE OF THE BUILDING

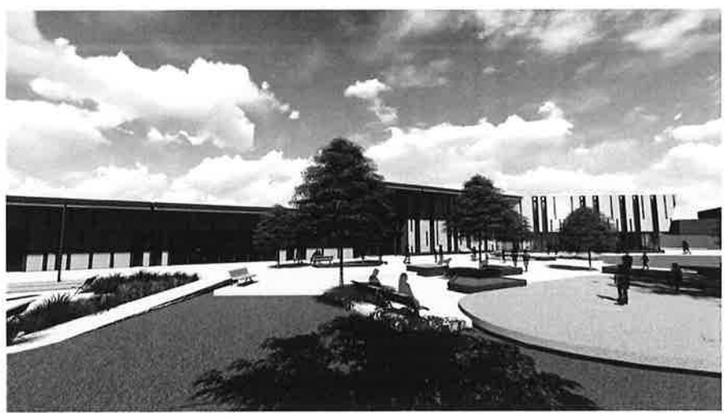


VIEW OF THE MEMORIAL

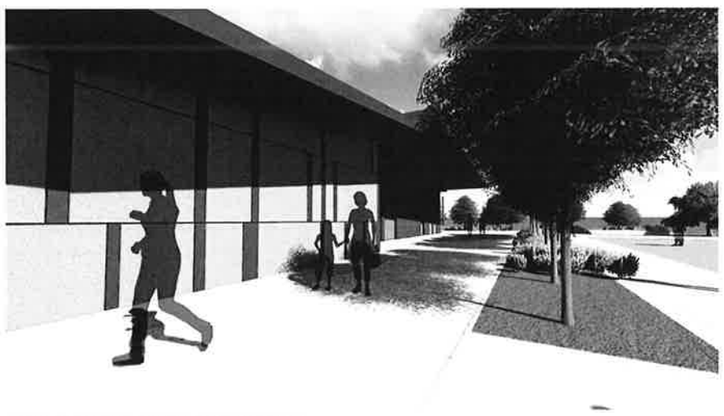
ENTRY FROM CARPARK

BUILDING ENTRY AND PLAZA

PEDESTRIAN VIEW FROM ENID AVENUE



VIEW FROM MEMORIAL DRIVE



VIEW FROM THE SOUTH-EAST CARPARK

PLAZA

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

Architect/ Designer
dwp
www.dwp.com

Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
3D VIEWS

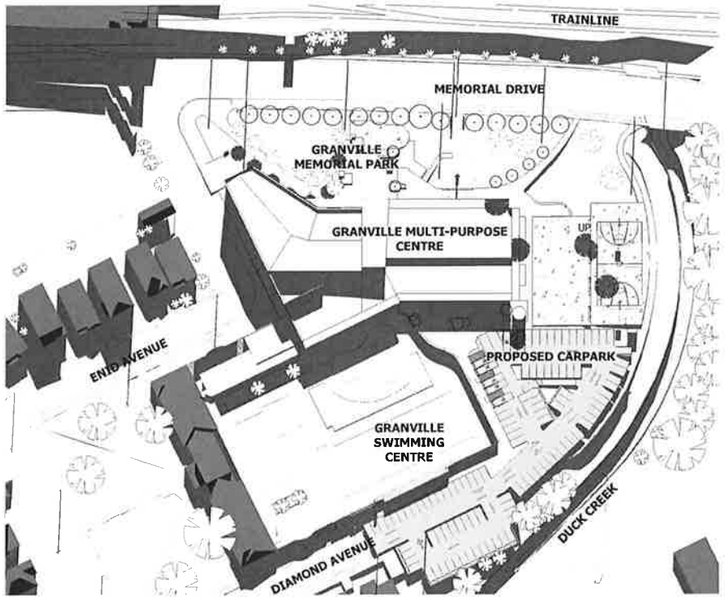
Scale (A1)
Date Printed
27/3/2018 3:44:57 PM

Drawing Number
DA001

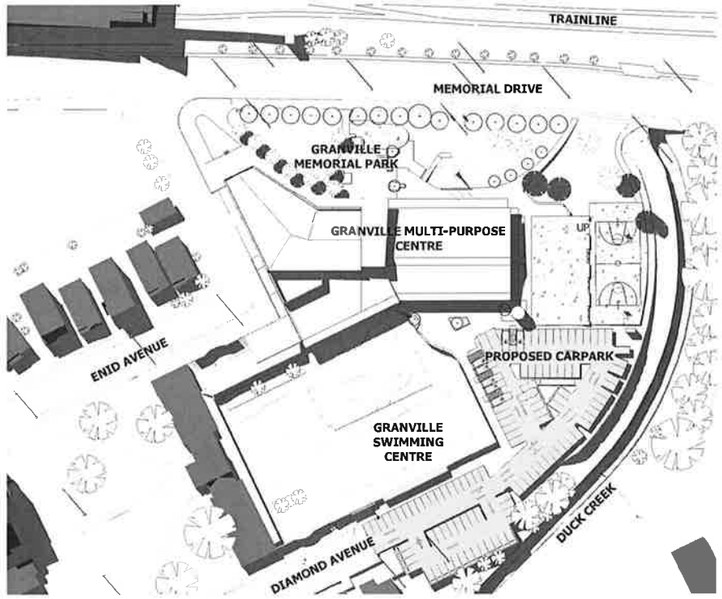
Issue
1

File Name: BIM 360://dwp_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt

WINTER SUN STUDIES_ JUNE 22ND



1 SHADOW PLAN_WINTER_9AM
1 : 1000



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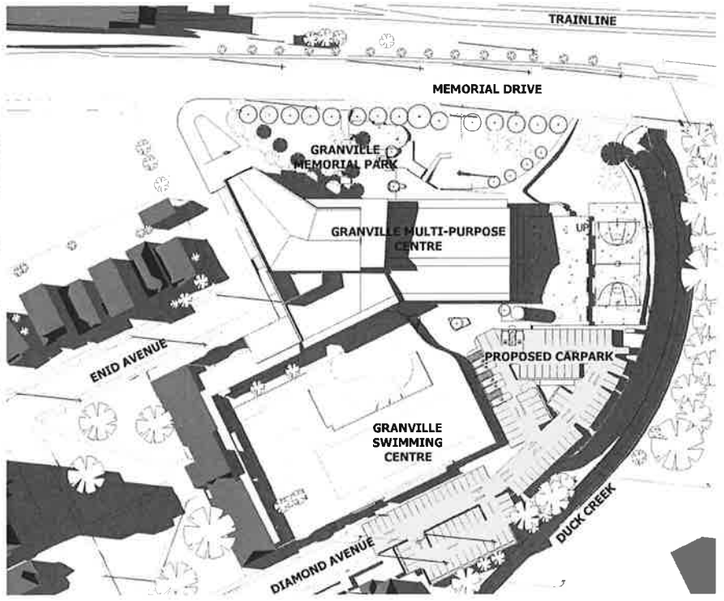
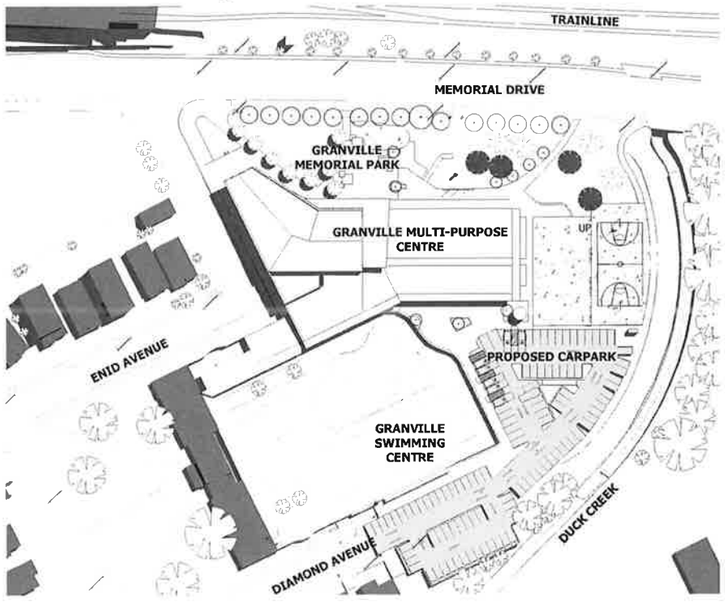


3 SHADOW PLAN_WINTER_3PM
1 : 1000

SUMMER SUN STUDIES_ DECEMBER 22ND



4 SHADOW PLAN_SUMMER_9AM
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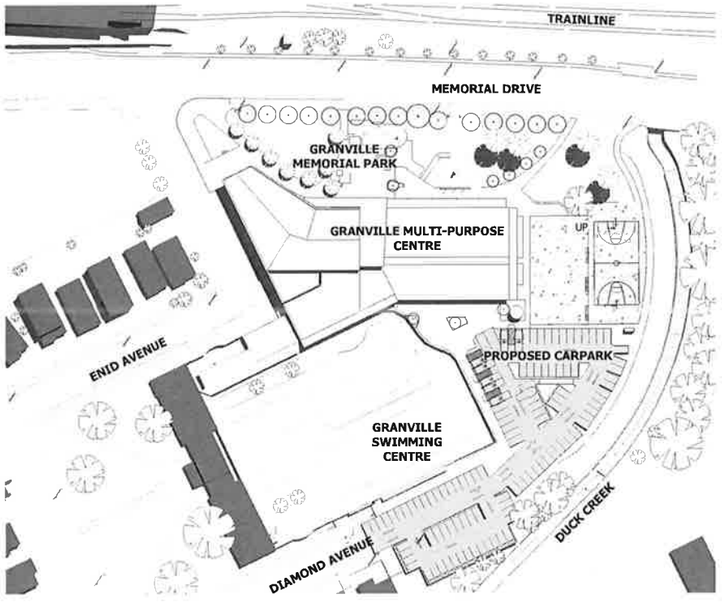

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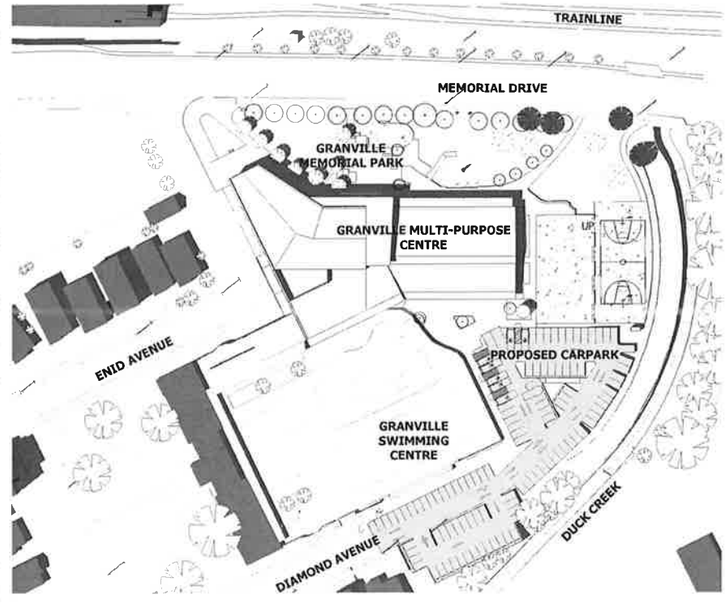

6 SHADOW PLAN_SUMMER_3PM
1 : 1000

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

Architect/ Designer
dwp
www.dwp.com

Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
SHADOW DIAGRAMS

Scale (A1) 1 : 1000
Date Printed 27/3/2018 12:32:46 PM

Drawing Number DA002
Issue 1

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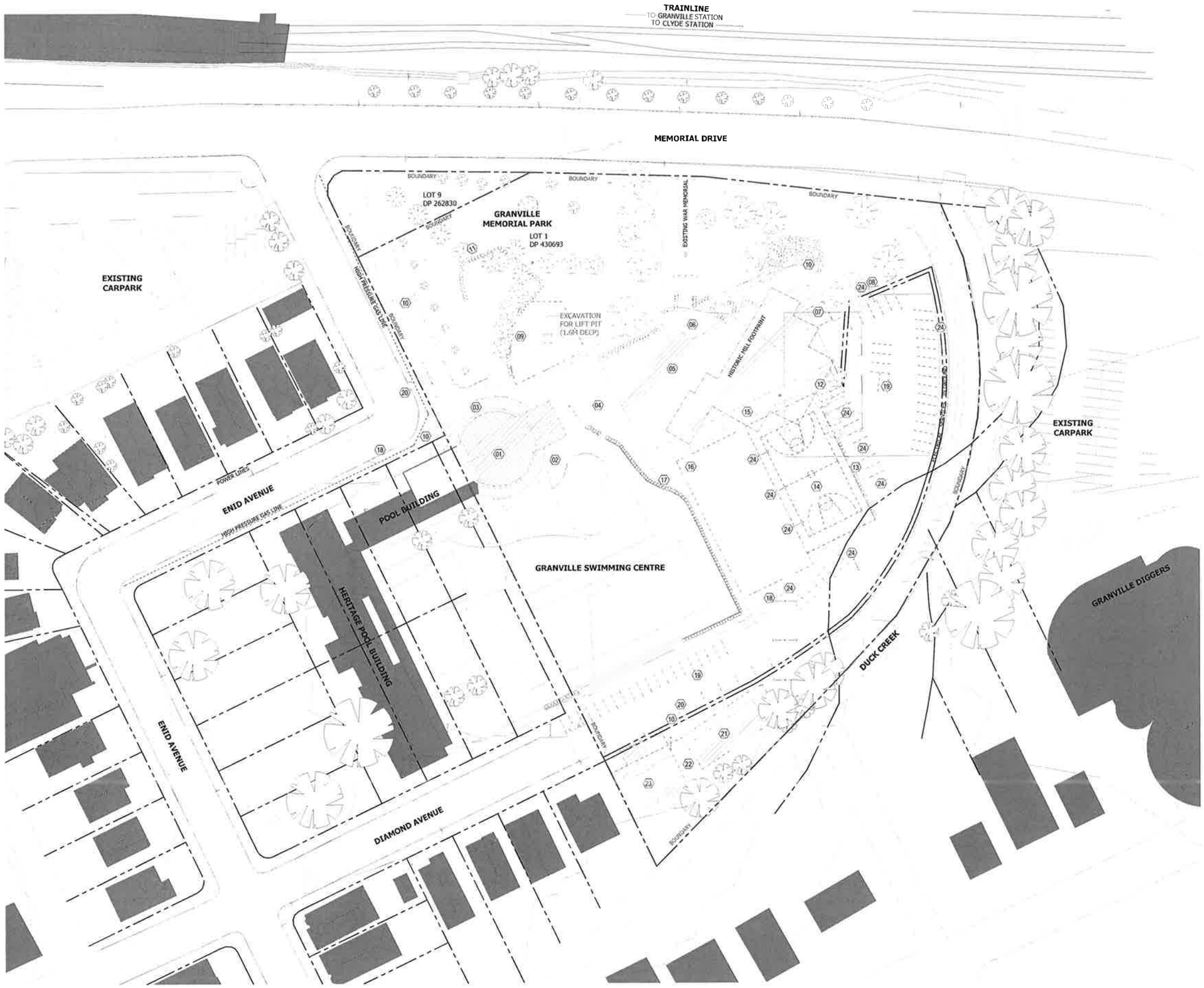


SITE DEMOLITION NOTES

(01) DEMOLISH PART OF EXISTING POOL ENTRY BUILDING.

(02) DEMOLISH PORTION OF THE EXISTING CONCRETE POOL PAVING. TO BE REINSTATED WITH NEW BUILDING.

(03) DEMOLISH AND REMOVE CONCRETE PAVING IN FRONT OF EXISTING POOL ENTRY BUILDING.

(04) DEMOLISH CONCRETE PAVING BETWEEN THE EXISTING POOL ENTRY AND EXISTING COMMUNITY CENTRE.

(05) TOTALLY DEMOLISH EXISTING COMMUNITY CENTRE.

(06) DEMOLISH ALL PAVING IN FRONT OF THE EXISTING COMMUNITY CENTRE.

(07) DEMOLISH EXISTING GARBAGE ENCLOSURE AND RAINWATER WATER TANK ALONG WITH SURROUNDING CONCRETE PAVING.

(08) DEMOLISH EXISTING TIMBER FENCE (KOPPERS LOGS).

(09) DEMOLISH EXISTING PLAY EQUIPMENT, SOFT FALL FLOORING, SURROUNDING METAL FENCE AND GARDEN BEDS.

(10) DEMOLISH CONCRETE FOOTPATH.

(11) DEMOLITION WORKS TO GRANVILLE MEMORIAL PARK INCLUDE REMOVAL OF TREES, DEMOLITION OF BENCHES AND TABLES AS WELL AS CONCRETE PADS FOR THE FULL EXTEND TO DEMOLITION WORKS IN THIS ARE REFER TO THE GROUND FLOOR DEMOLITION PLAN, FOR CUT AND FILL TO THE LANDSCAPING REFER TO CIVIL PLANS.

(12) DEMOLISH EXISTING SUBSTATION INCLUDING THE CONCRETE PAD BELOW AND SURROUNDING FENCING.

(13) DEMOLISH ROCK RETAINING WALL & PLANTING.

(14) DEMOLISH CONCRETE BASKETBALL COURT, STEEL BASKET BALL HOOP STRUCTURES AS WELL ASS THE SURROUNDING FENCE.

(15) DEMOLISH CONCRETE PAVING BEHIND EXISTING COMMUNITY CENTRE.

(16) DEMOLISH FENCING AROUND GRASSED SPACE.

(17) DEMOLISH CONCRETE FOOTPATH BESIDES SWIMMING CENTRE FENCE. PROTECT AND RETAIN POOL FENCE & HEDGE.

(18) DEMOLISH CONCRETE DRIVEWAY.

(19) DEMOLISH EXISTING CARPARK AND ROADWAY INCLUDING ALL ASSOCIATED SIGNAGE, AND KERBS.

(20) POWER POLE AND LINES TO BE REMOVED.

(21) 2 DIAMOND AVENUE TO BE TOTALLY DEMOLISHED. ST JOHNS FIRST AID BUILDING.

(22) DEMOLISH ALL FOOTPATHS, FENCING AND SITE SERVICES ASSOCIATED WITH THE BUILDINGS BEING DEMOLISHED.

(23) 2 DIAMOND AVENUE TO BE TOTALLY DEMOLISHED, GRANVILLE BABY HEALTH CENTRE.

(24) DEMOLISH LAMP POST.

GENERAL NOTES

THE ARCHITECTURAL LAYOUTS HAVE BEEN BASED ON THE SITE SURVEY, PREPARED BY TOTAL SURVEYING SOLUTIONS.
FILE_171042_A_20.06.2017

THE FOOTPRINT OF THE HISTORIC MILL IS INDICATIVE ONLY AND BASED ON HISTORIC PHOTOGRAPHS.

EXISTING BUILDING

EXISTING TREES

TREE TO BE REMOVED

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
I	ISSUED FOR DA	27.03.2018	AC	BM

Architect/ Designer
dwp
www.dwp.com

Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
SITE PLAN - EXISTING / DEMOLITION

Scale (A1) As Indicated
Date Printed 27/3/2018 12:33:07 PM

Drawing Number DA021
Issue 1

File Name: BIM 360://dwp_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt

BULK EARTHWORKS PLAN

SCALE:1:400

0 8 16 24 32 40m

8 6 4 2

SCALE 1:400

LEGEND

- EXISTING BOUNDARY
- PROPOSED TEMPORARY BATTERS LINE
- 4.60 EXISTING CONTOURS
- 4.60 CONTOURS BE

DEPTH OF CUT & FILL RANGE				
LOWER VALUE		UPPER VALUE		COLOUR
-6	to	-4	m	
-4	to	-2	m	
-2	to	-1	m	
-1	to	-0.8	m	
-0.8	to	-0.6	m	
-0.6	to	-0.4	m	
-0.4	to	-0.2	m	
-0.2	to	-0.1	m	
-0.1	to	-0.05	m	
-0.05	to	0.0	m	
0.0	to	0.05	m	
0.05	to	0.1	m	
0.1	to	0.2	m	
0.2	to	0.4	m	
0.4	to	0.6	m	
0.6	to	0.8	m	
0.8	to	1	m	
1	to	2	m	

PRELIMINARY BULK EARTHWORKS QUANTITIES		
CUT	2,470	m³
FILL	300	m³
EXCESS OF CUT OVER FILL	2,170	m³
EXCAVATION FOR RETAINING WALLS NOT INCLUDED IN CALCULATION		
EXCAVATION FOR SERVICE TRENCHES NOT INCLUDED IN CALCULATION		
TOPSOIL STRIPPING HAS NOT BEEN INCLUDED IN CALCULATION		

BULK EARTHWORKS GENERAL NOTES

REFER TO GEOTECHNICAL INVESTIGATION REPORT PREPARED BY DOUGLAS PARTNERS REF.86007.00 DATED AUG. 2017. FOR INFORMATION RELATING TO EXISTING GROUND CONDITIONS, SITE TREATMENT AND SUPERVISION.

THE LOCATIONS OF UNDERGROUND SERVICES SHOWN ON THESE DRAWINGS HAVE BEEN PLOTTED FROM SURVEY AND AUTHORITY INFORMATION. THE SERVICE INFORMATION HAS BEEN PREPARED ONLY TO SHOW THE APPROXIMATE POSITIONS OF ANY KNOWN SERVICES AND MAY NOT BE AS CONSTRUCTED OR ACCURATE.

HENRY AND HYMAS PTY LTD CAN NOT GUARANTEE THAT THE SERVICES INFORMATION SHOWN ON THESE DRAWINGS, ACCURATELY INDICATES THE PRESENCE OR ABSENCE OF SERVICES OR THEIR LOCATION AND WILL ACCEPT NO LIABILITY FOR INACCURACIES IN THE SERVICES INFORMATION SHOWN ARISING FROM ANY CAUSE WHATSOEVER. CONTRACTORS ARE TO CONTACT THE RELEVANT SERVICE AUTHORITY PRIOR TO COMMENCEMENT OF EXCAVATION.
FOR COMMENCEMENT OF WORKS ON SITE, SEARCH RESULTS ARE TO BE KEPT ON SITE AT ALL TIMES.

ALL SERVICES ARE TO BE LOCATED AND CUT OFF PRIOR TO THE COMMENCEMENT OF EXCAVATION AND FILLING OPERATIONS.

ALL TOP SOIL, ORGANIC MATTER AND FILL MATERIAL SHALL BE REMOVED FROM ALL AREAS UNDER BUILDING AND CARPARK LOCATIONS TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER. AREAS TO BE FULLY STRIPPED OF EXISTING FILL AND DARK BROWN BLACK UPPER ORGANIC ALLUVIUM.

UPON COMPLETION OF STRIPPING AND PRIOR TO PLACEMENT OF FILL THE ENTIRE SITE SHALL BE PROOF ROLLED WITH A MINIMUM OF 6 PASSES OF A VIBRATOR PADFOOT ROLLER OF NOT LESS THEN 9 TONNE MINIMUM DEAD WEIGHT OR AS SPECIFIED IN THE GEOTECHNICAL REPORT. ANY SOFT OR HEAVING AREAS SHALL BE REMOVED TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER TO A MINIMUM DEPTH OF 500mm AND THEN BACKFILLED WITH APPROVED MATERIAL IN 200mm THICK LOOSE LAYERS COMPACTED TO 98% OF STANDARD MAX. DRY DENSITY AND TO WITHIN +/- 2% OF STANDARD OPTIMUM MOISTURE CONTENT. APPROVED BACKFILL MATERIAL MAY BE CRUSHED ROCK OR SANDY LOAM WITH A PLASTICITY INDEX LESS THAN 15%.

IMPORTED FILLING:
THE CONTRACTOR WILL IMPORT SUITABLE FILL FROM AN EXTERNAL SOURCE. EXCAVATION MATERIALS MEETING THE REQUIRED SPECIFICATION MAY BE USED AS FILL. THIS MAY INCLUDE RECYCLED MATERIALS IF THEY ARE SUITABLY BLENDED/CONDITIONED TO MEET MATERIALS SPECIFICATIONS.

AN ADDITIONAL 300mm OVER EXCAVATION FOR SUBGRADE IMPROVEMENT MAY BE REQUIRED SUBJECT TO GEOTECH ENGINEER ADVICE

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY:
TSS TOTAL SURVEYING SOLUTIONS
DATUM: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DA ONLY	JK	TR	23.03.2018

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE

Client: CUMBERLAND COUCIL

Architect: dwp

Level 5,
79 Victoria Avenue
Chatswood NSW 2067

Telephone +61 2 9417 8400
Facsimile +61 2 9417 8337
Email email@hhconsult.com.au
Web www.henryandhymas.com.au

henry&hymas

Project: PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title: BULK EARTHWORKS PLAN

Drawn	Designed	Date
J Knight	T.Rozehnal	FEB 2018
Checked	Approved	Scale
T.Rozehnal	A.Francis	1:400 @ A1

Drawing number: 17A34_DA_BE01

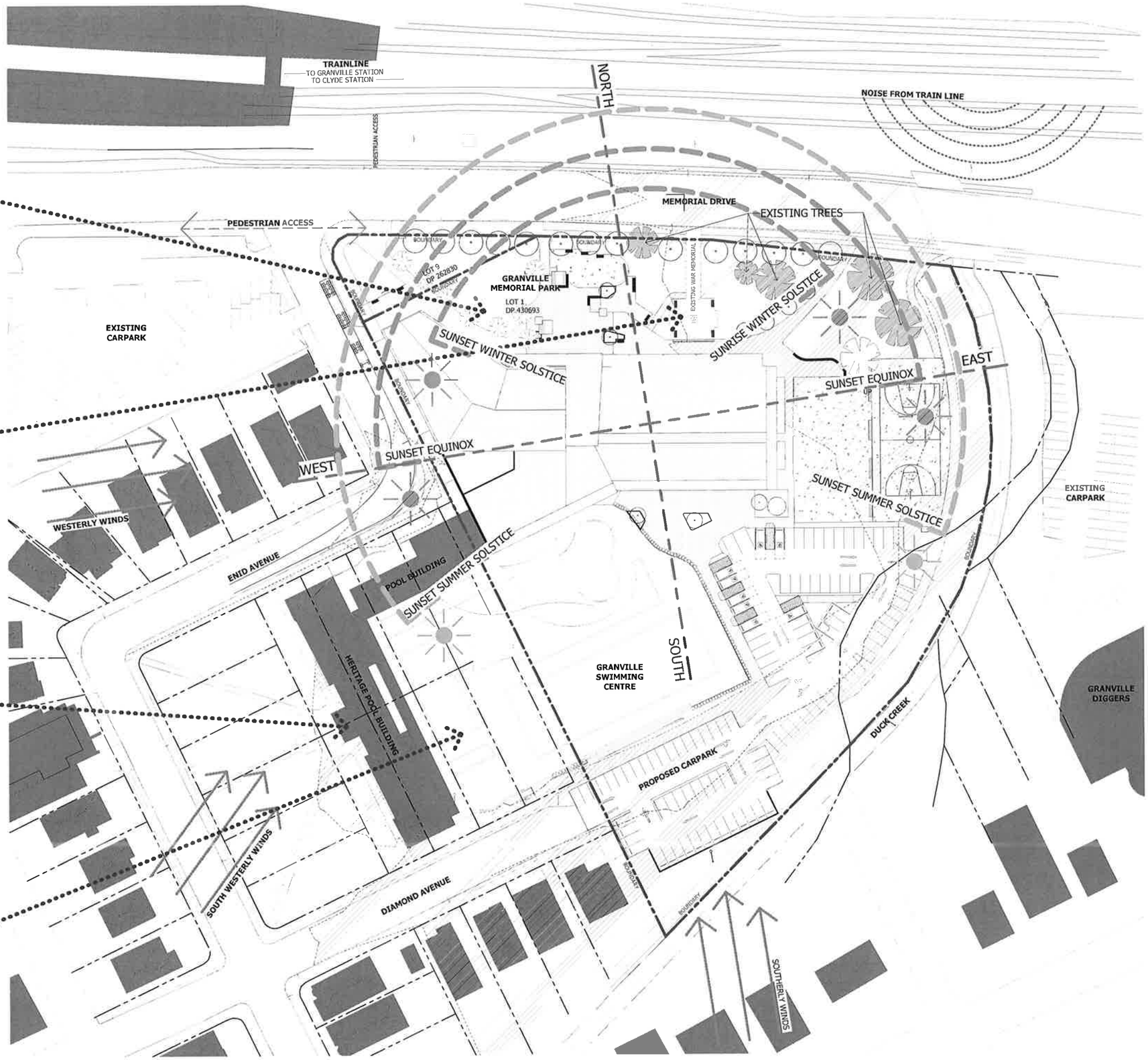
Revision: 01

GRANVILLE MEMORIAL PARK

EXISTING WAR MEMORIAL

HERITAGE POOL BUILDING

EXISTING SWIMMING POOL



DA_A111_SITE ANAYSIS PLAN
1 : 500

Notes

Verify all dimensions and levels on site and report any discrepancies to dwp for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents.

Use figured dimensions only. Do not scale from drawings. dwp cannot guarantee the accuracy of content and format for copies of drawings issued electronically. The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.

GENERAL NOTES

THE ARCHITECTURAL LAYOUTS HAVE BEEN BASED ON THE SITE SURVEY, PREPARED BY TOTAL SURVEYING SOLUTIONS.
FILE_171042_A_20.06.2017

THE FOOTPRINT OF THE HISTORIC MILL IS INDICATIVE ONLY AND BASED ON HISTORIC PHOTOGRAPHS.

PROPOSED ROAD & CARPARK
EXISTING BUILDING
EXISTING TREES
PROPOSED TREES

FLOOD NOTES

1% AEP FLOOD LEVEL BELOW 5.92mAHD
SITE AREA BELOW 5.1mAHD 5% AEP FLOOD LEVEL

RL NOTES

x 6.11 DENOTES RL (REDUCED LEVEL) FROM THE AHD (AUSTRALIAN HEIGHT DATUM)

BB BOTTOM OF BANK
EB EDGE OF BITUMEN
EC EDGE OF CONCRETE
EG EDGE OF GARDEN
IoK INVERSE OF KERB
LIP LIP OF KERB
PIT SERVICES PIT
TB TOP OF BANK
TG TOP OF GUTTER
~~TK TOP OF KERB~~

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

Architect/ Designer
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www.dwp.com

Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

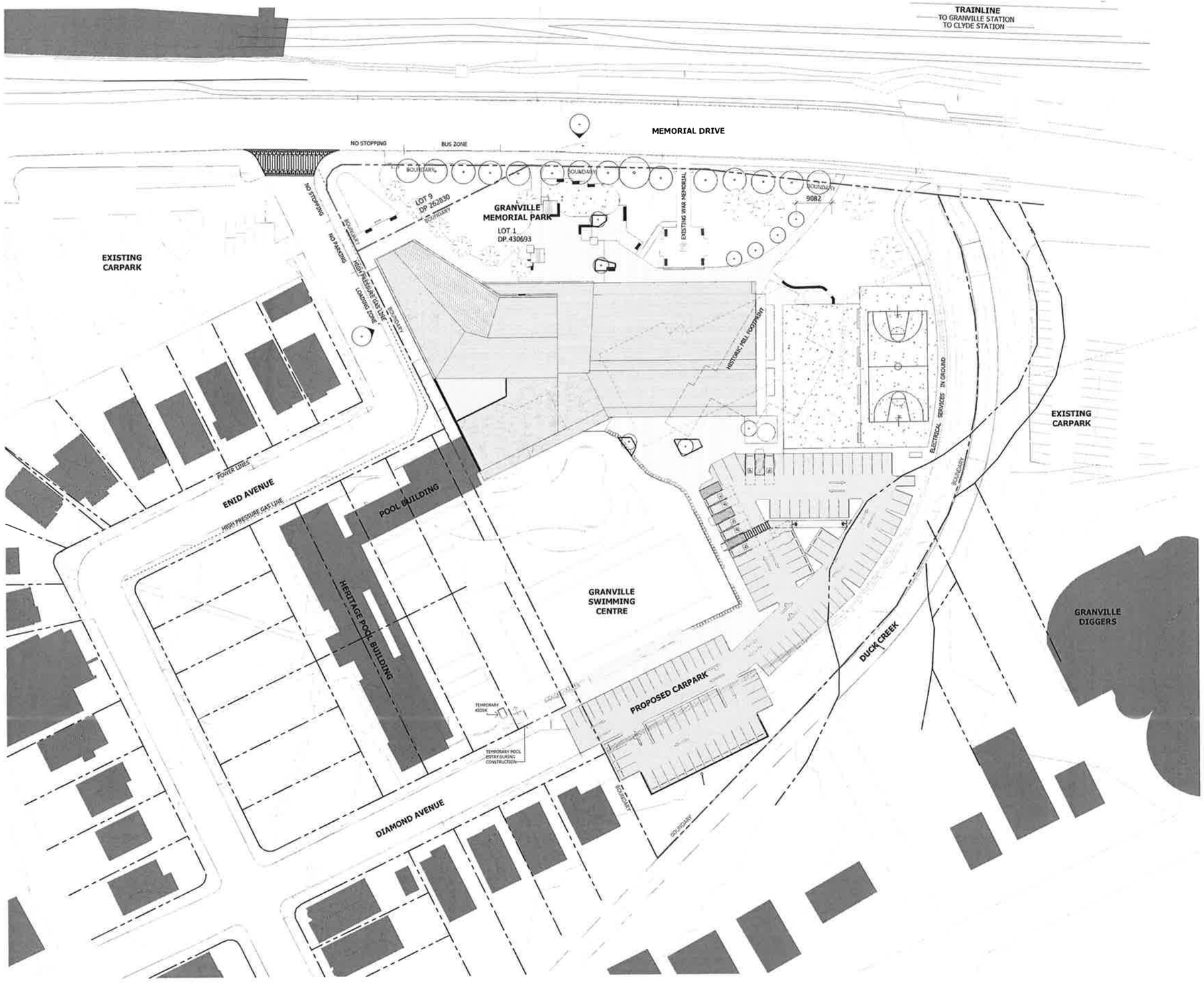
Project Number
AUSYD-17-0477

Drawing
SITE ANALYSIS

Scale (A1) As indicated
Date Printed 27/3/2018 12:33:52 PM

Drawing Number DA111
Issue 1

File Name: BIM 360://Wes_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt



GENERAL NOTES

THE ARCHITECTURAL LAYOUTS HAVE BEEN BASED ON THE SITE SURVEY, PREPARED BY TOTAL SURVEYING SOLUTIONS.
FILE_171042_A_20.06.2017

THE FOOTPRINT OF THE HISTORIC MILL IS INDICATIVE ONLY AND BASED ON HISTORIC PHOTOGRAPHS.

