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CIVIL ENGINEERING REPORT

PROPOSED INDUSTRIAL LOT SUB-DIVISION

Lot 2 DP1233067, South Street, Marsden Park

Date:	7 December 2018
Revision:	1
Issue:	1
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Prepared for:	**Strauss Property Developments**

S+P

FPA AUSTRALIA GOLD MEMBER Fire Protection Association Australia

AHSCA The Association of Hydraulic Services Consultants Australia (NSW) Inc.

DNV·GL ISO 9001

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Revision	Date	Description	Prepared	Reviewed	Approved
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Prepared by	Morgan Walter	Revision	1

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY 1

2. INTRODUCTION 2

2.1 Existing Site 2

2.2 Proposed Development 3

3. CIVIL ENGINEERING 4

3.1 General 4

3.2 Road Network 4

3.2.1 Future Road Network 4

3.2.2 Road Detailed Design & Construction 5

3.3 Site Drainage 5

3.3.1 Existing and Future Drainage 5

3.3.2 Design Parameters 6

3.3.3 Drainage Detailed Design & Construction 7

3.4 Lot Grading & Earthworks 7

3.5 Utilities Servicing 7

3.5.1 Electricity 7

3.5.2 Sewer 7

3.5.3 Water 7

4. CONCLUSION 8

APPENDIX A. EXISTING SITE SURVEY 9

APPENDIX B. CONCEPT ENGINEERING PLANS 10

APPENDIX C. SYDNEY WATER HYDRA MAP WITH CONCEPT WATER & SEWER MAIN EXTENSION 11

1. EXECUTIVE SUMMARY

Sparks & Partners have been engaged by Strauss Property Developments to provide civil engineering services to support the proposed Development Application for a proposed industrial lot sub-division at Lot 2 DP 1233067, South Street, Marsden Park. The engineering services include the concept design and documentation of the road network, lot grading, stormwater drainage infrastructure and a review of services infrastructure.

Blacktown City Council being the approval authority for the proposed development, require any proposed sub-division design to be undertaken in accordance with their Engineering Guide for Development and Civil Works Specification. The concept engineering design incorporates the requirements of these guidelines to inform the overall sub-division layout.

Meetings and correspondence have been undertaken with relevant stakeholders including Council, RMS, NSW Department of Planning and Sydney Business Park throughout the concept design phase to consider and coordinate different aspects of the sub-division.

The proposed sub-division has reviewed existing service provisions for electricity, water and sewer with service mains available for extension to the proposed sub-division.

2. INTRODUCTION

2.1 Existing Site

The site is approximately 7.235 Ha in area and is bounded by vacant lots on the western, southern and eastern boundaries, with a cul-de-sac at the end of South Street on the northern boundary. The site is generally clear covered in low grass, with a small covering of trees located in the northern corner, and sparse trees located in the south. A man-made dam is in the center of the site, refer to figure 1 for an aerial image of the existing site conditions. The site topography is that it falls from the south to the north, with the southern boundary being at RL44.740, and the northern boundary being at RL37.320. This gives the average slope of the site being approximately 1.8%. The site currently has two (2) land use zones being IN2 and SP2, with the SP2 zone running in a north south direction and dissecting the IN2 zone resulting in a small triangular IN2 portion being located on the eastern side of the site. A survey of the site is provided in Appendix A for reference.

Figure 1 - Existing Site (Source: Six Maps)

2.2 Proposed Development

The proposed development is to occupy the western portion of the site that is zoned IN2 and a portion of the SP2 zone. A 19 lot sub-division is proposed with Lot 1 being utilised for an internal road, with 18 lots being used for industrial purposes. A site plan of the sub-division has been prepared by SBA architects ref: 17264_DA110 [C] and is to be referred to in conjunction with this report.

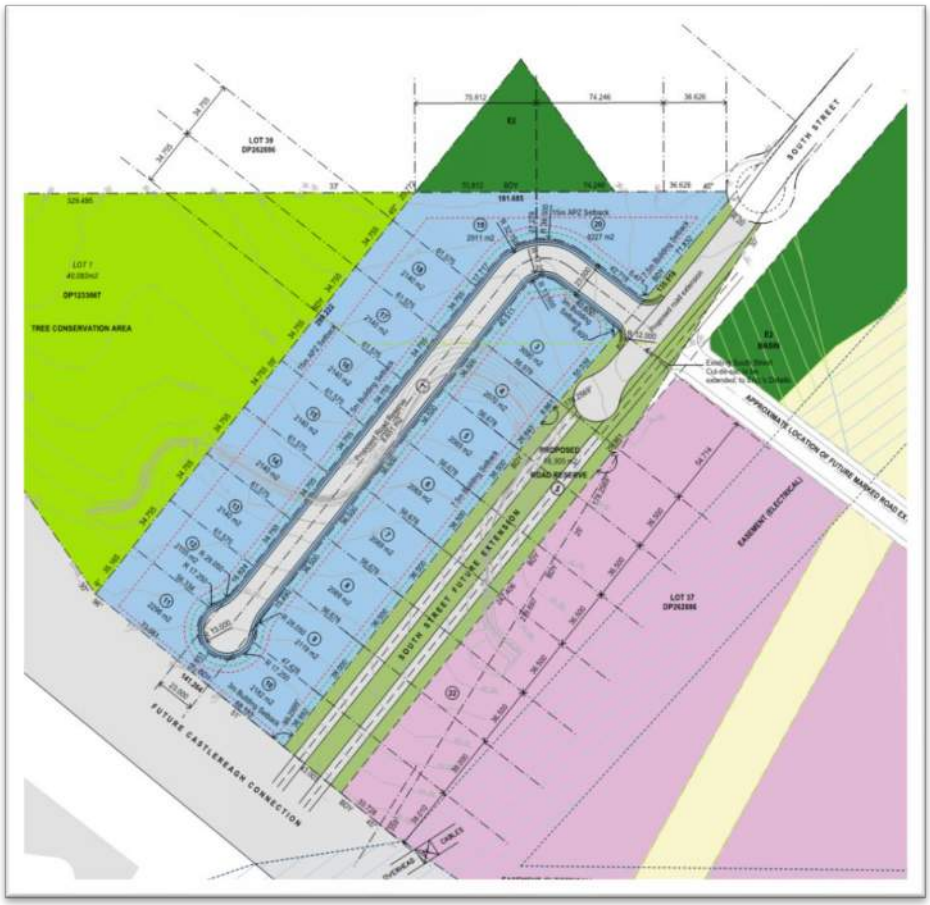


Figure 2 - Sub-division Layout (Source: SBA Architects)

3. CIVIL ENGINEERING

3.1 General

The civil engineering design for the sub-division has been undertaken with reference to the February 2018 version of the Blacktown City Council Engineering Guide for Development 2005 (BCCEGD), with specific reference made to section 3 Road Designs, and section 4 Drainage design. How the proposed development addresses and implements the requirements of each of these sections is discussed further below, with concept engineering plans provided in Appendix B for reference.

3.2 Road Network

The proposed road network consists of an extension to south street along the SP2 zoned alignment to a new cul-de-sac. Off the South St extension, a T intersection is proposed that will lead into a central spine road through the sub-division, which has a cul-de-sac proposed at the end. The concept horizontal and vertical design of the road network has been undertaken with reference to section 3 ROAD DESIGN of the BCCEDG. The horizontal layout has been undertaken with reference to Table 3.1: Road Hierarchy and Widths, with the resultant geometric road design criteria summarized in table 1.

Road Type	Carriageway Width (m)	Footway each side (m)	Total Road Reserve (m)	Number of Lanes	Kerb Return Radii (m)	Cul-de-sac Radii (m)
Industrial Collector – Within new industrial areas	15.5	3.75	23	2 Travel 2 parking	12.0	13.5 17.0 at property boundary

Table 1 - Road Hierarchy and Widths

3.2.1 Future Road Network

Currently there are several stakeholders undertaking various stages of planning and designs for the road network in the area. These stakeholders include Council, Sydney Business Park and RMS.

Council have advised that they are currently undertaking design of the Hollinsworth Ave extension from the east to tie in with an intersection at South St. At the time of this submission, Council advised that the design was in its early stages and that no design was available to allow for coordination. In this regard the proposed sub-division has aligned the location of its intersection as best as possible with the location of the future Hollinsworth Ave extension location to provide an aligned 4-way intersection. This will ensure that the future operation of the road network will not be compromised. The vertical alignment of the

intersection would need to be coordinated further as the Hollinsworth design becomes available from Council.

A meeting was held with NSW Department of Planning, RMS and Sydney Business Park on the 15th November 2018 to discuss the future planning of South St. The outcomes of the meeting are summarised below with meeting minutes still waiting to be received at the time of this submission.

RMS have advised that future planning is in place for the Castlereagh freeway that will run along the southern boundary of the site and will have an on/off ramp located at South Street. To date there is no design available to assess the impacts on the proposed sub-division and RMS expects that the design of this will not occur for a minimum of 10 years at this point in time. In this regard it was concluded that the design of the sub-division proceed on the existing basis as it is not possible to account for any future on/off ramp configuration at this time.

Sydney Business Park advised that they have undertaken a preliminary design of South St in conjunction with NSW Department of Planning to co-ordinate the alignment of major underground feeder cables by Endeavour Energy that will run from Glengarrie Rd, south along South St, to the Astoria St intersection. The design is being undertaken by Sydney Business Park at this point in time as part of a planning agreement, with the design ultimately being handed over to RMS for their review and action. As the road design stops at Astoria St it was deemed to have no major impact on the proposed sub-division at this point in time.

3.2.2 Road Detailed Design & Construction

Final detailed design of the road geometry and structural pavements would be undertaken prior to CC submission, with further coordination with Council most likely being undertaken. It is expected that as designs for Hollinsworth Ave are developed the intersection of South St will need to be coordinated with the sub-division intersection. Construction works would be undertaken in accordance with the latest version of the Blacktown City Council Civil Engineering Civil Works Specification.

3.3 Site Drainage

3.3.1 Existing and Future Drainage

There is currently no formal drainage system in place along South St with runoff from surrounding properties and South St following the existing contours of the land. The existing catchment drains to a drainage line, which is located approximately 200m north of the site running east to west and under South St, which conveys runoff to the north-west to South Creek, which connects to the Hawkesbury River. This land along the eastern side of South St is zoned SP2 drainage with Council currently undertaking detailed design of an estate On-Site Detention (OSD) basin which will be located on the south eastern corner of the intersection of South St and Astoria St. Council have provided copies of these plans (Ref: Section 94 CP21 Marsden Park Industrial Precinct, Package 1 Little Creek Tributary, Concept

Design, 80218059, by Cardno) to allow for coordination of the sub-division drainage. The plans show that the sub-division site is located within the catchment of the proposed future basin L3.2, which provides an OSD function only and not water quality treatment. At the time of this submission the design of the basin was still being developed in terms of final invert levels, and no confirmed date was able to be provided by Council as to when the design would be finalized.

To accommodate for the current status of the basin design, the sub-division drainage discharge connection has considered two scenarios which are as follows:

Scenario 1

The sub-division works are completed with a sub-division certificate issued and the estate basin is operational. The basin provides OSD for the sub-division controlling stormwater discharge from the area with on-lot provisions for water quality provided for each individual lot development as relevant development applications are submitted;

Scenario 2

The sub-division works are completed with a sub-division certificate issued and the estate basin not being operational, or works have not even commenced. Each individual lot would provide both OSD and water quality provisions to control stormwater discharge and water quality in accordance with Councils DCP for each of their relevant development application submissions.

As there is no formal drainage located in South St, the sub-division drainage proposal is to construct a drainage line from the site north along South St to a final discharge location where the proposed basin will be located, which is also where the existing natural drainage line for the catchment is. The current drainage concept has adopted an invert level that allows for the site to discharge freely to both the current drainage line and the proposed future OSD basin based in the concept basin levels provided. This ensures that staging of the development and local infrastructure works will not impact each other.

3.3.2 Design Parameters

The site drainage has been designed with reference to section 4 DRAINAGE DESIGN of the BCCEDG. The design provides a main drainage line that runs along the eastern side of the internal road, with interallotment drainage connections provided to every second lot which does not have a direct connection to the road drainage network. A preliminary design of the drainage system has been undertaken with reference to Appendix D DRAINAGE DESIGN MANUAL of the BCCEDG. A summary of the design parameters is provided in table 2

Development Type	Piped Drainage (Minor System) A.R.I.	Major System Drainage A.R.I.
Industrial	20 Years	100 Years

The details of the preliminary drainage design are located on the concept engineering plans with a plan network, catchment plans, pipe longitudinal sections and preliminary calculations provided.

3.3.3 Drainage Detailed Design & Construction

Final design of the sub-division drainage and construction details development would be undertaken prior to CC submission with the drainage design being undertaken in accordance with BCCEDG. It is anticipated that further detailed design coordination would be undertaken with Council prior to CC submission and construction works being undertaken in accordance with the latest version of the Blacktown City Council Civil Engineering Civil Works Specification

3.4 Lot Grading & Earthworks

The site grading does not alter the existing catchment boundaries, with stormwater runoff still being directed to the north as per existing conditions. To allow for the construction of the required drainage lines, works are required to the existing road formation of South St and the sub-division site. These works involve raising the site to ensure adequate cover to proposed drainage infrastructure is maintained and so that stormwater runoff is directed to the proposed road and future OSD basin rather the adjacent conservation land to the west. Details of the earthworks cut to fill depths are provided in Appendix B on drawings DA3.01 through to DA3.12, with the proposed maximum depth of cut being 2.0m and the proposed maximum depth of fill being 2.0m. The proposed boundary interface for the earthworks provides a stabilised batter with a maximum batter slope of 1V:3H, which is setback a minimum of 1.0m from the boundary line.

3.5 Utilities Servicing

3.5.1 Electricity

The site is currently serviced by an Endeavour Energy power pole located at the south western side of the existing cul-de-sac at the end of South S. The proposed sub-division will utilise this existing service and run the new electrical lines underground in accordance with the standards of Endeavour Energy. A Notification of Arrangement will be obtained from Endeavour Energy upon approval of the development application from Council which will outline the necessary arrangements to provide electrical services to the development.

3.5.2 Sewer

The site is currently not served by a sewer connection to the main Sydney Water sewer network. The current closest available sewer main is located north of the site at the intersection of South St and Darling St. The existing main is 300mm in size. It is proposed to extend this main to the site along South St with internal reticulation. Further coordination with Sydney Water would need to be undertaken with a detailed design undertaken prior to CC and upon receipt of the Notice of Requirements (NoR) from Sydney Water, with a final Section 73 certificate obtained prior to the release of the final sub-division certificate

3.5.3 Water

The site is currently not serviced by a water main. The current closest water main is provided by Sydney Water and is located at the north-west corner of the intersection of South St and

Darling St approximately 300m north of the site and is 225mm in size. A copy of the Sydney Water hydra map is provided in Appendix D highlighting the location of the existing water main. It is proposed to provide an extension to this main from the sub-division. A detailed design would be undertaken prior to CC and upon receipt of the Notice of Requirements (NoR) from Sydney Water, with a final Section 73 certificate obtained prior to the release of the final sub-division certificate.

4. CONCLUSION

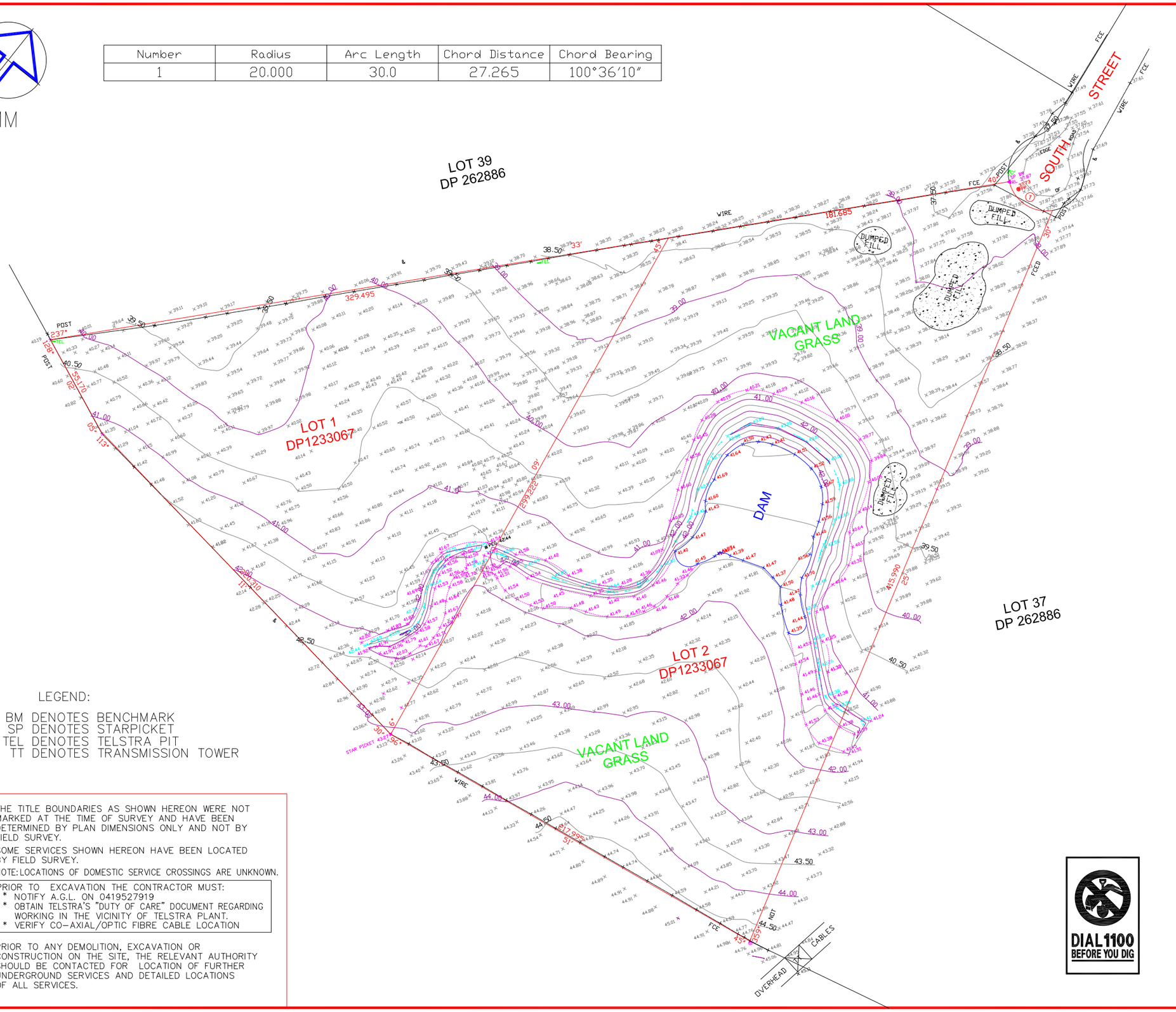
Based on the preparation of the concept engineering plans the proposed sub-division incorporates the engineering design requirements of the Blacktown City Council Engineering Guide for Development and Civil Works Specification. The sub-division considers relevant stakeholders from a planning and engineering design perspective, with road and drainage elements of the sub-division incorporating as best as possible these elements into the road layout and engineering design. Service connections are available for electricity, sewer and water, with extensions to the existing mains network being coordinated with the service authorities being undertaken upon development approval of the sub-division.

APPENDIX A. EXISTING SITE SURVEY

A3

MM

Number	Radius	Arc Length	Chord Distance	Chord Bearing
1	20.000	30.0	27.265	100°36'10"



LEGEND:

BM DENOTES BENCHMARK
SP DENOTES STARPICKET
TEL DENOTES TELSTRA PIT
TT DENOTES TRANSMISSION TOWER

THE TITLE BOUNDARIES AS SHOWN HEREON WERE NOT MARKED AT THE TIME OF SURVEY AND HAVE BEEN DETERMINED BY PLAN DIMENSIONS ONLY AND NOT BY FIELD SURVEY.

SOME SERVICES SHOWN HEREON HAVE BEEN LOCATED BY FIELD SURVEY.

NOTE: LOCATIONS OF DOMESTIC SERVICE CROSSINGS ARE UNKNOWN.

PRIOR TO EXCAVATION THE CONTRACTOR MUST:
* NOTIFY A.G.L. ON 0419527919
* OBTAIN TELSTRA'S "DUTY OF CARE" DOCUMENT REGARDING WORKING IN THE VICINITY OF TELSTRA PLANT.
* VERIFY CO-AXIAL/OPTIC FIBRE CABLE LOCATION

PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITY SHOULD BE CONTACTED FOR LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.

