APPENDIX H

QUEANBEYAN – PALERANG REGIONAL SPORTS COMPLEX

SERVICES INFRASTRUCTURE REPORT

Document No: LCE18241-001d

Prepared for:	Oxigen – James Hayter
Project No:	LCE18241-001
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CONTENTS

1 EXECUTIVE SUMMARY

The extract below summarises recommended engineering solutions for the incoming services for the proposed Queanbeyan-Palerang Regional Sports Complex (QPRSC). For detailed information regarding the alternative options and reasons behind the decisions, refer to the detailed content within this report.

Water Supply Establishment of a new 80mm potable cold-water supply connection to the site. New potable water distribution infrastructure is to reticulate in-ground within new Sports Pavilion's and Basketball Stadium via access roadway, extending from existing infrastructure provided at the site boundary.

Recycled/Rainwater Establishment of a new recycled water supply connection where available installed by others under a separate infrastructure engagement. The use of recycled water on turf fields is limited and may only be used below ground as a drip irrigation system on playing fields with approval. The use of rainwater harvesting and reuse on site is an option, however, requires large underground storage tanks to facilitate the water demand as indicated by civil services.

Fire Water Establishment of a new 150mm dedicated fire services supply connection to the site. New fire services supply infrastructure is to reticulate in-ground adjacent new Basketball Stadium and Major Sports Pavilion via access roadway, extending from existing infrastructure provided at the site boundary. The new fire services supply infrastructure will supply external double headed fire hydrants located adjacent the Basketball Stadium and Major Sports Pavilion to provide hydrant coverage.

Wastewater (sewer) Connection to new gravity sewer form industrial estate traversing the carpark area east to west to serve the Sports Pavilion's and Basketball Stadium where sufficient depth is available shall extend to an onsite sewer pump station. The onsite inground sewer pump station shall pump wastewater for connection to the authority sewer system.

Gas New reticulated gas system extending from North Tralee road is proposed to serve new gas-fired appliances and equipment within the Sports Pavilions and Basketball Stadium. Where natural gas connection is not provided a LP gas reticulation system shall be adopted.

Power Supply New pad mounted transformer to be located on site and to be coordinated with Council and Essential Energy.

Overhead Power Existing overhead power lines along Territory Parade to be retained. It is understood that these are to be well clear of proposed lighting towers and pole infrastructure.

Communications New NBNCo fibre optic incoming cable being negotiated by Council

2 INTRODUCTION

Lucid Consulting have been requested by Oxigen Landscape Architects to carry out an investigation of existing authority infrastructure surrounding the proposed QPRSC to determine its suitability for use at the proposed development.

The scope of works covered by this report is as follows:

- Identification of the type and existing infrastructure surrounding the site.
- Undertake an assessment of likely demand of required works with respect to the capacity of the existing infrastructure to determine the scope of works and necessary upgrades / extensions.

Information contained within this report has been sourced from the following locations:

- Dial Before You Dig (DBYD) information (21 November 2019).
- Project drawings received 20th November 2019.

This report has been written in the context that the services infrastructure will be required to be operational by January 2022.

3 HYDRAULIC SERVICES

3.1 WATER SUPPLY

3.1.1 EXISTING

The new Queanbeyan-Palerang Regional Sports Complex is to be constructed on land originally proposed as a golf course and previously conducted motor sports events. The primary greenfield site is adjacent to North Trallee Road where new infrastructure is to be proposed to be extended to the site as part of the new area development.

We are not aware of an existing water supply currently serving the development. There are existing water supplies located within the vicinity however are on the western side of North Tralee road across the border within the ACT. We are of the understanding that crossing borders may not be permitted.

Representatives of the NSW Government Public Works Advisory have indicated intent to extend new authority cold water ring main pipework through the new carpark zone of the sports complex to serve new facilities. These systems are to be designed and constructed by others and do not form part of this report.

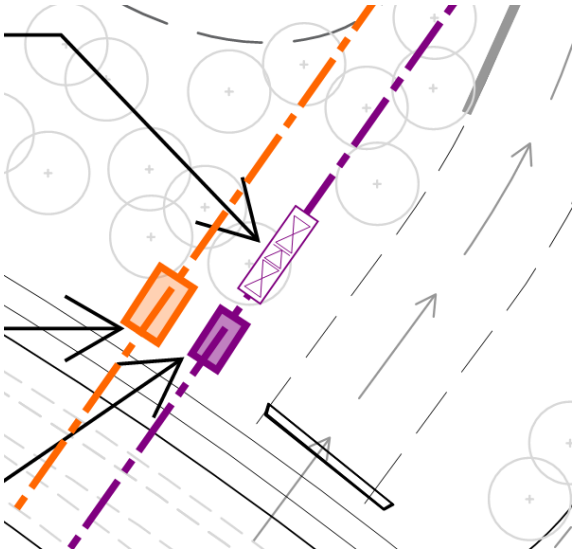
3.1.2 PROPOSED

It is proposed that a new 100mm potable water main is extended approximately in-ground along a new access roadway extending from the intersection of North Trallee road to the front entrance of the Sports complex pending final calculations undertaken as part of future stages of precinct design.

At the time of writing this report, a proposed construction programme for the new roadway is yet to be confirmed, however it is anticipated that establishment of new water supply infrastructure is able to be completed with sufficient timing to serve the QPRSC.

It is not currently proposed to oversize new site water connection to serve the possible future aquatic centre swimming pools and associated infrastructure identified by the QPRSC Master Plan. A dedicated water connection for the aquatic centre is recommended due to the main complex considering a separate water harvesting system.

New cold water infrastructure systems shall be installed within Stage 1 and carpark areas in the first instance. New cold water supplies to serve Stage 2 facilities (Basketball Stadium and [Northern] Minor Sporting Pavilion) will be extended from services take-offs installed under Stage 1 works.



Queanbeyan-Palerang Regional Sports Complex Proposed Water Meter Connection (shown purple).

3.2 RECYCLED/RAINWATER WATER SUPPLY

3.2.1 EXISTING

At the time of writing this report, we are unaware of an existing recycled water supply serving the site.

3.2.2 PROPOSED

Establishment of a new recycled water supply connection to the site where available shall be installed by others under separate infrastructure engagement. Dial before you dig information does not indicate a supply in the area of the site.

It is anticipated that should new recycled water infrastructure be installed under development works (works done by others) then this new system will be available for connection to the sports complex site to serve new irrigation infrastructure. Note the recycled water system would supply a below ground drip irrigation system type and separate from an above-ground irrigation system utilising potable and rainwater. In the case that above-ground irrigation systems are to be utilised, the use of an authority recycled water supply may not be appropriate (due to risks associated with airborne pollutants).

Underground storage tanks for rainwater harvesting and reuse is viable, however the available roof catchment area required to supply the playing fields year-round inadequate. The proposed onsite underground storage tanks and pumps are required to provide water for above ground irrigation systems. A potable back up supply is required to supplement the water demand used for irrigation during times of low rainfall to ensure reliable year-round water supply to the turf. It is not proposed to size new connections to potable water infrastructure to provide for irrigation of sports fields and landscaping areas. In addition to rainwater harvesting a water treatment system is required to remove debris and disinfect the water supply prior to discharge onto playing fields.