- PROPOSED ROAD & CARPARK
- EXISTING BUILDING
- EXISTING TREES
- PROPOSED TREES
- DEMOLISHED BUILDING
- PROPOSED BUILDING

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BH

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Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
PROPOSED SITE PLAN

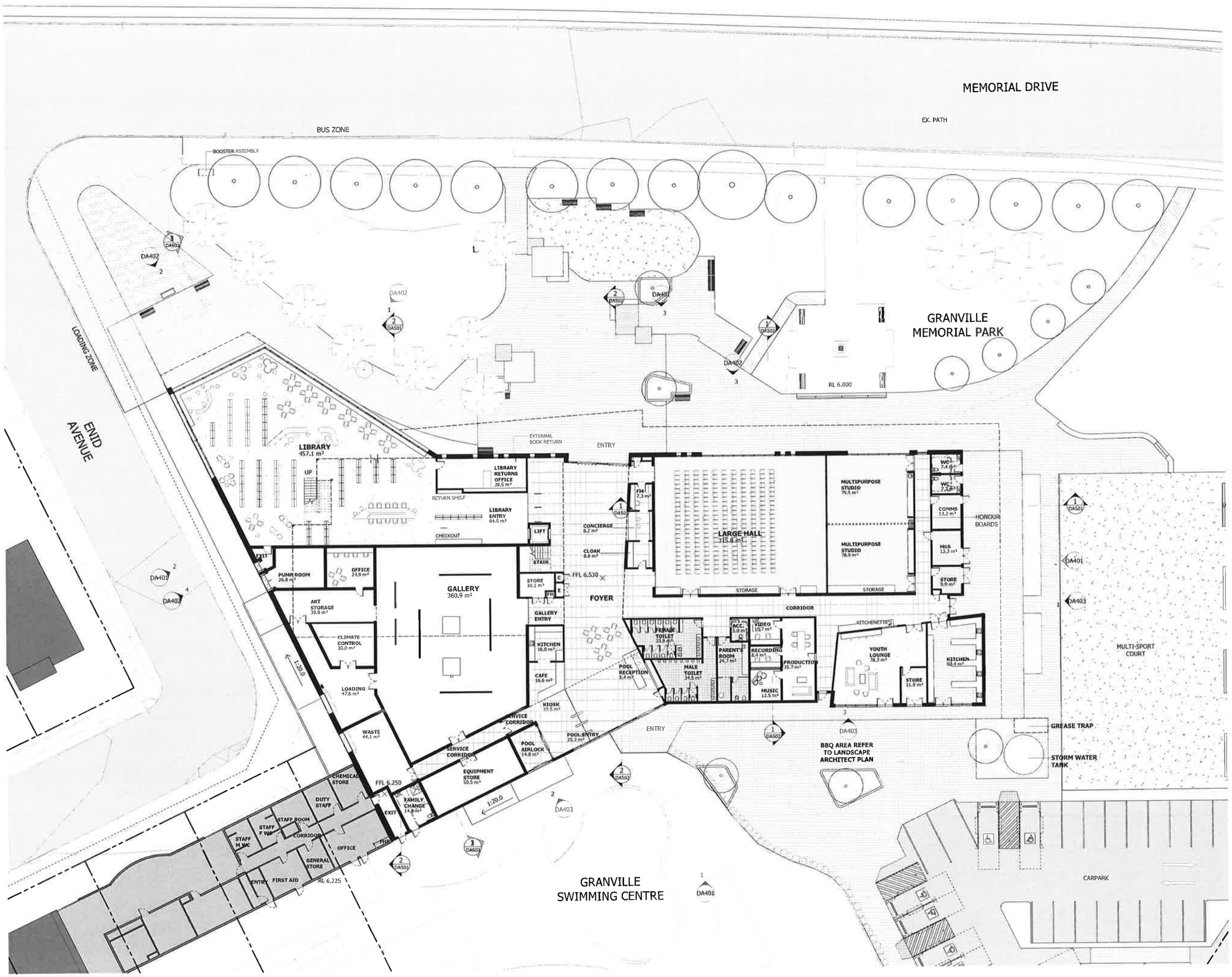
Scale (@ A1)
As indicated

Date Plotted
27/3/2018 12:33:32 PM

Drawing Number
DA101

Issue
1

File Name: BIM 360://dwg_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt



Notes

Verify all dimensions and levels on site and report any discrepancies to dwp for direction prior to the commencement of work.

Drawings are to be read in conjunction with all other contract documents.

Use figured dimensions only. Do not scale from drawings.
dwp cannot guarantee the accuracy of content and format for copies of drawings issued electronically. The completion of the Issue Details Checked and Authorised section is confirmation of the status of the drawing. The drawing shall not be used for construction unless endorsed 'For Construction' and authorised for issue.

AREA SCHEDULE (GROSS BUILDING)	
NAME	AREA
GROUND	2883 m²
LEVEL 1	601 m²
	3484 m²

1:100 0 25 5 m

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
3	ISSUED FOR DA	23.03.2018	AC	BM

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Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

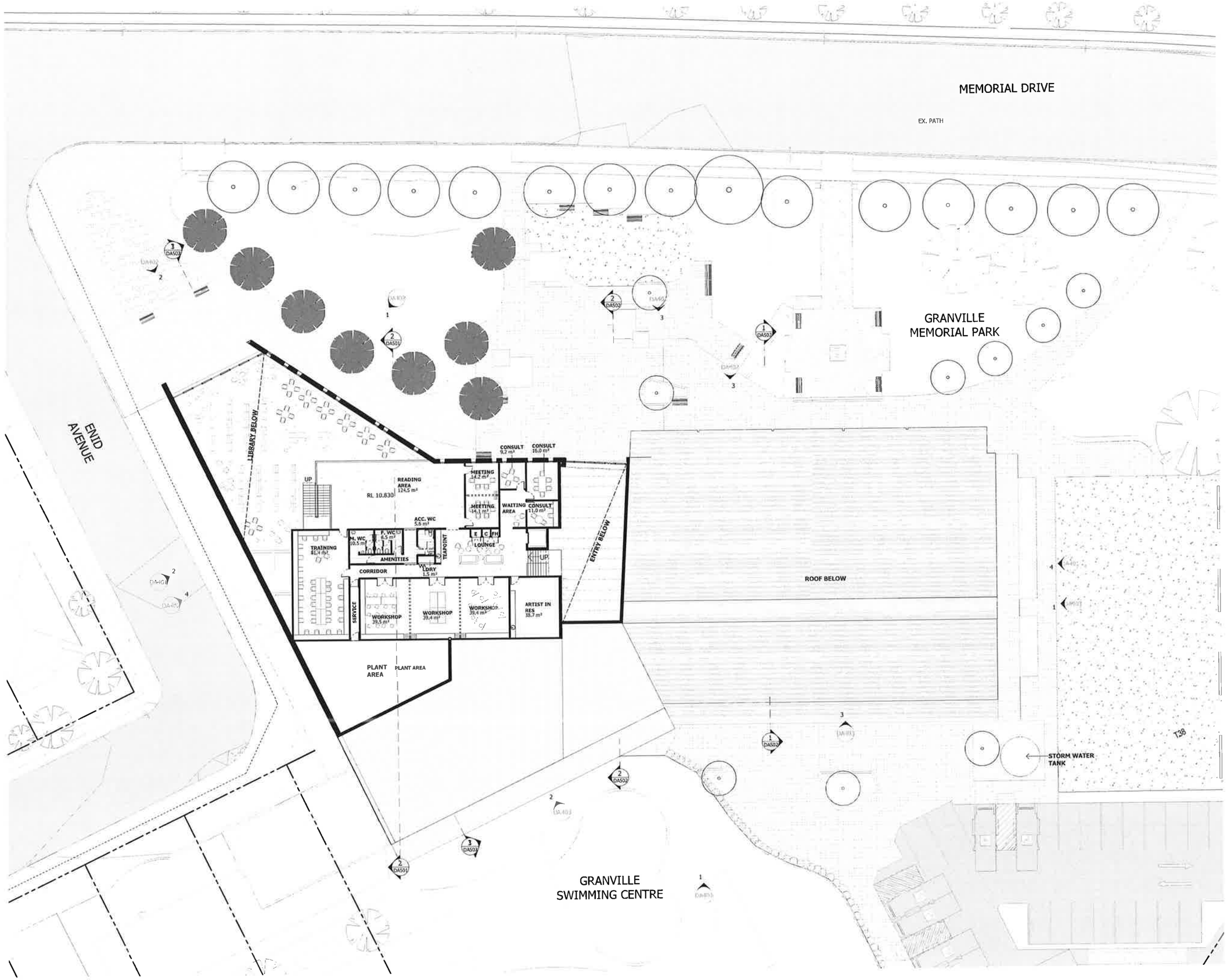
Project Number
AUSYD-17-0477

Drawing
GENERAL ARRANGEMENT PLAN - GROUND FLOOR

Scale (A1) 1 : 200
Date Printed 27/3/2018 12:34:14 PM

Drawing Number DA201
Issue 1

File Name: BIM 360://dwp_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt



AREA SCHEDULE (GROSS BUILDING)	
NAME	AREA
GROUND	2883 m²
LEVEL 1	601 m²
	3484 m²

1:100 @ 2.5 5 m

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

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Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
GENERAL ARRANGEMENT PLAN - LEVEL 1

Scale (A1) 1 : 200
Date Printed 27-Mar-18 1:22:00 PM

Drawing Number DA202
Issue 1

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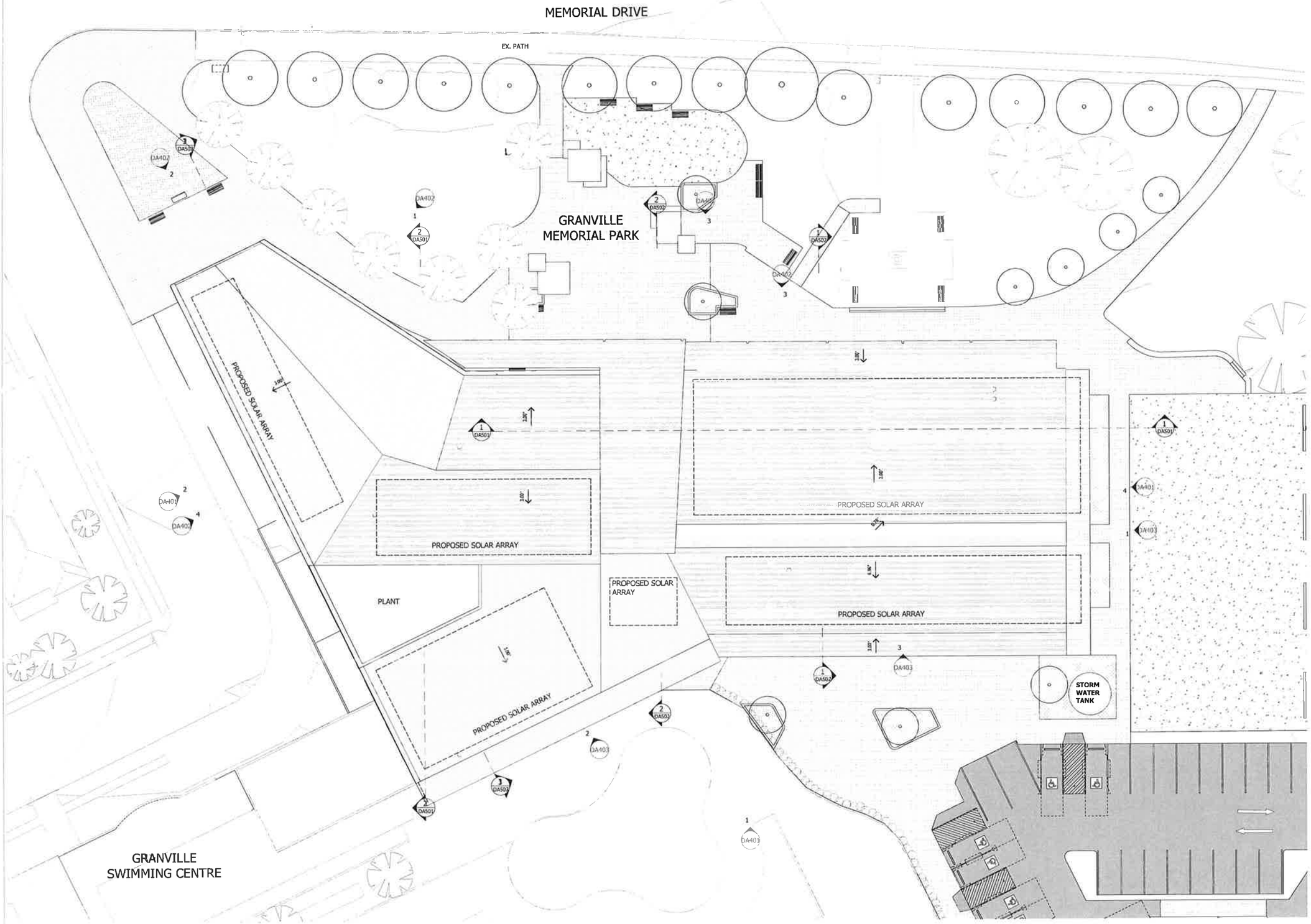

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

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Client
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Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

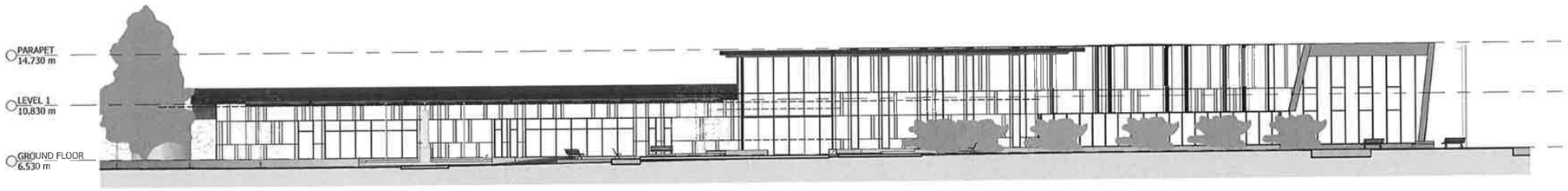
Project Number
AUSYD-17-0477

Drawing
GENERAL ARRANGEMENT PLAN - ROOF PLAN

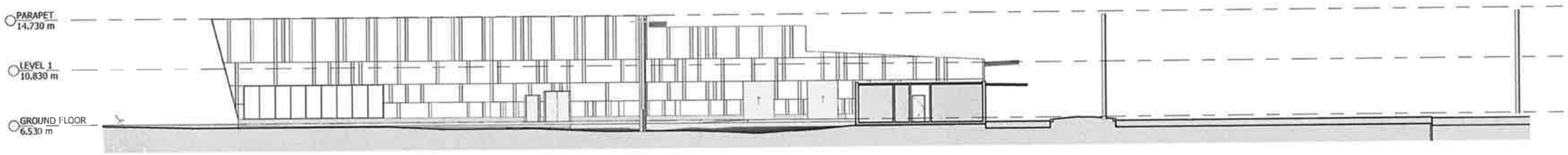
Scale (A1) 1 : 200
Date Printed 27-Mar-18 1:24:14 PM

Drawing Number DA203
Issue 1

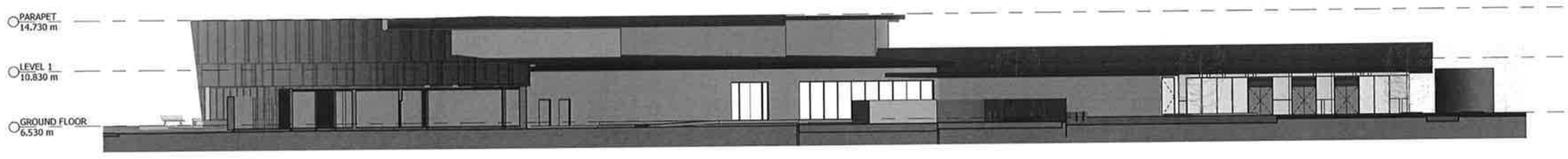
File Name: BIM 360://dwp_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt



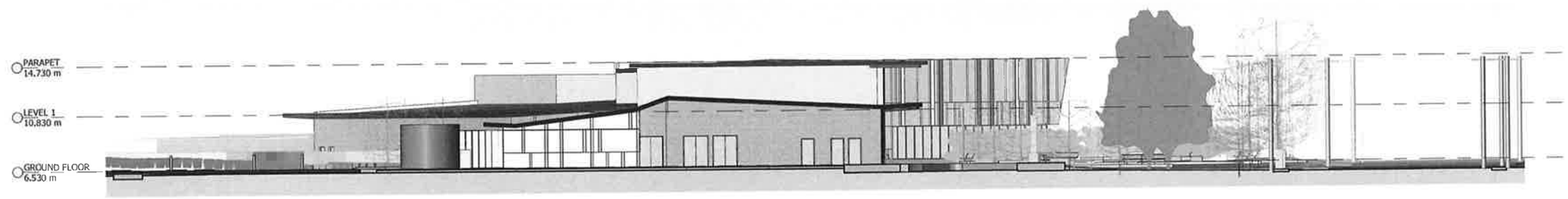
3 DA401_MEMORIAL DRIVE STREETSCAPE
1 : 200



2 DA401_ENID AVENUE STREETSCAPE
1 : 200



1 DA401_CARPARK/DIAMOND AVENUE STREETSCAPE
1 : 200



4 SPORT COURT STREETSCAPE
1 : 200

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BH

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Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
STREETSCAPE
ELEVATIONS

Scale (A1)
1 : 200

Date Printed
27/3/2018 12:36:28 PM

Drawing Number
DA401

Issue
1

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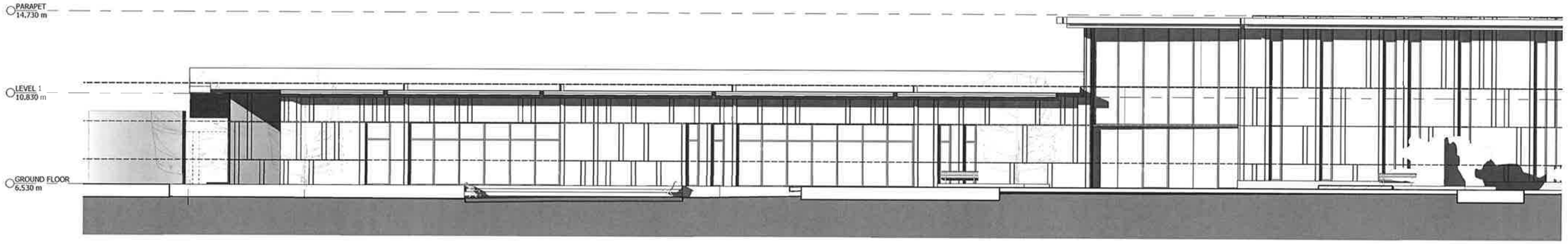
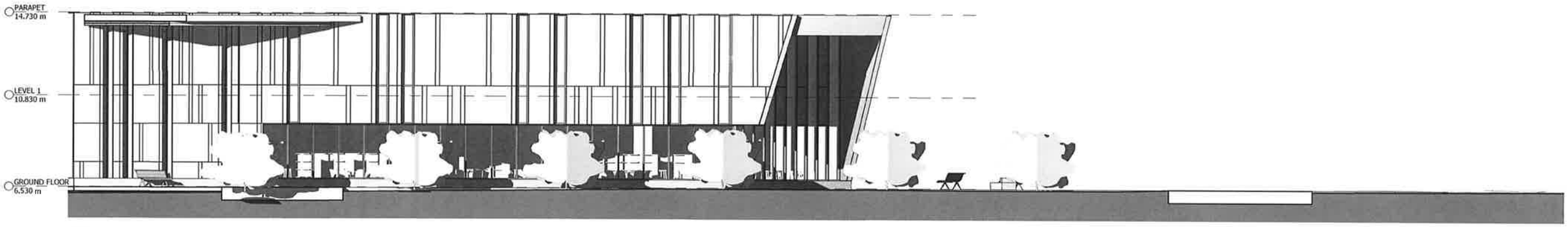
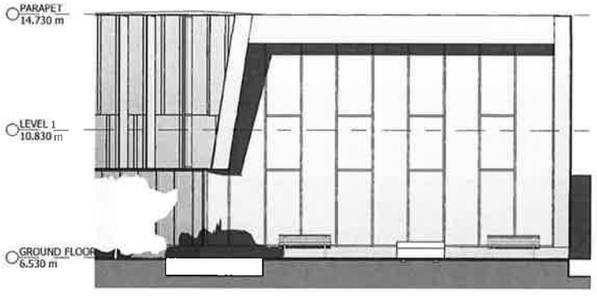


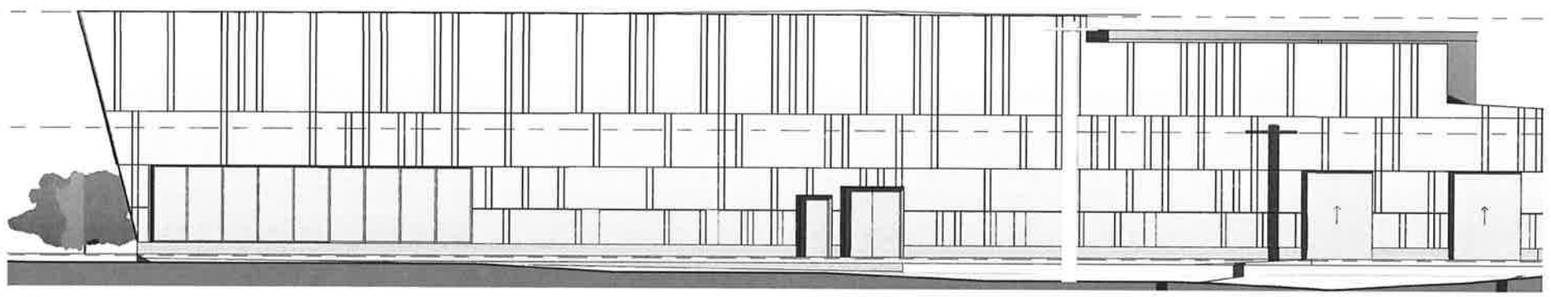
3 DA_A402_NORTH ELEVATION - VIEW FROM MEMORIAL DRIVE Copy 1
1 : 100



1 DA_A402_EAST ELEVATION
1 : 100



2 DA_A402_NORTH ELEVATION
1 : 100



4 DA_A402_WEST ELEVATION - VIEW FROM ENID AVENUE
1 : 100

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

Architect/ Designer
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Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

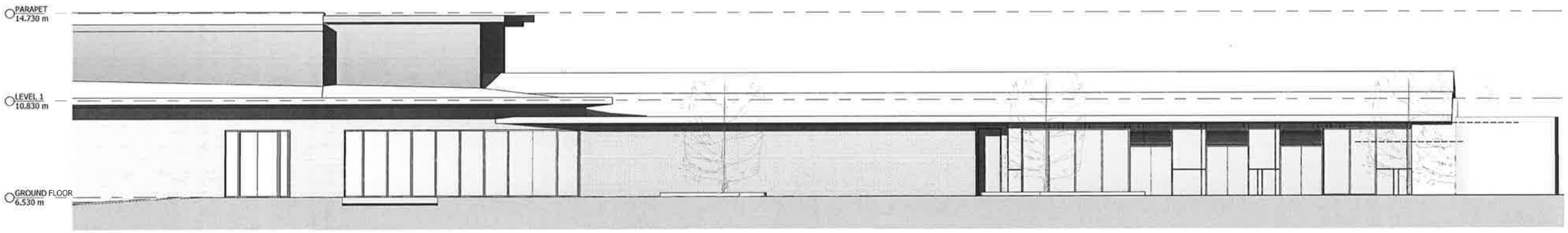
Project Number
AUSYD-17-0477

Drawing
BUILDING ELEVATIONS

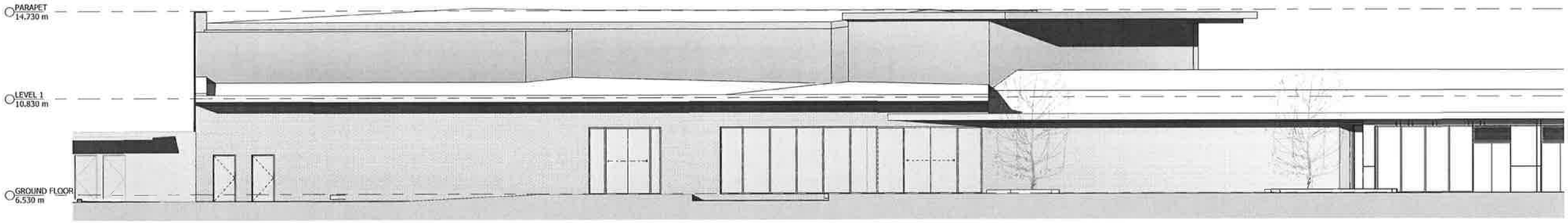
Scale (A1) 1 : 100
Date Printed 27-Mar-18 12:00:51 PM

Drawing Number DA402
Issue 1

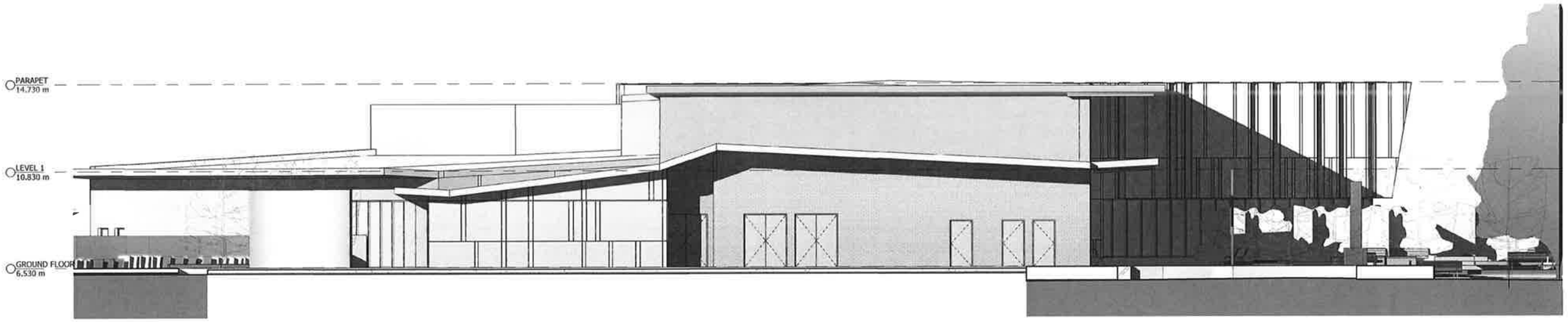
File Name: BIM 360://dwp_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt



3 SOUTH WEST ELEVATION - VIEW FROM CARPARK
1 : 100



2 SOUTH ELEVATION
1 : 100



1 SOUTH EAST ELEVATION
1 : 100

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

Architect/ Designer
dwp
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Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
BUILDING ELEVATIONS

Scale (A1)
1 : 100

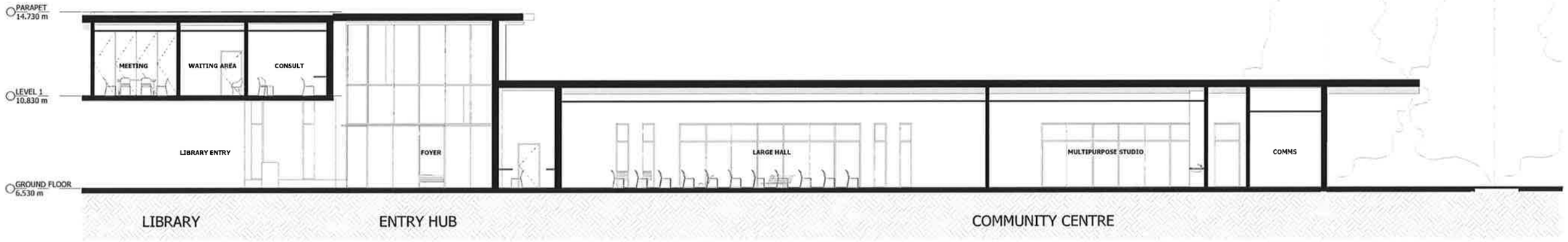
Date Printed
27-Mar-18 12:01:30 PM

Drawing Number
DA403

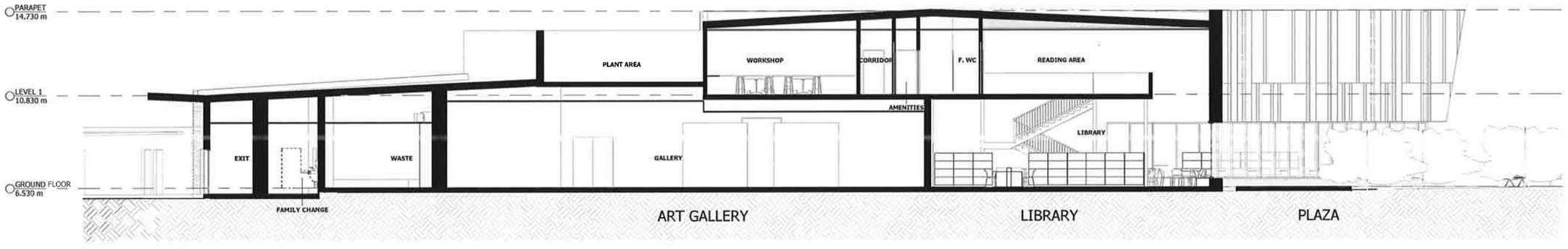
Issue
1

dwp

File Name: BIM 360://dwp_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt



1 SECTION 1
1 : 100



2 SECTION 2
1 : 100

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

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Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
SECTIONS

Scale (A1)
1 : 100

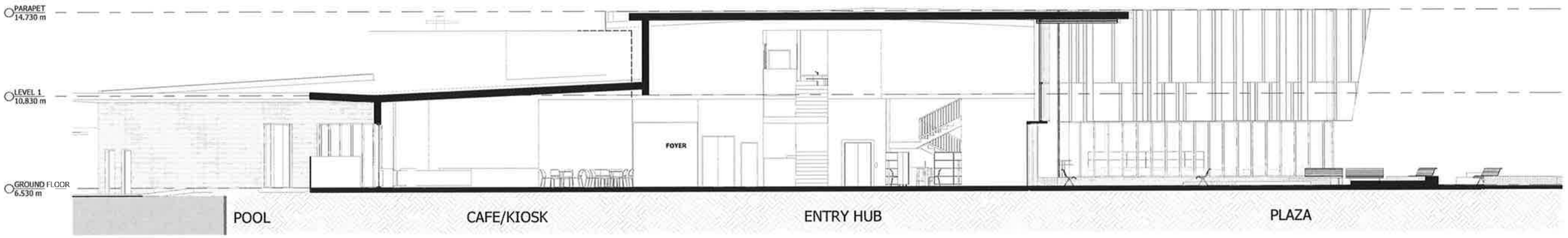
Date Printed
27-Mar-18 12:27:27 PM

Drawing Number
DA501

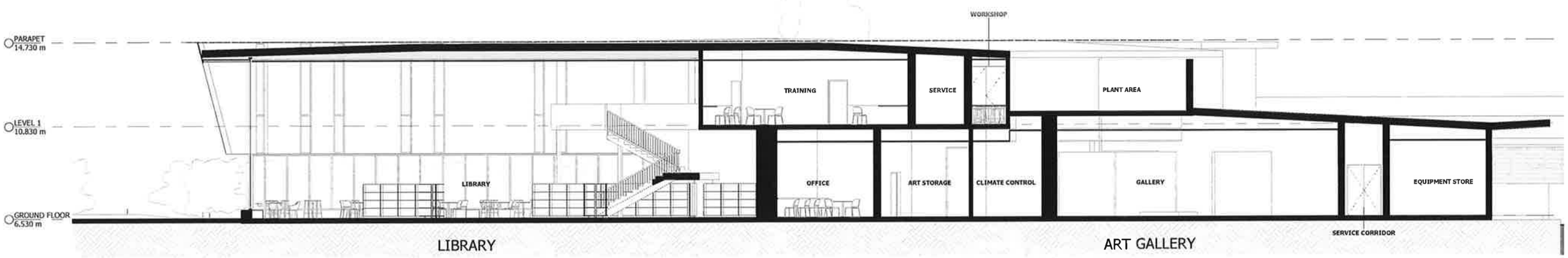
Issue
1

File Name: BIM 360://dwp_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_R2018.rvt

1 SECTION 3
1 : 100



2 SECTION 4
1 : 100



3 SECTION 5
1 : 100

SCHEMATIC DESIGN
NOT TO BE USED DURING CONSTRUCTION

Issue	Description	Date	Chk	Auth
1	ISSUED FOR DA	23.03.2018	AC	BM

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Client
CUMBERLAND COUNCIL

Project
GRANVILLE MULTIPURPOSE CENTRE

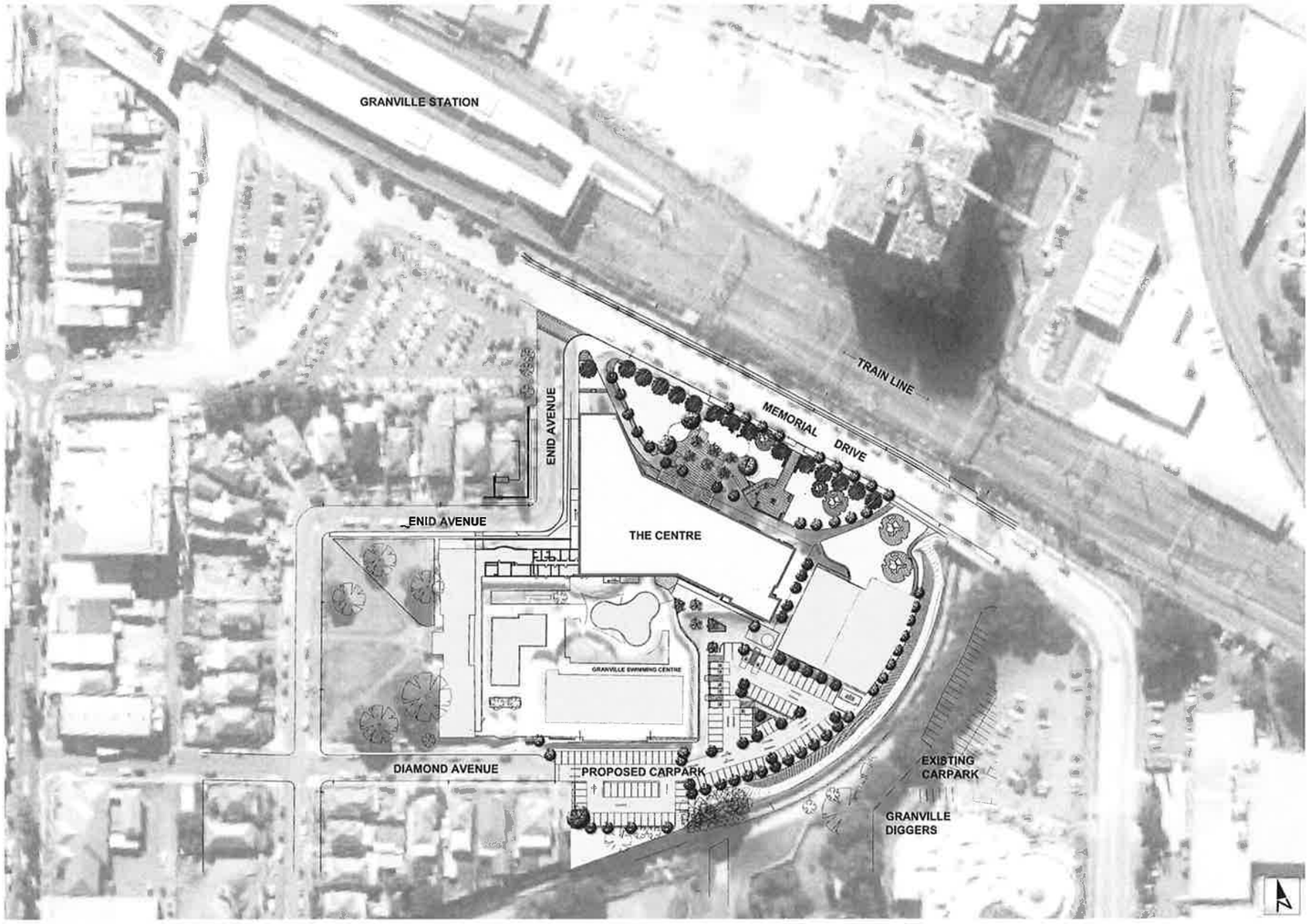
Location
1 MEMORIAL DRIVE
GRANVILLE NSW 2142

Project Number
AUSYD-17-0477

Drawing
SECTIONS

Scale (A1) 1 : 100
Date Printed 27-Mar-18 12:02:06 PM
Drawing Number DA502
Issue 1

File Name: BIM 360://dwp_AUSYD-17-0477_GRANVILLE MULTIPURPOSE/AUSYD-17-0477_GRANVILLE MP_CENTRAL_22018.rvt



SITE LOCATION / NOT TO SCALE

UMBACO LANDSCAPE ARCHITECTS

LANDSCAPE MASTER PLAN

Granville Multipurpose Centre, Granville

FOR

CUMBERLAND COUNCIL

TABLE OF CONTENTS

DESIGN PRINCIPLES	SK01
LANDSCAPE PLAN NORTH	SK02
LANDSCAPE PLAN SOUTH	SK03
PIAZZA AND STREETSCAPE	SK04
PLAY OPPORTUNITIES	SK05
BBQ AREA AND SPORTS FIELDS	SK06
PLANT MATERIALS	SK07
EXISTING TREE PLAN	SK08

DA SUBMISSION

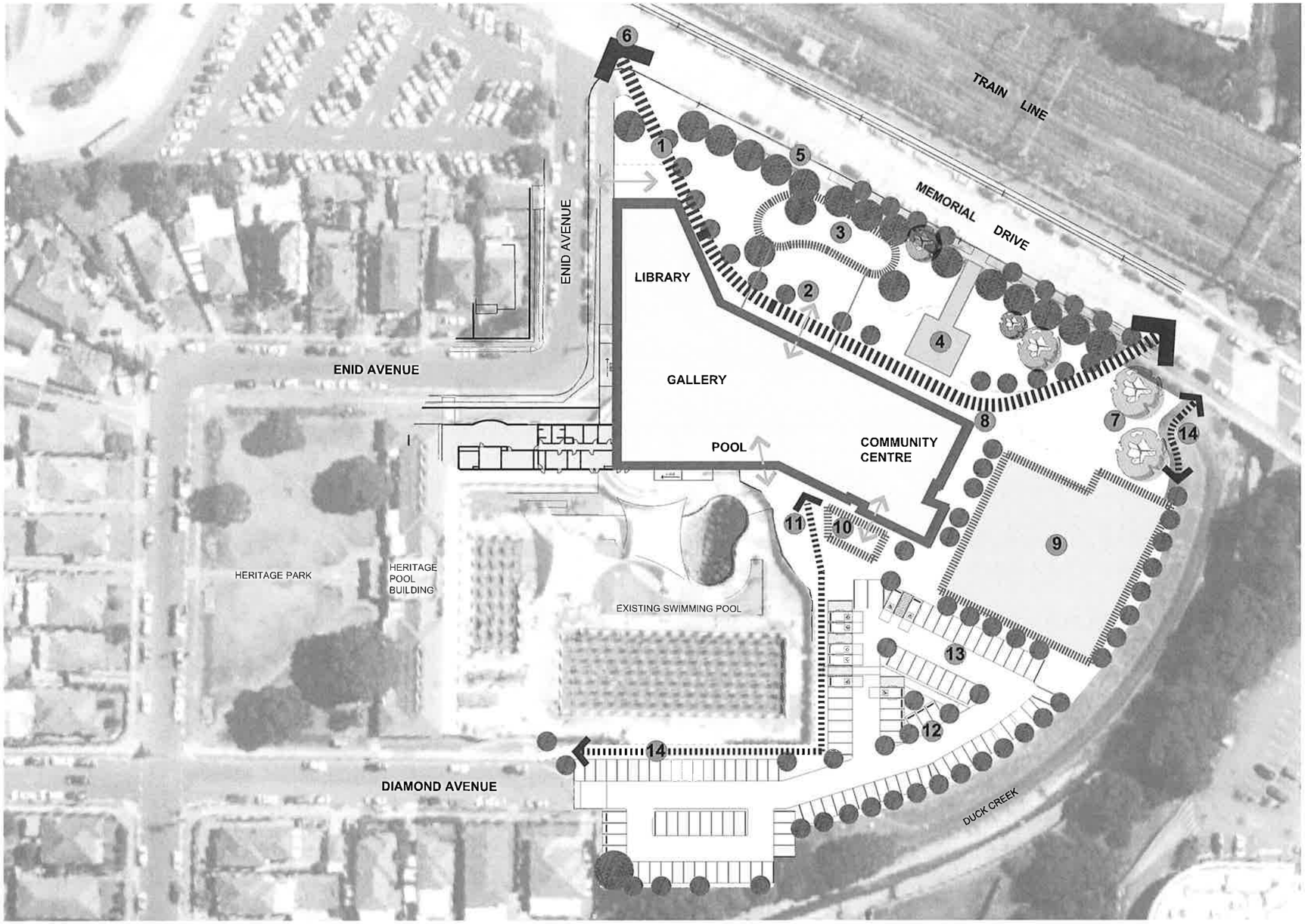
GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

MARCH 2018 **Issue H**

CUMBERLAND COUNCIL

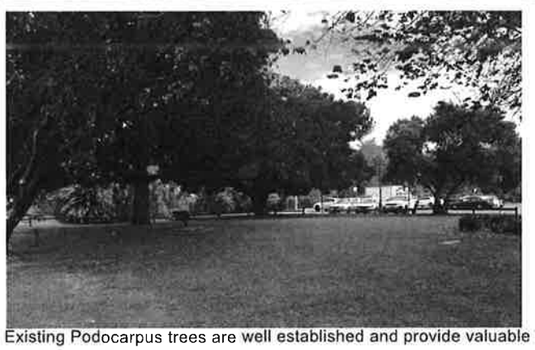
ARCHITECT dwp

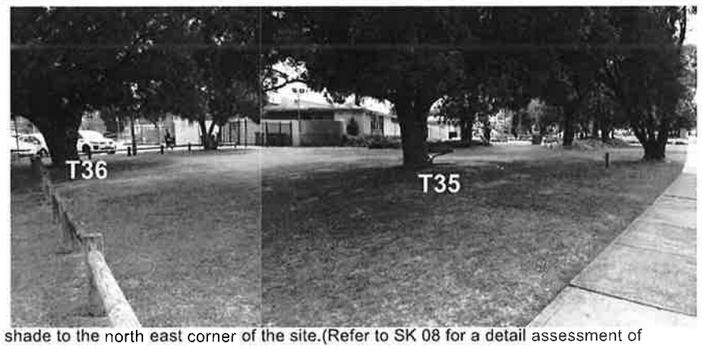
Umbaco
LANDSCAPE ARCHITECTS
T 02 9955 6772
www.umbaco.com.au



LEGEND

1. Establish generous entry pathway into the Centre
2. Provide appropriate civic forecourt
3. Provide new playspace appropriate to location in family friendly environment
4. Respect existing Memorial space
5. Use feature avenue to buffer parkland from traffic and noise
6. Provide legible park and entry to the Centre
7. Assess existing trees and maintain those providing broad canopy and longterm benefit
8. Locate key facilities out of 1:100 year flood events
9. Rebuild existing sport facilities into youth friendly environment
10. Provide BBQ area integrated with youth facilities
11. Provide presentable rear entry to the Centre
12. Plant additional trees to enhance environment and increase general wellbeing
13. Establish new carpark catering for 112 car spaces
14. Provide secondary pedestrian connections





Existing Podocarpus trees are well established and provide valuable shade to the north east corner of the site.(Refer to SK 08 for a detail assessment of existing trees).

