ACT Government
Infrastructure Canberra

Our Ref: iCBRFOI2526/61

schedule 2.2(a)(ii)

FREEDOM OF INFORMATION REQUEST

I refer to your application under section 30 of the *Freedom of Information Act 2016* (the Act), accepted by Infrastructure Canberra (iCBR) on 23 March 2026.

In your information access request, you sought access to:

Copies of advice, costings and findings of the consultancy awarded to CK Architecture to complete a feasibility assessment into the viability of a new dive pool at Stromlo Leisure Centre in the Molonglo Valley in 2024 by the ACT Property Group of Major Projects Canberra.

Contract Name: "Feasibility assessment and preliminary design for new territory owned pools".

Authority

I am an Information Officer appointed by the Director General under section 18 of the Act to deal with access applications made under Part 5 of the Act.

In accordance with section 40 of the Act, iCBR is required to provide a decision on your access application within 30 days. Third-party consultation was required and the 15-day extension was applied, therefore a decision is due on 27 May 2026.

Decision on access

Searches were completed for relevant information and the record identified as relevant to your application is listed in the schedule enclosed. This provides a description of each section of the document that falls within the scope of your request and the access decision for each of those documents.

My decision in relation to the documents relevant to your request summarised as follows:

- Partial access, to one document

My decision is detailed further in the following Statement of Reasons.

Statement of Reasons

In making my decision on disclosing government information, I must identify all relevant factors in Schedule 2 of the Act and determine, on balance, where the public interest lies.

In reaching my access decision, I have taken the following into account:

Factors favouring disclosure in the public interest

Schedule 2, Section 2.1(a)

- *(i) – promote open discussion of public affairs and enhance the governments accountability;*
- *(ii) contribute to positive and informed debate on important issues or matters of public interest;*
- *(iv) ensure effective oversight of expenditure of public funds;*
- *(viii) reveal the reason for a government decision and any background or contextual information that informed the decision;*

I am satisfied that these are relevant considerations favouring disclosure in this case, and in the interests of enhancing open discussion, I afford them significant weight.

Factors favouring non-disclosure in the public interest

Schedule 2, Section 2.2(a)

- (ii) – prejudice the protection of an individual's right to privacy or any other right under the *Human Rights Act 2004*;
- (xi) prejudice trade secrets, business affairs or research of an agency or person;
- (xii) prejudice an agency's ability to obtain confidential information;
- (xiii) prejudice the competitive commercial activities of an agency;
- (xvi) prejudice a deliberative process of government;

While the feasibility study itself has been completed, the project has not proceeded beyond the feasibility stage. Some content within the report covers several subjects such as technical, economic, financial, environmental considerations. By nature, the report is deliberative and consideration of its contents or associated works can be ongoing. Additionally, disclosure of the withheld pages including detailed feasibility analysis, assumptions and commentary from an unimplemented project may adversely affect the perception and interpretation of the third-parties business affairs, in relation to current and/or future projects. The disclosure of this information may further harm the government's ability to meaningfully collaborate or consult with these third parties.

I consider that the protection of an individual's right to privacy, especially during dealings with the ACT Government is a significant factor as the parties involved have provided their personal contact information and stakeholder input for the purposes of working with the ACT Government. I have considered this information and in my opinion the protection of individuals' personal details and any views provided outweighs the benefit which may be derived from releasing them. I consider that individuals are entitled to expect that the personal information they have supplied as part of this process to the ACT Government will be dealt with in a manner that protects their privacy.

Charges

I have decided to waive any charges in relation to this Freedom of Information application.

Online Publishing – Disclosure Log

Under section 28 of the Act, iCBR maintains an official online record of access applications called a Disclosure Log. Your original access application, my decision and documents released to you in response to your access application will be published on the iCBR Disclosure Log within three to ten working days after the date of the decision.

ACT Government
Infrastructure Canberra

Your personal details will not be published.

You may view the iCBR Disclosure Log at: Disclosure log - Infrastructure Canberra (act.gov.au).

Ombudsman Review

My decision on your access request is a reviewable decision as identified in Schedule 3 of the Act. You have the right to seek ombudsman review of this outcome under section 73 of the Act within 20 working days from the day that my decision is published on the iCBR Disclosure Log, or a longer period allowed by the Ombudsman.

If you wish to request a review of my decision you may write to the Ombudsman at:

The ACT Ombudsman
GPO Box 442
CANBERRA ACT 2601
Via email: actfoi@ombudsman.gov.au

ACT Civil and Administrative Tribunal (ACAT) Review

Under section 84 of the Act, if a decision is made under Section 82(2) on an Ombudsman review, you may apply to ACAT for review of the Ombudsman decision.

Further information may be obtained from the ACAT at:

ACT Civil and Administrative Tribunal
Level 4, 1 Moore Street
GPO Box 370
CANBERRA CITY ACT 2601
Telephone: (02) 6207 1740
http://www.acat.act.gov.au

Should you have any queries in relation to your request, please contact me via email iCBR.FOI@act.gov.au.

Please ensure you quote your reference number: **iCBRFOI2526/61**

schedule 2.2(a)(ii)

schedule 2.2(a)(ii)

Infrastructure Canberra
27/05/2026

FREEDOM OF INFORMATION REQUEST SCHEDULE

Please be aware that under the *Freedom of Information Act 2016*, some of the information provided to you will be released to the public through the ACT Government's Open Access Scheme. The Open Access release status column of the table below indicates what documents are intended for release online through open access.

Personal information or business affairs information will not be made available under this policy. If you think the content of your request would contain such information, please inform the contact officer immediately.

Information about what is published on open access is available online at: https://www.act.gov.au/infrastructurecanberra/about/freedom-of-information

NAME	WHAT ARE THE PARAMETERS OF THE REQUEST
ICBRFOI2526/61	*'Copies of advice, costings and findings of the consultancy awarded to CK Architecture to complete a feasibility assessment into the viability of a new dive pool at Stromlo Leisure Centre in the Molonglo Valley in 2024 by the ACT Property Group of Major Projects Canberra'* *Contract Name: "Feasibility assessment and preliminary design for new territory owned pools"*

Section Ref No	Pages	Description	Date	Status	Reason for non-release or deferral	Open Access release status
1.	-	Release Schedule	27/05/2026	-	-	Yes
2.	-	Decision Letter	27/05/2026	-	-	Yes
3.	**1 – 394**	Document 1: 241127 1A 1B Feasibility Report with Appendices	27/11/2024	Partial	*Out of scope* *Schedule 2.2(a)(ii)* *Schedule 2.2(a)(xi)* *Schedule 2.2(a)(xii)* *Schedule 2.2(a)(xvi)*	Yes
Total	Three documents total					

FINAL STAGE 1A & 1B - 27 November 2024

FEASIBILITY REPORT

FEASIBILITY STUDY & PRELIMINARY DESIGN OF TERRITORY OWNED POOLS

ck architecture

ACT Government

1.0 INTRODUCTION

1.1 PROJECT BRIEF

CK Architecture and our subconsultants have been engaged by ACT Property Group (ACTPG) of Major Projects Canberra, to carry out:

- A feasibility assessment and cost estimates for the decommissioning of Canberra Olympic Pool (COP) (Figure 1); and,
- A feasibility study, design options and cost estimates for a new dive pool at Stromlo Leisure Centre (SLC) (Figure 2).

1.2 FEASIBILITY REPORT PURPOSE

In the process of preparing this assessment a team of subconsultants has been engaged to provide advice regarding various areas including:

- Statutory Planning
- Aquatic Design and Engineering
- Recreation Planning
- Civil and Traffic Engineering
- Structural Engineering
- Electrical and Mechanical Services Engineering
- Cost Planning

The purpose of the feasibility assessment is to:

- Understand the ACTPG strategic vision and priorities regarding COP and SLC.
- Gather information regarding COP and SLC.
- Investigate COP and SLC existing pool locations.
- Engage with stakeholders to share and gather information.
- Analyse and synthesize information.
- Identify opportunities and challenges (current and future).
- Advise on the requirements to decommission COP.
- Advise on the requirements for a new dive pool at SLC.
- Explore and develop options for a new dive pool at SLC.
- Provide associated costings for options.
- Respond with recommendations.

Figure 1: Photograph: **Canberra Olympic Pool 50m lap pool under pneumatic structure**, 2018, Canberra Olympic Pool, https://www.canberraolympicpool.com.au/getmedia/2d0eaf70-6197-4202-898a-bfccc9e52d68/COP-1.png?ext=.png

Figure 2: Photograph: **Stromlo Leisure Centre 50m lap pool**, 2022, Martin Ollman, https://www.coxarchitecture.com.au/wp-content/uploads/2020/08/DSC00261-1980x1321.jpg

1.0 INTRODUCTION

1.3 FEASIBILITY ASSESSMENT STAGES

STAGE 1A

FEASIBILITY STUDY

- Develop a schedule of requirements and areas for dive pool components.
- Identify locations for a new dive pool (Figure 3).
- Prepare precedents and benchmarking study of similar indoor dive pool facilities.
- Undertake site visits and analysis to identify planning opportunities and constraints.
- Hold workshops and consultations with stakeholders, user groups, and sporting user groups.
- Liaise with the client to develop a 20-year operational financial projection for the dive facility.
- Prepare a report on construction options.
- Explore heating system options and report on potential network upgrades considering Building Management system (BMS) integration with new and existing equipment.
- Coordinate Quantity Surveyor QS and design team to prepare a high-level cost comparison of alternate options which includes capital and recurrent operating costs.

STAGE 1B

DESIGN OPTIONS AND COST ESTIMATES

- Investigate 5 options (as briefed) and an alternative option (as identified during engagement) with additional sub-options (alternate orientation of pool), develop area and component schedules, and test each option on possible site locations (Figure 4).
- Prepare detailed cost plans including a forecast of the projected patronage, a 20-year life cycle revenue, annual operating and maintenance budget, and projected financial performance of the facility.
- Undertake financial analysis to understand if an operational subsidy may be required.

Figure 3 : Photograph **Projected Site at SLC**, June 2024, CK Architecture.

Figure 4 : Digital Render **Potential Dive Pool at SLC**, August 2024, CK Architecture

STAGE 1C

COP COSTING REPORT

- Confirm parameters and gather inputs to develop a detailed costing report to secure, decommission and remediate the Canberra Olympic Pool facility.

STAGE 2

DESIGN IMPLEMENTATION

- Subject to the outcome of Stage 1. Following the Territory's examination and assessment of the data and suggestions provided during Stage 1.

1.0 INTRODUCTION

1.4 ASSUMPTIONS AND EXCLUSIONS

For the purpose of this report and associated costing, use the assumption that COP would not lie decommissioned for more than a year. This assumption of time is based on a recent public announcement (June 2024) by the ACT government regarding a commitment for a new Pool to be built in Civic that will be developed to replace COP. It is therefore assumed likely that COP would remain in use (dependent on COP's safety and condition at the time before decommissioning, including no major failure at the facility) until the new pool project was significantly commenced with a clear and defined completion date. Noting no commitment regarding the timing of a new pool facility in Civic by the current government has been made.

Fire safety, fire protection and hydraulic services are outside the scope of this feasibility report and have been excluded from this document and consultant documents.

Figure 5: Photograph: **Canberra Olympic Dive Board**, 1192, Canberra Times; https://www.pinterest.co.uk/pin/249316529345211586/

STAGE 1A

FEASIBILITY STUDY

2.0 SITE INVESTIGATIONS
3.0 STAKEHOLDER ENGAGEMENT
4.0 PRECEDENT BENCHMARKING
5.0 SITE SERVICING
6.0 BUILDING SERVICES

2.0 SITE INVESTIGATIONS

2.1 FEASIBILITY ASSESSMENT STAGES

Canberra Olympic Pool Block 7 Section 37, situated on 20587 sqm (Figure 6). The site is currently used for leisure centre with one (1) indoor pool and two (2) outdoor pools, a gym, and grassed areas, with four (4) beach volleyball courts.

Canberra Olympic Pool (COP) was built in 1955, and comprises a 50m pool, a dive pool (5m deep) and dive tower (with 2 x 1m springboards, 2 x 3m springboards, 5m diving platform and a 10m diving platform) (Figure 7), children's pool, reception, change rooms, shades structures, plant room, and kiosk. In 1992 an air supported dome structure (The Bubble) (Figure 8) was added to enable the 50m pool to be utilised year-round and this was replaced in 2008.

The design and consultant team carried out a site investigation at COP on 12 June 2024.

Figure 8: Photograph: **Canberra Olympic Pool 50m lap pool under pneumatic structure**, 2018, Canberra Olympic Pool, https://www.canberraolympicpool.com.au/getmedia/2d0eaf70-6187-4202-898a-bfccc9e52d68/COP-1.png?ext=.png

Figure 7: Photograph: **Site Visit to Canberra Olypmic Pool, June 2024, CK Architecture.**

Figure 6: Aerial map: **Canberra Olympic Pool**, 2023, ACTMAPi, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16196a91afbc026

2.0 SITE INVESTIGATIONS

CANBERRA OLYMPIC POOL DECOMMISSIONING

DECOMMISSIONING PLAN

The COP decommissioned period is expected to not more than a year. The commencement of the decommissioned period is unknown at this stage. The following factors regarding decommissioning have been considered and included in the feasibility cssessment and costings:

- **Assets -** Items for removal (including large bulky items and children's pool shade cloth).
- **Securing the site** - Including External Pools; Plant Room; Dive Tower; Buildings.
- **Discontinuation** - Of all internal lighting, external lighting circuits & mechanical systems.
- **Removal/relocation** - Of pool chemicals.
- **Essential fire services** - Will be maintained throughout the decommissioned period.

A number of risks associated with leaving the site unattended for the duration of the decommissioned period have been identified and evaluated. The existing structural drawings for the current 2008 pool dome and the condition of the surrounding buildings have been reviewed to determine whether structural adequacy can be maintained throughout the decommissioned period. The timber framed glazing to the pool plant has been identified as requiring remediation. It is suggested that removal of shrubs and vines up against the screens and barriers around the site should be undertaken to avoid the perimeter security being compromised. It has been determined that the bleachers currently on site belong to ACT Sport and Recreation and will be removed for reuse elsewhere.

Figure 9: Aerial map: **Canberra Olympic Pool**, 2023, ACTMAPi, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16196e95afbc026

Figure 10-11: Photograph: **Site Visit to Canberra Olympic Pool**, June 2024, CK

Figure 12: Photograph: **Site Visit to Canberra Olympic Pool**, June 2024, CK

Figure 13: Photograph: **Canberra Olympic Pool 50m lap pool under pneumatic structure**, 2018, Canberra Olympic Pool, https://www.canberracolympicpool.com.au/getmedia/2d0eaf70-6187-4202-898a-bfccc9e62d68/COP-1.png?ext=.png

Figure 14: Photograph: **Canberra olympic pool**, 1965, Uwe Steinward, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16196e91afbc026

2.0 SITE INVESTIGATIONS

2.2 STROMLO LEISURE CENTRE

SITE CONTEXT

Stromlo Leisure Centre is located on the eastern side of the Stromlo Forest Park precinct, in the district of Molonglo Valley, Canberra ACT. Stromlo Leisure Centre is located on Block 511 Section 0 Stromlo, at the corner of Uriarra Road and Dave McInnes Road (Figure 15). The site is used primarily for recreation with three (3) indoor pools and splash-park, a gym, cafe and creche.

PLANNING CONTEXT

Located in the ACT, Stromlo Leisure Centre is on land being held under leasehold and is managed on behalf of the Australian Government by the ACT Government, specifically the Territory Planning Authority (TPA). The site is within a Designated Area under the National Capital Plan (NCP) and any external works on site require approval from the National Capital Authority (NCA).

The site is also part of the Hills, Ridges and Buffer Spaces, and the National Capital Open Space Systems (NCOSS) according to the NCP's General Policy Plan. The site is therefore subject to the principles and policies in the NCP regarding Hills, Ridges and Buffer Spaces and NCOSS. Please refer to Appendix A for more detail regarding mentioned principles and policies.

Stromlo Leisure Centre was built 2020 and is located on the eastern side of the Stromlo Forest Park precinct. The indoor aquatic centre comprises: a 50m lap pool, 25m leisure pool, aquatic playground, bleachers, change rooms, reception, cafe, multi-purpose room, meeting room, staff areas and plant room, and is surrounded primarily on the northern and eastern sides by soft and hard landscaped areas (Figure 16). In 2023 an outdoor functional training gym was added to the east of the 50m pool. The SLC building was designed with consideration of a prospective future expansion to the south for incorporation of a new dive pool.

STROMLO FOREST PARK CONTEXT AND ADJACENT LAND USES

To the east of the site there is a proposed school site, to the south-east of the site there is land allocated for Molonglo Playing Fields; and to the south of the site a slope-style mountain biking trail course is in planning phase (Figure 17).

Figure 15: Aerial map: **Stromlo Leisure Centre,** 2023, ACTMAPi; https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

Figure 16: Aerial map: **Stromlo Leisure Centre,** 2023, ACTMAPi; https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

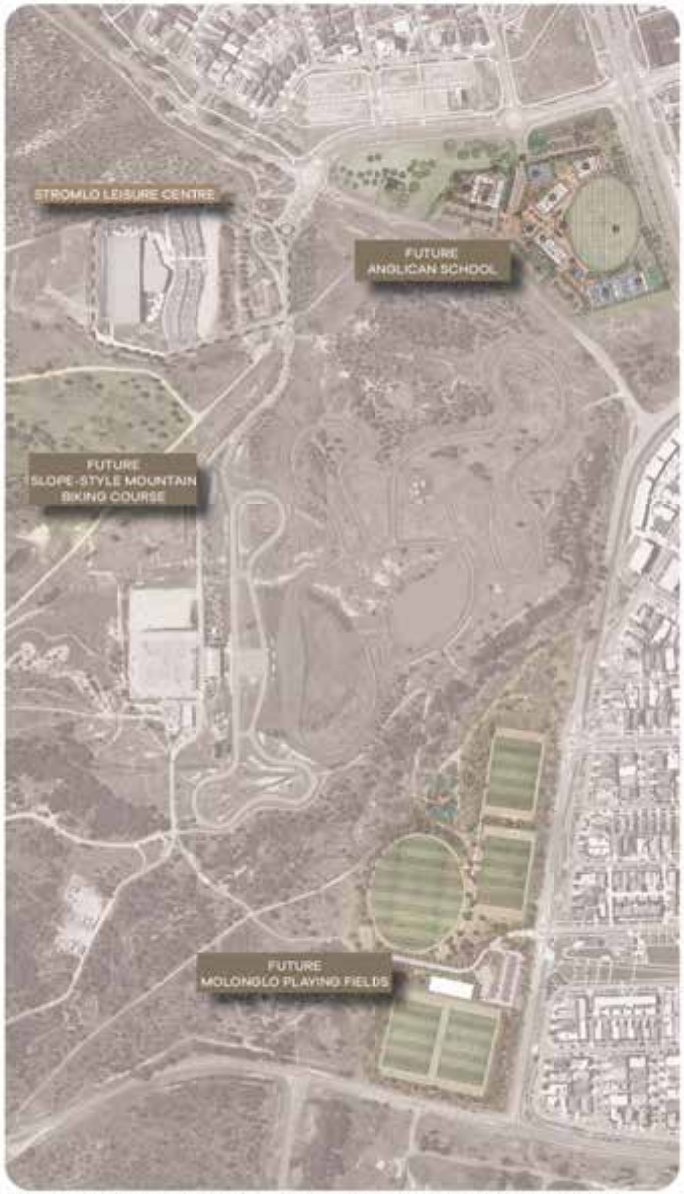


Figure 17: Aerial map & graphical overlay: **Stromlo Leisure Centre,** 2023, by ACTMAPi; https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

2.0 SITE INVESTIGATIONS

LANDSCAPE OVER TIME

Historical satellite imagery shows the changing landscape over the last few decades from a pine plantation to a multi-use recreational park known as Stromlo Forest Park, which includes Stromlo Leisure Centre.

1997

Figure 18: Aerial map **Stromlo Landscape - Pine Plantation**, 1997, ACTMAPI, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

2004

Figure 19: Aerial map **Lansdacpe After 2003 Bushfires**, 2004, ACTMAPI, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

2009

Figure 20: Aerial map **Stromlo Landscape**, 2009, ACTMAPI, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

2014

Figure 21: Aerial map **Stromlo Landscape**, 2014, ACTMAPI, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

2019

Figure 22: Aerial map **Stromlo landscape, Stromlo Leisure Centre Under Construction**, 2019, ACTMAPI, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

2023

FIGURE 23: Aerial map **Landscape Stromlo Leisure Centre**, 2023, ACTMAPI, https://apps.vertigisstudio.com/web/?app=fbfafed4f2f64670b16198e91afbc026

2.0 SITE INVESTIGATIONS

DESIGNING WITH COUNTRY CONSIDERATIONS

"Designing with country is an approach to design and planning that recognizes the unique systems of knowledge and ways of being of aboriginal people". (Cities, people love).

This project is on Ngunnawal Country. Country incorporates, both tangible and intangible elements. Country is cultural and spiritual. Country includes a knowledge of stories and cultural practices.

Figure 24: Photograph: **MT Stromlo Observatory**, August 2017, Visit Canberra, https://visitcanberra.com.au/attractions/56b23b733ed14ca745318141/mount-stromlo-obeervatory

Figure 25: Photograph: **Kangaroo Grass**, July 2024, Matthew Frawley, https://canberra.naturemapr.org/sightings/4580454

Figure 26: Photograph: **Stromlo Running Festival**, November 2023, Visit Canberra, https://visitcanberra.com.au/events/5d16e4d961a23a846fa23f27/15th-stromlo-running-festival

WALK ON COUNTRY

Our design process undertakes a Country centred approach. On 12 June 2024, the design subconsultant team experienced a Walk On Country at Stromlo Leisure Centre with Ngunnawal man Ritchie Allan from Traditional Owners Aboriginal Corporation (TOAC) (Figure 27). The group listened to Richie Allan, describing the importance of knowledge of the landscape, seasonality, biodiversity, sensory awareness, songlines, and significance of place for First Nations people, as summarised below:

SEASONALITY

Awareness of the six indigenous seasons, understanding, signs of change of season and what each season signifies and informs the reading of the landscape regarding movement and occurrence of animals and changes in vegetation. Reading the night sky, such as the constellation of the emu, informs and marks time and events.

BIODIVERSITY

Understanding of the ecosystem of the region on a macro-scale, sharing knowledge about the ways local flora and fauna co-exist in the area; and on a micro-scale understanding the behaviours and patterns of fauna (Figure 24), and changes in flora (Figure 25) with the seasons.

SENSORY AWARENESS

Insights regarding how sight, smell and touch of surroundings informs one of time and place for gathering of food, times to hunt, and time to move onto different places on Country.

SONGLINES

Songlines are aboriginal walking routes that cross the country linking important sites and locations. Describing high points around the Canberra region, including Mount Ainslie, Black Mountain and One Tree Hill. Mount Stromlo is a vantage point for viewing the landscape (Figure 26).

SIGNIFICANCE OF PLACE

Different places have different significance. Through their knowledge of Country, Ngunnawal people identified the best places to hunt, places to forage and places to meet. Sacred places, women's places, men's places.

As part of considerations for any design of a future new pool on this site, the design needs to consider the broader cultural landscape and ecosystem of which it is part. Part of the feasibility assessment includes understanding and mapping of fauna movement corridors; trees and vegetation; water overland flows; seasonal wind direction; and solar path.

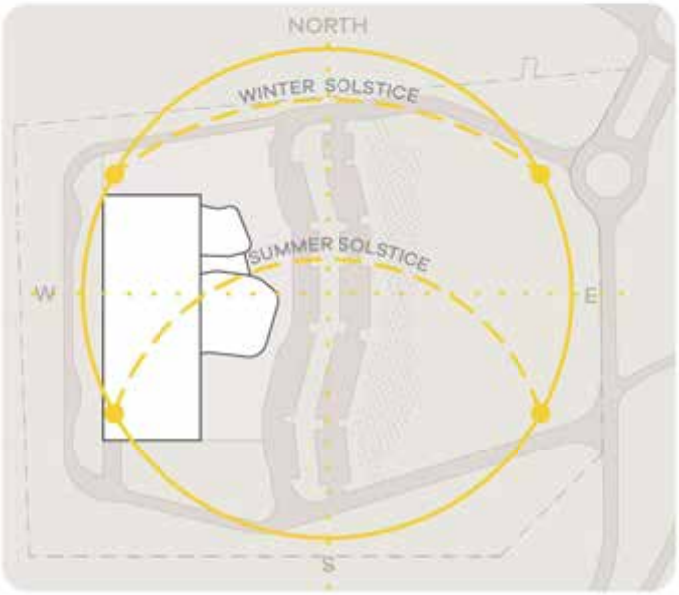
The proposed siting of the prospective new dive pool is on land immediately adjacent to the existing Stromlo Leisure Centre. Options analysis indicates that the preferred approach will be to extend the existing building. This proposed site has already been disturbed during the grading and benching of land as part of the construction process to build the existing building (2019), therefore it is unlikely that there are heritage places within the subject location. Refer to Appendix A (Statutory Planning, Stromlo Forest Park, Due Diligence Report, pages 7-8).

Schedule 2.2(a)(ii)

Figure 27: Photograph: **Walk on Country Stromlo Leisure Centre.** June 2024, CK

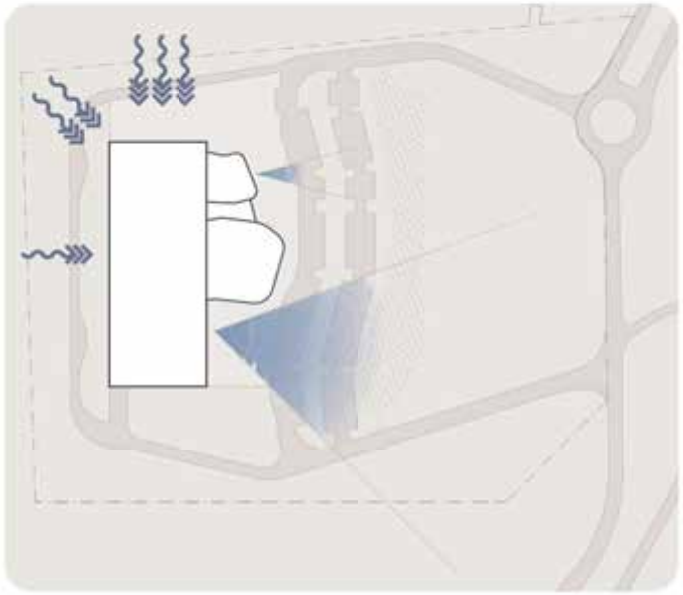
2.0 SITE INVESTIGATIONS

2.3 SITE ANALYSIS AND APPRAISAL



SOLAR PATH

The existing building is orientated north-south longitudinally with the entrance facing east. The building experiences just under 10 hours of daylight on Winter Solstice, in comparison to 14 and a half hours on Summer Solstice.

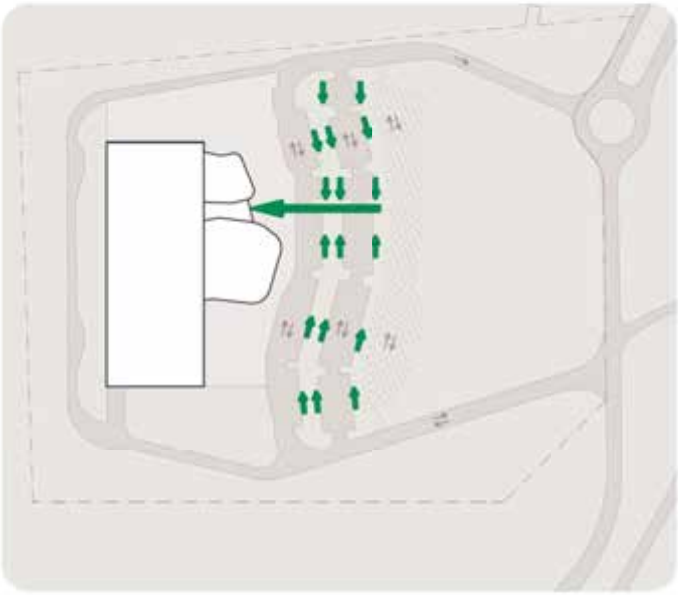


WIND

VIEWS

WIND / VIEWS

Like most of the Canberra region, SLC experiences prevailing winds from the north, north-west and west, with the windier period of the year between June and February.



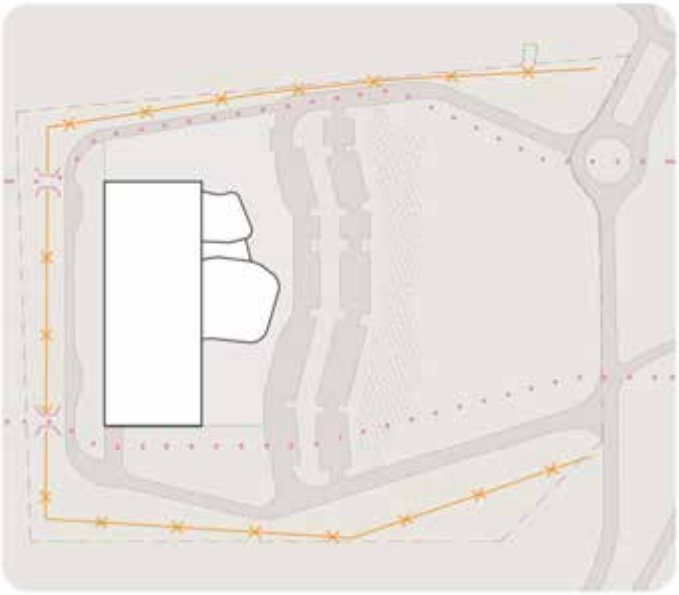
PEDESTRIAN CIRCULATION

VEHICULAR CIRCULATION

CIRCULATION

SLC has vehicular access via Dave McInnes Road to the east, where visitors can park in an on-site public car park with two-way aisles. Pedestrian footpaths run parallel to the car park, leading visitors to a central crossing which leads directly to the facility entrance.

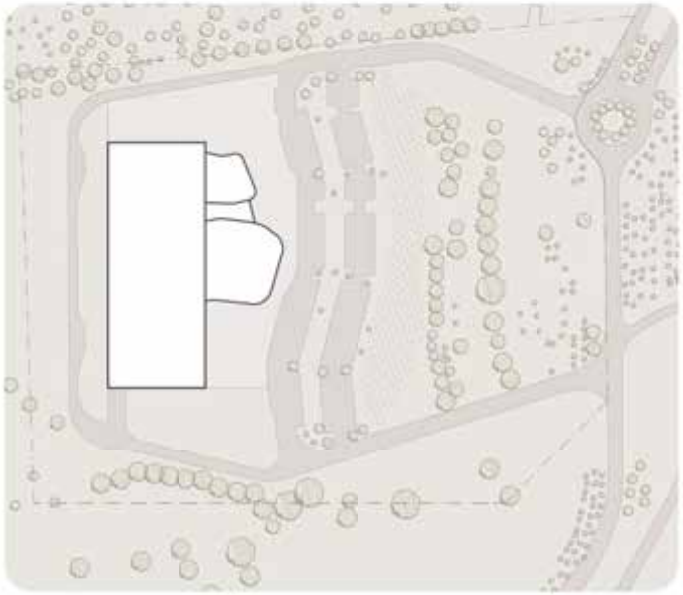
2.0 SITE INVESTIGATIONS

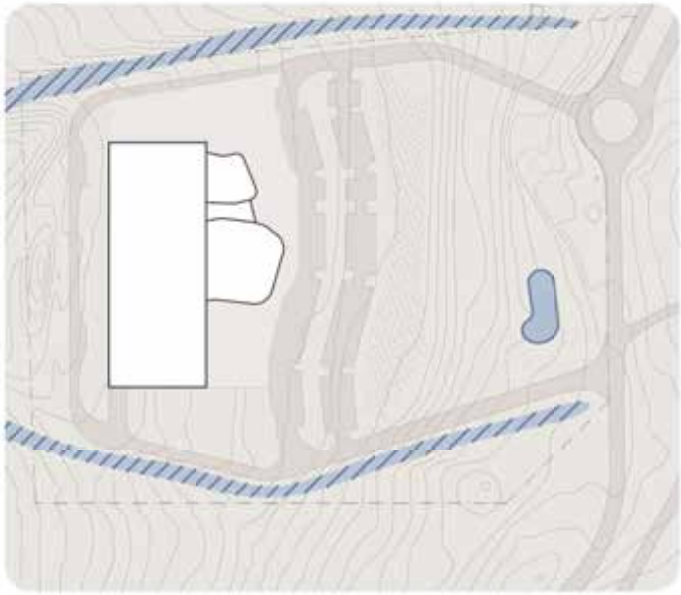


SHEEP FENCE

WILDLIFE CORRIDOR

WILDLIFE FENCELINE BREAKS





SWALES/BERMS

ONSITE DETENTION POND

CONTOUR LINES

ECOLOGY

A 1.2m high sheep fence runs along the northern, western and southern perimeters of the site. Two breaks along the fence along the western perimeter allow for all land-bound wildlife including kangaroos, wombats and echidnas to travel unimpeded in an east west direction.

CANOPY

The site contains some trees to the east of the car park, immature tree plantings within the car park, and landscaped gardens around the east and north of the building. Some established trees are also on the site boundary to the north and south but not on the subject site.

OVER FLOW AND WATER MANAGEMENT

The site slopes downward approximately 23m from east to west. With swales/berms to the north and south of the SLC site perimeter to divert overland water flows away from the structure and back into the landscape. Downhill to the east of the SLC building there is a onsite dentention pond (OSD).

2.0 SITE INVESTIGATIONS

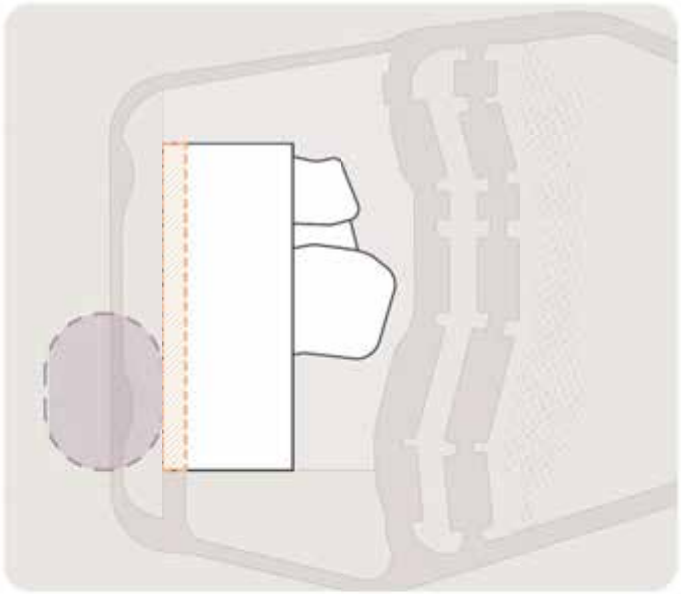
2.4 SITE JUSTIFICATION

PROPOSED ORIENTATION

The following siting locations for a new dive pool location:
Western, Northern and Eastern sides were assessed as *unsuitable*.

WESTERN SIDE

The western side of building **not** suitable as plant/service spaces run the western edge of building, is because it forms a visual and physical barrier to western side of building, also service road there.

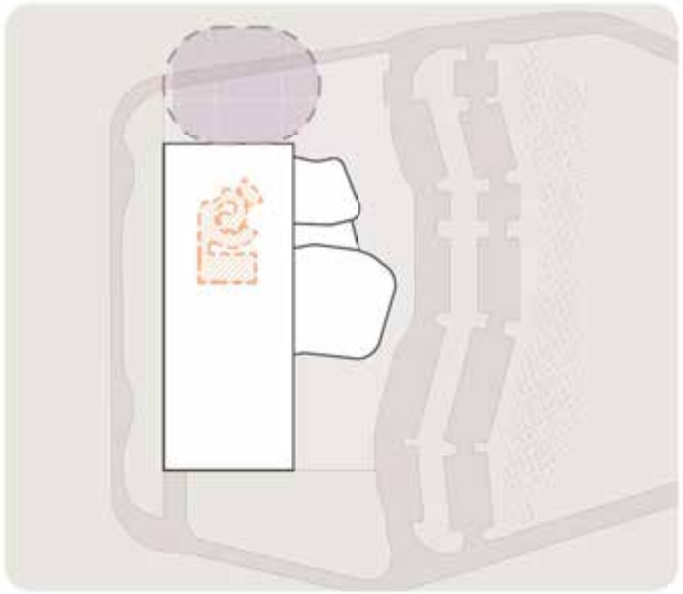


WESTERN SITING LOCATION

SERVICES CORRIDOR / CHEMICAL STORE

NORTHERN SIDE

The northern side of building **not** suitable area for a deep-water pool due to proximity to children's shallow pool.

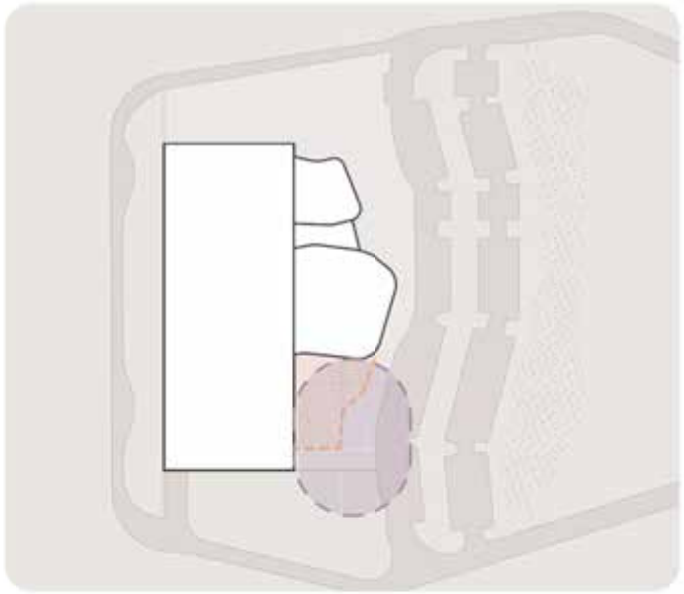


NORTHERN SITING LOCATION

CHILDREN'S POOL

EASTERN SIDE

The eastern side of building **not** suitable area for expansion due to location of recent outdoor facilities/infrastructure/ training area. There are also practical constraints such as the potential duplication of structure and the unnecessary introduction of internal guttering to divert rainwater from the high side of the existing roof.



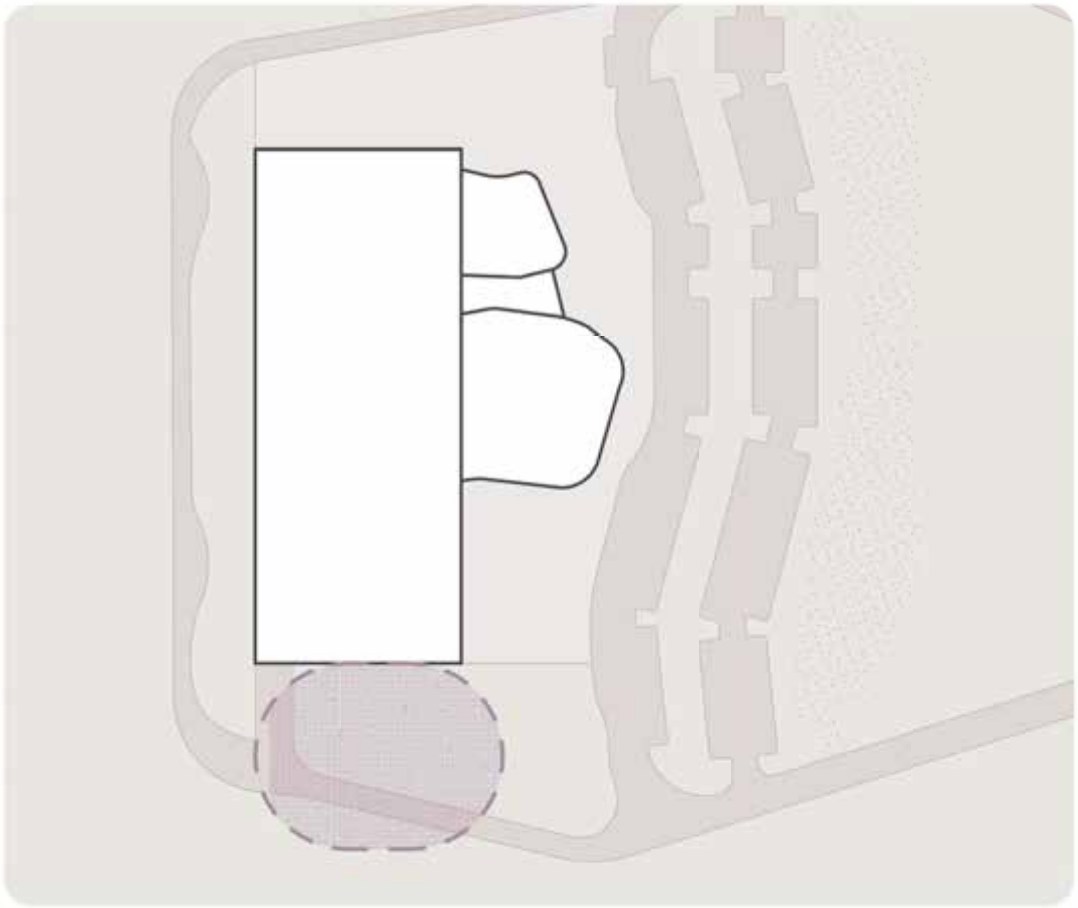
EASTERN SITING LOCATION

OUTDOOR GYM

2.0 SITE INVESTIGATIONS

PROPOSED ORIENTATION

The siting location for a new dive pool on the Southern side of the building has been assessed to be ***suitable***.



SOUTHERN SITING LOCATION

SOUTHERN SIDE

The southern side of building was previously identified as a site for future expansion. The structure, plant rooms, service corridors, spectator seating, roof and pool hall can be 'extruded' onto the southern site. Visual and functional connection between new and existing facility can exist, and views to the east can be maintained from both pools.

2.0 SITE INVESTIGATIONS

OPPORTUNITIES

ELEVATION

Site is elevated and visible from other parts of Canberra.

VIEWS

Aesthetic value of Eastern views from pool deck.

ENHANCE KEY ATTRACTOR

Addition of amenities at the existing pool will make the facility a more attractive place for visitors.

LEVERAGE EXISTING CORE POOL FACILITIES

Entry/cafe/cffices/ancillary space to create an expanded/ enhanced aquatic offering

SUSTAINABILITY

Low embod ed carbon and renewable energy solutions eg.solar, electrified heating plant.

ANCHOR

SLC has potential to become the anchor of and connect the larger recreational area.

DEMOGRAPHICS

The area's population is rapidly growing, with a large number of professionals and young families providing a source of local visitors.

FORM

A dive tower will be a striking visual element, a contrasting vertical form to the existing horizontal structure.

PARTICIPATION PATHWAY

Potential to grow participatcn in diving, swimming and water polo to provide entry level pathways for these sports

Figure 28: Photograph: **Stromlo Leisure Centre**, August 2020, COX Architecture, https://www.coxarchitecture.com.au/project/stromlo-leisure-centre/

CONSTRAINTS

LIMITED EXPANSION

The surrounding roads and existing buildings will limit locations for expansion and restrict siting options.

VIEW OBSTRUCTIONS

Depending on siting, the development has the potential to limit the eastern views from the pool ceck and bleachers.

TOPOGRAPHICAL CHALLENGES

Potential for increased construction costs and complexity; and Additional ramps for accessibility may be required compared to a flat site.

BUSHFIRE

SLC is currently on the outskirts of the zone affected by the 2003 fires.

EROSION/STORMWATER

Existing swales may need to be modified depending on the building footprint.

CONGESTION

Increased traffic from nearby roads and Mountain biking (especially on weekends).

UTILITY CONSTRAINTS

Existing infrastructure may need upgrading to support a larger facility.

BIODIVERSITY LOSS

Potential for biodiversity loss or perceived over-development of a non-urban area.

PROXIMITY TO PUBLIC TRANSPORT

Not easily accessible by public transport and a significant distance from main centres.

IMPACTS DURING CONSTRUCTION

Operational impacts during construction to pool users, operators and public in vicinity.

2.0 SITE INVESTIGATIONS

RISKS ANALYSIS

EXISTING SITE RELATED RISKS

- A geotechnical survey was carried out prior to the construction of the existing SLC building. This existing information is deemed a moderate risk at this stage of this feasibility study, due to uncertainty of deep ground conditions due to insufficient depth of core samples. A further detailed geotechnical survey of the proposed site for the new dive pool with core samples of at least dive pool footings depth would serve to mitigate this risk.

ENGINEERING RISKS

- Aquatic Engineering
  - Construction risks of dewatering deep dive bowl excavations due to overland flow management obstruction.
  - Serviceability to existing plantrooms during construction. Current Geotech information on Objective Connect deemed a moderate risk at this stage given the knowledge of how ground conditions have altered recently on the site.
- Mechanical & Electrical
  - Energy Provider available capacity to meet new project's energy demand.
  - Electrical demands for hydraulic and fire protection not available.
  - Mechanical noise impact of heat pumps and air handling units to neighbouring areas, acoustic consultant may be required. Acoustic louvres can add additional cost and should be reported as an exclusion from costing until expert advice available.

Contingency has been adjusted to take in consideration these risks.

STRUCTURAL RISKS

- Poor ground conditions on site with uncontrolled fill. Major load bearing columns requiring large/deep piled foundations.
- Sketch options have roof and timber rafters spanning further than in original building and will likely exceed their capacity.

PLANNING RISKS

- Building height, two storey allowable any higher need to demonstrate a critical facility and visual impacts for height justification.

CIVIL RISKS

- Increase of impervious area and stormwater runoff may have effect on existing stormwater network.
- Risk of interaction between pedestrians and construction vehicles during construction.

OVERALL PROJECT RISKS

- As part of overall strategy for ACT decisions regarding a future dive pool needs to be made as part of an overall stratEgy for pools in the ACT, with clear vision and objectives.

Figure 29: Photograph, **Stromlo Leisure Centre**, August 2019, Kane Constructions, https://www.kane.com.au/project/stromlo-leisure-centre

3.0 STAKEHOLDER ENGAGEMENT

The purpose of stakeholder engagement regarding the Feasibility Assessment and Preliminary Design for Territory Owned Pools project is to:

- Provide information to stakeholders regarding the feasibility study.
- Gather information from stakeholders to inform the feasibility study.
- Hold stakeholder meetings and workshops to gather and share information.
- Provide stakeholders with knowledge of the project's potential.

This Stakeholder Plan (SP) identifies stakeholders and outlines activities to engage with each stakeholder group. The four key stakeholder groups are:

- Government and Cross Directorate Stakeholders
- Pool Operators
- Sporting User Groups
- Utility Service Providers

3.1 STAKEHOLDER ENGAGEMENT PLAN

Stage 1 of the Feasibility Assessment comprised of three (3) stakeholder workshops. The purpose of the workshops was to:

- Share and gather information with stakeholders to inform the feasibility assessment.
- Engage with each stakeholder group to identify requirements, priorities and considerations;
- Assemble information regarding user requirements;
- Identify opportunities and challenges.

The three (3) workshops were conducted over a period of 9 weeks, during June/July 2024.

METHODOLOGY

The stakeholder engagement methodology is outlined below:

- Gather contact information.
- Build knowledge of stakeholder group.
- Prepare a list of Questions to provide to stakeholders prior to workshop.
- Gather and collate responses to Questions to inform Workshop content.
- Prepare Workshop Presentation slides, including workshop agenda, photos, aerial photos, data, key points, prompts etc.
- Conduct Workshops with each identified stakeholder group.
- Guide workshop discussion, and record discussion, key points and actions.
- Draft Workshop Notes and circulate to group for comment.
- Analyse and synthesize information.
- Document stakeholder activities and outcomes in Feasibility Report.

WORKSHOP QUESTIONS

The design and subconsultant team in consultation prepared a set of questions. This initial engagement was to prepare stakeholders prior to the Workshop; to finalise workshop preparations; and to assist in maximising the effectiveness of engagement time during the workshop, forming prompts for what was to be discussed.

Stakeholders were asked General Questions regarding various topics including: use of COP facility; use of SLC facility; aspirations, priorities and requirements; and opportunities and challenges. The Specific questions pinpointed areas our subconsultants required more detailed information for their inputs into the Feasibility Assessment and in the development of design options. Questions were provided by email at least two weeks prior to the Workshop, with responses due back 3 days prior to the Workshop.

Refer to Appendix B for detailed Workshop Notes and Questionnaires.

WORKSHOP 1	WORKSHOP 2	WORKSHOP 3
12 JUNE 2024	3 JULY 2024	24 JULY 2024
STAKEHOLDER GROUPS	**STAKEHOLDER GROUPS**	**STAKEHOLDER GROUPS**
Government / Cross-Directorate and Subconsultants	Pool Operators	Sporting User Groups
WORKSHOP FOCUS	**WORKSHOP FOCUS**	**WORKSHOP FOCUS**
Requirements and Considerations Opportunities and Constraints Indicative Siting Options Questions/Responses and Discussion	Requirements and Considerations Opportunities and Constraints Indicative Siting Options Operations Discussion Heating Systems Discussion Benchmarking – example projects	Requirements and Considerations Opportunities and Constraints Indicative Siting Options Questions/Responses and Discussion

3.0 STAKEHOLDER ENGAGEMENT

3.2 WORKSHOP 1

GOVERNMENT AND CROSS DIRECTORATE STAKEHOLDERS

The stakeholder groups identified by the ACT Property Group (ACTPG) as being relevant to this feasibility assessment are described in table below.

DIRECTORATE	CONTEXT
ACT Property Group (ACTPG)	Client

CROSS-DIRECTORATE	CONTEXT
Transport Canberra City Services (TCCS)	Stormwater and Flood Risk (WSUD), Traffic Impact Assessment (TIA), Tree Unit
National Capital Authority (NCA)	City South Precinct strategy inclusive of Canberra Olympic Pool (COP)
City Renewal Authority (CRA)	Similar Projects
Environment, Planning and Sustainable Development Directorate (EPSDD)	Stromlo Forest Park
ACT Sport and Recreation	Similar Projects

Figure 30: Photograph: **Site Visit Stromlo Leisure Centre**, June 2024, CK Architecture

WORKSHOP 1 FORMAT

Workshop 1 was conducted on Wednesday 12 June 2024, in a hybrid format (Microsoft Teams/in-person) from a meeting room at Stromlo Leisure Centre (SLC) and followed site visits at COP and SLC earlier in the day (Figure 30).

Refer to Appendix B for detailed Workshop Notes and Questionnaire.

WORKSHOP 1 DISCUSSION AREAS

- ACT Government Directorate stakeholders
- Asset Owner
- Government Management
- Risk Mangement
- Cross-Directorate coordination
- General Public perceptions

WORKSHOP 1 DISCUSSION FOCUS

- Requirements and Considerations (COP)
  - Priorities and Requirements
  - Site Conditions
  - Considerations for Decommissioning

- Requirements and Considerations (SLC)
  - Aspirations, priorities and requirements
  - Site Conditions and Adjacent Land Uses
  - Analysis and Appraisal
  - Opportunities and Constraints
  - Area Schedule and Indicative Siting Options
  - Cross-Directorate : key points from each Directorate:
    - Stromlo Forest Park
    - ACT Sport and Recreation
    - City Renewal Authority
    - Transport Canberra City Services

WORKSHOP 1 KEY TAKEAWAYS

CANBERRA OLYMPIC POOL

- No heritage sensitivities
- Decommissioning (not Demolition)
- Duration of decommissioned period to be confirmed
- Need to Secure Site
- Need to make safe pools – to mitigate fall risk
- COP is an important facility for water polo – demand will shift elsewhere once COP decommissioned.
- 3 schools utilise COP for carnivals

STROMLO LEISURE CENTRE

- Need to cater for both competitive and recreation users of the dive pool.
- Option 5 with 50m pool may be economically, environmentally and functionally unviable.
- Recreational needs described did not align with Options 1-5
- Risk management regarding 10m tower advised.
- Outdoor functional training gym was added to east side of facility in 2023.
- Slope-style mountain bike course planned to the south of SLC southern boundary.
- Demand for dive facilities is difficult to gauge as numbers could be genuinely low or affected by lack of attractive facilities.
- Decision to move away from 50m pool option due to higher operational costs (energy, chemical and maintenance), likely too high for demand.
- 30+ schools utilise SLC for carnivals.
- Consideration to upgrade SLC gas heating system to electric system.

NCA CONSULTATION

CK Architecture and Purdon Planning consultants engaged with NCA at the NCA headquarters on 25 July 2024 to present six (6) design options for the siting of a new dive pool at Stromlo Leisure Centre. NCA is unsupportive of Option 5 due to architectural treatment of existing building. NCA advised a full traffic impact assessment and tree removal approval from TCCS required for next stages. NCA recommended a visual impact study be carried out if the building exceeds the current height of the existing building. If the proposed building extension was to exceed the existing building height (10.5m) this would not necessarily be considered in keeping with a 2 storey building height limit.

3.0 STAKEHOLDER ENGAGEMENT

3.3 WORKSHOP 2

Schedule 2.2(a)(ii)

WORKSHOP 2 FORMAT

Workshop 2 was conducted on Wednesday 3 July 2024, in a hybrid format (Microsoft Teams/in-person) from a meeting room at Stromlo Leisure Centre (SLC) followed by a facility walk through (figure 31).

Refer to Appendix B for detailed Workshop Notes and Questionnaire.

WORKSHOP 2 DISCUSSION AREAS

- Asset Management
- Operations/Risk
- Management and Maintenance
- Stakeholder Identification – Sporting User Groups
- Aquatic Systems

WORKSHOP 2 FOCUS

- Requirements and Considerations (COP)
  - Demand and Usage
  - Large bulky items
  - Asset Register
  - Sporting User Groups
  - Utility Service Providers

- Requirements and Considerations (SLC)
  - Aspirations, priorities and requirements
  - Management and Maintenance
  - Sporting User Groups
  - Utility Service Providers
  - Site Analysis and Appraisal
  - Opportunities and Constraints
  - Siting Options
  - Indicative Options
  - Benefits and Challenges of Each Option

- Operations
  - Performance and Demand
  - Factors influencing type of new pool

- Aquatic Systems
  - SLC Heating Systems consideration of BMS integration (new and existing)
  - Longer term strategy/intentions for energy
  - Impact on multi functionality of dive pool on energy use
  - Benchmarking
  - Examples of dive pool precedents
  - Examples of movable floors
  - Examples of pool finish options and performance

- Benchmarking
  - Examples of dive pool precedents
  - Examples of movable floors
  - Examples of pool finish options and performance

Figure 31: Photograph: **Site Visit Stromlo Leisure Centre.** June 2024. CK Architecture.

3.0 STAKEHOLDER ENGAGEMENT

WORKSHOP 2 KEY TAKEAWAYS

Workshop 2 was a productive session Schedule 2.2(a)(ii) providing key insights into various operational, management and maintenance factors for consideration. Schedule 2.2(a)(ii) also provided information regarding key Sporting User Groups, and valuable feedback regarding Options presented.

CANBERRA OLYMPIC POOL

- Schedule 2.2(a)(ii) have strongly voiced concerns regarding the possible closure of COP.
- Security around COP good with high fence, vegetation cover preventing climbing, and security cameras.
- Plant is old with risk of mechanical failure before decommissioning.

Schedule 2.2(a)(ii)

Figure 32: Photograph. **Stakeholder meeting.** July 2024, CK Architecture.

STROMLO LEISURE CENTRE

Demand and Usage

- Demographics of the area, growing population need to meet demand.
- SLC is operating under maximum capacity for 'learn to swim' lessons.
- A large new school proposed to the east of site intending to utilise SLC as main venue for school swimming activities and events, which will increase demand on centre.

Priorities and Requirements

- Potential for negative public reception if recreational dive facility at COP is removed and not replaced elsewhere.
- Options regarding movable floor to provide multi functionality.
- Noted that generally pools with functions that don't require lane ropes (such as Dive pools) are better suited to moveable floors as there is less to do during change over periods.
- Ecology study required at later stage of project.

Challenges

- Elite diving facilities prohibit public use of diving boards, limiting public benefit.
- Nationally, 5m diving platforms not utilised by public recreationally (perhaps ACT now needs to consider this also).
- Potential for negative public reception if recreational dive facility at COP removed and not replaced elsewhere.
- Indicative site location constrained by existing access road, which would need to be replaced further to the south requiring significant earthworks.

Opportunities

- Leverage existing SLC facilities for an enhanced aquatic offering.
- Expand SLC to cater for increasing population and demand

Options

- Indicative Siting Locations – reasoning for each.
- Area Schedules for Options presented.
- Options 1-6 presented, with the benefits and challenges of each.
- Group discussion regarding Option 2 deemed most like COP.
- The proposed location for the new dive pool to the south of the existing 50m pool hall was broadly supported.
- Option 5 was not well supported due to the large body of water to heat and maintain; did not align with usage/ demand; and with site constraints to fit.
- Option 6 more suited to recreational users (not competition level); with a moveable floor offering versatility from learn-to-swim through to water polo and diving training.
- Option 6 wcs deemed suitable if a 5m platform added.

Schedule 2.2(a)(ii)

Figure 33: Photograph. **Stakeholder meeting.** July 2024, CK Architecture.

3.0 STAKEHOLDER ENGAGEMENT

3.4 WORKSHOP 3

Schedule 2.2(a)(ii)

WORKSHOP 3 FORMAT

Workshop 3 was conducted on Wednesday 24 July 2024, in a hybrid format (Microsoft Teams/in-person) from a meeting room at Constitution Place (ACT Government City Offices).

Refer to Appendix B for detailed Workshop Notes and Questionnaire.

WORKSHOP 3 DISCUSSION AREAS

- Sporting User Group information
- Sporting User Group needs
- Sporting User group performance and demand
- Sporting User group perspectives

WORKSHOP 3 DISCUSSION FOCUS

- About the Fecsibility Study
- About each Sporting Group
    - History, member numbers, activities
    - Aspirations
- Requirements and Considerations (SLC)
    - Priorities and requirements for SLC
    - Sporting User Group considerations for SLC
- Site Analysis and Appraisal (SLC)
    - Opportunities and Constraints
    - Indicative Siting Options

Figure 34: Photograph, **Canberra Schools Comp**, 2023, Canberra Waterpolo Academy, https://www.canberrawaterpoloacademy.com/

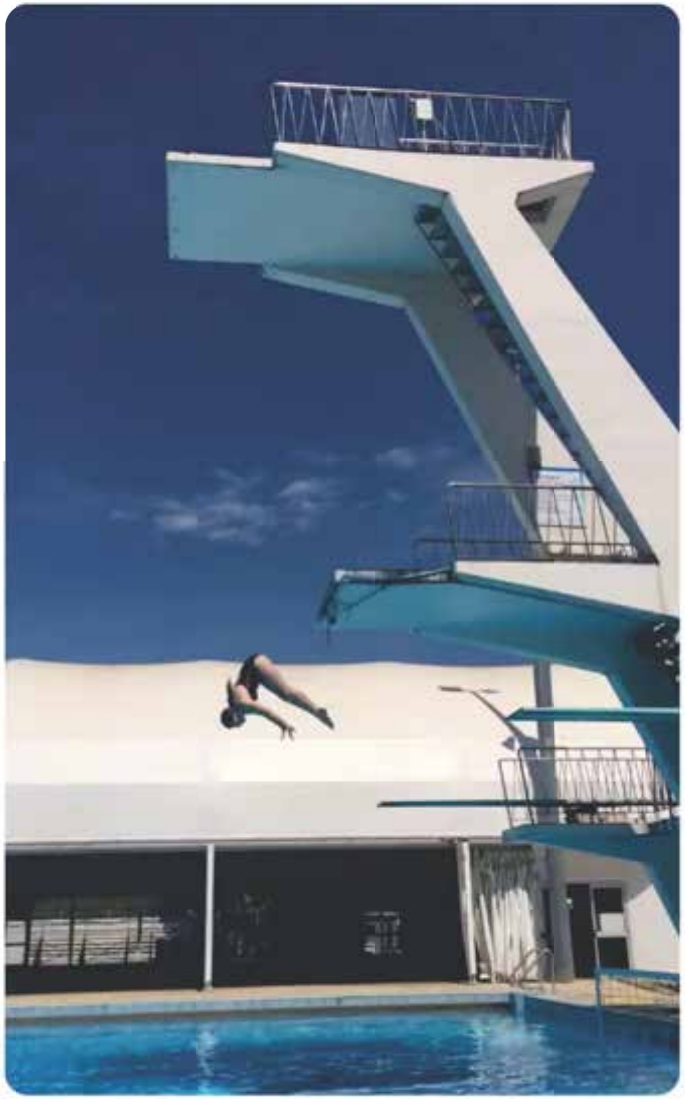


Figure 35: Photograph, **Canberra diver using the Civic Olympic Pool diving platform**, 2018, Dot Waldren, https://the-riotact.com/canberras-most-disadvantaged-sport/253111

3.0 STAKEHOLDER ENGAGEMENT

WORKSHOP 3 KEY TAKEAWAYS

Workshop 3 was well attended Schedule 2.2(a)(ii)

The group also discussed functional use, equipment needs and provided useful feedback on Options.

Schedule 2.2(a)(ii)

- Peak body in the ACT, includes 6 water polo clubs
- 1300 members
- All clubs use COP except Gungahlin AIS used for Competition
- Multiple pools to be used at once for comp is the preference
- Note preference for Indoor
- Min. width they require is 25m (not 20m as options noted) Preference would be 30m wide
- Can't use 50m pool at Stromlo as its not bookable by them due to recreational swimming
- Sydney Olympic Park Aquatic Centre (SOPAC) Pool a good example

Schedule 2.2(a)(ii)

- Using COP Dive Pool for 46 years
- 233 members
- In season they use the pool 3x per week for 1.5hrs at a time

Schedule 2.2(a)(ii)

Team provided input for a new dive pool which include: to meet the CMAS International Rules for the sport dictate pool requirements, including

- A 5 metre depth is strongly preferred so that members can train at the same depth as competitions interstate
- The pool sides should ideally be perpendicular to the bottom. If sloped sides are necessary, permanent attachment points for the goal and backboard are required, and smooth surfaces like tiles are preferred to minimize player injury.
- The club has expressed that ideally it could host state and national competitions and training camps.
- A purpose built indoor pool would be a 'game-changer' and support ACT to become more competitive at national level.

Schedule 2.2(a)(ii)

- Schedule 2.2(a)(ii) due to the fact they have no proper all year facility they note this would grow if they could have a proper all year facility.
- Require warm showers on Pool deck Schedule 2.2(a)(ii)
- Would like a warm spa Schedule 2.2(a)(ii)
- Need dryland equipment externally including inground Trampoline and dive-pit
- Disability access only needed for those with cerebral palsy or blind or deaf disability not wheelchair athletes
- Preference is for 10m but will accept 7.5m Platform
- Minimum depth they require is 5m for safety of amateurs
- Competition level pool required
- Tabled FINA Olympic and World championship requirement for 4.5m depth for 3m platform (where options show 3.8m depth)
- Gold Coast Aquatic Centre dryland dive facilities are best comparison Schedule 2.2(a)(ii)

Schedule 2.2(a)(ii)

- Noted that swimming must be considered use not just diving and other sports clubs
- These groups need a Civic pool as that's where they are located
- Asked why no federal funding had been given/sought for aquatic facilities in the ACT. "Of the two Federal Government funds where aquatic facility funding can be established, as well as the ALP federal election commitments between 2017 and 2022. The ACT has received $0 of the available $316,474,991 worth of funding. Aquatic infrastructure has been neglected in the ACT as the quality of current facilities declines and maintenance costs increase. "
- Supplied ACT Gov. aquatic strategy document 2013-2033 by email and asked for confirmation a new one was being written
- A Pool at Stromlo must consider Triathlon

Schedule 2.2(a)(ii)

- Lobbying for a centrally located pool in Civic
- A new pool should be close to a transport hub
- Dive Pool not suitable at Stromlo due to poor accessibility
- Which option is selected should not be decided by cost but rather overall project objectives

Schedule 2.2(a)(ii)

- A new pool should be close to a transport hub
- Note Stromlo is an unsuitable location for a Dive Pool as it is not accessible easily by Public Transport- eg it takes 1hr by bus from Woden
- Accommodation nearby is needed for competitions eg Phillip would supply this if one was located there

Schedule 2.2(a)(ii)

- Would like 2 sports to be able to operate at one time- eg Diving and Water Polo
- Sports Use is required not another general Recreational Pool is required
- All sports could expand their membership if they had better facilities
- A new Competition Level State Aquatic Centre would drive the tourism economy in the ACT
- New facility should be better not equal to what exists at COP

Figure 42: ADOBE INDESIGN TEXT TO IMAGE AI GENERATOR "Underwater Bubbles"

4.0 PRECEDENT BENCHMARKING

4.1 GENERAL TRENDS AND OBSERVATIONS

The following general trends provide insights regarding aquatic sports pathways, coaching models and venue compositions, which identify principles that need to be considered in the context of decision making regarding aquatic sports infrastructure.

SPORTS PATHWAY OPPORTUNITIES AND GENERAL PARTICIPATION

The AIS has developed the Foundations, Talent, Elite and Mastery framework to capture different sporting pathway phases and these are defined as:

- **Foundations** - Early development, refinement and the foundations of movement.
- **Talent** - Athletes progressing into high performance pathways.
- **Elite** - Achieving success though senior international representation,
- **Mastery** - Sustained success over multiple cycles.

