

# ASTRA AEROLAB CARPARK

WILLIAMTOWN, NSW, 2318  
DEVELOPMENT APPLICATION



LOCALITY PLAN

DRAWING LIST

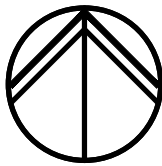
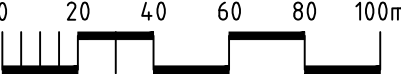
DWG No.	DRAWING TITLE
DA-02-C01.01	COVER SHEET, DRAWING LIST AND LOCALITY PLAN
DA-02-C02.01	CONCEPT EROSION AND SEDIMENT PLAN
DA-02-C02.11	CONCEPT EROSION AND SEDIMENT DETAILS
DA-02-C03.01	CONCEPT BULK EARTHWORK PLAN
DA-02-C04.01	CONCEPT GRADING PLAN
DA-02-C05.01	CONCEPT STORMWATER MANAGEMENT PLAN
DA-02-C06.01	CONCEPT LANDSCAPING PLAN

DRAWN: J.BEVITT  
DESIGNED: J.BEVITT  
JOB MANAGER: A.BROWN  
VERIFIER: A.BROWN

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	ISSUED FOR DA APPROVAL	JB	JB	AB	23.08.22
B	ISSUED FOR DA APPROVAL	JB	JB	AB	11.10.22
C	ISSUED FOR DA APPROVAL	JB	JB	AB	18.10.22
D	ISSUED FOR DA APPROVAL	JB	JB	AB	19.10.22
E	ISSUED FOR DA APPROVAL	JB	JB	AB	20.10.22

CLIENT
ASTRA AEROLAB
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD

	ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE.
SCALE 1:2000 @ A1	

	<b>NORTHROP</b> Newcastle Level 1, 215 Pacific Hwy, Charlestown NSW 2290 Ph (02) 4943 1777 Email newcastle@northrop.com.au ABN 81 094 433 100
---	---

