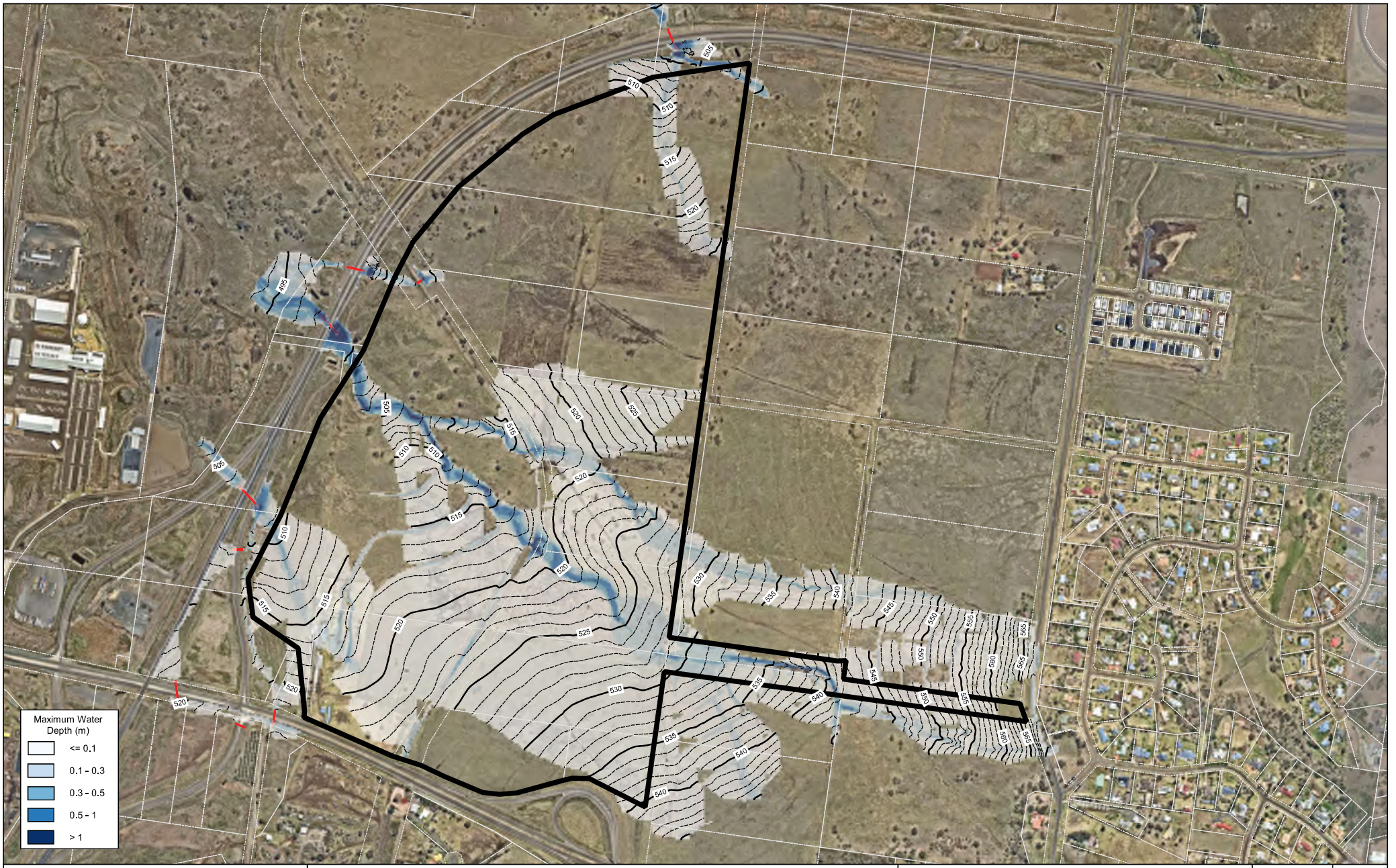
Appendix E Flood Mapping



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Scale (at A3)
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Metres
Geocentric Datum of Australia 1994
Map Grid of Australia Zone 56

RMA Engineers

Legend:
Cadastre
Existing Culvert
Site Boundary

Title:

