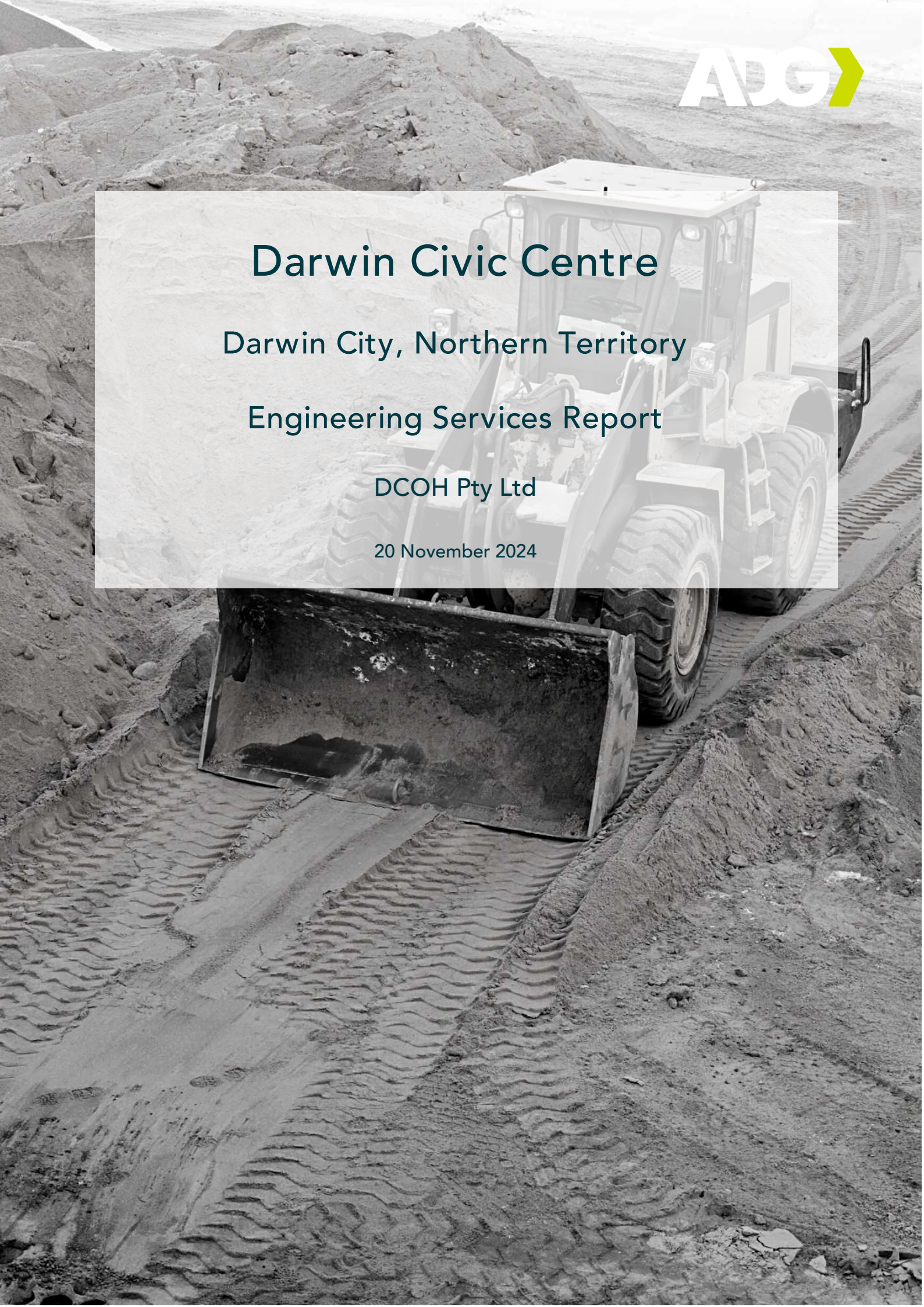


Darwin Civic Centre

Darwin City, Northern Territory

Engineering Services Report

DCOH Pty Ltd

20 November 2024

DOCUMENT VERIFICATION

Job Title **Darwin Civic Centre**

Job Number 25858.002

Document Title Engineering Services Report

DOCUMENT CONTROL

Date	Document	Revision No.	Author	Reviewer
8.11.24	Engineering Services Report - DRAFT	00	J. Lanyon	S. Warner
18.11.24	Engineering Services Report	01	J. Lanyon	S. Warner
20.11.24	Engineering Services Report	02	J. Mitchell	S. Warner

APPROVAL FOR ISSUE

Authority	Name	Signature	Date
Author	Jacinta Mitchell		20 November 2024
Reviewer	Sam Warner		20 November 2024

CONTENTS

1	**INTRODUCTION**	4
1.1	Property Details	4
2	**EXISTING SITE**	5
3	**ACID SULPHATE SOILS**	6
4	**STORM SURGE**	7
5	**BULK EARTHWORKS**	8
6	**ROADWORKS & ACCESS**	9
6.1	Existing Infrastructure	9
6.2	Proposed Infrastructure	9
7	**STORMWATER INFRASTRUCTURE AND ASSESSMENT**	10
7.1	Existing Infrastructure	10
7.2	Lawful Point of Discharge (LPD)	10
7.2.1	Existing LPD	10
7.2.2	Proposed LPD	11
7.3	Stormwater Quantity Objective	11
7.4	Peak Flow Estimation	11
7.4.1	Design Storm Events	11
7.4.2	Rational Method for Peak Flow Rate	11
7.4.3	Pre-Development Hydrology	12
7.4.4	Post-Development Hydrology	12
7.5	Detention Analysis	12
7.6	Stormwater Quality	12
7.7	External Catchments	13
8	**SEWER & WATER DEMANDS**	14
9	**WATER**	15
9.1	Existing Infrastructure	15
9.2	Point of Connection	15
10	**SEWER**	16
10.1	Existing Infrastructure	16
10.2	Point of Connection	16
11	**ELECTRICAL**	17
11.1	Point of Connection	17
12	**COMMUNICATIONS**	18
12.1	Point of Connection	18
13	**CONCLUSION**	19

TABLE OF FIGURES

Figure 1 - Development Site 4
Figure 2 - Acid Sulphate Soils 6
Figure 3 - NTG Storm Surge 7

TABLE OF TABLES

Table 1 - Property Details 4
Table 2 - Pre-development Catchment Details 12
Table 3 - Post-development Catchment Details 12
Table 4 - Proposed EP 14

APPENDICES

Appendix A Architectural Drawings
Appendix B Civil Concept Plan
Appendix C Service Concept Plan
Appendix D Site Survey and Utilities Mapping
Appendix E City of Darwin Stormwater Utilities Map

1 INTRODUCTION

ADG Engineers (Aust.) Pty Ltd was engaged by DCOH Pty Ltd to prepare an Engineering Services Report to support the Development Application for the proposed Darwin Civic Centre located on Harry Chan Avenue, Darwin. The proposed development is for a 21-story building featuring City of Darwin (CoD) Council offices, Council chambers, public library, four (4) levels of above ground carparking and office spaces. The building falls within the Civic Park precinct and seeks to integrate with the Darwin Civic and State Square Master Plan. Refer to Figure 1 for the proposed development site.

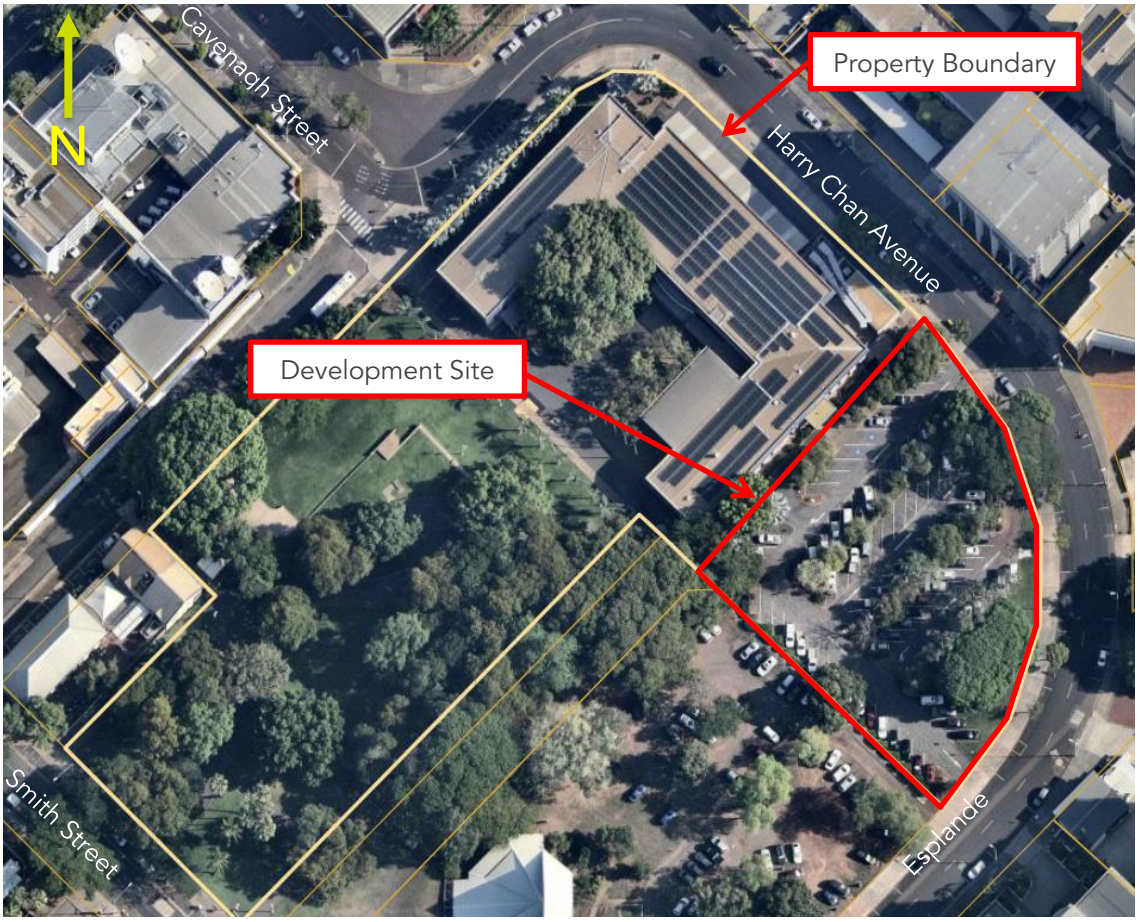


Figure 1 - Development Site

1.1 Property Details

The details of the property for the proposed development are provided in Table 1.

Table 1 - Property Details

Title	Lot 3981, Town of Darwin
Street Address	17 Harry Chan Avenue, Darwin City, NT
Site Area	1.995 ha
Development Site Area	0.486 ha

2 EXISTING SITE

The property consists of an existing two storey building, carparking facilities and public open space. The property can be access from Harry Chan Avenue or Smith Street. The proposed new building is to be located on the existing carpark in the eastern corner of the site. The existing carpark will be demolished as part of the works. Further works are proposed to the remainder of the lot as part of the Masterplan however this will be covered in a separate development application.

Vehicle access to the site is gained from two (2) existing crossovers on Harry Chan Avenue.

The site is bound by:

- Harry Chan Avenue to the north and west
- Cavenagh Street to the west;
- Harry Chan Avenue/Esplanade to the east;
- Smith Street to the south

The existing site condition is shown in Figure 1.

3 ACID SULPHATE SOILS

Acid sulphate soils are soils which contain iron sulphides and are generally found in low-lying, coastal areas below 20m AHD. A review of the Northern Territory Government's Natural Resources Maps (NR Maps) Acid Sulphate Soils Risk map overlay has indicated that the property is outside of an area that possesses a probability of acid sulphate soil occurrence. The NR maps overlay is shown in Figure 2 with the property identified.

Figure 2 - Acid Sulphate Soils

4 STORM SURGE

A review of NTG Storm Surge map dated September 2020 has identified that the property is not impacted from flooding during either a primary (1% AEP), secondary (0.1% AEP) or extreme (0.01% AEP) storm surge scenario. Refer to Figure 3 for the storm surge map and the property shown.

