

STAGE 2 & 3 - MCLEOD ROAD INDUSTRIAL, PARK RIDGE

Stormwater Management Plan

20 MAY 2026



Client: Andreatta Properties Pty Ltd

Prepared by: Arcadis Australia Pacific Pty Ltd

Date: 12 June 2026

Material Change of Use (MCU) Application Support

Stage 2 – McLeod Road Industrial Estate, Park Ridge

1 Introduction

This memorandum supports a Material Change of Use (MCU) application for Stage 2 of the McLeod Road Industrial Estate at Park Ridge. The assessment draws on the Engineering Services Report (GA0014-30131743-AAR) and Stormwater Management Plan (GA0015-30131743-AAR) and demonstrates that the development can be adequately serviced in accordance with Logan City Council requirements.

2 Site Description

Stage 2 is approximately 2.23 ha within a broader 16.6 ha master planned industrial estate. The site is predominantly cleared and located on land that grades northeast towards an established drainage corridor. Surrounding land uses include industrial development to the north and rural residential uses to the east and west.

3 Proposed Development

The development comprises subdivision into industrial lots and supporting infrastructure, including internal roads, stormwater drainage, water and sewer reticulation, and stormwater quality devices integrated within the road corridor.

4 Infrastructure Servicing

Stormwater will be conveyed via a pit and pipe system designed to a 20-year ARI standard, with major flows routed via overland flow paths. No on-site detention is required as flows are managed by a regional detention basin constructed as part of the master development. Water supply is provided via DN150 mains connected to Stage 1 infrastructure. Sewer servicing is achieved through connection to existing downstream network infrastructure with adequate spare capacity.

5 Stormwater Quality Management

The greater development, Stages 1-3, will adopt the Water Sensitive Urban Design (WSUD) principles, including the use of bio-retention verge systems for road runoff treatment.

However, specific to Stage 2, the prevailing catchment area within the road reserve is ~950m² and therefore poses no significant impervious area (<2,500m²). As such, in accordance with State Planning Policy no additional bio-retention, beyond that constructed under Stage 1, is considered for these works.

6 Environmental Controls (Construction Phase)

Erosion and sediment control measures will be implemented during construction in accordance with best practice guidelines. Measures include silt fences, stabilisation techniques and monitoring regimes to prevent off-site impacts.

7 Compliance with Logan Planning Scheme

The proposed development complies with the Logan Planning Scheme 2015 Infrastructure Code (9.4.3). The development is capable of being serviced, integrates with existing infrastructure networks, and meets stormwater, water, sewer and safety requirements.

8 Conclusion

Stage 2 of the development can be adequately serviced by existing and proposed infrastructure, meets stormwater quantity and quality requirements, and complies with all relevant planning scheme provisions. The proposal is therefore suitable for approval, subject to standard conditions and detailed design at the Operational Works stage.

Yours sincerely,



Alex Connolly
Civil Engineer – Urban Development and Regeneration
(07) 3329 7743

MCLEOD ROAD INDUSTRIAL ESTATE

STAGE 2, DETAILED DESIGN - CIVIL DRAWING SET

LOGAN CITY COUNCIL

DRAWING SCHEDULE

DRAWING NUMBER	DESCRIPTION
GENERAL	
MRI-AAP-DD-02-DRG-CV-0001	COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
MRI-AAP-DD-02-DRG-CV-0041	SAFETY IN DESIGN
MRI-AAP-DD-02-DRG-CV-0061	GENERAL ARRANGEMENT PLAN
MRI-AAP-DD-02-DRG-CV-0071	EXISTING FEATURES SURVEY PLAN
EARTHWORKS	
MRI-AAP-DD-02-DRG-CV-0101	BULK EARTHWORKS PLAN
MRI-AAP-DD-02-DRG-CV-0121	BULK EARTHWORKS SECTIONS SHEET 1
MRI-AAP-DD-02-DRG-CV-0122	BULK EARTHWORKS SECTIONS SHEET 2
MRI-AAP-DD-02-DRG-CV-0141	RETAINING WALL PLAN
MRI-AAP-DD-02-DRG-CV-0161	RETAINING WALL LONGITUDINAL SECTION SHEET 1
MRI-AAP-DD-02-DRG-CV-0162	RETAINING WALL LONGITUDINAL SECTION SHEET 2
MRI-AAP-DD-02-DRG-CV-0165	TYPICAL RETAINING WALL DETAILS
MRI-AAP-DD-02-DRG-CV-0171	EROSION & SEDIMENT CONTROL PLAN CONSTRUCTION PHASE
MRI-AAP-DD-02-DRG-CV-0181	EROSION & SEDIMENT CONTROL PLAN MAINTENANCE PHASE
MRI-AAP-DD-02-DRG-CV-0191	EROSION & SEDIMENT CONTROL DETAILS SHEET 1
MRI-AAP-DD-02-DRG-CV-0192	EROSION & SEDIMENT CONTROL DETAILS SHEET 2
MRI-AAP-DD-02-DRG-CV-0193	EROSION & SEDIMENT CONTROL DETAILS SHEET 3
ROADWORKS	
MRI-AAP-DD-02-DRG-CV-0201	ROADWORKS AND DRAINAGE LAYOUT PLAN
MRI-AAP-DD-02-DRG-CV-0221	CONTROL LINE SETOUT LAYOUT PLAN
MRI-AAP-DD-02-DRG-CV-0251	MC03 LONGITUDINAL SECTION
MRI-AAP-DD-02-DRG-CV-0252	MC03 CROSS SECTION
MRI-AAP-DD-02-DRG-CV-0341	SIGNS AND LINEMARKING PLAN
MRI-AAP-DD-02-DRG-CV-0351	PAVEMENT PLAN
MRI-AAP-DD-02-DRG-CV-0361	CIVIL WORKS DETAILS
STORMWATER DRAINAGE	
MRI-AAP-DD-02-DRG-CV-0421	STORMWATER CATCHMENT LAYOUT PLAN
MRI-AAP-DD-02-DRG-CV-0441	STORMWATER DRAINAGE LONGITUDINAL SECTION
MRI-AAP-DD-02-DRG-CV-0461	STORMWATER DRAINAGE CALCULATION TABLE
SERVICES	
MRI-AAP-DD-02-DRG-CV-0521	SEWER RETICULATION LAYOUT PLAN
MRI-AAP-DD-02-DRG-CV-0621	WATER RETICULATION LAYOUT PLAN



LOCALITY PLAN

1 : 5000

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HAZARD / RISK ASSESSMENT REGISTER - CIVIL WORKS

PROJECT	MCLEOD ROAD INDUSTRIAL - STAGE 2 WORKS
LOCATION	PARK RIDGE, LOGAN
PROJECT NUMBER	30131743
PROJECT DESCRIPTION	DETAILED DESIGN

A HAZARD is something with the potential to cause harm.
RISK is a combination of the likelihood of the harm occurring and the severity of the harm should it occur.
CONTROLS are measures to eliminate or reduce risk to an acceptable level.
ABNORMAL RISKS are aspects of our project, structure or materials as identified by our design which may present significant hazards that are unusual, not obvious or may be difficult to manage.

RISK ID NO	PROJECT PHASE	HAZARD / RISK DESCRIPTION	RISK MANAGER	CONSEQUENCE / LIKELY HARM	LIKELIHOOD	SEVERITY	INITIAL RISK RATING = L X S	TREATMENT OPTION MITIGATION ACTION FOR AVOIDANCE PLAN CONTROLS TO BE PROVIDED	CONSEQUENCE / LIKELY HARM	LIKELIHOOD	SEVERITY	RESIDUAL RISK RATING = L X S	- ADOPTED TREATMENT - REASON - BY WHOM	COMMENT
1	DESIGN / CONSTRUCTION	HIGH & STEEP BATTERS	ARCADIS / CONTRACTOR	ACCIDENT, VEHICLE DAMAGE, PERSONAL DISABILITY OR DEATH	4	5	20	CONTRACTOR TO PROVIDE TEMPORARY FENCING DURING CONSTRUCTION	VISIBLE BARRIER	2	5	10	- TREATMENT TO BE ADOPTED BY CONTRACTOR - CIVIL CONTRACTOR	
								LOWER BATTER HEIGHTS	INCREASED EARTHWORKS	4	3	12	- TREATMENT NOT ADOPTED - ADDITIONAL WORKS AND COST	
2	DESIGN/ CONSTRUCTION	FLOOD WATERS / RAINFALL FROM UPSTREAM CATCHMENT MAY CAUSE EROSION AND DAMAGE TO DRAINAGE CHANNELS AND MAY BE PRONE TO DANGEROUS FLOOD WATERS	ARCADIS	EROSION / DAMAGE TO CHANNEL & DROWNING	3	5	15	CONTRACTOR TO INSTALL AND MAINTAIN EROSION AND SEDIMENT CONTROL DEVICES AND ENSURE EXTENT OF WATERWAYS ARE KNOWN TO ALL SITE VISITORS AND STAFF.	NO EROSION IN CHANNEL AND KNOWN AREAS OF POTENTIAL DEEP WATER ZONES.	1	5	5	- TREATMENT ADOPTED - COST AND LIKELIHOOD REDUCTION EFFECTIVE - CIVIL CONTRACTOR	
3	CONSTRUCTION	PORTIONS OF THE EARTHWORKS MAY BE CONSTRUCTED USING BENCHED ZONES. PRIVATE SITE OPERATORS OR OTHERS MAY FALL INTO BENCHES / BATTERS	CIVIL CONTRACTOR	FALLING FROM HEIGHTS / MAJOR INJURY	3	4	12	CONTRACTOR PROVIDES MAN-PROOF FENCING AROUND OPEN BENCHED AREAS WITH ADEQUATE WARNING OF DEEP EXCAVATION AS WELL AS COVERING OPEN TRENCH WITH BOARDS.	ADEQUATE WARNING AND PROTECTION PROVIDED TO PREVENT NON-INTENTIONAL ENTRY.	1	4	4	- TREATMENT MAY BE ADOPTED - COST AND LIKELIHOOD REDUCTION EFFECTIVE - CIVIL CONTRACTOR	
4	CONSTRUCTION	SEDIMENT BASINS AND BIO-RETENTION BASINS ACCUMULATING SIGNIFICANT VOLUMES OF WATER DURING LARGE STORM EVENTS.	CIVIL CONTRACTOR	PERSONNEL OR EQUIPMENT SWEEP AWAY / SINKING / DROWNING	3	5	15	CONTRACTOR SHALL MONITOR WEATHER PREDICTION AGENCIES (I.E. BOM) FOR RAINFALL AND SEVERE WEATHER WARNINGS. MONITORING METHODOLOGY TO BE INCORPORATED IN CONSTRUCTION MANAGEMENT PLAN ALONG WITH SIGNAGE AND TEMPORARY FENCING WHERE NECESSARY.	PERSONNEL OR EQUIPMENT SWEEP AWAY / SINKING / DROWNING	1	5	5	- TREATMENT ADOPTED - SAFE WORK METHOD STATEMENT BY CIVIL CONTRACTOR SHOULD REDUCE THE LIKELIHOOD OF INJURY - CIVIL CONTRACTOR	
5	CONSTRUCTION	ROCK / MATERIAL HANDLING & PLACEMENT OF LARGE ROCK	CIVIL CONTRACTOR	PERSONAL INJURY, DISABILITY OR DEATH	2	3	6	SAFE WORK METHOD STATEMENT & PERSONAL AWARENESS	PERSONAL INJURY, DISABILITY OR DEATH	1	2	2	- TREATMENT MAY BE ADOPTED - COST AND LIKELIHOOD REDUCTION EFFECTIVE - CIVIL CONTRACTOR	
6	DESIGN	CONSTRUCTION OF ROAD REQUIRING FUTURE WORKS OR COMPLETION BY OTHERS.	ARCADIS	PERSONAL INJURY, DISABILITY OR DEATH	2	5	10	PROVIDE NECESSARY SIGNAGE TO INDICATE A TEMPORARY ROAD END AND SUFFICIENT ROAD DISTANCE TO STOP AND TURNAROUND.	PERSONAL INJURY, DISABILITY OR DEATH	1	5	5	- TREATMENT MAY BE ADOPTED - COST AND LIKELIHOOD REDUCTION EFFECTIVE - CIVIL CONTRACTOR	
7	CONSTRUCTION	OPEN EXCAVATION OVERNIGHT. PRIVATE SITE OPERATORS OR OTHERS MAY FALL INTO TRENCHES.	CIVIL CONTRACTOR	FALLING FROM HEIGHTS / MAJOR INJURY OR DEATH	3	4	12	TRENCH IS BACKFILLED EACH DAY BEFORE CONTRACTOR LEAVES SITE	TRENCH IS FILLED AND THEREFORE CANNOT BE FALLEN INTO	0	4	0	- TREATMENT MAY BE ADOPTED - COST PROHIBITIVE BUT HIGHLY EFFECTED AT REDUCING LIKELIHOOD - CIVIL CONTRACTOR	
								CONTRACTOR PROVIDES MAN-PROOF FENCING AROUND OPEN BENCHED AREAS WITH ADEQUATE WARNING OF DEEP EXCAVATION AS WELL AS COVERING OPEN TRENCH WITH BOARDS.	ADEQUATE WARNING AND PROTECTION PROVIDED TO PREVENT NON-INTENTIONAL ENTRY.	1	4	4	- TREATMENT MAY BE ADOPTED - COST AND LIKELIHOOD REDUCTION EFFECTIVE - CIVIL CONTRACTOR	

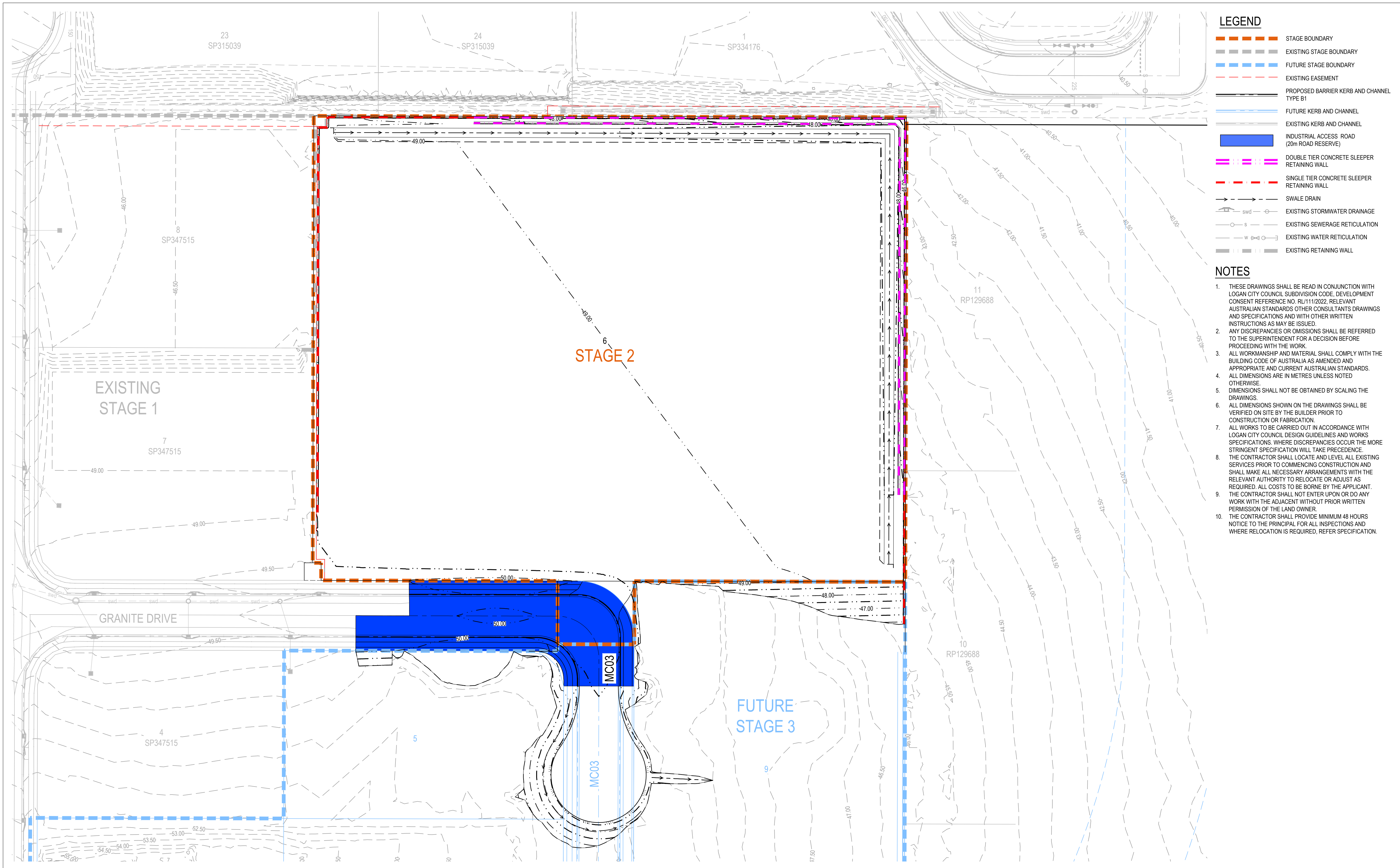
LIKELIHOOD	SCORE
OCCURRENCE VIRTUALLY INEVITABLE, MAY OCCUR MANY TIMES	5
OCCURRENCE NOT SURPRISING, MAY OCCUR MORE THAN ONCE	4
LIKELY TO OCCUR SOMETIMES	3
UNLIKELY TO OCCUR, THOUGH CONCEIVABLE	2
SO UNLIKELY THAT PROBABILITY IS CLOSE TO ZERO	1

SEVERITY	SCORE
FATALITY	5
MAJOR INJURY	4
SIGNIFICANT INJURY	3
FIRST AID INJURY	2
MINOR INJURY	1

RISK RATING					
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5
	1	2	3	4	5

RISK RATING RESULTS		
15-25	VERY HIGH	THIS ACTIVITY MUST NOT BE UNDERTAKEN, OR SHOULD BE STOPPED, UNTIL ADDITIONAL MEASURES HAVE BEEN PUT IN PLACE TO REDUCE THE RISK
8-12	HIGH	ALL REASONABLY PRACTICABLE CONTROL MEASURES MUST BE PUT IN PLACE BEFORE THIS TASK MAY PROCEED
3-6	MEDIUM	CONTROL MEASURES MUST BE PUT IN PLACE TO REDUCE THIS RISK UNLESS IT WOULD INVOLVE EXCESSIVE COST FOR LITTLE BENEFIT
1-2	LOW	NO FURTHER ACTION REQUIRED UNLESS BENEFICIAL ACTION CAN BE EASILY UNDERTAKEN

										Scales										Surveyor										Client										Status										Project										 Arcadis Australia Pacific Pty Limited Level 7, Seabank Building, 12-14 Marine Parade SOUTHPORT QLD 4215 ABN 76 104 485 289 Tel No: +61 7 5503 4800 www.arcadis.com/au Project Number30131743 Issue01																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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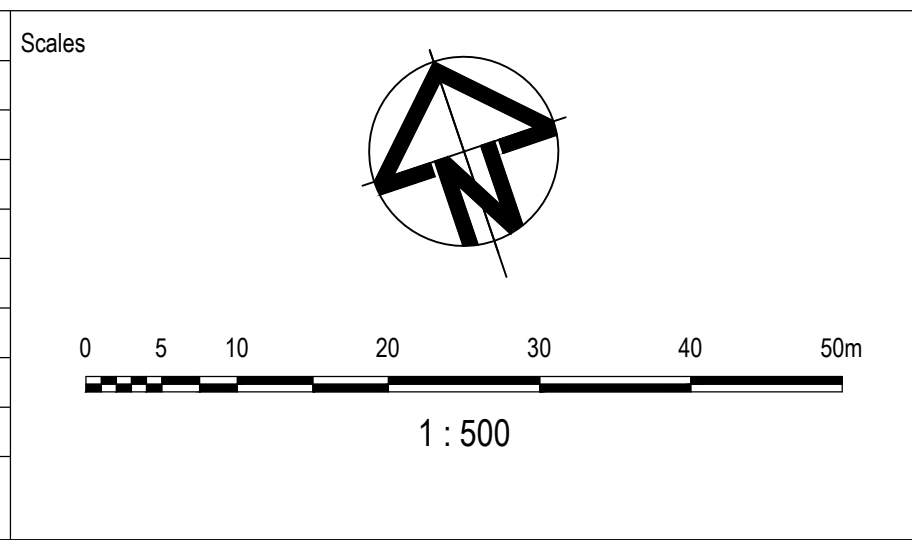
LEGEND

- STAGE BOUNDARY
- EXISTING STAGE BOUNDARY
- FUTURE STAGE BOUNDARY
- EXISTING EASEMENT
- PROPOSED BARRIER KERB AND CHANNEL TYPE B1
- FUTURE KERB AND CHANNEL
- EXISTING KERB AND CHANNEL
- INDUSTRIAL ACCESS ROAD (20m ROAD RESERVE)
- DOUBLE TIER CONCRETE SLEEPER RETAINING WALL
- SINGLE TIER CONCRETE SLEEPER RETAINING WALL
- SWALE DRAIN
- EXISTING STORMWATER DRAINAGE
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING RETAINING WALL

NOTES

- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH LOGAN CITY COUNCIL SUBDIVISION CODE, DEVELOPMENT CONSENT REFERENCE NO. RU/11/2022, RELEVANT AUSTRALIAN STANDARDS OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS AND WITH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED.
- ANY DISCREPANCIES OR OMISSIONS SHALL BE REFERRED TO THE SUPERINTENDENT FOR A DECISION BEFORE PROCEEDING WITH THE WORK.
- ALL WORKMANSHIP AND MATERIAL SHALL COMPLY WITH THE BUILDING CODE OF AUSTRALIA AS AMENDED AND APPROPRIATE AND CURRENT AUSTRALIAN STANDARDS.
- ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
- DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.
- ALL DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE VERIFIED ON SITE BY THE BUILDER PRIOR TO CONSTRUCTION OR FABRICATION.
- ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH LOGAN CITY COUNCIL DESIGN GUIDELINES AND WORKS SPECIFICATIONS. WHERE DISCREPANCIES OCCUR THE MORE STRINGENT SPECIFICATION WILL TAKE PRECEDENCE.
- THE CONTRACTOR SHALL LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND SHALL MAKE ALL NECESSARY ARRANGEMENTS WITH THE RELEVANT AUTHORITY TO RELOCATE OR ADJUST AS REQUIRED. ALL COSTS TO BE BORNE BY THE APPLICANT.
- THE CONTRACTOR SHALL NOT ENTER UPON OR DO ANY WORK WITH THE ADJACENT WITHOUT PRIOR WRITTEN PERMISSION OF THE LAND OWNER.
- THE CONTRACTOR SHALL PROVIDE MINIMUM 48 HOURS NOTICE TO THE PRINCIPAL FOR ALL INSPECTIONS AND WHERE RELOCATION IS REQUIRED, REFER SPECIFICATION.

01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
Issue	Description	DR	CH	VE	Date



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Drawn	J. VARGAS	Original Size	A1
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Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2

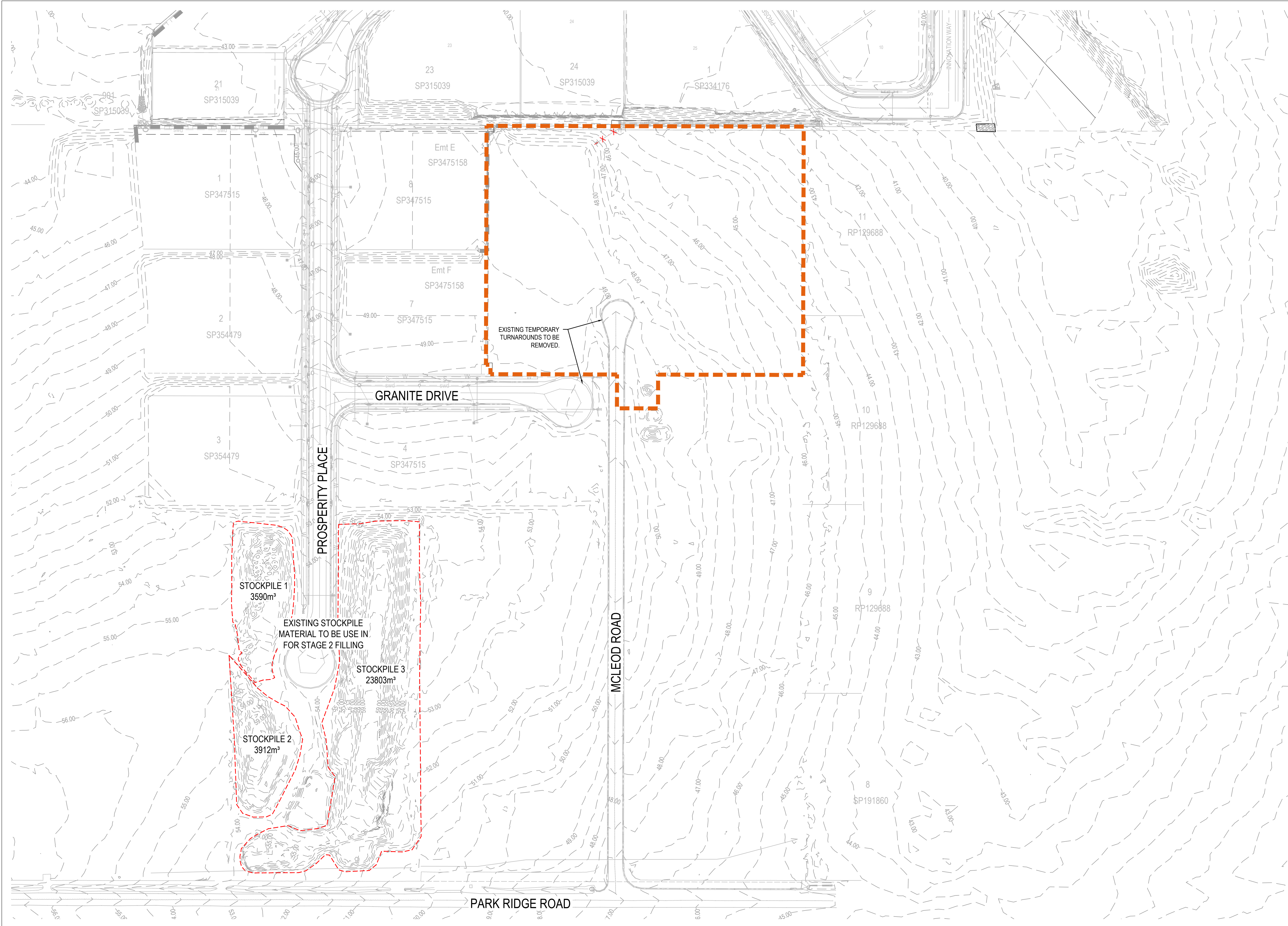
Title

GENERAL ARRANGEMENT
PLAN

Arcadis Australia Pacific Pty Limited
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SOUTHPORT QLD 4215
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Project Number	30131743
Issue	01

MRI-AAP-DD-02-DRG-CV-0061



LEGEND

5.0

EXISTING SURFACE CONTOURS

swd

EXISTING STORMWATER DRAINAGE

s

EXISTING SEWERAGE RETICULATION

w

EXISTING WATER RETICULATION

e

EXISTING ELECTRICAL

c

EXISTING COMMUNICATION

x

x swd x

EXISTING PITS AND PIPES TO BE DEMOLISHED

EXISTING EASEMENT

EXISTING EDGE OF BITUMEN

EXISTING KERB AND CHANNEL

EXISTING RETAINING WALL

STOCKPILE AREA

STAGE BOUNDARY

SERVICE CONFLICT NOTES

1.

THE EXISTING UTILITY SERVICES INFORMATION SHOWN HAS BEEN COMPILED FROM SURVEY INFORMATION SUPPLIED BY THE VARIOUS SERVICE AUTHORITIES.

2.

THE INFORMATION IS NOT INTENDED TO PROVIDE THE CONTRACTOR WITH COMPLETE OR ACCURATE INFORMATION CONCERNING THE LOCATION AND EXTENT OF UTILITY SERVICES.

3.

THE CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ANY DAMAGE INCURRED TO EXISTING UTILITY SERVICES AS A RESULT OF THE EXECUTION OF WORK UNDER THE CONTRACT. NO WORK SHALL BE CARRIED OUT WITHIN 3 METRES OF ANY EXISTING SERVICES WITHOUT PRIOR RECORDED CONSULTATION WITH THE RELEVANT AUTHORITY.

4.

THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND EXTENT OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.

5.

ALL EXISTING SERVICES AND STRUCTURES ARE TO BE MAINTAINED IN GOOD ORDER FOR THE DURATION OF THE CONTRACT AND WHERE RELOCATION IS REQUIRED, REFER SPECIFICATION.

01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
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Scales

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DEVELOPMENTS

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MCLEOD ROAD
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STAGE 2

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EXISTING FEATURES SURVEY
PLAN

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MRI-AAP-DD-02-DRG-CV-0071

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NOTE:
ALL TEMPORARY INTERNAL LOT PRIVATE
BATTERS TO BE MAX 1:2 AND CERTIFIED BY
GEOTECHNICAL ENGINEER FOR SLOPE
STABILITY, BENCHING REQUIREMENTS AND
MINIMUM FACTOR OF SAFETY OF 1.5.
BATTERS STEEPER THAN 1:4 TO BE
HYDROMULCHED AT COMPLETION OF
EARTHWORKS AND PRIOR TO DENSE PLANTING
IN ACCORDANCE WITH LANDSCAPE ARCHITECT
PLANS.

23
SP315039
EXISTING RETAINING WALL TO REMAIN
CONTRACTOR TO VERIFY ON SITE
CONSTRUCTION METHOD TO EXTEND
OR CONSTRUCT NEW WALLS TO
PROPOSED LEVELS WITH SITE
ENGINEER OR SUPERINTENDENT
PRIOR TO CONSTRUCTION

24
SP315039

SP334176

11
RP129688

10
RP129688

8
SP347515

7
SP347515

4
SP347515

EXISTING
STAGE 1

STAGE 2

FUTURE
STAGE 3

LEGEND

- PROPOSED SURFACE CONTOURS
- EXISTING SURFACE CONTOURS
- BUILDING PAD AND LEVEL
- SCOUR PROTECTION
- NOMINAL KERB LINE
- FUTURE NOMINAL KERB LINE
- DOUBLE TIER CONCRETE SLEEPER
RETAINING WALL
- SINGLE TIER CONCRETE SLEEPER
RETAINING WALL
- SWALE DRAIN
- EXISTING EASEMENT
- EXTENT OF WORKS BOUNDARY
- EXISTING STAGE BOUNDARY
- FUTURE STAGE BOUNDARY
- RETAINING WALL LEVELS
(TOP OF WALL AND BOTTOM OF WALL)
- EXISTING STORMWATER DRAINAGE
- EXISTING SEWERAGE RETICULATION
- EXISTING WATER RETICULATION
- EXISTING RETAINING WALL
- EXISTING KERB AND CHANNEL

NOTES

CUT/FILL VOLUMES

TOTAL CUT -2036m³
TOTAL FILL 43,307m³
TOTAL BALANCE (IMPORT FROM STAGE 3 STOCKPILE) 41,271m³

EARTHWORKS NOTES/ASSUMPTIONS

- PROPOSED CONTOURS REPRESENT BULK EARTHWORKS
LEVELS.
- HATCHING AND ESTIMATED VOLUMES SHOWN REPRESENTS
DEPTH RANGE BETWEEN EXISTING TOPO / SURVEY
INFORMATION AND DESIGN SURFACE.
- THE CUT AND FILL VOLUMES DO NOT INCLUDE THE PAVEMENT
MATERIALS REQUIRED.
- NO ALLOWANCE HAS BEEN MADE FOR
 - RETAINING WALLS
 - UTILITIES TRENCHING
 - BUILDING SLABS
 - BRIDGE FOOTINGS, WALLS, SLABS AND FOUNDATION
MATERIAL
- NO COMPACTION OR BULKING FACTORS HAVE BEEN APPLIED.

CUT FILL DEPTH RANGE

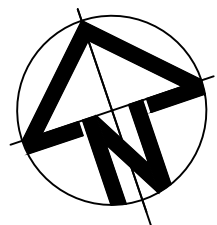
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-3	to -1.5	m
-1.5	to 0	m
0	to 1.5	m
1.5	to 3	m
3	to 4.5	m
4.5	to 6	m
6	to 7.5	m

BULK EARTHWORKS NOTES

- THE CONTRACTOR IS TO FENCE LIMIT OF WORKS PRIOR TO
PRE START MEETING WITH COUNCIL.
- SEDIMENT & EROSION CONTROL MEASURES ARE TO BE
INSTALLED PRIOR TO COMMENCEMENT OF CLEARING &
GRUBBING WORKS.
- AN AUTHORISED SPOTTER-CATCHER IS TO BE ON SITE PRIOR
TO THE COMMENCEMENT OF & DURING THE CLEARING WORK.
- ANY CLEARING REQUIRED TO BE UNDERTAKEN BY THE
CONTRACTOR IS TO BE STRICTLY IN ACCORDANCE WITH THE
COUNCIL APPROVED VEGETATION MANAGEMENT PLAN.
- THE AREA WITHIN THE LIMITS OF CLEARING SHALL BE
CLEARED OF ALL VEGETATION, ALL MINOR MAN-MADE
STRUCTURES (SUCH AS FENCES, BUILDING MATERIAL &
EXISTING DRIVEWAYS), ALL RUBBISH & OTHER MATERIALS
WHICH, IN THE OPINION OF THE SUPERINTENDENT, ARE
UNUSABLE FOR USE IN THE WORKS WITH THE EXCEPTION OF
CERTAIN TREES MARKED FOR PRESERVATION.
- TREES ARE TO BE MULCHED & STOCKPILED ON SITE FOR USE
IN LANDSCAPING.
- WHERE PARTS OF TREES CANNOT BE MULCHED, THEY ARE TO
BE DISPOSED OF OFF-SITE AT AN APPROVED FACILITY.
- ALL TOPSOIL FROM EARTHWORKS AREA SHALL BE STRIPPED &
STOCKPILED PRIOR TO THE COMMENCEMENT OF ANY
EARTHWORKS OPERATIONS.
- NOTWITHSTANDING THE LIMITS OF CUTTING & FILLING SHOWN
ON THE DRAWINGS, THE ACTUAL LIMITS SHALL BE
DETERMINED ON SITE BY THE ENGINEER DURING
CONSTRUCTION. FINISHED SURFACE CONTOURS MAY BE
ADJUSTED BY WRITTEN DIRECTION OF THE ENGINEER DURING
CONSTRUCTION.
- FILL AREAS SHALL BE CONSTRUCTED IN LAYERS NOT
EXCEEDING 300mm LOOSE DEPTH. THE FILL MATERIAL SHALL
BE COMPACTED TO 98% (MINIMUM) OF THE MAXIMUM DRY
DENSITY. TESTING SHALL BE IN ACCORDANCE WITH A.S.1289
(MODIFIED COMPACTION). THE CONTRACTOR SHALL SUPPLY
TO THE ENGINEER CERTIFICATION OF THE COMPACTION
ACHIEVED.
- ALL EARTHWORKS SHALL BE CARRIED OUT IN ACCORDANCE
WITH AS3798 UNDER LEVEL 1 SUPERVISION.
- ALL FILL PLACED ON THE SITE IS TO COMPRISE OF ONLY
NATURAL EARTH & ROCK & IS TO BE FREE OF ALL
CONTAMINANTS (REFER TO THE ENVIRONMENTAL
PROTECTION ACT 1994 SECTION 11). NO DEMOLITION
MATERIAL IS TO BE USED.
- UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT ALL
FILL SHALL BE PLACED AT BETWEEN +2% & -2% OF OPTIMUM
MOISTURE CONTENT.
- DESIGN LEVELS GIVEN ARE FINISHED SURFACE LEVELS.
- ALL NEW WORKS TO MATCH NEATLY WITH EXISTING. THE
CONTRACTOR SHALL CONFIRM LOCATION OF ALL EXISTING
SERVICES & PROTECT THESE SERVICES DURING
CONSTRUCTION. DAMAGED SERVICES SHALL BE REPAIRED AT
THE CONTRACTORS EXPENSE.
- ALL OF THE SITE SHALL BE KEPT FREE DRAINING DURING ALL
PHASES OF THE PROJECT.
- ALL ALLOTMENTS TO BE STABILISED WITHIN 7 DAYS OF
COMPLETION OF EARTHWORKS.
- BATTERS STEEPER THAN 1 IN 4 TO BE DESIGNED AND
CERTIFIED BY RPEQ GEOTECHNICAL ENGINEER AND TO
INCLUDE APPROPRIATE BENCHING, SLOPE STABILITY AND
FACTOR OF SAFETY.

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Issue	Description	DR	CH	VE	Date

Scales



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1 : 500

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Original Issue Signatures

Drawn

J. VARGAS

Original
Size

A1

Designed

G. GESMUNDO

Height
Datum

AHD

Project
Manager

A. CONNOLLY

Grid

MGA (ZONE 56)

Verified

G. ELLIS

R.P.E.Q. No: 17942
Date 21 May 26

Project

MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2

Title

BULK EARTHWORKS PLAN



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Drawing No.

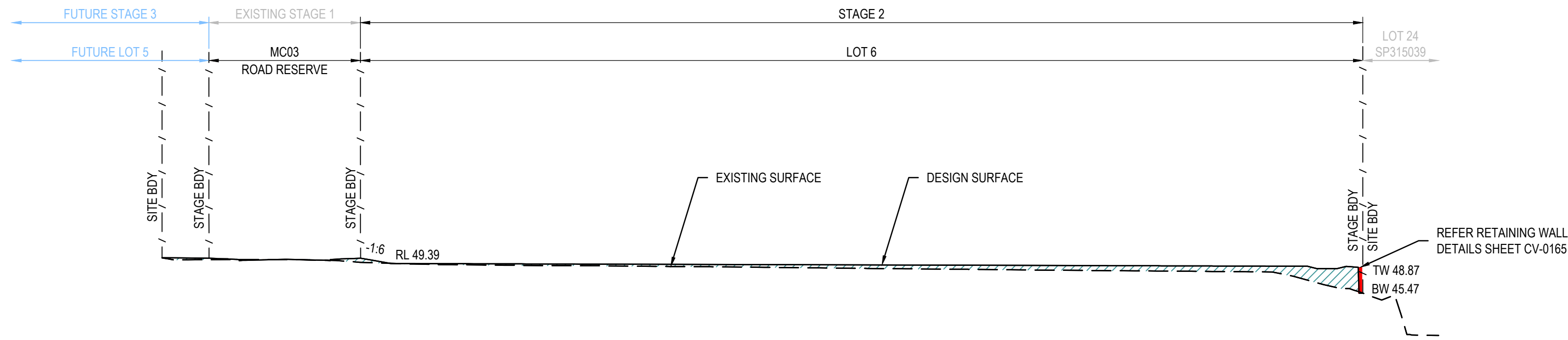
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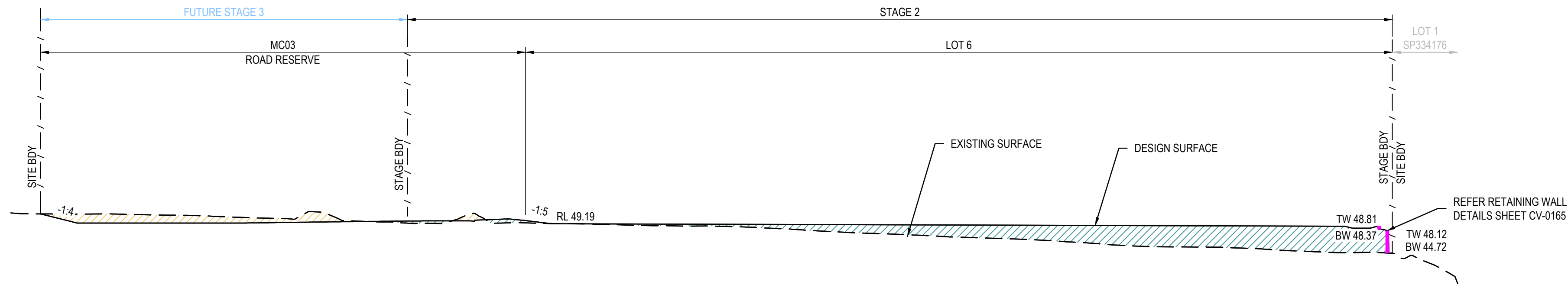
30131743

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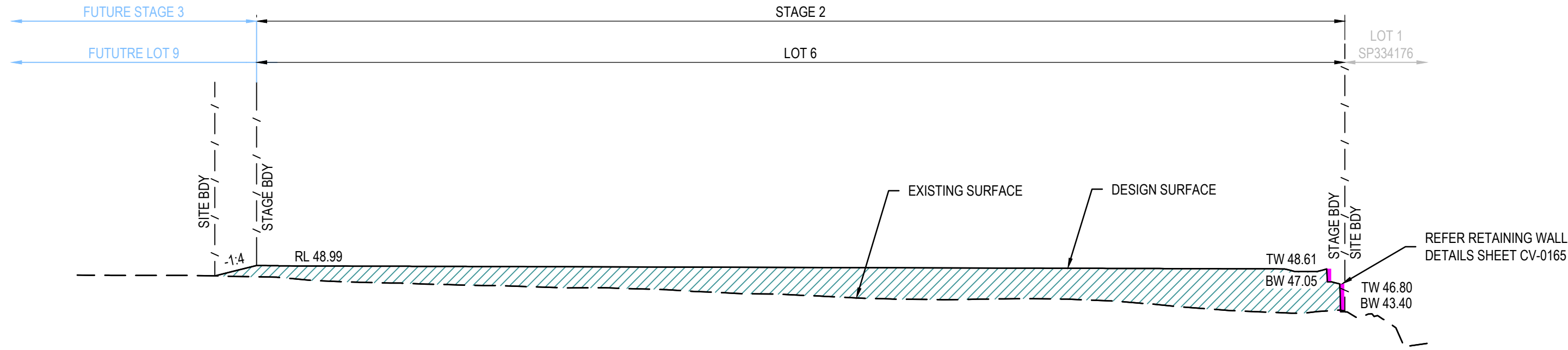
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SECTION A
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SECTION B
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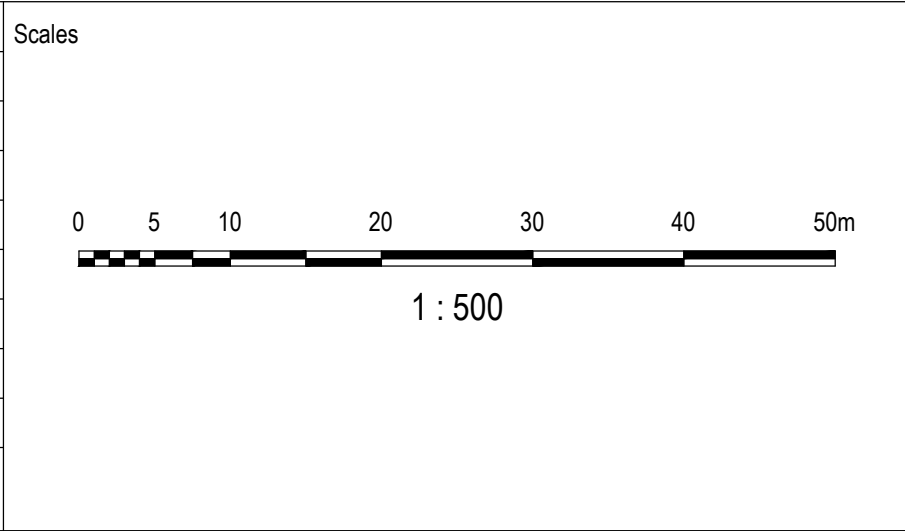
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1 : 500

LEGEND

- FILL AREA
- CUT AREA
- DOUBLE TIER CONCRETE SLEEPER RETAINING WALL
- SINGLE TIER CONCRETE SLEEPER RETAINING WALL
- EXISTING RETAINING WALL

NOTE:
ALL INTERNAL LOT PRIVATE BATTERS TO BE MAX 1:2 AND CERTIFIED BY GEOTECHNICAL ENGINEER FOR SLOPE STABILITY, BENCHING REQUIREMENTS AND MINIMUM FACTOR OF SAFETY OF 1.5.
BATTERS STEEPER THAN 1:4 TO BE HYDROMULCHED AT COMPLETION OF EARTHWORKS AND PRIOR TO DENSE PLANTING IN ACCORDANCE WITH LANDSCAPE ARCHITECT PLANS.