DIAL 1100 BEFORE YOU DIG

EAST coast POSITIONING

SURVEYORS

NORTHWEST
P.O. BOX 7388, BAULKHAM HILLS
N.S.W. 2153, Australia
Mob: 0408556914 or 0458957000
Email: info@ecpsurveyors.com.au

CLIENT/PROJECT

SBA ARCHITECTS

LOT 1 & 2, SOUTH ST
MARSDEN PARK

SURVEYOR: DD

CHECK: XG

AUTHORISED: MS

DETAIL SURVEY

AUTHORITY	BLACTOWN
PROPERTY	LOT 1 & 2 / DP1233067
LOCALITY	MARSDEN PARK
ORIGIN OF LEVELS	PM 49955 - CLASS B
DATUM	AHD
DATE	06/12/2017
DRAWN BY	DD
SHEET	1 OF 1
DRAWING No.	ECP1453.D.01
AMENDMENT	-

No.	AMENDMENTS	DRAWN	DATE:

FILE NAME: ECP1453.D.01

APPENDIX B. CONCEPT ENGINEERING PLANS

NEW INDUSTRIAL SUB-DIVISION
SOUTH STREET, MARSDEN PARK NSW 2765
CIVIL ENGINEERING

LOCALITY PLAN

NOT TO SCALE - COURTESY OF SIX MAPS

DRAWING SCHEDULE

Sheet Number	Sheet Title
DA1.01	COVER SHEET, LOCALITY PLAN & DRAWING SCHEDULE
DA1.02	GENERAL NOTES, SPECIFICATIONS AND LEGEND SHEET
DA1.03	GENERAL ARRANGEMENT PLAN SHEET
DA2.01	SEDIMENT AND EROSION CONTROL PLAN SHEET 1
DA2.02	SEDIMENT AND EROSION CONTROL PLAN SHEET 2
DA2.03	SEDIMENT AND EROSION CONTROL DETAILS SHEET
DA3.01	BULK EARTHWORKS CONTOUR PLAN SHEET 1
DA3.02	BULK EARTHWORKS CONTOUR PLAN SHEET 2
DA3.05	BULK EARTHWORKS DEPTH CUT TO FILL PLAN SHEET 1
DA3.06	BULK EARTHWORKS DEPTH CUT TO FILL PLAN SHEET 2
DA3.11	BULK EARTHWORKS SECTIONS SHEET 1
DA3.12	BULK EARTHWORKS SECTIONS SHEET 2
DA4.01	SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 1
DA4.02	SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 2
DA4.03	SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 3
DA4.04	SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 4
DA4.05	SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 5
DA4.11	STORMWATER DRAINAGE CATCHMENT PLAN SHEET 1
DA4.12	STORMWATER DRAINAGE CATCHMENT PLAN SHEET 2
DA4.21	STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 1
DA4.22	STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 2
DA4.23	STORMWATER DRAINAGE LONGITUDINAL SECTIONS SHEET 3
DA4.31	STORMWATER CALCULATION TABLE SHEET 1
DA4.32	STORMWATER CALCULATION TABLE SHEET 2
DA5.11	ROAD LONGITUDINAL SECTIONS SHEET 1
DA5.12	ROAD LONGITUDINAL SECTIONS SHEET 2
DA5.21	TYPICAL ROAD SECTIONS SHEET

D.A. APPROVAL

1. DO NOT SCALE OFF THIS DRAWING. USE DIMENSIONS & ARCHITECTURAL DRAWINGS ONLY
2. DRAWINGS TO BE READ IN CONJUNCTION WITH SPECIFICATION.
3. LEVELS ARE INDICATIVE ONLY AND ARE TO BE CHECKED PRIOR TO COMMENCEMENT OF ANY WORKS
4. AUTHORITIES MAINS AND/OR EXISTING SERVICES ARE TO BE LOCATED AND CHECKED PRIOR TO COMMENCEMENT OF ANY WORKS
5. COMPLETION OF THE QUALITY RECORD IS EVIDENCE THAT THE DESIGN AND DRAWING HAVE BEEN VERIFIED.

VERIFICATION
COMPLETION OF THE DRAWING STATUS IS EVIDENCE THAT THE DESIGN HAS BEEN VERIFIED AS CONFORMING TO THE REQUIREMENTS OF THE PROJECT QUALITY PLAN

DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
FOR INFORMATION ONLY		
FOR CLIENT APPROVAL		
FOR TENDER		
FOR CONSTRUCTION		

CHECKED	DATE
APPROVED	DATE
PAGE A1	PLOT DATE December 5, 2018

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NORTH POINT

SCALE
NOT TO SCALE

DATE	No	AMENDMENT	INIT	REV
05.12.18		ISSUE FOR DA APPROVAL	MW	1

DATE	No	AMENDMENT	INIT	REV

CLIENT: STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT: SBA ARCHITECTS

PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
COVER SHEET, LOCALITY PLAN & DRAWING SCHEDULE

SPARKS + PARTNERS
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AHSCA
The Association of Consultants Australia (NSW) Inc.
CORPORATE MEMBER

DATE DEC 2018	DESIGNED LC		
SCALE N.T.S.	DRAWN LC		
JOB No 18072	DWG No DA1.01	No IN SET --- OF	REV 1

SITE WORKS - GENERAL

1. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH LOCAL COUNCIL, AUSTRALIAN AND AUTHORITY STANDARDS.
2. ALL TRENCHING WORKS ARE TO BE RESTORED TO ORIGINAL CONDITION. IN LOCATION WITH ROCK TRENCHING TO BE BACKFILLED WITH APPROVED MATERIAL.
3. THE INTEGRITY OF ALL EXISTING AND NEW SERVICES IS TO BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
4. ALL PLANS ARE TO BE READ IN CONJUNCTION WITH APPROVED ARCHITECTS, STRUCTURAL ENGINEERS AND OTHER CONSULTANT'S PLANS. ANY DISCREPANCIES ARE TO BE NOTIFIED TO THE ENGINEER FOR CLARIFICATION.

SEDIMENT AND EROSION CONTROL

1. THE CONTRACTOR SHALL INSTIGATE ALL SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH BLACKTOWN CITY COUNCIL REQUIREMENTS AND THE IECA AUSTRALIASIA "BEST PRACTICE EROSION AND SEDIMENT CONTROL". THESE MEASURES ARE TO BE REGULARLY INSPECTED AND MAINTAINED.
2. THE SEDIMENT & EROSION CONTROL PLAN PRESENTS CONCEPTS ONLY, THE CONTRACTOR SHALL AT ALL TIMES BE RESPONSIBLE FOR THE ESTABLISHMENT & MANAGEMENT OF A DETAILED SCHEME MEETING COUNCIL'S DESIGN, AND ALL OTHER REGULATORY AUTHORITY REQUIREMENTS.
3. WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE SHALL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
   a. INSTALL ALL TEMPORARY SEDIMENT FENCES AND BARRIER FENCES. WHERE FENCES ARE ADJACENT TO EACH OTHER THE SEDIMENT FENCE CAN BE INCORPORATED INTO THE BARRIER FENCE.
   b. CONSTRUCT TEMPORARY STABILISED SITE ACCESS. INCLUDING SHAKE DOWN AND WASH PAD.
   c. INSTALL SEDIMENT CONTROL MEASURES AS OUTLINED ON THESE SEDIMENT AND CONTROL PLANS (ONCE APPROVED)
4. THE CONTRACTOR SHALL UNDERTAKE SITE DEVELOPMENT WORKS SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF MINIMUM WORKABLE SIZE.
5. AT ALL TIMES AND IN PARTICULAR DURING WINDY AND DRY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL. TACIFIERS MAY BE USED TO CONTROL DUST DURING EXTENDED PERIODS OF DRY WEATHER.
6. ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) SHALL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
7. WATER SHALL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS THE CATCHMENT AREA HAS BEEN STABILISED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED OUT.
8. TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES SHALL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE STABILISED / REHABILITATED.
9. THE CONTRACTOR SHALL ALLOW FOR THE ESTABLISHMENT OF ANY OTHER EROSION PROTECTION MEASURES. (IF APPLICABLE).
10. THE CONTRACTOR SHALL REGULARLY INSPECT (MINIMUM TWICE PER WEEK) ALL EROSION AND SEDIMENT CONTROL MEASURES TO ENSURE THEY ARE OPERATING EFFECTIVELY. REPAIRS AND/OR MAINTENANCE SHALL BE UNDERTAKEN REGULARLY AND AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.
11. ACCEPTABLE RECEPTORS SHALL BE USED FOR CONCRETE AND MORTAR SLURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER. WASTE FROM THESE RECEPTORS SHALL BE DISPOSED OF IN ACCORDANCE WITH REGULATORY AUTHORITY REQUIREMENTS. PAY ALL FEES AND PROVIDE EVIDENCE OF SAFE DISPOSAL.

FINISHED LEVELS

1. LEVELS BASED ON SURVEY PREPARED BY EAST COAST POSITIONING SURVEYORS Ref: ECP1453.D.01. THE CONTRACTOR SHALL VERIFY LEVELS PRIOR TO CONSTRUCTION COMMENCEMENT, ANY DISCREPANCIES SHALL BE NOTIFIED TO THE ENGINEER OR SUPERINTENDENT FOR CLARIFICATION.
2. ALL CONTOUR LINES & SPOT LEVELS INDICATE FINISHED PAVEMENT LEVELS U.N.O. ON PLAN.
3. PERMANENT BATTER SLOPES ARE TO HAVE A MAXIMUM GRADE OF 1V:3H.

SITE WORKS - ACCESS AND SAFETY

1. ALL WORKS ARE TO BE UNDERTAKEN IN A SAFE MANNER IN ACCORDANCE WITH ALL STATUTORY AND INDUSTRIAL RELATION REQUIREMENTS.
2. ACCESS TO ADJACENT BUILDINGS AND PROPERTIES SHALL BE MAINTAINED AT ALL TIMES.
3. WHERE NECESSARY SAFE PASSAGE SHALL BE PROVIDED FOR VEHICLES AND PEDESTRIANS THROUGH OR ADJACENT TO THE SITE.

STORMWATER

1. DESIGN CRITERIA.
   1.1. PIPED DRAINAGE - 1:20YR ARI
   1.2. OVERLAND FLOWS - GAP FLOW BETWEEN 1:20YR ARI & 1:100YR ARI
2. ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE FOLLOWING AUSTRALIAN STANDARDS AS2032, AS3500, AS3725 AND BLACKTOWN CITY COUNCIL SPECIFICATION.
3. ALL PIPES LESS THAN OR EQUAL TO Ø300mm IN SIZE ARE TO BE SOLVENT WELD-JOINTED UPVC CLASS SN6 U.N.O.
4. ALL PIPES Ø375mm OR GREATER IN SIZE ARE TO BE MIN. CLASS 3 REINFORCED CONCRETE PIPE (RCP) RUBBER RING JOINT (RRJ) OR FIBRE REINFORCED CONCRETE (FRC) VANTAGE PIPE PLUS (VPIPE+) WITH VPIPE PLUS COLLAR (VPIPE+ COLLAR) U.N.O.
5. ALL PIPES ARE TO BE LAID AT MIN. 1.0% GRADE U.N.O.
6. PIPE BEDDING IS TO BE HS2 UNDER ROADS AND TRAFFICKED AREAS AND SHALL BE H2 IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS U.N.O.
7. ALL PIPE BENDS AND JUNCTIONS ARE TO BE MADE WITH EITHER PURPOSE MADE FITTINGS OR STORMWATER DRAINAGE PITS.
8. MINIMUM COVER FROM THE OBVERT OF THE STORMWATER PIPE OF 300mm IS TO BE PROVIDED IN LANDSCAPED AREAS AND 600mm IN VEHICULAR TRAFFICKED AREAS U.N.O.
9. WHERE MINIMUM COVER CANNOT BE ACHIEVED CONCRETE ENCASEMENT OF THE AFFECTED PIPE IS MAY BE UNDERTAKEN WITH 20MPa CONCRETE WITH A MIN. COVER OF 150mm TO ALL SIDES OF THE PIPE. THE CONTRACTOR SHALL CONFIRM THIS REQUIREMENT WITH THE ENGINEER OR SUPERINTENDENT.
10. LAID PIPELINES ARE TO HAVE THE FOLLOWING CONSTRUCTED TOLERANCES:
    a. HORIZONTAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT;
    b. VERTICAL-1:300 ANGULAR DEVIATION FROM REQUIRED ALIGNMENT.
12. ALL DRAINAGE PITS ARE TO BE CAST IN-SITU, PRECAST DRAINAGE PITS MAY BE USED WITH APPROVAL FROM THE ENGINEER. THE CONTRACTOR SHALL SUBMIT A PRECAST PIT INSTALLATION WORK METHOD STATEMENT FOR ASSESSMENT BY THE ENGINEER FOR APPROVAL.
13. DRAINAGE PIT COVERS ARE TO BE EITHER GALVANISED STEEL OR CAST IRON CLASS 'B' IN LANDSCAPED AND PEDESTRIAN TRAFFICKED AREAS AND CLASS 'D' IN ALL VEHICULAR TRAFFICKED AREAS U.N.O.
14. EXISTING STORMWATER PIT LOCATIONS AND INVERT LEVELS TO BE CONFIRMED PRIOR TO COMMENCING WORKS ON SITE.
15. PROVIDE CLEANING EYES (RODDING POINTS) TO PIPES AT ALL CORNERS AND T-JUNCTIONS WHERE NO PITS ARE PRESENT.
16. DOWN PIPES CONNECTED DIRECT TO PIPES TO BE CONNECTED AT 45° TO THE FLOW DIRECTION WITH A CLEANING EYE PROVIDED AT GROUND LEVEL.

COUNCIL DETAILS

1. CONTRACTOR TO REFER TO BLACKTOWN CITY COUNCIL TECHNICAL SPECIFICATIONS DETAILS LISTED BELOW:

DRAWING No.	DRAWING NAME
A(BS)101M	STANDARD KERB AND GUTTERS
A(BS)106M	STANDARD GRATED GULLY PIT
A(BS)107M	STANDARD JUNCTION PIT
A(BS)111S	STEP IRONS
A(BS)113M	STANDARD STREET SIGNS & POSTS
A(BS)115M	CONSTRUCTION TRAFFIC SHAKE DOWN
A(BS)119S	SEDIMENT TRAPS FOR SURFACE INLET PITS
A(BS)121M	SEDIMENT FENCE & FILTERS
A(BS)122M	SEDIMENT TRAPS FOR KERB INLETS
A(BS)123M	PERIMETER & DIVERSION BANKS

2. REFER TO BLACKTOWN CITY COUNCIL CIVIL WORKS SPECIFICATION

CLEARING & GRUBBING

1. CLEARING MUST BE CARRIED OUT IN ADVANCE OF ANY EARTHWORK OPERATIONS AND IS TO INCLUDE THE REMOVAL OF ALL FOREIGN MATERIAL AND VEGETATION, EXCEPT TREES AND PLANTS REQUIRED TO BE PRESERVED, FROM WITHIN THE BOUNDARIES OF AREA AFFECTED BY EARTHWORKS OR OTHER AREAS TO BE CLEARED AS DESIGNATED ON THE DRAWINGS.
2. CLEARING SHALL INCLUDE BUT NOT LIMITED TO:
   a) THE FELLING, CUTTING AND REMOVAL OF ALL TREES STANDING OR FALLEN,
   b) THE REMOVAL OF ALL BRUSH, SHRUBS, GRASSES & OTHER VEGETATION.
   c) THE REMOVAL OF RUBBISH AND DEBRIS.
   d) THE REMOVAL OF SURFACE BOULDERS AND BOULDERS DISLODGES DURING VEGETATION REMOVAL AND,
   e) THE GRUBBING OUT OF ALL STUMPS AND ROOTS LARGER THAN 80mm DIAMETER OR WITH ANY DIMENSION GREATER THAN 300mm TO A DEPTH OF 300mm BELOW EITHER THE EXISTING SURFACE OR FINISHED SUBGRADE SURFACE, WHICHEVER IS THE LOWER.
3. THE BURNING OF MATERIALS IS PROHIBITED THROUGHOUT THE BLACKTOWN CITY COUNCIL AREA.
4. ALL MATERIAL CLEARED AND/OR GRUBBED IN ACCORDANCE WITH "BLACKTOWN COUNCIL - ENGINEERING CONSTRUCTION SPECIFICATION FOR CIVIL WORKS" SHALL BECOME THE PROPERTY OF THE APPLICANT AND SHALL BE REMOVED FROM SITE DISPOSED OF IN AN APPROPRIATE MANNER.

SETTING OUT NOTES

1. THE CONSTRUCTOR SHALL USE A SUITABLY QUALIFIED SURVEYOR TO SET OUT ALL WORKS. THE SURVEYOR SHALL ISSUE A CERTIFICATE TO THE PRINCIPAL CERTIFYING AUTHORITY CERTIFYING THAT THE WORKS HAVE BEEN SETOUT IN ACCORDANCE WITH THE APPROVED DRAWINGS PRIOR TO THE WORKS BEING CONSTRUCTED.
2. THE SURVEY WORK ASSOCIATED WITH THE CONTRACT SHALL INCLUDE SETTING OUT THE FOLLOWING COMPONENTS OF THE WORK:
   - ROADS AND KERBS
   - DRAINAGE STRUCTURES

SERVICES

1. IT IS THE CONTRACTOR RESPONSIBILITY TO NOTIFY THE RELEVANT SERVICES AUTHORITIES OF THE WORKS AND VERIFY THE LOCATION OF ALL EXISTING SERVICES PRIOR TO ANY CONSTRUCTION ACTIVITIES COMMENCING.
2. THE CONTRACTOR SHALL LIAISE AND COORDINATE THE TIMING OF THE CONSTRUCTION OF THE WORKS WITH THE RELEVANT SERVICES AUTHORITIES AND/OR OTHER CONSTRUCTORS INSTALLING SERVICES CONCURRENTLY AT THIS SITE.
3. THE LOCATION OF ALL EXISTING SERVICES SHOWN ON THE DRAWINGS ARE APPROXIMATE ONLY AND HAVE BEEN TAKEN FROM INFORMATION PROVIDED BY THE RELEVANT SERVICE AUTHORITIES.
4. THE CONSTRUCTOR SHALL BE RESPONSIBLE FOR ALL DAMAGE CAUSED TO EXISTING SERVICES AS A RESULT OF THE CONSTRUCTION WORKS.

SURVEY CONTROL

1. THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN INVESTIGATED BY "EAST COAST POSITIONING SURVEYORS". THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN, SPARKS AND PARTNERS DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS.
2. SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT SPARKS AND PARTNERS CONSULTING ENGINEERS.
3. ADOPT PM49955-CLASS B AS PER EAST COAST POSITIONING SURVEYORS. REF NO. "ECP1453.D.01" DATE : 06/12/2017

LEGEND

21.00	FINISHED SURFACE MAJOR CONTOUR LINE
21.10	FINISHED SURFACE MINOR CONTOUR LINE
21.10	EXISTING CONTOUR LINE
FALL 1.28%	DIRECTION OF SURFACE FALL
KG	PROPOSED KERB AND GUTTER - REFER DETAIL
KR	KERB RAMP - REFER DETAIL
	CONTROL LINE
MC01	PROPOSED ROAD NAME
KR01/02	PROPOSED KERB RETURN NAME
CH	CHAINAGE
	EXTENT OF BATTER
	PROPERTY BOUNDARY LINE
	ADJACENT BOUNDARY LINE
	LIMIT OF WORKS
	PROPOSED STORMWATER PIPE (< 225)
	PROPOSED STORMWATER PIPE (> 225)
	PROPOSED STORMWATER PIT
	PROPOSED SAG PIT
	PROPOSED KERB INLET PIT
PIT10/10	PIT TAG
HER	HIGH END RISER
IR	INTERMEDIATE RISER
	PROPOSED SUBSOIL DRAINAGE LINE
	PROPOSED STORMWATER PIPE (> 225)

NOTE :
THE DETAILS SHOWN ON THESE PLANS ARE CONCEPT ONLY AND FOR D.A. SUBMISSION. FINAL DETAILED DESIGN TO BE UNDERTAKEN AT CONSTRUCTION CERTIFICATE STAGE UPON RECEIPT OF D.A. CONSENT CONDITIONS.

D.A. APPROVAL

1. DO NOT SCALE OFF THIS DRAWING. USE DIMENSIONS & ARCHITECTURAL DRAWINGS ONLY
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5. COMPLETION OF THE QUALITY RECORD IS EVIDENCE THAT THE DESIGN AND DRAWING HAVE BEEN VERIFIED.