Final size of connection, flow rate and pressure characteristics and water quality requirements associated with irrigation water supplies are yet to be confirmed in coordination with project landscape/irrigation design representatives. Design of new rainwater harvesting water supply will involve provision of onsite storage tanks (tank farm) pumps and treatment facility.

3.3 FIRE WATER SUPPLY

3.3.1 EXISTING

The new Queanbeyan-Palerang Regional Sports Complex is to be constructed on a primary brownfield site located adjacent to Territory Parade where new infrastructure is to be proposed to be extended to the site as part of the new area development.

We are not aware of an existing fire services supplies currently serving the development. There are existing water supplies located within the vicinity however are on the western side of Territory Parade across the border within the ACT.

We are of the understanding that crossing borders may not be permitted.

Representatives of the NSW Government Public Works Advisory have indicated intent to extend new authority cold water ring main pipework through the new carpark zone of the sports complex to serve new facilities. These systems are to be designed and constructed by others and do not form part of this report.

3.3.2 PROPOSED FIRE SERVICES INFRASTRUCTURE

It is proposed that a new 150mm dedicated fire services main is extended approximately in-ground along a new access roadway extending from the intersection of Territory Parade.

The new 150mm dedicated fire services main will supply external fire hydrants located adjacent the new Basketball stadium, Major Sports Pavilion, Minor Sports Pavilions and Maintenance Shed which have been identified as required to be provided with Fire Hydrant protection in accordance with *Building Code of Australia 2019 (*BCA*) – Section E1.3*.

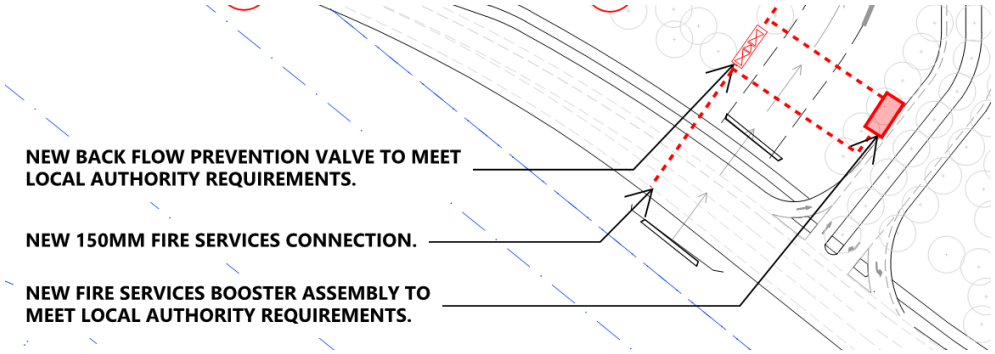
New in-ground pipework will run parallel to other services infrastructure within common services trenching where possible.

At the time of writing this report, a proposed construction programme for the new roadway is yet to be confirmed, however it is anticipated that establishment of new fire services supply infrastructure is able to be completed with sufficient timing to serve the QPRSC.

New fire services infrastructure systems shall be installed within Stage 1 and carpark areas in the first instance. New fire services infrastructure to serve Stage 2 facilities (Basketball Stadium and [Northern] Minor Sporting Pavilion) will be extended from services take-offs installed under Stage 1 works.

It is assumed adequate flow and pressures will be available from the new fire services supply infrastructure to service the required fire hydrant systems on site. If adequate flows and pressures are not available new dedicated fire services infrastructure (Pumpsets, tanks, etc) will be required to be provided.

Section 3.3.2.1 and *Section 3.3.2.2* detail the estiamted high level fire hdyrant demand for Building 2 (Basketball Stadium + Gym) and Budling 4 (Major Sports Paviliion) respecivley.



Queanbeyan-Palerang Regional Sports Complex Proposed Dedicated Fire Services Connection.

3.3.2.1 BASKETBALL STADIUM – FIRE HYDRANT DEMAND

The Basketball Stadium has been identified as requiring Fire Hydrant protection in accordance with BCA 2019 – *Section E1.3*.

Fire hydrant systems are required to be installed in accordance with Australian Standard 2419.1 (2005) – *Fire hydrant installations – Part 1: System design, installation and commissioning* (AS 2419.1) which dictates the flow and pressure requirements dependent on the number of storeys, floor area of the building's fire compartments and the classification of the building, as detailed in *AS2419.1 – Table 2.1*.

Based upon preliminary site plans, estimated fire hydrant demand for the Basketball Stadium are summarised as follows:

Characteristic	Assumed Value
Total Floor Area (m^2)	4,620 m^2
No. of stories	2
Building Classification (BCA)	Class 9b
No. of Fire Hydrant outlets required to flow simultaneously (*AS2419.1 – Table 2.1*)	2
Flow and Pressure Requirements at Fire Hydrant outlet (*AS2419.1 – Table 2.2*)	20 L/s @ 150 kPa

***Table 1** – Basketball Stadium characteristics and Fire Hydrant Requirements*

It is assumed the flow and pressure requirements above (20 L/s @ 150 kPa at hydrant outlet) will be available from the new fire services supply infrastructure. If these flow and pressure requirements cannot be achieved new dedicated fire services infrastructure (Pumpsets, tanks, etc) will be required to be provided.

3.3.2.2 MAJOR SPORTS PAVILION – FIRE HYDRANT DEMAND

The Major Sports Pavilion has been identified as requiring Fire Hydrant protection in accordance with BCA 2019 – *Section E1.3*.

Fire hydrant systems are required to be installed in accordance with AS2419.1 which dictates the flow and pressure requirements dependent on the number of storeys, floor area of the building's fire compartments and the classification of the building, as detailed in *AS2419.1 – Table 2.1*.

Based upon preliminary site plans, estimated fire hydrant demand for the Major Sports Pavilion are summarised as follows:

Characteristic	Assumed Value
Total Floor Area (m^2)	1,255 m^2
No. of stories	1
Building Classification (BCA)	Class 9b
No. of Fire Hydrant outlets required to flow simultaneously (*AS2419.1 – Table 2.1*)	2
Flow and Pressure Requirements at Fire Hydrant outlet (*AS2419.1 – Table 2.2*)	20 L/s @ 150 kPa

***Table 2** – Major Sports Pavilion characteristics and Fire Hydrant Requirements*

It is assumed the flow and pressure requirements above (20 L/s @ 150 kPa at hydrant outlet) will be available from the new fire services supply infrastructure. If these flow and pressure requirements cannot be achieved new dedicated fire services infrastructure (Pumpsets, tanks, etc) will be required to be provided.

3.3.2.3 MINOR SPORTS PAVILIONS – FIRE HYDRANT DEMAND

The Minor Sports Pavilions have been identified as requiring Fire Hydrant protection in accordance with BCA 2019 – *Section E1.3*.

Fire hydrant systems are required to be installed in accordance with AS2419.1 which dictates the flow and pressure requirements dependent on the number of storeys, floor area of the building's fire compartments and the classification of the building, as detailed in *AS2419.1 – Table 2.1*.