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Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

Title

BULK EARTHWORKS
SECTIONS
SHEET 1

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Project Number	30131743
Issue	01

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LEGEND

FILL AREA

CUT AREA

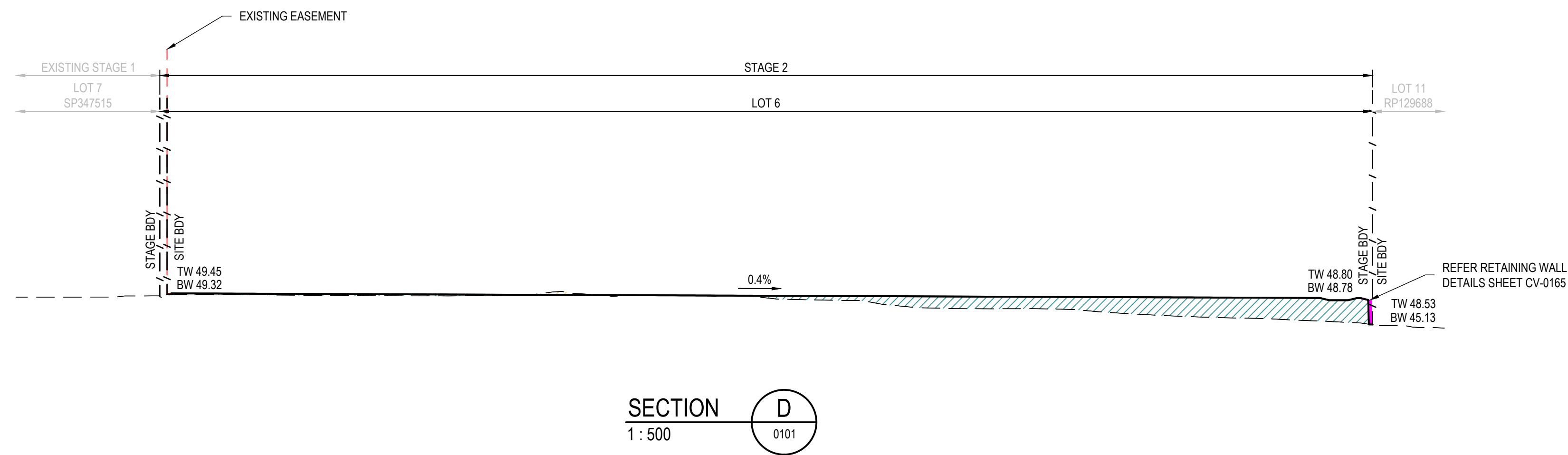
DOUBLE TIER CONCRETE SLEEPER
RETAINING WALL

SINGLE TIER CONCRETE SLEEPER
RETAINING WALL

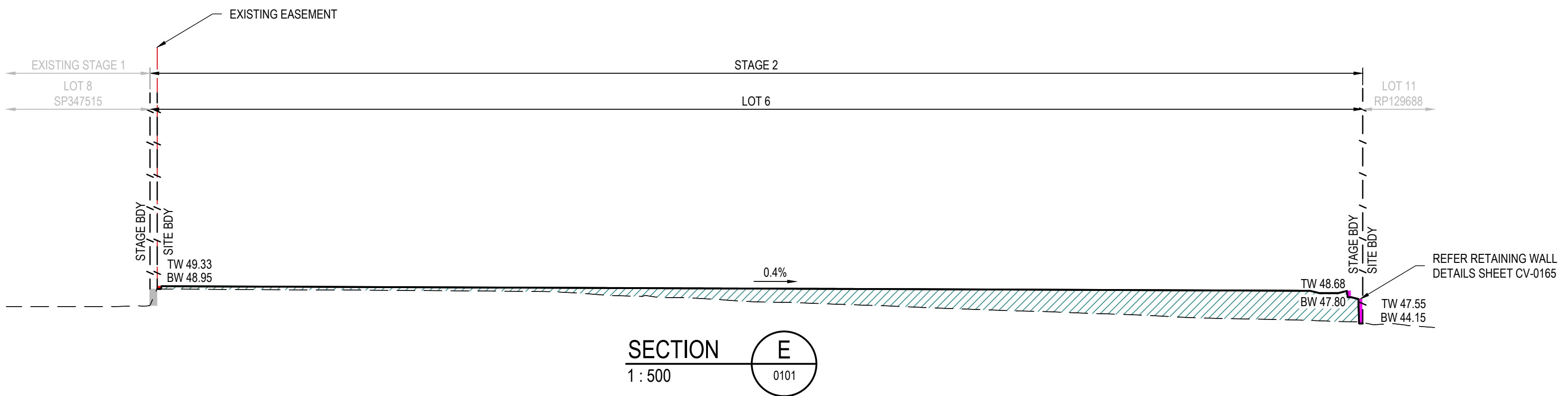
EXISTING RETAINING WALL

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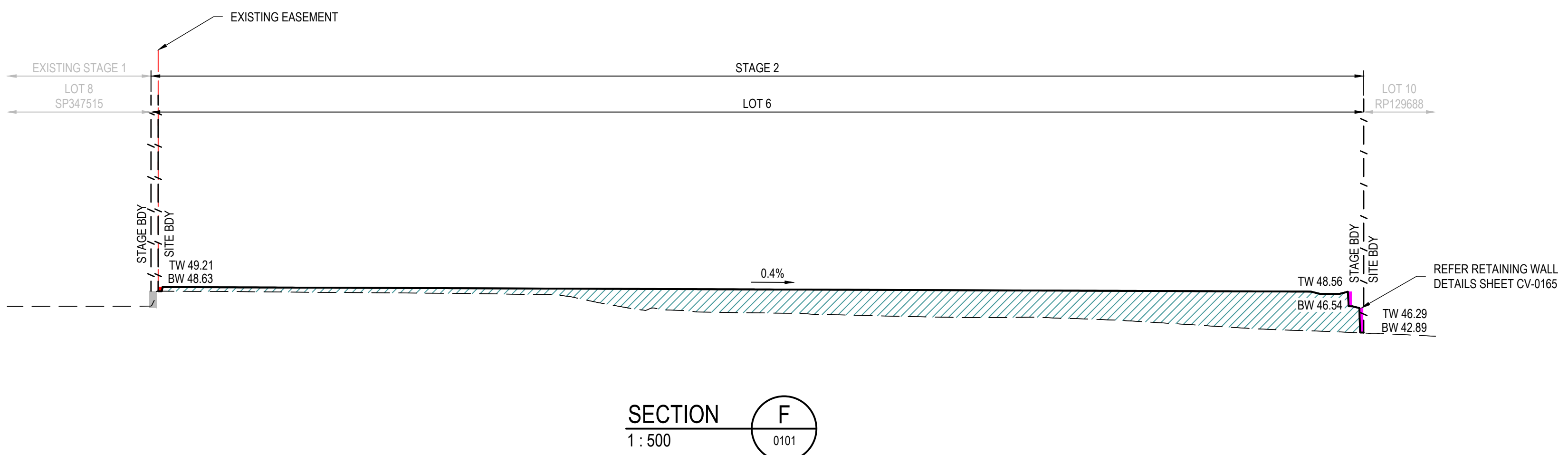
ALL INTERNAL LOT PRIVATE BATTERS TO BE MAX 1:2 AND CERTIFIED BY GEOTECHNICAL ENGINEER FOR SLOPE STABILITY, BENCHING REQUIREMENTS AND MINIMUM FACTOR OF SAFETY OF 1.5.
BATTERS STEEPER THAN 1:4 TO BE HYDROMULCHED AT COMPLETION OF EARTHWORKS AND PRIOR TO DENSE PLANTING IN ACCORDANCE WITH LANDSCAPE ARCHITECT PLANS.



SECTION D
1 : 500



SECTION E
1 : 500



SECTION F
1 : 500

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Issue	Description	DR	CH	VE	Date

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Project Manager	A. CONNOLLY
Verified	G. ELLIS

Original Size	A1
Height Datum	AHD
Grid	MGA (ZONE 56)
R.P.E.Q. No: 17942	Date 21 May 26

Project

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INDUSTRIAL ESTATE
STAGE 2

Title

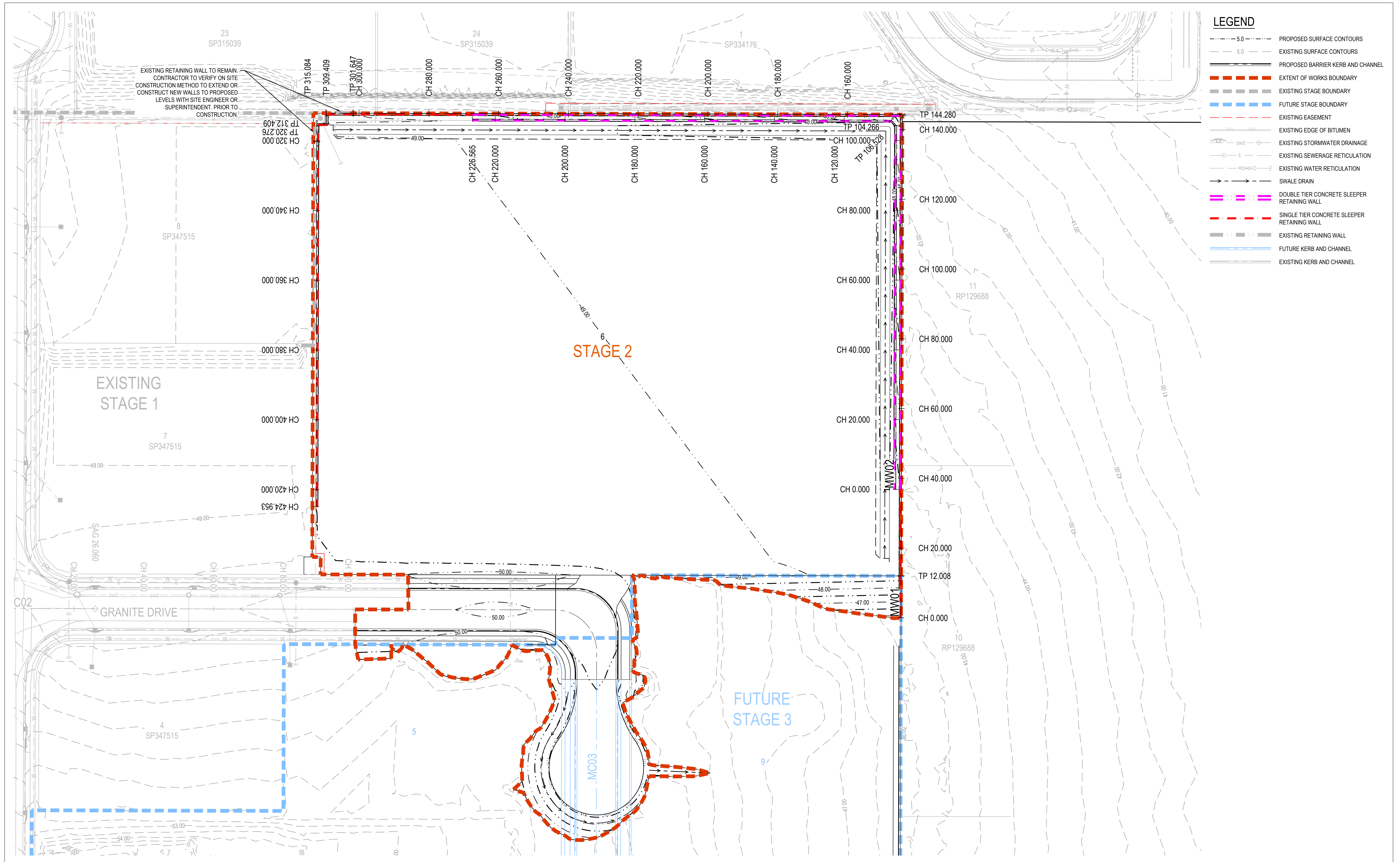
BULK EARTHWORKS
SECTIONS
SHEET 2

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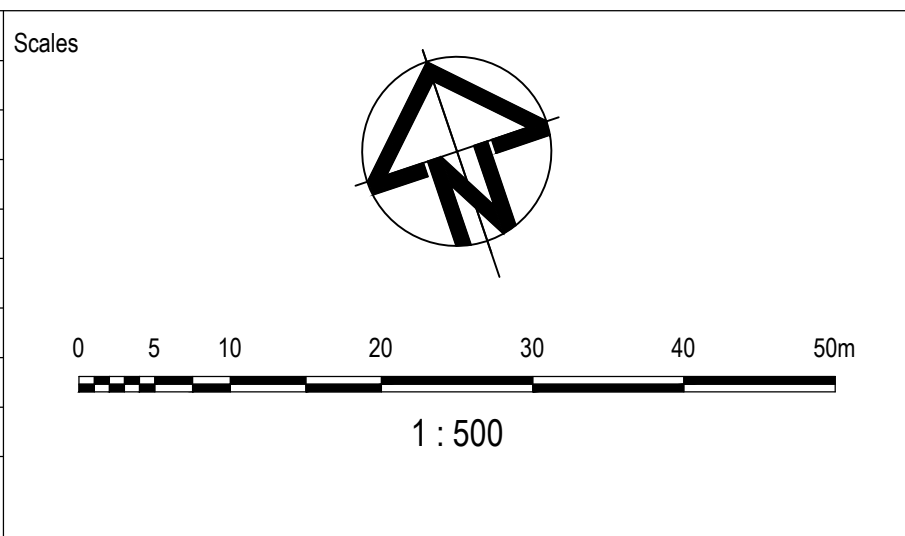
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Issue	01

Date Plotted: 19 May 2026 - 03:32PM

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Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

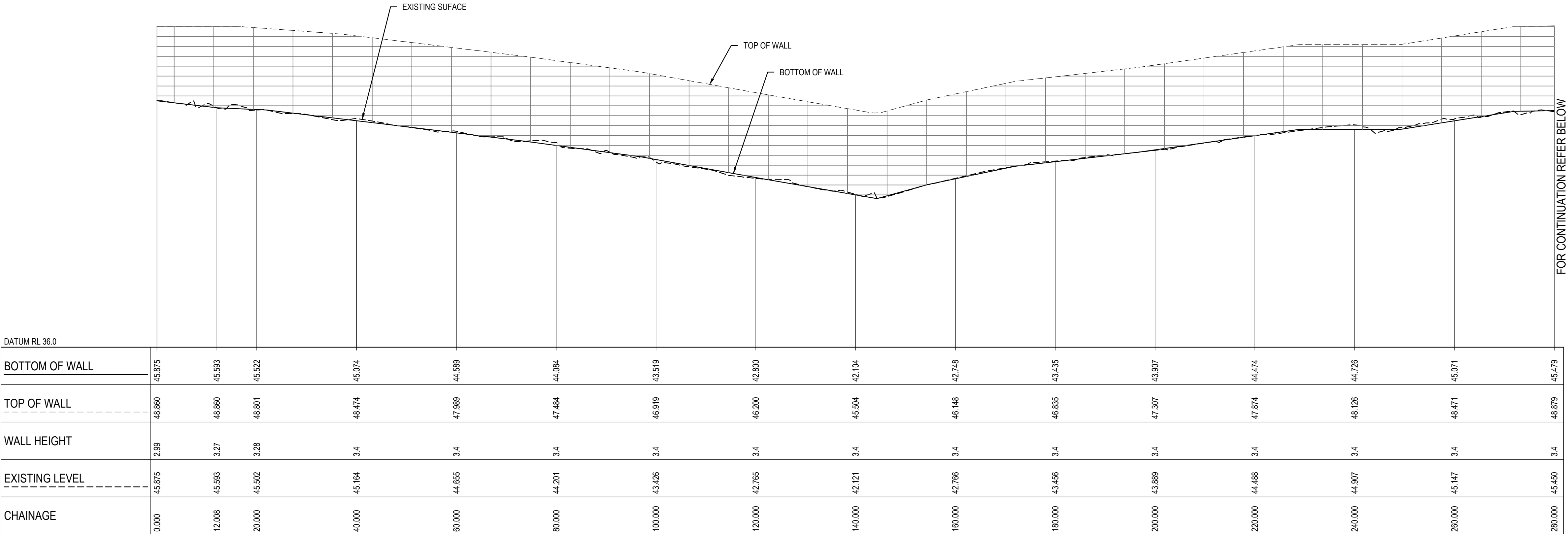
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RETAINING WALL
PLAN

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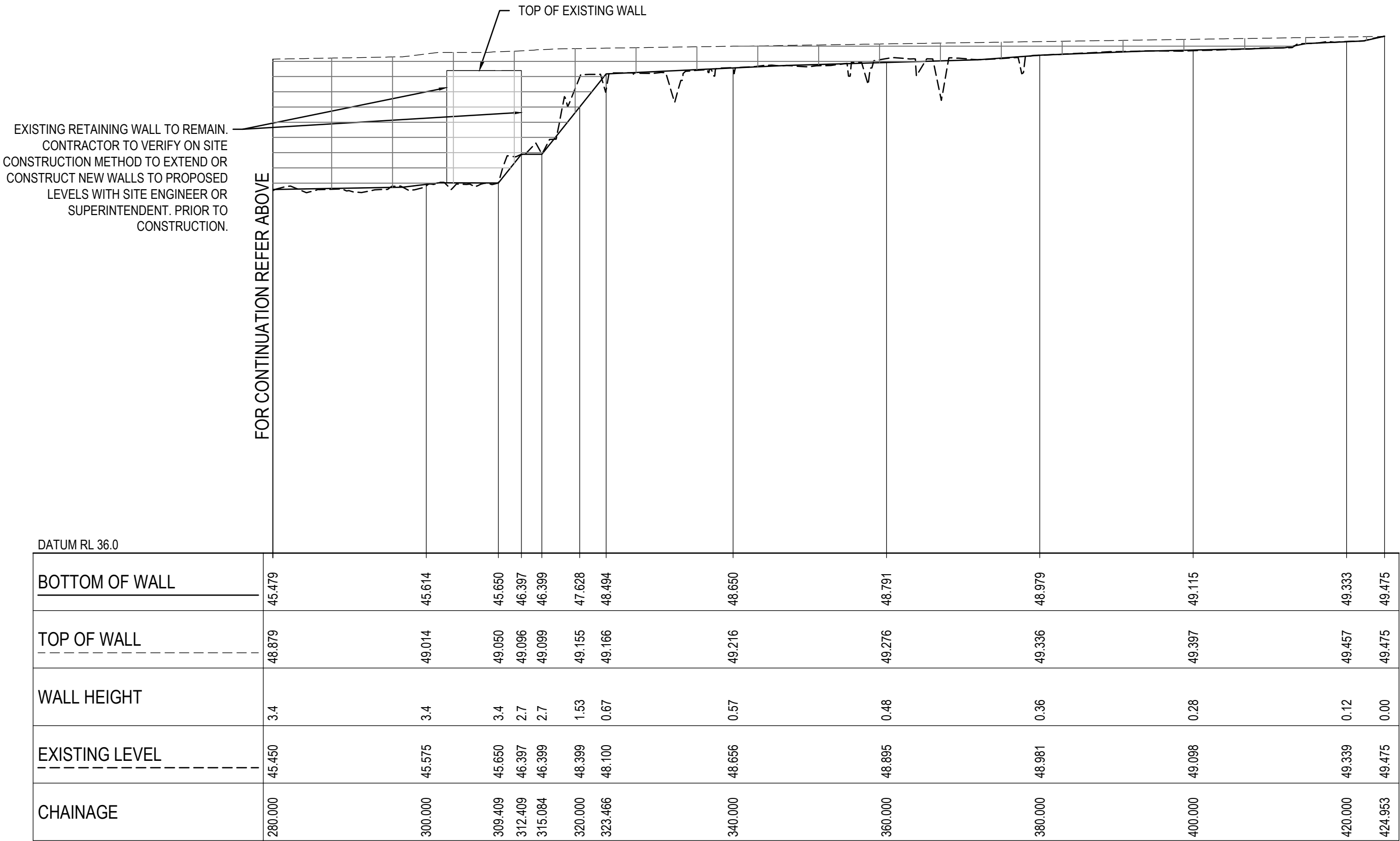
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MW01 LONGITUDINAL SECTION

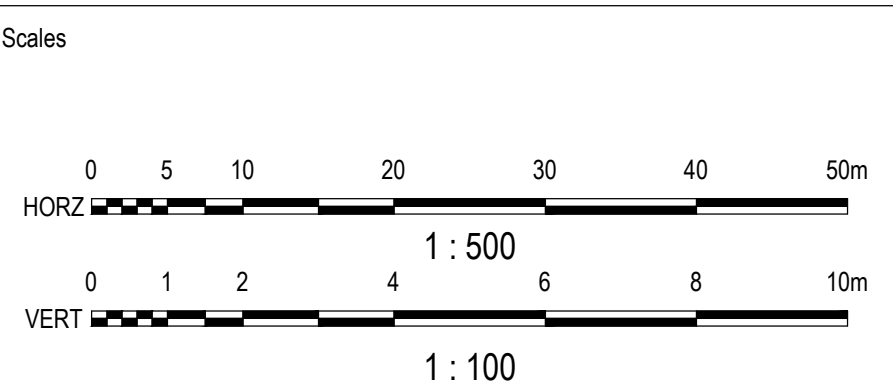
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MW01 LONGITUDINAL SECTION

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Project

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INDUSTRIAL ESTATE
STAGE 2

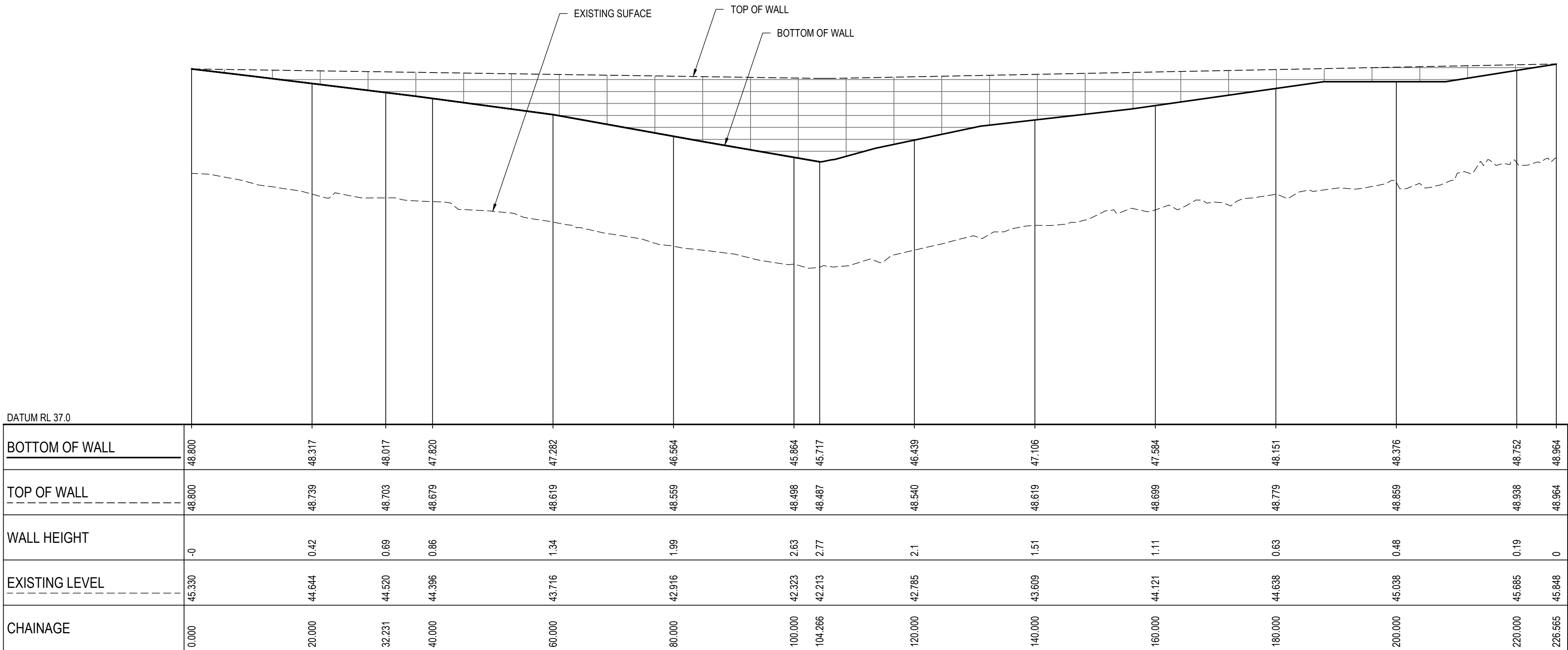
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RETAINING WALL
LONGITUDINAL SECTION
SHEET 1

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Issue	01

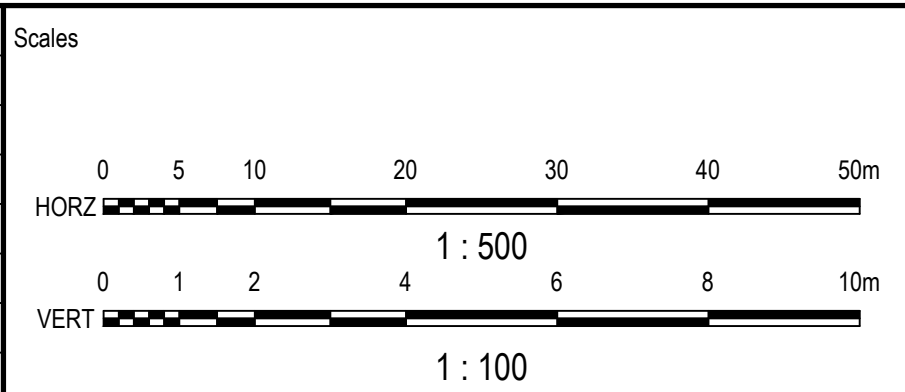
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MW02 LONGITUDINAL SECTION

SCALE 1:500 HORI.
1:100 VERT.

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Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

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STAGE 2

Title

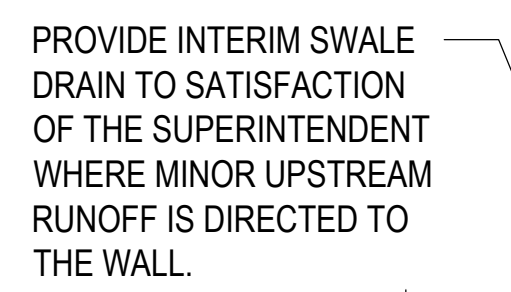
RETAINING WALL
LONGITUDINAL SECTION
SHEET 2



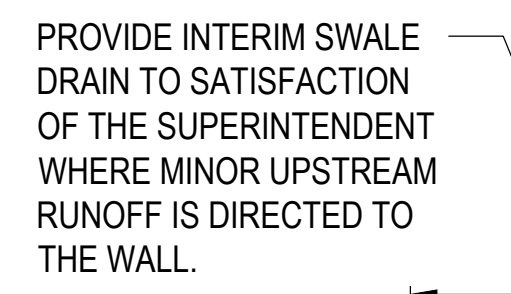
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Project Number	30131743
Issue	01

Drawing No. MRI-AAP-DD-02-DRG-CV-0162



SINGLE TIER RETAINING WALL
CONCRETE SLEEPER
SCALE 1:50



DOUBLE TIER RETAINING WALL
CONCRETE SLEEPER
SCALE 1:50

TYPICAL SLEEPER RETAINING WALL NOTES

1. DETAILS SHOWN ARE TYPICAL ONLY AND NOT FOR CONSTRUCTION. CONTRACTOR SHALL PROVIDE DESIGN DRAWINGS AND RELEVANT CERTIFICATIONS TO THE SUPERINTENDENT 10 WORKING DAYS PRIOR TO THE COUNCIL PRE-START MEETING (CONDITION 15.83). POST CONSTRUCTION CERTIFICATIONS MUST BE PROVIDED WITHIN 5 WORKING DAYS UPON COMPLETION OF THE WALL.
2. WALLS SHALL BE DESIGNED IN ACCORDANCE WITH AS4678 AND THE DEVELOPMENT APPROVAL CONDITIONS' EARTHWORKS-RETAINING STRUCTURES'.
3. CONCRETE STANDARD IS AS3600 STANDARD DESIGN EXPOSURE CLASSIFICATION SLEEPERS AND POSTS-B1 AND FOOTING-A2.
4. A MINIMUM SURCHARGE LOAD OF 10KPa SHALL BE USED WHERE THE RETAINING WALL IS BELOW AND ADJACENT TO ROAD RESERVE/DRIVEWAYS AND 5KPa ELSEWHERE. THE DESIGN MUST ALSO CONSIDER ANY CONSTRUCTION LOADS DURING BUILDING CONSTRUCTION.
5. WALL SHALL BE DESIGNED TO BRIDGE ANY UNDERGROUND SERVICES, SO AS NOT TO IMPOSE ANY ADDITIONAL LOADINGS.
6. ALL WALLS ADJACENT TO PROPERTY BOUNDARIES SHALL BE DESIGNED TO ALLOW FOR AND INSTALLED WITH FENCE BRACKETS MINIMUM FENCE HEIGHT IS 1.8m except where VARIED BY THE CONDITIONS OF APPROVAL.
7. SUBSOIL DRAINAGE BEHIND ALL WALLS TO INCLUDE DISCHARGE PIPE INTO THE NEAREST STORMWATER STRUCTURE (OR DEDICATED KERB ADAPTOR) AND BE FREE DRAINING. ALL WALL DRAINAGE LINES DISCHARGING THROUGH LOTS OR ROAD VERGE TO BE SOLID UPVC (NO SLOTS) AND MUST BE FREE DRAINING.

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Drawn	J. VARGAS		
Designed	G. GESMUNDO	Height Datum	AHD
Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS 	R.P.E. Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2

Title

TYPICAL RETAINING WALL DETAILS



Arcadis Australia Pacific Pty Limited
Level 7, Seabank Building, 12-14 Marine Parade
SOUTHPORT QLD 4215
ABN 76 104 485 289

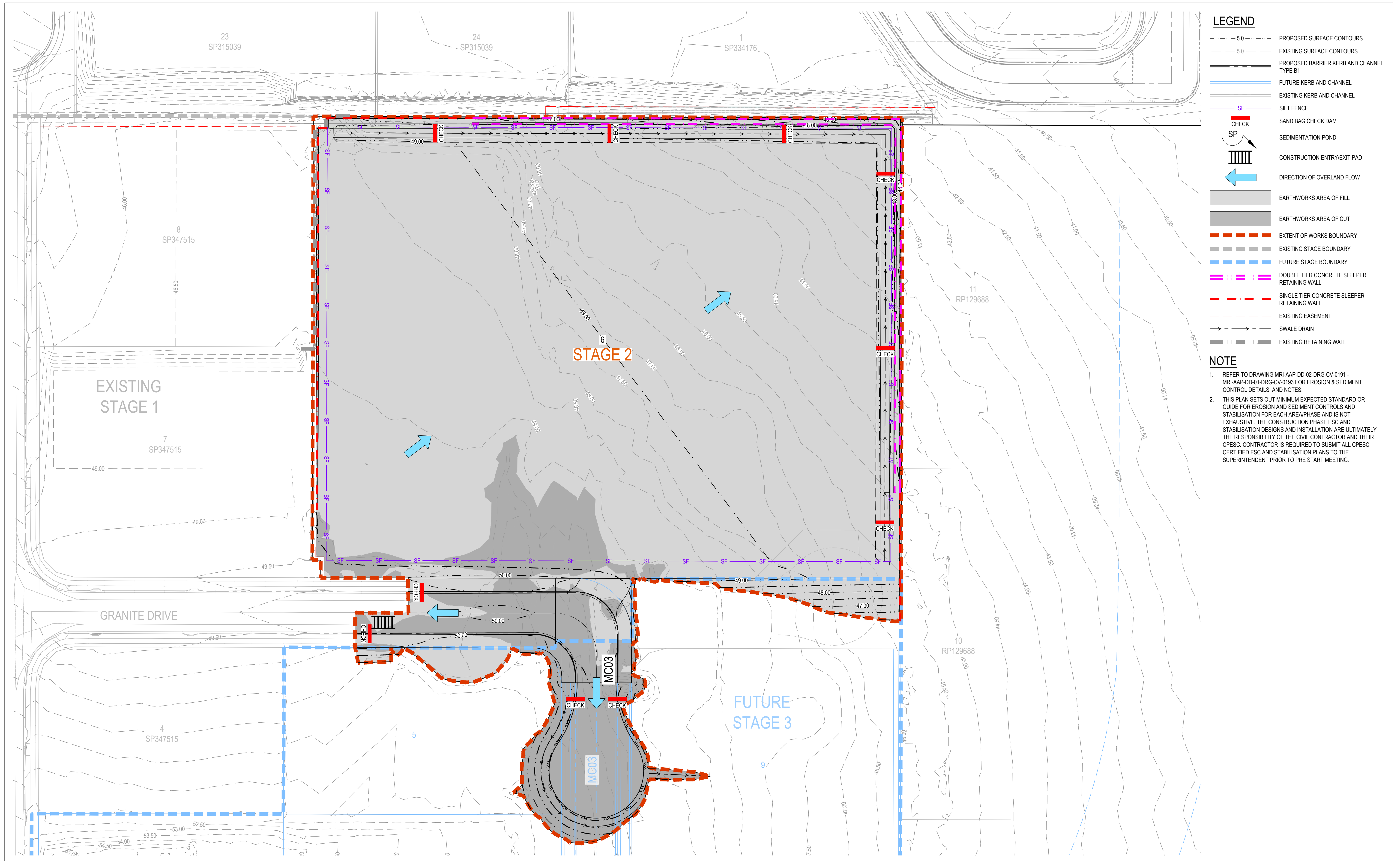
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Drawing No.

MRI-AAP-DD-02-DRG-CV-0165

01

Date Plotted: 19 May 2026 - 03:10PM File Name: C:\Users\pascual\3477\DCVACCDocs\Arcadis\AAU-30131743-McLeod Road Industrial\Project Files\01_WIP\01_CV\STG_02\DRG\MRI-AAP-DD-02-DRG-CV-0165-RetwallDetails.dwg



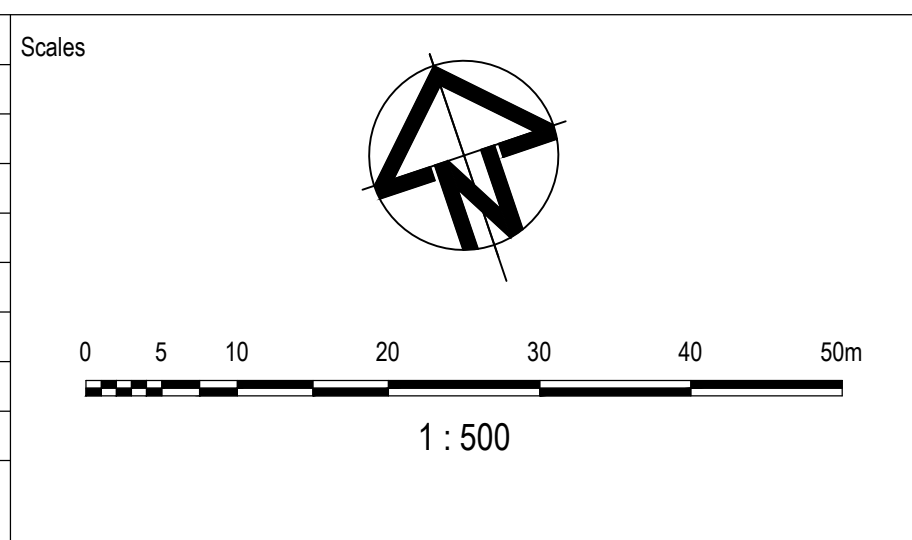
LEGEND

- 5.0--- PROPOSED SURFACE CONTOURS
- 5.0- EXISTING SURFACE CONTOURS
- PROPOSED BARRIER KERB AND CHANNEL TYPE B1
- FUTURE KERB AND CHANNEL
- EXISTING KERB AND CHANNEL
- SF SILT FENCE
- CHECK SAND BAG CHECK DAM
- SP SEDIMENTATION POND
- CONSTRUCTION ENTRY/EXIT PAD
- DIRECTION OF OVERLAND FLOW
- EARTHWORKS AREA OF FILL
- EARTHWORKS AREA OF CUT
- EXTENT OF WORKS BOUNDARY
- EXISTING STAGE BOUNDARY
- FUTURE STAGE BOUNDARY
- DOUBLE TIER CONCRETE SLEEPER RETAINING WALL
- SINGLE TIER CONCRETE SLEEPER RETAINING WALL
- EXISTING EASEMENT
- SWALE DRAIN
- EXISTING RETAINING WALL

NOTE

- REFER TO DRAWING MRI-AAP-DD-02-DRG-CV-0191 - MRI-AAP-DD-01-DRG-CV-0193 FOR EROSION & SEDIMENT CONTROL DETAILS AND NOTES.
- THIS PLAN SETS OUT MINIMUM EXPECTED STANDARD OR GUIDE FOR EROSION AND SEDIMENT CONTROLS AND STABILISATION FOR EACH AREA/PHASE AND IS NOT EXHAUSTIVE. THE CONSTRUCTION PHASE ESC AND STABILISATION DESIGNS AND INSTALLATION ARE ULTIMATELY THE RESPONSIBILITY OF THE CIVIL CONTRACTOR AND THEIR CPESC. CONTRACTOR IS REQUIRED TO SUBMIT ALL CPESC CERTIFIED ESC AND STABILISATION PLANS TO THE SUPERINTENDENT PRIOR TO PRE START MEETING.