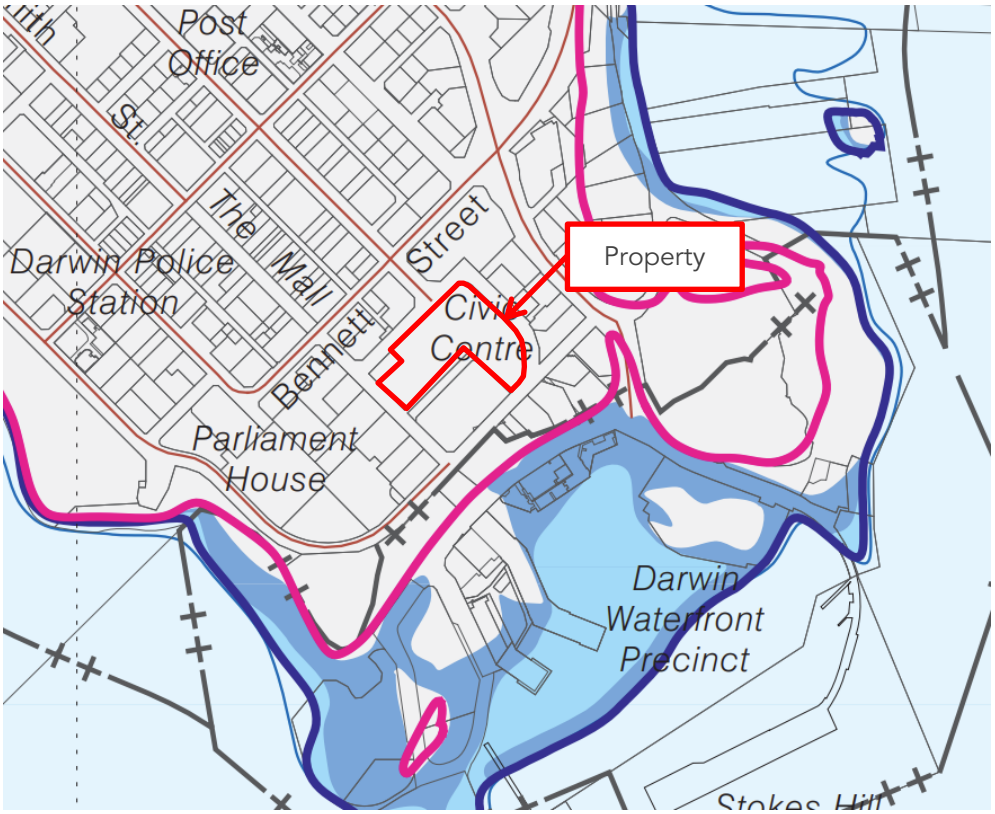


Figure 3 - NTG Storm Surge

5 BULK EARTHWORKS

A conceptual site grading and civil works plan has been developed for the Darwin Civic Centre and shall be refined during the detailed design of the stage. The earthworks strategy for the development was to follow the natural contours of the land and minimising the volume of cut and fill on site. The conceptual earthworks design has been developed in accordance with the NT Subdivision Guidelines. The design ensures all external pavement areas fall away from the building and overland flow is conveyed to the adjacent road reserve.

A concept grading plan has been developed to nominate floor levels and proposed grading across the site for the proposed development. A single external retaining wall has been proposed along the southern boundary of the site at a maximum height of 1m high. The design of the retaining wall shall be completed by a qualified structural engineer. The details of the proposed retaining wall shall be completed during the detailed design phase. It is noted that during the detailed design it is intended that this retaining wall will be minimised and coordinated with the landscape architect and may change to a landscaped batter or terrace. Refer to Appendix B for the conceptual civil works plan.

6 ROADWORKS & ACCESS

6.1 Existing Infrastructure

The subject site is adjacent to the following roads:

- Harry Chan Avenue – Local road with two (2) lanes of traffic in opposite directions. The street intersects with Cavenagh Street to the north-west of the development site and the Esplanade to the south-west. The road has two-way crossfall with a kerb and gutter drainage system and full width footpath on both sides of the road.

- Smith Street – Local road with two (2) lanes of traffic in opposite directions. The street intersects with Bennett Street and the Esplande to the south of the development site. The road has two-way crossfall with a kerb and gutter drainage system and full width footpath on both sides of the road.

- Cavenagh Street – Collector road with two (2) lanes of traffic in opposite directions. The street intersects with Harry Chan Avenue to the north-west of the development site. The road has two-way crossfall with a kerb and gutter drainage system and full width footpath on both sides of the road.

- Esplanade – Local road with two (2) lanes of traffic in opposite directions. The street intersects with Harry Chan Avenue to the south-west of the development site. The road has two-way crossfall with a kerb and gutter drainage system and full width footpath on both sides of the road.

The existing carpark in the area of the proposed development is currently accessed via two (2) crossovers to Harry Chan Avenue. Once crossover in the norther corner of the carpark and the other in the southern end o the carpark.

6.2 Proposed Infrastructure

As part of the new development, the existing crossovers for the carpark will be demolished and replaced with two (2) new crossovers to suit the proposed development. The location of the new crossovers is generally in the same location as the existing crossovers. The design of the crossovers shall be completed during the detailed design phase in coordination with the traffic engineer to ensure the crossovers are suitable for the proposed vehicles and their turning movements. The crossovers will generally be in accordance with the Northern Territory Subdivision Development Guidelines standard drawing SS1006. Refer to the architectural drawings in Appendix A and the preliminary civil document in Appendix B for further information regarding the new proposed crossovers.

There are no works or alterations proposed to the existing Council roads surrounding the development.

7 STORMWATER INFRASTRUCTURE AND ASSESSMENT

7.1 Existing Infrastructure

The Utility Mapping survey and the City of Darwin's (CoD) online stormwater mapping have identified the following infrastructure in the vicinity of the development:

- DN150 RCP main to the south-west of the development site. The main collects stormwater from the existing City of Darwin building. The main travels south-north before discharging into an existing manhole to the west of the development site.
- DN375 RCP main to the west of the development site. The main collects stormwater from the existing City of Darwin building. The main travels south-north before discharging into an existing manhole in the north-west of the development site.
- DN375 RCP main to the north-west of the development site. The main collects stormwater from the existing City of Darwin building. The main travels west-east before discharging into a large manhole on the northern side of the development site.
- DN375 RCP which traverses through the development site. The main travels from the south-west to the north-east of the development site. The main discharges at a large manhole on the northern side of the development site.
- DN225 RCP to the north-east of the site on Harry Chan Avenue. The main travels west-east along Harry Chan Avenue and terminates at a large manhole on the northern side of the development site.
- DN300 RCP to the north-east of the site on Harry Chan Avenue. The main collects stormwater from the side entry pits on the northern side of the road and discharges at the large manhole on the southern side of Harry Chan Avenue and on the northern side of the development site.
- An existing stormwater main north of the development site. The details of the main are unknown and its flow direction are to be confirmed.
- DN300 RCP to the east of the development site. The main collects stormwater from the existing road network side entry pits and discharges to the downstream side entry pit on the northern side of the road.

For further information, refer to the site survey and utilities mapping in Appendix D and City of Darwin's online stormwater utilities map in Appendix E.

7.2 Lawful Point of Discharge (LPD)

7.2.1 Existing LPD

Stormwater from the existing development site is currently collected in the internal pit and pipe infrastructure before being discharged into the Council stormwater network on Harry Chan Avenue which ultimately discharges to Darwin Harbour. Refer to the City of Darwin's online stormwater utilities map in Appendix E for further information.

7.2.2 Proposed LPD

It is proposed to maintain the existing flow regime and LPD for the site, being the Council stormwater network on Harry Chan Avenue. The proposed drainage connections are shown in the civil concept plan in Appendix B.

7.3 Stormwater Quantity Objective

The aim of the stormwater quantity assessment is to ensure that the development shall impose no adverse effects on downstream properties or receiving water bodies and that the conveyance of flows will be in a safe manner with minimal risk of human endangerment as well as the following objectives:

- Address the need for stormwater quantity control measures.
- Ensure there is no increase in peak discharges from the subject site for events up to and including the 1% AEP event.

It is essential that there are no increases in volume and flow rate of stormwater runoff, and that any increases are mitigated such that post-developed peak flows do not exceed those for the pre-developed case.

7.4 Peak Flow Estimation

7.4.1 Design Storm Events

Based on recommendations within the Northern Territory Subdivision Development Guidelines and AS3500.3, the major and minor storm events were selected as follows:

- Minor Event: 10% AEP
  - Surface drainage infrastructure sized for a 10% AEP storm through to point of discharge.
- Major Event: 1% AEP
  - Surface drainage overflows in events up to and including the 1% AEP storm will not present a hazard to people or cause significant damage to property.

7.4.2 Rational Method for Peak Flow Rate

The peak flow rate for the site has been obtained using the Rational Method (Equation 1) in accordance the Queensland Urban Drainage Manual (QUDM). It is noted that QUDM, as the name implies, is a Queensland guideline, however, is considered by the industry as a national guideline for the estimation and control for stormwater runoff. Summaries of the hydrology calculations can be seen in Sections 7.4.3 and 7.4.4 for the pre- and post-development scenarios respectively.

$$Q = (2.78 \times 10^{-3})\, Cy\, Iy\, A \qquad \text{Equation 1}$$

Q = Peak flow rate (m^3/s) for average recurrence interval

Cy = Co-efficient of runoff for ARI of y years (dimensionless)

A = Catchment area (ha)

Iy = Average rainfall intensity (mm/hr) for a design duration of t hours and an ARI of y years

7.4.3 Pre-Development Hydrology

The hydrology of the pre-development catchment has been assessed using the Rational Method. The development site has been assessed as a single catchment. The existing development site comprises of an existing carpark, external pavement and landscaped areas.

The percentage impervious for the existing development was measured using aerial imagery for the site. The Coefficient of discharge (C_Y) value for the catchment was derived from QUDM 2017 Table 4.5.3 and Table 4.5.4. F_y frequency factors were applied to determine runoff coefficients for various average recurrence interval (ARI) storm events in accordance with QUDM 2017 Table 4.5.2. QUDM 2017 Section 4.6 was applied to determine the minimum time of concentration to be 5 minutes. Rational Method calculations were performed, the results of which can be seen in Table 2.

Table 2 - Pre-development Catchment Details

Catchment	Area (ha)	% Impervious	C_{10}	C_{100}	Time of Concentration (t_c)	Q_{10} (m^3/s)	Q_{100} (m^3/s)
Development Site	0.486	68%	0.84	1.00	5	0.242	0.369

7.4.4 Post-Development Hydrology

As part of the post development scenario, the site shall consist of a new building, landscaping and external paved areas. Similarly, the site has been assessed as a single catchment for the development site.

The same process as the pre-development hydrology was applied to determine the coefficient of discharge, frequency factor, coefficients of runoff and minimum time of concentration to be 5 minutes. Rational Method calculations were performed, the results of which can be seen in Table 3.

Table 3 - Post-development Catchment Details

Catchment	Area (ha)	% Impervious	C_{10}	C_{100}	Time of Concentration (t_c)	Q_{10} (m^3/s)	Q_{100} (m^3/s)
Development Site	0.486	90%	0.88	1.00	5	0.253	0.369

7.5 Detention Analysis

Comparison of the estimated peak flows for the pre and post developed site for the proposed development site identifies an increase of 0.009m^3/s in the minor event (10% AEP) peak discharge and no change for the major event (1% AEP) peak discharge. The changes in the pre and post development flows are considered negligible and therefore no stormwater detention is proposed.

7.6 Stormwater Quality

As part of the development a stormwater quality treatment device will be provided at each outlet into Council's stormwater network in accordance with Section 7.10 of the NT Subdivision Development Guidelines. The details of the stormwater quality treatment device will be confirmed as part of the detailed design.

7.7 External **Catchments**

There are two (2) external catchments which fall towards the development site. Both catchments are to the west, north-west of the development site and discharge sheets flows towards the site. The catchments are the existing church allotment and civic park. As part of the proposed development, the flows from these upstream catchments will be captured and collected within the development site and discharged to the site's LPD. The details of this drainage arrangement shall be determined during the detailed design phase of the project. The site will be graded to ensure the upstream catchments do not convey water towards the entrances of the proposed building.