In addition to the above, there is recreational participation in sport related activities at community facilities, and this is highlighted by the relatively high community use of the dive boards at Canberra Olympic Pool (COP).

Given the differing requirements for each of these phases/ groups it is almost impossible to be everything to everyone in a facility. As one example, there is an incompatibility between an elite dive program and community-based usage. At Melbourne Sports and Aquatic Centre (MSAC), which is a National Dive Performance Centre, recreational/public use of the dive boards is not permitted.

Importantly, the design of an aquatic centre must reflect the overall pathway objectives.

Figure 43: Photograph: **onstruction continues inside the CenturyLink Center for the 2012 U.S. Olympic Swim Trials.**, 2012, myrtha pools; https://www.ketv.com/article/pool-construction-ahead-of-schedule-for-olympic-swim-trials/7634207

Figure 44: Photograph: **Indianapolis**, 2024, myrtha pools; https://www.myrthapools.com/en/projects/indianapolis-2024/

TRAINING CENTRES OF EXCELLENCE

Many National sporting organisations recruit talented athletes to well-resourced training squads. In swimming and diving a centre of excellence approach is considered optimal and regarded as best practice. Australia's National Swimming Coaches are predominately located in south-east Queensland, where there are a number of strong swimming clubs associated with swimming centres of excellence. The climate and swimming culture in these areas are conducive to elite swimming and proximal to the Brisbane Aquatic Centre, Queensland's premier aquatic complex for a multitude of aquatic sports. Elite coaches are attracted to leading focused centres, such as training centres of excellence.

This model relies upon athletes relocating to a training centre of excellence to train with an elite squad (e.g. Ariarne Titmus moved from Tasmania to SE Queensland in 2015). Elements of this method have some similarities to the approach in China for Diving, with 46 out of 56 Olympic gold medals won by divers from China since the 2000 Olympics.

MAJOR EVENTS - A MOVE TO TEMPORARY VENUES WITH CITY FOCUS

The trend for International and National events is of the construction and utilisation of temporary venues for major events in city centres. The recent Paris Olympics focused on temporary infrastructure showcasing the monuments, architecture and city scape as a backdrop for sports competitions to deliver a spectacular atmosphere and a more environmentally friendly major event. These temporary venues provided a focus on the city highlighting the city's key features such as the Eiffel Tower and the River Seine, whilst also proximal to hotels, restaurants, public transport links and conveniences of the city centre. The Aquatics Centre and the Climbing Wall were the only two permanent sports facilities to be built for the Paris 2024 Olympic Games. The new Aquatic Centre was used for Diving, Water Polo and Artistic Swimming, while the swimming competition was held in a temporary pool in an indoor arena.

Examples of temporary aquatic centre facilities that have been constructed for major events (often in existing stadiums) include:

- 2024 Olympic Games, Paris
- 2024 US Olympic Trials, Indianapolis (Figure 44)
- 2024 World Aquatic Championships, Doha
- 2023 World Aquatic Championships, Fukuoka
- 2022 FINA Swimming World Championships, Abu Dhabi
- 2020 (2021) Olympic Games, Tokyo
- 2016 Olympic Games, Rio de Janeiro
- 2007 FINA Swimming World Championships, Melbourne Park

The swimming venue for the 2028 Olympic Games in Los Angeles and 2032 in Brisbane are also likely to be temporary venues.

For further background regarding aquatic research see Appendix C Recreational Planning Report.

4.0 PRECEDENT BENCHMARKING

4.2 PRECEDENTS

AQUANATION (VIC)

Aquanation is located at Ringwood in Melbourne and is an indoor aquatic facility which includes a dive pool (20m x 25m) as an extension of the 10-lane 50m pool (the total pool length is 70m x 25m). The pool depth is graded to 5m deep, and has 1x 1m springboard, 1x 1m platform, 4x 3m springboards, 1x 3m platform, 1 x 5m platform, 1x 7.5m platform and a 10m platform. Aquanation affords multifunctional use offering swimming lessons and pool lane hire options. The pool is utilised by the Ringwood Dive Club and some water polo groups. Aquanation is the venue for occasional state level events (Figure 45).

MELBOURNE SPORTS AND AQUATIC CENTRE (VIC)

Melbourne Sports and Aquatic Centre (MSAC) is located in Albert Park, Melbourne. MSAC is a national centre of excellence and is utilised by Diving Victoria, the Victorian Institute of Sport, for water polo and events, with no public use. MSAC was the venue for the Commonwealth Games (2006) and the World Championships (2007). MSAC has two movable floors, one in a program pool and another in the 50m pool. MSAC is fully compliant to World Aquatics standards with pool depth graded to 5m, and 5x 1m springboards, 4x 3 m springboards, a 3m, 5m, 7.5m and 10m diving platforms (Figure 46).

The centre provides other diving related facilities including electronic timing and video board; modest dryland diving area; seating overlay customised for events; bubbler available for 10m tower usage; marshalling area for events; and dedicated spa pool provided for major events. events.

GOLD COAST DRYLAND DIVE FACILITY (QLD)

The Gold Coast Aquatic Centre was the venue for the 2018 Commonwealth Games and includes a Dryland Dive facility. This Dryland Dive facility is approximately 380-400sqm and includes springboard diving set-up into foam pits.

A large central diving pit serves two springboards, two 1m platforms and an in-set trampoline. Two in-set trampolines and two additional springboards with large landing mats are also provided. Stretching space is provided for warm-up and warm-down, as well as structural framing above trampolines for spotting apparatus (Figure 47).

Figure 45: Photograph: **The building site of the new Australian Diving Centre at Aquanation in Ringwood**, 2015, Richard Serong; https://www.heraldsun.com.au/leader/outer-east/ringwoods-revamped-aquatic-centre-finally-has-an-opening-date-after-a-threeyear-closure/news-story/49bb0e74fd5734db93faed6fa2ebc39e

Figure 46: Photograph: **State sports centres – MSAC**, 2021, Christine Tan photography https://maps.app.goo.gl/Ep4ZxQ3DPWiwtKH46

Figure 47: Photograph: **Gold Coast Aquatic Centre**, 2024, Mike McGrath; COOP studio.

4.0 PRECEDENT BENCHMARKING

PYMBLE LADIES COLLEGE (NSW)

Pymble Ladies College is located in the suburb of Pymble in Upper North Shore Sydney NSW. Pymble Ladies College includes an 8-lane indoor 50m competition pool with a dive tower located at one end. The shallow end of the pool is 2m deep and the deep end is 3.7m deep (minimum WA / FINA requirement) to serve the two 1m springboards, two 3m springboards and the 5m platform. A separate learn-to-swim pool is provided in an adjacent pool hall.

The facility is utilised by the school for swimming skills and activities and also offers a learn-to-swim program for the community. Due to spatial limitations, the positioning of the dive tower at the end of the 50m pool creates operational challenges for officiating and timekeeping of competitive swimming events and the like (Figure 48).

CAULFIELD GRAMMAR SCHOOL (VIC)

Caulfield Grammar School has aquatics facilities at each of two campuses (Wheelers Hill Campus and the St.Kilda East Campus) in Melbourne. The St.Kilda East Campus has a new facility that contains an indoor heated 8-lane 50m pool with a moveable boom and elevated spectator seating. Pool depth is generally 2.2m, with a 3.8m deep dive bowl (approximately 10m x 10m) serving one 1m springboard and one 3m springboard. A movable floor at the other end of the pool, extending for approximately 15m, caters for learn-to-swim classes and other aquatic programs.

The springboards are located on the side of the pool, close to one end, which does present challenges for officiating and timekeeping of competitive swimming events and the like (Figure 49).

CARNEGIE MEMORIAL SWIMMING POOL (VIC)

Carnegie Memorial Swimming Pool is located in south-eastern Melbourne in Koornang Park in the suburb of Carnegie. Carnegie Memorial Swimming Pool is a community level facility that is currently being redeveloped. The original facility, opened in the 1960's, included an outdoor 50m pool and dive pool (Figure 50).

The redeveloped facility will include an outdoor 50m competition pool and a new outdoor dive pool. The dive pool, including one 1m springboard and one 3m springboard, has been included in the redevelopment due to strong user group support, and will be used solely for recreation swimming / diving.

Figure 48: Photograph: **Pymble Ladies college swimming pool: Multiple dive platforms**, 2016, Crystal Pools, https://www.crystalpools.com.au/pymble-ladies-college-swimming-pool/ https://maps.app.goo.gl/Ep4ZxQ3DPWw9KH4E

Figure 49: Photograph: **Caulfield Grammar School Aquatic & Wellbeing Centre**, 2020, ADCO, https://www.adcoconstruct.com.au/case-study/caulfield-grammar-school-aquatic-and-wellbeing-centre/

Figure 50: Video: **Carnegie Swim Centre Redevelopment**, 2021, COOP Studio, https://www.facebook.com/GlenEiraCityCouncil/videos/carnegie-swim-centre-redevelopment/1225434744556007/

4.0 PRECEDENT BENCHMARKING

4.3 MOVEABLE FLOORS

MOVABLE FLOORS, FINANCIAL SUSTAINABILITY AND PARTICIPATION

Movable floors allow for the variation of water depth in pools. A movable floor is a type of platform that makes it possible to adjust pool depth as required (Figure 51). Hydraulic technology is utilised to adjust indoor (or outdoor) pools to make them shallower or deeper. Movable floors enable a pool to be multi-functional: shallow for learn-to-swim; deeper for water polo; even deeper for diving or artistic swimming. The movable floor can be raised level with the pool deck, creating an increased area of pool deck for other activities. In this arrangement the moveable floor also acts as a 'pool cover' which assists in keeping the pool water at temperature.

MOVEABLE FLOORS:

- Allow modification of pool depth
- Offer versatility enabling for multi-functional uses for various user groups
- Maximise utilisation of a pool (and the aquatic centre)
- Improve operational financial performance

A significant challenge for operators is the overall financial sustainability of an aquatic centre. This is a particularly relevant where there is a significant amount of deep water which results in higher operational costs and lower usage levels (per sqm). The opportunities provided by a movable floor can contribute to a paradigm shift in the potential use of deep-water spaces and hence impact on financial performance.

Movable floors are found in aquatic centres of differing scales and performance levels, from aquatic centres for excellence, such as the Melbourne Sports and Aquatic Centre (MSAC), through to inclusion in multifunctional pools at independent schools including Mentone Girls' Grammar (VIC) and Caufield Grammar School (VIC) (Figure 52). The consulting team involved in this feasibility assessment has not observed a movable floor in a dive pool, although it is understood that movable floors in dive pools do exist overseas.

Figure 51: Photograph: **Caulfield Grammar School Aquatic & Wellbeing Centre - Movable Floor**, 2020 , ADCO, https://www.adcoconstruct.com.au/case-study/caulfield-grammar-school-aquatic-and-wellbeing-centre/

Figure 52: Photograph: **Caulfield Grammar School Aquatic & Wellbeing Centre - Movable Floor**, 2020 , ADCO, https://www.adcoconstruct.com.au/case-study/caulfield-grammar-school-aquatic-and-wellbeing-centre/

5.0 SITE SERVICING

5.1 Environmental Sustainable Development (ESD) Considerations

SITING OF BUILDING

Collocating a new public pool with an existing aquatic facility has several ESD benefits.

There is the opportunity to extend the existing envelope. This represents a reduction in the volume of materials to enclose the required space compared to building a stand-alone facility with no shared walls.

Potential facilities that can be shared between the new and existing facility include changerooms, parking, entry facilities, pool equipment and staff. Although changerooms and other facilities will need to be supplemented, this shared relationship between new and existing facilities reduces the overall size and impact of the development as a whole compared to a stand-alone facility.

Also, since the site for the new pool is already located on disturbed land, the habitat and biodiversity loss is not expected to be as significant as if it were a development on a greenfield site. During the preparation of this report, anecdotal evidence that management strategies for maintaining flows of wildlife through the site have already been enacted and are working well.

5.2 ADDITIONAL SITE INVESTIGATIONS

The process of preparing the feasibility assessment has highlighted the need for additional site investigations required for development of design options as part of Stage 2 (subject to outcome of Stage 1):

SITE SURVEY

Topographical detail survey of the proposed site for extension.

ARBORIST REPORT AND TREE SURVEY

Regarding existing trees on the site, age, height, condition, species.

ECOLOGY REPORT

For Environmental Report regarding flora and fauna including advice regarding the Native Bees Connected Corridor.

CULTURAL HERITAGE REPORT

To interpret existing indigenous report relevant to proposed site for extension.

HYDRALIC ENGINEERING

Rainwater collection, hot water services, sanitary drainage and water supply

FIRE SERVICES ENGINEERING

Hydrants, external hydrants, sprinklers. Estimate of pump room for sprinklers if required.

GEOTECHNICAL SURVEY

A geotechnical survey was carried out prior to the construction of the existing SLC building. This existing information is deemed a moderate risk at this stage of this feasibility study, due to uncertainty of deep ground conditions due to insufficient depth of core samples. A further detailed geotechnical survey of the proposed site for the new dive pool with core samples of dive pool footings depth would serve to mitigate this risk.

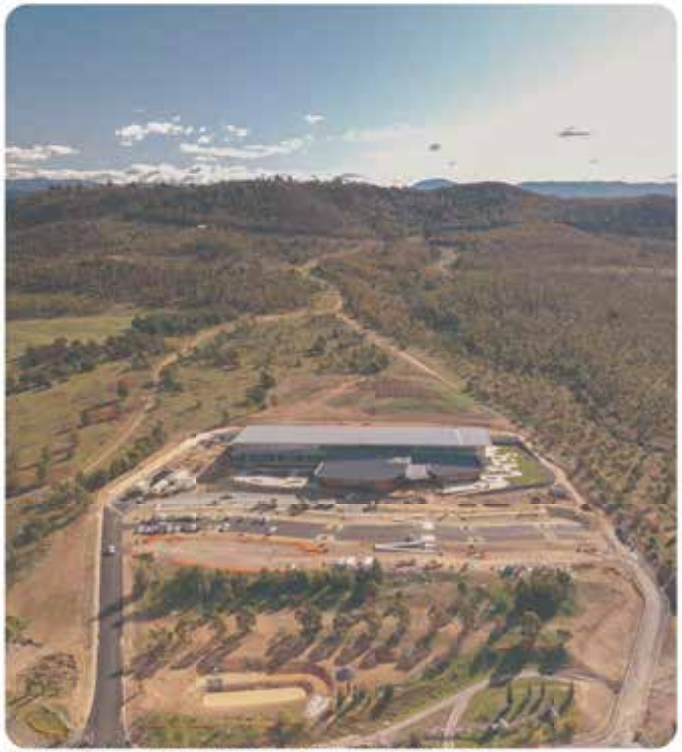


Figure 54: Photograph: Stromlo Leisure Centure, 2020, YMCANSW, https://www.ymcansw.org.au/stromlo/

5.0 SITE SERVICING

5.3 GENERAL ACCESS

The Stromlo Leisure Centre is located on Canberra's western most fringe, with access via the following transport modes:

PEDESTRIAN ACCESS

The hillside location is at the periphery of the footpath network, which terminates on the eastern side of Dave McInnes Road. On the western side of Dave McInnes Road there is a gravel pathway.

CYCLIST ACCESS

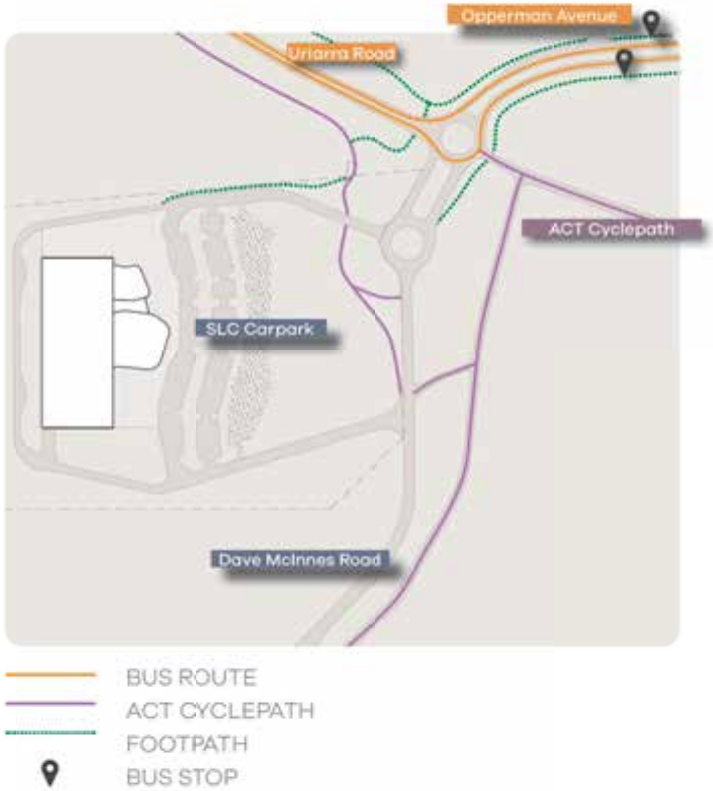
The aquatic facility is located on the ACT cyclepath network on Molonglo Valley's western most main route along Uriarra Road which turns southward into Dave McInnes Road. When approaching Stromlo Leisure Centre from the south, there is an on-road link to the aquatic facility. The facility is located 10-minute ride from Coombs Shopping Centre; a 15-minute ride from Denman Prospect Shopping Centre; 22-minute ride from Cooleman Court, Weston Creek; and a 38-minute ride from Woden Bus Interchange. There are a good number of bike racks provided at the aquatic facility.

PUBLIC TRANSPORT (BUS)

For pool users who travel to the facility via public transport, the nearest bus stop is on Opperman Avenue, serviced by Route 66 (Coolaman Court to Woden via Denman Prospect and Lyons), every 30-minutes on weekdays, hourly on Saturdays, and every two hours on Sundays. It is a 30-minute bus journey from Woden to Stromlo Leisure Centre. From the bus stop on Opperman Avenue it is a 3-minute walk up the hill to the facility. For pool users with limited mobility this incline may make the trip challenging.

VEHICULAR ACCESS

Access by private vehicle is via Opperman Avenue and Dave McInnes Road, with good level of vehicular amenity with the adjacent existing sealed and line-marked carpark interspersed with landscaping. There is also a temporary carpark located on the eastern side of the existing carpark. The intention is for the temporary carpark to be sealed in the future, subject to approvals process. The nearest public EV charging station is at Koko Molonglo Centre, in the suburb of Wright.



5.0 SITE SERVICING

5.4 SITE MAINTENANCE AND OPERATIONAL ACCESS

Site maintenance and operational accessibility including waste vehicles, commercial deliveries, and emergency access requirements are provided for as part of the functioning of the existing Stromlo Leisure Centre.

CHEMICAL DELIVERIES

Chemical delivery trucks approach the site via the access road and approach the chemical delivery store on the southern side of the building (via roller door). The Chemical deliverys truck parks so that unloading for delivery to the store occurs within the bunded area. Stormwater within the bund drains to the tradewaste drainage system.

WASTE REMOVAL

Waste trucks approach the existing Stromlo Leisure Centre waste collection area on the southern side of the building via the access road, to enable a forward movement on exiting the facility (reversing movements are not allowed under ACT regulations for safety reasons). Waste collection is 3xtimes per week for general waste (7x1500L hoppers) and 2x a week for recycling (3 x 1100L hoppers). Waste collection vehicles generally up to 12.5m long.

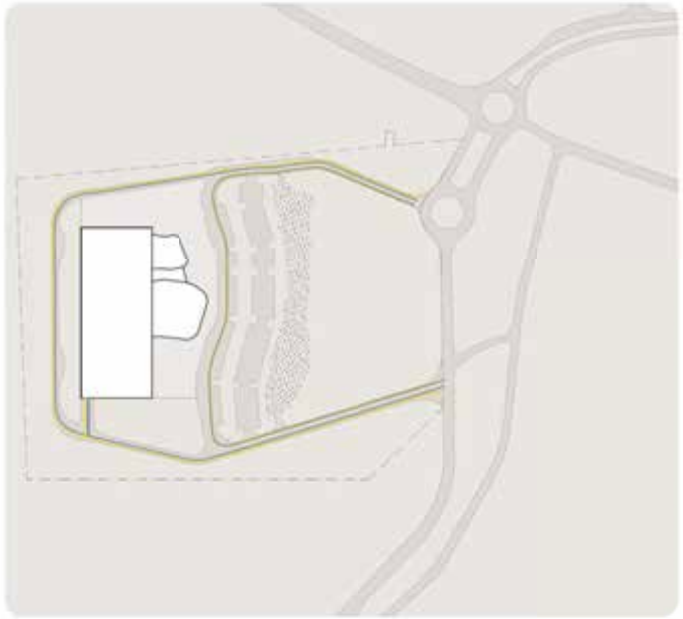
COMMERCIAL DELIVERIES

Functional and commercial deliveries/loading are primarily for the cafe and sports retail functions of Stromlo Leisure Centre. Supplies such as cafe food and other non-bulky deliveries are accommodated through a temporary loading zone at the building entrance.

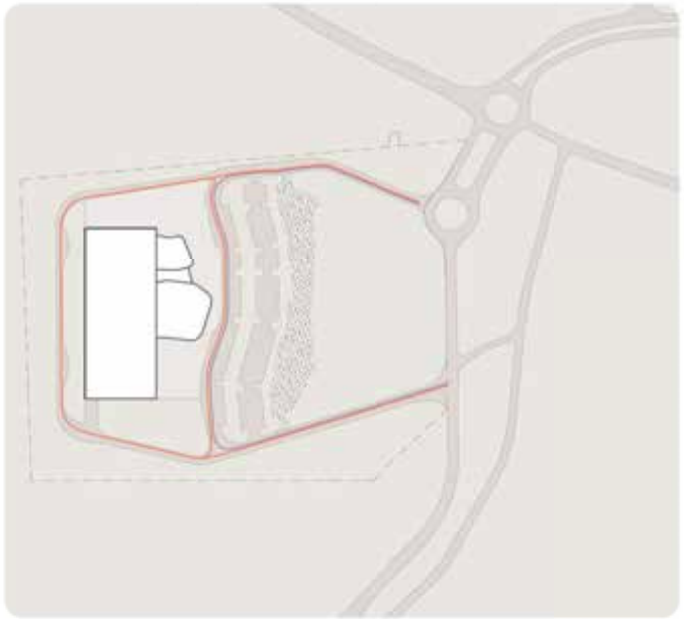
EMERGENCY SERVICES ACCESS

Ambulance parking can occur at the temporary loading zone at the building entrance.

Fire brigade require access to the in ground hydrants that are located around the facility. A hydraulic and fire services engineer will need to be engaged to advise on where fire vehicles will need to access and where fire services may need to be relocated for future stages.



CHEMICAL DELIVERIES
WASTE REMOVAL
COMMERCIAL DELIVERIES



AMBULANCE
FIRE

6.0 BUILDING SERVICES

6.1 ENERGY EFFICIENCY

SOLAR HEAT LOADS

The existing pool hall is oriented north south with a significant amount of high-level glazing to the east. Solar gains are obscured / redirected from the eastern facade by the internal facing gym and the change room areas and a 2.6m wide band of glazing with an opaque frit that reduces the overall facade Solar heat gain coefficient (SHGC). Currently the lower sections of the northern and southern facades are obscured from sunlight by a concrete sunshade. It is expected that a Section JV3 report will be conducted to determine minimum performance requirements for the double glazing to the east.

From an energy efficiency perspective, it is suggested that a portion of the southern building fabric be made opaque and insulated (rather than fully glazed) to improve the overall thermal resistance of the envelope to prevent heat loss from the southern elevation during the colder months. This would also permit views through larger expanses of clear glazing at ground level.

SHADING OF GLAZING

It is suggested that glazing to the west is to be confined to high level glazing and a projected overhang. To the eastern view side continuation of the frit used on the existing insulated glazed units would reduce the solar heat gain to some extent and for Options 1 and 2 additional external angled horizontal sun shading louvres could be considered to avoid discomfort glare to the spectators looking towards the east from the poolside seating. Highlight glazing between the higher and lower roofs in Options 1 and 2 may result in patch sunlight and could be a source of visual discomfort to the divers.

HEATING VENTILATION AND COOLING

The location of air handling units as close to the conditioned areas as possible with a narrow thermal comfort band, such as the changerooms and dryland training facility, will be ideal to avoid unwanted heat transfer along duct runs. The use of air-to-air heat exchangers within air handling units allows heat within the system to be recycled, limiting the need to reheat outside air and improving energy efficiency.

AIRTIGHTNESS

It is suggested that an airtightness consultant be engaged during the detail design development of this project, particularly to advise on construction detailing for connecting and sealing up to the existing building fabric. A blower door test before practical completion to confirm the performance of the new building envelope is also recommended.

LOW CARBON

Low carbon material options for the substructure and for the major component of pool shell options are limited. Given that these components are likely to be concrete, the main options would involve variation in industrial waste additives such as ground, granulated blast furnace slag (GGBFS), fly ash in conjunction with Portlan cement. In addition, recycled concrete aggregates could be investigated further for their appropriateness in reducing carbon in this project's life cycle.

The existing building already uses mass timber beams and struts to support the pitched roof over the pool hall. From a low carbon viewpoint, mass timber has both a low carbon impact during the production (A1-A3) stages of its life cycle and the longer the material remains in the building, the longer the biogenic carbon impact will be. Since many well used permanent indoor pools can be known to exceed 50 year life spans, the biogenic carbon impact by sequestering carbon in the mass timber building fabric can be considerable. Provided mass timber is not subjected to moisture directly, the reduced corrosion risk and minimal maintenance in humid environments mass timber make this material a competitive choice with other products on the market that are included in building assemblies.

If a low carbon aluminium cladding or window framing system were to be selected, the authenticity of low carbon certification should be considered. Carefully reviewing where the material has been processed. The carbon intensity of these aluminium products varies depending on what fuel mix is utilised in the smelting process.

BUILDING MANAGEMENT SYSTEM (BMS)

It is suggested that the existing BMS would be used to control the new mechanical plant. The BMS is essential for the SLC's ESD strategy as it centralises control, automates operations, analyses data, and optimises energy usage. Consideration of the costs of any upgrade to the existing BMS should be apportioned to the ESD component of the budget. Subject to further appraisal of the existing system an upgrade to the BMS is likely to ensure that the building is equipped with the latest technology to optimise energy use for the facility thereby reducing operational costs and carbon emissions.

POTABLE WATER REDUCTION

Through adherence to the general principals below, reliance on potable water can be reduced:

- Utilising water-efficient fixtures with WELS rating
- Limiting duration of water usage with timed flow tap and shower fixtures
- Reduce water externally by maintaining the selection of plants with low water requirement and reusing rainwater for irrigation.

Further advice from a hydraulic engineer should inform how potable water reductions are to be maximised.

6.0 BUILDING SERVICES

6.2 CIVIL, TRAFFIC AND STRUCTURAL CONSIDERATIONS

The civil, traffic and structural inputs for the feasibility report have been prepared by TTW (Appendix D – Civil, Traffic and Structural Report). This report includes review of existing related documentation, site stormwater conditions, geotechnical conditions, existing pavement conditions, car parking study, general traffic observations, and advice on parking requirements, as outlined below:

- Site Conditions
- Geotechnical Conditions
- Provision for Future Expansion
- Civil Considerations
    - Existing Stormwater
    - Existing Pavements
- Traffic Considerations
    - Parking Utilisation
    - Expected Parking Generation
    - Traffic Observations
- Structural Considerations
    - Footings
    - Concrete Structure
    - Roof

A services layout plan is provided to show how the facility will be appropriately serviced as part of the feasibility study, including:

- Anticipated traffic flow on the proposed site.
- Compliance with Parking and Vehicle Access General Code current and future parking needs.
- Identify connections to surrounding areas in line with Planning for Active Travel in ACT, including pedestrian pathways and maintenance routes.
- Integrate a preliminary traffic analysis.

6.3 ELECTRICAL AND MECHANICAL

The electrical and mechanical inputs for the feasibility report have been prepared by Introba (Appendix E – Mechanical and Electrical Services Feasibility Study). This report includes reviews of existing infrastructure and review and provision of conceptual design relating to mechanical and electrical/comms services as outlined below:

MECHANICAL

- Site visit to review existing mechanical systems serving the pool hall
    - Central heating plant
    - Air handling system
    - Mechanical electrical switchboard
    - Building management system (BMS)
- Review of existing as-built documents
- Review and recommendation of electric heating technology
- Mechanical engineering preliminary calculations, sizing and design of HVAC (heating, ventilation & air conditioning) systems for the new Dive Pool.
- Identification of additional plant spatial requirements
- Opinion of costs

ELECTRICAL

- Site visit to review existing mechanical systems serving the pool hall
- Central heating plant
- Air handling system
- Mechanical electrical switchboard
- Building management system (BMS)
- Review of existing as-built documents
- Review and recommendation of electric heating technology
- Mechanical engineering preliminary calculations, sizing and design of HVAC (heating, ventilation & air conditioning)
- systems for the new Dive Pool.
- Identification of additional plant spatial requirements
- Opinion of costs

ELECTRIFICATION

In line with ACT Government Policy to transition gas infrastructure to electric heating, it is worthwhile considering this transition for SLC occurring while there is a major construction project for the existing building. However, given most commercial gas-fired boilers for heating pools would not be expected to last more than 25 years, early transition to electric heating for the purposes of reducing carbon emissions would likely preference pools that have gas-fired boilers with sub optimal efficiency and are also reaching end of life. Given that net-zero emission targets would suggest transition would likely occur before the end of life of the gas-fired boilers, future master planning on the site would benefit from allocating sufficient area for an electric heat-pump outdoor plant so that it does not get subsumed by other uses. It should be noted that Evoenergy's Annual Planning Report 2023 details a proposed Molonglo Valley Zone substation 2nd Transformer with consultation scheduled for June2026. It is suggested that projected future increases in electrical demand both for a future extension and Electrification of the facility be raised with Evoenergy in the near future. While it is out of the scope of this report to designate an area and location for an electric heat-pump plant, the ideal location for an outdoor-electric heat pump would be near the heated bodies of water it is serving and outside the intersection of any critical bounding roads or major services paths surrounding the building.

While consideration needs to be given to not complicating maintenance at SLC with a variety of equipment that performs similar functions, the recommendations on equipment within this report are based on a review of the existing proven and emerging technologies. It is expected that further documentation stages would examine how overlaps between existing equipment and proposed equipment could be accommodated.

ELECTRICAL SERVICES

It has been identified that a new substation will be required at the feed-in at the north east of the site and number of existing pole lights will need to be relocated to make way for the dive pool. It has also been advised that the existing main switchboard located on the western side of the existing SLC building is not sufficient to meet the demand of the proposed extension. For each option, an additional main switchboard (MSB-2) is to be located on the western side of the extension. Similarly, a new Mechanical switchboard is required which will collocated with the electric heat pump outdoor enclosure.

6.0 BUILDING SERVICES

ELECTRIC HEAT PUMPS

Given the size of the body of water and air volume that requires heating, a standalone system without load sharing between the existing system would be required. The Electric heat pumps can be run on renewables and have the potential to be less carbon intensive than other sources of energy that are available to the site. The proposed electric heat pumps will act as a separate central heating hot water plant where heating hot water will be generated by these heat pumps and then delivered to coils within pool hall air handling unit(s), fan coil units and pool water heat exchangers. A central hot water plant enables better operational efficiency as well as providing greater in-built redundancy. Heat pump technology is now relatively well developed for commercial applications and are widely available on the market with multiple manufacturers as well as having great contractor installation familiarity.

It should be noted that for options 1-4 and 6, the exhaust from the existing AHU coincides with the preferred location of the electric heat pumps. It is envisaged that this exhaust air would need to be redirected with a screen above the level of the heat pumps so that the exhausted air is not directed towards the heat pumps. Since the intake for the heat pumps is on the roadside and the heat pumps also exhaust upwards, the potential for the corrosive air from the existing AHUs to recirculate back to the heat pumps is reduced (See Appendix E & F - Mech & Elec + Aquatic Engineering).

MECHANICAL SERVICES

The general principle for moderating indoor conditions within the dive pool hall is to supply air in a fabric duct encircling the pool hall at high level. In general terms, the air returns to the Air Handling Units (AHUs) beneath the pool-side seats and residual heat in this recovered air is extracted in a heat exchanger before being exhausted outside the building. The size and quantity of equipment necessary to heat, cool and ventilate the proposed dive pool building varies according to the volume of the space. Option 1 has the largest number of AHUs to turn over large volumes of air within the pool hall. In this instance, the operational costs would also be higher. Option 3, 4 and 6 only require one AHU located to the northwest of the pool hall which frees up more space and ceiling height for the Dryland training facility. Although there are a large variety of AHU types and configurations, a suggested preferred model of AHU with energy recovery ventilation is detailed in the Mechanical & Electrical Report (See Appendix E - Mech & Elec Report).

6.4 POOL HEATING AND TREATMENT

The heating and treatment of large volumes of water represents a significant operational expense that needs to be considered as part of this feasibility study.

Heating and treating costs are directly related to the volume of water in each system. Option 4 has the lowest volume, option 5 has the largest volume. Options 1 to 5 are biased towards competition use, hence these options with an operating water temperature of 27 degrees and water turnover frequency of between 3 and 4 hours (for sand filters) indicate various operating costs based primarily on the volume of water being heated and treated for each of these options. (See Appendix F - Aquatic engineering report and comparative table referenced under section 3.7).

Option 6 has an element of multifunctionality with an operating water temperature of 29 degrees and a movable floor. The 29 degree operating temperature is 1 degree higher than recommended for competitive swimming and diving, however, does allow for occasional adult teaching and children's teaching (which is at the lower end of pool water temperature recommendations). The additional multifunctionality of Option 6, which includes a movable floor, leads to higher costs despite having a similar water volume to Option 4. The increased operating temperature of 29 degrees Celsius and the more frequent water turnover rate of 2 hours significantly increase the initial capital costs for aquatic filtration, pumps, and equipment. These upfront costs, coupled with operating expenses that are 2.33 times higher than Option 4, present a financial challenge for this moveable floor option. Refer to Appendix F – Aquatic engineering report and comparative table referenced under section 3.7. ACT are to consider this accordingly when deciding to implement multifunctionality during the next phase of works.

The recommendations for sanitisation within the Aquatic report remains consistent for all 6 options. UV, Chlorine and other chemical treatments will all be a necessity to balance water quality. Variance of chemical usage is influenced by the final choice of filtration chosen by ACT Government to be developed in consultation during the next phase of design through understanding of the capital expenditure pressures considered with operationcl expenditure optimisation.

The chosen filtration system for the new dive pool at Stromlo Leisure Centre (SLC) will have a minor impact on annual heating and energy costs. While the primary driver of energy consumption is maintaining the pool water at the desired temperature, the type of filtration system introduces a marginal increase in energy requirements.

Based on information typically provided during the Detailed Design (DD) phase, the following table outlines the percentage increase in annual heating/energy costs associated with each option and filtration type, based on the HVAC and Pool heating and water recirculating operational energy in the Recreational Planner's Financial Projections (Appendix C)

	Sand Filtration % Increase on Previously Reported Energy Costs per Annum	UFF Filtration % Increase on Previously Reported Energy Costs per Annum
OPTION 1	1.40%	0.5%
OPTION 2	2.00%	0.5%
OPTION 3	1.55%	0.5%
OPTION 4	1.25%	0.5%
OPTION 5	1.20%	0.5%
OPTION 6	4.20%	1.35%

Table of % increase of annual heat/energy costs by filtration type

The filtration type as shown above has between 0.5% to 4.2% increase on energy requirements during operations depending on which option is developed, and which filtration system is chosen. There are other factors that could increase the stated percentages which are remain uncertain such as lack of maintenance, misuse of the system, vandalism, blockages, poor quality control during construction etc.

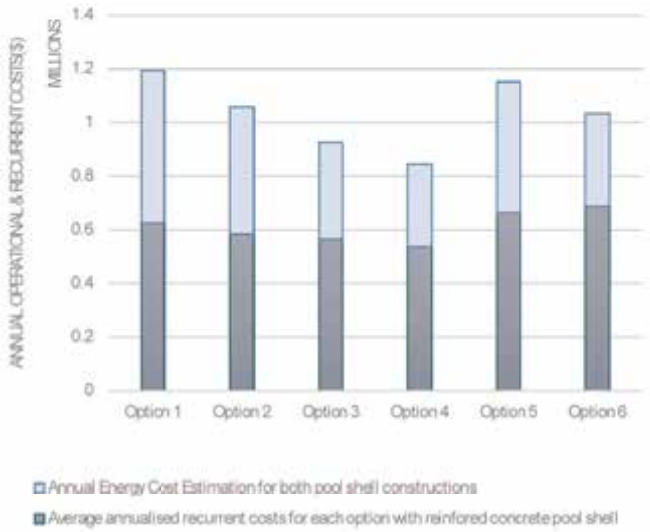
BUILDING SERVICES - OPERATIONAL AND RECURRING COSTING

The SLC Redevelopment Financial Projections (in Appendix C) provides a 20-year financial outlook based on the six redevelopment options being considered, offering insights into the long-term cost implications of deep water. Aquatic, Mechanical, Electrical, Civil and Quantity surveying disciplines have contributed to consolidating these projections based on the feasibility and preliminary design work that has been conducted.

Two of the major ongoing operational costs for the Dive pool will be recirculation, heating and treatment of the aquatic and HVAC systems. While there are large uncertainties in the calculations of the overall energy demands of these systems when benchmarked to a single option, the relative difference between options could be expected. Option 6 is relatively efficient compared to option 1 in terms of annual HVAC energy demand but the turnover rates and higher temperatures required for a multifunctional pool are the highest of the options. A higher rate of return from a deep water multifunctional pool would evidently be desirable to offset the energy costs. A sports-focused schedule for the new pool reveals limited use and low income compared to learn-to-swim classes. The current projections are based on a usage model that prioritises sports usage. This theoretical prioritisation of usage requires further consideration as it is an integral part of the cost feasibility of an Aquatic facility, especially if a movable floor is included.

The graph shows HVAC and Pool heating and recirculation operational energy cost for the 6 options. The greater the cost increase for operational Aquatic and HVAC systems, the greater the likelihood of an ongoing operational cost that would need to be offset by increased patronage. It must be noted Option 6 offers greater multifunctionality afforded by a moveable floor which would provide versatility to attract greater usage.

(See Graph 1 : based on data from correspondence between CK and Introba on 11/10/2024)

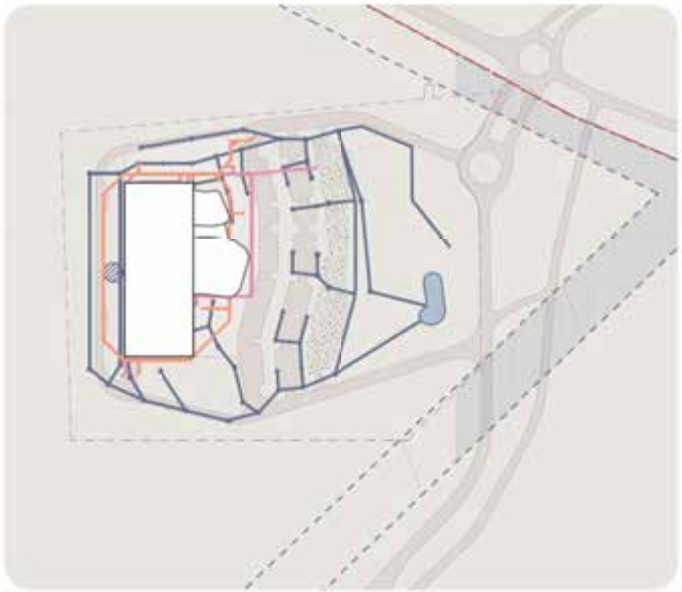


Graph 1: Annual Operational and Recurrent Costs, CK Architecture.

6.0 BUILDING SERVICES

6.5 EXISTING SERVICES

HYDRAULICS



STORM WATER
HYDRANTS
SEWAGE

WATER EASEMENT
ONSITE DETENTICN POND
UNDERGROUND RAINWATER TANK

ELECTRICAL AND EXTERNAL LIGHTING

ELECTRICAL MAINS
LIGHTING

Figure 55: Aerial map: **Stromlo Leisure Centre**,2023, by ACTMAPI https://apps.vertigisstudio.com/b/?app=fbfafed4f2f64670b1619be91afbc026

Figure 56: Photograph: **Stromlo substation**, July 2024, CK Architecture

STAGE 1B

FEASIBILITY STUDY

7.0 OPTIONS STUDY

Six (6) options are considered in this feasibility study. Sub options 4A and 5A are also discussed although option 5A was the only sub option evaluated with respect to construction costs.

7.1 OPTION 1

Option 1 (as briefed) is a 30m x 20m pool with a full suite of dive platforms and springboards, requiring a minimum depth of 5.0m.

The dimensions of 30m x 20m provide a World Aquatics (WA, formerly FINA) compliant field of play for competition diving and artistic swimming. However, these dimensions are not suitable for World Championship and Olympic men's water polo, which requires a 33m x 25m pool tank to provide sufficient pool space for a WA compliant 30m x 20m field of play. It is noted, too, that these briefed pool dimensions do not provide conventional lap swimming overflow / competition warm-up space.

Competitive dive provision includes:

- 1 x 10m platform
- 1 x 7.5m platform
- 1 x 5m platform
- 1 x 3m platform
- 1 x 1m platform
- 3 x 3m springboards
- 2 x 1m springboards

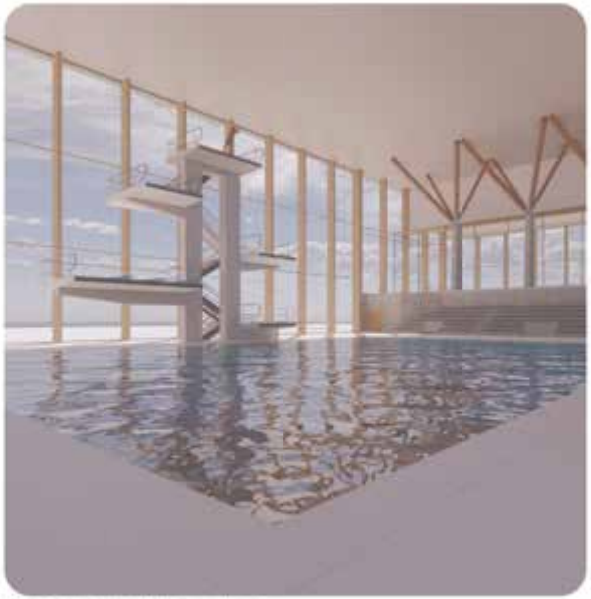
A Dryland Training facility (briefed) is provided and is anticipated to include training boards, foam pits, flat floor space for stretching, tumbling, etc and dedicated storage space.

Support facilities provided include the following:

- spa and concourse showers;
- spectator seating, in a similar format to that provided within the existing pool hall;
- dive pool designated change facilities - two change rooms and an accessible change space;
- pool plant room;
- storage space.

Option 1 3D massing studies

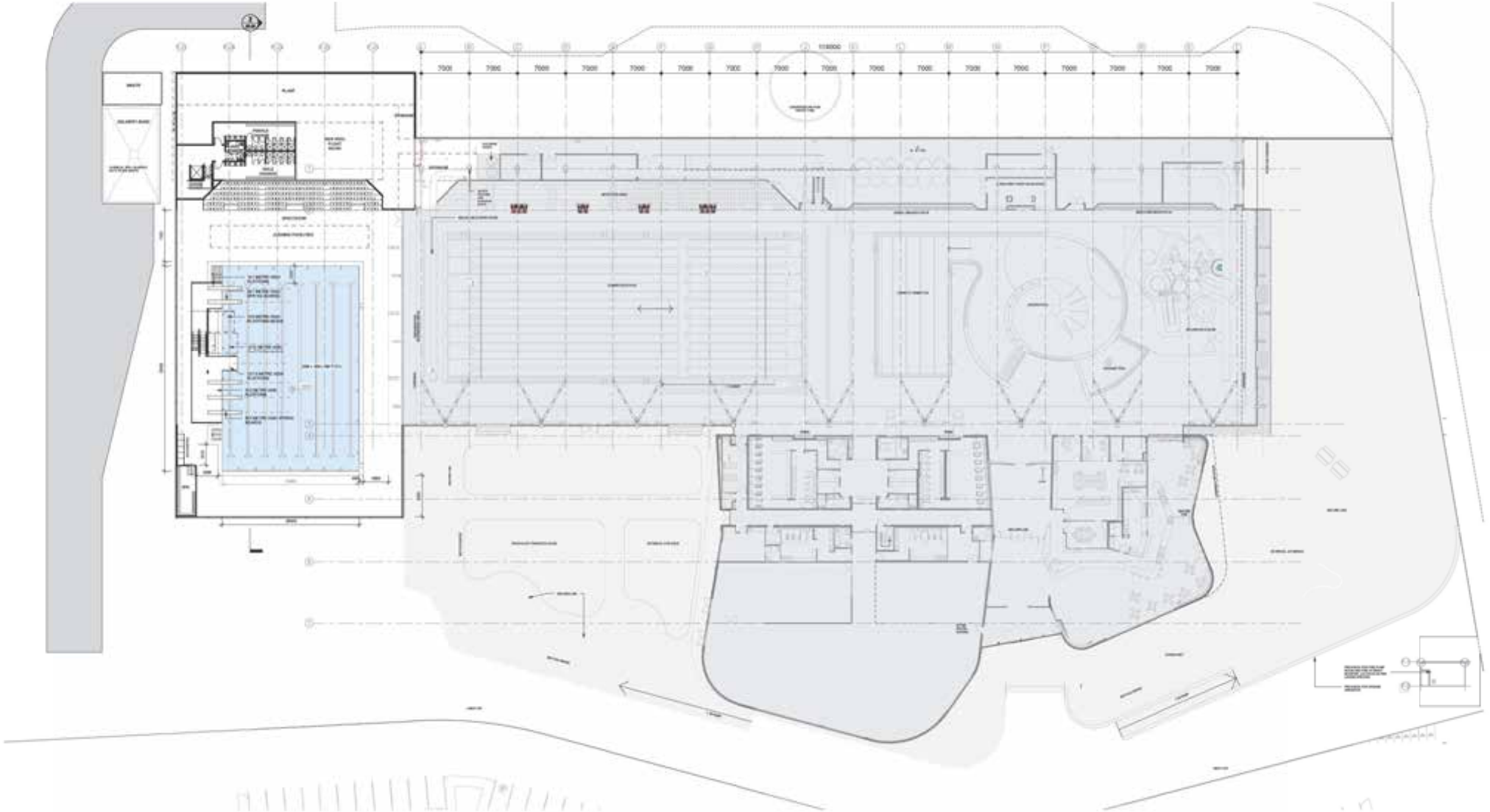
Option 1 3D massing studies



Included to show spatial height only

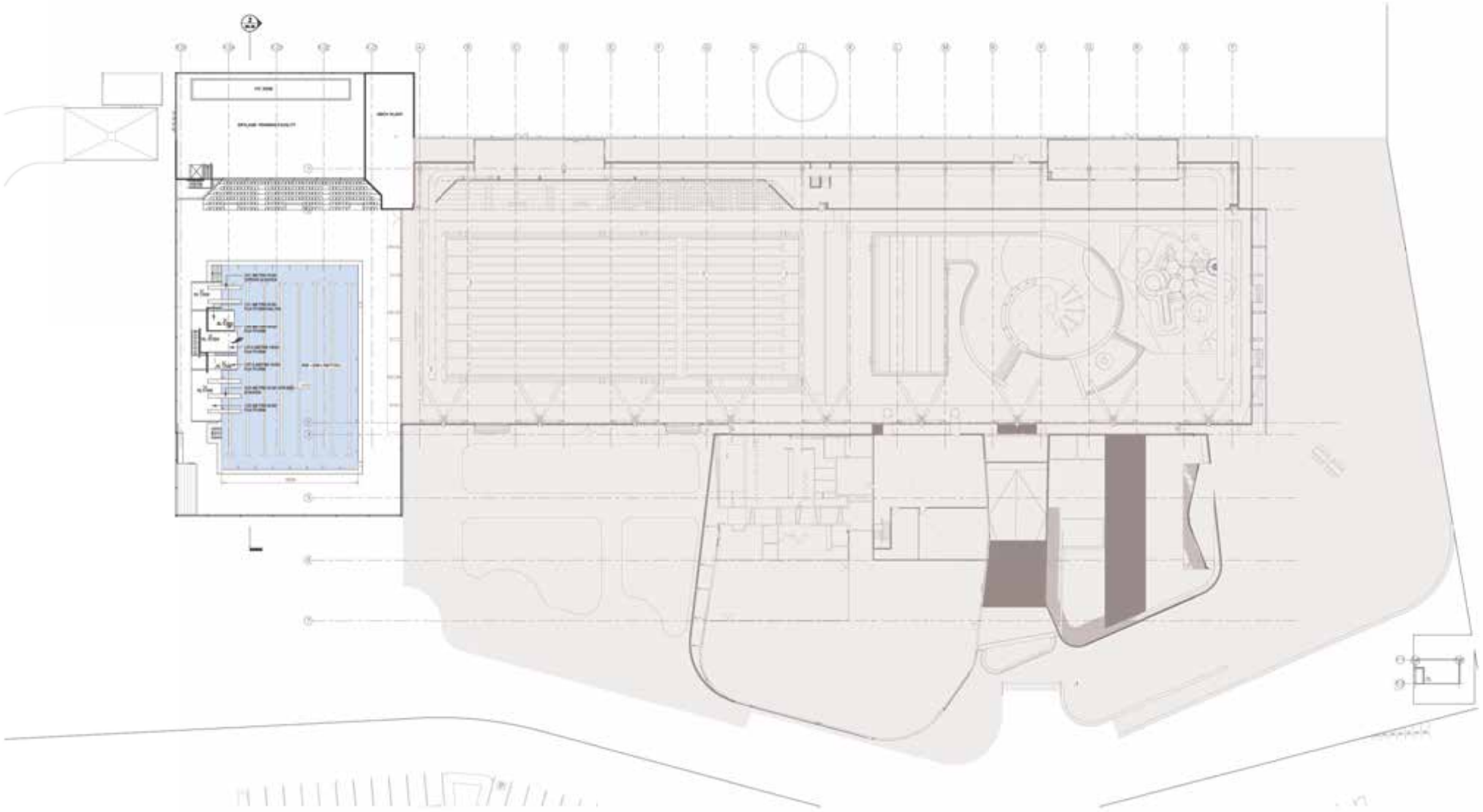
OPTION 1 - Ground Floor

N
NOT TO SCALE



OPTION 1 - First Floor

N
NOT TO SCALE



7.0 OPTIONS STUDY

7.2 OPTION 2

Option 2 (as briefed) is a 25m x 20m pool with a full suite of dive platforms and springboards, requiring a minimum depth of 5.0m.

The briefed dimensions (25m x 20m) provide a WA compliant field of play for competition diving, but will not provide a WA compliant field of play for water polo and artistic swimming. It is noted, too, that these pool dimensions do provide conventional lap swimming overflow / competition warm-up space.

Competitive dive provision includes:

- 1 x 10m platform
- 1 x 7.5m platform
- 1 x 5m platform
- 1 x 3m platform
- 1 x 1m platform
- 3 x 3m springboards
- 2 x 1m springboards

A Dryland Training facility (briefed) is provided and is anticipated to include training boards, foam pits, flat floor space for stretching, tumbling, etc and dedicated storage space.

Support facilities provided include the following:

- spa and concourse showers;
- spectator seating, in a similar format to that provided within the existing pool hall;
- dive pool designated change facilities - two change rooms and an accessible change space;
- pool plant room;
- storage space.

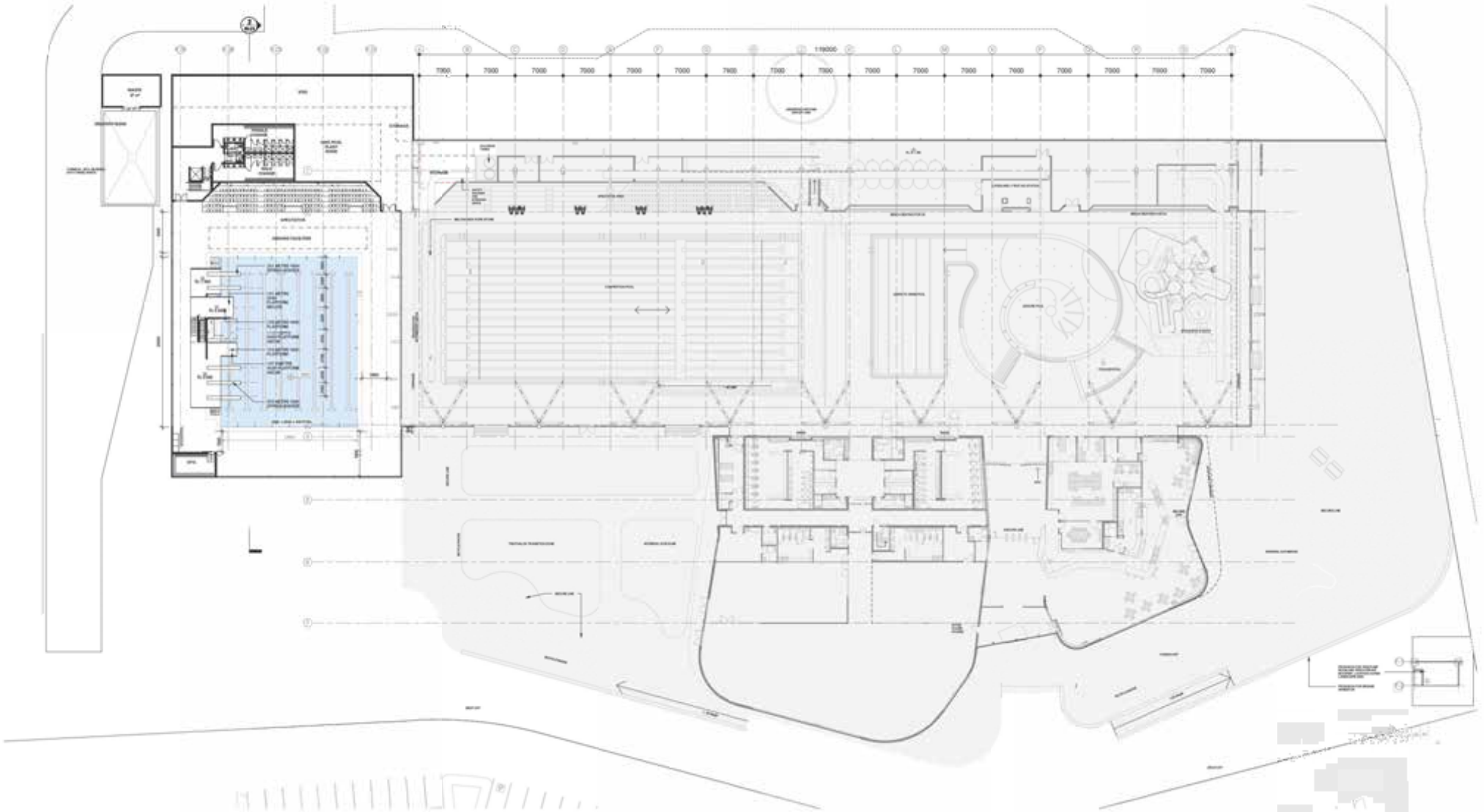
Option 2 3D massing studies

Option 2 3D massing studies

Included to show spatial height only

OPTION 2 - Ground Floor

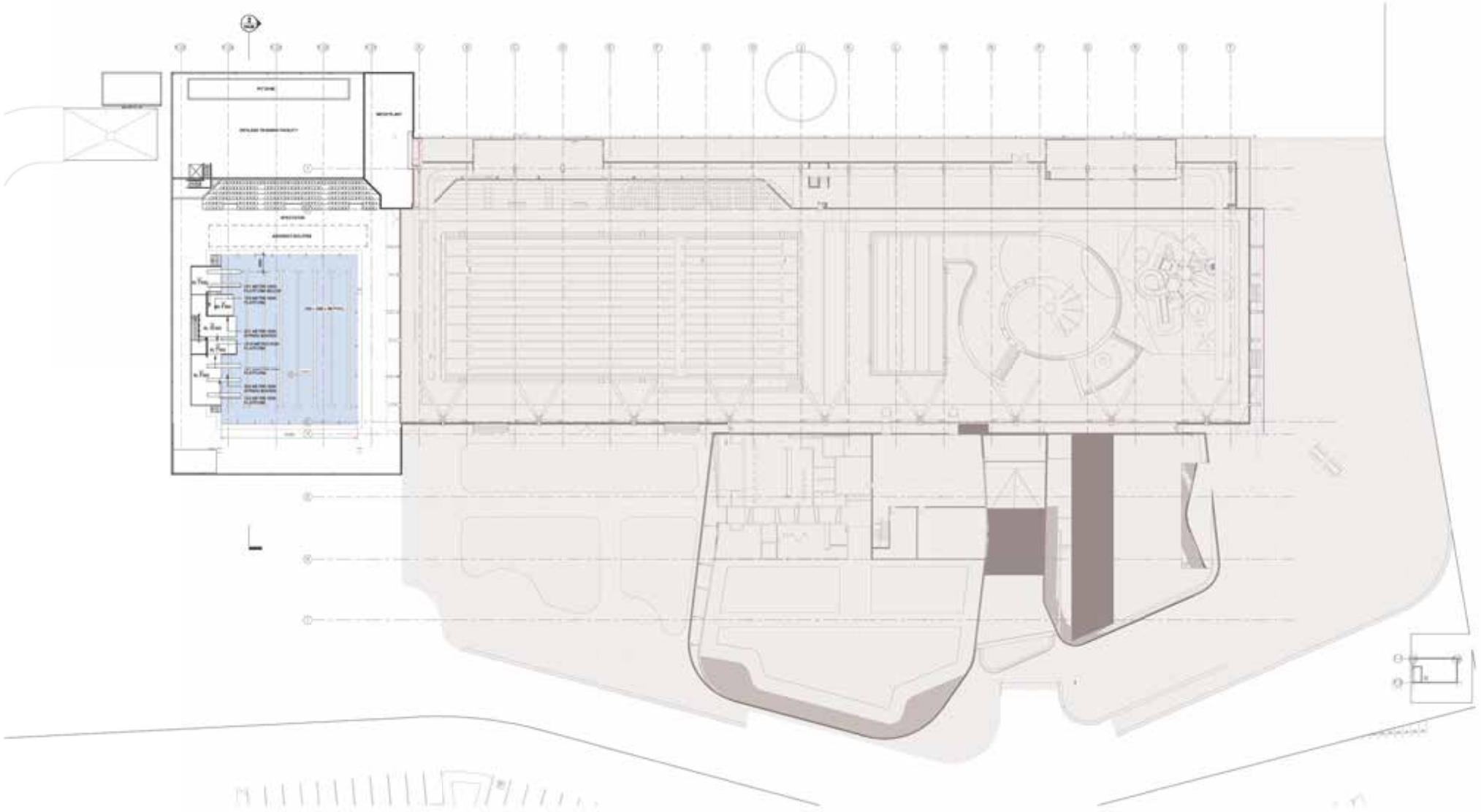
N
NOT TO SCALE



1 General Arrangement - Ground OPTION 2
SK-22 SCALE 1 : 200

OPTION 2 - First Floor

N
NOT TO SCALE



7.0 OPTIONS STUDY

7.3 OPTION 3

Option 3 (as briefed) is a 30m x 20m pool with a reduced suite of dive platforms and springboards, requiring a minimum depth of 3.8m. It is noted that this reduced offering limits development of a high performance pathway for young athletes within the Canberra region.

The briefed dimensions (30m x 20m) provide a WA compliant field of play for competition diving and for artistic swimming, but will not provide a WA compliant field of play for water polo. It is noted, too, that these pool dimensions do not provide conventional lap swimming overflow / competition warm-up space. .

Competitive dive provision includes:

- 1 x 5m platform
- 1 x 3m platform
- 1 x 1m platform
- 3 x 3m springboards
- 2 x 1m springboards

A Dryland Training facility (briefed) is provided and is anticipated to include training boards, foam pits, flat floor space for stretching, tumbling, etc and dedicated storage space.

Support facilities provided include the following:

- spa and concourse showers;
- spectator seating, in a similar format to that provided within the existing pool hall;
- dive pool designated change facilities - two change rooms and an accessible change space;
- pool plant room;
- storage space.

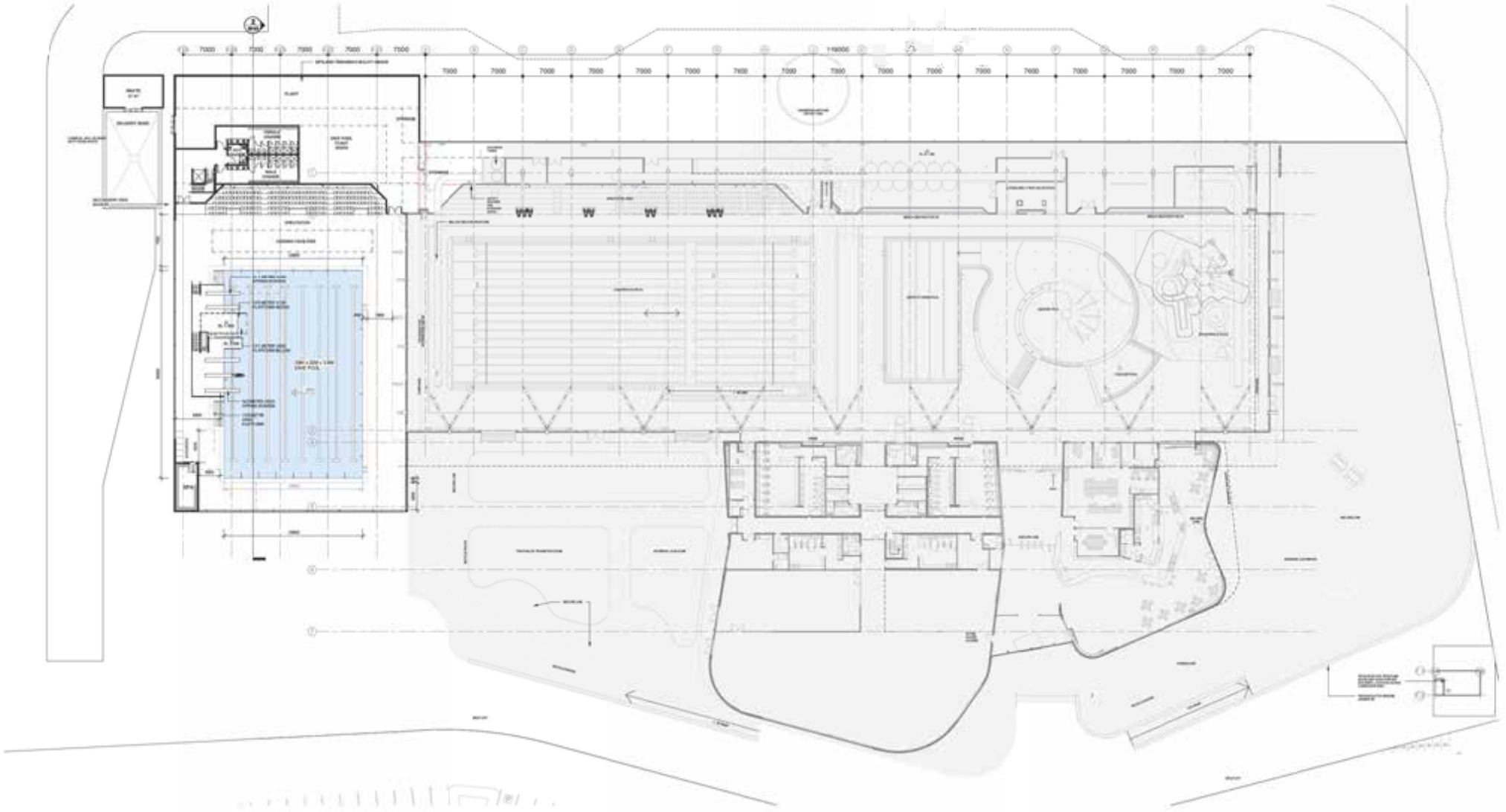
Option 3 3D massing studies

Option 3 3D massing studies

Included to show spatial height only

OPTION 3 - Ground Floor

N
NOT TO SCALE



OPTION 3 - First Floor

N
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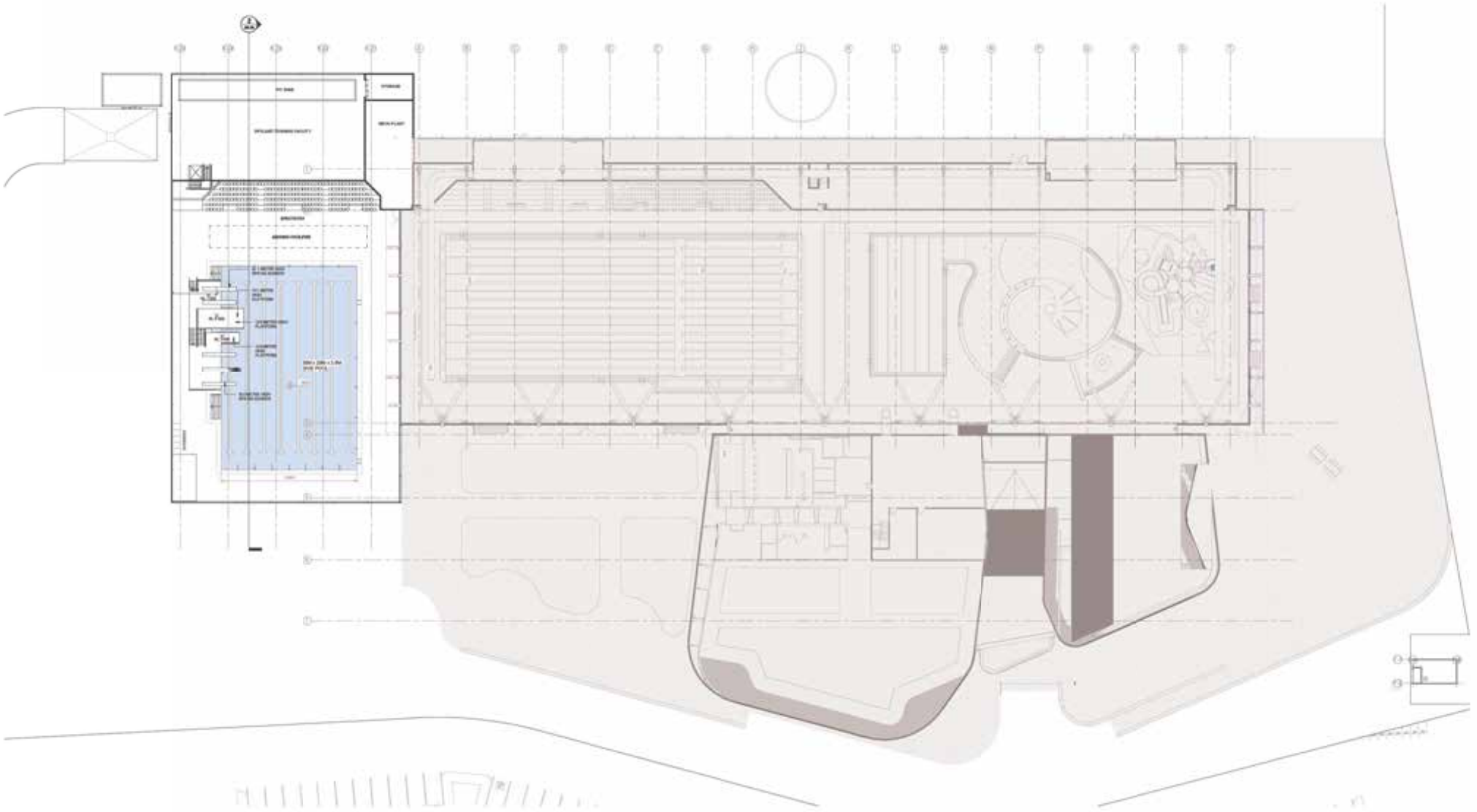


7.0 OPTIONS STUDY

7.4 OPTION 4

Option 4 (as briefed) is a 25m x 20m pool with a reduced suite of dive platforms and springboards, requiring a minimum depth of 3.8m. It is noted that this reduced offering limits development of a high performance pathway for young athletes within the Canberra region.