01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
Issue	Description	DR	CH	VE	Date



Surveyor

Planner

Client

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Drawn	J. VARGAS	Original Size	A1
Designed	G. GESMUNDO	Height Datum	AHD
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Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

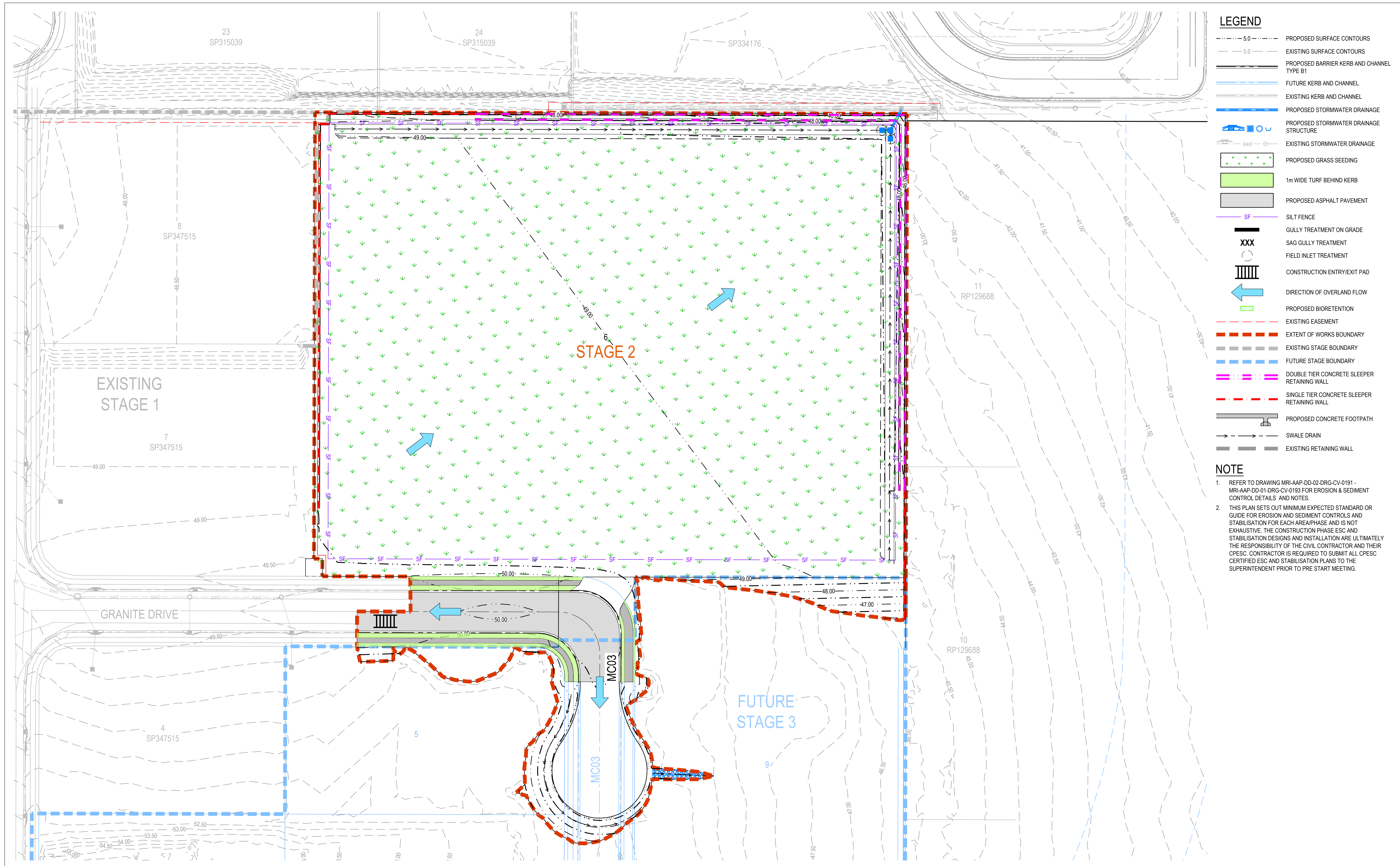
Title

EROSION & SEDIMENT
CONTROL PLAN
CONSTRUCTION PHASE

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Project Number	30131743
Issue	01

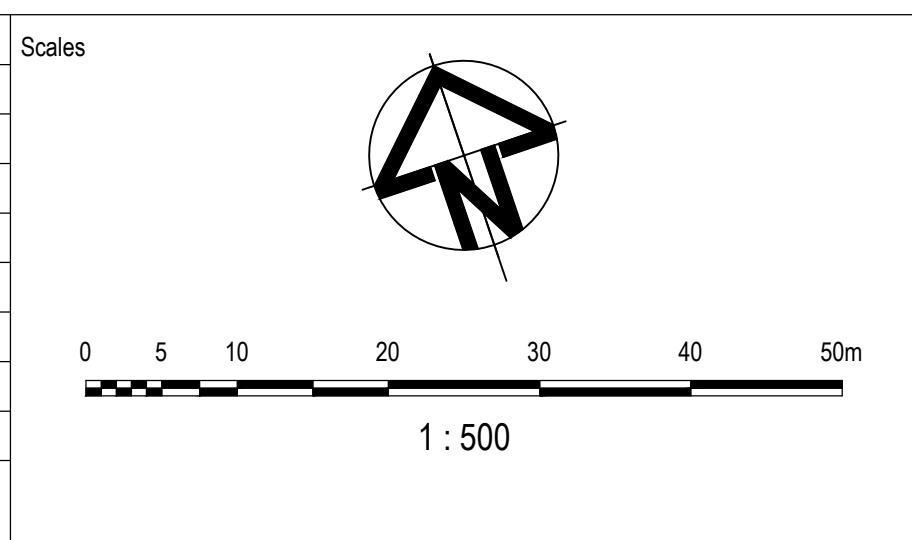
Drawing No. MRI-AAP-DD-02-DRG-CV-0171



- LEGEND**
- 5.0 --- PROPOSED SURFACE CONTOURS
 - 5.0 - EXISTING SURFACE CONTOURS
 - PROPOSED BARRIER KERB AND CHANNEL TYPE B1
 - FUTURE KERB AND CHANNEL
 - EXISTING KERB AND CHANNEL
 - PROPOSED STORMWATER DRAINAGE
 - PROPOSED STORMWATER DRAINAGE STRUCTURE
 - EXISTING STORMWATER DRAINAGE
 - PROPOSED GRASS SEEDING
 - 1m WIDE TURF BEHIND KERB
 - PROPOSED ASPHALT PAVEMENT
 - SF SILT FENCE
 - XXX GULLY TREATMENT ON GRADE
 - XXX SAG GULLY TREATMENT
 - III FIELD INLET TREATMENT
 - III CONSTRUCTION ENTRY/EXIT PAD
 - DIRECTION OF OVERLAND FLOW
 - PROPOSED BIORETENTION
 - EXISTING EASEMENT
 - EXTENT OF WORKS BOUNDARY
 - EXISTING STAGE BOUNDARY
 - FUTURE STAGE BOUNDARY
 - DOUBLE TIER CONCRETE SLEEPER RETAINING WALL
 - SINGLE TIER CONCRETE SLEEPER RETAINING WALL
 - PROPOSED CONCRETE FOOTPATH
 - SWALE DRAIN
 - EXISTING RETAINING WALL

- NOTE**
- REFER TO DRAWING MRI-AAP-DD-02-DRG-CV-0191 - MRI-AAP-DD-01-DRG-CV-0193 FOR EROSION & SEDIMENT CONTROL DETAILS AND NOTES.
 - THIS PLAN SETS OUT MINIMUM EXPECTED STANDARD OR GUIDE FOR EROSION AND SEDIMENT CONTROLS AND STABILISATION FOR EACH AREA/PHASE AND IS NOT EXHAUSTIVE. THE CONSTRUCTION PHASE ESC AND STABILISATION DESIGNS AND INSTALLATION ARE ULTIMATELY THE RESPONSIBILITY OF THE CIVIL CONTRACTOR AND THEIR CPESC. CONTRACTOR IS REQUIRED TO SUBMIT ALL CPESC CERTIFIED ESC AND STABILISATION PLANS TO THE SUPERINTENDENT PRIOR TO PRE START MEETING.

01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
Issue	Description	DR	CH	VE	Date



Surveyor

orion
spatial solutions

Planner

development
directive

Client

ANDREATA
DEVELOPMENTS

Status

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Drawn	J. VARGAS	Original Size	A1
Designed	G. GESMUNDO	Height Datum	AHD
Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

**MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2**

Title

**EROSION & SEDIMENT
CONTROL PLAN
MAINTENANCE PHASE**

ARCADIS

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Project Number	30131743
Issue	01

Drawing No. MRI-AAP-DD-02-DRG-CV-0181

1. EROSION AND SEDIMENT CONTROL MEASURES SHOWN ON THE DRAWINGS ARE MINIMUM REQUIREMENTS BASED ON THE UNDERSTOOD CONSTRUCTION SCOPE AND METHODOLOGY. IT IS THE CONTRACTORS RESPONSIBILITY AT ALL TIMES TO EMPLOY APPROPRIATE EROSION AND SEDIMENT CONTROL MEASURES BASED ON THE CONSTRUCTION METHODOLOGY, SEQUENCING OF WORKS AND LOCAL SITE CONDITIONS TO THE APPROVAL OF THE AUTHORISING AUTHORITY.
2. IT IS THE CONTRACTORS RESPONSIBILITY TO ENSURE INSPECTION, MAINTENANCE AND TESTING OF ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES ARE UNDERTAKEN ON SITE.
3. ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES MUST BE APPLIED AND MAINTAINED IN ACCORDANCE WITH THE LATEST INTERNATIONAL EROSION CONTROL ASSOCIATION (IECA) AUSTRALASIA BEST PRACTICE EROSION AND SEDIMENT CONTROL (BPESC) DOCUMENT.
4. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.
5. ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MUST BE IMPLEMENTED AND A REVISED EROSION AND SEDIMENT CONTROL PLAN (ESCP) MUST BE SUBMITTED FOR APPROVAL IN THE EVENT THAT SITE CONDITIONS CHANGE SIGNIFICANTLY FROM THOSE CONSIDERED WITHIN THIS ESCP.
6. IN CIRCUMSTANCES WHERE IT IS CONSIDERED NECESSARY TO PREPARE AN AMENDED EROSION AND SEDIMENT CONTROL PLAN (ESCP), AND WHERE THE DELIVERY OF SUCH AN AMENDED ESCP IS NOT IMMINENT, THEN ALL NECESSARY NEW OR MODIFIED EROSION AND SEDIMENT CONTROL WORKS MUST BE IN ACCORDANCE WITH THE LATEST VERSION OF THE IECA BPESC DOCUMENT. UPON APPROVAL OF THE AMENDED ESCP, ALL WORKS MUST BE IMPLEMENTED IN ACCORDANCE WITH THE AMENDED PLAN.
7. WHERE THERE IS A HIGH PROBABILITY THAT SERIOUS OR MATERIAL ENVIRONMENTAL HARM MAY OCCUR AS A RESULT OF SEDIMENT LEAVING THE SITE, APPROPRIATE ADDITIONAL EROSION AND SEDIMENT CONTROL MEASURES MUST BE IMPLEMENTED SUCH THAT ALL REASONABLE AND PRACTICABLE MEASURES ARE BEING TAKEN TO PREVENT OR MINIMISE SUCH HARM. ONLY THOSE WORKS NECESSARY TO MINIMISE OR PREVENT ENVIRONMENTAL HARM SHALL BE CONDUCTED ON-SITE PRIOR TO APPROVAL OF THE AMENDED EROSION AND SEDIMENT CONTROL PLAN (ESCP).
8. AT ALL TIMES THE CONTRACTOR SHALL MONITOR THE PREVAILING WEATHER CONDITIONS AND PROTECT ANY DOWNSTREAM CONSTRUCTION OR RECEIVING ENVIRONMENTS.
9. WORKS SHALL BE COMPLETED ON SITE GENERALLY IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
 - (i) PRE CONSTRUCTION - CONSTRUCT SILT FENCES PRIOR TO PRE-START MEETING, WHICH WILL PROTECT EXISTING DOWNSTREAM PROPERTIES, PARKS OR ROAD RESERVES FROM SEDIMENTATION AND EROSION.
 - (ii) CLEARING AND BULK EARTHWORKS - CONSTRUCT AND MAINTAIN SILT FENCES WHICH CONTROL SEDIMENTATION AND EROSION DURING CLEARING AND BULK EARTHWORKS. ALL DISTURBED AREAS TO BE EITHER GRASS SEEDS OR TURFED, AS SPECIFIED, AS SOON AS POSSIBLE OR WITHIN 7 DAYS OF FINAL TRIMMING OF EARTHWORKS.
 - (iii) MAINTENANCE PERIOD - CONSTRUCT AND MAINTAIN SILT MANAGEMENT CONTROLS WHICH CONTROL SEDIMENTATION AND EROSION PRIOR TO THE ESTABLISHMENT OF GRASS COVER AND REHABILITATION. PROVIDE GRASS FILTER STRIPS IN LOCATIONS AS SHOWN ON EROSION AND SEDIMENT CONTROL PLANS.
10. EROSION AND SEDIMENT CONTROL PROTECTION MEASURES SHALL BE MAINTAINED BY THE CONTRACTOR THROUGHOUT THE CONTRACT.

1. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND FUNCTIONAL PRIOR TO WORKS COMMENCING AND IN THE FOLLOWING SEQUENCE:
 - a. CONSTRUCT TEMPORARY STABILISED SITE ACCESS
 - b. PROVIDE INLET PROTECTION TO STORMWATER INLETS AND GULLIES ON ALL ROADS ADJOIN THE SITE.
 - c. CONSTRUCT BARRIER FENCING AROUND RESTRICTED 'NO-GO' ZONES OF THE RETAINED VEGETATION AND AREAS NOT TO BE DISTURBED AND AREAS WHICH REMAIN UN-WORKED.
 - d. INSTALL ALL TEMPORARY SEDIMENT FENCES
 - e. CONSTRUCT DIVERSION BANKS AS NECESSARY (PARALLEL TO CONTOURS) TO DIVERT RUNOFF FROM DISTURBED AREAS INTO THE SEDIMENT PONDS/BASINS
 - f. WORK AREAS TO BE DELINEATED BY BARRIER FENCING AND DIVERSION CHANNEL UPSLOPE AND SEDIMENT FENCING DOWNSLOPE.
 - g. MAINTAIN EXISTING SEDIMENT PONDS/BASINS AS LONG AS PRACTICALLY POSSIBLE
 - h. STABILISE ALL DISTURBED AREAS ASAP AND PROGRESSIVELY AS WORKS ARE COMPLETED.
 - i. TEMPORARY STABILISATION TO BE DONE USING MULCHING, HYDROMULCHING, HYDROSEEDING OR DIRECT SEEDING TO GIVE A 70% COVERAGE OF GROUND SURFACE WITHIN 14 DAYS OF WORKS COMPLETING (EVEN IF WORKS MAY CONTINUE LATER)
2. EROSION AND SEDIMENT CONTROL PROTECTION MEASURES MAY NEED TO BE REVISED AND UPDATED TO REFLECT THE SITE CONDITIONS AND PROGRESSION OF THE WORKS, I.E. MEASURES INCLUDING SEDIMENT FENCES SHOULD BE MOVED AND REINSTATED AS WORKS PROGRESS.

1. HIGH EFFLUENT DUST CONTROL TECHNIQUES MUST BE EMPLOYED ON SITE ON AN AS NEEDS BASIS TO PREVENT THE EMISSION OF DUST FROM THE SITE. SUCH TECHNIQUES MUST BE APPLIED TO THE MOVEMENT OF SOIL, SAND, ALL EXCAVATED AREAS, STOCKPILES, HAUL ROADS AND RAMPS, AND TO ANY OTHER AREAS OR APPLICATIONS WHERE THE POTENTIAL FOR DUST GENERATION EXISTS. THESE CONTROL TECHNIQUES MAY INCLUDE THE USE OF WATER SPRAYS, APPLICATION OF DUST SUPPRESSANTS, SURFACE STABILIZATION OR COVERING EXPOSED SURFACES. DUST CONTROL TECHNIQUES MUST BE EMPLOYED ON SITE AT ALL TIMES INCLUDING OUTSIDE NORMAL WORKING HOURS. ALL PERMANENT ROADS AND TRAFFICABLE AREAS MUST BE SEALED OR HARD SURFACED TO MINIMISE DUST GENERATION .
2. ALL OFFICE FACILITIES AND OPERATIONAL ACTIVITIES MUST BE LOCATED SUCH THAT ANY LIQUID EFFLUENT (E.G. PROCESS WATER, WASH-DOWN WATER, EFFLUENT FROM EQUIPMENT CLEANING, OR PLANT WATERING), CAN BE TOTALLY CONTAINED AND TREATED WITHIN THE SITE.
3. THE CONSTRUCTION SCHEDULE MUST AIM TO MINIMISE THE DURATION THAT ANY AND ALL AREAS OF SOIL ARE EXPOSED TO THE EROSIIVE EFFECTS OF WIND, RAIN AND SURFACE WATER.
4. LAND-DISTURBING ACTIVITIES MUST BE UNDERTAKEN IN ACCORDANCE WITH THE ESCP AND ASSOCIATED DEVELOPMENT CONDITIONS.
5. LAND-DISTURBING ACTIVITIES MUST BE UNDERTAKEN IN SUCH A MANNER THAT ALLOWS ALL REASONABLE AND PRACTICABLE MEASURES TO BE UNDERTAKEN TO:
 - (i) ALLOW STORMWATER TO PASS THROUGH THE SITE IN A CONTROLLED MANNER AND AT NON-EROSIVE FLOW VELOCITIES UP TO THE SPECIFIED DESIGN STORM DISCHARGE;
 - (ii) MINIMISE SOIL EROSION RESULTING FROM RAIN, WATER FLOW AND/OR WIND;
 - (iii) MINIMISE ADVERSE EFFECTS OF SEDIMENT RUNOFF, INCLUDING SAFETY ISSUES;
 - (iv) PREVENT, OR AT LEAST MINIMISE, ENVIRONMENTAL HARM RESULTING FROM WORK-RELATED SOIL EROSION AND SEDIMENT RUNOFF;
 - (v) ENSURE THAT THE VALUE AND USE OF LAND/PROPERTIES ADJACENT TO THE DEVELOPMENT (INCLUDING ROADS) ARE NOT DIMINISHED AS A RESULT OF THE ADOPTED ESC MEASURES.

- (i) THE DEVELOPMENT APPROVAL CONDITION ISSUED BY THE RELEVANT REGULATORY AUTHORITY; AND
 - (ii) THE APPROVED ESCP AND SUPPORTING DOCUMENTATION; OR
 - (iii) THE LATEST VERSION OF THE IECA BPESC DOCUMENT, IF THE STANDARDS AND SPECIFICATIONS ARE NOT CONTAINED IN THE APPROVED ESCP.
7. ANY WORKS THAT MAY CAUSE SIGNIFICANT SOIL DISTURBANCE AND ARE ANCILLARY TO ANY ACTIVITY FOR WHICH REGULATORY BODY APPROVAL IS REQUIRED, MUST NOT COMMENCE BEFORE THE ISSUE OF THAT APPROVAL.
 8. ADDITIONAL AND/OR ALTERNATIVE ESC MEASURES MUST BE IMPLEMENTED IN THE EVENT THAT SITE INSPECTIONS, THE SITE'S MONITORING AND MAINTENANCE PROGRAM, OR THE REGULATORY AUTHORITY, IDENTIFIES THAT UNACCEPTABLE OFF-SITE SEDIMENTATION IS OCCURRING AS A RESULT OF THE WORK ACTIVITIES.
 9. LAND-DISTURBING ACTIVITIES MUST NOT CAUSE UNNECESSARY SOIL DISTURBANCE IF AN ALTERNATIVE CONSTRUCTION PROCESS IS AVAILABLE THAT ACHIEVES THE SAME OR EQUIVALENT OUTCOMES AT AN EQUIVALENT COST.
 10. SEDIMENT (INCLUDING CLAY, SILT, SAND, GRAVEL, SOIL, MUD, CEMENT AND CERAMIC WASTE) DEPOSITED OFF THE SITE AS A DIRECT RESULT OF AN ON-SITE ACTIVITY, MUST BE COLLECTED AND THE AREA APPROPRIATELY CLEANED/REHABILITATED AS SOON AS REASONABLE AND PRACTICABLE, AND IN A MANNER THAT GIVES APPROPRIATE CONSIDERATION TO THE SAFETY AND ENVIRONMENTAL RISKS ASSOCIATED WITH THE SEDIMENT DEPOSITION.
 11. WHEREVER REASONABLE AND PRACTICABLE, BRICK, TILE AND MASONRY CUTTING MUST BE CARRIED OUT ON A PERVIOUS SURFACE, SUCH AS GRASS, OR OPEN SOIL, OR IN SUCH A MANNER THAT ALL SEDIMENT-LADEN RUNOFF IS PREVENTED FROM DISCHARGING INTO A GUTTER, DRAIN, OR WATER BODY.
 12. ADEQUATE WASTE COLLECTION BINS MUST BE PROVIDED ON-SITE AND MAINTAINED SUCH THAT POTENTIAL AND ACTUAL ENVIRONMENTAL HARM RESULTING FROM SUCH MATERIAL WASTE IS MINIMISED.
 13. CONCRETE WASTE AND CHEMICAL PRODUCTS, INCLUDING PETROLEUM AND OIL-BASED PRODUCTS, MUST BE PREVENTED FROM ENTERING AN INTERNAL WATER BODY, OR AN EXTERNAL DRAIN, STORMWATER SYSTEM, OR WATER BODY.
 14. ALL FLAMMABLE AND COMBUSTIBLE LIQUIDS, INCLUDING ALL LIQUID CHEMICALS IF SUCH CHEMICALS COULD POTENTIALLY BE WASHED OR DISCHARGED FROM THE SITE, ARE STORED AND HANDLED ON-SITE IN ACCORDANCE WITH RELEVANT STANDARDS SUCH AS AS1940 THE STORAGE AND HANDLING OF FLAMMABLE AND COMBUSTIBLE LIQUIDS.
 15. TRENCHES NOT LOCATED WITHIN ROADWAYS MUST BE BACKFILLED AND COMPACTED TO 95% STANDARD COMPACTION, CAPPED WITH TOPSOIL, AND COMPACTED TO A LEVEL AT LEAST 75mm ABOVE ADJOINING GROUND LEVEL AND APPROPRIATELY STABILISED.
 16. ALL STORMWATER, SEWER LINE AND OTHER SERVICE TRENCHES, NOT LOCATED WITHIN ROADWAYS, MUST BE MULCHED AND SEEDED, OR OTHERWISE APPROPRIATELY STABILISED WITHIN 7 DAYS AFTER BACKFILL.
 17. NO MORE THAN 150m OF A STORMWATER, SEWER LINE OR OTHER SERVICE TRENCH MUST BE OPEN AT ANY ONE TIME.
 18. SITE SPOIL MUST BE LAWFULLY DISPOSED OF IN A MANNER THAT DOES NOT RESULT IN ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.
 19. ALL FILL MATERIAL PLACED ON SITE MUST COMPRISE ONLY NATURAL EARTH AND ROCK, AND IS TO BE FREE OF CONTAMINANTS, BE FREE DRAINING, AND BE COMPACTED IN LAYERS NOT EXCEEDING 300mm TO 95% STANDARD RELATIVE DRY DENSITY IN ACCORDANCE WITH AS1289.
 20. FOOT AND VEHICULAR TRAFFIC WILL BE RESTRICTED IN RECENTLY STABILISED AREAS INCLUDING THOSE HYDROSEEDDED, TURFED OR GRASS SEEDDED.
 21. TEMPORARY SITE STABILISATION PROCEDURES MUST COMMENCE AT LEAST 30 DAYS PRIOR TO THE NOMINATED SITE SHUTDOWN DATE. AT LEAST 70% STABLE COVER OF ALL UNSTABLE AND/OR DISTURBED SOIL SURFACES MUST BE ACHIEVED PRIOR TO SHUTDOWN. THE STABILISATION WORKS MUST NOT RELY UPON THE LONGEVITY OF NON-VEGETATED EROSION CONTROL BLANKETS, OR TEMPORARY SOIL BINDERS.
 22. IF BIO-RETENTION FILTER MEDIA IS INSTALLED PRIOR TO 80% OF THE UPSTREAM CATCHMENT BEING FULLY DEVELOPED, THE FILTER MEDIA SHALL BE PROTECTED WITH A LAYER OF GEOFABRIC WITH TURF ON TOP.

1. LAND CLEARING MUST BE DELAYED AS LONG AS PRACTICABLE AND MUST BE UNDERTAKEN IN CONJUNCTION WITH DEVELOPMENT OF EACH STAGE OF WORKS, UNLESS OTHERWISE APPROVED BY SUPERINTENDENT.
2. ALL REASONABLE AND PRACTICABLE EFFORTS MUST BE TAKEN TO DELAY THE REMOVAL OF, OR DISTURBANCE TO, EXISTING GROUND COVER (ORGANIC OR INORGANIC) PRIOR TO LAND-DISTURBING ACTIVITIES.
6. BULK TREE CLEARING MUST OCCUR IN A MANNER THAT MINIMISES DISTURBANCE TO EXISTING GROUND COVER (ORGANIC OR INORGANIC).
7. BULK TREE CLEARING AND GRUBBING OF THE SITE MUST BE IMMEDIATELY FOLLOWED BY SPECIFIED TEMPORARY STABILISATION MEASURES (E.G. TEMPORARY GRASSING, OR MULCHING) PRIOR TO COMMENCEMENT OF EACH STAGE OF CONSTRUCTION WORKS.
8. DISTURBANCE TO NATURAL WATERCOURSES (INCLUDING BED AND BANKS) AND THEIR ASSOCIATED RIPARIAN ZONES MUST BE LIMITED TO THE MINIMUM PRACTICABLE.
9. NO LAND CLEARING SHALL BE UNDERTAKEN UNLESS PRECEDED BY THE INSTALLATION OF ADEQUATE DRAINAGE AND SEDIMENT CONTROL MEASURES, UNLESS SUCH CLEARING IS REQUIRED FOR THE PURPOSE OF INSTALLING SUCH MEASURES, IN WHICH CASE, ONLY THE MINIMUM CLEARING REQUIRED TO INSTALL SUCH MEASURES SHALL OCCUR.
10. LAND CLEARING MUST BE LIMITED TO 2M FROM THE EDGE OF ANY ESSENTIAL CONSTRUCTION ACTIVITY, AS SHOWN ON THE ENGINEERING PLANS, UNLESS OTHERWISE APPROVED BY SUPERINTENDENT.
11. PRIOR TO LAND CLEARING, AREAS OF PROTECTED VEGETATION, AND SIGNIFICANT AREAS OF RETAINED VEGETATION MUST BE CLEARLY IDENTIFIED (E.G. WITH HIGH-VISIBILITY TAPE, OR LIGHT FENCING) FOR THE PURPOSES OF MINIMISING THE RISK OF UNNECESSARY LAND CLEARING.
12. ALL REASONABLE AND PRACTICABLE MEASURES MUST BE TAKEN TO MINIMISE THE REMOVAL OF, OR DISTURBANCE TO, THOSE TREES, SHRUBS AND GROUND COVERS (ORGANIC OR INORGANIC) THAT ARE INTENDED TO BE RETAINED.
13. ALL LAND CLEARING MUST BE IN ACCORDANCE WITH THE FEDERAL, STATE AND LOCAL GOVERNMENT VEGETATION PROTECTION/PRESERVATION REQUIREMENTS AND/OR POLICIES.
14. LAND CLEARING IS LIMITED TO THE MINIMUM PRACTICABLE DURING THOSE PERIODS WHEN SOIL EROSION DUE TO WIND, RAIN OR SURFACE WATER IS POSSIBLE.
15. LAND CLEARING MUST NOT EXTEND BEYOND THAT NECESSARY TO PROVIDE UP TO EIGHT (8) WEEKS OF SITE ACTIVITY DURING THOSE MONTHS WHEN THE ACTUAL OR AVERAGE RAINFALL IS LESS THAN 45mm, SIX (6) IF BETWEEN 45 AND 100mm, FOUR (4) WEEKS IF BETWEEN 100 AND 225mm, AND TWO (2) WEEKS IF GREATER THAN 225mm.
16. NATIVE SITE VEGETATION REQUIRED AND APPROVED FOR CLEARING SHOULD BE MULCHED AND STOCKPILED FOR LATER USE IN LANDSCAPING, STABILISATION AND/OR SITE REHABILITATION WORKS.
17. SOIL DISTURBANCE ACTIVITIES ARE TO BE IN ACCORDANCE WITH CHAPTER 4.2 OF "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION" LANDCOM 4TH EDITION, 2004. SLOPE LENGTHS ON BATTERS ARE NOT TO EXCEED THOSE SPECIFIED IN TSC DEVELOPMENT CODE D7.45 & 5.6.

1. PRIOR TO THE COMMENCEMENT OF SITE WORKS, THE LOCATION OF THE SITE ACCESS POINT(S) MUST BE VERIFIED WITH THE RELEVANT REGULATORY AUTHORITY.
2. SITE ACCESS MUST BE RESTRICTED TO A MAXIMUM OF 2 PRACTICAL LOCATIONS AS SHOWN ON THE ESCP AND SUBJECT TO THE APPROVAL OF COUNCIL.
3. SITE EXIT POINTS MUST BE APPROPRIATELY MANAGED TO MINIMISE THE RISK OF SEDIMENT BEING TRACKED ONTO

5. INSTALL SEDIMENT FENCING AND/OR BARRIER FENCING TO CONFINE INGRESS TO AND EGRESS FROM THE SITE TO STABILISED ACCESS POINTS ONLY.
4. STORMWATER RUNOFF FROM ACCESS ROADS AND STABILISED ENTRY/EXIT POINTS MUST DRAIN TO AN APPROPRIATE SEDIMENT CONTROL DEVICE.
18. IF AFTER USING SHAKEDOWN DEVICE, MATERIAL IS STILL ADHERING TO TRUCK WHEELS, AND BEING DEPOSITED ON PUBLIC ROADS, A WHEEL WASHING DEVICE MUST BE INSTALLED AND USED AT SITE EXIT LOCATIONS TO ENSURE NO FURTHER MATERIAL IS CARTED OFF SITE AND DEPOSITED ON PUBLIC ROADS.

1. THE SHAKEDOWN DEVICE SHALL BE EITHER:- a) A SHAKER GRID (METAL BAR CATTLE GRID MINIMUM LENGTH 7m) PLACED TO ENSURE VEHICLES CROSSING THE GRID HAVE SUFFICIENT SPEED TO SHAKE OFF MUD AND CONTAMINANTS OR b) A 15m LONG SHAKEDOWN AREA CONSTRUCTED WITH 75mm CRUSHED ROCK AS SPECIFIED FURTHER BELOW:

1. **ROCK:** WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK, NOMINAL DIAMETER OF 75mm (SMALL DISTURBANCES) OR 100 to 150mm (LARGE DISTURBANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.
2. **FOOTPATH STABILISING AGGREGATE:** 25 to 50mm GRAVEL OR AGGREGATE.
3. **GEOTEXTILE FABRIC:** HEAVY-DUTY, NEEDLE - PUNCHED, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION:

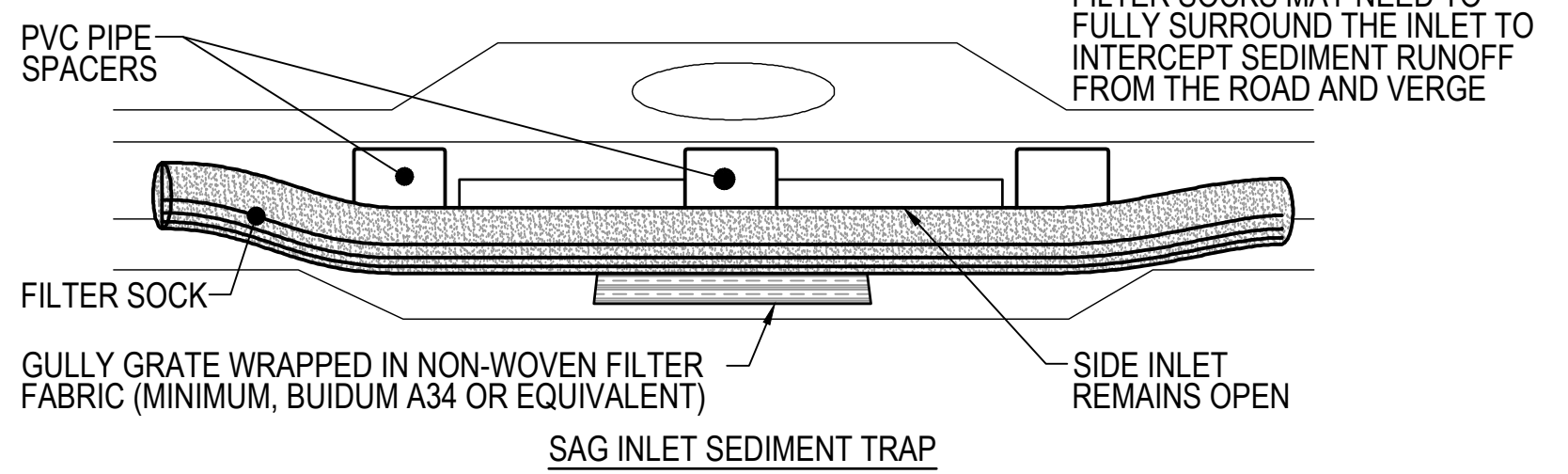
1. CLEAR THE LOCATION OF THE ROCK PAD, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE A FIRM FOUNDATION SO THAT THE ROCK IS NOT PRESSED INTO SOFT GROUND. CLEAR SUFFICIENT WIDTH TO ALLOW PASSAGE OF LARGE VEHICLES, BUT CLEAR ONLY THAT NECESSARY FOR THE EXIT. DO NOT CLEAR ADJACENT AREAS UNTIL THE REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.
2. IF THE EXPOSED SOIL IS SOFT, PLASTIC OR CLAYEY, PLACE A SUB-BASE OF CRUSHED ROCK OR A LAYER OF HEAVY-DUTY FILTER CLOTH TO PROVIDE A FIRM FOUNDATION.
3. PLACE THE ROCK PAD FORMING A MINIMUM 200mm THICK LAYER OF CLEAN, OPEN-VOID ROCK.
4. IF THE ASSOCIATED CONSTRUCTION SITE IS UP-SLOPE OF THE ROCKPAD, THUS CAUSING STORMWATER RUNOFF TO FLOW TOWARD THE ROCK PAD, THEN FORM A MINIMUM 300mm HIGH FLOW CONTROL BERM ACROSS THE ROCK PAD TO DIVERT SUCH RUNOFF TO A SUITABLE SEDIMENT TRAP.
5. THE LENGTH OF THE ROCK PAD SHOULD BE AT LEAST 15m WHERE PRACTICABLE, AND AS WIDE AS THE FULL WIDTH OF THE ENTRY OR EXIT AT AND LEAST 3m. THE ROCK PAD SHOULD COMMENCE AT THE EDGE OF THE OFF-SITE SEALED ROAD OR PAVEMENT.
6. FLARE THE END THE ROCK PAD WHERE IT MEETS THE PAVEMENT SO THAT THE WHEELS OF TURNING VEHICLES DO NOT TRAVEL OVER UNPROTECTED SOIL.
7. IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THEN COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

1. TOPSOIL SHALL BE STRIPPED AND STOCKPILED FOR LATER USE/ON SITE.
2. ALL REASONABLE AND PRACTICABLE MEASURES MUST BE TAKEN TO OBTAIN THE MAXIMUM BENEFIT FROM EXISTING TOPSOIL, INCLUDING:
 - (i) WHERE THE PROPOSED AREA OF SOIL DISTURBANCE DOES NOT EXCEED 2500m², AND THE TOPSOIL DOES NOT CONTAIN UNDESIRABLE WEED SEED, THE TOP 100mm OF SOIL LOCATED WITHIN AREAS OF PROPOSED SOIL DISTURBANCE (INCLUDING STOCKPILE AREAS) MUST BE STRIPPED AND STOCKPILED SEPARATELY FROM THE REMAINING SOIL.
 - (ii) WHERE THE PROPOSED AREA OF SOIL DISTURBANCE EXCEEDS 2500m², AND THE TOPSOIL DOES NOT CONTAIN UNDESIRABLE WEED SEED, THE TOP 50mm OF SOIL MUST BE STRIPPED AND STOCKPILED SEPARATELY FROM THE REMAINING TOPSOIL, AND SPREAD AS A FINAL SURFACE SOIL.
 - (iii) IN AREAS WHERE THE TOPSOIL CONTAINS UNDESIRABLE WEED SEED, THE AFFECTED SOIL MUST BE SUITABLY BURIED OR REMOVED FROM THE SITE.
3. STOCKPILES OF ERODABLE MATERIAL THAT HAS THE POTENTIAL TO CAUSE ENVIRONMENTAL HARM IF DISPLACED, MUST BE:
 - (i) APPROPRIATELY PROTECTED FROM WIND, RAIN, CONCENTRATED SURFACE FLOW AND EXCESSIVE UP-SLOPE STORMWATER SURFACE FLOWS.
 - (ii) LOCATED AT LEAST 2M (PREFERABLY 5M) FROM ANY HAZARDOUS AREA, RETAINED VEGETATION, ROADS AND CONCENTRATED WATER FLOW.
 - (iii) LOCATED UP-SLOPE OF AN APPROPRIATE SEDIMENT CONTROL SYSTEM.
 - (iv) PROVIDED WITH AN APPROPRIATE PROTECTIVE COVER (SYNTHETIC, MULCH OR VEGETATIVE) THAT REDUCES THE C-FACTOR ON BARE SURFACE AREAS TO 0.15 OR LESS AS DEFINED BY "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION" LANDCOM 4TH EDITION, 2004 APPENDIX M. THIS EQUATES TO 50% GRASS COVER IF SOIL HAS BEEN RECENTLY DISTURBED.
 - (iv) PROVIDED WITH AN APPROPRIATE PROTECTIVE COVER (SYNTHETIC, MULCH OR VEGETATIVE) IF THE MATERIALS ARE LIKELY TO BE STOCKPILED FOR MORE THAN 10 DAYS DURING THOSE MONTHS THAT HAVE A HIGH EROSION RISK.
 - (vi) PROVIDED WITH AN APPROPRIATE PROTECTIVE COVER (SYNTHETIC, MULCH OR VEGETATIVE) IF THE MATERIALS ARE LIKELY TO BE STOCKPILED FOR MORE THAN 5 DAYS DURING THOSE MONTHS THAT HAVE AN EXTREME EROSION RISK.
4. A SUITABLE FLOW DIVERSION SYSTEM MUST BE ESTABLISHED IMMEDIATELY UP-SLOPE OF A STOCKPILE OF ERODABLE MATERIAL THAT HAS THE POTENTIAL TO CAUSE ENVIRONMENTAL HARM IF DISPLACED, IF THE UP-SLOPE CATCHMENT AREA DRAINING TO THE STOCKPILE EXCEEDS 1500m².

1. SOCKS: MINIMUM Ø200mm SYNTHETIC OR BIODEGRADABLE TUBES MANUFACTURED FROM NON-WOVEN OR COMPOSITE FABRIC SUITABLE FOR THE "FILTRATION" OF COURSE SEDIMENT.
2. FILL MATERIALS: STRAW, CANE MULCH, COMPOSTED MATERIAL (AS4454), COARSE SAND, OR CLEAN AGGREGATE

1. ENSURE THE SOCKS ARE PLACED INDIVIDUALLY OR COLLECTIVELY (AS A SINGLE SEDIMENT TRAP) SUCH THAT:

- i) LEAKAGE AROUND OR UNDER THE SOCKS IS MINIMISED;
- ii) ADJOINING SOCKS ARE TIGHTLY BUTTED OR OVERLAPPED AT LEAST 450mm.
- iii) THE SURFACE AREA OF POTENTIAL WATER PONDING UP-SLOPE OF EACH SEDIMENT TRAP IS MAXIMISED.
- iv) TO THE MAXIMUM DEGREE PRACTICAL, ALL SEDIMENT-LADEN WATER WILL PASS THROUGH THE FORMED POND BEFORE FLOWING DOWN THE DOWN-SLOPE END OF THE SEDIMENT TRAP.



75mm, OR 100mm TO 150mm CRUSHED ROCK

20mm (MIN.)

3.0m (MIN.)

15m (MIN.)

2% SLOPE RUNOFF DIRECTED TO AN APPROPRIATE SEDIMENT TRAP

GEOTEXTILE FILTER CLOTH (MANDATORY WHEN WORKING ON CLAYEY SOILS)

MINIMUM 300mm HIGH FLOW CONTROL BERM INCORPORATED INTO THE ROCK PAD (THE PAD RECEIVES RUNOFF FROM THE ROAD DISTURBANCE (LOCATION MAY VARY))

PROPERTY BOUNDARY

FOOTPATH

KERB

ROADWAY

The diagrams illustrate two configurations for a rock pad used in erosion control:

- Left Diagram (Rock Pad Sloping Towards the Road):** Shows a rock pad with a top width of 3.0m (MIN) and a height of 15m (MIN). The pad slopes towards the roadway. Labels include: WORKSITE, LAND SLOPE, SEDIMENT FENCE, FOOTPATH, ROADWAY, and KERB (TYPE VARIES). A dashed line indicates the sediment fence location.
- Right Diagram (Rock Pad Sloping Away from Road):** Shows a similar rock pad with a top width of 3.0m (MIN) and a height of 15m (MIN), but it slopes away from the roadway. Labels include: WORKSITE, LAND SLOPE, SEDIMENT FENCE, FOOTPATH, ROADWAY, and KERB (TYPE VARIES). A dashed line indicates the sediment fence location.

COARSE SAND, OR CLEAN AGGREGATE

FLOW

EARTH BANK

2:1 SLOPE (MAX)

2.0m (MAX)

SEDIMENT FENCE

2:1 SLOPE (MAX)

50mm

CH SEDIMENT TRAP IS MAXIMISED.

WILL PASS THROUGH THE FORMED POND

01	ORIGINAL ISSUE	JV	GG	GE 19.05.26
Issue	Description	DR	CH	VE Date

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— DEVELOPMENTS —

FOR APPROVAL
CONSTRUCTION SUBJECT TO APPROVAL

Original Issue Signatures

Drawn	J. VARGAS	C
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Designed	C. GEMUNDO	H
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	G. GEMUNDO	

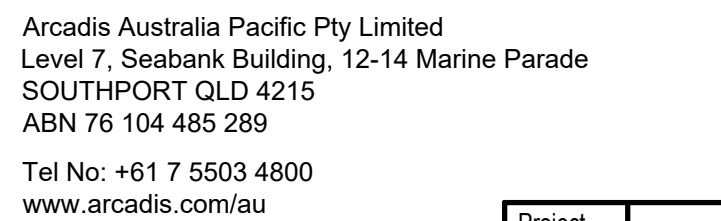
Project Manager	A. CONNOLLY	C
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Verified	G. ELLIS		F
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MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2

EROSION & SEDIMENT CONTROL DETAILS

SHEET 1



Project Number	30131
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MRI-AAP-DD-02-DRG-CV-0191

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1. WHEREVER REASONABLE AND PRACTICABLE, STORMWATER RUNOFF ENTERING THE SITE FROM EXTERNAL AREAS, AND NON-SEDIMENT LADE (CLEAN) STORMWATER RUNOFF ENTERING A WORK AREA OR AREA OF SOIL DISTURBANCE, MUST BE DIVERTED AROUND OR THROUGH THAT AREA IN A MANNER THAT MINIMISES SOIL EROSION AND THE CONTAMINATION OF THAT WATER FOR ALL DISCHARGES UP TO THE SPECIFIED DESIGN STORM DISCHARGE.
2. DURING THE CONSTRUCTION PERIOD, ALL REASONABLE AND PRACTICABLE MEASURES MUST BE IMPLEMENTED TO CONTROL FLOW VELOCITIES IN SUCH A MANNER THAT PREVENTS SOIL EROSION ALONG DRAINAGE PATHS AND AT THE ENTRANCE AND EXIT OF ALL DRAINS AND DRAINAGE PIPES DURING ALL STORMS UP TO THE RELEVANT DESIGN STORM DISCHARGE.
3. TO THE MAXIMUM DEGREE REASONABLE AND PRACTICABLE, ALL WATERS DISCHARGED DURING THE CONSTRUCTION PHASE MUST DISCHARGE ONTO STABLE LAND, IN A NON-EROSIVE MANNER, AND AT A LEGAL POINT OF DISCHARGE.
4. DURING THE CONSTRUCTION PERIOD, ROOF WATER MUST BE MANAGED IN A MANNER THAT MINIMISES SOIL EROSION THROUGHOUT THE SITE, AND SITE WETNESS WITHIN ACTIVE WORK AREAS.

1. CLEAR THE LOCATION FOR THE CHANNEL, CLEARING ONLY WHAT IS NEEDED TO PROVIDE ACCESS FOR PERSONNEL AND CONSTRUCTION EQUIPMENT.
2. REMOVE ROOTS, STUMPS, AND OTHER DEBRIS AND DISPOSE OF THEM PROPERLY. DO NOT USE DEBRIS TO BUILD ANY ASSOCIATED EMBANKMENTS.
3. EXCAVATE THE CHANNEL TO THE SPECIFIED SHAPE, ELEVATION AND GRADIENT (1% MIN). THE SIDES OF THE CHANNEL SHOULD BE NO STEEPER THAN A 2:1 (H:V) IF CONSTRUCTED IN EARTH, UNLESS SPECIFICALLY DIRECTED WITHIN THE APPROVED PLANS.
4. STABILISE THE CHANNEL AND BANKS IMMEDIATELY UNLESS IT WILL OPERATE FOR LESS THAN 30 DAYS. IN EITHER CASE, TEMPORARY EROSION PROTECTION (MATTING, ROCK, TURF, ETC.) WILL BE REQUIRED AS SPECIFIED WITHIN THE APPROVED PLANS OR AS DIRECTED.
5. IF THE CHANNEL IS CUT INTO A DISPERSIVE (SODIC) SOIL, THE EXPOSED DISPERSIVE SOIL MUST BE COVERED AND MAINTAINED WITH A MINIMUM 200mm THICK LAYER OF NON-DISPERSIVE SOIL PRIOR TO PLACEMENT OF EROSION PROTECTION MEASURES.
6. ENSURE THE CHANNEL DISCHARGES TO A STABLE AREA SUCH THAT SOIL EROSION WILL BE PREVENTED. SPECIFICALLY, ENSURE THE DRAIN DOES NOT DISCHARGE TO AN UNSTABLE FILL SLOPE.