PROJECT
ASTRA AEROLAB CARPARK WILLIAMTOWN NSW, 2318

DRAWING TITLE
COVER SHEET, DRAWING LIST AND LOCALITY PLAN

JOB NUMBER	
NL182640	
DRAWING NUMBER	REVISION
DA-02-C01.01	E
DRAWING SHEET SIZE = A1	

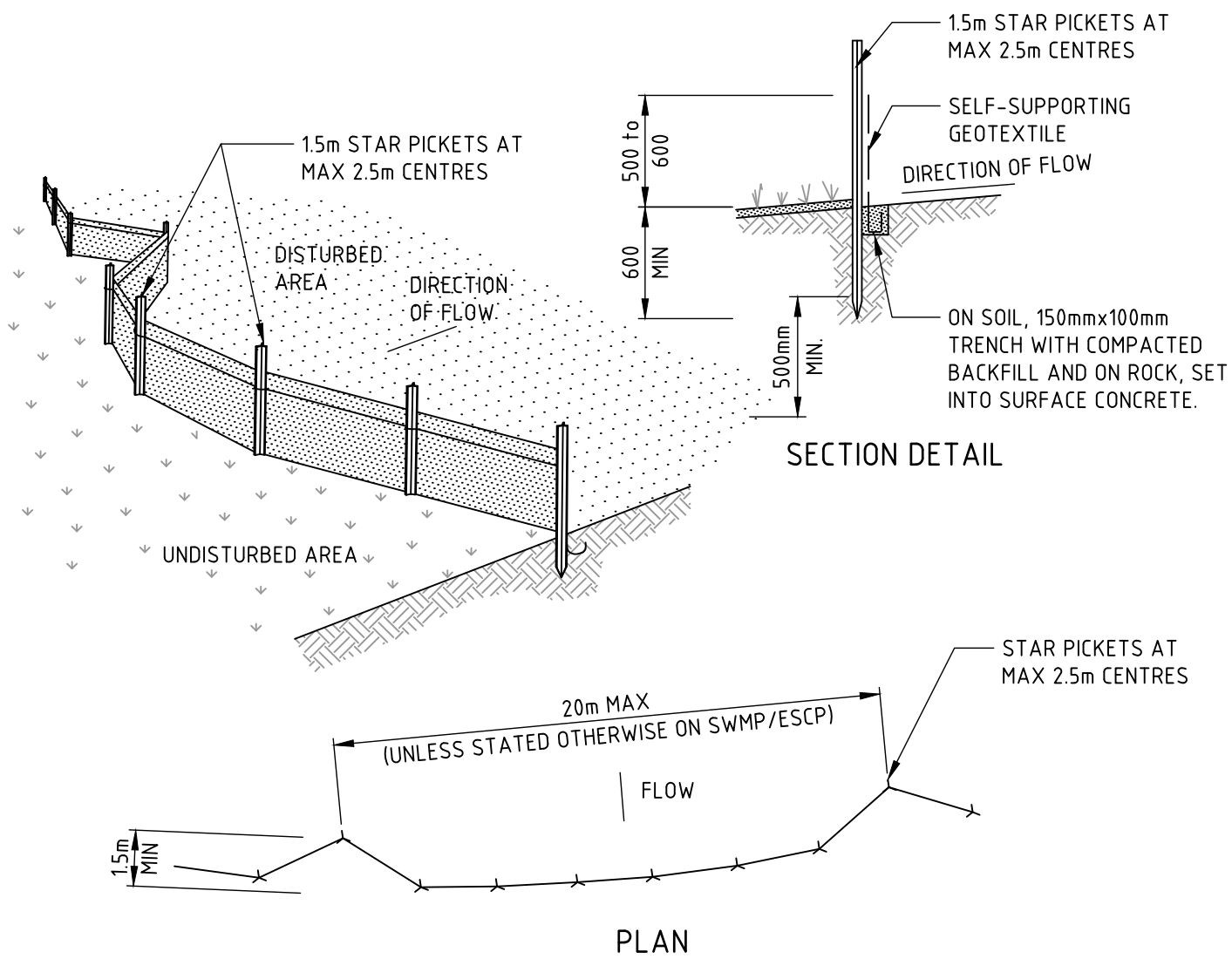
FOR APPROVAL







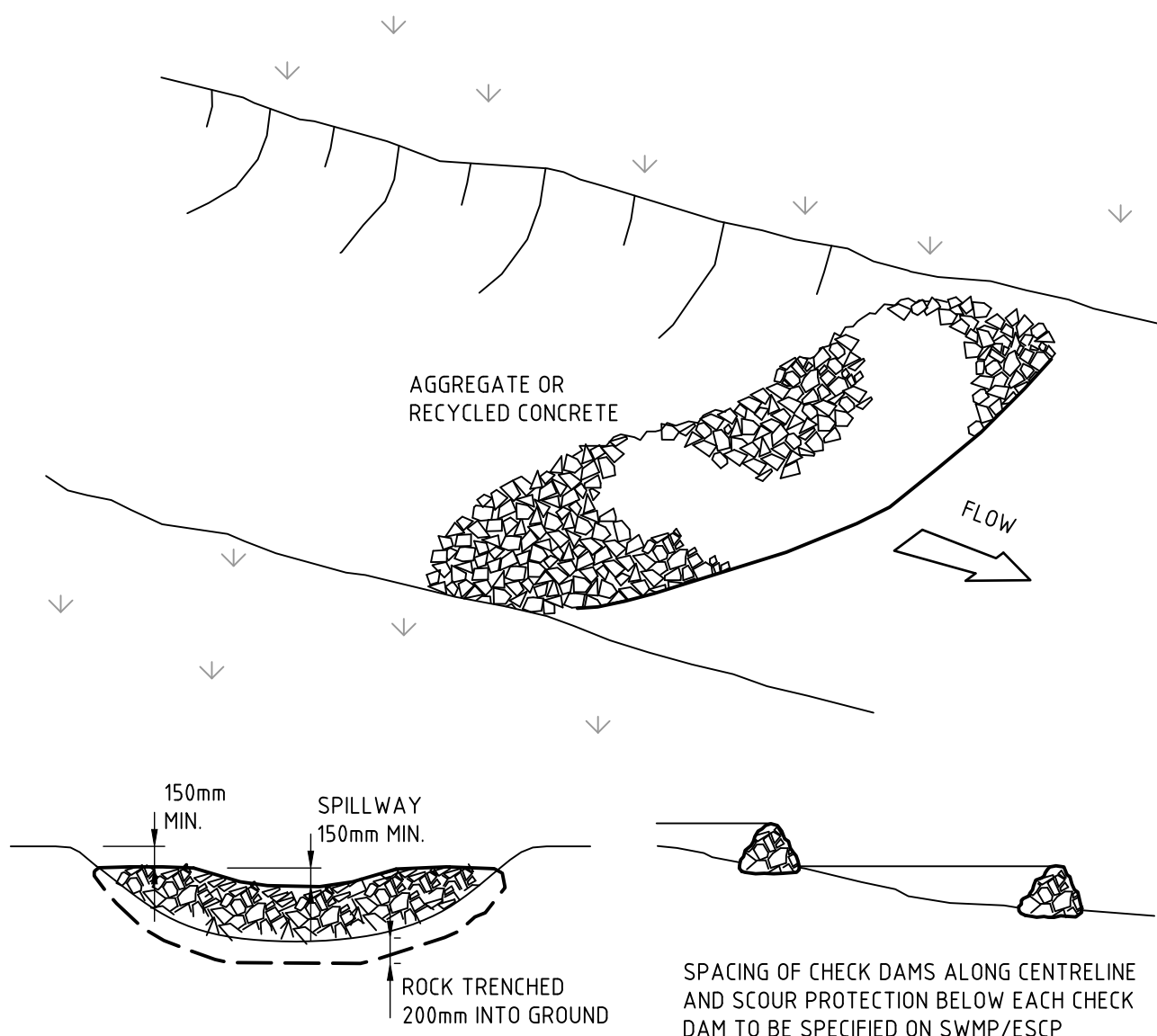
VERIFIER: A BROWN  
JOB MANAGER: A BROWN  
DESIGNED: J BEVITT  
DRAWN: J BEVITT



CONSTRUCTION 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 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED
3. DRIVE 15 METRE LONG STAR PICKETS INTO GROUND AT 2.5 METRE 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.

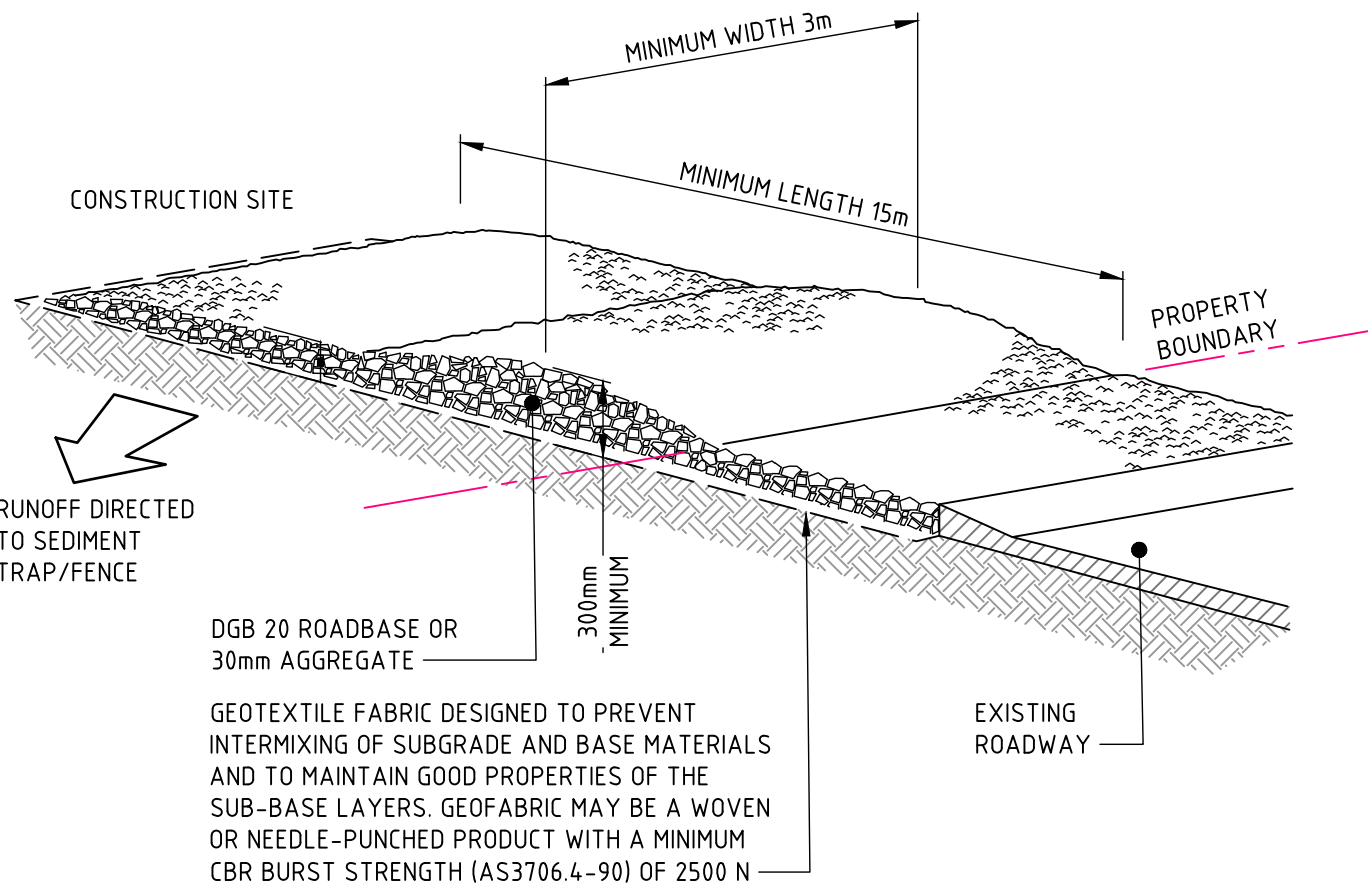
SEDIMENT FENCE (SD 6-8)



