Premise

MIRVAC

Central Park, Everleigh

ENGINEERING SERVICES REPORT

Report No: MIR017/R02003394

Rev: D

24 June 2021

PLANS AND DOCUMENTS
referred to in the PDA
DEVELOPMENT APPROVAL

Approval no: DEV2020/1131

Date: 13 July 2021

Queensland Government

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DOCUMENT AUTHORISATION					
Revision	**Revision Date**	**Report Details**			
A	20/07/20	Original Issue			
B	06/11/20	Amended per MIRVAC requests dated 04 November 2020			
C	29/04/21	Amended per MIRVAC requests dated 22 April 2021			
D	24/06/21	Amendments as agreed by EDQ on 24/6/21 via email to Mirvac			
Prepared By		**Reviewed By**		**Authorised By**	
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CONTENTS

1. INTRODUCTION 1
2. SITE CHARACTERISTICS 2
3. DATA 3
4. SERVICES FOR DEVELOPMENT 4
4.1 EARTHWORKS 4
4.2 EROSION & SEDIMENT CONTROL 4
4.3 ROADWORKS 5
4.4 TRAFFIC 5
4.5 STORMWATER DRAINAGE 5
4.6 SEWER RETICULATION 6
4.7 WATER RETICULATION 7
4.8 ELECTRICITY, LIGHTING, TELECOMMUNICATIONS & GAS 7
5. CONCLUSION 8

FIGURES

Figure 1.1: Central Park layout & sub-precinct split (prepared by Form Landscape Architects) 1
Figure 2.1: Site Location 2

APPENDICES

A.1 APPENDIX A – MASTERPLAN LAYOUT 9
A.2 APPENDIX B – CONCEPTUAL EARTHWORKS PLANS 10
A.3 APPENDIX C – CONCEPTUAL ROADWORKS PLANS 11
A.4 APPENDIX D – CONCEPTUAL STORMWATER DRAINAGE PLAN 12
A.5 APPENDIX E – CONCEPTUAL SEWER PLAN 13
A.6 APPENDIX F – CONCEPTUAL WATER PLAN 14
A.7 APPENDIX G – TRAFFIC STATEMENT 15

1. INTRODUCTION

Premise was commissioned by Mirvac to prepare an Engineering Services Report for the Central Park Precinct being the Regional (Major) Sports Park & Regional (Major) Recreation Park proposed within Everleigh. The Everleigh development is located at Teviot Road, Greenbank and is part of the Priority Development Area (PDA) with EDQ being the assessing authority. The Central Park site is located adjoining the constructed Everleigh Drive. The proposed park development consists of a range of uses. The Central Park precinct has been divided into sub-precincts defined as Lot 802, Lot 804, Lot 805, Lot 806, Lot 807, Lot 808, Lot 809, Lot 810, and Lot 811. The Central Park masterplan and split-up of the sub-precincts can be seen in the below figure 1.1. The Central Park General Arrangement plan, prepared by Form Landscape Architects, can be seen in Appendix A.

This report addresses the engineering services that will be required to service the proposed development and examines the development at an "as if complete" conceptual level for Development Approval. This report should be read in conjunction with the reports provided by Urbis (Town Planning).

Figure 1.1: Central Park layout & sub-precinct split (prepared by Form Landscape Architects)

2. SITE CHARACTERISTICS

The Central Park precinct has an approximate area of 256,610sqm and is located centrally within the Everleigh development. The site adjoins the constructed Everleigh Drive to the east and is bisected by Ivory Parkway which runs east west through the subject site creating a north and south distinction between the park area. The recently created school parcel is located to the east with future residential precincts fronting the north, south and south-east boundaries of the site.

Large portions of the subject site are situated over land which has previously had vegetation cleared. Some clearing will be required to develop the balance.

The natural surface profile within the central park precinct has been altered by several earthworks operations associated with previous approvals. These include partial filling within the northern park area adjacent Everleigh Drive, the construction of a water holding dam, a temporary sewer tankering site, permanent stormwater quality and quantity infrastructure south of Ivory Parkway, and some excavation adjacent the school site parcel to facilitate earthworks material requirements for the school. The natural topography involves a high point in the northern park area and a gully through the south park area which drains towards the southernmost part of the site. Precincts 1, 2, 3, 9 and 12, plus a small portion of Precinct 5, 6 & 8 fall towards the subject site. The natural surface profile gradings within the Central Park area range from 1% to 5%, with the invert of the natural gully having a mostly consistent longitudinal grade of approximately 1%.

The proposed site location in context with the Everleigh development can be seen in the figure below.

Figure 2.1: Site Location

3. DATA

Data for this report has been gathered from the following sources:

- Urbis Townplanners – Lot layout
- Economic Development Queensland (EDQ) – Greater Flagstone Priority Development Area plans and documents;
- Saunders Havill Group – Detail Survey;
- Approved (EDQ) MWH Global Movement Network Infrastructure Master Plan;
- Approved (EDQ) MWH Global Sewer and Water Master Plan;
- Logan City Council – Existing services location (where applicable and relevant) and Planning Scheme 2015 development information; and
- Dial Before You Dig.

4. SERVICES FOR DEVELOPMENT

4.1 EARTHWORKS

Earthworks will be required to facilitate the construction of the various features and elements proposed within the Central Park site. The earthworks will consist of excavations, filling and batters with maximum slope of 1 in 4. Retaining walls may be required to support future detail design of landscape outcomes. It is noted that the natural surface profile within the site has been previously altered by several earthworks operations that have been associated with previous approvals. These earthworks operations were designed and undertaken with consideration to the future design levels within the central park area.

A preliminary "as if complete" earthworks design has been carried out over the park site. While the target for the earthworks design was to minimise the cut and fill volumes associated with the earthworks operation along with targeting a cut to fill volume balance, there were several constraints that needed to be considered which influenced levels. These constraints included:

- Interface to existing constructed levels.
- Sports fields & courts surface grade requirements.
- Relationship between sports fields and the adjoining levels and access requirements.
- Access and disability grades along footpaths.
- Stormwater drainage outlet and channel levels.
- Stormwater detention volume requirements.
- Coordination with landscape design.

The earthworks design for the area has identified that the overall earthworks cut and fill volumes result in the requirement to source material from a location outside the park boundary to meet the fill material requirements. Material borrow areas outside the ROL6 works extent may vary based on balance development activities and earthworks strategies and cannot be definitively identified at this stage. Accordingly, such borrow areas will be identified and subject of separate clearing and earthworks applications.

There is a mapped low risk waterway at the southern extent of the southern park area. Earthworks associated with the wetland and stormwater channel are proposed at this location. Refer to the Significant Biodiversity Technical Report prepared by Saunders Havill Group for details on the waterway and associated requirements.

The proposed earthworks design and extent can be seen on the Concept Earthworks Sketch Plans provided in Appendix B.

4.2 EROSION & SEDIMENT CONTROL

Erosion and Sediment Control (ESC) measures will be required during all stages of development from site establishment to project completion. An Erosion and Sediment Control program will be designed and detailed during the detailed design phase.

4.3 ROADWORKS

Access to the Central Park precinct will be gained via Everleigh Drive (constructed with Precinct 1), Ivory Parkway (constructed with School Site Package 2) and Anderson Drive (approved and to be constructed with School Site Package 3).

Vehicle access into carparking within the Central Park site is provided at 3 locations. A park link road is proposed to traverse the Northern Park area with an entry/exit connection to Ivory Parkway and Anderson Drive at either end. A single entry/exit on Ivory Parkway is proposed to the carpark located within the Southern Park area.

Some minor alterations to the existing roads are required to facilitate these 3 connection points. Conceptual sketches showing the above configuration are provided in Appendix C.

4.4 TRAFFIC

A traffic statement has been prepared which assesses the proposed carparking and access works against relevant codes and standards and the effectiveness of surrounding road infrastructure to support the proposal. The traffic statement includes the following:

- Frontage assessment;
- Access assessment including turn warrant assessment, intersection analysis and sight distances;
- Northern Park Link (Road 53) assessment;
- Southern Car Park assessment; and
- Parking assessment.

The traffic statement can be seen in Appendix G.

4.5 STORMWATER DRAINAGE

The stormwater details described below can be seen on the Concept Stormwater Drainage Layout in Appendix D.

4.5.1.1 Stormwater Drainage

Underground stormwater drainage is proposed to collect surface runoff from the park link road and carparks, park spaces, and sports oval. Existing underground stormwater connection points have been provided from Ivory Parkway for the connection of the proposed Park stormwater. The existing connection points have been adequately sized for the contributing park catchment.

Provisions for upstream existing and future stormwater flows will also be provided. This includes the continuation of the overland flow channel from the recreation park constructed in Precinct 1 that will continue through the proposed ROL6 area. Underground stormwater pipework will also need to be constructed through the Northern Park to cater for upstream development areas. There are two (2) main connections required to service Precinct 12 and Precinct 9. An existing overland channel catering for major storm overland flows has been previously constructed within the site and adjoins the school site boundary.

4.5.1.2 Stormwater Channels

The existing temporary stormwater channels constructed with the school site Package 2 works that are located downstream of the stormwater outlet locations from Ivory Parkway will be reconstructed to their ultimate alignments. These will join with the proposed stormwater channel which flows to the proposed wetland. All stormwater channels will be sized to effectively convey the design flows of the contributing stormwater catchments and will consider final landscape finishes, velocities and shear stress. A preliminary channel sizing has been undertaken and adopted for the purpose of layout planning within the park area.

4.5.1.3 Wetland & Rainwater Harvesting

The wetland consists of a typical wetland stormwater quality treatment area and a stormwater harvesting area. The stormwater harvesting area will be a permanent water body that will be used for irrigating the sports fields. This will be achieved by installing a pumping facility nearby the harvesting waterbody which will pump the water via an irrigation network to the fields. It is noted that the rainwater harvesting proposal has in principle support from Logan City Council.

For further details on the proposed rainwater harvesting strategy refer to the Stormwater Report prepared by Engeny.

4.5.1.4 Stormwater Management - Quantity

Anderson Drive borders the eastern site boundary adjacent the proposed wetland. The earthworks for Anderson Drive will be carried out as part of this application. This road will be constructed to the ultimate levels which will contain large stormwater inflows and, in combination with appropriately sized stormwater culverts, will provide attenuation of flows by creating storage within the wetland area. The roadworks for Anderson Drive will be design and constructed under a future separate application. This detention will be designed to attenuate flows for the Central Park Precinct as well as existing and future development catchment area contributing to this location.

4.5.1.5 Existing Detention and Bioretention

Existing temporary detention bund and permanent bioretention basins are located to the south east of the Everleigh Drive / Ivory Parkway intersection. This infrastructure was constructed with Precinct 1. The detention bund will ultimately be removed as part of the proposed ultimate works for this precinct. The stormwater management (quantity) proposal is discussed in further detail in the Stormwater Report prepared by Engeny which accompanies this submission.

4.6 SEWER RETICULATION

Sewer connections will be provided for the proposed club houses and toilet block. This amounts to a total of 4 connections required.

A 225mm diameter sewer main will be constructed with Precinct 12 works through the northern park area and will service Precinct 12. This sewer line will largely follow the alignment of the northern park link road. Property connections for the sports oval club house and toilet block will be provided from this main. A new 225mm diameter sewer will be required through the northern park to service the future Precinct 9 development (plus other adjoining precincts). This main will be constructed at the western side of the northern park. A property connection for the courts club house will be gained from this main.

An existing 150mm diameter sewer pipe connection stub has been provided to the southern park area for connection to the club house. A future sewer rising main will be constructed within the southern park on an

alignment offset from the Ivory Parkway road boundary. This sewer rising main will be designed and constructed with the future Precinct 5 application. Appropriate space provision for this main has been provided within the site. The suitability of this alignment located within the park has been confirmed with Logan Water. This rising main will ultimately cross onto an alignment within verge of Anderson Drive rather than being within the park.

The details described above are shown on the Concept Sewer Plan in Appendix E.

4.7 WATER RETICULATION

An existing 250mm diameter water main is located in Ivory Parkway. Water service connections will be required for the proposed club houses. An additional water connection is required for the stormwater harvesting.

A proposed 150mm diameter link main will be constructed between Ivory Parkway and Precinct 9 to connect the high-level water zone. This main will be constructed generally parallel to the northern park link road. Services for the courts club house and sports oval club house will be gained from this water main.

The property service connection point for the club house located in the southern park area will be gained from the existing water main in Ivory Parkway.

A new water main extension will be required down the future Anderson Drive roadway to provide a watermain connection to the stormwater harvesting operations shed. This connection is required as a back-up if the stormwater harvesting pond does not have enough volume to meet the irrigation demands. The water network has been modelled and sized to ensure enough capacity is available for the irrigation demand.

The details described above are shown on the Concept Water Plan in Appendix F.

4.8 ELECTRICITY, LIGHTING, TELECOMMUNICATIONS & GAS

Electrical, telecommunication, and gas services exist in Ivory Parkway and have enough capacity for the electrical demands that are proposed to be generated by the Central Park precinct.

Electricity and NBN service connections will be provided to the proposed club houses. Electricity supply and lighting will be supplied throughout the central park site. Details of these will be confirmed during the operational works phase and will be designed in accordance with the relevant service provider requirements.

5. CONCLUSION

Based on the information collected and preliminary investigations carried out it has been established that the proposed development can be adequately serviced.

All service and infrastructure layouts are generally in accordance with the relevant approved infrastructure master plans, EDQ requirements, and other relevant and appropriate design standards and guidelines.