8 SEWER & WATER DEMANDS

The number of equivalent persons (EP) was used to calculate high level demand rates of the proposed water and sewerage reticulation. The proposed EP for the development was calculated based on the proposed architectural layout and applying EP rates as outlined in the PWC NT Supplements to WSAA Codes (2002) to the Net Lettable Area Yield and occupancy based upon NCC assessments of 1person / 10m^2 for offices and 15400 m^2 NLA for the development. Table 4 provides a summary of the EP calculations for the proposed development.

Table 4 - Proposed EP

Lot	Quantity	Unit	EP multiplier	Total EP
Business Office	1540	EP / employee	0.2	308
Total EP				308

9 WATER

9.1 Existing Infrastructure

The Utility Mapping survey, PWC's ArcGIS online mapping service and BYDA information have indicated that there is existing potable water infrastructure located within close proximity to the subject site, including:

- A DN150 CICL water distribution main located on the southern side of Harry Chan Avenue to the north and east of the development site. The existing main contains several valves and hydrants in various locations.
- A DN225 CICL water distribution main located on the northern side of Harry Chan Avenue to the north and east of the development site. The existing main contains several valves and hydrants in various locations and numerous property connections to the properties on the northern side of Harry Chan Avenue.
- A DN100 existing property connection located to the north of the site off the existing DN150 DICL main on Harry Chan Avenue.

For further information, refer to the site survey and utilities mapping in Appendix D.

9.2 Point of Connection

A new common water meter assembly is proposed, located adjacent the car park entry ramp point to the new development. The assembly will comprise a DN150 firefighting service and appropriately sized domestic metering service. Any sub metering will be achieved internally within the development.

Power Water will not permit a same size connection to a water main and so the new connection will be derived from the DN225 distribution main to the North of Harry Chan Avenue.

The hydraulic consultant will determine the extent of the upgrade and connection works that will be required for the proposed development during detailed design stage.

Refer sketch plan "GROUND LEVEL SITE PLAN - PROPOSED INFRASTRUCTURE SERVICES" included in Appendix C of this report for further context

10 SEWER

10.1 Existing Infrastructure

The Utility Mapping survey, PWC's ArcGIS online mapping service and BYDA information have indicated that there is existing sewer infrastructure located within close proximity to the subject site, including:

- A DN150 PVC gravity main located to the west of the development site on Harry Chan Avenue.
- A DN150 GEW gravity main located to the west of the development site on Harry Chan Avenue.
- A DN150 GEW gravity main located on the southern side of Harry Chan Avenue to the north of the development site
- A DN150 PVC gravity main located on the southern side of Harry Chan Avenue to the north of the development site. This main discharge into an existing DN300 PVC trunk main.
- A DN300 VC main trunk sewer located on Harry Chan Avenue to the north of the development site. The main travels north along the Harry Chan Avenue/Esplanade prior to connection into the DN450 GRP main on Frances Bay Drive.
- An existing DN150 property connection located to the west of the site off the existing DN150 PVC gravity main on Harry Chan Avenue. The connection discharges directly into access chamber 1/11 F/1.
- An existing sewer main on the western boundary of the Development site. The details of this main are unknown.

For further information, refer to the site survey and utilities mapping in Appendix D.

10.2 Point of Connection

As the development EP exceeds 80, the gravity sewer connection from the development to the authority main will be through a sewer chamber. The proposed point of connection will be the south of the building to the DN300 trunk sewer to the East of Harry Chan Avenue.

Being a main trunk sewer connection, a gas trap will also be required adjacent the new sewer chamber.

The hydraulic consultant will determine the extent of the upgrade and connection works that will be required for the proposed development during detailed design stage.

Refer sketch plan "GROUND LEVEL SITE PLAN - PROPOSED INFRASTRUCTURE SERVICES" included in Appendix C of this report for further context.

11 ELECTRICAL

The Utility Mapping survey, PWC's ArcGIS online mapping service and BYDA information have indicated the following electrical infrastructure located within close proximity to the subject site, including:

- A series of underground High Voltage (HV) cables with a nominal 11kV voltage located to the northern, western and eastern side of the Development site on the northern side of Harry Chan Avenue.
- A Ring Main Unit (RMU) located to the north-west of the Development site on the southern side of Harry Chan Avenue.
- A Distribution Transformer located to the north-west of the Development site on the southern side of Harry Chan Avenue.
- A Distribution Substation located to the north-west of the Development site on the southern side of Harry Chan Avenue.
- Two (2) underground Low Voltage (LV) service connections with a nominal 240V voltage located internally to the site. One connection services the existing Darwin City Council building and one services the adjacent Lot 4.
- One Low Voltage (LV) metered points with a nominal 240V voltage located internally to the site which services the existing Darwin Council building.

For further information, refer to the site survey and utilities mapping in Appendix D.

An electrical consultant will determine the extent of the upgrading and connection works that will be required to facilitate the required electrical reticulation for the proposed development at detailed design stage.

11.1 Point of Connection

A new Power Water Standard Indoor Substation, 2 transformer arrangement will be provided at ground level to the Northwest of the development, with external access and hardstand available immediately externally.

A new easement (alignment TBA) will run to the allotment boundary.

The electrical consultant will determine the extent of the upgrade and connection works that will be required for the proposed development during detailed design stage.

Refer sketch plan "GROUND LEVEL SITE PLAN - PROPOSED INFRASTRUCTURE SERVICES" included in Appendix C of this report for further context

12 COMMUNICATIONS

The Utility Mapping survey and BYDA information have indicated the following telecommunications infrastructure located within close proximity to the subject site, including:

- Existing 2 x 100mm AC communications conduits containing optic fibre to the north and east of the Development site along Harry Chan Avenue. BYDA has identified this as being Telstra infrastructure
- Existing 2 x 80mm AC communications conduit containing existing optic fibre connection to the site to service the existing Darwin City Council building.
- Existing communications pits and chambers for optic fibre infrastructure to the north-east of the Development site on the northern side of Harry Chan Avenue. The pits vary in depth between 0.5m to 1.1m. BYDA has identified these pits as being Telstra infrastructure with the pits being a combination of Type 8 and Type 6 communication pits and foot access chambers of varying size.
- Optus have identified there being existing communications infrastructure to the north and east of the development site on Harry Chan Avenue. The details of this infrastructure is unknown.
- Telstra have identified there being a Type 6 pit the east of the development site
- TPG Telecom have identified there being existing communications pit in vicinity of the site. The details of this pit is unknown.
- Vocus have identified there being pit and conduit to the north, on the northern side of Harry Chan Avenue, of the development site. Additionally, a pit and conduit runs to the south of the existing Council Building. The details of this infrastructure is unknown.

For further information, refer to the site survey and utilities mapping in Appendix D.

An electrical consultant will determine the extent of the upgrading and connection works that will be required to facilitate the required communications infrastructure for the proposed development at detailed design stage.

12.1 Point of Connection

It is anticipated that NBN, Telstra and Vocus services will be derived from the existing infrastructure to the North-east of the site.

The electrical consultant will determine the extent of the upgrade and connection works that will be required for the proposed development during detailed design stage.

Refer sketch plan "GROUND LEVEL SITE PLAN - PROPOSED INFRASTRUCTURE SERVICES" included in Appendix C of this report for further context

13 CONCLUSION

ADG Engineers have undertaken an Engineering Services Assessment for the proposed development site for the Darwin Civic Centre at 17 Harry Chan Avenue, Darwin City. The site can be adequately serviced by all essential infrastructure through the installation of new and existing infrastructure and connection to existing infrastructure. The works discussed within this report are subject to detailed design and authority approval. The design of all infrastructure shall be completed in accordance with all relevant authority guidelines/standards. Detailed engineering documentation shall be submitted to and approved by all relevant authorities prior to commencement of works onsite.

Appendix A
Architectural Drawings

Appendix B
Civil Concept Plan

LEGEND

- EXISTING SURFACE CONTOURS
- LIMIT OF WORKS
- SITE BOUNDARY
- EXISTING TUNNEL BOUNDARY
- EXISTING PROPERTY BOUNDARY
- EXISTING NOMINAL KERB LINE / EDGE OF ROAD
- EXISTING EDGE OF BITUMEN
- EXISTING ROAD CENTERLINE
- EXISTING EDGE OF BUILDING
- EXISTING EDGE OF BUILDING EAVE
- EXISTING STORMWATER DRAINAGE
- EXISTING STORMWATER DRAINAGE (RECORDS)
- EXISTING STORMWATER DRAINAGE (RECORDS CITY OF DARWIN GIS)
- EXISTING SEWER
- EXISTING SEWER (RECORDS)
- EXISTING SEWER RISING MAIN
- EXISTING SEWER RISING MAIN (RECORDS)
- EXISTING WATER
- EXISTING WATER (RECORDS)
- EXISTING UNDERGROUND ELECTRICITY
- EXISTING UNDERGROUND ELECTRICITY (RECORDS)
- EXISTING OVERHEAD ELECTRICITY
- EXISTING GAS
- EXISTING GAS (RECORDS)
- EXISTING NBN
- EXISTING NBN (RECORDS)
- EXISTING TELECOMMUNICATIONS
- EXISTING TELECOMMUNICATIONS (RECORDS)
- EXISTING FIBER OPTIC (RECORDS)
- EXISTING COMMUNICATIONS
- EXISTING UNKNOWN SERVICE
- ABANDONED SERVICE
- EXISTING BATTER
- EXISTING RETAINING WALL
- EXISTING FENCE
- EXISTING CONCRETE DRAIN
- EXISTING ROAD

- PROPOSED RETAINING WALL OR LANDSCAPED BATTER
- PROPOSED BUILDING FOOTPRINT
- PROPOSED STORMWATER DRAINAGE
- PROPOSED STORMWATER PIT
- PROPOSED SWALE/INVERT
- EXISTING SURFACE LEVEL
- PROPOSED GRADE
- PROPOSED SURFACE LEVEL
- PROPOSED DRIVEWAY AS PER NT SDG STD DRG SS1006.
- PROPOSED CHANGE OF GRADE
- PROPOSED FOOTPATH PAVEMENT
- PROPOSED LANDSCAPING

CAUTION

THE LOCATION AND DEPTH OF EXISTING SERVICES AS SHOWN IS BASED ON INFORMATION OBTAINED FROM UTILITY MAPPING DATED 30/10/23 AND COUNCIL RECORDS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THE ACTUAL LOCATION AND DEPTH OF EXISTING SERVICES PRIOR TO CARRYING OUT ANY EXCAVATION, TRENCHING OR TUNNELING WORKS.

HARRY CHAN AVE

PROPOSED TRENCH GRATE

PROPOSED TRENCH GRATE DRAINAGE TO DISCHARGE INTO EXISTING PIT

EXISTING SEP COVERTED TO GIP.

FUEL AND GENERATOR PAD

PROPOSED SWD TO CONNECT INTO EXISTING PIT

ESL: 26.00 · ESL: 25.90 · ESL: 26.15 · ESL: 26.20 · ESL: 26.20

PROPOSED DN225

RL: 26.43 · RL: 26.28

EXISTING SEP COVERTED TO GIP.