The briefed dimensions (25m x 20m) provide a WA compliant field of play for competition diving, but will not provide a WA compliant field of play for water polo and artistic swimming. It is noted, too, that these pool dimensions do provide conventional lap swimming overflow / competition warm-up space.

Competitive dive provision includes:

- 1 x 5m platform
- 1 x 3m platform
- 1 x 1m platform
- 3 x 3m springboards
- 2 x 1m springboards

A Dryland Training facility (briefed) is provided and is anticipated to include training boards, foam pits, flat floor space for stretching, tumbling, etc and dedicated storage space.

Support facilities provided include the following:

- spa and concourse showers;
- spectator seating, in a similar format to that provided within the existing pool hall;
- dive pool designated change facilities - two change rooms and an accessible change space;
- pool plant room;
- storage space.

OPTION 4A

Option 4A is an alternate orientation with a similar construction cost to option 4, which aligns the lap swimming 25m length with the adjacent existing 50m pool. The Dryland training facility is also located on the eastern side of the pool hall so that the dive pool appears as a continuation of the existing volume. The relocation of the Dryland training facility allows more flexibility on how the plant areas are planned.

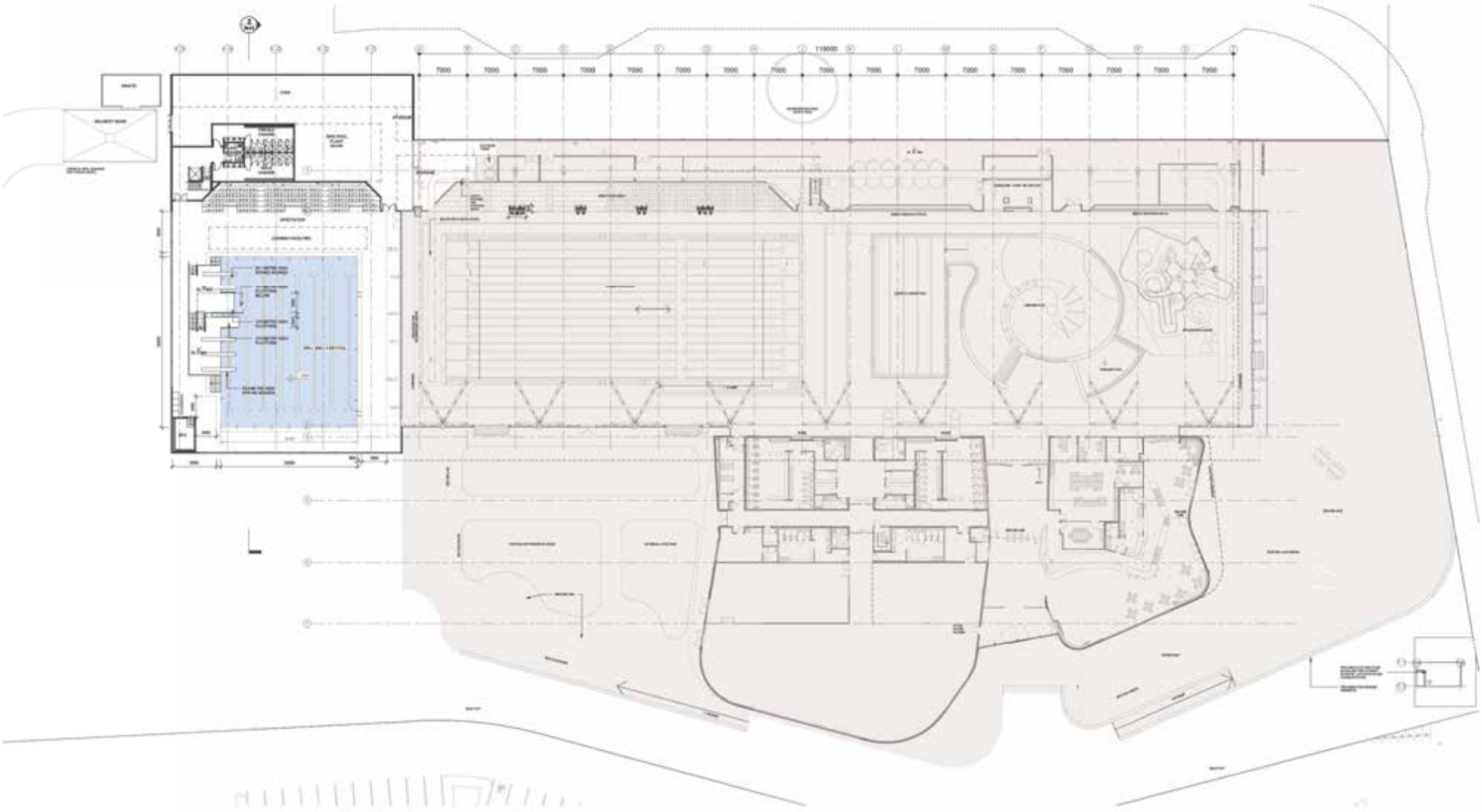
Option 4 3D massing studies

Option 4 3D massing studies

Included to show spatial height only

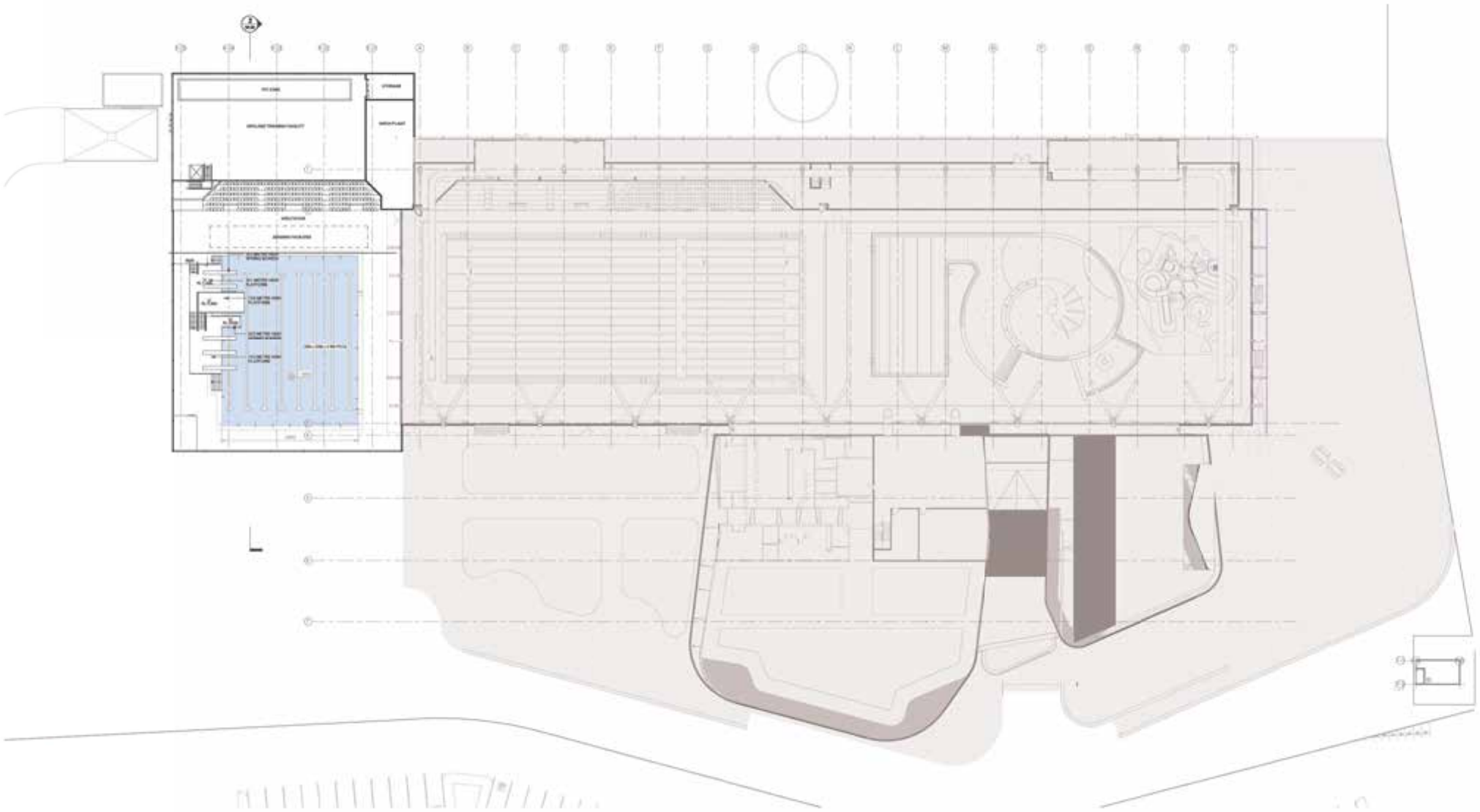
OPTION 4 - Ground Floor

N
NOT TO SCALE



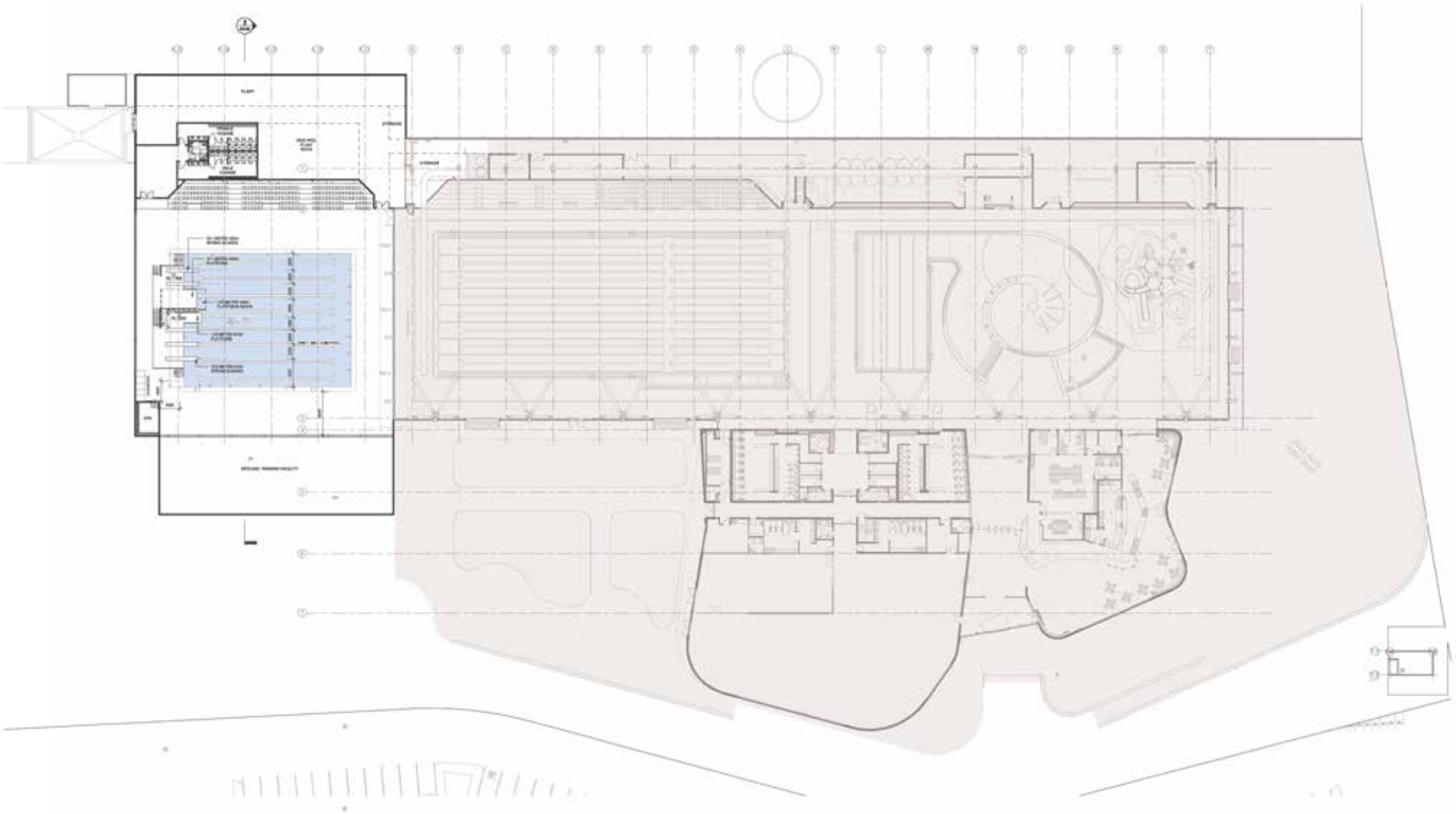
OPTION 4 - First Floor

N
NOT TO SCALE



OPTION 4A - Ground Floor

N
NOT TO SCALE



OPTION 4A - First Floor

N
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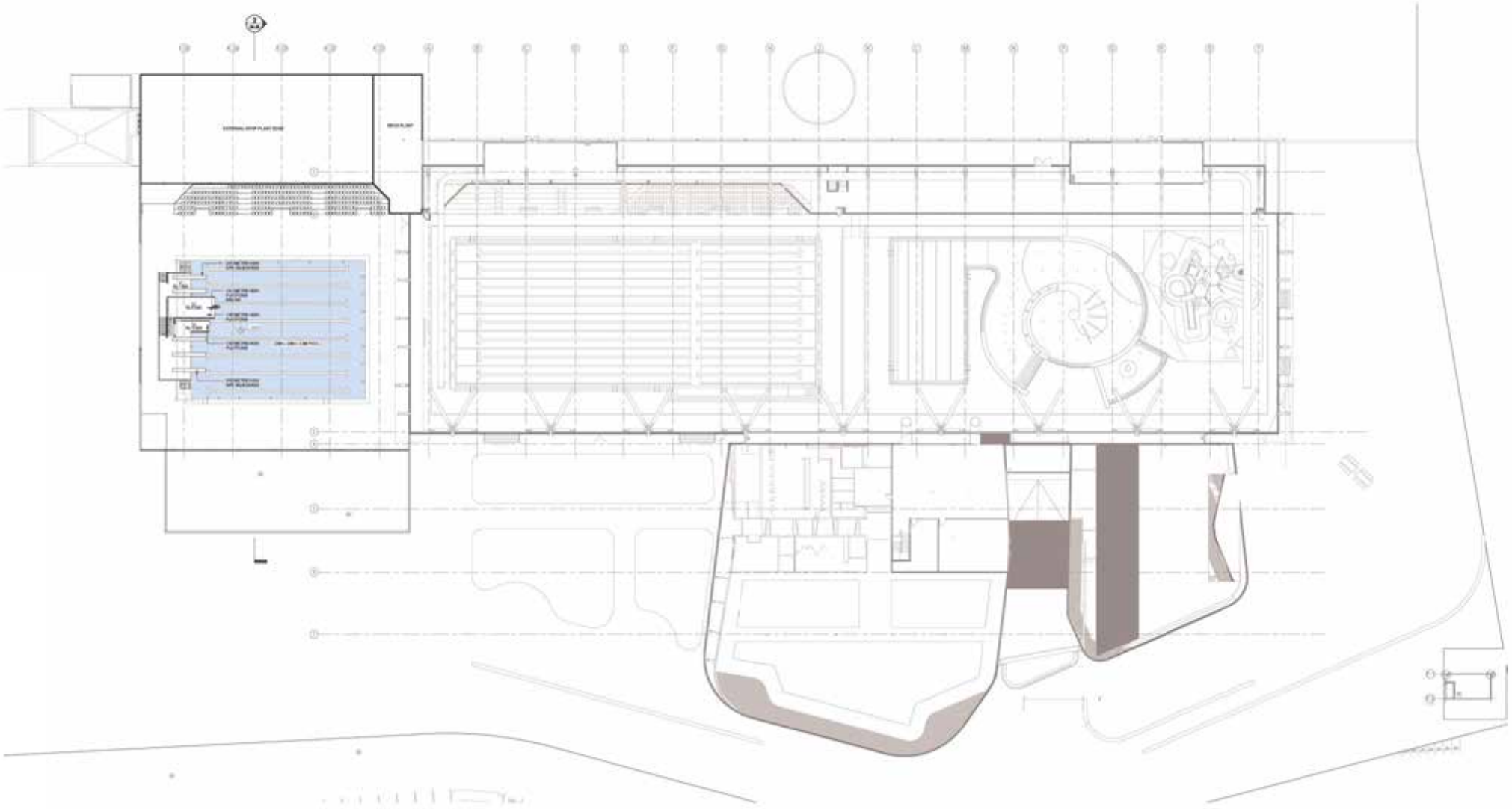


7.0 OPTIONS STUDY

7.5 OPTION 5

Option 5 (as briefed) is a 50m x 20m pool with a reduced suite of dive platforms and springboards, requiring a minimum depth of 3.8m. It is noted that this reduced offering limits development of a high performance pathway for young athletes with n the Canberra region.

The briefed dimensions (50m x 20m) provide a WA compliant field of play for competition diving and for artistic swimming (assuming at least 3m depth is retained for 30m), but will not provide a WA compliant field of play for water polo. It is noted, too, that these pool dimensions do provide conventional lap swimming overflow / competition warm-up space. It is assumed that a moveable boom is not required within this pool, however, a swim wall is recommended for operational flexibility.

Competitive dive provision includes:

- 1 x 3m platform
- 1 x 1m platform
- 3 x 3m springboards
- 2 x 1m springboards

A Dryland Training facility (briefed) is provided and is anticipated to include training boards, foam pits, flat floor space for stretching, tumbling, etc and dedicated storage space.

Support facilities provided include the following:

- spa and concourse showers;
- spectator seating, in a similar format to that provided within the existing pool hall;
- dive pool designated change facilities - two change rooms and an accessible change space;
- pool plant room;
- storage space.

OPTION 5A

Option 5A represents an alternative variation of Option 5. In this iteration, the dryland facility has been excluded from the design. A cost benefit analysis can be conducted to determine whether this component can be excluded.

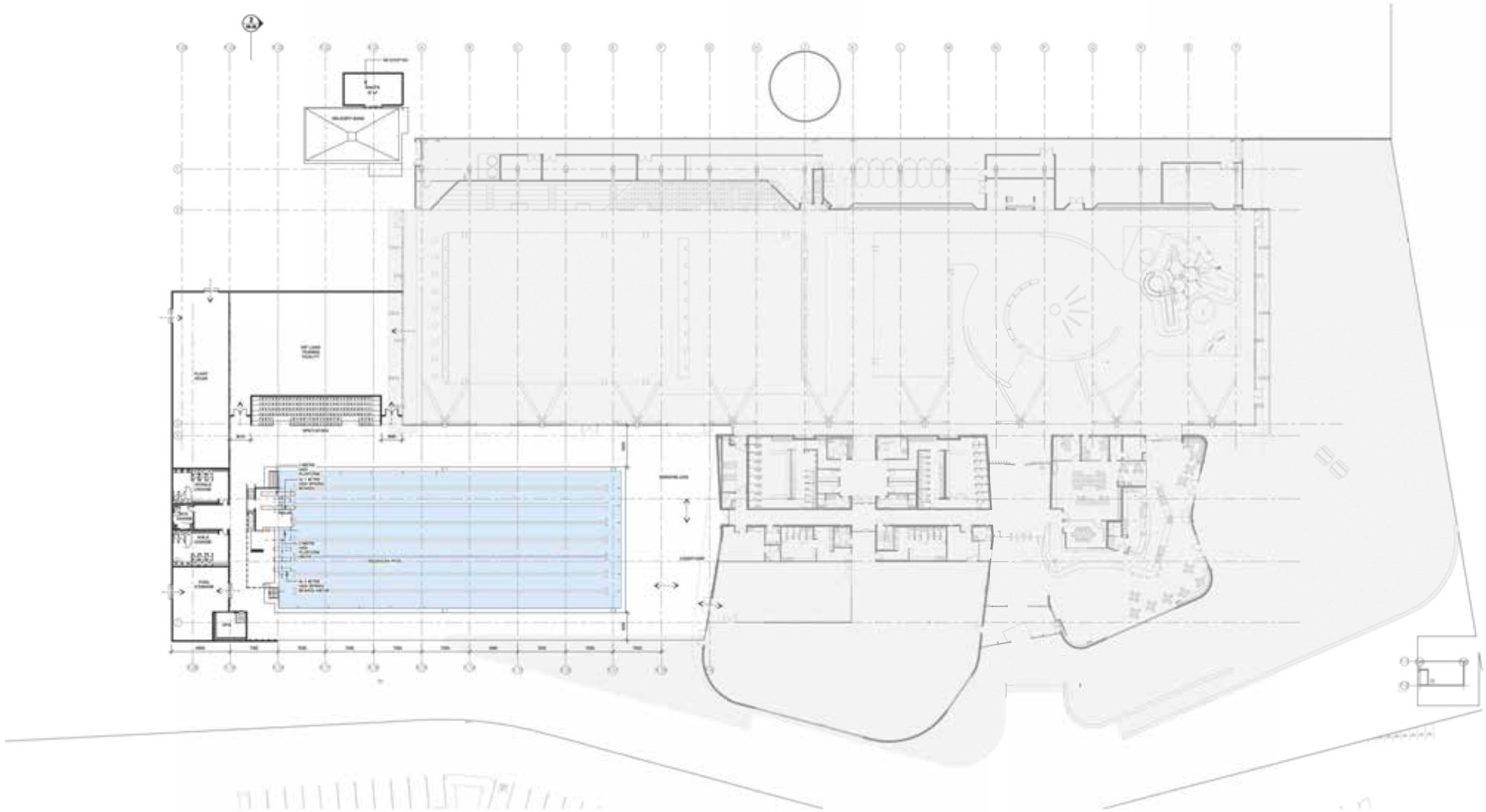
Option 5 3D massing studies

Included to show spatial height only

Included to show spatial height only

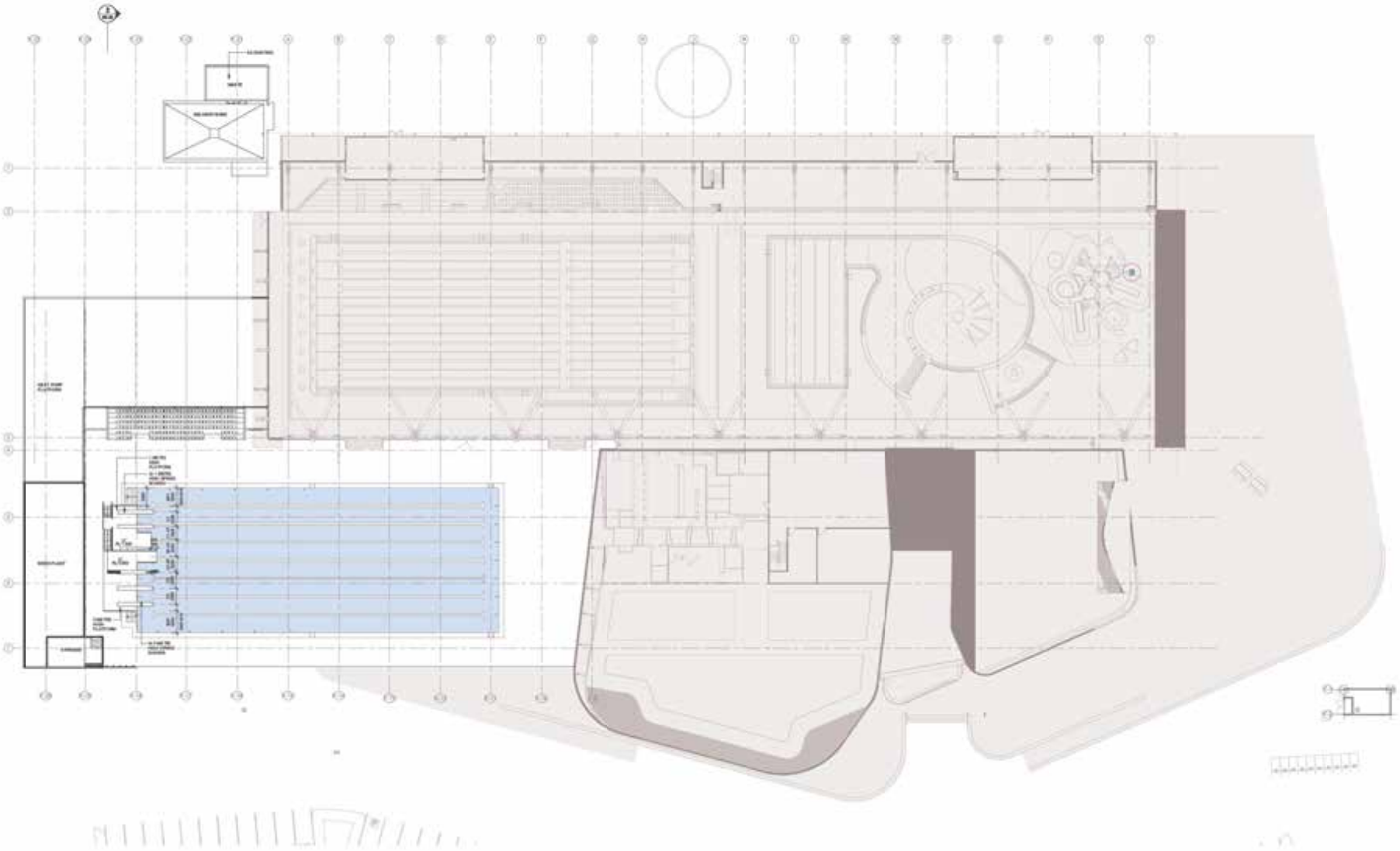
OPTION 5 - Ground Floor

N
NOT TO SCALE



OPTION 5 - First Floor

N
NOT TO SCALE



7.0 OPTIONS STUDY

7.6 OPTION 6

Option 6 (not briefed) is a 25m x 20m pool with a reduced suite of dive platforms and springboards, requiring a minimum depth of 3.8m. It is noted that this reduced offering limits development of a high performance pathway for young athletes with n the Canberra region.

The briefed dimensions (25m x 20m) provide a WA compliant field of play for competition diving, but will not provide a WA compliant field of play for water polo and artistic swimming. It is noted, too, that these pool dimensions do provide conventional lap swimming overflow / competition warm-up space.

Competitive dive provision includes:

- 1 x 5m platform (optional)
- 1 x 3m platform
- 1 x 1m platform
- 3 x 3m springboards
- 2 x 1m springboards

It is proposed that this option includes a moveable floor, providing enhanced operational flexibility in enabling the pool to be used safely for general recreation, aquatic fitness programs, learn-to-swim, and the like. This option is proposed as a hybrid offering that encourages broader participation and provides opportunity / potential to increase revenue due to increased programming / patronage to balance anticipated increased operational costs.

A Dryland Training facility (briefed) is provided and is anticipated to include training boards, foam pits, flat floor space for stretching, tumbling, etc and dedicated storage space. In this option, the proposed area of the dryland training space is reduced to reflect the reduction in diving platform / springboard provision.

Support facilities provided include the following:

- spa and concourse showers;
- spectator seating, in a similar format to that provided within the existing pool hall;
- dive pool designated change facilities - two change rooms and an accessible change space;
- pool plant room;
- storage space.

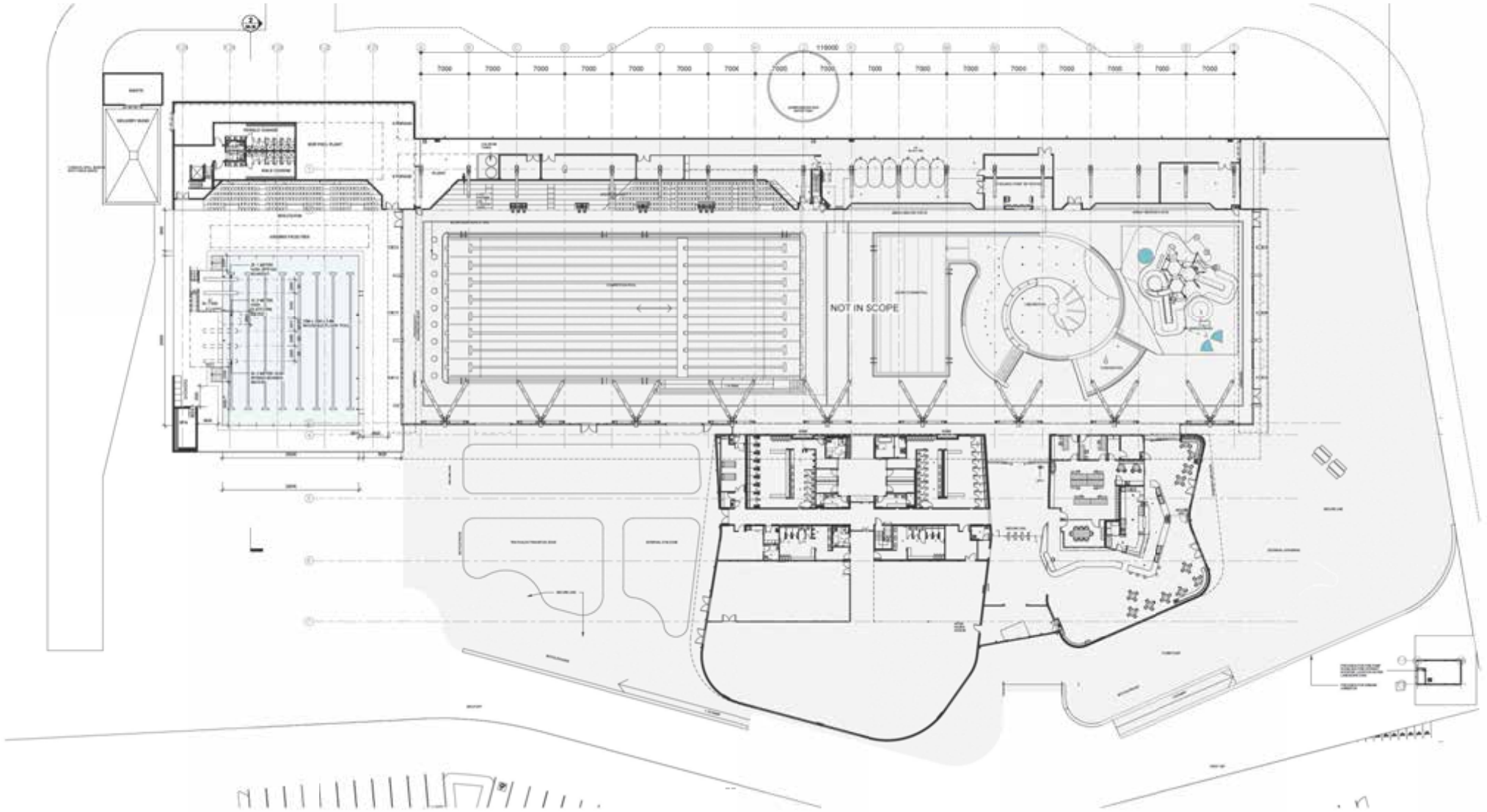
Option 6 3D massing studies

Option 6 3D massing studies

Option 6 3D massing studies

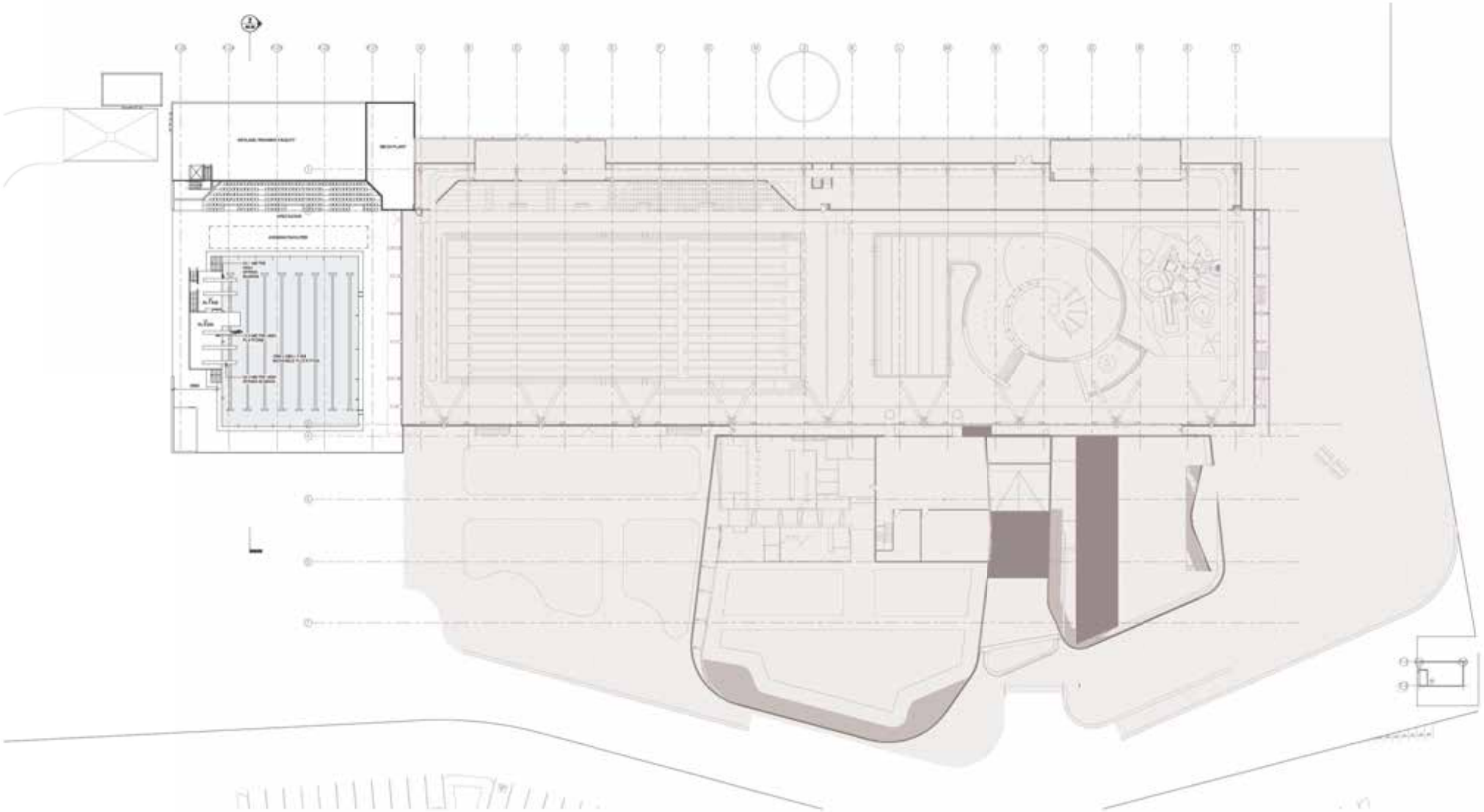
OPTION 6 - Ground Floor

N
NOT TO SCALE



OPTION 6 - First Floor

N
NOT TO SCALE



7.0 OPTIONS STUDY

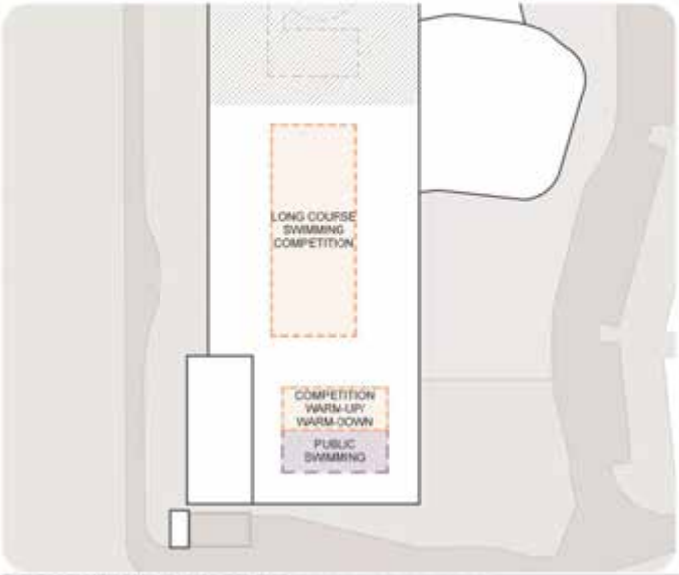
7.7 Programming Mode Configurations

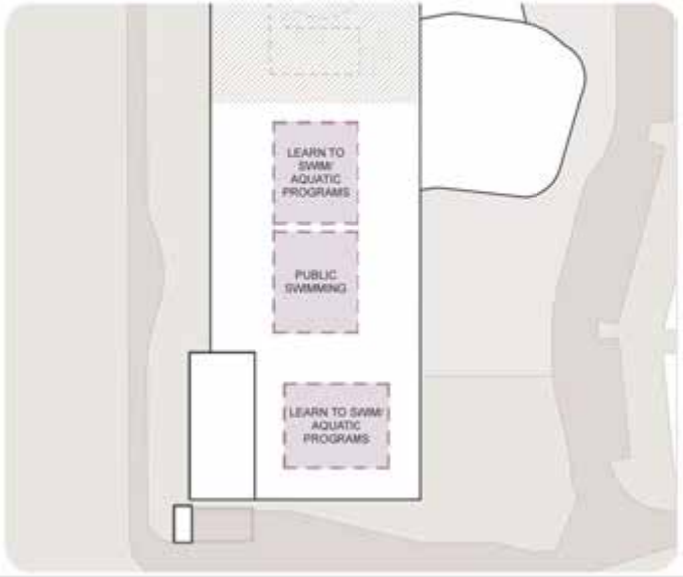
REPRESENTED ON OPTION 6

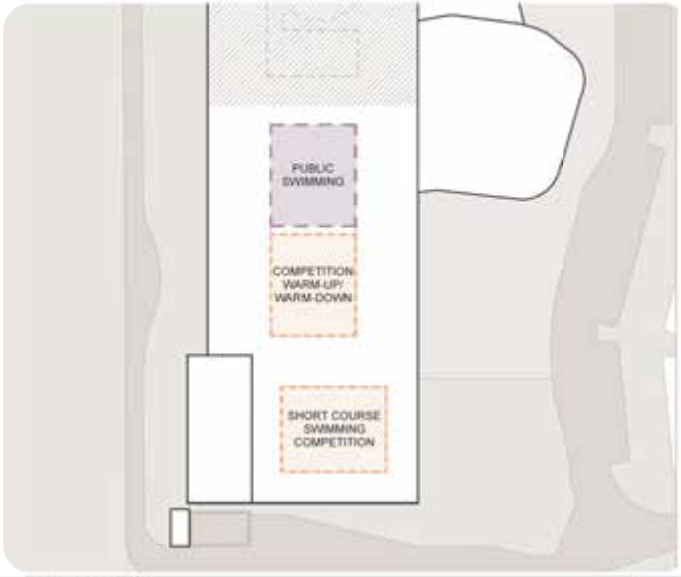
Dive Pool Option 6 provides flexible programming options, supports participants skill development and training, and accommodates a broad spectrum of groups for community benefit. These 5 configurations demonstrate how a new dive pool at Stromlo Leisure Centre could operate for various aquatic activities to maximise the usage of the dive pool, and more broadly the whole facility. The ability to change the pool depth frees up the existing 50m and 25m learn shallow depth pools for more varied use with potentially higher rates of return by meeting specific needs of users that are not catered for elsewhere. The modes are not limited to the 5 configurations shown.

DIVE POOL DEPTH MODE

DEEP	- Diving
MEDIUM	- Public Swimming
	- Short Course Swimming
SHALLOW	- Learn to swim
	- Aquatic programs







7.0 OPTIONS STUDY

FEASIBILITY ASSESSMENT CONSIDERATIONS AND COMPARISON

	Option 1	Option 2	Option 3	Option 4	Option 5	Option 6 (Alt.)
	30 x 20 x 5m pool, World Aquatics (WA) compliant - diving, water polo, artistic swimming Dryland training area 2 x 1m springboards 3 x 3m springboards 1 x 1m platform 1 x 3m platform 1 x 5m platform 1 x 7.5m platform 1 x 10m platform	25 x 20 x 5m pool, not WA compliant - diving, water polo, artistic swimming Dryland training area 2 x 1m springboards 3 x 3m springboards 1 x 1m platform 1 x 3m platform 1 x 5m platform 1 x 7.5m platform 1 x 10m platform	30 x 20 x 3.8m pool, not WA compliant - diving, water polo, artistic swimming Dryland training area 2 x 1m springboards 3 x 3m springboards 1 x 1m platform 1 x 3m platform 1 x 5m platform	25 x 20 x 3.8m pool, not WA compliant - diving, water polo, artistic swimming Dryland training area sub option 4A differs from 4 by it's eastern Dryland location. 2 x 1m springboards 3 x 3m springboards 1 x 1m platform 1 x 3m platform 1 x 5m platform	50 x 20 x 3.8m pool, WA compliant - diving, water polo, artistic swimming Dryland training area (with Dryland training area omitted in sub option 5A. 2 x 1m springboards 3 x 3m springboards 1 x 1m platform 1 x 3m platform	25 x 20m pool with max 3.8m movable floor, community and local competition focus Reduced Dryland training area 2 x 1m springboards 3 x 3m springboards 1 x 3m platform
Area	2,783.0m²	2,303.0m²	2,726.0m²	2,230.0m²	3,224.0.m²	2,074.0m²
Benefits	• WA (FINA) compliant - diving, artistic swimming • Includes concourse for competition - judging, marshalling, etc.	• WA (FINA) compliant - diving • Includes concourse for competition - judging, marshalling, etc.	• WA (FINA) compliant - diving, artistic swimming • Reduced capital / operating cost • Includes concourse for competition	• WA (FINA) compliant - diving • Reduced capital / operating cost • Includes concourse for competition	• WA (FINA) compliant - diving • Provides additional lap swimming / competition capacity	• WA (FINA) compliant - diving, artistic swimming • Reduced capitol / operating cost • Additional programming • Lower operational /management risk
Challenges	• Capital cost • Operating cost • Not water polo compliant • Limited additional programming • Operational / management risk	• Capital cost • Operating cost • Not water polo / artistic swimming compliant • Limited additional programming • Operational / management risk	• Not water polo compliant • Not compliant for all diving platform heights • Limited additional programming • Operational / management risk	• Not water polo / artistic swimming compliant • Limited additional programming • Operational / management risk	• Capital cost • Operating cost • Not water polo / artistic swimming compliant • Not compliant for all diving platform heights • Limited additional programming • Operational / management risk	• Not water polo / artistic swimming compliant • Not compliant for all diving platform heights • Additional maintenance of movable floor

8.0 INDICATIVE PROJECTIONS AND COST ESTIMATES

This section of the report examines the financial implications of the six proposed redevelopment options for the Stromlo Leisure Centre (SLC) over a 20-year period. The construction costs below are based on a tiled concrete pool shell option, noting that the construction cost variation to a modular option is only minor and is not material to the estimated projections. A summary table of the 20-year projections, construction costs and turnout costs is presented in 8.6. Renewal costs, based on advice from Wilde and Woollard, are also incorporated into these projections (Appendix G). Detailed breakdowns of the costs with variants for concrete and modular pool shell's are included in Appendix G. This information, combined with projected revenue, allows for an assessment of the net performance and financial viability of each option. A sensitivity analysis exploring the impact of variations in key assumptions is included to offer a comprehensive view of the potential financial outcomes.

Schedule 2.2(a)(xi),(xii),(xvi)

Schedule 2.2(a)(xi),(xii),(xvi)

8.5 SENSITIVITY ANALYSIS

Given the projected operational deficits, it is crucial to consider how variations in key assumptions might impact the financial outcomes. Several key building services disciplines including Hydraulic and Fire services have not yet been consulted at this stage. Also, the electricity tariff rate in the ACT is a significant factor influencing the overall financial performance. Fluctuations in this rate, driven by market forces or policy changes, could have a substantial impact on operational costs, particularly for energy-intensive deep-water facilities.

Variations in the projected (CPI), population growth, and local rates of income within the area could also affect the financial projections. The actual usage patterns of the facility, especially the frequency of movable floor adjustments in Option 6, will directly influence operational costs.

Further analysis is recommended to assess the financial implications of closing the Canberra Olympic Pool (COP) and integrating its existing operations into the SLC. The short fall from the upkeep of COP could potentially offset some of the projected deficits by leveraging existing infrastructure and operational efficiencies.

9.0 RECOMMENDATIONS

9.1 FEASIBILITY ASSESSMENT RECOMMENDATIONS

RECOMMENDATION 1

To best serve the diverse requirements that have been elicited from the stakeholder engagement process, it is evident that any further provision of public pool infrastructure would benefit from an overarching ACT pool strategy. The value of any further site-based feasibility studies would be enhanced if they were able to be situated within the terms of reference of such a strategy. In the absence of such terms of reference, recommendations for design options for a new dive pool at Stromlo Leisure Centre in this report should be considered to be guiding principles that inform the future approach for the design and distribution of public pools in the ACT.

RECOMMENDATION 2

Stromlo Leisure Centre does not have the capacity to be a state level diving, swimming and water polo facility, due to site constraints, and the nature of its location on the western periphery of Canberra, remote from hotels, restaurants and transit links.

RECOMMENDATION 3

The financial viability of each option requires a holistic assessment that considers not only the projected financial outcomes but also the social and community value the facility contributes to the region. While deep water facilities present inherent financial challenges, their role in promoting community health and well-being, supporting sports development, and providing recreational opportunities are essential factors in evaluating their overall value and justifying potential investment.

RECOMMENDATION 4

A facility that integrates flexible programming options, supports participants skill development and training, and accommodates a broad spectrum of groups for community benefit, constitutes an adaptable and effective response to community requirements. Stromlo Leisure Centre with its already high visitation rate and potential for extension both cater for a broad cross section of the community while generating additional revenue to offset operational costs. A reconfigured Stromlo Leisure Centre has the potential to grow participation in swimming, diving and water polo, and can provide entry level pathways for these sports.

Option 6 - 3D massing studies

For the reasons outlined in recommendation 4 Option 6 offers the greatest benefits to a wide cross section of the local community at Stromlo Leisure Centre.

APPENDICES

FEASIBILITY STUDY

A -	STATUTORY PLANNING	PURDON
B -	WORKSHOP NOTES AND QUESTIONNAIRES	
C -	RECREATIONAL PLANNING	WARREN GREEN CONSULTING
D -	CIVIL, TRAFFIC AND STRUCTURAL ENGINEERING	TAYLOR THOMSON WHITTING
E -	MECHANICAL AND ELECTRICAL	INTROBA
F -	AQUATIC ENGINEERING	MLEI
G -	QUANTITY SURVEYOR	WILDE AND WOOLARD

10.0 APPENDICES

APPENDIX A - STATUTORY PLANNING

DUE DILIGENCE REPORT

STROMLO LEISURE CENTRE –

DIVE POOL FACILITY

PART BLOCK 511 SECTION 0 STROMLO.

29 JULY 2024

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Table of Contents

Figures

1.0 Introduction

This report has been prepared by Purdon based on public information and plans provided by ACT Property Group as preliminary planning due diligence to assist the ACT Property Group regarding the opportunities and constraints associated with a proposed new dive pool facility at the existing Stromlo Leisure Centre (SLC) on part Block 511 Section 0 Stromlo., at the Corner of Uriarra Road and Dave McInnes Road. Refer to **Figure 1** and **Figure 2** below for subject site location and potential location of the dive pool facility.

This report outlines the statutory planning context, likely development opportunities, physical characteristics and potential constraints to future development.

Figure 1: Site Context

Source: Purdon (ACTmapi, 2024)

2.0 The Site

The site is part Block 511 Section 0 Stromlo.. For the purposes of this due diligence report, the subject site is as per **Figure 2: Location of Subject SiteFigure 2** below. The potential location of the dive pool facility is pictured on the south side of the existing building.

Figure 2: Location of Subject Site and Proposal Area

Source: Purdon (ACTMAPi, 2024)

The subject site is considered to be park of 'Stromlo Forest Park' as it is on the University of Canberra Stromlo Forest Park site map (see **Figure 3** below).

Figure 3: Stromlo Forest Park Site Map

Source: Purdon (Stromlo Forest Park Website <https://www.stromloforestpark.act.gov.au/visit/park-maps>, June 2024)

Other site characteristics include:

Subject Site Area	Part Block 511 Section 0 has an approximate area of 65,695 m² (6.57 ha)
Current Use	The site is currently used for leisure centre with 3 indoor pools and splash park, a gym, café, and creche.
National Capital Plan	The site is within a Designated Area and subject to the provisions of the National Capital Plan

Territory Plan Land Use Zoning	The site is zoned Designated Area.
Territory Plan Overlay Zone	The site has overlay zones: Urban Open Space; Public Land; and Special Purpose Reserve.
Existing Access	Vehicle access to the site is via Davie McInnes Road, Stromlo.
Existing Parking	There is an on-site public carpark (with overflow) to the east of the leisure centre building. There are 168 lined car park spots, 10 motorcycle spots, and 22 bike parking rings.
Vegetation	The site is developed with some trees to the east of the car park, immature tree plantings within the car park, and landscaped gardens around the east and north of the building. Some established trees are also on the site boundaries in particular to the north and south.
Registered trees	No Registered trees are on the subject site. (ACTMAPi, 2024).
Regulated trees	There are a number of trees on the subject site but not within the proposal area. According to ACTMAPi's Environment Map, there are no 'Mature Trees' present. If works are proposed near trees, it would be recommended to obtain an arborist report.
Adjacent Uses	Adjacent land uses are residential and community with key destinations in the nearby vicinity including: Stromlo Forest Park Multiuse recreational sporting facility (on same block), Mount Stromlo Observatory, Ruth Park Playground and Holden's Pond.
Topography & Drainage	The site slopes downward approximately 23m from east to west. The site drains to the surrounding street network.
Heritage	The subject site is protected under the *ACT Heritage Act 2004* (ACTMAPi, 2023). Block 511 Section 0 (formerly Block 447) Stromlo is included as a registered site within the ACT Heritage Register – '20148 Aboriginal Places – Stromlo & Kowen Forests' adopted 2005. Refer to document 'Aboriginal Places in Stromlo and Kowen Forests' on the ACT Heritage register website for full details. There are 14 places identified within former Block 447 as follows: • *09D1 - An isolated stone artefact located on a forest track.* • *67I1 - A scatter of at least 7 stone artefacts located on a forest track.* • *67I2 - An isolated stone artefact located on a forest track.* • *67I3 - A scatter of at least 2 stone artefacts located on a track.* • *67I4 - An isolated stone artefact located on a forest track at a vehicle turning area.* • *67I5 - An isolated stone artefact located on a forest track.* • *68G1 - An isolated stone artefact located on a forest track.* • *69J1 - A scatter of at least 2 stone artefacts located on a forest track.* • *69Q1 - An isolated stone artefact located on a track just above Little Creek.* • *99Q3 - An isolated stone artefact located on a forest track.* • *1/9 9F1 - A scatter of at least 3 stone artefacts located on a forest track.*

	• *1/9 9F2 - An isolated stone artefact located on a forest track.* • *1/9 9F3 - A scatter of at least 5 stone artefacts located on a forest track.* • *1/9 9J1 - A scatter of at least 7 stone artefacts located on a forest track.* Note: The above heritage listing is for a number of sites including retired Block 447 Stromlo (now part of Block 511 Section 0 Stromlo) which encompassed an area of 567 ha and which may include the area within the Subject Site of this study. Due to the fact that the Subject Site has been disturbed with an existing Leisure Centre, it is unlikely that there are heritage places within the location. It is recommended that a heritage assessment be conducted (if not already completed for the construction of the existing Leisure Centre) to determine that the proposed works location will not be near any of the heritage places listed above. The site is not protected as a Commonwealth, National, or World Heritage place under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
Bushfire	The subject site is wholly within a *Bushfire Prone Area* and *Bushfire Abatement Zone* as well as and partially within both an *Inner Asset Protection Zone* and *Outer Asset Protection Zone* (ACTMAPi, 2024). A Bushfire Risk Assessment Report will be expected for this proposal.
Flooding	The subject site is not listed as being subject to flooding (ACTMAPi, 2024).
Easements	There are no easements on the subject site however there are water easements adjacent to the boundary to the northeast and southeast (ACTMAPi, 2024). Refer to **Figure 2** for details.
Site Servicing	The site is fully serviced.
Contamination & Hazardous materials	There are no known contamination or hazardous materials on the site. The site is not listed on the *ACT Register of Contaminated Sites*.
Environmental Overlays	The following overlays are present within the subject site but not within the proposal area (ACTMAPi, 2024 and the ACT Ecological Network Dashboard, 2024): • *Ecological Communities – Potential Threatened Woodland* • *Urban Habitat Fragmentation - Fish Connected Habitat* • *Urban Habitat Fragmentation – Riparian Connected Habitat* • *Urban Habitat Fragmentation – Amphibians Connected Habitat* • *Urban Habitat Fragmentation – Grassland Reptiles Connected Habitat* • *Vegetation map* The following overlays are present within the proposal location: • *Urban Habitat Fragmentation – Native Bees Connected Habitat*

Figure 4: Location of Native Bees Connected Habitat

Source: Purdon (ACTMAPi, 2024)

The Native Bees Connected Habitat has a *Potential Connectivity Corridor* within approximately 17 m of the south side of the existing building. There is also a *Potential Core Habitat* within 20 m of the south side of the existing building.

This habitat would need to be further investigated as to any potential impacts. It should be noted that the data is limited as the mapping states the habitat and connectivity is likely overestimated and ground truthing studies should be conducted at any site of interest (refer to the data limitations disclaimer from the *ACT Ecological Network Dashboard*).

Soil

According to ACTMAPi (2024) the soil within the subject site is as follows:

- *Soil Landscapes – Burra*
- *Hydrogeological Landscapes – Reedy Creek*
- *Hydrogeological Management Areas – MA4/5, Mid slope and lower slope – colluvial*
- *Current Erosion Hazards – 3, Moderate erosion hazard*
- *Salinity Hazard – High*
- *Land and Soil Capability – 6, Low capability land*

A soil assessment will need to be conducted to understand the suitability of the soil (and consequent design requirements) for a deep pool.

3.0 Statutory Planning Controls

This section identifies the relevant planning controls that would affect the probability of a proposed diving pool facility extension to the existing Stromlo Leisure Centre.

3.1 Crown Lease

In the ACT all land is held under leasehold, that is, the Australian Government owns all the land and each proprietor has a Lease with the Government that provides additional covenants as to what can or cannot occur on each block. In the ACT, leases are managed on behalf of the Australian Government, by the ACT Government, specifically the Territory Planning Authority (TPA).

3.1.1 LESSEE

The Crown Lease is an Executive Lease where the Lessee is the Australian Capital Territoy in the care of the Chief Minister Treasury and Economic Development Directorate.

3.1.2 LAND

The land in the Crown Lease lists two sites:

- **Block 511 Section 0 Stromlo**
- Block 514 Section 0 Stromlo

The relevant block for this proposal is Block 511 Section 0 Stromlo.

3.1.3 TERM AND PURPOSE

The Crown Lease states:

> *RESERVING unto the Territory all minerals and the right to the use, flow and control of ground water under the surface of the land TO HOLD unto the Lessee for the term of ninety nine years commencing on the* ***Fourth day of June Two thousand and fifteen*** ***to be used by the Lessee for any purpose permitted pursuant to the National Capital Plan*** *YIELDING AND PAYING THEREFOR rent at the rate of five cents per annum if and when demanded and UPON AND SUBJECT TO the covenants conditions and agreements contained in this lease.*

This means that the use of the land must be consistent with the permitted land uses listed in the NCP. Refer to **Section 3.2.3** for a list of the permitted land uses in the NCP.

3.1.4 COVENANTS – TREES

Regarding trees, the Crown Lease states:

> *That the Lessee shall not cut down fell ringbark or otherwise injure or destroy (or suffer or permit the same) any live tree or tree-like plant on the land* ***without previous consent in writing of the Territory.***

This covenant is noted but as the proposal site does not have any trees, it will not be relevant unless the development area is expanded.

3.2 National Capital Plan

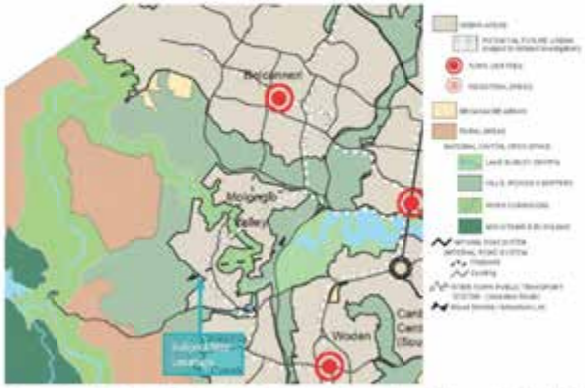
The Subject Site is within a Designated Area under the National Capital Plan (NCP) administered by the National Capital Authority (NCA) in accordance with *Australian Capital Territory (Planning and Land Management) Act 1988* (PALM Act). Therefore, any external works on-site require approval from the NCA evaluated against the requirements of the NCP.

Figure 5: Subject Site Within the Designated Areas of the National Capital Plan

Source: Purdon (Figure 1: Designated Areas, National Capital Plan, 2024)

According to the NCP's *General Policy Plan – Metropolitan Canberra*, the site is within the *Hills, Ridges and Buffers* (see **Figure 6** below).

Figure 6: Site location within the NCP's General Policy Plan - Metropolitan Canberra



Source: Purdon (Figure 2: General Policy Plan – Metropolitan Canberra, National Capital Plan, 2024)

The General Policy Plan also notes that the subject site forms part of the visual link between Mount Stromlo and the National Arboretum.

3.2.1 NATIONAL CAPITAL OPEN SPACE SYSTEM

The subject site is part of the National Capital Open Space System (NCOSS) of the NCP. The NCOSS recognises the importance of the natural setting of the National Capital. The NCP states that the NCOSS:

> *Essentially comprises the inner hills and ridges which surround and frame the urban areas, the major lakes and river corridors, and the distant mountains and bushland to the west of the Murrumbidgee River... Together these open spaces constitute a system which protects the environmental quality of Canberra's present and future water catchments, river systems, and important ecological and heritage areas from the increasing pressure of Canberra's growth.*

Four NCOSS land use categories are incorporated in the NCP:

- Lake Burley Griffin and Foreshores
- **Hills, Ridges and Buffer Spaces**
- River Corridors
- Mountains and Bushland

The site is subject to the principle and policies of the NCOSS detailed in the NCP.

3.2.2 HILLS, RIDGES AND BUFFER SPACES – INNER HILLS

The site is identified in the NCP as being within the 'South Canberra (West)' area of the *Inner Hills* of the *Hills, Ridges and Buffer Spaces*. Refer to **Figure 7** below which shows the site location within the *Inner Hills*. The site is adjacent to Mount Stromlo which is identified as one of the *Inner Hills* for Canberra Central.

Figure 7: Site location with the Inner Hills of the NCP

Source: Purdon (Figure 6: Inner Hills – South Canberra (west), National Capital Plan, 2024)

The NCP states that the *Inner Hills*:

> *Provide the scenic backdrop and natural setting for Canberra's urban areas and within Canberra Central that are integral to the Griffin's composition. Accordingly, their planning, design and development as open space areas are central to the maintenance and enhancement of the character of the National Capital.*

The site is subject to the following principles and policies of the NCP for *Hills, Ridges and Buffer Spaces:*

> ***Principle for Hills, Ridges and Buffer Spaces***
>
> *Hills, ridges and buffer spaces are to remain substantially undeveloped in order to protect the symbolic role and Australian landscape character of the hills and ridges as the scenic backdrop to the Parliamentary Zone, the City Centre and other National Capital precincts, to maintain the visual definition and physical containment of the surrounding towns and to ensure that their landscape, environmental and recreation values become an integral part of the National Capital.*
>
> ***Policies for Hills, Ridges and Buffer Spaces***
>
> a. *The Inner Hills will be protected as key symbolic and landscape elements in the Plan expressing the defined land, water and municipal axes and providing the dominant backdrop feature to the city.*
> b. *The hills and ridges must be planned and managed as a multiple-use recreation and environmental system with different parts having their own special character and use.*
> c. *The hill tops will continue to be used as key vantage points for viewing and understanding the National Capital. Development will be sited so as to minimise its visual impact on the Central National Area and any environmental impact on the hill tops.*
> d. *The environment and Australian landscape character of the hills and ridges will be protected and enhanced to provide a unified landscape setting for the National Capital.*
> e. *The rural landscape in the areas adjacent to the ACT border between Hall and the Murrumbidgee River will be retained as an intrinsic part of the National Capital character and with additional landscape treatment provide physical containment to this part of Belconnen. A similar landscape buffer will be provided between Belconnen and Gungahlin.*
> f. *Black Mountain, Mt Taylor, Tuggeranong Hill and Isaacs Ridge will continue to provide locations for current telecommunications facilities.*

Any proposal will need to be consistent with the above principle and policies.

3.2.3 PERMITTED LAND USES

The permitted land uses for the site as part of the *Inner Hills* of the NCOSS are as follows:

- ***Aquatic Recreation Facility (Stromlo Forest Park only)***
- *Agriculture*
- *Forestry (Green Hills, Tuggeranong, Ingledene, Stromlo and Fairbairn pine plantation and woodlots only)*
- *General Farming*
- *Indoor Recreation Facility (Stromlo Forest Park only)*

- *Landscape Buffer*
- *Nature Conservation Area*
- *Open Space*
- *Outdoor Education Establishment*
- *Outdoor Recreation Facility (not including stadiums, showgrounds, racecourses,*
- *motor racing and like activities)*
- *Park*
- *Pathway Corridor*
- *Public Utility*
- *Road*
- *Scientific Research Establishment*
- *Overnight Camping (Stromlo Forest Park and Elm Grove campsite only)*
- *Tourist Facility (Stromlo Forest Park only)*

The proposed diving pool facility would be considered to meet the definition of the current use of ***Aquatic Recreation Facility*** which is defined as:

> *A building or place used for a sporting, exercise, pastime or leisure activity, whether operated for gain or not which includes uses based on or adjacent to a water feature, such as a boat shed, boat landing facility, wharf, swimming facility and the like.*

3.2.4 DESIGN AND SITING GENERAL CODE

Any proposal will need to meet the conditions of the Design and Siting General Code. Some parts of this general code mentions residential, commercial and industrial buildings. We are of the opinion that the development proposed is a 'community' building and therefore these requirements are not relevant, however advice from the NCA can be sought. Within the *'Conditions for buildings other than detached houses'* the following are relevant to the proposal:

Coverage

> *Unless otherwise specifically provided for, the area occupied by buildings including any out-buildings on a block should not exceed one-half of the total area of the block.*

As the proposal area is relatively small, this condition is likely to be met.

Height

> *Generally, the height of any building should not exceed two storeys.*

The proposed dive pool building should not be higher than the existing building (which is 2 storeys). In order to fit a 10 m high diving platform, there may be need to make a case to the NCA for a higher building. The NCA should be approached prior to lodgement of the Works Approval to gain their initial support for this. As the Dive Pool is a permitted use for the site, the NCA is likely to support a higher building height to achieve this proposal.