Existing Lilipily hedge

Existing Memorial will be protected

DESIGN PRINCIPLES

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

DA SUBMISSION
SK 01 issue G March 2018

SCALE 1:500 @ A1
1:250 @ A3
0 5 10m 20m 40m

CUMBERLAND COUNCIL

ARCHITECT dwp

Umbaco
LANDSCAPE ARCHITECTS
T 02 9955 6772
www.umbaco.com.au

REFER TO SK02

POOL RECEPTION

ENTRY

1:20.0

RL 6.225

RL 6.53

BIKE RACKS

1:50

RL 6.46

1:40

RL 6.37

ROOF ABOVE

BBQ

RL 6.40

WATER TANK

OL BUILDING

GRANVILLE SWIMMING CENTRE

GRANVILLE SWIMMING CENTRE

BIKE RACKS

RL 6.28

1:33

FENCE

RL 5.95

Access to table tennis area and courts

MULTIPURPOSE COURT

GATE

RL 6.13

RL 5.63

TABLE TENNIS

T38

NEW PATH

Duck Creek

RL 5.60

BASKETBALL COURT

EX RL 5.54

MINI BUS

LOADING ZONE

Service 'hardstand' around the tank, no vegie garden possible

1:28

RL 6.03

PROPOSED CARPARK

New pathway around courts and to carpark area

PATH

Additional gate

RL 5.92

RL 5.32

ELECTRICITY KIOSK

Tree species will be resolved during detail design

Screening will be provided

RL 6.10

NEW PATH

EXISTING CARPARK

MOND NUE

PROPOSED CARPARK

DUCK CREEK

GRANVILLE DIGGERS

LEGEND

- EXISTING SIGNIFICANT TREES RETAINED
- PROPOSED FEATURE PAVING
- PROPOSED TREES REFER SK05 FOR SPECIES
- RL 6.20 PROPOSED LEVELS
- RL 6.02 EXISTING LEVELS
- AT ARTIFICIAL SURFACE TO MULTIPURPOSE COURT

LANDSCAPE PLAN SOUTH

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

RESPONSE TO FRANCES HAMILTON DA REFERRAL

REVISED PLAN

SK 03 issue J June 2018

SCALE 1:200 @ A1

0 1 5m 10m 15m

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LEGEND

- EXISTING SIGNIFICANT TREES RETAINED
- PROPOSED TREES REFER SK05 FOR SPECIES
- WPR WET POUR RUBBER SOFTFALL
- AT ARTIFICIAL SURFACE TO MULTIPURPOSE COURT
- PROPOSED FEATURE PAVING
- EXISTING PAVING SURROUNDING MEMORIAL RETAINED
- RL 6.20 PROPOSED LEVELS
- RL 6.02 EXISTING LEVELS
- PLAYGROUND FENCE (approx extent)
- PROPOSED HYPAR STYLE SHADE STRUCTURE TO PLAY AREA

Araucaria tree retained

BOOSTER ASSEMBLY

Existing Cherry trees retained on existing mound

Horse trough location to be confirmed

4500

MAin pathway relocated and widened.

Access provided between garden beds

Small trees / possibly Magnolia Little Gem along Enid Av frontage

T24 retained within the garden bed

Chess relocated

Option 1 play area shown, please refer to separate sheets for more details.

Playground fence / barrier from road as a combination of planting / sandstone rocks and artistic fence. Fence at the front not desirable.

ENID AVENUE

BUS DROP OFF ZONE

RAIL WAY

MEMORIAL DRIVE

TURF

BIKE RACKS

DOME

ORBIT

SWING SET

PIAZZA RL 6.50

LIBRARY

ENTRY

ROOF ABOVE

FFL 6.53

COMMUNITY CENTRE

POOL RECEPTION

ENTRY

BIKE RACKS

BBQ

MEMORIAL EXISTING PAVING

FLAG POLE

TPZ

EXISTING PATH

Trees 20, 21 & 22 fall within the centre of new Piazza. Their levels are 200 mm below proposed levels. Their RPZ zones are shown in red, extensive concrete cut out would be required to retain trees successfully to accommodate for their survival. (trees are cuurently in garden bed) This would disrupt the Piazza where the intent was to keep the Library forecourt open to accommodate for large crowds. Therefore retention of these trees is not supported.

Trees 32 & 33 are 500 mm below proposed levels. A concerte upturn with handrail would be required to retain these trees successfully. Relocated pathway shown in red.

Court fence relocated to 2 m from court line

Accessible Walkway achieved to table tennis area and basketball court. No steps required.

Relocated path encroaching on T35 tre TPZ

BOUNDARY

NEW PATH

TABLE TENNIS

MULTIPURPOSE COURT

FENCE

GATE

Duck Creek

REFER TO SK03

LANDSCAPE PLAN NORTH

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

RESPONSE TO FRANCES HAMILTON DA REFERRAL

REVISED PLAN

SK 02 issue J July 2018

SCALE 1:200 @ A1

0 1 5m 10m 15m

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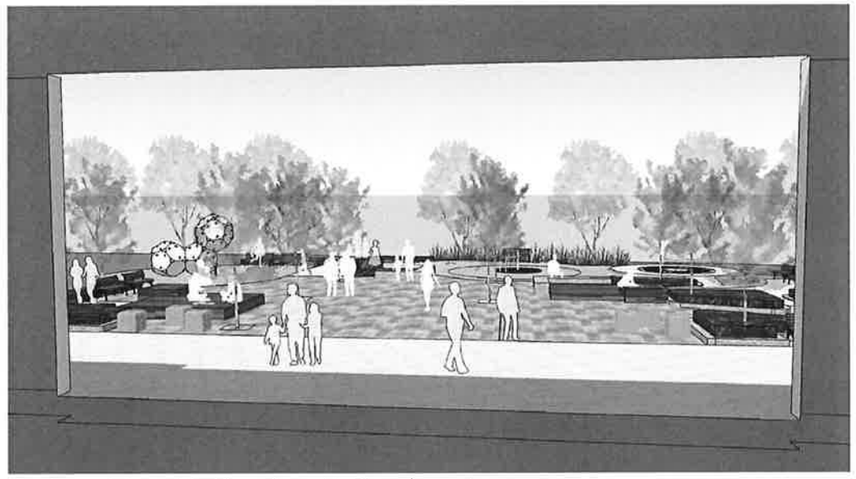
SECTION 1 SCALE 1:100

LEGEND to SK02

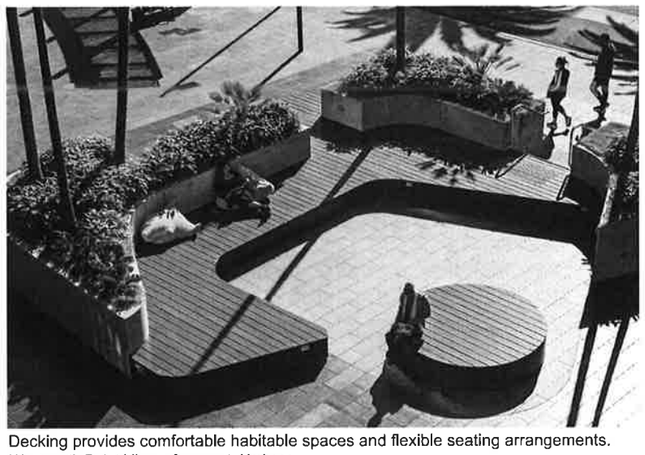
1. A welcoming entry space with new signage wall leading into piazza marked by tree avenue.
2. Bus waiting and seating area. Existing heritage horse trough is located on the edge of garden.
3. Generous lawn area with opportunity to spill out during community events.
4. Building entry opens up to piazza with feature trees and multifunctional seating arrangements allowing for groups of people and various event activities.
5. Proposed location for public art element, for example a bronze swimmer sculpture overlooking park and play area.(works under future funding)
6. Gentle transition to play area including a giant chess with seating walls.
7. Play area may offer popular play elements identified during public consultation. A barrier against the road will be reinforced with sandstone blocks and artistic fence.(works under future funding)
8. Undercover walkway along the building interface with additional seating opportunities.
9. Accessible Memorial Drive entry framed by trees.
10. Existing Memorial space is retained including seating and paving, with new allocated space for Victoria Cross recipients.
11. Accessible walkway from Memorial up to the podium. This helps to visually separate Memorial from the piazza area.
12. Existing entry into memorial pathway retained including two stone entry pillars.
13. Seating terrace overlooking generous lawns suitable for spillover events.
14. Existing two Podocarpus trees will be retained and protected, offering valuable broad canopy shade.
15. New connecting pathway along Duck Creek bank leading into sports courts area.(table tennis area to future funding)

Piazza tree in trafficable tree gate
Umbaco Image Library



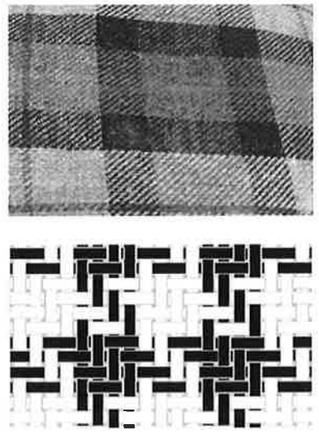
View from main foyer of the Library Centre into Piazza forecourt.

Tweed patterns as inspiration for paving surfaces, a reflection of site's manufacturing history



Decking provides comfortable habitable spaces and flexible seating arrangements.
Wentworth Point Library forecourt, Umbaco

Outdoor chess area
Clemton Park, Umbaco



PIAZZA & STREETSCAPE

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

DA SUBMISSION
SK 04 issue G March 2018

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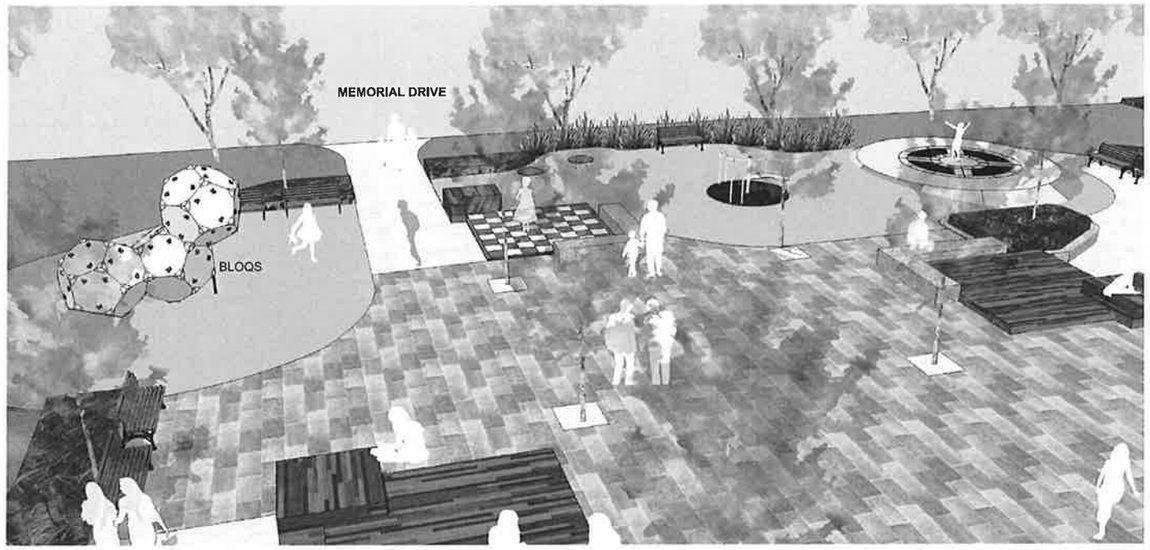
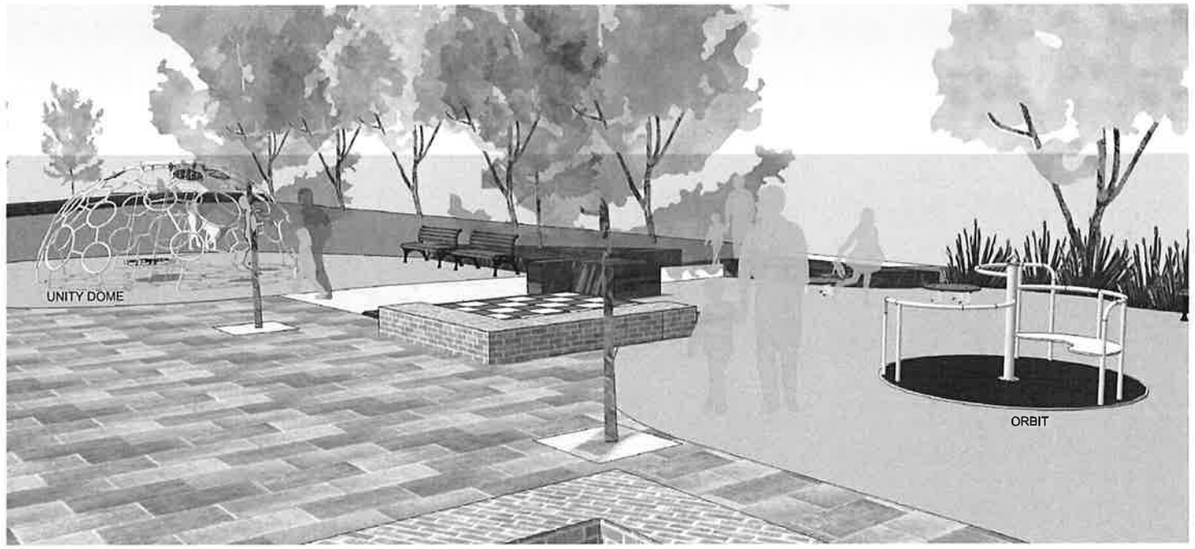


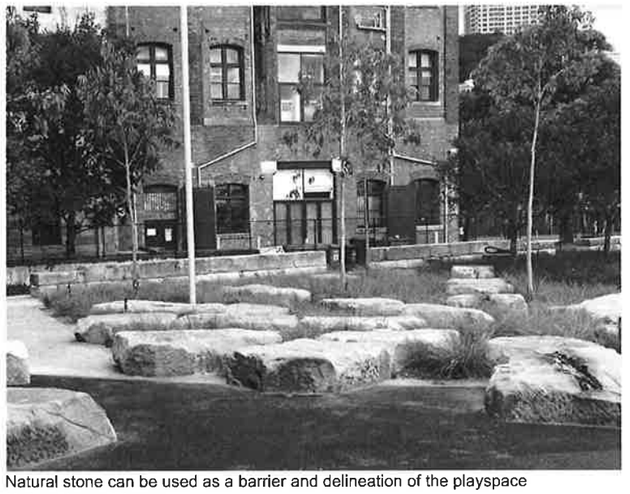
View at play area across the Piazza with potential play elements



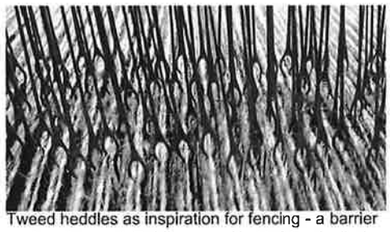
Unity Dome - as optional climbing element

Bloqx - Challenging architecturally designed climbing element.
Umbaco Image Library

'Orbit' - a fully accessible rotating element for all abilities and ages
Carss Park Playspace, Umbaco



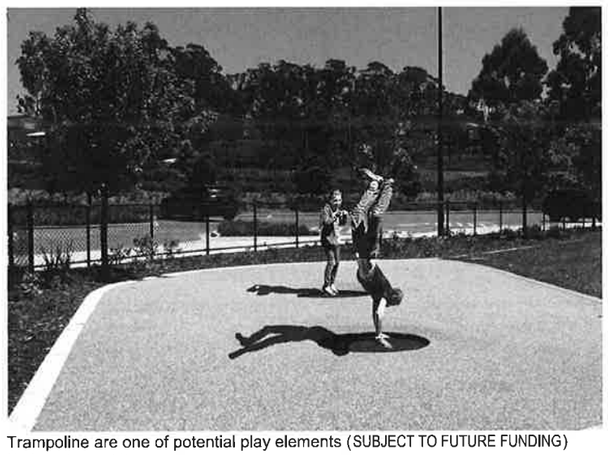
Natural stone can be used as a barrier and delineation of the playspace
Umbaco Image Library



Tweed heddles as inspiration for fencing - a barrier against the road (Public art - subject to future funding)

Wool spools or bobbins can be used as interactive play elements

Unity Dome, a playful climbing unit / an optional climbing element
Umbaco Image Library



Trampoline are one of potential play elements (SUBJECT TO FUTURE FUNDING)
Umbaco Image Library

A fun way to get children to interact with meaningful public art
Frew Park Brisbane, Umbaco Image Library

Proposed bronze sculpture of a young swimmer
(subject to future funding)

PLAY OPPORTUNITIES

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

DA SUBMISSION
SK 05 issue G — March 2018

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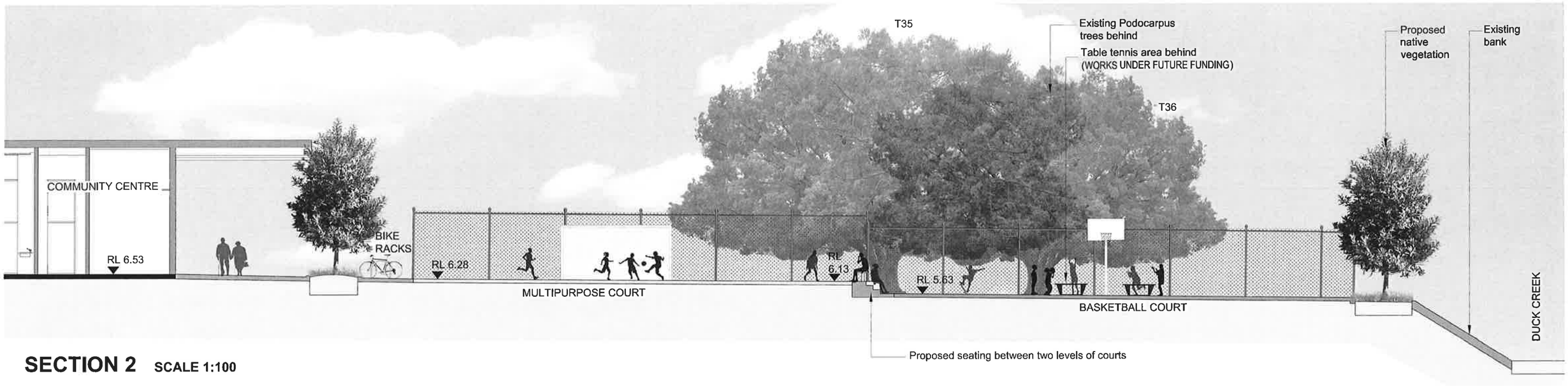

SECTION 2 SCALE 1:100

LEGEND to SK03

16. Youth program BBQ area including picnic seating, and BBQ unit covered by a weatherproof shade structure.
17. Veggie garden established around stormwater tank.
18. Rear entry court with seating and feature planting.(works under future funding) Bike racks located under the roof.
19. Fenced off multipurpose and basketball courts.
20. A separate table tennis area with picnic tables, bike racks and connecting pathway.(works under future funding)
21. Carpark with appropriate shade planting.
22. Proposed native vegetation along the creek bank.

Vegie garden around the water tanks
Umbaco image library

Potential timber deck seating at rear entry
Wentworth Point Library forecourt, Umbaco

BBQ area will be covered by a weatherproof shade structure.

Table tennis area with additional seating will provide attractive welcoming environment. (works under future funding)

Accessible BBQ unit to youth area
Umbaco Image Library

YOUTH BBQ AREA & SPORTS FIELDS

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE LANDSCAPE MASTER PLAN

DA SUBMISSION
SK 06 issue G March 2018

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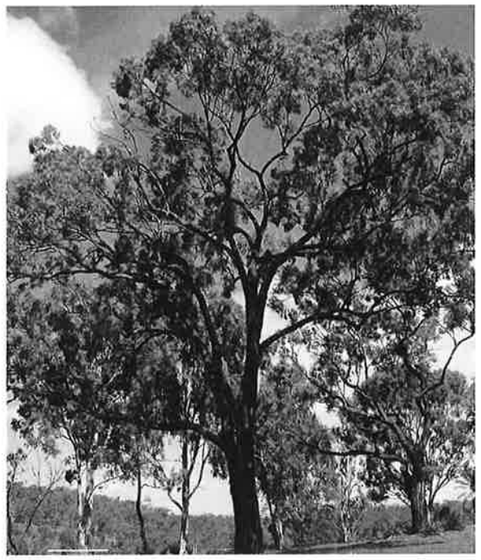
PROPOSED PLANT SPECIES FOR RESPECTIVE AREAS

LARGE CANOPY TREES FOR STREET AVENUE, CARPARK & CREEK EDGE

EUCALYPTUS MICROCORYS
Wide canopy native tree



EUCALYPTUS CREBRA
A locally native tree suitable to carpark edge

LOPHOSTEMON CONFERTUS
Proposed native street tree to Memorial Drive edge

ORNAMENTAL TREES TO REAR ENTRY AREA & CARPARK

CUPANIOPSIS ANACARDIOIDES
A broad canopy medium size tree

MAGNOLIA LITTLE GEM
Small decorative tree

TRISTANIOPSIS LAURINA 'LUSCIOUS'
Great medium size native tree

HIBISCUS TILIACEUS 'RUBRA'
Native foliage tree

SUGGESTED PLANT SCHEDULE

Botanical name	Common name	cont.size	min. height at planting	mature spread
LARGE CANOPY TREES / STREET AVENUE up to 25 m height				
Eucalyptus crebra	Narrow leaved Ironbark	100 L	2 m	30 m
Eucalyptus microcorys	Tallowwood	100 L	2 m	30 m
Lophostemon confertus	Brush Box	150 L	3 m	30 m
MEDIUM FEATURE TREES / PIAZA up to 15 m height				
Pyrus ussuriensis	Manchurian Pear	200 L	3 m	10 m
Waterhousia floribunda 'Green Avenue'	Waterhousia floribunda 'Green Avenue'	150 L	3 m	10-12 m
Tristaniopsis laurina 'Luscious'	WAter Gum 'Luscious'	100 L	3 m	8 m
TREES FOR REAR ENTRY up to 15 m height				
Magnolia Little Gem	Evergreen Magnolia	100 L	2 m	4-6 m
Hibiscus tiliaceus 'Rubra'	Native Hibiscus	100 L	2 m	4-6 m
Cupaniopsis anacardioides	Tuckaroo	200 L	3 m	6-8 m
SHRUBS/ PERENNIALS/ FEATURE PLANTS (up to 2 -3 m mature height)				
Doryanthes excelsa	Gymea Lily	300mm	0.6 m	2-3 m
Durrantha 'Sheenas Gold'	Durrantha 'Sheenas Gold'	200 mm	0.5 m	1 m
Callistemon 'Great BAlls of Fire'	Bottlebrush	200 mm	0.5 m	1 m
Callistemon 'Little John'	Bottlebrush	200 mm	0.4 m	1 m
Loropetalum chinensis 'Burgundy	Chinese Fringe Flower	200 mm	0.4 m	1.2 m
Melaleuca thymifolia	Melaleuca thymifolia	200 mm	0.4 m	0.8 m
Raphiolepis indica 'Snow Maiden'	Indian Hawthorn	300mm	0.3 m	1.2 m
Rosmarinus officinalis	Rosemary	200mm	500mm	1 m
Strelitzia reginae	Bird of Paradise	300mm	0.7 m	1.5 m
GROUNDCOVERS & GRASSES				
Dichondra repens 'Silver Fall'	Silver Dichondra	150mm	100mm	0.05 m
Lomandra 'Tanika'	Dwarf Lomandra	150 mm	300 mm	0.5 m
Trachelospermum tricolor	Tricolor Star Jasmine	150mm	0.15 m	0.2 m
Tulbaghia violacea	Silver Lace	150mm	200mm	0.2 m

FEATURE TREES TO PIAZZA AREA

WATERHOUSIA FLORIBUNDA 'GREEN AVENUE'
Great as an avenue tree

PYRUS USSURIENSIS
Great drought tolerant medium size tree

FEATURE PLANTS

DORYANTHES EXCELSA

CALLISTEMON 'GREAT BALLS OF FIRE'

BIRD OF PARADISE
Winter flowering drought tolerant shrub

SHRUBS AND MASS PLANTING

TRACHELOSPERMUM
JASMINOIDES 'TRICOLOR'

ROSMARINUS OFFICINALIS
Fragrant leaves

RAPHIOLEPIS 'SNOW MAIDEN'
Tough flowering shrub, forming nature hedge

LOMANDRA TANIKA

DURRANTHA

LOROPETALUM

PLANT MATERIALS

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — LANDSCAPE MASTER PLAN

DA SUBMISSION
SK 07 issue G March 2018

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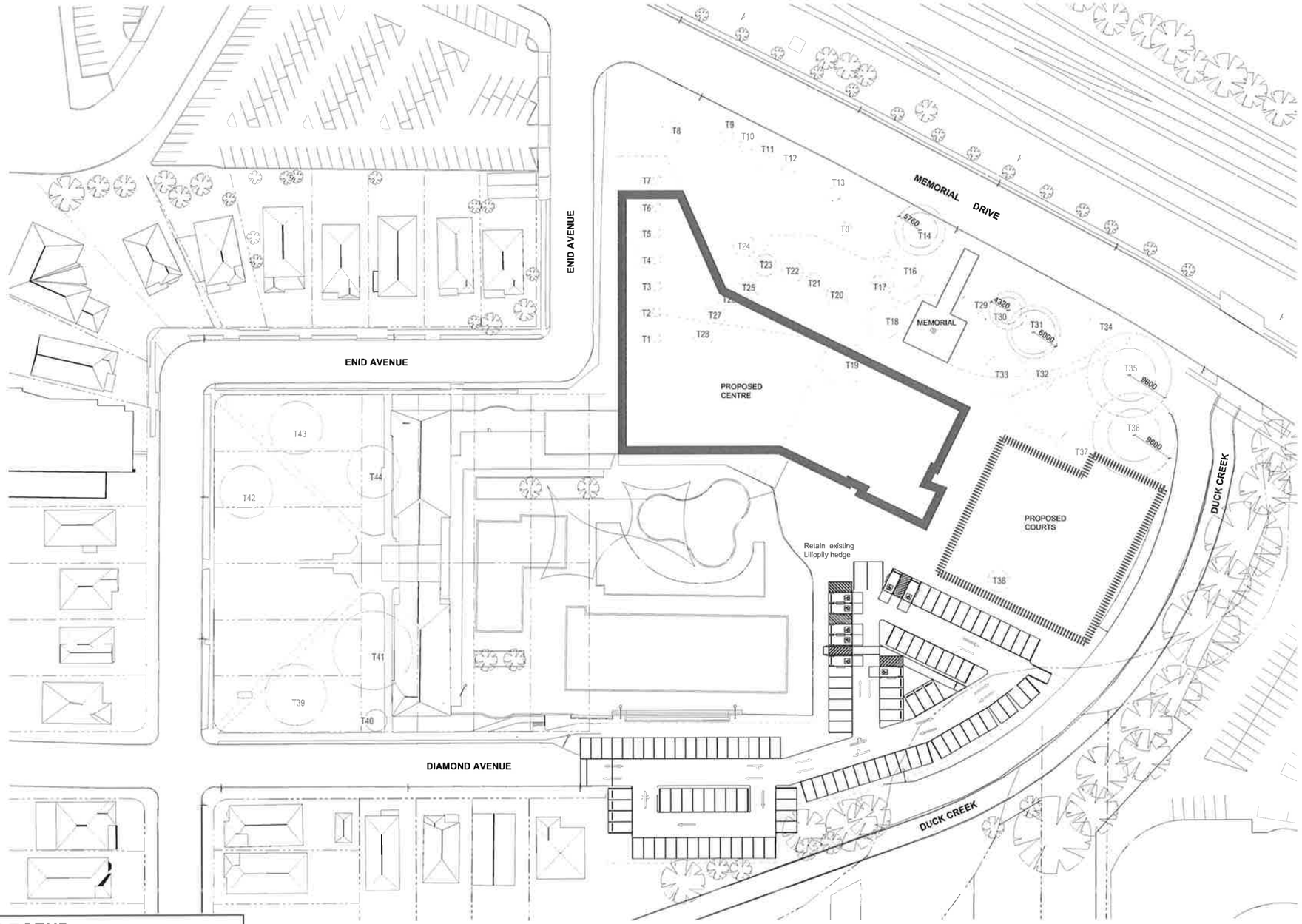

SCHEDULE OF EXISTING TREES

No	BOTANICAL NAME	COMMON NAME	HEIGHT	SPREAD	HEALTH	RECOMMENDATION
1	Syzygium australe	Bush Cherry	3	1.5	Good	To be removed
2	Syzygium australe	Bush Cherry	3	1.5	Good	To be removed
3	Syzygium australe	Bush Cherry	3	1,5	Good	To be removed
4	Syzygium australe	Bush Cherry	3	1.5	Good	To be removed
5	Syzygium australe	Bush Cherry	3	1.5	Good	To be removed
6	Syzygium australe	Bush Cherry	3	1.5	Good	To be removed
7	Syzygium australe	Bush Cherry	3	1.5	Good	To be removed
8	Araucaria cunninghamii	Hoop Pine	9	3	Good	To be removed
9	Prunus sp.	Prunus	5	4.5	Good	To be removed
10	Prunus sp.	Prunus	5	4.5	Good	To be removed
11	Prunus sp.	Prunus	5	4.5	Good	To be removed
12	Prunus sp.	Prunus	5	4.5	Good	To be removed
13	Prunus sp.	Prunus	5	4.5	Good	To be removed
14	Eucalyplus crebra	Iron Bark	12	5.5	Good	To be retained and protected
15	Stenocarpus sinuatus	Firewheel Tree	4	1	Good	To be removed
16	Fraxinus griffithii	Ash	10	5.5	Good	To be removed
17	Fraxinus griffithii	Ash	10	5.5	Good	To be removed
18	Fraxinus griffithii	Ash	10	5.5	Good	To be removed
19	Phoenix canariensis	Date Palm	14	5.5	Good	To be removed
20	Eucalyptus crebra	Iron Bark	9	3.0	Good	To be removed
21	Eucalyptus scoparia	Willow Gum	10	4.5	Good	To be removed
22	Eucalyptus crebra	Iron Bark	10	4,5	Good	To be removed
23	Eucalyptus scoparia	Willow Gum	10	4,5	Good	To be removed
24	Eucalyptus scoparia	Willow Gum	9	4	Good	To be removed
25	Corymbia maculata	Spotted Gum	17	3.5	Good	To be removed
26	Corymbia maculata	Spotted Gum	15	2	Good	To be removed
27	Corymbia maculata	Spotted Gum	17	3,5	Good	To be removed
28	Corymbia maculata	Spotted Gum	10	2	Good	To be removed
29	Phoenix canariensis	Date Palm	13	4.5	Good	To be removed
30	Ulmus procera	English Elm	17	7	Fair	To be retained and protected
31	Ulmus procera	English Elm	17	7	Fair	To be retained and protected
32	Ulmus procera	English Elm	17	7	Fair	To be removed
33	Ulmus procera	English Elm	17	7	Fair	To be removed
34	Callistemon viminalis	Weeping Bottle Brush	8	6	Good	To be removed
35	Podocarpus falcatus	Outenkqua Yellowwood	11	6	Good	To be retained and protected
36	Podocarpus falcatus	Outenkqua Yellowwood	11	6	Good	To be retained and protected
37	Callistemon viminalis	Weeping Bottle Brush	6	3	Good	To be removed
38	Elaeocarpus reticulatus	Blueberry Ash	4,5	2	Good	To be removed
39	Lophostemon confertus	Brushbox	16	6	Good	To be retained and protected
40	Butia capitata	Jelly Palm	8	2,5	Good	To be retained and protected
41	Lophostemon confertus	Brushbox	16	6	Good	To be retained and protected
42	Lophostemon confertus	Brushbox	12	5	Good	To be retained and protected
43	Lophostemon confertus	Brushbox	12	5	Good	To be retained and protected
44	Lophostemon confertus	Brushbox	14	5	Good	To be retained and protected

FOR MORE DETAILS ON THE CONDITION OF EACH TREE
REFER TO ARBORIST REPORT PREPARED BY MOORE TREES ARBORICULTURAL SERVICES

LEGEND

TREES TO BE RETAINED & PROTECTED

TREES TO BE REMOVED

TREE PROTECTION ZONE

SCALE 1:500@A1
SCALE 1:1000@A3

0 5 10m 20m 40m

Tree Protection Zone

Fence not to be removed without approval from Arborist

Within this fence there is to be

NO

Storage of materials
Trenching or excavation
Washing of tools or equipment

ADOPTED FROM ARBORIST REPORT PREPARED BY MOORE TREES ARBORICULTURAL SERVICES

Tree Trunk Protection

Protection not to be removed until all construction works completed.