CONSTRUCTION NOTES

1. CHECK DAMS CAN BE BUILT WITH VARIOUS MATERIALS, INCLUDING ROCKS, LOGS, SANDBAGS AND STRAW BALES. THE MAINTENANCE PROGRAM SHOULD ENSURE THEIR INTEGRITY IS RETAINED, ESPECIALLY WHERE CONSTRUCTED WITH STRAW BALES. IN THE CASE OF BALES, THIS MIGHT REQUIRE THEIR REPLACEMENT EACH TWO TO FOUR MONTHS.
2. TRENCH THE CHECK DAM 200mm INTO THE GROUND ACROSS ITS WHOLE WIDTH. WHERE ROCK IS USED, FILL THE TRENCHES TO AT LEAST 100mm ABOVE THE GROUND SURFACE TO REDUCE THE RISK OF UNDERCUTTING.
3. NORMALLY, THEIR MAXIMUM HEIGHT SHOULD NOT EXCEED 600mm ABOVE THE GULLY FLOOR. THE CENTRE SHOULD ACT AS A SPILLWAY, BEING AT LEAST 150mm LOWER THAN THE OUTER EDGES.
4. SPACE THE DAMS SO THE TOE OF THE UPSTREAM DAM IS LEVEL WITH THE SPILLWAY OF THE NEXT DOWNSTREAM DAM.

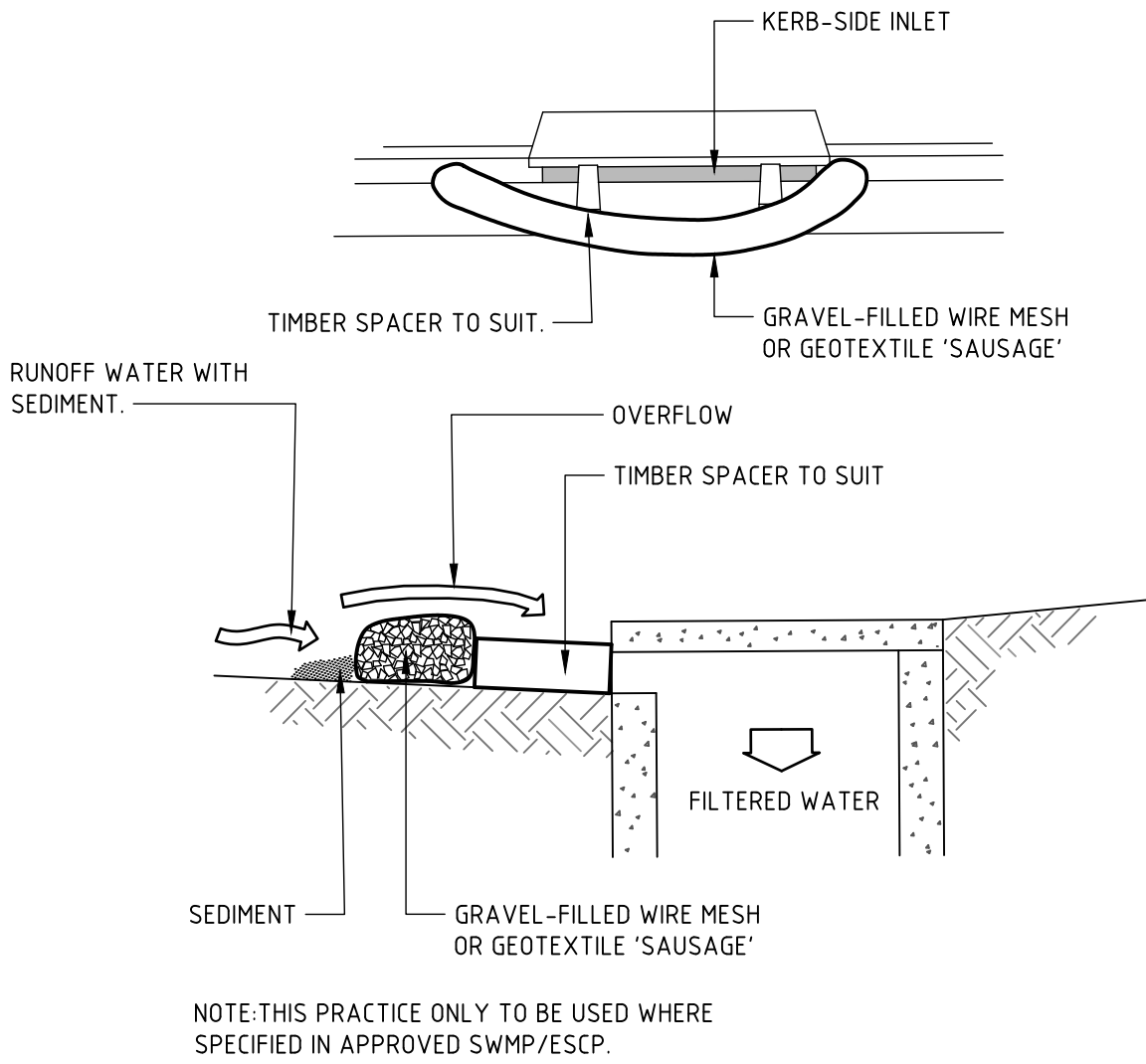
ROCK CHECK DAM (SD 5-4)



CONSTRUCTION NOTES

1. STRIP THE TOPSOIL, LEVEL THE SITE AND COMPACT THE SUBGRADE.
2. COVER THE AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
3. CONSTRUCT A 200mm THICK PAD OVER THE GEOTEXTILE USING ROAD BASE OR 30mm AGGREGATE.
4. ENSURE THE STRUCTURE IS AT LEAST 15 METRES LONG OR TO BUILDING ALIGNMENT AND AT LEAST 3 METRES WIDE.
5. WHERE A SEDIMENT FENCE JOINS ONTO THE STABILISED ACCESS, CONSTRUCT A HUMP IN THE STABILISED ACCESS TO DIVERT WATER TO THE SEDIMENT FENCE.

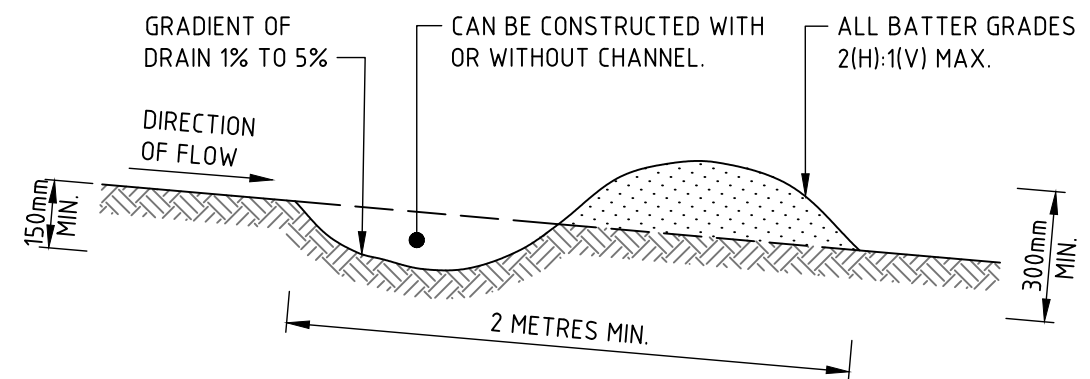
STABILISED SITE ACCESS (SD 6-14)



CONSTRUCTION NOTES

1. INSTALL FILTERS TO KERB INLETS ONLY AT SAG POINTS.
2. 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.
3. FORM AN ELLIPTICAL CROSS-SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. 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.