PROPOSED SEP OVER EXISTING MAIN

PROPOSED MANHOLE TO BREAK INTO EXISTING STORMWATER DRAINAGE

RL: 26.5 · 1.5% GRADE · 2.5% GRADE · RL: 26.35

ESL: 26.6

FFL: 26.9 · RL: 26.85

PROPOSED DN375

RL: 26.93 · RL: 26.94 · RL: 26.74 · 4% GRADE MAX · RL: 26.78

PROPOSED DN450

RL: 26.34 · ESL: 26.8 · ESL: 26.4

3 STEPS @ 190mm

RL: 26.78 · RL: 26.56 · 0.8% GRADE · RL: 26.97 · RL: 27.00

PROPOSED STUB FOR ROOFWATER DRAINAGE CONNECTION

EXISTING BUILDING TO BE RETAINED RL 27.10

PROPOSED DN150

RL: 26.97

PROPOSED TRENCH GRATE

RL: 27.00 · RL: 26.85 · RL: 26.43

PROPOSED STUB FOR ROOFWATER DRAINAGE CONNECTION

ESL: 27.00 · SWALE WITH CONCRETE INVERT AT MIN 0.5% GRADE · FFL: 27.00

REFER TO ARCHITECTURAL DRAWINGS FOR RAMP DETAILS

PROPOSED DN375

RL: 26.970

EXISTING SWD TO BE DECOMMISSIONED AND DIVERTED AROUND SITE

ESL: 27.04 · RL: 26.970 · RL: 27.00 · RL: 26.970 · RL: 26.75 · ESL: 26.60

PROPOSED TRENCH GRATE

RL: 26.76 · 1.2% GRADE · RL: 26.93

ESL: 27.1 · RL: 26.970 · RL: 26.970 · RL: 26.94

PROPOSED DN150 · 1.4% GRADE

RL: 26.55 · RL: 26.970

PROPOSED DN375 · 2.5% GRADE · SWALE WITH CONCRETE INVERT AT MIN 0.5% GRADE · ESL: 26.78

EXISTING GIP/MANHOLE AND COVERTED TO GIP AS REQUIRED.
LOWER PIT LID
ESL: 27.6
RL: 26.6
DIFF: 1m

RL: 26.79 · PROPOSED DN375 · RL: 26.95 · ESL: 27.3

ESL: 27.60 · RL: 26.765

PROPOSED RETAINING WALL OR LANDSCAPE BATTER MAX 1m HIGH EXTENT TO BE CONFIRMED DURING DETAILED DESIGN

EXISTING RAMP TO BE ADJUSTED AS REQUIRED TO SUIT NEW LEVELS. EXTENT OF WORKS TO BE CONFIRMED AS PART OF DETAILED DESIGN

PROPOSED STUB FOR ROOFWATER DRAINAGE CONNECTION

ISSUED FOR
INFORMATION ONLY

Rev	Date	Description	By	Chk
C	20.11.24	ISSUED FOR INFORMATION	SW	DG
B	20.11.24	ISSUED FOR INFORMATION	SW	DG
A	5.11.24	ISSUED FOR INFORMATION	JL	SW

DCOH

0 2 4 6 8 10m
SCALE 1:200
AT ORIGINAL SIZE (A1)

ADG
T:1300 657 402 E: info@adgce.com W: www.adgce.com
Quality Assurance ISO 9001:2015 | Work Health Safety ISO 45001:2018
Environmental Management ISO 14001:2015

Client: DCOH
Project Name: DARWIN CIVIC CENTRE

Discipline: CIVIL
Status: INFORMATION
Designed By: JL
Checked By: SW
Approved By: DG
Project No.: 25858
Drawn By: VA
Scale at A1: 1:200 m

Title: CIVIL CONCEPT PLAN
Drawing No.: SK01
Revision: C

FULL SIZE ON ORIGINAL 0 10 20 30 40 50 60 70 80 90 100mm

Appendix C
Service Concept Plan

EXISTING VOCUS PIT. NEW ROAD CROSSING & EXTEND TO NEW DEVELOPMENT

Extg 225 CICL WATER PRESSURE MAIN

Extg 150 CICL WATER PRESSURE MAIN

Extg UNDERGROUND HV CABLE MAINS

Extg PWC RMU

EXISTING TELSTRA / NBN PIT. EXTEND TO NEW DEVELOPMENT

NEW INDOOR SUBSTATION, 2 TRANSFORMER ARRANGEMENT & 3METER SUPPLY EASEMENT TO BOUNDARY

NEW FIRE & DOMESTIC WATER METER ASSEMBLY. NEW CONNECTION TO EXISTING 225 CICL WATER PRESSURE MAIN TO THE EAST OF HARRY CHAN AVENUE

NEW GRAVITY SEWER MAIN FROM BUILDING. ANY FUTURE GREASE TRAP (TBA) TO BE PROVIDED IN THIS AREA. IOS LOCATED AT BOUNDARY

EXISTING VOCUS PIT / COPNNECTION TO EXISTING COUNCIL BUILDING.

NEW GRAVITY SEWER MAIN TO CONNECT TO GRAVITY MAIN TRUNK SEWER VIA NEW SEWER CHAMBER & GAS TRAP CHAMBER TO THE EAST OF HARRY CHAN AVENUE.

TO BE RETAINED

NEW CROSSOVER FOR SERVICE ENTRY

1/B/3
D3.813

19.1
300-VC
-95.7
14.29

1/10
D6.29

22.53
300-VC
-3.1
22.4

6993

6500

SERVICE VEHICLE PARKIN

POTENTIAL EASEMENT

SUBSTATION

LOADING

CIVIC TOWER OVER SHOWN DASHED

CARPARK ENTRY

GALAMARRMA PLAZA

GALAMARRMA

1/2
D1.85
2/2
D1/35

NEW CROSSOVER TO MULTI-LEVEL CAR PARK

EXTENT OF EXISTING TUNNEL BELOW

TOWER FOOTPRINT DASHED OVER

Extg 300 VC GRAVITY MAIN TRUNK SEWER

V

6

LEGEND:
EXISTING WATER MAIN
EXISTING GRAVITY MAIN TRUNK SEWER
EXSITING GRAVITY MAIN SEWER
EXISTING UNDERGROUND HV CABLE
EXISTING UNDERGROUND COMMUNICATIONS

PROPOSED NEW WATER SERVICE
PROPOSED NEW GRAVITY SEWER

Darwin Civic Centre Redevelopment

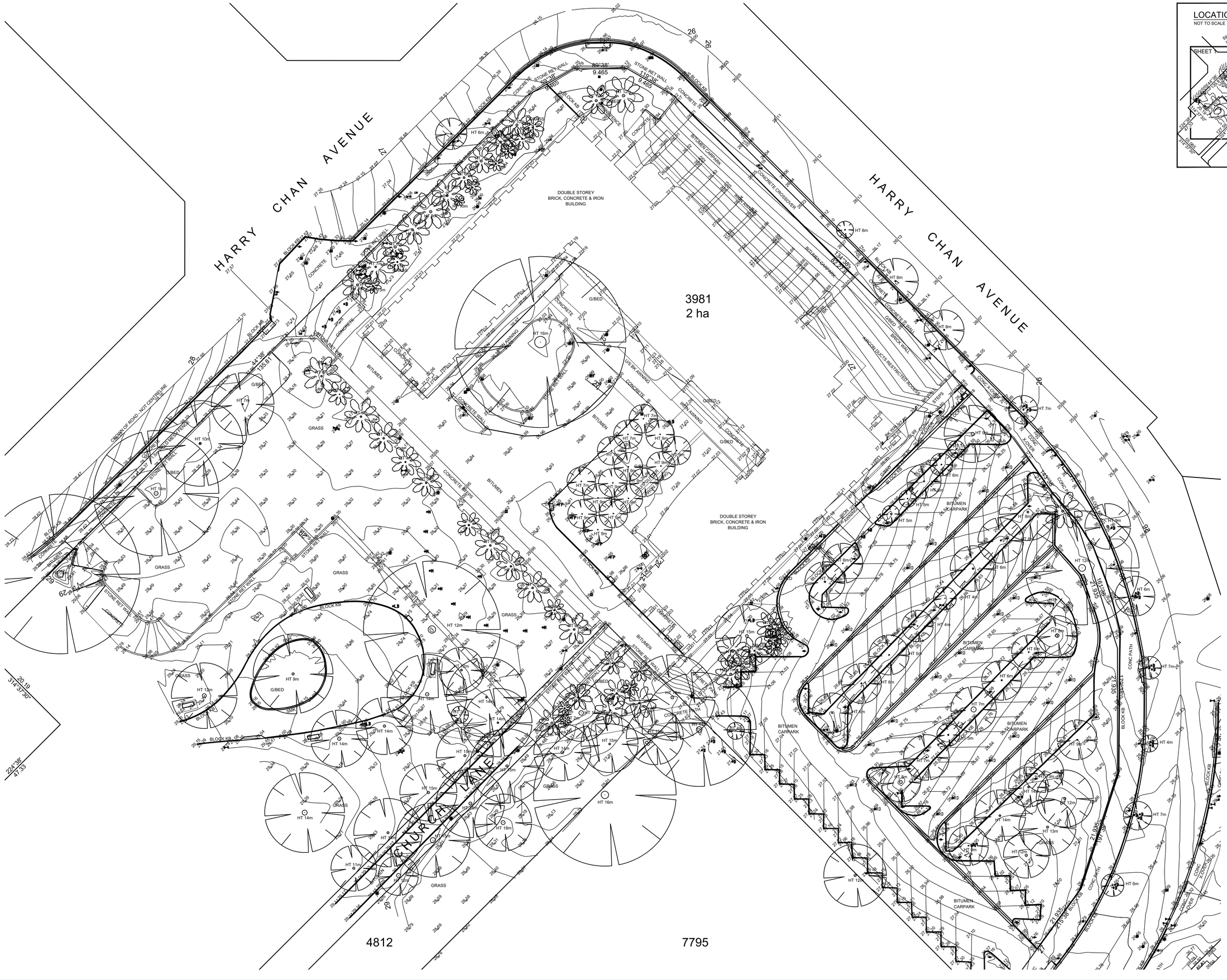
CA Architects
Cairns | Brisbane | Townsville | Darwin
e: reception@caarchitects.com.au t: +617 4031 6367

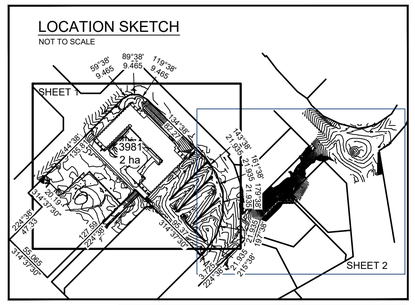
GROUND LEVEL SITE PLAN
PROPOSED INFRASTRUCTURE SERVICES

2248_ DA DA-003 Rev 3
Drawn: JH Check: CA
1/11/2024 3:59:54 PM
DRAFT DA ISSUE

DCOH 1 : 500 @ A3
0 10 20 30 40 50m
Scale 1:1000

Appendix D
Site Survey and Utilities Mapping





SURVEY CONTROL COORDINATE LISTING
MGA 94 Z52

STATION	EASTING	NORTHING	ELEVATION
S00157B03A	700505.538	8620699.794	5.500
S05156001	700368.272	8620872.113	5.849
S07154001	700706.39	8621580.038	9.570
S95222007	700339.697	8621053.926	26.652
S95222008	700680.853	8621301.603	26.260
S95222023	700851.679	8621541.478	5.911

NOTE:
AHD LEVEL DERIVED FROM COORDINATED REFERENCE MARKS LISTED IN TABLE

NOTE:
THIS PLAN HAS BEEN PREPARED WITH MGA94 COORDINATES.