Plot ratio

> *The Plot Ratio must not be greater than 0.40 for residential buildings other than detached houses, and 1.00 for commercial and industrial buildings, unless otherwise specifically provided for.*

Plot Ratio is calculated from the total block size. The proposal is for a community building so therefore we consider that there are no plot ratio requirements.

External appearance of buildings

The external treatment of buildings, including materials, colours and general standards of finish must ensure that the buildings, walls, fences and other ancillary structures are appropriate to and not discordant with the general development and amenity of the locality.

The architecture of the proposal must fit in with the existing site design.

To implement this general condition it is necessary for the following design and siting conditions to be exercised. In special circumstances, it may be necessary for the National Capital Authority to determine additional design and siting conditions to those set out hereunder.

Roofs

Permanently highly reflective metal roofs will not be approved. Generally, tiled roofs having a strong pattern or marked colour contrast will not be approved.

Structures above roofs

The design and siting conditions for detached houses with respect to structures above roofs will apply to buildings other than detached houses [as follows]:

a) Except as provided for below, structures above roofs are not permitted.

b) Structures necessary under the ACT building regulations, and solar energy devices, may be permitted. Proposals may be subject to conditions in respect of type, position, size, height or appearance.

c) External television antennae affixed at the rear of the main building in the least conspicuous position when viewed from public areas, may be permitted to extend no more than 1.5 m above the highest point of the roof.

d) External television antennae not meeting the requirements of (c) above may be permitted where the need for the proposal for reasonable reception of Canberra channels is established by a report from an appropriately qualified technician.

e) A radio transmitter mast or aerial should be on a freestanding structure at the rear of the main building in the least conspicuous position when viewed from public areas.

Screening walls

Generally, where service areas are visible from the road or a public reserve a screening wall or fence will be required.

The service areas will need to be screened from the surrounding public roads (not the driveways within the subject site) and also screened from the surrounding public reserves.

Landscaping and other matters

In order to satisfy the objectives contained in the general conditions it may be necessary for the National Capital Authority to require the submission of acceptable landscape proposals as a condition of approval.

The NCA may add further conditions to the Works Approval for the landscape design if applicable.

Siting of buildings

> *The siting of buildings on blocks must ensure adequate space for access, internal circulations, parking, off-street loading, light, air and landscaping.*

The proposal location appears to meet most of this condition however parking provision for the increased users as well as 'adequate landscaping' will need to be considered for the design.

> ***To implement this general condition it is necessary for the following design and siting conditions to be exercised. In special circumstances, it may be necessary for the National Capital Authority to determine additional design and siting conditions to those set out hereunder.***

Parking

> *Off-street parking spaces, open or enclosed, must be provided for all new buildings and enlargements or conversions of existing buildings.*
>
> *Alternative parking requirements may be considered where supported by a traffic and parking assessment and where agreed by the National Capital Authority.*

There are no minimum parking space requirements for 'community' buildings, however the NCA will need to see that the added capacity of users to the site have been considered.

3.2.5 OTHER RELEVANT CONTROLS OF THE NCP

Please note that any external signage will need to meet the *Signs General Code* and any external lighting will need to meet the *NCA's Outdoor Lighting Policy*.

3.2.6 CONCLUSION

The proposal for a dive pool facility is a use permitted in the NCP and therefore the crown lease. The above sections identify that to use the site for an extension to an *Aquatic Recreation Facility* or for a new free-standing building adjacent to the existing leisure centre building, further studies of the Aboriginal Heritage Places, Bushfire Risk, and Native Bees Connected Habitat and will need to be conducted for the proposal location.

If the building height is proposed to be more than 2 storeys (or higher than the existing building) the design will need to seek initial support from the NCA prior to WA lodgement. The design will need to meet the relevant requirements of the *Design and Siting General Code* including external appearance of buildings, roofs, structures above roofs, screening walls, landscaping, and siting of building including parking. Additionally, the proposal will need to meet the *Signs General Code* and *Outdoor Lighting Policy* if applicable.

3.3 Territory Plan

As the site is Designated Land, there are no planning controls within the Territory Plan that apply to physical works on the site. The only controls that apply from the Territory Plan to the site, involves the Crown Lease. As noted at Section 3.1 above, Crown Leases are managed by the Territory.

These controls include those that apply within the Lease Variation General Policy and the Subdivision General Policy. As subdivision/consolidation is not proposed, these controls are not reviewed in this report.

The only relevant consideration in the Crown Lease is the covenant for trees (see Section 3.1.4). This covenant requires that the lessee seek written consent from the ACT to remove any *'live tree or tree-like plant'* on the site. As there doesn't appear to be any trees in the proposal area, meeting this requirement is not likely to be necessary.

3.3.1 CANOPY COVERAGE

As there are no requirements in the NCP for canopy coverage, the NCA may look to the ACT policy for canopy coverage for the drafting of the landscaping requirements as mentioned above for the NCP's 'Landscaping and other matters'. In order to meet the NCP's 'screening walls' requirements to the adjacent reserve land, it would be suitable to demonstrate to the NCA that the ACT's canopy coverage requirements have been met for the site.

The strategic planning document *Canberra's Living Infrastructure Plan: Cooling The City, 2019*, has in part informed the *Urban Forest Act 2023*. The ACT refers to this document when specifying canopy coverage.

The relevant part of *Canberra's Living Infrastructure Plan: Cooling The City, 2019*, is on page 19 as follows:

> ***Action 2: Living infrastructure Targets***
>
> ***Achieve 30% tree canopy cover*** *(or equivalent) and 30% permeable surfaces in Canberra's urban footprint by 2024.*

3.4 Work Approval Application

In accordance with the *Australian Capital Territory (Planning and Land Management) Act 1988* (PALM Act), *'any external alteration to building or structure, demolition, landscaping or excavation works within the designated areas require the prior written approval of the NCA or a Works Approval'*. There are no exemptions from the requirement to seek Works Approval (WA) under the PALM Act for external works.

The process for a WA application differs from that of the Territory Planning Authority's Development Approval assessment process, refer to **Figure 8** below for the NCA's WA workflow.

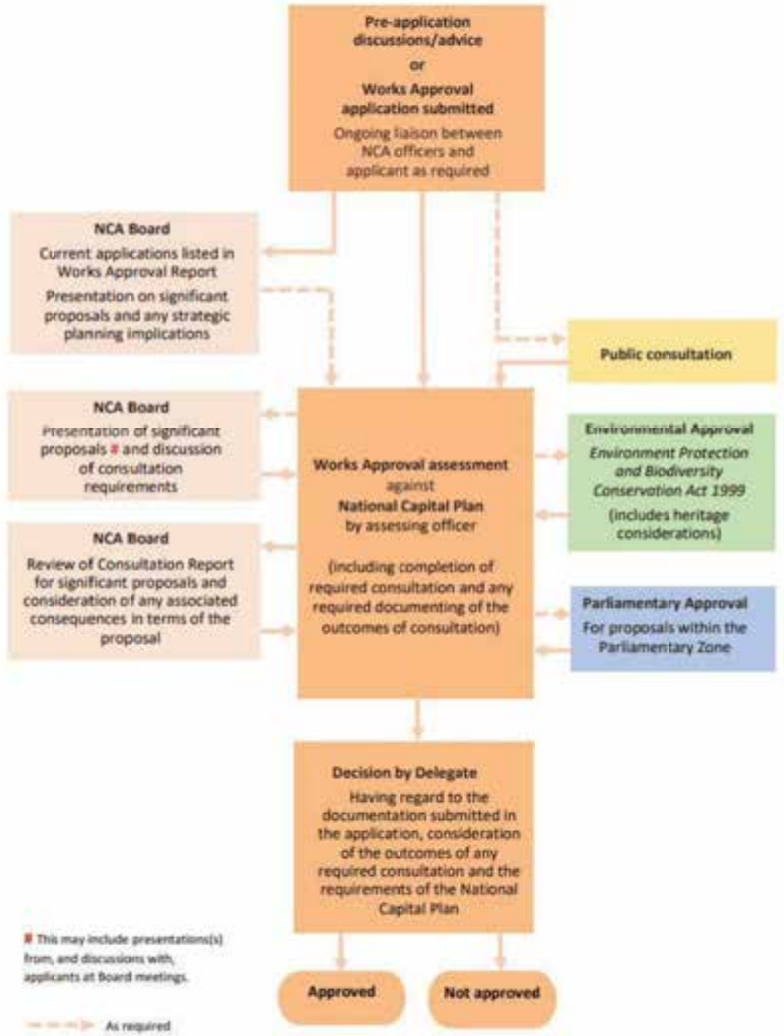
Once the WA submission is prepared, we submit via the NCA WAeL portal (similar to NSW Planning Portal). Once accepted for completeness, the NCA will review the application against the requirements of the plan. In this, they have full discretion as to whether any entity referral occurs. The assessment is subjective and only quantitative when such a number exists in a control.

WAs are assigned to one Planning Officer of the NCA and QA is provided once the decision progresses to the Delegate. There are no stages of assessment or referrals similar to the ACT system. Additionally, WAs normally feature less conditions but rather allow the proponent to comply with all other legislative requirements (like endorsement from utilities) without further input from the NCA.

The scale of the proposal would require a 'Major' WA application. The NCA states that assessment of a minor WA will take around 15 working days. For larger proposals such as this dive pool facility, there is no statutory timeframe and the assessment time depends on a number of aspects such as entity referrals, the NCA board, and any other considerations.

A minimum document checklist for submission of 'Major' WA applications is available on the NCA website.

Figure 8: Works Approval Workflow - Standard Process



Source: National Capital Authority, 2024

3.5 Costs

Should a Works Approval be required, the below lists the expected administrative costs applicable for the **2023/24 financial year**:

Table 1: Schedule of Fees for WA applications

Value of Works*	Fee Payable**
If the estimated cost of works does not exceed $100,000	$145.00 plus 0.45% of the amount in excess of $20,000 of the estimated cost of works
If the estimated cost of works exceeds $100,000 and not $500,000	$1,615.00 plus 0.35% of the amount in excess of $100,000
If the estimated cost of works exceeds $500,000 and not $1,000,000	$3,290.00 plus $0.35% of the amount in excess of $500,000
If the estimated cost of works exceeds $10,000,000	$27,840.00 plus 0.15% of the amount in excess of $10 million

**Value of works amounts are GST exclusive*

*** Fee payable is exempt from GST*

Please refer to the NCA website for an updated fee schedule after 31 June 2024.

4.0 Conclusion

This report has been prepared by Purdon as preliminary planning due diligence to assist the ACT Property Group regarding the opportunities and constraints associated with a proposed new dive pool facility at the existing Stromlo Leisure Centre on part Block 511 Section 0 Stromlo.

The above report has identified:

- The site is Designated Land, where the planning authority rests with the NCA, therefore a WA application is required for the proposal.
- The Crown Lease requires that the purpose of the site is *'to be used by the Lessee for any purpose permitted pursuant to the National Capital Plan'*.
- The NCP lists the proposed use of *Aquatic Recreation Facility* as a permissible use on the site.
- The following further studies will need to be conducted for the proposal location:
    - Aboriginal Heritage Places
    - Bushfire Risk
    - Native Bees Connected Habitat
- Based on our review of the NCP:
    - Building height is restricted to no more than 2 storeys (or no higher than the existing building) unless we get NCA support prior to WA lodgement. It is encouraged to approach the NCA early to ascertain the maximum supported height and minimise risk.
    - The design will need to meet the relevant requirements of the *Design and Siting General Code* including external appearance of buildings, roofs, structures above roofs, screening walls, landscaping, and siting of building including parking.
    - If applicable, the proposal will need to meet the requirements of the *Signs General Code* and *Outdoor Lighting Policy*.
    - Tree removal/ damaging activities will require approval from the Territory (TCCS).

Based on our review of the proposal and the planning controls, we consider it possible for the development of a new dive pool facility to be developed on this site pending the further studies listed above and the NCA support for a building higher than 2 storeys.

Should you require further clarification, we are available to discuss further options for the site.

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June 2024

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PURDON

10.0 APPENDICES

APPENDIX D - CIVIL, TRAFFIC AND STRUCTURAL ENGINEERING

TTW Structural Civil Traffic Façade

Civil, Traffic and Structural Feasibility Assessment

Design of ACT Pools

Prepared for CK Architecture / 22 August 2024

239110

TTW (ACT) PTY LTD (ACN 649 973 482)
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Your Partner in Engineering

DOCUMENT REGISTER

PREPARED BY	APPROVED BY	STATUS	REVISION	DATE
		Draft for Costing	A	19/07/2024
		Final Feasibility for Costing	B	16/08/2024
		Final Feasibility	C	22/08/2024

Contents

1.0 Introduction

TTW has been engaged by CK Architecture to prepare civil, traffic and structural inputs to the overall feasibility assessment of the extension of the Stromlo Leasure Centre and the securing of the Canberra Olympic Pool.

The specific elements of the feasibility assessment relate to:

- Review of existing reporting and documentation for the SLC to understand if provision had been made for future expansion (i.e. structure, parking and stormwater flows),
- Mapping of the proposed building on SLC site,
- Review of site stormwater conditions,
- Review of geotechnical conditions,
- Prepare parking study using aerial imagery for utilisation history,
- General traffic observations on site at intersections,
- Review of existing pavement conditions, and
- Provide advice on parking requirements.

2.0 Site Descriptions

The project considers two sites. The first is the Canberra Olympic Pool located on Block 7, Section 37 Canberra Central City (36 Constitution Avenue). The facility consists of a functioning existing Olympic Pool within a fabric enclosure, a decommissioned outdoor/diving pool, functioning plant rooms, bathrooms and administration buildings as well as landscape and external stormwater drainage. The facility is currently bound by Block 9, Section 37 and Block 1, Section 62 Canberra Central City.

The second site is located at Stromlo Forrest Park on a portion of Block 511 Section 0, Stromlo. The facility is known as the Stromlo Leasure Centre and consists of a functioning existing aquatic facility with associated parking, servicing, recreational elements and landscaping. The site is zoned as per the Territory Plan as DES: Designated, TSZ1: Transport and NUZ3: Hills, Ridges and Buffer Areas.

3.0 Review of Existing Reporting

As part of the feasibility assessment the following existing reporting and documentation has been reviewed for the Stromlo Leasure Centre site:

- Existing civil design drawings,
- Existing structural design drawings,
- Geotechnical investigation report for the car park expansion, and
- Original geotechnical report for the site.

The specific outcomes of the review of existing information are discussed in the following sections.

4.0 Geotechnical Conditions

TTW understands that significant earthworks were completed as part of the original Stromlo Aquatic Centre development however cannot confirm the exact methodology followed to remediate the site to remove buried organic material left over from the 2003 Canberra Bushfires.

Historical aerial imagery indicates that the earthworks completed was limited to the southern edge of the entry road and that works outside of this area would be located on uncontrolled fill.

5.0 Provision for Future Expansion

Assessment of the existing civil plans indicates that an additional 117 formalised on grade car parks can be facilitated in the lower tier of the car park if sealed and linemarked.

The building structure does not appear to have made specific allowance for a future expansion in terms of footing, column and roof design and detailing. As such, any extension should be treated as structurally independent of the existing building.

6.0 Existing Civil and Traffic

6.1 Existing Stormwater

There is significant existing stormwater infrastructure on the site constructed as part of the original Stromlo Aquatic Centre development. Specific stormwater infrastructure consists of:

- Surface inlet pits,
- Plantation sumps,
- Piped stormwater drainage,
- 260kL inground stormwater retention tank,
- 80kL sediment ponds,
- 230kL wetland, and
- Overland stormwater drainage channels.

6.2 Existing Pavements

There are several different pavements facilitating vehicle and pedestrian access to the existing facility. The specific pavement types include:

- Granular Asphaltic,
- Reinforced Concrete, and
- Gravel.

Refer Appendix C for comprehensive list of pavement types, pavement profiles, installation methodology where applicable, and location.

6.3 Existing Waste

The existing development contains a 10.1 x 4.3m waste room with 6x 1500L Waste hoppers collected 3x per week by private contractor, and 3x 1,100L Recycling hoppers collected 2x per week by private contractor. The existing waste room dimensions are not compliant to the current Development Control Code for Waste Management 2019 and EAN 24.

6.4 Existing Parking Facilities

The existing site is serviced by a formalised asphalt carpark. This carpark consists of 155 general parking spaces, 10 short stay parallel spaces and 8 DDA spaces. Additionally, there is an informal overflow gravel carpark bounded by large rocks to delineate the parking area which has a nominal capacity of 100 informal car spaces.

6.5 Existing Parking Utilisation

Traffic and parking observations have been conducted on site on the 18th July 2024 at 11am and 27th July at 11.30am. During both survey periods the car parks were observed to be underutilised with at least 50% capacity available.

Traffic observations were undertaken utilising NearMaps for the times available between 6th August 2020 and 29th July 2024. The investigation indicated that the car parking on site is generally has a maximum utilisation of 58% or nominally 165 cars spaced being utilised.

The exception to the general observations was on 26th November 2022 where only 35 of the available 282 car spaces were available. TTW assume there was a carnival occurring on this day. We note that the aerial imager from this day indicates that all vehicles were parked legally, and that there were likely car spaces available as required to support the parking generation

Assessment of historical aerial images over the facilities operational life indicates that the existing facility has sufficient formalised parking to support its general operation, and that during specific events and carnivals there is overflow parking available to provide sufficient increased capacity.

7.0 Proposed Civil and Traffic

The proposed development for Stromlo Leisure Centre has been split into 6 different options for consideration. The proposed works layout, including road and building for Options 1,2,3,4 and 6 are similar for the purposes of Civil design, where TTW has taken Option 6 as the site plan to use for the options assessment.

Option 5 has a significantly different building layout, with the proposed building wrapping around the east of the existing Stromlo Leisure Centre. The implications to Civil Design include different generation rates for waste, parking and SW requirements, with most other considerations and design being relatively similar to the other options.

Option 6 proposed building has a nominally 1777m² total building footprint area. It relocates the Southern portion of the service loop road, has a new waste room and relocated delivery bund.

Option 5 proposed building has a nominally 3000m² total building footprint area. It also relocates the Southern portion of the service loop road, has a new waste room and relocated delivery bund.

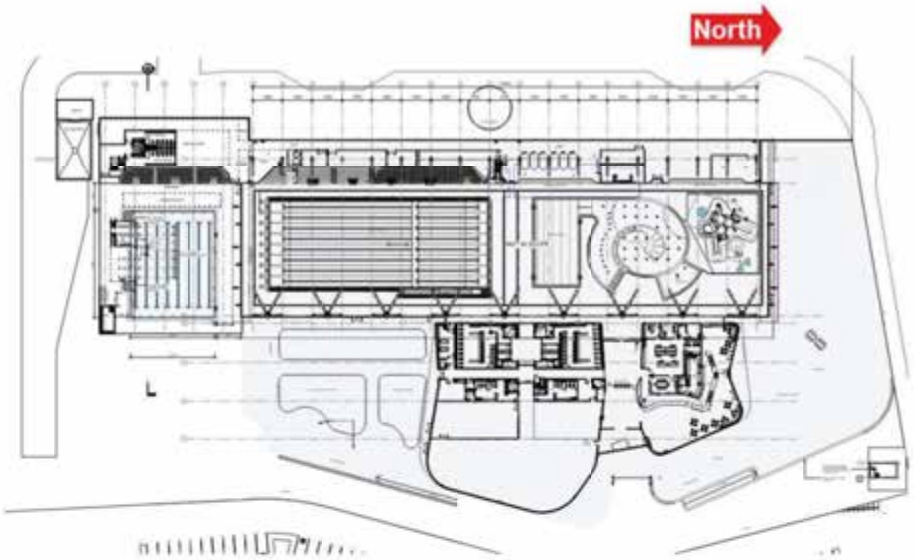

Figure 1: Architectural Plan for Option 6

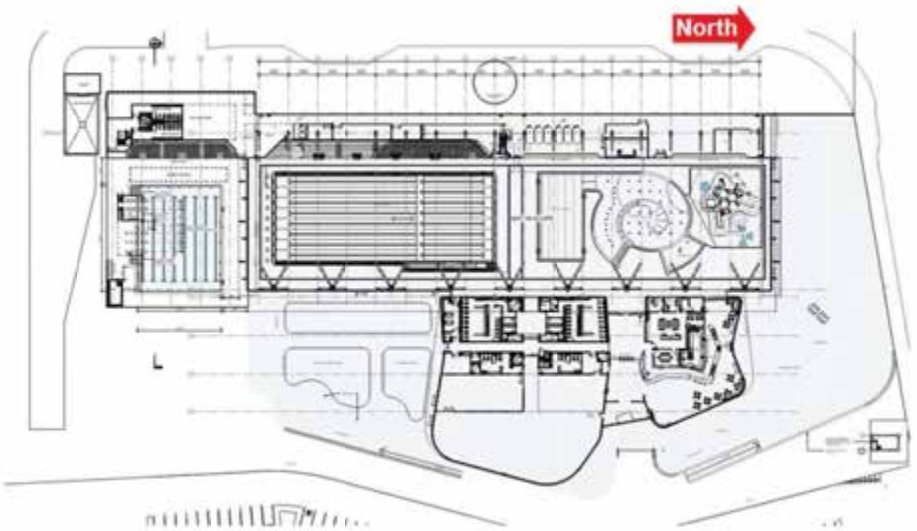

Figure 2: Architectural Plan for Option 5

This report primarily presents Feasibility Assessment from the perspective of Option 6 (similar to Option 1,2,3,4). The key difference between this and Option 5 are highlighted in Appendix B. All other design elements are similar to Option 6 for the purposes of Civil Feasibility Assessment.

7.1 Proposed Stormwater

Refer Civil drawing 04011 for Stormwater information. The proposed development impacts the existing stormwater infrastructure, requiring alterations to:

- The piped stormwater network,
- Overland flows,
- On site detention,
- On site retention, and
- Water quality treatments.

7.1.1 Piped Stormwater

Nominally 220m of new SW pipe will need to be installed to capture re route stormwater runoff from the existing stormwater system around the proposed development, and to capture runoff from the new building and direct it to the existing and proposed water quality controls.

7.1.2 Pits

New stormwater pits are proposed to pick up stormwater runoff from critical areas of the site, preventin water from flowing towards the proposed building. Pits required to successfully drain the areas around the proposed building include:

- Manholes,
- Type R-Sumps, and
- Grated inlet pits.

7.1.3 Overland Flows

The new building has a significant upstream catchment of nominally 4Ha draining towards it. To intercept the overland stormwater flow from the upstream catchment a significant channel of approximately 160m in length will need to be constructed on the western side of the internal roadway on the western side of the site. The channel will need to be at least 500mm deep and 2m wide and shall be grass lined.

The channel shall follow the loading dock access road along its southern alignment before directing stormwater to the existing channel located south of the site.

7.1.4 On-Site Retention

The existing 260kL inground stormwater retention tank does not have excess capacity to cater for the requirements of retention volume for the proposed development. The proposed development requires a new 31kL retention tank to collect roofwater.

7.1.5 On-Site Detention and Water Quality

The existing 230kL wetland can be upsized to cater for the detention and water quality requirements of the proposed development. The extent of the pond is to be increased to cater for an additional 25kL. The enlargement is proposed to be achieved through increased footprint, not increased depth, allowing the majority of the wetland to remain undisturbed.

7.1.6 Subsoil Drainage

Subsoil drains will be required along all new kerbs and pavement edges.

7.2 Proposed Pavements

New construe pavements are required to provide access to the loading dock and waste collection areas on the southern side of the building. The pavement and their construction methodologies shall match the pavements constructed for the original Aquatic Centre build.

7.3 Proposed Waste

The proposed facility has been assessed against the Act NoWaste Development Code for Best Practice Waste Management in the ACT. The facility has been classified as:

- Swimming (indoor recreational)" and
- Gym.

And has the the following waste generating areas:

- 1000m^2 of Swimming (indoor recreational) and
- 180m^2 of "Gym".

matching those of the original waste management strategy.

The proposed development produces an additional:

- 3628L of general waste per week and
- 826L additional recycling per week.

The total waste generated by the facility in its post development state requires:

- 7x1500L waste hoppers collected 3 times per week, and
- 3x1100L recycling hoppers collected 2 times per week.

And required an additional waste hopper to be facilitated on site.

Because of the requirement for an additional waste hopper, and the existing waste room size being not compliant with the current code, the new waste room dimensions are recommended to be 11.6m x 6.6m.

Waste is collected by a 12.5m waste truck that stops on the service road outside the waste room. Hoppers are carted from the waste room directly onto the service road, with the collection area being within 4m of the waste room roller door and max 1:33 grade.

7.4 Proposed Parking Generation

Assessment of the existing parking facilities and utilisation rates indicates that there is sufficient parking for major events and carnivals and over 50% of the current parking facilities being utilised during day to day operations.

As such it is TTW's opinion that no additional parking is required to support the proposed facility under normal conditions, and if special events or carnivals can be coordinated between the swimming and diving elements of the facility we do not see parking capacity as a major risk to the development.

7.5 Deliveries and Loading

Deliveries, loading and collection of waste will be disrupted during the construction of the new facility to the south of the existing pool. Temporary delivery and waste storage and collection will be required if the new waste and loading areas cannot be constructed prior to demolition of the existing.

Functional deliveries such as supplies, café food and other non-bulky deliveries can be accommodated through a temporary loading zone at the building entrance for use during construction.

8.0 Structural Considerations

8.1 Footings

As noted in the existing geotechnical report for the site by ACT Geotechnical Engineers (ref C9180 dated 26 March 2018), the site consists of deep uncontrolled fill which is unsuitable for footings or slab on ground. In order to construct new footings and/or slab on ground, the report recommends that the existing uncontrolled fill is removed and replaced with controlled fill. It is unclear what extent of remediation works have already taken place as part of the existing building works.

As recommended in the geotechnical report and consistent with the approach on the existing building, footings for load bearing columns should be constructed as piled foundations socketed into the underlying EW bedrock. Footings for lightly loaded walls, facades and columns can be founded on shallow strip footings on the remediated controlled fill.

8.2 Concrete Structure

Concrete structures proposed for the project consist of:

- Foundations: mixture of piled foundations socketed into EW rock, and shallow pad & strip footings founded on remediated controlled fill. Refer geotechnical report for further recommendations.
- Ground level slabs. A suspended apron slab to be provided around the perimeter of the pool similar to the existing building design. Required apron width to be confirmed dependant on pool construction methodology. Remainder of the ground level slabs are to be slab on ground on remediated fill.
- Suspended concrete slabs and columns for new diving towers.
- Concrete retaining walls.
- Suspended concrete slab, walls, columns and stairs for upper levels containing the dryland training area and mechanical plant.
- Raked concrete spectator seating.
- Cantilevered concrete columns supporting the timber framed roof.
- Concrete slabs on ground on remediated fill for waste room and external plant enclosure.

All concrete used on the project is to be at least 50MPa grade in accordance with AS3600 due to durability requirements of the building (C1 exposure classification).

Lateral stability of suspended slabs is to be achieved by the use of concrete shear walls.

8.3 Roof

The architectural design intent of the new roof is to replicate the aesthetics of the existing roof. The existing roof

consists of glulam timber purlins and rafters supported on diagonal glulam timber struts fixed to cantilevered concrete columns.

Due to the larger spans on the new roof compared to the existing, the sizes of the new primary rafters will need to be larger than those used on the existing building. The existing rafters are nominated as 1200x200 GL12 rafters on the existing drawings. Preliminary analysis indicates that the new roof will need to have approximately 1400x240 GL12 beams for the shorter span 25m pool options, and 1800x240 GL12 beams for the longer span 30m and 50m pool options. Timber struts which support the primary will also need to be larger sizes than those used on the existing building for the increased spans. An alternative structural approach could be considered such as using a bowstring truss arrangement utilising steel chords under the timber rafter.

Lateral stability of the roof is proposed to be achieved using cantilevered concrete columns and diagonal timber struts. Because the lateral loads for the building are only shared between two or three columns, the lateral forces on each column in the North/South direction are significantly higher than those on the existing building columns where there are 9 columns available to resist lateral loads in that direction. Lateral loads in the East/West direction will also be higher due to the taller façade heights and larger rafter spans exerting larger thrust forces. Alternative bracing options could be considered such as providing wall bracing within external walls or providing diagonal struts to columns, however currently the eastern and northern walls are fully glazed for aesthetics reasons so there would need to be some coordination required here if additional bracing is proposed to be added.

In all design options, the new roof is to be structurally independently of the existing roof. An expansion joint may need to be provided in the roof sheeting at the interface.

In Option 5, in order to keep the existing and new roofs structurally independent, new columns and piled footings are recommended at the western edge of the new roof as shown on the structural sketches. The adjacent existing columns and footings will not have sufficient capacity for the additional loads from the new roof. Strengthening works to the existing columns and footings would be theoretically possible but would be very technically complicated and expensive to achieve.

Schedule 2.2(a)(ii)

Appendix A

Civil Sketches Option 6

FEASIBILITY ASSESSMENT & PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS

DRAWING INDEX

NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
C	STAGE 1 - 100%	DC	EM 22.08.2024
B	STAGE 1 - 80%	DC	EM 16.08.2024
A	DRAFT DESIGN	CP	EM 19.07.2024

Client: ck architecture

Engineer: TTW www.ttwengineers.com

Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS

Drawing Title: GENERAL COVER SHEET

Scale at A1	Drawn	Designed	Approved
	EM	RT	CP

Project No. 239110 | Originator | Zone | Type | Role | Sheet No. | Rev: C

239110-TTW-00-SK-CI-00001-C

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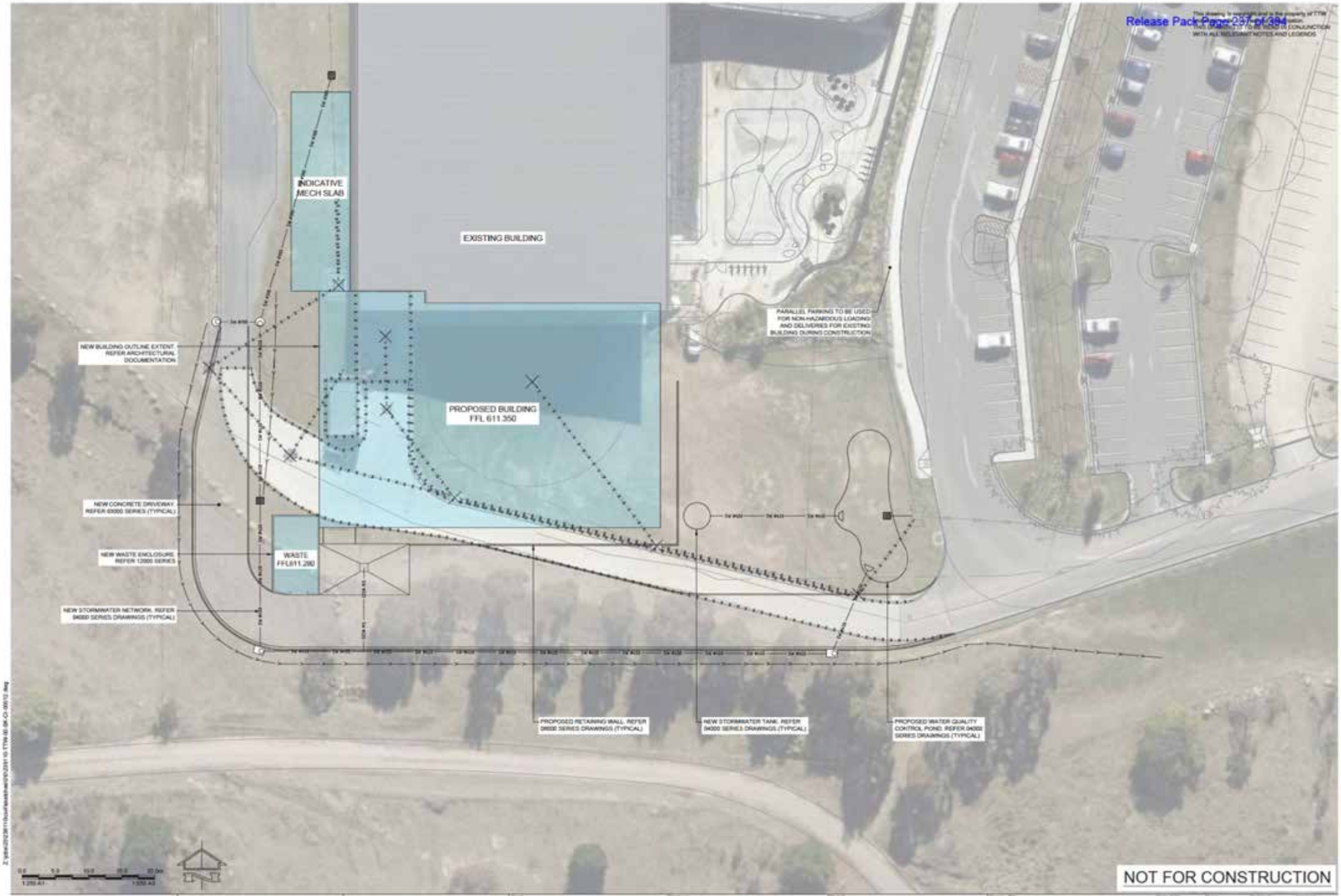

NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
C	STAGE 1 - 100%	DC	EM 22.08.2024
B	STAGE 1 - 80%	DC	EM 16.08.2024
A	DRAFT DESIGN	CP	EM 19.07.2024

Client: ck architecture

Engineer: TTW www.theirgroup.com

Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS

Drawing Title: GENERAL ARRANGEMENT PLAN

Scale at A1	Drawn	Designed	Approved
250	EM	RT	CP

Project No.	Originator	Zone	Type	Num	Sheet No.	Rev
239110	TTW	00	SK	CI	00012	C

22.08.2024 3:43 PM

NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
C	STAGE 1 - 100%	DC	EM 22.08.2024
B	STAGE 1 - 60%	DC	EM 16.08.2024
A	DRAFT DESIGN	CP	EM 19.07.2024

Client: ck architecture

Engineer: TTW www.theengineers.com

Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS

Drawing Title: EARTHWORKS CUT AND FILL VOLUMES PLAN

Scale at A1	Drawn	Designed	Approved
250	EM	RT	CP

Project No. | Originator | Zone | Type | Role | Sheet No. | Rev
239110-TTW-00-SK-CI-02011-C

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CONCRETE NOTES

1. TYPE GP CEMENT TO BE USED UNLESS OTHERWISE SPECIFIED.
2. ALL CONCRETE SHALL BE SUBJECT TO ASSESSMENT AND TESTING IN ACCORDANCE WITH THE PROJECT SPECIFICATION AND AS 1379.
3. CONCRETE TO BE CONSOLIDATED BY MECHANICAL VIBRATION.
4. ALL CONCRETE SURFACES TO BE CURED FOR A MINIMUM OF 7 DAYS.
5. CONCRETE CHARACTERISTIC COMPRESSIVE STRENGTH TO BE AS DEFINED IN AS 1379.

CONCRETE SPECIFICATION			
LOCATION	f'c MPa AT 28 DAYS	SPECIFIED SLUMP	NOMINAL AGG. SIZE
KERB	(S)25	80	20
VC & OCI	(S)32	80	20
PITS	(N)25	80	20
PEDESTRIAN PAVEMENT	(S)32	80	20
VEHICLE PAVEMENT	(S)32	80	20

1. EXPOSURE CLASSIFICATION B2.
2. THE DESIGN, CERTIFICATION, CONSTRUCTION AND PERFORMANCE OF FORMWORK, FALSEWORK AND BACKPROPPING IS THE RESPONSIBILITY OF THE CONTRACTOR.
3. THE PROPOSED METHOD OF INSTALLATION AND REMOVAL OF FORMWORK IS TO BE SUBMITTED TO THE SUPERINTENDENT FOR COMMENT PRIOR TO WORK BEING CARRIED OUT.
4. REINFORCEMENT TO BE FIXED AS SHOWN ON DRAWINGS.

REINFORCEMENT TYPE AND GRADE		
REINFORCEMENT NOTATION TYPE	DESCRIPTION	GRADE
N	HOT ROLLED RIBBED BAR	D500N
R	PLAIN ROUND BAR	R250N
SL	SQUARE MESH	500L
RL	RECTANGULAR MESH	500L

10. SUPPORTS AND SPACERS TO BE PROVIDED TO ENSURE THE FOLLOWING CONCRETE COVER TO ALL REINFORCEMENT UNLESS NOTED OTHERWISE.

REINFORCEMENT COVER			
	TOP (mm)	BOTTOM (mm)	SIDES (mm)
FOOTINGS	50	50	50
PAVEMENTS	30	50	-
EXPOSED TO WEATHER OR GROUND	50	50	50

11. COVER TO REINFORCEMENT ENDS TO BE 50mm UNLESS OTHERWISE NOMINATED.
12. PROVIDE N12-450 SUPPORT BARS TO TOP REINFORCEMENT AS REQUIRED, TENSION LAP UNLESS OTHERWISE NOMINATED.
13. ALL COGS TO BE STANDARD COGS AS DEFINED IN AS 3600 UNLESS OTHERWISE NOTED.
14. FABRIC END AND SIDE LAPS ARE TO BE PLACED STRICTLY IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATION TO ACHIEVE FULL TENSILE LAP. FABRIC SHALL BE LAID SO THAT THERE IS A MAXIMUM OF 3 LAYERS AT ANY LOCATION.

FABRIC LAP
SCALE 1:20

15. GAP BETWEEN LAPPED BARS TO BE IN ACCORDANCE WITH AS 3600.

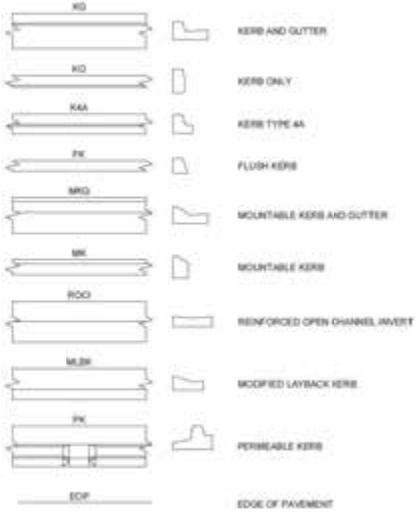
CONCRETE PAVEMENT NOTES

1. ALL EXPOSED CONCRETE PAVEMENTS ARE TO BE BROOM FINISHED UNLESS OTHERWISE NOTED.
2. ALL EDGES OF CONCRETE PAVEMENTS, INCLUDING KEYED AND DOWELLED JOINTS, ARE TO BE FINISHED WITH AN EDGING TOOL.
3. CONCRETE PAVEMENTS WITH GRADES OVER 10% ARE TO BE HEAVILY BROOM FINISHED.
4. CARBORUNDUM TO BE ADDED TO ALL STAIR TREADS AND RAMPED CROSSINGS UNLESS OTHERWISE STATED.

KERB AND PATH NOTES

1. ALL KERB AND PATHS ARE TO BE CONSTRUCTED IN ACCORDANCE WITH RELEVANT INDUSTRY STANDARDS AND SPECIFICATIONS.
2. ALL KERB TYPES TO BE CONSTRUCTED IN ACCORDANCE WITH GIVEN KERBING DETAILS.
3. REFER GIVEN CONCRETE SPECIFICATION TABLE FOR MINIMUM COMPRESSIVE STRENGTHS.
4. EXPANSIONS JOINTS SHALL BE CONSTRUCTED AT THE TANGENT POINTS OF CURVED KERBS AND ELSEWHERE AT 10m SPACINGS ALONG KERB FACE. REFER 03000 SERIES DRAWINGS.
5. WEAKEN PLAIN JOINTS SHALL BE CONSTRUCTED AT VEHICLE CROSSINGS, KERB RAMPS AND ELSEWHERE AT 3.0m SPACINGS ALONG KERB FACE. REFER 03000 SERIES DRAWINGS.
6. EXPANSIONS JOINTS SHALL BE CONSTRUCTED AT SUMPS, MANHOLES, AND UTILITY STRUCTURES ON ALL SIDES ADJACENT TO CONCRETE PAVEMENT.
7. PRAM RAMPS, VEHICLE CROSSINGS AND DRIVEWAYS SHALL BE BRUSH FINISHED (NON-SKID) PARALLEL WITH KERB, U.N.O.
8. PEDESTRIAN PATHS SHALL BE BRUSH FINISHED (NON-SKID) PERPENDICULAR TO KERB U.N.O.
9. WHEN PAVEMENT WIDENING OR KERB REPLACEMENT, THE EXISTING PAVEMENT IS TO BE SAWCUT AND BROKEN OUT TO ENABLE NEW PAVEMENT TO BE KEYED INTO EXISTING IN ACCORDANCE WITH GIVEN DETAILS. REFER 03000 SERIES DRAWINGS.
10. ALL CONCRETE TO BE CONTINUOUSLY CURED FOR A MINIMUM OF 7 DAYS.
11. ALL KERB JOINTS TO BE PERPENDICULAR TO KERB AND FINISHED WITH 5mm EDGE TOOL.
12. ALL PATH JOINTS TO BE PERPENDICULAR TO THE PATH EDGE AND FINISHED WITH 5mm EDGE TOOL.
13. ALIGN PATH JOINTS WITH ADJACENT KERB OR PAVEMENT JOINTS.
14. COMPACTED SUB-BASE MATERIAL LEVELS SHALL NOT DEVIATE 5mm OVER 3.0m TO ENSURE A SMOOTH SURFACE FINISH.
15. PATH WIDTH SHALL BE MEASURED FROM KERB FACE.

NOTATION LEGEND



JOINTING LEGEND

NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
B	STAGE 1 - 100%	CC EM	22.08.2024
A	STAGE 1 - 80%	CC EM	16.08.2024

Client: ck architecture

Engineer: TTW

Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS

Drawing Title: PAVEMENT NOTES AND LEGEND

Scale at A1	Drawn	Designed	Approved
	EM	RT	CP

Project No.	Originator	Zone	Type	Role	Sheet No.	Rev
239110	TTW	00	SK	CI	03001	B

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THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES AND LEGENDS

LEGEND

CONCRETE LOADING DOCK PAVEMENT

BROOM FINISH

150mm S32 CONCRETE SLAB REINFORCED WITH SL81 MESH (50 TOP COVER)

150mm DGB20 BASE MATERIAL COMPACTED TO 100% MMDD

1000mm REMOVE EXISTING SITE FILL, REMOVE ALL DELETERIOUS MATTER AND ROCK PARTICLES >5mm, CONFIRM SOIL HAS CBR 45% AND RELAY AND COMPACT TO 95% MMDD IN NO GREATSD THAN 150mm LAYERS OR REPLACE LAYER WITH SELECT FILL AS SPECIFIED

CONFIRM SUBGRADE CBR IS 45% AND COMPACT TO 95% MMDD

INDICATIVE MECH SLAB

EXISTING BUILDING

SPRAY SEAL MAKE GOOD

FALL

FALL

FALL

PROPOSED BUILDING
FFL 611.350

SU (TYPICAL)

WASTE
FFL611.280

KEY IN ASPHALT AS PER DETAIL ON 03041 DRAWING

NEW FLUSH KERB

PROVIDE NEW CONCRETE ROAD, REFER LEGEND

NEW KERB AND GUTTER (TYPICAL)

NEW KERB ONLY (TYPICAL)

DEMOLISH AND REMOVE EXISTING KERB ONLY

DEMOLISH AND REMOVE EXISTING KERB AND GUTTER

DEMOLISH AND REMOVE EXISTING CONCRETE ROAD
REINSTATE VERGE TREATMENT

JOINTING LEGEND

DOWELED EXPANSION JOINT

SAWN CONTROL JOINT

THICKENING EDGE

NOT FOR CONSTRUCTION

0 5.0 10.0 15.0 20.0m
1:250 A1 1:500 A3

Rev	Description	Eng Draft	Date
C	STAGE 1 - 100%	DC EM	22.08.2024
B	STAGE 1 - 60%	DC EM	16.08.2024
A	DRAFT DESIGN	CP EM	19.07.2024

Client: ck architecture

Engineer: TTW www.theirgroup.com

Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS

Drawing Title: PAVEMENT PLAN

Scale at A1	Drawn	Designed	Approved
250	EM	RT	CP

Project No.	Originator	Zone	Type	Role	Sheet No.	Rev
239110	TTW	00	SK	CI	03011	C

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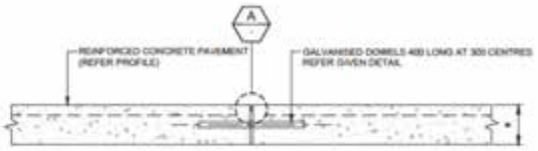
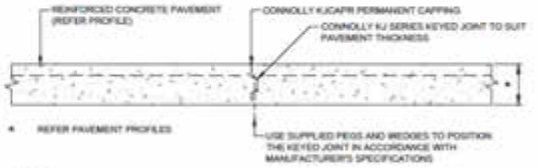


NOTE
1. CONNOLLY EXPANSION JOINT ACCEPTED OR APPROVED EQUIVALENT
2. PROVIDE 50mm COVER EITHER SIDE OF JOINT

DOWELED EXPANSION JOINT (DEJ)
SCALE 1:10



NOTE
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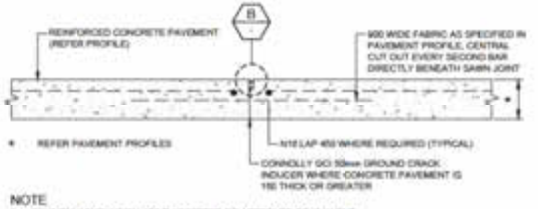
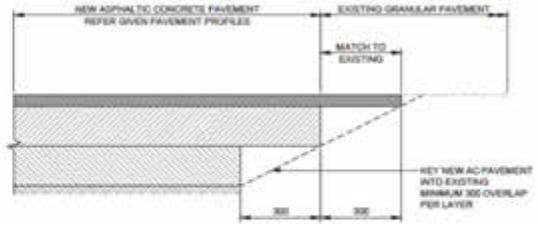
2. PROVIDE 50mm COVER EITHER SIDE OF JOINT

KEYED JOINT (KJ)
SCALE 1:10

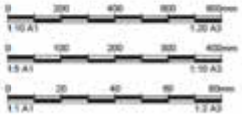


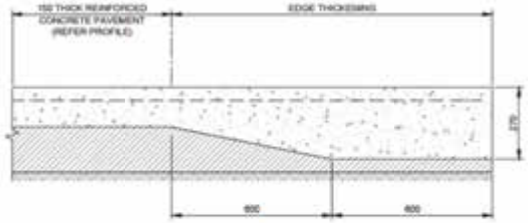
NOTE
1. CONNOLLY EXPANSION JOINT ACCEPTED OR APPROVED EQUIVALENT
2. PROVIDE 50mm COVER EITHER SIDE OF JOINT

SAWN CONTROL JOINT (SJ)
SCALE 1:10

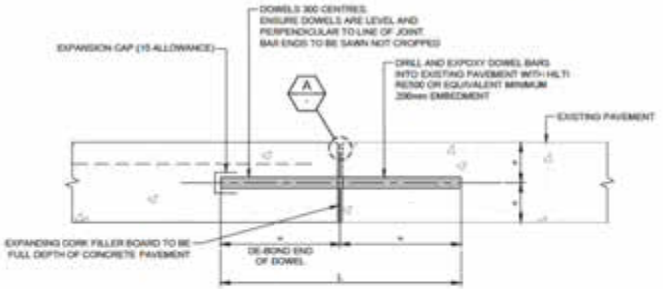


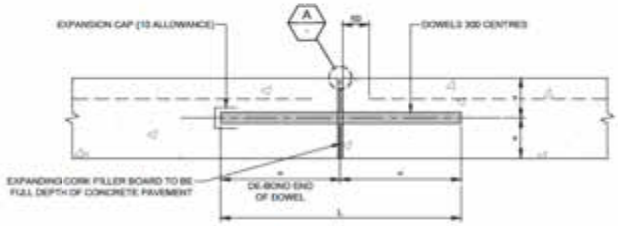
NEW ASPHALTIC CONCRETE PAVEMENT KEYED INTO EXISTING PAVEMENT DETAIL
SCALE 1:10





150 THICK REINFORCED CONCRETE PAVEMENT EDGE THICKENING
SCALE 1:10

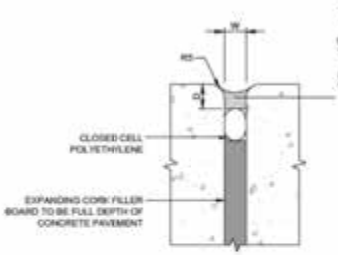




NOTE
DOWEL BARS TO BE PLAIN ROUND STEEL AND OF GRADE 250N

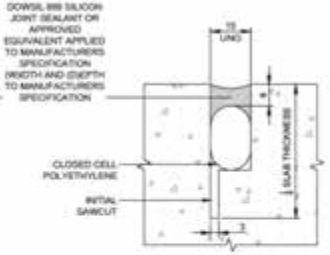
CONCRETE THICKNESS	DOWEL SIZE	DOWEL LENGTH (L)
150 - 190	Ø20	450
200 - 240	Ø24	450
250 - 270	Ø30	450
280 - 340	Ø33	450
>340	Ø36	500

DOWEL JOINT DETAIL
SCALE 1:5



NOTE
REFER TO CONCRETE JOINTING NOTES FOR TIMING OF SAW CUTS

DETAIL A
SCALE 1:1



NOTE
REFER TO CONCRETE JOINTING NOTES FOR TIMING OF SAW CUTS

DETAIL B
SCALE 1:1

NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
B	STAGE 1 - 100%	DC EM	22.08.2024
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Client: ck architecture
Engineer: TTW www.tkengineers.com
Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS
Drawing Title: PAVEMENT DETAILS

Scale at A1	Drawn	Designed	Approved
	EM	RT	CP

Project No.	Originator	Zone	Type	Role	Sheet No.	Rev
239110	TTW	00	SK	CI	03041	B

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THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES AND LEGENDS

STORMWATER DRAINAGE

1. ALL STORMWATER DRAINAGE WORKS ARE TO BE COMPLETED IN ACCORDANCE WITH THE RELEVANT STANDARDS AND SPECIFICATIONS OUTLINED IN THE PROJECT SPECIFICATION.
2. PRIOR TO COMMENCING WORK ONSITE THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UNDERGROUND SERVICES THROUGH MEANS OF POTHOLING. DISCREPANCIES BETWEEN THE CONSTRUCTION DRAWINGS AND CONDITIONS ONSITE SHALL BE REPORTED TO THE SUPERINTENDENT PRIOR TO THE COMMENCEMENT OF WORKS.
3. COVER LEVELS OF STORMWATER STRUCTURES ARE PROVISIONAL AND SHALL BE ADJUSTED TO SUIT THE SURROUNDING FINISHED GROUND LEVELS IN ACCORDANCE WITH DRAWINGS AND CONSTRUCTED KERB PROFILES.
10. GRATES AND COVERS FOR STORMWATER STRUCTURES SHALL CONFORM WITH AS 3996 AND AS 1428.1 FOR ACCESS REQUIREMENTS.
11. PIPES ARE TO BE INSTALLED IN ACCORDANCE WITH AS 3725. ALL BEDDING IS TO BE TYPE HD UNLESS OTHERWISE NOTED.
12. ALL CURVED PIPE ALIGNMENTS ARE TO BE ACHIEVED VIA DEFLECTION THROUGH THE JOINTS BETWEEN PIPES IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.
13. ALL STORMWATER PIPES ARE TO BE AT MINIMUM 1% GRADE UNLESS NOTED OTHERWISE.
14. STORMWATER PIPES GREATER THAN 7% SHALL HAVE SCOUR STOPS CONSTRUCTED AT 5m MAXIMUM SPACING.
15. ALL PIPE LENGTH, GRADES AND INVERT LEVELS ARE MEASURED AT THE CENTRE OF STORMWATER STRUCTURES OR FACE OF HEADWALLS UNLESS OTHERWISE NOTED.
16. INVERT LEVELS ARE TO BE USED FOR CONSTRUCTION. GRADES SHOWN ARE NOMINAL ONLY.
17. TRENCH BACKFILL SHALL BE IN ACCORDANCE WITH CONTRACT SPECIFICATIONS.
18. GRADES OF STORMWATER LINES ARE NOT TO BE REDUCED WITHOUT APPROVAL FROM THE SUPERINTENDENT
19. PIPES Ø300 OR LARGER TO BE REINFORCED CONCRETE (RCP) CLASS "2" APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS UNLESS NOTED OTHERWISE.
20. PIPES LESS THAN Ø300 TO BE SEWER GRADE uPVC WITH SOLVENT WELDED JOINTS UNLESS NOTED OTHERWISE.
21. ANY CHANGES IN MATERIAL MUST BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
22. ALL CONNECTIONS, JUNCTIONS AND ENLARGERS ARE TO BE MADE WITH MANUFACTURER'S FITTINGS.
23. ALL PIPES ARE DESIGNED FOR OPERATIONAL LOADS ONLY. THE CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO PROTECT PIPES DURING CONSTRUCTION.
24. THE CONTRACTOR SHALL UNDERTAKE TEMPORARY DIVERSION WORKS TO ENSURE THE EXISTING STORMWATER SYSTEM REMAINS OPERATIONAL DURING CONSTRUCTION.
25. THE CONTRACTOR SHALL UNDERTAKE TEMPORARY DIVERSION WORKS TO ENSURE ALL WORK IN PROGRESS IS PROTECTED UNTIL DEEMED FINISHED BY THE SUPERINTENDENT.
26. WORKS AS EXECUTED DOCUMENTATION IS THE RESPONSIBILITY OF THE CONTRACTOR UNLESS AGREED OTHERWISE.

NOT FOR CONSTRUCTION

Rev	Description	Eng Draft	Date
C	STAGE 1 - 100%	DC EM	22.08.2024
B	STAGE 1 - 80%	DC EM	16.08.2024
A	DRAFT DESIGN	CP EM	19.07.2024

Client: ck architecture

Engineer: TTW www.theirgroup.com

Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS

Drawing Title: STORMWATER AND SUBSOIL DRAINAGE PLAN

Scale at A1	Drawn	Designed	Approved
500	EM	RT	CP

Project No.	Originator	Zone	Type	Role	Sheet No.	Rev
239110	TTW	00	SK	CI	04011	C

22.08.2024 3:53 PM

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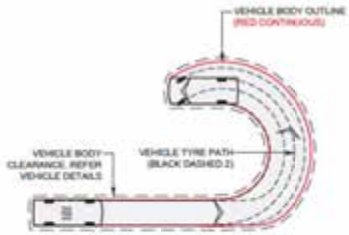
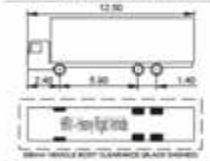
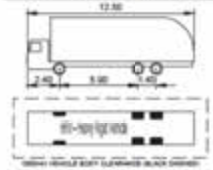


HRV - HEAVY RIGID VEHICLE



OVERALL WIDTH	2.500m
OVERALL BODY HEIGHT	4.300m
MINIMUM BODY GROUND CLEARANCE	0.417m
TRACK WIDTH	2.500m
KERB-TO-KERB TURNING RADIUS	12.500m

HRV - HEAVY RIGID VEHICLE (ACT WASTE)



OVERALL WIDTH	2.500m
OVERALL BODY HEIGHT	4.300m
MINIMUM BODY GROUND CLEARANCE	0.417m
TRACK WIDTH	2.500m
KERB-TO-KERB TURNING RADIUS	12.500m

VEHICLE SWEPT PATH NOTES

GENERAL

1. VEHICLE SWEPT PATHS ARE UNDERTAKEN USING AUTODESK VEHICLE TRACKING SOFTWARE.
2. SRV, MRV, HRV AND AV VEHICLE TEMPLATE SPECIFICATIONS ARE PROVIDED IN AS 2890.2.
3. DESIGN SPEED FOR ALL VEHICLES IS 5km/h UNLESS OTHERWISE NOTED.
4. VEHICLE SWEPT PATHS PROVIDED A PROOF OF CONCEPT FOR THE DESIGN ONLY. THE ABILITY OF A DESIGN TO ACCOMMODATE THE VEHICLE SWEPT PATH DOES NOT GUARANTEE THE COMPLIANCE OF THE DESIGN TO THE RELEVANT STANDARDS.

SRV, MRV, HRV, AV CLEARANCE REQUIREMENTS

1. LOW SPEED MANOEUVRES - VEHICLE MANOEUVRES INTO OR OUT OF SERVICE BAYS OR LOADING DOCKS REQUIRE 0.3m CLEARANCE ON BOTH SIDES OF THE VEHICLE BODY.
2. HIGH SPEED CORNERING MANOEUVRES - VEHICLE MANOEUVRES WITHIN ACCESS OR CIRCULATION ROADWAYS, CIRCULATION AISLES AND ON RAMPS REQUIRE 0.3m CLEARANCE ON THE INSIDE OF THE CORNER AND 0.8m ON THE OUTSIDE OF CORNER TO THE VEHICLE BODY. VEHICLE MANOEUVRES ON THE STRAIGHT REQUIRE 0.3m ON BOTH SIDES OF THE VEHICLE BODY.
3. PASSING VEHICLES - VEHICLES PASSING REQUIRE 0.3m CLEARANCE ON THE OUTSIDE OF BOTH VEHICLES BODIES, WITH 0.6m CLEARANCE BETWEEN VEHICLE BODIES.

NOT FOR CONSTRUCTION

0.6 5.0 10.0 15.0 20.0m
1:250 A1 1:500 A3

Rev	Description	Eng Draft	Date
C	STAGE 1 - 100%	DC EM	22.08.2024
B	STAGE 1 - 80%	DC EM	16.08.2024
A	DRAFT DESIGN	CP EM	19.07.2024

Client: ck architecture

Engineer: TTW www.theirgroup.com

Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS

Drawing Title: VEHICLE TURNING PATHS PLAN

Scale at A1	Drawn	Designed	Approved
250	EM	RT	CP

Project No.	Originator	Zone	Type	Role	Drawing No.	Rev
239110	TTW	00	SK	CI	11011	C

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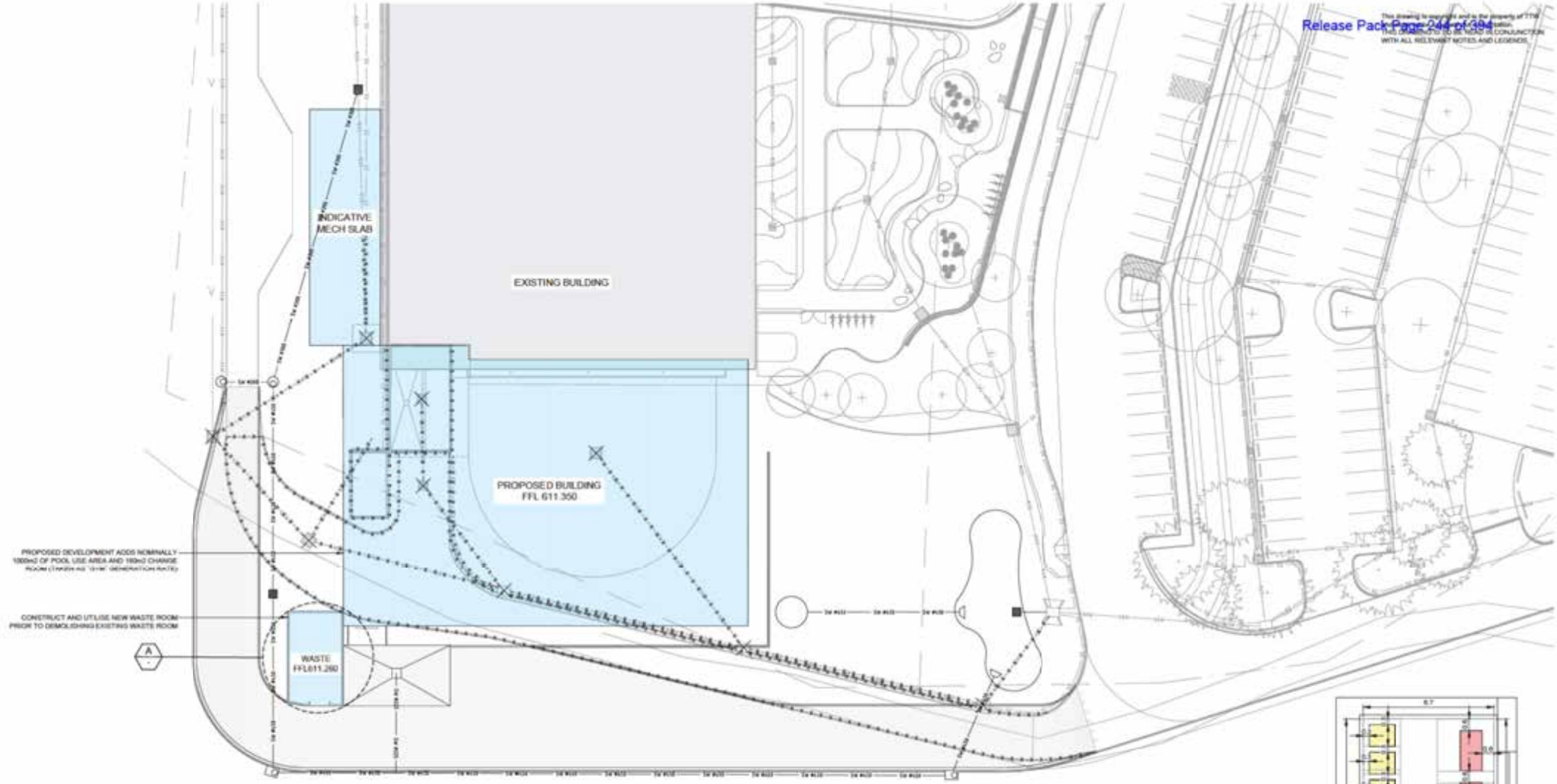
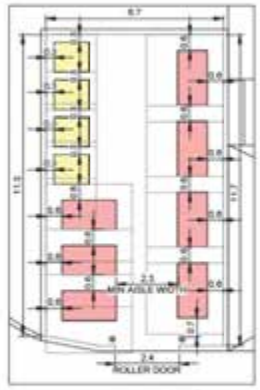




DETAIL A
SCALE 1:100

EXISTING DEVELOPMENT GENERATION RATES

GENERATION RATES	WASTE (L)	RECYCLING (L)	PER
GYM	10	10	L/100m2 GFA/DAY
CAFE	660	135	L/100m2 GFA/DAY
SWIMMING (INDOOR RECREATIONAL)	50	10	L/100m2 GFA/DAY
OFFICE	20	25	L/100m2 GFA/DAY

NOTE: GENERATION RATES ARE FROM BOTH THE ACT WASTE AND RECYCLING MANAGEMENT CODE OCTOBER 2018 AND THE RANDWICK CITY COUNCIL WHICH CONTAINS ADDITIONAL INFORMATION REGARDING WASTE IN RECREATIONAL FACILITIES

GENERATION RATE FROM CITY OF MELBOURNE WASTE GENERATION RATES (JAN 2025) ACT WASTE AND RECYCLING MANAGEMENT CODE OCTOBER 2018 RANDWICK CITY COUNCIL WASTE GENERATION RATES APPENDIX A ACT WASTE AND RECYCLING MANAGEMENT CODE OCTOBER 2018

PROPOSED DEVELOPMENT WASTE

PROPOSED COMMERCIAL COLLECTION	QUANTITY (L)
WASTE	3629
RECYCLING	826

EXISTING DEVELOPMENT WASTE, WITH ROOM DIMENSIONS 10mx4.3m

PROPOSED COMMERCIAL COLLECTION	QUANTITY (L)	BINS REQUIRED	PER
WASTE	26,600	6 x 1,500L HOPPERS	PRIVATE CONTRACTOR THRICE A WEEK
RECYCLING	5,700	3 x 1,100L HOPPERS	PRIVATE CONTRACTOR TWICE A WEEK
BOTH WASTE AND RECYCLING STORAGE PROVIDED CONSERVATIVE			

TOTAL DEVELOPMENT WASTE, WITH ROOM DIMENSIONS 11.7m x 6.7m

PROPOSED COMMERCIAL COLLECTION	QUANTITY (L)	BINS REQUIRED	PER
WASTE	30529	7 x 1,500L HOPPERS	PRIVATE CONTRACTOR THRICE A WEEK
RECYCLING	6529	3 x 1,100L HOPPERS	PRIVATE CONTRACTOR TWICE A WEEK

NOT FOR CONSTRUCTION

0.6 3.0 10.0 15.0 20.0m
1:250 A1 1:500 A3

Rev	Description	Eng Draft	Date
C	STAGE 1 - 100%	DC	EM 22.08.2024
B	STAGE 1 - 80%	DC	EM 16.08.2024
A	DRAFT DESIGN	CP	EM 19.07.2024

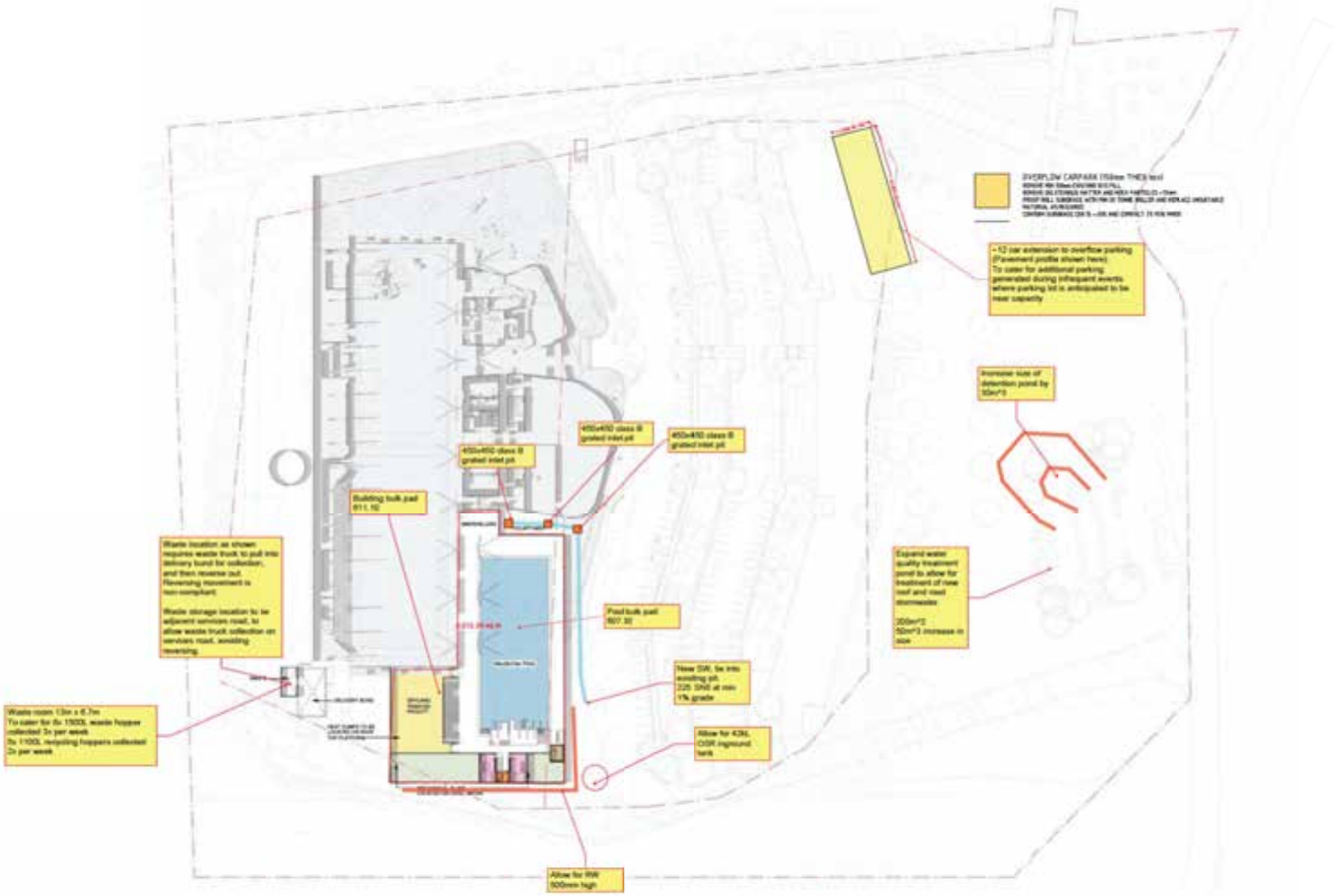
Client: ck architecture
Engineer: TTW www.ttwengineers.com
Project: FEASIBILITY ASSESSMENT AND PRELIMINARY DESIGN OF ACT TERRITORY OWNED POOLS
Drawing Title: WASTE MANAGEMENT PLAN

Scale at A1	Drawn	Designed	Approved
250	EM	RT	CP

Project No. 239110 | Originator | Zone | Type | Role | Sheet No. | Rev: -
239110-TTW-00-SK-CI-12011-C
22.08.2024 3:47 PM

Appendix B

Civil Sketches Option 5



CO.OP

STROMLO LEISURE CENTRE

100370

SITE PLAN - OPTION 5

1

PRELIMINARY

SK-17

CONSTRUCTION

REVISION	DESCRIPTION	DESIGNED	VERIFIED	APPROVED	DATE
B	CONSTRUCTION	AH	AH	JW	01.11.18
C	CONSTRUCTION	AH	AH	JW	06.11.18
D	CONSTRUCTION	AH	AH	JW	13.11.18
E	CONSTRUCTION	AH	AH	JW	08.02.19
F	CONSTRUCTION	AH	AH	JW	06.05.19
G	CONSTRUCTION	AH	AH	JW	17.09.19

DESIGNED: A. HOWARD
DRAWN: A. HOWARD
JOB MANAGER: J. WILTSHIRE
VERIFIER: J. WILTSHIRE

CLIENT: KANE CONSTRUCTIONS

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

ARCHITECT: COX ARCHITECTURE

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0 5 10 15 20m
PLAN SCALE 1:500 @ A1

NORTHROP
Canberra
Unit 2, 2-4 Shea Street, Pialligo ACT 2609
Ph: (02) 6295 1602 Fax: (02) 6295 1603
canberra@northropcon.com.au ABN 81 094 433 100

PROJECT: STROMLO LEISURE CENTRE
STROMLO RURAL BLOCK: 511

DRAWING TITLE: CIVIL WORKS
PAVEMENT PLAN
CIVIL WORKS LOCALITY

JOB NUMBER: CR172214
DRAWING NUMBER: C120
REVISION: G
DRAWING SHEET SIZE: A1

Appendix C

Existing Civil Design Pavement Profiles

REVISION	DESCRIPTION	DESIGNED	VERIFIED	APPROVED	DATE
B	CONSTRUCTION	AH	AH	JW	01.11.18
C	CONSTRUCTION	AH	AH	JW	06.11.18
D	CONSTRUCTION	AH	AH	JW	13.11.18
E	CONSTRUCTION	AH	AH	JW	08.02.19
F	CONSTRUCTION	AH	AH	JW	06.05.19
G	CONSTRUCTION	AH	AH	JW	17.09.19

DESIGNED: A. HOWARD
DRAWN: A. HOWARD
JOB MANAGER: J. WILTSHIRE
VERIFIER: J. WILTSHIRE

CLIENT: KANE CONSTRUCTIONS

DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

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ALL REPORT TO ARCHITECT'S DRAWINGS, OPENINGS TO BE VERIFIED WITH THE ARCHITECT AND ON SITE BEFORE MAKING SHOP DRAWINGS OR COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSMITTED ELECTRONICALLY.