VERIFICATION
COMPLETION OF THE DRAWING STATUS IS EVIDENCE THAT THE DESIGN HAS BEEN VERIFIED AS CONFORMING TO THE REQUIREMENTS OF THE PROJECT QUALITY PLAN

DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
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FOR CONSTRUCTION		

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05.12.18		ISSUE FOR DA APPROVAL	MW	1

DATE	No	AMENDMENT	INIT	REV

CLIENT: STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT: SBA ARCHITECTS

PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
GENERAL NOTES, SPECIFICATIONS AND LEGEND SHEET

SPARKS + PARTNERS
CONSULTING ENGINEERS
HYDRAULIC | CIVIL | FIRE
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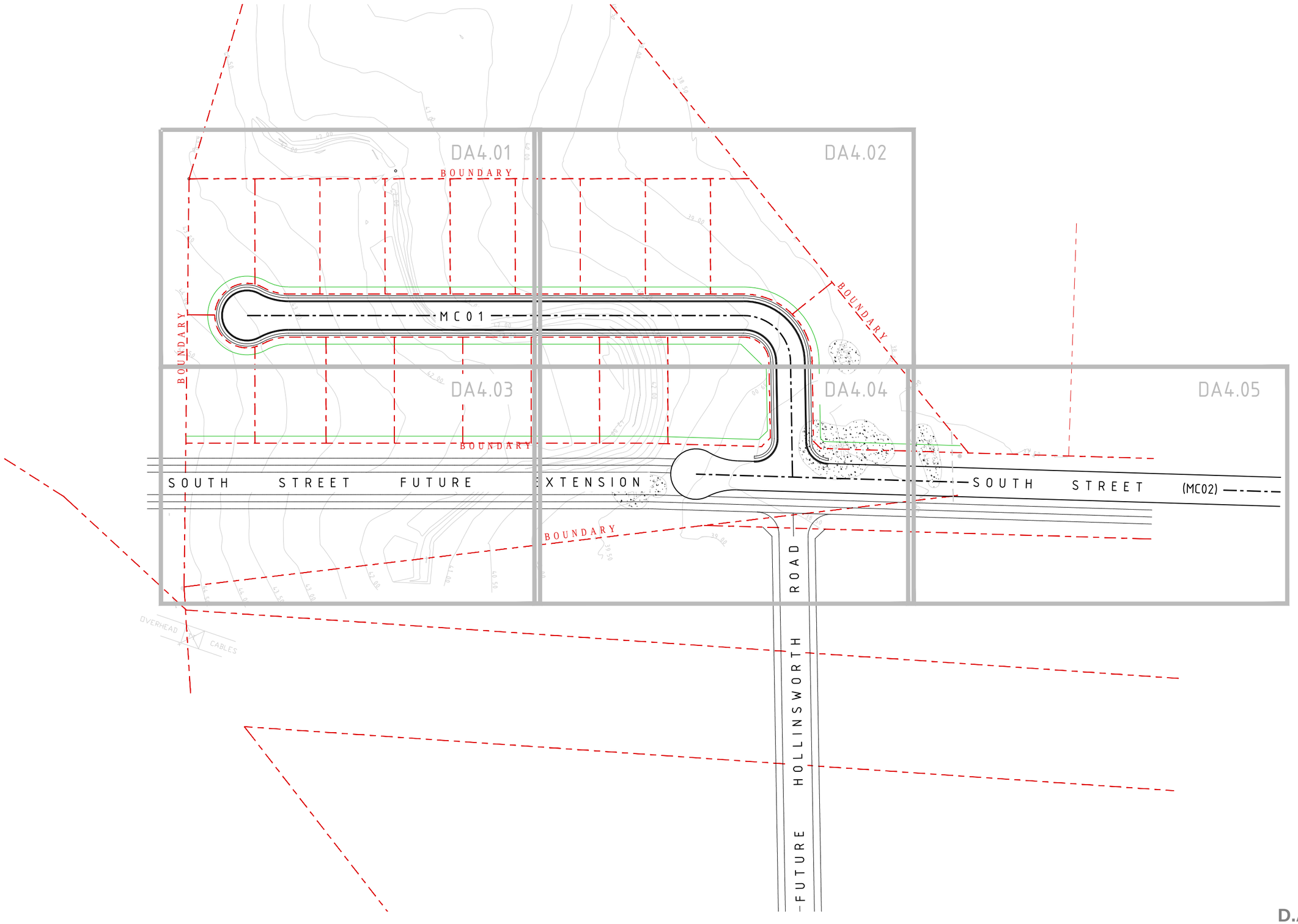
AHSCA
The Association of Consultants Australia (NSW) Inc. CORPORATE MEMBER

DATE DEC 2018	DESIGNED LC		
SCALE N.T.S.	DRAWN LC		
JOB No 18072	DWG No DA1.02	No IN SET --- OF	REV 1



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DATE	No	AMENDMENT	INIT	REV

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
GENERAL ARRANGEMENT PLAN
SHEET

D.A. APPROVAL

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DATE DEC 2018	DESIGNED LC	ISO 9001 - 2008 SERVICES COMPANY	AHSCA THE INSTITUTE of Consulting Arborists Australia (NSW) Inc. CORPORATE MEMBER
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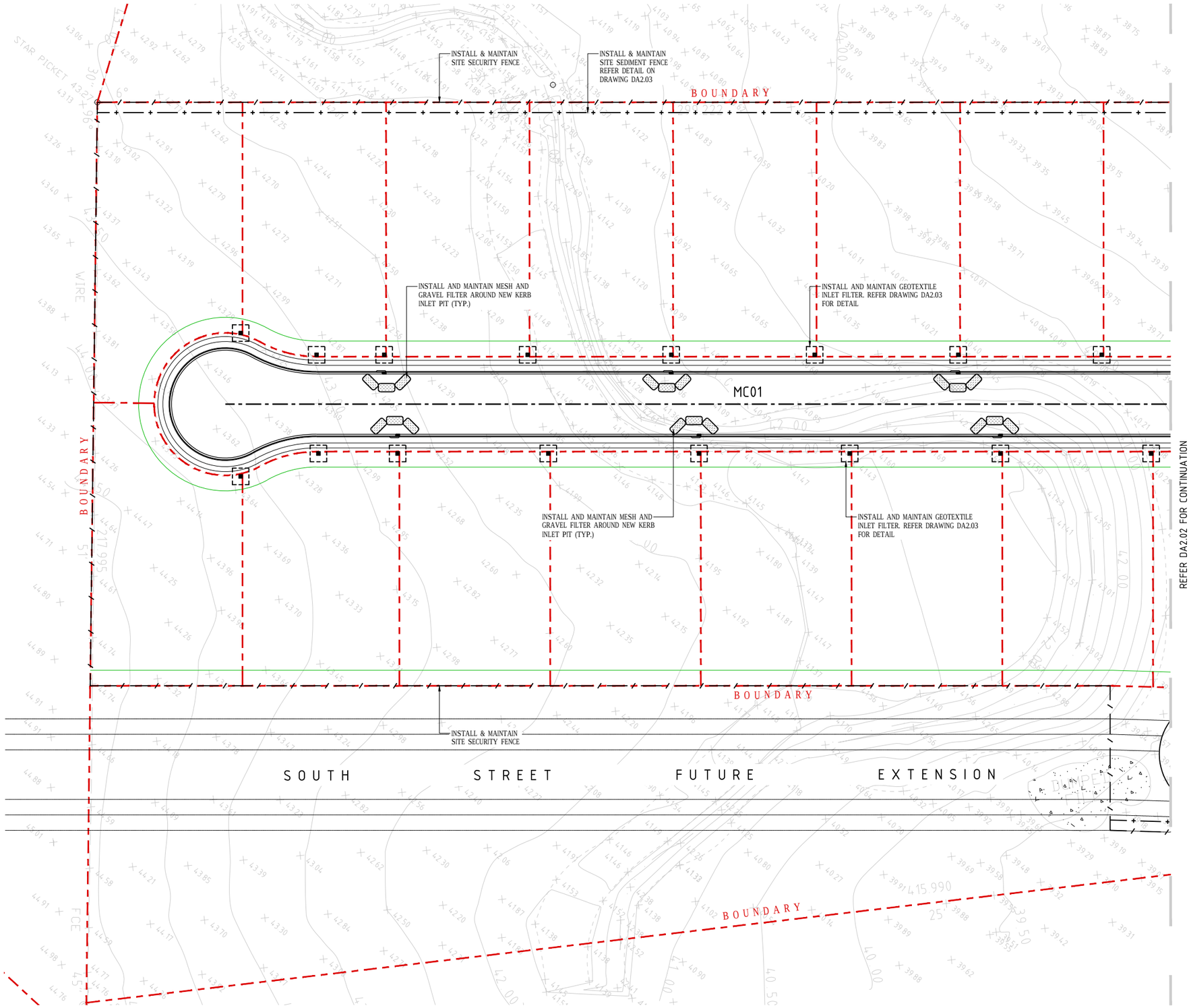

LEGEND

- SITE SECURITY FENCE
- SEDIMENT FENCE
- STABILISED SITE ACCESS
- SITE STOCKPILE
- MESH AND GRAVEL INLET FILTER
- EARTH BANK DIVERSION MOUND
- GEOTEXTILE INLET FILTER

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CLIENT: STRAUSS PROPERTY DEVELOPMENTS

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
SEDIMENT AND EROSION CONTROL PLAN SHEET 1

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AHSCA
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DEC 2018	LC	LC
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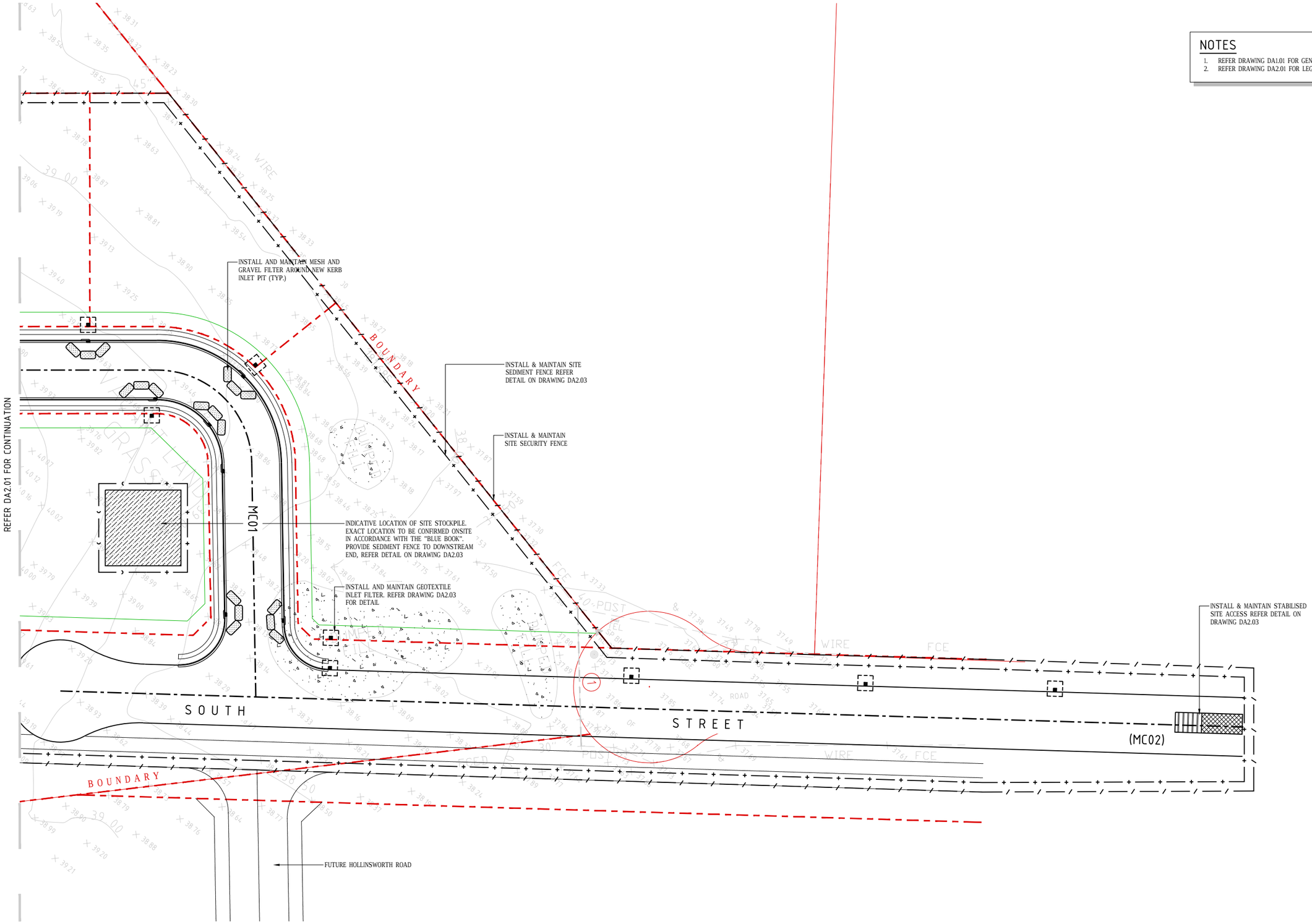
JOB No	DWG No	No IN SET	REV
18072	DA2.01	--- OF	1

D.A. APPROVAL

NOTES

1. REFER DRAWING DA1.01 FOR GENERAL NOTES
2. REFER DRAWING DA2.01 FOR LEGEND



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CLIENT: STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT: SBA ARCHITECTS

PROJECT: INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE: CIVIL DESIGN SEDIMENT AND EROSION CONTROL PLAN SHEET 2

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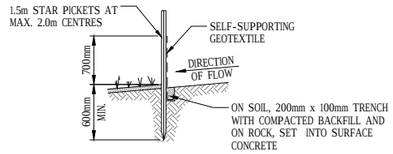

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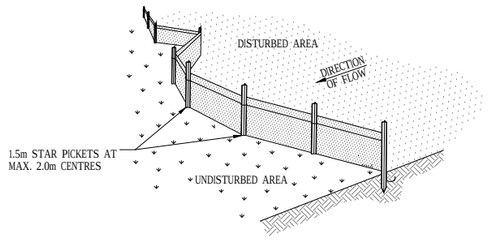
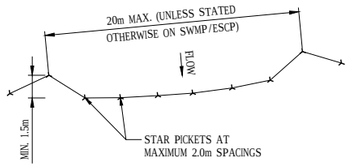




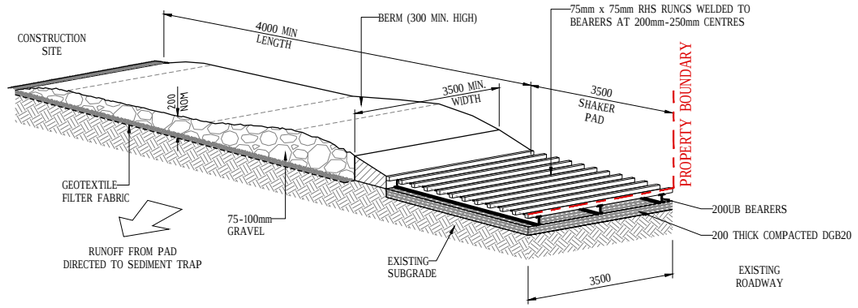
PLAN

SEDIMENT FENCE

NOT TO SCALE

NOTES:

1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50L/s IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 200mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.0m INTERVALS (MAX) AT THE DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.

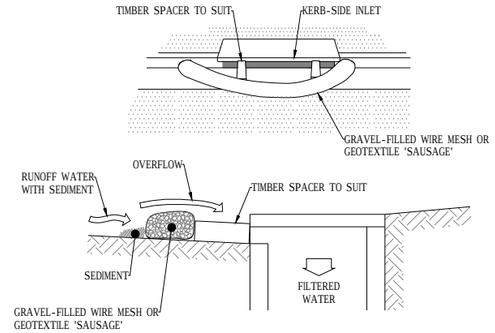


STABILISED SITE ACCESS WITH SHAKER PAD

NOT TO SCALE

MAINTENANCE

- THE TEMPORARY ACCESS SHALL BE MAINTAINED IN A CONDITION THAT PREVENTS TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY,
- THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL GRAVEL AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT,
- ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS OF WAY MUST BE REMOVED IMMEDIATELY.
- INSTALL BARRIER ON EITHER SIDE OF SHAKER PAD TO ENSURE VEHICLES ARE GUIDED ON TO THE PAD.
- INVERT OF SHAKER PAD TO BE DRAINED VIA AGRICULTURAL PIPE WRAPPED IN GEOTEXTILE FABRIC.

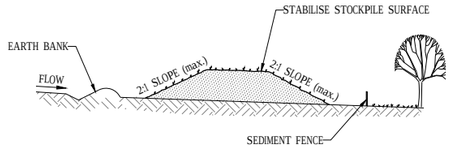


MESH AND GRAVEL INLET FILTER

NOT TO SCALE

NOTES:

1. THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP/ESCP.
2. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
3. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
4. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
5. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100-mm SPACE BETWEEN IT AND THE KERB INLET . MAINTAIN THE OPENING WITH SPACE BLOCKS.
6. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
7. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

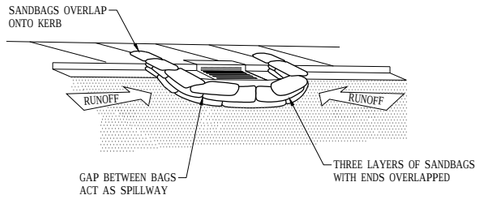


STOCKPILE

NOT TO SCALE

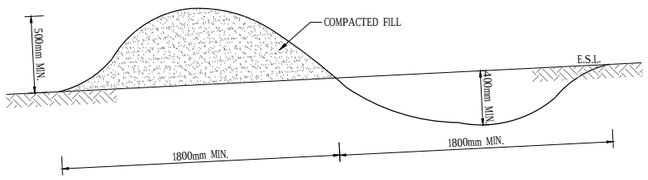
NOTES:

1. PLACE STOCKPILES MORE THAN 2 (PREFERABLY 5) METRES FROM EXISTING VEGETATION, CONCENTRATED WATER FLOW, ROADS AND HAZARD AREAS.
2. CONSTRUCT ON THE CONTOUR AS LOW, FLAT, ELONGATED MOUNDS.
3. WHERE THERE IS SUFFICIENT AREA, TOPSOIL STOCKPILES SHALL BE LESS THAN 2 METRES IN HEIGHT.
4. 4. WHERE THEY ARE TO BE IN PLACE FOR MORE THAN 10 DAYS, STABILISE FOLLOWING THE APPROVED ESCP OR SWMP TO REDUCE THE C-FACTOR TO LESS THAN 0.10.
5. CONSTRUCT EARTH BANKS ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES 1 TO 2 METRES DOWNSLOPE.



SEDIMENT TRAP FOR KERB INLET (AT LOW POINT - SANDBAG)

NOT TO SCALE



DIVERSION BANK

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CLIENT: STRAUSS PROPERTY DEVELOPMENTS

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
SEDIMENT AND EROSION CONTROL DETAILS SHEET

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CONSULTING ENGINEERS
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JOB No	DWG No	No IN SET	REV
18072	DA2.03	--- OF	1

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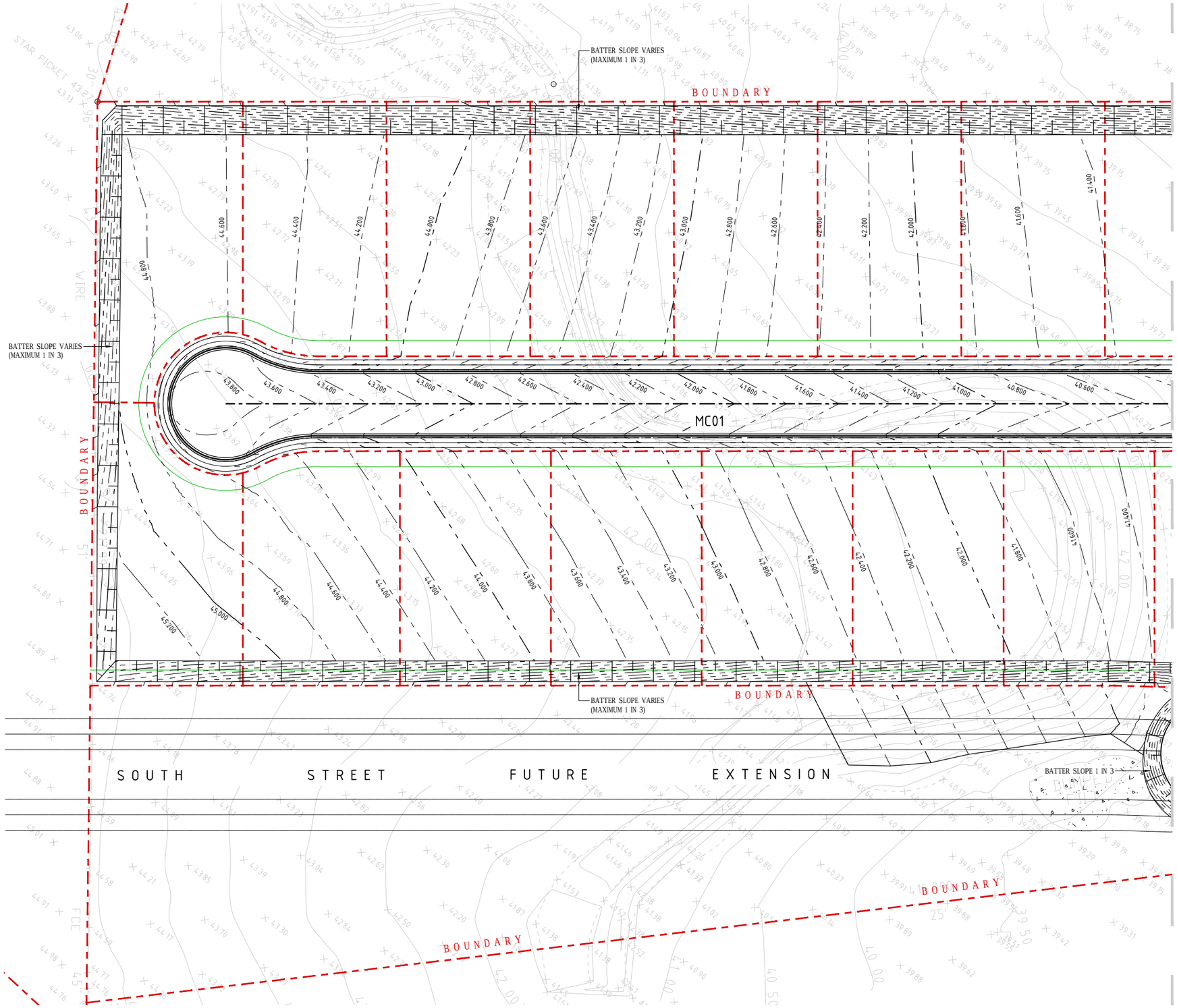

LEGEND

40.00	BULK EARTHWORKS SURFACE MAJOR CONTOUR LINE
39.80	BULK EARTHWORKS SURFACE MINOR CONTOUR LINE
39.00	EXISTING SURFACE CONTOUR LINE

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05.12.18		ISSUE FOR D.A. APPROVAL	MW	1

DATE	No	AMENDMENT	INIT	REV

CLIENT: STRAUSS PROPERTY DEVELOPMENTS

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
BULK EARTHWORKS CONTOUR PLAN SHEET 1