A.1 APPENDIX A – MASTERPLAN LAYOUT

2.0 ROL6 - General Arrangement Plan

Legend	Embellishment
	Internal access road(s)[1]
	Primary access road
	Secondary access road
	Parking (cars)
	Parking (buses)
	Parking (bicycles)
	Toilets
	Informal Active Recreational Space
	Paths (pedestrian / cycle)
	• *4.0m (pedestrian/cycle shared path in rec. & linear park)*
	• *4.0m (pedestrian/cycle shared path in road reserve)*
	• *2.5m (pedestrian/cycle shared path in park)*
	• *2.5m (pedestrian/cycle shared path in road verge)*
	• *Other path (1.5m minimum)*
	• *Boardwalk*
	Shade structures
	Play areas / facilities
	Seating
	Table & seating (covered)
	Table & seating (uncovered)
	Lighting
	Half-court, rebound wall or similar
	Barbeques
	Sports fields[2]
	Courts[2]
	Ancillary fields
	Spectator Seating[3]
	Community Events Space
	Bio-retention basin
	Open water
	Drainage channel
	Wetland
	Signage
	Study trail features
	Fenced dog park
	School provision
	Play Spine
	Club House[4]
	Pedestrian Crossing

Notes

1. *Where required for internal access only*
2. *Sports fields and courts should comply with accepted standards for the particular sport*
3. *Spectator seating may be provided by grass mound where appropriate*
4. *Proposed future clubhouse (by others).*

- *Locations, alignments and areas are indicative only and will be refined in subsequent applications. This plan generally shows the minimum embellishments required to comply with Guideline 12. Further embellishments may be proposed in subsequent applications.*

A.2 APPENDIX B – CONCEPTUAL EARTHWORKS PLANS

LEGEND - PROPOSED

- EXTENT OF CUT
- EXTENT OF FILL
- 12.0 — FINISHED MAJOR CONTOURS (0.50m)
- FINISHED MINOR CONTOURS (0.25m)

LEGEND - EXISTING

- 12.0 — EXISTING CONTOURS (0.50m)
- RETAINING WALL

EARTHWORKS VOLUMES

	CUT	FILL
ROL6 EARTHWORKS (12d VOLUME)	140,198m³	198,128m³
SUB-TOTAL	140,198m³	
BULKING (10%)	14,020m³	
TOTAL VOLUMES	**154,218m³**	**198,128m³**

THEREFORE BORROW REQUIRED = 43,910m³ (COMPACTED)

NOTE:

FIELD/COURT LINEWORK SHOWN IS NOMINAL ONLY (TO BE CONFIRMED IN DETAIL DESIGN)

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
27/04/2021	5	AMENDED DRAWING AS PER MIRVAC REQUEST	KK	
15/04/2021	4	AMENDED LEVELS SOUTH OF RECTANGULAR FIELDS	KK	
16/02/2021	3	AMENDED EARTHWORKS LEVELS AND VOLUMES PER EDQ DISCUSSIONS	KK	
04/11/2020	2	AMENDED PRECINCT NAMES	LL	
24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

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DESIGNED: KK
CHECKED: MM
PROJECT MANAGER: SS

SCALE: 0 50 100 150m
SCALE 1:2500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: MIRVAC GROUP
PROJECT: EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION: TEVIOT ROAD, GREENBANK
SHEET TITLE: OVERALL EARTHWORKS LAYOUT

JOB CODE: MIR017
SHEET NUMBER: SKC01
REV: 5

N

LEGEND - PROPOSED

- EXTENT OF CUT
- EXTENT OF FILL
- 12.0 — FINISHED MAJOR CONTOURS (0.50m)
- FINISHED MINOR CONTOURS (0.25m)

LEGEND - EXISTING

- 12.0 — EXISTING CONTOURS (0.50m)
- RETAINING WALL

NOTE:
FIELD/COURT LINEWORK SHOWN IS NOMINAL ONLY (TO BE CONFIRMED IN DETAIL DESIGN)

PRELIMINARY - NOT FOR CONSTRUCTION

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16/02/2021	3	AMENDED EARTHWORKS LEVELS PER EDQ DISCUSSIONS	KK	
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24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

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SCALE: 0 25 50 75m
SCALE 1:1250 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: MIRVAC GROUP
PROJECT: EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION: TEVIOT ROAD, GREENBANK
SHEET TITLE: EARTHWORKS LAYOUT PLANS - SHEET 1 OF 2

JOB CODE: MIR017
SHEET NUMBER: SKC02
REV: 5

LEGEND - PROPOSED

- EXTENT OF CUT
- EXTENT OF FILL
- 12.0 — FINISHED MAJOR CONTOURS (0.50m)
- FINISHED MINOR CONTOURS (0.25m)

LEGEND - EXISTING

- 12.0 — EXISTING CONTOURS (0.50m)
- RETAINING WALL

NOTE:
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N

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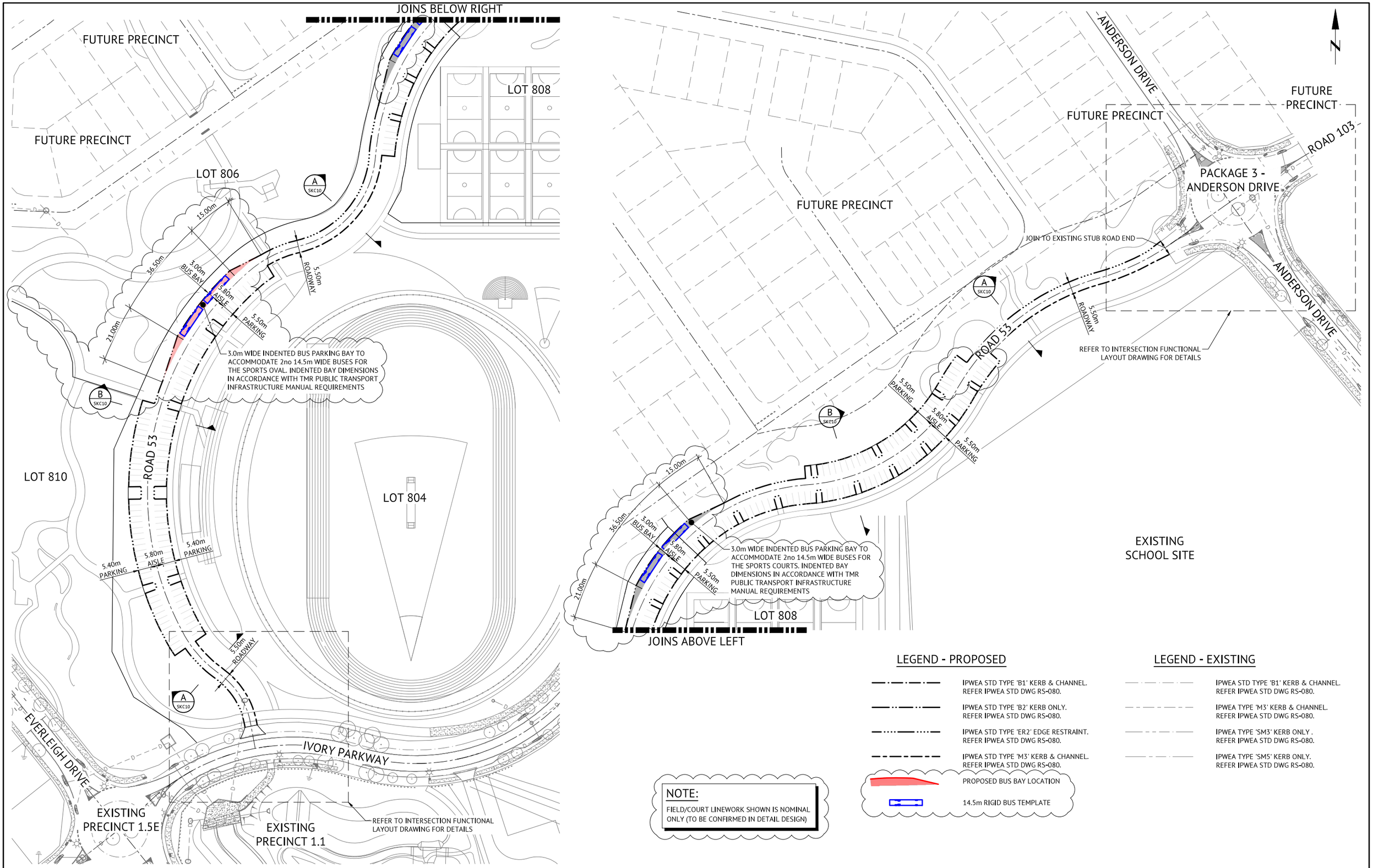
CHECKED MM
PROJECT MANAGER SS

SCALE
0 50 100 150m
SCALE 1:2500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT MIRVAC GROUP
PROJECT EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION TEVIOT ROAD, GREENBANK
SHEET TITLE EARTHWORKS LAYOUT PLANS - SHEET 2 OF 2

JOB CODE MIR017
SHEET NUMBER SKC03
REV 5

A.3 APPENDIX C – CONCEPTUAL ROADWORKS PLANS



LEGEND - PROPOSED

- IPWEA STD TYPE 'B1' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'B2' KERB ONLY. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'ER2' EDGE RESTRAINT. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'M3' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- PROPOSED BUS BAY LOCATION
- 14.5m RIGID BUS TEMPLATE

LEGEND - EXISTING

- IPWEA STD TYPE 'B1' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- IPWEA TYPE 'M3' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- IPWEA TYPE 'SM3' KERB ONLY . REFER IPWEA STD DWG RS-080.
- IPWEA TYPE 'SM5' KERB ONLY. REFER IPWEA STD DWG RS-080.

NOTE:
FIELD/COURT LINEWORK SHOWN IS NOMINAL ONLY (TO BE CONFIRMED IN DETAIL DESIGN)

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
27/04/2021	3	AMENDED DRAWING AS PER MIRVAC REQUEST	KK	
04/11/2020	2	AMENDED PRECINCT NAMES	KK	
24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

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CHECKED MM
PROJECT MANAGER SS

SCALE
0 15 30 45m
SCALE 1:750(A1)
ORIGINAL SHEET SIZE A1

CLIENT: MIRVAC GROUP
PROJECT: EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION: TEVIOT ROAD, GREENBANK
SHEET TITLE: NORTHERN PARK LINK ROAD OVERALL FUNCTIONAL LAYOUT

JOB CODE: MIR017
SHEET NUMBER: SKC07
REV: 3

LEGEND - PROPOSED

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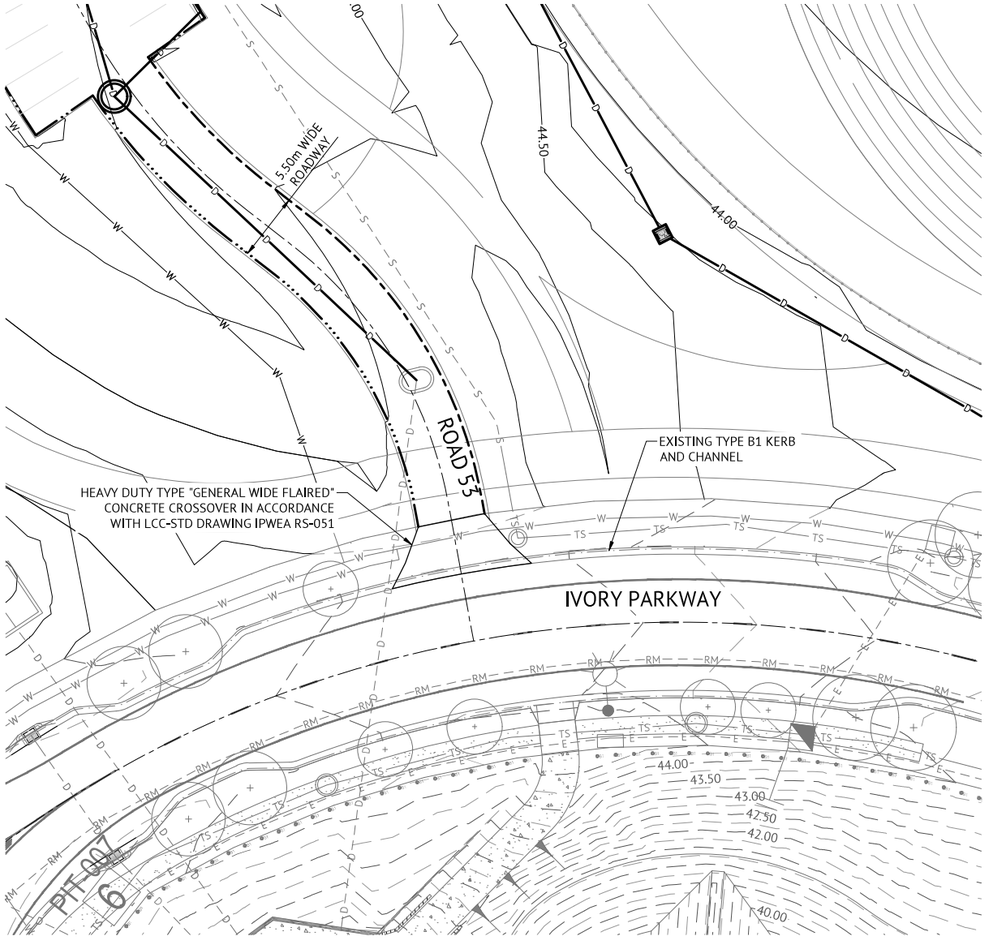
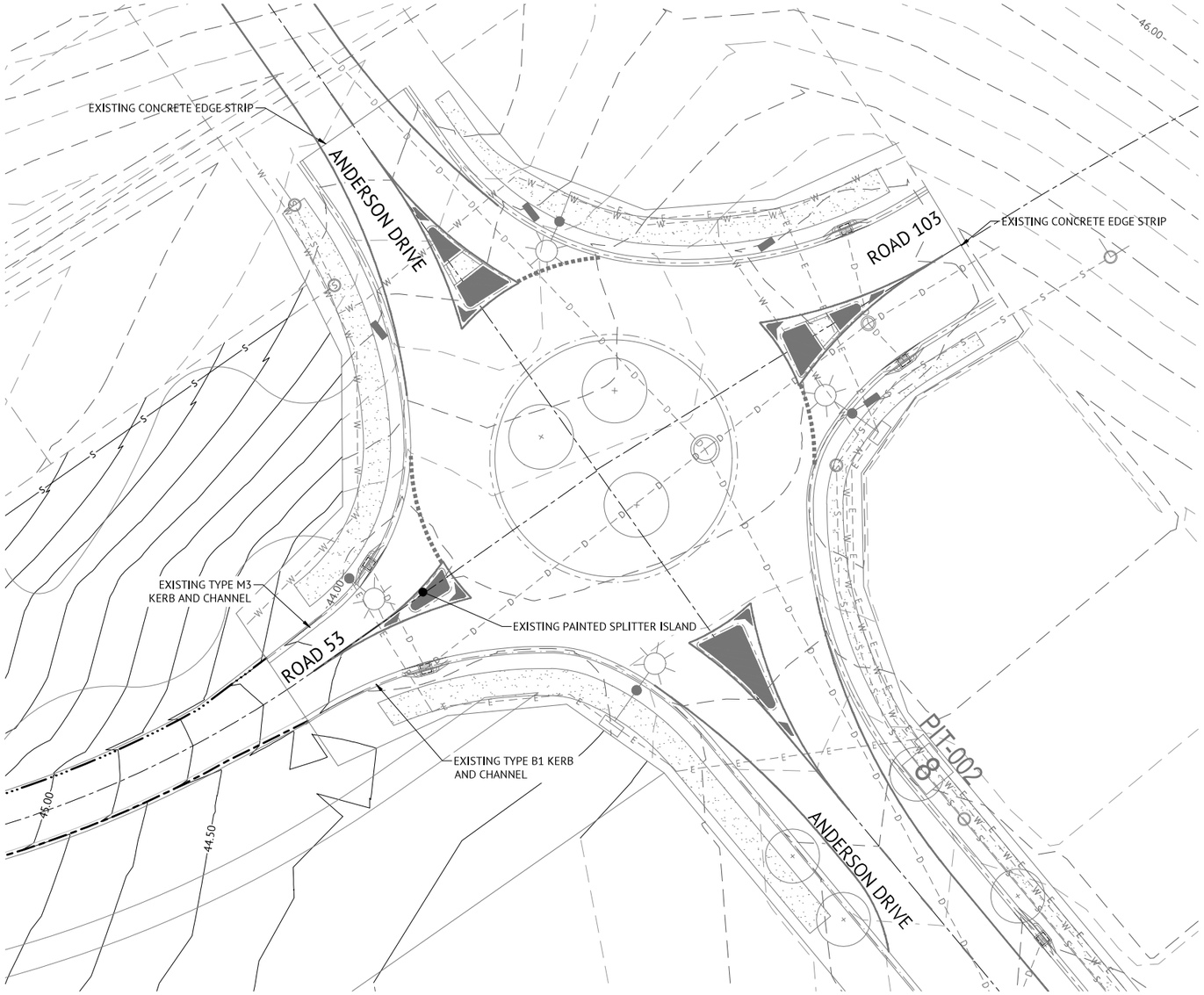
- IPWEA STD TYPE 'B2' KERB ONLY. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'ER2' EDGE RESTRAINT. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'M3' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- STORMWATER
- SEWER
- WATER

LEGEND - EXISTING

- STORMWATER
- SEWER
- TRUNK SEWER
- SEWER RISING MAIN
- WATER
- ELECTRICAL
- TELSTRA
- GAS



INTERSECTION IVORY PARKWAY AND ROAD 53



INTERSECTION ANDERSON DRIVE, ROAD 53 AND ROAD 103

NOTE:
FIELD/COURT LINEWORK SHOWN IS NOMINAL ONLY (TO BE CONFIRMED IN DETAIL DESIGN)

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
27/04/2021	2	AMENDED DRAWING AS PER MIRVAC REQUEST	KK	
24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

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SCALE
0 5 10 15m
SCALE 1:250 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: MIRVAC GROUP
PROJECT: EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION: TEVIOT ROAD, GREENBANK
SHEET TITLE: NORTHERN PARK LINK ROAD INTERSECTION FUNCTIONAL LAYOUT

JOB CODE: MIR017
SHEET NUMBER: SKC08
REV: 2

LOT 809

PROPOSED CAR PARK

PROPOSED CHANNEL

3.0m WIDE ROAD BUS PARKING TO ACCOMMODATE 2no 14.5m RIGID BUSES FOR THE SPORTS FIELDS. BUS BAY DIMENSIONS IN ACCORDANCE WITH TMR PUBLIC TRANSPORT INFRASTRUCTURE MANUAL REQUIREMENTS.