Based upon preliminary site plans, estimated fire hydrant demand for the Minor Sports Pavilions are summarised as follows:

Characteristic	Assumed Value
Total Floor Area (m^2)	720 m^2
No. of stories	1
Building Classification (BCA)	Class 9b
No. of Fire Hydrant outlets required to flow simultaneously (*AS2419.1 – Table 2.1*)	1
Flow and Pressure Requirements at Fire Hydrant outlet (*AS2419.1 – Table 2.2*)	10 L/s @ 150 kPa

***Table 3** – Minor Sports Pavilion characteristics and Fire Hydrant Requirements*

It is assumed the flow and pressure requirements above (10 L/s @ 150 kPa at hydrant outlet) will be available from the new fire services supply infrastructure. If these flow and pressure requirements cannot be achieved new dedicated fire services infrastructure (Pumpsets, tanks, etc) will be required to be provided.

3.4 WASTEWATER SERVICES

3.4.1 EXISTING

The new Queanbeyan-Palerang Regional Sports Complex is to be constructed on a brownfield site adjacent North Tralee road.

There is existing sewer infrastructure located within the vicinity however is on the western side of North Tralee road across the border within the ACT.

We are of the understanding that crossing borders may not be permitted.

3.4.2 PROPOSED

The proposed site is adjacent a proposed housing development where we are of the understanding new wastewater services shall be extended to service the new development.

At the time of writing this report, a proposed construction programme for new Sports Complex access roadway is yet to be confirmed, however it is anticipated that the establishment of new sewer infrastructure reticulating within Northern Access Road could be completed with sufficient timing to serve the new Sports Complex and traverse acres the carpark east to west.

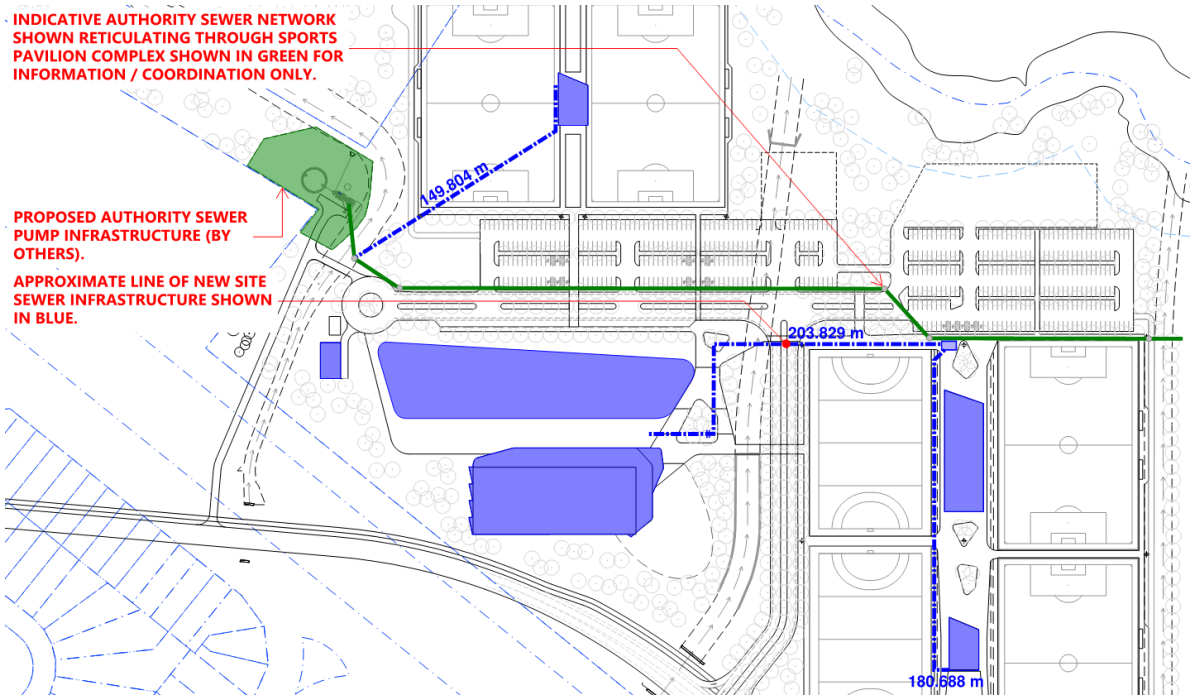
Based on correspondence and documentation received from NSW Government Public Works Advisory representatives, it is understood that new authority sewer infrastructure (comprising authority sewer pipework

and pump station) is to be installed to reticulate across new Sports complex carparking. These systems are to be designed and constructed by others and do not form part of this report.

Based on an interpretation of current Architectural design documentation, it is anticipated that a majority of wastewater fixtures and tapware will be located within the Pavilion buildings and Basketball Stadium. It is proposed that a gravity wastewater network shall extend from new authority sewer infrastructure (reticulating through the sports complex carpark) to serve new buildings. Based on currently proposed depths of new sewer infrastructure, it is proposed to provide a new sewer pump station for receipt of sewer discharge from the new Basketball Stadium, Major Sports Pavilion and Minor Sports Pavilion.

New site sewer infrastructure pipework shall be installed within Stage 1 and carpark areas in the first instance. New sewer systems to serve new Basketball Stadium will be extended from services take-offs installed under Stage 1 works. New sewer systems to serve new Northern Minor Sporting Pavilion will extend from a new connection to authority sewer infrastructure (adjacent new authority sewer pump station).

It is not currently proposed to oversize new site wastewater sewer pump station to serve the possible future aquatic centre swimming pools and associated infrastructure identified by the QPRSC Master Plan. There is opportunity to review the system capacity prior to installation should proposed building demands and flows be made available for review.



Queanbeyan-Palerang Regional Sports Complex Proposed Sewer Connection.

3.5 GAS SERVICES

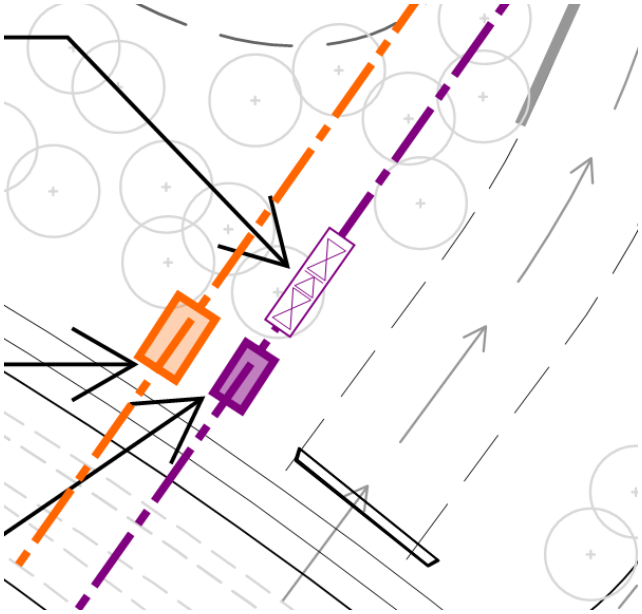
3.5.1 EXISTING

Information obtained for dial before you dig enquires indicated natural gas infrastructure within the vicinity is unavailable. It is understood that a new gas main will be present within the North Tralee Road and appropriate for connection into our site.

3.5.2 PROPOSED

A new connection point via above ground gas meter enclosure is proposed to be provided at the entrance location at North Tralee Road. This connection is to be via the newly established infrastructure of the surrounding industrial development.

Gas sizing is to be undertaken within future stages of design once the total load is accurately understood with finalisation of new building arrangements and internal fitout details.



Queanbeyan-Palerang Regional Sports Complex Proposed Gas Meter Connection (shown orange).