CONTOUR LEGEND - 0.1M INTERVALS
MAJOR CONTOURS 00
MINOR CONTOURS

LEGEND:
COMMS PIT
ELECTRICAL PIT
ELECTRICAL SWITCHBOARD
ELECTRICAL LIGHT POLE
ELECTRICAL FLOOD LIGHT
DRAINAGE GRATE
DRAINAGE MANHOLE
SEWER MANHOLE
PARK METER
ROAD MARKING RD
FLAG POLE FP
GATE
BOLLARD B
SIGN
LITTER BIN LB
WATER IRRIGATION VALVE
WATER STOP VALVE
WATER HYDRANT H
WATER MARKER
WATER METER WM
UNDEFINED SERVICE U
NATURAL SURFACE SPOT HT

REV	DESCRIPTION	DRN	DATE	APP
B	CORRECTION TO BUILDING LINEWORK ON SHEET 1	MR	22/09/23	WB

Land Surveys
1/11 Bombing Road
Winnellie NT 0821
T (08) 8984 4078
E darwin@landsurveys.net.au
www.landsurveys.net.au

SCALE @ A1 : 1:300
5 0 5 10 15

SURVEYED BY: NS / RL
SURVEYED ON: 18 - 31/05/2023 & 07/07/2023

DRAWN BY: ED
DRAWN ON: 14/08/2023

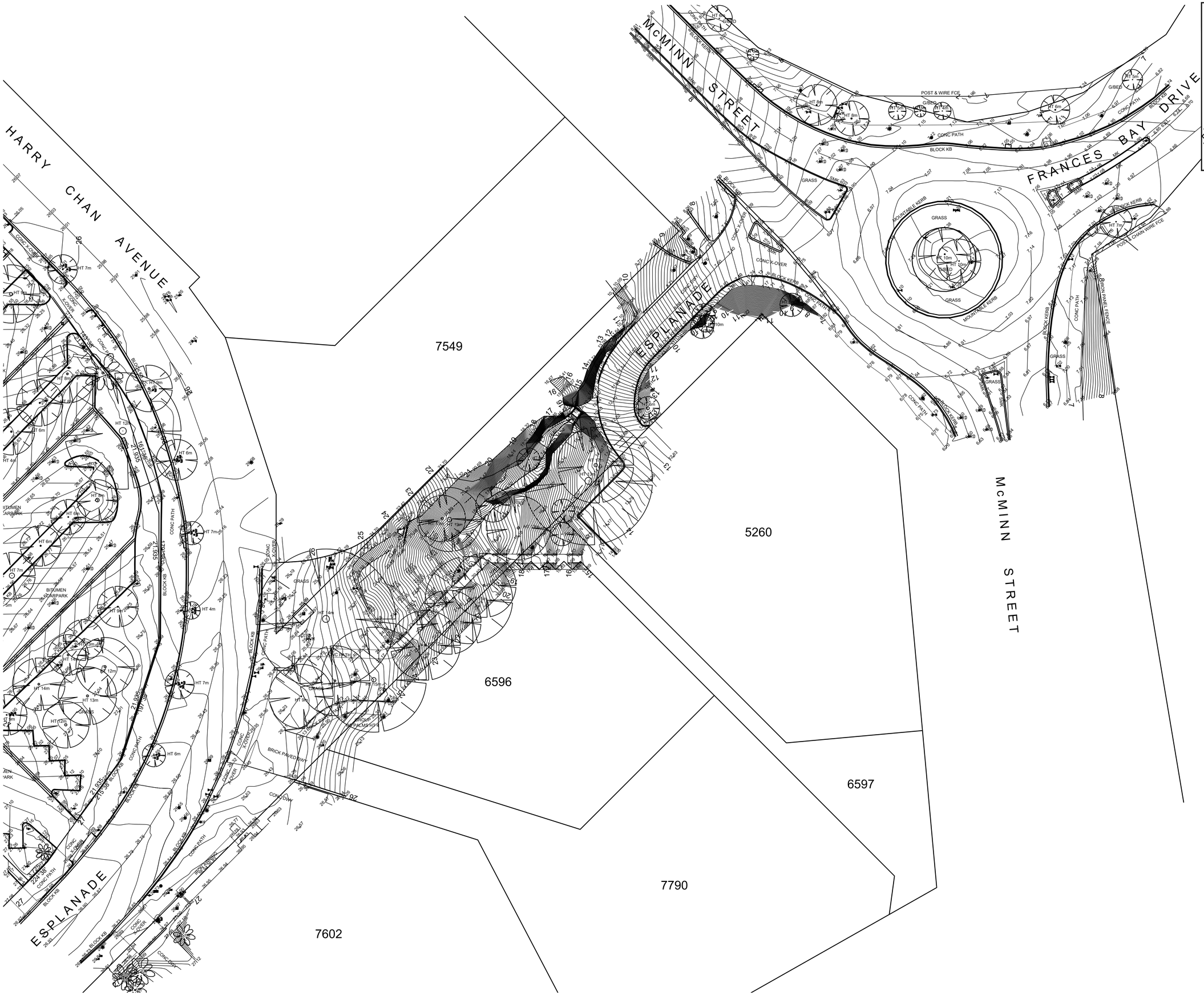
HOR DATUM: MGA 94 Z52
VERT DATUM: AHD

TOPOGRAPHIC SURVEY
DARWIN CIVIC CENTRE REDEVELOPMENT
HARRY CHAN AVENUE
DARWIN CITY, NT, 0800

CLIENT:
CITY OF DARWIN

JOB No.	PLAN	DRG	REV	SHEET
2300520	FS	001	B	1 OF 2

LS F 219



LOCATION SKETCH

NOT TO SCALE

SURVEY CONTROL COORDINATE LISTING MGA 94 Z52

STATION	EASTING	NORTHING	ELEVATION
S00157B03A	700505.538	8620699.794	5.500
S05156001	700368.272	8620872.113	5.849
S07154001	700706.39	8621580.038	9.570
S95222007	700339.697	8621053.926	26.652
S95222008	700680.853	8621301.603	26.260
S95222023	700851.679	8621541.478	5.911

NOTE:
AHD LEVEL DERIVED FROM COORDINATED REFERENCE MARKS LISTED IN TABLE

NOTE:
THIS PLAN HAS BEEN PREPARED WITH MGA94 COORDINATES.

CONTOUR LEGEND - 0.1M INTERVALS

MAJOR CONTOURS 00

MINOR CONTOURS

LEGEND:

COMMS PIT	C
ELECTRICAL PIT	E
ELECTRICAL SWITCHBOARD	E
ELECTRICAL LIGHT POLE	✱
ELECTRICAL FLOOD LIGHT	✱F
DRAINAGE GRATE	
DRAINAGE MANHOLE	●
SEWER MANHOLE	●
PARK METER	•
ROAD MARKING	RD
FLAG POLE	FP
GATE	
BOLLARD	B
SIGN	
LITTER BIN	LB
WATER IRRIGATION VALVE	
WATER STOP VALVE	
WATER HYDRANT	H
WATER MARKER	
WATER METER	WM
UNDEFINED SERVICE	U
NATURAL SURFACE SPOT HT	+

REV	DESCRIPTION	DRN	DATE	APP
B	CORRECTION TO BUILDING LINEWORK ON SHEET 1	MR	22/09/23	WB

Land Surveys
1/11 Bombing Road
Winnellie NT 0821
T (08) 8984 4078
E darwin@landsurveys.net.au
www.landsurveys.net.au

SCALE @ A1 : 1:300

5 0 5 10 15

SURVEYED BY: NS / RL

SURVEYED ON: 18 - 31/05/2023 & 07/07/2023

DRAWN BY: ED

DRAWN ON: 14/08/2023

HOR DATUM: MGA 94 Z52

VERT DATUM: AHD

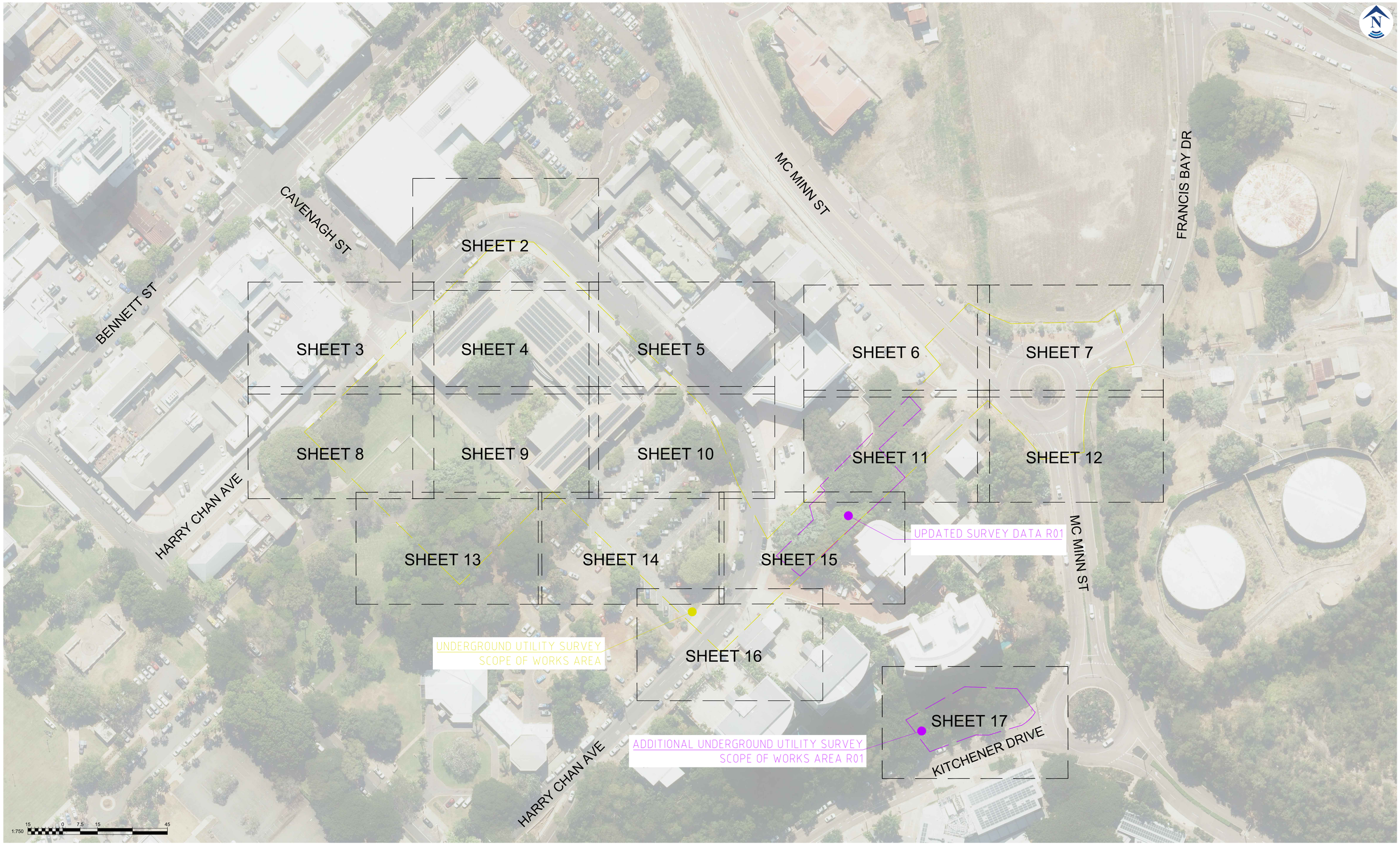
TOPOGRAPHIC SURVEY

DARWIN CIVIC CENTRE REDEVELOPMENT
HARRY CHAN AVENUE
DARWIN CITY, NT, 0800

CLIENT:
CITY OF DARWIN

JOB No.	PLAN	DRG	REV	SHEET
2300520	FS - 001		B	2 OF 2

LS F 219



REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING

Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207

Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:750	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