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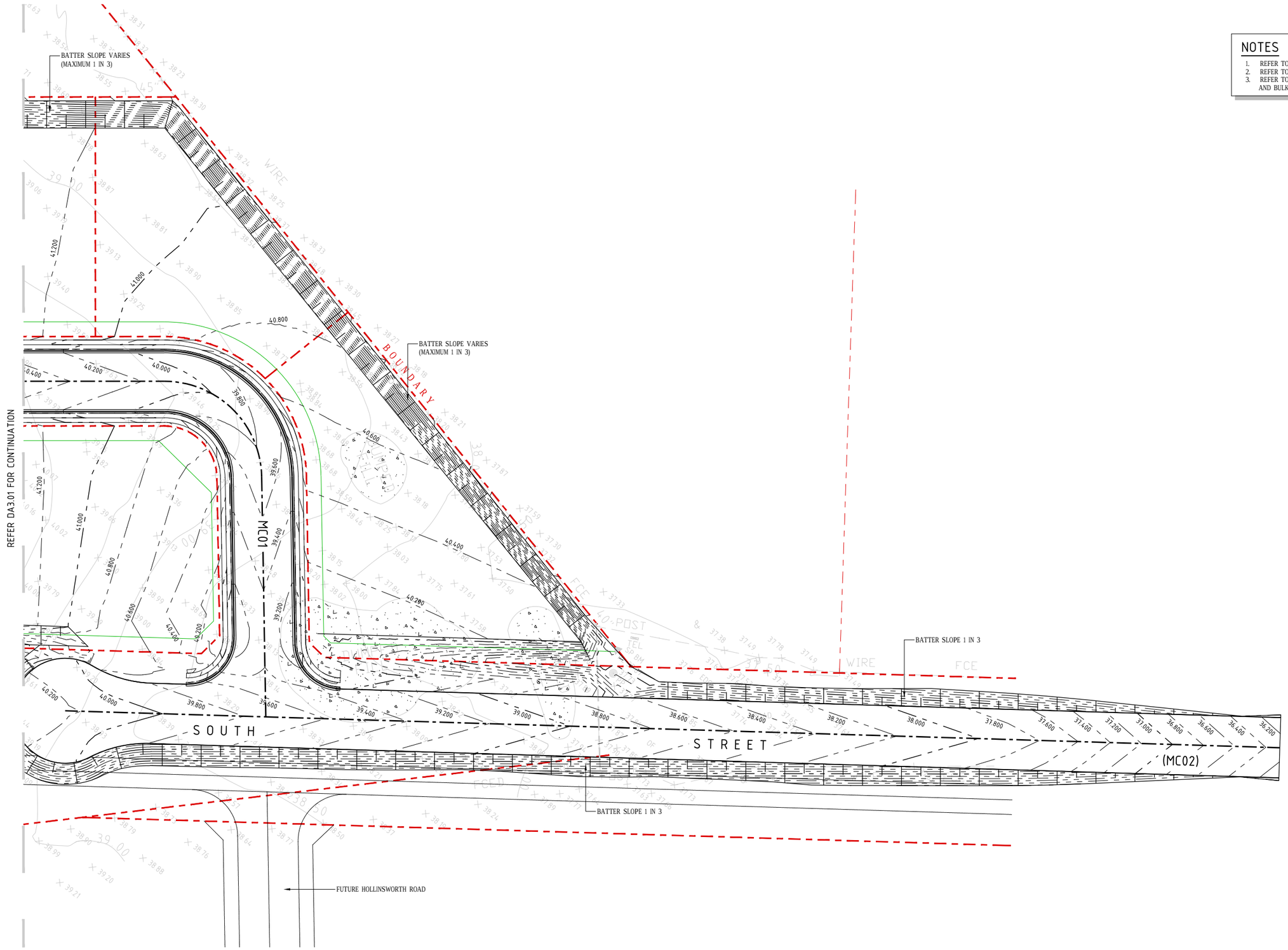
JOB No 18072	DWG No DA3.01	No IN SET ---- OF	REV 1

D.A. APPROVAL

NOTES

1. REFER TO DRAWING DA1.02 FOR GENERAL NOTES
2. REFER TO DRAWING DA3.01 FOR LEGEND
3. REFER TO DRAWING DA3.05 & DA3.06 FOR CUT AND FILL DEPTH AND BULK EARTHWORKS VOLUME CALCULATIONS



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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
BULK EARTHWORKS CONTOUR PLAN SHEET 2

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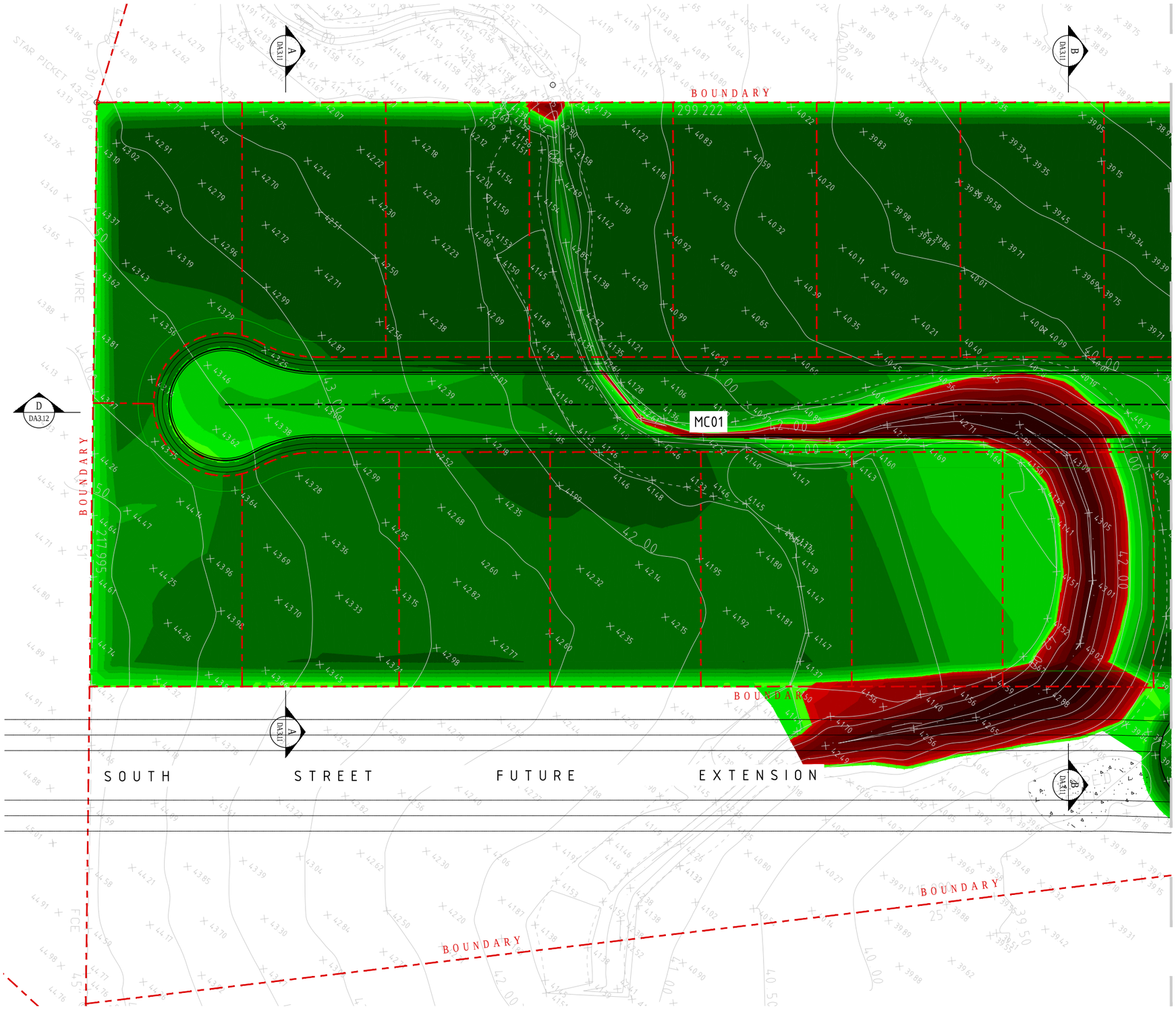
JOB No 18072	DWG No DA3.02	No IN SET ---- OF ---- REV 1



LEGEND

CUT:		FILL:	
-5.0 TO -2.5m		0.0 TO 0.1m	
-2.5 TO -1.5m		0.1 TO 0.25m	
-1.5 TO -1.0m		0.25 TO 0.5m	
-1.0 TO -0.75m		0.5 TO 0.75m	
-0.75 TO -0.5m		0.75 TO 1.0m	
-0.5 TO -0.25m		1.0 TO 1.5m	
-0.25 TO -0.1m		1.5 TO 2.5m	
-0.1 TO 0.0m		2.5 TO 5.0m	

NOTES

1. REFER TO DRAWING DA1.01 FOR GENERAL NOTES AND SPECIFICATIONS
2. CUT TO FILL DEPTHS SHOWN ARE BASED ON LEVEL SHOWN ON SURVEY PREPARED BY EAST COAST SURVEYORS, REF: ECP1453.D.01, DATED 06/12/2017
3. VOLUMES DETAILED BELOW DO NOT TAKE INTO ACCOUNT BULKING & COMPACTION OF THE MATERIAL, DETAILED EXCAVATION FOR ALL SERVICES TRENCHING & FOUNDATIONS, AND BACKFILL FOR RETAINING WALL CONSTRUCTION. CONTRACTOR TO CONFIRM VOLUMES BASED ON WORKS METHODOLOGY EMPLOYED.

   CUT - 2,864m^3
   FILL - 81,152m^3

   TOTAL IMPORT - 78306m^3
   (EXCLUDES TRENCHING FOR OTHER SERVICES)

4. VOLUMES BASED ON THE FOLLOWING THICKNESSES' AS SHOWN ON AND TAKEN FROM FINISHED SURFACE:
   - ROAD PAVEMENT - 690mm
   - FOOTPATH - 100mm

5. EARTHWORKS AREAS ARE BASED ON STRIPPED TOPSOIL (100mm) PRIOR TO EARTHWORKS.

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CLIENT: STRAUSS PROPERTY DEVELOPMENTS

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
BULK EARTHWORKS DEPTH CUT TO FILL PLAN SHEET 1

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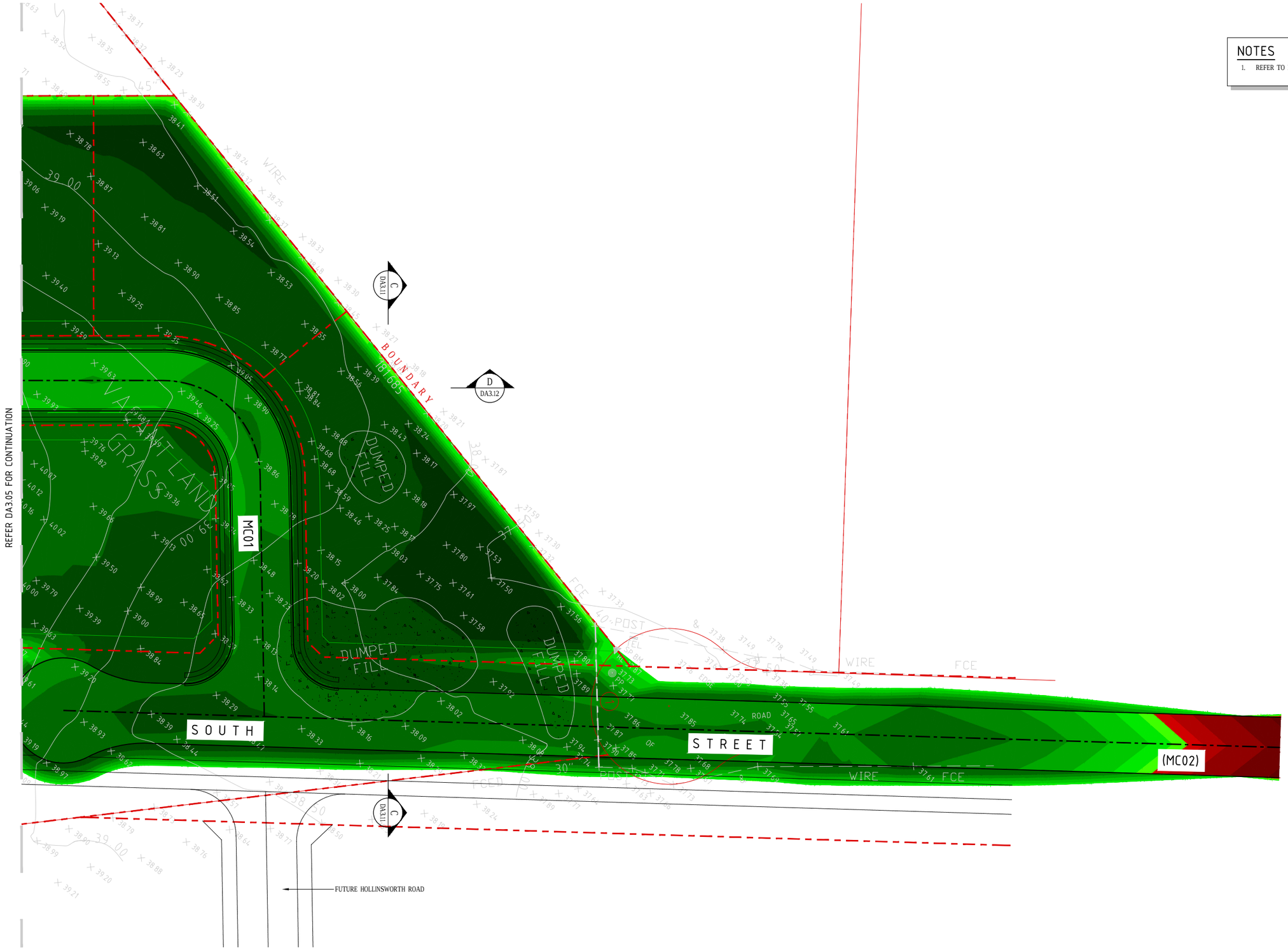
DEC 2018	LC	LC	1:500	18072	DA3.05	---- OF	1



NOTES

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
BULK EARTHWORKS DEPTH CUT TO FILL PLAN SHEET 2

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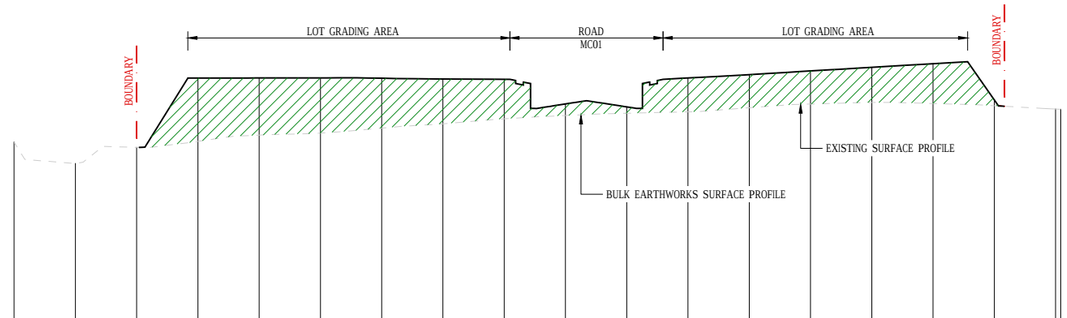
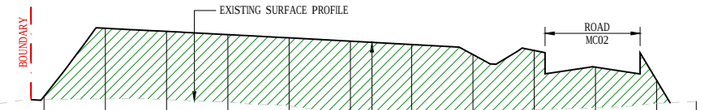


DATUM R.L. 36.000

DESIGN SURFACE LEVEL				44.452	44.456	44.459	44.447	44.422	44.412	43.608	43.512	44.455	44.563	44.687	44.804	44.921	43.736		
EXISTING SURFACE LEVEL	42.363	41.663	42.190	42.387	42.591	42.657	42.819	42.959	43.122	43.230	43.304	43.350	43.484	43.605	43.657	43.622	43.551	43.410	43.465
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	179.484

BULK EARTHWORKS SECTION A
DA3.05

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100



DATUM R.L. 32.000

DESIGN SURFACE LEVEL			38.478	40.697	40.596	40.492	40.386	40.277	40.169	39.841	39.975	39.429	38.996	
EXISTING SURFACE LEVEL	38.167	38.230	38.373	38.392	38.365	38.285	38.163	37.892	37.887	37.956	38.030	38.104	38.247	38.311
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	126.458

BULK EARTHWORKS SECTION C
DA3.06

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

DATUM R.L. 32.000

DESIGN SURFACE LEVEL				41.446	41.435	41.454	41.475	41.498	41.519	40.897	40.603	41.551	41.605	41.654	41.703	41.752	40.378	40.237	
EXISTING SURFACE LEVEL	38.922	38.949	39.050	39.181	39.316	39.480	39.685	39.916	40.066	40.956	42.299	42.849	42.175	42.058	42.177	42.564	42.501	41.884	39.946
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	179.484

BULK EARTHWORKS SECTION B
DA3.05

HORIZONTAL SCALE 1:500
VERTICAL SCALE 1:100

LEGEND

CUT AREA

FILL AREA

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CLIENT: STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT: SBA ARCHITECTS

PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
BULK EARTHWORKS SECTIONS
SHEET 1

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JOB No 18072	DWG No DA3.11	No IN SET ---- OF	REV 1

NOTES

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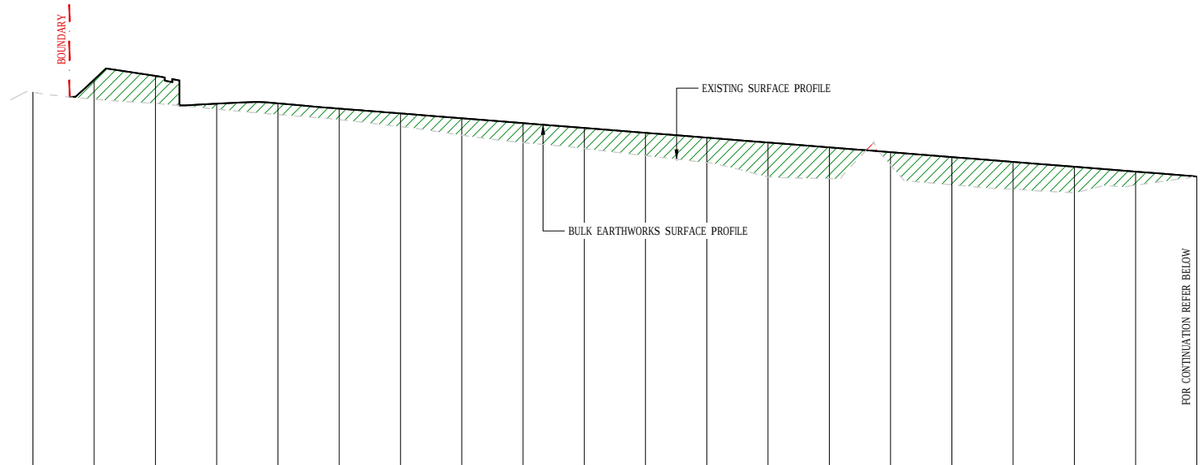

DATUM R.L. 32.000

CHAINAGE	DESIGN SURFACE LEVEL	EXISTING SURFACE LEVEL
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10.000	44.645	44.002
20.000	44.764	43.865
30.000	43.856	43.677
40.000	43.867	43.501
50.000	43.695	43.335
60.000	43.539	43.106
70.000	43.380	42.830
80.000	43.222	42.585
90.000	43.064	42.392
100.000	42.906	42.159
110.000	42.747	41.932
120.000	42.589	41.464
130.000	42.431	41.409
140.000	42.273	41.853
150.000	42.115	41.208
160.000	41.956	41.068
170.000	41.798	40.949
180.000	41.640	41.196
190.000	41.482	41.517
200.000		

BULK EARTHWORKS SECTION

D
DA3.05/3.06

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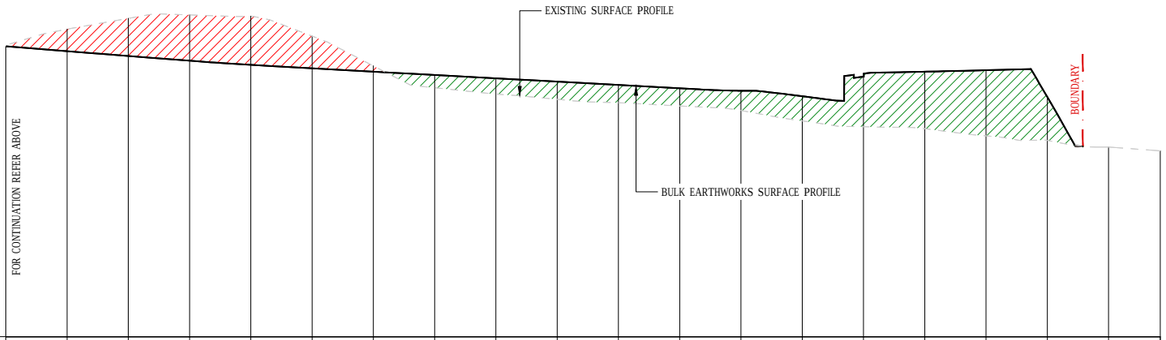
VERTICAL SCALE 1:100



DATUM R.L. 32.000

CHAINAGE	DESIGN SURFACE LEVEL	EXISTING SURFACE LEVEL
200.000	41.482	41.517
210.000	41.323	42.041
220.000	41.165	42.394
230.000	41.012	42.507
240.000	40.877	42.463
250.000	40.763	41.814
260.000	40.654	40.842
270.000	40.546	40.130
280.000	40.438	39.921
290.000	40.329	39.752
300.000	40.221	39.639
310.000	40.112	39.536
320.000	40.032	39.389
330.000	39.853	39.047
340.000	40.490	38.856
350.000	40.654	38.795
360.000	40.703	38.559
370.000	39.828	38.411
380.000		38.195
388.451		38.069

BULK EARTHWORKS SECTION

D
DA3.05/3.06

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
BULK EARTHWORKS SECTIONS
SHEET 2