4 ELECTRICAL SERVICES

4.1 ELECTRICAL INFRASTRUCTURE

4.1.1 EXISTING

According to Dial before you dig information there does not appear to be any existing underground electrical services assets owned and operated by Essential Energy who are the local electrical supply authority in the region.

The development to the west of the proposed site appears to be of a commercial/industrial classification and is expected to contain existing infrastructure. As can be seen in google street view images existing high voltage overhead infrastructure is present.

View looking northeast along Territory Rd.

4.1.2 PROPOSED ELECTRICAL INFRASTRUCTURE

It is understood that Village Building is actively planning a new residential subdivision directly adjacent the proposed Sports Complex location to the south. As part of this development they will be extending a new high voltage service along the proposed Northern Access Road.

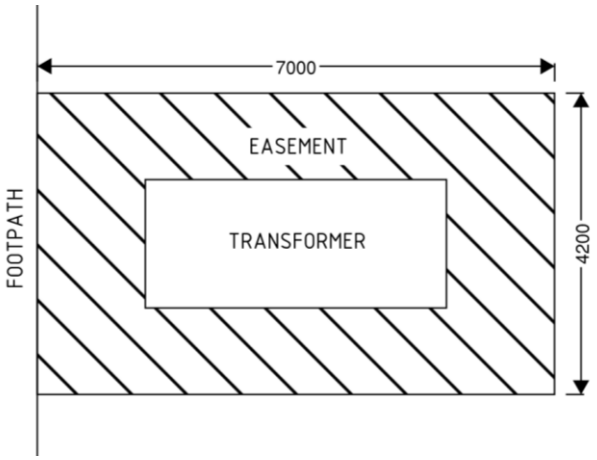
The Sports Complex will require a new pad mounted substation to enable electrical services connections for the site. Based upon preliminary site plans, estimated electrical demand for development is summarised on the following page.

	Lighting (Amps A/Ø))	General Power (Amps (A/Ø))	Mechanical Loads (Amps (A/Ø))
Soccer Pitches (S1, S2, S3, S4)	340	15 (Allow 10A single phase per pitch)	NA
Hockey Field (H1, H2)	150	10 (Allow 10A single phase per pitch)	NA
Indoor Basketball Courts	20	Included Below	NA
Local Roadways and Pathways	2	NA	NA
Carparks	4	NA	NA
Basketball Stadium	80	160	280
Major Sports Pavilion	30	60	150
Minor Sports Pavilion	8	20	TBA
Total	**634**	**265**	**430**
Total (kVA)	**438**	**183**	**297**

TOTAL PRELIMINARY SITE ESTIMATED MAXIMUM DEMAND (kVA)	**918**

To support a load of this size, it is expected that at a 1500kVA pad mounted substation will be required from Essential Energy. The above electrical demand is to be revised as the project progresses.

The spatial requirements for the substation are given below:



External Pad Mounted Substation

It is proposed that high voltage cabling is to reticulate into the site from the Northern Access Road, north up the main boulevard to a location central for the site transformer. The transformer is ideally to be located centrally to accommodate the electrical load, reduce excessive amounts of submain cabling trenching and sizing requirements.

In addition to the transformer a new site main switchboard will need to be located adjacent the transformer to supply the site. Several smaller distribution boards are proposed to be provided throughout the site and supplied via underground submains. These will service the clubrooms, sports lighting towers, general lighting to carparks and pathways.

It is proposed services reticulate in common trenches with the appropriate clearances to minimise overall trenching to the site. The main common trench will most likely be through the main entrance road of the facility.

4.1.3 PROPOSED LIGHTING SYSTEMS

Sports lighting levels are to be provided to the site with the following illumination levels for each pitch as follows:

Zone	Illumination Level	Uniformities
Hockey Pitch 1 & Soccer Pitch 3	1000 Lux Horizontal	U_1: 0.6 and U_2: 0.4 (AS2560.2.3)
Hockey Pitch 2 & Soccer Pitch 4	500 Lux Horizontal	U_1: 0.6 and U_2: 0.4 (AS2560.2.3)
Soccer Pitches 5 & 6	200 Lux Horizontal	U_1: 0.6 and U_2: 0.4 (AS2560.2.3)
Multi Sports Fields	200 Lux Horizontal	U_1: 0.6 and U_2: 0.4 (AS2560.2.3)
Indoor Basketball Courts	350 lux	0.5
Local Roadways and Pathways	P4	AS1158
Carparks	P11c and P12	AS1158

The soccer pitches and multi-sports field lighting levels have been specified as per the requirements defined by the Queanbeyan-Palerang Regional Council.

The criteria used to define the AS1158 local roadways, pathways and carpark lighting subcategory selections have been explained below.

The P4 lighting subcategory was selected for local roadways and pedestrian pathways based on the following factors:

- We predict that there will be a low level of pedestrian activity between the carpark and the pedestrian pathways and crossings.
- We predict there to be a low risk of crime in this area.

The P11c lighting subcategory was selected for local carparks based on the following factors:

- We predict this to be an area of low night-time vehicle or pedestrian movements.
- We predict there to be a low risk of crime in this area.
- We predict <25% night-time occupancy rates.
- P12 lighting compliance will be required in locations where there are to be disabled carparks.

All indoor and outdoor lighting infrastructure is to utilise LED technology throughout the site.

Each lighting tower is to be provided with a local associated lighting tower distribution board to accommodate the following infrastructure:

- Electrical distribution.
- Event power outlets.
- Lighting control gear.
- Cbus/DALI lighting control gear.
- Fibre and communications cabling infrastructure for lighting control system.
- Power Monitoring Units (PMU's)
- Local control switches for override control.
- Fans for active cooling of equipment.

4.2 COMMUNICATION INFRASTRUCTURE

4.2.1 EXISTING

At present there are no communications services to the site or reticulating along the surrounding roads.

4.2.2 PROPOSED

As with the electrical infrastructure Village developers will be responsible for reticulation of new NBNCo services along the Northern Access Road

It is understood that the Council is currently in negotiations to provide a new optical fibre connection to the facility. This optical fibre would serve as a lead in service for telephony and communications services.

The connection is to be via incoming conduits and reticulate to the communications room located at the central changing room building. It is proposed that the carrier fibre termination equipment will be housed in this room.

The communications room will also be provided with a full-size communications rack to accommodate network switches, patch panels for general communications outlets and specialty services such as lighting control and CCTV systems.

Active equipment is to be supplied by the council, and the infrastructure requirements coordinated with council to ensure the compatibility of these items.

5 MECHANICAL SERVICES

BASKETBALL STADIUM

There are 4 basketball courts located within the proposed Basketball Stadium building which require air conditioning. From a high-level evaporative cooling is an ideal form of cooling for this type of space due to its low cost, and effectiveness at higher supply air flow rates. The below table has several figures/assumptions which were used to complete a high-level estimation of the required evaporative cooling.

Assumption	Figure	Assumption	Figure
Basketball Stadium floor area	5000 m2	External Conditions (from AIRAH)	31.1oC(DB)/22.7oC (WB)
Basketball Stadium area (cooling area)	3500m2	Energy Consumption for Evaporative Cooling	0.6kW per 1000L/s
Heat Load (High-level check)	200W/m2	Basketball Area Height	8m
Internal room temperature (assumed worst-case)	26oC	Evaporative Cooling Efficiency (Typical)	90%

From these assumptions it was calculated that approximately 700kW of cooling was required for comfort cooling. Based on the design temperatures these would equate to a flowrate of 190,000 L/s which for this space is 25 Air Changes per Hour (ACH). This ACH value is typical for evaporative cooling. Taking a typical unit for large applications (Bonnaire C series), it would require 10 units to achieve this flow rate. These units would be typically be spread across the roof and can be centralised to minimise when they can be seen from the ground. Using the typical electrical data, this cooling system would require 150kW of input power at 280 Amps (3-phase).