Around the base of this tree there is to be

NO

Storage of materials
Trenching or excavation
Washing of tools or equipment

Tree Protection Zone

NO ACCESS

TREE PROTECTION ZONE REQUIREMENTS

The TPF shall be installed as far from trunk as possible and beyond the TPZ where space allows. Tree protection zone (TPZ) must be established to protect the select trees during construction. The tree protection fence shall be a minimum 1.8 m high permanent metal mesh fence with posts secured into ground. TPF must be installed prior to any demolition, clearing, grading or construction work and remain in place in functioning condition until construction is complete. Signage must be installed stating NO ENTRY - TREE PROTECTION ZONE in accordance with AS 1319.

There must be no storage of materials or machinery in the area of the TPZ. No alteration in soil levels or excavations undertaken, no location of services or stockpiling of soil or rubble. No structures should be attached to the tree.
Any trenching - if necessary, shall be done manually with the minimal disturbance to the tree; Any works required within this zone shall be under the direction of, and to the satisfaction of, a suitably qualified AQF Level 5 Arborist.

Woodchip mulch must be installed to a depth of 75mm within the fenced off protection area.
Permanent irrigation lines shall be installed for continuous watering during hot summer weather.
A suitably qualified AQF Level 5 Arborist must monitor the tree and provide advice on any necessary after care, if required.

In areas where fence can not be installed trunk protection and ground protection should be installed prior to the commencement of works and remain in place until after construction works have been completed.

EXISTING TREE PLAN

GRANVILLE MULTIPURPOSE CENTRE , GRANVILLE — **LANDSCAPE MASTER PLAN**

DA SUBMISSION
SK 08 issue F March 2018

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PROPOSED MULTI-PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW
CIVIL ENGINEERING WORKS

GENERAL NOTES:

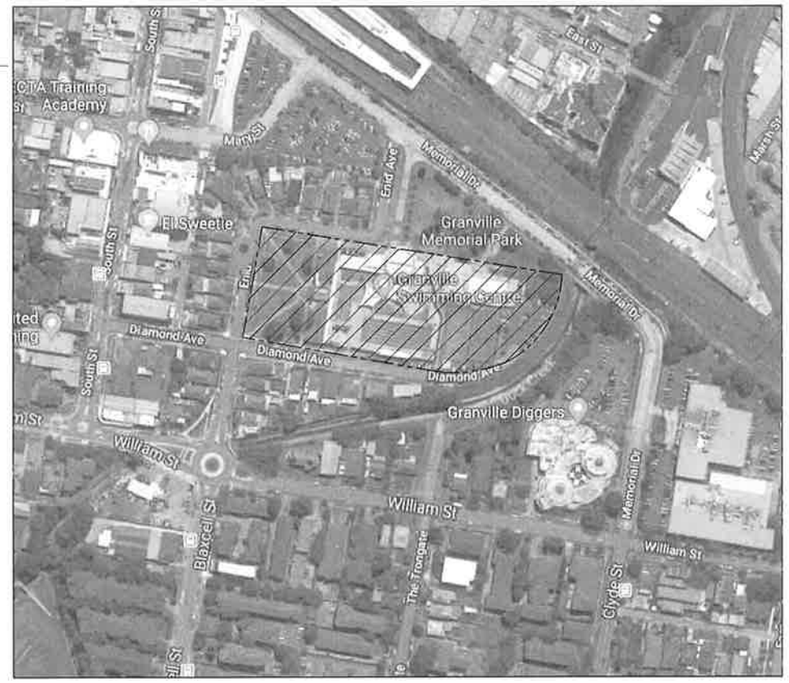
1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH CITY OF PARRAMATTA COUNCIL'S SPECIFICATION. CONTRACTOR TO OBTAIN AND RETAIN A COPY ON SITE DURING THE COURSE OF THE WORKS.
2. ALL NEW WORKS ARE TO MAKE A SMOOTH JUNCTION WITH EXISTING CONDITIONS AND MARRY IN A 'WORKMANLIKE' MANNER.
3. THE CONTRACTOR IS TO VERIFY THE LOCATION OF ALL SERVICES WITH EACH RELEVANT AUTHORITY. ANY DAMAGE TO SERVICES SHALL BE RECTIFIED BY THE CONTRACTOR OR THE RELEVANT AUTHORITY AT THE CONTRACTOR'S EXPENSE. SERVICES SHOWN ON THESE PLANS ARE ONLY THOSE EVIDENT AT THE TIME OF SURVEY OR AS DETERMINED FROM SERVICE DIAGRAMS. H & H CONSULTING ENGINEERS PTY. LTD CANNOT GUARANTEE THE INFORMATION SHOWN NOR ACCEPT ANY RESPONSIBILITY FOR INACCURACIES OR INCOMPLETE DATA.
4. SERVICES & ACCESSES TO THE EXISTING PROPERTIES ARE TO BE MAINTAINED IN WORKING ORDER AT ALL TIMES DURING CONSTRUCTION.
5. ADJUST EXISTING SERVICE COVERS TO SUIT NEW FINISHED LEVELS TO RELEVANT AUTHORITY REQUIREMENTS WHERE NECESSARY.
6. REINSTATE AND STABILISE ALL DISTURBED LANDSCAPED AREAS.
7. MINIMUM GRADE OF SUBSOIL SHALL BE 0.5% (1:200) FALL TO OUTLETS.
8. ALL TEMPORARY SEDIMENT AND EROSION CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS, EROSION AND SEDIMENTATION CONTROL PLAN AND CITY OF PARRAMATTA COUNCIL'S REQUIREMENTS WHERE APPLICABLE.
9. CONTRACTOR TO CHECK AND CONFIRM SITE DRAINAGE CONNECTIONS ACROSS THE VERGE PRIOR TO COMMENCEMENT OF SITE DRAINAGE WORKS.
10. PROPERTIES AFFECTED BY THE WORKS ARE TO BE NOTIFIED IN ADVANCE WHERE DISRUPTION TO EXISTING ACCESS IS LIKELY.

EXISTING SERVICES & FEATURES

- THE CONTRACTOR SHALL ALLOW FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF ALL EXISTING SERVICES IN AREAS AFFECTED BY WORKS WITHIN THE CONTRACT AREA OR AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT.
- THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
- PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF HIS PROGRAM FOR THE RELOCATION/ CONSTRUCTION OF TEMPORARY SERVICES.
- CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN SUPPLY TO EXISTING BUILDING REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED, THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.
- INTERRUPTION TO SUPPLY OF EXISTING SERVICES SHALL BE DONE SO AS NOT TO CAUSE ANY INCONVENIENCE TO THE PRINCIPAL. CONTRACTOR TO GAIN APPROVAL FROM THE SUPERINTENDENT FOR TIME OF INTERRUPTION.
- EXISTING SERVICES, BUILDINGS, EXTERNAL STRUCTURES AND TREES SHOWN ON THESE DRAWINGS ARE EXISTING FEATURES PRIOR TO ANY DEMOLITION WORKS.
- EXISTING SERVICES UNLESS SHOWN ON SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COMPLETE A 'DIAL BEFORE YOU DIG' SEARCH AND TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.

SURVEY NOTES

THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY THE SURVEYOR SPECIFIED IN THE TITLE BLOCK.
THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. HENRY AND HYMAS PTY. LTD. DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT HENRY AND HYMAS PTY. LTD. THE FOLLOWING NOTES HAVE BEEN TAKEN DIRECTLY FROM ORIGINAL SURVEY DOCUMENTS.
DATUM A.H.D



LOCALITY SKETCH

SCALE: NTS

DRAWING SCHEDULE	
17A34_DA_C000	COVER SHEET, DRAWING SCHEDULE, NOTES AND LOCALITY SKETCH
17A34_DA_C100	GENERAL ARRANGEMENT PLAN
17A34_DA_C101	CONCEPT PLAN - SHEET 1 OF 3
17A34_DA_C102	CONCEPT PLAN - SHEET 2 OF 3
17A34_DA_C103	CONCEPT PLAN - SHEET 3 OF 3
17A34_DA_C200	STORMWATER MISCELLANEOUS DETAILS AND PIT LID SCHEDULE
17A34_DA_C201	CARTRIDGE FILTER WATER QUALITY TREATMENT SYSTEM DETAILS
17A34_DA_C202	PLANTING IN GRANITE PAVING DETAIL
17A34_DA_C250	CATCHMENT PLAN - SHEET 1 OF 2
17A34_DA_C251	CATCHMENT PLAN - SHEET 2 OF 2
17A34_DA_SE01	SEDIMENT & EROSION CONTROL PLAN
17A34_DA_SE02	SEDIMENT & EROSION CONTROL DETAILS AND TYPICAL SECTIONS
17A34_DA_BE01	BULK EARTHWORKS PLAN

SITEWORKS NOTES

- DATUM : A.H.D.
- ORIGIN OF LEVELS : REFER TO BENCH OR STATE SURVEY MARKS WHERE SHOWN ON PLAN.
- CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF WORK.
- ALL WORKS TO BE UNDERTAKEN IN ACCORDANCE WITH THE DETAILS SHOWN ON THE DRAWINGS & THE DIRECTIONS OF THE SUPERINTENDENT.
- EXISTING SERVICES UNLESS SHOWN ON THE SURVEY PLAN HAVE BEEN PLOTTED FROM SERVICES SEARCH PLANS AND AS SUCH THEIR ACCURACY CANNOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS ACHIEVED.
- THE CONTRACTOR SHALL ARRANGE ALL SURVEY SETOUT TO BE CARRIED OUT BY A REGISTERED SURVEYOR.
- CARE IS TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATION IS TO BE UNDERTAKEN OVER TELSTRA OR ELECTRICAL SERVICES. HAND EXCAVATE IN THESE AREAS.
- CONTRACTOR TO OBTAIN AUTHORITY APPROVALS WHERE APPLICABLE.
- MAKE SMOOTH TRANSITION TO EXISTING SURFACES AND MAKE GOOD.
- THESE PLANS SHALL BE READ IN CONJUNCTION WITH APPROVED LANDSCAPE, ARCHITECTURAL, STRUCTURAL, HYDRAULIC AND MECHANICAL DRAWINGS AND SPECIFICATIONS
  OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED RELATING TO DEVELOPMENT AT THE SITE.
- TRENCHES THROUGH EXISTING ROAD AND CONCRETE PAVEMENTS SHALL BE SAWCUT TO FULL DEPTH OF CONCRETE AND A MINIMUM OF 50mm IN BITUMINOUS PAVING.
- ALL BRANCH GAS AND WATER SERVICES UNDER DRIVEWAYS AND BRICK PAVING SHALL BE LOCATED IN Ø80 uPVC SEWER GRADE CONDUITS EXTENDING A MINIMUM OF 500mm BEYOND EDGE OF PAVING.
- GRADES TO PAVEMENTS TO BE AS IMPLIED BY RL'S ON PLAN. GRADE EVENLY BETWEEN NOMINATED RL'S. AREAS EXHIBITING PONDING GREATER THAN 5mm DEPTH WILL NOT BE ACCEPTED UNLESS IN A DESIGNATED SAG POINT.
- ALL COVERS AND GRATES ETC TO EXISTING SERVICE UTILITIES ARE TO BE ADJUSTED TO SUIT NEW FINISHED SURFACE LEVELS WHERE APPLICABLE.

SUBSOIL DRAINAGE NOTES

1. GENERAL PROVIDE SUBSOIL DRAINS TO INTERCEPT GROUNDWATER SEEPAGE AND PREVENT WATER BUILD-UP BEHIND WALLS AND UNDER FLOORS AND PAVEMENT. CONNECT SUBSOIL TO SURFACE DRAINS OR TO THE STORMWATER DRAINAGE SYSTEM AS APPLICABLE.
2. PIPE DEPTH:
   PROVIDE THE FOLLOWING MINIMUM CLEAR DEPTH, MEASURED TO THE CROWN OF THE PIPE, WHERE THE PIPE PASSES BELOW THE FOLLOWING ELEMENTS:
   - 100mm BELOW FORMATION LEVEL OF THE PAVEMENT, KERB OR CHANNEL.
   - 100mm BELOW THE AVERAGE GRADIENT OF THE BOTTOM OF FOOTINGS.
3. JOINTING:
   AT JUNCTIONS OF SUBSOIL PIPES PROVIDE TEES, COUPLINGS OR ADAPTORS TO AS2439.1.
4. TRENCH WIDTH MINIMUM 300mm
5. PIPE UNDERLAY
   GENERAL: GRADE THE TRENCH FLOOR EVENLY TO THE GRADIENT OF THE PIPELINE. IF THE TRENCH FLOOR IS ROCK, CORRECT ANY IRREGULARITIES WITH COMPACTED BEDDING MATERIAL. BED PIPING ON A CONTINUOUS UNDERLAY OF BEDDING MATERIAL, AT LEAST 75mm THICK AFTER COMPACTION. LAY THE PIPE WITH ONE LINE OF PERFORATIONS AT THE BOTTOM.

   CHASES: IF NECESSARY TO PREVENT PROJECTIONS SUCH AS SOCKETS AND FLANGES FROM BEARING ON THE TRENCH BOTTOM OR UNDERLAY.
6. PIPE SURROUNDS:
   GENERAL: PLACE THE MATERIAL IN THE PIPE SURROUND IN LAYERS SMALLER THAN OR EQUAL TO 200mm LOOSE THICKNESS, AND COMPACT WITHOUT DAMAGING OR DISPLACING PIPING.
   DEPTH OF OVERLAY: TO THE UNDERSIDE OF THE BASE OF OVERLYING STRUCTURES SUCH AS PAVEMENTS, SLABS AND CHANNELS. TO WITHIN 150mm OF THE FINISHED SURFACE OF UNPAVED OR LANDSCAPED AREAS.
7. FILTER SOCKS PROVIDE POLYESTER PERMEABLE SOCKS CAPABLE OF RETAINING PARTICLES OF 0.25mm SIZES. SECURELY FIT OF JOIN THE SOCK AT EACH JOINT.

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY:
TSS TOTAL SURVEYING SOLUTIONS
DATUM AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DA ONLY	IK	TR	23.03.2018

Client: CUMBERLAND COUCIL
Architect: dwp

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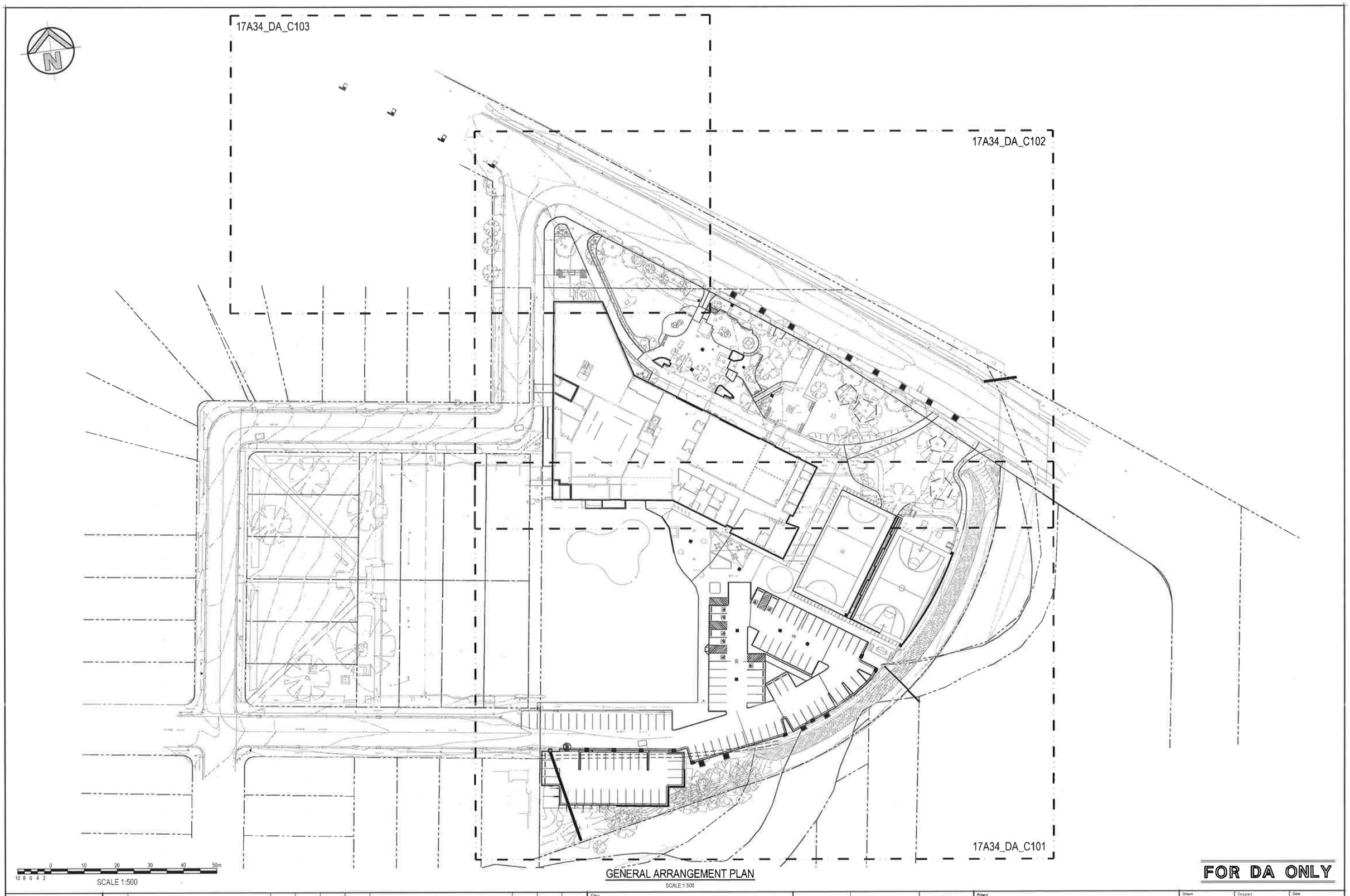
Project: PROPOSED MULTI - PURPOSE CENTRE ENID AVENUE, GRANVILLE NSW
Title: COVER SHEET, DRAWING SCHEDULE NOTES AND LOCALITY SKETCH

Drawn	Designed	Date
J Knight	T Rozelnal	FEB 2018
Checked	Approved	Scale
T Rozelnal	A Francis	NTS

Drawing number: 17A34_DA_C000
Revision: 01



GENERAL ARRANGEMENT PLAN

SCALE:1:500

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY:
TSS TOTAL SURVEYING SOLUTIONS
DATUM AHD

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01	ISSUED FOR DA ONLY	IK	TR	23.03.2018

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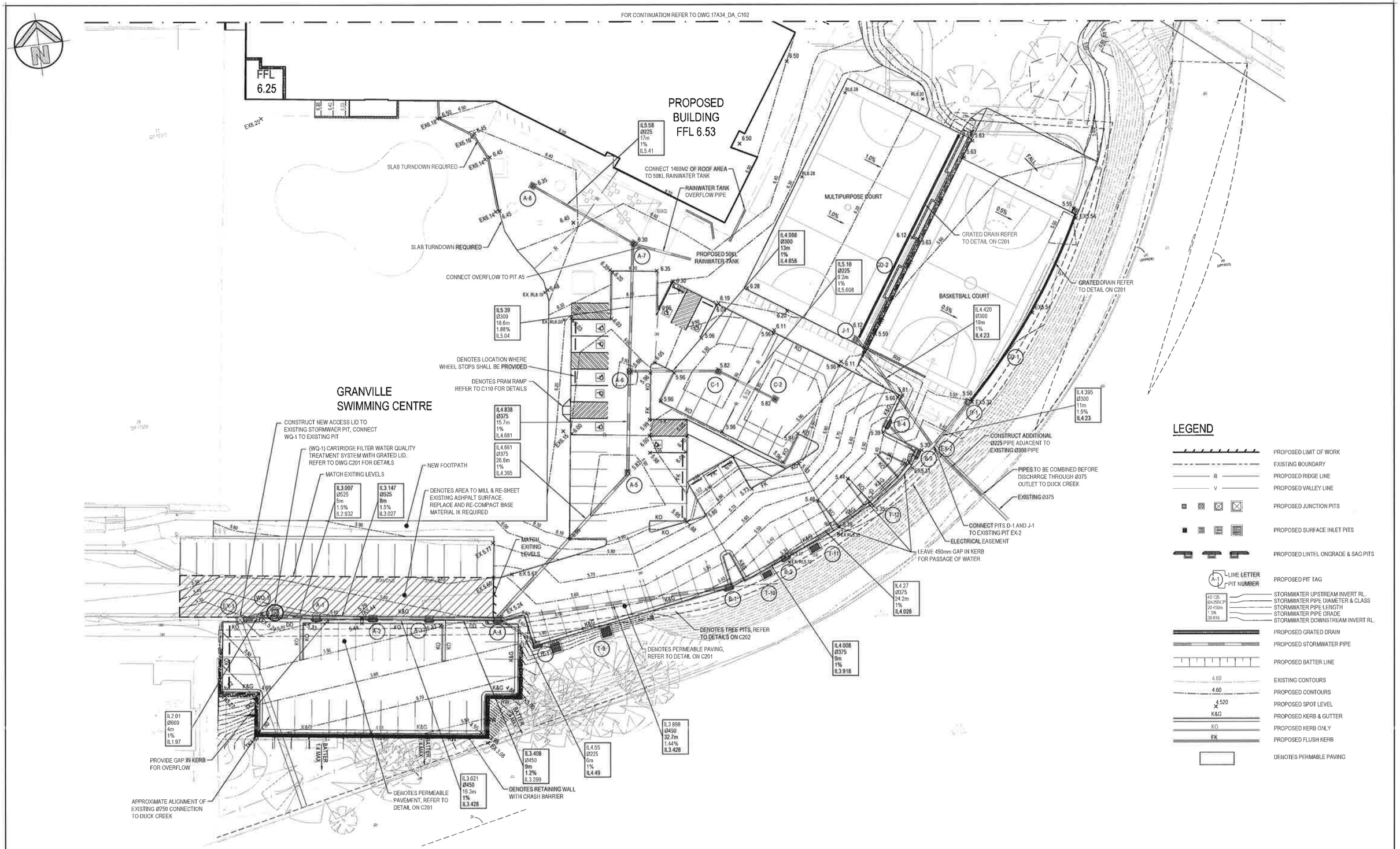
Project
PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title
GENERAL ARRANGEMENT PLAN

Drawn	Designed	Date
J.Knight	T.Reinehall	FEB 2018
Checked	Approved	Scale
T.Reinehall	A.Francis	1:500 @ A1

Drawing number: 17A34_DA_C100
Revision: 01



CONCEPT PLAN

SCALE: 1:250

0 5 10 15 20 25m

5 4 3 2 1

SCALE 1:250

FOR DA ONLY

SURVEY INFORMATION

SURVEYED BY:
TSS TOTAL SURVEYING SOLUTIONS
DATUM: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	IK	TR	23.03.2018
01	ISSUED FOR CONCEPT	MS	NW	08.03.2018

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE

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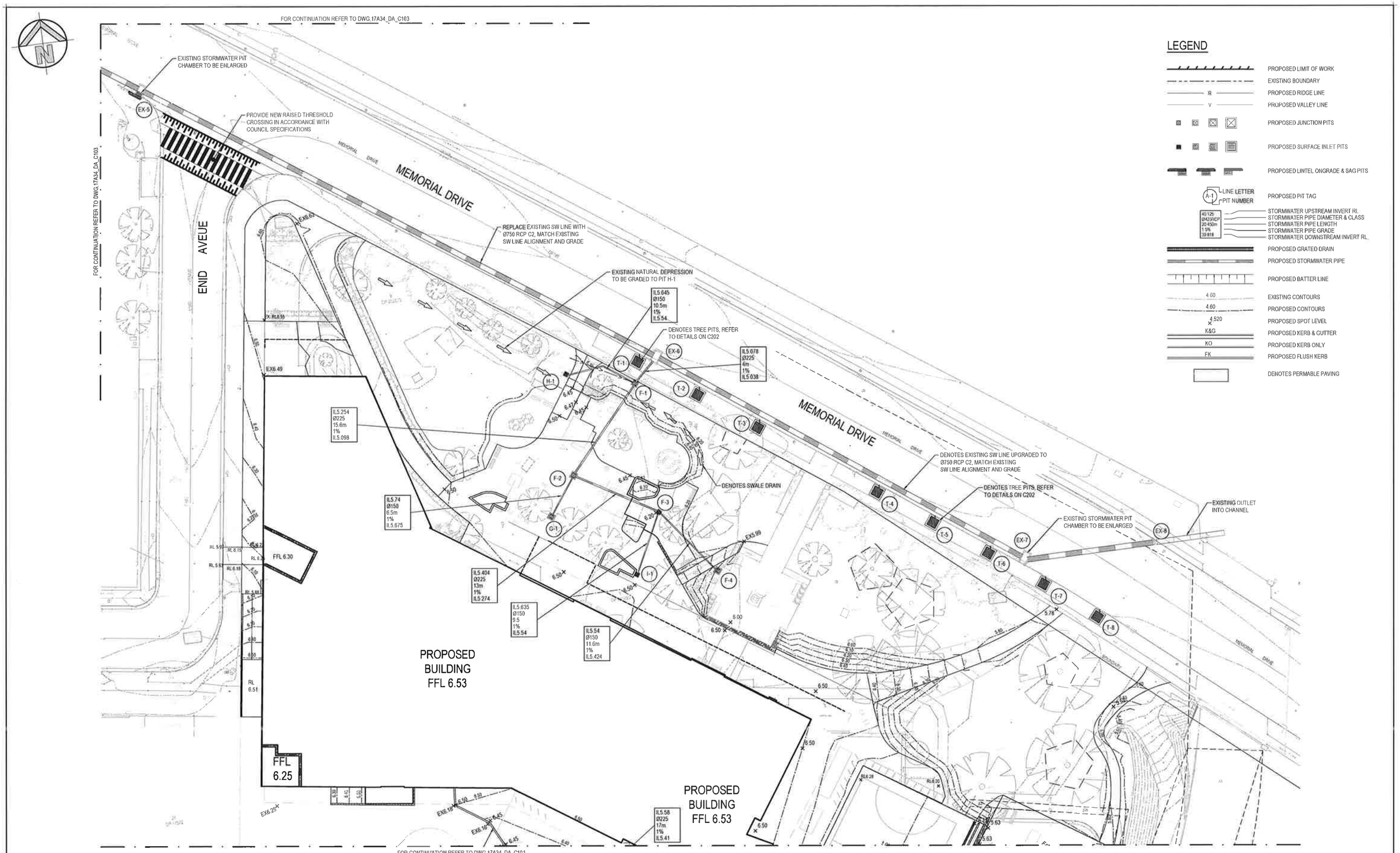
Project
PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Drawn: J.Knight | Designed: T.Rozehnal | Date: FEB 2018
Checked: T.Rozehnal | Approved: A.Francis | Scale: 1:250 @ A1

Title
CONCEPT PLAN
SHEET 1 OF 3

Drawing number: 17A34_DA_C101
Revision: 02



LEGEND

- PROPOSED LIMIT OF WORK
- EXISTING BOUNDARY
- PROPOSED RIDGE LINE
- PROPOSED VALLEY LINE
- PROPOSED JUNCTION PITS
- PROPOSED SURFACE INLET PITS
- PROPOSED LINTEL ONGRADE & SAG PITS
- PROPOSED PIT TAG (LINE LETTER / PIT NUMBER)
- STORMWATER UPSTREAM INVERT RL.
- STORMWATER PIPE DIAMETER & CLASS
- STORMWATER PIPE LENGTH
- STORMWATER PIPE GRADE
- STORMWATER DOWNSTREAM INVERT RL.
- PROPOSED GRATED DRAIN
- PROPOSED STORMWATER PIPE
- PROPOSED BATTER LINE
- EXISTING CONTOURS
- PROPOSED CONTOURS
- PROPOSED SPOT LEVEL
- PROPOSED KERB & GUTTER
- PROPOSED KERB ONLY
- PROPOSED FLUSH KERB
- DENOTES PERMABLE PAVING

CONCEPT PLAN

SCALE: 1:250

0 5 10 15 20 25m

SCALE 1:250

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY:
TSS TOTAL SURVEYING SOLUTIONS
DATUM AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	IK	TR	23.03.2018
01	ISSUED FOR CONCEPT	MS	NW	08.03.2018

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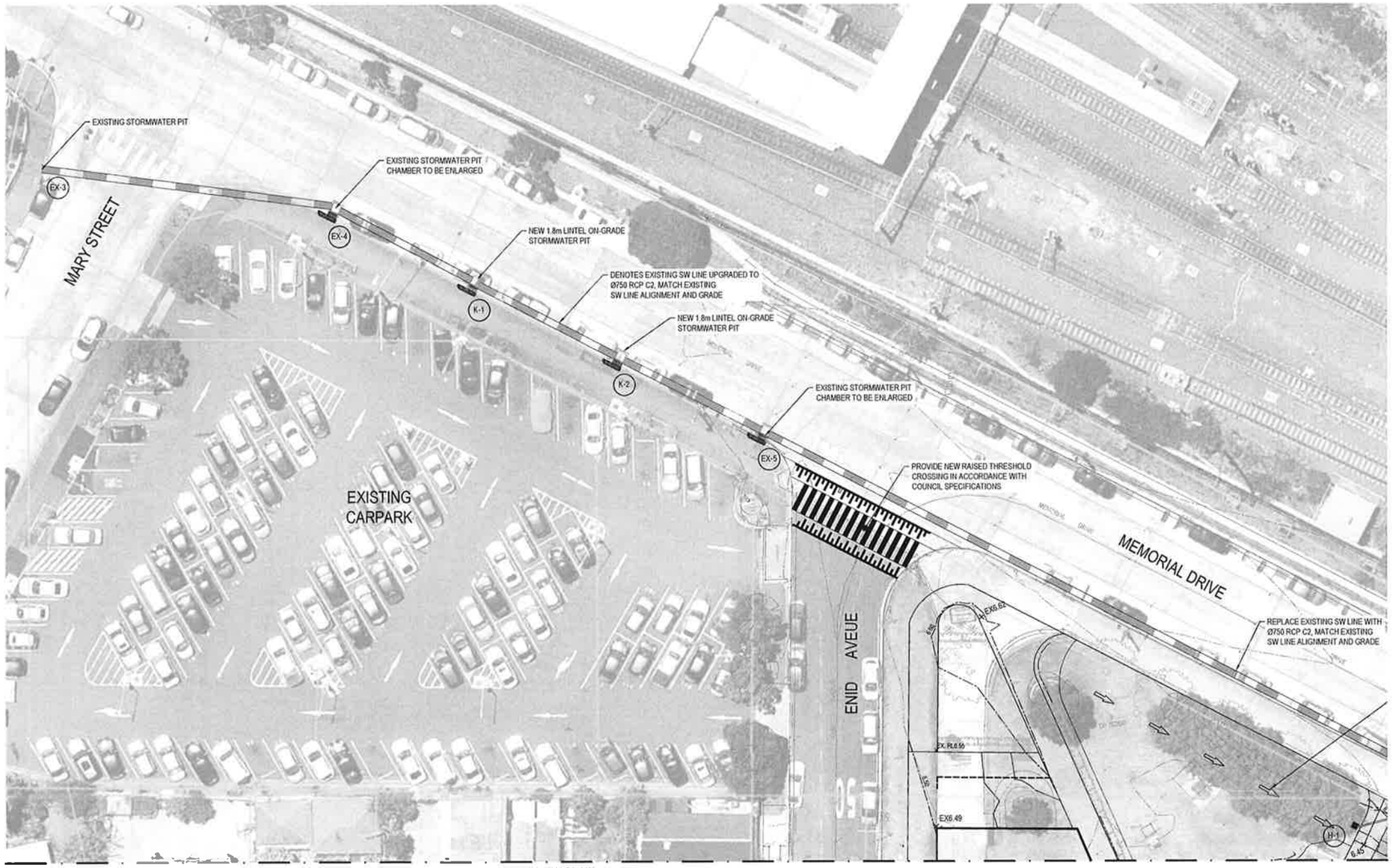
Project: PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title: CONCEPT PLAN
SHEET 2 OF 3

Drawn	Designed	Date
J Knight	T.Rezenhail	FEB 2018
Checked	Approved	Scale
T.Rezenhail	A.Francis	1:250 @ A1

Drawing Number: 17A34_DA_C102
Revision: 02



FOR CONTINUATION REFER TO DWG:17A34_DA_C102

CONCEPT PLAN

SCALE: 1:250

LEGEND

- PROPOSED LIMIT OF WORK
- EXISTING BOUNDARY
- PROPOSED RIDGE LINE (R)
- PROPOSED VALLEY LINE (V)
- PROPOSED JUNCTION PITS
- PROPOSED SURFACE INLET PITS
- PROPOSED LINTEL ONGRADE & SAG PITS
- PROPOSED PIT TAG (LINE LETTER / PIT NUMBER, e.g. A-1)
- STORMWATER UPSTREAM INVERT RL.
- STORMWATER PIPE DIAMETER & CLASS
- STORMWATER PIPE LENGTH
- STORMWATER PIPE GRADE
- STORMWATER DOWNSTREAM INVERT RL.
- PROPOSED GRATED DRAIN
- PROPOSED STORMWATER PIPE
- PROPOSED BATTER LINE
- EXISTING CONTOURS (4.60)
- PROPOSED CONTOURS (4.60)
- PROPOSED SPOT LEVEL (4.520)
- PROPOSED KERB & GUTTER (K&G)
- PROPOSED KERB ONLY (KO)
- PROPOSED FLUSH KERB (FK)
- DENOTES PERMABLE PAVING

0 5 10 15 20 25m

5 4 3 2 1

SCALE 1:250

FOR DA ONLY

SURVEY INFORMATION

SURVEYED BY:
TSS TOTAL SURVEYING SOLUTIONS
DATUM AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
02	ISSUED FOR DA ONLY	IK	TR	22.03.2018
01	ISSUED FOR CONCEPT	MS	NW	08.03.2018

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE

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Project: PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title: CONCEPT PLAN
SHEET 3 OF 3

Drawn	Designed	Date
J.Knight	T.Rozehnal	FEB 2018
Checked	Approved	Scale
T.Rozehnal	A.Francis	1:250 @ A1

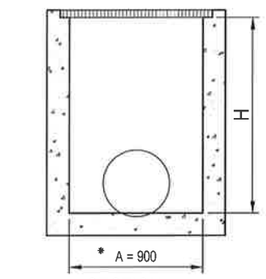
Drawing number: 17A34_DA_C103

Revision: 02

TYPICAL PIT CHAMBER SIZES

IT IS THE CONTRACTORS RESPONSIBILITY TO SELECT PIT CHAMBER SIZE WITH REGARDS TO PIPE SIZE, DEPTH TO INVERT AND SKEW ANGLE. REFER SKETCHES BELOW.

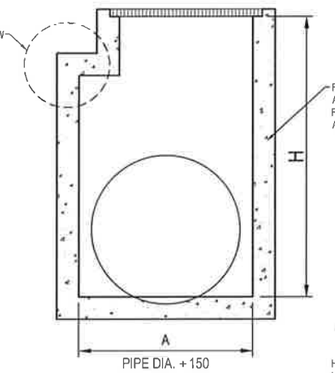
1. SELECT PIT CHAMBER USING THE STEPS BELOW.
2. SELECT PIT CHAMBER SIZE DEPENDING ON THE PIPE DIAMETERS.
3. CHECK PIT CHAMBER SIZE TO SATISFY DEPTH TO INVERT REQUIREMENTS.
   CHECK PIT CHAMBER DIMENSIONS TO SATISFY THE SKEW ANGLE IN THE TABLE.