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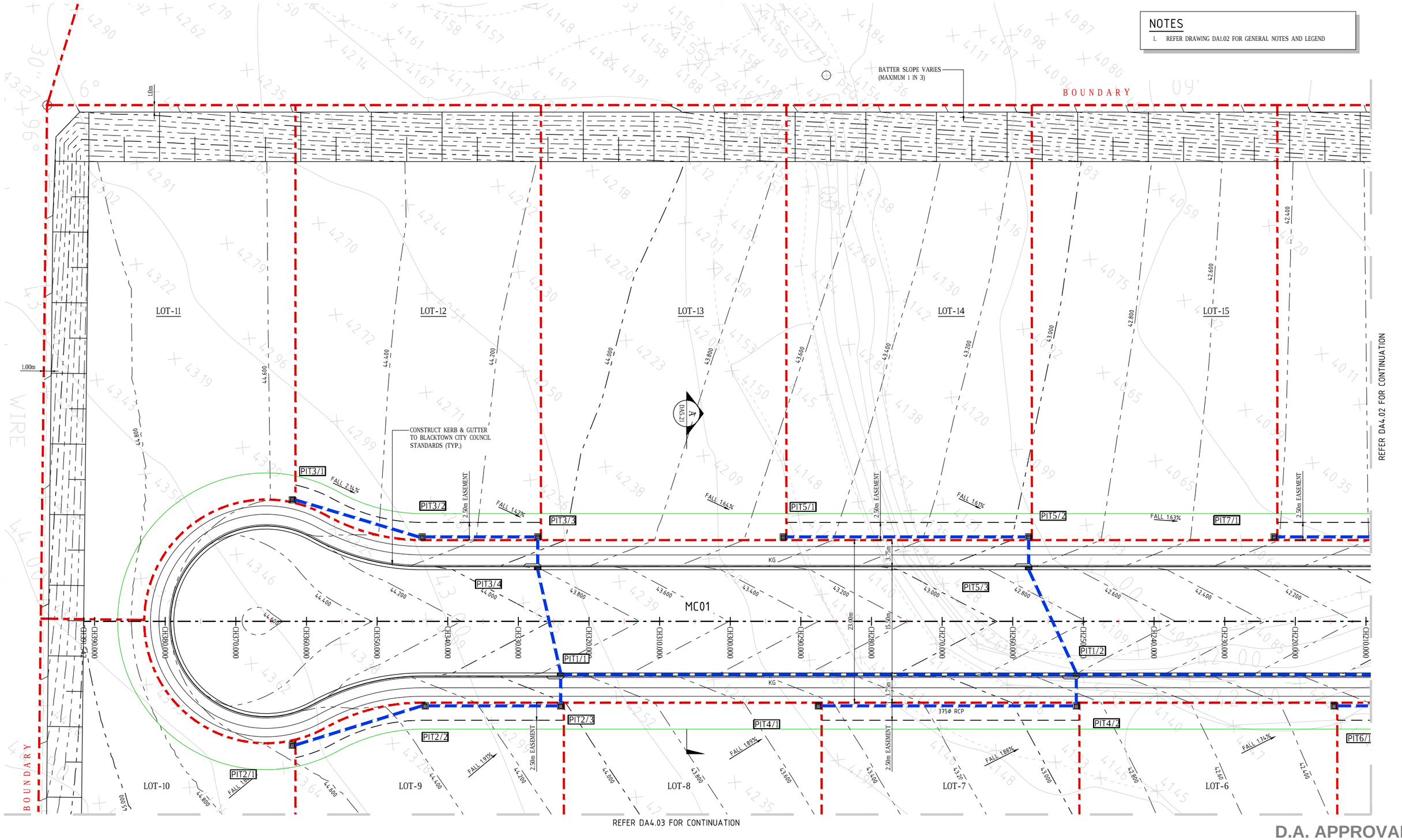
AS SHOWN	18072	DA3.12	---- OF	1

D.A. APPROVAL

NOTES

1. REFER DRAWING DA1.02 FOR GENERAL NOTES AND LEGEND



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0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0
METRES

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DATE	No	AMENDMENT	INIT	REV

CLIENT: STRAUSS PROPERTY DEVELOPMENTS

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 1

SPARKS + PARTNERS
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DATE	DEC 2018	DESIGNED	LC
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JOB No	18072	DWG No	DA4.01
No IN SET	--- OF	REV	1

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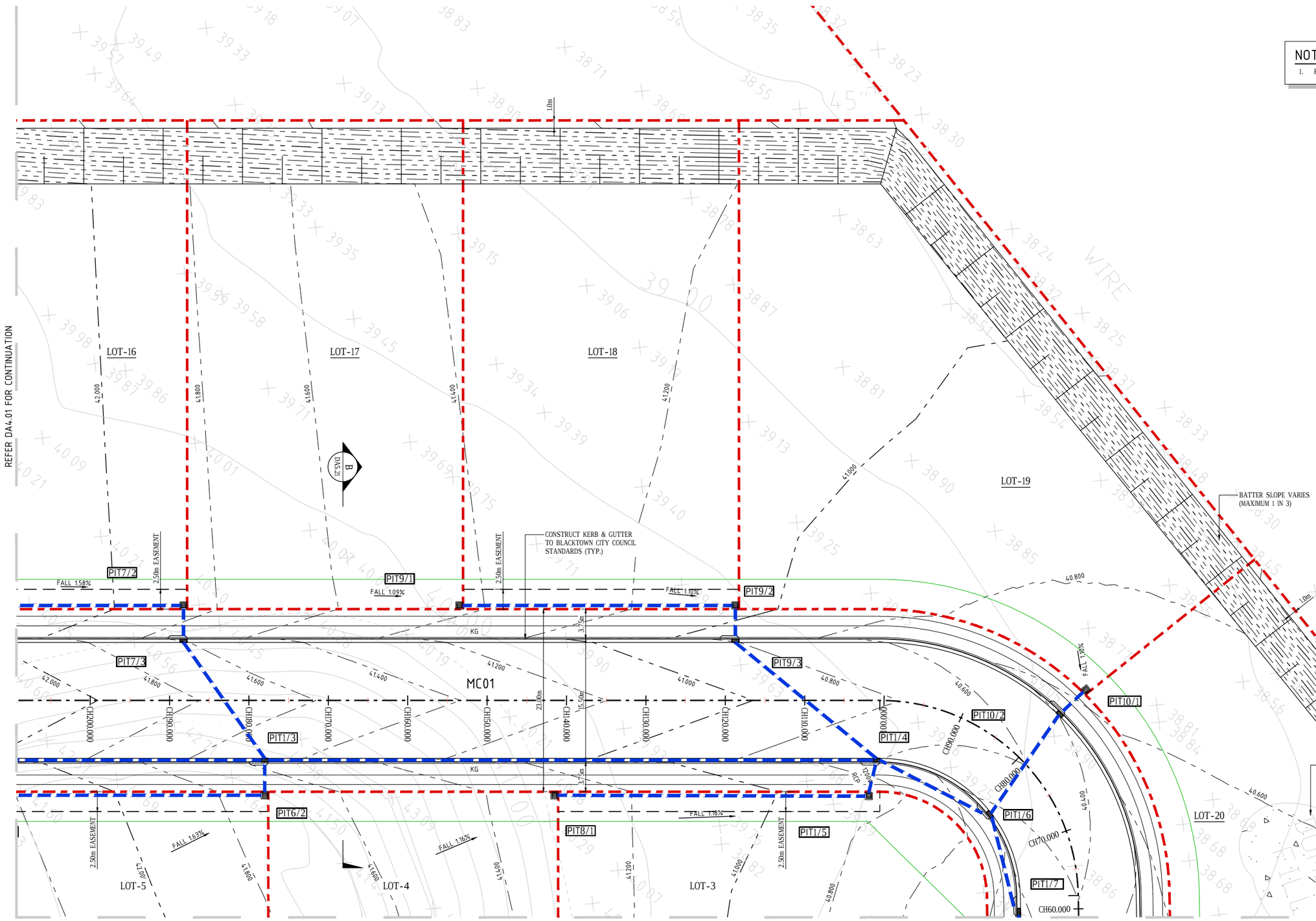
ISO 9001 - 2000 QUALITY SYSTEMS CERTIFIED
ISO/IEC 17025 Construction Australia (NSW) Inc. CORPORATE MEMBER

NOTES

1. REFER DRAWING DA1.02 FOR GENERAL NOTES AND LEGEND



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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 2

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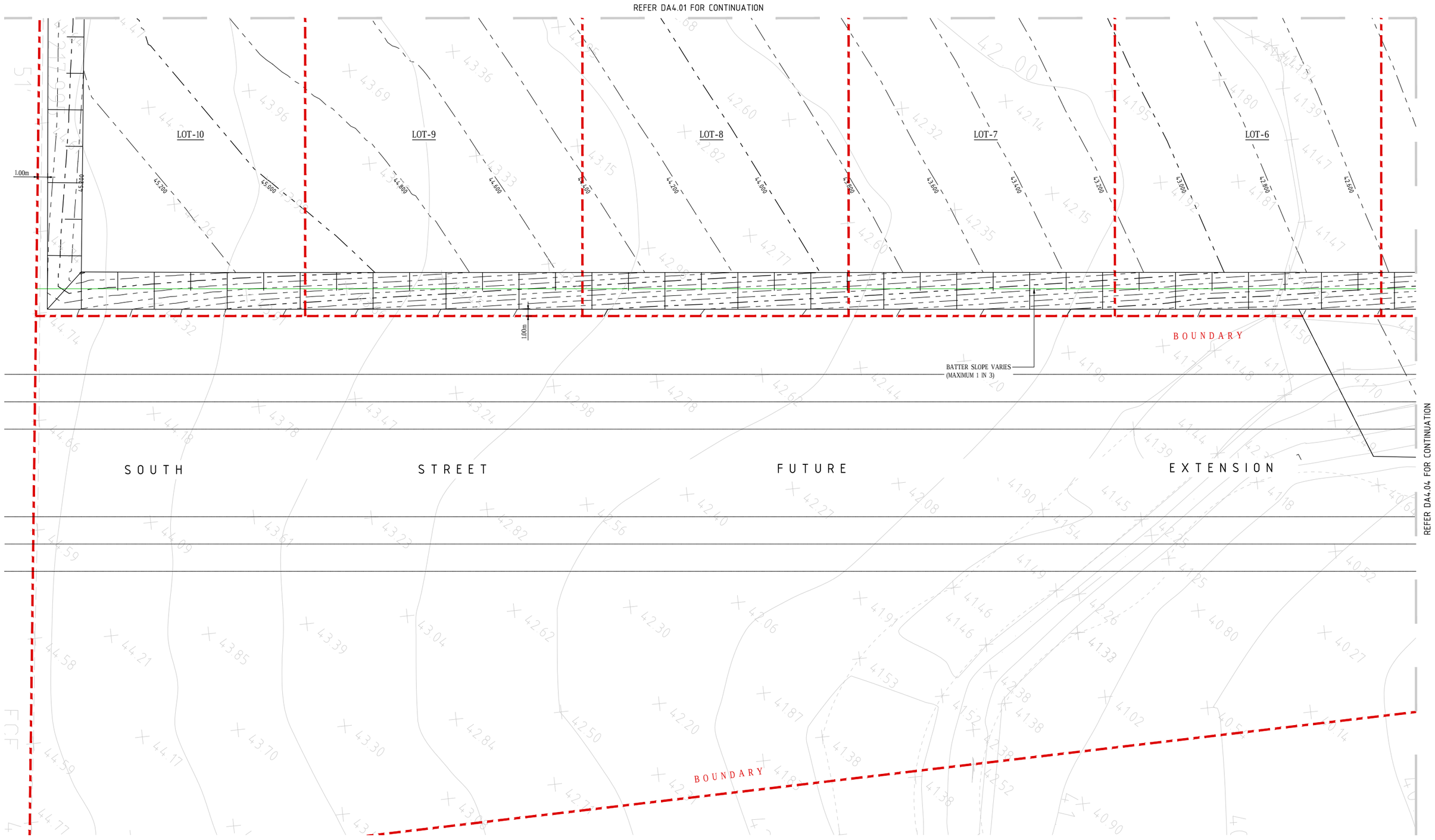

NOTES

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 3

SPARKS + PARTNERS
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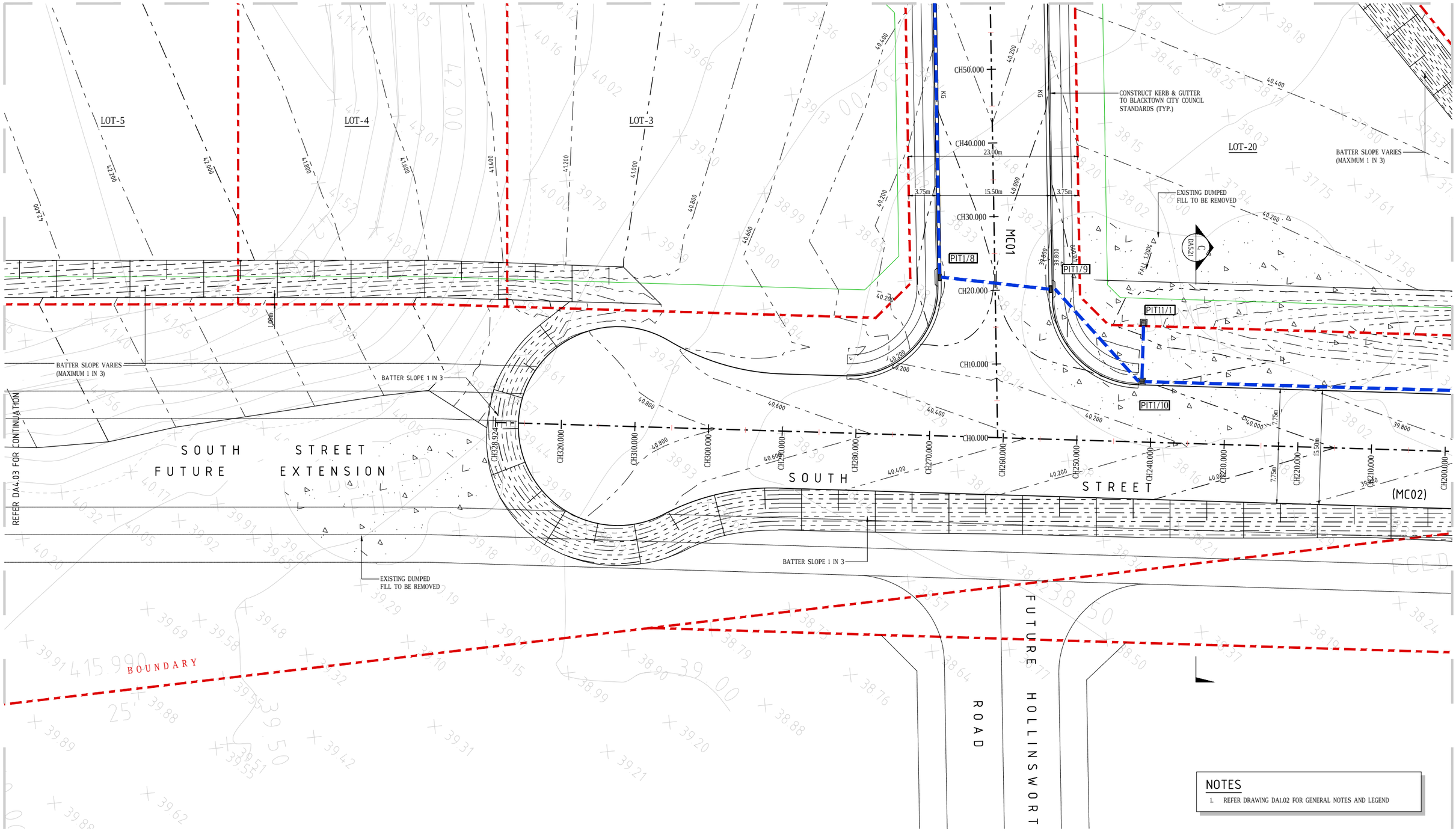

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CLIENT: STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT: SBA ARCHITECTS
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PROJECT: INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE: CIVIL DESIGN
SITEWORKS AND STORMWATER MANAGEMENT PLAN SHEET 4

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JOB No 18072	DWG No DA4.04	No IN SET ---- OF ---- REV 1

REFER DA4.02 FOR CONTINUATION

NOTES

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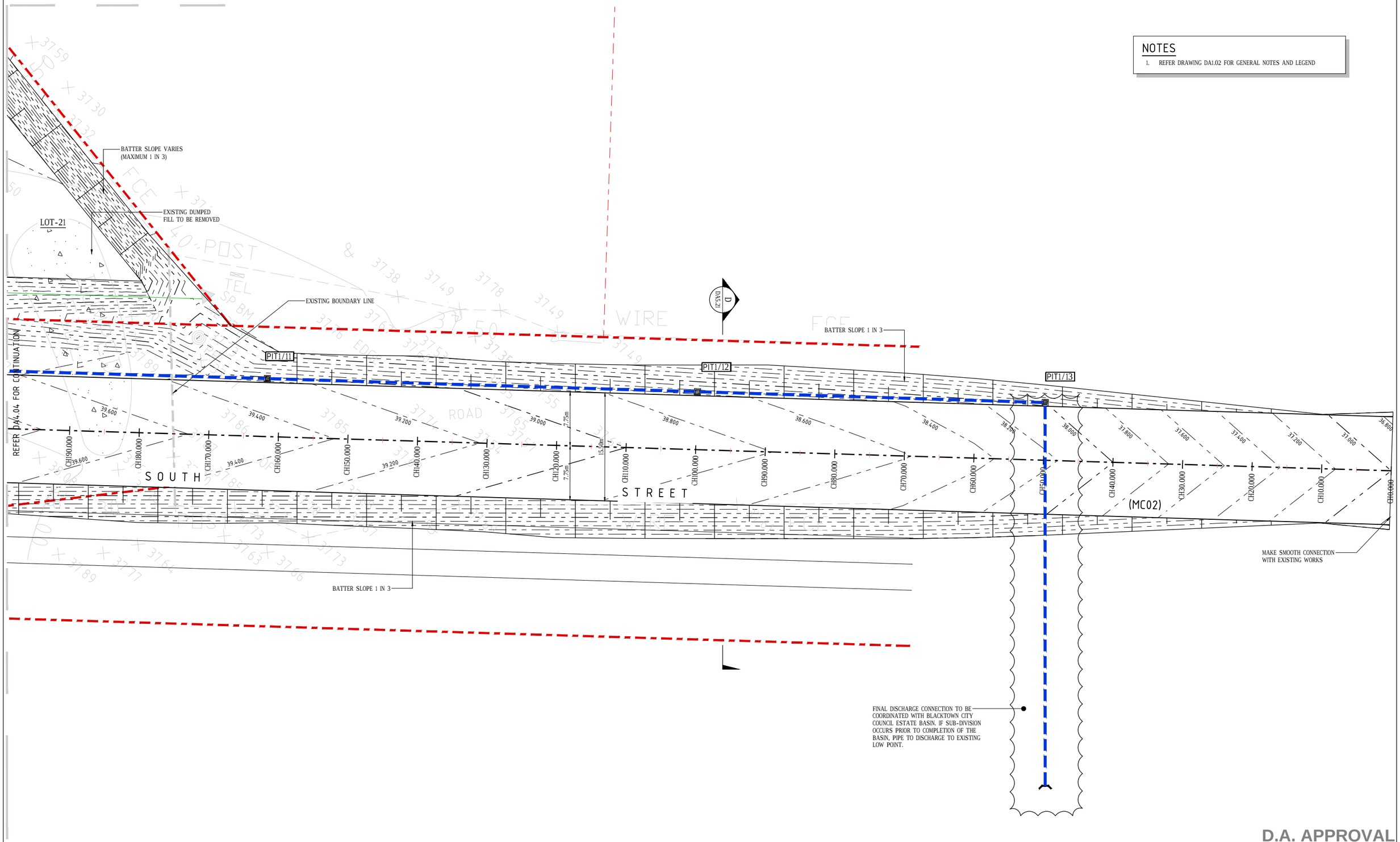

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DATE	No	AMENDMENT	INIT	REV

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH
STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
SITEWORKS AND STORMWATER
MANAGEMENT PLAN SHEET 5

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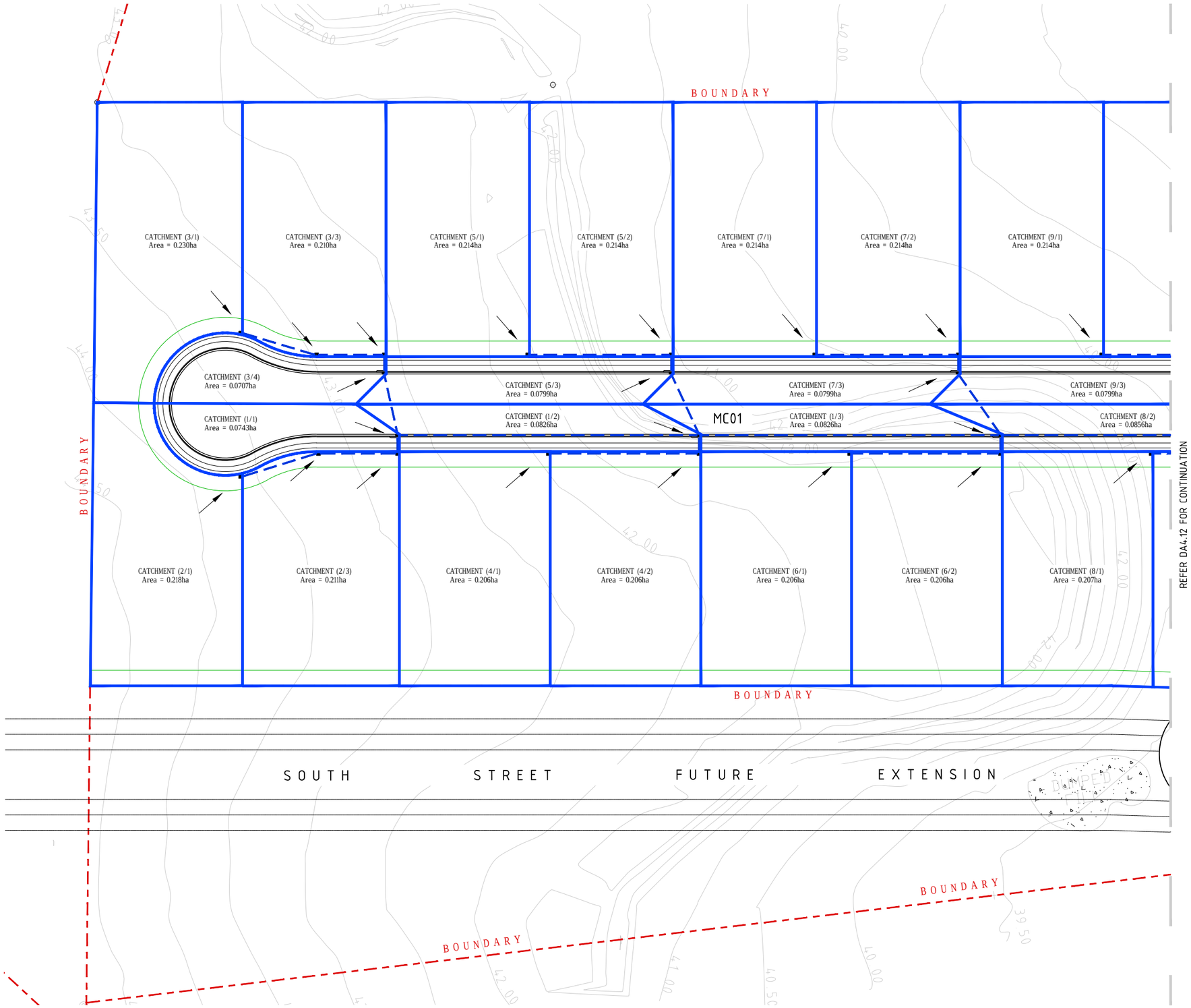
DATE	DESIGNED	DRAWN
DEC 2018	LC	LC
SCALE 1:100		