0 5 10 15 20m
PLAN SCALE 1:500 @ A1

NORTHROP
Canberra
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Ph: (02) 6280 1600 Fax: (02) 6280 1603
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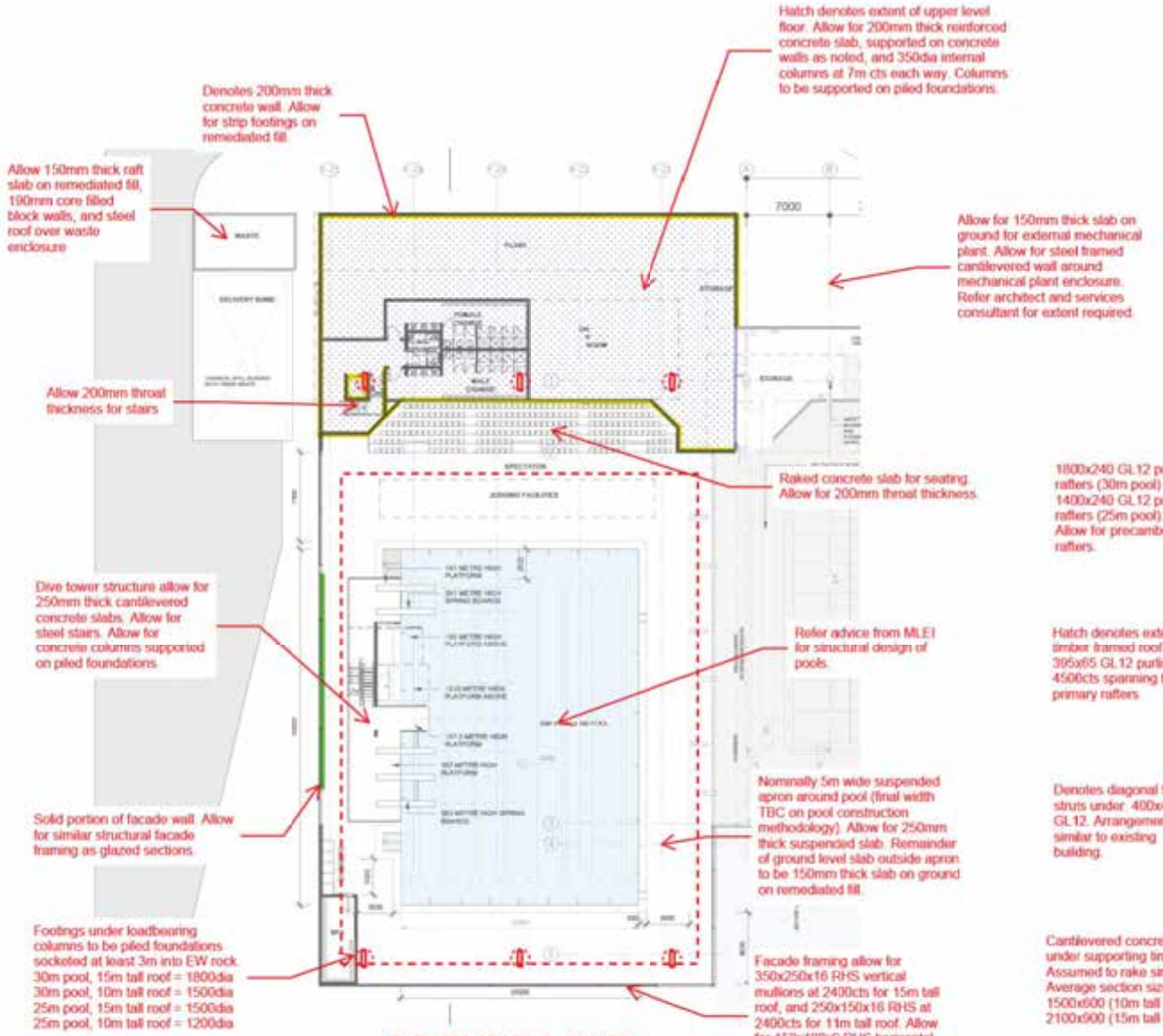
PROJECT: STROMLO LEISURE CENTRE
STROMLO RURAL BLOCK: 511

DRAWING TITLE: CIVIL WORKS
PAVEMENT PLAN
CIVIL WORKS LOCALITY

JOB NUMBER: CR172214
DRAWING NUMBER: C120
REVISION: G
DRAWING SHEET SIZE: A1

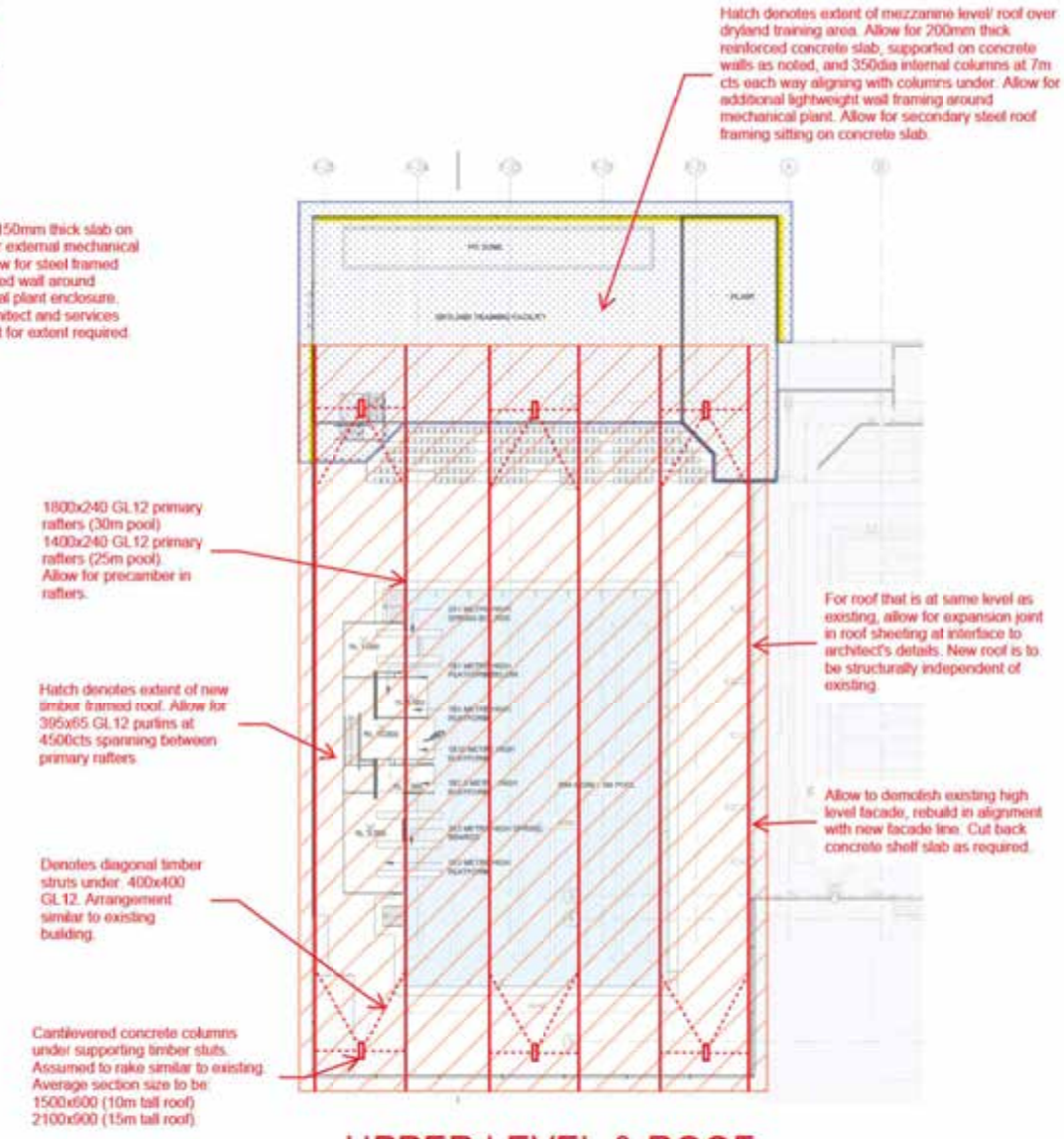
Appendix D

Structural Sketches



GROUND LEVEL

Note: Sketches shown over 30m pool drawings. 25m pool options are similar except where noted.

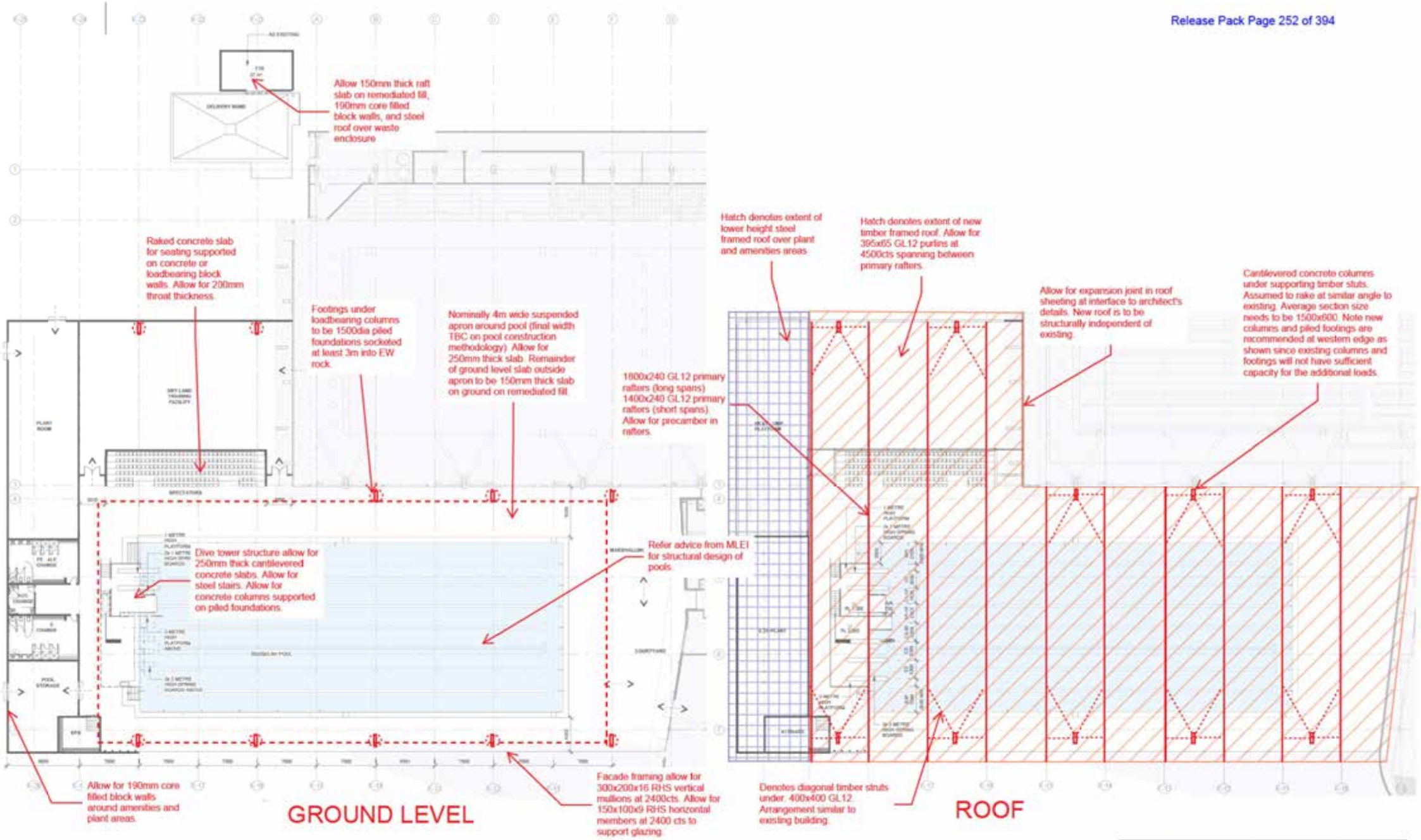


UPPER LEVEL & ROOF

Note: Sketches shown over 30m pool drawings. 25m pool options are similar except where noted.

Notes:
1. All concrete to be S50.
2. All steelwork to be HDG.
3. Refer geotechnical report by ACT Geotechnical Engineers (ref C9180 dated 26 March 2018) for further detail on soil remediation required for shallow footings and slabs on ground.

Job Name :	Stromlo Leisure Centre Dive Pool
Sketch Title:	Feasibility Assessment
	Options 1, 2, 3, 4, 6
Date:	22/08/2024
By:	LE
TTW Structural Civil Traffic Façade	Job Number: 239110
	Sketch No. : SK01 [C]



Notes:
1. All concrete to be S50.
2. All steelwork to be HDG.
3. Refer geotechnical report by ACT Geotechnical Engineers (ref C9180 dated 26 March 2018) for further detail on soil remediation required for shallow footings and slabs on ground.

Job Name :	Stromlo Leisure Centre Dive Pool
Sketch Title:	Feasibility Assessment
	Option 5 - 50m Pool
Date:	22/08/2024
By:	LE
Job Number:	239110
Sketch No. :	SK02 [C]

TTW Structural Civil Traffic Façade

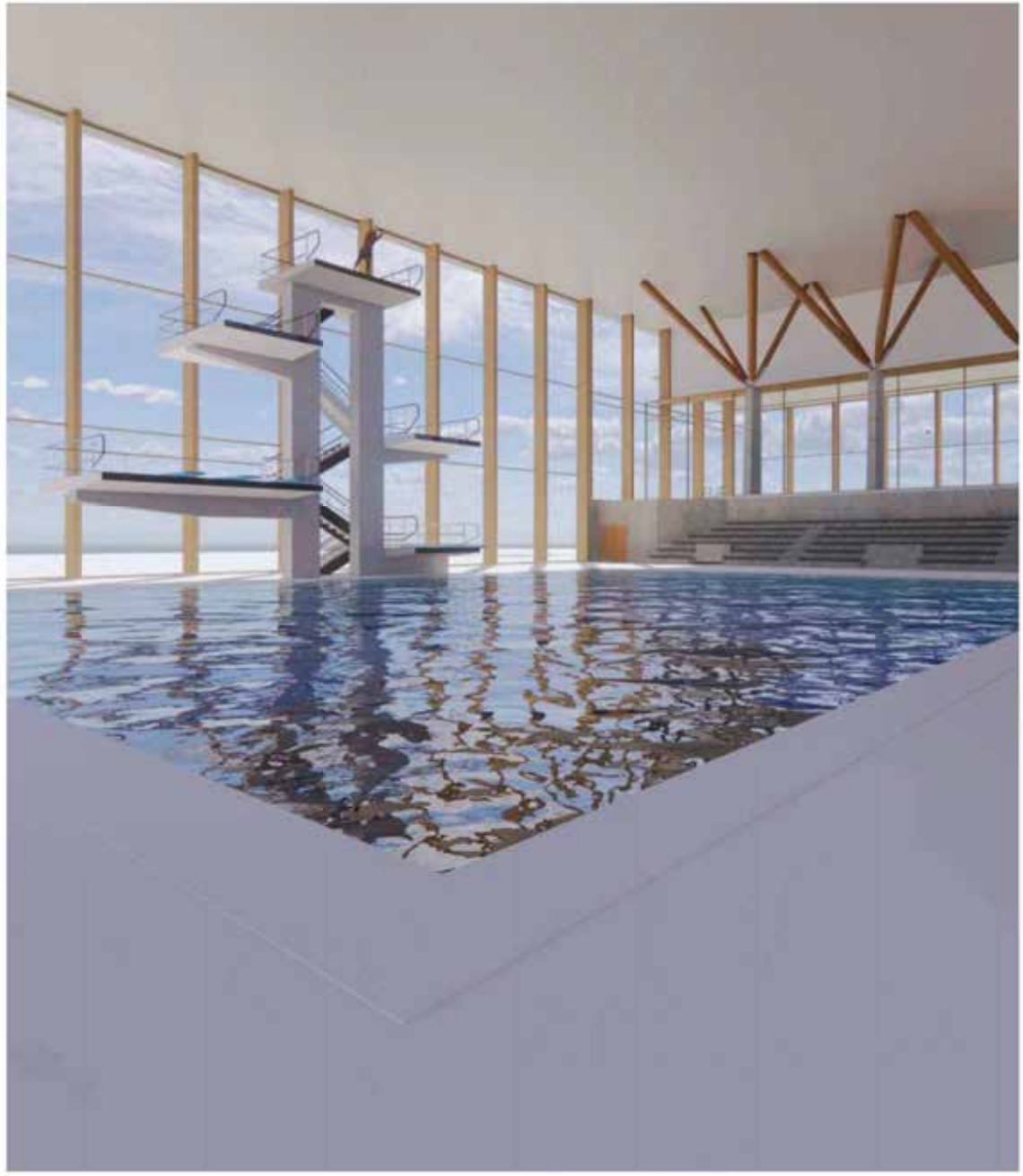
10.0 APPENDICES

APPENDIX E - MECHANICAL AND ELECTRICAL

Stromlo Leisure Centre

DIVE POOL EXTENSION – MECHANICAL & ELECTRICAL SERVICES FEASIBILITY STUDY

August 2024



Introba

Issue	Description	Date	Prepared By	Signed Off
v0	Draft Issue (40%) for comments	17.07.2024	Schedule 2.2(a)(ii)	
V1	Draft Issue (80%) for comments	16.08.2024		
V2	Final (100%) issue	16.08.2024		

Project Office
Level 3, 395 Collins Street
Melbourne, VIC 3000
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Project Contact:

V1.0

Table of Contents

1 Introduction

ACT Property Group (ACTPG) has engaged Introba to provide a feasibility study and preliminary design of the development of a new indoor Dive Pool extension at the existing Stromlo Leisure Centre (SLC). The existing facility is located at the corner of Urianna Rd & Dave McInnes Rd, Stromlo, ACT.

SLC was opened in 2020 and consists of indoor heated 50m Olympic pool, indoor heated program pool, splash park for kids, gym, creche and café. It is understood that the initial design of SLC included an option for a Dive Pool facility to the south of the main building. While this was not constructed as part of the initial construction of the facility, the Centre was designed in such a way as to allow for the later construction of an indoor Dive Pool.

The facility currently has a central heating plant, using gas-fired boilers, to provide water heating and air heating to the pools and pool hall respectively. Domestic hot water heating (for showers and hand basins) is achieved via instantaneous gas-fired water heaters. It is understood that ACTPG is looking to convert all gas uses in the facility to electric heating systems in the future. At this stage there are no immediate plans for this electric heating upgrade of existing gas-fired systems however, moving forward new heating systems for the proposed new Dive Pool will be of electric systems.

1.1 Scope of Feasibility Study

This feasibility report relates to the proposed new Dive Pool extension at SLC. The scope of the feasibility study involves the review and provision of conceptual design relating to **mechanical** and **electrical/comms** services only, and includes:

Mechanical

- Site visit to review existing mechanical systems serving the pool hall
  - Central heating plant
  - Air handling system
  - Mechanical electrical switchboard
  - Building management system (BMS)
- Review of existing as-built documents
- Review and recommendation of electric heating technology
- Mechanical engineering preliminary calculations, sizing and design of HVAC (heating, ventilation & air conditioning) systems for the new Dive Pool.
- Identification of additional plant spatial requirements
- Opinion of costs

Electrical

- A site visit to review the electrical infrastructure condition and capacity.
- Review of existing electrical as-built documents
- An assessment of new power requirements and existing maximum demands
- Review of electrical energy data and authority contract on existing substation kiosk.
- Preliminary lighting design for new Dive Pool hall in accordance with Level of Play
- Sizing of new site main switchboard and substation kiosk
- Early liaison with electrical authority
- Identification of electrical spatial requirements including Comms room
- Opinion of costs

A recommendation has been put forward to the Consultants team to engage hydraulic engineer, fire protection engineer and fire safety engineer to provide advice on these disciplines to provide a complete feasibility of the proposed new Dive Pool. At this point in time, this has not progressed.

1.2 Sources of Information

The following sources of information were used in the current feasibility study:

- Information gathered during site visit to Stromlo Leisure Centre
- As-built drawings
- SLC Billing data
- Dial-Before-You-Dig information
- CO.OP design drawings for new Dive Pool
- Pool Consultant's heat load and electrical demands

1.3 Design Options

At the time of this Draft Report, there are a total of 6 conceptual design options. These concept architectural design are as below. Mechanical, Electrical / Comms conceptual design response will be based on these options.

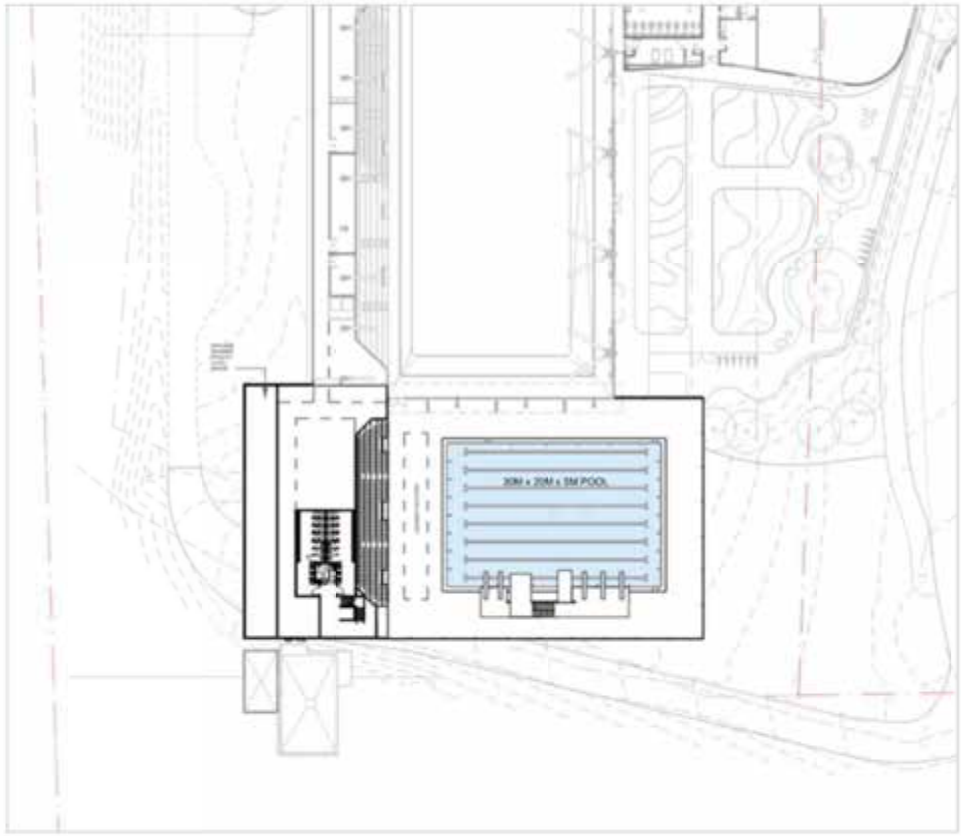


Figure 1 *New Dive Pool – Option 1*

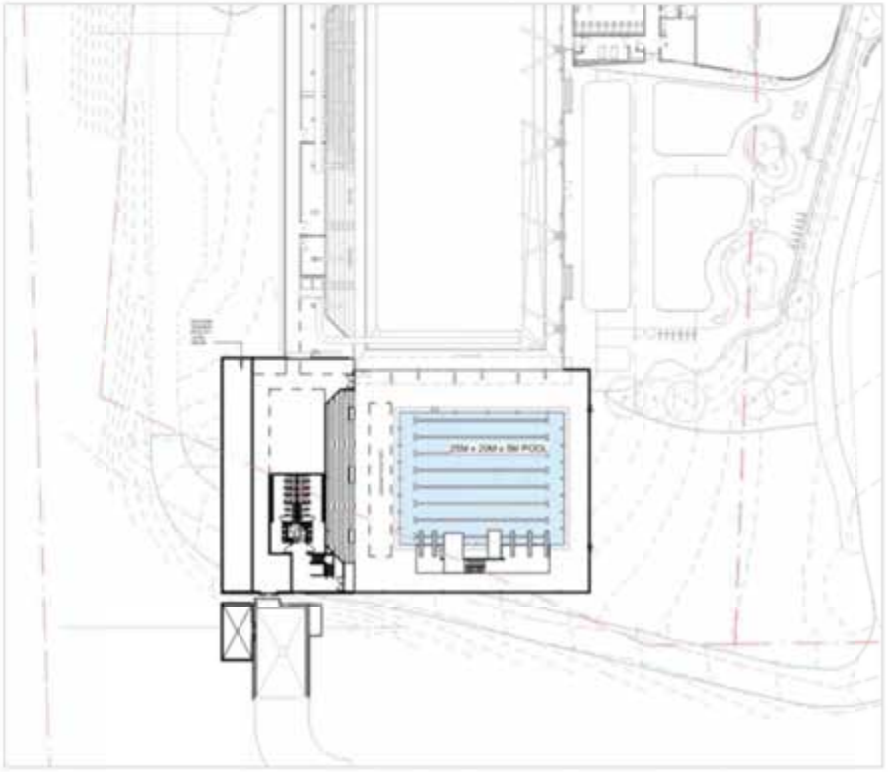


Figure 2 *New Dive Pool – Option 2*

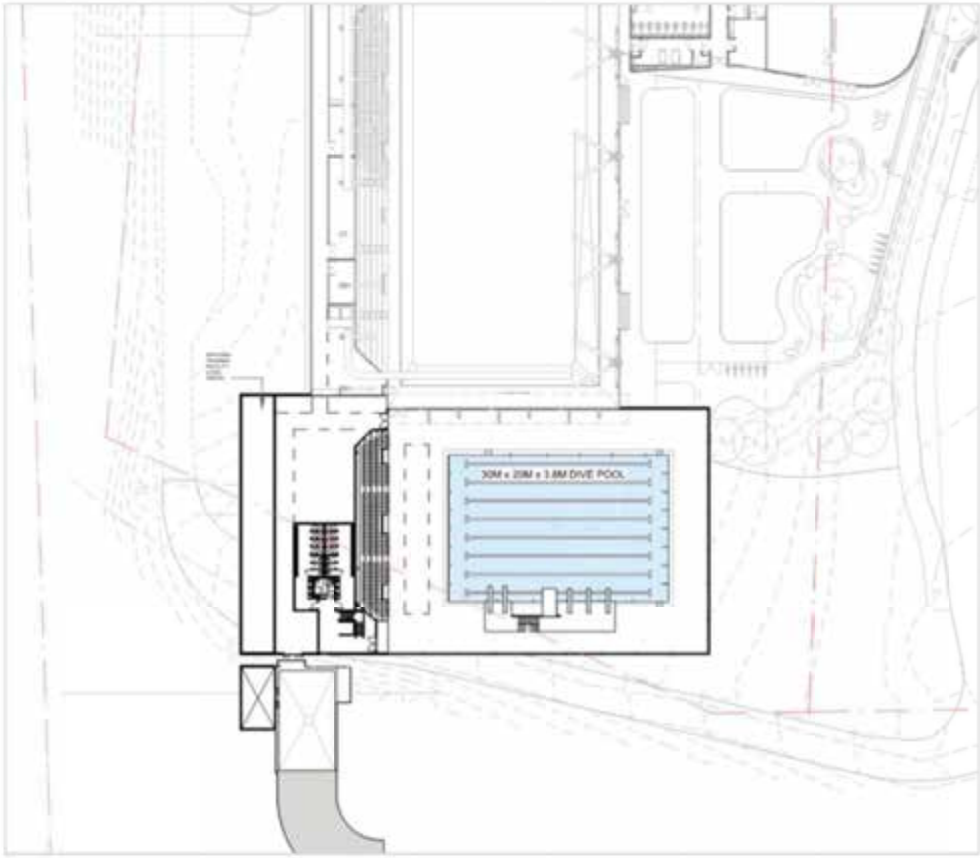


Figure 3 *New Dive Pool – Option 3*

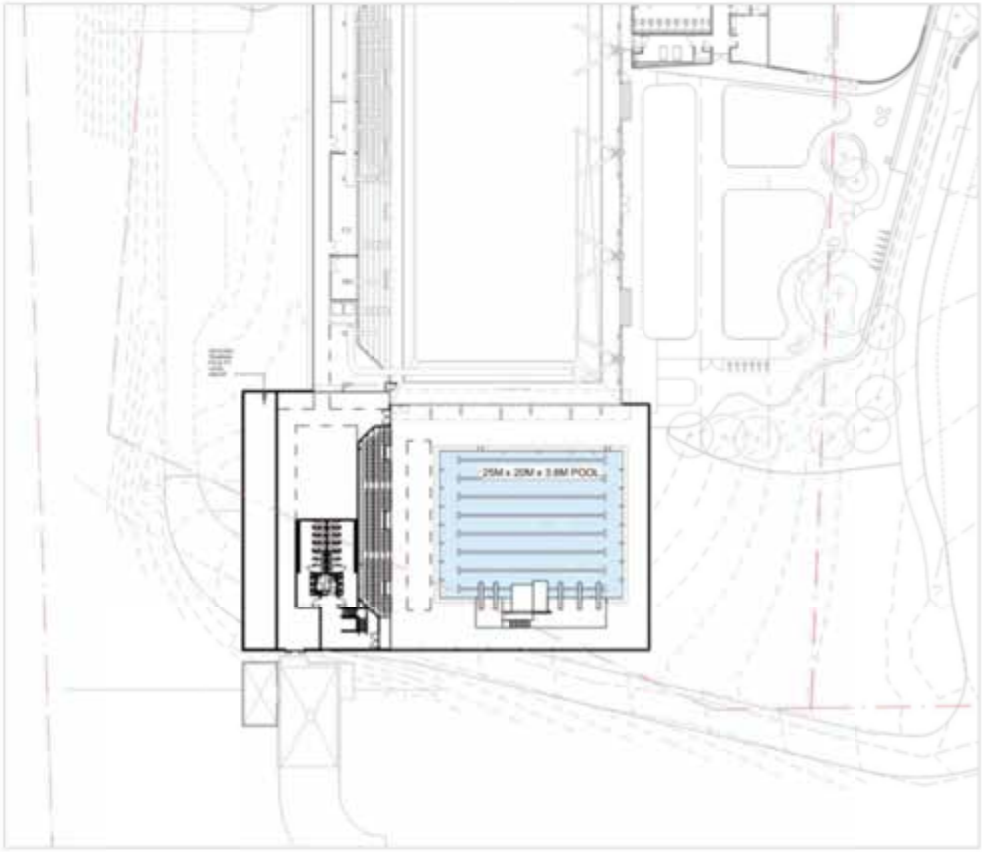


Figure 4 *New Dive Pool – Option 4*

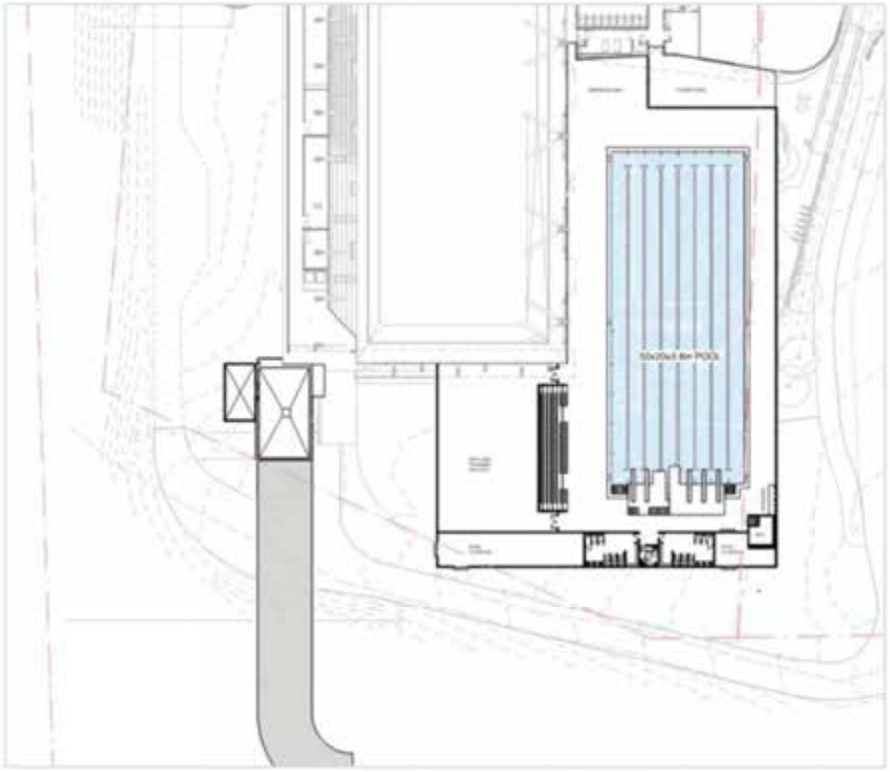


Figure 5 *New Dive Pool – Option 5*

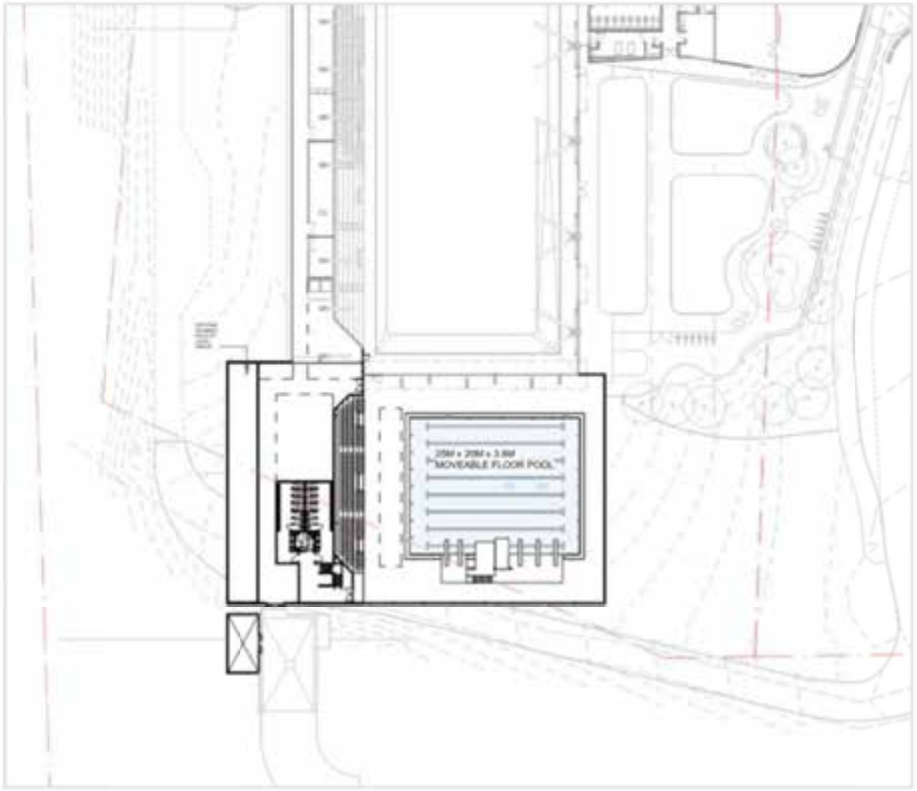


Figure 6 *New Dive Pool – Option 6*

2 Mechanical Services

2.1 Existing Mechanical Plant

The below sub-sections provide descriptions of the main components of the existing mechanical plant serving the existing pool facility.

2.1.1 Existing Natural Gas

The SLC site has two high pressure gas main feeds, one with ∅100 pipe at 35kPa and the other with ∅40 pipe at 35kPa. The high pressure gas feeds are regulated down to ∅125 pipe at 5kPa and the other with ∅50 pipe at 5kPa respectively to be used within the facility.

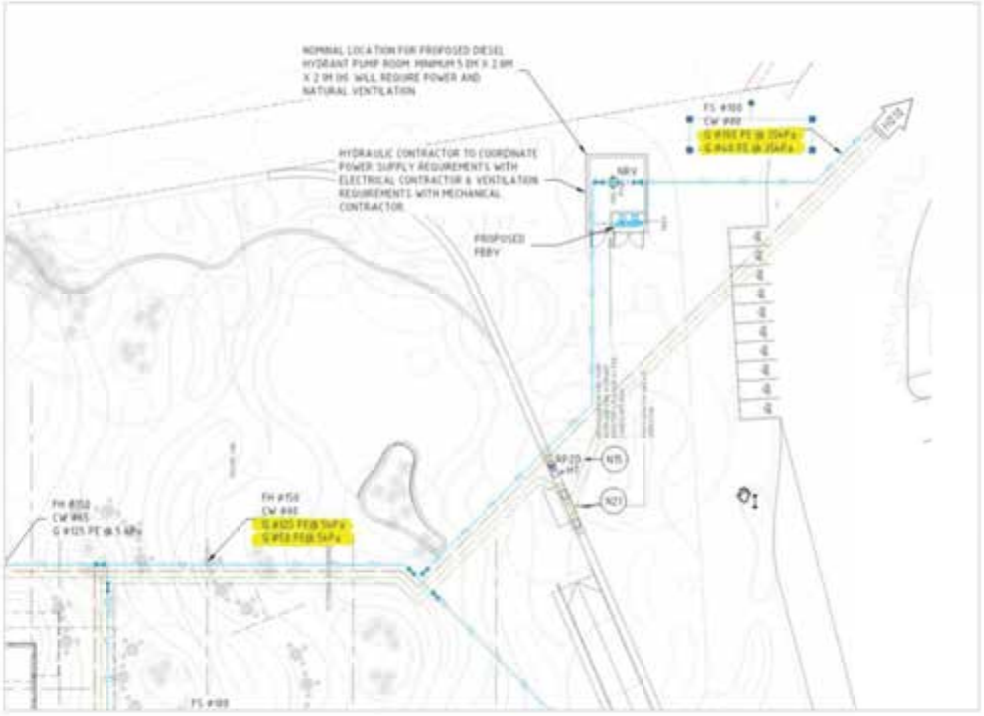


Figure 7 *In-ground gas pipe lines – extract of Tender drawing H201 rev D.*

The following are the major usages of gas within the building:

- Mechanical boilers
  - 2-off boilers for the generation of water heating and ventilation air heating
  - 1-off boiler serving ERV-01
- Domestic hot water heating via instantaneous heaters
- Kitchen cooking

2.1.2 Existing Central Heating System

The existing central heating system consists of the following:

- 2-off condensing gas-fired Simons Boilers at 1,050kW heating each, 97% efficiency.
- Primary-only pumping arrangement, one pump per boiler
- Pumps with variable speed drives (VSD)
- Field demands include:
  - 4-off air handling unit coils for heating ventilation of the pool hall
  - 2 off water heat exchanger for water heating of pools

Based on connected field heating demands of 2,140kW peak (estimated from schematic flow rates) and available total capacity of 2,100kW, there does not appear to be spare heating capacity in the existing central heating system.

The central heating system was installed in 2020 and appears to be good condition and working order.

Figure 8 *Installed condensing Boiler #2 by Simons Boilers.*

Figure 9 *Installed primary-only pumping arrangement – primary heating pumps 1 & 2.*

2.1.3 Existing Pool Hall Air Handling Systems

The existing pool hall is served by 2 custom-built air handling plantrooms. These air handling plantrooms are located on the western side of the building, one to the north and one to the south.

Each plantroom consists of:

- 2-off supply air fans @ 14700L/s each (Estimate), fan with VSD
- 1-off exhaust/return air fan @ 29,400L/s, fan with VSD
- Heating hot water coils
- Heat recovery run-around loop including pipework, coil and pump
- Local mechanical services switch board
- 2 outside air intake dampers
- 1 discharge louver on building façade
- 1 return air grille (on Level 1)

Air distribution within the pool hall is via fabric ducts with jet nozzles. The fabric ducts are reticulated at high level and around the perimeter of the pool hall.

Return air location within the pool hall is on Level 1 i.e. at high level. This is not compliant with AS1668.2-2012 and industry accepted pool design guidelines.

Figure 10 *Supply air fan, heating coil with motorised damper within custom built air handling plant room.*

Figure 11 *Fabric duct with jet nozzles.*

2.1.4 Existing Mechanical Services Switchboards (MSSBs)

Electrical switchboards for mechanical plant, MSSBs, are installed locally where major mechanical plant equipment are, including Boiler Plantroom, Air Handling Plant Room north & south and Level 1 Plantroom above administration spaces.

Figure below shows the MSSBs and their rating capacities.

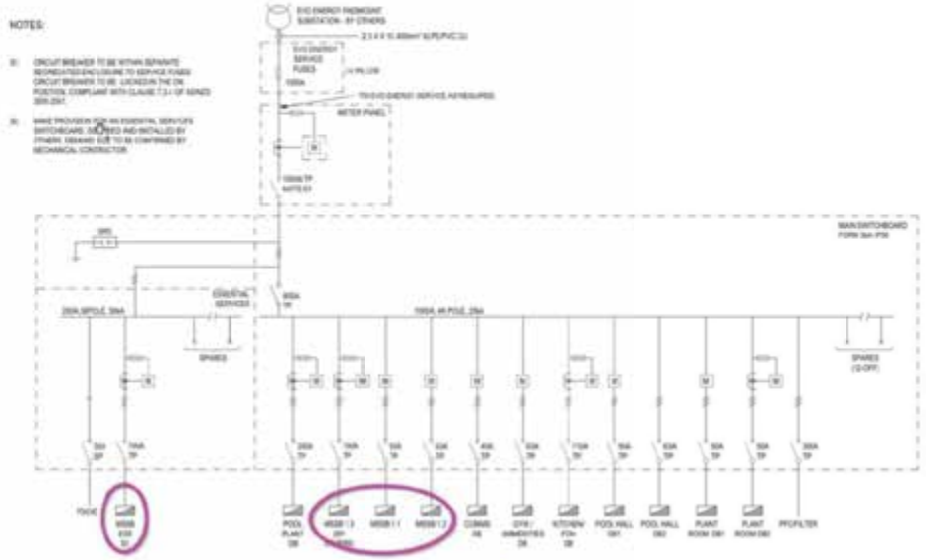


Figure 12 Fabric duct with jet nozzles.

2.1.5 Existing Building Management System

Further information will be provided.

2.2 Review of Heating Technologies

As aforementioned, it is understood that ACTPG prefers new heating systems for the Dive Pool to be of electric heating systems, also called heat pumps

Currently there are several types of HPs on the market available for consideration for the proposed new Dive Pool. These heat pumps use different refrigerant technologies and can generate varying water temperatures as well as having different energy efficient performances and environmental impacts. The main types of refrigerants available include natural refrigerant (e.g. CO2), Hydrofluorocarbons (HFC), and Hydrofluorocarbon + Hydrofluoroolefin (HFC+HFO). Selection of the type of heat pump for will be based key considerations such as market familiarity, cost, refrigerant mandatory phase-down, capacity range and integration with existing systems onsite.

Australia's refrigerant phase-down scheme aims to reduce the refrigerants that have high global warming impacts, typically applicable to HFCs and refrigerant blends (HFC+HFO). The scheme started in 2018 and applies through to 2036, HFC imports will be gradually reduced to 15% of the pre-2018 levels by 2036.

Refrigerants, which have zero or near to zero global warming potential (GWP) are not affected by the Government's phase-down legislation. These include natural refrigerants (e.g. ammonia, CO_2), hydrocarbons (e.g. propane) and HFO refrigerants (non-blend, e.g. R1234yf).

It should be noted that at the end of phase-down period, 2036, significant reduction of refrigerant use will be implemented however HFC usage will still be allowed for system maintenance purposes.

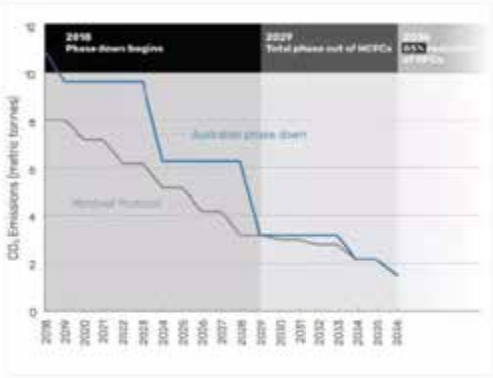


Figure 13 Australia's refrigerant phase-down time line.

2.2.1 Proven Technologies

The below table provides a high-level summary of the main characteristics and performances of each heat pump refrigerant technologies.

Table 1 High-level summary of different heat pump refrigerants.

Parameter	CO_2 Natural Refrigerant HPs	HFC Refrigerant HPs	HFC+HFO Refrigerant Blend HPs
Heating Capacity Range	Limited - Max heating capacity of 50kW	Flexible - Capacity can reach up to 600kW	Flexible - Capacity can reach 1,100kW
Maximum Heating Hot Water Temperature	Up to 90°C	Up to 80°C	Up to 55°C
Coefficient of Performance – COP (At Design Conditions)	2.9	2.0 to 2.6	2.0 to 2.5
Refrigerant	R744 – CO_2 (Carbon dioxide)	R410a R32	R454b R513a
Cost	High $800/kW to $1,150/kW	Low $300/kW to $370/kW	Medium $450/kW
Global Warming Potential (GWP)	1	675 to 2,088	466 - 573

Based on the key characteristics of Table 1 above, the following can be summarised:

- CO_2 natural refrigerant heat pumps have the best GWP, however the heating capacity of these units are low. For a high heating demand facility, a great number of units will be required which will have impact on maintenance cost. These type of heat pumps are also the highest in capital cost per kW of heating, reaching up to 3 times more capital cost compared to other refrigerant technologies.

- HFC heat pumps have the lowest comparable capital costs, however their environmental impact is highest with GWP reaching up to 2,088. With the Government's refrigerant phase-down scheme, these heat pump will be most affected due to their refrigerants being wholly HFC.
- Refrigerant blend heat pumps that use a combination of HFC & HFO, are a newer technology and have low to medium capital cost per kW of heating. Their GWP levels are on the lower side compared to HFC heat pumps and that they will be less affected by the Government's refrigerant phase-down scheme compared to pure HFC refrigerant heat pumps.

Figure 14 *Typical natural refrigerant CO_2 heat pumps from Revere (left) and Mitsubishi Electric.*

Figure 15 *Typical pure HFC refrigerant heat pumps - R410a (left) and R32 (right).*

Figure 16 *Typical R454b heat pumps using a refrigerant blend – HFC + HFO.*

2.2.2 Other Emerging Systems

Other heat pumps refrigerant technology not mentioned above include HFO, Ammonia and Propane heat pumps. These heat pumps very low GWPs comparable to CO_2 heat pumps however, they are emerging technologies that either:

- Still have small capacity units e.g. HFO type
- Requiring complex systems integration, requiring specialist contractors and high maintenance e.g. ammonia type
- The use of highly flammable refrigerant that require provision of additional safety procedure and leak detection systems in place e.g. propane type

Most of these emerging systems and have not been fully tested for aquatic centre applications.

Figure 17 *Rheem HFO heat pump with R1234yf refrigerant – typically 30kW to 40kW heating capacity.*

Figure 18 Typical ammonia heat pump by Sabroe.

Figure 19 Typical propane heat pump with a maximum of 132kW heating capacity by Revere.

2.2.3 Heat Pump Type Recommendation

Based on the available heat pump technologies outlined above and considering the current proposed new Dive Pool project which is an extension of the existing building, it is recommended that a proven technology with an all-arounder characteristics such as capital cost, flexibility in total heating capacities, good GWP values and medium energy efficiency; the refrigerant blend (HFO+HFC) type of heat pump systems is used.

As such spatial planning for the 6 architectural concept options will be based on this refrigerant blend heat pump type.

2.3 New Dive Pool – Heating Demands

A preliminary assessment of the new Dive Pool's total heating demands for the combined pool water heating, pool hall air heating and shower/change room air heating was carried out.

Table 2 below shows a summary of the heating demands of each option for the heating-only spaces. Domestic heating water (DHW)for showers/basins demand is currently not known and requires a Hydraulic Consultant's inputs. The Dryland Training room's ventilation heating is not included since this space requires both heating and cooling and will be proposed with a reverse cycle system.

Pool water heating demands were based on information received from the Pool Consultant – MLEI Consulting Engineers, while air heating demands were calculated based on the proposed geometry of the new dive pool options.

Table 2 New Dive Pool estimated heating demands.

Concept Option	Water Heating – Start-up Load From Cold (kW)	Poolhall Air Heating Load (kW)	Changeroom Air Heating Load (kW)	Total HHW Load [kW]
1	1,600	905	12	**2,265**
2	1,380	669	12	**1,854**
3	1,300	426	12	**1,564**
4	1,150	315	12	**1,329**
5	2,050	530	12	**2,332**
6	1,300	382	6	**1,520**

It can be observed that the new dive pool's total heating demand for all options are relatively high with 2 options being greater than the total heating demand of the current SLC facility at 2,100kW heating.

2.4 New Dive Pool – Heating Plant

Due to the relatively high estimated total heating demands outlined above, it is proposed that the new heating plant for the Dive Pool extension is a fully standalone system central heating plant system. A standalone central heating system allows for the separation from the existing gas-fired heating system as well as enable the use of different heating hot water temperatures.

The proposed central heating system will be a primary-secondary system (as opposed to the existing primary-only system) allows for better flow and temperature controls for electric heat pumps. This system comprises of heat pumps, primary circulation pumps, secondary circulation pumps, pipework, flow & return headers, valves & controls and connected field demands. The main features of the system are shown below.

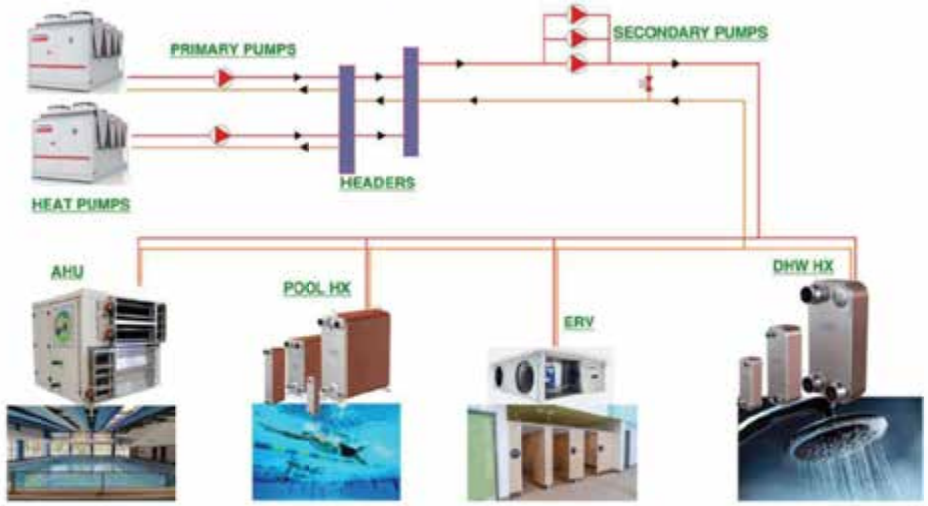


Figure 20 Simple schematic showing the proposed central heating plant for the new Dive Pool.

Due to the heating dominant nature of the new Dive Pool, heat pumps and circulation pumps are proposed with multiple units to enable at least 70% redundancy i.e. when a unit fails, there will be at least 70% total capacity remaining.

Note that the above schematic also shows the connection of the DHW heat exchanger for showers and hand basin hot water demand. However, on confirmation of the hydraulic consultant, this component can also be separated out to have a standalone system.

2.5 New Dive Pool – Pool Hall Air Handling System

The heating and ventilating of pool halls is an energy intensive process and is required to provide:

- Fresh air ventilation to the users
- Minimisation of pool water evaporation rates (and hence minimisation of the risk of corrosion)
- Extraction of chloramine and other contaminants
- Heating thermal comfort
- Passive humidity control (passive humidity control is provided by passing dry air through the space with the aim of avoiding relative humidity levels above 60% in the pool hall. No active dehumidification via cooling is proposed)

In the Canberra climate, past published data (from the AIRAH Technical Handbook) shows that for a large portion of the year, the external ambient air has (absolute) moisture content lower than that of the proposed internal pool hall conditions (typically 28°C / 60% relative humidity).

Therefore, for the Canberra climate the typical ventilation response is to ventilate the pool halls with heated full outdoor air to provide humidity control and achieving better indoor air quality as opposed to the use of active cooling to dehumidify recirculated pool hall air with minimum fresh air provision to meet minimum compliance requirements.

As such, the air handling units proposed for the new Dive Pool hall will be full fresh air units, i.e. 100% outside air supplied to the pool hall, and the equivalent being exhausted out of the space. The main pool hall temperature conditions are typically at 28°C or 1 degree above the pool water temperature thus the outgoing exhaust airstream contains high thermal energy content (e.g., warm air being discharged). As such, in heating mode, heat exchange media will be proposed in air handling units to recover the energy of the outgoing airstream and transfer that energy onto the incoming air stream. This process results in an overall reduction in the air heating energy required to maintain pool hall temperature setpoints.

Air-to-air heat exchange media offer energy recovery of 65% to 90% of the outgoing high energy content airstream. This is more efficient than a run-around coil heat recovery system, typical at 50%. Figure below shows the energy recovery process whereby the heat exchanger recovers the outgoing airstream's energy to raise the incoming cold air at winter design temperature of 3.5C and raising it up to 20C without any active central plant heating energy input.

Figure 21 *Typical heat exchange process on a 3.5C cold day.*

There are two types of air handling units with built-in heat recovery – ERVAHU.

- Option 1 – ERVAHU with DX (direct expansion) reverse cycle system self-generate heating
  - This type of ERVAHU saves plant spatial requirements overall since they have internal DX system, however they are typically limited to smaller size capacities. Larger size capacities are also available however they will require custom-made and are only available from a few manufacturers.
  - These units are for pool hall applications and are manufactured with corrosive resistant materials.
  - Can also provide tempered-cooling
- Option 2 – ERVAHU with heating hot water coils
  - This type of ERVAHU has heating coils and require heating hot water to be provide such as from the central heating system. They are more compact in size however require an external heating source. These AHUs have a wide range of capacities.
  - These units are for pool hall applications and are manufactured with corrosive resistant materials.

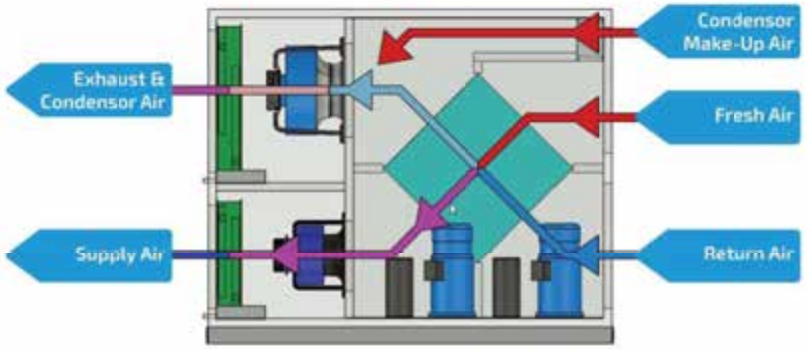


Figure 22 *Typical Armcor ERVAHU with DX system with two compressors (large blue units) to self-generate heating.*

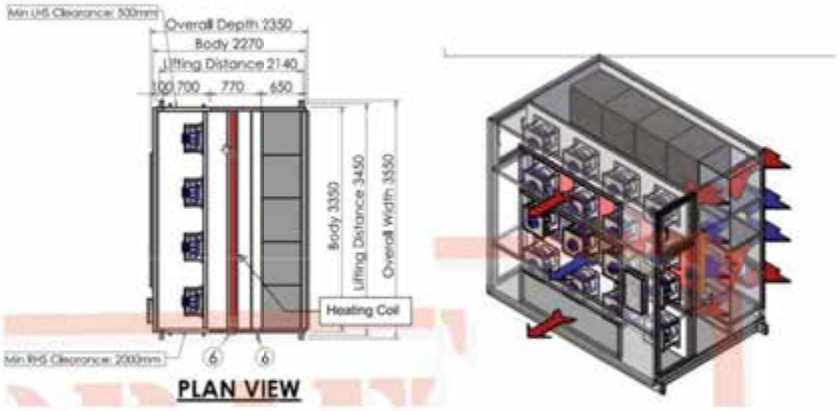


Figure 23 *Typical Air Change ERVAHU with a heating coil.*

Cooling is not typically provided for pool halls due to the percentage of times that external ambient temperatures exceed pool hall temperature is estimated, especially for the ACT. As such cooling is not recommended to save the capital cost that will be required to be in place to cater for very low occurrence in a typical year.

Based on the limited size of the ERVAHU with DX system, it is proposed that the new Dive Pool is to utilise ERVAHU under Option 2 to allow more market availability and competitiveness tendering. Table below shows the preliminary air flow rate requirements of the proposed options including the number of ERVAHUs required. Where possible 2 ERVAHUs are proposed to increase redundancy, however each ERVAHU will have multiple fans within the unit which provides their own inherent redundancy as fans are typically reliable and that not all fans will likely to fail at the same time.

Table 3 *New Dive Pool estimated air flow requirements.*

Concept Option	Estimated Air Flow Rate (L/s)	Poolhall Air Heating Load (kW)	ERVAHUs Proposed
1	32,500	905	2-off ERVAHU @ 16,000L/s Each
2	26,260	669	2-off ERVAHU @ 14,000L/s Each
3	16,720	426	1-off ERVAHU @ 16,800L/s Each
4	12,360	315	1-off ERVAHU @ 12,400L/s Each
5	20,800	530	2-off ERVAHU @ 10,400L/s Each
6	15,000	382	1-off ERVAHU @ 16,000L/s Each

The air delivery system will generally be at high level via fabric duct with laser cut holes or jet nozzles to increase air velocities and reach. Return air will be extracted from the pool hall at low level as per ASHRAE natatorium design guidelines and AS1668.2 requirements to increase effectiveness to extracting out the heavier than air chloramines. The low level return air is reticulated back to the air handling plant for energy recovery before being exhausted to atmosphere. A net negative pressure will be maintained within the pool hall to limit the transfer of pool hall air to other parts of the building.

2.6 New Dive Pool – Shower Change & Amenities Ventilation

Shower change rooms throughout the facility are proposed to be provided with energy efficient in-ceiling energy recovery ventilators (ERV) with heating coils or roof mounted ERVs. These units provide full fresh air into the space as well as doubling up to provide extraction of shower steam and toilet emissions while also provide heating via the integrated HHW coils.

The units are proposed to be located within the ceiling void over the spaces they serve and connected to supply, return and discharge ductwork. Fresh air is ducted to these units via roof mounted cowls. Alternatively they can be mounted on the roof using roof-mounted ERVs.

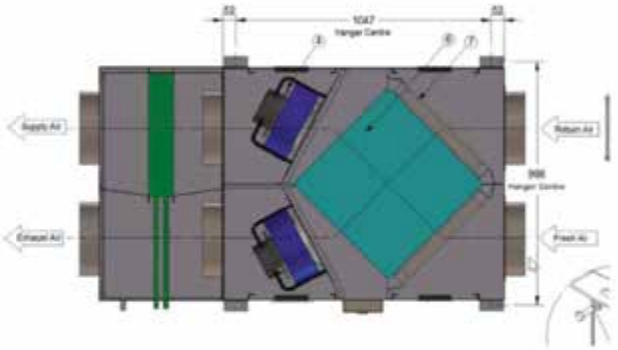


Figure 24 *Typical showers/change rooms inceiling ERV with heating hot water coil.*

2.7 New Dive Pool – Dryland Training Air Conditioning System

It is understood that the Dryland Training facility is similar to a gym space and as such this space will require both heating and cooling provisions and typically higher fresh air ventilation requirements. Since cooling is required to this space it is proposed that a DX-type of air conditioning system is proposed via the following options:

1. Roof top packaged with economy cycle is to be used for this space. Energy recovery is also proposed to enhance energy efficiency of the system by recovering the heat from the outgoing air relieve due to high fresh air requirements.
2. VRV system with an external condensing unit connecting to local fan coil units within the ceiling space via refrigerant pipework.