This does not include the other portion of the Basketball Stadium building, as the exact application was unknown. Evaporative cooling can be extended to also supply this area or a separate cooling system (such as wall-mounted split units) could be used.

MAJOR SPORTS PAVILION

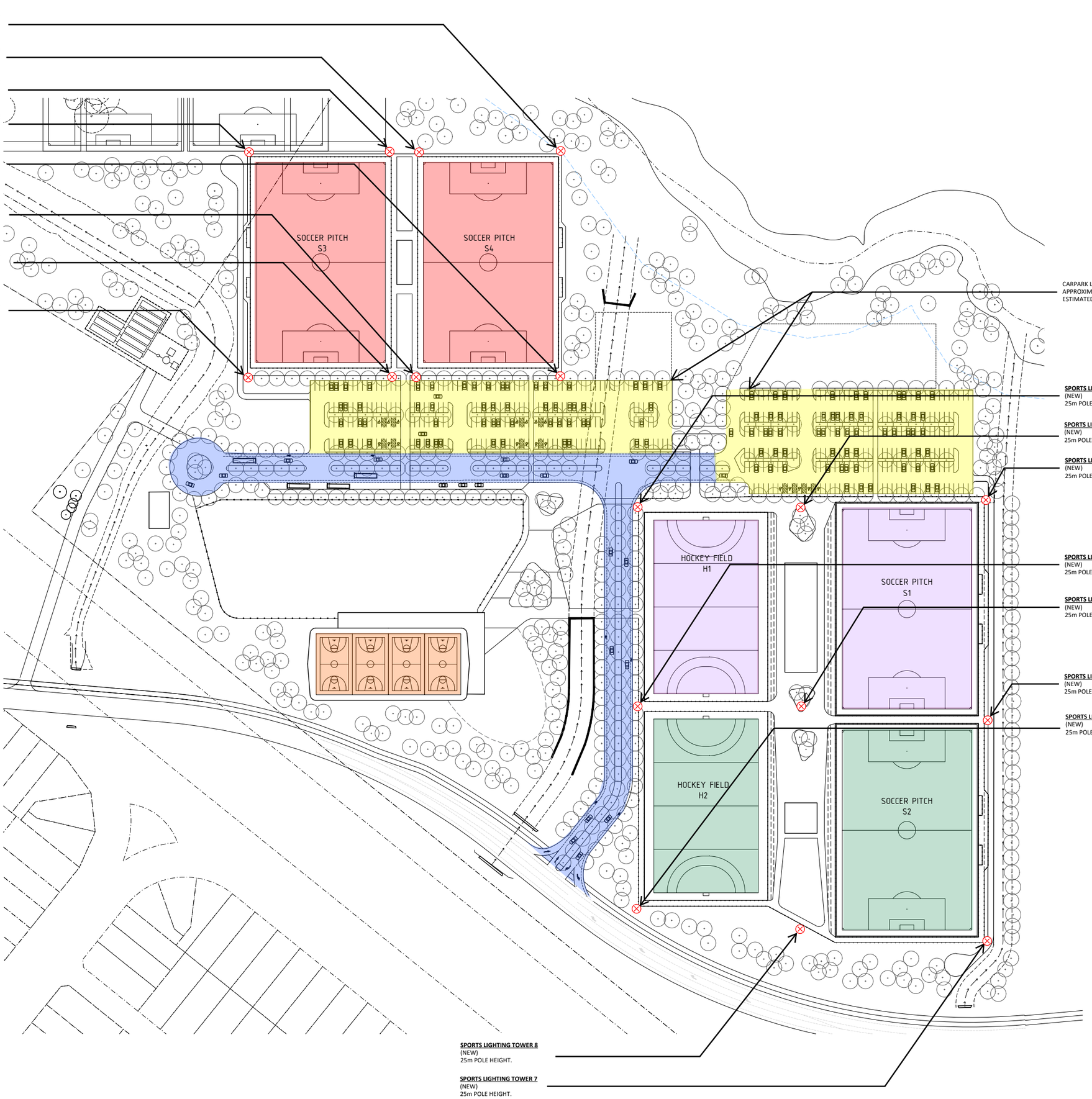
It is assumed that this is a closed building, with no large openings such as a viewing area. With this assumption a package unit would be best suited to provide outside air and cooling to the space. A package unit also has an advantage in that it can be floor or roof mounted depending upon on the requirements of the pavilion. As a high-level calculation 2, 50kW package units would be sufficient to serve the pavilion.

These units would be relatively large, with a floor area of 2x2m, but can be floor or roof mounted depending upon on the requirements of the pavilion.

MINOR SPORTS PAVILIONS

These buildings are assumed to comprise of toilets, shower and changerooms. Only exhaust ventilation would then be required for this space, which would be sized based on the amount of toilets and showers present within the pavilion.

APPENDIX A – SERVICES SKETCHES



SPORTS LIGHTING TOWER 10
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 11
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 12
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 13
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 17
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 16
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 15
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 14
(NEW)
25m POLE HEIGHT.

Scale
1:1000 (A1), 1:2000 (A3)
0 10 25 50m

N

LEGEND OF SYMBOLS

25m SPORTS LIGHTING TOWER

LIGHTING CATEGORIES LEGEND

- SPORTS PITCHES / FIELDS TO BE ILLUMINATED TO AN AVERAGE HORIZONTAL LUMINANCE OF 1000 LUX.
- SPORTS PITCHES / FIELDS TO BE ILLUMINATED TO AN AVERAGE HORIZONTAL LUMINANCE OF 500 LUX.
- SPORTS PITCHES / FIELDS TO BE ILLUMINATED TO AN AVERAGE HORIZONTAL LUMINANCE OF 200 LUX.
- BASKETBALL COURTS TO BE ILLUMINATED TO AN AVERAGE HORIZONTAL LUMINANCE OF 350 LUX.
- CARPARKS TO BE ILLUMINATED TO P11c AND P12 LIGHTING CATEGORIES.
- ROADWAYS AND PATHWAYS TO BE ILLUMINATED TO P4 LIGHTING CATEGORY.

CARPARK LUMINARIES PROPOSED TO BE MOUNTED ON 6m POLES.
APPROXIMATE SPACINGS OF 34m BETWEEN POLES.
ESTIMATED TOTAL OF 51 LUMINARIES.

SPORTS LIGHTING TOWER 3
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 2
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 1
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 4
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 5
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 6
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 9
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 8
(NEW)
25m POLE HEIGHT.