1. THE APPLICATION OF LIQUID-BASED STUFF SUPPRESSION MEASURES MUST ENSURE THAT SEDIMENT-LAND RUNOFF RESULTING FROM SUCH MEASURES DOES NOT CREATE A TRAFFIC OR ENVIRONMENTAL HAZARD.
2. ALL TEMPORARY EARTH BANKS, FLOW DIVERSION SYSTEMS, AND EMBANKMENTS ASSOCIATED WITH CONSTRUCTED SEDIMENT BASINS MUST BE MACHINE-COMPACTED, SEEDED AND MULCHED FOR THE PURPOSES OF ESTABLISHING A TEMPORARY VEGETATIVE COVER WITHIN 10 DAYS AFTER GRADING.
3. UNPROTECTED SLOPE LENGTHS MUST NOT EXCEED 80M, OR AN EQUIVALENT VERTICAL FALL OF 3M.
4. THE CONSTRUCTION AND STABILISATION OF EARTH BANKS STEEPER THAN 6:1 (H:V) MUST BE STAGED SUCH THAT NO MORE THAN 3 VERTICAL-METRES OF ANY BATTER IS EXPOSED TO RAINFALL AT ANY INSTANT.
5. SYNTHETIC REINFORCED EROSION CONTROL MATS AND BLANKETS MUST NOT BE PLACED WITHIN, OR ADJACENT TO, RIPARIAN ZONES AND WATERCOURSES IF SUCH MATERIALS ARE LIKELY TO CAUSE ENVIRONMENTAL HARM TO WILDLIFE OR WILDLIFE HABITATS.
6. A MINIMUM 60% GROUND COVER MUST BE ACHIEVED ON ALL NON-COMPLETED EARTHWORKS EXPOSED TO ACCELERATED SOIL EROSION IF FURTHER CONSTRUCTION ACTIVITIES OR SOIL DISTURBANCES ARE LIKELY TO BE SUSPENDED FOR MORE THAN 30 DAYS DURING THOSE MONTHS WHEN THE EXPECTED RAINFALL IS LESS THAN 30mm; MINIMUM 70% COVER WITHIN 30 DAYS IF BETWEEN 30 AND 45mm; MINIMUM 70% COVER WITHIN 20 DAYS IF BETWEEN 45 AND 100mm; MINIMUM 75% COVER WITHIN 10 DAYS IF BETWEEN 100 AND 225mm; AND MINIMUM 80% COVER WITHIN 5 DAYS IF GREATER THAN 225mm. (ALTERNATIVE TO ABOVE)

1. EROSION CONTROL MATS MUST BE STORED AWAY FROM DIRECT SUNLIGHT OR COVERED WITH ULTRAVIOLET PROTECTIVE SHEETING UNTIL THE SITE IS READY FOR THEIR INSTALLATION.
2. VEHICLES AND CONSTRUCTION EQUIPMENT MUST NOT BE PERMITTED TO MANEUVER OVER THE MATTING UNLESS IT HAS BEEN COVERED WITH A LAYER OF SOIL OR GRAVEL AT LEAST 150mm THICK.
3. IF THE CHANNEL IS TO BE GRASSED, PREPARE A SMOOTH SEED BED OF APPROXIMATELY 75mm OF TOPSOIL, SEED, FERTILISE, WATER AND RAKE TO REMOVE ANY REMAINING SURFACE IRREGULARITIES.
4. EXCAVATE A 300mm DEEP BY 150mm WIDE ANCHOR TRENCH ALONG THE FULL WIDTH OF THE UPSTREAM END OF THE AREA TO BE TREATED.
5. AT LEAST 300mm OF THE MAT MUST BE ANCHORED INTO THE TRENCH WITH THE ROLL OF MATTING RESTING ON THE GROUND UP-SLOPE OF THE TRENCH.
6. WHEN SPREADING THE MATS, AVOID STRETCHING THE FABRIC. THE MATS SHOULD REMAIN IN GOOD CONTACT WITH THE SOIL.
7. THE INSTALLATION PROCEDURE MUST ENSURE THAT THE MAT ACHIEVES AND RETAINS GOOD CONTACT WITH THE SOIL.
8. DAMAGED MATTING MUST BE REPAIRED OR REPLACED.

1. TURF SHOULD BE USED WITHIN 12 HOURS OF DELIVERY, OTHERWISE ENSURE THE TURF IS STORED IN CONDITIONS APPROPRIATE FOR THE WEATHER CONDITIONS (e.g. A SHADED AREA).
2. MOISTENING THE TURF AFTER IT IS UNROLLED WILL HELP MAINTAIN ITS VIABILITY.
3. TURF SHOULD BE LAID ON A MINIMUM 75mm BED OF ADEQUATELY FERTILISED TOPSOIL. RAKE THE SOIL SURFACE TO BREAK THE CRUST JUST BEFORE LAYING THE TURF.
4. DURING THE WARMER MONTHS, LIGHTLY IRRIGATE THE SOIL IMMEDIATELY BEFORE LAYING THE TURF.
5. ENSURE THE TURF IS NOT LAID ON GRAVEL, HEAVILY COMPACTED SOILS, OR SOILS THAT HAVE BEEN RECENTLY TREATED WITH HERBICIDES.
6. ENSURE THE TURF EXTENDS UP THE SIDES OF THE DRAIN AT LEAST 100mm ABOVE THE ELEVATION OF THE CHANNEL INVERT, OR AT LEAST TO A SUFFICIENT ELEVATION TO FULLY CONTAIN EXPECTED CHANNEL FLOW.
7. ON CHANNEL GRADIENTS OF 3:1(H:V) OR STEEPER, OR IN SITUATIONS WHERE HIGH FLOW VELOCITIES (i.e. VELOCITY >1.5m/s) ARE LIKELY WITHIN THE FIRST TWO WEEK FOLLOWING PLACEMENT, SECURE THE INDIVIDUAL TURF STRIPS WITH WOODEN OR PLASTIC PEGS.
8. ENSURE THAT INTIMATE CONTACT IS ACHIEVED AND MAINTAINED BETWEEN THE TURF AND THE SOIL SUCH THAT SEEPAGE FLOW BENEATH THE TURF IS AVOIDED.
9. WATER UNTIL THE SOIL IS WET 100mm BELOW THE TURF. THEREAFTER, WATERING SHOULD BE SUFFICIENT TO MAINTAIN AND PROMOTE HEALTHY GROWTH.

1. ALL ROCK MUST BE HARD, WEATHER RESISTANT, AND DURABLE AGAINST DISINTEGRATION UNDER CONDITIONS TO BE MET IN HANDLING, PLACEMENT AND OPERATION.
2. ALL ROCK MUST HAVE ITS GREATEST DIMENSION NOT GREATER THAN 3 TIMES ITS LEAST DIMENSIONS.
3. THE ROCK USED IN FORMATION OF THE DRAIN MUST BE EVENLY GRADED WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL ROCK SIZE AND HAVE SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN THE LARGER ROCK. DIRT, FINES, AND SMALLER ROCK MUST NOT EXCEED 5% BY WEIGHT.
4. THE DIAMETER OF THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. SPECIFIC GRAVITY TO BE AT LEAST 2.5.
5. FILTER CLOTH GEOTEKSTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM 'BIDIM A24 OR EQUIVALENT.
6. PRIOR TO PLACEMENT, ALL ROCKS MUST BE VISUALLY CHECKED FOR SIZE, ELONGATION, CRACKS, DETEIORATION AND OTHER VISIBLE DEFECTS. THE DEGREE AND THOROUGHNESS OF SUCH CHECKING MUST BE APPROPRIATE FOR THE POTENTIAL CONSEQUENCES ASSOCIATED WITH FAILURE OF THE STRUCTURE OR PURPOSE FOR WHICH THE MATERIAL WILL BE USED.
7. IF A FILTER CLOTH UNDERLAY IS SPECIFIED, PLACE THE FILTER FABRIC DIRECTLY ON THE PREPARED FOUNDATION. IF MORE THAN ONE SHEET OF FILTER CLOTH IS REQUIRED OVER THE AREA, OVERLAP THE EDGE OF EACH SHEET AT LEAST 300mm, AND SECURE ANCHOR PINS AT MINIMUM 1M SPACING ALONG THE OVERLAP.
8. ENSURE THE FILTER CLOTH IS PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION OF THE FABRIC AND THE ROCK. REPAIR ANY DAMAGE BY REMOVING THE ROCK AND REPLACING WITH ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA OVERLAPPING THE EXISTING FABRIC A MINIMUM OF 300mm.
9. PLACEMENT OF ROCK SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER LAYER. PLACE ROCK SO THAT IT FORMS A DENSE, WELL-GRADED MASS OF ROCK WITH A MINIMUM OF VOIDS.
10. PLACE ROCK LINING TO THE EXTENT AND DEPTH INDICATED WITHIN THE APPROVED PLANS.
11. ENSURE THE ROCK IS PLACED IN AN APPROPRIATE MANNER TO AVOID DISPLACING UNDERLYING MATERIALS OR PLACING UNDUE IMPACT FORCE ON THE BEDDING MATERIALS.
12. ENSURE THE ROCK IS PLACED WITH A MINIMUM THICKNESS OF 1.5 TIMES THE NOMINAL ROCK SIZE (D50).
13. ENSURE MATERIALS THAT ARE D50 AND LARGER ARE POSITIONED FLUSH WITH THE TOP SURFACE WITH FACES AND SHAPES MATCHED TO MINIMISE VOIDS.
14. ENSURE PROJECTIONS ABOVE OR DEPRESSIONS UNDER THE SPECIFIED TOP SURFACE ARE LESS THAN 20% OF THE ROCK LAYER THICKNESS. THE AVERAGE SURFACE PLANE OF THE FINISHED ROCK IS DEFINED AS THE PLANE WHERE 50% OF THE TOPS OF ROCKS WOULD CONTACT.
15. ENSURE THE COMPLETED CHANNEL HAS SUFFICIENT DEPTH (AS SPECIFIED FOR THE TYPE OF CHANNEL) MEASURED FROM THE CHANNEL INVERT (AVERAGE SURFACE PLANE ALONG CHANNEL INVERT) TO THE TOP OF THE EMBANKMENT. THE AVERAGE SURFACE PLANE OF THE FINISHED ROCK IS DEFINED AS THE PLANE WHERE 50% OF THE TOPS OF ROCKS WOULD CONTACT.
16. TO THE MAXIMUM DEGREE PRACTICABLE, THE MATERIAL BETWEEN LARGER ROCK MUST NOT BE LOOSE OR EASILY DISPLACED BY THE EXPECTED FLOW.
17. AFTER PLACEMENT OF THE ROCK LINING, ENSURE THE DRAIN HAS A CONSTANT FALL IN THE DESIRED DIRECTION FREE OF OBSTRUCTIONS.

1. ROCK: 150 TO 300mm EQUIVALENT DIAMETER HARD EROSION RESISTANT ROCK.
2. RECYCLED CONCRETE: 150 TO 300mm EQUIVALENT DIAMETER FREE FROM FINES AND CEMENT DUST.
3. SANDBAGS: GEOTEXTILE BAGS (WOVEN SYNTHETIC, OR NON-WOVEN BIODEGRADABLE) FILLED WITH CLEAN COARSE SAND, CLEAN AGGREGATE, OR COMPOST.

1. PRIOR TO PLACEMENT OF THE SEDIMENT TRAP, ENSURE THE DRAINAGE CHANNEL IS DEEP ENOUGH TO PREVENT WATER BEING UNSAFELY DIVERTED OUT OF THE DRAIN ONCE THE CHECK DAMS ARE INSTALLED.
2. LOCATE EACH CHECK DAM SEDIMENT TRAP AS DIRECTED WITHIN THE APPROVED PLANS, OR OTHERWISE AT SUCH A SPACING TO ACHIEVE THE REQUIRED SEDIMENT TRAPPING OUTCOMES. REFER DETAIL.
3. PLACE EACH CHECK DAM SEDIMENT TRAP TO THE LINES AND PROFILE SHOWN IN THE APPROVED PLAN OR AS DIRECTED BY THE SITE SUPERVISOR.

1. THE OUTLET SILL OF THE SPREADER SHOULD BE PROTECTED WITH EROSION CONTROL MATTING TO PREVENT EROSION DURING THE ESTABLISHMENT OF VEGETATION. THE MATTING SHOULD BE A MINIMUM OF 1200mm WIDE EXTENDING AT LEAST 300mm UPSTREAM OF THE EDGE OF THE OUTLET CREST AND BURIED AT LEAST 150mm IN A VERTICAL TRENCH. THE DOWNSTREAM EDGE SHOULD BE SECURELY HELD IN PLACE WITH CLOSELY SPACED HEAVY-DUTY WIRE STAPLES AT LEAST 150mm LONG.
2. ENSURE THAT THE OUTLET SILL (CREST) IS LEVEL FOR THE SPECIFIED LENGTH.
3. IMMEDIATELY AFTER CONSTRUCTION, TURF, OR SEED AND MULCH WHERE APPROPRIATE, THE LEVEL SPREADER.



CONSTRUCTED DIMENSIONS OF TRIANGULAR V-DRAINS		
DRAIN TYPE	FORMED WIDTH WITH OR WITHOUT BANK	FORMED DEPTH WIDTH OR WITHOUT BANK
TYPE-AV	2.0m	0.30m
TYPE-BV	2.7m	0.45m
TYPE-CV	3.9m	0.65m



01	ORIGINAL ISSUE	JV	GG	GE	18.05.26
Issue	Description	DR	CH	VE	Date

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CONSTRUCTION SUBJECT TO APPROVAL			
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Original Issue Signatures		Original Size	A1
wn	J. VARGAS	Height	AHD
igned	G. GESMUNDO	Datum	
ect	A. CONNOLLY	Grid	MGA (ZONE 56)
ified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2

EROSION & SEDIMENT CONTROL DETAILS SHEET 2



Drawing No.

MRI-AAP-DD-02-DRG-CV-0192

Project
Number

Issue

1. OPTIMUM BENEFIT MUST BE MADE OF EVERY OPPORTUNITY TO TRAP SEDIMENT WITHIN THE WORK SITE, AND AS CLOSE AS PRACTICABLE TO ITS SOURCE.
2. SEDIMENT TRAPS MUST BE INSTALLED AND OPERATED TO BOTH COLLECT AND RETAIN SEDIMENT.
3. THE POTENTIAL SAFETY RISK OF A PROPOSED SEDIMENT TRAP TO SITE WORKERS AND THE PUBLIC MUST BE GIVEN APPROPRIATE CONSIDERATION, ESPECIALLY THOSE DEVICES LOCATED WITHIN PUBLICLY ACCESSIBLE AREAS.
4. ALL REASONABLE AND PRACTICABLE MEASURES MUST BE TAKEN TO PREVENT, OR AT LEAST MINIMISE, THE RELEASE OF SEDIMENT FROM THE SITE.
5. SUITABLE ALL-WEATHER MAINTENANCE ACCESS MUST BE PROVIDED TO ALL SEDIMENT CONTROL DEVICES.

1. SEDIMENT FENCE TO BE INSTALLED ALONG A LINE OF CONSTANT GROUND ELEVATION WHEREVER PRACTICAL.
2. BOTH ENDS OF THE SEDIMENT FENCE TO EXTEND UP THE SLOPE AT LEAST 1m.
3. SUPPORT POST TO BE SPACED A MAXIMUM 2m UNLESS THE FENCE IS SUPPORTED BY A TOP WIRE OR MESH BACKING. IN WHICH CASE 3m MAXIMUM SPACING.
4. FENCE 'RETURNS' SHALL BE INSTALLED AT MAXIMUM 20m SPACING IF FENCE IS INSTALLED ALONG THE CONTOUR. OTHERWISE 5 TO 10m MAXIMUM SPACING DEPENDING ON SLOPE.
5. MINIMUM 4 STAPLES OR TIE WIRES PER STAKE.

1. **FABRIC: POLYPROPYLENE, POLYAMIDE, NYLON, POLYESTER, OR POLYETHYLENE WOVEN OR NON-WOVEN FABRIC, AT LEAST 700mm IN WIDTH AND A MINIMUM UNIT WEIGHT OF 140GSM. ALL FABRICS TO CONTAIN ULTRAVIOLET INHIBITORS AND STABILISERS TO PROVIDE A MINIMUM OF 6 MONTHS OF USEABLE CONSTRUCTION LIFE (ULTRAVIOLET STABILITY EXCEEDING 70%).**
2. **FABRIC REINFORCEMENTS: WIRE OR STEEL MESH MINIMUM 14-GAUGE WITH A MAXIMUM MESH SPACING OF 200mm.**
3. **SUPPORT POSTS/STAKES: 1500mm" (MIN.) HARDWOOD, 2500mm" (MIN.) SOFTWOOD, OR 1.5kg/m (MIN) STEEL STAR PICKETS WITH SAFETY CAPS SUITABLE FOR ATTACHING FABRIC.**

1. LOCATE THE SPILL-THROUGH WEIR SUCH THAT THE WEIR CREST WILL BE LOWER THAN THE GROUND LEVEL AT EACH END OF THE FENCE.
2. ENSURE THE CREST OF THE SPILL-THROUGH WEIR IS AT LEAST 300mm ABOVE THE GROUND ELEVATION.
3. SECURELY TIE A HORIZONTAL CROSS MEMBER (WEIR) TO THE SUPPORT POSTS/STAKES EACH SIDE OF THE WEIR. CUT THE FABRIC DOWN THE SIDE OF EACH POST AND FOLD THE FABRIC OVER THE CROSS MEMBER AND APPROPRIATELY SECURE THE FABRIC.
4. INSTALL A SUITABLE SPLASH PAD AND/OR CHUTE IMMEDIATELY DOWN-SLOPE OF THE SPILL-THROUGH WEIR TO CONTROL SOIL EROSION AND APPROPRIATELY DISCHARGE THE CONCENTRATED FLOW PASSING OVER THE WEIR.

1. ENSURE THAT THE INSTALLATION OF THE SEDIMENT TRAP WILL NOT CAUSE UNDESIRABLE SAFETY OR FLOODING ISSUES.
2. WHERE POSSIBLE, EXCAVATE A 200x200mm TRENCH AROUND THE INLET STRUCTURE.
3. SPACE STAKES EVENLY AROUND THE PERIMETER OF THE STORMWATER INLET AT A MAXIMUM 1m SPACING AND SECURELY DRIVE THEM INTO THE GROUND.
4. WHERE NECESSARY, INSTALL A HORIZONTAL SPILL-THROUGH WEIR TO LIMIT THE MAXIMUM HEIGHT WATER PONDING AROUND THE STRUCTURE.
5. ENSURE THE MAXIMUM POND HEIGHT WILL NOT CAUSE A SAFETY HAZARD, INCLUDING UNDESIRABLE FLOODING OF AN ADJACENT PROPERTY OR ROADWAY. WHEREVER PRACTICAL, THE SPILL-THROUGH WEIR SHOULD BE AT LEAST 300mm ABOVE GROUND LEVEL.
6. IF A SPILL THROUGH WEIR IS NOT INSTALLED, THEN FRAME THE TOP OF THE STAKES WITH HORIZONTAL CROSS MEMBERS.
7. CUT FABRIC FROM A CONTINUOUS ROLL TO ELIMINATE JOINTS.
8. PLACE THE BOTTOM 300mm OF FABRIC IN THE EXCAVATED TRENCH
9. SECURELY FASTEN THE FABRIC TO THE STAKES AND CROSS MEMBERS AT THE FABRIC JOINT, OVERLAP THE FABRIC TO THE NEXT STAKE.
10. BACKFILL THE TRENCH WITH AT LEAST 200mm OF AGGREGATE OR COMPACTED SOIL. IF A TRENCH CANNOT BE EXCAVATED, LAY THE BOTTOM 300mm OF FABRIC EVENLY ON THE GROUND SURFACE AND COVER WITH A 300mm LAYER OF AGGREGATE, NOT EARTH OR SOIL.
11. WHERE REQUIRED, INSTALL A FLOW CONTROL BUND TO MAINTAIN THE SPECIFIED POOL DEPTH AND CONTROL THE MOVEMENT OF WATER.
12. TAKE ALL NECESSARY MEASURES TO MINIMISE THE SAFETY RISK CAUSED BY THE STRUCTURE AND TO PREVENT UNSAFE ENTRY INTO THE STORMWATER INLET.

1. REMOVE ALL VEGETATION AND TOPSOIL FROM UNDER THE DAM WALL AND FROM WITHIN THE STORAGE AREA.
2. PREPARE THE SITE UNDER THE EMBANKMENT BY RIPPING AT LEAST 100mm TO HELP BOND COMPACTED FILL TO THE EXISTING SUBSTRATE.
3. FOR EARTH EMBANKMENT MATERIAL TYPE AND COMPACTION REFER TO DTMR SPECIFICATION MRTS04 SECTION 14.2.6 - WATER RETAINING EMBANKMENTS.
4. CONSTRUCT EMERGENCY SPILLWAY.
5. INSTALL MARKER POST SHOWING MAXIMUM STORAGE AND SETTLING ZONE VOLUMES.
6. AS-CONSTRUCTED PLANS MUST BE PREPARED FOR ALL CONSTRUCTED SEDIMENT BASINS AND ASSOCIATED EMERGENCY SPILLWAYS. SUCH PLANS MUST APPROPRIATELY VERIFY THE BASIN'S DIMENSIONS, LEVELS AND VOLUMES, AND MUST BE SUBMITTED TO THE RELEVANT REGULATORY AUTHORITY WITHIN 14 CALENDAR DAYS OF THE CONSTRUCTION OF EACH BASIN.
7. BASINS SHOULD BE APPROPRIATELY FENCED AND MARKED BY WARNING SIGNS IF UNSUPERVISED PUBLIC ACCESS IS LIKELY AND PUBLIC SAFETY IS AT RISK.

1. ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES MUST BE INSPECTED:
 - (i) AT LEAST DAILY (WHEN WORK IS OCCURRING ON-SITE);
 - (ii) AT LEAST WEEKLY (WHEN WORK IS NOT OCCURRING ON-SITE);
 - (iii) WITHIN 24 HOURS OF EXPECTED RAINFALL; AND

- INSPECTION SHALL BE CONDUCTED IN LINE WITH THE FOLLOWING AS A MINIMUM:
- i) RECORD TYPE OF DEVICE/CONTROL MEASURE BEING INSPECTED AND ITS LOCATION;
 - ii) RECORD THE CONDITION OF EACH DEVICE/CONTROL MEASURE BEING INSPECTED;
 - iii) RECORD MAINTENANCE REQUIREMENTS FOR DEVICE/CONTROL MEASURE BEING INSPECTED;
 - iv) RECORD SEDIMENT VOLUMES REMOVED FROM DEVICE/CONTROL MEASURE BEING INSPECTED;
 - v) RECORD DETAILS OF SEDIMENT BASIN TREATMENT, FLOCCULANT DOSAGE AND CLEANOUTS;
 - vi) RECORD SEDIMENT DISPOSAL PROCEDURES AND LOCATION;
- ALL DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES MUST BE MAINTAINED IN PROPER WORKING ORDER AT ALL TIMES DURING THEIR OPERATIONAL LIVES.
- SEDIMENT CONTROL DEVICES MUST BE DE-SILTED AND MADE FULLY OPERATIONAL AS SOON AS REASONABLE AND PRACTICABLE AFTER A SEDIMENT-PRODUCING EVENT, WHETHER NATURAL OR ARTIFICIAL. IF THE DEVICE'S SEDIMENT RETENTION CAPACITY FALLS BELOW 75% OF ITS DESIGN RETENTION CAPACITY, DE-SILT SEDIMENT TRAP IF THE SEDIMENT LEVEL EXCEEDS 1/3 OF THE CRIST HEIGHT.
- MATERIALS, WHETHER LIQUID OR SOLID, REMOVED FROM SEDIMENT CONTROL DEVICES DURING MAINTENANCE OR DECOMMISSIONING, MUST BE DISPOSED OF IN A MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.
- ALL WATER QUALITY DATA, INCLUDING DATES OF RAINFALL, DATES OF TESTING, TESTING RESULTS AND DATES OF WATER RELEASE, MUST BE KEPT IN AN ON-SITE REGISTER. THE REGISTER IS TO BE MAINTAINED UP TO DATE FOR THE DURATION OF THE APPROVED WORKS AND BE AVAILABLE ON-SITE FOR INSPECTION BY THE RELEVANT REGULATORY AUTHORITY ON REQUEST.
- AT NOMINATED INSTREAM WATER MONITORING SITES, A MINIMUM OF 3 WATER SAMPLES MUST BE TAKEN AND ANALYSED, AND THE AVERAGE RESULT USED TO DETERMINE QUALITY.
- ALL ENVIRONMENTALLY RELEVANT INCIDENTS MUST BE RECORDED IN A FIELD LOG THAT MUST REMAIN ACCESSIBLE TO ALL RELEVANT REGULATORY AUTHORITIES.
- WASHING/FLUSHING OF SEALED ROADWAYS MUST ONLY OCCUR WHERE SWEEPING HAS FAILED TO REMOVE SUFFICIENT SEDIMENT AND THERE IS A COMPELLING NEED TO REMOVE THE REMAINING SEDIMENT (E.G. FOR SAFETY REASONS). IN SUCH CIRCUMSTANCES, ALL REASONABLE AND PRACTICABLE SEDIMENT CONTROL MEASURES MUST BE USED TO PREVENT, OR AT LEAST MINIMISE, THE RELEASE OF SEDIMENT INTO RECEIVING WATERS. ONLY THOSE MEASURES THAT WILL NOT CAUSE SAFETY AND PROPERTY FLOODING ISSUES SHALL BE EMPLOYED. SEDIMENT REMOVED FROM ROADWAYS MUST BE DISPOSED OF IN A LAWFUL MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.

- MAINTENANCE MOWING OF ALL ROAD SHOULDERS, TABLE DRAINS, BATTERS AND OTHER SURFACES LIKELY TO EXPERIENCE ACCELERATED SOIL EROSION MUST AIM TO LEAVE THE GRASS LENGTH NO SHORTER THAN 50mm WHERE REASONABLE AND PRACTICABLE.
- MAINTENANCE MOWING MUST BE DONE IN A MANNER THAT WILL NOT DAMAGE THE PROFILE OF FORMED, SOFT EDGES, SUCH AS THE CREST OF EARTH EMBANKMENTS.

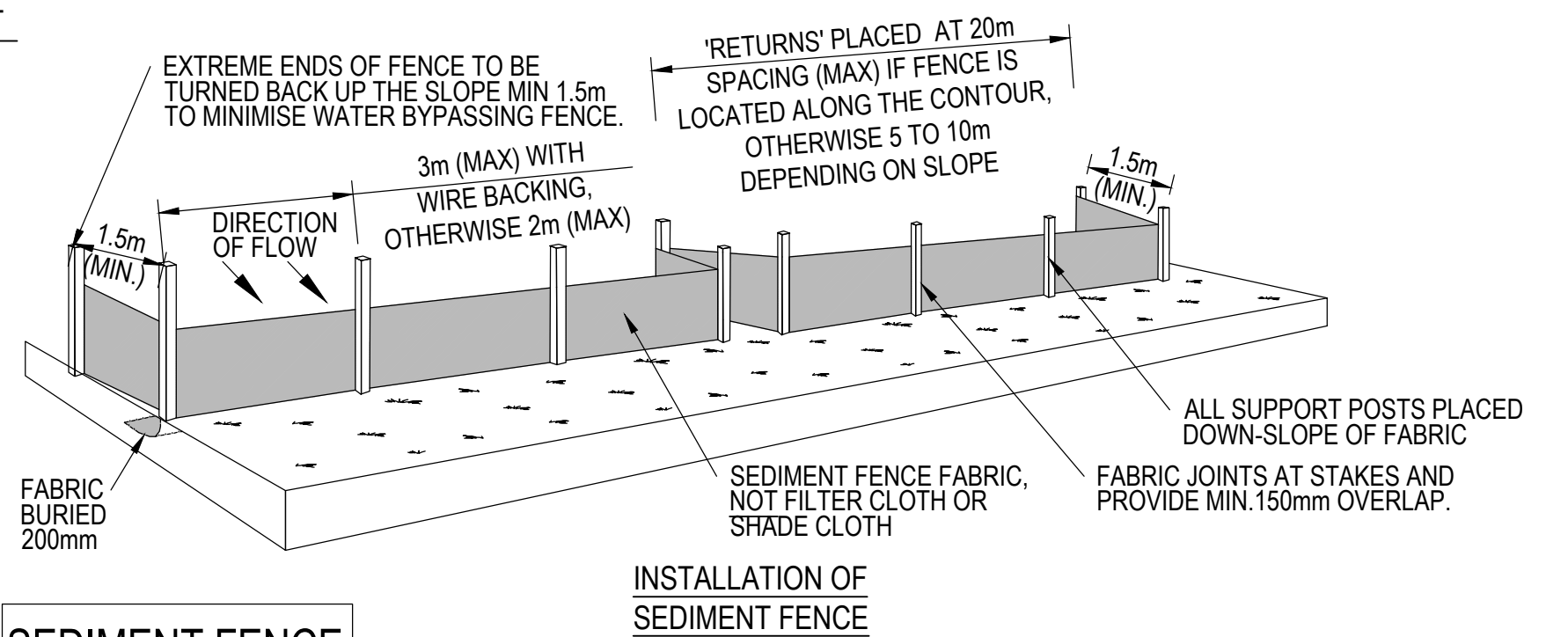
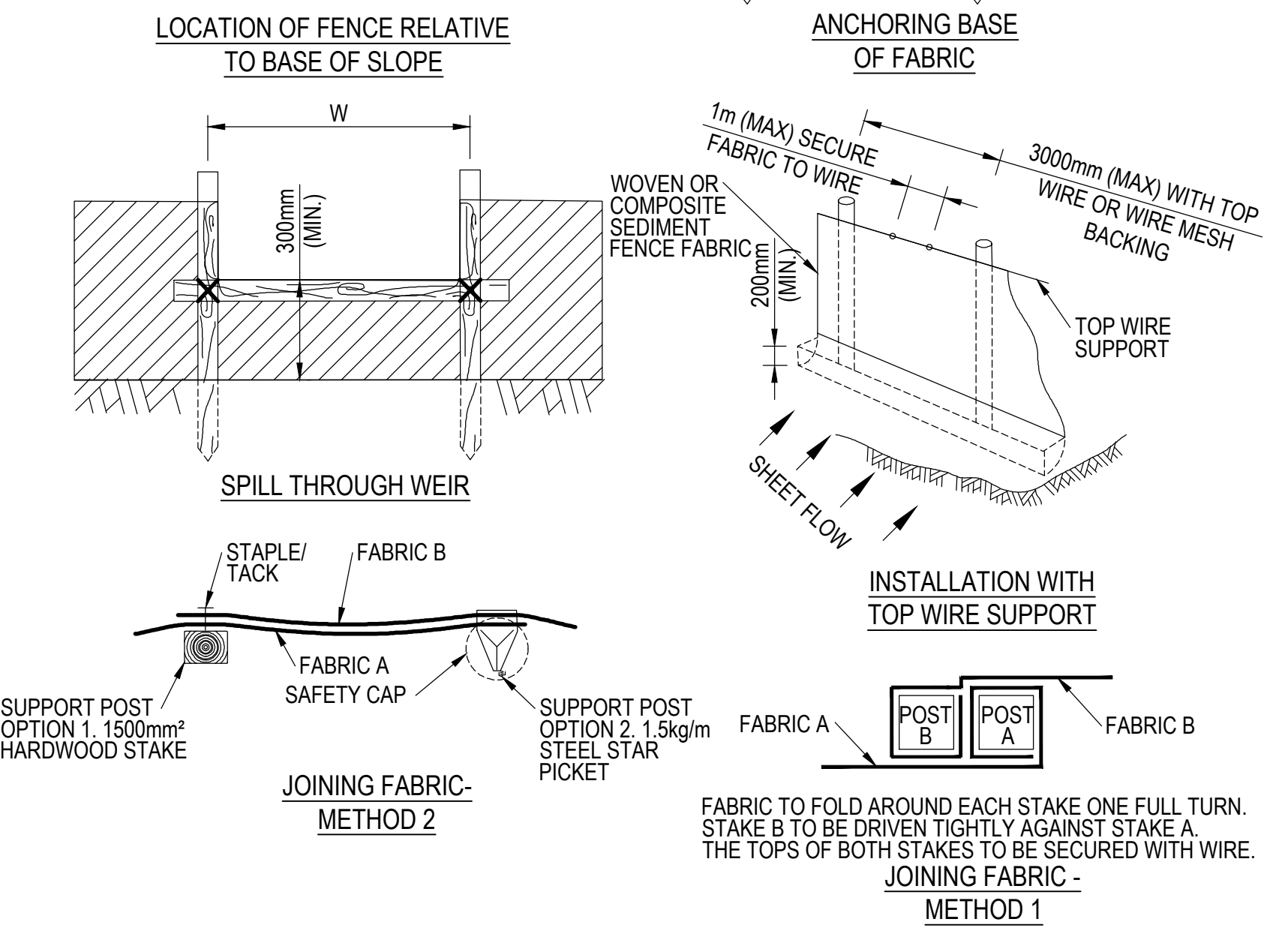
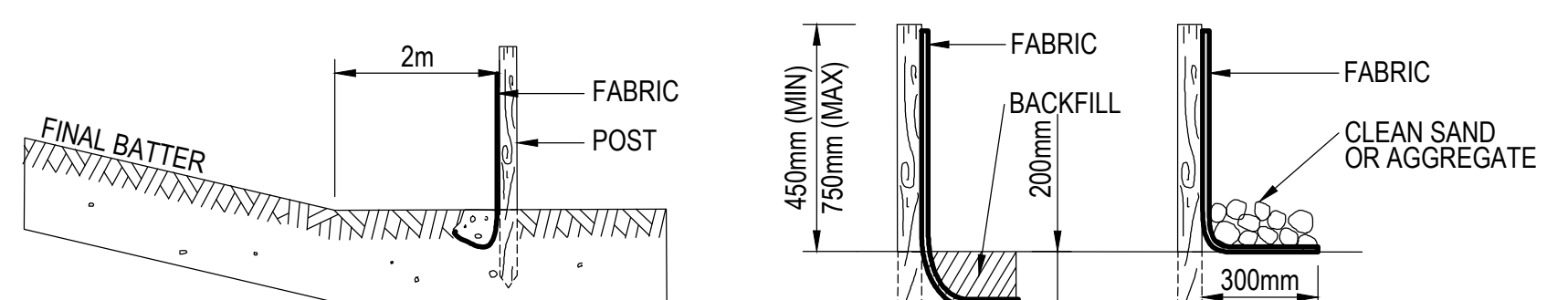
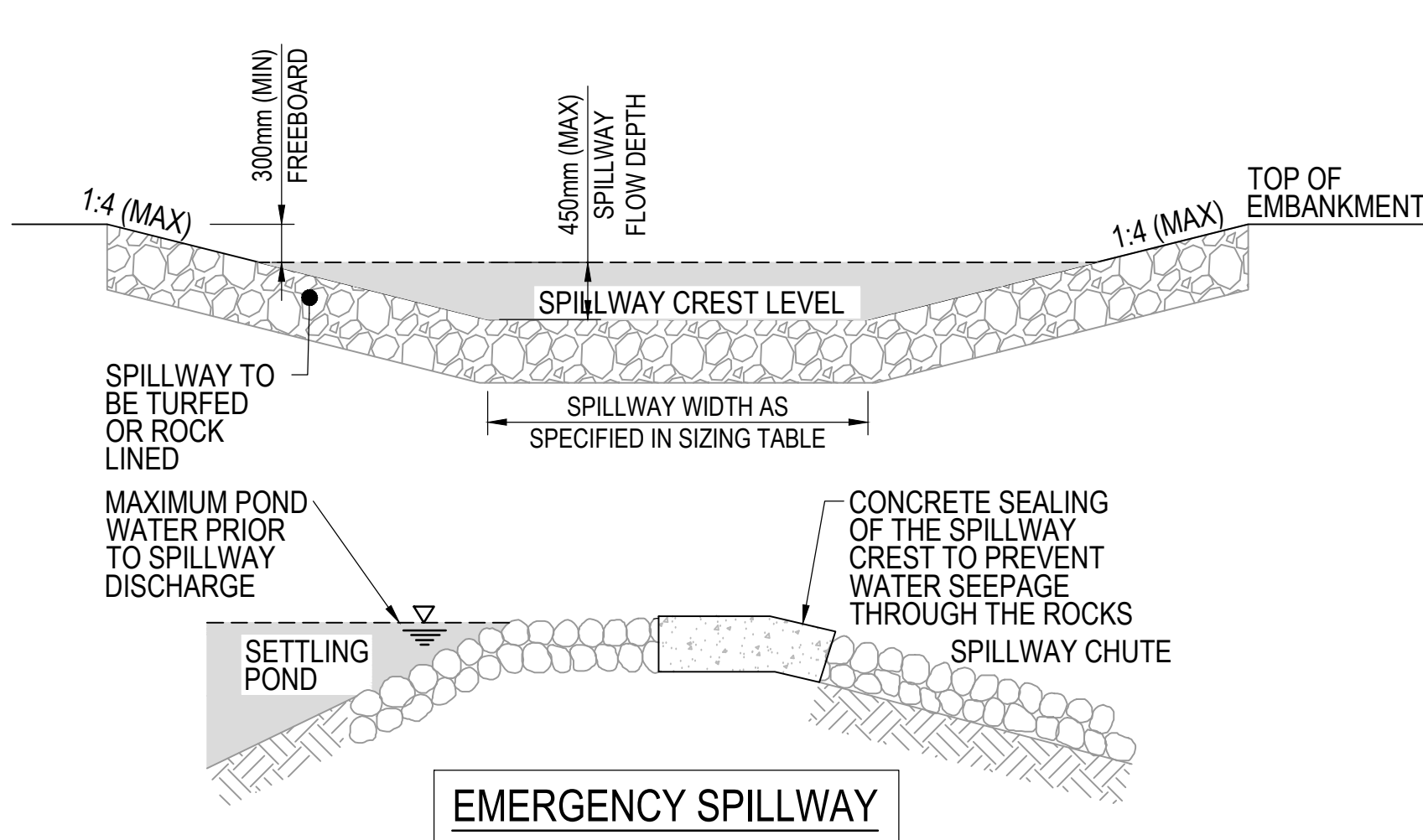
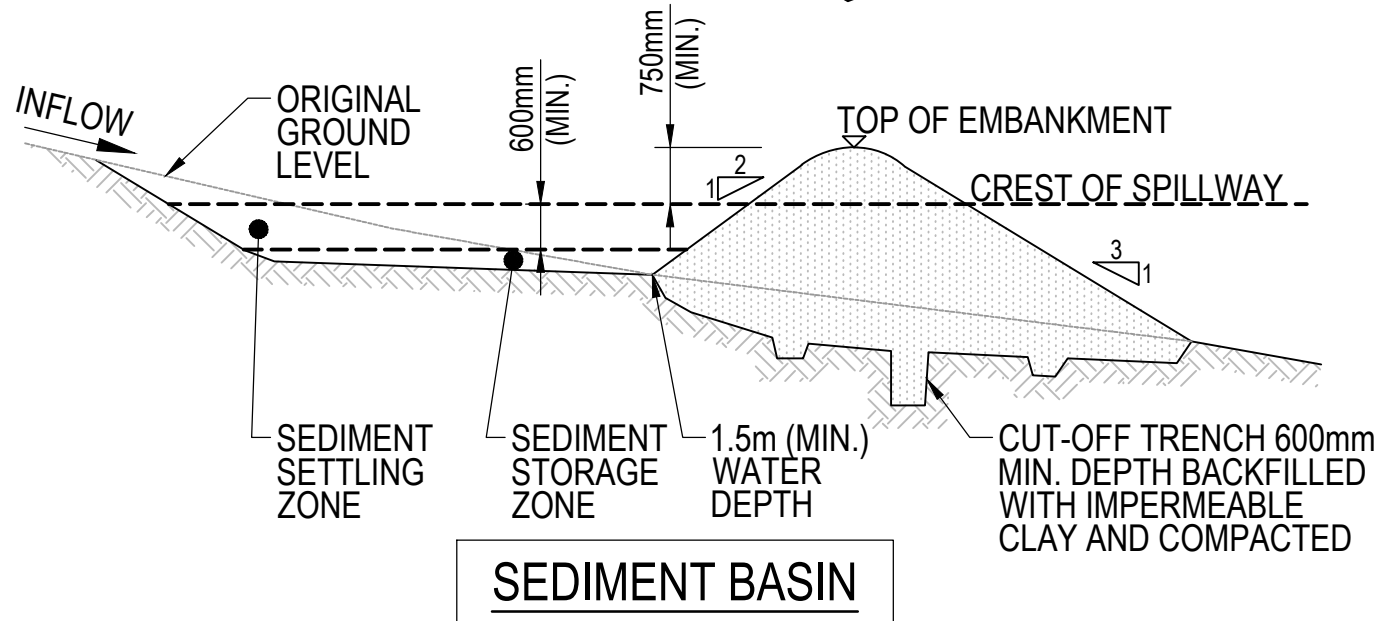
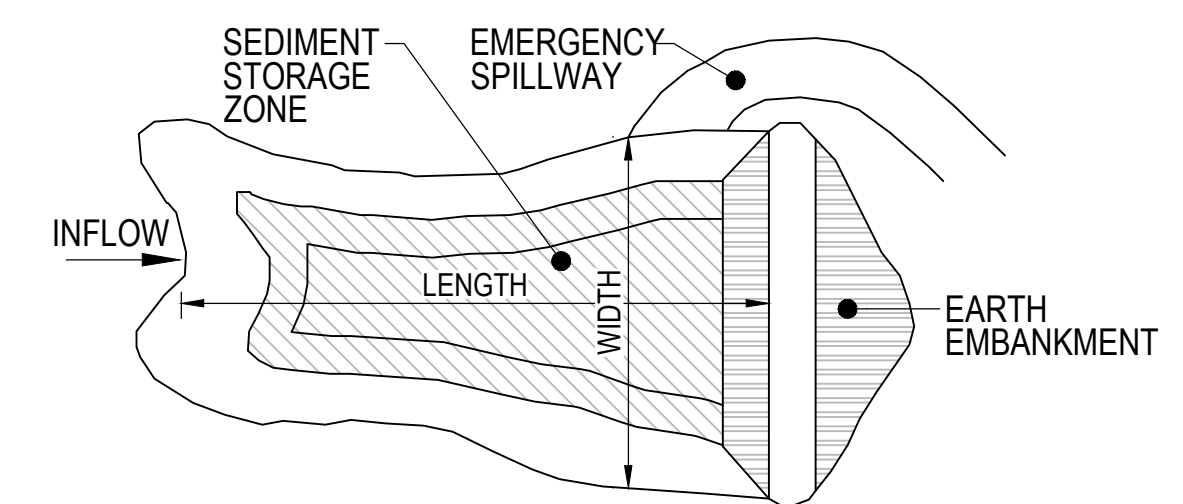
2. CONSTRUCTED SEDIMENT BASINS MUST BE MAINTAINED AND FULLY OPERATIONAL THROUGHOUT THE CONSTRUCTION PERIOD AND UNTIL EACH BASIN'S CATCHMENT AREA ACHIEVES 80% GROUND COVER ON ALL SOIL SURFACES.
3. SEDIMENT MUST BE REMOVED FROM SEDIMENT BASINS WHEN THE VOLUME OF THE SEDIMENT EXCEEDS THE DESIGNATED SEDIMENT STORAGE VOLUME, OR THE DESIGN MAXIMUM SEDIMENT STORAGE ELEVATION.
4. SEDIMENT BASIN WATER QUALITY SAMPLES MUST BE TAKEN AT A DEPTH NO GREATER THAN 200mm ABOVE THE LEVEL OF SETTLED SEDIMENT BY A SUITABLY QUALIFIED PERSON. WATER TESTING TO BE UNDERTAKEN USING EITHER A HANDHELD PHOTURBIDITY METER OR SAMPLES COLLECTED FOR LABORATORY TESTING PRIOR TO BASIN DEWATERING. ALL LABORATORY TESTING TO BE UNDERTAKEN BY A NATA ACCREDITED LABORATORY.
5. ALL WATER PUMPED FROM THE SEDIMENT BASIN SHALL BE TESTED FOR ENVIRONMENTAL COMPLIANCE AGAINST THE RELEASE CRITERIA IN THE TABLE BELOW (AS A MINIMUM), UNLESS ALTERNATIVE (MORE STRINGENT) STANDARDS ARE SPECIFIED BY THE LOCAL AUTHORITY PRIOR TO RELEASE.