46.50m

10.00m

A SKC10

5.50m WIDE ROADWAY

PROVIDE BREAK IN PAINTED MEDIAN

HEAVY DUTY TYPE "GENERAL WIDE FLAIRED" CONCRETE CROSSOVER IN ACCORDANCE WITH LCC STD DRAWING IPWEA RS-051

IVORY PARKWAY

43.00 42.50 42.00 41.50 41.00 40.00 39.50 43.50 44.00

LEGEND - PROPOSED

- IPWEA STD TYPE 'B1' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'B2' KERB ONLY. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'ER2' EDGE RESTRAINT. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'M3' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- RM — FUTURE RISING MAIN
- PROPOSED BUS BAY LOCATION
- 14.5m RIGID BUS TEMPLATE

LEGEND - EXISTING

- D — STORMWATER
- S — SEWER
- TS — TRUNK SEWER
- RM — SEWER RISING MAIN
- W — WATER
- E — ELECTRICAL
- T — TELSTRA
- G — GAS

NOTE:
FIELD/COURT LINEWORK SHOWN IS NOMINAL ONLY (TO BE CONFIRMED IN DETAIL DESIGN)

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
27/04/2021	3	AMENDED DRAWING AS PER MIRVAC REQUEST	KK	
05/11/2020	2	AMENDED PRECINCT NAME	KK	
24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

REVISIONS

Premise

BRISBANE OFFICE
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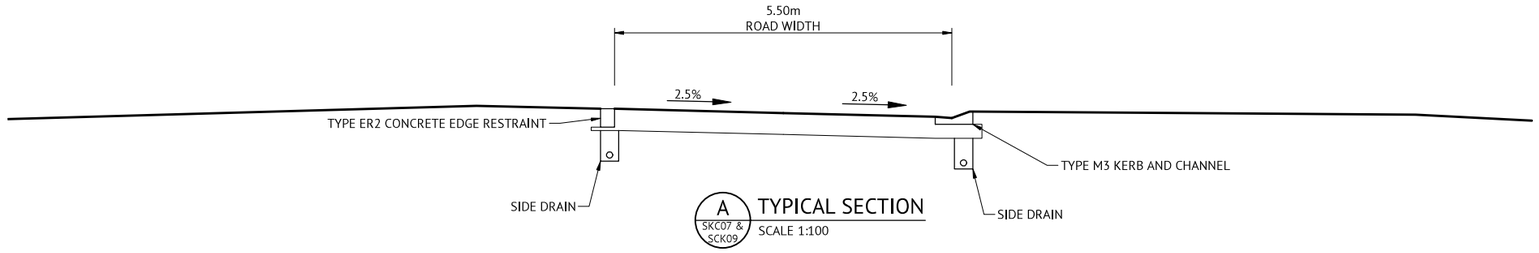
PO BOX 361
FORTITUDE VALLEY, QLD 4006
PH: (07) 3253 2222
WEB: www.premise.com.au

DESIGNED KK
CHECKED MM
PROJECT MANAGER SS

SCALE
0 5 10 15m
SCALE 1:250 (A1)
ORIGINAL SHEET SIZE A1

CLIENT MIRVAC GROUP
PROJECT EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION TEVIOT ROAD, GREENBANK
SHEET TITLE SOUTHERN CAR PARK ROAD TRAFFIC FUNCTIONAL LAYOUT

JOB CODE MIR017
SHEET NUMBER SKC09
REV 3



A SKC07 & SCK09 TYPICAL SECTION
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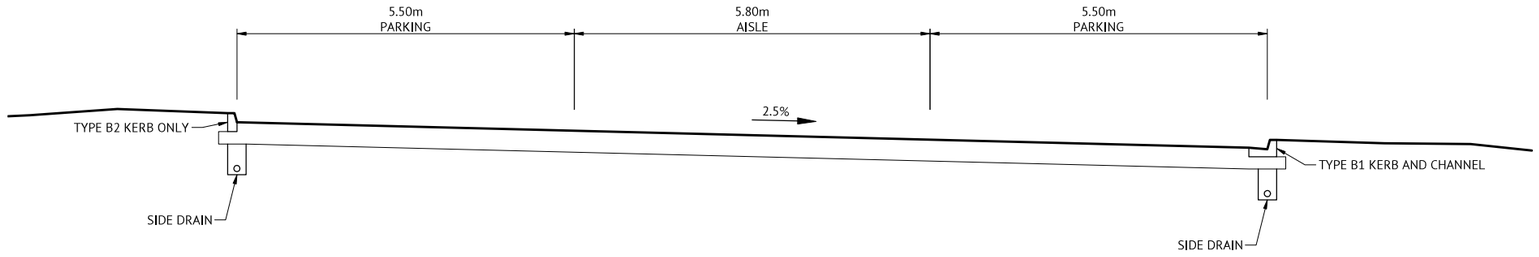

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PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

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DESIGNED KK
CHECKED MM
PROJECT MANAGER SS

SCALE
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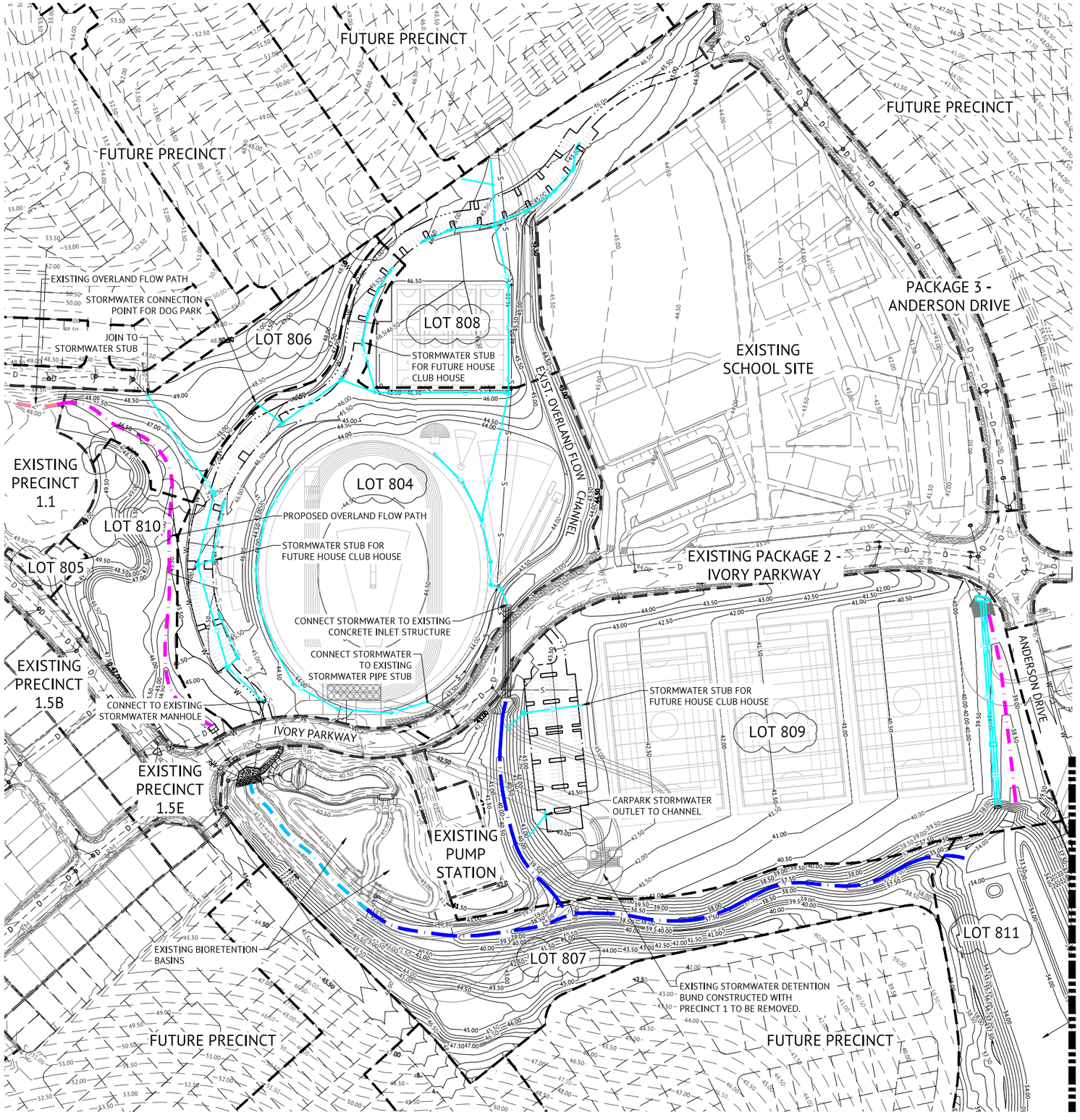
SCALE 1:50 (A1)
ORIGINAL SHEET SIZE A1

CLIENT MIRVAC GROUP
PROJECT EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION TEVIOT ROAD, GREENBANK
SHEET TITLE TYPICAL CROSS SECTIONS

JOB CODE MIR017
SHEET NUMBER SKC10
REV 1

A.4 APPENDIX D – CONCEPTUAL STORMWATER DRAINAGE PLAN



LEGEND - PROPOSED

- IPWEA STD TYPE 'B1' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'B2' KERB ONLY. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'ER2' EDGE RESTRAINT. REFER IPWEA STD DWG RS-080.
- IPWEA STD TYPE 'M3' KERB & CHANNEL. REFER IPWEA STD DWG RS-080.
- CONCRETE FOOTPATH. REFER LCC STD DWGS.
- D — STORMWATER
- S — SEWER
- W — WATER
- 12.0 — FINISHED CONTOURS (0.50m)
- OVERLAND FLOW PATH
- STORMWATER CHANNEL

LEGEND - EXISTING

- D — STORMWATER
- S — SEWER
- TS — TRUNK SEWER
- RM — SEWER RISING MAIN
- W — WATER
- E — ELECTRICAL
- T — TELSTRA
- G — GAS
- OVERLAND FLOW PATH
- STORMWATER CHANNEL

NOTE:
FIELD/COURT LINEWORK SHOWN IS NOMINAL ONLY (TO BE CONFIRMED IN DETAIL DESIGN)

N

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
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16/02/2021	3	AMENDED EARTHWORKS LEVELS PER EDQ DISCUSSIONS	KK	
05/11/2020	2	AMENDED PRECINCT NAMES	KK	
24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

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CHECKED MM
PROJECT MANAGER SS
PROJECT DIRECTOR PAT BRADY RPEQ 7112

SCALE
0 30 60 90m
SCALE 1:1500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT MIRVAC GROUP
PROJECT EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION TEVIOT ROAD, GREENBANK
SHEET TITLE PRELIMINARY STORMWATER DRAINAGE LAYOUT PLAN

JOB CODE MIR017
SHEET NUMBER SKC04
REV 4

A.5 APPENDIX E – CONCEPTUAL SEWER PLAN

LEGEND - PROPOSED

- S — DN150 PVC GRAVITY SEWER
- S — DN225 PVC GRAVITY SEWER
- S — MAINTENANCE STRUCTURE
- RM — FUTURE SEWER RISING MAIN
- D — STORMWATER DRAINAGE
- W — DRINKING WATER MAIN
- 12.0 — FINISHED CONTOURS (0.50m)

LEGEND - EXISTING

- S — GRAVITY SEWER
- TS — TRUNK SEWER
- RM — SEWER RISING MAIN
- D — STORMWATER DRAINAGE
- W — WATER
- E — ELECTRICAL
- T — TELSTRA
- G — GAS

N

NOTE:
FIELD/COURT LINEWORK SHOWN IS NOMINAL ONLY (TO BE CONFIRMED IN DETAIL DESIGN)

FUTURE PRECINCT
FUTURE PRECINCT
JOIN TO SEWER STUB CONSTRUCTED IN PACKAGE 3 - ANDERSON DRIVE
FUTURE PRECINCT 6
PACKAGE 3 - ANDERSON DRIVE
SEWER CONNECTION FOR FUTURE CLUB HOUSE
LOT 808
LOT 806
EXISTING SCHOOL SITE
EXISTING PRECINCT 1.1
LOT 804
EXISTING TEMPORARY RISING MAIN WITHIN ROAD VERGE TO BE DECOMMISSIONED (ABANDONED IN PLACE AND GROUT-FILLED) FOLLOWING CONSTRUCTION OF FUTURE ULTIMATE RISING MAIN.
PROPERTY CONNECTION FOR CONNECTION OF TOILET BLOCK
PROPERTY CONNECTION FOR FUTURE CLUB HOUSE
LOT 805
LOT 810
FUTURE SEWER RISING MAIN CONNECTION TO EXISTING STUB AT DISCHARGE MANHOLE
DN225 SEWER CONSTRUCTED WITH PRECINCT 12.3
JOIN TO EXISTING SEWER STUB CONSTRUCTED IN PACKAGE 2 - IVORY PARKWAY
FUTURE ULTIMATE RISING MAIN LOCATED WITHIN PARK LOT. DESIGN AND CONSTRUCTION OF RISING MAIN UNDERTAKEN WITH FUTURE PRECINCT 6 WORKS.
SEWER CONNECTION FOR FUTURE CLUB HOUSE
EXISTING PRECINCT 1.5B
LOT 809
JOIN TO EXISTING SEWER STUB CONSTRUCTED IN PACKAGE 2 - IVORY PARKWAY
EXISTING PRECINCT 1.5E
EXISTING SEWER TANKERING SITE DUE TO BE DECOMMISSIONED PRIOR TO CENTRAL PARK CONSTRUCTION COMMENCEMENT
EXISTING PUMP STATION
LOT 807
LOT 811
JOINS ABOVE RIGHT
FUTURE PRECINCT
FUTURE PRECINCT
JOINS BELOW LEFT
LOT 809
FUTURE PRECINCT
FUTURE RISING MAIN WITHIN ANDERSON DRIVE ROAD RESERVE
LOT 811
FUTURE SEWER PUMP STATION
FUTURE PRECINCT

PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
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25/11/2020	2	AMENDED PRECINCT NAMES	KK	
24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