SECTION
NTS

*A = 600 FOR PIPES UP TO 375 DIA.

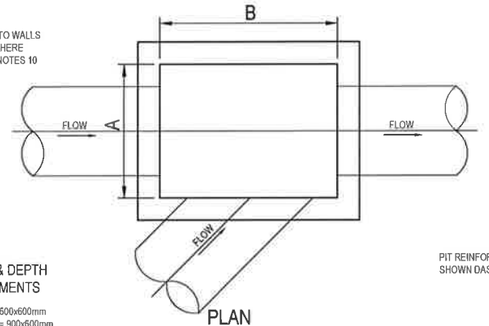
(1) PIT CHAMBER DIMENSIONS FOR PIPES UP TO 600 DIA.



SECTION
NTS

(1) PIT CHAMBER FOR PIPES GREATER THAN 600 DIA.

FOR B = 600mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 225mm
FOR B = 900mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 375mm
FOR B = 1200mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 600mm
FOR B = 1500mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 825mm
FOR B = 1900mm - MAX. SIDE ENTRY PIPE AT 45° SKEW = 1050mm

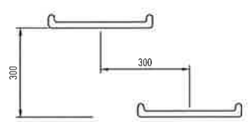


PLAN
NTS

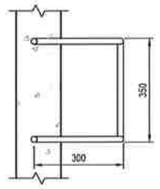
(3) PIT CHAMBER FOR SIDE ENTRY ON SKEW

(2) PIT SIZE & DEPTH REQUIREMENTS

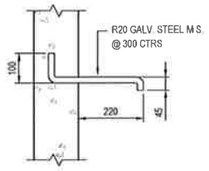
H = 0-900mm - AxB = 600x600mm
H = 900-1200mm - AxB = 900x600mm
H = >1200mm - AxB = 900x900mm



ELEVATION



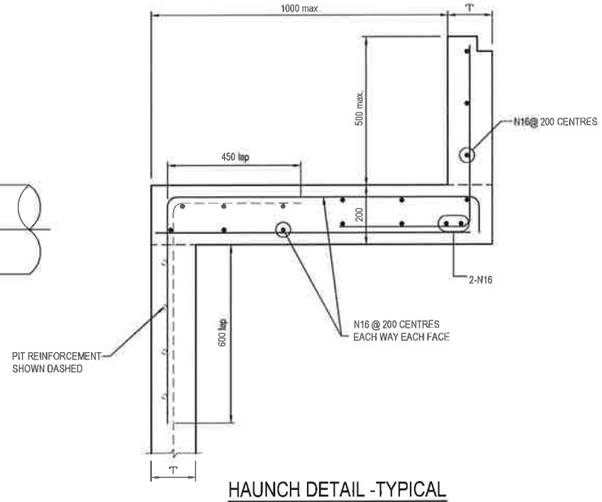
PLAN



SECTION

TYPICAL STEP IRON DETAIL

SCALE 1:10

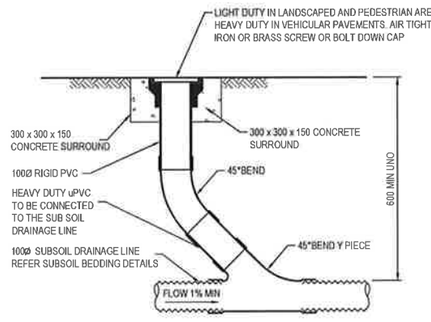


HAUNCH DETAIL -TYPICAL

SCALE 1:10

PIT LID SCHEDULE

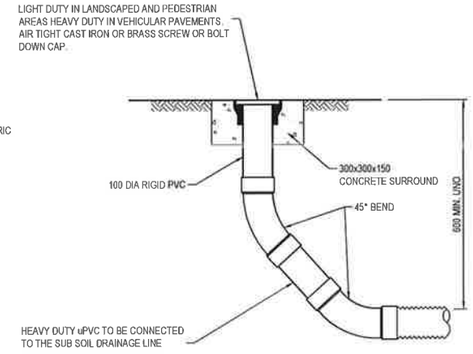
PIT/STRUCTURE NUMBER	DESCRIPTION
A-1 A-2 A-3 A-4 B-2	PROPOSED SAG KERB INLET PIT WITH 1.2m LINTEL AND HEAVY DUTY GRATED LID CLASS "D", FITTED WITH ENVIROPOD PIT BASKET IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS.
B-1 B-3 B-4 R-1	PROPOSED ON GRADE KERB INLET PIT WITH 1.2m LINTEL AND HEAVY DUTY GRATED LID CLASS "D", FITTED WITH ENVIROPOD PIT BASKET IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS.
A-5 A-6 A-7 A-8 C-1 C-2	PROPOSED SURFACE INLET PIT WITH 600x600 HINGED MEDIUM DUTY GRATED LID CLASS "C" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS.
D-1 F-1 F-2 F-3 F-4 G-1 H-1 I-1 J-1	PROPOSED SURFACE INLET PIT WITH 600x600 HINGED LIGHT DUTY GRATED LID CLASS "B", FITTED WITH ENVIROPOD PIT BASKET IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS.
GD-1 GD-2	PROPOSED 200mm WIDE LIGHT DUTY GRATED DRAIN CLASS "B" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS.
K-1 K-2	PROPOSED ON GRADE KERB INLET PIT WITH 1.8m LINTEL AND HEAVY DUTY GRATED LID CLASS "D" IN ACCORDANCE WITH LOCAL COUNCIL REQUIREMENTS.
WQ-1	CARTRIDGES FILTER SYSTEM, WATER QUALITY TREATMENT SYSTEM. REFER TO DWG17A34_CC_C201 FOR DETAILS
EX-1	EXISTING JUNCTION PIT DRAINING TO DUCK CREEK
EX-2	EXISTING SURFACE INLET PIT DRAINING TO DUCK CREEK
EX-3 EX-4 EX-5 EX-6 EX-7 EX-8	EXISTING ON GRADE INLET PIT LOCATED ON MEMORIAL DRIVE, DRAINING TO DUCK CREEK



INTERMEDIATE RISER (IR)

SCALE 1:10

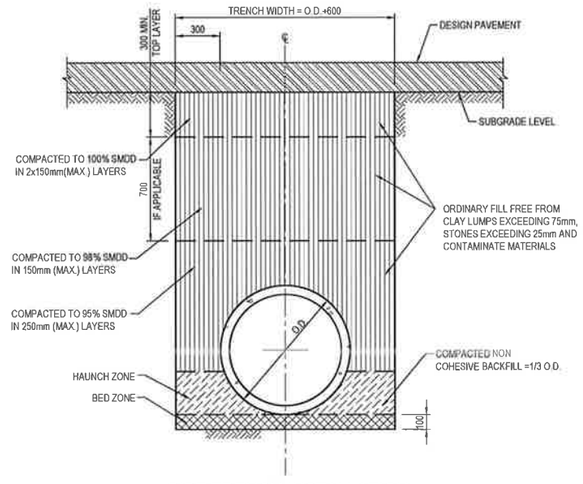
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



FLUSHING POINT (FP)

SCALE 1:10

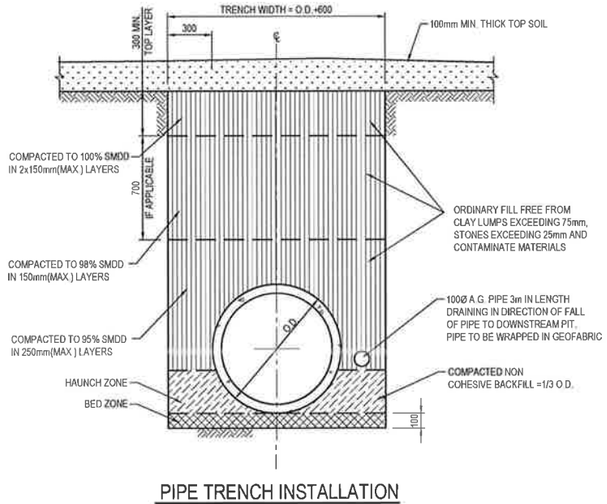
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



PIPE TRENCH INSTALLATION BENEATH PAVEMENT

(H1 & H2 SUPPORT)

SCALE 1:20



PIPE TRENCH INSTALLATION IN LANDSCAPE AREAS

(H1 & H2 SUPPORT)

SCALE 1:20

0 200 400 600 800 1000mm
200 100
SCALE 1:10

0 400 800 1200 1600 2000mm
400 200
SCALE 1:20

DRAINAGE NOTES:

1. ALL STORMWATER WORK TO COMPLY WITH AS 3500 PART 3.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE MINIMUM COVER OF 600mm ON ALL PIPES.
3. PROTECTION OF PIPES DUE TO LOADS EXCEEDING W7 WHEEL LOAD SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
4. BEDDING TYPE SHALL BE TYPE H2 FOR RCP. WHERE NECESSARY THE OVERLAY ZONE SHALL BE REDUCED TO ACCOMMODATE PAVEMENT REQUIREMENTS. REFER TO THIS DRAWING FOR DETAILS.
5. MINIMUM COVER OVER EXISTING PIPES FOR PROTECTION DURING CONSTRUCTION SHALL BE 800mm.
6. NO CONSTRUCTION LOADS SHALL BE APPLIED TO PLASTIC PIPES.
7. FINISHED SURFACE LEVELS SHOWN ON LAYOUT PLAN DRGS TAKE PRECEDENCE OVER DESIGN DRAINAGE SURFACE LEVELS.
8. ALL PIPES UP TO AND INCLUDING 300 DIA. SHALL BE SOLVENT OR RUBBER RING JOINTED PVC CLASS SH PIPE TO AS1260. ALL OTHER PIPES TO BE RCP USING CLASS 2 RUBBER RING JOINTED PIPE. HARDIES FRC PIPE MAY BE USED IN LIEU OF RCP IF DESIRED IN GROUND. ALL AERIAL PIPES TO BE PVC CLASS SH.
9. ALL PITS IN NON TRAFFICABLE AREAS TO BE PREFABRICATED POLYESTER CONCRETE "POLYCRETE" WITH "LIGHT DUTY" CLASS B GALV. MILD STEEL GRATING AND FRAME.
   ALL PITS IN TRAFFICABLE AREAS (CLASS "D" LOADING MAX) TO HAVE 150mm THICK CONCRETE WALLS AND BASE CAST IN-SITU f'c=32 MPa, REINFORCED WITH N12-200 BOTH LOADING WAYS CENTRALLY PLACE .U.N.O. ON SEPARATE DESIGN DRAWINGS IN THIS SET. GALV.MILD STEEL GRATING AND FRAME TO SUIT DESIGN LOADING. PRECAST PITS, RECTANGULAR OR CIRCULAR IN SHAPE, MAY BE USED IN LIEU AND SHALL COMPLY WITH RELEVANT AUSTRALIAN STANDARDS.
10. ALL PITS, GRATINGS AND FRAMES SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION AND TO BE IN ACCORDANCE WITH AS3500.3 AND AS3996.
11. PIT CHAMBER DIMENSIONS ARE TO BE SELECTED TO SATISFY THE FOLLOWING:
    - PIPE SIZE
    - DEPTH TO INVERT
    - SKEW ANGLE
    REFER TYPICAL PIT CHAMBER DETAILS BELOW
    IF PIT LID SIZE IS SMALLER THAN THE PIT CHAMBER SIZE THEN THE PIT LID IS TO BE CONSTRUCTED ON THE CORNER OF THE PIT CHAMBER WITH THE STEP IRONS DIRECTLY BELOW. ALTERNATIVELY THE PIT LID TO BE USED, IS TO BE THE SAME SIZE AS THE PIT CHAMBER.
12. FOR PIPE SIZES GREATER THAN Ø300mm, PIT FLOOR IS TO BE BENCHED TO FACILITATE FLOW.
13. GALVANISED STEP IRONS SHALL BE PROVIDED AT 300 CTS FOR PITS HAVING A DEPTH EXCEEDING 1200mm. SUBSOIL DRAINAGE PIPE SHALL BE PROVIDED IN PIPE TRENCHES ADJACENT TO INLET PIPES. (MINIMUM LENGTH 3m).
14. ALL SUBSOIL PIPES SHALL BE 100mm SLOTTED PVC IN A FILTER SOCK, UNO, WITH 3m INSTALLED UPSTREAM OF ALL PITS.
15. ALL PIPEWORK SHALL HAVE MINIMUM DIAMETER 100.
16. MINIMUM GRADE FOR ROOFWATER DRAINAGE LINES SHALL BE 1%.
17. ALL PIPE JUNCTIONS AND TAPER UP TO AND INCLUDING 300 DIA. SHALL BE VIA PURPOSE MADE FITTINGS.
18. ALL ROOF DRAINAGE TO BE INSTALLED IN ACCORDANCE WITH AS3500, PART 3. TESTING TO BE UNDERTAKEN AND REPORTS PROVIDED TO THE SUPERINTENDENT.
19. LOCATION OF THE DIRECT DOWN PIPE CONNECTIONS MAY VARY ON SITE TO SUIT SITE CONDITIONS, WHERE CONNECTION SHOWN ON LONG SECTIONS CHAINAGES ARE INDICATIVE ONLY.
20. PITS IN EXCESS OF 1.5 m DEEP TO HAVE WALL AND FLOOR THICKNESS INCREASED TO 200mm. REINFORCED WITH N12@200 CTS CENTRALLY PLACED BOTH WAYS THROUGHOUT U.N.O.ON SEPARATE DESIGN DRAWINGS IN THIS SET. IF DEPTH EXCEEDS 5m CONTACT ENGINEER.
21. SUBSOIL DRAINAGE LINES FOR LANDSCAPE AREA NOT SHOWN ON THESE DRAWINGS. REFER TO LANDSCAPING PLANS FOR DETAILS.
22. ALL STORMWATER PITS TO HAVE Ø100 uPVC SLOTTED SUBSOIL PIPES CONNECTED TO THEM, THESE SUBSOILS TO EXTEND 3m UPSTREAM OF THE PIT AT A MINIMUM GRADE.

FOR DA ONLY

SURVEY INFORMATION
SURVEYED BY:
TSS TOTAL SURVEYING SOLUTIONS
DATUM: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
01	ISSUED FOR DA ONLY	IK	TR	20.03.2018

Client: CUMBERLAND COUCIL
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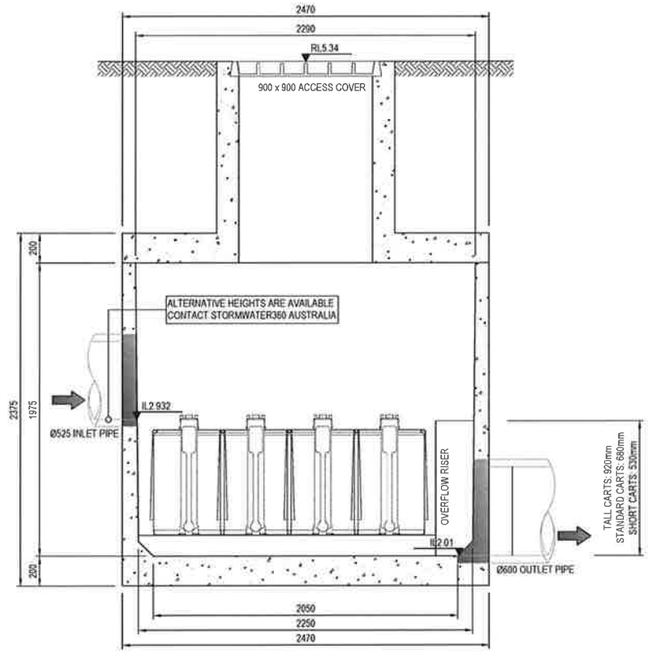
Project: PROPOSED MULTI - PURPOSE CENTRE ENID AVENUE, GRANVILLE NSW
Title: STORMWATER MISCELLANEOUS DETAILS & PIT LID SCHEDULE

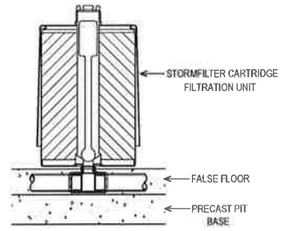
Drawn	Designed	Date
I.Khatchab	T.Reutehnall	FEB 2018
Checked	Approved	Scale
T.Reutehnall	A.Francis	AS NOTED @ A1

Drawing number: 17A34_DA_C200
Revision: 01

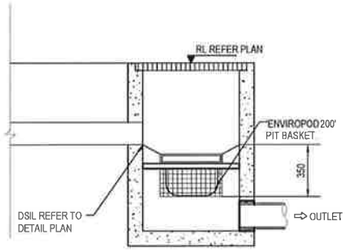


MANHOLE STORMFILTER SECTION

SCALE: 1:20



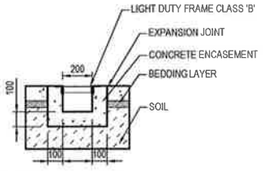
STORMFILTER CARTRIDGE DETAIL



SCHEMATIC SECTION ENVIROPOD 200 SERIES

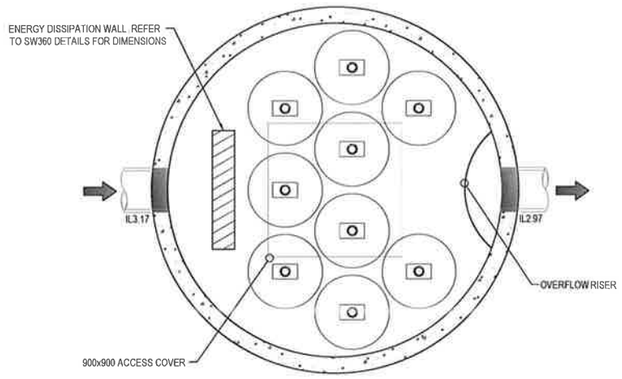
SCALE 1:20

NOTE: TO ENSURE THAT THE CORRECT CONFIGURATION OF THE "ENVIROPOD" PITS IS ACHIEVED, REFER TO INVERT LEVELS ON THE DETAIL PLANS. THESE INVERTS WILL ENSURE CORRECT COVER AND CONFIGURATION IS ACHIEVED.

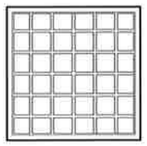


GRATED DRAIN

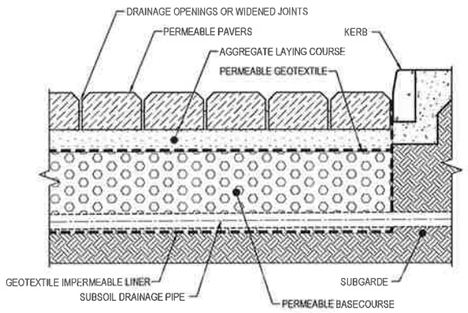
SCALE 1:20



MANHOLE STORMFILTER PLAN



900 x 900 ACCESS COVER



DENOTES PERMEABLE PAVEMENT DETAIL

SCALE: 1:20

0 400 800 1200 1600 2000mm

400 200

SCALE 1:20

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SURVEY INFORMATION

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DATUM AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
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REVISION	AMENDMENT	DRAWN	DESIGNED	DATE

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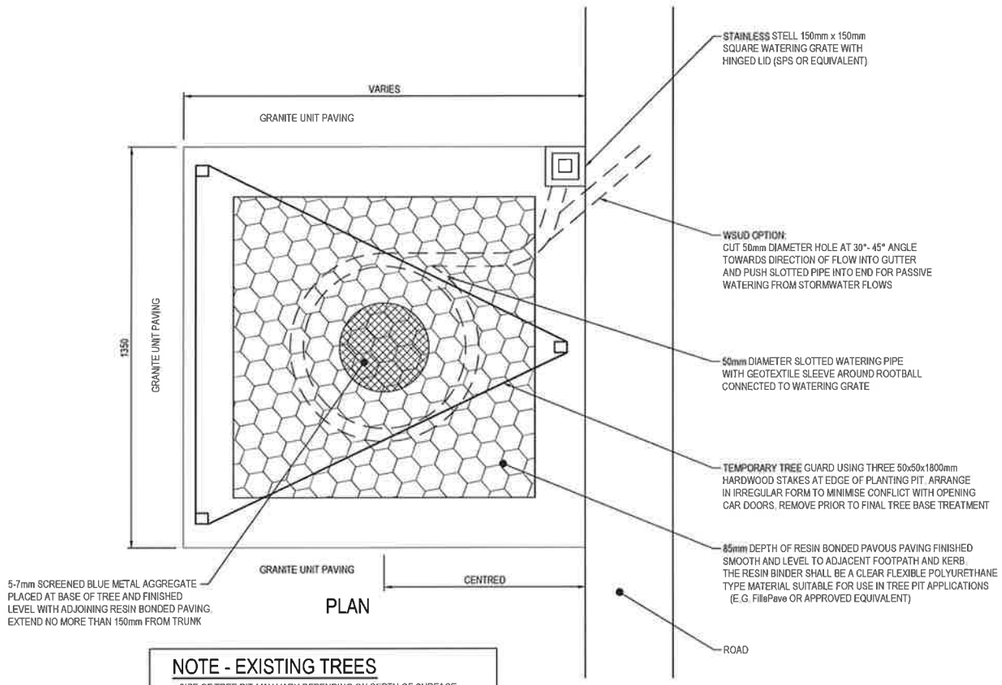
Project: PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title: CARTRIDGE FILTER WATER QUALITY TREATMENT SYSTEM DETAILS

Drawn	Designed	Date
J.Knight	T.Rozehnal	FEB 2018
Checked	Approved	Scale
T.Rozehnal	A.Francis	AS NOTED @ A1

Drawing number: 17A34_DA_C201

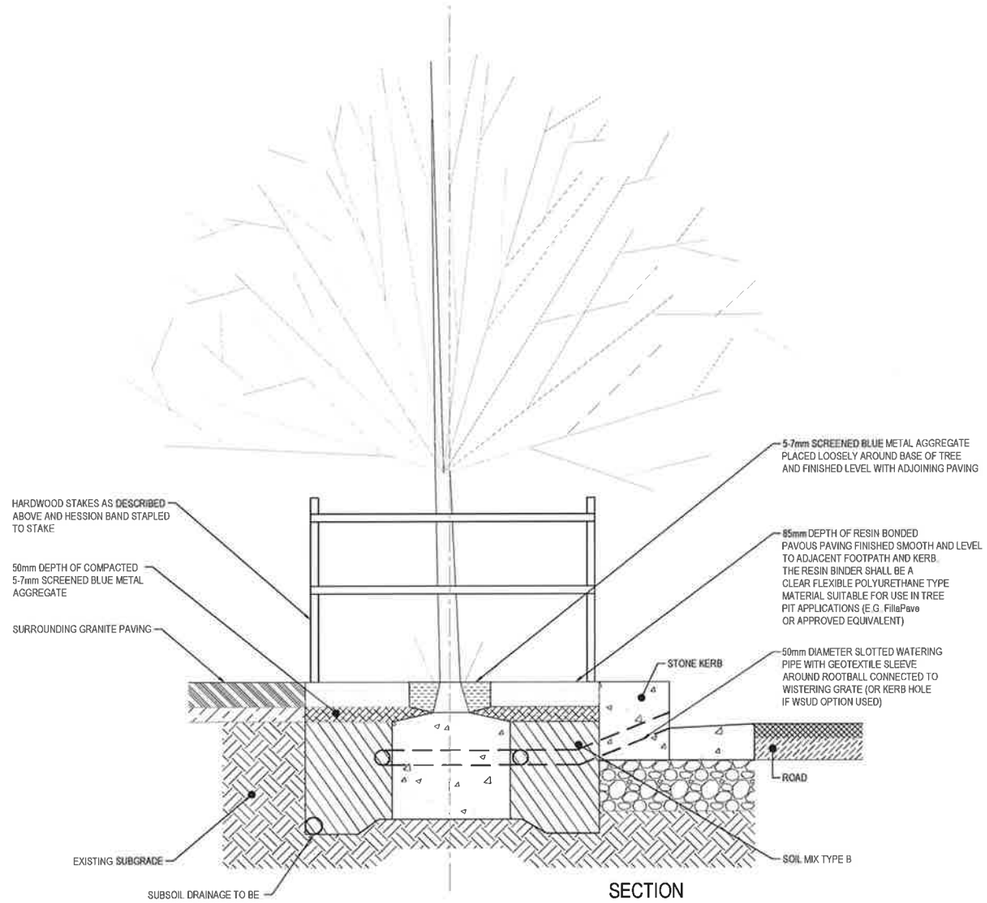
Revision: 01



PLAN

NOTE - EXISTING TREES

- SIZE OF TREE PIT MAY VARY DEPENDING ON DEPTH OF SURFACE ROOTS OR TRUNK FLARE OF MATURE TREES.
- PAVING CONSTRUCTION MAY BE ALTERED TO ACCOMODATE TREE ROOTS AT THE DIRECTION OF COUNCIL
- TREE PIT SURFACE TO BE INSTALLED LEVEL WITH SURROUNDING PAVING, LEAVING SURFACE ROOTS EXPOSED WHERE NECESSARY.



SECTION

PLANTING IN GRANITE PAVING DETAIL

SCALE 1:10

0 200 400 600 800 1000mm
200 100

SCALE 1:10

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SURVEYED BY:
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Project: PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title: PLANTING IN GRANITE PAVING DETAIL

Drawn	Designed	Date
J.Knight	T.Rabenhall	FEB 2018
Checked	Approved	Scale
T.Rabenhall	A.Francis	AS NOTED @ A1

Drawing number: 17A34_DA_C202
Revision: 01

FOR CONTINUATION REFER TO DWG.17A34_DA_C251

AREA = 1330m²

AREA = 802m²

AREA = 291

AREA = 185

AREA = 840m²

AREA = 691m²

AREA = 382m²

AREA = 425m²

AREA = 216m²

AREA = 95m²

AREA = 173

AREA = 291m²

AREA = 297m²

AREA = 156m²

AREA = 241m²

AREA = 180m²

AREA = 329m²

AREA = 292m²

AREA = 235m²

AREA = 203m²

CONCEPT PLAN

SCALE: 1:250

0 5 10 15 20 25m

SCALE 1:250

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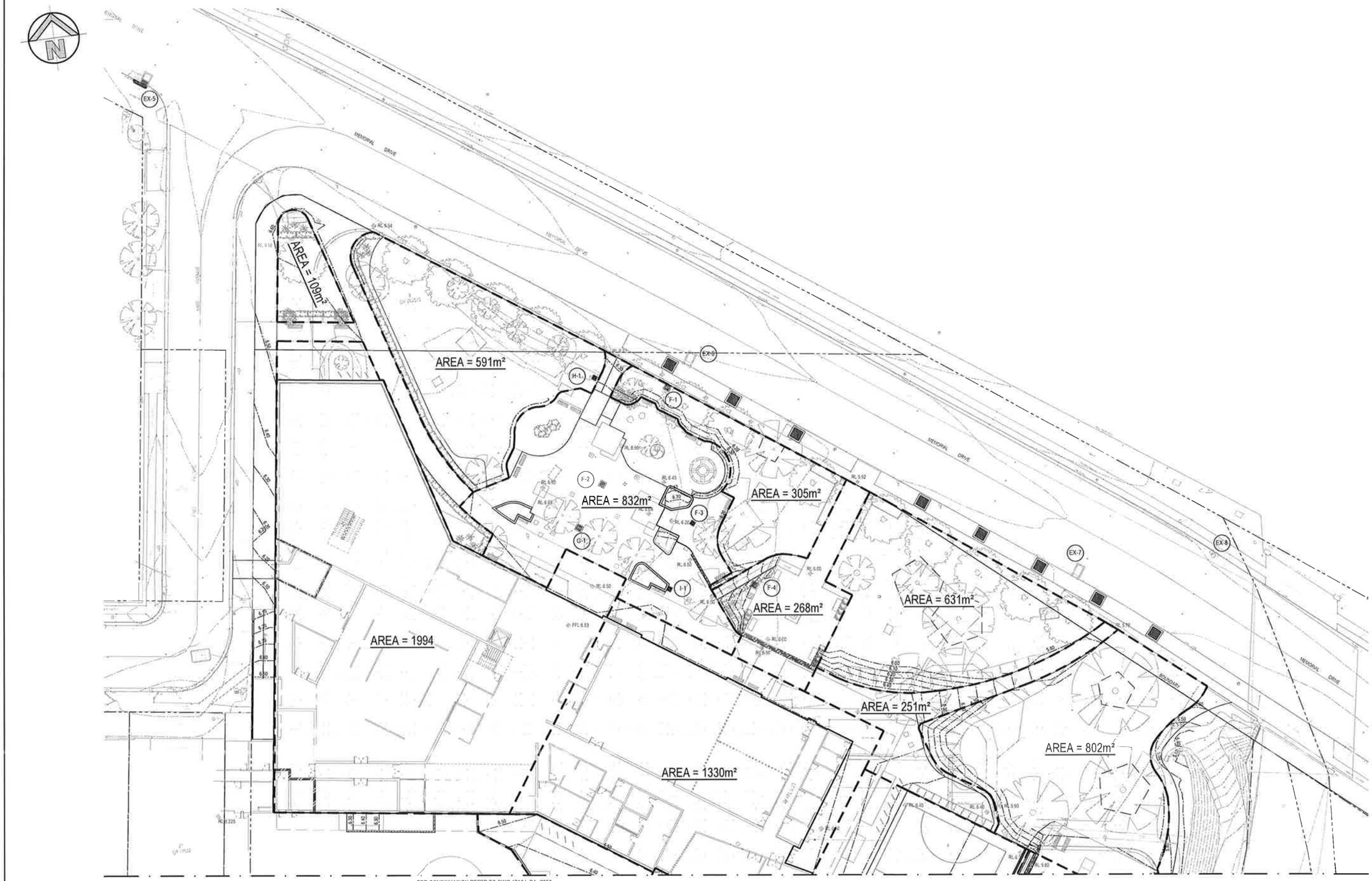
Project: PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title: CATCHMENT PLAN
SHEET 1 OF 2

Drawn	Designed	Date
J.Knight	T.Rezeinyal	FEB 2018
Checked	Approved	Scale
T.Rezeinyal	A.Francis	1:250 @ A1

Drawing number: 17A34_DA_C250

Revision: 01



CATCHMENT PLAN

SCALE:1:250

0 5 10 15 20 25m

5 4 3 2 1

SCALE 1:250

FOR DA ONLY

SURVEY INFORMATION

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01	ISSUED FOR DA ONLY	TR	TR	23.02.2018

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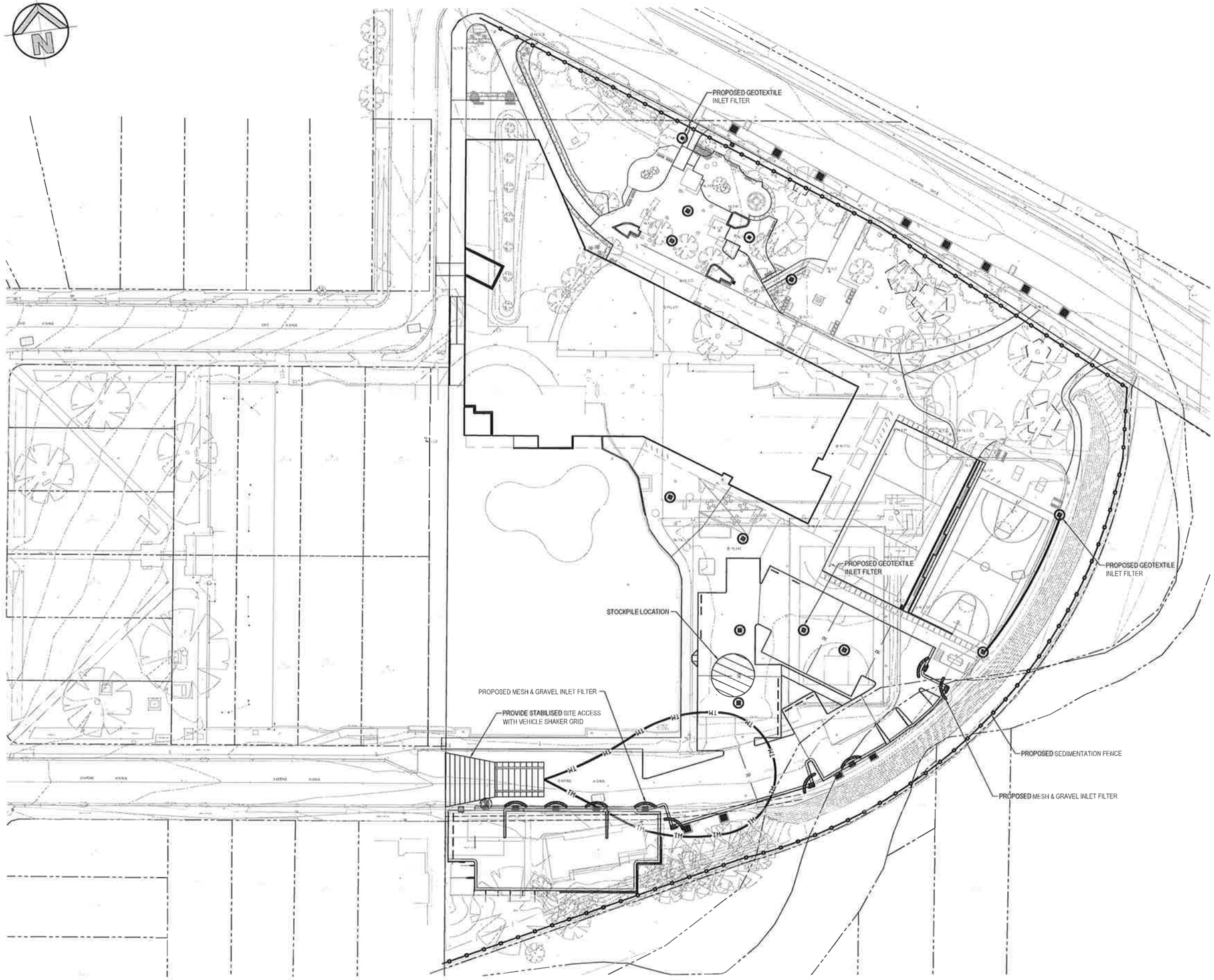
Project: PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title: CATCHMENT PLAN
SHEET 2 OF 2

Drawn	Designed	Date
J.Knight	T.Rozenthal	FEB 2018
Checked	Approved	Scale
T.Rozenthal	A.Franchi	1:250 @ A1

Drawing number: 17A34_DA_C251 | Revision: 01



LEGEND

- TRAFFIC MANOEUVRING
- PROPOSED SEDIMENTATION FENCE
- PROPOSED VEHICLE SHAKER GRID
- PROPOSED STABILISED SITE ACCESS
- PROPOSED STOCKPILE LOCATION
- GEOTEXTILE INLET FILTER
- PROPOSED MESH & GRAVEL INLET FILTER

SEDIMENT & EROSION CONTROL NOTES

- ALL SEDIMENT CONTROL DEVICES ARE TO BE CONSTRUCTED, PLACED AND MAINTAINED IN ACCORDANCE WITH RESPECTIVE COUNCIL SPECIFICATIONS AND LANDCOM'S "SOIL AND CONSTRUCTION" MANUAL.
- ALL PERIMETER & SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO, OR AS THE FIRST STEP IN EARTH WORKS AND/OR CLEARING.
- THE SEDIMENT & EROSION CONTROL PLAN MAY REQUIRE FUTURE ADJUSTMENT TO REFLECT CONSTRUCTION STAGING. IT IS ALSO THE CONTRACTORS RESPONSIBILTY TO PREPARE THEIR OWN SEDIMENT AND EROSION CONTROL PLAN WHICH SUITS THE DESIGNED CONSTRUCTION STAGING.
- FILTRATION BUFFER ZONES ARE TO BE FENCED OFF AND ACCESS PROHIBITED TO ALL PLANT AND MACHINERY.
- ALL TEMPORARY EARTH BERMS, DIVERSIONS & SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED & MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.
- ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER STORMS FOR STRUCTURAL DAMAGE OR CLOGGING. TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE LOCATION.
- ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR REUSE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION OF THE STOCKPILES.
- ALL EARTHWORK AREAS SHALL BE ROLLED EACH EVENING TO SEAL THE EARTHWORKS.
- ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END. ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND STRAW MULCHED WITHIN 14 DAYS OF COMPLETION OF FORMATION U.N.O. BY LANDSCAPE ARCHITECTS.
- UPON COMPLETION OF ALL EARTHWORKS OR AS DIRECTED BY COUNCIL SOIL CONSERVATION TREATMENTS SHALL BE APPLIED SO AS TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.
- EROSION AND SILT PROTECTION MEASURES ARE TO BE MAINTAINED AT ALL TIMES.