MESH AND GRAVEL INLET FILTER (SD 6-11)

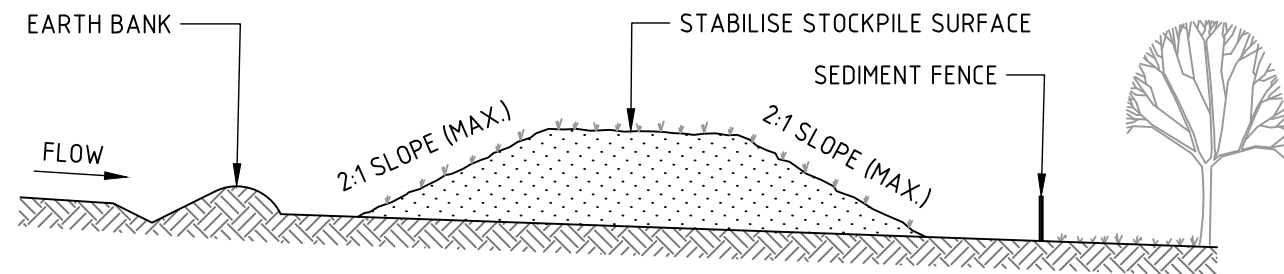


CONSTRUCTION NOTES

1. BUILD WITH GRADIENTS BETWEEN 1 AND 5 PERCENT.
2. AVOID REMOVING TREES AND SHRUBS IF POSSIBLE - WORK AROUND THEM.
3. ENSURE THE STRUCTURES ARE FREE OF PROJECTIONS OR OTHER IRREGULARITIES THAT COULD IMPEDE WATER FLOW.
4. BUILD THE DRAINS WITH CIRCULAR, PARABOLIC OR TRAPEZOIDAL CROSS SECTIONS, NOT V SHAPED.
5. ENSURE THE BANKS ARE PROPERLY COMPACTED TO PREVENT FAILURE.
6. COMPLETE PERMANENT OR TEMPORARY STABILISATION WITHIN 10 DAYS OF CONSTRUCTION.

NOTE: ONLY TO BE USED AS TEMPORARY BANK WHERE MAXIMUM UPSLOPE LENGTH IS 80 METRES.

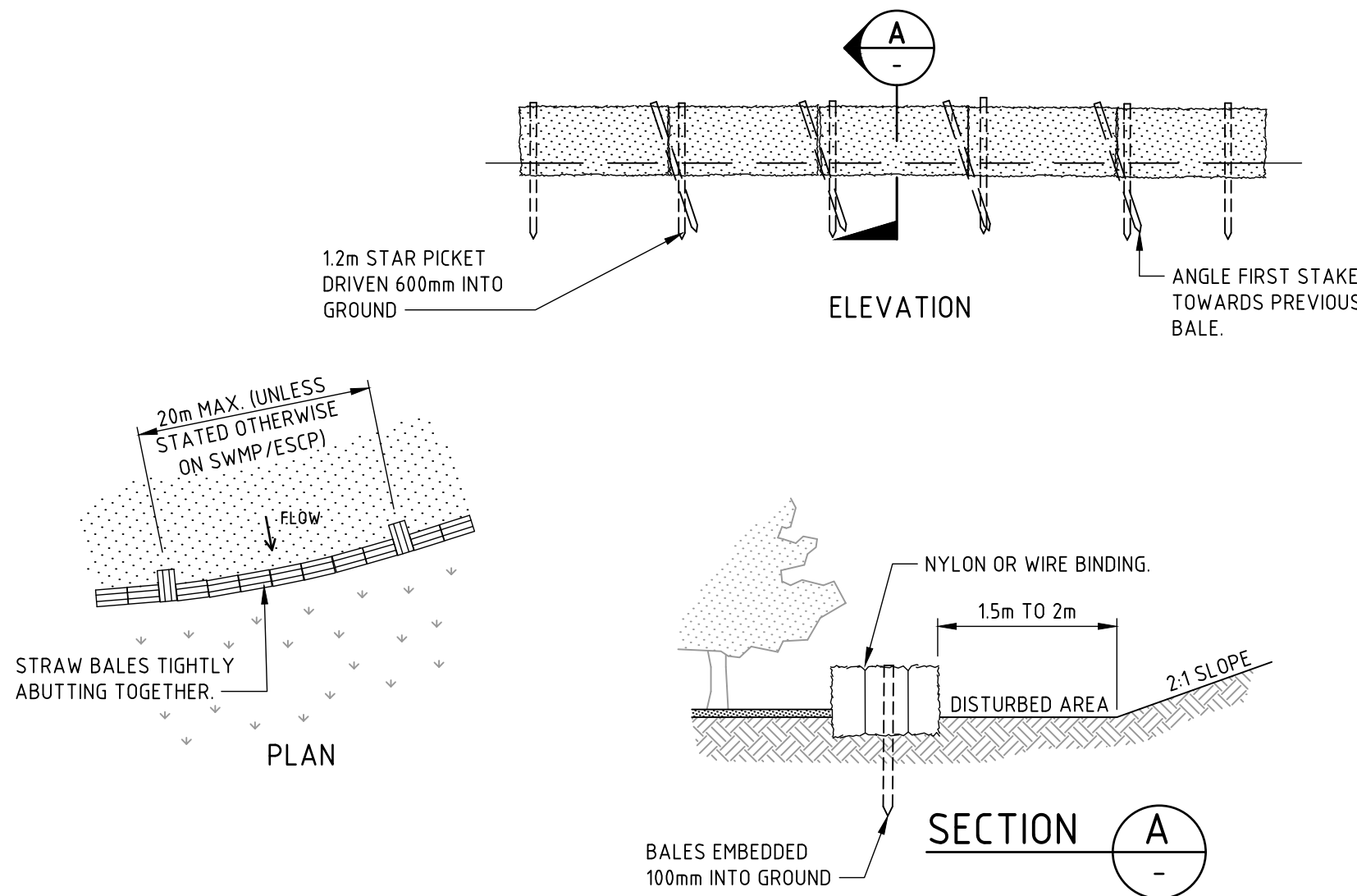
EARTH BANK - LOW FLOW (SD 5-5)



CONSTRUCTION NOTES

1. PLACE STOCKPILES MORE THAN 2m (PREFERABLY 5m) 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 2m IN HEIGHT.
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 (STANDARD DRAWING 5-5) ON THE UPSLOPE SIDE TO DIVERT WATER AROUND STOCKPILES AND SEDIMENT FENCES (STANDARD DRAWING 6-8) 1 TO 2m DOWNSLOPE.