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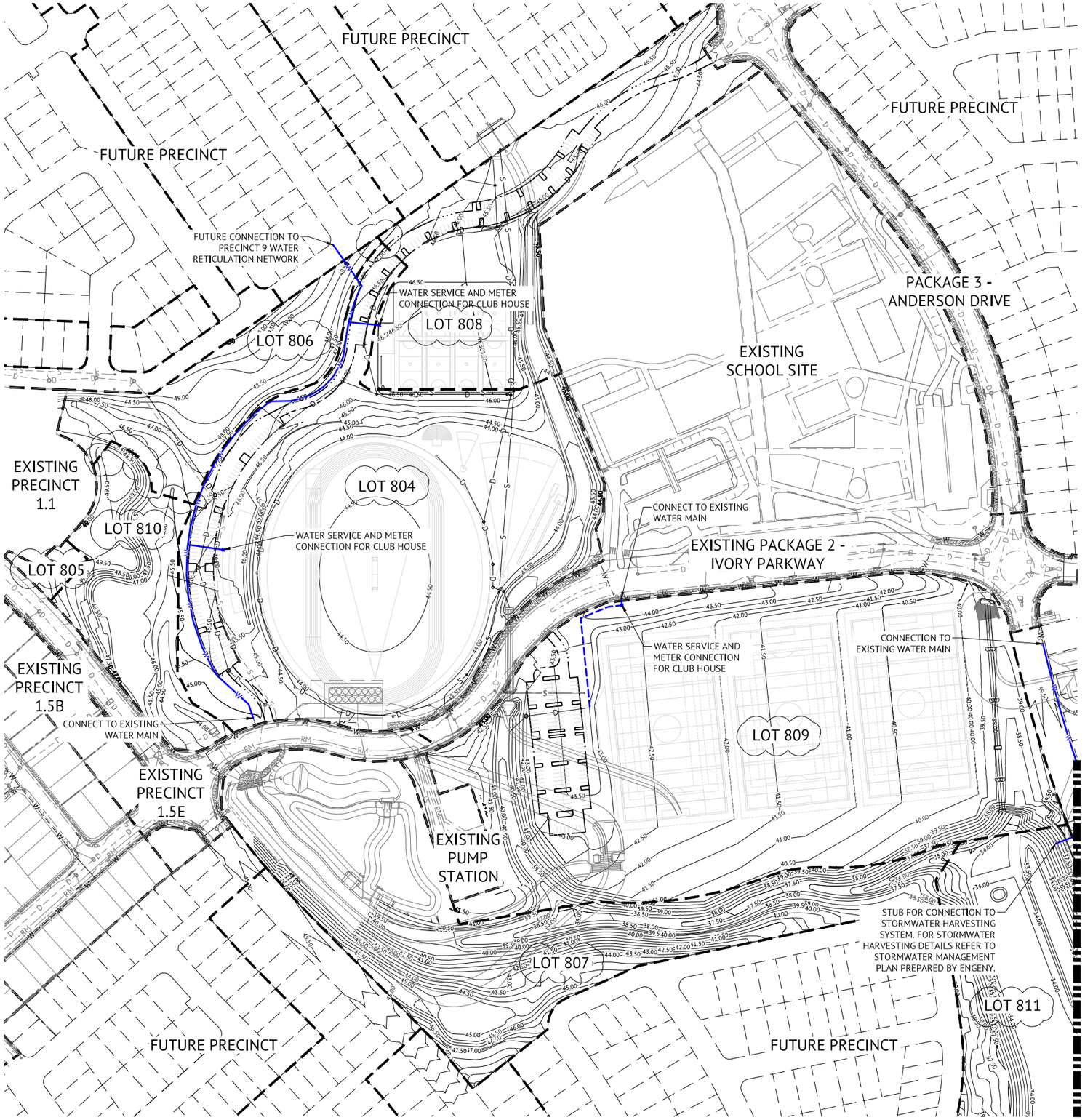
DESIGNED: KK
CHECKED: MM
PROJECT MANAGER: SS

SCALE
0 30 60 90m
SCALE 1:1500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: MIRVAC GROUP
PROJECT: EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION: TEVIOT ROAD, GREENBANK
SHEET TITLE: PRELIMINARY SEWER RETICULATION LAYOUT PLAN

JOB CODE: MIR017
SHEET NUMBER: SKC05
REV: 3

A.6 APPENDIX F – CONCEPTUAL WATER PLAN



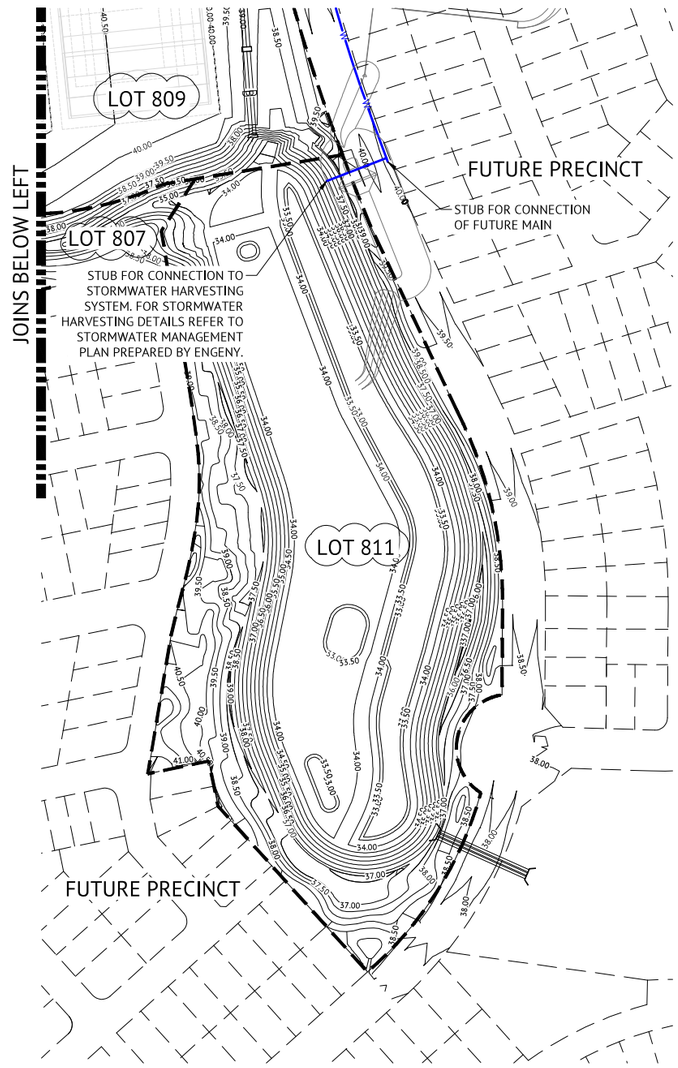
LEGEND - PROPOSED

W	POTABLE WATER MAIN
D	STORMWATER
S	GRAVITY SEWER

LEGEND - EXISTING

W	WATER
D	STORMWATER
S	GRAVITY SEWER
TS	TRUNK SEWER
RM	SEWER RISING MAIN
E	ELECTRICAL
T	TELSTRA
G	GAS

NOTE:
FIELD/COURT LINEWORK SHOWN IS NOMINAL ONLY (TO BE CONFIRMED IN DETAIL DESIGN)



PRELIMINARY - NOT FOR CONSTRUCTION

DATE	REV	DESCRIPTION	REC	APP
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05/11/2020	2	AMENDED PRECINCT NAMES	KK	
24/06/20	1	PRELIMINARY - NOT FOR CONSTRUCTION	MM	

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DESIGNED: KK
CHECKED: MM
PROJECT MANAGER: SS

SCALE: 0 30 60 90m
SCALE 1:1500 (A1)
ORIGINAL SHEET SIZE A1

CLIENT: MIRVAC GROUP
PROJECT: EVERLEIGH REGIONAL SPORTS & RECREATION PARKS
LOCATION: TEVIOT ROAD, GREENBANK
SHEET TITLE: PRELIMINARY WATER RETICULATION LAYOUT PLAN

JOB CODE: MIR017
SHEET NUMBER: SKC06
REV: 3

A.7 APPENDIX G – TRAFFIC STATEMENT

TRAFFIC STATEMENT – EVERLEIGH REGIONAL SPORT & RECREATION PARKS

29/04/2021

Bradley Jones

MIR-017-R01

1. INTRODUCTION

Premise was engaged by Mirvac to prepare a Traffic Statement for Everleigh regional sport & recreation parks based on Premise sketches:

- MIR-017-SKC06: Northern Park Link Overall Functional Layout;
- MIR-017-SKC07: Northern Park Link Intersection Functional Layout;
- MIR-017-SKC08: Southern Car Park Road Traffic Functional Layout; and
- MIR-017-SKC09: Typical Cross Sections.

The precinct incorporates parking for more than 440 cars and six (6) buses including:

- 106 off-street spaces provided at the western end of the Northern Park Link near a proposed sports oval
- 125 off-street spaces provided in the Southern Car Park near three (3) proposed sports fields; and
- 107 off-street spaces provided at the eastern end of the Northern Park Link near eight (8) proposed courts.
- 62 spaces on Ivory Parkway passing through the regional sport & recreation parks; and
- Approximately 200 on street parking spaces which front the regional sport and recreation parks located on Everleigh Drive, Anderson Drive, Watercress Drive and the future road south of the parkland (south) and wetland.

This statement includes:

- Frontage assessment;
- Access assessment including turn warrant assessment, intersection analysis and sight distances;
- Northern Park Link (Road 53) assessment;
- Southern Car Park assessment; and
- Parking assessment.

2. FRONTAGE ASSESSMENT

2.1 Approved Movement Network Infrastructure Master Plan

"Movement Network Infrastructure Master Plan: Teviot Road, Greenbank" dated 03 March 2017 by MWH for Mirvac was approved on 9 August 2017 as part of the development approval DEV2016/768. Figure 1 reproduced from the "Movement Network Infrastructure Master Plan" shows the road layout and hierarchy map. The regional sport & recreation parks are located centrally within the Everleigh development with frontage to Neighbourhood Connector 1 class roads and residential standard lots. A park connector is aligned generally east-west through the regional sport & recreation parks with a community facility (school) located on the northwest corner of the eastern Neighbourhood Connector 1 / Park Connector intersection.

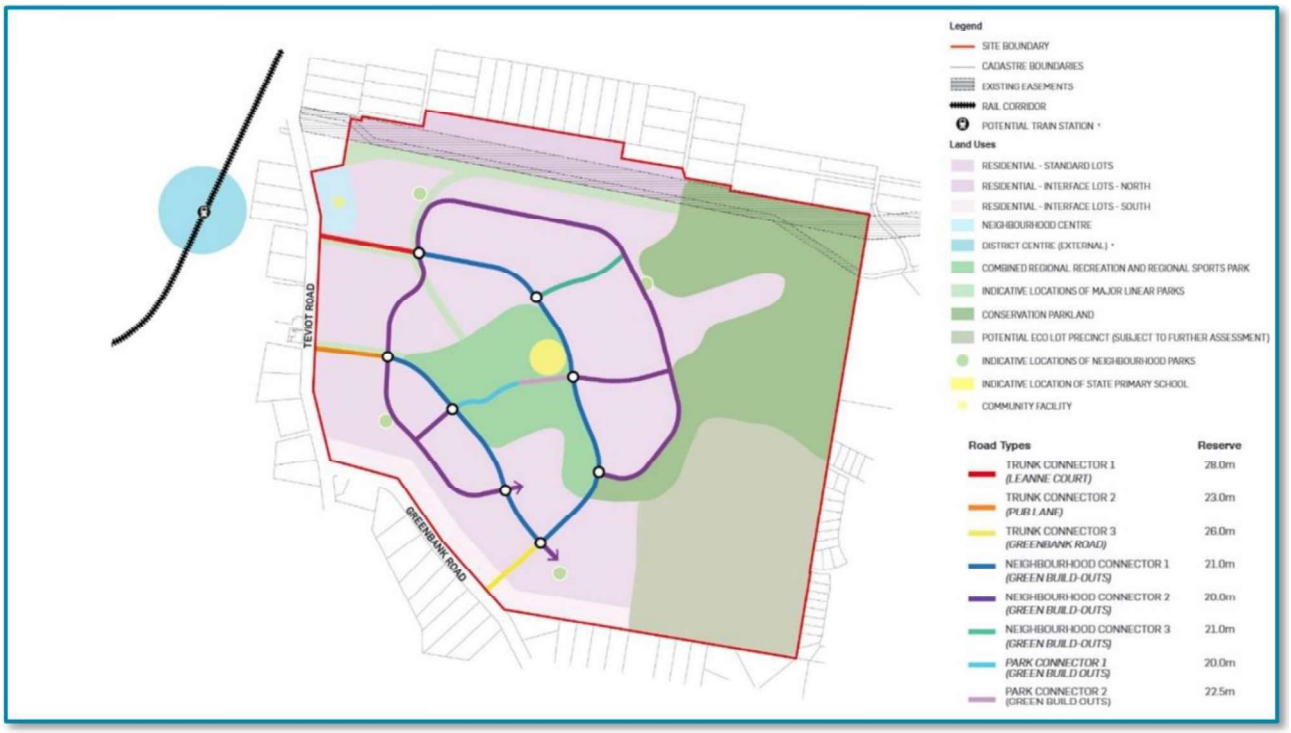

Figure 1 - Road layout and hierarchy map (reproduced from the "Movement Network Infrastructure Master Plan")

As shown by MIR-017-SKC06, Everleigh Drive to the west and Anderson Drive to the east are Neighbourhood Connector 1 class roads. Figure 2 reproduced from the "Movement Network Infrastructure Master Plan" shows the cross section of a Neighbourhood Connector 1. This cross section is generally consistent with a Neighbourhood Connector in the "PDA guideline no. 06: Street and movement network" (Economic Development Queensland, February 2019). Guideline 6 provides the following additional information regarding neighbourhood connectors:

- Neighbourhood connector streets connect neighbourhood destinations including shops and parks, provide access to the surrounding road network and can include a bus and a safe family friendly cycling route;
- 3000 – 7499 vpd;
- Direct property access;
- No traffic calming;
- Default 50 km/h posted speed; and
- 120 metres intersection spacing.

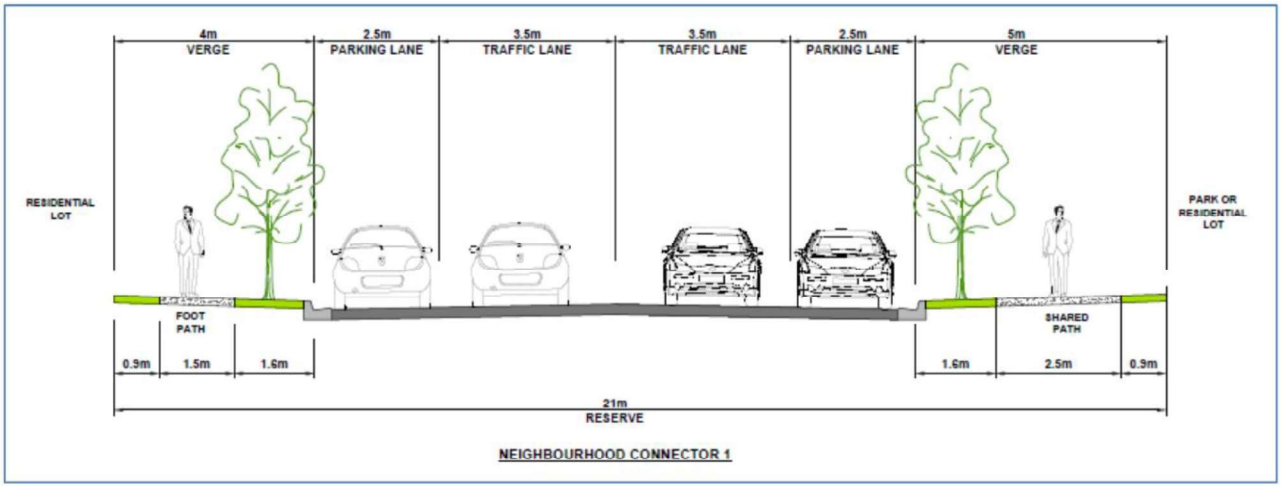

Figure 2 - Neighbourhood Connector 1 cross section (reproduced from the "Movement Network Infrastructure Master Plan")

Ivory Parkway as shown by MIR-017-SKC06, SKC07 and SKC08 is a Park Connector. Figure 3 and Figure 4 reproduced from the "Movement Network Infrastructure Master Plan" respectively show the cross section of a Park Connector 1 with regional park on both sides and a Park Connector 2 adjacent to a school. Park Connectors differ from Neighbourhood Connectors in that no shared path is provided off-road. This is acceptable as off-road cycle facilities are provided in the adjacent regional park. The Park Connector 2 differs from a Park Connector 1 in that the footpath adjacent to the school is widened from the standard minimum width of 1.5m to 4m which provides for movement of students on foot and bicycles as well as waiting children and parents at school pick-up time.