PARAMETER	RELEASE CRITERIA
SUSPENDED SOLIDS	50mg/l MAX
pH	WITHIN RANGE 6.5-8.5
TURBIDITY	60 NTU MAX

6. THE SEDIMENT BASIN SHALL BE TREATED BY FLOCCULATION AFTER ALL RAINFALL EVENTS (>5mm) USING GYPSUM OR ALUM. MANUAL DOSAGE OF BASIN SHALL BE UNDERTAKEN USING A MINIMUM RATE OF 32kg/100m³ FOR GYPSUM AND 1.5-8kg/100m³ FOR ALUM. HIGHER DOSAGE MAY BE REQUIRED DEPENDING ON SOIL TYPE AND APPLICATION TECHNIQUE. ALUM SHALL NOT BE USED WHERE THE CATCHMENT DISCHARGES DIRECTLY TO A WATERWAY.
7. THE CHOSEN FLOCCULANT SHALL BE SPREAD EVENLY OVER THE BASIN SURFACE AREA. THE BASIN WILL REQUIRE A PUMP SYSTEM TO SPRAY SLURRY OF FLOCCULANTS OVER SURFACE AT AN ANGLE OF 10°-20°.
8. THE TREATED BASIN SHALL BE DEWATERED WITH A PUMP SYSTEM WITH A FLOATING INLET TO ENSURE SETTLED SEDIMENT IS NOT ENTRAINED AND DISCHARGED. BASIN DEWATERING SHALL OCCUR WITHIN 5 DAYS FROM CONCLUSION OF RAINFALL EVENT.

1. ALL DISTURBED AREAS IDENTIFIED AS VERY LOW, LOW, MEDIUM, HIGH, OR EXTREME EROSION RISK MUST BE SUITABLY STABILISED WITHIN 60, 30, 20, 10 OR 5 DAYS RESPECTIVELY, OR PRIOR TO ANTICIPATED RAINFALL, WHICHEVER IS THE GREATER, FROM THE DAY THAT SOIL DISTURBANCES ON THE AREA HAVE BEEN FINALISED.
2. THE TYPE OF GRASS COVER APPLIED TO COMPLETED EARTHWORKS SHOULD BE COMPATIBLE WITH THE ANTICIPATED LONG-TERM LAND USE, ENVIRONMENTAL RISK, AND SITE REHABILITATION MEASURES.
3. UNLESS OTHERWISE DIRECTED BY SUPERINTENDENT OR WHERE DIRECTED BY THE REVEGETATION PLAN, TOPSOIL MUST BE PLACED AT A MINIMUM DEPTH OF 75mm ON SLOPES 4:1 (H:V) OR

- PLATTER, AND 50mm ON SLOPES STEEPER THAN 4:1.
- THE PH LEVEL (SOIL:WATER 1:5) OF TOPSOIL MUST BE ADEQUATE TO ENABLE ESTABLISHMENT AND GROWTH OF THE SPECIFIED VEGETATION.
- SOIL AMELIORANTS MUST BE ADDED TO THE SOIL IN ACCORDANCE WITH THE APPROVED LANDSCAPE/REVEGETATION PLANS AND/OR SOIL ANALYSIS.
- SOIL DENSITY/COMPACTION MUST BE ADJUSTED PRIOR TO SEEDING/PLANTING IN ACCORDANCE WITH THE RELEVANT SPECIFICATIONS, SOIL REPORT AND/OR APPROPRIATE REFERENCE PLANS.
- ALL UNSTABLE OR DISTURBED SOIL SURFACES MUST BE ADEQUATELY STABILISED AGAINST EROSION TO ACHIEVE A C-FACTOR OF 0.15 OR LESS AS DEFINED BY "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION" LANDCOM 4TH EDITION, 2004 APPENDIX M. THIS EQUATES TO MINIMUM 50% GRASS COVER IF SOIL HAS BEEN RECENTLY DISTURBED ON ALL LANDS, STOCKPILES AND OTHER EXPOSED MATERIALS SCHEDULED TO REMAIN UNATTENDED FOR A DURATION OF MORE THAN 20 DAYS.
- ALL TEMPORARY DRAINAGE, EROSION AND SEDIMENT CONTROL MEASURES MUST BE REMOVED AFTER ACHIEVING A SATISFACTORY "OFF-MAINTENANCE INSPECTION" BY THE RELEVANT REGULATORY AUTHORITY.
- DISPOSE OF ANY COLLECTED SEDIMENT OR FILL IN A LAWFUL MANNER THAT DOES NOT CAUSE ONGOING SOIL EROSION OR ENVIRONMENTAL HARM.
- IMMEDIATELY PRIOR TO THE CONSTRUCTION OF THE PERMANENT STORMWATER TREATMENT DEVICE, APPROPRIATE FLOW BYPASS CONDITIONS MUST BE ESTABLISHED TO PREVENT SEDIMENT-LADEN WATER ENTERING THE DEVICE.
- IMMEDIATELY FOLLOWING THE CONSTRUCTION OF THE FILTER MEDIA OF THE PERMANENT STORMWATER TREATMENT DEVICE, THE FILTER MEDIA MUST BE COVERED BY HEAVY-DUTY FILTER CLOTH (MINIMUM BIDUM A44 OR EQUIVALENT) AND A MINIMUM 200mm LAYER OF EARTH OR SACRIFICIAL FILTER MEDIA. SUCH EARTH AND FILTER CLOTH MUST NOT BE REMOVED FROM THE DEVICE UNTIL SUITABLE SURFACE CONDITIONS BEING ACHIEVED WITHIN THE BASIN'S CATCHMENT AREA.
- IMMEDIATELY FOLLOWING THE CONSTRUCTION OF THE PERMANENT STORMWATER TREATMENT DEVICE AN APPROPRIATE TYPE 2 SEDIMENT TRAP MUST BE INSTALLED IN A MANNER TO PREVENT SEDIMENT INTRUSION INTO THE DEVICE.
- THE MINIMUM SEDIMENT CONTROL STANDARD FOR THE PROTECTION OF THE PERMANENT STORMWATER TREATMENT DEVICE DURING THE CONSTRUCTION AND MAINTENANCE PHASES IS A TYPE 2 SEDIMENT TRAP. (ALTERNATIVE TO ABOVE)
- PLANT ESTABLISHMENT WITHIN THE PERMANENT STORMWATER TREATMENT DEVICE MUST BE DELAYED UNTIL SEDIMENT INTRUSION INTO THE DEVICE IS SUITABLY UNDER CONTROL.
- UPON SUITABLE CONDITIONS BEING ACHIEVED WITHIN THE BASIN'S CATCHMENT AREA, THE OPERATIONAL FEATURES OF THE PERMANENT STORMWATER TREATMENT SYSTEM MUST BE MADE FULLY OPERATIONAL (I.E. MAINTENANCE AND/OR RECONSTRUCTION AS REQUIRED).
- THE PERMANENT STORMWATER TREATMENT FEATURES OF THE REHABILITATED BASIN MUST NOT BE MADE OPERATIONAL UNTIL ALL UP-SLOPE SITE STABILISATION MEASURES HAVE BEEN IMPLEMENTED AND ARE APPROPRIATELY WORKING TO CONTROL SOIL EROSION AND SEDIMENT RUNOFF IN ACCORDANCE WITH THE SPECIFIED ESC STANDARD. (ALTERNATIVE TO ABOVE).



01	ORIGINAL ISSUE	JV	GG	GE	18.05.26
Issue	Description	DR	CH	VE	Date

NOT TO SCALE



development
directive



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Drawn	J. VARGAS	Original Size
Designed	G. GESMUNDO	Height Datum
Project Manager	A. CONNOLLY	Grid
Verified	G. ELLIS 	R.P.E.C. Date 2

MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2

EROSION & SEDIMENT CONTROL DETAILS SHEET 3



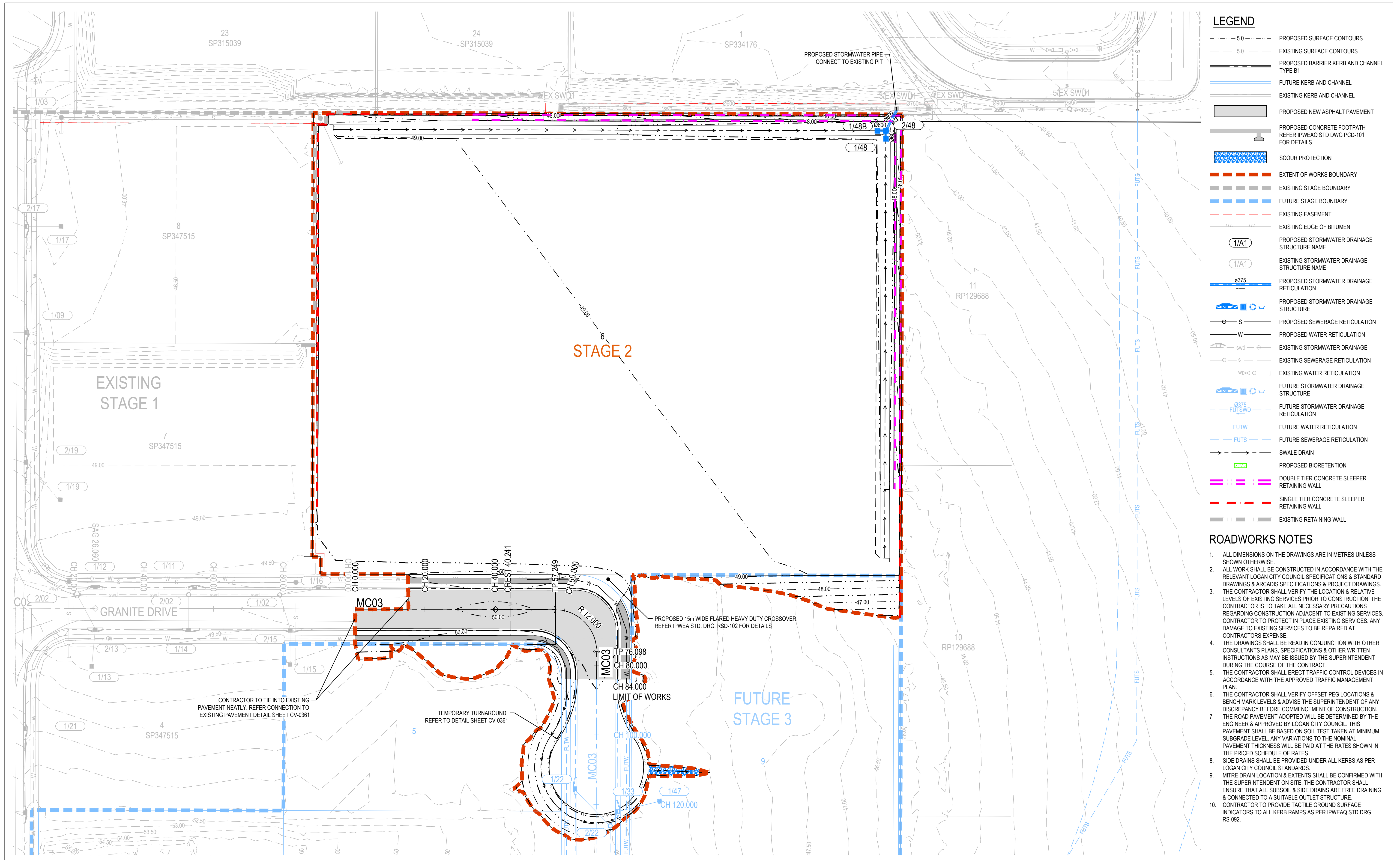
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MRI-AAP-DD-02-DRG-CV-0193

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Number

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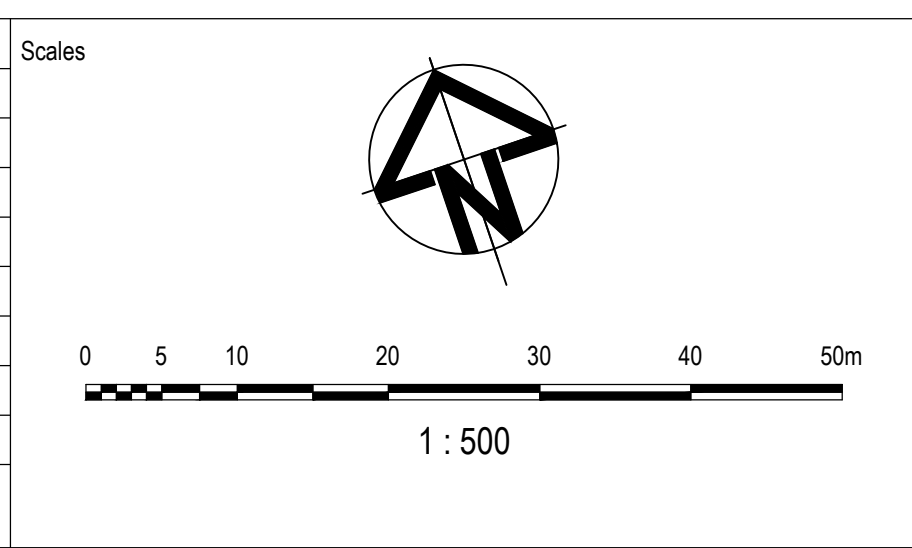
01



- LEGEND**
- 5.0 --- PROPOSED SURFACE CONTOURS
 - 5.0 --- EXISTING SURFACE CONTOURS
 - PROPOSED BARRIER KERB AND CHANNEL TYPE B1
 - FUTURE KERB AND CHANNEL
 - EXISTING KERB AND CHANNEL
 - PROPOSED NEW ASPHALT PAVEMENT
 - PROPOSED CONCRETE FOOTPATH REFER IPWEAQ STD DWG PCD-101 FOR DETAILS
 - SCOUR PROTECTION
 - EXTENT OF WORKS BOUNDARY
 - EXISTING STAGE BOUNDARY
 - FUTURE STAGE BOUNDARY
 - EXISTING EASEMENT
 - EXISTING EDGE OF BITUMEN
 - (1/A1) PROPOSED STORMWATER DRAINAGE STRUCTURE NAME
 - (1/A1) EXISTING STORMWATER DRAINAGE STRUCTURE NAME
 - ø375 PROPOSED STORMWATER DRAINAGE RETICULATION
 - PROPOSED STORMWATER DRAINAGE STRUCTURE
 - S PROPOSED SEWERAGE RETICULATION
 - W PROPOSED WATER RETICULATION
 - swd EXISTING STORMWATER DRAINAGE
 - s EXISTING SEWERAGE RETICULATION
 - wd EXISTING WATER RETICULATION
 - PROPOSED STORMWATER DRAINAGE STRUCTURE
 - ø375 FUTURE STORMWATER DRAINAGE RETICULATION
 - FUTW FUTURE WATER RETICULATION
 - FUTS FUTURE SEWERAGE RETICULATION
 - SWALE DRAIN
 - PROPOSED BIORETENTION
 - DOUBLE TIER CONCRETE SLEEPER RETAINING WALL
 - SINGLE TIER CONCRETE SLEEPER RETAINING WALL
 - EXISTING RETAINING WALL

- ROADWORKS NOTES**
- ALL DIMENSIONS ON THE DRAWINGS ARE IN METRES UNLESS SHOWN OTHERWISE.
 - ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE RELEVANT LOGAN CITY COUNCIL SPECIFICATIONS & STANDARD DRAWINGS & ARCADIS SPECIFICATIONS & PROJECT DRAWINGS.
 - THE CONTRACTOR SHALL VERIFY THE LOCATION & RELATIVE LEVELS OF EXISTING SERVICES PRIOR TO CONSTRUCTION. THE CONTRACTOR IS TO TAKE ALL NECESSARY PRECAUTIONS REGARDING CONSTRUCTION ADJACENT TO EXISTING SERVICES. CONTRACTOR TO PROTECT IN PLACE EXISTING SERVICES. ANY DAMAGE TO EXISTING SERVICES TO BE REPAIRED AT CONTRACTORS EXPENSE.
 - THE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER CONSULTANTS PLANS, SPECIFICATIONS & OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED BY THE SUPERINTENDENT DURING THE COURSE OF THE CONTRACT.
 - THE CONTRACTOR SHALL ERECT TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE APPROVED TRAFFIC MANAGEMENT PLAN.
 - THE CONTRACTOR SHALL VERIFY OFFSET PEG LOCATIONS & BENCH MARK LEVELS & ADVISE THE SUPERINTENDENT OF ANY DISCREPANCY BEFORE COMMENCEMENT OF CONSTRUCTION.
 - THE ROAD PAVEMENT ADOPTED WILL BE DETERMINED BY THE ENGINEER & APPROVED BY LOGAN CITY COUNCIL. THIS PAVEMENT SHALL BE BASED ON SOIL TEST TAKEN AT MINIMUM SUBGRADE LEVEL. ANY VARIATIONS TO THE NOMINAL PAVEMENT THICKNESS WILL BE PAID AT THE RATES SHOWN IN THE PRICED SCHEDULE OF RATES.
 - SIDE DRAINS SHALL BE PROVIDED UNDER ALL KERBS AS PER LOGAN CITY COUNCIL STANDARDS.
 - MITRE DRAIN LOCATION & EXTENTS SHALL BE CONFIRMED WITH THE SUPERINTENDENT ON SITE. THE CONTRACTOR SHALL ENSURE THAT ALL SUBSOIL & SIDE DRAINS ARE FREE DRAINING & CONNECTED TO A SUITABLE OUTLET STRUCTURE.
 - CONTRACTOR TO PROVIDE TACTILE GROUND SURFACE INDICATORS TO ALL KERB RAMPS AS PER IPWEAQ STD DRG RS-092.

01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
Issue	Description	DR	CH	VE	Date



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Planner

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Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS 	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

Title

ROADWORKS AND DRAINAGE
LAYOUT PLAN

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www.arcadis.com/au

Project Number	30131743
Issue	01

Drawing No. MRI-AAP-DD-02-DRG-CV-0201

PROPOSED CONCRETE FOOTPATH
REFER IPWEAQ STD DWG PCD-101
FOR DETAILS

EXISTING STAGE BOUNDARY

FUTURE STAGE BOUNDARY

FUTURE KERB AND CHANNEL

EXISTING KERB AND CHANNEL

8
SP347515

7
SP347515

EXISTING STAGE 1

6
STAGE 2

11
RP129688

4
SP347515

5

9

10
RP129688

GRANITE DRIVE

MC03

CH 0.000

CH 20.000

CH 40.000

CREST 40.241

TP 57.249

CH 60.000

R 12.000

TP 76.098

CH 80.000

CH 84.000

CH 100.000

CH 120.000

MC03

MC03

TP 76.098

CH 80.000

CH 84.000

LIMIT OF WORKS

C02

SAG 26.060

CH 20.00

CH 40.00

CH 60.00

CH 80.00

CH 100.00

CH 120.00

Scales



0 5 10 20 30 40 50m

1 : 500

Client



The logo for Andreatta Developments features a stylized blue lowercase 'a' with a green leaf on top. Below the 'a' is the word 'ANDREATA' in bold blue uppercase letters, followed by 'DEVELOPMENTS' in smaller blue uppercase letters, separated by a green horizontal line.

Project	MCLEOD ROAD INDUSTRIAL ESTATE STAGE 2
Title	CONTROL LINE SETOUT LAYOUT PLAN

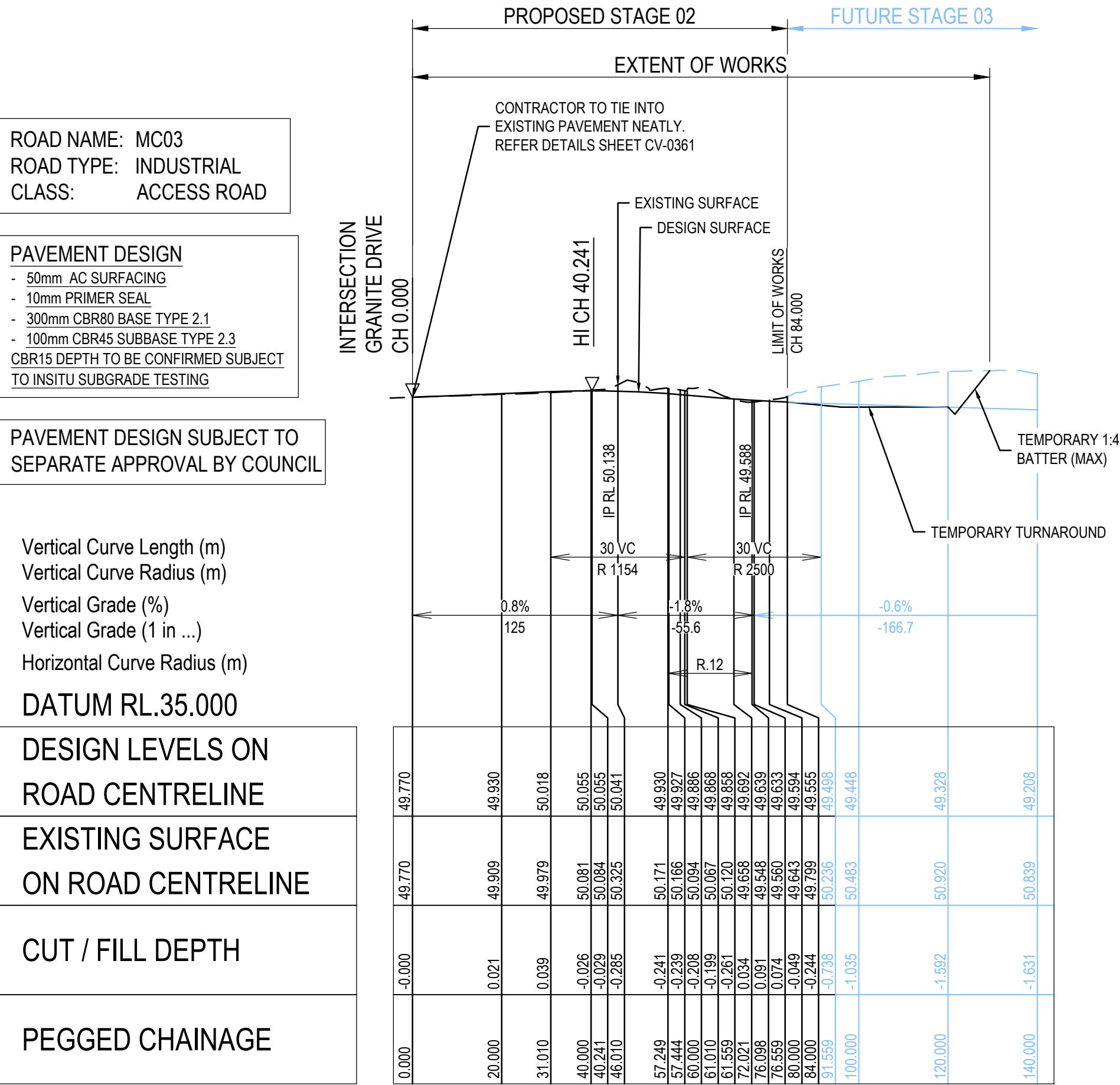


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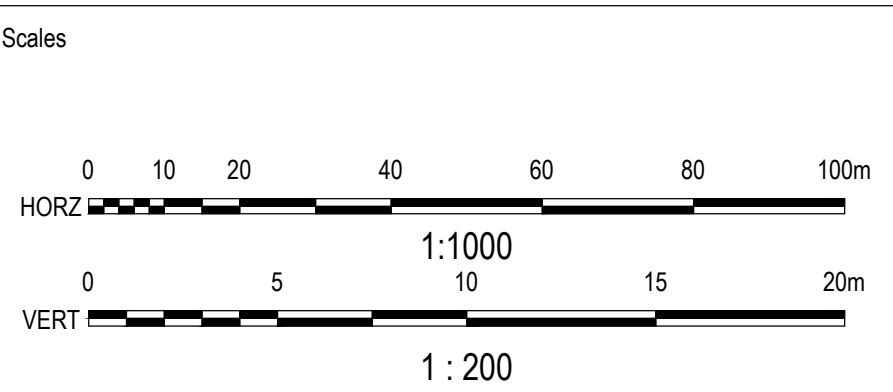
MRI-AAP-DD-02-DRG-CV-0221



MC03 LONGITUDINAL SECTION

SCALE: HORIZONTAL - 1:1000
VERTICAL - 1:200

01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
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orion spatial solutions

Planner

development directive

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ANDREATA DEVELOPMENTS

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Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)	
Verified	G. ELLIS 	R.P.E.Q. No: 17942 Date 21 May 26		

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

MC03
LONGITUDINAL SECTION

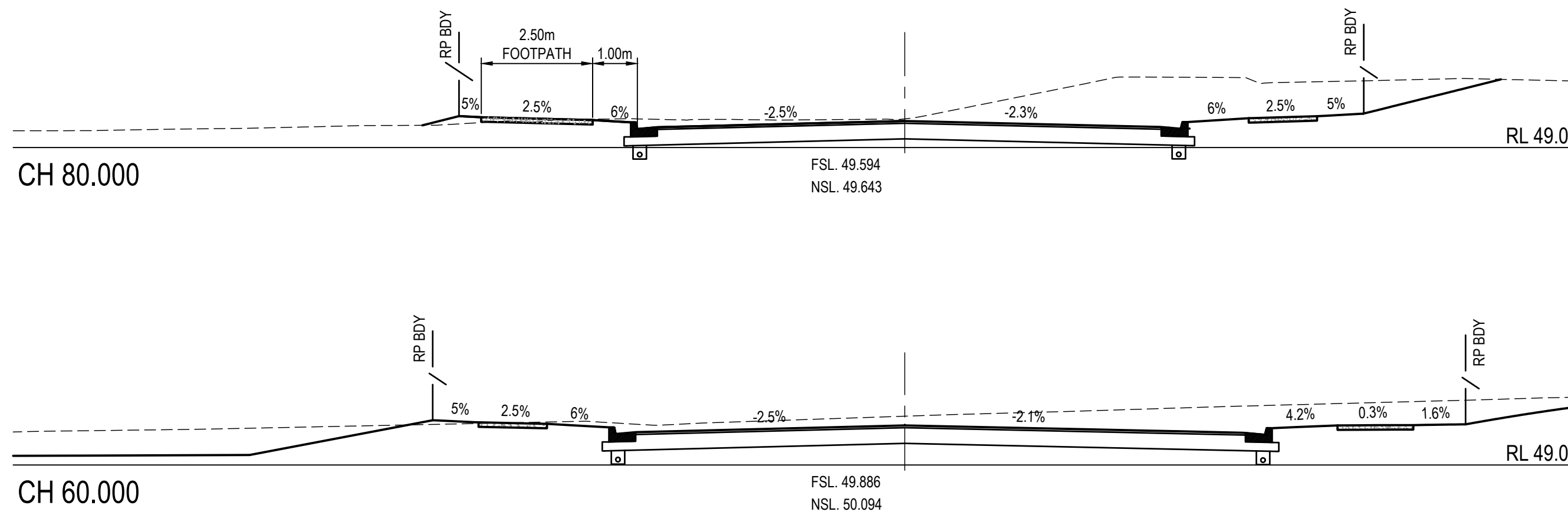
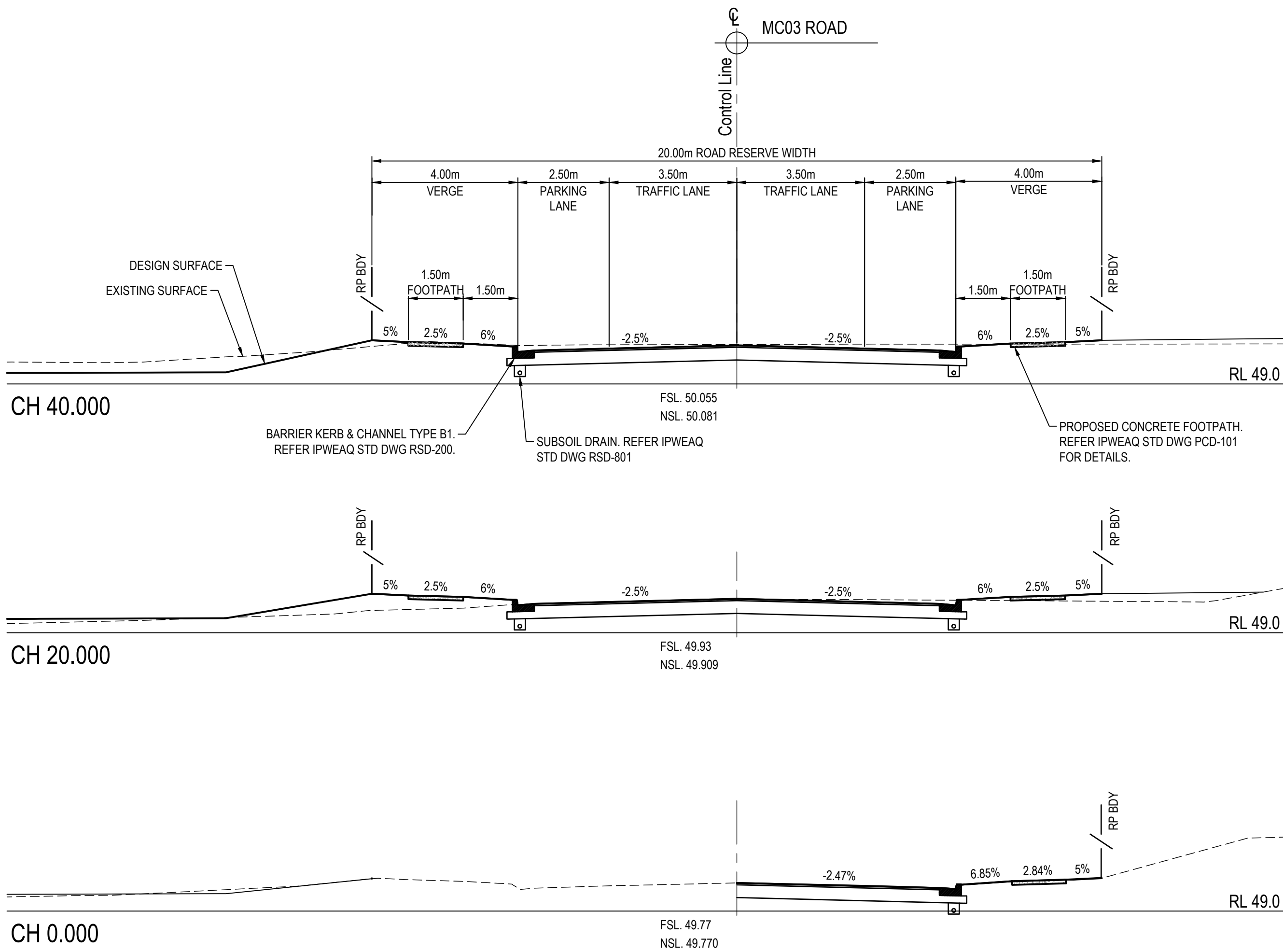
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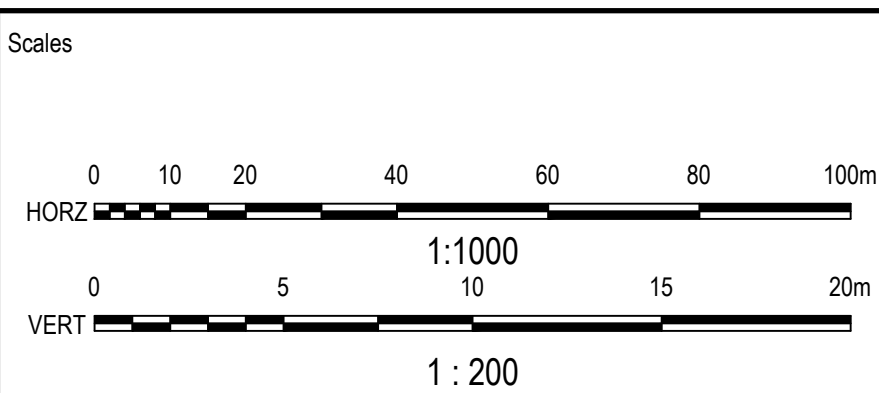
Project Number 30131743

Issue 01

MRI-AAP-DD-02-DRG-CV-0251



01	ORIGINAL ISSUE	JV	GG	GE	18.05.26
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Verified	G. ELLIS 	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2

Title

MC03
CROSS SECTION

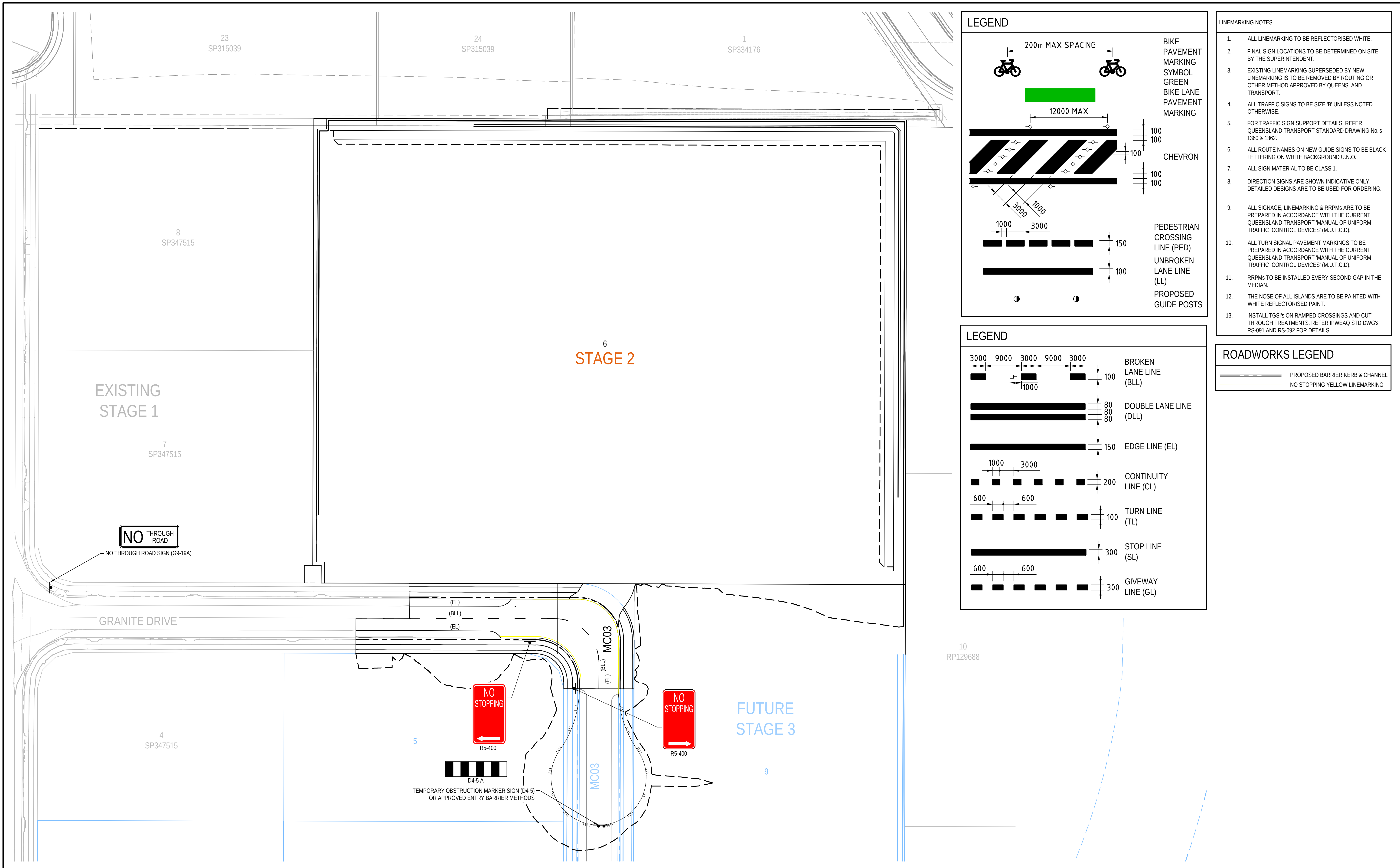


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Project Number 30131743

Issue 01

Drawing No. MRI-AAP-DD-02-DRG-CV-0252



LEGEND

BIKE PAVEMENT MARKING SYMBOL GREEN BIKE LANE PAVEMENT MARKING

200m MAX SPACING

12000 MAX

CHEVRON

PEDESTRIAN CROSSING LINE (PED)

UNBROKEN LANE LINE (LL)

PROPOSED GUIDE POSTS

LEGEND

BROKEN LANE LINE (BLL)

DOUBLE LANE LINE (DLL)

EDGE LINE (EL)

CONTINUITY LINE (CL)

TURN LINE (TL)

STOP LINE (SL)

GIVEWAY LINE (GL)

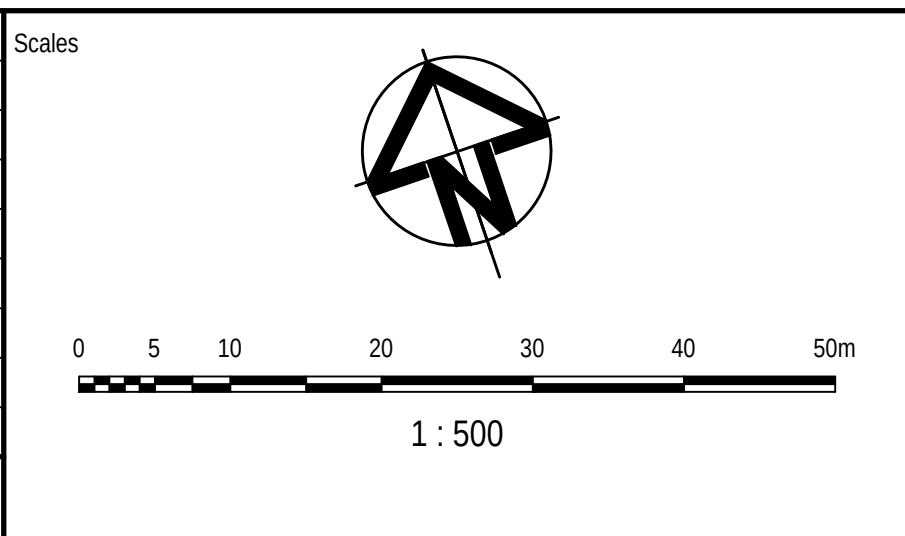
- LINEMARKING NOTES**
- ALL LINEMARKING TO BE REFLECTORISED WHITE.
 - FINAL SIGN LOCATIONS TO BE DETERMINED ON SITE BY THE SUPERINTENDENT.
 - EXISTING LINEMARKING SUPERSEDED BY NEW LINEMARKING IS TO BE REMOVED BY ROUTING OR OTHER METHOD APPROVED BY QUEENSLAND TRANSPORT.
 - ALL TRAFFIC SIGNS TO BE SIZE 'B' UNLESS NOTED OTHERWISE.
 - FOR TRAFFIC SIGN SUPPORT DETAILS, REFER QUEENSLAND TRANSPORT STANDARD DRAWING No.'s 1360 & 1362.
 - ALL ROUTE NAMES ON NEW GUIDE SIGNS TO BE BLACK LETTERING ON WHITE BACKGROUND U.N.O.
 - ALL SIGN MATERIAL TO BE CLASS 1.
 - DIRECTION SIGNS ARE SHOWN INDICATIVE ONLY. DETAILED DESIGNS ARE TO BE USED FOR ORDERING.
 - ALL SIGNAGE, LINEMARKING & RRPMS ARE TO BE PREPARED IN ACCORDANCE WITH THE CURRENT QUEENSLAND TRANSPORT 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES' (M.U.T.C.D.).
 - ALL TURN SIGNAL PAVEMENT MARKINGS TO BE PREPARED IN ACCORDANCE WITH THE CURRENT QUEENSLAND TRANSPORT 'MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES' (M.U.T.C.D.).
 - RRPMs TO BE INSTALLED EVERY SECOND GAP IN THE MEDIAN.
 - THE NOSE OF ALL ISLANDS ARE TO BE PAINTED WITH WHITE REFLECTORISED PAINT.
 - INSTALL TGSi's ON RAMPED CROSSINGS AND CUT THROUGH TREATMENTS. REFER IPWEAQ STD DWG'S RS-091 AND RS-092 FOR DETAILS.