JOB No	DWG No	No IN SET	REV
18072	DA4.05	--- OF ---	---



NOTES

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
STORMWATER DRAINAGE
CATCHMENT PLAN SHEET 1

SPARKS + PARTNERS
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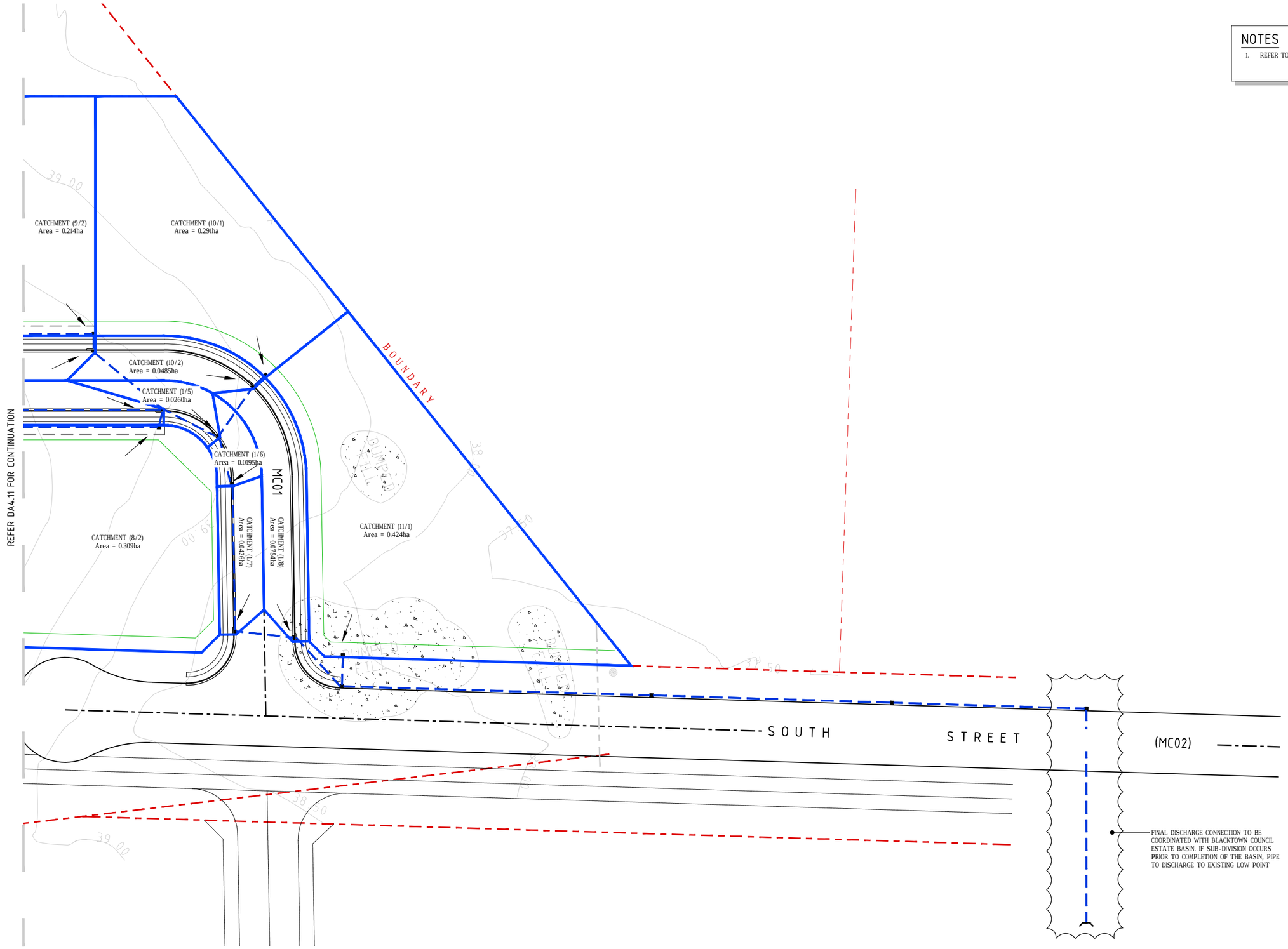
1:500	18072	DA4.11	---- OF	1

D.A. APPROVAL

NOTES

1. REFER TO DRAWING DA1.01 FOR GENERAL NOTES



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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
STORMWATER DRAINAGE
CATCHMENT PLAN SHEET 2

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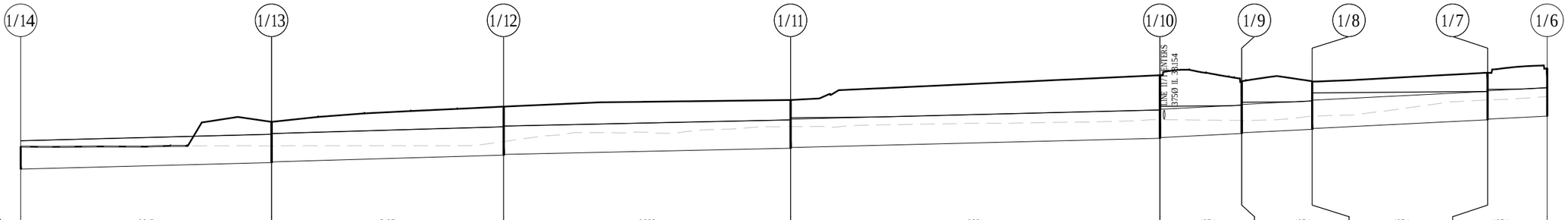
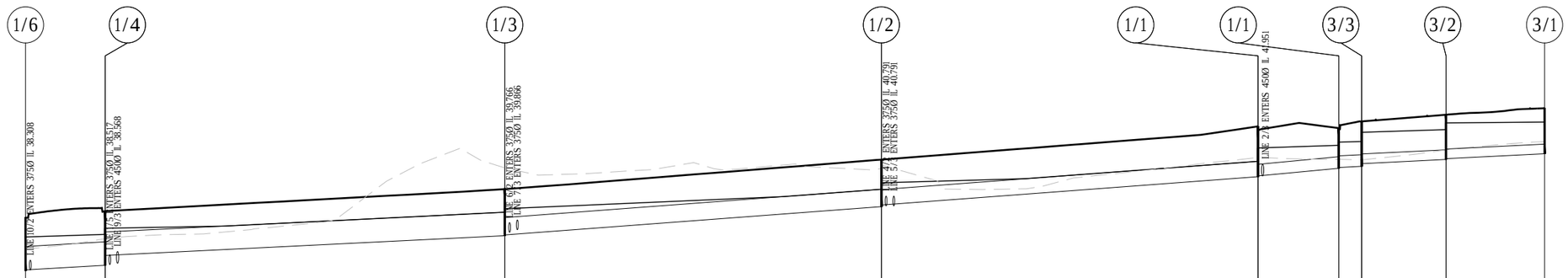


	1/14	1/13	1/12	1/11	1/10	1/9	1/8	1/7	1/6
CAPACITY (l/sec)	2917	3127	2666	2881	4074	4074	4074	4074	
VELOCITY (m/s)	2.74	2.90	2.55	2.72	3.55	3.54	3.53	3.53	
PIPE DETAILS	1200Ø Class 3 RRJ	1200Ø Class 3 RRJ	1200Ø Class 3 RRJ	1200Ø Class 3 RRJ	1200Ø Class 3 RRJ	1200Ø Class 3 RRJ	1200Ø Class 3 RRJ	1200Ø Class 3 RRJ	
SLOPE/GRADE	0.5%	0.6%	0.4%	0.5%	1.0%	1.0%	1.0%	1.0%	
DATUM RL 31									
HGL (1 ln 20 Yr)	37.220	37.497 / 37.527	37.821 / 37.851	38.116 / 38.207	38.544 / 38.700	38.759 / 38.875	38.932 / 39.276	39.341 / 39.428	39.498
DEPTH TO INVERT	0.967	1.754 / 1.724	2.085 / 2.055	2.074 / 2.044	2.714 / 2.684	2.239 / 2.209	2.055 / 2.025	2.026 / 1.996	2.061
INVERT LEVEL	36.000	36.277 / 36.307	36.601 / 36.631	36.896 / 36.926	37.324 / 37.354	37.530 / 37.560	37.712 / 37.742	38.120 / 38.150	38.278
FINISHED SURFACE	36.967	38.031	38.686	38.970	40.038	39.769	39.767	40.146	40.339
EXISTING SURFACE	36.967	37.001	37.184	37.827	38.127	38.092	38.281	38.972	39.115
CHAINAGE	0.000	54.060	104.060	165.908	245.497	263.120	278.287	316.121	328.957
	54.060	50.000	61.848	79.589	17.623	15.167	37.835	12.835	

DRAINAGE LONGITUNDINAL SECTION - LINE 1

SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	1/6	1/4	1/3	1/2	1/1	1/1	3/3	3/2	3/1
CAPACITY (l/sec)	2004	1856	1021	745	393	284	175	175	
VELOCITY (m/s)	3.51	3.17	2.96	2.97	2.74	2.04	1.74	1.64	
PIPE DETAILS	900Ø Class 3 RRJ	900Ø Class 3 RRJ	675Ø Class 3 RRJ	600Ø Class 3 RRJ	450Ø Class 3 RRJ	450Ø Class 3 RRJ	375Ø Class 3 RRJ	375Ø Class 3 RRJ	
SLOPE/GRADE	1.2%	1.0%	1.5%	1.5%	1.9%	1.0%	1.0%	1.0%	
DATUM RL 33.3									
HGL (1 ln 20 Yr)	39.584	39.684 / 39.923	40.546 / 40.680	41.434 / 41.685	42.519 / 43.037	43.138 / 43.260	43.283 / 43.641	43.744	44.003 / 44.204
DEPTH TO INVERT	2.031	2.102 / 1.720	1.865 / 1.775	1.822 / 1.757	1.947 / 1.917	1.542 / 1.511	1.740 / 1.638	1.733	1.703 / 1.765
INVERT LEVEL	38.308	38.487 / 38.868	39.636 / 39.666	40.761 / 40.826	41.921 / 41.951	42.248 / 42.279	42.323 / 42.425	42.589	42.619 / 42.810
FINISHED SURFACE	40.339	40.508	41.441	42.583	43.868	43.790	44.063	44.322	44.575
EXISTING SURFACE	39.115	39.521	42.261	42.263	42.668	42.594	42.575	42.958	43.281
CHAINAGE	328.957	344.384	421.860	494.860	567.859	583.515	587.940	604.314	623.427
	15.427	77.476	73.000	73.000	15.655	4.425	16.374	19.114	

DRAINAGE LONGITUNDINAL SECTION - LINE 1 & 3

SCALES: HORIZONTAL 1:500 VERTICAL 1:100

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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
STORMWATER DRAINAGE
LONGITUDINAL SECTIONS SHEET 1

D.A. APPROVAL

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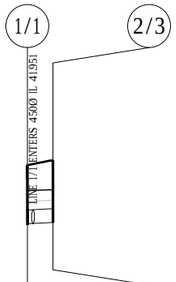
CORPORATE MEMBER

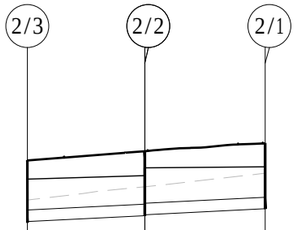
DATE DEC 2018	DESIGNED LC		
SCALE AS SHOWN	DRAWN LC		
JOB No 18072	DWG No DA4.21	No IN SET ---- OF	REV 1



	1/1	2/3
CAPACITY (l/sec)	286	
VELOCITY (m/s)	2.05	
PIPE DETAILS	450Ø Class 3 RRJ	
SLOPE/GRADE	1.0%	
DATUM RL 37		
HGL (1 In 20 Yr)	43.037	43.058
DEPTH TO INVERT	1.917	2.023
INVERT LEVEL	41.951	41.993
FINISHED SURFACE	43.868	44.016
EXISTING SURFACE	42.668	42.723
CHAINAGE	0.000	4.160
	4.160	

DRAINAGE LONGITUNDINAL SECTION - LINE 2

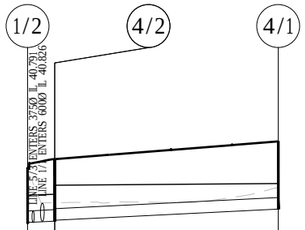
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	2/3	2/2	2/1
	175	176	
	1.70	1.62	
	375Ø Class 3 RRJ	375Ø Class 3 RRJ	
	1.0%	1.0%	
HGL (1 In 20 Yr)	43.407	43.523 / 43.375	43.960
DEPTH TO INVERT	1.993	2.105 / 2.075	2.133
INVERT LEVEL	42.023	42.214 / 42.244	42.441
FINISHED SURFACE	44.016	44.319	44.574
EXISTING SURFACE	42.723	43.158	43.598
CHAINAGE	4.160	23.330	42.963
	19.170	19.633	

DRAINAGE LONGITUNDINAL SECTION - LINE 2

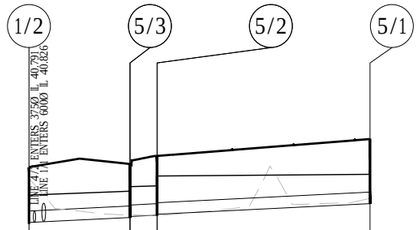
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	1/2	4/2	4/1
	175	175	
	1.64	1.60	
	375Ø Class 3 RRJ	375Ø Class 3 RRJ	
	1.0%	1.0%	
	RL 35.8		
HGL (1 In 20 Yr)	41.685	41.710 / 42.010	42.201
DEPTH TO INVERT	1.792	2.024 / 1.934	2.208
INVERT LEVEL	40.791	40.835 / 40.865	41.230
FINISHED SURFACE	42.583	42.859	43.438
EXISTING SURFACE	42.263	41.437	41.925
CHAINAGE	0.000	4.426	40.925
	4.426	36.500	

DRAINAGE LONGITUNDINAL SECTION - LINE 4

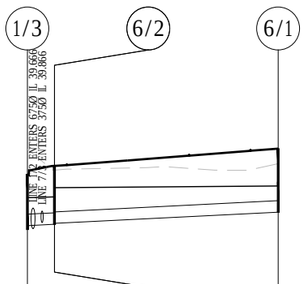
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	1/2	5/3	5/2	5/1
	175	175	175	
	1.93	1.69	1.61	
	375Ø Class 3 RRJ	375Ø Class 3 RRJ	375Ø Class 3 RRJ	
	1.0%	1.0%	1.0%	
	RL 35.8			
HGL (1 In 20 Yr)	41.685	41.811 / 41.962	41.989 / 42.310	42.511
DEPTH TO INVERT	1.792	1.734 / 1.704	1.934 / 1.904	2.106
INVERT LEVEL	40.791	40.956 / 40.906	41.030 / 41.060	41.408
FINISHED SURFACE	42.583	42.690	42.964	43.514
EXISTING SURFACE	42.263	41.040	41.021	41.574
CHAINAGE	0.000	16.488	20.913	55.668
	16.488	4.425	34.755	

DRAINAGE LONGITUNDINAL SECTION - LINE 5

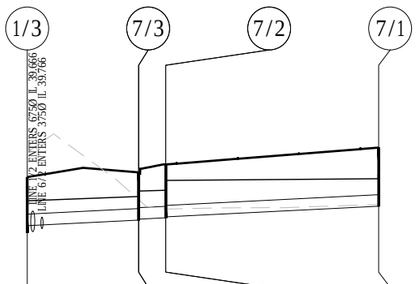
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	1/3	6/2	6/1
CAPACITY (l/sec)	175	175	
VELOCITY (m/s)	1.64	1.60	
PIPE DETAILS	375Ø Class 3 RRJ	375Ø Class 3 RRJ	
SLOPE/GRADE	1.0%	1.0%	
DATUM RL 34.8			
HGL (1 In 20 Yr)	40.680	40.704 / 41.005	41.195
DEPTH TO INVERT	1.675	1.906 / 1.876	2.076
INVERT LEVEL	39.766	39.810 / 39.840	40.205
FINISHED SURFACE	41.441	41.716	42.281
EXISTING SURFACE	42.261	41.575	41.789
CHAINAGE	0.000	4.425	40.924
	4.425	36.500	

DRAINAGE LONGITUNDINAL SECTION - LINE 6

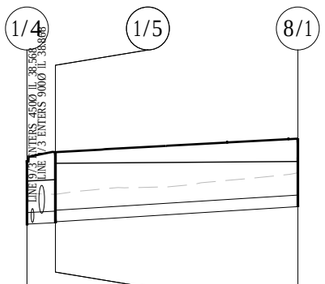
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	1/3	7/3	7/2	7/1
	175	175	175	
	1.93	1.69	1.61	
	375Ø Class 3 RRJ	375Ø Class 3 RRJ	375Ø Class 3 RRJ	
	1.0%	1.0%	1.0%	
	RL 34.9			
HGL (1 In 20 Yr)	40.680	40.819 / 40.995	41.021 / 41.342	41.543
DEPTH TO INVERT	1.575	1.543 / 1.513	1.741 / 1.711	1.913
INVERT LEVEL	39.866	40.048 / 40.078	40.122 / 40.152	40.500
FINISHED SURFACE	41.441	41.591	41.863	42.413
EXISTING SURFACE	42.261	40.726	40.408	40.556
CHAINAGE	0.000	18.195	22.620	57.374
	18.195	4.425	34.755	

DRAINAGE LONGITUNDINAL SECTION - LINE 7

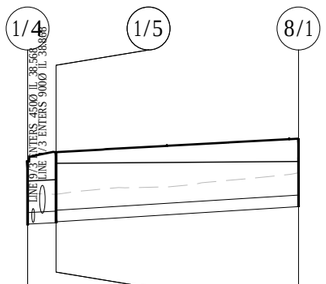
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	1/4	1/5	8/1
	175	196	
	2.22	1.74	
	375Ø Class 3 RRJ	375Ø Class 3 RRJ	
	1.0%	1.3%	
	RL 33.5		
HGL (1 In 20 Yr)	39.923	39.970 / 40.502	40.697
DEPTH TO INVERT	2.072	2.304 / 2.274	2.218
INVERT LEVEL	38.517	38.563 / 38.593	39.088
FINISHED SURFACE	40.588	40.867	41.306
EXISTING SURFACE	39.521	39.490	40.191
CHAINAGE	0.000	4.641	44.220
	4.641	39.579	

DRAINAGE LONGITUNDINAL SECTION - LINE 8

SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	1/4	1/5	8/1
	175	196	
	2.22	1.74	
	375Ø Class 3 RRJ	375Ø Class 3 RRJ	
	1.0%	1.3%	
	RL 33.5		
HGL (1 In 20 Yr)	39.923	39.970 / 40.502	40.697
DEPTH TO INVERT	2.072	2.304 / 2.274	2.218
INVERT LEVEL	38.517	38.563 / 38.593	39.088
FINISHED SURFACE	40.588	40.867	41.306
EXISTING SURFACE	39.521	39.490	40.191
CHAINAGE	0.000	4.641	44.220
	4.641	39.579	

DRAINAGE LONGITUNDINAL SECTION - LINE 8

SCALES: HORIZONTAL 1:500 VERTICAL 1:100

D.A. APPROVAL

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PRELIMINARY		
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CHECKED	DATE	
APPROVED	DATE	
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05.12.18		ISSUE FOR D.A. APPROVAL	MW	1

DATE	No	AMENDMENT	INIT	REV

CLIENT: STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT: SBA ARCHITECTS
Suite 702, 83 Mount Street, North Sydney NSW 2060
T 02 9929 6988 F 02 9929 6990
E info@sbaarch.com.au W www.sbaarch.com.au

PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

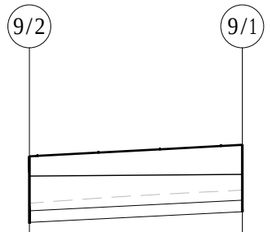
DRAWING TITLE
CIVIL DESIGN
STORMWATER DRAINAGE
LONGITUDINAL SECTIONS SHEET 2

SPARKS + PARTNERS
CONSULTING ENGINEERS
HYDRAULIC | CIVIL | FIRE
Level 1, 91 George Street | Parramatta | NSW 2150
P 02 9891 5033 | F 02 9891 3898 | E admin@sparksandpartners.com.au