Pre-Developed Maximum WSL and Depth - 1% AEP Toowoomba Sports Precinct

Project Number:	Rev:
16567	A
SFW-PRE-01	
Date: 03/12/2021	

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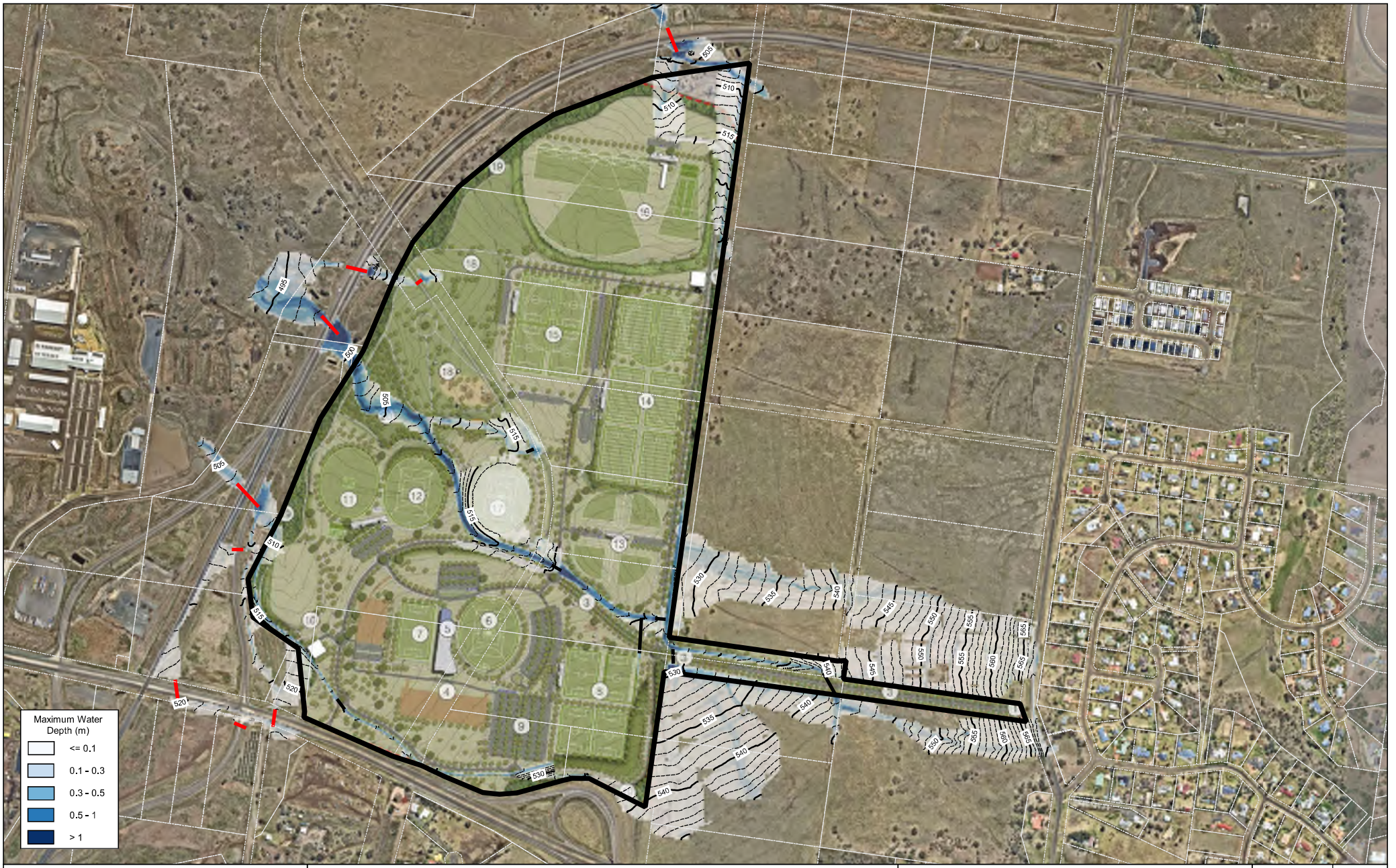

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Metres
Geocentric Datum of Australia 1994
Map Grid of Australia Zone 56

RMA Engineers

Legend:
Cadastre
Site Boundary
Culverts
Existing Culvert
Proposed Culvert

Title:

Post-Developed Maximum WSL and Depth - 1% AEP Toowoomba Sports Precinct

Project Number:	Rev:
16567	1
SFW-PO-01	
Date:	15/06/2022

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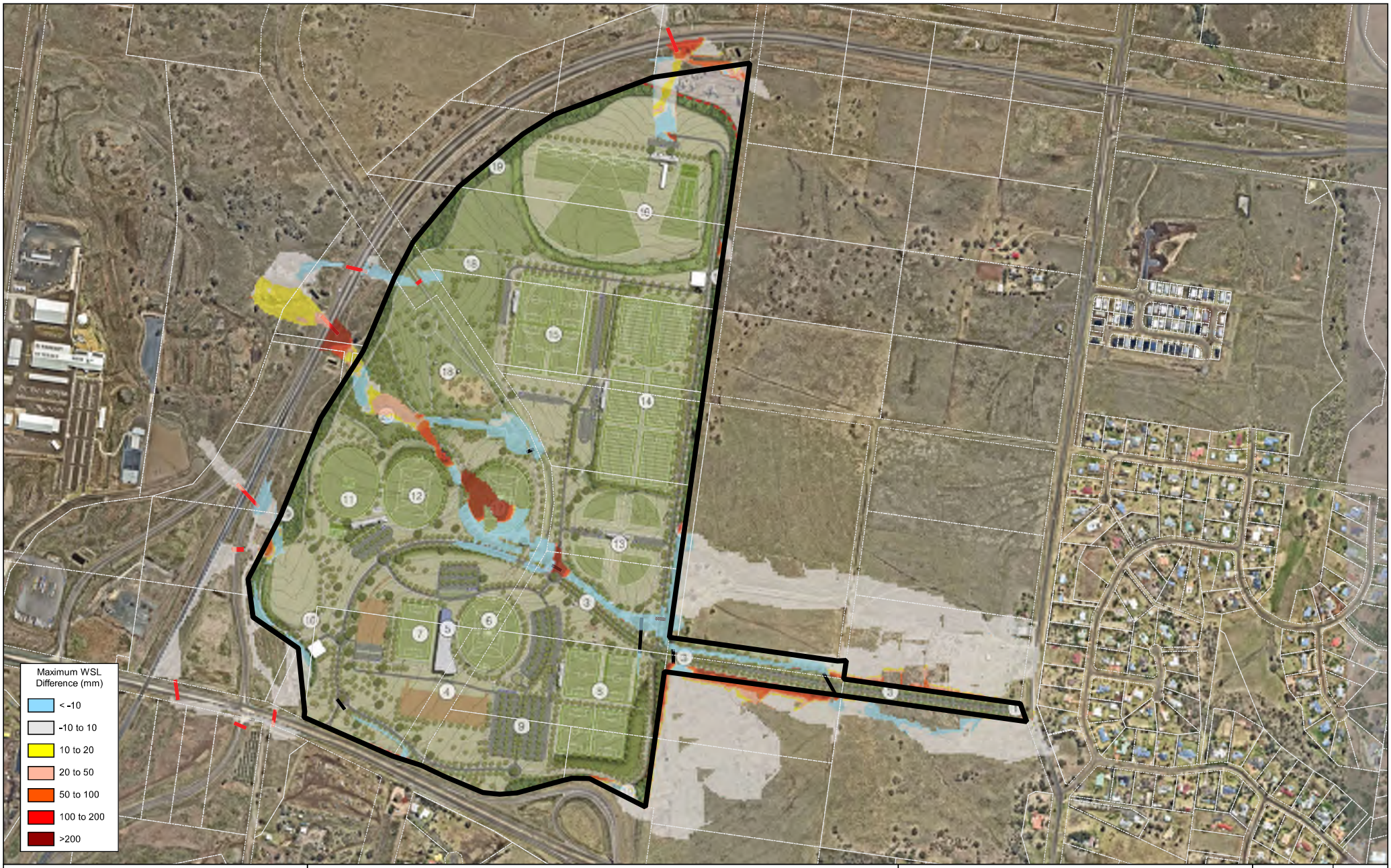

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Scale (at A3)
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0 75 150 225 300
Metres
Geocentric Datum of Australia 1994
Map Grid of Australia Zone 56

RMA Engineers

Legend:
Cadastre
Site Boundary
Culverts
Existing
Proposed

Title:

WSL Difference
1% AEP
Toowoomba Sports Precinct

Project Number:	Rev:
16567	1
SFW-WSL-01	
Date:	15/06/2022

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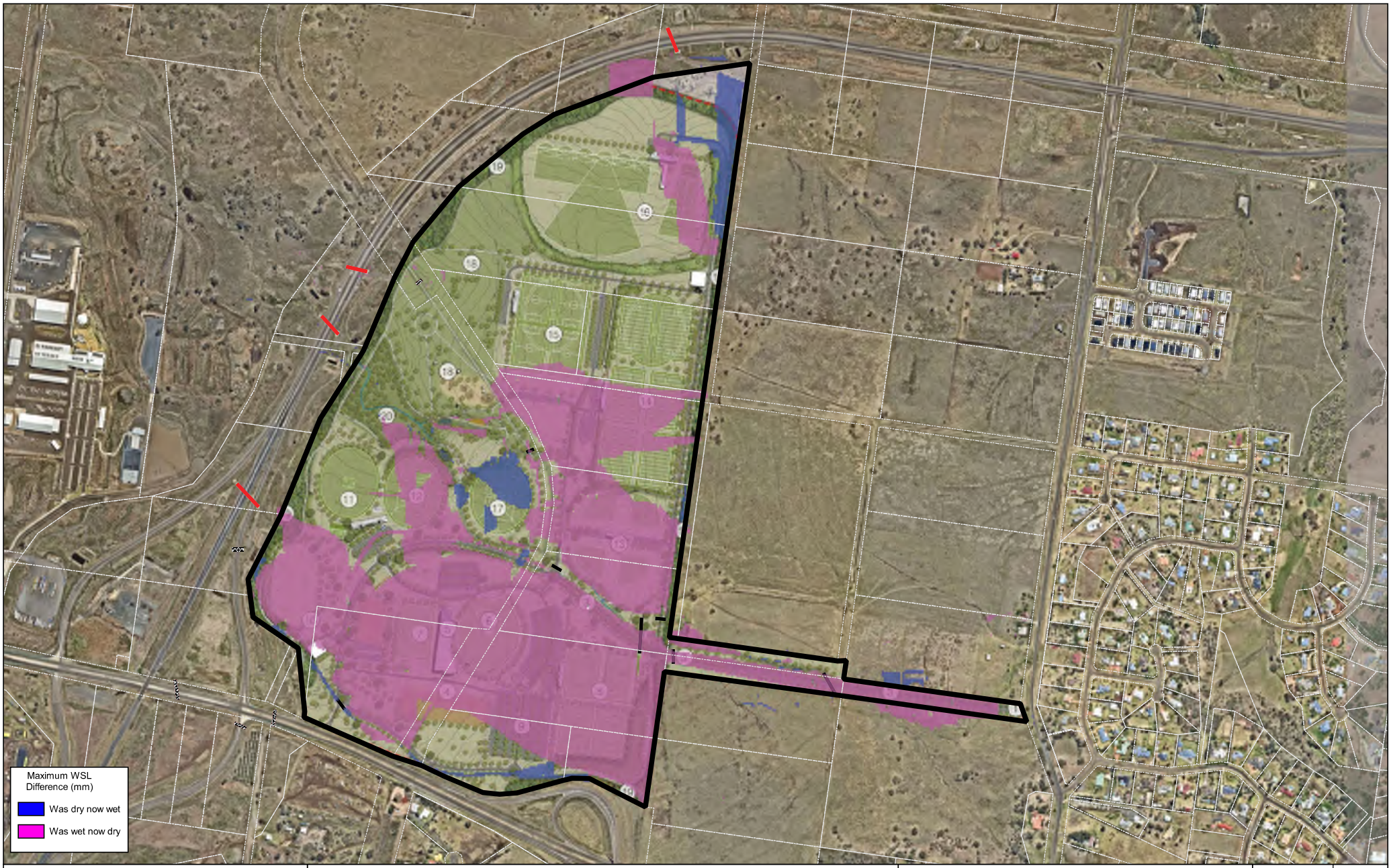

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Scale (at A3)
1:8,000
0 75 150 225 300
Metres
Geocentric Datum of Australia 1994
Map Grid of Australia Zone 56

RMA Engineers

Legend:
Cadastre
Site Boundary
Culverts
Existing
Proposed

Title:

Wet Dry Plot - 1% AEP
Toowoomba Sports Precinct

Project Number:	Rev:
16567	1
SFW-WD-01	
Date:	15/06/2022

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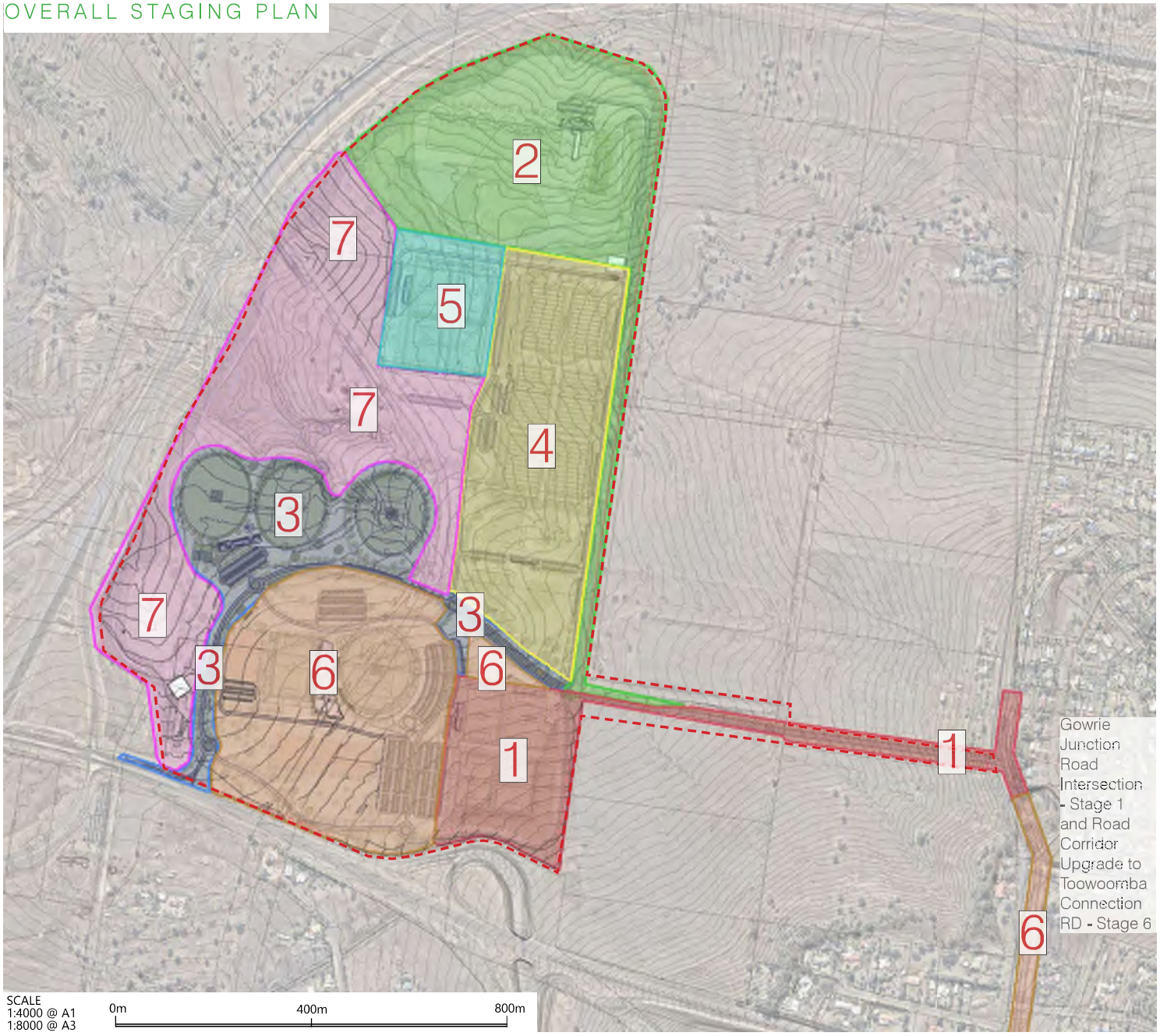
Appendix F Toowoomba Region Sports Precinct Overall Staging Plan

OVERALL STAGING PLAN



STAGING SEQUENCE

Stage 1
Southern rectangular fields, clubhouse, parking, access road boulevard to be south side only leading to Gowrie Junction Road intersection. Existing shooting club and archery to remain.

Stage 2
Relocation of shooting club and archery, indoor range, shared clubhouse, parking and access road. Construct roundabout and northern side of boulevard road. Provide access to Toowoomba Connection Rd.

Stage 3
Ovals, practice nets, clubhouse, parking and road access.

Stage 4
Diamond Fields, rectangular fields, shared fields, clubhouses, parking and access roads.