ROADWORKS LEGEND

PROPOSED BARRIER KERB & CHANNEL

NO STOPPING YELLOW LINEMARKING

01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
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ANDREATA
DEVELOPMENTS

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Verified	G. ELLIS 	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE STAGE 2

Title

SIGNS AND LINEMARKING PLAN

ARCADIS

Arcadis Australia Pacific Pty Limited
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ABN 76 104 485 289
Tel No: +61 7 5503 4800
www.arcadis.com/au

Project Number

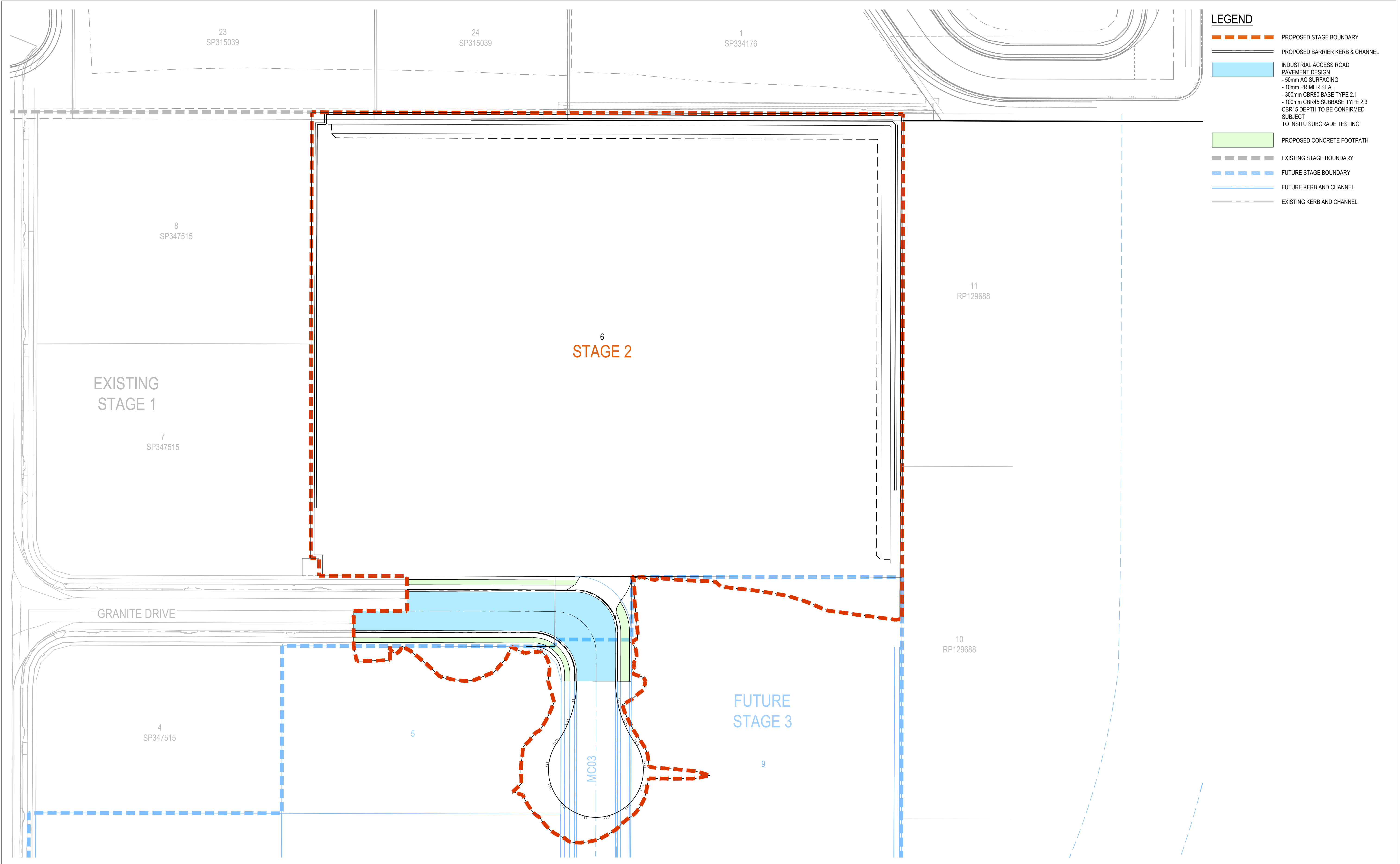
30131743

Issue

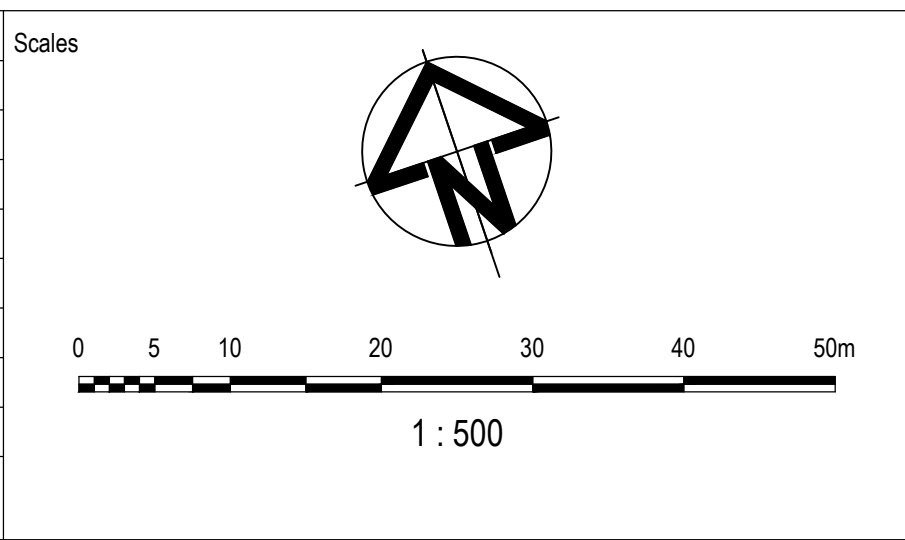
01

Drawing No.

MRI-AAP-DD-02-DRG-CV-0341



01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
Issue	Description	DR	CH	VE	Date



Surveyor

Planner

Client

Status			
FOR APPROVAL CONSTRUCTION SUBJECT TO APPROVAL			
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Original Issue Signatures			
Drawn	J. VARGAS	Original Size	A1
Designed	G. GESMUNDO	Height Datum	AHD
Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

Title

PAVEMENT PLAN

Arcadis Australia Pacific Pty Limited
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Project Number	30131743
Issue	01

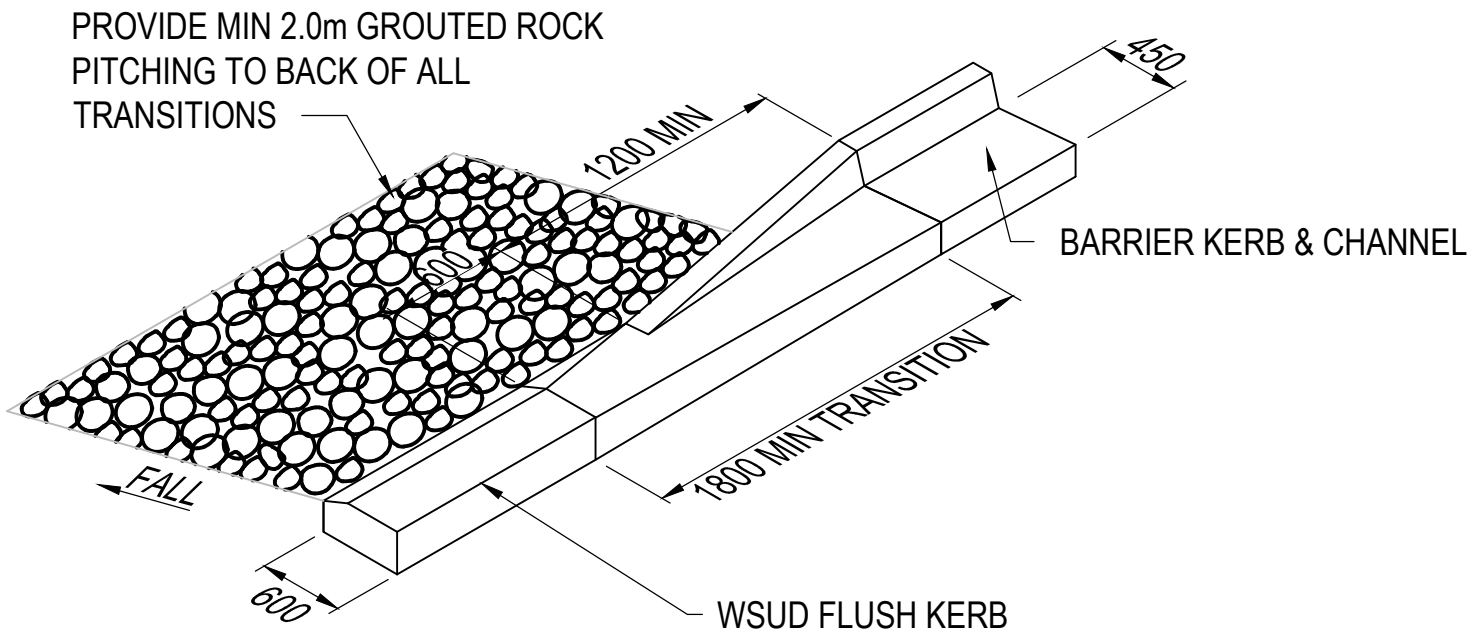
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MRI-AAP-DD-02-DRG-CV-0351

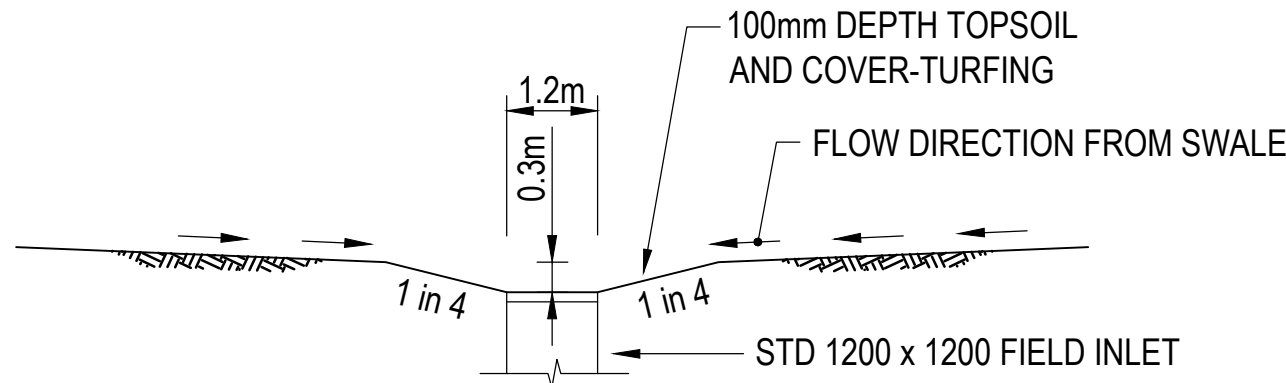
SOIL FILTER MEDIA NOTES		
PARAMETER	TEST METHOD IN ACCORDANCE WITH	REQUIREMENT
SATURATED HYDRAULIC CONDUCTIVITY	ASTM f1815-11	50 - 500 mm/hr (200 PREFERRED)
pH	AS 4419	5.5 - 7.5
ELECTRICAL CONDUCTIVITY	AS 4419	<1.2 dS/m
NITROGEN CONTENT	AS 4419	<800 mg/kg
PHOSPHORUS CONTENT	AS 4419	<40 mg/kg
ORGANIC CONTENT	AS 4419	3% - 10%, WHERE ORGANIC CONTENT IS BELOW THIS THRESHOLD, THE FILTER MEDIA MAY BE AMELIORATED BY ADDING 50mm OF COMPOST AND TINING IT INTO THE TOP 150mm OF FILTER MEDIA.
PARTICLE SIZE DISTRIBUTION	AS 1289.3.6.1 - 1995	CLAY & SILT 3 - 6% (<0.05mm) VERY FINE SAND 5 - 30% (0.05 - 0.15mm) FINE SAND 10 - 30% (0.15 - 0.25mm) MEDIUM TO COARSE SAND 40 - 60% (0.25 - 1.0mm) COARSE SAND 7 - 10% (1.0 - 2.0mm) FINE GRAVEL <3% (2.0 - 3.4mm)

BIO-FILTRATION NOTES

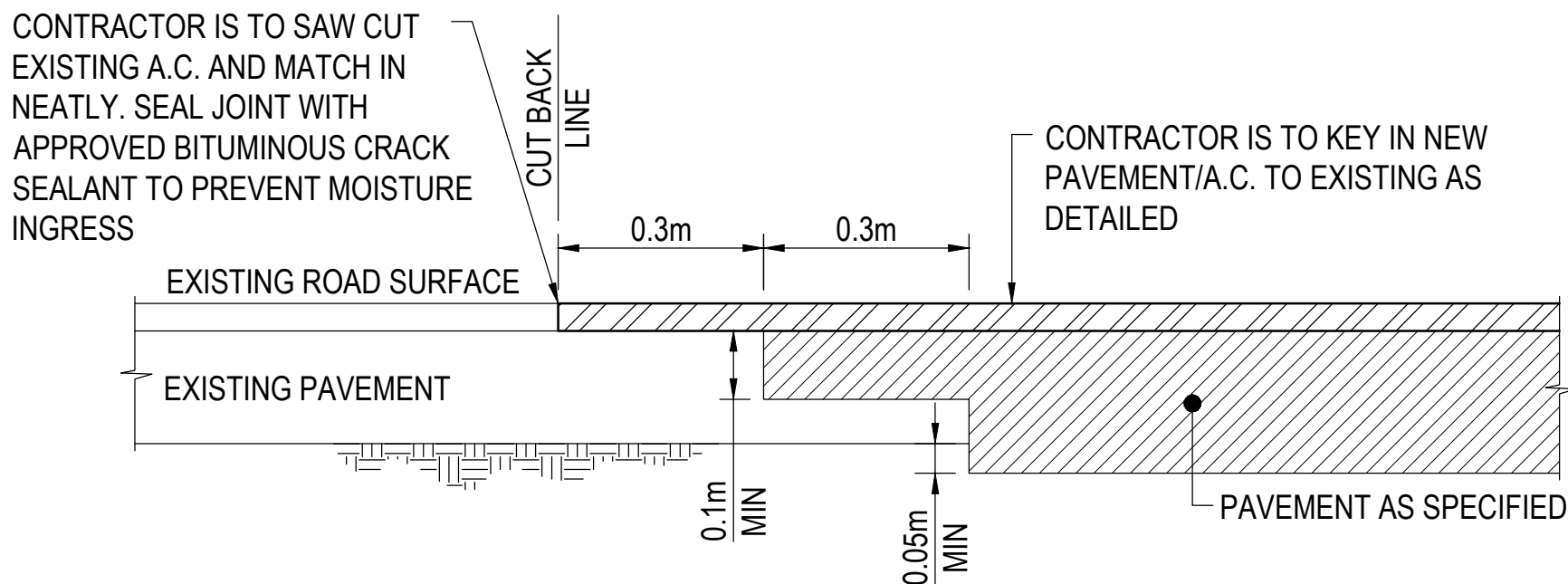
- MINIMUM FILTER DEPTH IS TO BE 0.8m AND IS TO CONSIST OF THE FOLLOWING MEDIA:
- 0.5m OF SANDY LOAM MATERIAL WITH A HYDRAULIC CONDUCTIVITY OF 50-500mm/h (200 PREFERRED).
 - TRANSITION LAYER - MINIMUM 100mm COARSE SAND TYPICALLY 1mm PARTICLE SIZE DIAMETER WITH <2% FINES.
 - DRAINAGE LAYER - FINE GRAVEL (NOMINAL 2-5mm) WITH <2% FINES.
 - ALL UNDERDRAINAGE PIPES TO BE COVERED BY A MINIMUM 50mm DRAINAGE LAYER MATERIAL.
 - CONTRACTOR TO ERECT SIGNAGE IDENTIFYING THE PURPOSE OF THE BIO-RETENTION BASIN AS PER COUNCIL REQUIREMENTS.
 - CONTRACTOR TO INSTALL GEOFABRIC, LAY TOPSOIL AND TURF AFTER BASIN INTERNAL DRAINAGE AND FILTER MEDIA IS INSTALLED TO PROTECT FILTER MEDIA. TURF AND GEOFABRIC TO BE REMOVED AFTER 80% OF BUILDINGS AND CONSTRUCTION IS COMPLETE.



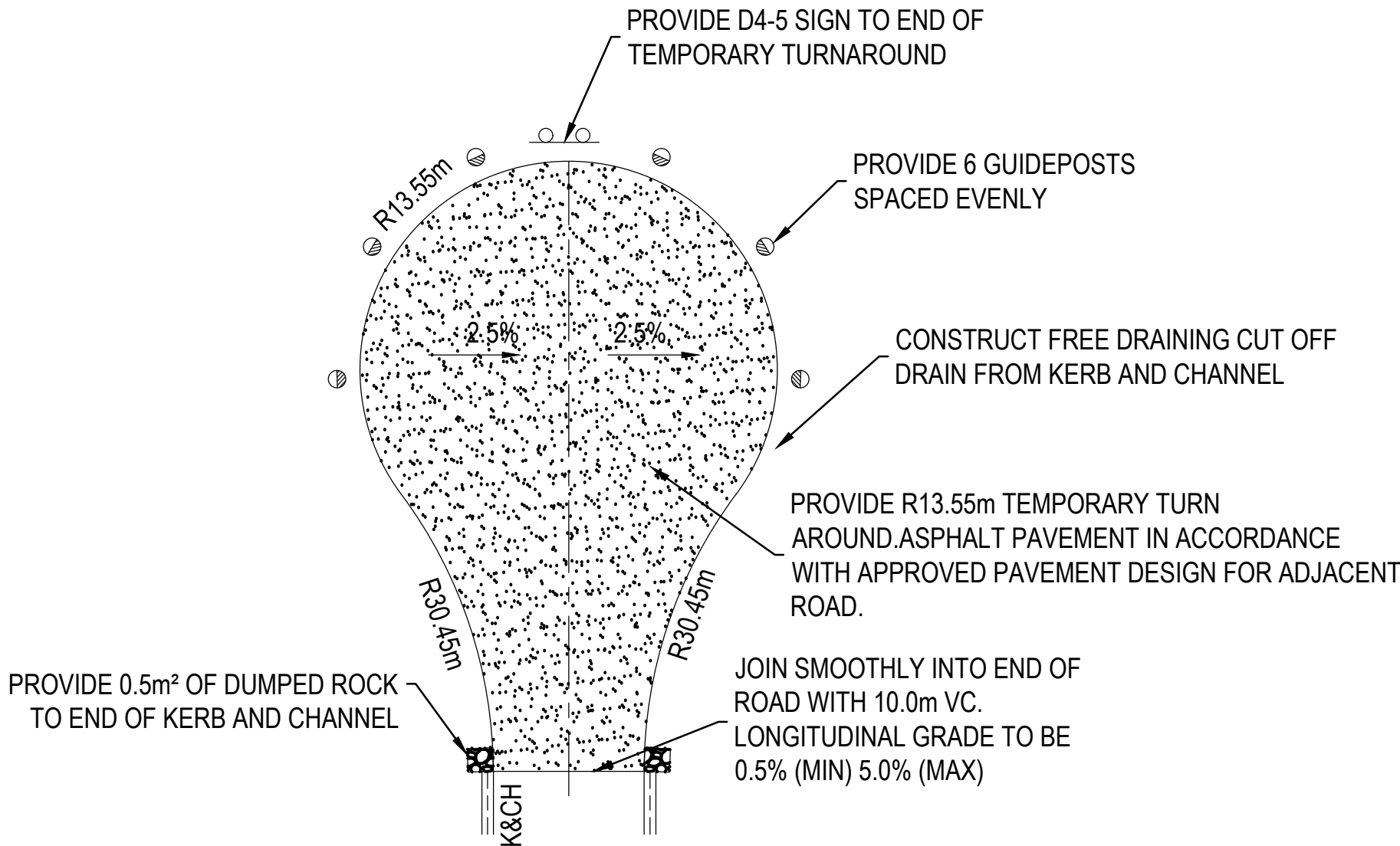
KERB TRANSITION DETAIL
SCALE 1:25



SWALE TRANSITION INTO I.A.D FIELD INLET IN SAG
SCALE 1:100

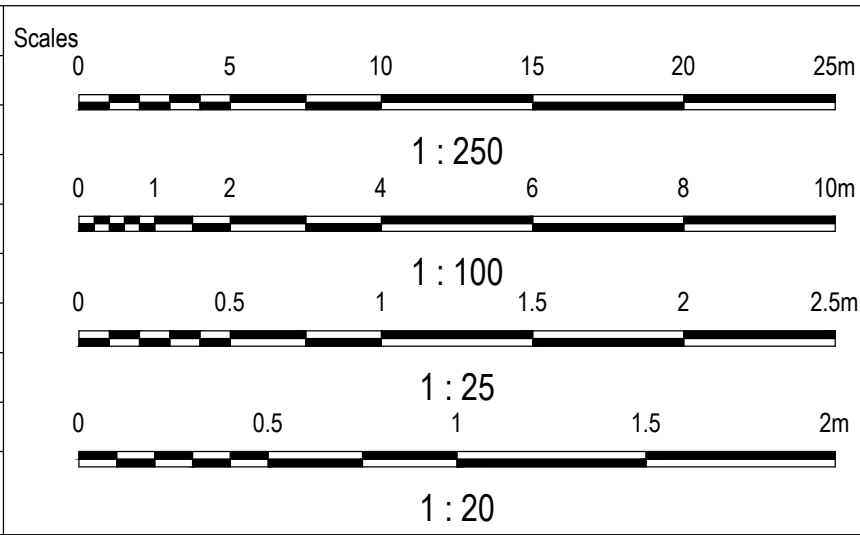


CONNECTION TO EXISTING PAVEMENT
TYPICAL DETAIL
SHOWING LONGITUDINAL CONSTRUCTION DETAIL
FOR CONNECTION TO EXISTING PAVEMENT/A.C.
N.T.S



TEMPORARY TURN AROUND DETAIL
SCALE 1:250

01	ORIGINAL ISSUE	JV	GG	GE	19.05.26
Issue	Description	DR	CH	VE	Date



Surveyor

orion spatial solutions

Planner

development directive

Client

ANDREATA DEVELOPMENTS

Status	FOR APPROVAL CONSTRUCTION SUBJECT TO APPROVAL		
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Drawn	J. VARGAS	Original Size	A1
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Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS 	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

CIVIL WORKS DETAILS

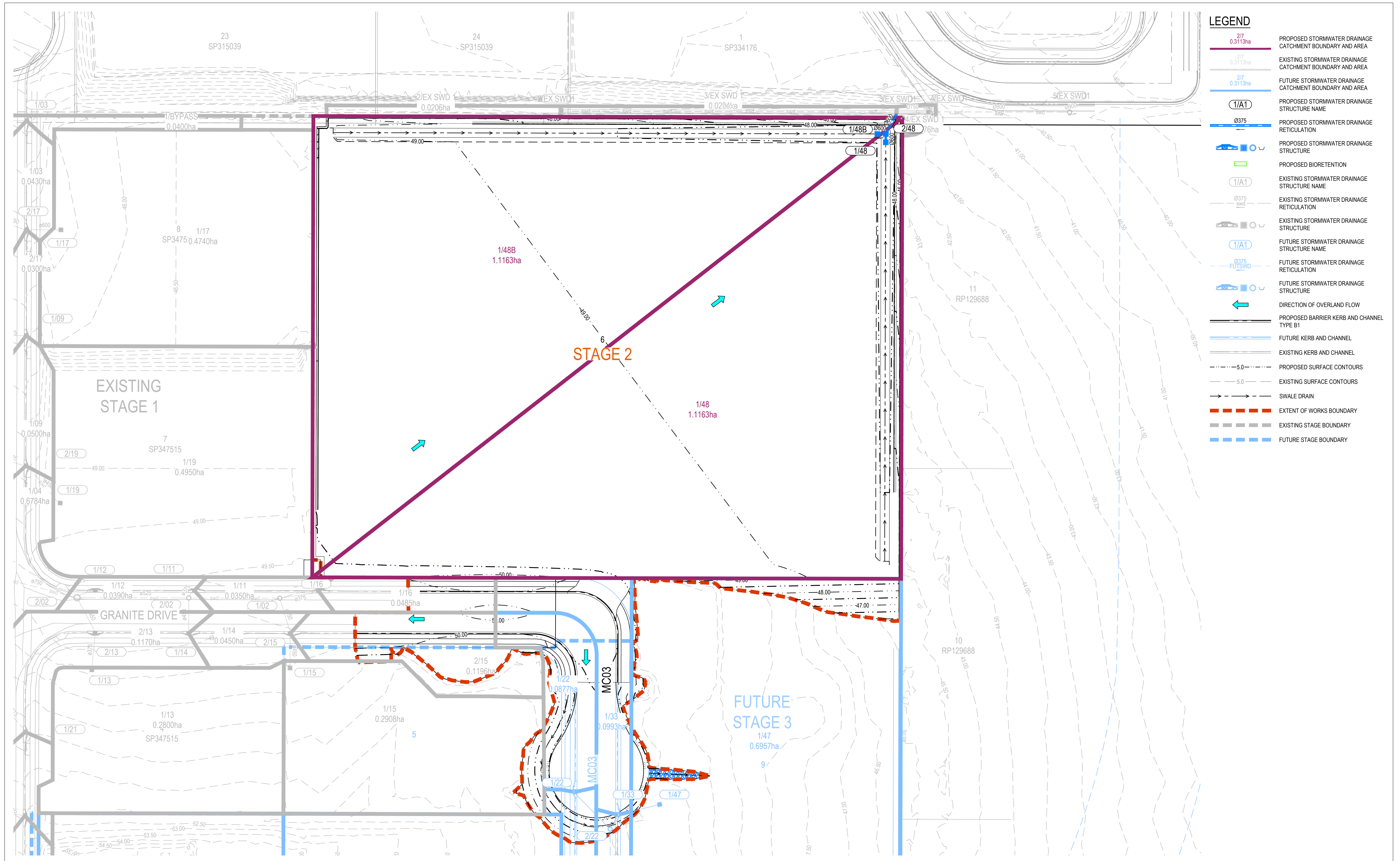
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Project Number 30131743

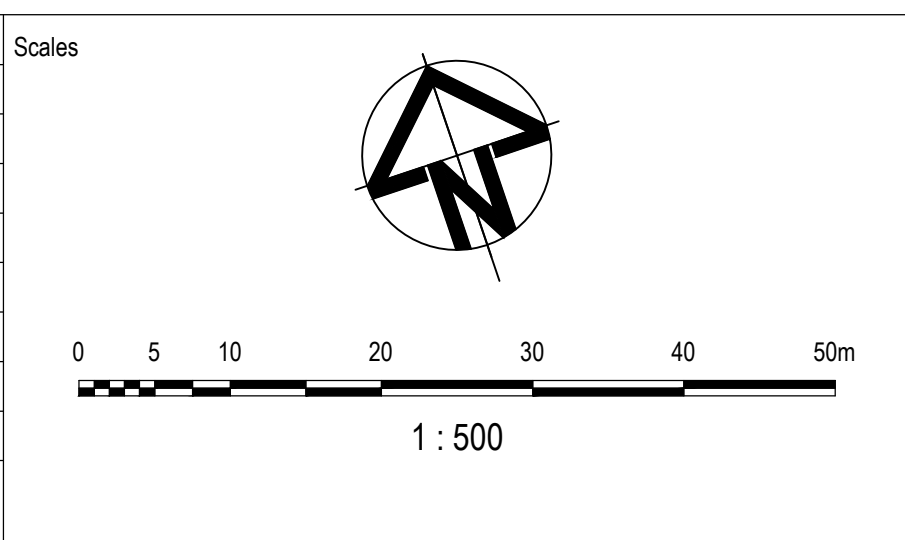
Issue 01

MRI-AAP-DD-02-DRG-CV-0361



- LEGEND**
- 2/7 0.3113ha PROPOSED STORMWATER DRAINAGE CATCHMENT BOUNDARY AND AREA
 - 2/7 0.3113ha EXISTING STORMWATER DRAINAGE CATCHMENT BOUNDARY AND AREA
 - 2/7 0.3113ha FUTURE STORMWATER DRAINAGE CATCHMENT BOUNDARY AND AREA
 - 1/A1 PROPOSED STORMWATER DRAINAGE STRUCTURE NAME
 - Ø375 PROPOSED STORMWATER DRAINAGE RETICULATION
 - PROPOSED STORMWATER DRAINAGE STRUCTURE
 - PROPOSED BIORETENTION
 - 1/A1 EXISTING STORMWATER DRAINAGE STRUCTURE NAME
 - Ø375 SWD EXISTING STORMWATER DRAINAGE RETICULATION
 - EXISTING STORMWATER DRAINAGE STRUCTURE
 - 1/A1 FUTURE STORMWATER DRAINAGE STRUCTURE NAME
 - Ø375 FUTURE SWD FUTURE STORMWATER DRAINAGE RETICULATION
 - FUTURE STORMWATER DRAINAGE STRUCTURE
 - DIRECTION OF OVERLAND FLOW
 - PROPOSED BARRIER KERB AND CHANNEL TYPE B1
 - FUTURE KERB AND CHANNEL
 - EXISTING KERB AND CHANNEL
 - PROPOSED SURFACE CONTOURS
 - EXISTING SURFACE CONTOURS
 - SWALE DRAIN
 - EXTENT OF WORKS BOUNDARY
 - EXISTING STAGE BOUNDARY
 - FUTURE STAGE BOUNDARY

01	ORIGINAL ISSUE	JV	MB	GE	19.05.26
Issue	Description	DR	CH	VE	Date



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Planner

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Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

Title

STORMWATER CATCHMENT
LAYOUT PLAN

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Project Number	30131743
Issue	01

Drawing No. MRI-AAP-DD-02-DRG-CV-0421

CO-ORDINATES		507090.989E 6935783.892N	507091.394E 6935786.259N	507095.449E 6935791.972N
STRUCTURE NAME		1/48	2/48	
STRUCTURE DESCRIPTION		IPWEA DOME TOP FIELD INLET 1200x1200	DOME TOP FIELD INLET OVER 1200 CHAMBER STRUCTURAL DESIGN REQUIRED (BY CONTRACTOR)	EXISTING FIELD INLET 900x900

- NOTES:
- ALL CUSTOM ACCESS CHAMBERS ARE TO BE DESIGN AND CONSTRUCTED BY CONTRACTOR. STD ACCESS CHAMBER TO BE CONSTRUCTED IN ACCORDANCE WITH IPWEA STD-DWG-DS-010
 - ALL ACCESS CHAMBERS LOCATED IN ROADWAY OR PROPOSED CROSSOVER / FUTURE DRIVEWAYS ARE TO HAVE TYPE D MANHOLE COVER (ROADWAY) STD DWG DS-019
 - THE CONTRACTOR SHALL VERIFY THE SETOUT AND LOCATION OF EXISTING PITS AND PIPES PRIOR TO CONSTRUCTION.

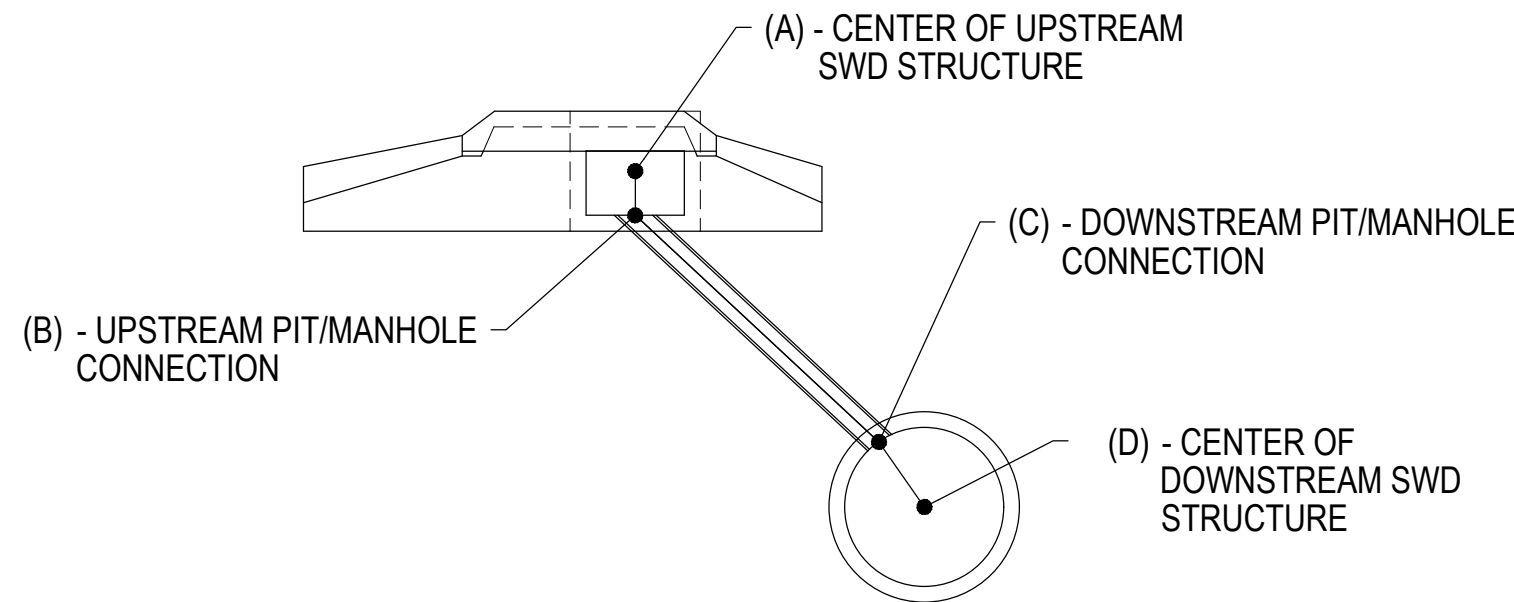
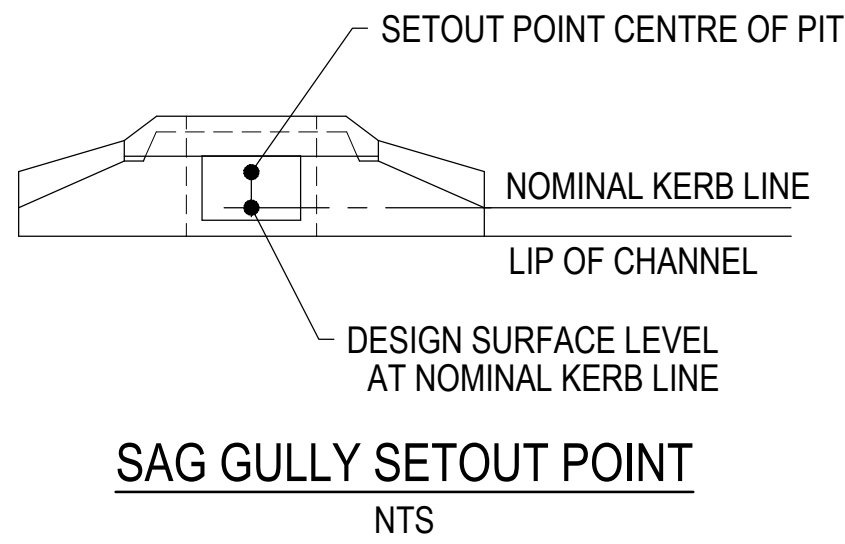
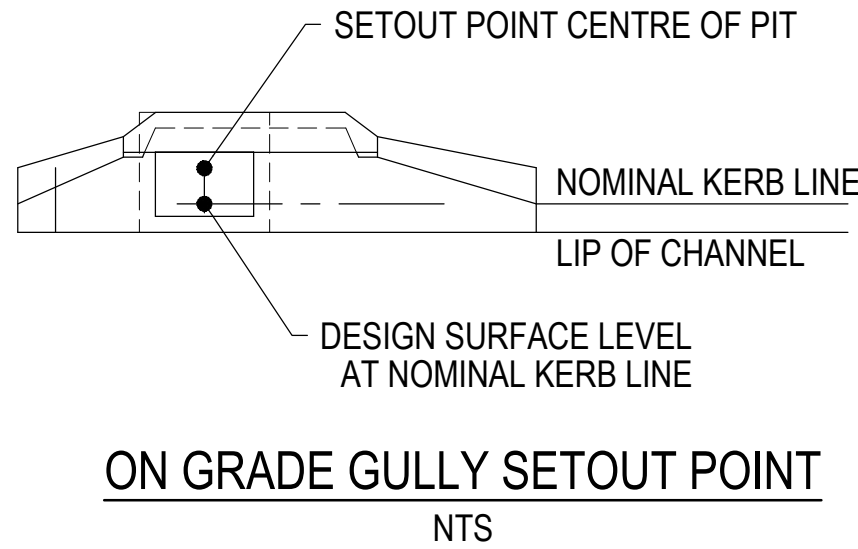
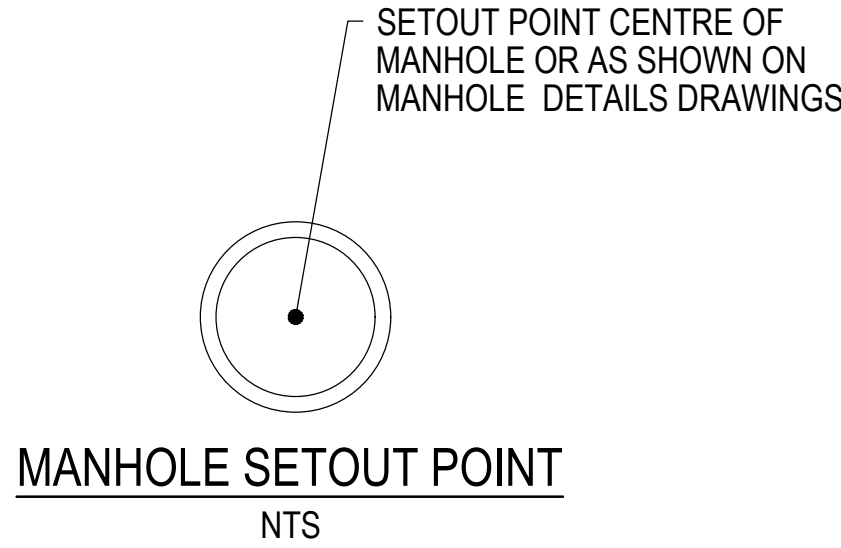
LEGEND	
	Q2 HYDRAULIC GRADE LEVEL
	Q20 HYDRAULIC GRADE LEVEL

PIPE SIZE (mm)	600	600
PIPE CLASS	RCP3	RCP3
PIPE GRADE (%)	1.00%	7.00%
PIPE SLOPE (1 in X)	100.0	14.3
FULL PIPE FLOW VELOCITY (m/s)	2.13	4.25
PART PIPE FLOW VELOCITY (m/s)	2.48	6.29
DATUM RL	30.000	
HYDRAULIC GRADE LEVEL	47.785 46.904 48.857 43.632	41.860 41.590 41.676
PIPE FLOW (cumecs)	0.602	1.202
PIPE CAPACITY AT GRADE (cumecs)	0.614	1.625
DEPTH TO INVERT	1.796 1.815 7.774	1.800 1.843
INVERT LEVEL OF DRAIN	46.400 46.376 40.418	39.923 39.880
DESIGN (& EXISTING) SURFACE LEVEL	48.196 (42.425)	41.723 (42.012)
CHAINAGES	-1.894 2.400 0.506	7.061 7.567

LINE 48

507090.017E 6935786.655N	507091.394E 6935786.259N
1/48B	2/48
IPWEA DOME TOP FIELD INLET 1200x1200	DOME TOP FIELD INLET OVER 1200 CHAMBER STRUCTURAL DESIGN REQUIRED

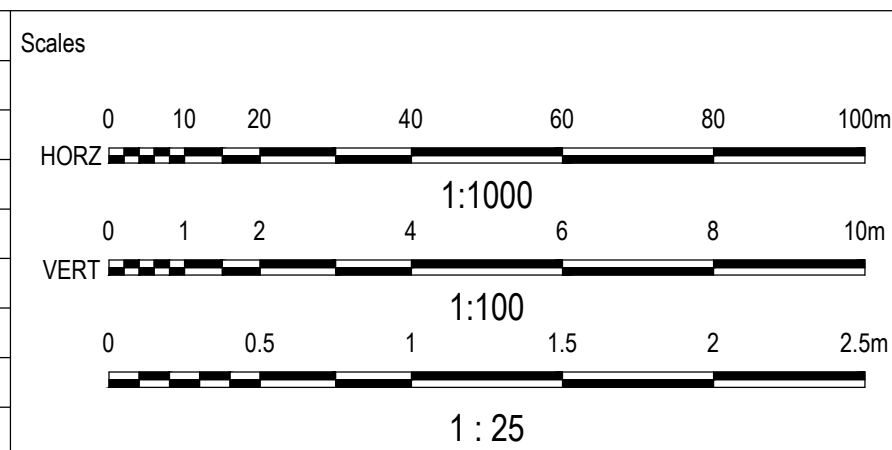
48B



- NOTES:
- SEGMENT BC IS THE PIPE LENGTH MEASURED ALONG THE CENTERLINE.
 - THE CHAINAGE DIFFERENCE BETWEEN THE TWO SWD STRUCTURES (SHOWN IN THE LONG SECTION) IS THE SUM OF SEGMENTS AB, BC, AND CD

CHAINAGE DIFFERENCE BETWEEN SWD STRUCTURES
NTS

01	ORIGINAL ISSUE	JV	MB	GE	19.05.26
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Planner

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Project Manager	A. CONNOLLY	Grid	MGA (ZONE 56)
Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

MCLEOD ROAD INDUSTRIAL ESTATE
STAGE 2

STORMWATER DRAINAGE
LONGITUDINAL SECTION

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Project Number	30131743
Issue	01

MRI-AAP-DD-02-DRG-CV-0441

SEWER NOTES

- ALL WORK & MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SOUTH EAST QUEENSLAND SEWERAGE CODE SPECIFICATIONS & STANDARDS.
- UNLESS SPECIFIED OTHERWISE ALL MATERIALS & WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
- THE CONSTRUCTION OF THE SEWERAGE WORK SHOWN ON THIS DRAWING SHALL BE INSPECTED BY AN ENGINEER WHO HAS RPEQ REGISTRATION. SEWERAGE WORKS NOT COMPLYING WITH THIS REQUIREMENT WILL NOT BE PERMITTED TO CONNECT INTO THE SEQ SERVICE PROVIDER SEWERAGE SYSTEM.
- ALL WORK ASSOCIATED WITH LIVE SEWERS OR MAINTENANCE HOLES SHALL BE CARRIED OUT BY THE SEQ SERVICE PROVIDER AT THE DEVELOPER'S COST.
- ALL PIPES & MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE 'ACCEPTED PRODUCTS & MATERIALS' LIST.
- WHERE PIPES ARE LAID IN FILL, THE FILLING SHALL BE CARRIED OUT IN LAYERS NOT EXCEEDING 300mm (LOOSE) IN DEPTH & SHALL BE COMPACTED UNTIL THE COMPACTION IS NOT LESS THAN 95% OF THE MATERIALS MAXIMUM COMPACTION WHEN TESTED IN ACCORDANCE WITH A.S. 1289 (MODIFIED COMPACTION). TESTING SHALL BE CARRIED OUT AFTER EACH ALTERNATE LAYER. IN ALL SUCH CASES APPROVAL OF CONSTRUCTED SEWERS WILL NOT BE ISSUED BY THE SEQ SERVICE PROVIDER UNLESS CERTIFICATES ARE PRODUCED CERTIFYING THAT THE REQUIRED COMPACTION HAS BEEN ACHIEVED.
- WHERE SEWERS HAVE A GRADE OF 1 IN 20 OR STEEPER, BULKHEADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SEQ SEWER CODE.
- THE CONTRACTOR SHALL VERIFY THE LOCATION & DEPTH OF EXISTING SERVICES WITH RELEVANT AUTHORITIES BEFORE COMMENCING WORKS.
- SEWERS SHALL BE DISUSED /ABANDONED IN ACCORDANCE WITH PROCEDURES SET OUT IN THE SEQ SEWER CODE.
- BENCH MARK & LEVELS TO AHD.
- EXISTING ALLOTMENTS REQUIRING A PROPERTY CONNECTION FROM EXISTING SEWERS SHALL BE PROVIDED BY THE SEQ SERVICE PROVIDER AT THE DEVELOPERS COST.
- ALL MANHOLES 1500mm DIAMETER AND LARGER AND/ OR MANHOLES GREATER THAN 4.0m IN DEPTH TO BE LINED AS PER SOUTH EAST QUEENSLAND SEWERAGE CODE. REFER SEQ-SPS-1407 FOR DETAILS.
- ALL MAINTENANCE HOLES ARE TO BE CONSTRUCTED USING CONCRETE CONTAINING CALCAREOUS AGGREGATE. IF CALCAREOUS AGGREGATE CONCRETE IS NOT AVAILABLE FOR MAINTENANCE HOLES POURED AFTER 1 AUGUST 2016, AN APPROVED INTERNAL PE LINER CAST IN PLACE IS TO BE CONSTRUCTED. MAINTENANCE HOLES POURED PRIOR TO THIS DATE WITHOUT USING CALCAREOUS AGGREGATE CONCRETE WILL ONLY BE ACCEPTED WITH SUFFICIENT (AS DETERMINED BY THE SUPERINTENDENT) PROOF THAT ALL REASONABLE EFFORTS WERE MADE TO SOURCE CALCAREOUS AGGREGATE CONCRETE.