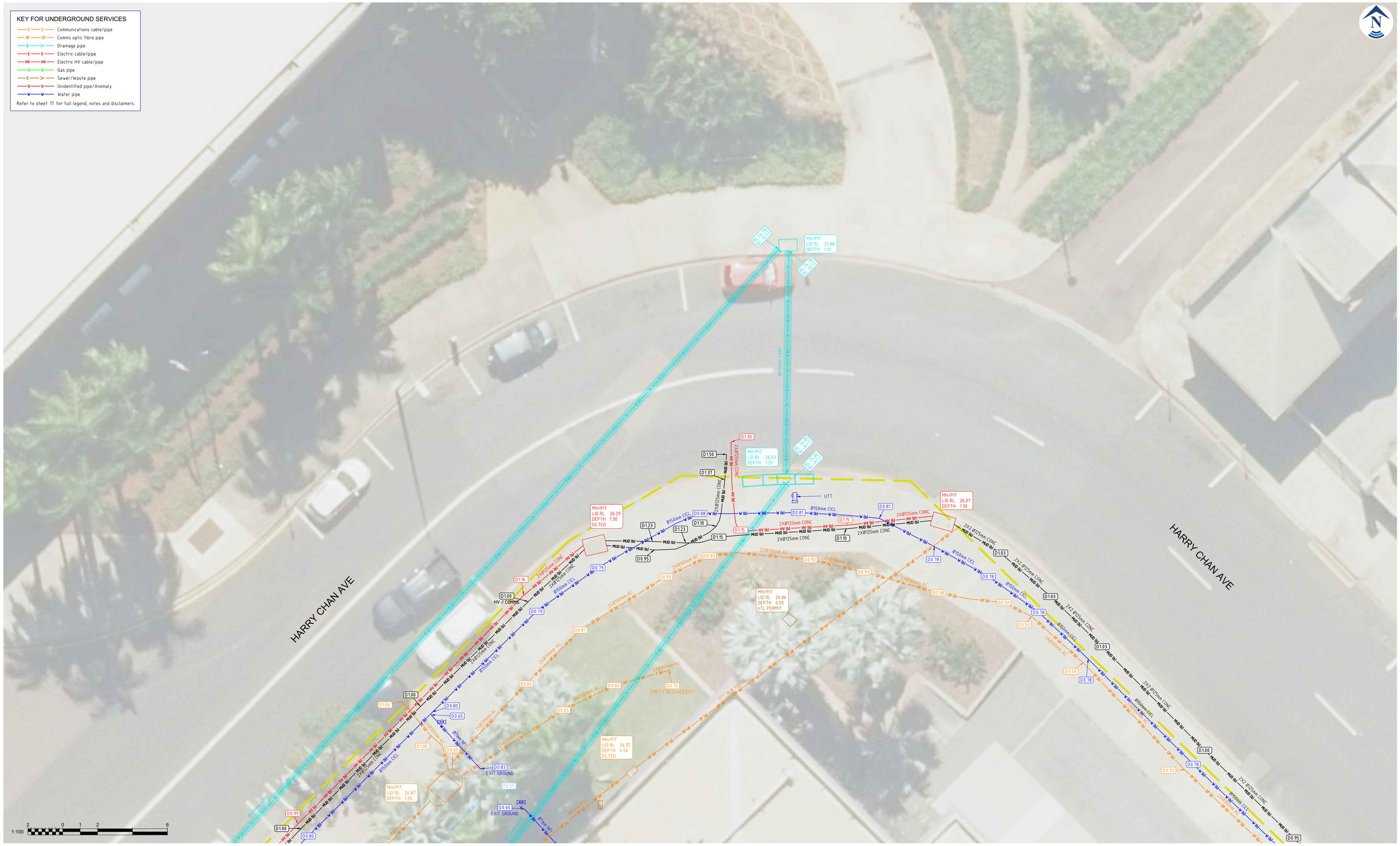
SHEET 1 OF 18

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- C — C — Communications cable/pipe
- OF — OF — Comms optic fibre pipe
- D — > — Drainage pipe
- E — E — Electric cable/pipe
- HV — HV — Electric HV cable/pipe
- G — G — Gas pipe
- S — > — Sewer/Waste pipe
- U — U — Unidentified pipe/Anomaly
- W — W — Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.



REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	- 5071 -	US -	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- Communications cable/pipe
- Comms optic fibre pipe
- Drainage pipe
- Electric cable/pipe
- Electric HV cable/pipe
- Gas pipe
- Sewer/Waste pipe
- Unidentified pipe/Anomaly
- Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

CAVENAGH ST

HARRY CHAN AVE

IRRIGATION CONTROL BOX

1:100 2 0 1 2 6

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING

Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207

Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- Communications cable/pipe
- Comms optic fibre pipe
- Drainage pipe
- Electric cable/pipe
- Electric HV cable/pipe
- Gas pipe
- Sewer/Waste pipe
- Unidentified pipe/Anomaly
- Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

MH/PIT LID RL 26.87 DEPTH 1.20
MH/PIT LID RL 26.88 DEPTH 0.42 SILTED
MH/PIT LID RL 26.98 DEPTH 1.64
MH/PIT LID RL 27.05 DEPTH 0.65
MH/PIT LID RL 27.36 DEPTH 1.92
MH/PIT LID RL 27.05 DEPTH 1.58
MH/PIT LID RL 26.20 DEPTH 0.64 SILTED
MH/PIT LID RL 26.92 DEPTH 1.50 SILTED,NVP
MH/PIT LID RL 27.01 DEPTH 1.58 SILTED
MH/PIT LID RL 27.02 DEPTH 0.51
MH/PIT LID RL 27.05 DEPTH 0.40
MH/PIT LID RL 27.57 DEPTH 0.65
MH/PIT LID RL 26.96 DEPTH 0.60
MH/PIT LID RL 26.92 DEPTH 0.53
MH/PIT LID RL 26.83 DEPTH 0.00 UTI
MH/PIT LID RL 26.89 DEPTH 0.49 SILTED NVP
MH/PIT LID RL 26.97 DEPTH 0.47 SILTED NVP

IRRIGATION CONTROL BOX
HV / COMMS
UTT BLOCKED
EXIT GROUND

1:100

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

SHEET 4 OF 18

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

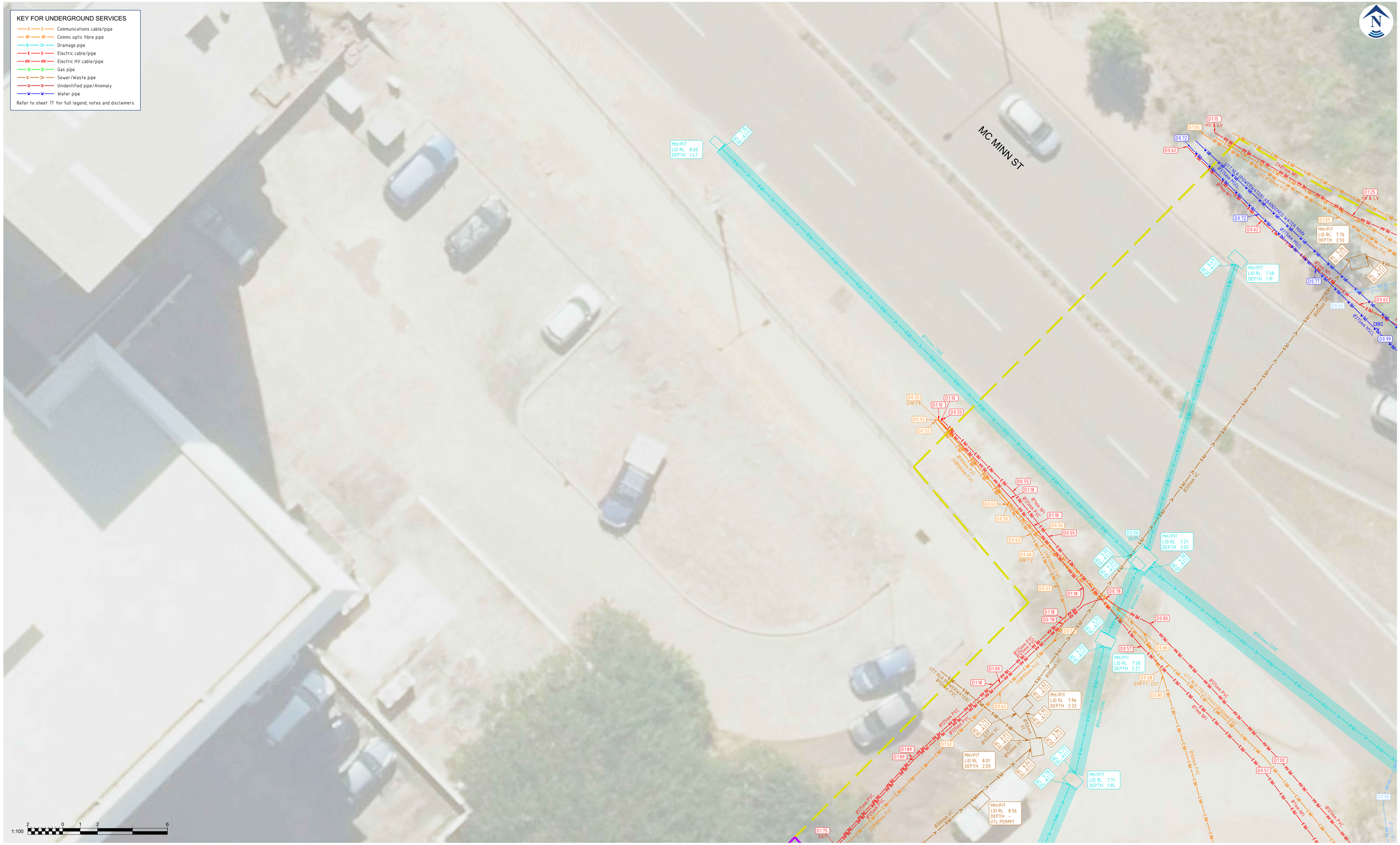
STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- C — C — Communications cable/pipe
- OF — OF — Comms optic fibre pipe
- D — D — Drainage pipe
- E — E — Electric cable/pipe
- HV — HV — Electric HV cable/pipe
- G — G — Gas pipe
- S — S — Sewer/Waste pipe
- U — U — Unidentified pipe/Anomaly
- W — W — Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.



REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING

Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207

Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

SHEET 6 OF 18

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- C — C — Communications cable/pipe
- OF — OF — Comms optic fibre pipe
- D — D — Drainage pipe
- E — E — Electric cable/pipe
- HV — HV — Electric HV cable/pipe
- G — G — Gas pipe
- S — S — Sewer/Waste pipe
- U — U — Unidentified pipe/Anomaly
- W — W — Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

MC MINN ST

FRANCIS BAY DR

UTT NLR (TELSTRA)Ø100mm PVC

UTT NLR (POWERWATER)Ø7mm NFI

UTT NLR (POWERWATER)Ø300mm VC

UTT NLR (POWERWATER) ABANDONED WATER MAIN

MH/PIT LID RL 7.76 DEPTH 2.55

MH/PIT LID RL 7.17 DEPTH 2.35

MH/PIT LID RL 7.11 DEPTH 1.15

MH/PIT LID RL 7.03 DEPTH 0.96

MH/PIT LID RL 7.05 DEPTH 2.65

1:100 2 0 1 2 6

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING

Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207

Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

SHEET 7 OF 18

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- C — C — Communications cable/pipe
- OF — OF — Comms optic fibre pipe
- D — D — Drainage pipe
- E — E — Electric cable/pipe
- HV — HV — Electric HV cable/pipe
- G — G — Gas pipe
- S — S — Sewer/Waste pipe
- U — U — Unidentified pipe/Anomaly
- W — W — Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