SPORTS LIGHTING TOWER 7
(NEW)
25m POLE HEIGHT.

oxigen

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Project
Queanbeyan-Palerang Regional Sports Complex

Client
Queanbeyan-Palerang Regional Council

Lead
Oxigen

Architecture
Greenway Architects

Civil, Traffic, Stormwater + Structural Engineering
TTW

Services Engineering
Lucid

Cost Planning
RLB

Drawing Title
LIGHTING CONCEPT DESIGN - SITE PLAN

Date
28.05.2020

Project number
15.028

Drawing number
LCE18241-ESK-001

Revision
C

Plot File Created: May 26, 2020

LEGEND OF SYMBOLS

- INDICATIVE SEWER PUMP STATION INFRASTRUCTURE
- INDICATIVE NATURAL GAS METER/REGULATOR
- INDICATIVE WATER METER INFRASTRUCTURE
- INDICATIVE DRINKABLE COLD WATER PIPEWORK
- INDICATIVE SEWER PIPEWORK
- INDICATIVE NATURAL GAS PIPEWORK
- INDICATIVE BACK FLOW PREVENTION VALVE

NOTE: ALL PIPEWORK AND PLANT / EQUIPMENT LOCATIONS ARE INDICATIVE ONLY.

STAGE 2:
PROPOSED MINOR SPORTS PAVILION.

NEW SEWER INFRASTRUCTURE PIPEWORK CONSTRUCTED UNDER STAGE 2 WORKS TO SERVE NEW MINOR SPORTS PAVILION.

PROPOSED AUTHORITY SEWER PUMP INFRASTRUCTURE (BY OTHERS).

SITE SEWER PIPEWORK INSTALLED UNDER STAGE 1 WORKS TO SERVE NEW BASKETBALL STADIUM BUILDING (CONSTRUCTED UNDER STAGE 2 WORKS).

STAGE 1:
PROPOSED MAINTENANCE SHED.

APPROXIMATE LINE OF PROPOSED SITE SEWER, DRINKABLE COLD WATER AND NATURAL GAS PIPEWORK IN-GROUND TO SERVE BASKETBALL STADIUM BUILDING.

STAGE 2:
PROPOSED BASKETBALL STADIUM + GYM.

APPROXIMATE LOCATION OF PROPOSED DRINKABLE COLD WATER BACKFLOW PREVENTION ASSEMBLY.

APPROXIMATE LOCATION OF PROPOSED SITE NATURAL GAS AUTHORITY METER AND REGULATOR ASSEMBLY.

APPROXIMATE LOCATION OF PROPOSED SITE DRINKABLE COLD WATER METER.

SITE SERVICES TAKE-OFFS (COLD WATER AND NATURAL GAS PIPEWORK) FOR EXTENSION TO SERVE NEW MINOR SPORTS PAVILION (CONSTRUCTED UNDER STAGE 2 WORKS).

INDICATIVE LOCATION / FOOTPRINT OF FUTURE BUILDING SHOWN FOR COORDINATION OF SERVICES PATHWAYS ONLY.

INDICATIVE AUTHORITY SEWER NETWORK SHOWN RETICULATING THROUGH SPORTS PAVILION COMPLEX SHOWN FOR INFORMATION / COORDINATION ONLY.

PROPOSED SITE SEWER PUMP STATION TO SERVE MAJOR SPORTS PAVILLION, MINOR SPORTS PAVILION AND BASKETBALL STADIUM BUILDING. NEW SITE SEWER PUMP STATION TO DISCHARGE TO NEW AUTHORITY SEWER NETWORK RETICULATING THROUGH SPORTS PRECINCT.

REQUIREMENT FOR SITE SEWER PUMPSTATION MAY BE AVOIDED IN FUTURE STAGES OF DESIGN VIA LOWERING OF AUTHORITY SEWER NETWORK PIPEWORK OR RISING OF BASKETBALL PAVILION RL.

SITE SERVICES TAKE-OFFS (SITE SEWER, COLD WATER AND NATURAL GAS PIPEWORK) FOR EXTENSION TO SERVE NEW BASKETBALL STADIUM BUILDING (CONSTRUCTED UNDER STAGE 2 WORKS).

STAGE 1:
PROPOSED MAJOR SPORTS PAVILLION.

APPROXIMATE LINE OF PROPOSED DRINKABLE COLD WATER AND NATURAL GAS PIPEWORK IN-GROUND TO SERVE NEW MAJOR PAVILION AND MINOR PAVILION BUILDINGS (CONSTRUCTED UNDER STAGE 1 WORKS).

STAGE 1:
PROPOSED MINOR SPORTS PAVILLION.

149.804 m
386.835 m
383.518 m
148.517 m
203.829 m
39.117 m
39.117 m
24.536 m
29.264 m
167.038 m
167.467 m
70.595 m
73.370 m
180.688 m