VEGETATION PROTECTION

- A. TREES LOCATED ALONG THE FOOTPATH SHALL BE, TRANSPLANTED PRIOR TO CONSTRUCTION, OR REPLACED IF DESTROYED.
- B. WHEN WORKING WITHIN 4m OF TREES, RUBBER OR HARDWOOD GIRDLES SHALL BE CONSTRUCTED WITH 1.8m BATTENS CLOSELY SPACED & ARRANGED VERTICALLY FROM GROUND LEVEL. GIRDLES SHALL BE STRAPPED TO TREES PRIOR TO CONSTRUCTION & REMAIN UNTIL COMPLETION.
- C. TREE ROOTS SHALL BE TUNNELLED UNDER, RATHER THAN SEVERED. IF ROOTS ARE SEVERED THE DAMAGED AREA SHALL BE TREATED WITH A SUITABLE FUNGICIDE. CONTACT RELEVANT COUNCIL ARBORIST FOR FURTHER ADVICE.
- D. ANY TREE LOPPING REQUIRED SHOULD BE UNDERTAKEN BY AN APPROVED ARBORIST.

SOIL

- A. TOPSOIL & SUBSOIL SHALL BE STOCKPILED SEPARATELY.
- B. CARE SHALL BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STORMWATER SYSTEM. THIS MAY INVOLVE PLACING APPROPRIATE SEDIMENT CONTROLS AROUND STOCKPILES.

CREEK CROSSINGS

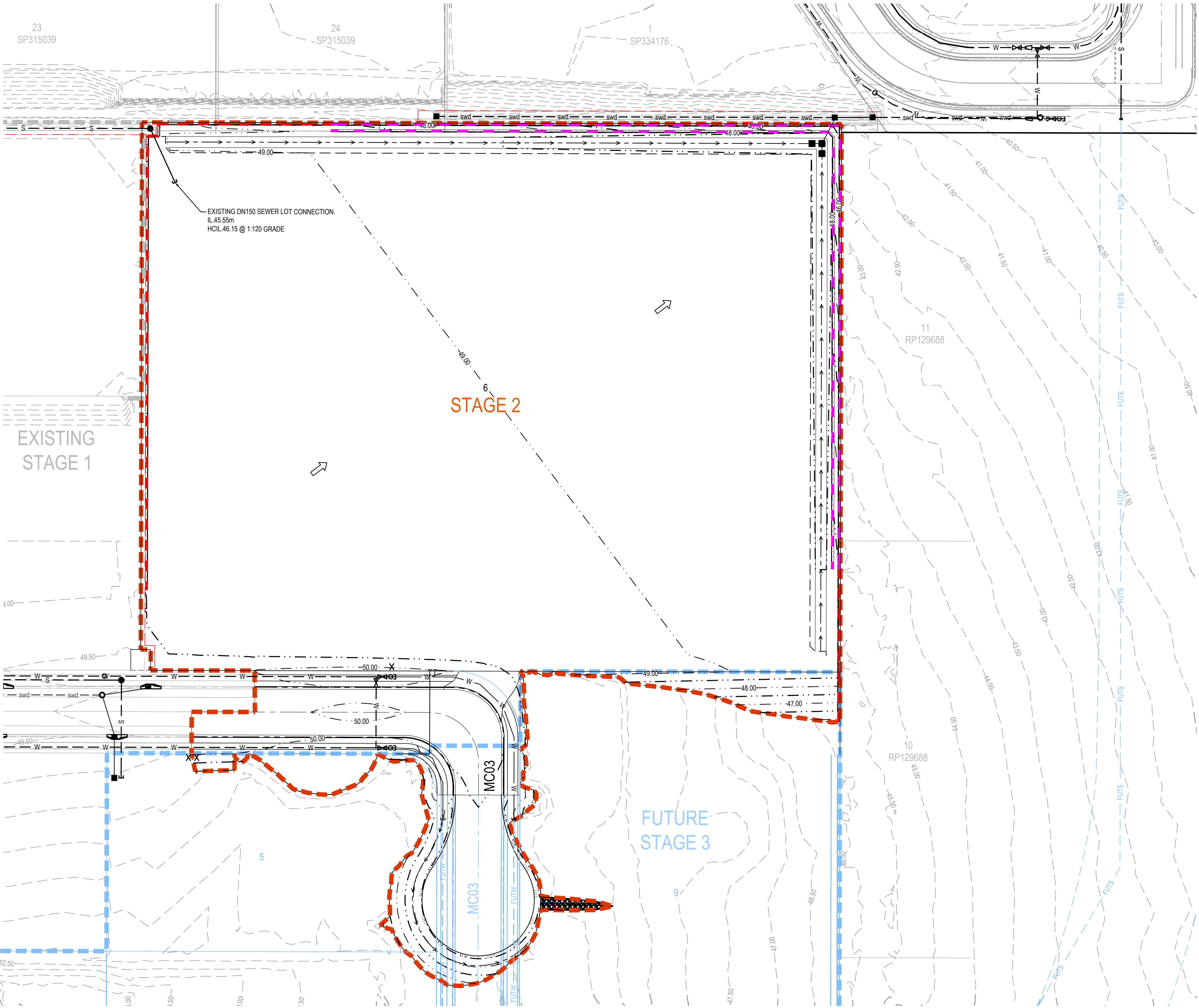
- A. SILTATION CONTROL MEASURES SHALL BE PLACED DOWNSTREAM OF ANY EXCAVATION WORK.
- B. APPROPRIATE SEDIMENT CONTROLS SHALL BE USED TO PREVENT SEDIMENT FROM ENTERING THE CREEK.
- C. NO SOIL SHALL BE STOCKPILED WITHIN 5m OF THE CREEK.

REHABILITATION

- A. PREDISTURBANCE SOIL PROFILES & COMPACTION LEVELS SHALL BE REINSTATED.
- B. PREDISTURBANCE VEGETATION PATTERNS SHALL BE RESTORED.

SAFETY

- A. THE DESIGN & CONSTRUCTION OF THE WORKS SHALL COMPLY WITH ALL QUEENSLAND LEGISLATION.



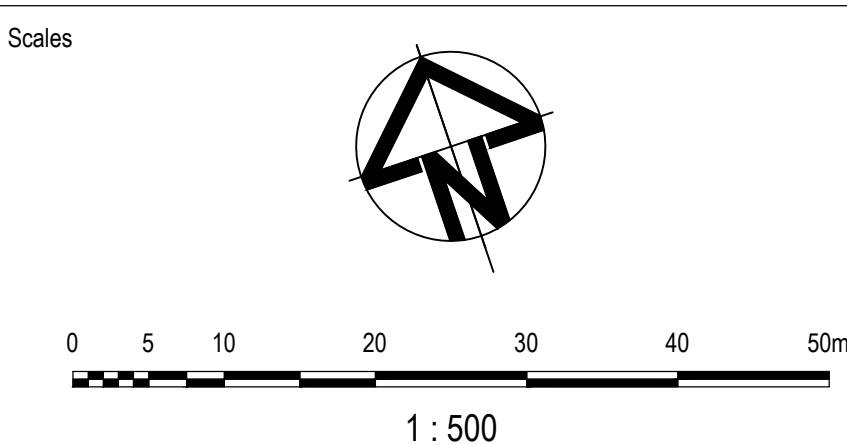
LEGEND

- LOCAL GRAVITY SEWERAGE LINE, MANHOLE & STRUCTURE NUMBER
- EXISTING EASEMENT
- PROPOSED STORMWATER DRAINAGE
- PROPOSED WATER RETICULATION
- FUTURE SEWERAGE RETICULATION
- EXISTING SEWERAGE RETICULATION
- EXISTING STORMWATER DRAINAGE
- EXISTING WATER RETICULATION
- PROPOSED SURFACE CONTOURS
- EXISTING SURFACE CONTOURS
- PROPOSED BARRIER KERB AND CHANNEL
- FUTURE KERB AND CHANNEL
- EXISTING KERB AND CHANNEL
- DOUBLE TIER CONCRETE SLEEPER RETAINING WALL
- SINGLE TIER CONCRETE SLEEPER RETAINING WALL
- EXISTING RETAINING WALL
- EXTENT OF WORKS BOUNDARY
- EXISTING STAGE BOUNDARY
- FUTURE STAGE BOUNDARY
- SLOPE OF LOT
- SWALE DRAIN

LIVE WORKS SCHEDULE IS AS PER LIVE WORKS TABLE IN STANDARD DRAWING SEQ-SEW-1102-1. SUFFICIENT DETAIL WILL BE PROVIDED AT THE PRE START MEETING.

ALL LIVE WORKS TO COUNCIL'S EXISTING SEWER NETWORK TO BE CARRIED OUT BY LCC AT THE APPLICANT'S EXPENSE, OR BY CONTRACTOR UNDER SUPERVISION BY LCC AND SUBJECT TO LIVE WORKS APPROVAL AT NO COST TO COUNCIL.

01	ORIGINAL ISSUE	JV	HG	GE	19.05.26
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ANDREATA
DEVELOPMENTS

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Verified	G. ELLIS	R.P.E.Q. No: 17942 Date 21 May 26	

Project

**MCLEOD ROAD
INDUSTRIAL ESTATE
STAGE 2**

Title

**SEWER RETICULATION
LAYOUT PLAN**

ARCADIS

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Project Number	30131743
Issue	01

MRI-AAP-DD-02-DRG-CV-0521

1. THE CONTRACTOR SHALL CONTACT ALL RELEVANT SERVICE AUTHORITIES FOR DETAILED LOCATION OF SERVICES PRIOR TO COMMENCEMENT OF WORKS ON THE SITE. ANY DAMAGE TO EXISTING SERVICES WILL BE RECTIFIED AT THE CONTRACTORS EXPENSE.
2. MAINS SHALL BE LAID ON A 1425m OFFSET ALIGNMENT FROM THE PROPERTY BOUNDARY UNLESS NOTED OTHERWISE.
3. ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH CURRENT SOUTH EAST QUEENSLAND WATER SUPPLY CODE SPECIFICATIONS AND STANDARDS.
4. UNLESS SPECIFIED OTHERWISE ALL MATERIALS AND WORK SHALL COMPLY WITH THE RELEVANT AUSTRALIAN STANDARDS.
5. ADOPT LIP OF KERB OR SHOULDER OF ROAD AS PERMANENT LEVEL. COVER ON MAINS FROM PERMANENT LEVEL. TO BE MINIMUM 750mm - 0150 AND MINIMUM 1000mm - 0225 FOR INDUSTRIAL/ COMMERCIAL AREAS AS SHOWN IN TABLE 7.2 OF SEQ CODE AND STD DRG SEQ-WAT-1200-2.
7. CONDUITS TO BE INSTALLED IN ACCORDANCE WITH THE STANDARD DRAWINGS.
8. ALL MATERIALS USED IN THE WORKS SHALL COMPLY WITH THE SEQ-SP'S ACCEPTED PRODUCTS AND MATERIALS LIST OR BE APPROPRIATELY SHOWN, LISTED AND DEFINED IN THE ENGINEERING SUBMISSION SO THAT THE ALTERNATIVE PRODUCT OR MATERIAL CAN BE ASSESSED AND IF APPROPRIATE, APPROVED BY THE SEQ-SP.
9. TEST/CHLORINATION POINTS TO BE INSTALLED IN ACCORDANCE WITH STANDARD DRAWING NO SEQ-WAT-1410-1.
10. THE CONSTRUCTION OF THE WATER RETICULATION WORK SHOWN ON THIS DRAWING MUST BE SUPERVISED BY AN ENGINEER WHO HAS RPEQ REGISTRATION. WORKS NOT COMPLYING WITH THIS REQUIREMENT WILL NOT BE PERMITTED TO CONNECT TO THE RETICULATION SYSTEM.
11. A COUNCIL INSPECTION IS REQUIRED TO INSPECT THE FITTINGS PRIOR TO BACKFILLING THE MAIN.
12. SERVICES CROSSING A ROAD ARE TO BE INSTALLED IN A CONDUIT UNABLE TO EXTEND 300mm BEYOND THE KERB, AND IS TO BE LAID IN ACCORDANCE WITH CLAUSE 5.11.3 AND 5.11.6 OF THE SEQ W8S D&C CODE, AND WITH DRAWINGS 8-00322 AND 8-00324.
13. SERVICES SHOULD BE LOCATED ON THE OPPOSITE SIDE PROPERTY BOUNDARY FROM THE ELECTRICAL SERVICE PILLAR, AND ALSO LOCATED 300mm FROM PROPERTY BOUNDARY, AND 1000mm FROM ANY ELECTRICAL SUPPLY OR SOURCE (E.G. STREETLIGHTS).
14. ALL WATER MAINS TO BE TYPE C EMBEDDED IN ACCORDANCE WITH STD DWG SEQ-WAT-1200-1, SEQ-WAT-1200-2 AND SEQ-WAT-1201-1. PROPOSED DN225 WATERMAIN ALIGNMENT HAS BEEN SETOUT AT 2.575m OFFSET FROM THE FUTURE ULTIMATE RAI DRIVE INDUSTRIAL COLLECTOR ROAD NOMINAL KERB LINE.
16. EXISTING ROAD PAVEMENT TO BE REINSTATED AND WATERMAIN ROAD CROSSING TRENCH AND BEDDING TO BE UNDERTAKEN IN ACCORDANCE WITH 'TYPE L' CONSTRUCTION FOR CROSSING SEALED ROADS ON SEQ STD DWG SEQ-WAT-1204-1.

1. EXCAVATE AND EXPOSE EXISTING MAIN AT PROPOSED LIVE CONNECTION POINTS TO ENSURE CONNECTION VERTICAL LEVEL OF NEW MAIN AND ENSURE PROPOSED POINT OF CONNECTION IS MIN. 1.5m AWAY FROM EXISTING SPIGOT / SOCKET JOINT.
2. CONSTRUCT NEW DN150 WATERMAIN UP TO CONNECTION LIVE WORKS CONNECTION POINTS INCLUDING ROAD CROSSING WHERE REQUIRED.
3. UNDERTAKE CHLORINATION AND PRESSURE TESTING OF NEW MAIN TO SEQ CODE REQUIREMENTS.
4. LIAISE WITH LOGAN WATER FOR SHUT DOWN REQUIREMENTS AND ISOLATION POINTS OF EXISTING MAIN.
5. EXISTING DN150 WATERMAIN TO BE DE-ENERGISED IF REQUIRED AND CONNECTION POINT ISOLATED BY LOGAN WATER.
6. LOGAN WATER TO MAKE CONNECTION TO EXISTING MAIN USING PRE-CHLORINATED FITTINGS, REMOVING PORTION OF EXISTING WATERMAIN WHERE NECESSARY.
7. LOGAN WATER TO REINSTATE MAIN INTO SERVICE.
8. ANY REDUNDANT FITTINGS OR WATER MAIN TO BE REMOVED AND APPROPRIATELY DISPOSED OF BY CIVIL CONTRACTOR.

EXISTING
STAGE 1

CONNECT TO EXISTING Ø150 PVC-M
WATER MAIN. REFER LIVE WORKS
TABLE ITEM (1) FOR DETAILS.

CONNECT TO EXISTING Ø150 PVC-M
WATER MAIN. REFER LIVE WORKS
TABLE ITEM (2) FOR DETAILS.

5

NO.	DESCRIPTION	WATER DIA / MAT.	ADJACENT LOT No.	DEPTH OF COVER
(A)	CONTRACTOR TO INSTALL NEW MAIN AND LEAVE 1.0M SHORT OF PROPOSED CONNECTION.	150Ø PVC-M PN16 SERIES 2	LOT 6	0.750m
(B)	FOLLOWING SUCCESSFUL "ON MAINTENANCE" INSPECTION AND TESTING, LOGAN WATER (OR CONTRACTOR UNDER LOGAN WATER SUPERVISION) TO COMPLETE END OF LINE CONNECTION INCLUDING REMOVAL OF EXISTING THRUST BLOCK, (2) x 150mm GIBAULT JOINTS AND 3.0m OF 150Ø PVC-M PN16 WATER MAIN.			
(A)	CONTRACTOR TO INSTALL NEW MAIN AND LEAVE 1.0M SHORT OF PROPOSED CONNECTION.	150Ø PVC-M PN16 SERIES 2	LOT 5	0.750m
(B)	FOLLOWING SUCCESSFUL "ON MAINTENANCE" INSPECTION AND TESTING, LOGAN WATER (OR CONTRACTOR UNDER LOGAN WATER SUPERVISION) TO COMPLETE END OF LINE CONNECTION INCLUDING REMOVAL OF EXISTING THRUST BLOCK, (2) x 150mm GIBAULT JOINTS AND 3.0m OF 150Ø PVC-M PN16 WATER MAIN.			

	PROPOSED Ø150 PN20 UPVC-M WATER MAIN
	PROPOSED D1CL ROAD CROSSING
	PROPOSED STORMWATER DRAINAGE
	PROPOSED SEWERAGE RETICULATION
	EXISTING WATER RETICULATION
	EXISTING STORMWATER DRAINAGE
	EXISTING SEWERAGE RETICULATION
	FUTURE WATER RETICULATION
	PROPOSED BARRIER KERB AND CHANNEL
	FUTURE KERB AND CHANNEL
	EXISTING KERB AND CHANNEL
	EXISTING EASEMENT
	DOUBLE TIER CONCRETE SLEEPER RETAINING WALL
	SINGLE TIER CONCRETE SLEEPER RETAINING WALL
	EXISTING RETAINING WALL
	EXTENT OF WORKS BOUNDARY
	EXISTING STAGE BOUNDARY
	FUTURE STAGE BOUNDARY
	SWALE DRAIN

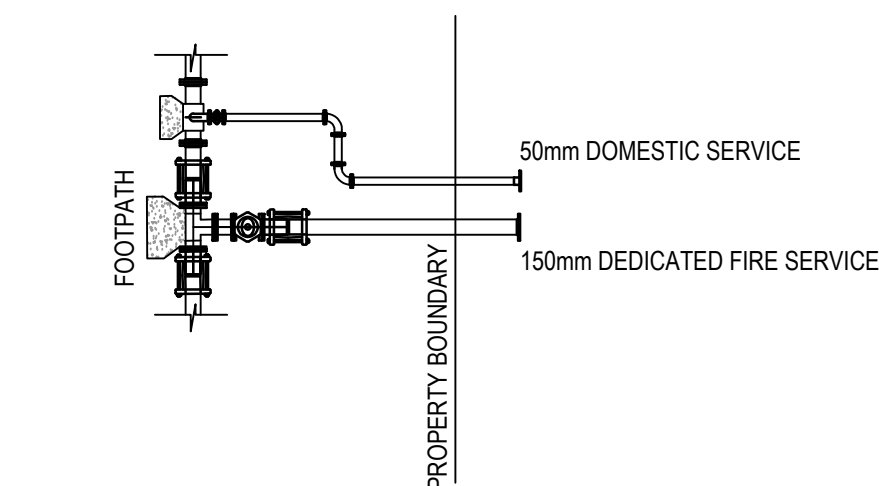
- A. TREES LOCATED ALONG THE FOOTPATH SHALL BE, TRANSPLANTED PRIOR TO CONSTRUCTION, OR REPLACED IF DESTROYED.
- B. WHEN WORKING WITHIN 4m OF TREES, RUBBER OR HARDWOOD GIRDLES SHALL BE CONSTRUCTED WITH 1.8m BATTENS CLOSELY SPACED & ARRANGED VERTICALLY FROM GROUND LEVEL. GIRDLES SHALL BE STRAPPED TO TREES PRIOR TO CONSTRUCTION & REMAIN UNTIL COMPLETION.
- C. TREE ROOTS SHALL BE TUNNELLED UNDER, RATHER THAN SEVERED. IF ROOTS ARE SEVERED THE DAMAGED AREA SHALL BE TREATED WITH A SUITABLE FUNGICIDE. CONTACT RELEVANT COUNCIL ARBORIST FOR FURTHER ADVICE.
- D. ANY TREE LOPPING REQUIRED SHOULD BE UNDERTAKEN BY AN APPROVED ARBORIST.

A. TOPSOIL & SUBSOIL SHALL BE STOCKPILED SEPARATELY.
B. CARE SHALL BE TAKEN TO PREVENT SEDIMENT FROM ENTERING THE STORMWATER SYSTEM. THIS MAY INVOLVE PLACING APPROPRIATE SEDIMENT CONTROLS AROUND STOCKPILES.

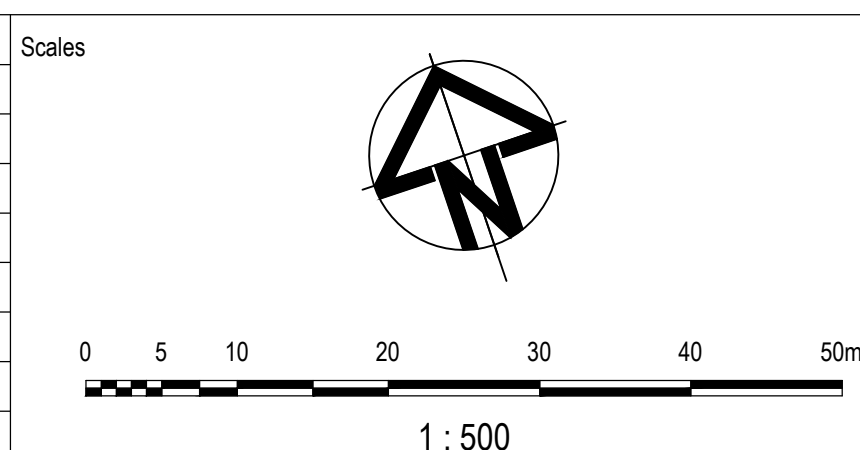
- A. SILTATION CONTROL MEASURES SHALL BE PLACED DOWNSTREAM OF ANY EXCAVATION WORK.
- B. APPROPRIATE SEDIMENT CONTROLS SHALL BE USED TO PREVENT SEDIMENT FROM ENTERING THE CREEK.
- C. NO SOIL SHALL BE STOCKPILED WITHIN 5m OF THE CREEK.

- A. PREDISTURBANCE SOIL PROFILES & COMPACTION LEVELS SHALL BE REINSTATED.
- B. PREDISTURBANCE VEGETATION PATTERNS SHALL BE RESTORED.

A. THE DESIGN & CONSTRUCTION OF THE WORKS SHALL COMPLY WITH ALL QUEENSLAND LEGISLATION.



STANDARD COMMERCIAL NON-ROAD
CROSSING WATER SERVICES
NOT TO SCALE



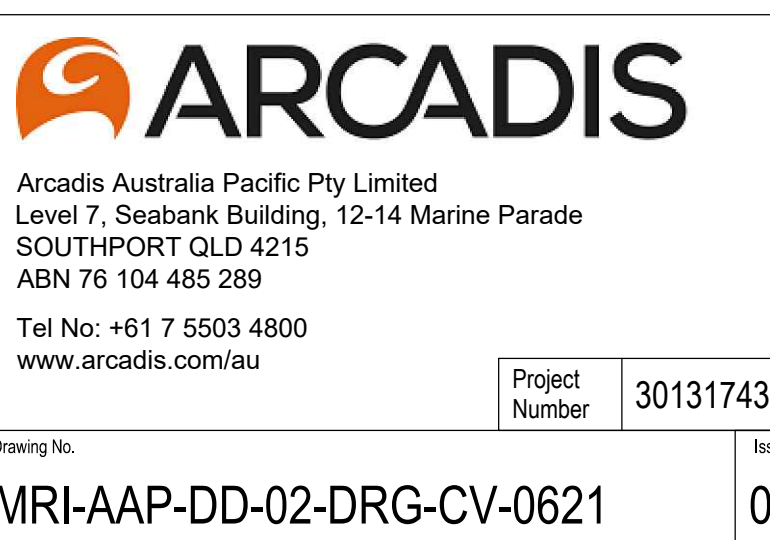
Surveyor	 orion spatial solutions
Planner	 development directive

Client

The logo for Andreatta Developments features a stylized blue 'a' with a green leaf on top. Below the 'a' is the word 'ANDREATTA' in large, bold, blue capital letters, and 'DEVELOPMENTS' in smaller, blue capital letters below it, separated by a thin green horizontal line.

Status			
FOR APPROVAL CONSTRUCTION SUBJECT TO APPROVAL			
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Project	MCLEOD ROAD INDUSTRIAL ESTATE STAGE 2
Title	WATER RETICULATION LAYOUT PLAN



ANDREATTA PROPERTIES PTY LTD

STAGE 2 & 3 - MCLEOD ROAD INDUSTRIAL, PARK RIDGE

STORMWATER MANAGEMENT PLAN

Author Alex Connolly

Checker Alex Connolly

Approver Gary Ellis
RPEQ17942

Report No GA0011-30131743-AAR

Date 20/05/2026

Revision Text 04

This report has been prepared for Andreatta Properties Pty Ltd in accordance with the terms and conditions of appointment for the Stage 2 & 3 - Mcleod Road Industrial Project dated March 2022. Arcadis Australia Pacific Pty Limited (ABN 76 104 485 289) cannot accept any responsibility for any use of or reliance on the contents of this report by any third party.

REVISIONS

Revision	Date	Description	Prepared by	Approved by
01	12/12/2024	Original Issue	LS	RM
02	10/07/2025	IR Response	OP	EM
03	25/11/2025	Further IR Response	OP	RM
04	20/05/2026	Minor layout/catchment change	AC	GE

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APPENDICES

APPENDIX A

Architectural & Engineering Plans

APPENDIX B

Stormwater Management Asset Information

1 EXECUTIVE SUMMARY

Andreatta Properties has commissioned Arcadis to prepare a Stormwater Management Plan (SMP) for a Stage 2 & 3 within the McLeod Road industrial subdivision development located at Park Ridge Road, Park Ridge. The proposed development is comprised of multiple industrial lots.

This report is provided in support of an ROL/MCU application over the subject site, subsequent to a previous ROL application (application number RL/111/2022/1) over the larger landholding. The ROL/MCU application related to this report is for the purpose of development of Stages 2 & 3 into multiple industrial lots. The original ROL application for the first stage of development is RL/111/2022/1 and should be referred to in conjunction with this report for the master planned civil infrastructure to service the site.

This report demonstrates the proposed development can be constructed and operated in accordance with the Water Sensitive Urban Design (WSUD) Requirements of Council, the South-East Queensland State Planning Policy (SPP) (2017), the Queensland Development Code, the Queensland Urban Drainage Manual (QUDM) (2016) and the Environmental Protection (Water) Policy (2009).

The two primary objectives of this SMP are to ensure that:

1. Suitable measures are incorporated in the development to ensure that there are no adverse impacts to downstream receiving waterways, property or infrastructure resulting from any increase to peak discharging stormwater flow rates.

This report demonstrates that the subject site complies with the overarching stormwater quantity strategy outlined in Arcadis' overall Stormwater Management Plan (GA0002-30131743-AAR-SMP - RL/111/2022/1). No on-site detention is required to facilitate the development as developed flows are catered for in the planning of the downstream regional detention basin north of the site.

The SMP within ROL application RL/111/2022/1 should be referred to for the overall strategy for the catchment and the details of the regional detention system. This report specifically addresses the discharge from the subject site into the regional detention system.

2. Details of a proposed stormwater quality treatment train are provided to ensure the discharge of stormwater from the site is of adequate quality standards to comply with the requirements of Logan City Council (LCC) and the South-East Queensland Healthy Waterways Partnership.

Water quality objectives have been achieved by the provision of a proposed stormwater treatment train which has been specifically designed and verified to achieve the necessary water quality objectives in the operational phase of the development. The proposed treatment system includes the following:

- Bio-pod tree pits to manage the road network.
- Private bio-retention system for each lot as part of future applications.

All the stormwater quality controls detailed in this document are contained within the development site will be handed over to the LCC following the completion of the 'On Maintenance' period post construction. Regular maintenance of the proposed treatment measures must be undertaken to ensure the continuing performance of the stormwater quality treatment train.

Erosion and sediment control measures during construction shall be undertaken in accordance with the SPP and Council requirements.

2 EXISTING SITE CHARACTERISTICS

2.1 Previous Site Application

The subject site is part of a master planned industrial and mixed-use development site. The master planned development site's initial Stage 1 application reference number is RL/111/2022/1. This report seeks to demonstrate that the proposed development will be serviced in accordance with the allowances set in the ROL RL/111/2022/1 and the construction of the downstream regional detention basin.

2.2 Site Description, Existing Land Use and Area

The site is bordered by Park Ridge Road to the south, the Green Road industrial development to the north under application number OW/150/2021 and existing rural residential land to the east and west. The development site covered under the ROL has a total area of 16.6ha; Stages 2 & 3 forms 13.865ha of this area.

In its current state, the site is consisting of residential dwellings, permanent and temporary structures, dams and grassed areas. In terms of vegetation, the site contains medium dense vegetation within lot 5 RP 129688. While lot 4 RP 129688 consists of mostly cleared area with short grass cover. The majority of the remaining lots consist of houses and short grass cover.

A locality plan is provided below in Figure 2-1.



Figure 2-1 Site Locality Plan (Aerial Imagery Courtesy of Nearmap 2023)

2.3 Existing Topography

The first stage of development underwent earthworks under OW/186/2023 to provide a profiled pad suitable for access, drainage and services. The site is proposed to predominantly grade to the northeast with approximately 0.5%-2% slope. The site is contained within three stormwater catchments with flows directed generally northeast, which ultimately enters the existing conveyance path north of the site flowing in a northerly direction towards Green Road.

2.4 LCC Stormwater Priority Infrastructure Plan

The development site sits within a catchment which features a regional detention basin to service the sites stormwater discharge. A review of the LCC Priority Infrastructure Plan (PIP), for trunk stormwater infrastructure Map PIP- 5.0 has identified the following:

- The site is within the Park Ridge B2 service catchment;

- A newly constructed regional stormwater basin is to the north of the site; and
- The site is within a priority infrastructure area

An extract of Council map showing the site and regional basin locations is presented below in Figure 2-2.

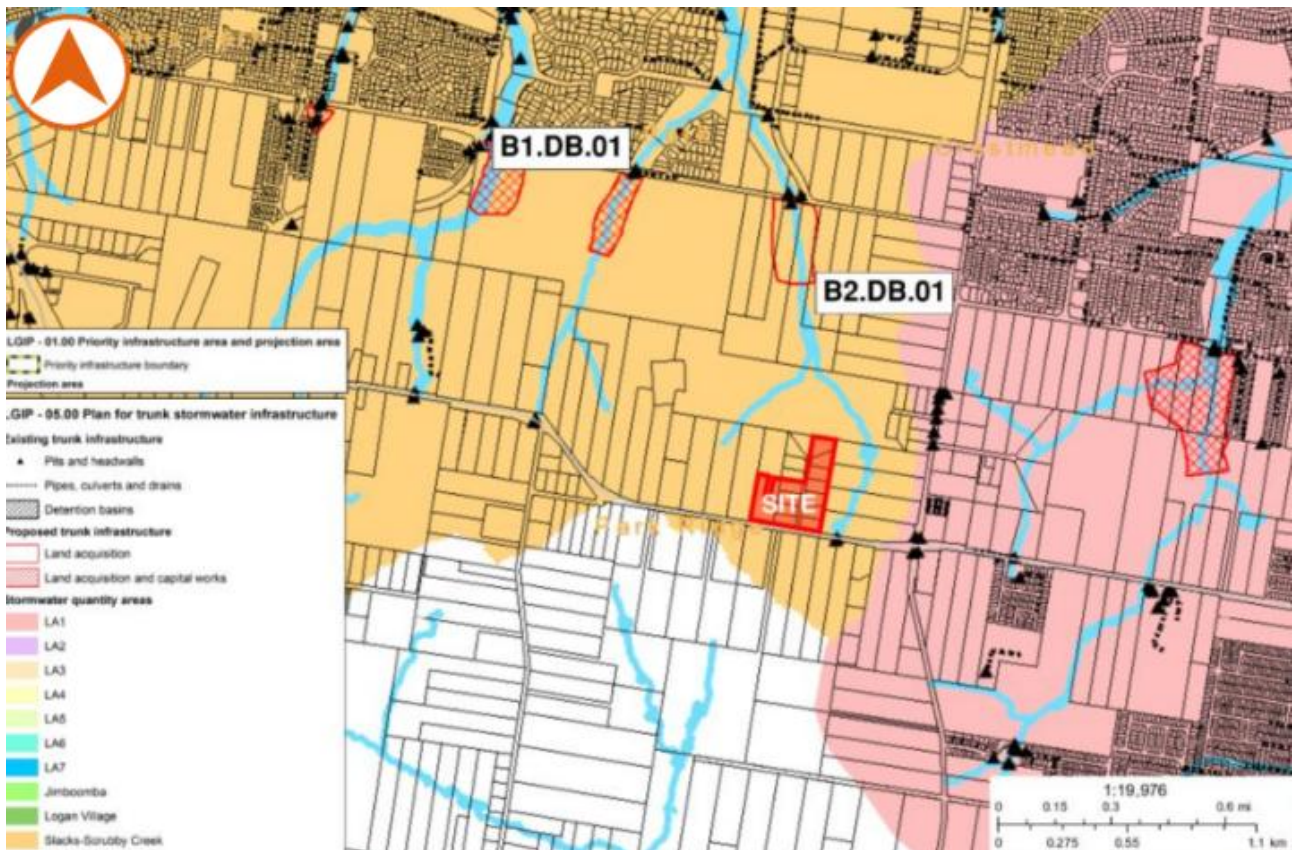


Figure 2-2 Extract from LCC Stormwater PIP Map (Courtesy of LCC)

3 PROPOSED DEVELOPMENT

The proposed development will deliver a transport depot and low impact industry subdivision, including:

- Public services infrastructure including stormwater drainage, sewage and water reticulation; and
- Internal private stormwater treatment devices.

Figure 3-1 depicts the indicative layout proposal for the development.

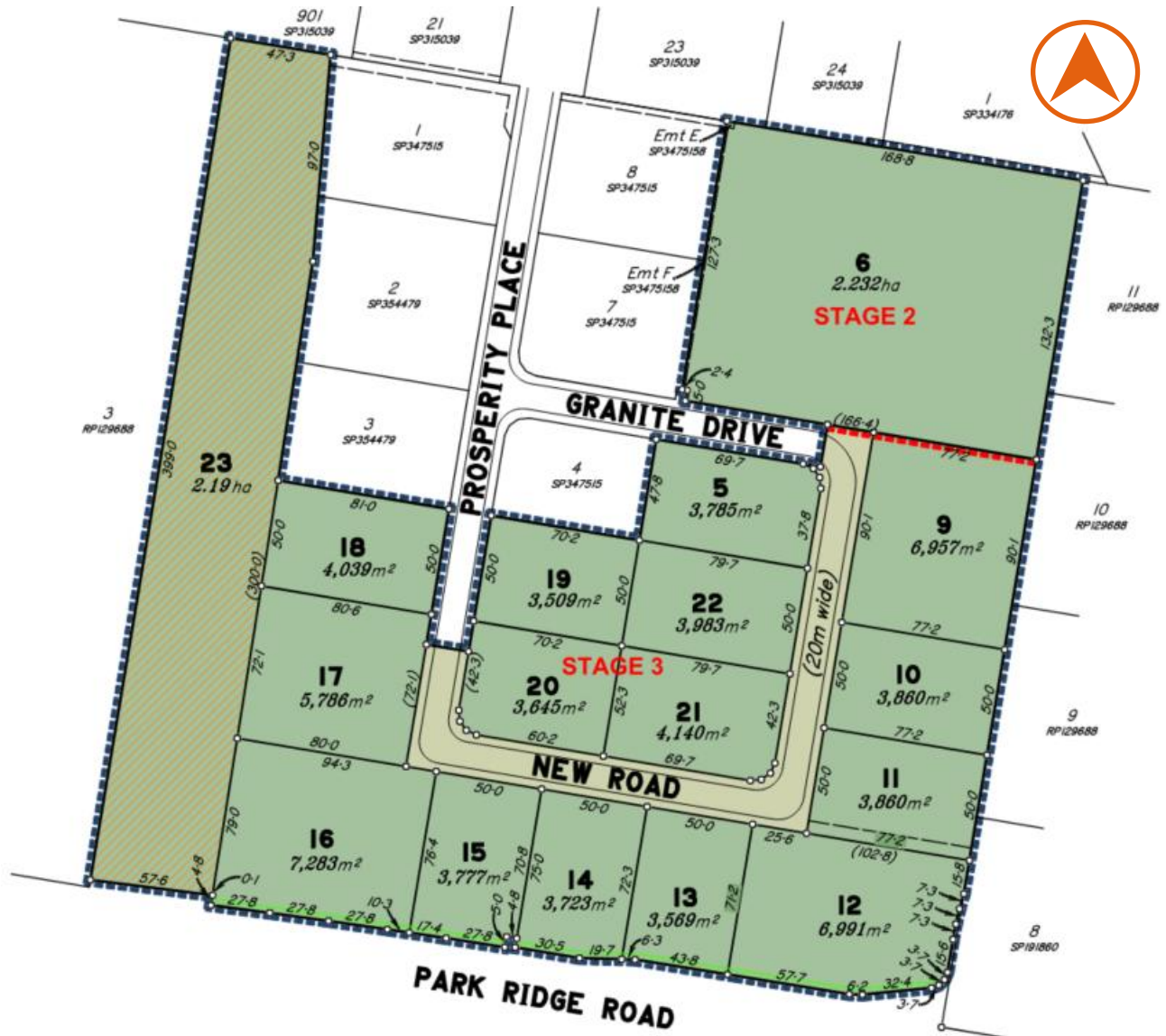


Figure 3-1 Development Proposal Plan (Courtesy of Orion)

4 LAWFUL POINT OF DISCHARGE

4.1 Existing Stormwater Drainage

As noted above, the proposed development site forms part of a master planned development site. As a part of the ROL approval RL/111/2022/1, a Stormwater Management Plan (GA0002-30131743-AAR SMP) was submitted for the associated industrial development. This report described the design and determination of the regional detention system to the north of the subject site proposed under the master Stormwater Management Plan F0002-10026866-AAR SMP (RL/61/2019), making allowance for the development of the newly created lots.

This specific report will look to demonstrate that the development of Stages 2 & 3 complies with the allowances made in sizing the regional detention system. This report will focus solely on the development site, whilst aligning with the above-mentioned SMP's strategy.

The development site generally grades northeast towards the proposed extension of Prosperity Place which ultimately conveys flows to a drainage corridor that acts to services all stages of the previous development to the north (RL/61/2019) as well as Stage 1 of the Mcleod Road Industrial Estate (RL/111/2022/1). This central drainage corridor discharges from south to north. Runoff conveyed by this corridor exits the site to the north where it combines with another major conveyance path approximately 400m downstream of Green Road.

An existing catchment plan has been provided in the Engineering Drawings in Appendix A.

4.2 Proposed Discharge Characteristics and QUDM Lawful Point Of Discharge Test

In the developed case, the site demonstrates compliance with the QUDM (2017) as follows:

The location of the discharge is under the lawful control of the local government or other statutory authority from whom permission to discharge has been received. This will include park, drainage or road reserve, stormwater drainage easement.

This report demonstrates that the discharge from Stages 2 & 3 of the development complies with QUDM (2017) by maintaining as much as practically possible the existing discharge characteristics. The discharge includes connection to previously constructed infrastructure and discharge to a future Council LGIP designated road reserve. No on-site detention is required to facilitate the development as developed flows are catered for in the planning of the downstream regional detention basin north of the site.

The SMP within ROL application RL/111/2022/1 should be referred to for the overall strategy for the catchment and the design of the regional detention system. This report specifically addresses the discharge from the subject site into the regional detention system.

When maintain discharging location, the discharge will not cause an actionable nuisance. In general terms this implies no worsening as a result of discharge.

Sections 5, 6 and 7 of this report provide discussions illustrating no actionable nuisance anticipated. It is noted that optimisation of the development sites drainage system will be undertaken during the operational works phase of the development.

Engineering drawings in Appendix A provide further details of the proposed system.

5 STORMWATER MANAGEMENT STRATEGY

As noted above, this site's stormwater management strategy falls within a larger regional catchment plan, designed and documented in the previously submitted ROL application RL/111/2022/1 and overarching ROL application RL/61/2019. The stormwater strategy for the master planned development has made allowance for the development site. This section of the report will provide a summary of the strategy and how the development will fit into the overall scheme outlined in the previous Stormwater Reports.

5.1 Objective

The main objective of this assessment is to show flows generated by the proposed development are generally in accordance with the regional assessment strategy documented in the Stormwater Management Plan, GA0002-30131743-AAR (associated with development approval RL/111/2022/1).