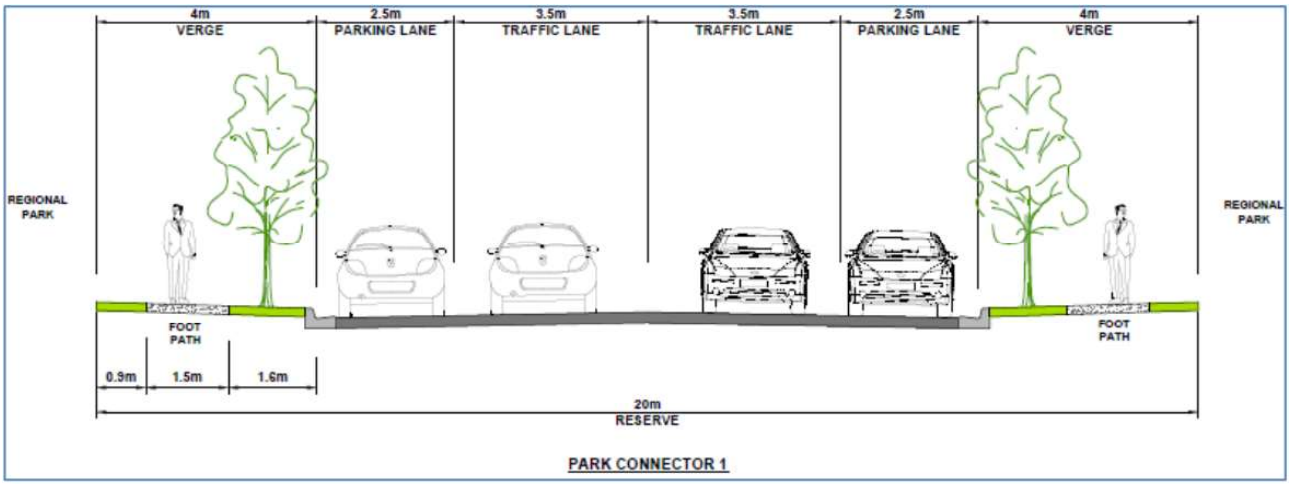

Figure 3 - Park Connector 1 cross section (reproduced from the "Movement Network Infrastructure Master Plan")

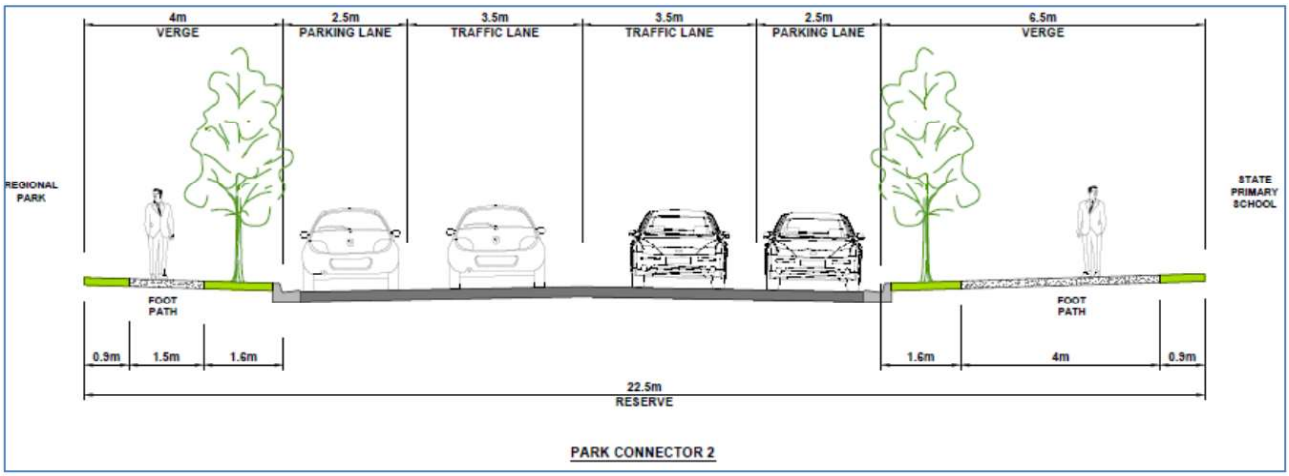

Figure 4 - Park Connector 2 cross section (reproduced from the "Movement Network Infrastructure Master Plan")

In areas where residential standard lots are located adjacent to the regional sport & recreation park, Access Streets (Park) may provide frontage. Figure 5 reproduced from the "Movement Network Infrastructure Master Plan" shows the cross section of an Access Street (Park). This cross section is generally consistent with a Neighbourhood Access Street in Guideline 6 except that the verge width adjacent to the park is reduced to 2.2m. This is acceptable as services corridors are not required on the park frontage.

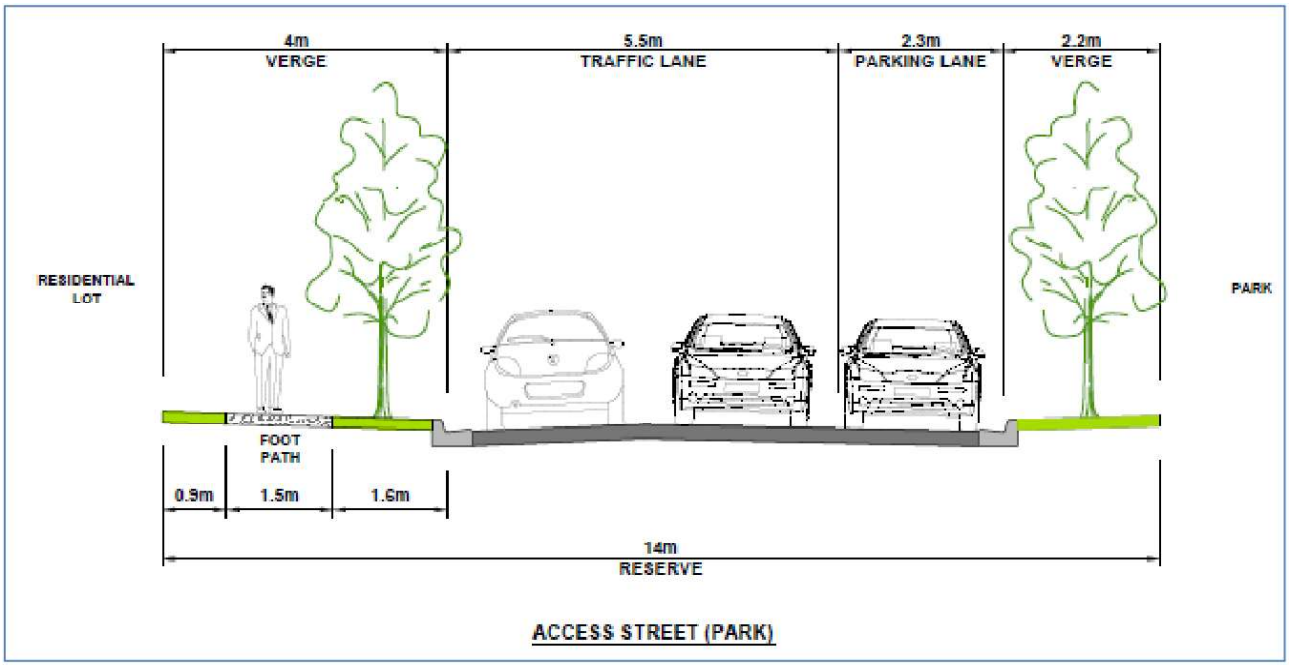

Figure 5 - Access Street (Park) cross section (reproduced from "Movement Network Infrastructure Master Plan")

Figure 6 reproduced from the "Movement Network Infrastructure Master Plan" shows the ultimate public transport network. Bus routes can be provided on Neighbourhood and Park Connectors with indented bus stop pairs proposed adjacent to the regional sport & recreation parks at the following locations:

- On Everleigh Drive immediately north of Ivory Parkway;
- On Anderson Drive adjacent to the community facility (school); and
- On Anderson Drive south of Ivory Parkway.

The indicative internal school bus stop has been designed as a service lane on the school's Ivory Parkway frontage with capacity for five (5) buses and will be available to support the regional sport & recreation parks at times other than school drop-off and pick-up.

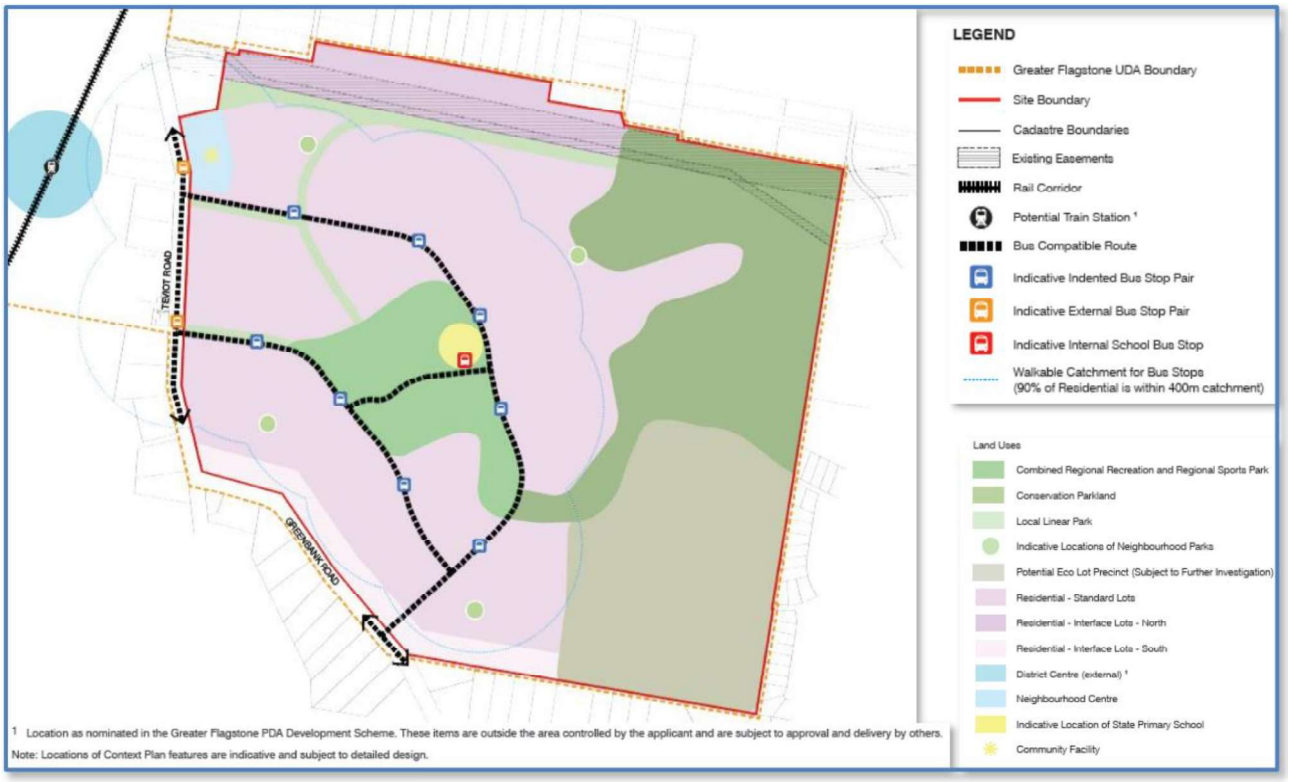

Figure 6 - Ultimate public transport network (reproduced from "Movement Network Infrastructure Master Plan")

2.2 "Without Development" Traffic Volumes

Figure 7 shows estimated typical daily traffic volumes on Everleigh Drive, Anderson Drive and Ivory Parkway fronting the regional sport & recreation park when Everleigh is fully developed. Traffic volumes are consistent with those recommended as appropriate for a Neighbourhood Connector in Guideline 6.

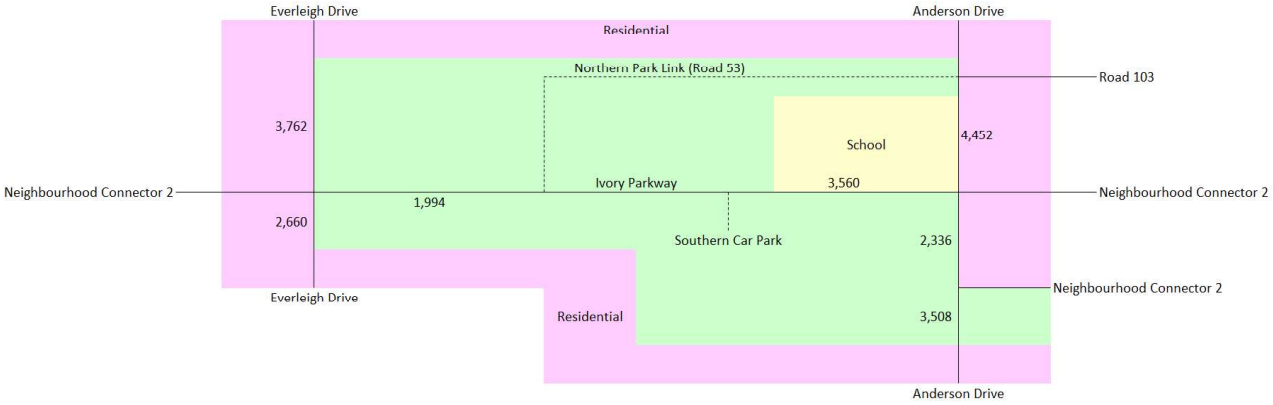

Figure 7 - Estimated typical daily traffic volumes when Everleigh is fully developed

Figure 8 and Figure 9 respectively show estimated typical morning and evening peak hour traffic volumes at intersections on Everleigh Drive, Anderson Drive and Ivory Parkway fronting the regional sport and recreation park when Everleigh is fully developed.