4.J
4.I
1.F
1.C
B
E
D
C
B
A
A
2.J
2.I
3.J
3.I

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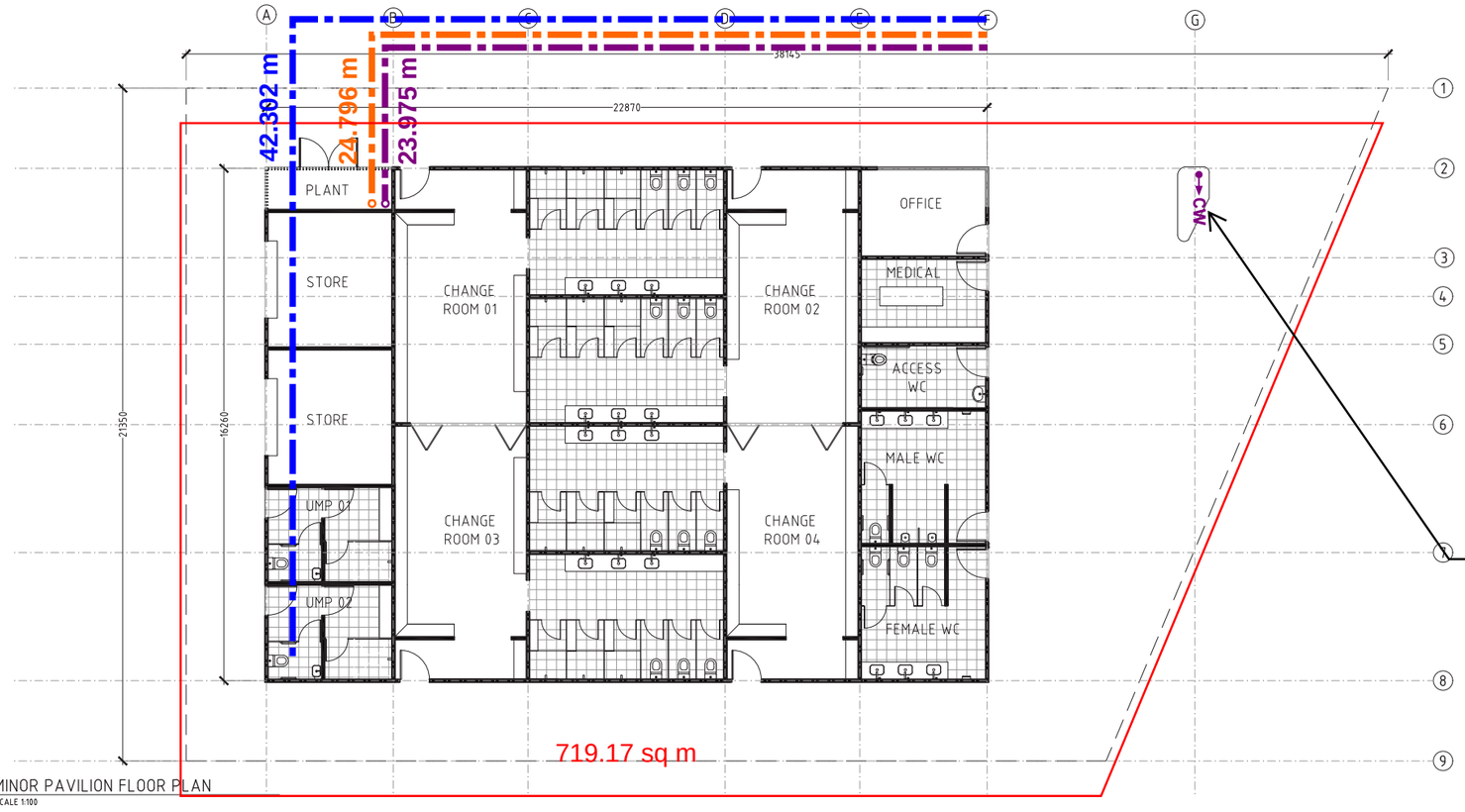
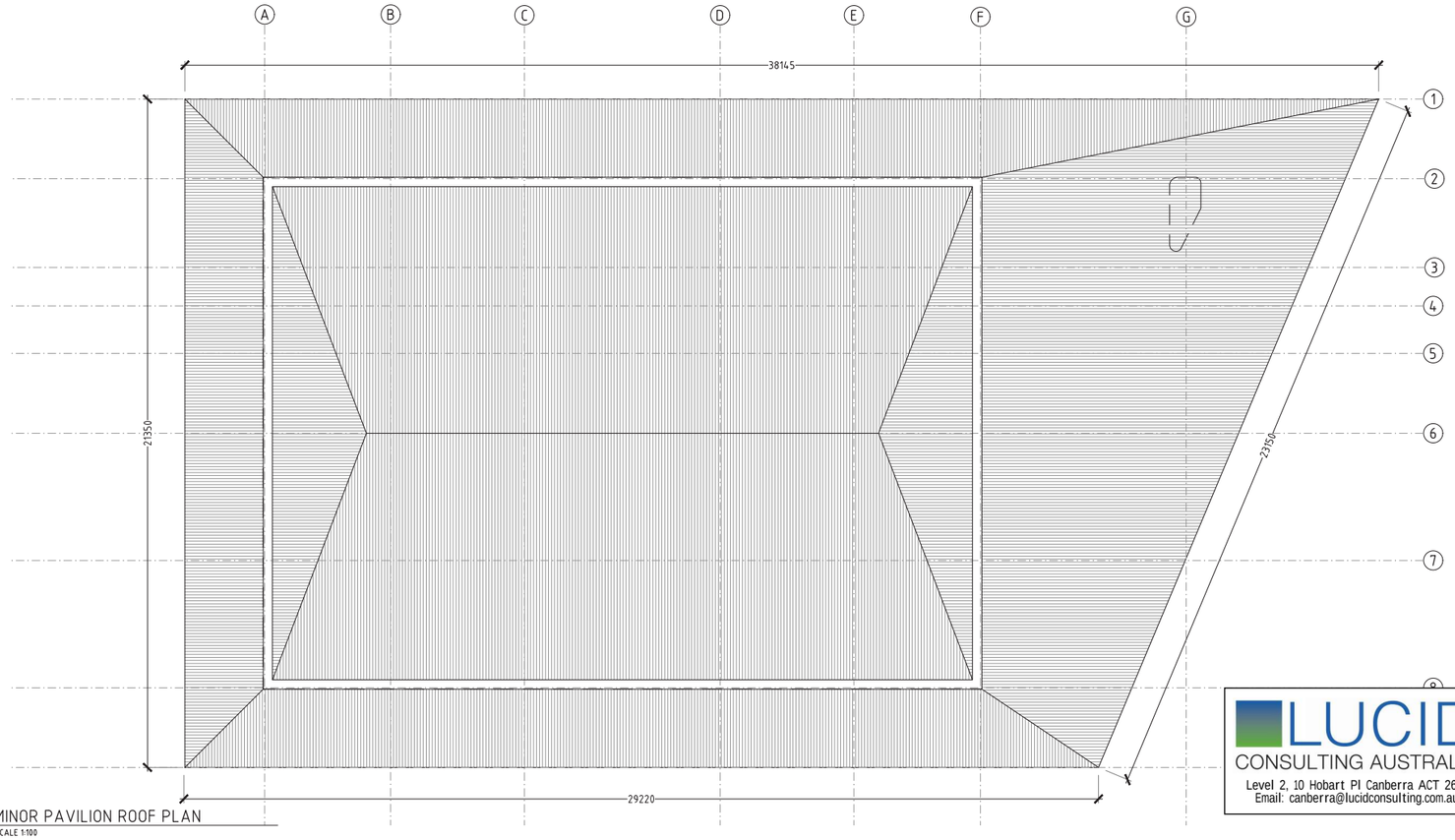
Drawing:	LCE18241-H-SK-001
Title:	INDICATIVE HYDRAULIC SERVICES SITE SKETCH
Project:	LCE18241 - QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
Engineer:	MF
Revision:	D
Date:	28.05.20

oxigen	Project: Queanbeyan-Palerang Regional Sports Complex	Drawing Title: Site Layout	1:1000 (A1), 1:2000 (A3); 0 10 25 50m; N	Client: QPRC	Project number: 15.028	Revision: Draft	Date: 29.04.20



01 MINOR PAVILION FLOOR PLAN
SCALE 1:100



02 MINOR PAVILION ROOF PLAN
SCALE 1:100

Scale 1:100 (A1), 1:200 (A3)
0 1 2 3 4 5m

LEGEND OF SYMBOLS

- INDICATIVE SEWER PUMP STATION INFRASTRUCTURE
- INDICATIVE NATURAL GAS METER/REGULATOR
- INDICATIVE WATER METER INFRASTRUCTURE
- INDICATIVE DRINKABLE COLD WATER PIPEWORK
- INDICATIVE SEWER PIPEWORK
- INDICATIVE NATURAL GAS PIPEWORK
- INDICATIVE BACK FLOW PREVENTION VALVE

NOTE: ALL PIPEWORK AND PLANT / EQUIPMENT LOCATIONS ARE INDICATIVE ONLY.