Stage 5
Northern rectangular fields, clubhouse and parking.

Stage 6
Premier Hub, premier oval, premier rectangular field, parking and access roads. Local park and playground north of southern soccer fields and construct north side of boulevard road.
Potential upgrade to Gowrie Junction Road to Toowoomba Connection Road.
Include Entry Parkland, Southern and Northern Setdown areas and overflow parking areas

Stage 7
District Park and facilities including parking, access, playground and stormwater treatment channels.

TOOWOOMBA REGION SPORTS PRECINCT

2020 MASTER PLAN

PO BOX 1640, Buddina, QLD 4575 T: 07 5493 4677 E: admin@greenedgedesign.com.au www.greenedgedesign.com.au

N

SCALE: AS SHOWN @A1
DRAWING: DC-34 [0]
PROJECT: 19009
DATE: 26-05-2022

CLIENT: TOOWOOMBA REGION

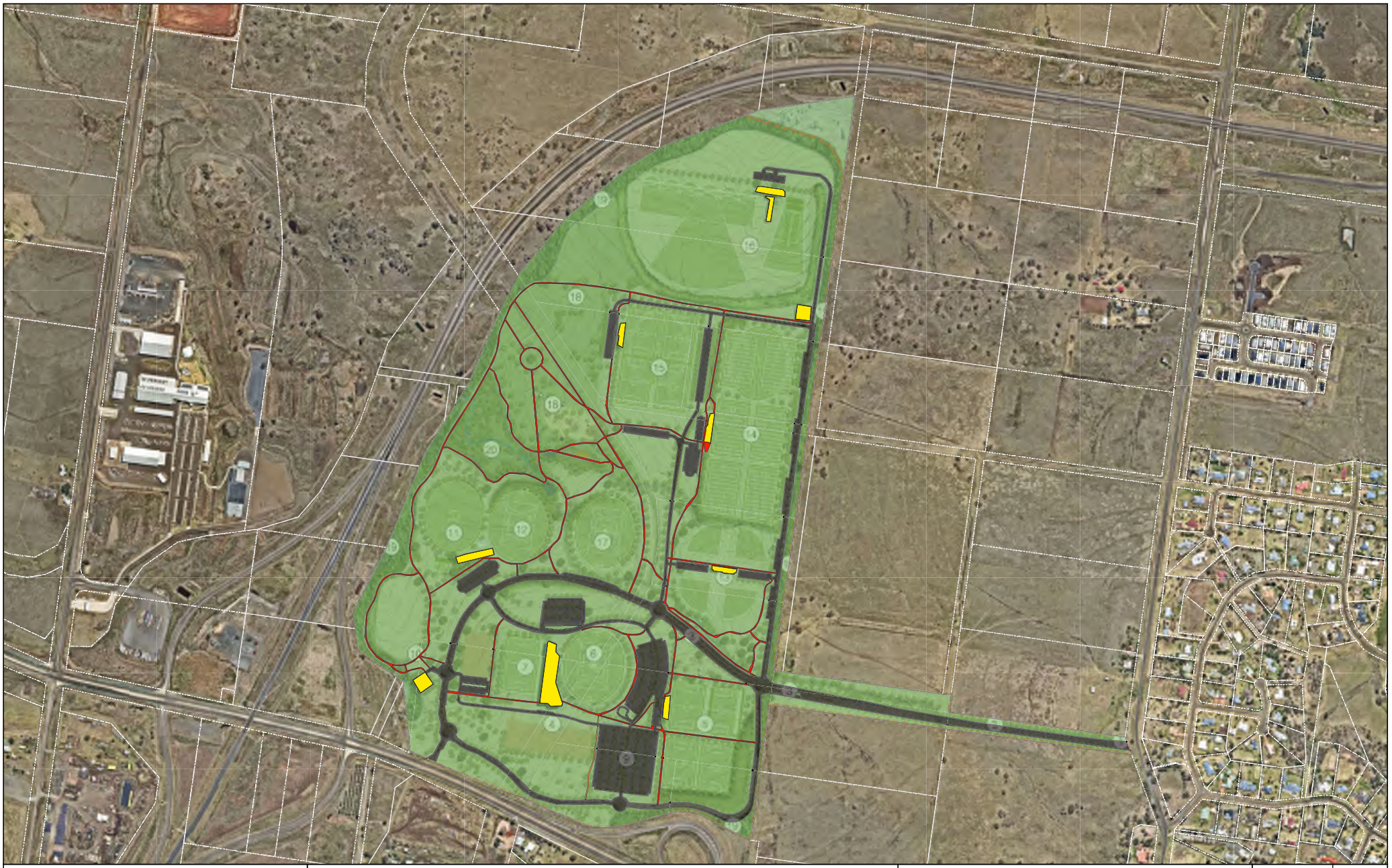
CONSULTANTS: GHD

LEAD CONSULTANT: OTIUM SPORT + LEISURE

Open architecture studio

GREENEDGE DESIGN
creative thinking | design edge
Landscape Architecture | Urban design | Master Planning | Environmental