There is no clear definitive advantage of one option over the other.

Option 1 roof top packaged unit provides installation and maintenance efficiency in that there will only one single unit to service, however it has limited ability to turn down its fan energy consumption during low load/occupancy conditions.

Option 2 provides the ability to dividing the space into multiple zones which can be turned on/off as required to further reduce energy usage. However, this option has more smaller units to maintain and install.

From the feasibility architectural design where there plant space above/adjacent to the Dryland Training area is limited, it is proposed that Option 2 is provided to enable fan coil units to utilise the high ceiling space thereby reducing mechanical plant requirements.

Based on the proposed area of the Dryland Training space, the following are estimated capacity and unit sizing:

- Estimated cooling ~ 80kW
- Estimated heating ~ 70kW
- Total Supply Air Flow Rate ~ 4,000L/s

Figure below shows a typical DX roof top packaged unit.

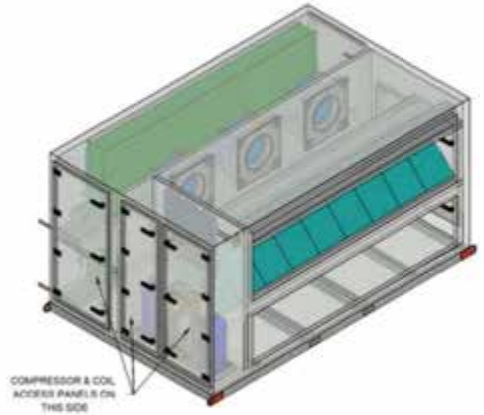


Figure 25 *Typical Armcor DX roof top packaged air conditioning unit.*

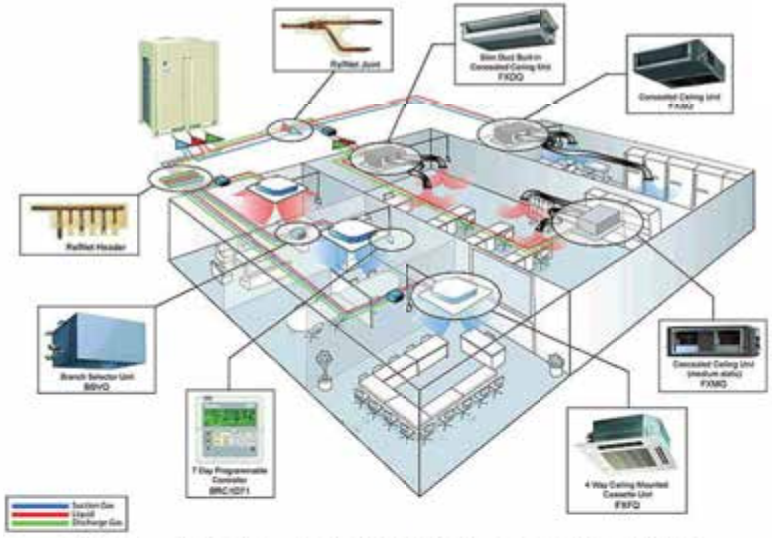


Figure 26 *Basic schematic of a VRV system with heat recovery by Daikin.*

2.8 New Dive Pool – Pool Plant Ventilation

The plantrooms housing pool equipment often emit high levels of corrosive air. The typical minimum ventilation rates from the Standards in many situations are not adequate and resulting in equipment being corroded over time. For the new Dive Pool's pool equipment plantroom it will be proposed with higher levels of flow rate at 150% above typical Standards increase air change within the room minimising the risk of corrosion.

Ventilation to the pool plant is proposed with mechanical ventilation and natural air make-up via louvres where possible. Mechanical ventilation can be achieved with either an in-line fan ceiling suspended or a roof mounted fan.

2.9 Corrosion Mitigation

Air movement associated with pool plant room and pool halls contain corrosive contaminants. To assist in reducing risks of corrosion of mechanical equipment, the following will be proposed:

- Air handling unit plant, heat exchangers and fans will be specified with corrosion resistance grade
- Ductwork will be painted to provide a corrosion protection layer
    - Supply air ductwork – external painting
    - Exhaust air ductwork – external and internal painting.

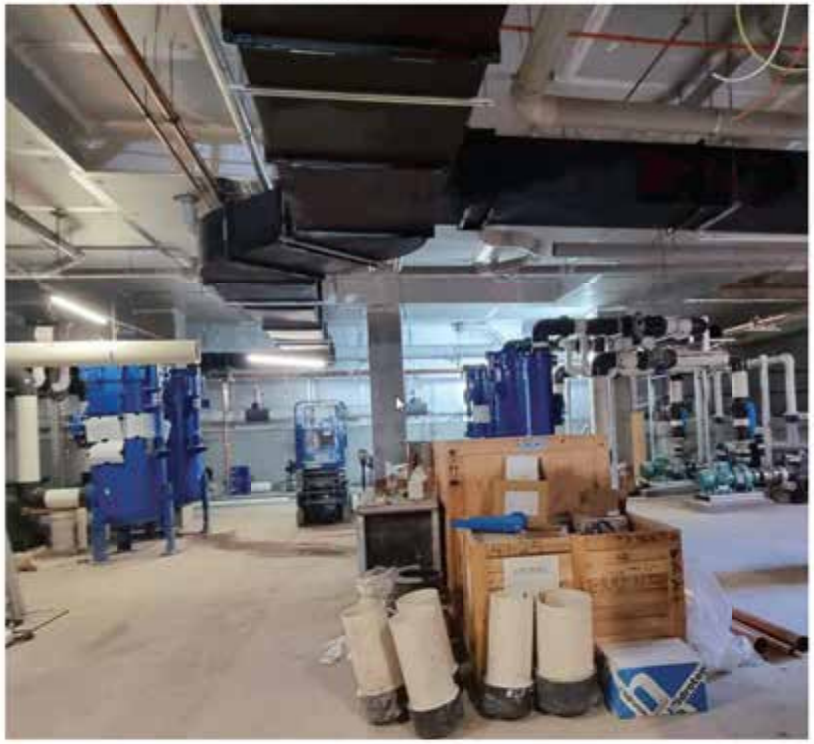


Figure 27 *Typical painted ductwork within pool plant room to minimise corrosion.*

2.10 Mechanical Electrical

New electrical demand requirements for the proposed mechanical systems will be high, especially new electric heat pumps. As such new dedicated mechanical services switchboards (MSSB) will be required and new sub-main feeds to be reticulated from the new main electrical board and new substation (refer electrical section).

New MSSBs will be strategically located such that to minimise larger submain cable runs as well as closer to the mechanical equipment that they serve.

All MSSBs are proposed with energy meters for monitoring connected to the BMS, general fire alarm signal from building's the fire indicator panel (to enable operation in a fire event) and indicator lamps.

2.11 New Dive Pool – Building Management System (BMS)

All new mechanical systems for the proposed new Dive Pool will be controlled and monitored by the existing Building Management System. Further details will be provided on the required scope of works to the existing BMS.

2.12 New Dive Pool – Acoustic Attenuation

Acoustic attenuation of mechanical services systems will be to the requirements of the Acoustic Consultant. However, the proposed mechanical equipment will be proposed with low noise emission types where possible, and not impacting their capacity or system energy efficiency (e.g. chillers and heat pumps).

Some of the typical acoustic attenuation provisions will includes:

- Internal insulation
- Duct mount attenuators
- Provision of ductwork bends
- Wrapping of exposed ceiling0hung units (e.g. FCUs, ERVFCUs)
- Acoustic louvres

Figure 28 *Typical air handling unit attenuator (left) and acoustic wrapping of ceiling hung ERV unit.*

It should be noted that the new externa plant for the heat pumps and air handling unit may have impact on the neighbouring properties and require inputs from the acoustic consultant on noise mitigation strategies.

2.13 New Dive Pool – Summary of Major Plant Spatials

Table 4 below shows a summary of the major plant spatial requirements for each of the options including heat pump external plant, air handling units plant, Dryland Training air handling unit plant and Shower/Change plant.

Table 4 *Plant spatial summary.*

Concept Option	Heat Pump External Plant (m2)		AHU Plant Area (m2)		Dryland Plant Area (m2)		Change / Shower Area (m2)		Total Mechanical Plant Area (m2)
1	231	18.8 x 12.3 Minimum Width 6m 2.6m high External, no roof over	168	28 x 6 - Minimum Width 6m - 3.1m high max - External or in a plantroom - Close to/adjacent Pool Hall	49	8.9 x 5.5 - Minimum Width 5.5m - 2.2m high max - External or in a plantroom - On top of/adjacent to Dryland	18	7.1 x 2.6 - Minimum Width 2.5m - 2.2m high max - External or in a plantroom - can be flexible, connect to space via 2 duct runs	466
2	206	16.8 x 12.3 Minimum Width 6m 2.6m high External, no roof over	138	26.6 x 5.2 - Minimum Width 5.2m - 3.1m high max - External or in a plantroom - Close to/adjacent Pool Hall	49		18		411
3	205	16.7 x 12.3 Minimum Width 6m 2.6m high External, no roof over	111	21.4 x 5.2 - Minimum Width 5.2m - 3.1m high max - External or in a plantroom - Close to/adjacent Pool Hall	49		18		383
4	148	12.0 x 12.3 Minimum Width 6m 2.6m high External, no roof over	65	10.8 x 6 - Minimum Width 6m - 3.1m high max - External or in a plantroom - Close to/adjacent Pool Hall	49		18		280
5	259	21.1 x 12.3 Minimum Width 6m 2.6m high External, no roof over	109	21.1 x 12.3 - Minimum Width 5.2m - 3.1m high max - External or in a plantroom - Close to/adjacent Pool Hall	49		18		436
6	169	13.7 x 12.3 Minimum Width 6m 2.6m high External, no roof over	79	15.2 x 12.3 - Minimum Width 5.2m - 3.1m high max - External or in a plantroom - Close to/adjacent Pool Hall	49		18		315

2.14 New Dive Pool – Operational Energy Estimation

To provide a high-level indication of the HVAC (heating ventilation and air conditioning) operational energy of each option and considering that Option 1 has the potential to be the highest energy user due to the high water heating and air handling capacities, the following provides a relative comparison of energy reduction of other options in comparison to Option 1.

Note that this estimation is approximate and are based on the following:

- Energy estimation mostly used power rating from equipment and applied 24/7 operation
- HVAC energy including:
  - Heat pump for air heating and pool water heating
  - Circulation pumping
  - General exhaust fans
  - Air handling unit fans
  - Air conditioning
- Pool water heating based on maintenance loading of each option provided by MLEI Consulting
- A diversity of 60% applied to reflect seasonal variation of external ambient in a typical year
- Electrical lighting is excluded
- Pool water filtration and pumping/circulation are excluded
- Domestic hot water energy consumption excluded

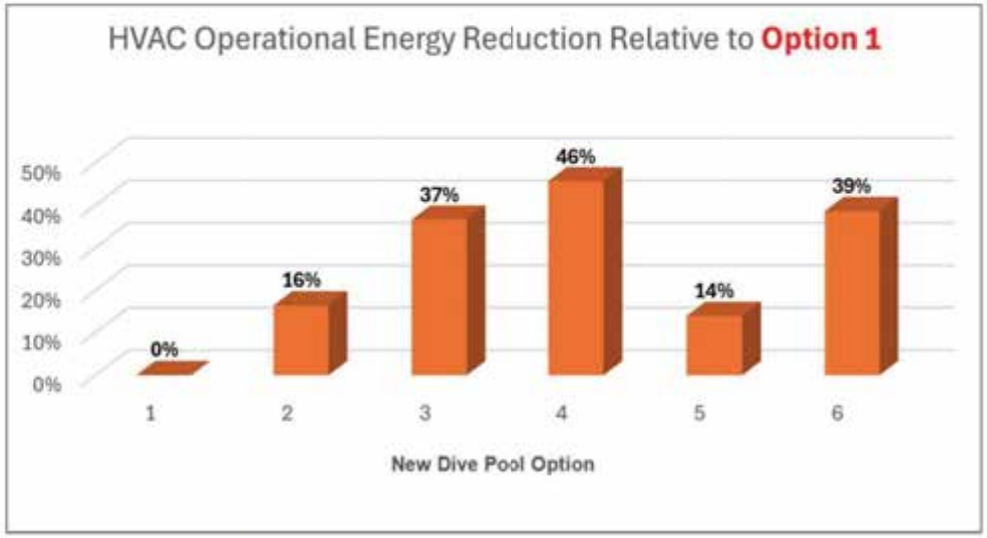


Figure 29 *Estimated HVAC operational energy consumption reduction relative to Option 1.*

3 Electrical Services

3.1 Existing Electrical Infrastructure

3.1.1 Incoming Supply

There is an existing High Voltage (HV) supply from Uriarra Road to the substation feeding the Leisure centre as shown in the DBYD plan below. From discussions in the workshop, we understand there has been an electricity grid upgrade in Jan 2024 and the supply to Stromlo Leisure Centre (SLC) has since then been unreliable leading to several power outages. There have been 5 power outages since start of 2024 affecting nearby suburbs and SLC. A preliminary advice email has been issued to Evoenergy to review the power reliability in the area and we are awaiting feedback.

Figure 30 *DBYD plan for site*

3.1.2 Substation and Distribution Pillar

Stromlo Leisure Centre is supplied by a utility Evo Energy, 500kVA padmount substation, via an LV pillar switchboard located adjacent to the substation. We have requested the existing supply offer contract information to confirm the substation is dedicated to the aquatic centre. The current assumption for the report and max demand calcs is the 500kVA substation is dedicated to feed the leisure centre.

Figure 31 *Evo Energy 500KVa padmount substation and LV pillar*

3.1.3 Existing Main Switchboard

The existing Main switchboard (MSB) is located in a dedicated main switchroom and as noted on Construction dwg taped on the MSB 16x1C 630mm2 XLPE underground submains run from the LV pillar to the existing MSB. The MSB is Form 3B rated for 1000A.

Figure 32 *Main Switchboard*

3.1.4 Existing Spare Capacity

The existing max demand for the Leisure centre is approx. 278kVA derived from the 2024 utility bills. A request has been made to provide utility bills for the year 2022 and 2023; so that a longer term maximum demand review can be completed. A spare capacity of approximately 222kVA is available in the 500kVA substation for the proposed works. However, if the substation is proven to feed adjacent properties also, the spare capacity will be less.

3.1.5 Existing Electrical Services in Vicinity of Proposed Dive Pool Extension

There are existing LED Post top fittings located in the proposed dive pool extension area as shown in the figure below. The LED post top to be relocated to suite the new location.

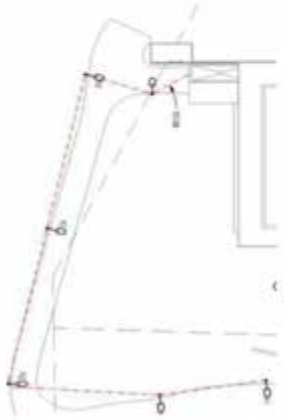


Figure 33 Existing light fitting in the proposed Dive pool extension

3.2 Proposed Electrical Works

3.2.1 Substation

The proposed max demand for the 6 options noted in the table below:

	Existing Building Maximum Demand [kVA] 2024	New Demands [kVA] (Does not include existing demand)	New Demands [kVA] (Includes existing demand)	Existing Substation [kVA]	New Loads [kVA] (New max demand – existing substation)	New Substation [kVA]	Spare capacity TX
Option 1	278	1,900	2,178	500	1,400	1500	7%
Option 2	278	1,707	1,985	500	1,207	1500	20%
Option 3	278	1,422	1,700	500	922	1000	8%
Option 4	278	1,307	1,585	500	807	1000	19%
Option 5	278	1,869	2,147	500	1,369	1500	9%
Option 6	278	1,419	1,697	500	919	1000	8%

A new Evo Energy padmount substation is proposed to feed the increased demand of the facility based on the above options; which all require an electrical load beyond the abilities of a 500kVA substation. Based on the preliminary VA/m^2 calculation and preliminary Mechanical loadings, the demand for the facility is estimated in the order of 1000-1500kVA; which will require an equivalently sized substation. This is in addition to the existing substation on site. The loads include an allowance for an all-electric solution for HVAC DHW and pool heating;. Further coordination with the authorities will be required to finalise the substation requirements; this would form part of the detailed design (in future). A new Evo Energy easement will be required for the substation and HV cable to the substation in accordance with the authority requirements. Also, crane access to the substation location will be required. A preliminary advice email has been issued to Evoenergy to discuss the substation upgrade options and are awaiting feedback from the authority.

3.2.2 Site Main Switchboard

A new main switchboard will be required to serve the site to match the increased load, incorporating authority/retailer metering, energy monitoring, and other facilities to be coordinated.

3.2.3 Metering

New energy retailer metering is to be provided in the main switchboard room. 24/7 unimpeded access will be required for supply authority access.

The retailer metering will be integrated into the site MSB in accordance with the authority requirements. Due to the presence of supply authority meters and current transformers, the MSB will require 24 hour unimpeded access from the supply authority.

New energy sub-metering will be integrated into the main switchboard and interfaced with the new energy management system.

3.2.4 Distribution boards

For distribution of power supplies to general lighting and power loads within the areas for the new dive pool, distribution boards will be installed. Each distribution board will service the general power requirements and lighting in their respective zones within the proposed area of the building and provide separate metering of these services.

Proposed distribution board locations are shown on the drawings in the appendix and are currently nominated to serve the below areas:

- Dive Pool
- Amenity and Plant area for Drive pool
- Dryland Training facility on Level 1

3.2.5 Power Reticulation

Lighting and power distribution boards to be provided at strategic locations throughout the proposed area of the building to provide safe electrical zoning. Distribution boards will be provided with 30% spare capacity and will be fitted with RCD safety protection to all lighting and power circuits as required by AS3000:2018 Wiring Rules.

3.2.6 General Power

The general power installation shall comprise of general power outlets and direct connections to be coordinated with special equipment.

3.2.7 Lighting

Lighting to be provided throughout the proposed area of the facility to comply with the lighting requirements specified by AS 1680 (internal) and AS1158 (external).

Lighting to pool areas will be designed to AS2560.2.5 for sports lighting to swimming pools – in particular with respect to the requirements for glare and veiling reflectance from the water surface which are critical for lifeguard supervision of the pools.

Table 2.1.1 — LTPs for aquatic sports

Level of play	Average horizontal maintained illuminance ($\bar{E}_h$)	Minimum horizontal uniformity		Maximum glare rating (GR)		Minimum colour rendering index (R_a)
		($E_{hmin}/\bar{E}_h$) (U_1)	(E_{hmin}/E_{hmax}) (U_2)	Outdoor	Indoor	
Recreation or training, and low-level local competition	150	0.50	0.30	50	40	65
Club, interclub or district competition	300	0.60	0.40	50	40	65
National or state competition	600	0.70	0.50	50	40	80

NOTE Refer to particular requirements of *FINA Facilities Rules* should they be deemed applicable and to Clause 2.1.4.2 for specific requirements for competition diving.

As per coordination with the client, the proposed category for the Dive pool is 600lux, national or state competition level.

In addition to the Australian Standards the lighting will comply with the NCC for energy density levels.

All lighting will comprise commercial quality high efficiency, long life LED type fittings of high colour rendering quality.

3.2.8 Lighting Controls

The existing lighting control to be extended to include the proposed areas. Lighting controls shall be provided in accordance with NCC Part J7 requirements. Internal lighting to amenities will be controlled by local switches and motion sensors to switch off lighting when those areas are not in use.

3.2.9 Exit Signage and Emergency Lighting

Exit signage and emergency lighting will be provided throughout the proposed area of the facility in accordance with the requirements of the NCC and AS 2293. Test switches will be installed in the local distribution boards.

3.2.10 Spatial Requirements

ELECTRICAL SERVICES

FUNCTION	CONTENTS	APPROX. SPACE REQUIREMENTS		PREFERED LOCATION	ADJACENCIES	NOTES
		AREA	HEIGHT (Clear)			
Evo Energy External Kiosk Substation	• 1x 2MVA kiosk substation (500 ((existing)+1500kVA) • HV earth grid • Incoming HV cabling and outgoing LV to MSB.	7.5m x 7.5m easement	• Open to sky	• Adjacent to existing kiosk	• Access to Street for delivery crane. • Direct, level, unhindered access • Prefer to locate it close to main switchroom to reduce long cable runs	• 24hr crane access required. • Crane axle load: approximately 22 tonnes • Height and truck access – 5200mm ceiling height clearance • Above flood level • Easement/lease agreement and operated by Evo Energy • Fire separation from building to Evo Energy requirements
Existing Main switchboard to be renamed to Main distribution board-1	• Main distribution board MDB-1	•	•	•		• The existing Main switchboard does not have spare capacity to feed the new load and a new site MSB is to be located external close to the substation reducing increase in cost due to large cable runs. • Feed the existing main switchboard (renamed to MDB-1) from the new main switchboard . •
External Main Switchboard	• Main switchboard MSB • Meter panels •	• 5000mm x 1000mm	•	• Located close to the new proposed substation • Located as close as possible to the incoming supply.	Minimum 1m clearance at the front, (600mm clearance from door swing)	• Feed MDB-1 and MDB-2 from new site MSB.
Secondary LV Switch Room	• Main Distribution Board -2 • Energy Sub Meters	• 3500mm x 6000mm	• 3000mm minimum clear	• Ground floor,dive pool extension	• As close to main loads (mech, pool plant) as possible.	• Must not have sewer, water, fire, or stormwater pipes traversing • 2 exit doors (opening outward), one of which to be double leaf for equipment delivery • 1 door minimum egress door size 900mm wide x 2200mm high • 1 door minimum egress door size 1800mm

FUNCTION	CONTENTS	APPROX. SPACE REQUIREMENTS		PREFERED LOCATION	ADJACENCIES	NOTES
						wide x 2400mm high
Electrical Riser/Cupboard	• LV cabling risers • Distribution boards • Lighting control and miscellaneous electrical equipment	• All Levels • Typical 2000mmWx600mm Deep •	• Full height floor to floor	• Located to allow cabling to enter/exit • Opening into common space/corridor • Nominally 2x GF and 1XL1	• Located to best serve logical groups of spaces.	• Continuous straight vertical run from ground floor to level 1 • Centrally located in floor plate to reduce cabling lengths and earth loop impedance. • Smoke sealed doors if located in egress path. • 600mm clearance required from open cupboard door swing to opposite wall or other obstruction. minimum door size 2200mm high and width to be confirmed to suit equipment, typically 750mm wide

3.2.11 Power Authority Liaison

Preliminary substation upgrade advice has been sent to the power authority – EVO Energy. A copy of the correspondence including a follow up is provided in Appendix C of this document.

Introba understand from the project team that there is currently a plan by EVO Energy to deliver a new Zone Substation for the area. This is promising and to ensure that EVO Energy is to consider the new electrical load of this New Dive Pool project in their planning, it is suggested that application with EVO Energy is to take place early in the next phase.

4 Communication Services

4.1 Existing Communications Infrastructure

4.1.1 Incoming services

As per the D8YD and electrical plans received, the site has an incoming Telstra connection to the main communications room. The existing main communications room houses 3x45RU data rack with sufficient spare capacity.

Figure 34 *Existing Comms data rack*

4.2 Proposed Communication Works

4.2.1 Communications Room

Due to the size of the facility and distance of the proposed dive pool area from the main communications room, a 42RU data rack is recommended to be provided in the new area of the facility in a dedicated communications room to ensure data outlets for the dive pool can be reached in less than 90m from the communications room.

Minimum 600mm clearance is to be provided to the rear of the rack for patching and equipment installation. Room can be provided with double sided doors for access if required.

Confirmation required on the size and preferred manufacturer of the rack.

4.2.2 Fibre Cabling

New fibre cabling is to meet the following requirements (as noted in the existing communications schematic):

- 50/125 µm Fibre OM3

4.2.3 Horizontal Cabling

Cat6A horizontal cabling to be provided and preferred manufacturers to be coordinated.

4.2.4 Wi-Fi

Wifi coverage to be provided to the internal and external spaces.

The specification and provision of the WAPs will be confirmed.

4.2.5 Data Outlets

Patch leads shall be provided for all patch panel and filed outlets throughout the proposed area of the facility.

Data outlets will be coordinated with other services as required, including point of sale, AV, BMS, security, membership systems.

4.2.6 Spatial Requirements

COMMUNICATIONS ROOM

FUNCTION	CONTENTS	APPROX. SPACE REQUIREMENTS		PREFERED LOCATION	ADJACENCIES	NOTES
		AREA	HEIGHT (Clear)			
Secondary Comms Cupboard for Dive pool	• Local rack with active equipment providing data outlets and network connectivity in its respective area • Air conditioning • 1x 42 RU racks proposed	• 2m wide x 1.5m deep	• 2800mm, full height walls	• Area adjacent pool • Required to be located to provide coverage to full site within the 90m cable length limit • No wet area	• Far from main comms room to provide additional coverage of facility.	• No ceiling • 1m door width • 90m cable run maximum from rack termination to furthest outlet (indicatively 65m horizontal distance) • Currently based on 800x900mm rack footprints.
Communications Risers	Communications backbone cabling	Located in comms rooms	Floor to ceiling	Located in comms rooms	Located in comms rooms	Located in comms rooms

5 Opinion of costs

The following table provides opinions of costs for mechanical and electrical services proposed work for each of the 6 options.

Mechanical Opinion of Costs	Mechanical Estimated Costs	Electrical Estimated Costs	Total Mechanical & Electrical Estimated Costs
Option 1	$2,906,000	$2,623,250	**$5,529,250**
Option 2	$2,549,000	$2,445,250	**$4,994,250**
Option 3	$2,209,000	$2,592,950	**$4,801,950**
Option 4	$1,994,000	$2,423,400	**$4,417,400**
Option 5	$2,769,000	$2,869,950	**$5,638,950**
Option 6	$2,252,000	$2,425,300	**$4,677,300**

5.1 Mechanical Summary of Scope of Works Associated with Costs Above

- "HFO+HFC Blend" Heat Pumps (Excl. DHW loads)
  - Pipework
  - Pumps - secondary and primary
  - Variable speed drives
  - Valves and controls
  - Dosing and expansion systems
- Air handling units with HHW coils
- Roof Top Packaged Air Conditioning
- Shower/Amenities exhaust ventilation system
- Pool Plant Room Exhaust Ventilation
- Ductwork & Associated Accessories
  - Pool hall with fabric ductwork
  - Rigid ductwork to other areas
  - Corrosion mitigation e.g. painting of ductwork
- Diffusers, Grilles, Louvres & Associated Accessories
- AHU attenuations
- Controls & Monitoring - BMS
- Electrical Works: MSSBs, Electrical Wiring etc.
- Commissioning and DLP

5.2 Electrical Summary of Scope of Works Associated with Costs Above

- General lighting and power reticulation
- New local distribution boards (DBs)
- Lighting fittings throughout new Dive Pool
- Lighting controls
- New site Main Switchboard (MSB)
- Modification of existing MSB to become Main Distribution Board (MDB)
- Submains cable reticulation from new MSB to new Dive Pool DBs including mechanical services switchboards
- Relocation of existing light poles – 5-off allowed
- Substation kiosk (EVO Energy discretion)
  - an estimation of $390k has been allowed. The final cost will not be known until the Authorities have made their detailed engineering design.
- New low voltage pillar
  - an estimation of $50k has been allowed. The final cost will not be known until the Authorities have made their detailed engineering design
- Communication rack and horizontal cabling from main comms room
- Fibre cable from main comms room to new satellite comms rack/room
- Commissioning and DLP

5.3 Exclusions & Clarifications

- Cost estimates based on our high level Concept Design
  - Some costs are mainly based on rates per area.
- Builder's associated works for the relocation of 5-off existing external light poles
- Builder's associated works for the new electrical reticulation from substation at site entry to new Dive Pool
- Hydraulic works and systems
- Fire services works and systems
- Power authority costs (budgeted) items like new Substation, HV mains cabling, Point of Supply connection etc only
  - Civil works like Substation kiosk foundation, new MSB room, Conduits excavation & trenching
- Demolition of existing HV infrastructure like HV mains, HV Pillar, existing Point of Connection etc
- No security access works allowance
- Demolition Cost
- QS to review all services allowances and use their recent projects to benchmark before using the above figures.
- Inflation rates not accounted for. QS to review and include uplift margins as required.
- All builder's work in conjunction
- External excavation and trenching for engineering services and reinstatement
- Removal & disposal of hazardous materials in accordance with OH&S guide lines
- FFE
- GST
- Structural engineering
- Civil engineering
- ESD initiatives
- Green Star initiatives
- Contingencies
- Professional fees
- Comms active equipment
- Landscape external lighting

6 Further Investigations & Risks

The following are key risks and further investigations required:

1. Power authority
    a. Further liaising with the local power authority to understand the requirements and availability of additional electrical capacity to meet project's new demand requirement.
    b. Risk commentary: Even with the proposed addition of a new full electric dive pool facility alone, the increase in electrical demand is high, early liaison with the authority is required in the next phase to secure addition power.
        i. This risk is considered as – Medium-High
2. New Substation
    a. Site spatial availability for new substation.
    b. Risk commentary: A new substation requires at least ~55m^2 or clear area and with no services to a depth of 15m. Given that the area in the vicinity of the existing substation is relatively clear, these requirements can be met with further surveying.
        i. This risk is considered as – low
3. Power authority
    a. A total provisional sum of $440k has been allowed for power authority Customer contribution costs. This may increase/decrease pending the power authority's assessment of the works required to their infrastructure to meet new Dive Pool's electrical demand.
    b. Risk commentary: The provisional sum above is based on our experience with new authority substations. Depending on how much additional infrastructure the power authority need to provide to the area to accommodate the new dive pool loads, the amount will vary. Given that there have been issues with power outages to the building with the current load, more infrastructure upgrade works could be required.
        i. This risk is considered as – Medium-High
4. Maximum Demand
    a. Current maximum demands are for mechanical and electrical works only, electrical demands for hydraulics and fire protection not available and may increase the substation size.
    b. Risk commentary: The highest hydraulic systems associated electrical demand is due to heat pumps to generate domestic hot water for showers and hand basin usages. This load, other hydraulic pump systems and fire services demands will have a small impact on the overall project electrical demand that will need to be estimated. For now we have included a best-guess estimate as part of the substation size.
        i. This risk is considered as - low
5. Site Spatial Availability
    a. Hydraulic DHW plant spatial requirement from hydraulic consultant not available at this stage
    b. Risk commentary: Given that there is a proposed mechanical plant on ground level towards the west, this plant can be further extended to accommodate for hydraulic heat pumps
        i. This risk is considered as - low
6. Mechanical Noise
    a. Mechanical heat pumps and air handling unit plant will operate 24/7 and they are relatively noisy. Acoustic consultant's assessments are required to understand impact to neighbouring area and attenuation requirements.
    b. Risk commentary: Based on initial site review, the heat pumps are relatively far from the closest residential dwelling.
        i. This risk is considered as – low.
7. Services Costs
    a. Costs for hydraulic works not available
    b. Costs for fire protection works not available
    c. Risk commentary: Quantity Surveyor to allow for associated costs
        i. This risk is considered as – Medium.

Appendix A Explanatory Information

Exclusive Use

This report has been prepared by Introba Consulting PTY ("Introba"), at the request of ACT Government ("the Client") exclusively for the benefit and reliance of the Client.

This report is an engineering report prepared in accordance with the Client's directions, having due regard to the assumptions that Introba may be reasonably expected to make in accordance with sound engineering practice and exercising the obligations and the level of skill, care and attention required of it under the terms of the engagement.

The following section contains important information about this report. This report, in whole or in part, may only be reproduced, or distributed with the prior written permission of Introba or the Client, and this permission must accompany every copy of this report.

Introba's engagement by the Client is on the basis that Introba's liability, whether under the law of contract, tort, statue, equity or otherwise, is limited as set out in the terms of the engagement.

Third Party Reliance

This report is prepared exclusively in accordance with instructions given by or on behalf of our Client. Introba therefore excludes any responsibility for the use of, or reliance on, the report by any third party and the use of, or reliance on, the report by any third party is at the risk of that party. Any third party wishing to act upon any material contained in this report should first contact Introba for detailed advice which will take into account that party's particular requirements.

It is not possible to make a proper assessment of this report without a clear understanding of the terms of engagement under which the report has been prepared, including the scope and directions given to, and the assumptions made by, Introba in the preparation of this report.

Scope

The particular scope of Introba's brief in this matter, including the scope of investigation requested by the Client, means that the report necessarily concentrates on readily apparent major items.

The review/investigation of the existing engineering services installation involved:

- Visual inspection of the installed plant, distribution system(s), and other building services.
- Perusal of existing design drawing(s).
- Perusal of existing technical specifications.
- Perusal of shop drawing(s).
- Review of Operating and Maintenance Manual(s).
- Review of previous report(s).
- Discussion with project team

The investigation did not include:

- An exhaustive examination of all aspects of the existing installation.
- Analyses of original design calculations, specifications and as-installed records for the existing installation.
- Possible latent defects contained in inaccessible sections of the existing installation.
- Verification of plant and system capabilities and operation for the existing installation.
- Measurements of air and water flow rates and temperatures, electrical loadings, switchboard temperatures etc.

As noted above our review/investigation encompassed a perusal of existing documentation and we have relied on the information obtained from the listed documents.

This report is provided strictly on the basis that the information that has been provided can be relied on is accurate, complete and adequate. However, we accept no liability for the accuracy or otherwise of this information, except where Introba expressly indicates in the report that it has verified the information to its satisfaction.

Nothing in this report shall be read or applied so as to purport to exclude, restrict or modify, or have the effect of excluding, restricting or modifying the application of all or any of the provisions of the Trade Practices Act 1974 or any other legislation which by law cannot be excluded, restricted or modified.

Hazardous Materials

Introba expressly excludes investigation or advice in relation to the actual or potential presence of pollution, contamination or asbestos, or the actual or potential risk of any incident affecting the safety of operation. Introba recommends that the services of a registered occupational hygienist be commissioned to carry out investigations and prepare the necessary report in respect of the presence of asbestos or other hazardous building materials.

Limits on Cost Estimates

Introba has no control over the cost of labour, materials, equipment or services furnished by others, contractors' methods of determining prices, or competitive bidding or market conditions. Any cost estimates provided in this report represent our best judgement as an experienced and qualified professional consultant, familiar with the relevant industry. Introba cannot guarantee that proposals, bids or actual construction costs will not vary from the cost estimates provided.

Commercial Feasibility

Nothing in this engineering report should be construed as an opinion concerning the commercial feasibility of the property or asset.

Compliance with Current Building Codes, Regulations and Standards

Building Codes, Regulations and Standards (Regulations), particularly with respect to fire safety systems, may have changed since the original construction. Buildings constructed in accordance with the Regulations in force at the time, may not now comply with current Regulations.

The report may identify areas of non-compliance with current Regulations but it does not purport to provide a comprehensive analysis of compliance with current Regulations. Accordingly Introba recommends that the Client should seek specialist regulatory/building code advice to confirm any non-conformances.

Accuracy

If the reader should become aware of any inaccuracy in or change to any of the facts, findings or assumptions made in this report, the reader is requested to inform Introba so that we may assess its significance and review the report's comments and recommendations.

Exclusions

The following specialist consultancies are outside the scope of this report, and it is therefore recommended that specific advice be sought.

- Fire Protection Engineering
- Fire Safety Engineering
- Hydraulic Engineering
- Audio Visual Consultancy
- Structural Engineering
- Civil Engineering
- Acoustic Consultancy
- DDA Advice

- OH & S Measures
- Safety in Design Consultancy
- Building Regulations Advice
- Traffic Consultancy
- Architectural Advice
- Hazardous Materials & Dangerous Goods Advice

Appendix B New Dive Pool Mechanical & Electrical Concept Sketches

The following sketches provide conceptual layouts for mechanical and electrical services design. QS is to also review and allow for all associated builders works in conjunction.

STROMLO LEISURE CENTRE

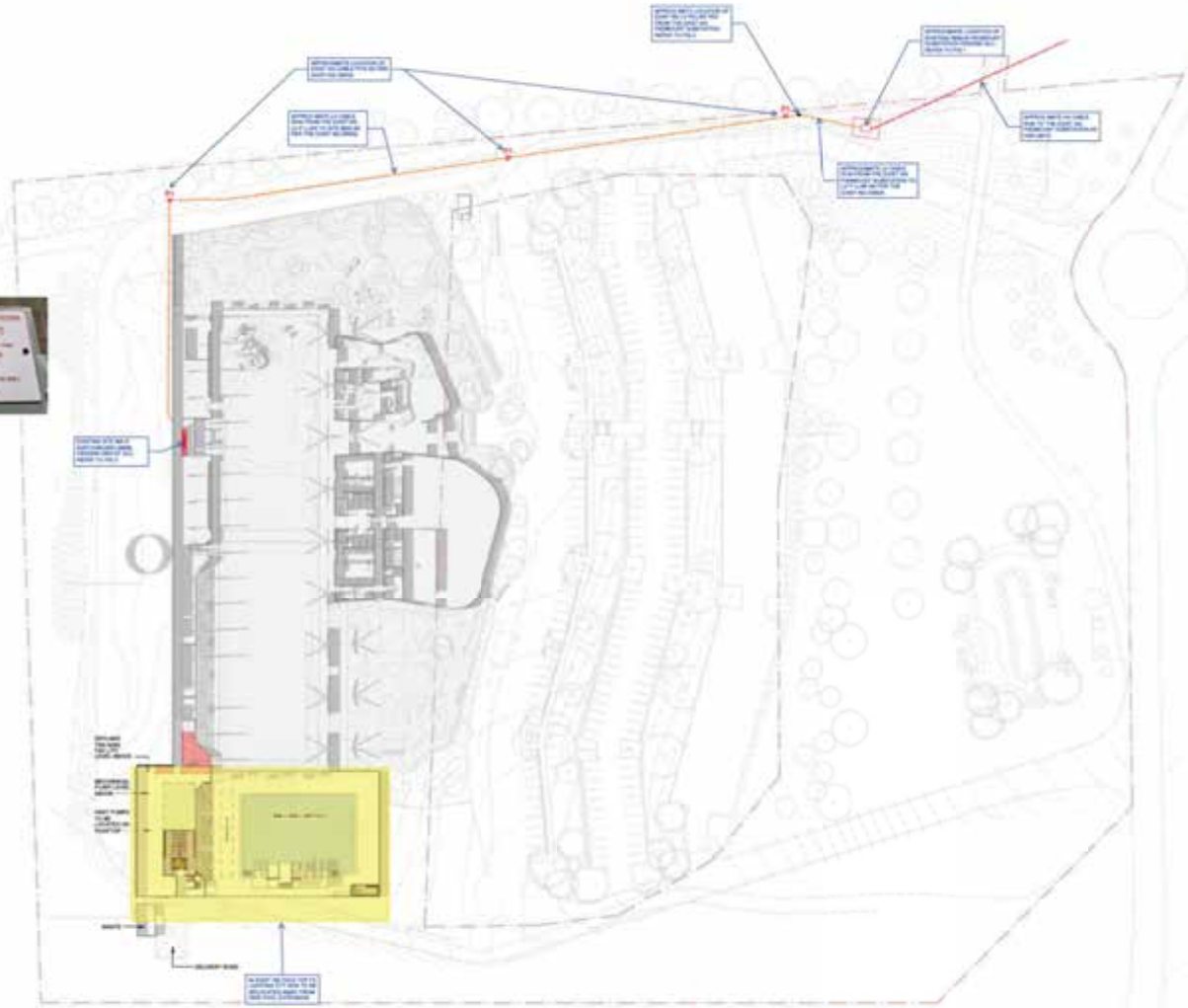
DIVE POOL FEASIBILITY

ELECTRICAL SERVICES

FIG 1. EXISTING 3000A FAGWATH SUBSTATION

FIG 2. EXISTING LV PILLAR

FIG 3. EXISTING MDP, MSB



10499-SKE-CD01
EXISTING SITE PLAN

Introba Design: AK
Date: 16.08.24
P1

CO.OP

STROMLO LEISURE CENTRE

100370

SITE PLAN - OPTION 1

1

PRELIMINARY

SK-13

STROMLO LEISURE CENTRE

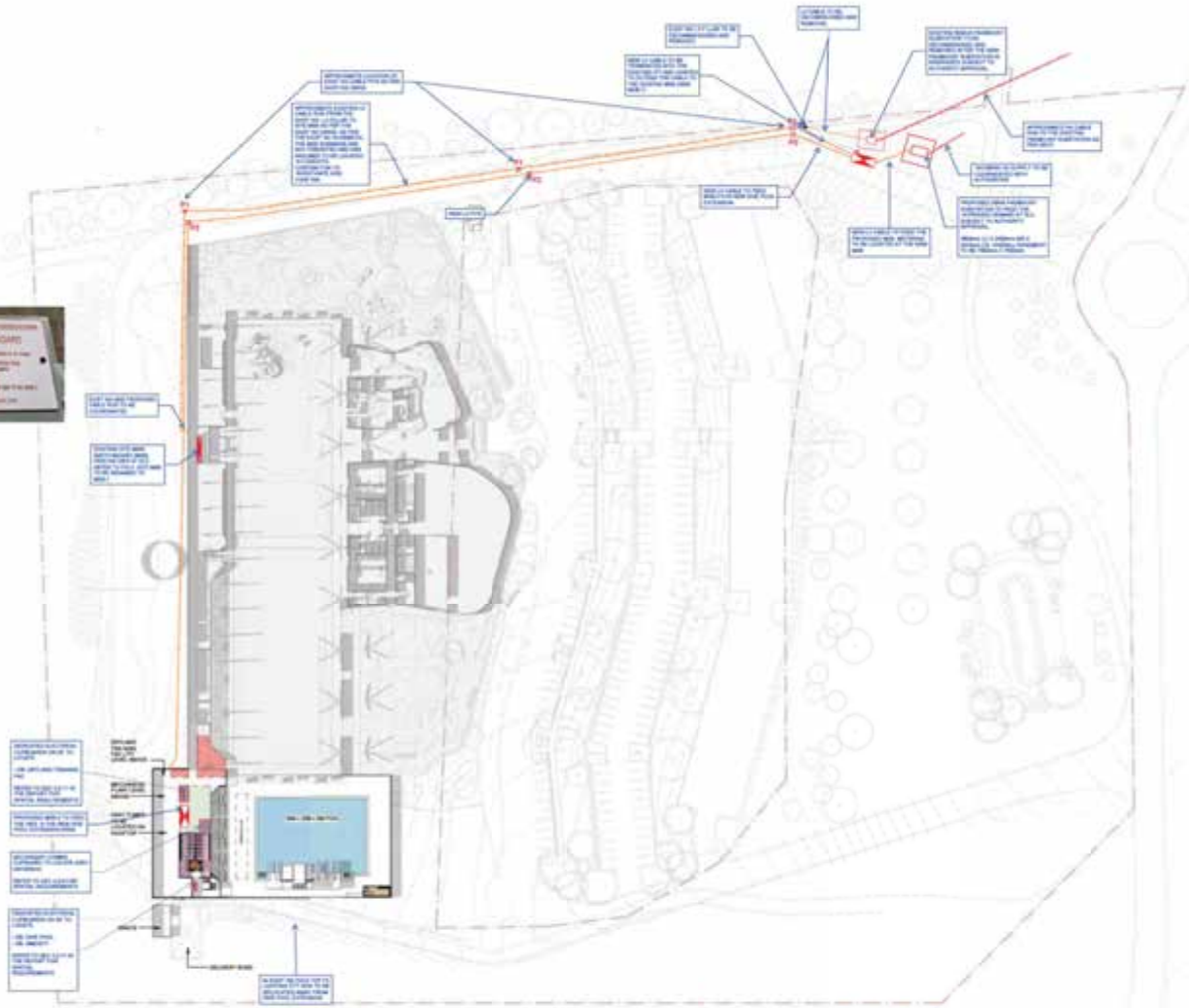
DIVE POOL FEASIBILITY

ELECTRICAL SERVICES

FIG 1. EXISTING 3000A PADMOUNTED SUBSTATION

FIG 2. EXISTING LV PILLAR

FIG 3. EXISTING MDP, MDB FEEDING EXISTING DP'S & AC PLT.



10499-SKE-CD01
PROPSED SITE PLAN

Introba Design: AK Date: 16.08.24 P1

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STROMLO LEISURE CENTRE

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SITE PLAN - OPTION 1

1

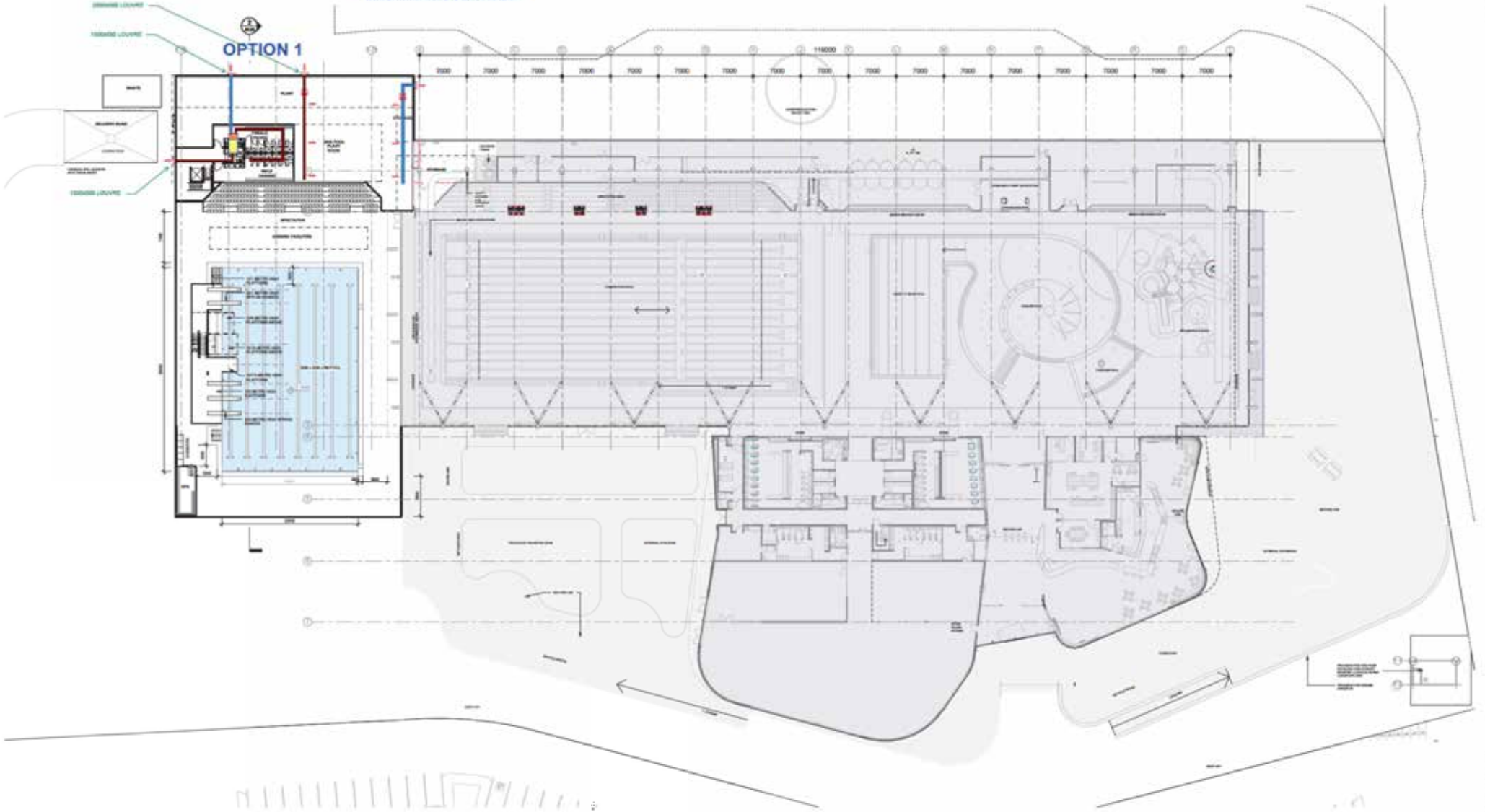
PRELIMINARY

SK-13

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES



10499-SKM-CD01
PROPOSED LAYOUT

Introba Design: TTD
Date: 19.06.24
P1

CO.OP

STROMLO LEISURE CENTRE

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OPTION 1

1

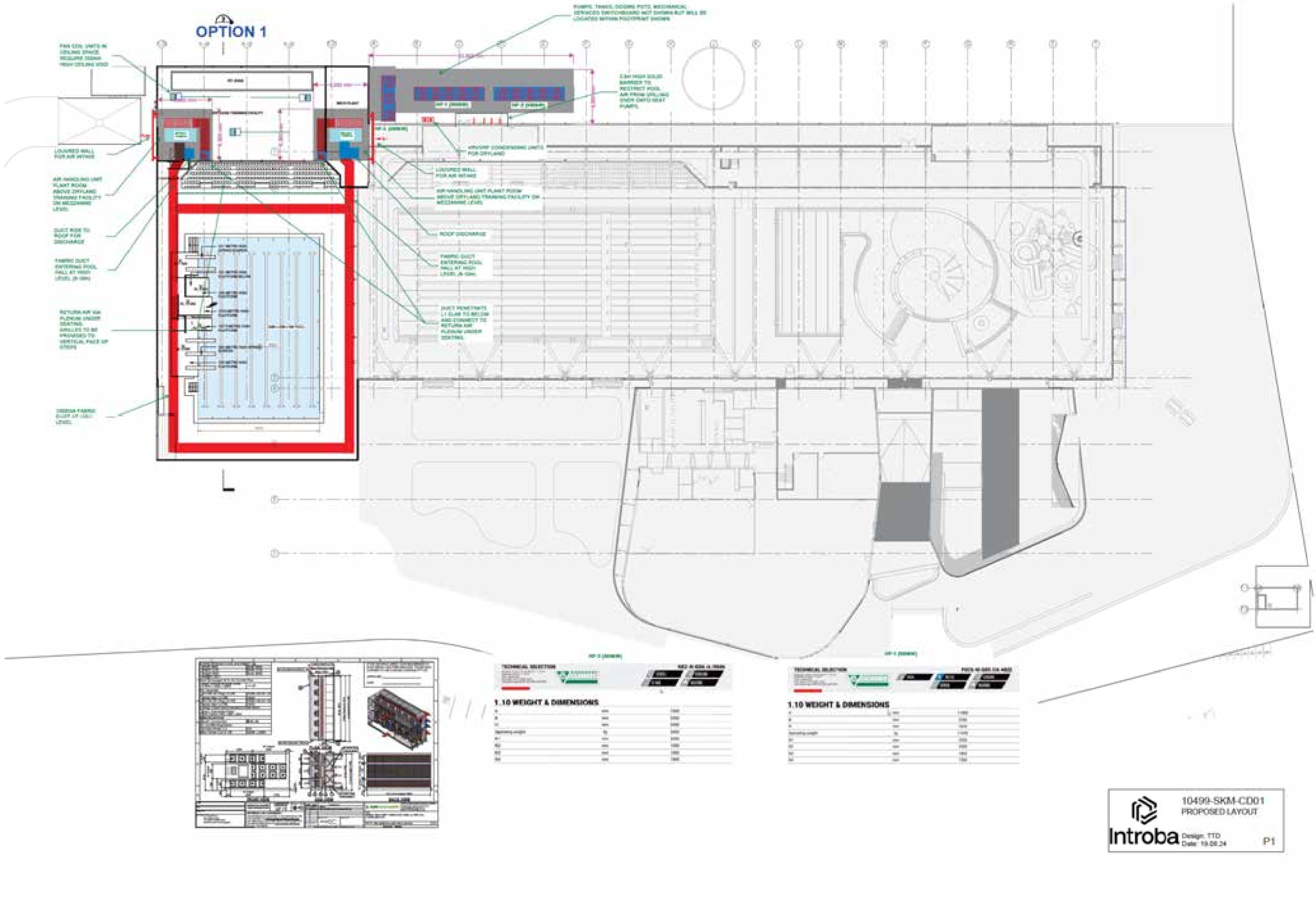
PRELIMINARY

SK-01

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES



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STROMLO LEISURE CENTRE

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OPTION 1 - LEVEL 1

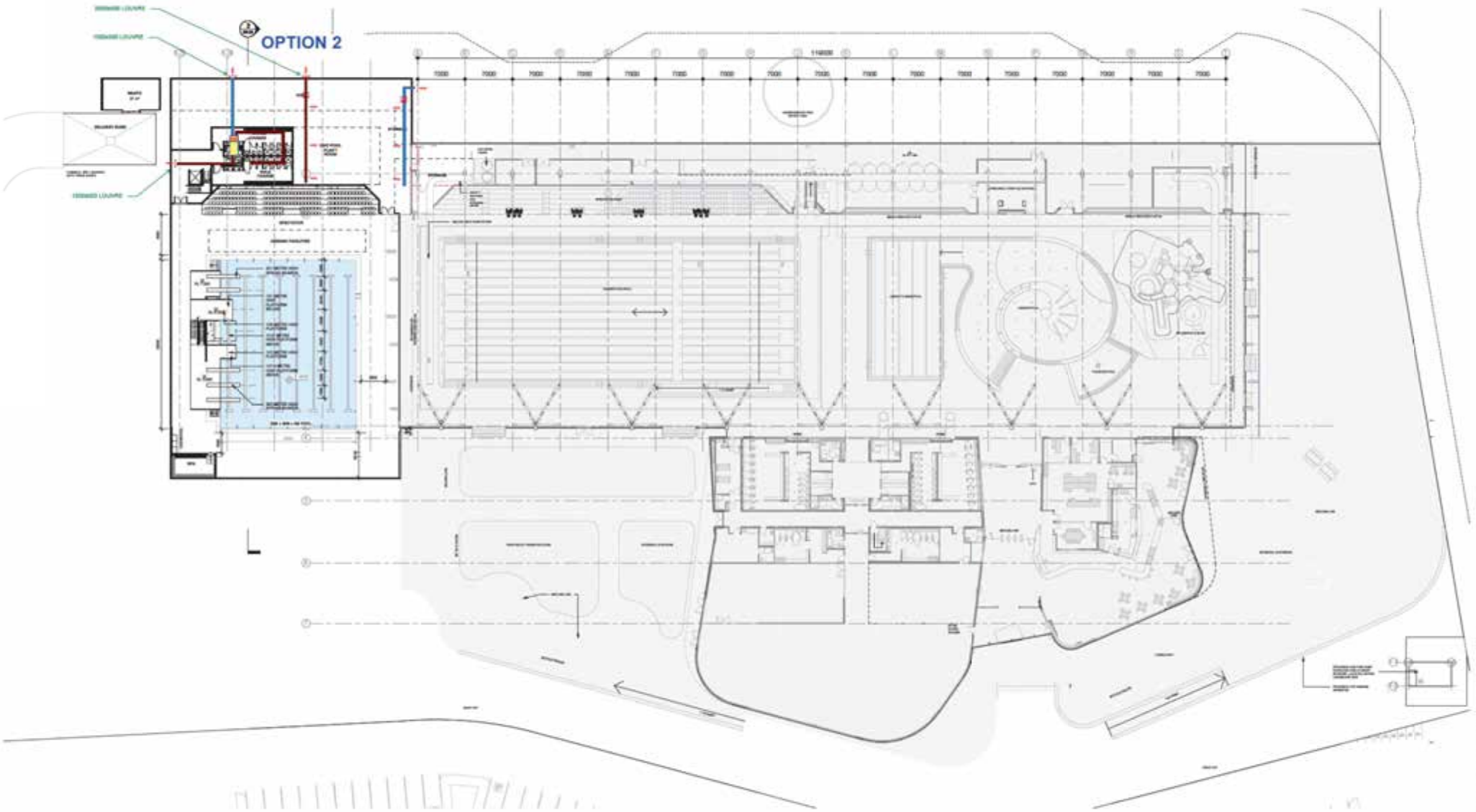
PRELIMINARY

SK-02

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES



General Arrangement - Ground OPTION 2
SCALE 1:100

Introba
10499-SKM-CD01
PROPOSED LAYOUT
Design: TTD
Date: 19.08.24
P1

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STROMLO LEISURE CENTRE

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OPTION 2

PRELIMINARY

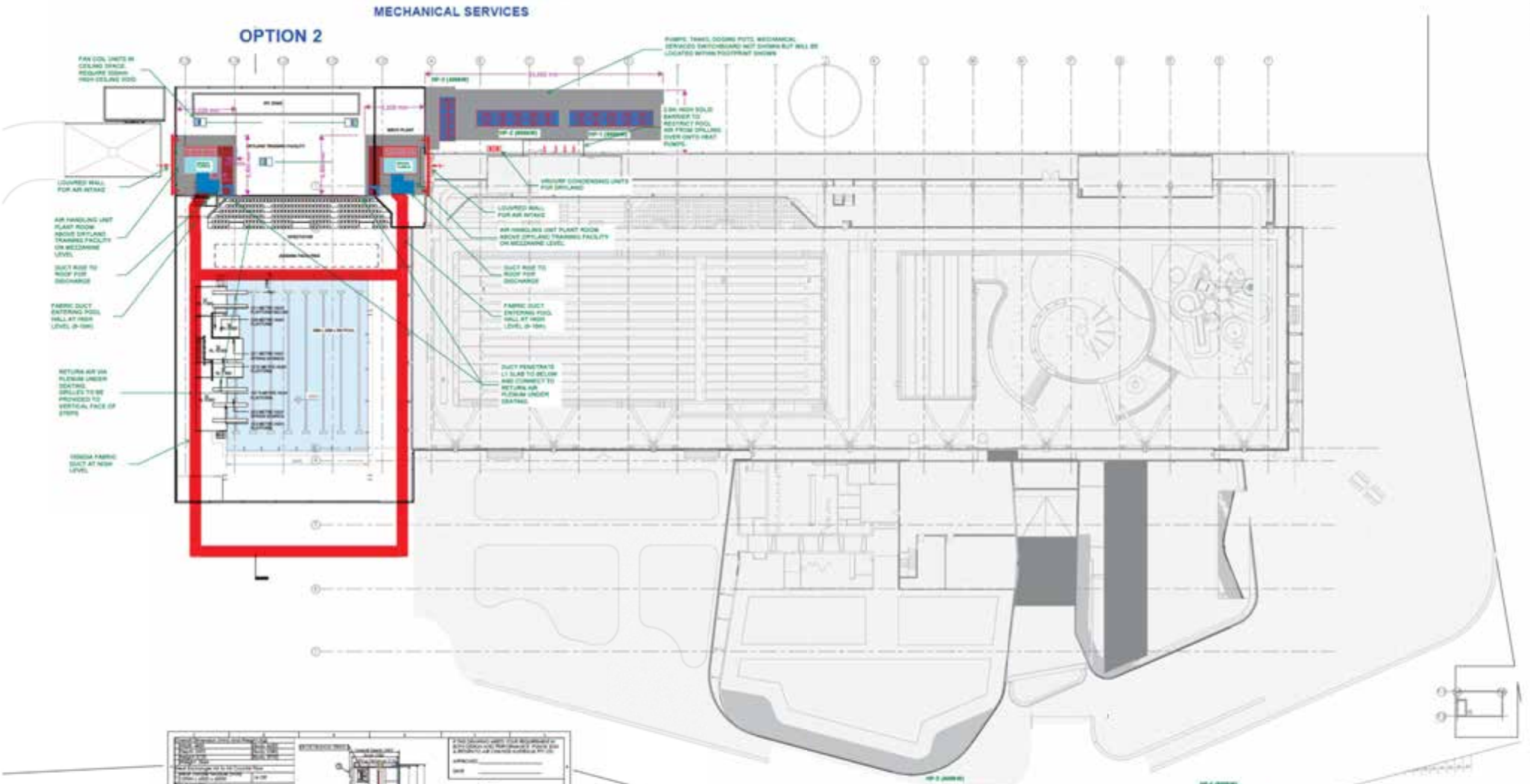
SK-03

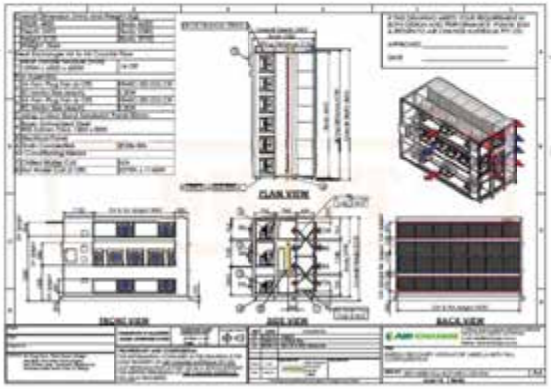
STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES

OPTION 2





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10499-SKM-CD01
PROPOSED LAYOUT
Design: TTD
Date: 19.08.24
P1

CO.OP

STROMLO LEISURE CENTRE

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OPTION 2 - LEVEL 1

1

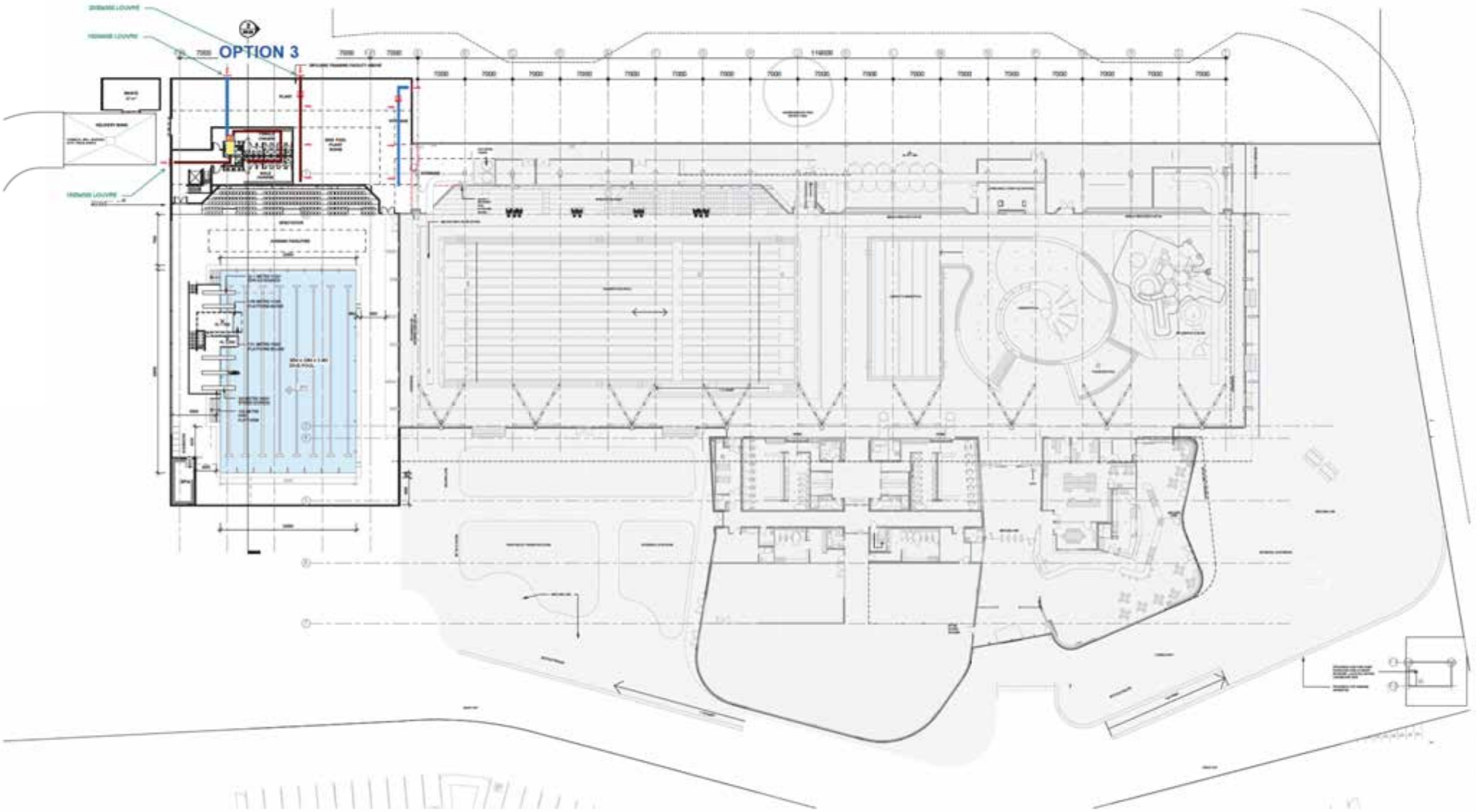
PRELIMINARY

SK-04

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES



General Arrangement - Ground OPTION 3

10499-SKM-CD01
PROPOSED LAYOUT

Introba Design: TTD Date: 19.06.24 P1

CO.OP

STROMLO LEISURE CENTRE

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OPTION 3

PRELIMINARY

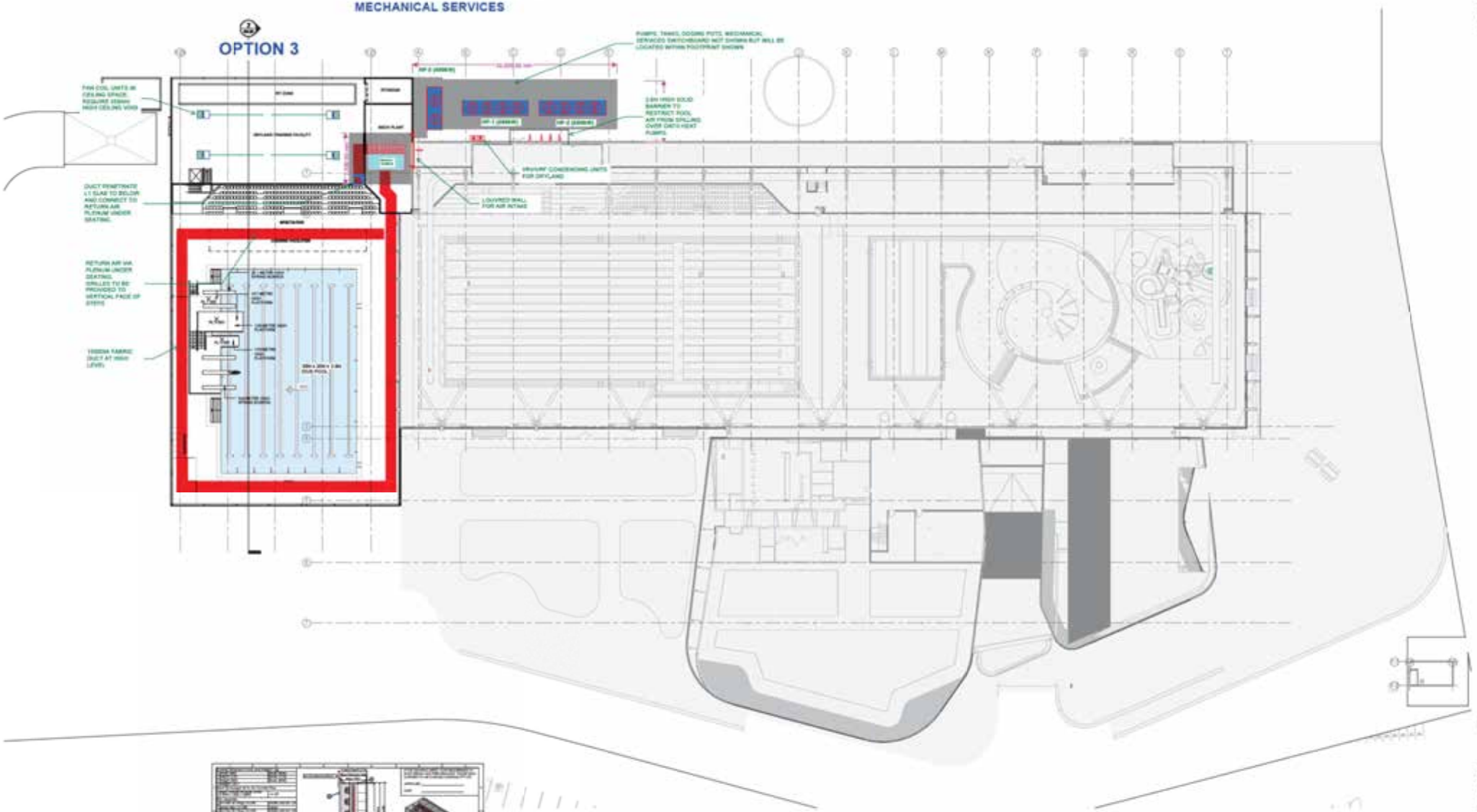
SK-05

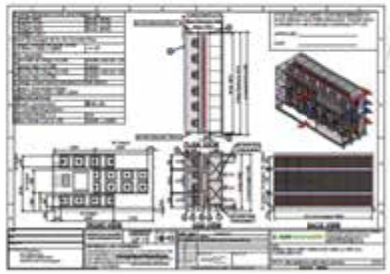
STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES

OPTION 3





10499-SKM-CD01
PROPOSED LAYOUT

Introba Design: TTD
Date: 19.08.24
P1

CO.OP

STROMLO LEISURE CENTRE

100370

OPTION 3 - LEVEL 1

PRELIMINARY

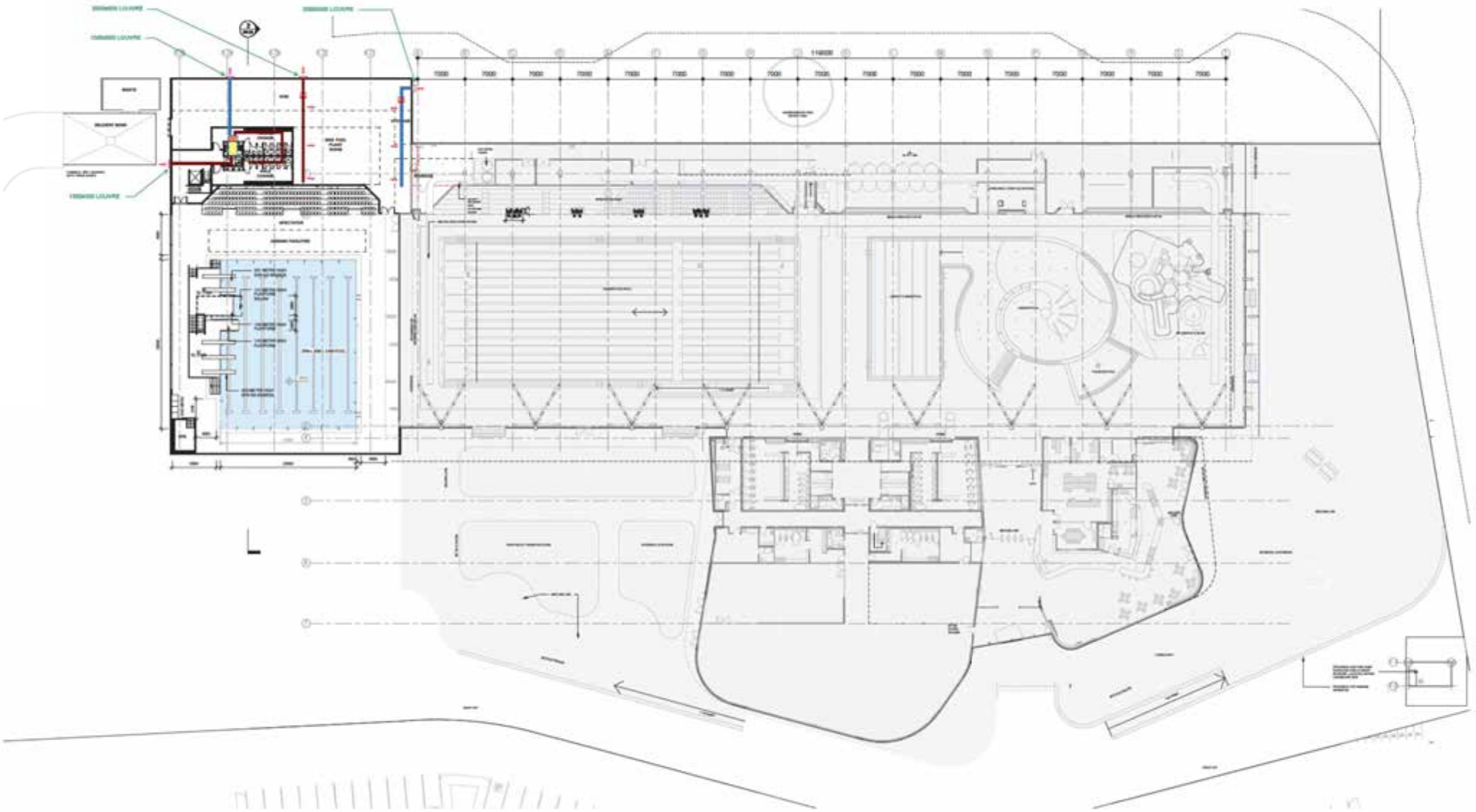
SK-06

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES

OPTION 4



1 General Arrangement - Ground OPTION 4
SCALE 1:100

Introba
10499-SKM-CD01
PROPOSED LAYOUT
Design: TTD
Date: 19.06.24
P1

CO.OP

STROMLO LEISURE CENTRE

100370

OPTION 4

1

PRELIMINARY

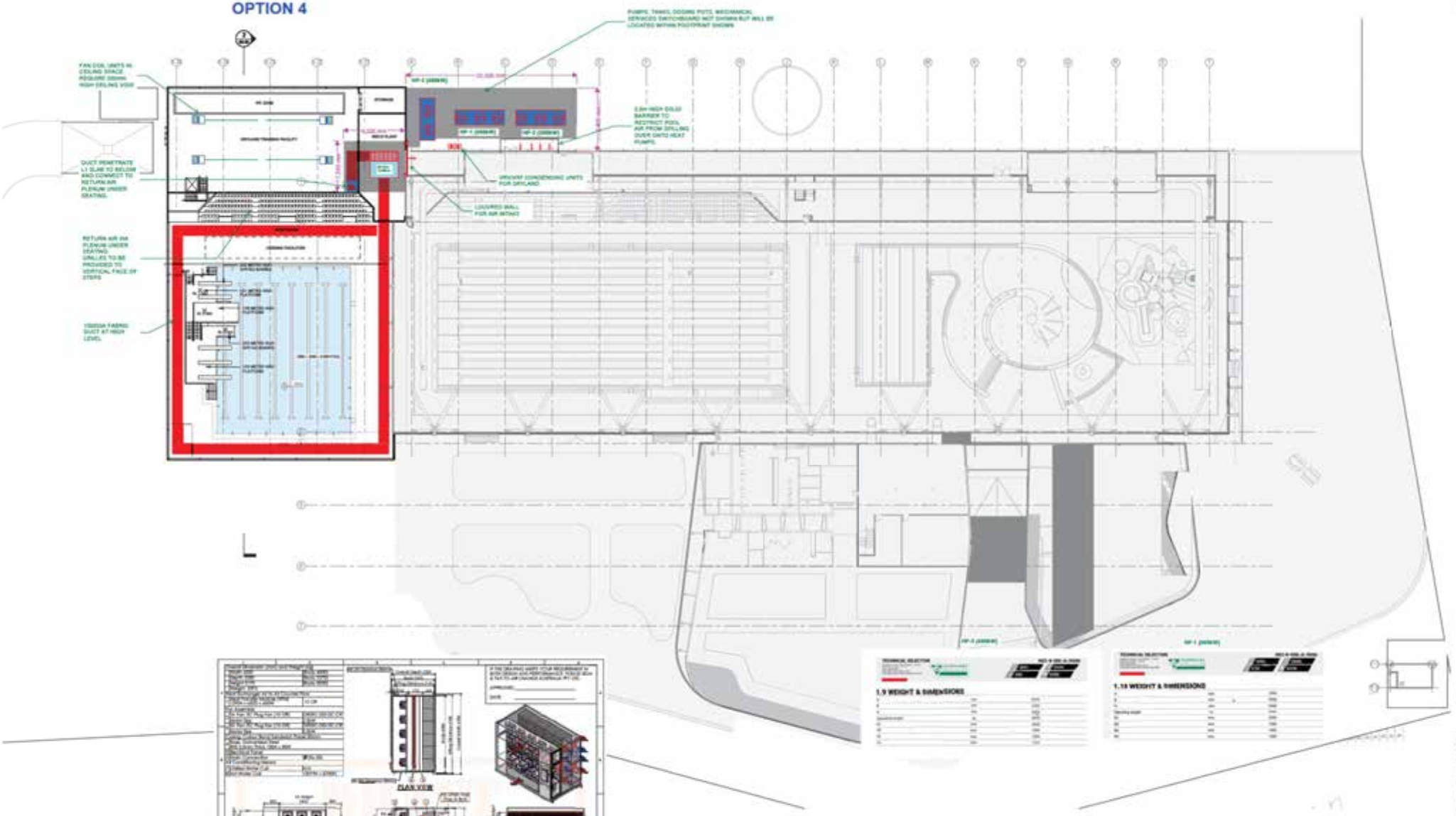
SK-07

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES

OPTION 4



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10499-SKM-CD01
PROPOSED LAYOUT
Design: TTD
Date: 19.08.24
P1

CO.OP

STROMLO LEISURE CENTRE

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OPTION 4 - LEVEL 1

1

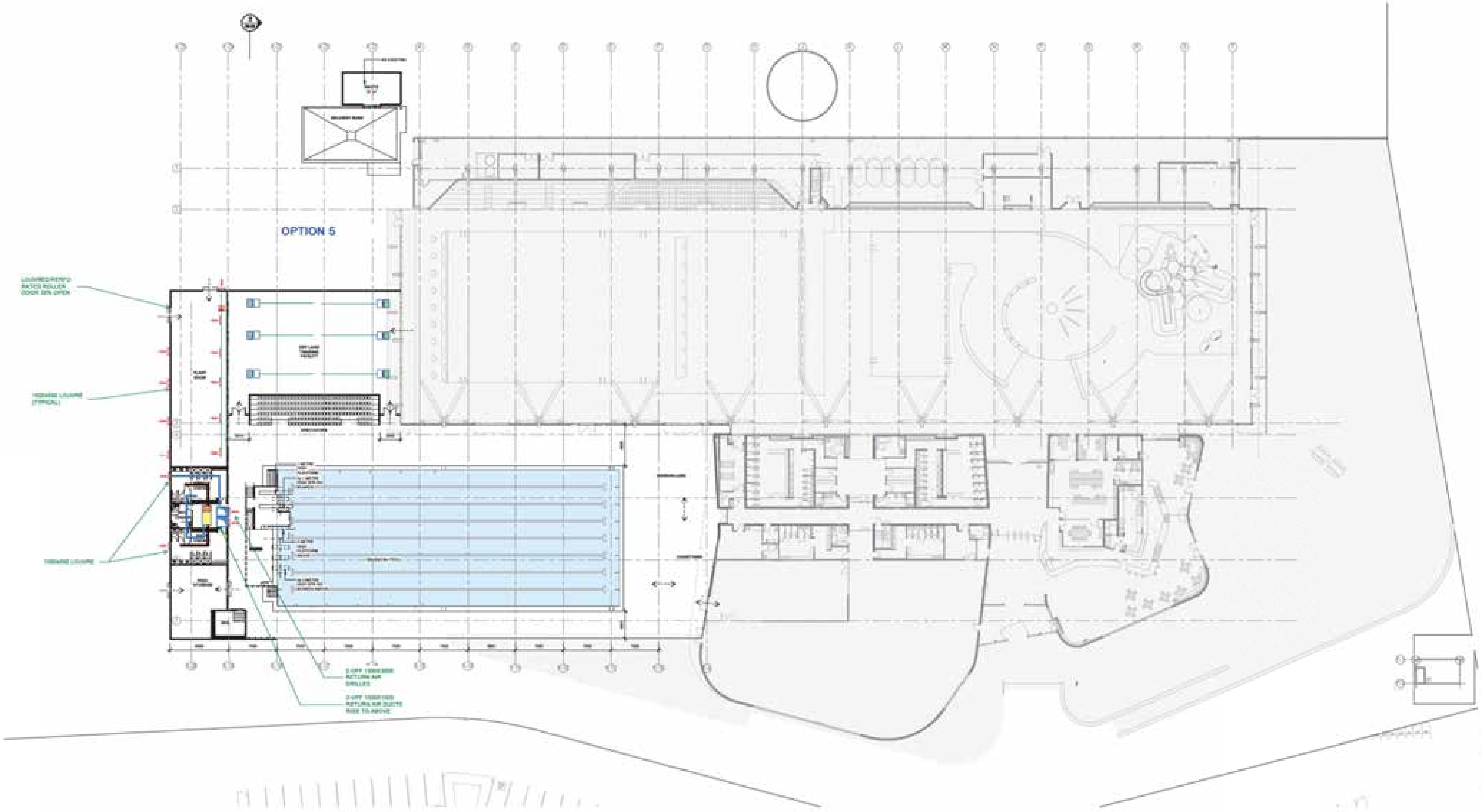
PRELIMINARY

SK-08

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES



CO.OP

STROMLO LEISURE CENTRE

100370

OPTION 5 - GROUND

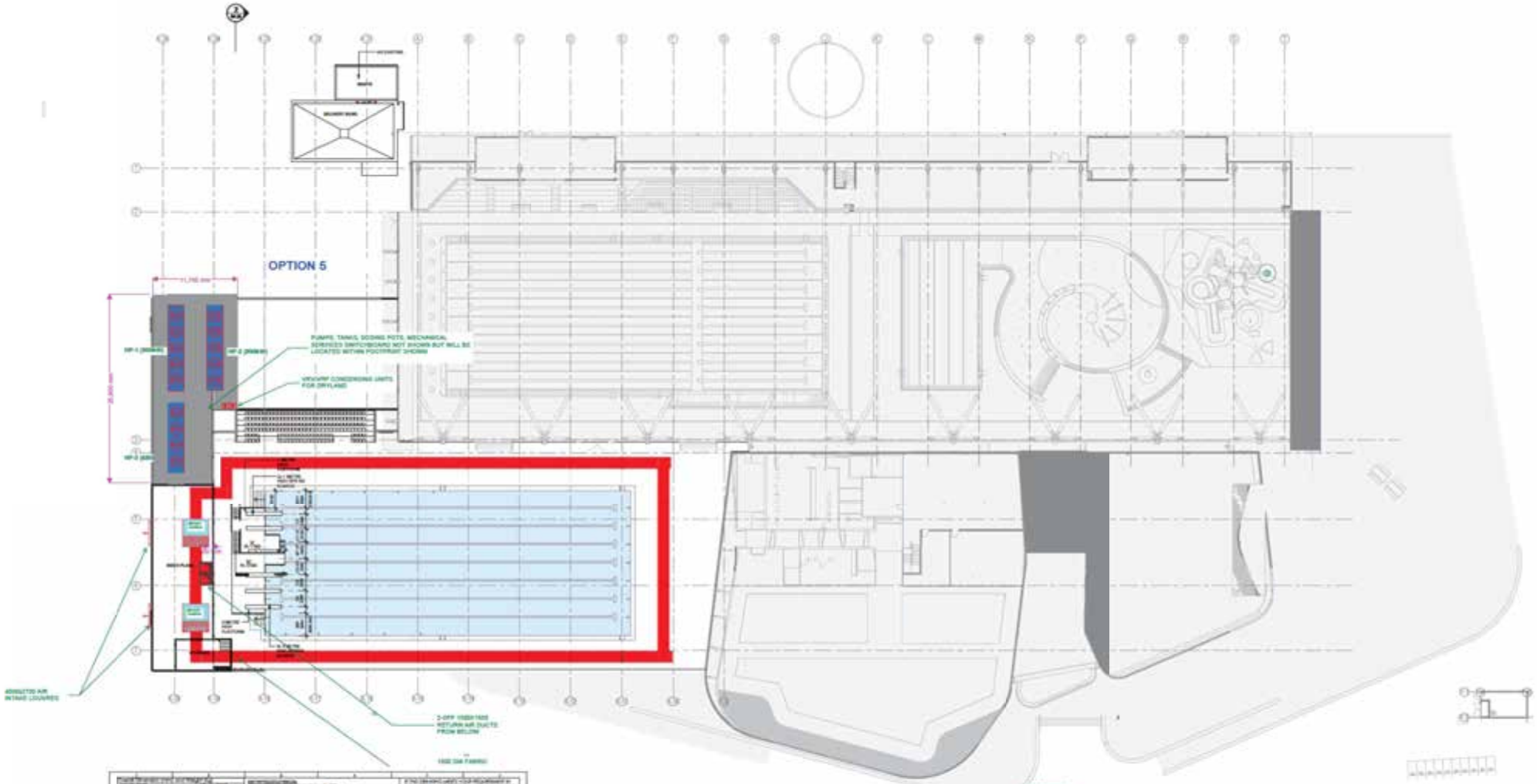
PRELIMINARY

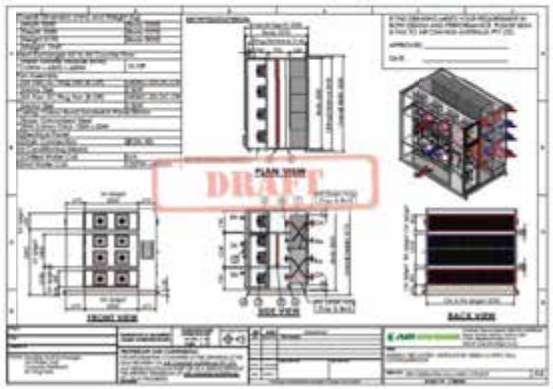
SK-09

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES





10499-SKM-CD01
PROPOSED LAYOUT

Introba Design: TTD Date: 19.08.24 P1

CO.OP

STROMLO LEISURE CENTRE

100370

OPTION 5 - LEVEL 1

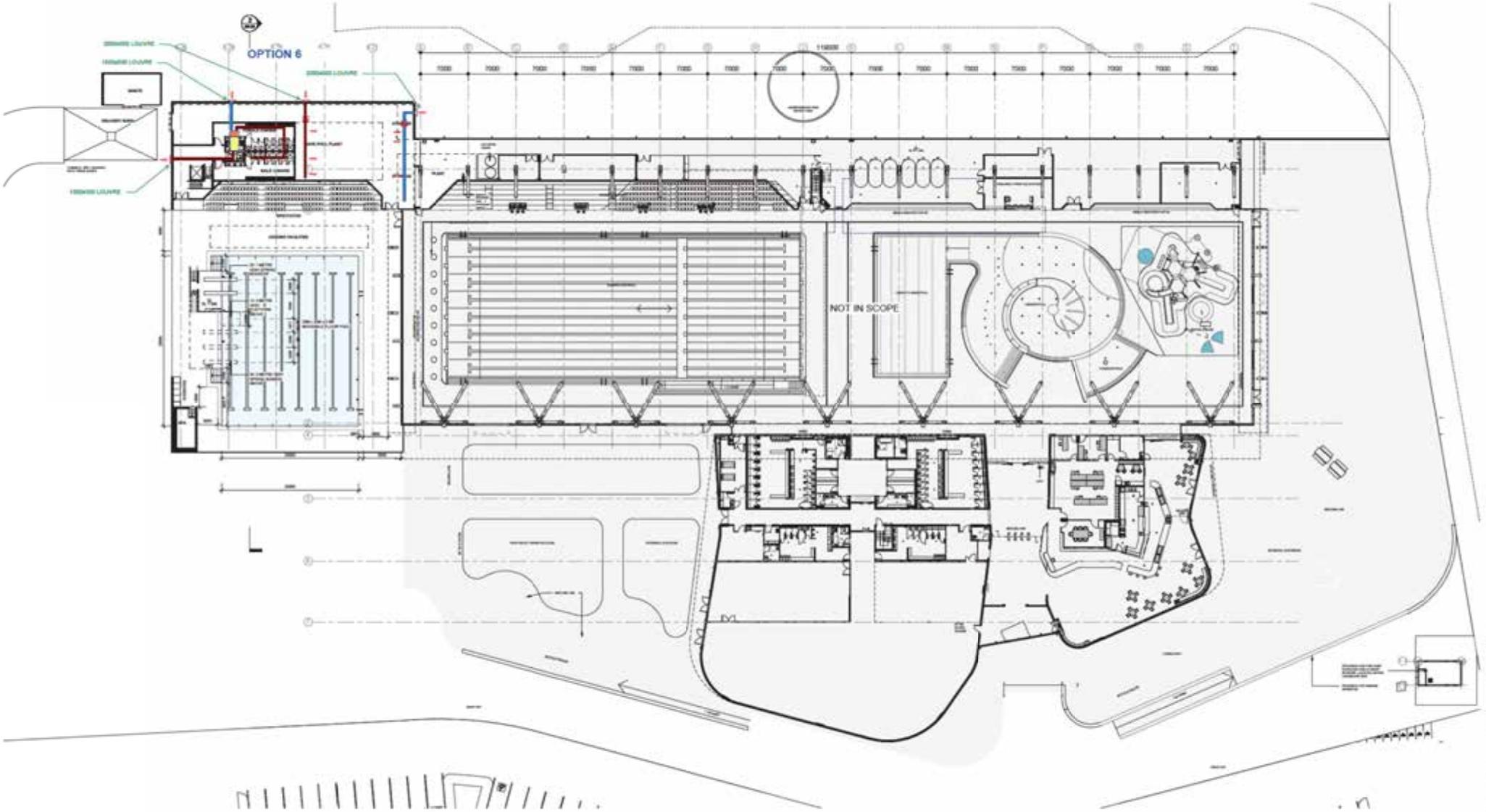
PRELIMINARY

SK-10

STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES



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STROMLO LEISURE CENTRE

100370

OPTION 6

1

PRELIMINARY

SK-11

10499-SKM-CD01
PROPOSED LAYOUT

Introba Design: TTD
Date: 19.08.24

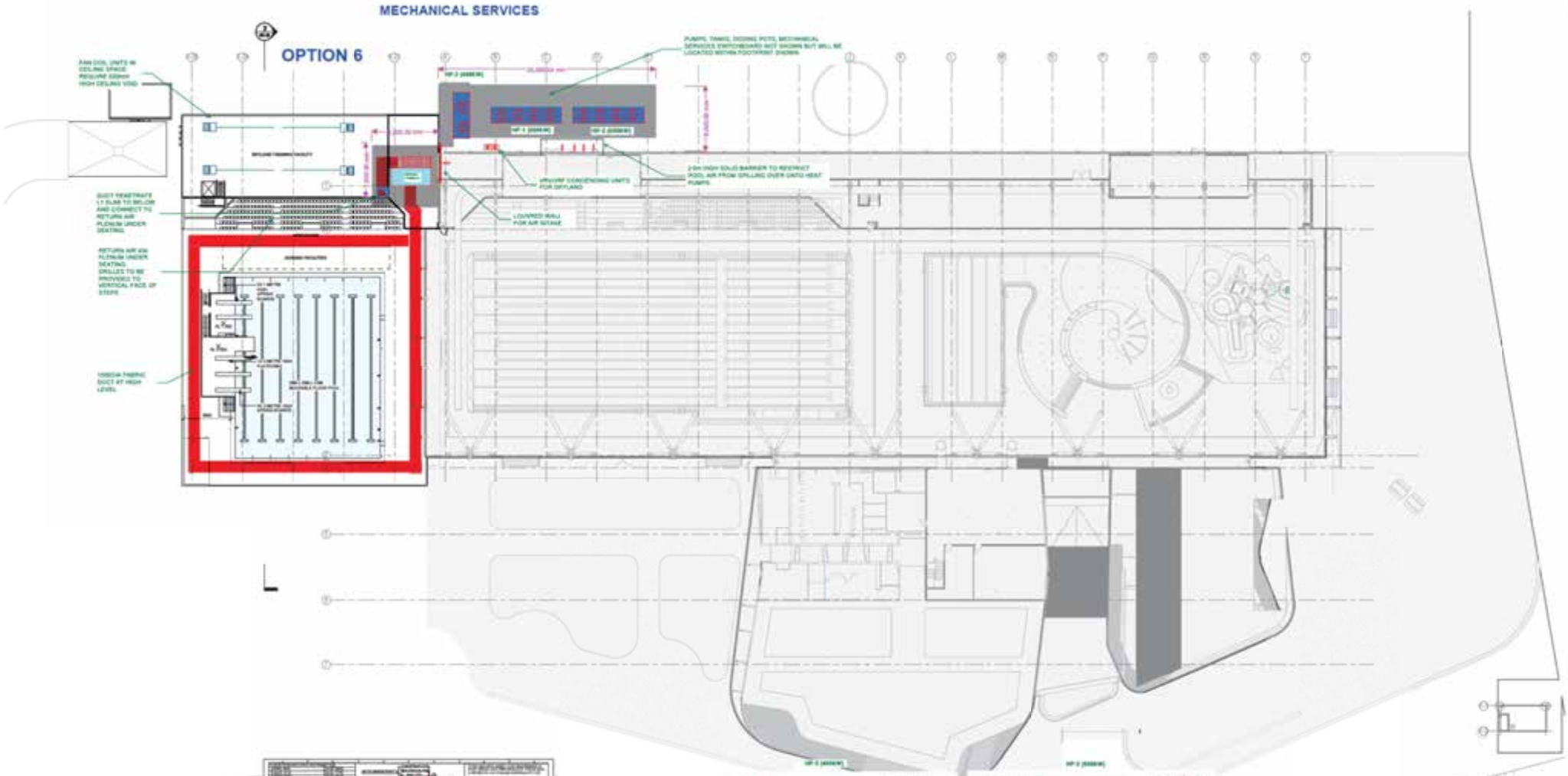
P1

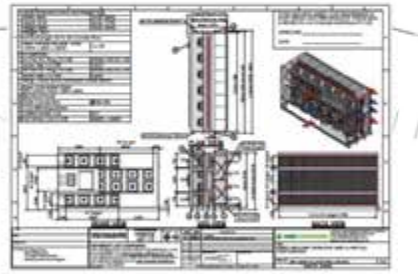
STROMLO LEISURE CENTRE

DIVE POOL FEASIBILITY

MECHANICAL SERVICES

OPTION 6





Introba

10499-SKM-C001
PROPOSED LAYOUT

Design: TTD
Date: 19.06.24

P1

CO.OP

STROMLO LEISURE CENTRE

100370

OPTION 6 - LEVEL 1

1

PRELIMINARY

SK-12

Appendix C Power Authority Preliminary Liaison

Schedule 2.2(a)(ii)

From: Schedule 2.2(a)(ii)
Sent: Tuesday, 20 August 2024 3:55 PM
To: network.connectionadvice@evoenergy.com.au
Cc: Schedule 2.2(a)(ii)
Subject: FW: Stromlo Leisure Center - Substation upgrade and power reliability
Attachments: 2024-07-16 - 0010499 - Max Demand.pdf; Pages from 240712_SLC_options combined.pdf

Importance: High

Hello,

Following up on the email below. Can you please advise?

Thanks,

Schedule 2.2(a)(ii)

Senior Engineer, Electrical

Introba

Wurundjeri Country | Melbourne, VIC, Australia | Australia/Melbourne

T +61 392 490 259

Introba.com | LinkedIn

Designing Living Systems. Transforming Built Environments. Read more about us here.

From: Schedule 2.2(a)(ii)
Sent: Wednesday, August 14, 2024 4:28 PM
To: network.connectionadvice@evoenergy.com.au
Schedule 2.2(a)(ii)
Subject: FW: Stromlo Leisure Center - Substation upgrade and power reliability
Importance: High

Hello,

I'm writing to receive preliminary substation upgrade advice on Stromlo Leisure Centre. The center is fed from an existing Evoenergy 500kVA substation which feeds and LV pillar feeding the existing site Main switchboard.

There is a new indoor Dive pool extension proposed at Stromlo center and the center wants to convert the facility to an all electric heating system. Due to the increased loads, a increase of 1500kVA substation is proposed to feed the facility assuming the existing 500kVA substation is dedicated to the leisure center.

Please see the attached max demand and site plan.

out of scope

Thanks,

Stromlo Dive pool
AS3000 Maximum Demand Calculation
Date 16.07.2024
Option 1

Note the below loads do not include existing max demand for the site

	Space Name	Space Type	Area	Lighting VA/m2	Lighting Total	Power VA/m2	Power Total	HVAC kW/m2	HVAC Total	Subtotal kVA	Floor Subtotal	Total VA/m2 Check
Aquatic Facilities												
2219												
	Dive Pool	Pool Hall	1470	8	11760	3	4410	150	220500	237		161
	Spectator	Pool Hall	112	8	896	3	336	150	16800	18		161
	Male change	Amenities	40	5	200	40	1600	20	800	3		65
	Female change	Amenities	40	5	200	40	1600	20	800	3		65
	ACC WC	Amenities	8	5	40	40	320	20	160	1		65
	Dryland Training Facility	Gym	140	10	1400	100	14000	590	83000	140		960
Building services	Dive pool plant room	Plant	107	7	749	5	535	15	1605	3		37
264	Storage	Circulation/Store	11	5	55	5	55	20	220	0		30
	Storage	Circulation/Store	63	5	315	5	315	20	1260	2		30
	Waste Management	Circulation/Store	37	5	185	5	185	20	740	1		30
	Foyer	Circulation/Store	46	5	230	5	230	20	920	1		30
			Area		Light		Power		Mech	Total		
Total Estimated			2474 m2		20. kVA		63.6 kVA			82.6 kVA		
					28.9 A		91.8 A			120.7 A		
Estimated Diversity Factor				Diversification Factor	0.7		0.7					
				Diversified Figure	14. kVA		44.5 kVA			58.5 kVA		
					20.2 A		64.2 A			84.5 A		

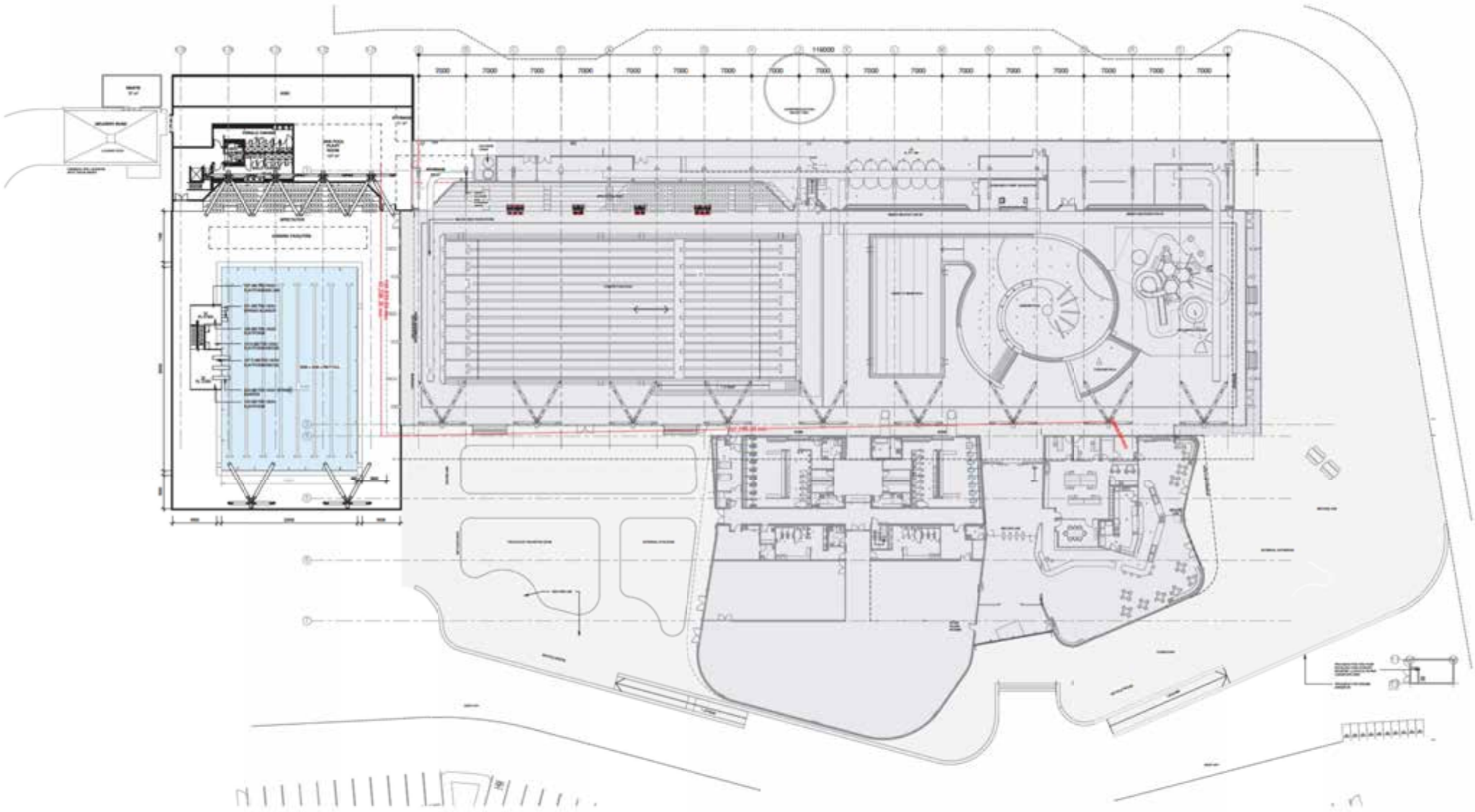
Other Loads			Qty	Load Each kW	AS3000 Load	Amps	
Hydraulic			1	96.88	72.7 kVA	104.8787529	AS3000 DF
Pool Plant			1	262.96	263. kVA	379.5612009	Saratoga
Mitsbi					1506.23454	2717.657569	AS3000 DF
Total					**1841.9 kVA**	3202.097109	

Total Load including other loads	**1925.5 kVA**
Total Diversified Load including other loads	**1900.4 kVA**
	3202.1 A

2000 TX Size
5% Spare Available

1500 TX Size
27% Spare Available

Not considering existing Tx



CO.OP

STROMLO LEISURE CENTRE

917102

OPTION 1

1

PRELIMINARY

SK-01

10.0 APPENDICES

APPENDIX F - AQUATIC ENGINEERING

ACT Territory Pools

Final Feasibility Design Basis Report

Reference: A2023-13467

Revision 2

Date: 23.08.2024

Contents

Appendix A

Aquatic Design Feasibility Sketches

1. Introduction

1.1 Project Background

Project Overview: -

MLEI Consulting Engineers have been appointed by CK Architecture on behalf of ACT Property to undertake feasibility assessments for ACT Territory Pools and the options presented for a pool extension to Stromlo Leisure centre adjacent to the existing pool hall. The feasibility options respond to the stakeholder workshops 1 and 2 held on 12th June 2024 and 3rd July 2024, respectively. The project needs to address the decommissioning of dive pool facility at Canberra Olympic Pool, with replacement infrastructure to enhance appeal to both recreational and professional swimmers/divers.

Photo 1: Stromlo Leisure Centre

1.2 Intent of the DBR

This document will be used as a reference to ensure the consistency with the design inputs. It has been prepared to define the criteria used for the concept aquatic design and various approaches, construction methodology and aquatic hydraulic considerations to the expansion of aquatic infrastructure. This includes a list of the relevant code, standards and advisory guidelines as well as the assumptions made to inform the conceptual design, design loads, material properties, performance criteria and like.

The report aims to explain our design assumptions and construction methodology which can be challenged or modified during the detailed design to rationalise the aquatic performance criteria.

1.3 Project Description

Stromlo Leisure centre is located at Corner of Uriarra Road and Dave McInnes Road, ACT 2611. There is a large east facing carpark with a site topography falling from west to east at approximately 1 in 20. Opening times are 7 days a week, typically 5.30am until 9.30pm Monday to Friday, 7am until 7.30pm Saturday and Sundays. Patrons enter from the east with gym, studios and creche located to the south of foyer, and meeting rooms, work area and café located north of foyer. Male and female change facilities are located south of foyer which feed into the main pool hall.

As you enter the pool hall, there is waterplay/ leisure pool, toddlers pool and learn to swim pool which is all linked as one body of water.

To the south is a 50m x 8 lane competition pool ranging from 1.4m to 2.0m deep which is treated as a separate body of water.

Tiered concrete seating flanks the western side of 50m pool with the aquatic plantroom and storage located behind to the west set at a subterranean level cutting into the natural fall of the site formed with precast concrete retaining walls.

Existing 50m pool is designed for a turnover of 3.66 hours based on Geoff Ninnes Fong original design drawings, however the actual flow rate is likely to be higher as the original design was based on the best-case scenario of clean filters operating after a backwash. We suspect the turnover is likely to be well over 4.0 hours which currently does not meet the requirements of NSW "Public Swimming Pool and Advisory Document" dated 2013.

Balance tank to 50m pool is located adjacent to the pool and runs beneath the plantroom footprint to gain access for maintenance from the plantroom via an access hatch.

Existing LTS, Leisure, Toddler and water play pools are all combined and drain to a combined balance tank. The existing design turnover is 1.0 hour based on Geoff Ninnes Fong original design drawings. This again is likely to be higher during general operations again not meeting the requirements of NSW "Public Swimming Pool and Advisory Document" dated 2013. There is also the risk currently being managed by Belgravia due to the combined body of water for LTS/Leisure and Toddler pools of *Cryptosporidium* and *Giardia* contamination from faecal incidents which are higher risks for leisure and toddler/ water play pools. A faecal incident in this combined body of water would result in a shutdown and treatment/disinfection for the combined pools in question.

We understand Algae has been an ongoing issue for the 50m pool which can only be addressed by severing the link between indoor and outdoor activities.

The existing 50m pool is reticulated and filtered by 3 No. Chadstone sand filters (MHS-7250) which are approximately 4.35m long by 2.0m diameter high each. Each filter goes through a frequent backwash cycle with the wastewater discharged at an agreed rate to sewer.

The existing combined LTS. Leisure and Toddler pools are reticulated and filtered by 3 No. Chadstone sand filters (MHS-7250) which are approximately 4.35m long by 2.0m diameter high each. Each filter goes through a frequent backwash cycle with the wastewater discharged at an agreed rate to sewer.

Waste water from these weekly or fortnightly backwash cycles can be extensive and adds to operational water consumption, energy consumption through heating and chemical consumption through treatment.

Based on ACT Geotechnical Engineers report dated 26th March 2018, the existing soil strata comprises a mixture of gravelly Clayey Sand, or gravelly Sandy CLAY fill overlying layers of alluvium before hitting bedrock at depths of 5.5 – 6.5m and in some instances not identified in the borehole logs hence in excess of 10m in depth. Record drawings show existing pool bases are piled using 600 diameter piles keyed into rock with working loads of up to 575 kN.

Current facility utilises sodium hypochlorite storage tanks (2 x 2750 litres) in an internal bunded enclosure of 8.0m3 located adjacent to southern bunded delivery zone. Carbon Dioxide drum is also located internally within the plantroom adjacent to delivery zone with gas leak detector and alarm. Both 50m pool and combined LTS/Leisure and Toddler pools have UV disinfection on the return lines.

2. DESIGN STANDARDS AND REFERENCES

All engineering services design provided by MLEI will comply with the latest requirements of the following:

2.1 STATUTORY

Occupational Health and Safety and Welfare Regulations, 1995

National Construction Code of Australia (2022)

2.2 CODES AND STANDARDS

Relevant Australian Standards including and others:

AS/NZS 1170.0-2002 - Structural design actions - Part 0: General principles

AS/NZS 1170.1-2002 - Structural design actions - Part 1: Permanent, imposed and other actions

AS 1170.4-2007 - Structural design actions –Part 4: Earthquake actions in Australia

AS 2159-1995 - Piling - design and installation

AS 3600-2018 - Concrete structures

AS 3735 – 2001 - Design of Concrete Structures for Retaining Liquids

AS 1428.1-2001 - Design for access and mobility, general requirements for access-new building work

AS/NZS 1260-2009 – PVC-U pipes and fittings for drain, waste and vent application.

AS 1477 -2006-2009 – PVC pipes and fittings for pressure applications.

AS 1926 – 2012 – Swimming Pool Safety Standards.

NSW Guidelines for Public Pools and Spa Pools 2022 draft

2.3 SITE INVESTIGATIONS

MLEI have been provided with an existing site investigation report prepared by ACT Geotechnical Engineers report dated 26th March 2018, the existing soil strata comprises a mixture of gravelly Clayey Sand, or gravelly Sandy CLAY fill overlying layers of alluvium before hitting bedrock at depths of 5.5 – 6.5m and in some instances not identified in the borehole logs hence in excess of 10m in depth.

3. FEASIBILITY ASSESSMENTS

3.1 AQUATICS DESIGN

There are 6 options currently presented for consideration as per the below summary table based on Coop Studio:

Options	Description
1	30 m x 20 m x 5 m deep pool, WA compliance – Diving, water polo, artistic swimming
2	25 m x 20 m x 5 m deep pool, WA compliance – Diving, water polo, artistic swimming
3	30 m x 20 m x 3.8 m deep pool, not WA compliance – Diving, water polo, artistic swimming
4	25 m x 20 m x 3.8 m deep pool, not WA compliance – Diving, water polo, artistic swimming
5	50 m x 20 m x 3.8 m deep pool, WA compliance – Diving, water polo, artistic swimming
6	25 m x 20 m x max 3.8 m deep moveable floor pool, community and local competition focus.

We envisage during the next phase of works the options will be reduced in number to enable a focussed design response. In the interim we provide the following high level aquatics commentary: -

3.2 TURNOVER TIMES

The depth and profile of pools generates pool water volumes ranging from 1900 m3 to 3800 m3 which will need to be turned over and treated in accordance with NSW Guidelines for Public Pools and Spa Pools 2022 draft (see extract below); -

Table 1 Recommended turnover times for different types of public swimming pools and spa pools.

Maximum turnover time	Pool type
20 min	Interactive water features, spas, and hydrotherapy pools
1 hour	Waterslide, wading, indoor learn to swim pools
2 hours	Outdoor learn-to-swim, lazy river, program, wave, artificial lagoons with unrestricted access, pools used by incontinent people
4 hours	School, 25 m and 50 m leisure pools (recommended to be 2 hours if used by general public)
6 hours	Retirement village pool (not used for organized exercise activities), residential apartment, gym, resort, holiday park and motel pools
8 hours	Diving pool

Adapted from: **Pool Water Treatment Advisory Group 2017, Swimming pool water – treatment and quality standards for pools and spas** and the **Centres for Disease Control and Prevention 2018, The model aquatic health code** (refer to '**Reference Materials**').

Options 1 to 5 will require client agreement in turnover time due to the higher volumes of water involved in these pools which will impose a CapEx premium for filtration, water reticulation systems and pumps. Typically dive pools only can be designed for an 8 hour turn over, however community use larger format pools can apply a maximum turnover of 4 hours (although 2 hours is recommended if used by the general public).

For options 1 to 5, If usage can be agreed with ACT Territory and User groups to be split competition usage to community usage 80:20 weighted towards competition use, MLEI recommends pushing turnovers to **4.0 hours.**

Should the weighting for competition usage vs community usage be equally weighted, MLEI recommend pushing turnovers closer to **3.0 hours.**

For option 6 which is a hybrid solution with moveable floor and predominantly community usage, MLEI recommends a rationalised turnover of **2.0 hours.**

We note the above pool turnover recommendations contained in NSW Guidelines for Public Pools and Spa Pools 2022 draft is based on Pressurised Sand Filters. Should alternative Precoat/ Ultra Fine Filtration be chosen (Higher CapEx cost for UFF filters compared to pressurised sand filters), the following formulae can be applied from the NSW guidelines: -

Calculating Turnover Time

The Stevenson formulae for pool turnover times are derived from PWTAG (1999) and WHO (2006) recommendations (Table 6). Some swimming pool designers recommend that the turnover time is to be increased by 15% and 10% if Ultra Fine Filtration is used for indoor and outdoor swimming pools, respectively.

Table 6: Pool Turnover Time Formulas

Pool type	Filter type	Turnover Time Calculation *
Indoor	Granular	(1.3 X depth) + 0.2 hours
	Ultrafine	[(1.3 X depth) + 0.2 hours] x 1.15
Outdoor	Granular	(1.8 X depth) + 0.2 hours
	Ultrafine	[(1.8 X depth) + 0.2 hours] x 1.10

* Depth is in metre units. Pools deeper than 4 metres are to be calculated as a 4-metre depth pool.

The formula above (Table 6) does not apply to pool water features, bubble pools, waterslide splash pools, beach pools, pools with moveable floors, spa pools, shallow leisure pools, wave pools, and hydrotherapy pools. The turnover times for these pools must instead be specified by a professional pool designer.

Summary Table for MLEI recommended Pool Turnover times: -

Option	Pressurised Sand Filters 80:20 competition: community use	Pressurised Sand Filters 50:50 competition: community use	Precoat/ UFF filtration
1	4.0 hours	3.0 hours	4.6 hours
2	4.0 hours	3.0 hours	4.6 hours
3	4.0 hours	3.0 hours	4.6 hours
4	4.0 hours	3.0 hours	4.6 hours
5	4.0 hours	3.0 hours	4.6 hours
6	2.0 hours	2.0 hours	2.3 hours

3.3 POOL OPERATING TEMPERATURES

Recommended pool operating temperatures for Options 1 to 6 can be based on PWTAG Code of Practice: -

14.1) Pool water heating
Table 3 gives recommended temperature ranges for different types and use of pool

Table 3 Pool temperatures:

Pool use	Temperature range (°C)
Competitive swimming and diving, fitness swimming, training	26-28
Recreational swimming and adult teaching	27-29
Leisure waters	28-30
Children's teaching	29-31
Babies, young children, disabled and infirm	30-32
Hydrotherapy and aquatic rehabilitation pools	32 -36 Ideally at 34.5° C (thermoneutral)

14.2) Pool hall air
The pool hall air temperatures should be no more than 1deg C above or below that of the water temperature.

- **Air temperatures over 30°C should be avoided.**
- **Hydrotherapy and aquatic rehabilitation pool air temperature should be maintained at approximately 25-28°C**
- **Relative humidity should be maintained at a level of 60% (no less than 50%, no more than 70%) throughout the pool hall area.**
- **The pool hall area (water plus wet surrounds) should preferably be ventilated at a rate of over10 litres of ventilation air per second per square metre of pool hall area.**
- **Where leisure pools include extensive water features, consideration should be given to increasing the ventilation rate.**
- **Ventilation systems should ideally be designed to provide 100% fresh air or where this is not achievable a minimum of 12 litres per second of fresh air for each occupant of the pool hall (bathers, staff and spectators). An extra 10% on top of the running rate should be available when necessary (e.g. for temporary higher bather loads or if high levels of contaminants are detected in the pool atmosphere) there is further guidance on the HSE website. (Ventilation and air conditioning during the coronavirus (COVID-19) pandemic Removal of some coronavirus (COVID-19) restrictions https://www.hse.gov.uk/coronavirus/equipment-and-machinery/air-conditioning-and-ventilation/index.htm)**

For options 1 to 5, we recommend a pool operating temperature of 27 degrees Celsius.

Option 6 based on its multifunctionality, we recommend a constant pool operating temperature of 29 degrees Celsius which would cater for majority of temperature ranges stated in Table 3 of PWTAG, which is 1 degree higher than recommended for competition swimming. Our recommendation for a constant operating temperature to Option 6, is to maintain an improved control on chemical balance and water quality without having to build in enhanced redundancy within the sanitation systems such as UV and dosing units. Depending on the final pool finish adopted, there may be merit in revisiting the operating temperatures and systems adopted as per the

3.4 FILTRATION OPTIONS

There are multiple pool filtration systems on the market with constantly evolving new technologies and new systems being introduced. The current filtration system utilising Chadstone Pressurised Sand Filters is a robust system implemented across multiple facilities across several decades. Subject to CapEx pressures, environmental and ESD considerations and energy and water consumption targets there are multiple options available. We have also considered operator feedback in that keeping systems consistent for the facility would help keep future training and operations simpler and easier to maintain.

The two options considered are as follows: -

1) Pressurised Glass/Sand Filters: -

Option 1 pressurized filters with glass media; however, sand media may be used. Glass media has a higher upfront cost, however, has greater efficiencies with maintenance and backwashing and therefore lower long-term costs / water usage. The backwashing of glass media can be up to 50% less than sand media and produce water savings of up to 50% by volume. The lifespan of active glass can be 10 years plus if properly maintained due to its smooth surfaces and quicker release of contaminants. The lifespan of sand media can be 5 to 7 years if maintained properly. As denoted the pressurised filters for the proposed pool extension would link to the existing backwash system and add to the water discharged to sewer as wastewater. The size of plantroom to accommodate pressurised filters increases building costs as the space required in plantrooms to accommodate these units are greater than other filtration options considered. The benefits of Pressurised filters are that they have lower upfront CapEX costs per unit however, higher energy and water consumption requirements than other filtration options. The benefit of pressurised filters at Stromlo is that it's an expansion to the existing building set up, which will assist with simplifying ongoing operations and maintenance schedules. As the plantroom extension is located at subterranean level, there will be an added CapEx building cost relating to greater excavations for larger balance tanks and plant spaces.

Option	Approx. plant capacity based on Chadstone Granular Filters	Original MHS-7250 filter numbers	Filter footprint m2	Filter rate per MHS-7250 filter
4 (smallest pool volume)	580 m3/hr	3 No.	Approx. 40 m2	26.7 m3/hr/m2
5 (largest pool volume)	1175 m3/hr	6 No.	Approx. 80 m2	27.0 m3/hr/m2
6 (multifunctional impact on turnover times)	1350 m3/hr	7 No.	Approx. 91 m2	26.6 m3/hr/m3

2) Precoat/Ultra Fine filtration: -

Option 2 Ultra Fine filtration as known as "Pre-coat" filters with Perlite Media (not D.E). Precoat filters can filter out particles of a smaller size than glass / sand media filters and have a reduced footprint within the plantroom, however, the larger units require higher than standard floor to ceiling heights. These filters have a higher upfront CapEx costs per unit, although now there are more competitors in the market this is assisting in providing commercial refinement.

There are reductions in water usage (cost savings) dependant on which filter is selected over the lifetime of the filter through the substitution of the traditional backwashing process with either a "reverse flow backwash" to smaller filters or "bumping/gravity drain down" process which, uses less water and therefore less chemicals and heating of water etc, the whole of life offerings from Pre-coat filtration can be significant and assists with ESD initiatives if this is a key performance requirement for Stromlo Leisure Centre.

It should be noted that "bumping/gravity drain down" which occurs approximately every 5-6 weeks depending on pool usage and patronage involves the emptying of each filter to a macerator or vortex pump and pit before discharging the water and perlite to sewer in accordance with EPA requirements.

Option	Approx. plant capacity based on Precoat/UFF filters	Chadstone Precoat Filters	Chadstone Precoat Filter Approx. flow rate per filter	Neptune Benson UFF	Neptune Benson Approx. flow rate per filter
4 (smallest pool volume)	580 m3/hr	2 No. CPC2000-112 (2100 diameter)	2.1 m3/hr/m2	2 No. SP 49-48-1548 (1400 diameter)	2.12 m3/hr/m2
5 (largest pool volume)	1175 m3/hr	3 No. CPC2000-112 (2100 diameter)	2.5 m3/hr/m2	2 No. SP 55-48-2076 (1570 diameter)	2.75 m3/hr/m2
6 (multifunctional impact on turnover times)	1350 m3/hr	3 No. CPC2000-123 (2250 diameter)	3.0 m3/hr/m2	3 No. SP 55-48-2076 (1570 diameter)	2.45 m3/hr/m3

Summary of considerations and recommendations: -

Based on our initial high-level assessment of the existing plantroom and infrastructure set up at SLC, if choosing pressurised sand filters (with either sand or other media) or Chadstone Precoat UFF filters, allowance should be made for supplementary backwash tanks within the plantroom to cater for the operational requirements of these type of filters.

Should a "non-back wash" UFF filtration system be adopted, the additional requirements for backwash tanks can be negated with provisions made for a macerator or vortex pump and pit for emptying "non back wash" UFF filters prior to discharging the water and perlite to sewer in accordance with EPA requirements.

If capital cost pressures exceed the drive for ESD initiatives, then our recommendation is for pressurised sand filters with glass media to be adopted for the future dive pool expansion.

If ESD and water/energy consumption initiates take precedence over capital cost, our recommendation is "Non backwash" UFF filtration for the future dive pool expansion.

A "non backwash" UFF filtration system compared to a Chadstone Precoat UFF filtration or traditional pressurised Sand filtration system could offer plantroom reductions of 30-40%.

We also understand the existing filter laterals have been replaced since SLC initially opened hence there may be future consideration of replacing pre-existing filtration with alternative options to minimise ongoing maintenance operations.

3.5 POOL SHELL OPTIONS

The following notes and tabulated summary table are intended to illustrate an unbiased professional opinion regarding the range of potential design considerations and ensure our professional expertise has taken account of current research and recommendations.

The emergence of stainless-steel modular pools has broadened swimming pool construction, with there now being multiple supply and manufacturer options with a track record for supplying the Australian market – this has led to a cost efficient and competitive aquatic pool shell market. We appreciate the initial ACT territory brief has expressed a desire to explore options other than traditional concrete pool shells with tiled finishes to enable informed client decisions to be made.

Figure 1 Modular Shell Isometric

Figure 2 Modular Shell section

Photograph 2: Modular Shell application for LTS pool.

Photograph 3: Concrete Shell/ Tile construction.

Photograph 4: Concrete Shell/ Tile construction.

	Concrete Pool Shells	Modular Pool Shells
Structural Comparison	Monolithic design and detailing for concrete pool shell and pool surrounds when designed in accordance with AS:3735 & AS 3600.	Stainless steel side walls incorporating Structural stainless-steel framing fixed to a reinforced concrete floor.
	Design Life 50-years+	Design Life 25-years
		A corridor around the stainless-steel shell is recommended to enable inspections to back face of the shell and support structure.
Waterproofing	Inherent within well-constructed in-situ reinforced concrete pools meeting AS:3735. Will be augmented by waterproof separation membrane liner and/or render.	Factory-bonded PVC-faced galvanized or stainless-steel wall panels and PVC floor liner, with all seams thermally welded.
Finishes	Typically, fully ceramic tiles on render backing is the preferred finish. Alternative vinyl liners can also be applied to concrete pool shells or high-grade Epoxy Pool paints. Tile finishes have risk of failure from "shell shock" when the pool is emptied or filled quickly or is heated or cooled at a rate greater than 0.25 degrees an hour. Tiled finishes depending on quality control during install can be expected to be replaced every 15-25 years. Tile grouting depending on type of grout used can be expected to be replaced every 5-7 years.	PVC factory-applied finish to wall panels and PVC liner sheet to floor panels. PVC liners do not suffer from "shell shock" hence the liner finish does not suffer from these risk of defects. Vinyl liners can be expected to be replaced every 10 years unless one of the newer technologies is implemented with a higher CapEx to enhance Performance.
Robustness	Robust – controlled risk of damage from vandalism or pool hall activities. Durable although tiled finishes can get chipped Concrete provides stable construction Workmanship is critical to waterproofing and long-term life of the pool in particular control joint detailing.	PVC lining can suffer from mechanical damage from sharp objects and vandalism E.g. Puncture may result in leakage. Potential movement issues at the junctions with loose linings and more rigid wall/floor and wall/surrounds. Workmanship is critical to waterproofing and long-term life of the pool. Modular pool suppliers offer yearly maintenance inspections for routine maintenance repairs.
Service life to protect structure	Long service life for concrete shells designed and constructed in accordance with AS 3735 & AS 3600.	Periodic replacement of liners required (approximately every 10 to 15 years). Needs factoring into maintenance and repairs schedules.
Maintenance	Nominal long-term maintenance of pool concrete structure. Re-grouting of ceramic tiles may be required at 10-15-year intervals. The life of finishes will depend upon quality of materials specified, typically 10 to 15 years with chemically resistant grouts 7-10 years for standard cementitious grouts. Maintenance of pool water quality, and chemicals utilized. Cementitious grouts require routine inspections and maintenance.	Routine inspections recommended and repair of PVC-liner damages required at the earliest opportunity. Recommendation is for an annual maintenance agreement with the modular supplier to maintain finishes warranties. Recommend annual inspection of stainless-steel structure to check for pitting/corrosion.

	Concrete Pool Shells	Modular Pool Shells
Construction	Increased construction period for building concrete shells due to pour sequencing, waiting time for curing periods, hydrostatic testing periods, concrete shell preparation and shrinkage cracking repairs prior to finishes applications.	Prefabrication hence off-site design and prefabrication time requires early order placement in the contract. Concrete support slabs and retaining walls have shorter time periods compared to concrete pools.
	Wet trade for pool finishes requires a period for application and curing to ensure longevity and maintenance reduction.	Shorter installation periods. Maximum warranty period 15 years with an additional cost associated with the maintenance agreement otherwise Standard 12-year warranty provided. There are newer vinyl/PVC technologies being supplied to the market that offer up to 25-year warranties.
	Long-term warranty 10-15 years depending on type of grouts, the latent defects period will be 10 years on the builder and the patent defects period will be 12 months).	Reductions in construction programme compared to a concrete pool. The latent defects period will be 10 years on the builder and the patent defects period will be 12 months).
	Overall comparative construction program although possible increases dependent on material selections.	
Quality control	Extensive ITP's to be followed when prepping and applying the tiled finishes. 100% Adhesive coverage to back of tiles paramount as well as ensuring tile notches are broken when laying. Dimensional control dependent on the quality of workmanship on site.	Resolution of severe defects and leakage can be complex requiring potential drainage of pool and resulting in closure. Dimensional control achieved through factory prefabrication and site control.
Pool Shell construction	Concrete pools typically support concourse loads and are designed to retain soil in locations where they are not surrounded by a basement level.	The capital cost comparisons for Modular pools typically do not include the additional expenditure in structure surrounding the pool. Noting that there will need to be supporting vertical wall structure for the concourse which also acts as retaining structure around the pool. Base slabs are required to support the modular floor panels.
Environmental Costs	Full Recyclable. Fully sustainable sourced from local materials and labor	Single use polymer liners manufactured in Europe or America and transported.

There are pros and cons to both systems in relation to initial capital expenditure vs ongoing maintenance requirements depending on the type of pool finishes selected. Based on options 1 to 5 which are bias towards competition use, we suspect the modular pool system with vinyl liner can be a viable option due to the deep bodies of water being proposed. We recommend both water retaining concrete and modular pools are Tendered, and market tested.

3.6 ENERGY AND HEATING REQUIREMENTS

Feasibility options 1 to 6 have varying demands on initial heat up loads and maintaining loads as per the below summary table: -

Option	Pool operating temperature (degrees Celsius)	Startup load from cold (kW)	Maintenance load (kW)
1	27	1600 kW	715 kW
2	27	1380 kW	640 kW
3	27	1300 kW	600 kW
4	27	1150 KW	535 KW
5	27	2050 KW	960 kW
6	29 (constant for multi-function)	1300 kW	600 kW

High level electrical load requirements to cater for filtration pumps, UV, shunt pump, compressors, mixing tanks, chemical units, testing equipment, GPO's and chlorine equipment = **380 amps / 230 kW (this load is in addition to the heat loads specified in the table above).**

3.7 LIFECYCLE COST COMPARITIVE ASSESSMENT

The following assessment considers all 6 options from a whole of life energy consumption considering heating and treating costs only. Due to multiple variables such as filtration options, patronage variables we have assumed all options have the same base load requirements and assessments are based on a comparative basis.

Option	Whole of life cycle costs multiplier
1	+1.55 times operating costs of base case (option 4)
2	+1.32 times operating costs of base case (option 4)
3	+1.21 times operating costs of base case (option 4)
4	Base case + 1.0 (lowest load)
5	+2.03 times operating costs of base case (option 4)
6	+2.33 times operating costs of base case (option 4)

3.8 SANITISATION OF INDOOR POOLS

Typically, indoor commercial pools have three primary options for sanitisation: -

- Liquid Chlorine (Sodium Hypochlorite)
- Gaseous Chlorine
- Granular Chlorine (Calcium Hypochlorite)

The current centre uses Sodium Hypochlorite, and since the proposed pool extension is likely to be biased towards competition usage with some community overspill with pool operating temperatures not exceeding 30 degrees Celsius, then Sodium Hypochlorite expansion will be suitable for optimisation of initial CapEx and continuation of OpEx.

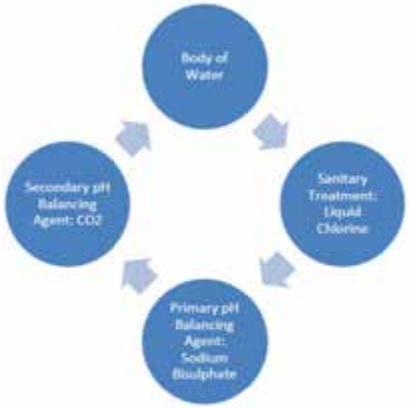


Figure 3 Diagram for Chemical treatment.

Due considerations for coordination with design team: -

- Appropriate volume of external bunded areas for deliveries including shut off valves to cater for 12.5m long delivery trucks. Shut off valves to be operated during a delivery to prevent contamination of stormwater system.
- Sodium hypochlorite (Liquid Chlorine) calcifies water, often leaving unsightly white residue on the tiles, etc. if cleaning is not regularly maintained. It also increases pH and therefore Sodium Bisulphate or Sodium thiosulphate is used to lower ph. Sodium Bisulphate is a powder and would require a bunded mixing tank within the plant room to dose the pools. Sodium thiosulphate is a crystal alternative.
- Carbon Dioxide Cylinder, currently located within access corridor of back of house plantroom at Stromlo. MLEI recommend during extension works, this cylinder is rehoused externally in a fenced enclosure to mitigate risks of cylinder leakage and OH&S risks of retaining this cylinder indoors.

Photo 5: Internal location of CO2 Cylinder.

Photo 6: Current Chlorine tank and internal bund.

3.9 EQUIPMENT CONSIDERATIONS

Figure 4: UV Treatment.

A UV treatment system is required for the proposed pool extension We will detail this system within the plant room and coordinate with surrounding equipment.

UVT Monitoring is a world first in swimming pool technology primarily used in drinking water plants UVT is extremely advantageous when it comes to sustainable design and operational cost reductions. It aids with the ESD parameters due to its power reducing capabilities. UVT also allows better control of water quality and balance in individual pools.

3.10 CONTROL OF THERMAL PERFORMANCE OF POOL STRUCTURES

MLEI recommends insulating both the pool shell and balance tank structures to enhance the thermal performance and reduction of energy usage/heat loss through the aquatic structures. The use of XPS or similar insulation board is recommended surrounding the aquatic structures.

In terms of other sources for potential heat loss, this is hugely variable depending on a multitude of factors. Typically, higher pool operating temperatures result in greater evaporation losses, hence the importance of optimising the functionality of future expansion dive pool in terms of operating temperature.

Shallow bodies of water with high surface area like zero depth splash pads suffer from greater evaporation losses than deeper bodies of water of similar surface area, mainly due to the higher operating temperature of the pool water combined with evaporation off the cooler surfaces.