0 8 16 24 32 40m
8 6 4 2
SCALE 1:400

SEDIMENT & EROSION CONTROL PLAN

SCALE:1:400

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SURVEYED BY:
TSS TOTAL SURVEYING SOLUTIONS
DATUM: AHD

REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
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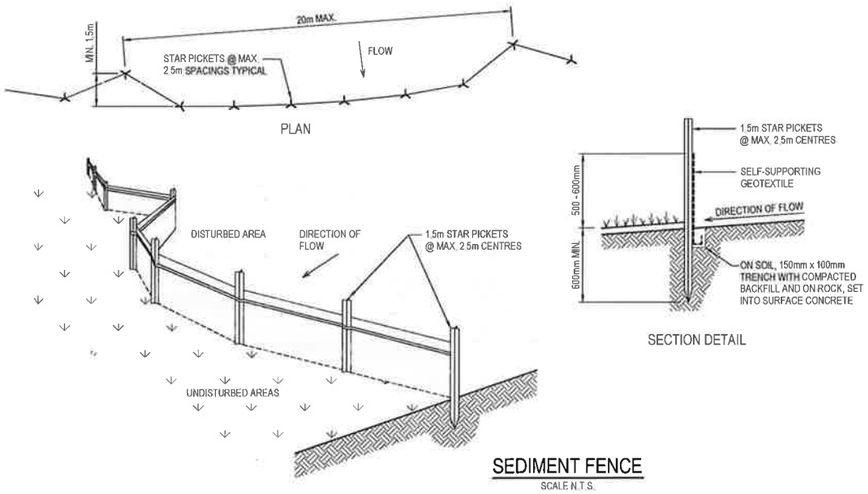
Project: PROPOSED MULTI - PURPOSE CENTRE
ENID AVENUE, GRANVILLE NSW

Title: SEDIMENT & EROSION CONTROL PLAN

Drawn	Designed	Date
J.Knight	T.Reichenhall	FEB 2018
Checked	Approved	Scale
T.Reichenhall	A.Franklin	1:400 @ A1

Drawing number: 17A34_DA_SE01
Revision: 01

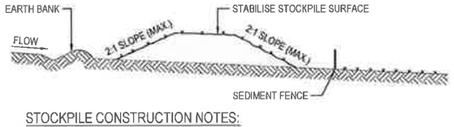


SEDIMENT FENCE

SCALE N.T.S.

SEDIMENT FENCE CONSTRUCTION NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. 3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND @ 2.5m INTERVALS (MAX.) AT THE DOWNSLOPE EDGE OF THE TRENCH, ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. 4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. 5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP. 6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

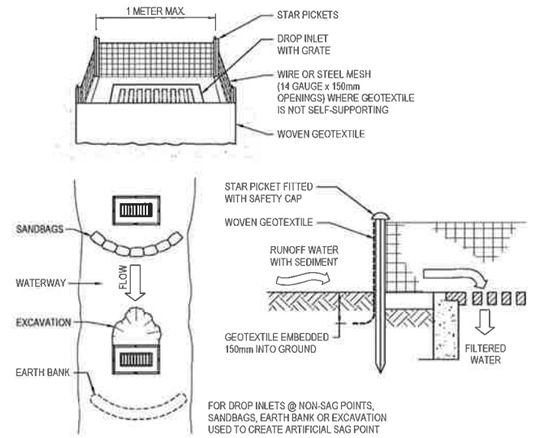


STOCKPILE CONSTRUCTION NOTES:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. WHERE THEY ARE TO BE PLACED FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED E.S.C.P. OR S.W.M.P. TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.

STOCKPILES

SCALE N.T.S.

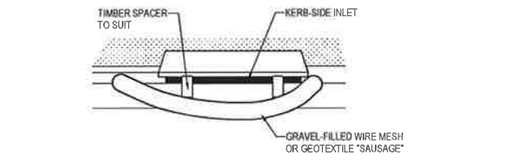


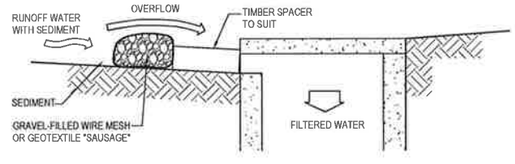
GEOTEXTILE INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SEDIMENT BARRIER MADE FROM GEOTEXTILE.
2. PICKET SPACING TO BE MAXIMUM 1.0m.
3. IN WATERWAYS, ARTIFICIAL SAG POINTS CAN BE CREATED WITH SANDBAGS OR EARTH BANKS AS SHOWN IN THE DRAWING.
4. DO NOT COVER THE INLET WITH GEOTEXTILES UNLESS THE DESIGN IS ADEQUATE TO ALLOW FOR ALL WATERS TO BYPASS IT.

GEOTEXTILE INLET FILTER

SCALE N.T.S.



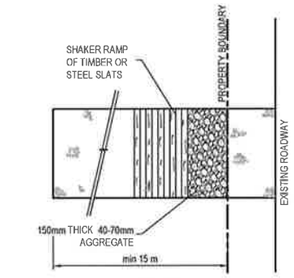


MESH & GRAVEL INLET FILTER CONSTRUCTION NOTES:

1. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
2. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
3. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
4. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
5. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY CAN FIRMLY ABUT EACH OTHER AND SEDIMENT / LADEN WATERS CANNOT PASS BETWEEN.

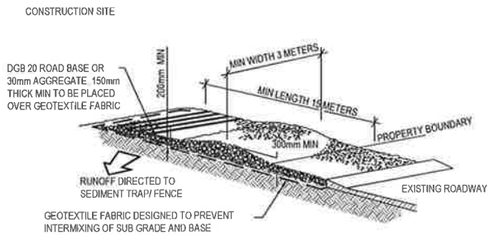
MESH & GRAVEL INLET FILTER

SCALE N.T.S.



PLAN
STABILISED SITE ACCESS WITH SHAKER RAMP

NTS



STABILISED SITE ACCESS WITH SHAKER RAMP

N.T.S.

NOTES:

1. THIS DEVICE IS TO BE LOCATED AT ALL EXITS FROM CONSTRUCTION SITE.
2. THIS DEVICE IS TO BE REGULARLY CLEANED OF DEPOSITED MATERIAL SO AS TO MAINTAIN A 50mm DEEP SPACE BETWEEN PLANKS.
3. ANY UNSEALED ROAD BETWEEN THIS DEVICE AND NEAREST ROADWAY IS TO BE TOPPED WITH 100mm THICK 40-70mm SIZE AGGREGATE.
4. ALTERNATIVELY, THREE(3) PRECAST CONCRETE CATTLE GRIDS (AS MANUFACTURED BY *HUMES CONCRETE MAY BE USED. 1, 2 & 3 ABOVE ALSO APPLY.

FOR DA ONLY

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REVISION	AMENDMENT	DRAWN	DESIGNED	DATE
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Project: PROPOSED MULTI - PURPOSE CENTRE ENID AVENUE, GRANVILLE NSW
Title: SEDIMENT & EROSION CONTROL DETAILS AND TYPICAL SECTIONS

Drawn	Designed	Date
J.Knight	T.Roehrlhal	FEB 2018
Checked	Approved	Scale
T.Roehrlhal	A.Franklin	NTS @ A1

Drawing number: 17A34_DA_SE02
Revision: 01

Remedial Action Plan

Cumberland Council

1 Memorial Drive,

Granville 2142

Prepared for:

Cumberland Council

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ABBREVIATIONS

AEC	Areas of Environmental Concern
AHD	Australian Height Datum
ANZECC	Australian and New Zealand Environment and Conservation Council
ASC	Assessment of Site Contamination
ASS	Acid Sulfate Soils
BaP	Benzo(a)pyrene
BGL	Below Ground Level
BTEX	Benzene, Toluene, Ethylbenzene and Xylenes
BTEXN	Benzene, Toluene, Ethylbenzene, Xylenes and Naphthalene
CLP	Contaminated Land Policy
CLM	Contaminated Land Management Act
COC	Chain of Custody
CPAHs	Carcinogenic Polycyclic Aromatic Hydrocarbons
CRC CARE	Cooperative Research Centre for Contamination Assessment and Remediation or the Environment
CSM	Conceptual Site Model
DEC	Department of Environment and Conservation NSW
DECC	Department of Environment and Climate Change NSW
DECCW	Department of Environment, Climate Change and Water NSW
DLWC	Department of Land and Water Conservation
DP	Deposited Plan
DQO	Data Quality Objectives
DQI	Data Quality Indicator
DSI	Detailed Site Investigation
EILs	Ecological Investigation Levels.
EPA	NSW Environmental Protection Authority
EPL	Environmental Protection License
ESA	Environmental Site Assessment
ESLs	Ecological Screening Levels
GILs	Groundwater Investigation Levels
GW	Ground Water
GME	Groundwater Monitoring Event
HILs	Health Investigation Levels
HSLs	Health Screening Levels
LEL	Lower Explosive Limit
LEP	Local Environment Plan
LGA	Local Government Area
LCS	Laboratory Control Samples
LOR	Limit of Reporting
LNAPL	Light Non-Aqueous Phase Liquids
mAHD	Metres Australian Height Datum (above mean sea level)
MAHs	Monocyclic Aromatic Hydrocarbons
NAPL	Non-Aqueous Phase Liquid
NATA	The National Association of Testing Authorities
NEPM	National Environment Protection Measure
NHMRC	National Health Medical Research Council
NTU	National Turbidity Unit
OCP	Organochlorine Pesticides
OEH	Office of Environment and Heritage NSW
OPP	Organophosphate Pesticides
PAH	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyl
PCOC	Potential Contaminants of Concern
PPM	Parts Per Million
PSI	Preliminary Site Investigation
PVC	Polyvinyl Chloride
QA	Quality Assurance
QC	Quality Control
RAC	Remediation Acceptance Criteria
RAP	Remedial Action Plan
RPD	Relative Percent Difference
SESL	SESL Australia Pty Limited
SVOC	Semi-Volatile Organic Compounds
SVR	Site Validation Report
SWL	Standing Water Level
TDS	Total Dissolved Solids
TEQ	Toxic Equivalence Quotient
TPH	Total Petroleum Hydrocarbons
TRH	Total Recoverable Hydrocarbon
USCS	Unified Soil Classification System
VOC	Volatile Organic Compound

1 EXECUTIVE SUMMARY

SESL Australia (SESL) was engaged by Crown Project Services on behalf of Cumberland Council (the client) to prepare a Remedial Action Plan (RAP) to manage known soil contamination located at 1 Memorial Drive, Granville NSW 2142 (the site), as part of the proposed development of the Granville Multi-purpose Centre. This RAP has been prepared to detail the required actions by which the contamination will be managed, so that the site can be considered suitable for the proposed use in accordance with the relevant regulatory guidelines.

The goal of the remediation is to manage the known contamination in order to remove the unacceptable risk posed to human health, and render the site suitable for the proposed use. The purpose of the RAP is to:

- Provide a plan of remediation for the site to remove the unacceptable risk posed to human health by the known contamination;
- Establish remediation acceptance criteria that are appropriate for the proposed use of the site post remediation and development; and
- Demonstrates that the proposed remediation strategy is compliant with state and local government planning statutes, is complaint with the NSW EPA endorsed guidelines under Section 105 of the Contaminated Land Management Act 1997, and properly addressed issues relating to site environmental management, community relations and contingency planning.

SESL understands that the proposed development at the site includes the construction of a multi-purpose community centre, library, regional gallery and extension of the current car park. The existing swimming pools and outdoor recreation facilities are proposed to be retained at the site.

Based on nature of the site and proposed use of the site post remediation, a remedial strategy was selected by the key stakeholders. In consideration of the limitations of the site, cost of remediation, nature of contamination and the associated human health risks, it was determined that the most appropriate remedial option for the site is ‘On-site Management’.

The objective of the remediation design is to ensure that all materials known to be contaminated are encapsulated by site features, to ensure that contact between contamination and site users is prevented, and that the site is considered suitable for the proposed use. Materials will be encapsulated by a range of site features, including both hardstand (impermeable) features and soft landscape (permeable) features.

This method involves encapsulating materials known to be contaminated, utilising multiple encapsulation techniques, dependant on the proposed landscape feature. In areas of proposed accessible soils, the installation of a geotextile marker layer and an appropriately sized capping layer is required to encapsulate contaminants. In areas of proposed hardstand materials, no additional works are required as hardstand materials are considered sufficient in encapsulating contaminated materials. Should contaminated materials be

required to be removed from site due to proposed design levels, the 'Excavation and Offsite Disposal' remediation methodology will be implemented.

Based on the contamination identified in the previous site investigation, this RAP has been developed to detail the remediation strategies that will be necessary to render the site suitable for public recreational use, following the completion of the proposed development. The Site Environmental Controls and Contingency Plan outlined in this report must be implemented to ensure good environmental practices are adopted and corrective actions are performed in a timely manner.

The outcome of additional asbestos quantification (see Section 4.6) is required to confirm the site environmental control and validation protocols in relation to the management of the identified bonded asbestos. Should friable asbestos be identified, the additional measures described in Section 18 must be implemented.

SESL concludes that the strategies outlined will achieve the objectives of the RAP and render the site suitable for the ongoing recreational use and proposed development. Documentation of the success of remediation is required in a subsequent Site Remediation and Validation Report (SRVR) at the conclusion of remedial works.

This remedial strategy requires the development and implementation of a site-specific Environmental Management Plan (EMP) to outline how future site activities will maintain the suitability of the site.

2 INTRODUCTION

SESL Australia (SESL) was engaged by Crown Project Services on behalf of Cumberland Council (the client) to prepare a Remedial Action Plan (RAP) to manage known soil contamination located at 1 Memorial Drive, Granville NSW 2142 (the site), as part of the proposed development of the Granville Multi-purpose Centre. This RAP has been prepared to detail the required actions by which the contamination will be managed, so that the site can be considered suitable for the proposed use in accordance with the relevant regulatory guidelines.

SESL understands that the proposed development at the site includes the construction of a multi-purpose community centre, library, regional gallery and extension of the current car park. The existing swimming pools and outdoor recreation facilities are proposed to be retained at the site.

A Detailed Site Investigation (DSI) was undertaken by SESL (SESL Report: J000719 – Detailed Site Investigation) to characterise site soils and groundwater, to determine the contamination status of the site and comment on the suitability of the site for the proposed development. This DSI incorporated the previous investigation conducted at the site by Douglas Partners in August 2017 (*Project 86007.01*), and included intrusive soil assessment, groundwater monitoring well installation and groundwater sampling. The findings of this DSI are summarised in Section 4 of this plan.

This RAP is required to manage the identified contamination, establish remediation acceptance criteria, detail validation requirements and comment on the requirement for the ongoing management of the site post remediation, to ensure that the developed site is suitable for the proposed land use.

2.1 OBJECTIVES

The overall objective of this RAP is to prescribe appropriate remedial actions that will manage the risks posed to current and future site users by the known contamination, and will render the site suitable for the proposed public open space land use, following the completion of the proposed development. To achieve this objective, the RAP has been designed to:

- Provide a plan of remediation for the site to remove the unacceptable risk that contaminated soils pose to human health;
- Establish remediation acceptance criteria that are appropriate for the intended ongoing use of the site in the context of the identified contamination;
- Detail an appropriate waste management procedure for spoil materials generated as part of the proposed development; and
- Demonstrate that the proposed remediation strategy is compliant with state and local government and planning statutes and compliant with NSW EPA endorsed guidelines under Section 105 of the Contaminated Land Management Act 1997 and properly addresses issues relating to site environmental management, community relations and contingency planning.

2.2 STAKEHOLDERS

The key stakeholders involved in the implementation of the RAP are provided in Table 1.

Table 1 – Stakeholders

Stakeholder
Cumberland Council (Site Owner)
Crown Projects Services (Project Manager)
Remediation Contractor
SESL Australia (Remediation/Validation Consultant)
NSW EPA Site Auditor
Current Site Occupier/s
Future Site Occupier/s
Surrounding Land Occupiers & Local Community

2.3 REGULATORY GUIDELINES

The preparation of this RAP has been undertaken in consideration of (but not limited to) the following regulatory guidance documents and standards:

- ANZECC and ARMCANZ (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality (October 2000);
- ASTM (2000). Standard Practice D2488 90 Description and Identification of Soils (Visual-Manual Procedure). American Society for Testing and Materials;
- Code of Practice for the Safe Removal of Asbestos, 2nd Edition (National Occupational Health and Safety Commission, April 2005);
- EnHealth (2012) Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards, Department of Health and Ageing and EnHealth Council, Commonwealth of Australia (2012);
- How to Safely Remove Asbestos: Code of Practice (WorkCover, 2012):
- National Environmental Protection Council (NEPC) (2013). National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended April 2013);
- NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Ed.) (2017);
- NSW Department of Urban Affairs and Planning (1998) Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land, August (1998);
- NSW EPA (1995). Sampling Design Guidelines (1995);
- NSW EPA (1996). Protection of the Environment Operations (Waste) Regulation (1996);
- NSW EPA (2014). Waste Classification Guidelines (November 2014);

- NSW EPA (2015). Guidelines on the Duty to Report Contamination under the Contaminated Land Management Act 1997 (July 2015);
- NSW OEH (2011). Guidelines for Consultants Reporting on Contaminated Sites (2011). NSW Office of Environment and Heritage;
- Standards Australia (1993) AS1726-1993. Geotechnical Site investigations Australian Standard;
- Standards Australia (2005). Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds AS4482.1 (2005) and Part 2: Volatile substances, AS4482.2 (2005);
- Western Australia Department of Health (2009). Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia; and
- Work, Health and Safety Act 2011.

2.4 OUTLINE OF THE RAP

The RAP has been developed under the guidance of the appropriate regulatory framework endorsed by the NSW Environment Protection Authority (EPA) and complies with the provisions of the NSW Contaminated Land Management Act 1997 and associated guidelines and regulations.

The RAP will discuss the following:

- Site Description;
- Summary of Previous Investigation;
- Site Environmental Setting;
- Remediation Design;
- Remediation Acceptance Criteria;
- Compliance with Regulatory Requirements;
- Remediation Methodology;
- Waste Classification and Offsite Disposal;
- Validation Procedures;
- Site Environmental Controls
- Contingency Planning;
- Work Health and Safety; and
- Community Consultation and Liaison.

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2.5 PERSONNEL

SESL's Environmental Consulting Team prepared this RAP based on information obtained through the DSI conducted at the site. The personnel involved for this project is shown in Table 2 – Project Personnel.

Table 2 – Project Personnel

Personnel	Title	Project Task
Ryan Jacka B Env Sc, M Env Sc, MEIANZ, ASSSI, CEnvP	Senior Environmental Scientist	• Conduct report review and authorisation.
Andrew Jacovides B Nat Sci (Env Mgt)	Environmental Scientist	• Conduct soil and groundwater sampling (DSI) • Report Preparation (DSI & RAP)
Fiona Warden B Env Sci & Mgt	Environmental Scientist	• Conduct soil and groundwater sampling (DSI)

3 SITE DESCRIPTION

3.1 SITE LOCATION

The site is located at 1 Memorial Drive, Granville NSW 2142, approximately 18 km west of the Sydney Central Business District (CBD). The site encompasses 16 lots, as detailed in Table 3 below, and is accessible via Memorial Drive and Diamond Avenue.

3.2 SITE IDENTIFICATION

The following details the portion of land subject to this RAP (Table 3).

Table 3 – Site Identification

Site Owner	Cumberland Council
Site Address	1 Memorial Drive
Lot and DP Number	Lot 21-34 DP17572, Lot 1 DP 510570, Lot 1 430632, Lot 9 DP262830. Investigation area encompassed the majority of Lot 1 DP430693 (part) and Lot 9 DP262830.
Local Government Area	Cumberland Council Local Government Area
Current Zoning	RE1: Public Recreation – Parramatta Local Environmental Plan 2011, Land Zoning Map – Sheet LZN_010 and Sheet LZN_011
Distance from Sydney CBD	Approximately 18 km west of the Sydney CBD
Geographical Coordinates (centre of site)	33°50'058''S; 150°41.128'E
Investigation Area	Approximately 1.5 hectares (Figure 3)
Site Elevation	Approximately 5 to 8 m AHD
Locality Map	Figure 1
Site Layout	Figure 2 and 3

3.3 SITE LAYOUT AND INFRASTRUCTURE

The investigation area features include:

- Outdoor basketball court and playing field (actively in use);
- Car parking lot (actively in use);
- Community centre building (actively in use);
- Swimming centre reception building (actively in use);
- Granville Memorial Park (GMP) (actively in use);
- Playground within GMP (actively in use);
- Baby Health Centre (Disused); and
- St Johns First Aid Centre (actively in use).

A site plan and investigation area overview is provided in Figure 3 of this report.

3.4 SURROUNDING LAND USE

The site is surrounded by predominately high density residential land use (R4), with an area of mix land use (B4) to the north and northwest. Directly north of the site is boarded by Memorial Drive and Granville Station. The Grandville swimming centre swimming pools lies directly west of the investigation area, Diamond Avenue and Duck Creek boarder the site to the south-east and east, while residential dwellings exist adjacent to the Baby Health Centre, to the south west of the site. (refer to Figure 3).

3.5 SITE HISTORY

An in-depth review of the site history was undertaken by Douglas Partners to assess the historical use of the site, and assess the potential for contaminating activities to have been undertaken at the site. The historical review included a review of:

- Current and historical certificates of title.
- Current and historical aerial photographs.
- Council planning documentation.
- NSW EPA Contaminated Lands database.

This history review identified the historical operation of the Granville Woollen Mill & Bowling Greens at the site, as well as the infilling of the former Duck Pond and general site filling as the most significant historical activities in regard to potential contamination.

Refer to Section 5 of the Douglas Partners report for an in-depth review of site history (Appendix E).

4 SUMMARY OF PREVIOUS INVESTIGATIONS

The following contamination information was presented in SESL's Detailed Site Investigation (SESL Report: J000719 – Detailed Site Investigation).

4.1 PRELIMINARY CONCEPTUAL SITE MODEL

A preliminary conceptual site model (CSM) was developed based on the information obtained prior to the intrusive sampling and analysis, including desktop review, site walkover and review of previous investigations. This model has been established to assess the potential sources of impact, chemicals of concern, transport mechanism and receptors present at the site.

This review of information identified the following potential Areas of Environmental Concern (AEC):

- AEC 1: Historical tweed mill and associated activities;
- AEC 2: Demolition of former structures;
- AEC 3: Historical filling with soils of unknown origin and contamination status;
- AEC 4: Management of former bowling greens and park; and
- AEC 5: Presence of Actual or Potential Acid Sulfate Soils.

The location of the historical mill, former structures and former bowling greens are provided in Figures 6 & 7 of this report. Historical filling has occurred across the site, including the former duck pond (location provided in Figure 6). The location of potential acid sulfate soil is detailed in the acid sulfate soil management plan prepared for the site (Appendix D).

4.2 SITE WORKS SUMMARY

An initial site walkover was conducted by SESL's Environmental Scientist Andrew Jacovides on 19/02/2017 to inspect sampling locations and prepare for intrusive works. A soil sampling and groundwater well installation event was undertaken by SESL's Environmental Scientist's Andrew Jacovides and Fiona Warden on the 20/02/2018 to for the collection of samples for the purpose of analysis. An additional sampling and groundwater well development event was conducted by Andrew Jacovides and Fiona Warden on 26/02/2018. A final site visit was conducted by Andrew Jacovides on 07/03/2018 to conduct groundwater sampling for the purpose of analysis.

A total of (59) soil samples were collected from surface soils and subsoils at the site, for the purpose of analysis for contaminants of potential concern and acid sulfate soil assessment. A total of 25 sampling locations were established as part of this investigation, in accordance with the minimum sampling point requirements as set out in the Sampling Design Guidelines (NSW EPA, 1995) for a site of this size (1.5 ha). These sampling points

were in addition to the sampling conducted by Douglas Partners, who conducted intrusive sampling at ten (10) locations within the northern section (memorial park) of the investigation area (see Section 4.5). Samples were collected on a systematic basis, to best characterise the fill materials known to exist at the site, and assess the potential contamination associated with the identified AECs. Additionally, three (3) groundwater samples were collected at the site, one from each of the groundwater monitoring wells installed. Groundwater samples were collected using low-flow sampling techniques and analysed for identified potential contaminants of concern.

Fill materials of varying depths were identified in all areas of intrusive investigation. The identified fill varied in depth across the site, with fill observed to a maximum depth of >3.2 metres. The fill materials varied significantly in colour and structure across the site, and included a mixture of clays, sand, silt, rock and ash. Where suspected natural subsoils were reached by intrusive sampling, soils were characterised by predominately light to medium clays, with medium plasticity. Natural subsoils were observed to vary in colour, with observed colours including brown, yellow-brown, grey and orange.

4.3 SUMMARY OF CONTAMINATION

Based on the analysis of soil and groundwater samples, this investigation has assessed the contamination status of the site in regard to human and ecological health. The presence of fill materials can mask contamination sources from previous land uses. However, the investigations have been conducted to characterise all potentially contaminated soils across the whole of the site, and have adequately assessed the potential for contamination of all AECs, detailed in Section 4.1. A summary of analytical data (specifically exceedances in the adopted thresholds) is provided in the Analytical Tables attached to this RAP.

4.3.1 *Health Investigation and Screening Levels*

Elevated heavy metals (lead & nickel), PAHs and ACM fragments (bonded asbestos) were identified in concentrations that are above the adopted guidelines (HIL-C & HSL-C). All other contaminants of concern within soil samples were determined to be below the adopted thresholds.

4.3.2 *Ecological Investigation and Screening Levels*

Ecological Investigation Levels (EILs) have been derived for selected metals and organic compounds and are applicable for assessing risk to terrestrial ecosystems (NEPC, 2013). The site specific EIL thresholds were adopted from those developed by Douglas Partners, as detailed in the 'Douglas Partners - Report on Detailed Site Investigation for Contamination – Project 86007.01' (Appendix D). An Interactive (Excel) Calculation Spreadsheet was used for calculating site-specific EIL for these contaminants, and has been provided in the ASC NEPM Toolbox available on the SCEW (Standing Council on Environment and Water) website (http://www.scew.gov.au/node/941).

The concentration of zinc was observed to exceed the adopted EIL within a single sample (BH4 700-800) based on the investigation conducted by SESL. All other contaminant concentrations were within the adopted site specific EILs across the investigations conducted by SESL and Douglas Partners.

SESL considers the observed EIL exceedance to be insignificant, as the calculated UCL (95%) (Appendix F) indicates that the concentration of zinc across the site is below the adopted threshold. Additionally, the observed terrestrial receptors at the site (predominately mature trees) showed no sign of deterioration or stress and the proposed remedial actions will improve the quality of the soil conditions at the site, in regard to ecological receptors.

Ecological Screening Levels (ESL) are provided in Schedule B1 of the ASC NEPM 2013 and provide low reliability levels for assessing ecological risk (Table 1B(6)). Of note are the broad and consistent elevation of benzo(a)pyrene (BaP) across the investigation area.

4.3.3 *Groundwater Investigation Levels*

For the six groundwater wells onsite, copper, zinc, ammonia and total nitrogen have all been detected above the adopted NEPM Groundwater Investigation Levels during the three sampling rounds completed by Douglas Partners and SESL. All other analytes were below the adopted criteria.

The source of the metals, nitrogen and ammonia is unknown. Given all groundwater wells on site contain elevated contaminant concentrations and the historical industrial nature of the surrounding area, the source may potentially be offsite. The shallow groundwater encountered during the investigation was observed to interact with fill material. The fill material is known to contain elevated concentrations of zinc, and may be responsible for elevated zinc results in groundwater. The current and proposed site use will have no interaction with groundwater on site.

Groundwater is not expected to be encountered during the remediation and construction works. Should the proposed works change and groundwater is expected to be encountered, a dewatering plan will be required, taking into consideration the contaminant concentrations and treatment required prior to discharge or disposal.

4.4 UPDATED CONCEPTUAL SITE MODEL

The CSM for the site was updated following the additional data obtained through the sampling and analysis undertaken as part of this DSI. The updated CSM was developed based on the actual sources of impact, chemical concern, transport mechanisms and receptors.

Based on the analysis of soil samples, this investigation has been able to determine that the historical importation of fill materials has impacted upon the contamination status of the site (AEC 3). Potential acid sulfate soils (AEC 5) were confirmed, though not expected to influence the proposed development (see Section 4.4.5).

Based on the site observations and soil analysis, elevated heavy metals (lead & nickel), PAHs and ACM fragments (bonded asbestos) are the contaminants of concern identified in concentrations that were observed to be elevated above the threshold of the adopted guidelines (HIL-C & HSL-C).

4.4.1 *Lead*

Lead is a cumulative toxicant that affects multiple body systems and is particularly harmful to young children. In the body, lead is distributed to the brain, liver, kidney and bones. It is stored in teeth and bones where I accumulates over time. The main potential exposure pathways of lead include the inhalation of dusts generated during soil disturbance, ingestion of contaminated soils or dust and dermal contact with contaminated soils.

Due to the nature of the contaminant, the main risk of transport through migration of contaminated material through erosion and dust during soil disturbance.

4.4.2 *Carcinogenic Polycyclic Aromatic Hydrocarbons*

CPAHs have been linked to a range of cancers, including skin, lung, bladder, liver and stomach cancer. Potential exposure pathways include the inhalation of dusts generated during soil disturbance, ingestion of contaminated soils or dust and dermal contact with contaminated soils.

Due to the nature of the contaminant, the main risk of transport through migration of contaminated material through erosion and dust during soil disturbance.

4.4.3 *Asbestos Containing Material Fragments*

The inhalation of asbestos fibres is known to cause lung cancer, mesothelioma, asbestosis and cancer of the larynx & ovary. The primary exposure pathway of friable asbestos is the inhalation of asbestos contaminated soils or dust.

Bonded asbestos only poses a significant risk to site users when crushed, broken or weathered, causing the release of asbestos fibres (friable asbestos).

4.4.4 *Leachability Potential*

Analysis was conducted to determine the leachability potential of contaminants within soil samples collected within close vicinity to the surface (0 – 500 mm) that exceeded the adopted threshold (HIL – C). Toxicity characteristic leaching procedure (TCLP) analysis was conducted to determine the leaching potential of these contaminants. The leachable potential was determined to be below the practical limit of reporting within all samples, with the exception of Lead within the sample ‘BH16 500-600’, which was determined to be 0.1 mg/L. Additionally, lead concentrations in groundwater samples collected at the site were determined to be below the adopted threshold, indicating that though some leaching may be occurring, it is not resulting in measurable contamination at levels requiring further investigation or action.

Analytical results are provided in the Analytical Table attached to this RAP.

4.4.5 *Acid Sulfate Soil*

Acid sulfate soils were identified at the site during the DSI conducted by Douglas Partners and SESL. The location and depth of these materials is discussed in Section 5.5 of this report. Based on the locality of these soils, SESL does not suspect that they will be encountered during the proposed remedial works. In the event that acid sulfate soils are encountered, they will be managed in accordance with the Acid Sulfate Management Plan prepared for the site (Appendix E).

4.5 PREVIOUS DETAILED SITE INVESTIGATION

Douglas Partners prepared a 'Report on Detailed Site Investigation for Contamination – Project 86007.01' for the 'proposed Granville Multi-purpose Centre'. This report was prepared for Cumberland Council in August 2017. This investigation included a desktop study of the site history, a site walkover, and limited soils and groundwater sampling & analysis. The intrusive investigation and sampling undertaken as part of this assessment was limited to assessing the northern section of the site, where the library/art gallery is proposed for development.

Intrusive sampling was conducted within the investigation area, including the development of ten (10) boreholes and three (3) groundwater wells. Selected soil samples and groundwater samples were analysed for a suite of potential contaminants. Analytical results were compared against the site assessment criteria (SAC) for all samples analysed. A single fragment of suspected ACM (fibre cement fragment) was identified during sampling (Borehole 10 between 2.6 and 2.9 m bgl). Laboratory analysis confirmed the presence of chrysotile asbestos within the fragment.

This investigation determined that all analytical results for soils were within the SAC adopted for the site. It was noted that no odour, staining or other significant sign of environmental concern was noted during soil sampling with the exception of asbestos identified.

The investigation noted that concentrations of heavy metals, PAH, TRH, BTEX, PCB, and total phenols in groundwater samples were below the practical quantitation limits (PQLs) or groundwater investigation levels (GILs) with the exception of elevated levels of nitrogen and ammonia with two samples.

It should be noted that intrusive works associated with this investigation were limited to the northern section of the site, and the conclusions apply only to the area investigated throughout the investigation. Additionally SESL identified contaminants of concern in concentrations that exceeded the assessment criteria in the area the assessment was undertaken. As such, the conclusions of the DSI prepared by SESL (SESL Report: J000719 – Detailed Site Investigation) and by which this this RAP is based differ from those outlined in the DSI prepared by Douglas Partners (Report on Detailed Site Investigation for Contamination – Project 86007.01).

4.6 INVESTIGATION GAPS AND ADDITIONAL INVESTIGATION

Although Asbestos Containing Material (ACM) fragments were identified during the investigation, due to limitations in investigation access, the concentration of the ACM fragments within materials at the site is currently unknown.

Additional investigation are proposed as part of heritage investigations, requiring the construction of test pits to allow inspection of the soil profile & its contents. SESL propose to undertake additional ACM quantification, by obtaining bulk samples of soil.

This additional investigation has the potential to add significant value to the outcome of the remediation, including reducing costs of offsite disposal, as detailed in Section 10 of this plan. The assessment will also provide additional information regarding the nature of the asbestos contamination and degree of site controls required to manage health risks during remediation and future site management.

4.6.1 *Sampling Protocol*

SESL understands that Aboriginal archaeological heritage excavations are proposed within the investigation area, and includes the development of 13 test pits systematically across the site. SESL proposes to conducted asbestos quantification sampling and analysis in co-ordination with the archaeologist. It is critical that site activities are managed by contractors experienced in managing asbestos risks during excavation.

Sampling will involve the collection of one 10 L sample from each relevant stratum (or per 1 m depth for thick units) and additional samples from any suspect spots, with each sample manually screened on-site through a 7 mm sieve and the material retained on the sieve examined for any bonded ACM and/or suspect material. If materials are too heavy for screening (e.g. clay soils), the 10L bulk samples will be processed by the NATA laboratory.

If visible fibrous asbestos (FA) materials are present or suspected, the soil will be wetted to minimise the release of fibres and the sample spread out for inspection on a contrasting colour material, to identify suspect material. Any identified bonded ACM and FA (and suspect materials assumed to contain asbestos) will be weighed for each sample and documented to assist with calculating asbestos soil concentration as described in ASC NEPM Schedule B1. If suspect materials are found, representative samples (e.g. 1 in 10 of similar materials) will be forwarded for laboratory analysis in accordance with AS 4964-2004. Alternatively, based on the appearance of the materials, SESL may assume these are positive.

In addition to each bulk sample, an additional, wetted, 500 ml sample will be submitted for laboratory analysis.

5 ENVIRONMENTAL SETTING

5.1 TOPOGRAPHY AND DRAINAGE

The site topography was observed generally slope in a south-easterly direction, and has an elevation of between 5 – 8 metres (m) Australian Height Datum (AHD). Surface waters are expected to flow across the site in a general south-easterly direction, and managed by stormwater infrastructure present at the site.

5.2 GEOLOGY

The *Soil Landscapes map of Sydney (Soil Landscape Series Sheet 9130,* Chapman and Murray, 1989) indicates the site is within an area of Disturbed Landscape (xx), characterised by terrain that has been extensively by human activity, including complete disturbance, removal or burial of soil. Soils in this area have been removed, greatly disturbed or buried, and landfill including soil, rock, building and waste materials have been added.

Based on the site observations and intrusive soil sampling, this description of a heavy disturbed soil profile is consistent with the soil profiles observed at the site. Fill materials of varying depths were identified in all areas of intrusive investigation. The identified fill varied in depth across the site, with fill observed to a maximum depth of approximately 5 metres (MW3). The fill materials varied significantly in colour and structure across the site, and included a mixture of clays, sand, silt, rock and ash. Where natural subsoils were reached by intrusive sampling, soil were characterised by predominately by light to medium clays, with medium plasticity. Natural subsoils were observed to vary in colour, with observed colours including brown, yellow-brown, grey and orange.

Subsoils considered a risk of being classified as Potential Acid Sulfate Soils (PASS) were identified within a section of the site toward the north-eastern boundary. These materials consisted of wet, grey clay materials with medium plasticity. The PASS materials observed at the site are discussed in depth in Section 5.5 of the RAP and the Acid Sulfate Soils Management Plan (ASSMP) prepared by SESL for the site (Appendix E).

5.3 HYDROGEOLOGY

The aquifers on site are described as porous, extensive and of low to moderate productivity (Hydrogeology Map of Australia : Commonwealth of Australia (Geoscience Australia). A groundwater bore search was undertaken using the Bureau of Meteorology groundwater database. Twenty (20) bores were identified within a 1 km radius of the site. A summary of bore features and a plan of the bore locations is provided SESL Report: J000719 – Detailed Site Investigation.