HARRY CHAN AVE

MH/PIT
LID RL 26.92
DEPTH 0.53

MH/PIT
LID RL 28.30
DEPTH -
CIVIV PARK LIGHTING SUB

1:100 2 0 1 2 6

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

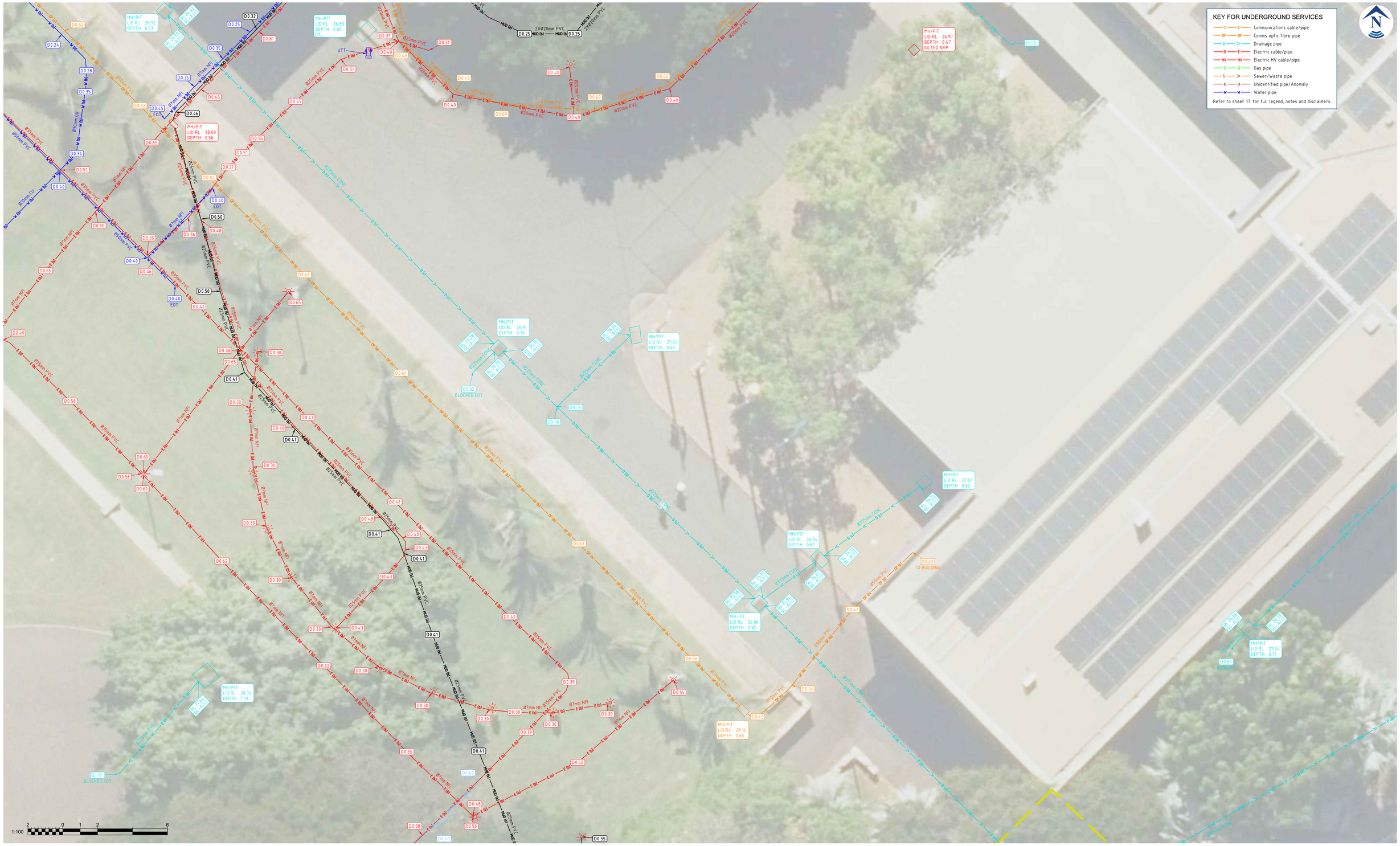
UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS



REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- C — C — Communications cable/pipe
- OF — OF — Comms optic fibre pipe
- D — D — Drainage pipe
- E — E — Electric cable/pipe
- HV — HV — Electric HV cable/pipe
- G — G — Gas pipe
- S — S — Sewer/Waste pipe
- U — U — Unidentified pipe/Anomaly
- W — W — Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

HARRY CHAN AVE

1:100

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING

Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207

Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

SHEET 10 OF 18

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- C — C — Communications cable/pipe
- OF — OF — Comms optic fibre pipe
- D — D — Drainage pipe
- E — E — Electric cable/pipe
- HV — HV — Electric HV cable/pipe
- G — G — Gas pipe
- S — S — Sewer/Waste pipe
- U — U — Unidentified pipe/Anomaly
- W — W — Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

ADDITIONAL SURVEY
DATA UPDATED - R01

MH/PIT
LID RL 8.56
DEPTH -
UTL PERMIT

UTS FURTHER - OBSTRUCTED TRACE

UTT WATER RISER

MH/PIT
LID RL 17.50
DEPTH 5.80

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

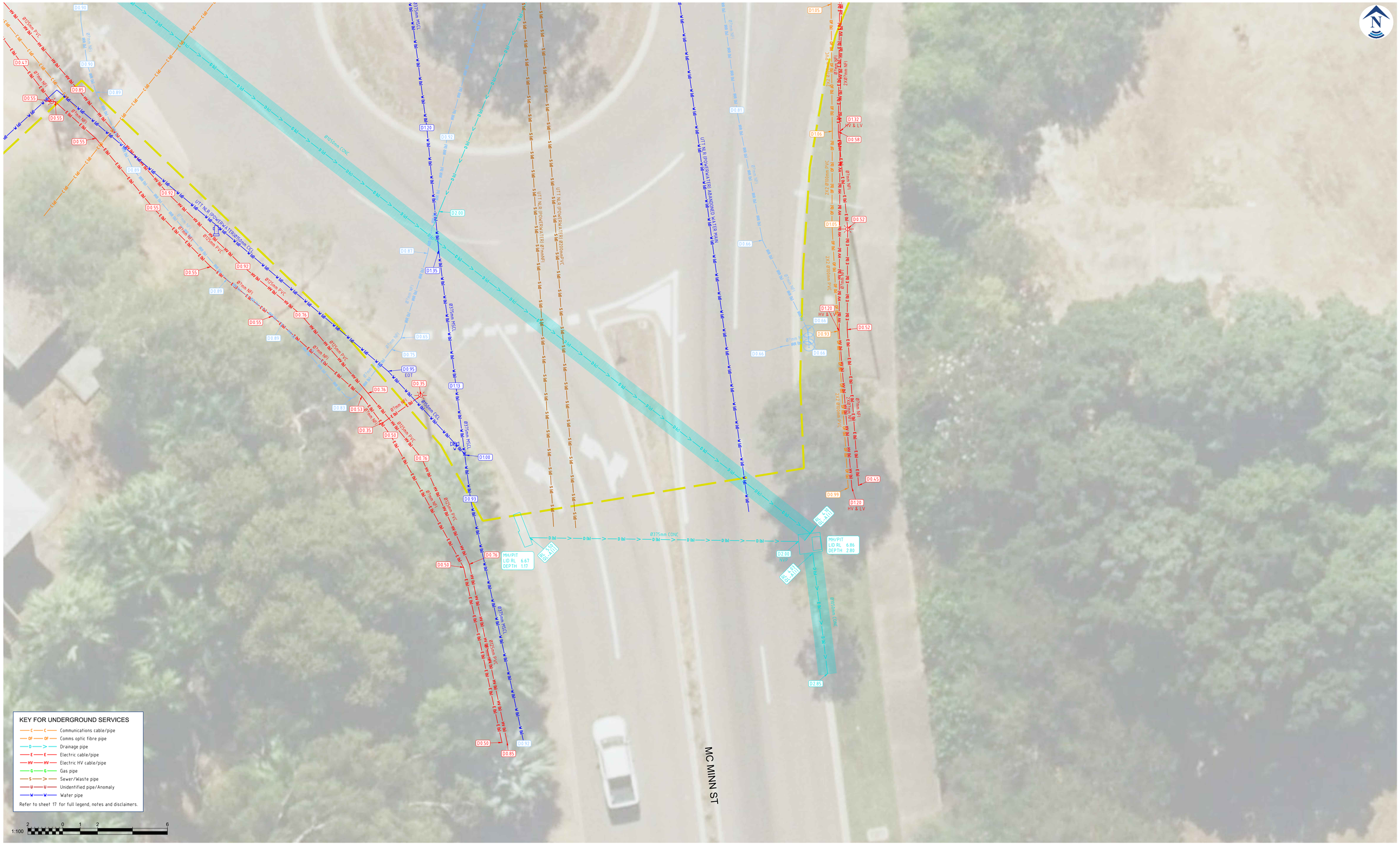
Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS
UNDERGROUND UTILITY SURVEY
DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS



REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING

Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207

Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS
UNDERGROUND UTILITY SURVEY
DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING

Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207

Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

HARRY CHAN AVE

ADDITIONAL SURVEY
DATA UPDATED - R01

KEY FOR UNDERGROUND SERVICES
- Communications cable/pipe
- Comms optic fibre pipe
- Drainage pipe
- Electric cable/pipe
- Electric HV cable/pipe
- Gas pipe
- Sewer/Waste pipe
- Unidentified pipe/Anomaly
- Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

1:100

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

SHEET 15 OF 18

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- C — C — Communications cable/pipe
- OF — OF — Comms optic fibre pipe
- D — D — Drainage pipe
- E — E — Electric cable/pipe
- HV — HV — Electric HV cable/pipe
- G — G — Gas pipe
- S — S — Sewer/Waste pipe
- U — U — Unidentified pipe/Anomaly
- W — W — Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

HARRY CHAN AVE

1:100 2 0 1 2 6

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING

Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207

Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS

UNDERGROUND UTILITY SURVEY

DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

KEY FOR UNDERGROUND SERVICES

- C — C — Communications cable/pipe
- OF — OF — Comms optic fibre pipe
- D — > — Drainage pipe
- E — E — Electric cable/pipe
- HV — HV — Electric HV cable/pipe
- G — G — Gas pipe
- S — > — Sewer/Waste pipe
- U — U — Unidentified pipe/Anomaly
- W — W — Water pipe

Refer to sheet 17 for full legend, notes and disclaimers.

ADDITIONAL SURVEY
DATA UPDATED - R01

SEWER ASSETS NOT ATTEMPTED TO LOCATE?
NOT PART OF THIS UPDATE SURVEY?

KITCHENER DRIVE

1:100

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS
UNDERGROUND UTILITY SURVEY
DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	1:100	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	34496754	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

SUBSURFACE UTILITY INFORMATION (SUI) AS5488.1:2019 CLASSIFICATION

QUALITY LABELING UTILITY INFORMATION BY A CLASSIFICATION CODE ALLOWS THE USER OF THIS INFORMATION TO UNDERSTAND CLEARLY HOW THE INFORMATION WAS COLLECTED AND THEN PLACE AN APPROPRIATE AMOUNT OF RELIANCE ON IT. PROJECT RISKS RELATED TO UNDERGROUND UTILITIES CAN THEN BE PROPERLY MANAGED.

QUALITY A:

INFORMATION IS THE HIGHEST POSSIBLE LEVEL OF ACCURACY AND IS OBTAINED EXPOSING THE UNDERGROUND UTILITY USING A NON DESTRUCTIVE EXCAVATION (POT HOLING) TECHNIQUE. THE VERTICAL INFORMATION FOR THIS LOCATING METHOD IS TO THE TOP OF THE SHALLOWEST PART OF THE LOCATED SERVICE. THE 3D LOCATION IS RECORDED AS AN X,Y,Z COORDINATE. EXPECTED HORIZONTAL AND VERTICAL ACCURACY IS +/-50mm.

QUALITY B:

INFORMATION IS COLLECTED BY DESIGNATING THE HORIZONTAL AND VERTICAL LOCATION OF UNDERGROUND UTILITIES BY USING ELECTROMAGNETIC PIPE AND CABLE LOCATORS, SONDES OR FLEXI TRACE, GROUND PENETRATING RADAR AND ACOUSTIC PULSE EQUIPMENT. THIS IS THE MOST COMMON FORM OF UTILITY LOCATING AND ALTHOUGH AN X,Y, AND Z AXIS CAN BE ESTABLISHED IT IS NOT ALWAYS ENTIRELY ACCURATE DUE TO DIFFERING ELECTROMAGNETIC FIELDS, SOIL CONDITIONS AND MULTIPLE BANKS OF CABLES AFFECTING THE LOCATING SIGNAL. EXPECTED HORIZONTAL ACCURACY IS +/-300mm, VERTICAL ACCURACY +/-500mm.

QUALITY C:

INFORMATION IS COLLECTED BY CORRELATING THE SURVEY OF VISIBLE UTILITY SURFACE FEATURES SUCH AS MARKER PLATES OR WATER HYDRANTS AND ACQUIRED DIAL BEFORE YOU DIG PLANS TO DRAW A STRING WHICH SHOWS THE APPROXIMATE POSITION OF SERVICES. THIS METHOD DOES NOT USUALLY SHOW MULTIPLE BANKS OF CABLES AND DOES NOT ALWAYS SHOW THREE DIMENSIONAL INFORMATION. EXPECTED HORIZONTAL ACCURACY (SURFACE FEATURES ONLY) IS +/-300mm.