STOCKPILES (SD 4-1)



CONSTRUCTION NOTES

1. CONSTRUCT THE STRAW BALE FILTER AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE.
2. PLACE BALES LENGTHWISE IN A ROW WITH ENDS TIGHTLY ABUTTING. USE STRAW TO FILL ANY GAPS BETWEEN BALES. STRAWS ARE TO BE PLACED PARALLEL TO GROUND.
3. ENSURE THAT THE MAXIMUM HEIGHT OF THE FILTER IS ONE BALE.
4. EMBED EACH BALE IN THE GROUND 75mm TO 100mm AND ANCHOR WITH TWO 12 METRE STAR PICKETS OR STAKES. ANGLE THE FIRST STAR PICKET OR STAKE IN EACH BALE TOWARDS THE PREVIOUSLY LAID BALE. DRIVE THEM 600mm INTO THE GROUND AND, IF POSSIBLE, FLUSH WITH THE TOP OF THE BALES. WHERE STAR PICKETS ARE USED AND THEY PROTRUDE ABOVE THE BALES, ENSURE THEY ARE FITTED WITH SAFETY CAPS.
5. WHERE A STRAW BALE FILTER IS CONSTRUCTED DOWNSLOPE FROM A DISTURBED BATTER, ENSURE THE BALES ARE PLACED 1 TO 2 METRES DOWNSLOPE FROM THE TOE.
6. ESTABLISH A MAINTENANCE PROGRAM THAT ENSURES THE INTEGRITY OF THE BALES IS RETAINED - THEY COULD REQUIRE REPLACEMENT EACH TWO TO FOUR MONTHS.

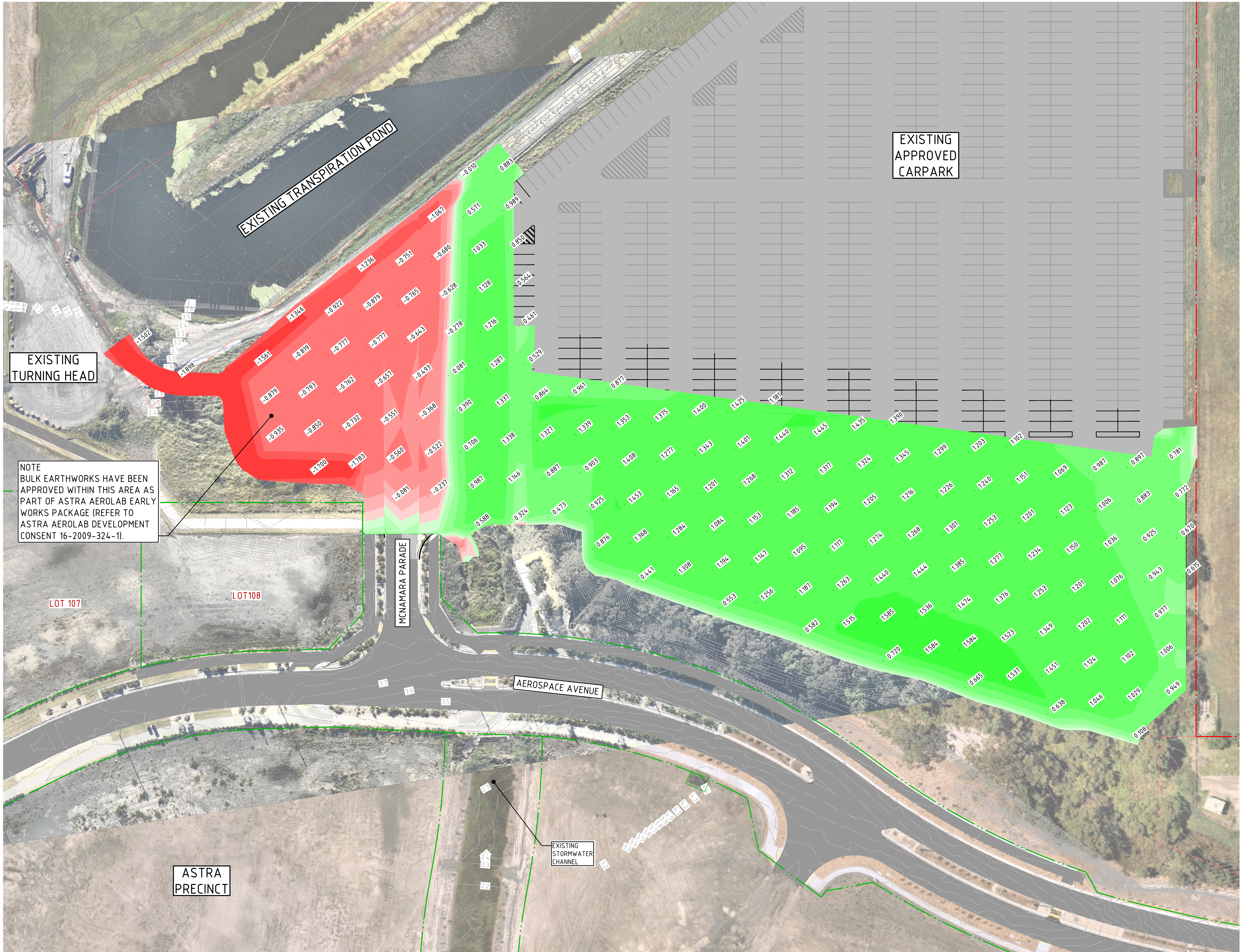
STRAW BALE FILTER (SD 6-7)

FOR APPROVAL

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT		ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE.	PROJECT	DRAWING TITLE	JOB NUMBER
A	ISSUED FOR DA APPROVAL	JB	JB	AB	25.08.22	ASTRA AEROLAB			ASTRA AEROLAB CARPARK WILLIAMTOWN NSW, 2318	CONCEPT EROSION AND SEDIMENT DETAILS	NL182640
B	ISSUED FOR DA APPROVAL	JB	JB	AB	11.10.22						DRAWING NUMBER
C	ISSUED FOR DA APPROVAL	JB	JB	AB	18.10.22						DA-02-C02.11
D	ISSUED FOR DA APPROVAL	JB	JB	AB	19.10.22						REVISION
E	ISSUED FOR DA APPROVAL	JB	JB	AB	20.10.22						E
						DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED	THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD				DRAWING SHEET SIZE = A1



DRAWN: J BEVITT  
DESIGNED: J BEVITT  
JOB MANAGER: A BROWN  
VERIFIER: A BROWN



LEGEND	
	EXISTING LOT BOUNDARIES
	EXISTING EASEMENTS
	ASTRA LOT BOUNDARIES
	BULK EARTHWORKS DEPTHS
	EXISTING CONTOURS

DEPTH OF CUT	
	- 2.0m TO - 1.5m
	- 1.5m TO - 1.0m
	- 1.0m TO - 0.5m
	- 0.5m TO - 0.25m
	- 0.25m TO - 0.1m
	- 0.1m TO - 0.0m
DEPTH OF FILL	
	0.0m TO 0.1m
	0.1m TO 0.25m
	0.25m TO 0.5m
	0.5m TO 1.0m
	1.0m TO 1.5m
	1.5m TO 2.0m

NOTES:	
1.	NEGATIVE ELEVATIONS DENOTES AREAS TO BE CUT.
2.	POSITIVE ELEVATIONS DENOTES AREAS TO BE FILLED.
3.	CUT/FILL DEPTHS ARE FROM THE EXISTING BULK EARTHWORKS (PART OF EARLY WORKS PACKAGE) TO PROPOSED FINISH SURFACE.
4.	REFER TO GRADING PLAN FOR DETAILED LEVELS.
5.	NO ALLOWANCE HAVE BEEN MADE FOR, CARPARK PAVEMENTS, FOOTPATH PAVEMENTS, LANDSCAPING, SERVICE TRENCHES, STORMWATER TRENCHES, CULVERT SLAB, FOOTINGS OR FOUNDATIONS, SETTLEMENT, BULKING FACTOR, ETC.