The ambient air temp inside the pool hall needs to be set by Services Consultant close to the operating temperature of deep bodies of water to control dew point and surface evaporation. Factors to also consider are intended patronage numbers and turnover of users during normal operational proceedings.

Current options include the provisions for a movable floor to aid with multi functionality in option 6. Insulated moveable floors raised to the top surface of pools act in a similar way to pool blankets laid over the surface, all helping to reduce surface evaporation. Technical data from moveable floor suppliers advise on speeds of 250-300 mm/min in raising and lowering movable floors.

3.11 DIVE POOL TECHNICAL DESIGN CONSIDERATIONS

As a general principle, when new pools are being designed, diving stages and springboards should only be installed over a separate purpose designed pool.

Should diving boards be incorporated into a swimming pool, then the area of pool needed for safe diving will need to: -

1) Be physically separated from all other activities taking place in the pool: examples being movable bulkheads, swim walls and portions of movable floor raised for shallower swimming activities.
2) Comply with FINA Facilities Rules for Diving.
3) Have its own independent supervision/life guarding provisions.

A movable floor can increase pool flexibility and allow the pool to be used for a wider range of activities with the pool depth having to be increased to accommodate the movable floor structure and mechanism.

The following criteria also apply: -

1) **Colour of pool finish:** walls can be white or pale blue. A dark blue floor is preferred as this, in conjunction with agitation of the water surface by water sprays, assist divers in seeing the water surface and will minimise accidents.
2) **Pool shell profile:** Determined by FINA requirements and whether a movable floor is installed. Where the dive pool also acts as a 25m training pool, the lane markings should be provided in a colour which contrasts with floor of pool. The markings should be 0.2/0.3 m in width and each lane shall end 2.0m from the end walls of the pool with a distinctive cross line 1.0m long. Target lines should be provided on the end walls in the centre of each lane. These should extend within interruption to the floor of the pool and have a cross line 0.5m long 0.3m below the surface of water.
3) **Pool Edge Details:** Should be level with the water line to help swimmers maintain contact and balance before diving. Raised sections o the surround with a flat edge can also be helpful for teaching and coaching.
4) **Ladders and steps:** should be recessed. They should be positioned to encourage divers to follow a safe route to rapidly exit the water after completing their dives, while avoiding the danger areas of other boards.

The type and positioning of steps will be affected by the board layout, other activities accommodated in the pool and whether a movable floor is specified.

1) **Rest ledges:** if provided must be fully recessed at a water depth of not less than 1.2m.
2) **Surface agitators:** FINA requirement to help divers in visual perception of the water surface. Normally the agitation is made via water sprays directed on to the surface of water.
3) **Bubblers:** Installed on the pool floor to provide compressed air cushion of bubbles to help protect divers from injury.
4) **Underwater lighting, windows and surveillance:** For enhancement in water safety for patrons.
5) **Training Harnesses:** Consideration should be given to the provision of training harnesses attached to the roof structure for some of the taller boards.

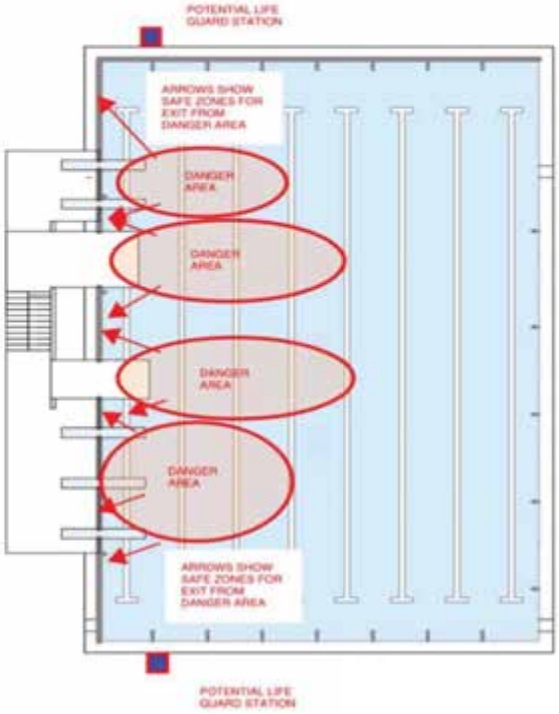
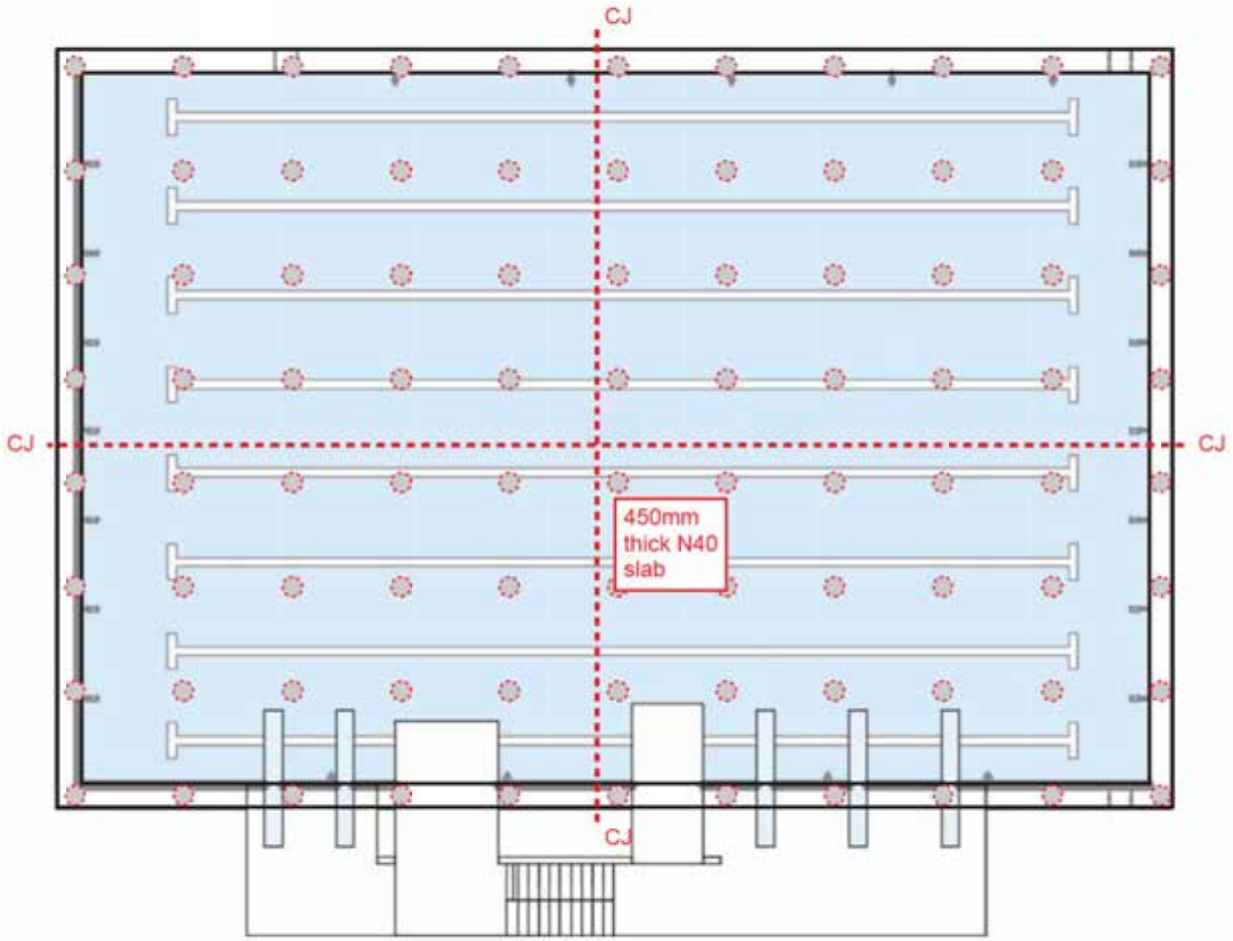


Figure 5: Lifeguarding and Exit points

4. APPENDIX A

Aquatic Design Feasibility Sketches

A2023-13467 - Stromlo
2024.08.23
MLEI Sketch AQSK10 - Concept Plans



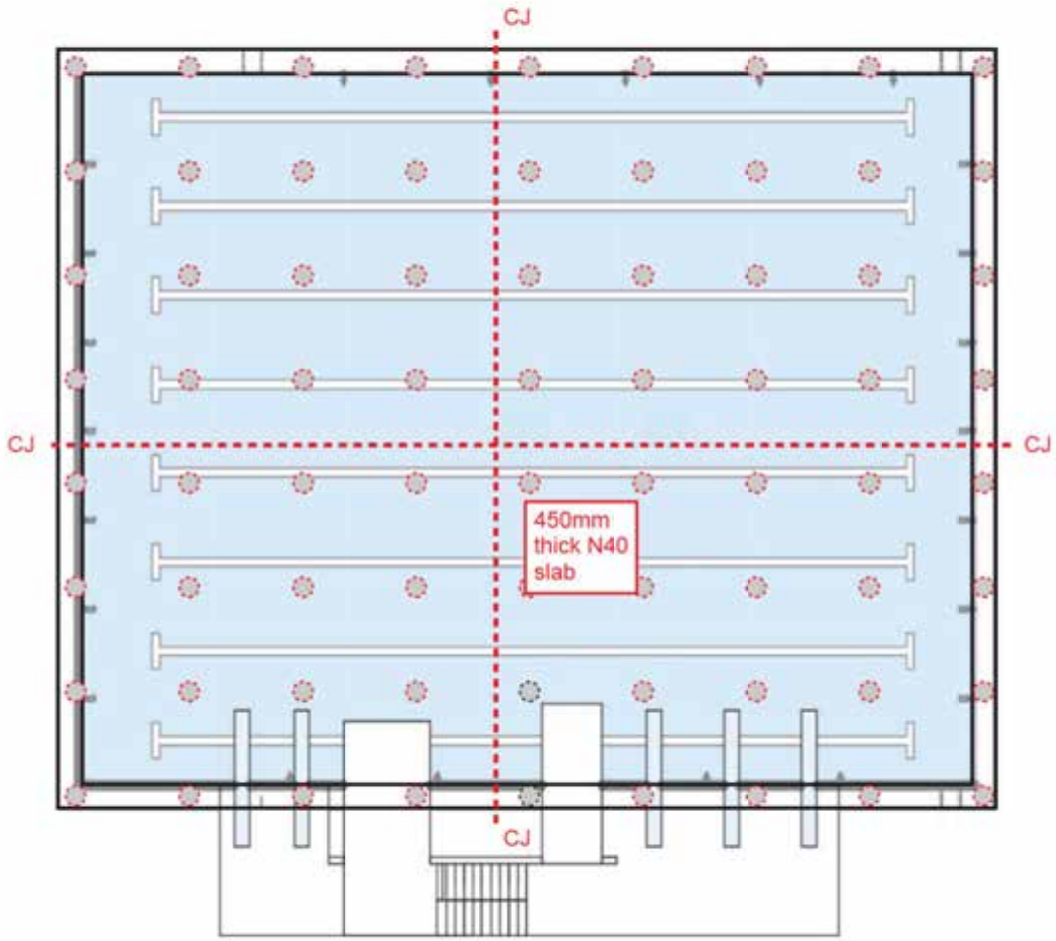
Option 1: 30m x 20m x 5.0m deep Pool

Notes:

denotes pile with max. 750kN WL

Total 88 nos. of piles, excluding loads from the dive platform and dive tower.

A2023-13467 - Stromlo
2024.08.23
MLEI Sketch AQSK11 - Concept Plans



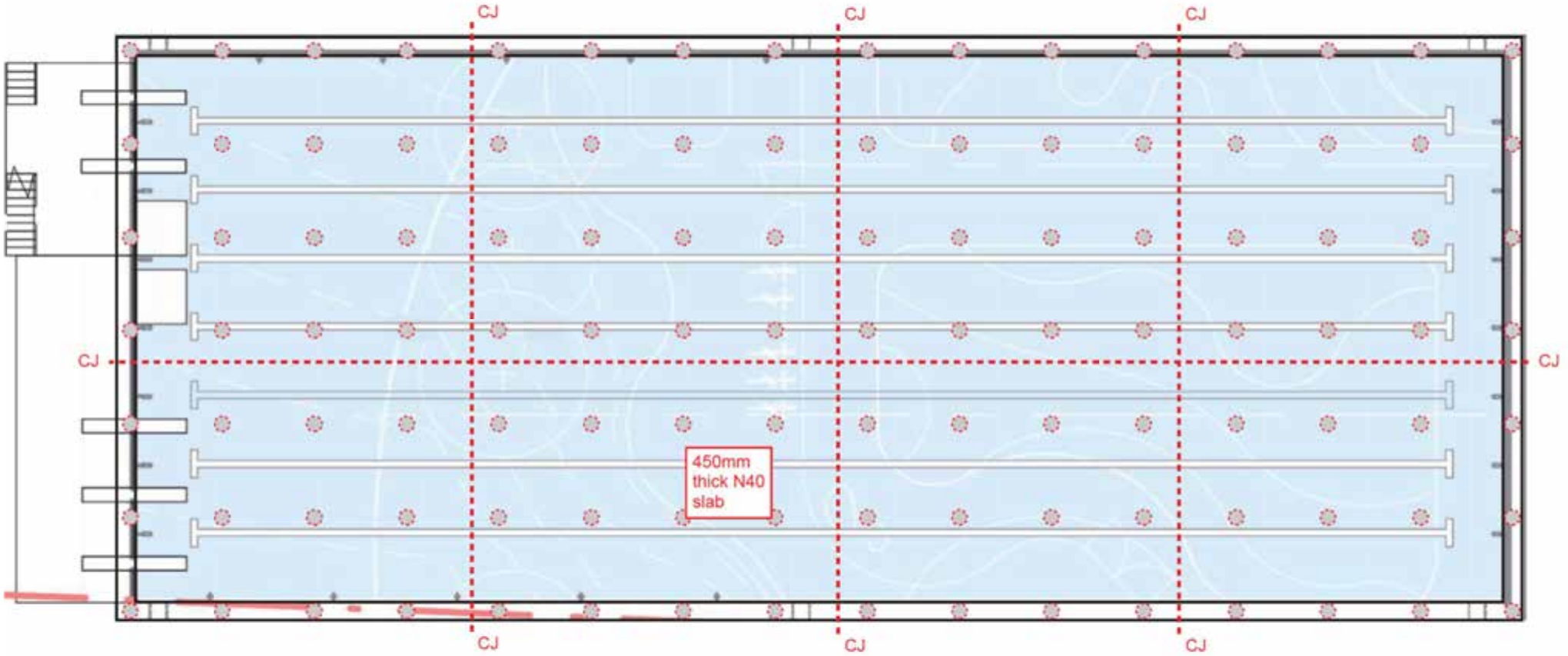
Option 2: 25m x 20m x 5.0m deep Pool

Notes:

denotes pile with max. 750kN WL

Total 72 nos. of piles, excluding loads from the dive platform and dive tower.

A2023-13467 - Stromlo
2024.08.23
MLEI Sketch AQSK12 - Concept Plans



Option 3: 50m x 20m x 3.8m deep Pool

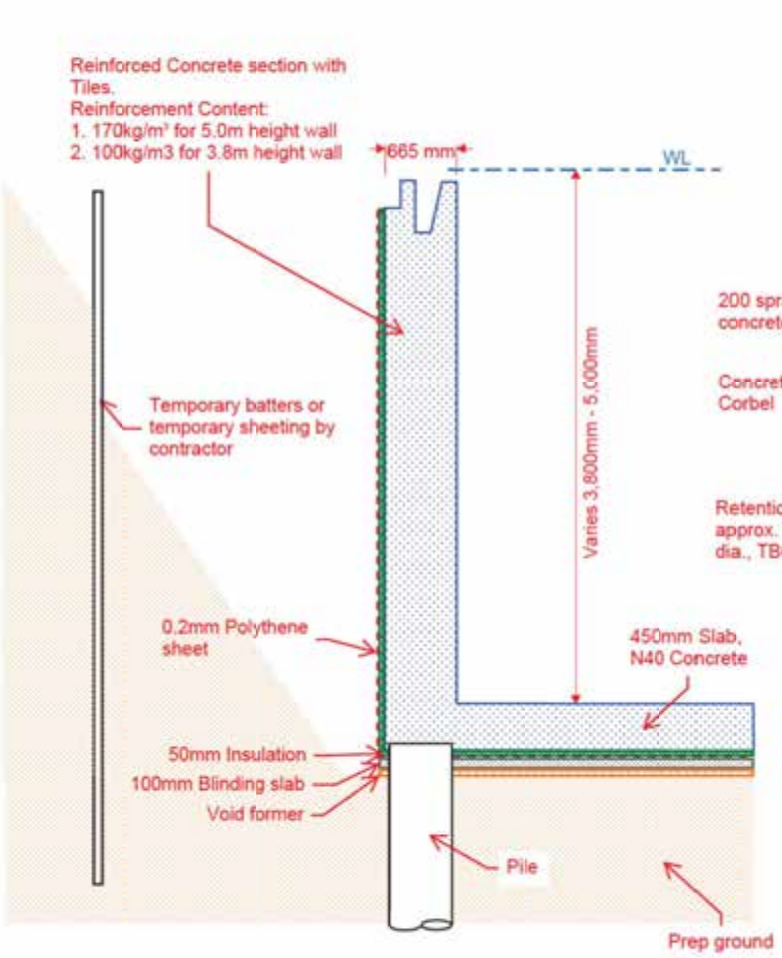
Notes:

denotes pile with max. 750kN WL

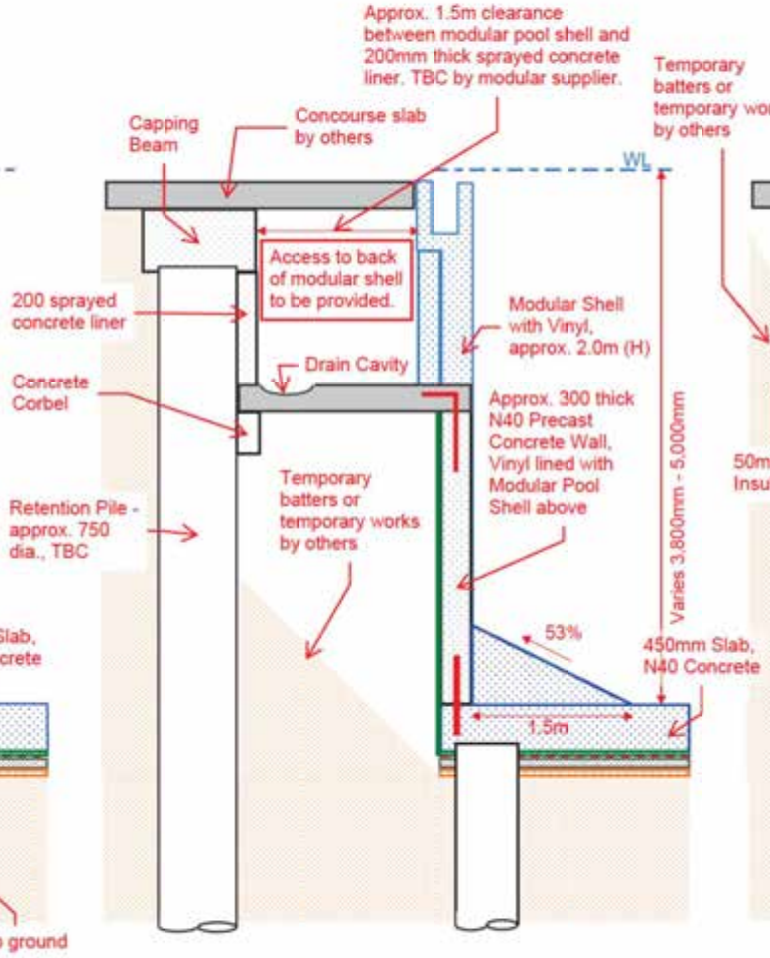
Total 112 nos. of piles, excluding loads from the dive platform and dive tower.

A2023-13467 - Feasibility Study & Prelim. Design for COP & SLC
2024.08.23 (R2)
MLEI Sketch - Options on Various Pool Shell Schemes

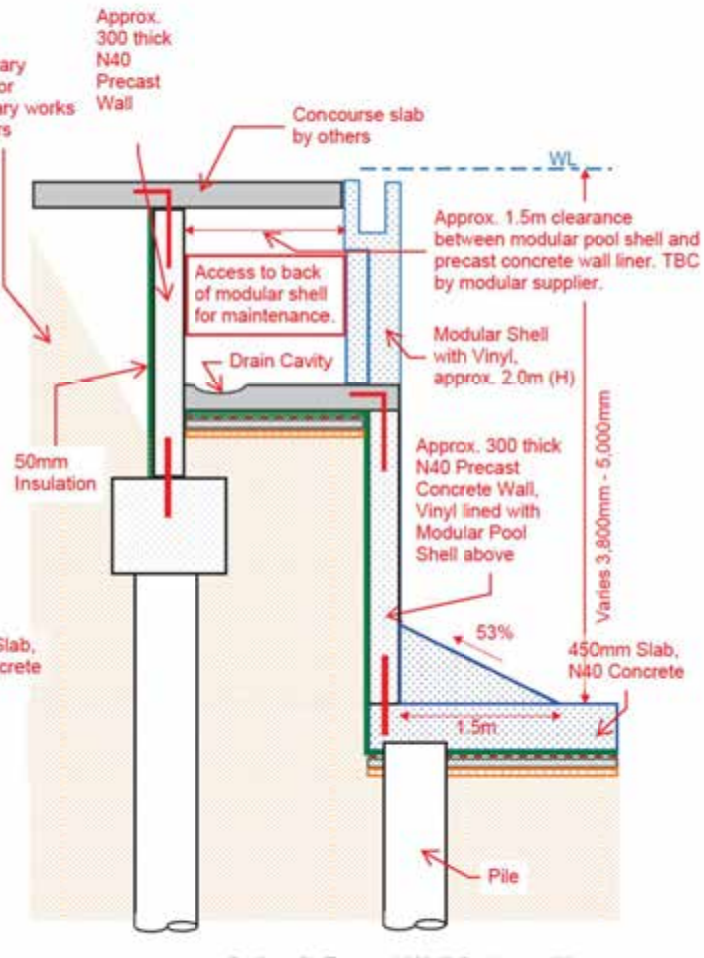
Notes:
1. The principal contractor and the nominated subcontractors shall, by means of benching, props, shoring, fencing and dewatering as necessary, maintain excavations in a stable and safe condition at all times.
2. Contractor is responsible for all necessary temporary works to ensure the existing structure is maintained in a stable condition and no localised part of structure is overstressed.



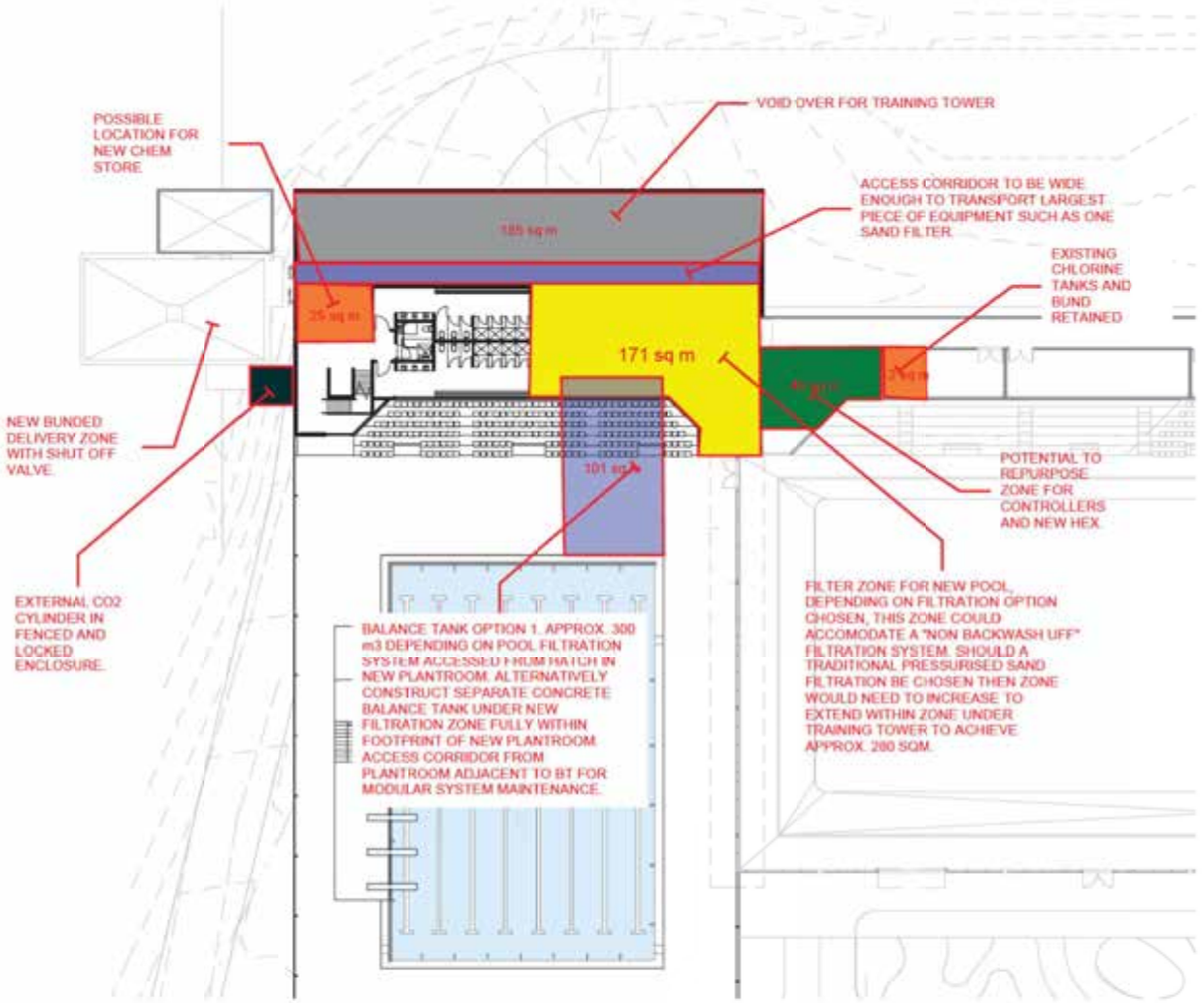
Option 1: Reinforced Concrete Wall with Tiles



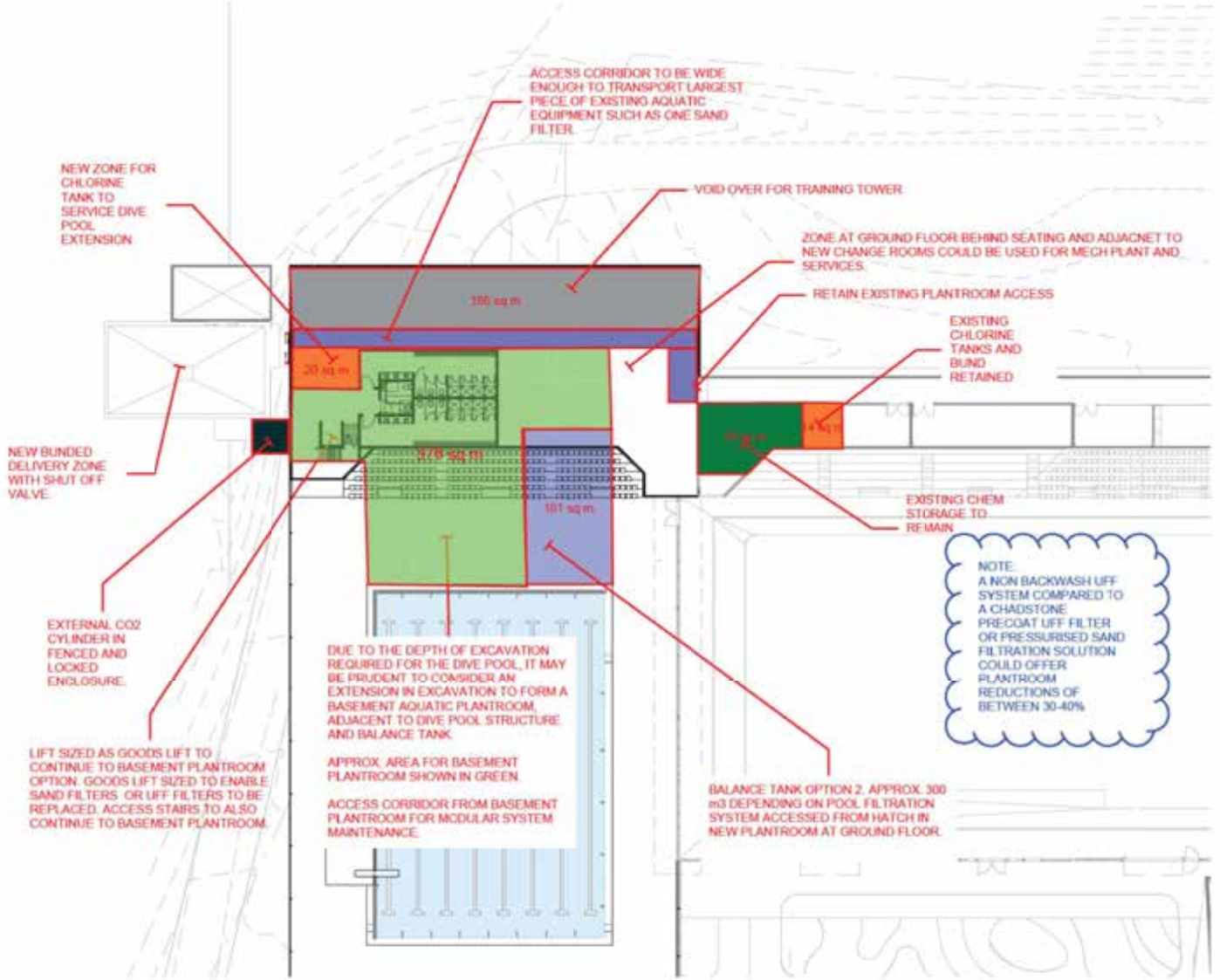
Option 2: Retention Piled System with Sprayed Concrete Walls, Base Slab with Drained Cavity to Support Modular Shell by Specialist



Option 3: Precast Wall System with Sprayed Concrete Walls, Base Slab with Drained Cavity



A2023-13467 - Feasibility Study & Prelim. Design for COP & SLC
2024.08.23
MLEI Sketch - AQUATIC PLANTROOM CONSIDERATIONS OPTION 1 AT GROUND FLOOR



A2023-13467 - Feasibility Study & Prelim. Design for COP & SLC
2024.08.23
MLEI Sketch - AQUATIC PLANTROOM CONSIDERATIONS OPTION 2 AT BASEMENT

10.0 APPENDICES

APPENDIX G - QUANTITY SURVEYOR

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ACT Territory Owned Pools

Stage 1a & 1b - Feasibility and Design Options Cost Plan

29 August 2024

Prepared by:

Wilde and Woollard Consultants Pty Ltd
28 Eyre Street
KINGSTON ACT 2604

On behalf of:

CK Architecture (Australia) Pty Ltd
Unit 2, 24 Thesiger Court,
DEAKIN ACT 2600

WILDE AND WOOLLARD

Document Issue Sheet

Issue No.	Document	Issue Date	Document Issued To	Prepared By	Checked By	Reviewed By
1	Stage 1a & 1b - Feasibility and Design Options Draft Cost Plan	25/07/2024	CK Architecture	schedule 2.2(a)(ii)		
2	Stage 1a & 1b - Feasibility and Design Options Draft Cost Plan	30/07/2024	CK Architecture			
3	Stage 1a & 1b - Feasibility and Design Options Cost Plan	29/08/2024	CK Architecture			

Issue log	Comments
1	Stage 1a & 1b - Feasibility and Design Options Draft Cost Plan
2	Stage 1a & 1b - Feasibility and Design Options Draft Cost Plan
3	Stage 1a & 1b - Feasibility and Design Options Cost Plan

Director Authorisation	
Director Name and Qualifications	schedule 2.2(a)(ii)
Date	29/08/2024

1. This report is confidential and should not be distributed to any other recipients without approval from the Client.

2. This report is based upon project specific information provided to Wilde and Woollard and our opinion of general market conditions at the time of preparing this report. Any subsequent changes may result in significant cost impacts.

3. Quantities and rates identified in this report are indicative only and are for the purpose of estimating the cost. They are not to be used for any other purpose.

Acronyms

Acronym	Meaning
CK	CK Architecture (Australia) Ltd Pty
ESD	Environmentally Sustainable Design
EXCL	Excluded
FECA	Fully Enclosed Covered Area
FF&E	Furniture Fittings and Equipment
FY	Financial Year
GFA	Gross Floor Area
GST	Goods and Services Tax
INCL	Included
MPC	Major Project Canberra
P.A.	Per Annum
SLC	Stromlo Leisure Centre
TBC	To Be Confirmed
UCA	Unenclosed Covered Area
WW	Wilde and Woolland Consultants Pty Ltd

Project: ACT Territory Owned Pools
Stage 1a & 1b - Feasibility and Design Options Cost Plan - Issue: 3
Date: 29 August 2024

Contents

1.0 Executive Summary

1.1 Purpose

The following report has been prepared for CK Architecture to advise the potential costs for the proposed new Dive Pool extension at Stromlo Leisure Centre.

1.2 Scope of Works

The proposed works comprise the provision area as follows:

- SLC - Option 1 - Extension for 30 x 20 x 5m dive pool including 10m platform, associated external works and services.
- SLC - Option 2 - Extension for 25 x 20 x 5m dive pool including 10m platform, associated external works and services.
- SLC - Option 3 - Extension for 30 x 20 x 3.8m dive pool including 5m platform, associated external works and services.
- SLC - Option 4 - Extension for 25 x 20 x 3.8m dive pool including 5m platform, associated external works and services.
- SLC - Option 5 - Extension for 50 x 20 x 3.8m dive pool including 3m platform, associated external works and services.
- SLC - Option 5a - Extension for 50 x 20 x 3.8m dive pool including 3m platform, associated external works and services (No Dryland Training Facility)
- SLC - Option 6 - Extension for 25 x 20 x 3.8m dive pool including 3m platform, moveable floor, associated external works and services.

1.3 Out-Turn Cost

All costs noted in this report are exclusive of GST.

The out-turn cost is summarised as follows:-

Table 1.1 Out-Turn Cost - Reinforced Concrete Pool Shell with Tiles

Item	Description	Construction Cost	Out-Turn Cost
1	Option 1 - Extension for 30 x 20 x 5m dive pool including 10m platform	$ 46,164,000	$ 77,043,000
2	Option 2 - Extension for 25 x 20 x 5m dive pool including 10m platform	$ 42,357,000	$ 70,689,000
3	Option 3 - Extension for 30 x 20 x 3.8m dive pool including 5m platform	$ 39,039,000	$ 65,152,000
4	Option 4 - Extension for 25 x 20 x 3.8m dive pool including 5m platform	$ 36,113,000	$ 60,269,000
5	Option 5 - Extension for 50 x 20 x 3.8m dive pool including 3m platform	$ 47,466,000	$ 79,214,000
6	Option 5a - Extension for 50 x 20 x 3.8m dive pool including 3m platform (No Dryland Training Facility)	$ 45,255,000	$ 75,525,000
7	Option 6 - Extension for 25 x 20 x 3.8m dive pool including 3m platform and moveable floor	$ 39,444,000	$ 65,829,000

Project: ACT Territory Owned Pools
Stage 1a & 1b - Feasibility and Design Options Cost Plan - Issue: 3
Date: 29 August 2024

1.0 Executive Summary

Table 1.2 Out-Turn Cost - Precast Wall System with Modular Shell

Item	Description	Construction Cost	Out-Turn Cost
1	Option 1 - Extension for 30 x 20 x 5m dive pool including 10m platform	$ 48,440,000	$ 77,504,000
2	Option 2 - Extension for 25 x 20 x 5m dive pool including 10m platform	$ 42,633,000	$ 71,149,000
3	Option 3 - Extension for 30 x 20 x 3.8m dive pool including 5m platform	$ 39,303,000	$ 65,594,000
4	Option 4 - Extension for 25 x 20 x 3.8m dive pool including 5m platform	$ 36,353,000	$ 60,669,000
5	Option 5 - Extension for 50 x 20 x 3.8m dive pool including 3m platform	$ 47,862,000	$ 79,876,000
6	Option 5a - Extension for 50 x 20 x 3.8m dive pool including 3m platform (No Dryland Training Facility)	$ 45,651,000	$ 76,185,000
7	Option 6 - Extension for 25 x 20 x 3.8m dive pool including 3m platform and moveable floor	$ 39,684,000	$ 66,228,000

Please Refer to Sections 3 and 4 of this report for assumptions and exclusions.

2.0 Out-Turn Cost Summary

On the basis of the information as listed in Sections 3.0 and 4.0 of this document, the cost of the works is summarised as follows:-

Table 2.1 Out-Turn Cost Summary - Reinforced Concrete Pool Shell with Tiles

Ref	Description	%	Total
	Option 1		
	Building Extension for 30 x 20 x 5m Dive Pool (Trade Cost Only)		$ 38,470,000
	Preliminaries and Profit	20.0%	$ 7,694,000
	Total Construction Cost		**$ 46,164,000**
	ESD	3.0%	$ 1,385,000
	Consultant Fees and Authority Fees	7.5%	$ 3,567,000
	Escalation to Dec 2028	16.6%	$ 8,486,000
	Design and Construction Contingency	25.0%	$ 14,901,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,540,000
	Total Out-Turn Cost		**$ 77,043,000**
	Option 2		
	Building Extension for 25 x 20 x 5m Dive Pool (Trade Cost Only)		$ 35,297,000
	Preliminaries and Profit	20.0%	$ 7,060,000
	Total Construction Cost		**$ 42,357,000**
	ESD	3.0%	$ 1,271,000
	Consultant Fees and Authority Fees	7.8%	$ 3,273,000
	Escalation to Dec 2028	16.6%	$ 7,786,000
	Design and Construction Contingency	25.0%	$ 13,672,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,330,000
	Total Out-Turn Cost		**$ 70,689,000**
	Option 3		
	Building Extension for 30 x 20 x 3.8m Dive Pool (Trade Cost Only)		$ 32,532,000
	Preliminaries and Profit	20.0%	$ 6,507,000
	Total Construction Cost		**$ 39,039,000**
	ESD	3.0%	$ 1,172,000
	Consultant Fees and Authority Fees	7.5%	$ 3,016,000
	Escalation to Dec 2028	16.6%	$ 7,176,000
	Design and Construction Contingency	25.0%	$ 12,601,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,148,000
	Total Out-Turn Cost		**$ 65,152,000**

Project: ACT Territory Pools
Stage 1a - Feasibility Study - Issue: 1
Date: 25 July 2024

2.0 Out-Turn Cost Summary

On the basis of the information as listed in Sections 3.0 and 4.0 of this document, the cost of the works is summarised as follows:-

Table 2.1 Out-Turn Cost Summary - Reinforced Concrete Pool Shell with Tiles

Ref	Description	%	Total
	Option 4		
	Building Extension for 25 x 20 x 3.8m Dive Pool (Trade Cost Only)		$ 30,094,000
	Preliminaries and Profit	20.0%	$ 6,019,000
	Total Construction Cost		**$ 36,113,000**
	ESD	3.0%	$ 1,084,000
	Consultant Fees and Authority Fees	7.5%	$ 2,790,000
	Escalation to Dec 2028	16.6%	$ 6,638,000
	Design and Construction Contingency	25.0%	$ 11,657,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 1,987,000
	Total Out-Turn Cost		**$ 60,269,000**
	Option 5		
	Building Extension for 50 x 20 x 3.8m Dive Pool (Trade Cost Only)		$ 39,555,000
	Preliminaries and Profit	20.0%	$ 7,911,000
	Total Construction Cost		**$ 47,466,000**
	ESD	3.0%	$ 1,424,000
	Consultant Fees and Authority Fees	7.5%	$ 3,667,000
	Escalation to Dec 2028	16.6%	$ 8,725,000
	Design and Construction Contingency	25.0%	$ 15,321,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,611,000
	Total Out-Turn Cost		**$ 79,214,000**
	Option 5a		
	Building Extension for 50 x 20 x 3.8m Dive Pool - No Dryland Facility (Trade Cost Only)		$ 37,712,000
	Preliminaries and Profit	20.0%	$ 7,543,000
	Total Construction Cost		**$ 45,255,000**
	ESD	3.0%	$ 1,358,000
	Consultant Fees and Authority Fees	7.5%	$ 3,496,000
	Escalation to Dec 2028	16.6%	$ 8,319,000
	Design and Construction Contingency	25.0%	$ 14,607,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,490,000
	Total Out-Turn Cost		**$ 75,525,000**
	Option 6		
	Building Extension for 25 x 20 x 3.8m Dive Pool with Moveable Floor (Trade Cost Only)		$ 32,870,000
	Preliminaries and Profit	20.0%	$ 6,574,000
	Total Construction Cost		**$ 39,444,000**
	ESD	3.0%	$ 1,184,000
	Consultant Fees and Authority Fees	7.5%	$ 3,048,000
	Escalation to Dec 2028	16.6%	$ 7,251,000
	Design and Construction Contingency	25.0%	$ 12,732,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,170,000
	Total Out-Turn Cost		**$ 65,829,000**

2.0 Out-Turn Cost Summary

On the basis of the information as listed in Sections 3.0 and 4.0 of this document, the cost of the works is summarised as follows:-

Table 2.2 Out-Turn Cost Summary - Precast Wall System with Modular Shell

Ref	Description	%	Total
	Option 1		
	Building Extension for 30 x 20 x 5m Dive Pool (Trade Cost Only)		$ 38,700,000
	Preliminaries and Profit	20.0%	$ 7,740,000
	Total Construction Cost		**$ 46,440,000**
	ESD	3.0%	$ 1,394,000
	Consultant Fees and Authority Fees	7.5%	$ 3,588,000
	Escalation to Dec 2028	16.6%	$ 8,537,000
	Design and Construction Contingency	25.0%	$ 14,990,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,555,000
	Total Out-Turn Cost		**$ 77,504,000**
	Option 2		
	Building Extension for 25 x 20 x 5m Dive Pool (Trade Cost Only)		$ 35,527,000
	Preliminaries and Profit	20.0%	$ 7,106,000
	Total Construction Cost		**$ 42,633,000**
	ESD	3.0%	$ 1,279,000
	Consultant Fees and Authority Fees	7.5%	$ 3,294,000
	Escalation to Dec 2028	16.6%	$ 7,837,000
	Design and Construction Contingency	25.0%	$ 13,761,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,345,000
	Total Out-Turn Cost		**$ 71,149,000**
	Option 3		
	Building Extension for 30 x 20 x 3.8m Dive Pool (Trade Cost Only)		$ 32,752,000
	Preliminaries and Profit	20.0%	$ 6,551,000
	Total Construction Cost		**$ 39,303,000**
	ESD	3.0%	$ 1,180,000
	Consultant Fees and Authority Fees	7.5%	$ 3,037,000
	Escalation to Dec 2028	16.6%	$ 7,225,000
	Design and Construction Contingency	25.0%	$ 12,687,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,162,000
	Total Out-Turn Cost		**$ 65,594,000**

Project: ACT Territory Pools
Stage 1a - Feasibility Study - Issue: 1
Date: 25 July 2024

2.0 Out-Turn Cost Summary

On the basis of the information as listed in Sections 3.0 and 4.0 of this document, the cost of the works is summarised as follows:-

Table 2.2 Out-Turn Cost Summary - Precast Wall System with Modular Shell

Ref	Description	%	Total
	Option 4		
	Building Extension for 25 x 20 x 3.8m Dive Pool (Trade Cost Only)		$ 30,294,000
	Preliminaries and Profit	20.0%	$ 6,059,000
	Total Construction Cost		**$ 36,353,000**
	ESD	3.0%	$ 1,091,000
	Consultant Fees and Authority Fees	7.5%	$ 2,809,000
	Escalation to Dec 2028	16.6%	$ 6,682,000
	Design and Construction Contingency	25.0%	$ 11,734,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,000,000
	Total Out-Turn Cost		**$ 60,669,000**
	Option 5		
	Building Extension for 50 x 20 x 3.8m Dive Pool (Trade Cost Only)		$ 39,885,000
	Preliminaries and Profit	20.0%	$ 7,977,000
	Total Construction Cost		**$ 47,862,000**
	ESD	3.0%	$ 1,436,000
	Consultant Fees and Authority Fees	7.5%	$ 3,698,000
	Escalation to Dec 2028	16.6%	$ 8,798,000
	Design and Construction Contingency	25.0%	$ 15,449,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,633,000
	Total Out-Turn Cost		**$ 79,876,000**
	Option 5a		
	Building Extension for 50 x 20 x 3.8m Dive Pool - No Dryland Facility (Trade Cost Only)		$ 38,042,000
	Preliminaries and Profit	20.0%	$ 7,609,000
	Total Construction Cost		**$ 45,651,000**
	ESD	3.0%	$ 1,370,000
	Consultant Fees and Authority Fees	7.5%	$ 3,527,000
	Escalation to Dec 2028	16.6%	$ 8,391,000
	Design and Construction Contingency	25.0%	$ 14,735,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,511,000
	Total Out-Turn Cost		**$ 76,185,000**
	Option 6		
	Building Extension for 25 x 20 x 3.8m Dive Pool with Moveable Floor (Trade Cost Only)		$ 33,070,000
	Preliminaries and Profit	20.0%	$ 6,614,000
	Total Construction Cost		**$ 39,684,000**
	ESD	3.0%	$ 1,191,000
	Consultant Fees and Authority Fees	7.5%	$ 3,066,000
	Escalation to Dec 2028	16.6%	$ 7,295,000
	Design and Construction Contingency	25.0%	$ 12,809,000
	Major Project Canberra Fees, Insurance and Training Leavy	5.5%	$ 2,183,000
	Total Out-Turn Cost		**$ 66,229,000**

5.0 Area Schedule

The areas used as a basis for the cost plan are summarised as follows:-

Table 5.1 Area - Stromlo Leisure Centre Dive Pool Extension

Scope Element	Area (m2)
Option 1	2783
Option 2	2303
Option 3	2726
Option 4	2230
Option 5	3224
Option 5a	2824
Option 6	2074

Note: The above areas are based on 100370-ACTP-Area schedule-Dive pools received on 23 July 2024.

Project: ACT Territory Owned Pools
Stage 1a & 1b - Feasibility and Design Options Cost Plan - Issue: 3
Date: 29 August 2024

A Cost Plan (Trade Cost Only)

Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Factor	Total
1	TRADE COST ONLY					
2	Option 1 (30 x 20 x 5m pool)	2,783	m2	13,823		38,470,000
3	Option 2 (25 x 20 x 5m pool)	2,303	m2	15,327		35,297,000
4	Option 3 (30 x 20 x 3.8m pool)	2,726	m2	11,934		32,532,000
5	Option 4 (25 x 20 x 3.8m pool)	2,230	m2	13,495		30,094,000
6	Option 5 (50 x 20 x 3.8m pool)	3,224	m2	12,269		39,555,000
7	Option 5a (50 x 20 x 3.8m pool) No Dry Land Training Facility	2,824	m2	13,354		37,712,000
8	Option 6 (25 x 20m pool with max 3.8m) + Moveable Floor	2,074	m2	15,849		32,870,000

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 1 (30 x 20 x 5m pool)					
1	Area Measurement				0
2	Substructure				1,273,000
3	Columns				565,000
4	Upper Floors				506,000
5	Staircases				187,000
6	Roof				4,012,000
7	External Walls				292,000
8	Windows				7,565,000
9	External Doors				10,000
10	Internal Walls				740,000
11	Internal Screens & Borrowed Lights				INCL.
12	Internal Doors				30,000
13	Wall Finishes				135,000
14	Floor Finishes				408,000
15	Ceiling Finishes				276,000
16	Fitments				120,000
17	Special Equipment				610,000
18	Hydraulic Services				390,000
19	Gas Services				EXCL.
20	Mechanical Services				2,906,000
21	Fire Protection				418,000
22	Electrical and Communication Services				2,184,000
23	Transportation Systems				120,000
24	Special Services				56,000
25	Builder's Work in Connection with Services				304,000
26	Pool and Spa				8,280,000
	Subtotal – Building Works				**31,387,000**
27	Site Preparation				595,000
28	Roads, Footpaths & Paved Areas				1,003,000
29	Boundary Walls, Fencing & Gates				EXCL.
30	Outbuildings & Covered Ways				233,000
31	Landscaping & Improvements				150,000
32	Special Provisions				3,452,000
	Subtotal – External Works				**5,433,000**
33	External Stormwater Drainage				640,000
34	External Sewer Drainage				50,000

Schedule 2.2(a)(xiii)

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options
29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 1 (30 x 20 x 5m pool)					*(Continued)*
35	External Water Supply				30,000
36	External Gas				EXCL.
37	External Fire Protection				30,000
38	External Electric Light & Power				900,000
39	External Communications				EXCL.
	Subtotal – External Services				**1,650,000**
	Option 1 (30 x 20 x 5m pool)				**38,470,000**

Schedule 2.2(a)(xiii)

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options
29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 1 (30 x 20 x 5m pool)					*(Continued)*
35	External Water Supply				30,000
36	External Gas				EXCL.
37	External Fire Protection				30,000
38	External Electric Light & Power				900,000
39	External Communications				EXCL.
	Subtotal – External Services				**1,650,000**
	Option 1 (30 x 20 x 5m pool)				**38,470,000**

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 2 (25 x 20 x 5m pool)					
1	Area Measurement				0
2	Substructure				1,064,000
3	Columns				554,000
4	Upper Floors				507,000
5	Staircases				187,000
6	Roof				3,373,000
7	External Walls				281,000
8	Windows				6,556,000
9	External Doors				10,000
10	Internal Walls				740,000
11	Internal Screens & Borrowed Lights				INCL.
12	Internal Doors				30,000
13	Wall Finishes				135,000
14	Floor Finishes				388,000
15	Ceiling Finishes				264,000
16	Fitments				120,000
17	Special Equipment				590,000
18	Hydraulic Services				370,000
19	Gas Services				EXCL.
20	Mechanical Services				2,549,000
21	Fire Protection				346,000
22	Electrical and Communication Services				2,006,000
23	Transportation Systems				120,000
24	Special Services				47,000
25	Builder's Work in Connection with Services				302,000
26	Pool and Spa				8,175,000
	Subtotal – Building Works				**28,714,000**
27	Site Preparation				562,000
28	Roads, Footpaths & Paved Areas				1,032,000
29	Boundary Walls, Fencing & Gates				EXCL.
30	Outbuildings & Covered Ways				233,000
31	Landscaping & Improvements				150,000
32	Special Provisions				2,956,000
	Subtotal – External Works				**1,977,000**
33	External Stormwater Drainage				640,000
34	External Sewer Drainage				50,000

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 2 (25 x 20 x 5m pool)					*(Continued)*
35	External Water Supply				30,000
36	External Gas				EXCL.
37	External Fire Protection				30,000
38	External Electric Light & Power				900,000
39	External Communications				EXCL.
	Subtotal – External Services				**1,650,000**
	Option 2 (25 x 20 x 5m pool)				**35,297,000**

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 3 (30 x 20 x 3.8m pool)					
1	Area Measurement				0
2	Substructure				1,216,000
3	Columns				294,000
4	Upper Floors				470,000
5	Staircases				116,000
6	Roof				3,962,000
7	External Walls				292,000
8	Windows				3,448,000
9	External Doors				10,000
10	Internal Walls				740,000
11	Internal Screens & Borrowed Lights				INCL.
12	Internal Doors				30,000
13	Wall Finishes				135,000
14	Floor Finishes				408,000
15	Ceiling Finishes				276,000
16	Fitments				120,000
17	Special Equipment				580,000
18	Hydraulic Services				390,000
19	Gas Services				EXCL.
20	Mechanical Services				2,209,000
21	Fire Protection				409,000
22	Electrical and Communication Services				2,153,000
23	Transportation Systems				120,000
24	Special Services				55,000
25	Builder's Work in Connection with Services				267,000
26	Pool and Spa				8,070,000
	Subtotal – Building Works				**25,770,000**
27	Site Preparation				547,000
28	Roads, Footpaths & Paved Areas				992,000
29	Boundary Walls, Fencing & Gates				EXCL.
30	Outbuildings & Covered Ways				233,000
31	Landscaping & Improvements				150,000
32	Special Provisions				3,190,000
	Subtotal – External Works				**5,112,000**
33	External Stormwater Drainage				640,000
34	External Sewer Drainage				50,000

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 3 (30 x 20 x 3.8m pool)					*(Continued)*
35	External Water Supply				30,000
36	External Gas				EXCL.
37	External Fire Protection				30,000
38	External Electric Light & Power				900,000
39	External Communications				EXCL.
	Subtotal – External Services				**1,650,000**
	Option 3 (30 x 20 x 3.8m pool)				**32,532,000**

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 4 (25 x 20 x 3.8m pool)					
1	Area Measurement				0
2	Substructure				1,010,000
3	Columns				254,000
4	Upper Floors				470,000
5	Staircases				116,000
6	Roof				3,323,000
7	External Walls				281,000
8	Windows				3,168,000
9	External Doors				10,000
10	Internal Walls				740,000
11	Internal Screens & Borrowed Lights				INCL.
12	Internal Doors				30,000
13	Wall Finishes				135,000
14	Floor Finishes				388,000
15	Ceiling Finishes				264,000
16	Fitments				120,000
17	Special Equipment				580,000
18	Hydraulic Services				380,000
19	Gas Services				EXCL.
20	Mechanical Services				1,994,000
21	Fire Protection				335,000
22	Electrical and Communication Services				1,984,000
23	Transportation Systems				120,000
24	Special Services				45,000
25	Builder's Work in Connection with Services				272,000
26	Pool and Spa				7,860,000
	Subtotal – Building Works				**23,879,000**
27	Site Preparation				521,000
28	Roads, Footpaths & Paved Areas				952,000
29	Boundary Walls, Fencing & Gates				EXCL.
30	Outbuildings & Covered Ways				233,000
31	Landscaping & Improvements				150,000
32	Special Provisions				2,709,000
	Subtotal – External Works				**4,565,000**
33	External Stormwater Drainage				640,000
34	External Sewer Drainage				50,000

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 4 (25 x 20 x 3.8m pool)					*(Continued)*
35	External Water Supply				30,000
36	External Gas				EXCL.
37	External Fire Protection				30,000
38	External Electric Light & Power				900,000
39	External Communications				EXCL.
	Subtotal – External Services				**1,650,000**
	Option 4 (25 x 20 x 3.8m pool)				**30,094,000**

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 5 (50 x 20 x 3.8m pool)					
1	Area Measurement				0
2	Substructure				1,541,000
3	Columns				361,000
4	Upper Floors				121,000
5	Staircases				57,000
6	Roof				4,600,000
7	External Walls				639,000
8	Windows				3,985,000
9	External Doors				30,000
10	Internal Walls				790,000
11	Internal Screens & Borrowed Lights				INCL.
12	Internal Doors				40,000
13	Wall Finishes				120,000
14	Floor Finishes				495,000
15	Ceiling Finishes				327,000
16	Fitments				120,000
17	Special Equipment				570,000
18	Hydraulic Services				390,000
19	Gas Services				EXCL.
20	Mechanical Services				2,769,000
21	Fire Protection				484,000
22	Electrical and Communication Services				2,430,000
23	Transportation Systems				NA.
24	Special Services				65,000
25	Builder's Work in Connection with Services				336,000
26	Pool and Spa				11,220,000
	Subtotal – Building Works				**31,490,000**
27	Site Preparation				727,000
28	Roads, Footpaths & Paved Areas				1,072,000
29	Boundary Walls, Fencing & Gates				EXCL.
30	Outbuildings & Covered Ways				240,000
31	Landscaping & Improvements				550,000
32	Special Provisions				3,806,000
	Subtotal – External Works				**6,395,000**
33	External Stormwater Drainage				640,000
34	External Sewer Drainage				50,000

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 5 (50 x 20 x 3.8m pool)					*(Continued)*
35	External Water Supply				30,000
36	External Gas				EXCL.
37	External Fire Protection				30,000
38	External Electric Light & Power				920,000
39	External Communications				EXCL.
	Subtotal – External Services				**1,670,000**
	Option 5 (50 x 20 x 3.8m pool)				**39,555,000**

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 5a (50 x 20 x 3.8m pool) No Dry Land Training Facility					
1	Area Measurement				0
2	Substructure				1,383,000
3	Columns				361,000
4	Upper Floors				121,000
5	Staircases				57,000
6	Roof				4,120,000
7	External Walls				639,000
8	Windows				3,861,000
9	External Doors				30,000
10	Internal Walls				460,000
11	Internal Screens & Borrowed Lights				INCL.
12	Internal Doors				20,000
13	Wall Finishes				70,000
14	Floor Finishes				416,000
15	Ceiling Finishes				267,000
16	Fitments				120,000
17	Special Equipment				470,000
18	Hydraulic Services				390,000
19	Gas Services				EXCL.
20	Mechanical Services				2,542,000
21	Fire Protection				424,000
22	Electrical and Communication Services				2,290,000
23	Transportation Systems				NA.
24	Special Services				57,000
25	Builder's Work in Connection with Services				309,000
26	Pool and Spa				11,220,000
	Subtotal – Building Works				**29,627,000**
27	Site Preparation				727,000
28	Roads, Footpaths & Paved Areas				1,072,000
29	Boundary Walls, Fencing & Gates				EXCL.
30	Outbuildings & Covered Ways				240,000
31	Landscaping & Improvements				570,000
32	Special Provisions				3,806,000
	Subtotal – External Works				**6,415,000**
33	External Stormwater Drainage				640,000
34	External Sewer Drainage				50,000

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 5a (50 x 20 x 3.8m pool) No Dry Land Training Facility					*(Continued)*
35	External Water Supply				30,000
36	External Gas				EXCL.
37	External Fire Protection				30,000
38	External Electric Light & Power				920,000
39	External Communications				EXCL.
	Subtotal – External Services				**1,670,000**
	Option 5a (50 x 20 x 3.8m pool) No Dry Land Training Facility				**37,712,000**

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 6 (25 x 20m pool with max 3.8m) + Moveable Floor					
1	Area Measurement				0
2	Substructure				929,000
3	Columns				250,000
4	Upper Floors				449,000
5	Staircases				87,000
6	Roof				3,323,000
7	External Walls				281,000
8	Windows				3,168,000
9	External Doors				10,000
10	Internal Walls				740,000
11	Internal Screens & Borrowed Lights				INCL.
12	Internal Doors				30,000
13	Wall Finishes				135,000
14	Floor Finishes				388,000
15	Ceiling Finishes				264,000
16	Fitments				120,000
17	Special Equipment				570,000
18	Hydraulic Services				390,000
19	Gas Services				EXCL.
20	Mechanical Services				2,252,000
21	Fire Protection				312,000
22	Electrical and Communication Services				1,986,000
23	Transportation Systems				120,000
24	Special Services				42,000
25	Builder's Work in Connection with Services				284,000
26	Pool and Spa				10,485,000
	Subtotal – Building Works				**26,615,000**
27	Site Preparation				521,000
28	Roads, Footpaths & Paved Areas				992,000
29	Boundary Walls, Fencing & Gates				EXCL.
30	Outbuildings & Covered Ways				233,000
31	Landscaping & Improvements				150,000
32	Special Provisions				2,709,000
	Subtotal – External Works				**1,896,000**
33	External Stormwater Drainage				640,000
34	External Sewer Drainage				50,000

Elemental Summary

WILDE AND WOOLLARD

Project: 1724 ACT Territory Owned Pools
Building: Stromlo Leisure Centre Dive Pool Extension – Reinforced Concrete Pool Shell with Tiles
Details: Stages 1a and 1b – Feasibility Study and Design Options 29 August 2024

Auto code	Description	Quantity	Unit	Rate	Total
Option 6 (25 x 20m pool with max 3.8m) + Moveable Floor					*(Continued)*
35	External Water Supply				30,000
36	External Gas				EXCL.
37	External Fire Protection				30,000
38	External Electric Light & Power				900,000
39	External Communications				EXCL.
	Subtotal – External Services				**1,650,000**
	Option 6 (25 x 20m pool with max 3.8m) + Moveable Floor				**32,870,000**

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ACT Territory Owned Pools

Stage 1a & 1b - Feasibility and Design Options - Asset Replacement Indicative Costs

Issue No. 1

Date: 21 October 2024

Prepared by:

Wilde and Woollard Consultants Pty Ltd
28 Eyre Street
KINGSTON ACT 2604

On behalf of:

CK Architecture (Australia) Pty Ltd
Unit 2, 24 Thesiger Court,
DEAKIN ACT 2600

Project: ACT Territory Owned Pools
Stage 1a & 1b - Feasibility and Design Options - Asset Replacement Indicative Costs - Issue: 1
Date: 21 October 2024

Document Issue Sheet

Issue No.	Document	Issue Date	Document Issued To	Prepared By	Checked By	Reviewed By
1	Asset Replacement Indicative Costs	21/10/2024	CK Architecture	schedule 2.2(a)(ii)		

Issue log	Comments
1	Asset Replacement Indicative Costs

Director Authorisation

Director Name and Qualifications: schedule 2.2(a)(ii)

Date 21/10/2024

1. This report is confidential and should not be distributed to any other recipients without approval from the Client.

2. This report is based upon project specific information provided to Wilde and Woollard and our opinion of general market conditions at the time of preparing this report. Any subsequent changes may result in significant cost impacts.

3. Quantities and rates identified in this report are indicative only and are for the purpose of estimating the cost. They are not to be used for any other purpose.

Project: ACT Territory Owned Pools
Stage 1a & 1b - Feasibility and Design Options - Asset Replacement Indicative Costs - Issue: 1
Date: 21 October 2024

Contents

1.0 - Executive Summary

1.1 Purpose

The following report has been prepared for CK Architecture to compare facility asset replacement costs for the proposed dive pool at Stromlo over a 20 year study period.

This report is to be read in conjunction with the Wilde and Woollard Capital Cost Report dated 29 August 2024.

1.2 Options Analysed

The scope of works proposed have been split into the following construction types.

Table 1.2.1 Construction Types

Project Option	
Type 1:	Reinforced Concrete Pool Shell with Tiles
Type 2:	Precast Wall System with Modular Shell

Of the above construction types, the following facility options have been proposed.

Table 1.2.3 Project Options

Project Option	
Option 1:	Extension for 30 x 20 x 5m dive pool including 10m platform
Option 2:	Extension for 25 x 20 x 5m dive pool including 10m platform
Option 3:	Extension for 30 x 20 x 3.8m dive pool including 5m platform
Option 4:	Extension for 25 x 20 x 3.8m dive pool including 5m platform
Option 5:	Extension for 50 x 20 x 3.8m dive pool including 3m platform
Option 5a:	Extension for 50 x 20 x 3.8m dive pool including 3m platform (No Dryland Training Facility)
Option 6:	Extension for 25 x 20 x 3.8m dive pool including 3m platform and moveable floor

1.3 Key Assumptions and Methodology

- The analysis has been limited to only the asset replacement costs of the proposed facility. **All other operating and maintenance expenditure are identified by others**.
- For the purposes of this report, all costs identified have been priced in 2024/25 dollars pending confirmation of construction program.
- All costs identified have been calculated as an averaged and annualised cost over the 20-year study period.

2.0 - Cost Summary

2.1 Cost Summary - Construction Type 1 - Reinforced Concrete Pool Shell with Tiles

The following table summarises the asset replacement costs associated with each option as an averaged and annualised cost.

All costs identified are priced at 2024/25 prices and excludes GST.

Table 2.1 - Cost Summary - Construction Type 1 - Reinforced Concrete Pool Shell with Tiles

Project Option		Averaged Annualised Cost
Option 1:	Extension for 30 x 20 x 5m dive pool including 10m platform	$ 626,515
Option 2:	Extension for 25 x 20 x 5m dive pool including 10m platform	$ 583,578
Option 3:	Extension for 30 x 20 x 3.8m dive pool including 5m platform	$ 566,203
Option 4:	Extension for 25 x 20 x 3.8m dive pool including 5m platform	$ 536,078
Option 5:	Extension for 50 x 20 x 3.8m dive pool including 3m platform	$ 663,388
Option 5a:	Extension for 50 x 20 x 3.8m dive pool including 3m platform (No Dryland Training Facility)	$ 612,075
Option 6:	Extension for 25 x 20 x 3.8m dive pool including 3m platform and moveable floor	$ 686,390

2.0 - Cost Summary

2.2 Cost Summary - Construction Type 2 - Precast Wall System with Modular Shell

The following table summarises the asset replacement costs associated with each option as an averaged and annualised cost.

All costs identified are priced at 2024/25 prices and excludes GST.

Table 2.2 - Cost Summary - Construction Type 2 - Precast Wall System with Modular Shell

Project Option		Averaged Annualised Cost
Option 1:	Extension for 30 x 20 x 5m dive pool including 10m platform	$ 681,203
Option 2:	Extension for 25 x 20 x 5m dive pool including 10m platform	$ 631,890
Option 3:	Extension for 30 x 20 x 3.8m dive pool including 5m platform	$ 611,453
Option 4:	Extension for 25 x 20 x 3.8m dive pool including 5m platform	$ 576,015
Option 5:	Extension for 50 x 20 x 3.8m dive pool including 3m platform	$ 730,888
Option 5a:	Extension for 50 x 20 x 3.8m dive pool including 3m platform (No Dryland Training Facility)	$ 679,575
Option 6:	Extension for 25 x 20 x 3.8m dive pool including 3m platform and moveable floor	$ 726,265