AHSCA
The Association of Hydraulic Consultants Australia Limited Inc.
CORPORATE MEMBER

DATE	DESIGNED	DRAWN
DEC 2018	LC	LC

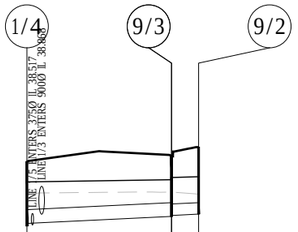
SCALE	JOB No	DWG No	No IN SET	REV
AS SHOWN	18072	DA4.22	--- OF	1



CAPACITY (l/sec)	175	
VELOCITY (m/s)	1.61	
PIPE DETAILS	375Ø Class 3 RRJ	
SLOPE/GRADE	1.0%	
DATUM RL 33.3		
HGL (1 in 20 Yr)	40.415	40.616
DEPTH TO INVERT	2.156	2.183
INVERT LEVEL	38.903	39.251
FINISHED SURFACE	41.059	41.434
EXISTING SURFACE	39.526	39.957
CHAINAGE	28.035	62.789
	34.755	

DRAINAGE LONGITUNDINAL SECTION - LINE 9

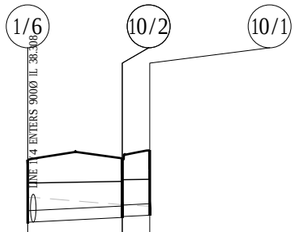
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	282	175
	1.95	1.69
	450Ø Class 3 RRJ	375Ø Class 3 RRJ
	1.0%	1.0%
RL 33.6		
	39.923	39.995
	2.020	1.987
	38.568	38.799
	40.588	40.786
	39.521	39.592
	0.000	23.609
	23.609	4.426

DRAINAGE LONGITUNDINAL SECTION - LINE 9

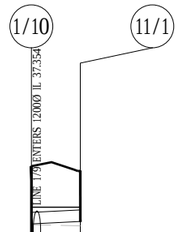
SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	175	175
	1.77	1.73
	375Ø Class 3 RRJ	375Ø Class 3 RRJ
	1.0%	1.0%
RL 33.3		
	39.584	39.639
	2.031	1.918
	38.308	38.463
	40.339	40.381
	39.115	38.878
	0.000	15.427
	15.427	4.498

DRAINAGE LONGITUNDINAL SECTION - LINE 10

SCALES: HORIZONTAL 1:500 VERTICAL 1:100



	0
	0.00
	375Ø Class 3 RRJ
	1.0%
RL 33.2	
	38.700
	1.884
	38.154
	40.038
	38.127
	0.000
	7.987

DRAINAGE LONGITUNDINAL SECTION - LINE 11

SCALES: HORIZONTAL 1:500 VERTICAL 1:100

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PAGE A1	PLOT DATE December 5, 2018

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DATE	No	AMENDMENT	INIT	REV
05.12.18		ISSUE FOR D.A. APPROVAL	MW	1

DATE	No	AMENDMENT	INIT	REV

CLIENT

ARCHITECT

PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
STORMWATER DRAINAGE
LONGITUDINAL SECTIONS SHEET 3

SPARKS + PARTNERS
CONSULTING ENGINEERS
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AHSCA

DATE DEC 2018	DESIGNED LC		
SCALE AS SHOWN	DRAWN LC		
JOB No 18072	DWG No DA4.23	No IN SET ---- OF	REV 1

D.A. APPROVAL

HGL Report - 1 In 20 Yr

Pipe ID	Pipe Class	Pipe Diameter	Pipe Length	Pipe Design Flow	Mannings n	Pipe Velocity	Pipe Velocity Head	HGL at Downstream Pit	Pipe Friction Slope	Pipe Friction Loss	HGL at Upstream Pit	Pit Loss Coefficient	Pipe Head Loss	Adopted Upstream Water Level	Pit Surcharge Level (Pit Inlet/Outlet Level)	Downstream Pipe Obvert	Upstream Pipe Obvert	Downstream Pipe Invert	Upstream Pipe Invert	Pipe Slope	Pipe Design Flow	Pipe HGL Capacity	Pipe Manning Capacity	Remarks
		(mm)	(m)	(l/s)		(m/s)	(m)	(m)	(%)	(m)	(m)	Ku	(m)	(m)	(m)	(m)	(m)	(m)	(m)	(%)	(l/s)	(l/s)	(l/s)	
1/13-1/14	Class 3 RRJ	1200	54.060	2209.5	0.013	1.89	0.182	37.220	0.00	0.097	37.497	2.138	0.390	37.887	37.001	37.220	37.497	36.000	36.277	0.512	2209.5	3785.8	2916.5	
1/12-1/13	Class 3 RRJ	1200	50.000	2209.5	0.013	1.89	0.182	37.527	0.00	0.090	37.821	0.500	0.091	37.912	37.184	37.527	37.821	36.307	36.601	0.589	2209.5	4065.0	3126.7	
1/11-1/12	Class 3 RRJ	1200	61.848	2209.5	0.013	1.89	0.182	37.851	0.00	0.111	38.116	0.500	0.091	38.207	38.970	37.851	38.116	36.631	36.896	0.428	2209.5	3452.5	2665.6	
1/10-1/11	Class 3 RRJ	1200	79.589	2209.5	0.013	1.89	0.182	38.207	0.00	0.143	38.544	0.859	0.157	38.700	40.038	38.146	38.544	36.926	37.324	0.500	2209.5	3738.6	2881.1	
1/9-1/10	Class 3 RRJ	1200	17.623	2200.0	0.013	1.88	0.181	38.700	0.00	0.031	38.750	0.691	0.125	38.875	39.769	38.574	38.750	37.354	37.530	1.000	2200.0	5325.5	4074.4	
1/11-1/10	Class 3 RRJ	375	7.987	0.0	0.013	0.00	0.000	38.700	0.00	0.000	38.700	4.000	0.000	38.700	39.883	38.529	38.609	38.154	38.234	1.002	0.0	244.7	0.0	
1/8-1/9	Class 3 RRJ	1200	15.167	2171.3	0.013	1.86	0.176	38.875	0.00	0.026	38.932	1.957	0.344	39.276	39.767	38.780	38.932	37.560	37.712	1.000	2171.3	5325.5	4074.4	
1/7-1/8	Class 3 RRJ	1200	37.835	2154.8	0.013	1.84	0.173	39.276	0.00	0.065	39.341	0.500	0.087	39.428	40.146	38.962	39.340	37.742	38.120	1.000	2154.8	5325.5	4074.4	
1/6-1/7	Class 3 RRJ	1200	12.835	2145.1	0.013	1.84	0.172	39.428	0.00	0.022	39.498	0.500	0.086	39.584	40.339	39.370	39.498	38.150	38.278	1.000	2145.1	5325.5	4074.4	
1/41/6	Class 3 RRJ	900	15.427	1989.5	0.013	3.06	0.477	39.584	0.01	0.100	39.684	0.500	0.239	39.923	40.588	39.218	39.397	38.308	38.487	1.155	1989.5	2670.9	2003.6	
10/2-1/6	Class 3 RRJ	375	15.427	143.1	0.013	1.30	0.086	39.584	0.00	0.055	39.639	0.658	0.056	39.696	40.381	38.683	38.838	38.308	38.463	1.000	143.1	244.5	175.3	
1/31/4	Class 3 RRJ	900	77.476	1487.8	0.013	2.29	0.267	39.923	0.00	0.286	40.546	0.500	0.134	40.680	41.441	39.778	40.546	38.868	39.636	0.991	1487.8	2470.8	1856.3	
9/3-1/4	Class 3 RRJ	450	23.609	213.0	0.013	1.34	0.092	39.923	0.00	0.072	39.995	0.789	0.072	40.067	40.786	39.018	39.249	38.568	38.799	0.978	213.0	389.9	282.0	
1/51/4	Class 3 RRJ	375	4.641	245.0	0.013	2.22	0.251	39.923	0.01	0.047	39.970	2.118	0.532	40.502	40.867	38.892	38.938	38.517	38.563	1.000	245.0	244.5	175.3	
10/1-10/2	Class 3 RRJ	375	4.498	127.0	0.013	1.15	0.067	39.696	0.00	0.013	39.708	4.000	0.270	39.978	40.655	38.868	38.913	38.493	38.538	1.000	127.0	244.5	175.3	
1/21/3	Class 3 RRJ	675	73.000	1052.6	0.013	2.96	0.447	40.680	0.01	0.636	41.434	0.562	0.251	41.685	42.583	40.339	41.434	39.666	40.761	1.500	1052.6	1389.8	1021.4	
6/2-1/3	Class 3 RRJ	375	4.425	180.7	0.013	1.64	0.137	40.680	0.01	0.025	40.704	2.200	0.300	41.005	41.716	40.141	40.185	39.766	39.810	0.994	180.7	243.8	174.8	
7/3-1/3	Class 3 RRJ	375	18.195	213.0	0.013	1.93	0.190	40.680	0.01	0.139	40.819	0.928	0.176	40.995	41.591	40.241	40.423	39.866	40.048	1.000	213.0	244.6	175.4	
9/2-9/3	Class 3 RRJ	375	4.426	186.8	0.013	1.69	0.146	40.067	0.01	0.026	40.094	2.200	0.321	40.415	41.059	39.204	39.248	38.829	38.873	1.000	186.8	244.5	175.3	
8/1-1/5	Class 3 RRJ	375	39.579	90.3	0.013	0.82	0.034	40.502	0.00	0.059	40.560	4.000	0.137	40.697	41.306	38.968	39.463	38.593	39.088	1.251	90.3	274.4	196.1	
1/11/2	Class 3 RRJ	600	73.000	620.0	0.013	2.21	0.249	41.685	0.01	0.414	42.519	2.082	0.518	43.037	43.868	41.424	42.519	40.826	41.921	1.500	620.0	1021.0	745.3	
4/2-1/2	Class 3 RRJ	375	4.426	180.7	0.013	1.64	0.137	41.685	0.01	0.025	41.710	2.200	0.300	42.010	42.859	41.166	41.210	40.791	40.835	1.000	180.7	244.5	175.3	
5/3-1/2	Class 3 RRJ	375	16.488	213.0	0.013	1.93	0.190	41.685	0.01	0.126	41.811	0.797	0.151	41.962	42.690	41.166	41.331	40.791	40.956	1.001	213.0	244.6	175.4	
6/1-6/2	Class 3 RRJ	375	36.500	90.3	0.013	0.82	0.034	41.005	0.00	0.054	41.059	4.000	0.137	41.195	42.281	40.215	40.580	39.840	40.205	1.000	90.3	244.5	175.3	
7/2-7/3	Class 3 RRJ	375	4.425	186.8	0.013	1.69	0.146	40.995	0.01	0.026	41.021	2.200	0.321	41.342	41.863	40.453	40.497	40.078	40.122	0.994	186.8	243.8	174.8	
9/1-9/2	Class 3 RRJ	375	34.755	93.4	0.013	0.85	0.036	40.415	0.00	0.055	40.470	4.000	0.146	40.616	41.434	39.278	39.626	38.903	39.251	1.000	93.4	244.5	175.3	
2/3-1/1	Class 3 RRJ	450	4.160	280.6	0.013	1.76	0.159	43.037	0.01	0.022	43.058	2.200	0.349	43.407	44.016	42.401	42.443	41.951	41.993	1.010	280.6	396.2	286.5	
3/4-1/1	Class 3 RRJ	450	15.655	315.1	0.013	1.98	0.200	43.037	0.01	0.101	43.138	0.609	0.122	43.260	43.790	42.401	42.698	41.951	42.248	1.897	315.1	547.6	392.7	
4/1-4/2	Class 3 RRJ	375	36.500	90.3	0.013	0.82	0.034	42.010	0.00	0.054	42.064	4.000	0.137	42.201	43.438	41.240	41.605	40.865	41.230	1.000	90.3	244.5	175.3	
5/2-5/3	Class 3 RRJ	375	4.425	186.8	0.013	1.69	0.146	41.962	0.01	0.026	41.989	2.200	0.321	42.310	42.964	41.361	41.405	40.986	41.030	0.994	186.8	243.8	174.8	
7/1-7/2	Class 3 RRJ	375	34.755	93.4	0.013	0.85	0.036	41.342	0.00	0.055	41.397	4.000	0.146	41.543	42.413	40.527	40.875	40.152	40.500	1.001	93.4	244.7	175.4	
2/2-2/3	Class 3 RRJ	375	19.170	188.1	0.013	1.70	0.148	43.407	0.01	0.115	43.523	1.705	0.252	43.775	44.319	42.398	42.589	42.023	42.214	0.996	188.1	244.1	175.0	
3/3-3/4	Class 3 RRJ	450	4.425	284.1	0.013	1.79	0.163	43.260	0.01	0.023	43.283	2.200	0.358	43.641	44.063	42.729	42.773	42.279	42.323	0.994	284.1	393.1	284.3	
5/1-5/2	Class 3 RRJ	375	34.755	93.4	0.013	0.85	0.036	42.310	0.00	0.055	42.365	4.000	0.146	42.511	43.514	41.435	41.783	41.060	41.408	1.001	93.4	244.7	175.4	
2/1-2/2	Class 3 RRJ	375	19.633	95.6	0.013	0.87	0.038	43.775	0.00	0.032	43.808	4.000	0.153	43.960	44.574	42.619	42.816	42.244	42.441	1.003	95.6	245.0	175.6	
3/2-3/3	Class 3 RRJ	375	16.374	192.0	0.013	1.74	0.154	43.641	0.01	0.103	43.744	1.679	0.259	44.003	44.322	42.800	42.964	42.425	42.589	1.002	192.0	244.7	175.5	
3/1-3/2	Class 3 RRJ	375	19.114	99.9	0.013	0.90	0.042	44.003	0.00	0.034	44.037	4.000	0.167	44.204	44.575	42.994	43.185	42.619	42.810	0.999	99.9	244.4	175.3	

D.A. APPROVAL

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DATE	No	AMENDMENT	INIT	REV

CLIENT: STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT: SBA ARCHITECTS

PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
STORMWATER CALCULATION
TABLE SHEET 1

SPARKS + PARTNERS
CONSULTING ENGINEERS
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AHSCA
The Association of Consultants Australia (NSW) Inc.
CORPORATE MEMBER

DATE	DESIGNED	DRAWN
DEC 2018	LC	LC

SCALE N.T.S.
JOB No 18072
DWG No DA4.31
No IN SET ---- OF
REV 1

Catchment Hydrology - NETWORK 1 Return Period: 20 Location: Marsden Park

Pit No.	Catchment Pervious Area	Catchment Impervious Area	Pit C Factor	Pit Effective Area	Adopted Pit Tc	Rainfall Intensity	Total Catchment Flow	Catchment Flow Direct to Pipe	Catchment Flow to Pit Inlet	Bypass Received From Pit No.	Bypass Flow Received	Total Flow to Pit	Pit Inlet Inflow	Pit Bypass Flow	Bypass to Pit
	(Ha)	(Ha)		(Ha)	(min)	(mm/hr)	(l/s)	(l/s)	(l/s)		(l/s)	(l/s)	(l/s)	(l/s)	
1/13						177.0				1/12			0.0		1/14
1/12						177.0				1/11			0.0		1/13
1/11						177.0				1/10			0.0		1/12
1/10						177.0				1/9	9.5	9.5	9.5		
										11/1					1/11
1/9	0.007	0.068	0.888	0.067	5	177.0	32.7		32.7	1/8	5.4	38.2	28.7	9.5	1/10
11/1						177.0							0.0		1/10
1/8	0.004	0.039	0.888	0.038	5	177.0	18.8		18.8	1/7	3.2	22.0	16.5	5.4	1/9
1/7	0.002	0.018	0.888	0.018	5	177.0	8.7		8.7	1/6	4.1	12.9	9.7	3.2	1/8
1/6	0.003	0.023	0.888	0.023	5	177.0	11.3		11.3	1/5		16.6	12.5		
										10/2	5.3			4.1	1/7
1/4	0.009	0.077	0.888	0.076	5	177.0	37.5		37.5	1/3	17.3	63.5	43.6		
										9/3	8.7			19.8	1/5
10/2	0.005	0.044	0.888	0.043	5	177.0	21.4		21.4	10/1		21.4	16.1	5.3	1/6
1/3	0.008	0.075	0.888	0.074	5	177.0	36.2		36.2	1/2	14.0	58.9	41.6		
										6/2				17.3	1/4
										7/3	8.7				
9/3	0.008	0.072	0.888	0.071	5	177.0	34.9		34.9	9/2		34.9	26.3	8.7	1/4
1/5	0.031	0.278	0.888	0.274	5	177.0	134.8	134.8		1/4	19.8	19.8	19.8		
										8/1					1/6
10/1	0.029	0.262	0.888	0.258	5	177.0	127.0	127.0					0.0		10/2
1/2	0.008	0.075	0.888	0.074	5	177.0	36.2		36.2	1/1	8.0	52.9	38.9		
										4/2				14.0	1/3
										5/3	8.7				
6/2	0.021	0.186	0.888	0.184	5	177.0	90.3	90.3		6/1			0.0		1/3
7/3	0.008	0.072	0.888	0.071	5	177.0	34.9		34.9	7/2		34.9	26.3	8.7	1/3
9/2	0.021	0.193	0.888	0.190	5	177.0	93.4	93.4		9/1			0.0		9/3
8/1	0.021	0.186	0.888	0.184	5	177.0	90.3	90.3					0.0		1/5
1/1	0.007	0.067	0.888	0.066	5	177.0	32.3		32.3	2/3		32.3	24.3		
										1/1				8.0	1/2
4/2	0.021	0.186	0.888	0.184	5	177.0	90.3	90.3		4/1			0.0		1/2
5/3	0.008	0.072	0.888	0.071	5	177.0	34.9		34.9	5/2		34.9	26.3	8.7	1/2
6/1	0.021	0.186	0.888	0.184	5	177.0	90.3	90.3					0.0		6/2
7/2	0.021	0.193	0.888	0.190	5	177.0	93.4	93.4		7/1			0.0		7/3
9/1	0.021	0.193	0.888	0.190	5	177.0	93.4	93.4					0.0		9/2
2/3	0.021	0.191	0.888	0.188	5	177.0	92.5	92.5		2/2			0.0		1/1
1/1	0.007	0.064	0.888	0.063	5	177.0	31.0		31.0	3/3		31.0	31.0		1/1
4/1	0.021	0.186	0.888	0.184	5	177.0	90.3	90.3					0.0		4/2
5/2	0.021	0.193	0.888	0.190	5	177.0	93.4	93.4		5/1			0.0		5/3
7/1	0.021	0.193	0.888	0.190	5	177.0	93.4	93.4					0.0		7/2
2/2	0.021	0.191	0.888	0.188	5	177.0	92.5	92.5		2/1			0.0		2/3
3/3	0.021	0.190	0.888	0.187	5	177.0	92.1	92.1		3/2			0.0		1/1
5/1	0.021	0.193	0.888	0.190	5	177.0	93.4	93.4					0.0		5/2
2/1	0.022	0.197	0.888	0.194	5	177.0	95.6		95.6			95.6	95.6		2/2
3/2	0.021	0.190	0.888	0.187	5	177.0	92.1	92.1		3/1			0.0		3/3
3/1	0.023	0.206	0.888	0.203	5	177.0	99.9	99.9					0.0		3/2

Pit Schedule - NETWORK 1

Pit No.	Pit Type	Easting	Northing	Comment
		(m)	(m)	
1/14	HEADWALL	14040.09	6295425.134	
1/13	STD. JUNCTION PIT	13986.34	6295430.912	
1/12	STD. JUNCTION PIT	13979.47	6295381.387	
1/11	STD. JUNCTION PIT	13969.65	6295320.323	
1/10	STD. JUNCTION PIT	13959.11	6295241.435	
1/9	STD. GRATED GULLY PIT	13945.32	6295230.468	
11/1	STD. GRATED GULLY PIT	13951.20	6295242.538	
1/8	STD. GRATED GULLY PIT	13942.09	6295215.649	
1/7	STD. GRATED GULLY PIT	13904.41	6295219.070	
1/6	STD. GRATED GULLY PIT	13891.79	6295216.739	
1/4	STD. GRATED GULLY PIT	13883.51	6295203.719	
10/2	STD. GRATED GULLY PIT	13880.17	6295226.896	
1/3	STD. GRATED GULLY PIT	13875.19	6295126.691	
9/3	STD. GRATED GULLY PIT	13866.60	6295187.249	
1/5	STD. JUNCTION PIT	13887.76	6295201.855	
10/1	STD. JUNCTION PIT	13877.47	6295230.491	
1/2	STD. JUNCTION PIT	13867.36	6295054.113	
6/2	STD. JUNCTION PIT	13879.59	6295126.216	
7/3	STD. GULLY PIT	13859.13	6295118.141	
9/2	STD. JUNCTION PIT	13862.20	6295187.724	
8/1	STD. JUNCTION PIT	13883.51	6295162.505	
1/1	STD. GULLY PIT	13859.79	6294981.507	
4/2	STD. JUNCTION PIT	13871.76	6295053.638	
5/3	STD. GULLY PIT	13851.67	6295049.032	
6/1	STD. JUNCTION PIT	13875.68	6295089.927	
7/2	STD. JUNCTION PIT	13854.73	6295118.616	
9/1	STD. JUNCTION PIT	13858.47	6295153.170	
2/3	STD. JUNCTION PIT	13863.92	6294981.060	
1/1	STD. GULLY PIT	13844.21	6294979.924	
4/1	STD. JUNCTION PIT	13867.84	6295017.349	
5/2	STD. JUNCTION PIT	13847.27	6295049.507	
7/1	STD. JUNCTION PIT	13851.00	6295084.062	
2/2	STD. JUNCTION PIT	13861.86	6294962.001	
3/3	STD. JUNCTION PIT	13839.81	6294980.399	
5/1	STD. JUNCTION PIT	13843.54	6295014.953	
2/1	STD. JUNCTION PIT	13865.36	6294942.683	
3/2	STD. JUNCTION PIT	13838.05	6294964.120	
3/1	STD. JUNCTION PIT	13830.87	6294946.408	