Appendix G Stormwater quality catchment plan



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Scale (at A3)
1:8,000
0 75 150 225 300
Metres
Geocentric Datum of Australia 1994
Map Grid of Australia Zone 56

RMA Engineers

Legend:
Site Boundary
Surface Types
Concrete
Road
Ground
Roof

Title:
Post-development Stormwater Quality Catchment Plan
Toowoomba Sports Precinct

Project Number:	Rev:
16567	0
SFW-CAT-02	
Date:	17/06/2022

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Appendix H MUSIC model parameters

H1. General

The following outlines parameters adopted in the MUSIC modelling analysis.

H2. Catchments

The proposed development has been modelled assuming a single, englobo catchment within the MUSIC model.

Areas for the land use types have been adopted based on site layout plans.

The following table summarises the individual land use type characteristics used in the analysis.

Table H1: Post-developed (mitigated) catchment areas (for MUSIC)

MUSIC land use types	Area (ha)	Percentage Impervious (%)
Commercial Roof	1.426	100
Commercial Roads	14.995	85
Commercial Ground Level - Concrete	3.038	100
Commercial Ground level	118.585	15

H3. Rainfall data

Meteorological data from the Bureau of Meteorology recording station nearest the site (41467 Toowoomba Regional Council) has been used. The rainfall data sequence adopted is 1961 - 1970 at 6 minute time steps.

The following rainfall and potential evapotranspiration (PET) data has been adopted.

Table H2: Rainfall and PET data (for MUSIC)

Council			Station ID			Station Name			Climate Period		
Toowoomba Regional Council			41467			Toowoomba City Council			1/1/1961-31/12/1970		
Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
173	133	137	100	74	63	66	81	104	139	158	173

H4. Source nodes

Model parameters for source node pollutant generation and soil characteristics were taken directly from the appropriate sections of the MUSIC Modelling Guidelines without modification.

The following tables summarise the recommended rainfall runoff parameters and pollutant export parameters for split catchment land use that have been used in the MUSIC model.

Table H3: Source nodes – rainfall runoff parameters

Parameter	Commercial
Rainfall Threshold (mm)	1
Soil Storage Capacity (mm)	18
Initial Storage (% capacity)	10
Field Capacity (mm)	80
Infiltration Capacity Coefficient a	243
Infiltration Capacity Coefficient B	0.6
Initial Depth (mm)	50
Daily Recharge Rate (%)	0
Daily Deep Seepage Rate (%)	31

Table H4: Source nodes – pollutant export parameters

Flow Type	Surface Type	TSS log_{10} values		TP log_{10} values		TN log_{10} values	
		Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Commercial							
Baseflow parameters	Roof	N/A	N/A	N/A	N/A	N/A	N/A
	Roads	0.78	0.39	-0.60	0.50	0.32	0.30
	Ground level	0.78	0.39	-0.60	0.50	0.32	0.30
Stormflow parameters	Roof	1.30	0.38	-0.89	0.34	0.37	0.34
	Roads	2.43	0.38	-0.30	0.34	0.37	0.34
	Ground level	2.16	0.38	-0.39	0.34	0.37	0.34

H5. Treatment device characteristics

Bioretention Basin

The following table outlines the characteristics adopted in the analysis for the bioretention basin.

Table H5: Characteristics of the proposed treatment device – Bioretention Basin

Parameter	Values
Extended Detention Depth	0.30 m
Surface Area	8455 m^2
Minimum Filter Area	8235.5 m^2
Filter Depth	0.5 m
Saturated Hydraulic Conductivity	200 mm/hr
Maximum TN content of filter media	400 mg/kg
Maximum orthophosphate content of filter media	30 mg/kg
Overflow Weir Width	3.60 m
Exfiltration Rate (mm/hr)	0.0