CUT AND FILL QUANTITIES	
TOTAL CUT	3,006m³
TOTAL FILL	13,768m³
BALANCE	10,762m³ (REQUIRED MATERIAL)

FOR APPROVAL

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE
A	ISSUED FOR DA APPROVAL	JB	JB	AB	23.08.22
B	ISSUED FOR DA APPROVAL	JB	JB	AB	11.10.22
C	ISSUED FOR DA APPROVAL	JB	JB	AB	18.10.22
D	ISSUED FOR DA APPROVAL	JB	JB	AB	19.10.22
E	ISSUED FOR DA APPROVAL	JB	JB	AB	20.10.22

CLIENT
ASTRA AEROLAB
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD
---

	ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR, AND MAY BE INCOMPLETE IF COPIED TO BLACK & WHITE.
SCALE 1:500 @ A1	

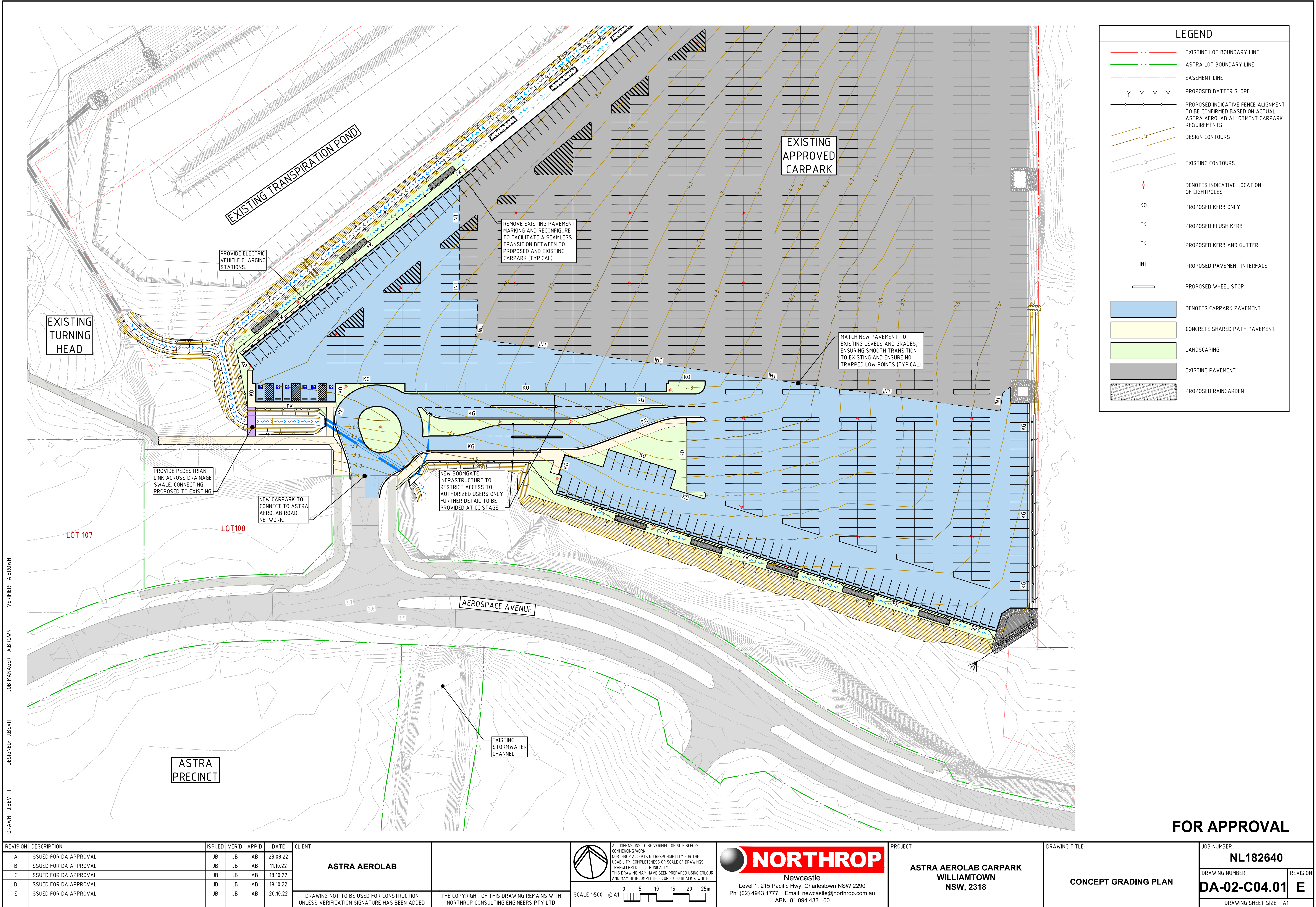
Newcastle
Level 1, 215 Pacific Hwy, Charlestown NSW 2290
Ph (02) 4943 1777 Email newcastle@northrop.com.au
ABN 81 094 433 100