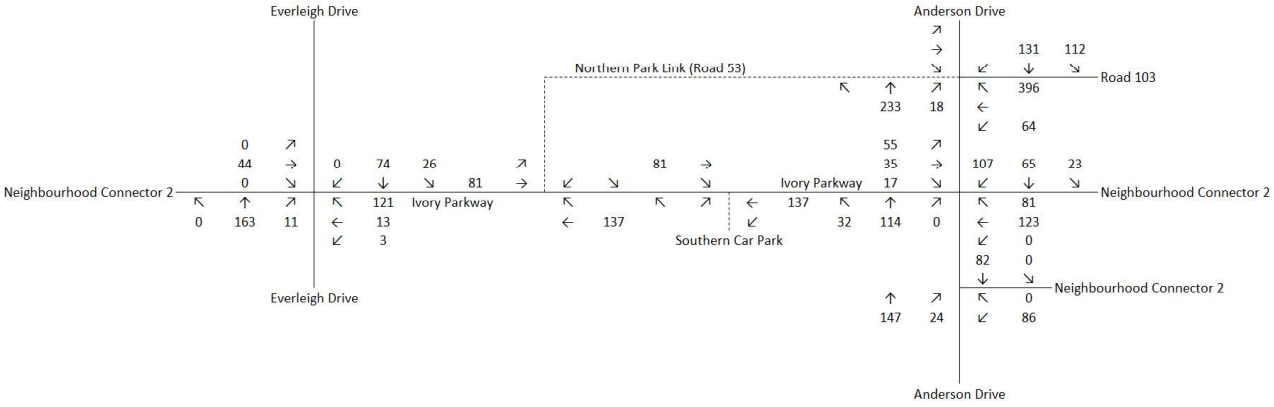

Figure 8 - Estimated typical morning peak hour traffic volumes when Everleigh is fully developed

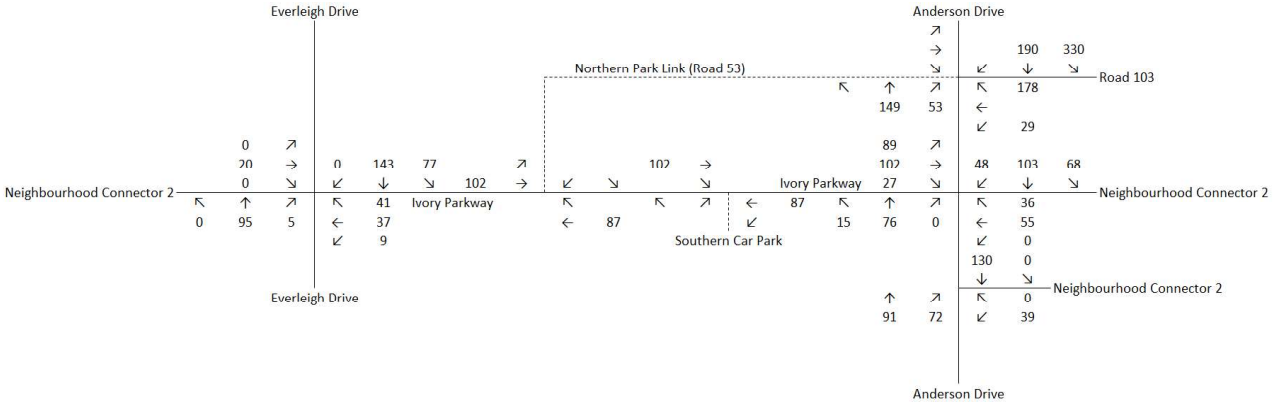

Figure 9 - Estimated typical evening peak hour traffic volumes when Everleigh is fully developed

3. ACCESS ASSESSMENT

Vehicle access to the regional sport & recreation parks will be provided at the following three (3) locations:

- Anderson Drive / Northern Park Link (Road 53) / Road 103 crossroads controlled by a single lane roundabout;
- Ivory Parkway / Northern Park Link (Road 53) priority T-intersection; and
- Ivory Parkway / Southern Car Park priority T-intersection.

3.1 Development Traffic

Peak hour development traffic generation has been estimated on the basis that every off-street parking space generates one (1) inbound and one (1) outbound trip during a single hour. This is a conservative assumption implying that there is an exchange of cars for every off-street parking space during a single hour. Given the mix of activities taking place within the regional sport and recreation park this traffic generation is considered appropriate as the 30th highest hourly volume (30HHV)

The distribution of development traffic on the external road network has been estimated based on the distribution of residential lots within Everleigh.

Figure 10 shows estimated peak hour regional sport & recreation park traffic volumes at intersections on Everleigh Drive, Anderson Drive and Ivory Parkway fronting the regional sport & recreation park when Everleigh is fully developed.

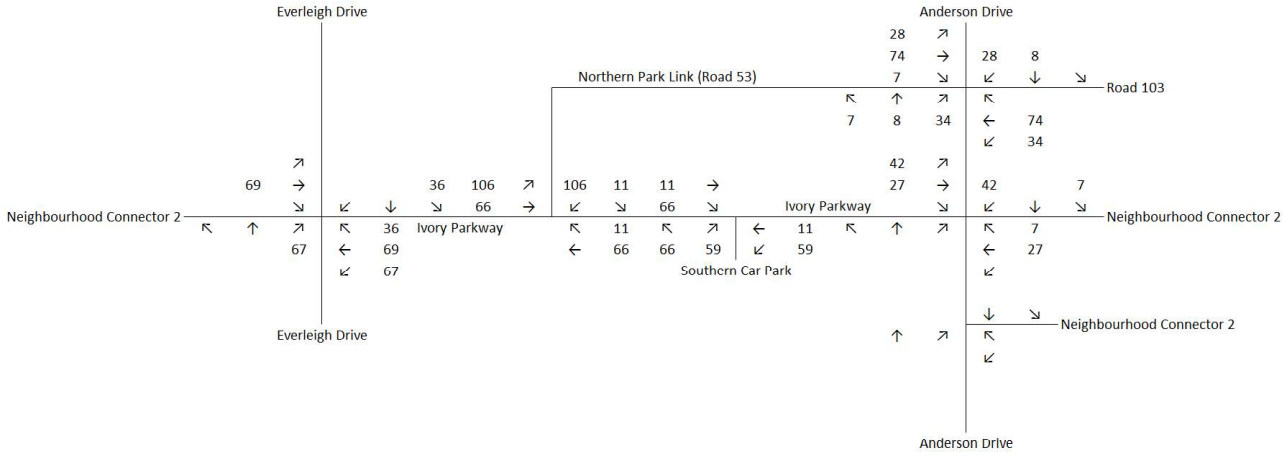

Figure 10 - Estimated peak hour regional sport and recreation park traffic volumes

3.2 "With Development" Traffic

With development traffic is estimated by summing development traffic and "without development" traffic. Figure 11 and Figure 12 respectively show morning and evening peak hour traffic volumes at intersections on Everleigh Drive, Anderson Drive and Ivory Parkway fronting the regional sport & recreation parks assuming peak regional sport & recreation parks traffic (Figure 10) occurs during the commuter peak hours (Figure 8 and Figure 9). Such an extreme traffic scenario could represent a regional interschool sports event taking place on a typical school day and would be very rare (say once per year).

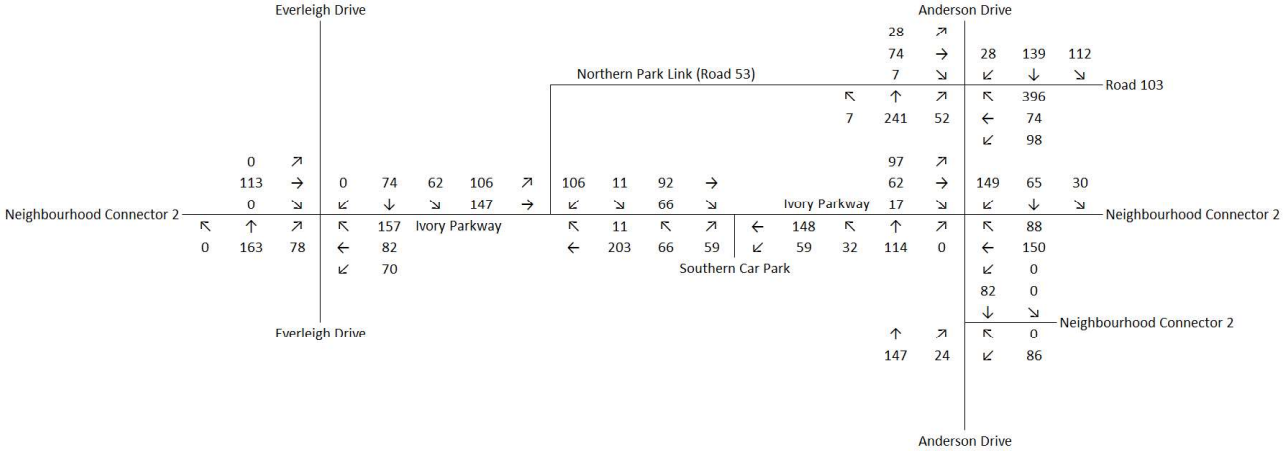

Figure 11 - Estimated morning peak hour traffic volumes with peak regional sport and recreation park traffic

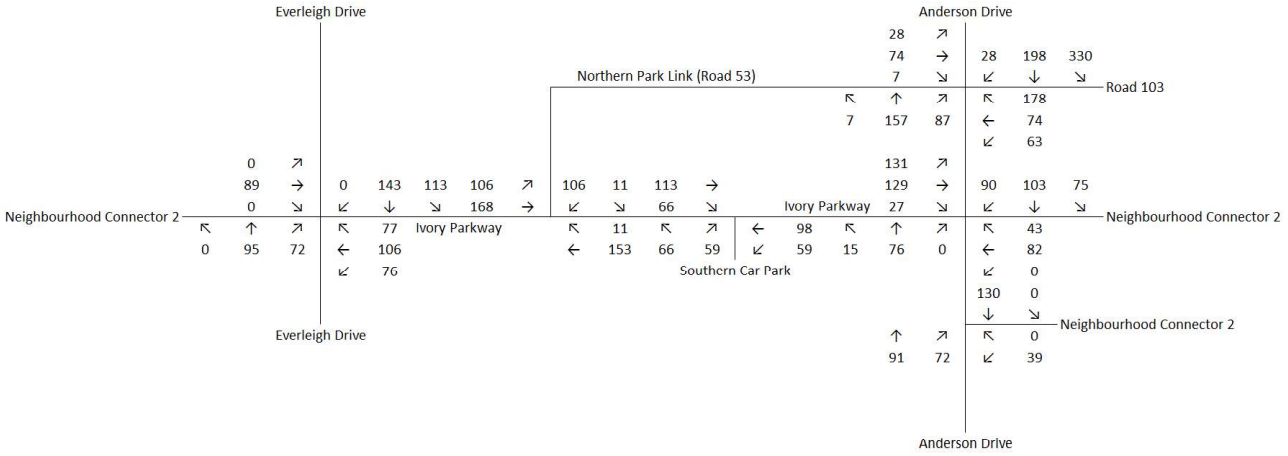

Figure 12 - Estimated evening peak hour traffic volumes with peak regional sport and recreation park traffic

3.3 Turn Warrant Assessment

A turn warrant assessment was undertaken using the Normal Design Domain major road turn treatment warrants specified in the "Supplement to Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections" (Road Planning & Design Manual – Edition 2: volume 3, Transport and Main Roads, August 2014) for a design speed which is less than or equal to 70km/h.

Adopting the "with development" traffic volumes shown by Figure 11 and Figure 12 as design traffic volumes, basic left and right (BAL / BAR) turn treatments are warranted on Ivory Parkway at the Northern Park Link (Road 53) priority T-intersection. Basic turn treatments provide no auxiliary lane for turning traffic and require traffic to turn directly from through traffic lanes on the major road.

Adopting the "with development" traffic volumes shown by Figure 11 and Figure 12 as design traffic volumes, a basic left (BAL) turn treatment is warranted on Ivory Parkway at the Southern Car Park priority T-intersection. The warranted right turn treatment on Ivory Parkway at the Southern Car Park priority T-intersection is on the borderline between a basic right (BAR) turn treatment and a channelised right turn treatment with a short turn slot (CHR(S)). Given the conservative nature of the estimated "with development" traffic volumes (refer Section 3.2), it is recommended that the BAR treatment is provided.

As the Anderson Drive / Northern Park Link (Road 53) / Road 103 crossroads is proposed to be controlled by a single lane roundabout, a turn warrant assessment is not required.

3.4 Intersection Analysis

Access intersection analysis was undertaken using SIDRA Intersection Version 9 (SIDRA). SIDRA is an advanced micro-analytical traffic tool for evaluation of intersections. SIDRA reports intersection performance in terms of a range of parameters including:

- **Demand Volumes (V)**: The modelled number of vehicles arriving at the intersection during the assessment hour. Demand volumes are calculating by dividing the peak hour volumes by the peak flow factor (PFF). SIDRA's default PFF is 95%;
- **Degree of Saturation (DoS)**: The ratio of the demand volume, V, to the theoretical capacity. An intersection is considered to be operating at its practical capacity when the DoS reaches 0.80 for a priority-controlled intersection and 0.85 for a roundabout;
- **Average Delay (D)**: The mean control delay including both queuing delay and geometric delay for all vehicles arriving during the assessment period including the delay experienced after the end of the flow period until the departure of the last vehicle arriving during the flow period;
- **95th Percentile Back of Queue Length (Q)**: The maximum backward extent of the queue relative to the stop line or give-way / yield line during a signal cycle or gap acceptance cycle below which 95% of all queue lengths fall. For design purposes, the 95th percentile back of queue length is generally accepted as the maximum queue length.

3.4.1 ANDERSON DRIVE / NORTHERN PARK LINK / ROAD 103 ROUNDABOUT

The Anderson Drive / Northern Park Link (Road 53) / Road 103 crossroads was analysed on the basis of "with development" traffic volumes shown by Figure 11 and Figure 12 and the single lane roundabout arrangement shown by Figure 13. The following movement summary tables copied from SIDRA indicate that the roundabout:

- Is operating well below its practical capacity with a maximum DoS of 0.492 despite the conservative assumption that peak regional sport & recreation parks traffic occurs during the commuter peak hour;
- Delays are short with the maximum average delay to any movement being 13.5sec for the right turn from the Northern Park Link (Road 53) to Anderson Drive during the morning peak hour; and
- Queues are not expected to exceed four (4) vehicles or a queue storage length of 30m which are not expected to impact on adjacent intersections or accesses. Given the very short delays expected at the roundabout, queues are considered to be rolling queues where vehicles are able to manage their speed in order to avoid coming to a complete stop at the intersection.