QUALITY D:

INFORMATION IS THE MOST BASIC LEVEL OF UTILITY LOCATIONS USING ONLY INFORMATION BASED ON EXISTING DIAL BEFORE YOU DIG PLANS OR OTHER RECORDS AND BY MEASURING BOUNDARY OFFSETS ETC. THIS METHOD OF UTILITY LOCATION SHOULD ALWAYS BE TREATED AS AN INDICATION OF THE PRESENCE OF A SERVICE ONLY AND SHOULD NOT BE USED FOR DESIGN. TOLERANCE DOES NOT APPLY TO AN INDICATIVE LOCATION THAT IS ATTRIBUTED TO QUALITY LEVEL D.

DETECTION DISCLAIMER:

ELECTROMAGNETIC LOCATING TECHNIQUES AS WELL AS GROUND PENETRATING RADAR HAVE BEEN UTILISED IN THE LOCATION OF UNDERGROUND SERVICES. THESE RESULTS ARE NOT INFALLIBLE AND A NON DESTRUCTIVE DIG PROCESS SHOULD BE CARRIED OUT TO CONFIRM SERVICE IDENTIFICATION, POSITIONS AND PARTICULARLY HEIGHTS, WHERE THESE ARE CRITICAL. ALTHOUGH ALL REASONABLE EFFORT HAS BEEN MADE IN LOCATING AND MAPPING THE UNDERGROUND SERVICES, THE COMPLETE EXTENTS OF THE THIS UTILITY SURVEY INFORMATION CANNOT BE GUARANTEED.

SURVEY TECHNIQUE DISCLAIMER:

ALL SURVEY INFORMATION COLLECTED BY UTILITY MAPPING SHOWN ON THIS PLAN HAS BEEN SURVEYED USING GNSS AND TPS SURVEY METHODS. EXPECTED MINIMUM ACCURACY OF GNSS SURVEY DATA IS +/-50mm. ACCURACY IS SUBJECT TO VARIATION DEPENDANT ON SITE CONDITIONS AND SURVEY CONTROL NETWORK SOURCES. AFOREMENTIONED TOLERANCE PROVIDED SHOULD BE USED AS A GUIDE ONLY AND REVIEWED ON A PROJECT BY PROJECT BASIS.

AERIAL IMAGERY DISCLAIMER:

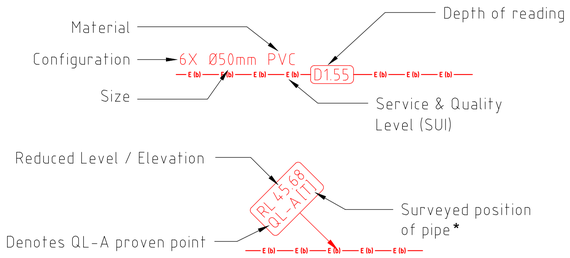
AERIAL IMAGERY HAS BEEN SUPPLIED UNDER A COMMERCIAL LICENCE AGREEMENT AND IS NOT TO BE REPRODUCED FOR ANY OTHER PURPOSES OTHER THAN THAT INTENDED BY UTILITY MAPPING UNDER ANY CIRCUMSTANCE WITHOUT WRITTEN APPROVAL. FEATURES SHOWN ON IMAGERY ARE INDICATIVE ONLY AND MAY NOT REPRESENT THE TRUE AND FINAL POSITION OF FEATURES ON SITE.

KEY FOR UNDERGROUND SERVICES

- Air line
- Chemical cable/pipe
- Communications cable/pipe
- Comms optic fibre pipe
- Drainage pipe
- Electric earth cable/pipe
- Electric cable/pipe
- Electric direct buried cable
- Electric HV cable/pipe
- Fuel pipe
- Gas pipe
- Irrigation pipe
- Chilled water pipe
- Heated water pipe
- Oil pipe
- Rail counter cable/pipe
- Sewer/Waste pipe
- Sewer pressure main pipe
- Traffic cable/pipe
- Unidentified pipe/Anomaly
- Water pipe
- Underground storage tank
- Multi user duct
- Empty duct
- Overhead service
- Survey Boundary
- Survey Boundary - No Access
- Cable/Pipe group or duct
- Trench scar

- Air pit centre
- Air valve
- Chemical pit centre
- Chemical valve
- Comms main marker
- Comms pillar
- Comms pole
- Comms pit centre
- Drainage connection
- Drainage down pipe
- Drainage pump
- Drainage pit centre
- Electric dome
- Electric earth cover
- Electric earth spike
- Electric junction box
- Electric light
- Electric light pole
- Electric main marker
- Electric power pole
- Electric pit centre
- Electric sign centre
- Fuel access point
- Fuel pit centre
- Fuel valve
- Gas bottle
- Gas meter
- Gas main marker
- Gas pit centre
- Gas test point
- Gas valve
- Irrigation pit centre
- Irrigation sprinkler
- Irrigation valve
- Mechanical chilled water valve
- Mechanical hot water valve
- Mechanical pit centre
- Oil pit centre
- Oil valve
- Rail junction box
- Rail light
- Rail pit centre
- Rail signal control box
- Rail traffic signal
- Sewer main marker
- Sewer connection
- Sewer flush point
- Sewer inspection opening
- Sewer inspection shaft
- Sewer pit centre
- Sewer pipe vent
- Sewer valve
- Traffic camera
- Traffic pit centre
- Traffic signal light
- Traffic sensor
- Unknown main marker
- Unknown pit centre
- Unknown valve
- Water bore
- Water connection
- Water fire hose
- Water hydrant
- Water meter
- Water main marker
- Water pump
- Water pit centre
- Water tap
- Water valve
- Characteristic change
- Pothole (indicative)
- Miscellaneous pipe riser
- End of trace

EXPLANATION OF PIPE ANNOTATION



* Surveyed position of pipe: C = Centre, I = Invert, T = Top, G = Ground Level
Where Ground Level is shown it indicates that no depth has been obtainable.

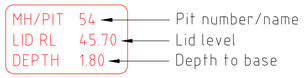
EXPLANATION OF CONFIGURATION

Pipe configuration is annotated as the number of pipes per row. For example:

2x3x4 (total of 9 pipes) =

Where pipes are not clearly defined in rows, a single total number is given eg. 9x.

EXPLANATION OF PIT ANNOTATION



EXPLANATION OF SUBSURFACE UTILITY INFORMATION (SUI AS5488)

- Denotes electric pipe/cable verified to QL-A
- Denotes electric pipe/cable verified to QL-B
  → Verified utility
- Denotes electric pipe/cable verified to QL-C
- Denotes electric pipe/cable verified to QL-D
  → Unverified utility

ABBREVIATIONS FOR UNDERGROUND SERVICES

MATERIALS

AC	Asbestos cement
ALK	Alkathene
BR	Brick
CI	Cast iron
CICL	Cast iron cement lined
CONC	Concrete
CU	Copper
DI	Ductile iron
DICL	Ductile iron cement lined
DIPL	Ductile iron poly lined
EW	Earthenware
FG	Fibreglass
GI	Galvanised iron
GRP	Glass reinforced plastic
MDPE	Medium density polyethylene
MS	Medium steel
MSCL	Medium steel cement lined
PE	Polyethylene
PVC	Polyvinyl chloride
RC	Reinforced concrete
SGW	Salt glazed ware
SI	Spun iron
SPL	Steel poly lined
ST	Steel
VC	Vitrified clay

GENERAL INFORMATION

AR	Assumed route
B/D	Backdrop
CL	Cover level
DB	Direct buried
DOC	Depth of cover
DTB	Depth to base
DTI	Depth to invert
DTS	Depth to silt
DTW	Depth to water
EOT	End of trace
FOD	Full of debris
FOS	Full of silt (silted)
GPR	Ground penetrating radar
IL	Invert level
NFI	No further information
NLA	Not located - route assumed
NLI	Not located - route plotted from on-site information
NLR	Not located - route plotted from records
NLT	Not located - plotted from visible trench scar detail
NS	No signal
NVP	No visible pipes
OBV	Obvert
PS	Poor signal
SL	Silt level
TFR	Taken from records (QL-D)
UTF	Unable to find
UTL	Unable to lift
UTR	Unable to rod
UTS	Unable to survey
UTT	Unable to trace
VP	Vent pipe
WL	Water level

NOTES FOR UNDERGROUND SERVICES

1. Pipe sizes which cannot be obtained by visual survey are taken from record drawings/marker plates where available.
2. Cable routes shown as a single line may actually consist of many cables, refer to annotated configuration details.
3. Drainage pipe sizes & invert levels have been determined without man entry into chambers. Every effort has been made to correctly obtain this information, however, accuracy is dependent on visibility from the surface.
4. All annotations depict 'depth to service' UNLESS otherwise stated. Annotations marked 'RL' indicate the true elevation of service feature.
5. Utility lines located using Electromagnetic Induction (EMI) or similar proving techniques are assumed to have been located to the approximate CENTRE of the service.
6. Utility lines located using Ground Penetrating Radar (GPR) or similar proving techniques are assumed to have been located to the TOP of the service.

REV	REVISION DESCRIPTION	DATE	DRN	CHK
2	ADDITIONAL SEWER DATA (SHEETS 5,6,7,11,15,16)	30/10/23	LCC	JP
1	ADDITIONAL SCOPE AND UPDATED SURVEY (SHEETS 11, 15 & 17)	13/07/23	JCR	JP

Utility MAPPING
Suite 2, 85 Salmon Street
Port Melbourne
VIC 3207
Ph: 1300 62 77 46
Mail: melbourne@utilitymapping.com.au
Web: www.utilitymapping.com.au

LAND SURVEYS
UNDERGROUND UTILITY SURVEY
DARWIN CIVIC CENTER
HARRY CHAN AVENUE
DARWIN CITY, NT

LOCATED:	JP	CHECKED:	JP	DATE:	09/06/2023
SURVEYED:	JP	SCALE AT A1:	NTS	DATUM:	AHD
DRAWN:	TN/JCR	DBYD REF:	VARIOUS	GRID:	MGA94 Z52

STATE/YEAR	JOB No	DRG TYPE	DRG No	REV
VIC23	5071	US	01	R02

SHEET 18 OF 18

C:\Users\Carlo Celis\Utility Mapping\Projects - Documents\General\2023\VIC\VIC23-5071 Darwin Civic Centre - LS\06 Drafting\R02\VIC23-5071-US 01 R02.dwg CARLO CELIS

Appendix E
City of Darwin Stormwater Utilities Map

City of Darwin Stormwater Utility Map - 18/11/2024

https://darwin.maps.arcgis.com/apps/webappviewer/index.html?id=bf930bbb76124cee95d8856ded2abf5c

Adelaide

Level 6, 19 Grenfell Street
Adelaide SA 5000

Phone: 1300 657 402

Email: info@adgce.com

Brisbane

596 Milton Road
Toowong, QLD 4066

Postal: PO Box 1492 Toowong
BC QLD 4066

Phone: 1300 657 402

Email: info@adgce.com

Canberra

Level 1, 68 Northbourne Avenue
Canberra, ACT, 2600, Australia

Phone: 1300 657 402

Email: info@adgce.com

Darwin

Suite G01, Manunda Place
38 Cavenagh Street
Darwin, NT 0800

Phone: 1300 657 402

Email: info@adgce.com

Gold Coast

Suite 201, Level 1, 1 Short Street
Southport, QLD 4215

Postal: PO Box 208
Southport, QLD 4215

Phone: 1300 657 402

Email: info@adgce.com

Hobart

Tenancy 1B, Level 1,
199 Collins Street
Hobart TAS 7000

Phone: 1300 657 402

Email: info@adgce.com

Melbourne

321 / 838 Collins Street
Docklands, VIC 3008

Phone: 1300 657 402

Email: info@adgce.com

Perth

Suite 9, Level 2, 23 Railway Road,
Subiaco WA 6008

Phone: 1300 657 402

Email: info@adgce.com

Sunshine Coast

Level 3, 2 Emporio Place
Maroochydore, QLD 4558

Postal: PO Box 5014
Maroochydore BC,
QLD 4558

Phone: 1300 657 402

Email: info@adgce.com

Sydney

Suite 22.02, Level 22,
111 Pacific Highway,
North Sydney, NSW, 2060

Phone: 1300 657 402

Email: info@adgce.com

Toowoomba

Tenancy 8, 158 Margaret Street
Toowoomba QLD 4350

Phone: 1300 657 402

ADG Engineers
www.adgce.com