The subject site will tie into the overarching hydrologic assessment strategy as per Arcadis' Stormwater Management Plan, F0002-10026866-AAR SMP (RL/61/2019).

5.2 Catchments

The site is currently split into three catchments, East-1, East-2 and East-3. For the proposed development, catchments will be consolidated into two catchments with D-east-1 discharging north into the existing infrastructure constructed under easement in OW/150/2021 and D-east-2 discharging to the future LGIP road reserve and ultimately the drainage corridor leading to the regional basin. Refer to Table 5-1 and Figures 5-1 and 5-2 below.

This will be accomplished via a network of pit and pipe drainage infrastructure, with both stages draining into the water way corridor adjacent to the site.

Ultimately, the sites runoff is conveyed via this waterway corridor north towards Green Road to the regional detention basin in accordance with the Stormwater Management Plan F0002-10026866-AAR (RL/61/2019).

Table 5-1 Summary of Catchments

Catchment	Catchment Area (ha)
E-East-1	2.1385
E-East-2	2.4252
E-East-3	4.3931
D-East-1	2.2316
D-East-2	8.0999

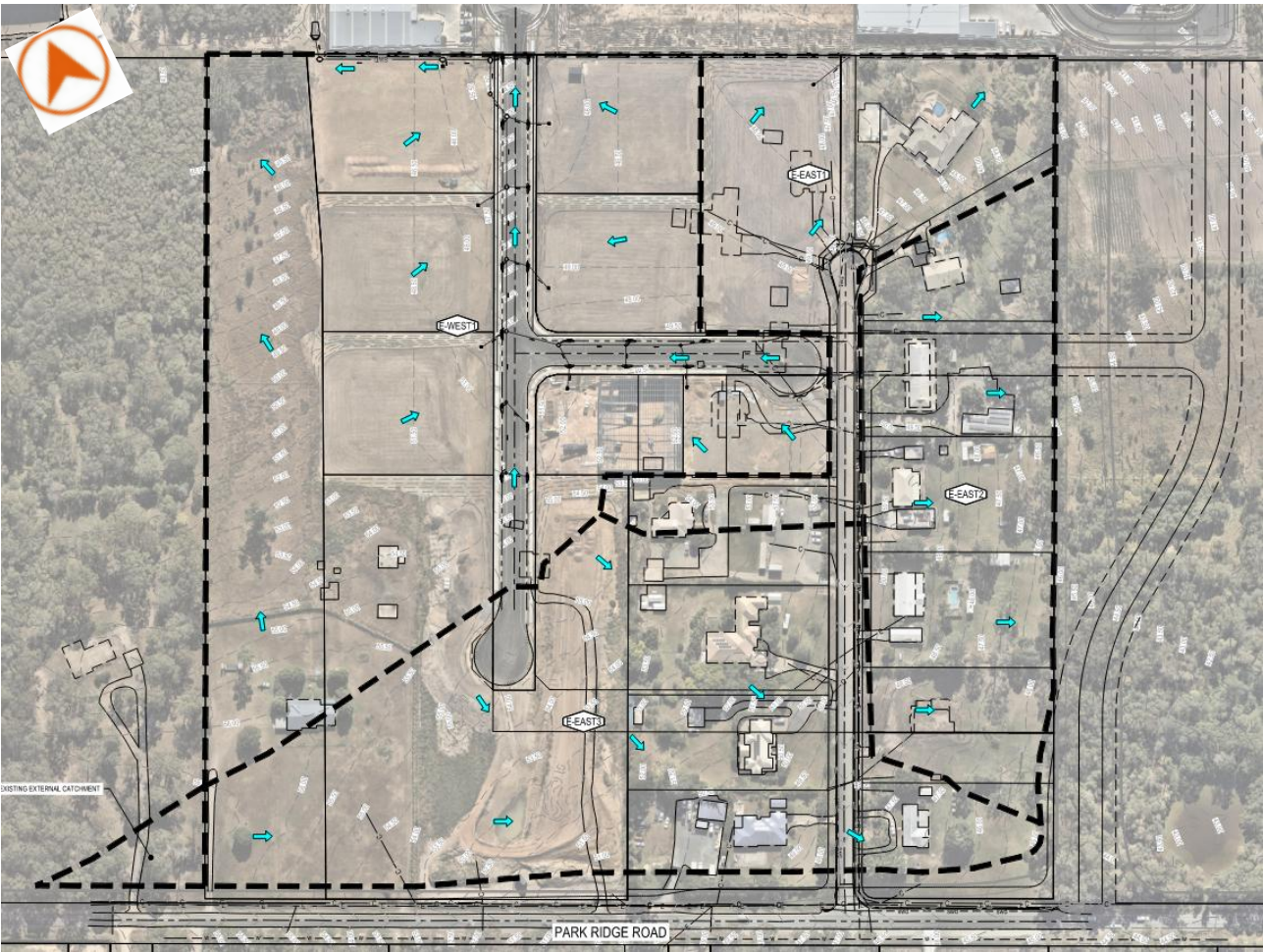


Figure 5-1: Site Catchment Layout Plan - Existing



Figure 5-2: Site Catchment Layout Plan - Developed

5.3 Discharge and Drainage Management

The subject site will utilise infrastructure provided under OW/150/2021 as well as overland flow discharge into Council future road infrastructure and drainage reserve to connect into and discharge captured stormwater runoff from the developed site. Discharged flows from the developed site have been catered for under the downstream regional detention basin provided under RL/61/2019.

In accordance with Section 7 of QUDM (2016), the internal stormwater drainage system is proposed to be designed for Level IV allotment drainage. Therefore, the site will provide 5% AEP (20year) internal pit and pipe drainage, with any larger events discharging via overland flow to surrounding council infrastructure.

6 FLOODING AND CONVEYANCE MANAGEMENT

The development site is not within the Flood Hazard mapping area under the LCC Planning Scheme Flood Hazard Overlay.

7 OPERATIONAL PHASE STORMWATER QUALITY

7.1 Objectives

To prevent degradation of LCC waterways, ecologically sustainable development principles have been embraced and regulated by LCC. The core principles of Water Sensitive Urban Design (WSUD) are to:

- Protect natural ecosystems;
- Integrate stormwater treatment into the urban landscape;
- Protect water quality;
- Reduce runoff and peak flows; and
- Add value while minimising development costs.

With these principles in mind, this stormwater management plan aims to:

1. Identify the water quality and quantity objectives and performance criteria;
2. Estimate the pollutant loads; and
3. Detail within the management plan, strategies aimed at achieving the required objectives.

Water quality objectives during both the construction and operational phases of a development are presented within LCC Planning Scheme Policies and are detailed in this section of this report.

Water quality parameters and the proposed limits applicable for this development have been selected in accordance with the State Planning Policy (2017). The Water Quality reduction targets stipulated by these guidelines are presented in in Table 7-1 below:

Table 7-1 Water Quality Operational Phase Performance Criteria

Pollutant	Criteria
Total Suspended Solids (TSS)	80%
Total Phosphorus (TP)	60%
Total Nitrogen (TN)	45%
Gross Pollutants	90%

7.2 Proposed Stormwater Treatment Devices

WSUD aims to minimise the impact of a development on the natural water cycle by reducing the export of pollutants, sediments and nutrients from the site into the natural watercourse. In order to treat the stormwater runoff from the site, various treatment devices can be used throughout the development area and these concepts can be integrated into the overall design of the road layouts, road cross sections, stormwater layouts and water supply reticulation systems. Stormwater from each development stage will follow a specially designed stormwater quality treatment train prior to discharge from the site, which will ensure compliance with the water quality objectives.

It is noted that treatment train has only been proposed to mitigate water quality for the road area. Each lot will be required to meet the LCC water quality objectives as part of future applications.

The proposed road infrastructure will be treated by seventeen WSUD Bio-Retention Street Tree Pods that will be located in the verge of the roadways.

7.2.1 WSUD Bio-Retention Verge Pods

A bio-retention area is a vegetated region where runoff is filtered through a filter media layer (e.g. sandy loam) as it percolates downwards to receiving underlying drainage. Specific vegetation is to be incorporated into the landscaping of bio-retention areas which effectively reduces nutrient loads. Appendix A of Healthy Waterways' Water Sensitive Urban Design Technical Guidelines for South East Queensland provides guidance on selecting appropriate plant species for systems where plants have a functional role in stormwater treatment.

A typical example of a bio-pod is presented in Figure 7-1 and Figure 7-2 below.



Figure 7-1 Example of a WSUD Bio-Retention Verge Pod Design (Image Courtesy: Water by Design)



Figure 7-2 Example of a WSUD Bio-Retention Verge Pod Design (Image Courtesy: Water by Design)

7.3 Modelling Of The Developed Site (MUSIC)

Modelling of the site was undertaken using the 'Model for Urban Stormwater Improvement Conceptualisation (MUSIC)' as promoted by the LCC and the South-East Queensland Healthy Waterways Partnership. The development was modelled using the lumped catchment approach. An appropriate type of land use was applied to all surface types within the developed catchments. Consequently, a treatment train was established for the site, ensuring that water discharging adheres to the specified water quality objectives.

Meteorological data for input into MUSIC was obtained from Shailer Park (40715 SHAILER) from the Bureau of Meteorology. Six-minute time step rainfall data was obtained for the climate period from 1/1/1990 to 31/12/1999. The catchment parameters of the MUSIC modelling are specified within the South-East Queensland Healthy Waterways Partnerships' Water by Design MUSIC Modelling Guidelines for South East Queensland Version 1 (2010) and have been modelled as such.

Development areas only have been assessed for water quality. The site has been split into 2 catchments for quality treatment, Catchment West and Catchment East; each grading to different treatment areas. Catchment West has been graded to the north-west through streetside bio-pods prior to discharging to the lawful point of discharge. Catchment East is represented by several sub catchments, grading to the secondary lawful point of discharge, again through streetside bio-pods prior to discharging into the existing boundary channel along the south-east.

7.3.1 Pollutant Source Node Details

The pollutant source node parameters input into the MUSIC model were determined using the South-East Queensland Healthy Waterways Partnership's Water by Design MUSIC Modelling Guidelines for South-East Queensland version 1 (2010), specifically Tables 3.7 and 3.8 for commercial and industrial surface types. It is noted that all baseflow parameters for roof surfaces are adopted as 0.00 or N/A. Developed catchment parameters were based on the site proposal plan.

A summary of the source nodes has been provided in Table 7-2 below.

Table 7-2 Summary of Contributing Catchments

Catchment	Node Type	Catchment Area (ha)	Impervious (%)
MC03 Road	Road	0.8400	90
MC02 Road	Road	0.0320	90

7.4 Treatment Device Details For Modelling

The bio-retention area has been designed specifically in accordance with the Bio-retention Technical Design Guidelines (2012). Details of the location and standard design of the proposed treatment device areas are presented in the Engineering Drawings in Appendix A of this report.

The complete copies of the design and summary checklists from the Healthy Waterways Water Sensitive Urban Design Technical Design Guidelines for Southeast Queensland (WSUD TDG), are provided in Appendix D of this report. General parameters for the bio-retention areas have been modelled as per Table 7-3 below.

Table 7-3 Arcadis Bio-Retention Tree Pod MC03 Modelling Parameters

Parameter	Bio-Retention Basin
Minimum Surface Area	109
Minimum Filter Media Area (m ²)	109
Extended Detention Depth (m)	0.15
Minimum Filter Media Depth (m)	0.7
Saturated Hydraulic Conductivity (mm/hour)	200
Filter Media Total Nitrogen (mg/kg)	400
Filter Media Orthophosphate (mg/kg)	30

7.5 MUSIC Model Layout and Results

The developed site has been modelled in accordance with the sub-catchment regime to ensure the entire site meets pollutant reduction objectives. For further details and sub-catchment areas, refer to engineering drawings attached in Appendix A.

A diagrammatical view and pollutant reduction results can be found in Figure 7-3 below.

7.6 MUSIC Model Layout and Results

The proposed sub catchments and proprietary devices have been modelled to demonstrate the achieved pollutant mitigation provided. For further details and sub-catchment areas, refer to engineering drawings attached in Appendix A.

A diagrammatical view and pollutant reduction results can be found in Figure 7-3 below.

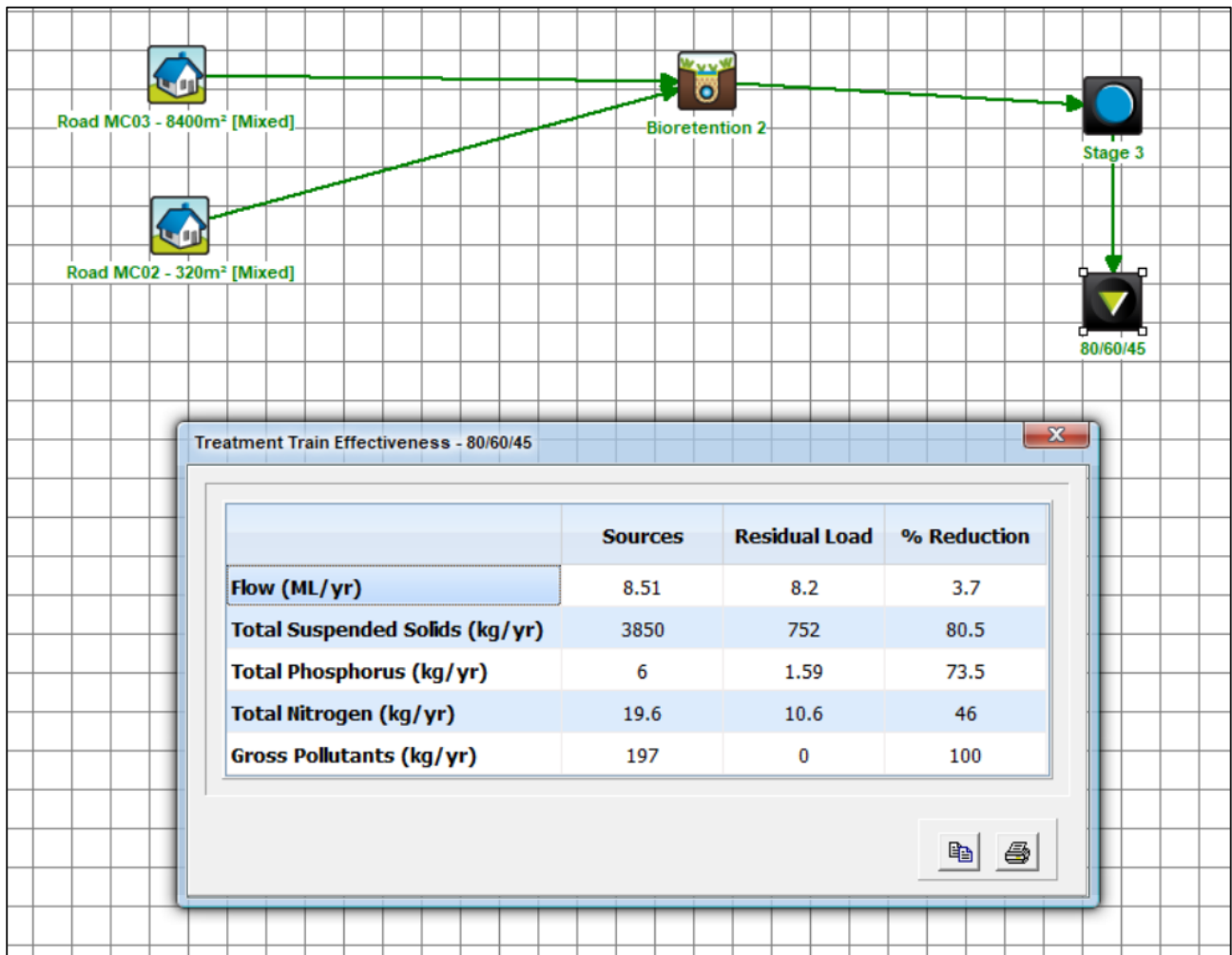


Figure 7-3 MUSIC Model Layout and Pollutant Reduction Results

8 STORMWATER QUALITY CONSTRUCTION PHASE

8.1 Water Quality Objectives

Table 8-1 Construction Phase Quality Objectives (SPP and LCC LDG)

Pollutant	Criteria
Drainage Control	Design life and design storm of temporary drainage works: 1. Disturbed area open for <12 months—1 in 2 ARI; 2. Disturbed area open for 12-24 months—1 in 5 ARI; 3. Disturbed area open for > 24 months—1 in 10 ARI;
Erosion Control	4. Minimise exposure of disturbed soils at any time; 5. Avoid or minimise large construction activities in the wet season; 6. Divert water run-off from undisturbed areas around disturbed areas; and 7. Use erosion risk ratings to determine appropriate erosion control measures.
Sediment Control	Use soil loss rates to determine appropriate sediment control measures Design storm for sediment control basins should be based on retaining the maximum sediment quantity for the maximum volume of water run-off Site discharge during sediment basin dewatering should not exceed 50 mg/L TSS and pH between 6.5–8.5
Stormwater Drainage / Flow Management	Hydraulics and hydrology—Take all reasonable and practicable measures to minimise significant changes to the natural waterway hydraulics and hydrology from: • peak flow for the one-year and 100-year ARI event (respectively for aquatic ecosystems and flood protection); • run-off frequency and volumes entering receiving waters; and • Uncontrolled release of contaminated stormwater.
Water Quality Outcomes	Stormwater flows from undisturbed and disturbed areas—manage to help protect environmental values Coarse sediment—coarse sediment is retained on site Fine sediment—Site discharge during sediment basin dewatering has a TSS concentration less than 50 mg/L Turbidity—Site discharge during sediment basin dewatering has a turbidity (NTU) less than 10% above receiving waters turbidity— measured immediately upstream of the site Nutrients (N & P)—Nitrogen and phosphorus are managed through sediment control. pH—Site discharge during sediment basin dewatering has a pH range 6.5–8.5 Litter and other waste—Prevent litter/waste entering the site, the stormwater system or watercourses that discharge from the site. Also minimise or sufficiently contain on-site litter and waste production and regularly clear waste bins Hydrocarbons and other contaminants—Hydrocarbons and other contaminants are prevented from entering the stormwater system or internal watercourses that discharge from the site. Wash down water—Wash down water is prevented from entering the stormwater system or internal watercourses that discharge from the site Cations and anions—Cations and anions including aluminium, iron and Sulfate are managed as required under an approved acid Sulfate soil management plan

Table 8-1 provides the construction phase stormwater quality objectives outline by the State Planning Policy. Additional relevant acts, policies and information that may be useful for construction phase planning include:

- Environmental Protection Act (1994);
- Environmental Protection (Water) Policy (2009);
- Queensland Development Code, Sediment and Erosion Control (2010); and
- Best Practice Erosion and Sediment Control for Building and Construction Sites Guidelines (2008).

8.2 Erosion And Sediment Control Plan Purpose

During the construction phase, it shall be the Principal Contractor's responsibility to ensure the objectives of Table 8-1 are achieved.

The following section of this report provides a suggested framework for an Erosion and Sediment Control Plan. This includes recommended actions and responses for specific activities; monitoring and reporting; and construction of specifically designed site-specific sediment basins.

8.3 Specific Activities

8.3.1 Erosion And Sediment Control Of Distributed Land

During the construction phase, it shall be the Principal Contractor's responsibility to ensure the following:

- Diversion of any clean water runoff that may interfere with land disturbance by the use of earth bunds, or other control devices deemed appropriate by a suitable supervisor;
- Reduction of sediment migration from disturbed land parcels by implementing silt fences, sediment basins or other control devices as deemed appropriate by a suitable supervisor;
- Where cut to fill operations produce a spoil it is recommended that the excess material be placed upstream of the excavation location to ensure any sediment runoff is directed back into the trench. Earth bunds or sediment fences may be required to control direction of sediment flow should the spoil be placed on the downstream side of the excavation site;
- Control measures such as a gully pit sediment barrier (see Arcadis drawings attached) shall be installed around inlet pits where required reducing the potential for sediment discharge into the surrounding stormwater system;
- Any sediment deposited from construction vehicles will be swept up and removed; and
- Erosion and sediment control devices may only be removed once disturbed lands which they are protecting are rehabilitated and capable of resisting further erosion.

8.3.2 Spoil And Stockpile Management

It shall be the Principal Contractor's responsibility to oversee the following controls during the construction phase unless otherwise specified:

- The placement of spoil and stockpile material shall be kept at a maximum distance from stormwater inlets, gutters and stormwater pipes to reduce unnecessary sediment migration into nearby infrastructure;
- Spoil and stockpile material shall be placed in a way that reduces the likelihood of sedimentation, erosion and slippage. Advice from an appropriate project manager/representative shall be sought in this instance;
- Spoil or stockpile material that is deemed a contaminant shall be placed on a designated zone of either fill material, plastic or concrete with the installation of appropriate containment devices. Advice from an appropriate project manager/representative shall be sought in this instance as the resulting control will be highly dependent on the severity of contamination; and
- It shall be the Project Manager's responsibility to foresee and develop appropriate control measures to prevent the impacts of spoil and stockpile material prior to construction activities. Monitoring and reporting shall also be required during the implementation of any given device associated with spoil and stockpile management.

8.3.3 Erosion Control

It shall be the Principal Contractor's responsibility to oversee the following controls during the construction phase:

- Traffic of any type shall be kept away from areas of rehabilitation to promote stabilisation of the zone;
- Where wind and water are acknowledged as potential erosion sources temporary protection shall be installed. Such measures only apply to zones of spoil, stockpile and land disturbance which are unlikely to receive works within a period of 6-8 weeks. Further advice from an appropriate project manager/representative shall be sought in this instance as the resulting control will be highly dependent on the disturbance type and erosion source; and
- Once viable, final landscaping shall be undertaken on applicable zones to increase stability.

8.3.4 Personnel Training

- It shall be the Principal Contractor's responsibility to oversee the following training protocols during the construction phase:
- Environmental management and incident reporting is to be included on all site induction courses; and
- All personnel are to receive adequate training in; work place health and safety issues, environmental management, best practice erosion and sediment control practices, incident reporting procedures and where applicable site inspection and maintenance procedures.

8.3.5 Miscellaneous

- It is the Principal Contractor's responsibility to ensure erosion and sediment controls are operated and maintained in an effective operational condition. These structures are not allowed to accumulate sediment volume in excess of 70% sediment storage design capacity as per Section 6 of the Urban Stormwater Quality Planning Guidelines 2010;
- Sediment removed from control measures must be disposed of in a manner approved by the local Council that does not cause pollution and forms part of the Contractor's obligation;
- Any chemicals, fuel or oil stored on site shall be stored under cover in a bounded area or placed sufficiently above ground level to prevent contamination of surface water;
- A waste concrete receptor (disposal area) must be established if significant concreting is to occur on site. The site must be surrounded by perimeter bunds and be clearly signed; and
- A general waste collection area shall be established which is to include appropriate pollutant runoff controls, dependent on the nature of the waste.

8.4 Project Personnel Responsibilities

A description of the key personnel involved with implementing the Erosion and Sediment Control Plan are listed in Table 7-2. It is recommended that all parties involved attend a pre-construction conference to discuss and clarify all issues associated with sediment and erosion control as well as this plan.

Table 8-2 Project Personnel Responsibilities

Project Role	Responsibilities
Superintendent	• Authorisation of this plan; and • Review and monitoring of this plan.
Contractor / Site Manager	• Implementation of this plan; • Monitoring of this plan; • Supervising any activities or requirements required by this plan; • Implementation of this plan; • Supervising any activities or requirements required by this plan; and • Ensuring all personnel are aware of the contractual agreements associated with this plan.
All Personnel	• Ensuring they are aware of the contractual agreements associated with this plan; and • Informing appropriate personnel of any issues that may arise with respect to the desired sediment and erosion control measures.

8.5 Monitoring And Responsibility

8.5.1 All Personnel

It is the obligation of all personnel to report any failures in the erosion and sediment control works utilised during the projects life cycle. Any identified errors within the sediment and erosion control system shall be reported in writing to a relevant project manager. A formal inquiry shall be undertaken in accordance with the reported issue as well as the relevant party procedures (i.e. Principal Contractor).

8.5.2 Contractor/Contractor's Foreman

It shall be the responsibility of the Contractor and Contractor's Foreman to monitor and report on the erosion and sediment control measures utilised in the construction phase. Inspections are to be undertaken:

- On a daily basis during earthworks, land disturbance, spoil or stockpile activities and rain events;
- Weekly during site inactivity; and
- Within 24 hours prior to expected rainfall and 18 hours prior to intense rainfall events.
- The following shall be inspected or reported on:
 - Erosion and sediment control devices are in the correct location and are working as defined by this plan;
 - Drainage systems both internal and external to the site are operating effectively or to pre-construction efficiencies;
 - Spilled material is removed if it can potentially mobilise via stormwater runoff or wind;
 - Stabilisation of disturbed land parcels has been undertaken in an effective manner;
 - Excess sediment has been removed from erosion and sediment measures appropriately if the device is operation ineffectively or requires decommissioning.; and
- It is understood that repairs, maintenance or reinstallation may be required if any control measures are operating inadequately, or if infrastructure is damaged due to inefficient operation of the outlined measures.

8.5.3 Environmental Representative

It shall be the responsibility of the environment representative to periodically inspect and report on the effectiveness of the erosion and sediment controls during the construction phase of the project. Technical advice shall be given to personnel outlying any uncertainty with regards to the; applicability, installation, operation, maintenance, removal or rehabilitation of any sediment and erosion control.

8.6 Construction Phase Sediment Control Devices

As the site has been assessed as a multiple catchments, it is appropriate to approach the assessment of construction phase sediment devices in a similar manner.

In accordance with the Best Practice Erosion and Sediment Control Manual (ICEA 2009) the construction phase catchment has been classified to determine the level of sediment and erosion control techniques required. The site is identified as per Table 4.4.6 (ICEA 2009) to be closest to the Ipswich locality and therefore attracts an average monthly rainfall depth of 31mm to 125mm.

As the extent of soil disturbance is widespread, Type 1 techniques will be used in accordance with Table 4.5.3. This will require control techniques such as a vehicle shakedown at the site entry, sediment fences, sediment basins and check dams. Preliminary explanations of the measures can be found in the engineering drawings in Appendix A.

9 CONCLUSION

This SBSMP has been prepared to provide a design proposal and guide to the stormwater quantity and quality management techniques for the site as part of a Development Permit for an MCU application.

The two primary objectives of this SBSMP have been to ensure that:

- 1. Suitable measures are incorporated in the development to ensure that there are no adverse impacts to downstream receiving waterways, property or infrastructure resulting from any increase to peak discharging stormwater flow rates.**

This report demonstrates that the subject site complies with the overarching stormwater quantity strategy outlined in Arcadis' overall Stormwater Management Plan (GA0002-30131743-AAR-SMP - RL/111/2022/1). No on-site detention is required to facilitate the development as developed flows are catered for in the planning of the downstream regional detention basin north of the site.

The SMP within ROL application RL/111/2022/1 should be referred to for the overall strategy for the catchment and the design of the regional detention system. This report specifically addresses the discharge from the subject site into the regional detention system.

- 2. Details of a proposed stormwater quality treatment train are provided to ensure the discharge of stormwater from the site is of adequate quality standards to comply with the requirements of Logan City Council (LCC) and the South-East Queensland Healthy Waterways Partnership.**

Water quality objectives have been achieved by the provision of a proposed stormwater treatment train which has been specifically designed and verified to achieve the necessary water quality objectives in the operational phase of the development. The proposed treatment system includes the following:

- Bio-pod tree pits to manage the road network.
- Private bio-retention system for each lot as part of future applications.

All the stormwater quality controls detailed in this document are contained within the development site will be handed over to the LCC following the completion of the 'On Maintenance' period post construction. Regular maintenance of the proposed treatment measures must be undertaken to ensure the continuing performance of the stormwater quality treatment train.

Erosion and sediment control measures during construction shall be undertaken in accordance with the SPP and Council requirements.

APPENDIX A

Architectural & Engineering Plans



Legend

Stage Boundary

Subject Site Boundary

Proposed Lots

Proposed New Road Reserve

Proposed Future State Road

Proposed 3m Landscape Buffer (In Allotment)

Notes

Any licence, express or implied, to use this document for any purpose whatsoever is restricted to the terms of the agreement or implied agreement between Orion Spatial Solutions and the instructing party.

Design subject to Local Authority approval and detail engineering design requirements. Areas and dimensions are approximate only and are subject to final survey.

Road widening boundary (Park Ridge Road) derived from preliminary survey plan dimensions (DP361504 & DP361505).

Development Summary

No. Exist Lots:
RP Description:

4
Lots 5 & 6 on SP347515, Lot 900 on SP361504 and Lot 100 on SP361505

Site Area:

12.116 ha

Stage 2
No. Proposed Lots:

16

Total Area of Proposed Lots:
Total Area of New Road:
Local Authority:
Existing Encumbrances:

8.965 ha
9,637 m²
Logan City
Emt A on SP347515 (to be surrendered as a part of Stage 3)
Emt's B, G, H, I, J & K on SP347515 (to be surrendered as a part of Stage 2)

Proposed Encumbrances:

6m wide sewer/stormwater Easement (in Lot 11)



SURVEY SERVICES

DEVELOPMENT ADVISORY

SPATIAL SOLUTIONS

BRISBANE

GOLD COAST

ORIONSS.COM.AU

(07) 3902 8160

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admin@orionss.com.au

Proposed Lot Reconfiguration

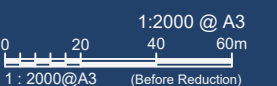
Transit Industrial Estate Stages 2 & 3

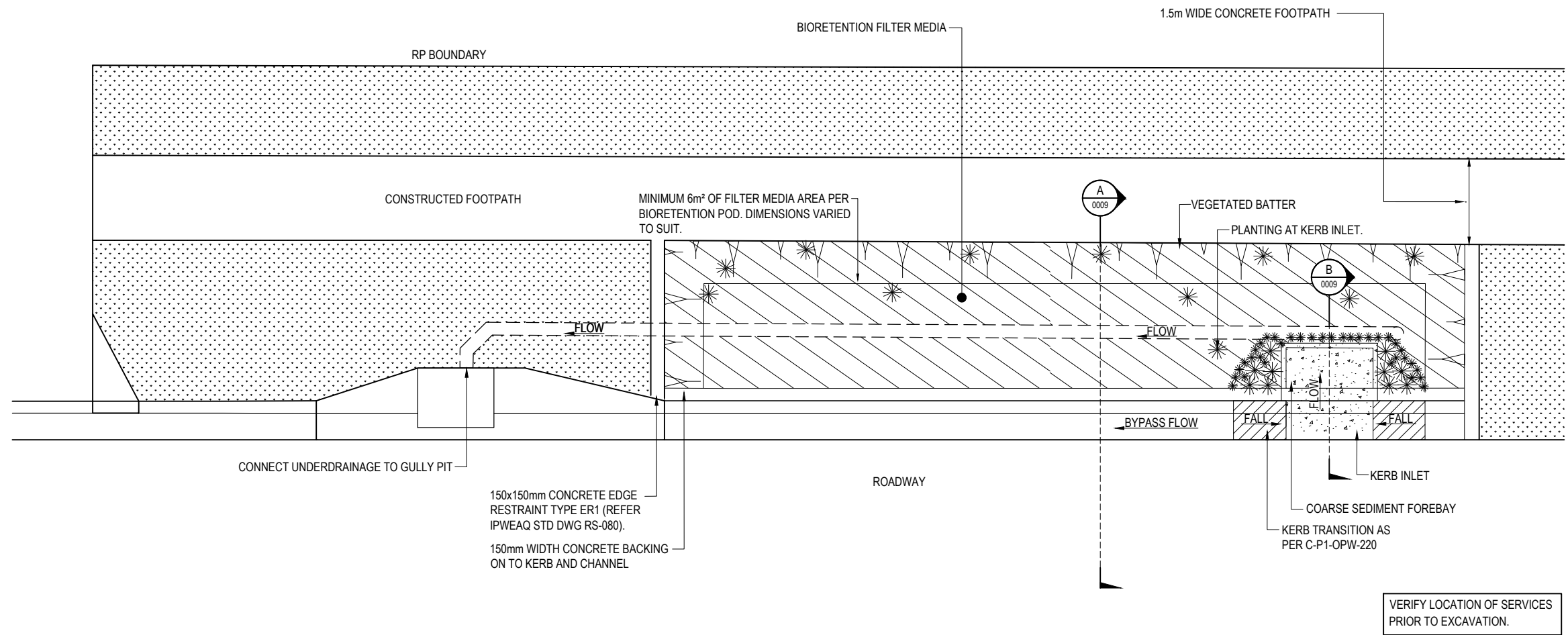
298 Park Ridge Road, Park Ridge

Plan No: S-2446-025-I

Date: 19/05/2026

Client: Andreatta Properties





STREETSCAPE BIORETENTION POD - TYPICAL LAYOUT
NTS

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Project Number	30131743
Issue	01



APPENDIX B

Stormwater Management Asset Information

BIORETENTION BASIN CONSTRUCTION INSPECTION CHECKLIST									
Asset I.D.					Inspected By:				
Site:					Date:				
					Time:				
Constructed By:					Weather:				
					Contact During Visit:				

Items inspected	Checked		Satisfactory		Items inspected	Checked		Satisfactory	
	Y	N	Y	N		Y	N	Y	N
DURING CONSTRUCTION & ESTABLISHMENT									
A. FUNCTIONAL INSTALLATION					Structural components				
Preliminary Works					15. Location and configuration of inflow systems as designed				
1. Erosion and sediment control plan adopted					16. Location and levels of overflow pits as designed				
2. Temporary traffic/safety control measures					17. Under-drainage connected to overflow pits as designed				
3. Location same as plans					18. Concrete and reinforcement as designed				
4. Site protection from existing flows					19. Set down to correct level for flush kerbs (streetscape applications only)				
Earthworks and Filter Media					20. Kerb opening width as designed				
5. Bed of basin correct shape and slope									
6. Batter slopes as plans					B. SEDIMENT & EROSION CONTROL (IF REQUIRED)				
7. Dimensions of bioretention area as plans					21. Stabilisation immediately following earthworks and planting of terrestrial landscape around basin				
8. Confirm surrounding soil type with design					22. Silt fences and traffic control in place				
9. Confirm filter media specification in accordance with Step 4					23. Temporary protection layers in place				
9. Provision of liner (if required)									
10. Under-drainage installed as designed					C. OPERATIONAL ESTABLISHMENT				
11. Drainage layer media as designed					24. Temporary protection layers and associated silt removed				
12. Transition layer media as designed (if required)					Vegetation				
14. Extended detention depth as designed					25. Planting as designed (species and densities)				
					26. Weed removal and watering as required				

FINAL INSPECTION									
1. Confirm levels of inlets and outlets					6. Check for uneven settling of banks				
2. Confirm structural element sizes					7. Under-drainage working				
3. Check batter slopes					8. Inflow systems working				
4. Vegetation as designed					9. Maintenance access provided				
5. Bioretention filter media surface flat and free of clogging									

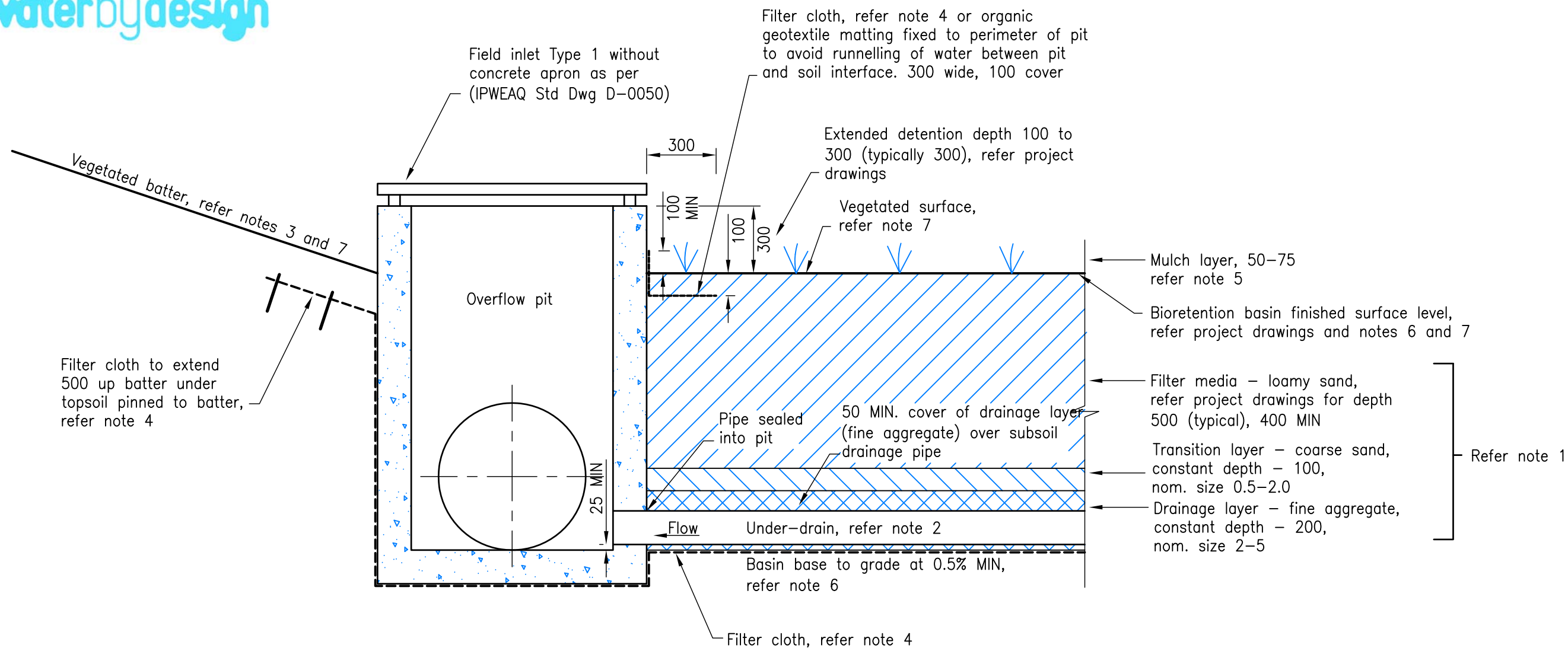
COMMENTS ON INSPECTION									

ACTIONS REQUIRED									

Inspection officer signature:									
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BIORETENTION BASIN MAINTENANCE CHECKLIST			
Inspection Frequency:	1 to 6 monthly	Date of Visit:	
Location:			
Description:			
Asset I.D.			
Site Visit by:			
INSPECTION ITEMS:	Y	N	Action Required (details)
Sediment accumulation at inflow points?			
Litter within basin?			
Erosion at inlet or other key structures?			
Traffic damage present?			
Evidence of dumping (e.g. building waste)?			
Vegetation condition satisfactory (density, weeds etc)?			
Watering of vegetation required?			
Replanting required?			
Mowing/slashing required?			
Clogging of drainage points (sediment or debris)?			
Evidence of ponding?			
Damage/vandalism to structures present?			
Surface clogging visible?			
Drainage system inspected?			
Resetting of system required?			
COMMENTS			

BIORETENTION BASIN ASSET TRANSFER CHECKLIST			
Asset I.D.			
Asset Location:			
Construction by:			
'On-maintenance' Period:			
TREATMENT	Y	N	
System appears to be working as designed visually?			
No obvious signs of under-performance?			
MAINTENANCE	Y	N	
Maintenance plans and indicative maintenance costs provided for each asset?			
Vegetation establishment period completed (2 years)?			
Inspection and maintenance undertaken as per maintenance plan?			
Inspection and maintenance forms provided?			
ASSET INSPECTED FOR DEFECTS AND/OR MAINTENANCE ISSUES AT TIME OF ASSET TRANSFER	Y	N	
Sediment accumulation at inflow points?			
Litter within basin?			
Erosion at inlet or other key structures?			
Traffic damage present?			
Evidence of dumping (e.g. building waste)?			
Vegetation condition satisfactory (density, weeds etc)?			
Watering of vegetation required?			
Replanting required?			
Mowing/slashing required?			
Clogging of drainage points (sediment or debris)?			
Evidence of ponding?			
Damage/vandalism to structures present?			
Surface clogging visible?			
Drainage system inspected?			
COMMENTS/ACTIONS REQUIRED FOR ASSET TRANSFER			
ASSET INFORMATION	Y	N	
Design Assessment Checklist provided?			
As constructed plans provided?			
Copies of all required permits (both construction and operational) submitted?			
Proprietary information provided (if applicable)?			
Digital files (e.g. drawings, survey, models) provided?			
Asset listed on asset register or database?			



BIORETENTION BASIN OVERFLOW PIT DETAIL

NOTES:

1. Bioretention media specification shall be in accordance with the Facility for Advancing Biofiltration "Guidelines for Soil Filter Media in Bioretention Systems". Bioretention hydraulic conductivity shall be in accordance with the Facility for Advancing Biofiltration 'Practice Note 1: In Situ Measurement of Hydraulic Conductivity'. The number of samples to be tested shall be in accordance with the "Water Sensitive Urban Design Construction and Establishment Guidelines – Swales, Bioretention Systems and Wetlands (Water by Design)".
2. Under-drain: slotted rigid pipe (uPVC or similar to AS 2439.1) or approved equivalent, 0.5% MIN. grade. Refer project drawings for diameter and invert level (Typically $\phi 100-150$). Pipe should not be installed with a filter sock surrounding pipe. Under-drainage pipes shall be sealed into pits using grout or other approved watertight seal.
3. Refer to project drawings for vegetated batter slopes (1 in 3 MAX, 1 in 4 typical) and batter topsoil requirements.
4. Filter cloth – non-woven geotextile. Filter cloth not to be placed between any filter layers. Impervious liner may be required subject to soil testing requirements in accordance with the "Water Sensitive Urban Design Technical Design Guidelines" (Water by Design).
5. Basin finished surface level is top of filter media. Surface to be mulched and planted as per landscape drawings.
6. Construction tolerances as documented in the "Water Sensitive Urban Design Construction and Establishment Guidelines – Swales, Bioretention Systems and Wetlands" (Water by Design) must be achieved. Construction tolerances must be noted on project plans. Invert levels of pits, pipes and base levels must be noted on project drawings.
7. Refer landscape drawings for plant specification. Plant specification and density shall be in accordance with the "Water Sensitive Urban Design Technical Design Guidelines" (Water by Design).
8. All dimensions are in millimetres unless otherwise noted.

These drawings have been developed in consultation between the participating councils.
BEFORE USE, the user shall confirm that the drawing has been adopted by the appropriate council

A	13/01/2010	ORIGINAL ISSUE
Rv.	DATE	REVISIONS



INSTITUTE OF PUBLIC WORKS ENGINEERING AUSTRALIA
QUEENSLAND DIVISION INC.
STANDARD DRAWINGS

BIORETENTION STANDARD PROFILE
OVERFLOW PIT

DRAWING No.

WSUD-001

A
Rv.