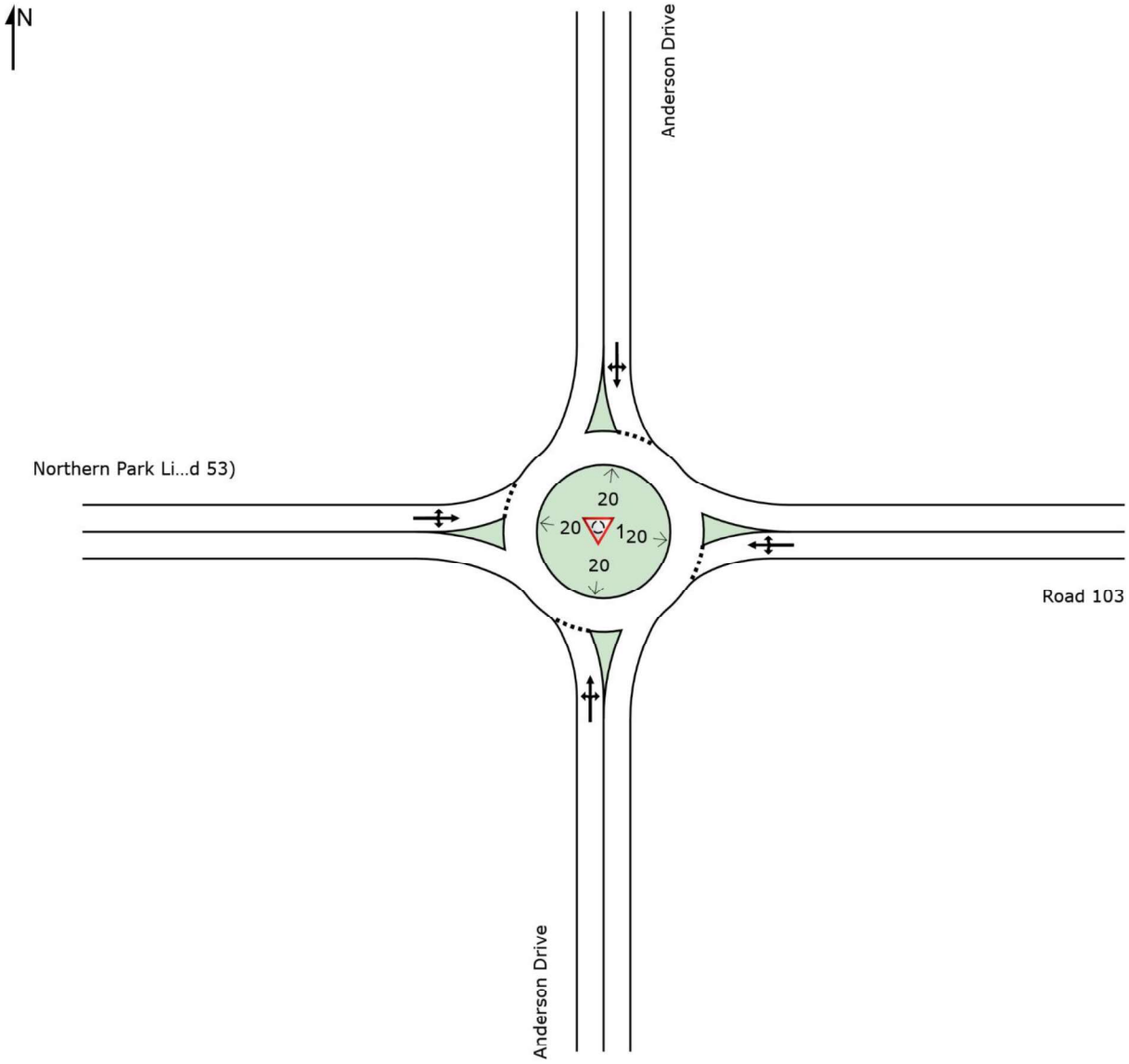

Figure 13 - Anderson Drive / Northern Park Link (Road 53) / Road 103 single lane roundabout - SIDRA layout

MOVEMENT SUMMARY

Site: 1 [1AM (Site Folder: General)]

Anderson Drive / Northern Park Link (Road 53) / Road 103 crossroads
Single lane roundabout
Design morning peak hour traffic
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
1	L2	7	5.0	7	5.0	0.372	7.5	LOS A	2.5	18.4	0.73	0.77	0.73	51.6
2	T1	241	5.0	254	5.0	0.372	7.7	LOS A	2.5	18.4	0.73	0.77	0.73	52.8
3	R2	52	5.0	55	5.0	0.372	12.4	LOS B	2.5	18.4	0.73	0.77	0.73	52.7
Approach		300	5.0	316	5.0	0.372	8.5	LOS A	2.5	18.4	0.73	0.77	0.73	52.7
East: Road 103														
4	L2	98	5.0	103	5.0	0.492	5.3	LOS A	3.8	27.9	0.52	0.64	0.52	51.4
5	T1	74	5.0	78	5.0	0.492	5.5	LOS A	3.8	27.9	0.52	0.64	0.52	52.6
6	R2	396	5.0	417	5.0	0.492	10.1	LOS B	3.8	27.9	0.52	0.64	0.52	52.5
Approach		568	5.0	598	5.0	0.492	8.7	LOS A	3.8	27.9	0.52	0.64	0.52	52.3
North: Anderson Drive														
7	L2	112	5.0	118	5.0	0.239	4.7	LOS A	1.5	10.7	0.37	0.50	0.37	53.6
8	T1	139	5.0	146	5.0	0.239	4.9	LOS A	1.5	10.7	0.37	0.50	0.37	55.0
9	R2	28	5.0	29	5.0	0.239	9.6	LOS A	1.5	10.7	0.37	0.50	0.37	54.8
Approach		279	5.0	294	5.0	0.239	5.3	LOS A	1.5	10.7	0.37	0.50	0.37	54.4
West: Northern Park Link (Road 53)														
10	L2	28	5.0	29	5.0	0.157	8.6	LOS A	1.0	7.0	0.73	0.75	0.73	51.6
11	T1	74	5.0	78	5.0	0.157	8.9	LOS A	1.0	7.0	0.73	0.75	0.73	52.8
12	R2	7	5.0	7	5.0	0.157	13.5	LOS B	1.0	7.0	0.73	0.75	0.73	52.7
Approach		109	5.0	115	5.0	0.157	9.1	LOS A	1.0	7.0	0.73	0.75	0.73	52.5
All Vehicles		1256	5.0	1322	5.0	0.492	7.9	LOS A	3.8	27.9	0.56	0.65	0.56	52.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 1 [1PM (Site Folder: General)]

Anderson Drive / Northern Park Link (Road 53) / Road 103 crossroads
Single lane roundabout
Design evening peak hour traffic
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Anderson Drive														
1	L2	7	5.0	7	5.0	0.253	5.7	LOS A	1.5	11.3	0.53	0.63	0.53	52.1
2	T1	157	5.0	165	5.0	0.253	5.9	LOS A	1.5	11.3	0.53	0.63	0.53	53.4
3	R2	87	5.0	92	5.0	0.253	10.5	LOS B	1.5	11.3	0.53	0.63	0.53	53.3
Approach		251	5.0	264	5.0	0.253	7.5	LOS A	1.5	11.3	0.53	0.63	0.53	53.3
East: Road 103														
4	L2	63	5.0	66	5.0	0.303	5.4	LOS A	1.9	14.2	0.51	0.64	0.51	51.8
5	T1	74	5.0	78	5.0	0.303	5.7	LOS A	1.9	14.2	0.51	0.64	0.51	53.0
6	R2	178	5.0	187	5.0	0.303	10.3	LOS B	1.9	14.2	0.51	0.64	0.51	52.9
Approach		315	5.0	332	5.0	0.303	8.2	LOS A	1.9	14.2	0.51	0.64	0.51	52.7
North: Anderson Drive														
7	L2	330	5.0	347	5.0	0.477	5.2	LOS A	3.6	26.2	0.50	0.56	0.50	53.4
8	T1	198	5.0	208	5.0	0.477	5.4	LOS A	3.6	26.2	0.50	0.56	0.50	54.7
9	R2	28	5.0	29	5.0	0.477	10.1	LOS B	3.6	26.2	0.50	0.56	0.50	54.6
Approach		556	5.0	585	5.0	0.477	5.5	LOS A	3.6	26.2	0.50	0.56	0.50	53.9
West: Northern Park Link (Road 53)														
10	L2	28	5.0	29	5.0	0.123	6.3	LOS A	0.7	4.9	0.57	0.62	0.57	52.8
11	T1	74	5.0	78	5.0	0.123	6.5	LOS A	0.7	4.9	0.57	0.62	0.57	54.1
12	R2	7	5.0	7	5.0	0.123	11.2	LOS B	0.7	4.9	0.57	0.62	0.57	53.9
Approach		109	5.0	115	5.0	0.123	6.8	LOS A	0.7	4.9	0.57	0.62	0.57	53.7
All Vehicles		1231	5.0	1296	5.0	0.477	6.7	LOS A	3.6	26.2	0.51	0.60	0.51	53.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: SIDRA Roundabout LOS.
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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3.4.2 IVORY PARKWAY / NORTHERN PARK LINK (ROAD 53) T-INTERSECTION

The Ivory Parkway / Northern Park Link (Road 53) T-intersection was analysed on the basis of "with development" traffic volumes shown by Figure 11 and Figure 12 and the BAL / BAR priority intersection arrangement shown by Figure 14. The following movement summary tables copied from SIDRA indicate that the priority T-intersection:

- Is operating well below its practical capacity with a maximum DoS of 0.156 despite the conservative assumption that peak regional sport & recreation parks traffic occurs during the commuter peak hour;
- Delays are very short with the maximum average delay to any movement being 7.6sec for the right turn from the Northern Park Link (Road 53) to Ivory Parkway during the morning peak hour; and
- Queues are not expected to exceed one (1) vehicle and therefore are not expected to impact on adjacent intersections or accesses.

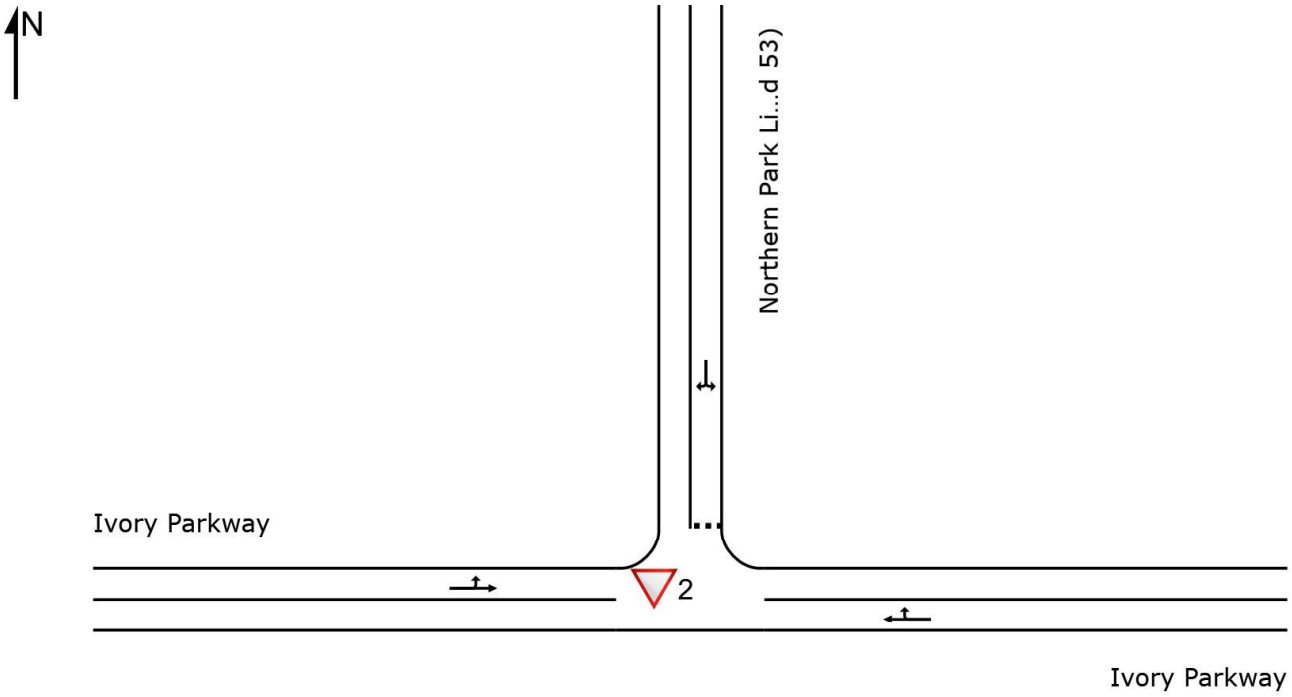

Figure 14 - Ivory Parkway / Northern Park Link (Road 53) BAL/BAR priority T-intersection - SIDRA layout

MOVEMENT SUMMARY

Site: 2 [2AM (Site Folder: General)]

Ivory Parkway / North Park Link (Road 53) priority T-intersection
Design morning peak hour traffic
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ivory Parkway														
5	T1	203	5.0	214	5.0	0.122	0.1	LOS A	0.1	0.7	0.05	0.03	0.05	59.5
6	R2	11	5.0	12	5.0	0.122	6.6	LOS A	0.1	0.7	0.05	0.03	0.05	57.0
Approach		214	5.0	225	5.0	0.122	0.4	NA	0.1	0.7	0.05	0.03	0.05	59.4
North: Northern Park Link (Road 53)														
7	L2	11	5.0	12	5.0	0.144	6.1	LOS A	0.5	3.6	0.40	0.70	0.40	52.0
9	R2	106	5.0	112	5.0	0.144	7.6	LOS A	0.5	3.6	0.40	0.70	0.40	51.4
Approach		117	5.0	123	5.0	0.144	7.5	LOS A	0.5	3.6	0.40	0.70	0.40	51.5
West: Ivory Parkway														
10	L2	106	5.0	112	5.0	0.144	5.6	LOS A	0.0	0.0	0.00	0.25	0.00	56.0
11	T1	147	5.0	155	5.0	0.144	0.0	LOS A	0.0	0.0	0.00	0.25	0.00	57.7
Approach		253	5.0	266	5.0	0.144	2.4	NA	0.0	0.0	0.00	0.25	0.00	57.0
All Vehicles		584	5.0	615	5.0	0.144	2.7	NA	0.5	3.6	0.10	0.26	0.10	56.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 2 [2PM (Site Folder: General)]

Ivory Parkway / North Park Link (Road 53) priority T-intersection
Design evening peak hour traffic
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Ivory Parkway														
5	T1	153	5.0	161	5.0	0.094	0.1	LOS A	0.1	0.7	0.07	0.04	0.07	59.4
6	R2	11	5.0	12	5.0	0.094	6.6	LOS A	0.1	0.7	0.07	0.04	0.07	56.9
Approach		164	5.0	173	5.0	0.094	0.6	NA	0.1	0.7	0.07	0.04	0.07	59.2
North: Northern Park Link (Road 53)														
7	L2	11	5.0	12	5.0	0.140	6.2	LOS A	0.5	3.5	0.40	0.69	0.40	52.1
9	R2	106	5.0	112	5.0	0.140	7.4	LOS A	0.5	3.5	0.40	0.69	0.40	51.5
Approach		117	5.0	123	5.0	0.140	7.3	LOS A	0.5	3.5	0.40	0.69	0.40	51.6
West: Ivory Parkway														
10	L2	106	5.0	112	5.0	0.156	5.6	LOS A	0.0	0.0	0.00	0.23	0.00	56.1
11	T1	168	5.0	177	5.0	0.156	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	57.9
Approach		274	5.0	288	5.0	0.156	2.2	NA	0.0	0.0	0.00	0.23	0.00	57.2
All Vehicles		555	5.0	584	5.0	0.156	2.8	NA	0.5	3.5	0.10	0.27	0.10	56.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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3.4.3 IVORY PARKWAY / SOUTHERN CAR PARK T-INTERSECTION

The Ivory Parkway / Southern Car Park T-intersection was analysed on the basis of "with development" traffic volumes shown by Figure 11 and Figure 12 and the BAL / BAR priority intersection arrangement shown by Figure 15. The following movement summary tables copied from SIDRA indicate that the priority T-intersection:

- Is operating well below its practical capacity with a maximum DoS of 0.119 despite the conservative assumption that peak regional sport & recreation parks traffic occurs during the commuter peak hour;
- Delays are very short with the maximum average delay to any movement being 7.1sec for the right turn from the Southern Car Park to Ivory Parkway during the morning peak hour; and
- Queues are not expected to exceed one (1) vehicle and therefore are not expected to exceed to impact on adjacent intersections or accesses.