Three (3) groundwater bores were installed within the investigation area as part of SESL's investigation, with three existing wells installed by Douglas Partners in 2017. Standing water level within SESL's bores ranged

between 2.61 m (bgl) and 3.61 m (bgl). The location of each bore is provided in Figure 2 and Appendix E for Douglas Partners well locations. Groundwater was observed within the fill materials in two (2) of the groundwater monitoring wells installed at the time of assessment (Refer to Appendix B).

Groundwater flow direction was calculated based on a review of data in the Douglas Partners DSI. The three wells installed as part of SESL's investigation were not included as a level survey of the new well locations was not conducted as part of the assessment. Based on the calculation of flow direction from Douglas Partners data, groundwater is assumed to flow in a north westerly direction towards Memorial Drive. This calculated direction is suspected to be erroneous as a result of a suspected erroneous standing water level result. This flow direction is contradictory to surface contours and the proximity to Duck Creek which would indicate groundwater should flow towards the east. Additional site level survey and gauging is considered necessary to confirm flow direction.

5.3.1 *Encountering Groundwater*

Based on the depth of groundwater observed throughout the investigation, SESL considers it unlikely that groundwater will be encountered throughout the remediation and construction works. Should groundwater be encountered throughout the works, a Dewatering Plan should be developed by a suitably qualified consultant, detailing appropriate management strategies for the groundwater.

5.4 SURFACE

No surface water bodies exist within the site investigation area. Duck Creek exists adjacent to the southern and south-eastern boundary of the site, and runs in a north and north-easterly direction. Duck Creek is a heavily urbanised water body, assumed to consist of predominantly urban runoff and stormwater.

5.5 ACID SULFATE SOIL

Based on the intrusive sampling/investigation conducted at the site, potential acid sulfate soils (PASS) are known to exist within the natural clay materials in at least one locations at the site. Borehole location 21 was identified to have soils described as wet, grey clay materials with medium plasticity, 2 m below the current surface level (2 – 3 m).

It was noted that exceedances in all action criteria were recorded in both samples collected from BH21, including titratable actual acidity (TAA), titratable potential acidity (TPA) and titratable sulfidic acidity (TSA). The TSA concentrations in these samples exceeded the assessment criteria the assessment criteria (18 H+/tonne), indicating that the acidity of the soil is related to the sulfur content.

Based on the analysis, a liming rate of 6 kg CaCO3/t would be required for the sample BH21 2000-2200, while 2 kg $CaCO_3$/t would be required for the sample BH21 2800-3000, should the soils be excavated or exposed to oxygen.

SESL considers it unlikely that acid sulfate soils should be encountered throughout the proposed remediation works. However should acid sulfate soils be encountered, they must be managed under the site specific Acid Sulfate Soils Management Plan (ASSMP), prepared for the site by SESL. The ASSMP is provided in Appendix D of this report.

6 REMEDIATION DESIGN

The goal of the remediation is to manage the known contamination in order to remove the unacceptable risk posed to human health, and render the site suitable for the proposed use. The purpose of the RAP is to:

- Provide a plan of remediation for the site to remove the unacceptable risk posed to human health by the known contamination;
- Establish remediation acceptance criteria that are appropriate for the proposed use of the site post remediation and development; and
- Demonstrates that the proposed remediation strategy is compliant with state and local government planning statutes, is complaint with the NSW EPA endorsed guidelines under Section 105 of the Contaminated Land Management Act 1997, and properly addressed issues relating to site environmental management, community relations and contingency planning.

6.1 REMEDIATION HIERARCHY

The preferred order of options for site remediation and management is detailed in Volume 1 of the NEPM (1999 amended 2013. The NEPM Assessment of Site Contamination Policy Framework (16) states the that the preferred hierarchy of options for site clean-up and/or management is:

- on-site treatment of the contamination so that it is destroyed or the associated risk is reduced to an acceptable level; and
- off-site treatment of excavated soil, so that the contamination is destroyed or the associated risk is reduced to an acceptable level, after which soil is returned to the site; or,

  if the above are not practicable,
- consolidation and isolation of the soil on site by containment with a properly designed barrier; and
- removal of contaminated material to an approved site or facility, followed, where necessary, by replacement with appropriate material;

  or,
- where the assessment indicates remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

6.2 REVIEW OF REMEDIAL OPTIONS

The possible remediation options considered were:

- Do Nothing;
- Monitored Natural Attenuation;
- On-Site Treatment;

- Excavation and Off-site Disposal; and
- On-Site Management.

6.2.1 *Do Nothing:*

The "Do Nothing" approach involves leaving the contaminated soil materials in their current locations and either continue the development without concern for the remediation of contaminated soils, or continue the existing use. This approach is considered inappropriate due to several factors:

- Areas requiring remediation are at the ground surface and exposed. The current use of the site would be affected by the presence of uncovered contaminated materials and would not be suitable for sensitive land use;
- The areas of concern at the surface exceed the adopted land use criteria and are not considered acceptable for ongoing use without remediation or management being undertaken; and
- The contaminants that have been identified are known to be persistent in the environment and will pose a long-term health and environmental hazard if left on the site in their current state.

6.2.2 *Monitored Natural Attenuation:*

Natural attenuation is the degradation, immobilisation or destruction of hydrocarbons, or other potential contaminants, by natural processes. The natural attenuation process is controlled by the contaminants of concern and the physical, chemical, biological and hydro geological properties of the site. Natural attenuation is not considered appropriate for this site as the contamination present at the site (asbestos & heavy metals) will not naturally degrade, and poses an unacceptable risk for current and future uses of the site.

6.2.3 *On Site Treatment:*

On site treatment methods include both in-situ and ex-situ treatments of soils. Treatment may be physical, chemical, mechanical or biological. On site treatments have the potential to be cheaper than offsite disposal. The main disadvantages of some onsite treatment are the time constraints, or the inability to treat the contaminants to an acceptable level.

On site Treatment is not considered to be an appropriate remedial action, as some contaminants present at the site (heavy metals & buried asbestos) cannot be easily or effectively treated.

6.2.4 *On Site Management:*

On Site Management of the contamination would involve selective remediation across the site to reduce the impact to human health or the environment and long-term management of any remaining contamination.

On site management would primarily involve the placing of a permeable surface marker layer (such as geo-fabric material) across the contaminated area and then covering with soil layers or encapsulating the contaminated materials with hardstand concrete (or other media). The site would then require a site-specific

Environmental Management Plan (EMP) to prevent the exposure of the contamination to the users or future workers of the site.

The disadvantages of such a strategy would be the imposing of an ongoing site specific EMP, associated notification obligations on the land title and ongoing management of the site for compliance with the EMP. SESL considers this remediation method to be suitable for the site, and is considered a preferable option in removing the risks associated with the identified contamination.

6.2.5 *Excavation and Off-site Disposal:*

This method includes the excavation of the fill material, and the disposal of said material at an appropriately licensed landfill.

This approach has the advantage of removing the contaminated soils from the site (to an extent practicable) and removing land use restrictions associated with contaminated soils. It also has the advantage of being relatively fast and may not further impact other areas of the site. The main disadvantage of excavation and disposal is the expense associated with offsite disposal to an appropriately licensed landfill, and the requirement to import materials to return the topography of the site to design level. SESL considers this remediation method to be suitable for the site

6.2.6 *Selected Remediation Option:*

Based on nature of the site and proposed use of the site post remediation, a remedial strategy was selected by the key stakeholders. In consideration of the limitations of the site, cost of remediation, nature of contamination and the associated human health risks, it was determined that the most appropriate remedial option for the site is ‘On-site Management’.

This method involves encapsulating materials known to be contaminated, utilising multiple encapsulation techniques, dependant on the proposed landscape feature. In areas of proposed accessible soils, the installation of a geotextile marker layer and an appropriately sized capping layer is required to encapsulate contaminants. In areas of proposed hardstand materials, no additional works are required as hardstand materials are considered sufficient in encapsulating contaminated materials. Should contaminated materials be required to be removed from site due to proposed design levels, the ‘Excavation and Offsite Disposal’ remediation methodology will be implemented. Further details are provided in Section 9.3 of this plan.

This remedial option was selected based on the following:

- The requirement to manage unacceptable health risks posed to current and future site users;
- The immobile nature of the identified soil contamination at the site;
- The proposed final design levels of the site, post remediation and development; and
- The extensive costs associated with the disposal of contaminated soils and importation of suitable fill materials.

7 REMEDIATION ACCEPTANCE CRITERIA

Remediation acceptance criteria (RAC) are a set of criteria that detail the required condition and nature of the site media, in regard to known contamination, for the site to be considered suitable for the proposed use.

The Remediation Acceptance Criteria (RAC) requires that:

- All soils proposed for offsite disposal must be adequately characterised and disposed of offsite to an appropriately licensed waste facility.
- A permeable marker layer must be adequately installed (detailed in Section 9) in all soft landscaped areas, atop the contaminated soils, prior to the installation of a capping layer.
- All accessible site soils (identified to be fill soils) must be encapsulated by an adequate capping layer (detailed in Section 9) to prevent potential contact with known contaminated materials by site users.
- All soils imported onto the site must be characterised as either Excavated Natural Material (ENM) in accordance with the NSW EPA Excavated Natural Material Order, 2014 or Virgin Excavated Natural Material (VENM) in accordance with the definition of VENM as stated in the Protection of Environment Operations (POEO) Act, 1997. All imported materials must be accompanied by a characterisation/classification report developed by a reputable environmental professional.
- Imported soils used as a capping layer must be appropriately validated to ensure it complies with the 'imported material acceptance criteria' detailed in Table 4 below. Validation must be undertaken by a suitably qualified environmental professional. Further details are provided in Section 9.2 of this RAP.
- The imported material acceptance criteria has been derived from the *NSW EPA excavated natural material order, 2014*. This criteria has been selected based on its low contaminant threshold. The selected criteria is more sensitive than the previously adopted human health criteria for insitu site materials (Health Investigation Levels – C, NEPM (1999, Amended 2013)) and will ensure protection of human health, based on the proposed use of the site.
- A suitably qualified environmental consultant must conduct all validation inspections and validation sampling required during and following the completion of the remediation works. The consultant must ensure the validation analysis frequencies outlines in the ENM Order (if applicable) or VENM materials at a rate of 1 sample per 250m^3. (See additional detail in Section 9.2). VENM results must assessed as reflective of natural background levels for the source site, and be below the ENM criteria for applicable contaminants. No organic contaminants or asbestos can be detected in the VENM materials.

Table 4 – ENM Acceptance Criteria

Contaminant	Acceptance Criteria	Guideline Reference
Mercury	1 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Cadmium	1 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Lead	100 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Arsenic	40 mg/kg	NSW EPA Excavated Natural Material Order, 2014

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Contaminant	Acceptance Criteria	Guideline Reference
Chromium	150 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Copper	200 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Nickel	60 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Zinc	300 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Polycyclic Aromatic Hydrocarbons	40 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Benzo(a)pyrene	1 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Benzene	0.5 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Toluene	65 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Ethyl-benzene	25 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Xylene	15 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Total Recoverable Hydrocarbons (C_{10} – C_{36})	500 mg/kg	NSW EPA Excavated Natural Material Order, 2014
Rubber, plastic, bitumen, paper, cloth, paint and wood	0.1%	NSW EPA Excavated Natural Material Order, 2014
Asbestos (all forms)	Absent	

8 COMPLIANCE WITH REGULATORY REQUIREMENTS

8.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT AND REGULATIONS

Remedial works at the site are not considered to present a designated development under Schedule 3 of the Environmental Planning and Assessment Act 1979. Furthermore, the program of rehabilitation works described in this RAP has been designed so that works shall not adversely affect the environment and will be an improvement to the environment. For these reasons the remediation works should not require the preparation of an Environmental Impact Statement (EIS).

8.2 STATE ENVIRONMENTAL PLANNING POLICY (SEPP NO.55 – REMEDIATION OF LAND)

State Environmental Planning Policy No 55 (SEPP 55) - Remediation of Land under the Environmental Planning and Assessment Act 1979 (EP&A Act) applies to works involving remediation or management of contaminated land in NSW. The objective of this planning policy is to provide a state-wide planning approach to the remediation of contaminated land. In particular, the policy aims to promote the remediation of contaminated land for the purpose of reducing risk of harm to human health or any other aspect of the environment.

Remediation can be Category 1 requiring consent of the relevant planning authority or Category 2 not requiring consent. Both Category 1 and Category 2 remediation require notification 30 days prior to the planned commencement of remediation to the consent authority. This remediation program is considered Category 1.

8.3 NSW PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

The objective of the Act relevant to this RAP is to protect, restore and enhance the quality of the environment in NSW, having regard to the need to maintain ecologically sustainable development and to increase opportunities or public involvement and participation in environmental protection. The Act prohibits the contamination of land through any means including the improper application of waste and prescribe the requirements for triggering which sites require an environmental protection license to operate. The objectives of the RAP align with the Act by focusing on an improved human and environmental amenity of the site and providing details of community consultation requirements.

8.4 FORMER HOLROYD CONTAMINATED LAND POLICY 2001 – CONTAMINATED LAND RISK

The former Holroyd Council Contaminated Land Policy (CLP) 2001 has been adopted by Cumberland Council. The aim of this CLP is to establish objectives and development controls for the development of land within local government area. The objectives of this CLP aims to:

- ensure that changes of land use will not increase the risk to human health or the environment;
- avoid inappropriate restrictions on land use in response to land contamination issues; and

- provide information to support decision making and to inform the community.

Section 4.10 of the CLP states that no contaminated soil shall be encapsulated or capped on the site that contains concentrations of contaminants that are above the soil investigation levels for urban development sites in NSW for the range of landuses permissible on the subject site. SESL note that although some contaminants exist above the now HIL-C, overall contaminant average (95% UCL – Appendix F) is acceptable (with the exclusion of outliers for cPAHs), and therefore not triggering the exclusion for capping as an option. The on-site containment proposed by this RAP is considered an additionally conservative approach, and would therefore meet the DCP objectives by reducing risk following site changes.

The CLP was prepared prior to the revision of the ASC NEPM and increased promotion of onsite risk management of contamination. The objectives of SEPP55 are met by the proposed remediation strategy. Further, limitations on alternate remediation methods exist due to the presence of Aboriginal and European heritage items.

9 REMEDIATION METHODOLOGY

The Remediation Contractor who undertakes the remediation work must prepare a work method statement incorporating relevant sections of this RAP into a work methodology. Asbestos works must be supervised by a suitably qualified asbestos removalist contractor (Class B). Should friable asbestos be determined to exist at the site, all works must be supervised by a Class A asbestos removalist contractor.

The indicative work methodology can be summarised as follows:

9.1 REMEDIATION DESIGN OBJECTIVES

The objective of the remediation design is to ensure that all materials known to be contaminated are encapsulated by site features, to ensure that contact between contamination and site users is prevented, and that the site is considered suitable for the proposed use.

Materials will be encapsulated by a range of site features, including both hardstand (impermeable) features and soft landscape (permeable) features. How these features must be implemented to mitigate the risk posed by the encapsulated contaminated materials is detailed below in Table 5. As the nature of contaminants present a physical risk when contact or inhalation, the capping distance needs to be sufficient to prevent direct contact during ordinary use of the site (i.e. not future construction/maintenance). As such, impermeable surfaces or 300mm soil cover is considered sufficient to prevent an exposure pathway from forming.

Table 5 – Encapsulated Material Management

Landscape Feature Type	Included Features	Implementation Requirement
Hardstand (impermeable)	Concrete, footpaths, buildings, softfall material and bitumen	No additional implementation requirements – hardstand materials sufficient in encapsulating contaminated materials.
Soft Landscape (permeable)	Gardens, turfed areas and any areas with accessible soils	Geotextile marker layer followed by a minimum of 300 mm soil capping layer must be installed atop contaminated materials.

9.2 ON SITE MANAGEMENT

This strategy involves the encapsulation by physical barrier, or installation of a permeable marker layer and appropriate capping layer across the areas of accessible soils, in order to encapsulate the known contamination, and remove the unacceptable health risks posed to site users. Encapsulation design drawings are provided in Figure 4 of this RAP. Any materials that cannot be managed in this way and require offsite disposal must be handled in accordance with Section 9.3.

The following methodology must be implemented for on site management:

- In areas where impermeable hardstand layers are proposed (including concrete foundations, slabs, hardstand materials, structures and bitumen carpark) no additional works are required, as these layers

are considered suitable for encapsulating the contaminants, and preventing potential contact with site users.

- In all areas where accessible soils are proposed, contaminated materials must be encapsulated through the installation of a geotextile marker layer and a soil capping layer, to prevent contact between site users and the known contamination.
- A geo-textile marker layer (i.e. Profab®) must be installed atop contaminated soils. This layer must be installed up to the boundary of the encapsulation area, to the edge of hardstand materials, and as close as possible to the stem of the trees present on site. This layer must be permeable in order to allow for water and gaseous exchange. The material used for this layer must be approved for use by the validating consultant prior to installation.
- When installing the marker layer, the fabric should be pegged under hard stand materials where possible. Where this is not possible pegs should be used to hold the fabric in place. Where sheets of the fabric overlap, a 300 mm overlap must be used to ensure no gaps in the coverage of the layer. Upon completion of the marker layer installation, the validating consultant must conduct an inspection, and give approval to proceed before moving on to the next stage of the remediation works.
- Following the installation of the marker layer, fill materials must be imported onto the site for use as the capping layer. These materials must be visually inspected by the validating consultant at the time of importation, to ensure that material descriptions match those detailed on the accompanying classification certificates/reports. Prior to installation (spreading) of these materials, they must be subject to assessment to confirm suitability for use. Sampling and analysis of imported materials must be conducted by the validating consultant at a ratio of 1 sample per 250 m^3 (1:250m^3). In the event that material volumes from a single source are <750 m^3, a minimum of three (3) validation samples must be collected and analysed to confirm suitability. The results from this assessment must be compared against the 'Imported Material Acceptance Criteria' detailed in Section of this report. The imported material acceptance criteria has been derived from the *NSW EPA excavated natural material order, 2014*. This criteria has been selected based on its low contaminant threshold. The selected criteria is more sensitive than the previously adopted human health criteria for insitu site materials (Health Investigation Levels – C, NEPM (1999, Amended 2013)) and will ensure protection of human health, based on the proposed use of the site.
- For imported materials classified as VENM, the supporting consultants' report must be prepared with consideration of the information suggested by NSW EPA for the classification of VENM (https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material), with the addition of chemical validation at a ratio of 1 sample per 500m^3 (1:500m^3) with a minimum of 3 samples per source. Analysis schedule to include TRH, BTEX, PAH, OCP, PCB, Metals (8) and asbestos.
- Following the approval of the imported materials by the validating consultant, the media capping layer must be installed to create a physical barrier to the contaminated materials beneath the marker layer. Soil materials are considered most suitable for this layer, and must be approved by the validating consultant prior to installation. This soil capping layer must be installed at a minimum depth of 300 mm across all areas of accessible soils.

- The option for the installation for a deeper capping layer should be considered in landscaping areas with deeper root systems and underground services. Design drawings are provided in Figure 5.
- Should materials known to be contaminated be proposed for excavation in order for the topography of the site to meet design levels following remediation, excavated materials can either be disposed of offsite (in accordance with Section 9.3 of this plan) or relocated on the site to areas proposed to be elevated. If materials are relocated on the site, they must be managed in accordance with Section 9.2 and Table 5 in this plan.
- Consideration should be given for the intended use of the topsoil materials (i.e. turf underlay or garden soil) from a horticultural perspective (based on the most suitable soil type as described in Soils for Landscape Development - Leake and Haege 2014), but also meet the RAC. Imported engineering fill must meet the Excavated Natural Material Order (EPA, 2014) or VENM definition of POEO Act 1997 and corresponding validation requirements.

9.3 Excavation and Offsite Disposal

In order for the site topography to comply with the relevant design levels across the site post remediation, the excavation and offsite disposal of insitu soils may be required. Excavation must be conducted to a depth that ensures the design levels are achieved following the installation of the required capping layer. The requirement for this methodology to be applied will likely trigger the notification requirements of SafeWork NSW. SESL recommend that the design be reviewed prior to commencement of works, and if offsite disposal is required, the remediation contractor submit the necessary notifications to SafeWork NSW.

If excavation and offsite disposal is required throughout the remedial works, the following methodology must be implemented:

- A suitably qualified remediation/excavation contactor must be engaged to supervise the earthworks conducted as part of the remediation of the site. This contactor must hold (at a minimum) a Class B removalist licence.
- Prior to excavation/earth moving, warning signs at the boundaries of the site (at least 10m from the removal areas) must be erected. Signs must conform to AS1319 - 1994 – Safety Signs for the Occupational Environment.
- A stockpiling area must be established where excavated soils will be stockpiled awaiting waste classification sampling and offsite disposal. This stockpiling area must have appropriate erosion and sediment controls installed, and cannot include areas of validated capping soils.
- Excavation of soils and other fill materials should occur utilising plant equipment (excavator or similar), until the proposed depth is reached. Spoil material is to be stockpiled in the designated stockpiling area detailed above.
- The contractor must barricade the area so that only workers wearing correct PPE and experienced in handling the material are allowed in the vicinity of the works. The licensed asbestos contractor should

dampen the soil during the excavation and loading process to ensure asbestos fibre migration is minimised.

- All persons involved in the works, including excavator operators, must be wearing correct Personal Protective Equipment (PPE) when inside the works area. PPE at a minimum must include: disposable coveralls of 100% synthetic materials or a mixed natural/synthetic fabric capable of providing adequate protection against fibre penetration, a P2 (or better) disposable, half-face particulate respirator, gloves, hardhat and steel cap boots.
- Should the nature of the known asbestos contamination change following the additional assessment detailed in Section 4.6 (e.g. friable asbestos is identified), alterations to the management procedures for asbestos disturbance works will be required.
- During any works where disturbance of asbestos contaminated materials is required, the contractor is to ensure daily air monitoring at selected sensitive receptors is implemented. Although only required by SafeWork NMSW for friable removals, this additional site control is considered suitable due to the widespread nature of asbestos, potential for dust generation, and sensitivity of surrounding receptors.
- All stockpiled materials are considered to be asbestos containing, and must be managed as such. All practicable precautions should be taken to prevent/reduce dust generation throughout the stockpiling processes. When stockpiled materials are being disturbed (moved, added to or loaded out) dust suppression techniques should be utilised to prevent dust generation. When stockpiles are not being disturbed, they must be covered with plastic.
- Following stockpiling, spoil materials must be subject to waste classification sampling and analysis undertaken by a suitably qualified environmental professional. Sampling and analysis is to be conducted at a ratio of 1 sample per 100 m^3 (1:100m^3). Waste classification results are to be supplemented with results from previous investigation conducted at the site (DSI).
- Following waste classification assessment, the validating consultant must prepare a waste classification report detailing the findings of the assessment in accordance with the NSW EPA Waste Classification Guidelines, 2014. Further details are provided in Section 10 of this plan.
- Following waste classification spoil materials are to be loaded into trucks under dust suppression procedures, and transported to a licensed waste facility suitable for accepting the wastes. All excavation and disposal works must be conducted by a suitably qualified asbestos removalist contractor.
- The Protection of the Environment Operations (Waste) Regulation 2014 states that tracking and reporting of asbestos waste is required for waste loads consisting of greater than 100kg of asbestos waste or more than 10 square metres of asbestos sheeting. This requirement utilises the NSW EPA WasteLocate online consignment tool (https://wastelocate.epa.nsw.gov.au/).
- Spoils considered asbestos containing must be tracked using the NSW EPA ‘Waste Locate System’, and all weighbridge dockets are to be provided to the validating consultant.

9.4 TREE PROTECTION AREA

The encapsulation or excavation and disposal of materials within the Tree Protection Zones (TPZ) at the site are not considered suitable remediation strategies, as these actions are likely to lead to the decline and eventual death of any significant trees. Validation of the TPZ is outlined in Section 12.

10 WASTE CLASSIFICATION AND OFFSITE DISPOSAL

The selected remediation method may require the excavation and offsite disposal of excess soil materials, in order to achieve the required design levels following the completion of the remedial works. As such, a waste classification assessment is required to be undertaken by the validating consultant, as stated in Section 9.3 of this plan.

In accordance with the NSW EPA Waste Classification Guidelines, any materials propose for offsite disposal must be subject to a Waste Classification Assessment. In line with industry best practice, this assessment should be conducted by a suitably qualified environmental professional. This assessment is required to determine an appropriate waste classification for the offsite removal of materials in accordance with the NSW EPA Waste Classification Guidelines – Part 1: Classifying Waste (2014), and Identify issues that may impact the classification of the waste materials.

10.1 Assessment Criteria

The NSW EPA Waste Classification Guidelines: Part 1 Classifying Waste (2014) is a set of guidelines used to classify waste materials for the purpose of offsite disposal. This document details a six step procedure for determining the type of waste and the waste classification. Part of the procedure, for materials not classified as special waste or pre-classified waste, is a comparison of analytical data initially against contaminant threshold (CT) values specific to a waste category. Alternatively, the data can be assessed against specific contaminant concentration (SCC) thresholds when used in conjunction with toxicity characteristic leaching procedure (TCLP) thresholds.

10.2 Sampling and Analysis Plan

Waste classification assessment and sampling must be conducted by the validating consultant (or suitably qualified environmental professional). The sampling objective was to gather information with regard to the type, location, level and extent of potential contamination within stockpiled materials, for the purpose of off-site disposal.

Sampling and analysis is to be conducted at a ratio of 1 sample per 100 m^3 (1:100m^3) in order to appropriately characterise wastes. Samples must be collected from stockpiles utilising hand equipment with a minimum of 200 mm of surface material removed before collecting the sample. The samples must be placed in laboratory supplied containers and labelled & stored in ice before being transferred to a NATA accredited laboratory for the purpose of analysis.

The analysis of soil samples must be undertaken against the criteria outlined in the NSW EPA Waste Classification Guidelines – Part 1: Classifying Waste 2014. This includes at a minimum:

- Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni and Zn);

- Polycyclic aromatic hydrocarbons (P AH);
- Total petroleum hydrocarbons C6 to C36 (TPH);
- Benzene, Toluene, Ethylbenzene and Xylenes (BTEX);
- Organochlorine Pesticides (OCP);
- Polychlorinated Biphenyls (PCB); and
- Asbestos in Soil (presence/absence).

Soil sampling for the purpose of waste classification must be performed under the following procedures:

- Decontamination of all sampling equipment between sampling;
- Use of disposable gloves during sampling, with each pair of gloves disposed of between individual sample collection;
- Labelling of sampling containers with individual and unique identification; and
- Controlled under chain of custody procedures.

10.3 Reporting

For each waste classification assessment conducted, the validation consultant (or environmental professional) undertaking the assessment must prepare a 'Waste Classification Report'. The report must detail the process and findings of the investigation, including:

- Introduction and Background;
- Assessment Objective;
- Sampling and Analysis Plan;
- Assessment Criteria;
- Fieldwork and Analytical Results; and
- Conclusions/Findings.

10.4 Current Classification

Based on previous investigation undertaken at the site (DSI), insitu soils are known to contain an asbestos. As such, all soils are considered to be asbestos containing and classifiable as Special Waste (asbestos containing) in accordance with the NSW EPA Waste Classification Guidelines, 2014. Additional waste classification assessment is required to confirm the contaminant concentrations of any soils proposed for offsite disposal, to accurately characterise these soils and confirm an appropriate waste classification.

The concentration of the asbestos containing materials within materials at the site is currently unknown, as the intrusive investigation conducted was limited to borehole construction (test pits weren't permitted to be

constructed, due to the potential for heritage items to exist at the site). SESL understands that test pits are proposed to be constructed at the site as part of the heritage investigation, and recommend that an additional investigation be conducted in coordination with the heritage investigation, in order to quantify the volume of asbestos materials present at the site. SESL recommends that this additional investigation has the potential to classify some materials as non-asbestos containing, reducing the cost of offsite disposal. Further details are provided in Section 4.6 of this RAP.

11 QUALITY ASSURANCE AND CONTROL

11.1 DATA QUALITY OBJECTIVES (DQO)

In determining the type, quantity and quality of data needed to support decisions relating to the validation of this remediation program, the seven-step DQO approach has been undertaken in accordance with Schedule B2 under ASC NEPM 2013. The DQOs are presented in detail in the following sections.

11.1.1 *Step 1 - State the Problem*

Previous site investigations have confirmed the presence of fill materials across the site, that in discrete locations exceed the adopted HIL's and are also suspected to contain asbestos. Sufficient validation certainty is required to supplement the previous investigations to ensure the site can be considered suitable for the ongoing public open space use.

11.1.2 *Step 2 - Identify the Decision/Goal of the Study*

Refer to Section 2.1 of the report for the detailed objectives of this study. The goal of the validation program is to confirm that the adopted remediation strategies are implemented effectively, identify any residual contamination on-site, identify associated potential risk and provide suitable evidence that the remediated site is suitable for ongoing public open space use.

The decisions to be made based on the results of this assessment are as follows:

- Have remediation methods been successful in managing contamination on the site?
- Are residual insitu surface materials in the TPZ suitable for the ongoing landuse?
- What are the potential requirements for further investigation, remediation and/or management of potential contamination identified on the site in the future?

11.1.3 *Step 3 - Identify Information Inputs*

The inputs required to make the above decisions are as follows:

- Historical investigations, including geotechnical and environmental reports.
- Validation inspections and analytical results.
- Site level surveys.
- Imported material validation certificates.

11.1.4 *Step 4 - Define the Study Boundaries*

The boundaries of the environmental assessment have been identified as follows:

- The study boundary is the development area as described in (Section 3 and Figure 3)

- The study will include all historical information for all soil and groundwater points within the development boundary, and additional validation of the final site surface (top 300mm).
- The findings of this study are required prior to site occupation.

11.1.5 *Step 5 - Develop the Analytical Approach (or Decision Rule)*

The decision rules for this assessment are as follows:

- If validation works, including visual assessment, and analysis of contaminants of concern, identify the remediation works are successful, then remediation works and validation findings will be used to develop the management actions required to maintain the site's suitability for the ongoing public open space use.
- If validation works, including visual assessment, and the analysis of contaminants of concern, identify that remediation works have not been successful, then additional remediation and validation will be required..

11.1.6 *Step 6: Specify the Performance or Acceptance Criteria*

The acceptable limits on decision errors to be applied for the assessment and the manner of addressing possible decision errors have been developed based on the DQIs of precision, accuracy, representativeness, comparability and completeness and are in the DQIs presented Section 11.2.

The potential for significant decision errors are to be minimised by:

- Appropriate supervision and control of remediation works by experienced environmental consultants;
- Implementation of remediation works by contractors experienced in remediation projects;
- Preparation of robustly reviewed assessment reports, including site auditor review;
- Ensuring the validation works provide sufficient evidence of remediation success; and
- Ensuring that the criteria set for the validation works are appropriate for the proposed use of the site.

The potential for significant decision errors are to be minimised by completing a robust QA/QC program.

11.1.7 *Step 7: Optimise the Design for Obtaining Data*

Based on the objectives of the remediation and validation works, the design of the validation program is based obtaining visual confirmation at multiple stages of the remediation program, robust validation data on all imported materials, combined visual and analytical assessment of residual uncapped surface soils (i.e. TPZ) and presentation of all new and historical information in the validation report.

11.2 Data Quality Indicators and Data Evaluation

SESL has selected the following Data Quality Indicators (DQIs) to ensure that the data obtained from the validation program are of sufficient quality to be used to draw reliable and representative conclusion in regards to the decision rules.

Table 6 – Data reliability assessment

DQI	Laboratory considerations	Field considerations	Comments
Completeness	Sampling frequencies meet validation requirements. Analysis conducted in accordance with validation requirements. Appropriate laboratory methods employed. Sample documentation including field notes, COC, SRA complete. Sample holding times complied with.	All site areas and critical locations inspected. All hold points visually confirmed (as necessary). Site assessment conducted in accordance to SESL's SOPs. Site assessment conducted by experienced contaminated land consultant. Documentation undertaken correctly and peer reviewed.	As per ASC NEPM 2013 data considered acceptable and reliable.
Comparability	Utilise consistent methods with historical investigations and compliant with ASC NEPM 2013. Adopt standard laboratory PQL for all analytes. Maintain the same primary laboratory as historical assessments (where possible)	Same site inspection methodologies used on each day of validation, with consistent notes taking procedures. Site assessment conducted in accordance to SESL's SOPs. Site assessment conducted by experienced contaminated land consultant.	As per ASC NEPM 2013, data considered acceptable and reliable.
Representativeness	All analysis performed in accordance with the validation requirements.	Appropriate selection of media, sampling method, preservation and compliance to holding times.	As per ASC NEPM 2013, data considered acceptable and reliable.
Precision	Review and assessment of laboratory and inter-laboratory duplicates. Appropriate field duplicates.	Site inspection conducted appropriately and complied with ASC NEPM 2013 Schedule B2. Site assessment conducted in accordance to SESL's SOPs.	As per ASC NEPM 2013, data considered acceptable and reliable.
Accuracy	Analysis and assessment of field blanks, rinsate blanks, and laboratory QA data (matrix, method and surrogate result).	Site inspection conducted appropriately and complied with ASC NEPM 2013 Schedule B2. Site assessment conducted in accordance to SESL's SOPs.	As per ASC NEPM 2013, data considered acceptable and reliable.

In the event if any of the DQIs are not met, the following steps will be undertaken:

- Review information provided or obtained to identify the non-conformances.
- Determine the cause of the non-conformances.
- Identify the course of action required to rectify the non-conformances.

In the event the non-conformances cannot be rectified, determine how the non-conformance will significantly affect the usefulness of the data to determine if the data will be used with discretion or marked as invalid.

12 VALIDATION PROCEDURES

12.1 ENVIRONMENTAL CERTIFICATION

A qualified professional must undertake a validation assessment, presented in a Site Remediation and Validation Report (SRVR), in accordance with the relevant NSW EPA guidelines and AS4482.1.

Validation assessment should be conducted throughout the remediation works, and incorporate the critical hold points as detailed in Section 12.3. Sufficient validation works should be conducted so that the validation report will be able to conclude that the residual soils present at the site will meet the remediation acceptance criteria and NSW EPA standards, and that the site will be suitable for the proposed residential land use.

12.2 VALIDATION REGIME

12.2.1 *Validation of Selected Geotextile Marker Layer*

The validating consultant must inspected the selected geotextile marker layer material, or be familiar with the material selected. It must be confirmed that the marker layer is appropriately durable, is permeable (in order to allow for water and gaseous exchange) and is considered suitable for use.

12.2.2 *Validation of Installation of Marker Layer*

Following the installation of the marker layer, the validating consultant must ensure that:

- The marker layer is appropriately pegged down, either under handstand materials or by pegs, to ensure that it is held in-place prior to capping layer installation;
- Where marker layer sheets meet that there is a minimum of a 300 mm overlap, to ensure that no gaps are present within the marker layer; and
- The entire area of the site that is proposed for accessible soils (soft landscape) is covered by the marker layer.
- Once complete, a site level survey is conducted to determine that the topography is at a suitable level so that the site will meet design levels at the conclusion of the remedial works.

Following the validation of the marker layer installation, the site is considered suitable for the installation of the soil capping layer.

12.2.3 *Validation of Imported Material*

The validation of imported materials, including those to be utilised for the capping layer, must be undertaken to ensure compliance with the RACs outlined in Section of this plan, and must be completed prior to the instalment of the material.

- Any materials to be used for engineered backfilling or the required capping layer should ideally be sourced from certified Virgin Excavated Natural Material (VENM), as defined in the Protection of Environment Operations Act (POEO), 1997.
- Other imported materials may also include Excavated Natural Material (ENM) as defined by the NSW EPA in 'the excavated natural material order 2014', provided the ENM is also aesthetically acceptable.
- Imported material certified as VENM or ENM must be supported by the appropriate certification documents as well as the results from laboratory analysis conducted on the material.
- Prior to installation (spreading) of these materials, they must be subject to assessment to confirm suitability for use. Sampling and analysis of imported materials must be conducted by the validating consultant at a ratio of 1 sample per 250 m^3 (1:250m^3), to ensure suitability and verify the classification as ENM/VENM. This analysis must include all contaminants outlined in Table 4 of this plan. Additionally, each load of materials imported to the site must be inspected and documented as consistent with the source of the material.
- Samples must be collected from imported material stockpiles utilising hand equipment with a minimum of 200 mm of surface material removed before collecting the sample. The samples must be placed in laboratory supplied containers and labelled & stored in ice before being transferred to a NATA accredited laboratory for the purpose of analysis.
- It is recommended that imported horticultural soils (i.e. turf and garden soils), should assessed to ensure acceptable performance for the proposed plantings. SESL recommends that the soils be determined fit for purpose by an appropriate qualified horticultural soil scientist, and be supported by appropriate laboratory analysis. In addition to the validation analysis detailed in Table 4, analysis should include cation exchange capacity, organic matter, nitrogen, phosphorus, major and minor plant nutrients and trace elements. Consideration should also be given to geophysical factors, including such as permeability.