PROJECT
ASTRA AEROLAB CARPARK WILLIAMTOWN NSW, 2318

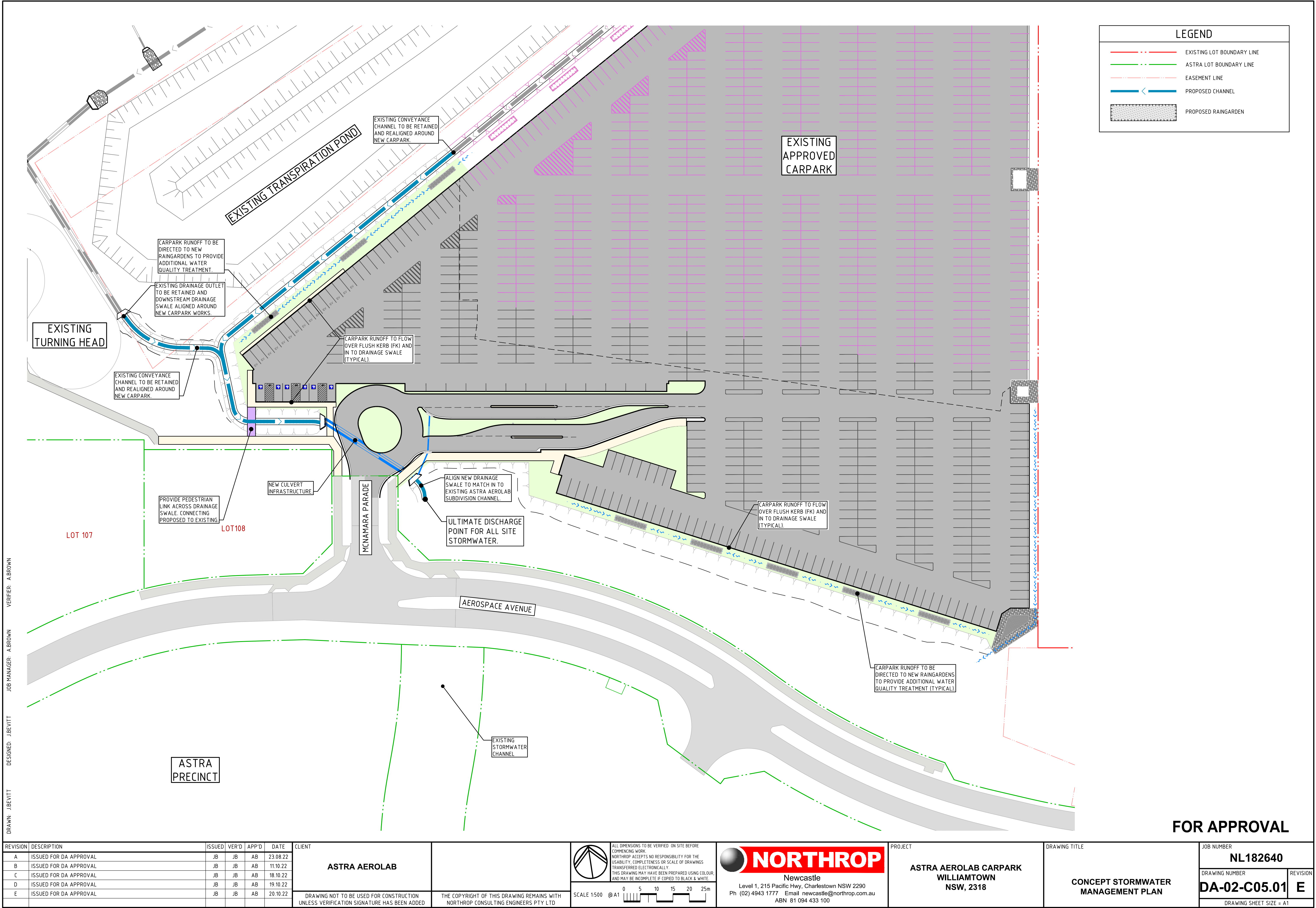
DRAWING TITLE
CONCEPT BULK EARTHWORK PLAN

JOB NUMBER	
NL182640	
DRAWING NUMBER	REVISION
DA-02-C03.01	E
DRAWING SHEET SIZE = A1	












LEGEND

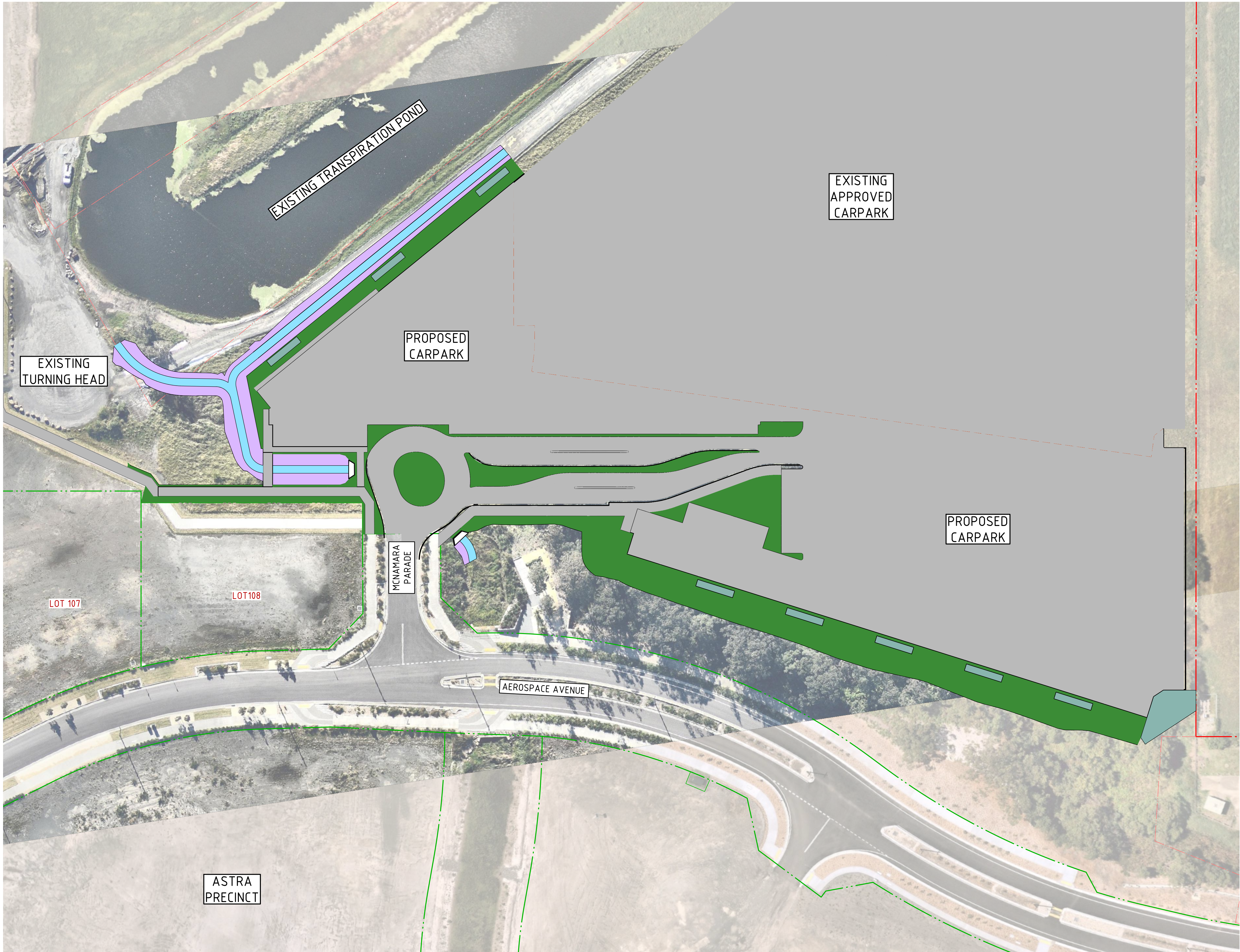
- EXISTING LOT BOUNDARY LINE
- ASTRA LOT BOUNDARY LINE
- EASEMENT LINE
- PROPOSED CHANNEL
- PROPOSED RAINGARDEN