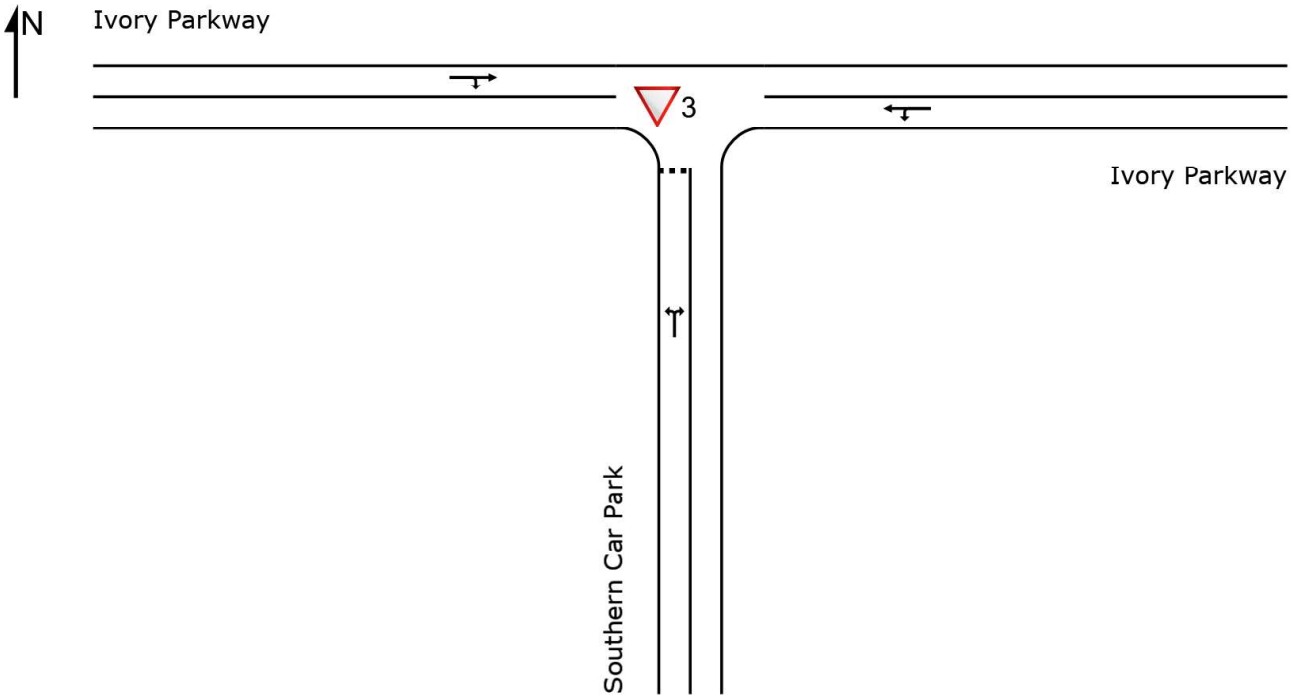

Figure 15 - Ivory Parkway / Southern Car Park BAL/BAR priority T-intersection - SIDRA layout

MOVEMENT SUMMARY

Site: 3 [3AM (Site Folder: General)]

Ivory Parkway / Southern Car Park priority T-intersection
Design morning peak hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Southern Car Park														
1	L2	66	5.0	69	5.0	0.119	6.1	LOS A	0.4	3.2	0.29	0.61	0.29	52.6
3	R2	59	5.0	62	5.0	0.119	7.1	LOS A	0.4	3.2	0.29	0.61	0.29	52.0
Approach		125	5.0	132	5.0	0.119	6.6	LOS A	0.4	3.2	0.29	0.61	0.29	52.3
East: Ivory Parkway														
4	L2	59	5.0	62	5.0	0.117	5.6	LOS A	0.0	0.0	0.00	0.17	0.00	56.6
5	T1	148	5.0	156	5.0	0.117	0.0	LOS A	0.0	0.0	0.00	0.17	0.00	58.4
Approach		207	5.0	218	5.0	0.117	1.6	NA	0.0	0.0	0.00	0.17	0.00	57.9
West: Ivory Parkway														
11	T1	92	5.0	97	5.0	0.101	0.5	LOS A	0.4	3.1	0.27	0.25	0.27	56.8
12	R2	66	5.0	69	5.0	0.101	6.3	LOS A	0.4	3.1	0.27	0.25	0.27	54.6
Approach		158	5.0	166	5.0	0.101	2.9	NA	0.4	3.1	0.27	0.25	0.27	55.9
All Vehicles		490	5.0	516	5.0	0.119	3.3	NA	0.4	3.2	0.16	0.31	0.16	55.7

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

Site: 3 [3PM (Site Folder: General)]

Ivory Parkway / Southern Car Park priority T-intersection
Design evening peak hour
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Southern Car Park														
1	L2	66	5.0	69	5.0	0.115	5.9	LOS A	0.4	3.1	0.23	0.59	0.23	52.7
3	R2	59	5.0	62	5.0	0.115	7.0	LOS A	0.4	3.1	0.23	0.59	0.23	52.2
Approach		125	5.0	132	5.0	0.115	6.4	LOS A	0.4	3.1	0.23	0.59	0.23	52.5
East: Ivory Parkway														
4	L2	59	5.0	62	5.0	0.089	5.6	LOS A	0.0	0.0	0.00	0.22	0.00	56.2
5	T1	98	5.0	103	5.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.22	0.00	58.0
Approach		157	5.0	165	5.0	0.089	2.1	NA	0.0	0.0	0.00	0.22	0.00	57.3
West: Ivory Parkway														
11	T1	113	5.0	119	5.0	0.110	0.3	LOS A	0.4	3.1	0.21	0.22	0.21	57.3
12	R2	66	5.0	69	5.0	0.110	6.1	LOS A	0.4	3.1	0.21	0.22	0.21	55.0
Approach		179	5.0	188	5.0	0.110	2.5	NA	0.4	3.1	0.21	0.22	0.21	56.4
All Vehicles		461	5.0	485	5.0	0.115	3.4	NA	0.4	3.1	0.15	0.32	0.15	55.6

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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3.5 Sight Distances

The "Guide to Traffic Impact Assessment" (Transport and Main Roads, December 2018) identifies three (3) sight distance criteria for consideration in intersection design being:

- Approach Sight Distance (ASD);
- Minimum Gap Sight Distance (MGSD); and
- Safe Intersection Sight Distance (SISD).

The spacing between intersections / accesses is frequently specified in order to meet minimum sight distance standards.

SISD provides sufficient distance for a driver of a vehicle on the major road to observe a vehicle on a minor road approach moving into a collision situation (e.g. in the worst case, stalling across the traffic lanes), and to decelerate to a stop before reaching the collision point. With a posted speed limit of 50km/h (refer Section 2.1) the design speed for Anderson Drive , Everleigh Drive and Ivory Parkway is 60km/h being 10km/h above the posted speed limit. The "Guide to Road Design Part 4A: Unsignalised and Signalised Intersections" (Austroads 2017) specifies SISD for a design speed of 60km/h is approximately 120m which is consistent with the minimum intersection spacing specified by Guideline 6 for Neighbourhood Connectors (including Park Connectors). SISD is the ideal sight distance standard to be achieved at all accesses and intersections but this is not always practical.

MGSD is based on distances corresponding to the critical acceptance gap that drivers are prepared to accept when undertaking a crossing or turning manoeuvre at intersections. For a two-lane road such as Ivory Parkway the critical acceptance gap is considered 5sec which corresponds to a travel distance of approximately 80m at the design speed of 60km/h. The "Guide to Traffic Impact Assessment" recommends provision of MGSD as the minimum sight distance standard at public road intersections if SISD cannot be achieved.

ASD is the minimum level of sight distance which must be available on the minor road approaches to all intersections and access to ensure that drivers are aware of the presence of an intersection / access. The "Guide to Road Design Part 4A: Unsignalised and Signalised Intersections" specifies ASD for a design speed of 60km/h is approximately 70m which is consistent with the proposed spacing between Everleigh Drive and the Northern Park Link (Road 53) on Ivory Parkway. The "Guide to Traffic Impact Assessment" indicates that for access intersections (not public road intersections) it is acceptable to provide ASD only without satisfying the requirements of MGSD and SISD. Therefore, the proposed separation between Everleigh Drive and the Northern Park Link (Road 53) on Ivory Parkway is considered acceptable.

4. NORTHERN PARK LINK (ROAD 53)

The Northern Park Link (Road 53) provides access to 213 parking spaces associated with the proposed sports oval and courts but also provides a direct link between the intersections of Anderson Drive with Road 103 and Everleigh Drive with Ivory Parkway. To minimise through traffic and vehicle speeds on the Northern Park Link (Road 53) it is recommended that the carriage width is minimised and traffic calming devices are provided at regular intervals along the link.

Australian Standards Parking Facilities Part 1: Off-Street Car Parking (AS2890.1) specifies parking for sports facilities as user class 2 parking. Therefore, the minimum dimensions required for 90^0 parking are:

- 2.5m wide bays;
- 5.4m long bays (unless overhanging a low kerb); and
- 5.8m wide aisles.

Based on AS2890.1, it is recommended that where 90^0 parking is provided the aisle width should be 5.8m which is the minimum permitted for user class 2 parking. Where parking is not provided, the carriageway width could be reduced to 5.5m. On curves with a radius of less than 50m some widening may be required to ensure adequate clearance is provided between vehicles travelling in opposite directions.

"Streets for People" is a compendium for South Australian Practice published by the Government of South Australia which provides information and guidance for the development of pedestrian and cycle friendly environments that promote health and strengthen communities. It recommends a maximum spacing between traffic calming devices of 80m to achieve operating speeds no greater than 30km/h which are typical for all successful shared street types. Appropriate traffic calming devices for use on the Northern Park Link (Road 53) are:

- Wombat crossings, that is, raised pedestrian crossings (zebra), where the park's path network crosses the Northern Park Link (Road 53);
- A single-lane slow point between the parking areas for the sports oval and courts; and
- Road humps as required to ensure the spacing between traffic calming devices is 50m to 90m.

5. SOUTHERN CAR PARK

As with the Northern Park Link (Road 53) (refer Section 4), the Southern Car Park is a user class 2 parking facility in accordance with AS2890.1 and the minimum dimensions for 90^0 parking are:

- 2.5m wide bays;
- 5.4m long bays (unless overhanging a low kerb); and
- 5.8m wide aisles.

The proposed layout complies with AS2890.1 with respect to providing for efficient vehicle circulation and separation between the external road network and conflict points within the car park.

6. PARKING ASSESSMENT

Logan Planning Scheme 2015 SC6.2.5 Infrastructure Part 3.12 Parks Infrastructure Standards lists typical parking for parks as:

- District Recreation Park = 40 parking bays that meet relevant Australian standard; and
- Metropolitan Sport Park = 400 parking bays that meet relevant Australian standard including bus parking and turnaround or pull through.

Without making any allowance for sharing of parking spaces between facilities the desirable parking provision is 440 car spaces plus bus parking. This is provided by:

- 106 off-street car spaces provided at the western end of the Northern Park Link near a proposed sports oval;
- 125 off-street car spaces provided in the Southern Car Park near three (3) proposed sports fields; and
- 107 off-street car spaces provided at the eastern end of the Northern Park Link near eight (8) proposed courts.
- 62 car spaces on Ivory Parkway passing through the regional sport & recreation parks;
- Approximately 200 on street parking spaces which front the regional sport and recreation parks located on Everleigh Drive, Anderson Drive, Watercress Drive and the future road south of the parkland (south) and wetland.; and
- Parking for six (6) buses located as described below:
  - Two (2) on-road bus parking bays located on Ivory Parkway to service the Sports Fields.
  - Two (2) indented bus parking bays located on the Northern Park Link to service the Sports Oval; and
  - Two (2) indented bus parking bays located on the Northern Park Link to service the Sports Courts.

Logan City Council's Servicing, Access and Parking Code specifies car parking should be provided at the following rates for outdoor sport and recreation uses:

- 4 spaces per court;
- 1 space for every 3 seats at a sports arena;
- 15 spaces per field; and
- 1 space per 15m^2 of gross floor area.

Based on the above parking rates:

- The 106 parking spaces provided at the western end of the Northern Park Link (Road 53) near the proposed sports oval support up to 1,590m^2 of clubhouses or 318 arena seats at the field;
- The 125 parking spaces provided in the Southern Car Park near the proposed sports fields support three (3) sports fields (45 parking spaces) plus up to 1,200m^2 of clubhouses or 240 arena seats; and
- The 107 parking spaces provided at the eastern end of the Northern Park Link (Road 53) near the proposed courts support eight (8) courts (32 parking spaces) plus up to 1,125m^2 of clubhouses or 225 arena seats.

The above stated overall number of car parking spaces have been provided on the basis that all sports and recreation uses' peak periods will be operating simultaneously. This is a conservative assumption which does not consider sharing of parking between uses whose peak operating periods are unlikely to coincide.

As stated in Sections 4 and 5, Australian Standards Parking Facilities Part 1: Off-Street Car Parking (AS2890.1) specifies parking for sports facilities as user class 2 parking. Therefore, the minimum dimensions required for 90^0 parking are:

- 2.5m wide bays;
- 5.4m long bays (unless overhanging a low kerb); and
- 5.8m wide aisles.

6.1 Bicycle Parking

Australian Standard: Parking Facilities – Part 3: Bicycle Parking Facilities (AS 2890.3:1993) specifies three (3) classes of bicycle parking facilities. Table 7.1 adapted from AS 2890.3:1993 summaries the bicycle parking classes.

Class	Security Level	Description
1	High	Fully enclosed individual lockers
2	Medium	Locked compounds with communal access using duplicate keys
3	Low	Facilities to which the bicycle frame and wheels can be locked. Unless the frame and both wheels of a bicycle can be locked to a facility, it cannot be regarded as secure and will not meet the requirements of AS 2890.3:1993.

EDQ and Logan City Council and Austroads provide limited guidance on requirements for bicycle parking rates of provision for recreation / sports parks and outdoor sports and recreation. Based on Austroads' Guide to Traffic Management Part 11: Parking Management Techniques, it is recommended that Class 3 parking be provided at all sports fields and associated facilities for visitors / spectators with Class 1 / 2 facilities for employees / players incorporated within club house buildings (if required).

Thirty (30) Class 3 bicycle parking spaces are proposed to be provided within the Central Park area which corresponds to more than one (1) bicycle parking space per 15 car parking spaces. The location of these spaces within the Central Park is listed below.

- 10 bicycle parking spaces - Future Club House – Park Lot 804
- 10 bicycle parking spaces - Future Club House – Park Lot 808
- 10 bicycle parking spaces - Future Club House – Park Lot 809

7. WEEKEND PEAK PERIOD

The preceding discussion and analysis is based on the extreme traffic scenario of a regional interschool sports event taking place on a typical school day. The scenario implies that all on-site facilities are utilised to their capacity with ever off-street parking space generating one (1) inbound and one (1) outbound trip during the commuter peak hour with no diversion or linking of trips generated by the adjacent community facility (school). This scenario is likely to occur only once per year. As indicated above, this extreme traffic scenario can be accommodated safely and efficiently by the proposed transport infrastructure.

Realistically, it is unlikely that peak periods for all sport and recreation facilities, the adjacent school and commuter trips will coincide.

Given the scale and mix of uses within the regional sport & recreation parks, it is likely that not all parking facilities will be fully utilised at the same time. Also the assumption that all spaces generate one (1) inbound and one (1) outbound trip during a single hour is conservative as people the average dwell time for on-site parking is likely to be greater than 80min to allow participation in / watching of an entire sports game. Therefore, the typical peak traffic generation of the development is likely to be less than 70% of the 30HHV estimated in Section 3.1.

A major event such as described in Section 3.1 would most likely occur on a weekend or, if it did occur during a school day, would be managed to avoid the peak in event traffic coinciding with commuter peak periods. Therefore, the traffic generation on the surrounding road network would likely be around 60% of the "without development" traffic identified in Section 2.2 and traffic flows would be more balanced further improving the efficiency of intersections.

Based on the above discussion, it is concluded that the proposed transport infrastructure would operate even better during a weekend peak period than the very good performance already demonstrated for the extreme traffic scenario analysed, As discussed in Section 6, the proposed parking supply is understood to comply with both Logan City Council's Park Infrastructure Standards, and Servicing, Access and Parking Code.