1 **COLD WATER POINT FOR DRINK FOUNTAIN EXTERNAL TO MINOR SPORTS PAVILIONS TO BE COORDINATED UNDER FUTURE STAGES OF DESIGN.**

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Drawing: LCE18241-H-SK-002
Title: INDICATIVE HYDRAULIC SERVICES SITE SKETCH
Project: LCE18241 - QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
Engineer: MF
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Client
Queanbeyan-Palerang Regional Council

Lead
Oxigen

Architecture
Greenway Architects

Civil, Traffic, Stormwater + Structural Engineering
TTW

Services Engineering
Lucid

Cost Planning
RLB

Drawing Title
Minor Pavilion - Floor Plan & Roof Plan

Date
27.05.2020

Project number
15.028

Drawing number
102

Revision
C

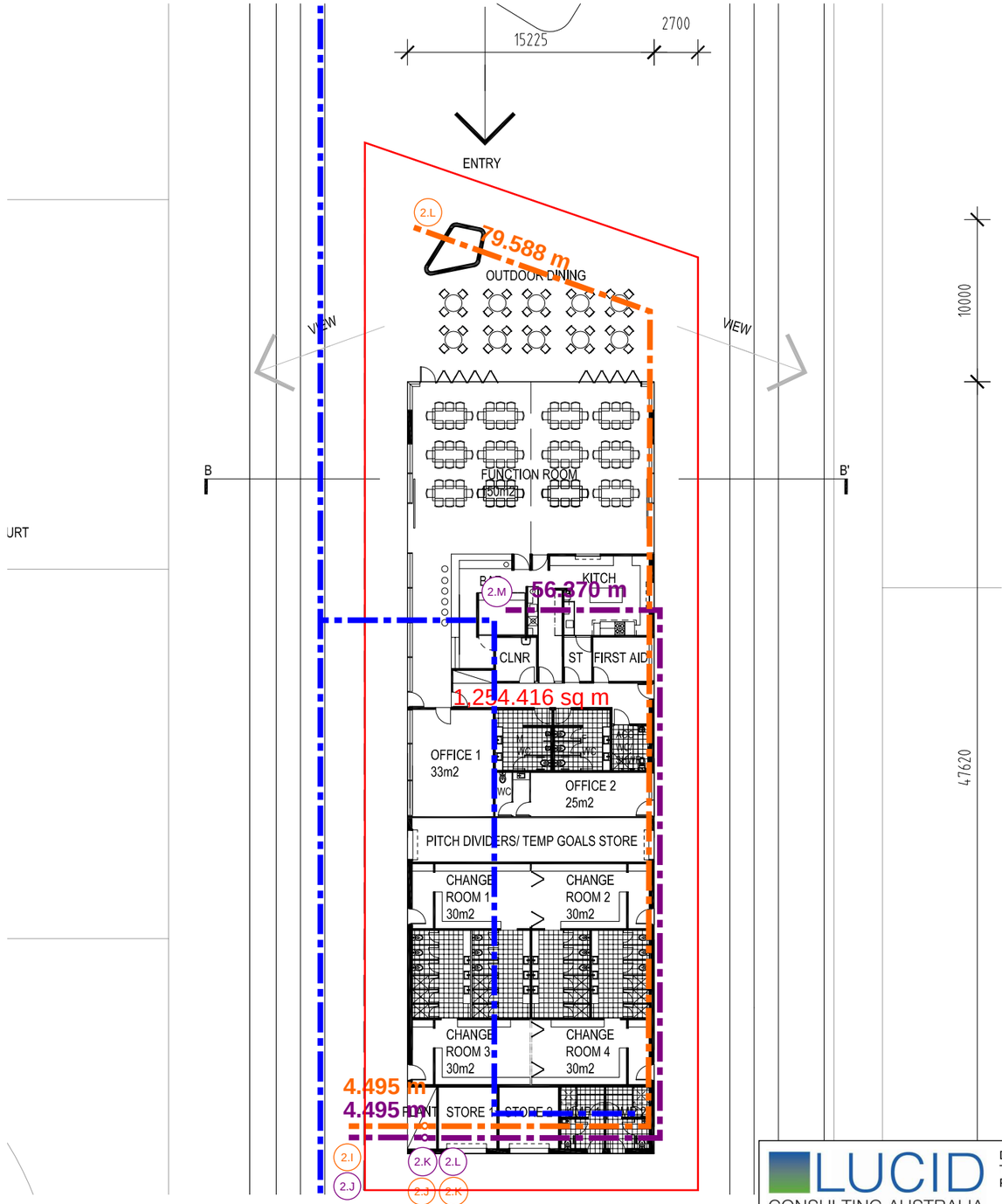
Scale 1:300

N

LEGEND OF SYMBOLS

- INDICATIVE SEWER PUMP STATION INFRASTRUCTURE
- INDICATIVE NATURAL GAS METER/REGULATOR
- INDICATIVE WATER METER INFRASTRUCTURE
- INDICATIVE DRINKABLE COLD WATER PIPEWORK
- INDICATIVE SEWER PIPEWORK
- INDICATIVE NATURAL GAS PIPEWORK
- INDICATIVE BACK FLOW PREVENTION VALVE

NOTE: ALL PIPEWORK AND PLANT / EQUIPMENT LOCATIONS ARE INDICATIVE ONLY.



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Drawing: LCE18241-H-SK-003
Title: INDICATIVE HYDRAULIC SERVICES SITE SKETCH
Project: LCE18241 - QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
Engineer: MF
Revision: D
Date: 28.05.20

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Project
Queanbeyan-Palerang Regional Sports Complex

Client
Queanbeyan-Palerang Regional Council

Lead
Oxigen

Architecture
Greenway Architects

Civil, Traffic, Stormwater + Structural Engineering
TTW

Services Engineering
Lucid

Cost Planning
RLB

Drawing Title
Major Pavilion - Floor Plan

Date
27.05.2020

Project number
15.028

Drawing number
202

Revision
C

Scale 1:300 (A3)

88.731 m

81.141 m
79.783 m
8.297 m
7.581 m
74.374 m
73.171 m
6.878 m
6.878 m
32.534 m
31.734 m

4,241.764 sq m

372.27 sq m

STORE 105m2
CHANGE ROOM 1 25m2
CHANGE ROOM 2 25m2
CHANGE ROOM 3 25m2
CHANGE ROOM 4 25m2
CLNR
F WC
M WC
ACC WC
ASADA 11m2
FIRST AID
REC WC SHOWER
OFFICE 25m2
PLANT
KITCHEN
STORE
CAFE/BAR
FOYER/ CAFE
ENTRY
HALL
STAIR TO UPPER LEVEL VIEWING
STAIR GROUND FLOOR
BASKETBALL COURT 4
BASKETBALL COURT 3
BASKETBALL COURT 2
BASKETBALL COURT 1
BASKETBALL STADIUM 4200m2
TIERED SEATING
GYM 14 m
STORE
TIERED SEATING

10300
1800
46000
35700
3000
3000
15100
3000
84400
10800
2600

GROUND FLOOR PLAN

UPPER FLOOR PLAN

LEGEND OF SYMBOLS

- INDICATIVE SEWER PUMP STATION INFRASTRUCTURE
- INDICATIVE NATURAL GAS METER/REGULATOR
- INDICATIVE WATER METER INFRASTRUCTURE
- INDICATIVE DRINKABLE COLD WATER PIPEWORK
- INDICATIVE SEWER PIPEWORK
- INDICATIVE NATURAL GAS PIPEWORK
- INDICATIVE BACK FLOW PREVENTION VALVE

NOTE: ALL PIPEWORK AND PLANT / EQUIPMENT LOCATIONS ARE INDICATIVE ONLY.

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Title: INDICATIVE HYDRAULIC SERVICES SITE SKETCH
Project: LCE18241 - QUEANBEYAN-PALERANG REGIONAL SPORTS COMPLEX
Engineer: MF
Revision: D
Date: 28.05.20

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Queanbeyan-Palerang Regional Sports Complex

Client
Queanbeyan-Palerang Regional Council

Lead
Oxigen

Architecture
Greenway Architects

Civil, Traffic, Stormwater + Structural Engineering
TTW

Services Engineering
Lucid

Cost Planning
RLB

Drawing Title
Basketball Stadium - Floor Plan

Date
27.05.2020

Project number
15.028

Drawing number
302

Revision
C