FOR APPROVAL

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT			PROJECT	DRAWING TITLE	JOB NUMBER	
A	ISSUED FOR DA APPROVAL	JB	JB	AB	23.08.22	ASTRA AEROLAB		<p>ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WORK. NORTHROP ACCEPTS NO RESPONSIBILITY FOR THE USABILITY, COMPLETENESS OR SCALE OF DRAWINGS TRANSFERRED ELECTRONICALLY. THIS DRAWING MAY HAVE BEEN PREPARED USING COLOUR AND MAY BE INCOMPLETE IF COPIED TO BLACK &amp; WHITE.</p>		ASTRA AEROLAB CARPARK WILLIAMTOWN NSW, 2318	NL182640	
B	ISSUED FOR DA APPROVAL	JB	JB	AB	11.10.22						DRAWING NUMBER	REVISION
C	ISSUED FOR DA APPROVAL	JB	JB	AB	18.10.22						DA-02-C05.01	E
D	ISSUED FOR DA APPROVAL	JB	JB	AB	19.10.22							
E	ISSUED FOR DA APPROVAL	JB	JB	AB	20.10.22							
DRAWING NOT TO BE USED FOR CONSTRUCTION UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED						THE COPYRIGHT OF THIS DRAWING REMAINS WITH NORTHROP CONSULTING ENGINEERS PTY LTD	SCALE 1:500 @ A1		Level 1, 215 Pacific Hwy, Charlestown NSW 2290 Ph (02) 4943 1777 Email newcastle@northrop.com.au ABN 81 094 433 100	CONCEPT STORMWATER MANAGEMENT PLAN	DRAWING SHEET SIZE = A1	



VERIFIER: A BROWN  
JOB MANAGER: A BROWN  
DESIGNED: J BEVITT  
DRAWN: J BEVITT



LEGEND	
	EXISTING LOT BOUNDARY LINE
	ASTRA LOT BOUNDARY
	EASEMENT LINE
	DENOTES EXTENT OF COUCH TURF
	CHANNEL BASE 'MP1'
	CHANNEL EMBANKMENT 'MP2'
	GARDEN BEDS 'MP3'

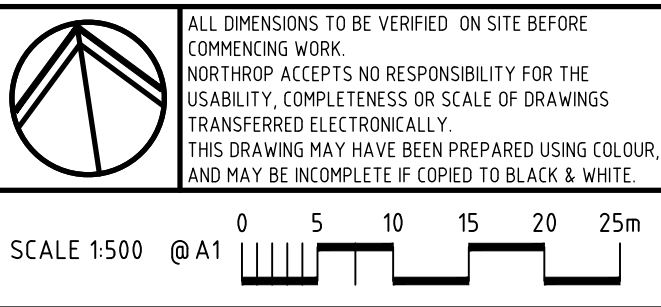
BOTANICAL NAME	COMMON NAME	SCHEDULED SIZE	PLANTING DENSITY
MP1 – CHANNEL BASE			
CAREX APPRESSA	TALL SEDGE	HIKO TUBE	1 PLANT PER sqm
CYPERUS ERAGROSTIS	UMBRELLA SEDGE	HIKO TUBE	0.5 PLANTS PER sqm
LOMANDRA 'KATRINUS'	KATRINUS	HIKO TUBE	0.5 PLANTS PER sqm
LOMANDRA LONGIFOLIA	Mat Rush	HIKO TUBE	1 PLANT PER sqm
GAHNIA CLARKEI	TALL SAW SEDGE	HIKO TUBE	1 PLANT PER sqm
JUNCUS USITATUS	COMMON RUSH	HIKO TUBE	1 PLANT PER sqm
DIANELLA CAERULEA	BLUE FLAX LILY	HIKO TUBE	1 PLANT PER sqm
FICINIA NODOSA	KNOBBY CLUB-RUSH	HIKO TUBE	1 PLANT PER sqm
MP2 – CHANNEL EMBANKMENT/SIDE			
DIANELLA CAERULEA	BLUE FLAX LILY	HIKO TUBE	0.5 PLANT PER sqm
CARPOBROTUS GLAUCESCENS	PIGFACE	2.5 LITRE	1 PLANT PER 50 sqm
HARDENBERGIA VIOLACEA	FALSE SARSPARILLA	HIKO TUBE	1 PLANT PER 6 sqm
LOMANDRA 'KATRINUS'	KATRINUS	HIKO TUBE	1 PLANT PER sqm
LOMANDRA LONGIFOLIA	MAT RUSH	HIKO TUBE	1 PLANT PER sqm
AUSTRADANTHON TENUIOR	WALLABY GRASS	HIKO TUBE	1 PLANT PER sqm
IMPERATA CYLINDRICA	BLADY GRASS	HIKO TUBE	1 PLANT PER sqm
THEMEDA AUSTRALIS	KANGAROO GRASS	HIKO TUBE	1 PLANT PER sqm
FICINIA NODOSA	KNOBBY CLUB-RUSH	HIKO TUBE	1 PLANT PER sqm
MP3 – GARDEN BED			
MIXTURE OF NATIVE AUSTRALIAN SHRUB AND GROUNDCOVERS WITH MAXIMUM MATURE HEIGHT OF 1m. PROPOSED SPECIES MIX TO BE PROVIDED TO SUPERINTENDENT FOR REVIEW AND APPROVAL.			
FINISH TYPE	SOIL DEPTH	SOIL TYPE	MULCH TYPE
TURF	100mm	S1	N/A
MP1 – MASS PLANTING TYPE 1 (CHANNEL BASE)	150mm	S3	ORGANIC MULCH EQUAL TO ANL FOREST FINES
MP2 – MASS PLANTING TYPE 2 (CHANNEL EMBANKMENT/SIDE)	150mm	S3	ORGANIC MULCH EQUAL TO ANL FOREST FINES
MP3 – MASS PLANTING TYPE 3 (GARDEN BED)	250mm	S2	ORGANIC MULCH EQUAL TO ANL HARDWOOD CHIP

FOR APPROVAL

REVISION	DESCRIPTION	ISSUED	VER'D	APP'D	DATE	CLIENT
A	ISSUED FOR DA APPROVAL	JB	JB	AB	23.08.22	ASTRA AEROLAB
B	ISSUED FOR DA APPROVAL	JB	JB	AB	11.10.22	
C	ISSUED FOR DA APPROVAL	JB	JB	AB	18.10.22	
D	ISSUED FOR DA APPROVAL	JB	JB	AB	19.10.22	
E	ISSUED FOR DA APPROVAL	JB	JB	AB	20.10.22	

DRAWING NOT TO BE USED FOR CONSTRUCTION  
UNLESS VERIFICATION SIGNATURE HAS BEEN ADDED

THE COPYRIGHT OF THIS DRAWING REMAINS WITH  
NORTHROP CONSULTING ENGINEERS PTY LTD





**NORTHROP**  
Newcastle  
Level 1, 215 Pacific Hwy, Charlestown NSW 2290  
Ph (02) 4943 1777 Email newcastle@northrop.com.au  
ABN 81 094 433 100

PROJECT

**ASTRA AEROLAB CARPARK  
WILLIAMTOWN  
NSW, 2318**

DRAWING TITLE

**CONCEPT LANDSCAPING PLAN**

JOB NUMBER

**NL182640**

DRAWING NUMBER

**DA-02-C06.01**

REVISION

**E**

DRAWING SHEET SIZE = A1