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ARCHITECT: SBA ARCHITECTS
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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
STORMWATER CALCULATION
TABLE SHEET 2

D.A. APPROVAL

SPARKS + PARTNERS
CONSULTING ENGINEERS
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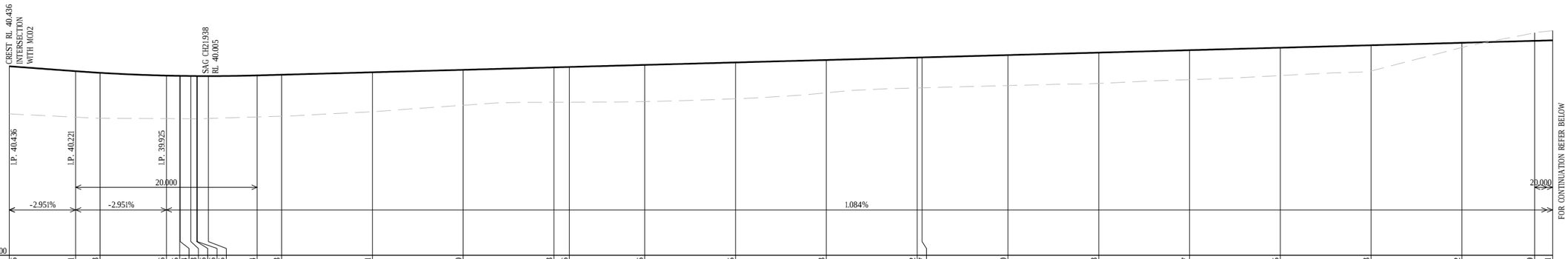
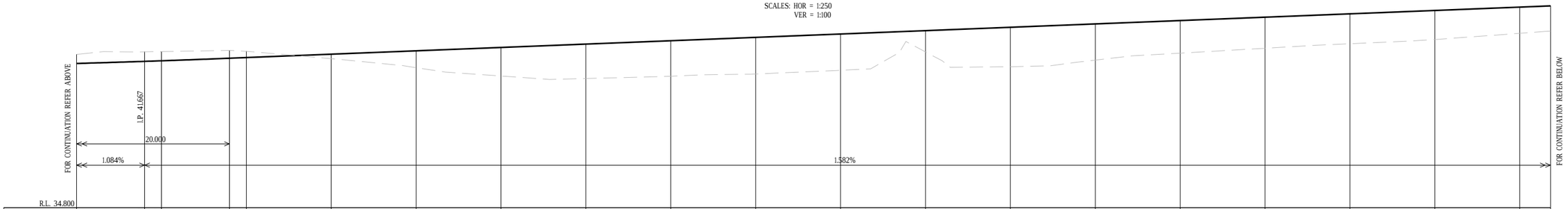


DESIGN SURFACE	40.436	40.221	40.148	40.026	40.015	40.014	40.008	40.006	40.006	40.005	40.034	40.063	40.171	40.280	40.388	40.406	40.496	40.605	40.713	40.822	40.827	40.930	41.038	41.147	41.255	41.363	41.472	41.559	41.581
EXISTING SURFACE	38.34	38.19	38.14	38.13	38.12	38.14	38.12	38.12	38.12	38.13	38.20	38.23	38.43	38.72	38.85	38.85	38.88	39.00	39.27	39.48	39.49	39.59	39.68	39.85	40.02	40.23	41.27	41.91	42.01
CHAINAGE	0.000	7.308	10.000	17.309	18.778	18.836	20.000	20.651	20.709	21.938	27.309	30.000	40.000	50.000	60.000	61.695	70.000	80.000	90.000	100.000	100.540	110.000	120.000	130.000	140.000	150.000	160.000	168.015	170.000

ROAD MC01 - LONGITUDINAL SECTION

SCALES: HOR = 1:250
VER = 1:100



DESIGN SURFACE	41.581	41.680	41.707	41.825	41.857	42.015	42.173	42.331	42.490	42.648	42.806	42.964	43.123	43.281	43.439	43.597	43.756	43.914	44.072	44.230	44.288
EXISTING SURFACE	42.01	42.13	42.14	42.19	42.15	41.81	41.38	40.99	40.87	40.98	41.09	41.26	42.12	41.43	41.74	42.07	42.29	42.51	42.70	43.00	43.10
CHAINAGE	170.000	178.015	180.000	188.015	190.000	200.000	210.000	220.000	230.000	240.000	250.000	260.000	270.000	280.000	290.000	300.000	310.000	320.000	330.000	340.000	343.635

ROAD MC01 - LONGITUDINAL SECTION

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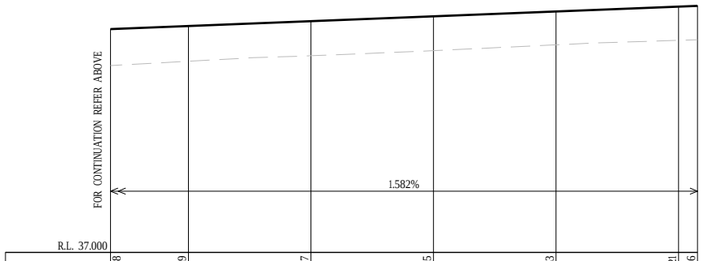
VER = 1:100



DESIGN SURFACE	44.288	44.389	44.547	44.705	44.863	45.021	45.046
EXISTING SURFACE	43.10	43.24	43.42	43.59	43.78	43.92	43.94
CHAINAGE	343.635	350.000	360.000	370.000	380.000	390.000	391.542

ROAD MC01 - LONGITUDINAL SECTION

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DATE	No	AMENDMENT	INIT	REV

CLIENT
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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
ROAD LONGITUDINAL SECTIONS
SHEET 1

D.A. APPROVAL

SPARKS + PARTNERS
CONSULTING ENGINEERS
HYDRAULIC | CIVIL | FIRE
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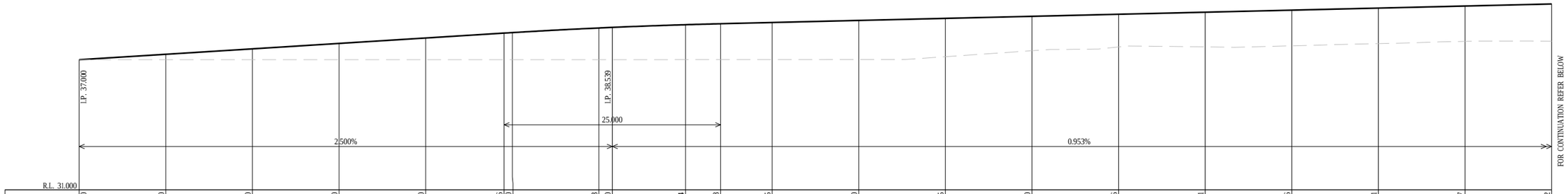
AHSCA
ISO 9001 : 2000 QUALITY MANAGEMENT COMPANY
The Australian Institute of Consultants Australia (2006) Inc. CORPORATE MEMBER

DATE	DESIGNED	DRAWN
DEC 2018	LC	LC
SCALE AS SHOWN		
JOB No 18072	DWG No DA5.11	No IN SET --- OF	REV 1

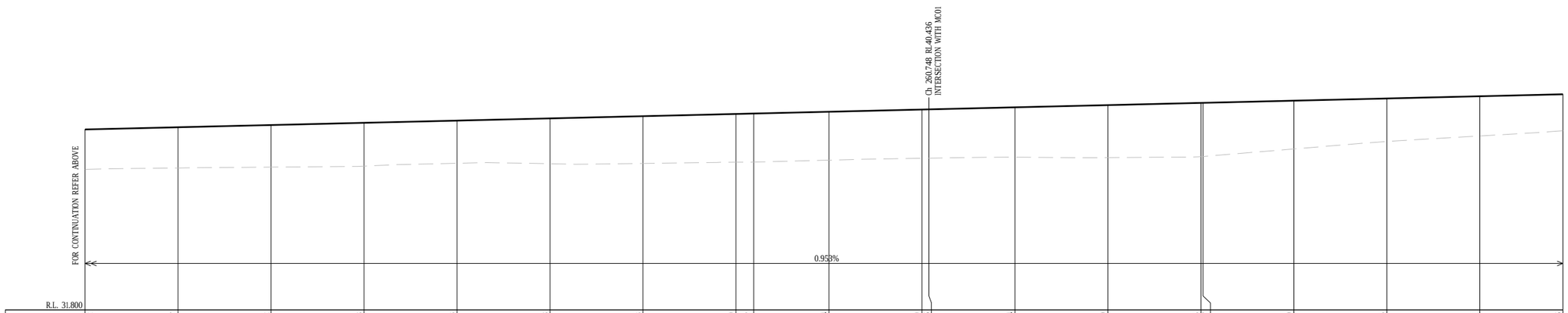


R.L. 31.000

CHAINAGE	DESIGN SURFACE	EXISTING SURFACE
0.000	37.000	37.00
10.000	37.250	37.00
20.000	37.500	37.00
30.000	37.750	37.00
40.000	38.000	37.00
49.052	38.226	37.00
50.000	38.250	37.00
60.000	38.463	37.00
61.552	38.490	37.00
70.000	38.614	37.00
74.052	38.658	37.00
80.000	38.715	37.00
90.000	38.810	37.01
100.000	38.905	37.14
110.000	39.000	37.42
120.000	39.096	37.59
130.000	39.191	37.59
140.000	39.286	37.64
150.000	39.381	37.74
160.000	39.477	37.85
170.000	39.572	37.85

ROAD MC02 (SOUTH STREET) - LONGITUDINAL SECTION

SCALES: HOR = 1:250
VER = 1:100



R.L. 31.800

CHAINAGE	DESIGN SURFACE	EXISTING SURFACE
170.000	39.572	37.85
180.000	39.667	37.91
190.000	39.762	37.95
200.000	39.858	37.99
210.000	39.953	38.11
220.000	40.048	38.10
230.000	40.143	38.11
240.000	40.239	38.16
241.914	40.257	38.16
250.000	40.334	38.25
260.000	40.429	38.33
260.748	40.436	38.34
270.000	40.524	38.38
280.000	40.620	38.36
290.000	40.715	38.40
290.232	40.717	38.41
300.000	40.810	38.73
310.000	40.905	39.05
320.000	41.001	39.29
328.924	41.086	39.52

ROAD MC02 (SOUTH STREET) - LONGITUDINAL SECTION

SCALES: HOR = 1:250
VER = 1:100

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VERIFICATION
COMPLETION OF THE DRAWING STATUS IS EVIDENCE THAT THE DESIGN HAS BEEN VERIFIED AS CONFORMING TO THE REQUIREMENTS OF THE PROJECT QUALITY PLAN

DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
FOR INFORMATION ONLY		
FOR CLIENT APPROVAL		
FOR TENDER		
FOR CONSTRUCTION		

CHECKED | DATE
APPROVED | DATE
PAGE A1 | PLOT DATE December 5, 2018

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05.12.18		ISSUE FOR D.A. APPROVAL	MW	1

DATE	No	AMENDMENT	INIT	REV

CLIENT: STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT: SBA ARCHITECTS
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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
ROAD LONGITUDINAL SECTIONS
SHEET 2

D.A. APPROVAL

SPARKS + PARTNERS
CONSULTING ENGINEERS
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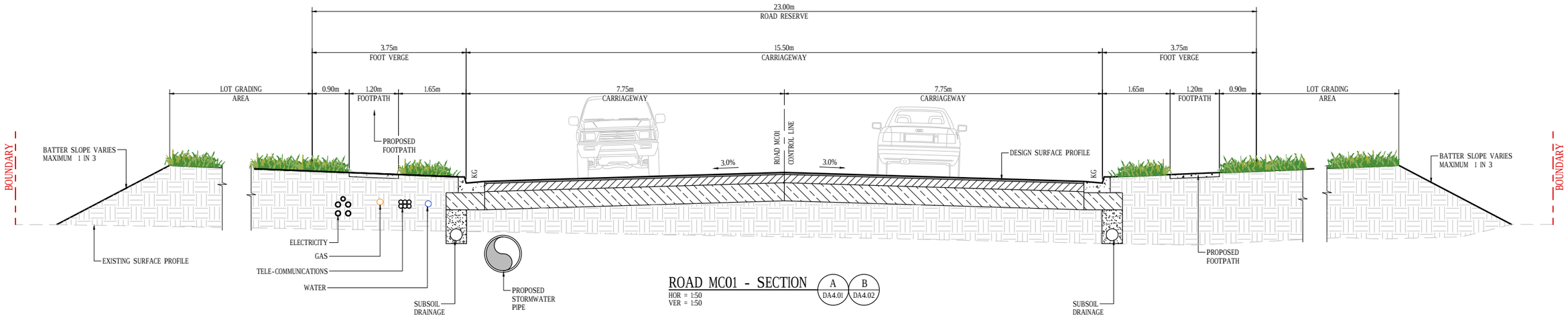
DATE	DESIGNED	DRAWN
DEC 2018	LC	LC
SCALE: AS SHOWN		

AHSCA
ISO 9001 / 2008 CERTIFIED COMPANY
ACKNOWLEDGED Consultants Australia (ACA) Inc. CORPORATE MEMBER

JOB No	DWG No	No IN SET	REV
18072	DA5.12	--- OF	1



ROAD MC01 - SECTION

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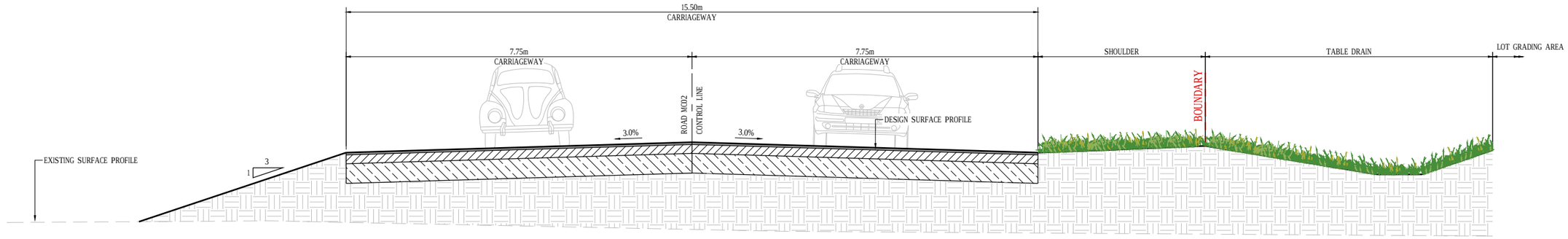
VER = 1:50

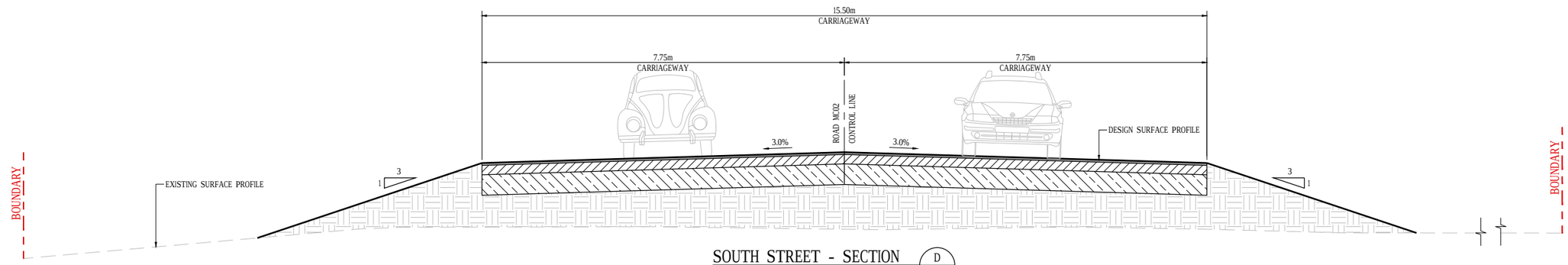
A DA4.01 | B DA4.02



SOUTH STREET - SECTION

HOR = 1:50
VER = 1:50

C DA4.04



SOUTH STREET - SECTION

HOR = 1:50
VER = 1:50

D DA4.05

D.A. APPROVAL

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VERIFICATION
COMPLETION OF THE DRAWING STATUS IS EVIDENCE THAT THE DESIGN HAS BEEN VERIFIED AS CONFORMING TO THE REQUIREMENTS OF THE PROJECT QUALITY PLAN

DRAWING STATUS	INITIAL	DATE
PRELIMINARY		
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FOR TENDER		
FOR CONSTRUCTION		

CHECKED	DATE
APPROVED	DATE
PAGE A1	PLOT DATE December 5, 2018

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05.12.18		ISSUE FOR D.A. APPROVAL	MW	1

DATE	No	AMENDMENT	INIT	REV

CLIENT
STRAUSS PROPERTY DEVELOPMENTS

ARCHITECT
SBA ARCHITECTS
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PROJECT
INDUSTRIAL SUB-DIVISION SOUTH STREET, MARSDEN PARK

DRAWING TITLE
CIVIL DESIGN
TYPICAL ROAD SECTIONS SHEET

SPARKS + PARTNERS
CONSULTING ENGINEERS
HYDRAULIC | CIVIL | FIRE
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AHSCA
The Association of Consultants Australia (NSW) Inc.
CORPORATE MEMBER

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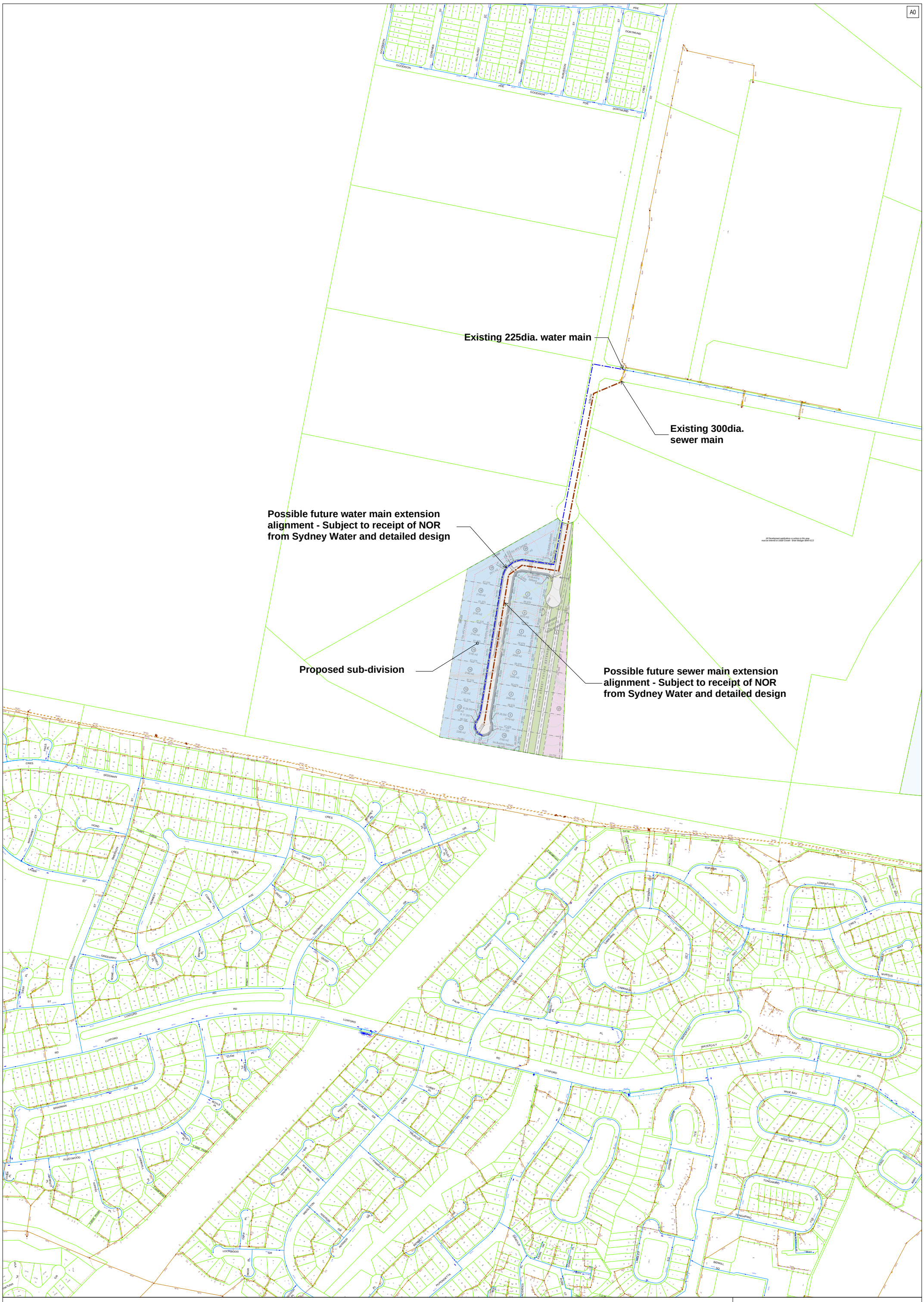
DEC 2018	LC	LC

SCALE	JOB No	DWG No	No IN SET	REV
AS SHOWN	18072	DA5.21	--- OF	1

APPENDIX C. SYDNEY WATER HYDRA MAP WITH CONCEPT WATER & SEWER MAIN EXTENSION

A0



DBYD Address:
n/a South Street
Marsden Park NSW 2765

DBYD Job No: 15130763

DBYD Sequence No: 76630812

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SYDNEY WATER CORPORATION

Scale: 1:2000

Date of Production: 18/10/2018

Plan 1 of 1

N

0m 30m 60m 90m 120m 150m