12.2.4 *Validation of Capping Layer*

Following the installation of the capping layer, validation of the installation must be undertaken to ensure that it is fit for purpose. This validation must include:

- Inspection conducted by the validating consultant, confirming that the capping soils have been installed across all areas of the site that are proposed to have accessible soils; and
- Potholing of the capping layer utilising hand equipment (e.g. hand auger) and measurement of depth. Potholing must occur at a ratio of 1 pothole location per 1000 m^2 (1:1000m^2). All locations must be confirmed as having a capping depth of at least 300 mm.
- A final site level survey at the completion of works to provide additional evidence of capping depth when compared to the survey obtained in Section 12.2.2. Additionally, the site survey must confirm and map the extent of the various types of capping barrier implemented at the site. The survey must be generated to clearly show the extent of hardstand areas, soft capping areas and where a geotextile marker layer has been included.

Following the validation of the capping layer installation, the site is considered suitable for the installation of turf or proposed planting.

12.2.5 *Validation of Tree Protection Zone (TPZ)*

Due to the requirement to protect the rootzone of significant trees (Figure 4), the addition of 300mm capping is not appropriate as it may result in tree decline due to changes in soil aeration. Therefore, as the remediation design criteria cannot be met within in the TPZ, the following validation procedure must implemented:

- Inspection conducted by the validating consultant, involving a grid inspection within the TPZ with a minimum of two passes at 90 degrees to each other. Any suspected ACM fragments identified are to be removed during the pass. Passes continue until 2 sequential passes do not identify any further suspected ACM; and
- Surface (0-100mm) soil sampling at a ratio of 1 location per 100 m^2 (10m grid).
- Analysis of contaminants of concern (metals, PAH and asbestos) for assessment against HIL-C.

Following the validation of the capping layer installation, the site is considered suitable for the installation of turf or proposed planting.

12.3 CRITICAL HOLD POINTS

Throughout the remediation process, a number of critical hold points must be adhered to prior to progression of the remediation works. These hold points have been established in order to assure that the required remediation steps have been appropriately completed before additional works are conducted. The sign off of these holds points will ensure the appropriate implementation of this RAP.

Critical hold points for the required remedial works are detailed in Table 5 below.

Table 7 – Critical hold Points

#	Critical Hold Point	To Be Completed Prior To
1	Inclusion of these Category 1 remediation works into the development application for the redevelopment with subsequent notification to Council 30 days prior to commencement of works.	Commencement of remediation works
2	Receipt of conditions of consent	Commencement of remediation works
3	Engagement of appropriately qualified excavation/remediation contractor (Class B or A asbestos removalist as necessary) and remediation consultant review of contractor work plans	Commencement of remediation works
4	Remediation consultant witness of site controls	Commencement of remediation works
5	Remediation consultant approval of geotextile marker	Installation of geotextile marker layer
6	Waste Classification Assessment	Offsite disposal of excavated soil materials
7	Remediation consultant validation of appropriate installation of marker layer	Installation of capping soils
8	Site level survey of geofabric layer	Installation of capping soils
9	Imported material RAC compliance validation	Installation of capping soils

10	Validation of capping layer depth (300 mm)	Installation of turf
11	Final site level survey of finished surface	Completion of validation report

12.4 SITE REMEDIATION AND VALIDATION REPORT

Following the conclusion of the remedial works, the validating consultant must prepare a Site Remediation and Validation Report (SRVR). This SRVR must detail:

- The methodologies used in the remediation of the site;
- Site validation inspection and sampling events conducted throughout the remedial works;
- Disposal records (weighbridge dockets) of the materials excavated and disposed of throughout the remedial works;
- Compliance of the remedial works with the RACs detailed in this plan;
- Compliance with the critical hold points, detailed in Section 12.3 of this plan; and
- The findings of the validation assessment.

The SRVR must be prepared in consideration of the *Contaminated Site: Guidelines for Consultants Reporting on Contaminated Sites* (NSW OEH, 2011) and must come to a conclusion as to whether the site can be considered suitable for the proposed use following the completion of the remedial works, in accordance with the adopted legislative guidelines.

To verify the validation works conducted, the SRVR must include:

- Validation evidence, including photographic evidence of capping installation works;
- Validation analytical data for all imported materials;
- Summary tables of analytical results compared with adopted criteria (Table 4); and
- A registered survey verifying the extent and depth of the capping layer.

Following completion of the SRVR, a site specific Environmental Management Plan (EMP) must be developed to outline the as-built site condition, type and location of contamination, management strategies for monitoring and maintenance of the site. This EMP is required to ensure the site remains suitable for the landuse, detailing methodologies for engaging with subsurface materials, and outlining a review period.

13 SITE ENVIRONMENTAL CONTROLS

13.1 OVERVIEW

The remediation of the site must be carried out in a manner that does not harm or degrade the environment (both on-site and off-site). All people involved in the project must ensure the protection of human health and the environment throughout the duration of the works with special consideration of the following:

- Asbestos Management;
- Work procedures;
- Control of fugitive emissions;
- Dust control measures;
- Erosion, sediment and surface water management;
- Equipment cleaning and operation; and
- Stockpiles.

13.2 WORK PROCEDURES

13.2.1 *Establishment and Site Preparation*

Prior to commencement of remediation activities, the remediation contractor shall prepare a work site management plan. The objectives of the work site management plans are:

- To protect the health of site workers, adjacent landowners and the general public during remediation works; and
- To ensure workers do not negatively impact on potential environmental receptors and comply with applicable environmental legislations.

A control strategy must be proposed within the plan for the management of all possible sources of exposure or dust release on the site.

The following are the major points that need to be considered in the work site management plan:

- Safety of personnel both on and off site.
- Responsibility for the supply and application of isolating materials (e.g. ropes, barriers, plastic screens, waste containers, warning signs, etc), if required.
- Limiting access to remediation area.
- Perimeter/security fencing and erosion control.
- Transport facilities.

- Availability of water and drainage.
- Staff amenities and decontamination areas.
- Protection of adjacent residential structures.
- Waste disposal responsibilities and clean-up requirements.
- Notification to, and approval from, regulating authorities where necessary.
- Cleanliness standards that much be achieved to fulfil the contract.

The site management plan must comply with Former Holroyd Council Development Control Plan, development consent conditions and other applicable guidelines or legislations.

13.2.2 *Site Boundaries and Fencing*

Warning signs at the boundaries of the remediation areas (at least 10 metres from the removal areas) should be labelled “REMEDIATION AREA – NO UNAUTHORISED ENTRY”. Signs must conform to Australian Standard 1319-1994 – *Safety Signs for the Occupational Environment.*

Entry to the remediation area shall be restricted to personnel directly engaged in the soil remediation. Other persons entering the area shall be required to observe the appropriate safety precautions for that area.

13.2.3 *Supervisory Personnel*

Supervisory personnel shall have a detailed knowledge of the precautions and procedures demanded by contaminated soil remediation and clean-up. In the light of this knowledge and personal experience, supervisors shall assume the following responsibilities:

- The total remediation procedure; the setting up, the actual remediation (i.e. removal) and final cleaning operation.
- Ensure that all necessary measures are taken to reduce the airborne dust, and that in any case, workers are not exposed to levels exceeding the recommended exposure standard.
- Arrange for, and assess results of, air monitoring where appropriate.
- Ensure that all workers under their supervision are adequately trained in the safe working practices associated with working on constructions sites.
- Ensure that the remediation of the contaminated soil is continually supervised and that the operation is carried out in a safe and proper manner.
- Ensure that personal protective equipment is available to all workers and maintained in good condition.
- Ensure that the remediation site is maintained in a clean condition, that waste is quickly and properly disposed of, and that the personal hygiene procedures are continually observed.

13.2.4 *Emission Controls*

All contaminated stockpiles, unless in use (i.e. loading out, etc.), shall be covered with an impermeable cover, or maintained in a manner to prevent (as far as practicable) the generation of dust. The covering must be weighted down so it does not blow away with wind. Physical barriers such as construction fencing must restrict access to these areas.

Wetting of all work areas, where active soil disturbance shall occur that day, shall begin prior to the start of the disturbance activities. Wetting shall be conducted as appropriate, based on the visual observations of the Site Manager or other appointed supervisor. This may be done by hand or using mechanical sprayers.

Maintenance wetting shall occur at the close of each workday in preparation of the following day's work zones. If maintenance wetting from the previous workday appears adequate (in other words, preliminary movement of machinery to a work zone must not yield emissions), and passes inspection, additional initial wetting will not be required. Wetting shall occur to prevent the possible emission of material during the movement of equipment to another location. Care must be taken to assure that the application of water does not produce emissions from the ground surface and that there is not excessive over-watering.

During the actual soil disturbance activity, water shall be applied to the site of the disturbance, as appropriate, to suppress any visible emission. In general, personnel tasked with wetting duties must be assigned to each soil disturbance area to complete this wetting activity. Wetting shall be undertaken using a hose with spreading head to ensure even wetting occurs.

13.2.5 *Wind Speed Work Stoppage*

The application of a wind speed work stoppage requirement is designed to control fugitive emissions due to increased air velocity. In the event of high wind speeds, excavation work must be stopped at the site until wind speeds are reduced to a speed that shall not generate visible emissions from the site. For the purposes of this site, work must be stopped when:

- Wind speeds reach a sustained 40 km/h; or,
- Any wind speed at which particulates are observed by site personnel to be entrained in the air stream.

If site-specific weather creates conditions that may result in fugitive emissions, work stoppage may occur at wind speeds less than specified above based on decisions of the Site Manager. The Site Manager shall make the decision as to when it is appropriate to restart.

13.2.6 *Dust Control Measures*

Prior to any intrusive works or other disruptive activities carried out on site, consideration must be given to how the work or activity can be undertaken with minimal dust generation. All works should be undertaken with control of dust as a priority. The dust control or avoidance measures should be documented in a SWMS prepared for

the proposed works. Secondary controls, such as the wearing of dust masks should also be considered during potential dust exposure.

Should any unexpected hazards arise, the Client should be contacted immediately so that the risks (health or safety) can be re-evaluated and the appropriate level of management and/or protection can be implemented prior to the recommencement of any works.

The following procedures and techniques will aid to control dust generation:

- Erection of dust screens around the perimeter of the site;
- A tarpaulin (or equivalent) will securely cover all loads of soil material entering or leaving the site;
- Water sprays will be used across the site over unsealed or bare surfaces;
- Plastic sheeting will be used by the remediation contractor to cover excavation faces and stockpiles where necessary; and
- Materials at the site will be processed, handled, moved and stored in a proper and efficient manner in order to minimise exposure.

If the above procedures and techniques are not sufficient to control dust, then further contingency measures may include:

- Reduce area of disturbed surfaces;
- Installation of perimeter sprays on the remediation site boundary fencing;
- Conducting work in more favourable weather conditions;
- Modifying the manner in which excavation work is conducted at the site;
- Using different equipment which generates less dust; and
- Using equipment in more favourable weather conditions

13.2.7 *Spills and Leaks*

On site control measures must be in place throughout the remediation works to protect the surrounding environment from spills and leaks:

- Construction of stormwater retention basins or diversion drains;
- Presence of an emergency supply spill control equipment, such as oil absorbent materials; and
- Containment of any storage tanks or drums within bunded areas, which have the capacity of 110% of the largest tank contained, or 25% of the total volume of all drums, whichever is greater.

Works required within this RAP do not contain activities that will require any liquids to be stored on site, with the exception of fuels for machinery. These shall be kept to a minimum at all times.

13.3 ASBESTOS MANAGEMENT

In the event that remediation works are being undertaken that involve the excavation or disturbance of asbestos containing materials or suspected asbestos containing materials, the following site controls must be adhered to.

13.3.1 *Site Boundaries and Fencing*

Prior to excavation/earth moving, warning signs at the boundaries of the site (at least 10m from the removal areas) must be erected. Signs must conform to AS1319 - 1994 – Safety Signs for the Occupational Environment.

Entry to the asbestos works area shall be restricted to personnel directly engaged in works, and that are adequately trained in the handling of asbestos containing materials.

13.3.2 *Supervisory Personnel*

Asbestos works must be supervised by a suitably qualified asbestos removalist contractor (Class B). Should friable asbestos be determined to exist at the site, all works must be supervised by a Class A asbestos removalist contractor.

13.3.3 *Personal Protection Equipment*

The contractor must barricade the area so that only workers wearing correct PPE and experienced in handling the material are allowed in the vicinity of the works. The licensed asbestos contractor should dampen the soil during the excavation and loading process to ensure asbestos fibre migration is minimised.

All persons involved in the works, including excavator operators, must be wearing correct Personal Protective Equipment (PPE) when inside the works area. PPE at a minimum must include: disposable coveralls of 100% synthetic materials or a mixed natural/synthetic fabric capable of providing adequate protection against fibre penetration, a P2 (or better) disposable, half-face particulate respirator, gloves, hardhat and steel cap boots.

13.3.4 *Variation to nature of known asbestos*

Should the nature of the known asbestos contamination change following the additional assessment detailed in Section 4.6 (e.g. friable asbestos is identified), alterations to the management procedures for asbestos disturbance works may be required.

13.3.5 *Stockpile Management*

All stockpiled materials are considered to be asbestos containing, and must be managed as such. All practicable precautions should be taken to prevent/reduce dust generation throughout the stockpiling processes. When stockpiled materials are being disturbed (moved, added to or loaded out) dust suppression techniques should be utilised to prevent dust generation. When stockpiles are not being disturbed, they must be covered with plastic.

13.4 Erosion, Sediment and Surface Water Management

13.4.1 *Approach*

An important part of the remedial works shall be the management of erosion, sediment and surface water. The strategy to be adopted must aim to:

- Prevent soil erosion at the site;
- Protect off site waters and sediment from being polluted by onsite sources;
- Minimise impacts to on-site surface waters from remedial works during the project; and facilitate the implementation of the remedial works program.

The strategy shall involve the installation and operation of a number of environmental control measures that shall be progressively implemented as work progresses across the site. The design approach adopted must satisfy the following principles:

- Control water flow from the top of the site, through the works and out the bottom of the site via the construction of earthen bunds to regulate water flow;
- In the case of an extreme rainfall event, overflow water from unremediated areas shall be filtered through straw bales and silt fences prior to discharge from the fill area. Given the short duration of the rehabilitation program, the probability of an extreme event occurring is considered to be low; and
- Rehabilitate disturbed lands as quickly as possible.

Regular maintenance of all erosion, sedimentation and pollution control devices shall be undertaken to ensure their continuing effective and efficient operation.

13.4.2 *Stormwater Control in Remediated Areas*

Erosion protection in disturbed areas of the site shall be provided by:

- Grassing and the establishment of other vegetation; and
- The construction and maintenance of or erosion and sediment control measures such as contour drains, straw bales and silt fences.

13.5 Noise and Vibration Control Measures

Noise and vibration levels must be controlled throughout the project. Special precautions must be taken to avoid nuisance in neighbouring areas, particularly from machinery, vehicles and warning sirens. The control measures to be implemented shall include the following:

- All construction vehicles involved in the rehabilitation project must generally enter and leave the site in accordance with specified site entry controls; and
- Use of suitable construction techniques and methodologies.

13.6 EQUIPMENT CLEANING AND OPERATION

Throughout the remediation, controls must be placed on the operation and movement of equipment. General procedures that shall be implemented include the following:

- Equipment working within an excavation area must be washed inside the area so that any wash water shall run into the excavation. Wash waters shall be allowed to naturally evaporate or be removed from the excavation area along with ponded surface water;
- Equipment washing facilities must be provided for the effective cleaning of equipment after they have been exposed to contaminated fill, and prior to their leaving the site. The facilities shall also be used to clean other earthmoving plant and equipment used on site;
- All vehicles transporting materials on site shall be operated in a manner so as to prevent any loss of materials during loading, transport and unloading activities; and
- Any storage tanks or drums used for fuels or liquids shall be bunded and bund shall contain at least 110% of the largest tank contained or 25% or the total volume of all drums, whichever is the greater, and the bund shall not be penetrated by any services.

13.7 STOCKPILES

- All excavated fill materials or soils are considered to be contaminated and asbestos containing;
- All stockpiles of soil or other materials shall be placed away from drainage lines, gutters or stormwater pits or inlets.
- All stockpiles of soil or other materials likely to generate dust or odours shall be covered.
- All stockpiles of contaminated soil shall be stored in a secure area and be covered as soon as practicable, and remain covered at all times, unless loading out.

13.8 REMEDIATION SCHEDULE

It is recommended that site remediation activities be coordinated with other trades to prevent unauthorised personnel from being present in the remediation area. Works are not considered complete until validation certificates are presented.

13.8.1 *Hours of Operation*

This remediation process must be conducted in normal site hours as required by the Former Holroyd Council DCP.

- Monday - Friday 7am - 6pm
- Saturday 8am - 4pm
- No work is permitted on Sundays or Public Holidays

No machinery or trucks must operate on site outside of the times.

13.8.2 *Potential Effects on Community and Environment*

There is a potential for fugitive dust generated during the excavation and loading of trucks. The leading hand must arrange the following dust control measures:

- Hosing with fine spray of water on exposed surfaces particularly during hot windy days.
- Hosing vehicles and covering loads prior to movement on site and especially prior to leaving the site (if required).
- Ensure all public roadways are kept as clean as possible.

All noise producing equipment should meet the requirements of the Protection of the Environment Operations Act 1997 (NSW) and Protection of the Environment Operations Act (Noise Control Regulations) 2008. All contractors must ensure work times are adhered to.

The control of odours during excavations must be monitored during the remediation process. Should odours be detected beyond the site boundary suppressant equipment must be deployed immediately to control odours entering nearby properties. All work must cease upon the detection of odours outside the property boundary. Commencement of work may take place once odours are controlled and validated by a suitably qualified professional.

13.8.3 *Personnel*

Prior to commencement of the remediation works the remediation contractor must prepare a complete list of remediation contacts including site personnel. Personnel must hold the required certificates to complete the works required.

14 CONTINGENCY PLANNING

14.1 OVERVIEW

The unexpected conditions that could feasibly occur at the site include:

- The uncovering of greater amounts of ground contamination than presently estimated;
- Removal of contaminated materials;
- The uncovering of presently unknown types of contamination (e.g. Coal Tar);
- The generation of unacceptable dust;
- The generation of unacceptable odours;
- The generation of unacceptable noise and or vibration levels; and
- Spills or leak of hazardous materials.

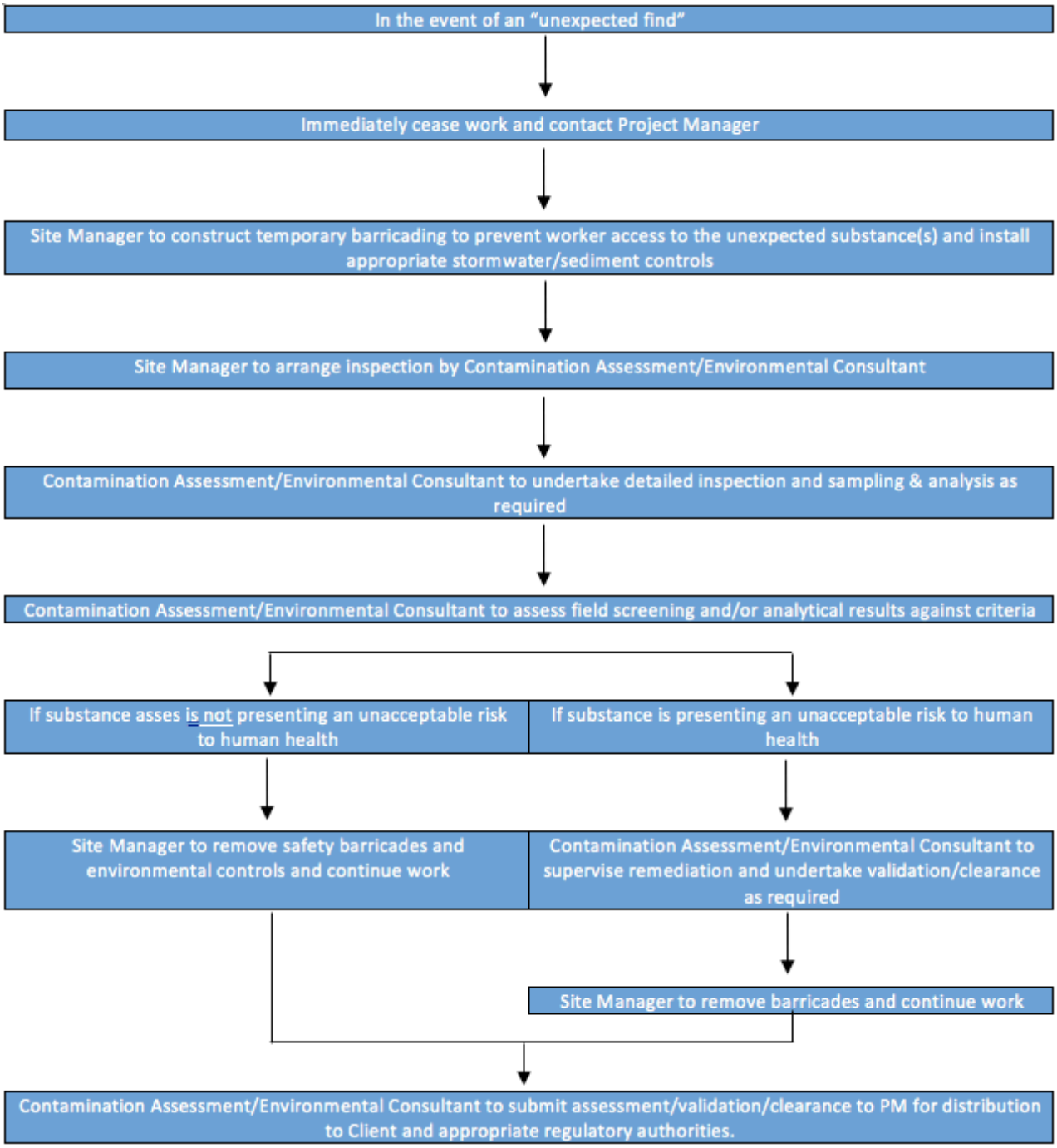
Procedures that shall be used to address these contingencies are provided in the following sections.

14.2 UNKNOWN TYPES OF MATERIALS / UNEXPECTED FINDS

If any unknown materials are encountered during remedial works by the observation of any unusual physical/sensory characteristics of the material (i.e. odours), the procedure detailed in Section 15 of this plan must be followed.

15 UNEXPECTED FINDS

This procedure details the actions to be taken if contamination is in soil or material not detailed in this report is suspected to have been encountered during excavation/remediation activities:



16 WORK HEALTH AND SAFETY

The remediation contractor must prepare a Work Health and Safety Plan to establish standard health and safety procedures for the personnel involved in the remedial works at the site.

Areas to be addressed in the plan include but are not limited to:

- Identification and Management of hazards, including:
    - Exposure and possible absorption through skin of contaminants;
    - Inhalation of volatile contaminant vapours;
    - Slips, trips, bumps, falls, falling objects, crushing injuries typical of every construction related job site;
    - Fire or explosion; and
    - Physical hazards, noise and hot weather.
- General work procedures for personal hygiene;
- Personal Protective Equipment (PPE); and
- Emergency management.

17 COMMUNITY CONSULTATION AND LIAISON

Community engagement, consultation and liaison are essential to ensure the remediation does not impact on the public amenity of the local community. Cumberland Council is a key stakeholder and the community consultation strategy developed should be adhered to by those undertaking remediation. It is understood that community consultation is currently managed by Cumberland Council.

The remediation and intended development of the site constitutes a significant development in the local area, and may be of interest and/or concern to some local residences. It is important that the remediation contractor understand the concerns that the local community may have in regards to the works, so that they can provide clear information in response to these concerns or make amendments to site management to account for these concerns.

Examples of community consultation that may be adopted include:

- Identify relevant stakeholder, including: local residents and local government.
- Hold initial stakeholder meetings;
- Work scheduling for consultation;
- Review, amend and feedback to the stakeholders any changes made in consideration of information provided by the stakeholders;
- Letterbox drop with information on the progress of works, any changes to works, or any upcoming potential disturbances;
- Hold progress stakeholder meetings;
- Provide an avenue for communication, contact names and phone numbers, or websites and email addresses; and
- Monitor and evaluate the effectiveness of the consultation strategy, establish feedback processes and implement changes to the strategy accordingly.

The fundamental focus of the community consultation strategy is to be open, receptive and honest to all concerned parties. A relationship of trust needs to be fostered for the community to be receptive to information and to actively participate in the process.

18 ADDITIONAL ASBESTOS CONTROL MEASURES

Additional investigations are proposed to confirm the nature of asbestos contamination at the site (see Section 4.6). These investigations are proposed to be conducted in coordination with cultural heritage investigations involving test pits across the remediation area. Currently, asbestos has been observed in bonded form and site and environmental controls outlined in this RAP are managing exposure risk on this basis. Should additional investigations identify the presence of friable asbestos, additional measures are required.

Should additional investigations identify the presence of friable asbestos, the following additional measures must be implemented:

Prior to Remediation

- Engagement of Class A asbestos contractor or supervisor.
- Preparation of asbestos removal control plan (ARCP) by licensed asbestos assessor (LAA).
- Additional site controls are required by ARCP.

During Remediation

- Ensure air monitoring is conducted at boundary positions adjacent sensitive receptors (identified by LAA) and at site amenities buildings.
- Daily reporting of asbestos fibre counts by NATA accredited asbestos identifier.
- All excavation equipment to have air conditioning in reverse to prevent dust intrusion.
- Asbestos decontamination unit in place as prescribed by the LAA and outlined in the ARCP.
- PPE to include full coveralls and respirator as required in the ARCP.
- Additional emphasis on dust suppression and preventative wetting.

Validation

- Clearance certificate by LAA including review of air monitoring results.
- Clearance to include all plant and equipment used in the remediation area.
- Clearance certificate included in SRVR. The clearance certificate must be provided for all accessible soils at the conclusion of the remediation works.

19 CONCLUSION

Based on the contamination identified in the previous site investigation, this RAP has been developed to detail the remediation strategies that will be necessary to render the site suitable for public recreational use, following the completion of the proposed development.

The Site Environmental Controls and Contingency Plan outlined in this report must be implemented to ensure good environmental practices are adopted and corrective actions are performed in a timely manner.

The outcome of additional asbestos quantification (see Section 4.6) is required to confirm the site environmental control and validation protocols in relation to the management of the identified bonded asbestos. Should friable asbestos be identified, the additional measures described in Section 18 must be implemented.

SESL concludes that the strategies outlined will achieve the objectives of the RAP and render the site suitable for the ongoing recreational use and proposed development. Documentation of the success of remediation is required in a subsequent Site Remediation and Validation Report (SRVR) at the conclusion of remedial works.

This remedial strategy requires the development and implementation of a site-specific Environmental Management Plan (EMP) to outline how future site activities will maintain the suitability of the site.

20 REFERENCES

- ANZECC and ARMCANZ (2000). Australian and New Zealand Guidelines for Fresh and Marine Water Quality (October 2000);
- ASTM (2000). Standard Practice D2488 90 Description and Identification of Soils (Visual-Manual Procedure). American Society for Testing and Materials
- Australian Standard AS1726:1994 Geotechnical Site Investigations
- Australian Standards AS4482.1:2005 Guide to the Sampling and Investigation of Potentially Contaminated Soil (Part 1 & 2)
- enHealth 2012, Australian exposure factor guidance. Environmental Health Subcommittee (enHealth) of the Australian Health Protection Principal Committee, Canberra, Australia.
- Code of Practice for the Safe Removal of Asbestos, 2nd Edition (National Occupational Health and Safety Commission, April 2005);
- EnHealth (2012) Environmental Health Risk Assessment: Guidelines for assessing human health risks from environmental hazards, Department of Health and Ageing and EnHealth Council, Commonwealth of Australia (2012);
- Holroyd Development Control Policy, 2013
- Holroyd Contaminated Land Policy, 2001
- How to Safely Remove Asbestos: Code of Practice (WorkCover, 2012):
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (April 2013) (NEPC 2013, Canberra)
- NSW EPA (2017) Guidelines for the NSW Site Auditor Scheme (3rd Ed.) (2017)
- NSW EPA (2014) Waste Classification Guidelines Part 1: Classifying Waste
- NSW EPA (1995) Contaminated Sites: Sampling Design Guidelines
- NSW EPA (1999) Contaminated Sites: Guidelines of Significant Risk of Harm from Contaminated Land and the Duty to Report
- NSW Department of Urban Affairs and Planning (1998) Managing Land Contamination: Planning Guidelines: SEPP 55 Remediation of Land, August (1998
- NSW OEH (2011) Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Sites
- Soil Series No. 1, 2nd Edition, 1998 and 3rd Edition, (1999) Health-Based Soil Investigation Levels, National Environmental Health Forum monographs
- Standards Australia (1993) AS1726-1993. Geotechnical Site investigations Australian Standard
- Standards Australia (2005). Guide to the investigation and sampling of sites with potentially contaminated soil. Part 1: Non-volatile and semi-volatile compounds AS4482.1 (2005) and Part 2: Volatile substances, AS4482.2 (2005
- WA DoH (2009) Guidelines for the Assessment, Remediation and Management of Asbestos-Contaminated Sites in Western Australia (2009)
- Work, Health and Safety Act 2011.

21 LIMITATIONS

This report only covers the conditions observed at the time of investigation at the locations investigated. Should there be any variation in the conditions beyond this date, further assessment will be required.

This report is for the use of the client and any relevant authorities that rely on the information for development applications and approval processes. Any reliance on this report by third parties shall be at such parties' sole risk. This report shall only be presented in full and may not be used to support any other objective other than those set out in the report.

SESL's assessment is necessarily based on the result of limited site investigations and upon the restricted program of visual assessment of the surface and consultation of available records. Neither SESL, nor any other reputable consultant, can provide unqualified warranties nor does SESL assume any liabilities for site conditions not observed, or accessible during the time of investigations.

No site investigations can be thorough enough to provide absolute confirmation of the presence or absence of substances, which may be considered contaminating, hazardous or polluting. Similarly, the level of testing undertaken cannot be considered to unequivocally characterise the degree or extent of contamination on site. In addition, regulatory or guideline criteria for the evaluation of environmental soil and groundwater quality are frequently being reviewed and concentrations of contaminants which are considered acceptable at present may in the future be considered to exceed acceptance criteria. Similar changes over time may prevail regarding site remediation standards as different regulatory mechanisms are developed and implemented.

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25th July 2018

Ref: 0301-1813_02

Cumberland Council
C/- Taren Miller
Crown Project Services (CPS)
Level 10, 3 Spring Street
SYDNEY NSW 2000

Via email: taren.miller@crownprojects.com.au

Dear Taren,

RE: Interim Site Audit Advice –Remediation Action Plan, Proposed Granville Multi-purpose Centre - 1 Memorial Drive, Granville, NSW

James Davis of Enviroview Pty Ltd has been engaged to provide the services of a NSW EPA Contaminated Land Accredited Site Auditor, accredited under Part 4 of the *Contaminated Land Management Act 1997* (NSW), to conduct a Site Audit in relation to the site identified as the Proposed Granville Multi-purpose Centre, 1 Memorial Drive, Granville NSW 2142 (the 'Site'), in accordance with the Act and relevant guidelines made or approved under s 105 of that Act.

The request for the Site Audit was made with the purpose of facilitating the proposed development of the site and to ensure that the site is suitable for the proposed land use with regards to potential contamination of the land. This is to be achieved by having the various reports that have and will be prepared reviewed by the Site Auditor and for the Auditor to provide initially, by way of Site Audit Interim Advice, confirmation that the site is able to be made suitable for the proposed use, and following remediation and validation, to provide certification by way of a site audit statement that the site is suitable for the land use commensurate with the proposed development.

As such, the objective of the Site Audit is to provide a Site Audit Report and Site Audit Statement to certify that in the Auditor's opinion, in relation to contaminated land, the site is suitable for the land use commensurate with the proposed development of the site for recreational and public open space use.

An Interim Advice is provided to assist in regard to requirements of the Site Audit at a particular stage of the Audit. It is a requirement of the NSW EPA that the Site Auditor specifies that the interim advice does not constitute a Site Audit Statement or a Site Audit Report, does not pre-empt the final Site Audit conclusions and clarifies that a Site Audit Statement will be issued at the end of the audit process.

The purpose of this interim advice is to provide the Site Auditor's opinion on whether the site can be made suitable for the proposed recreational and public open space use. I have been provided with the following reports upon which I have based my opinion:

> SESL Australia Pty Ltd, *Remedial Action Plan, Cumberland Council, 1 Memorial Drive, Granville NSW 2142.* Reference J001008 – Remedial Action Plan, Revision 3.1, dated 25 July 2018.

In support of the review of the Remediation Action Plan the Auditor has also considered information presented in the following reports:

> SESL Australia Pty Ltd, *Remedial Options Review, Crown Project Services, Granville Multi-purpose Centre, Granville NSW 2142.* Reference J001008 – Remedial Options, dated 12 June 2018.
>
> SESL Australia Pty Ltd, *Cover Letter for Detailed Site Investigation Report.* Reference J000719 – Cove Letter, dated 21 March 2018.
>
> SESL Australia Pty Ltd, *Detailed Site Investigation, Crown Project Services, 1 Memorial Drive, Granville.* Reference J000719 Revision 1.0, dated 16 March 2018.
>
> Douglas Partners Pty Ltd, *Detailed Site Investigation for Contamination, Proposed Granville Multi-purpose Centre, 1 Memorial Drive, Granville.* Reference 86007.01 Draft Revision B, dated 13 October 2017[1].

According to the NSW EPA *Guidelines for Consultants Reporting on Contaminated Sites* (NSW OEH 2011) a Remedial Action Plan (RAP) should:

- set remediation goals that ensure the remediated site will be suitable for the proposed use and will pose no unacceptable risk to human health or to the environment
- document in detail all procedures and plans to be implemented to reduce risks to acceptable levels for the proposed site use
- establish the environmental safeguards required to complete the remediation in an environmentally acceptable manner
- identify and include proof of the necessary approvals and licences required by regulatory authorities.

In summary, the key points to be included in a RAP are as follows:

- The remediation goal is for the site to be made suitable for the proposed land use with reference to criteria based on those made or approved by the NSW EPA for the validation of the site during remediation works;
- The RAP discusses the applicable remediation options and presents the rationale for the selection of the preferred option, in this case a containment option. Therefore, the suitability of the site for the proposed landuse will be subject to the implementation of a

[1] *It is noted that the cover page of this document incorrectly states an issue date of August 2017. This date of August 2017 appears to relate to issue of Draft A of the document. The Auditor has considered version Draft B issued in October 2017.*

long-term site management plan to ensure that appropriate controls are implemented to maintain the containment;

- The process of validation, including details of the proposed sampling and analysis programme and validation reporting is presented;
- The RAP discusses the environmental management controls that will need to be considered in the implementation of the remediation; and
- The requirements for approval and permits for the remediation have been identified.

In general, the RAP meets the requirements of the guidelines and it is my opinion that the site can be made suitable with the implementation of the RAP referenced above. Specific plans and specifications detailing the design of the containment capping should be prepared once the final detail of building design and constructability is finalised, including requirements with regard to underground services and deep plantings.

As the success of the remediation strategy and therefore the suitability of the site is dependent on a long-term site management plan being prepared and implemented it is required that a draft of that management plan is prepared before remediation commences and that the plan is reviewed by the Site Auditor to ensure that the requirements of such a plan are practicable, and that the mechanisms for the requirements of the plan to be notified and to reasonably be made enforceable are satisfied.

The remediation option proposed is contingent on those notification mechanisms ensuring that the containment is protected from any unintentional or uncontrolled disturbance that could affect the integrity of the physical barrier.

It is recommended that there is a requirement for a Site Audit to be undertaken by a NSW EPA Accredited Site Auditor in relation to the suitability of the site for the proposed land use as a condition of consent for the development so that a Site Audit can be completed as a Statutory Site Audit under the *Contaminated Land Management Act 1997* and to ensure the remedial works conducted, the subsequent validation report and long-term site management plan are prepared in accordance with the relevant NSW EPA Guidelines and that any conclusions by the consultant that the site has been made suitable for the proposed landuse are appropriate and in accordance with the guidelines made or approved by the NSW EPA.

Thank you for your time in regard to this matter. If you require additional information or clarification, please do not hesitate to contact me.

Yours sincerely

James Davis
NSW EPA Contaminated Land Site Auditor
Enviroview Pty Ltd