PROJECT: PROPOSED RESOURCE RECOVERY FACILITY

PLANSET: CONCEPT CIVIL WORKS

CLIENT: OUTLINE PLANNING CONSULTANTS

LOCALITY PLAN
NOT TO SCALE

LGA: GUNNEDAH SHIRE COUNCIL

16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

DRAWING LIST		
DWG NO.	REV	DWG TITLE
GENERAL		
PS01-A000	I	COVER SHEET
PS01-A050	G	DEVELOPMENT OVERVIEW PLAN
PS01-A300	H	SITE PLAN
PS01-A310	D	UNLOADING AND PROCESSING SHED PLAN
PS01-A311	E	UNLOADING AND PROCESSING SHED ELEVATIONS AND SECTION
PS01-A312	B	RESTRICTED WASTE STORAGE SHED PLAN AND ELEVATIONS
CONSTRUCTION MANAGEMENT WORKS		
PS01-B300	G	SEDIMENT, EROSION CONTROL & DEMOLITION PLAN
PS01-B310	A	SEDIMENT & EROSION CONTROL DETAILS
EARTHWORKS		
PS01-C100	E	EARTHWORKS GRADING PLAN
PS01-C500	E	EARTHWORKS CUT-FILL PLAN
PS01-C600	E	SITE SECTION A - PROCESSING SHED AND OPEN STORAGE BAYS
PS01-C601	E	SITE SECTION B - OPEN STORAGE BAYS AND FACILITY PADS
PS01-C602	E	SITE SECTION C - UNLOADING SHED, PROCESSING SHED AND TRUCK WASH DOWN AREA
DRAINAGE		
PS01-E100	G	DRAINAGE PLAN
PS01-E200	B	DRAINAGE DETAILS
PS01-E600	E	OSD CATCHMENT PLAN, MODEL LAYOUT & RESULT
PS01-E700	F	WATER QUALITY CATCHMENT PLAN, MODEL & RESULT
STRUCTURE AND PAVEMENTS		
PS01-G400	E	PAVEMENT PLAN
PS01-GZ00	I	SWEPT PATH ANALYSIS PLAN - AV
PS01-GZ10	I	SWEPT PATH ANALYSIS PLAN - B DOUBLE
PS01-GZ20	C	SWEPT PATH ANALYSIS PLAN - HRV
PS01-GZ30	C	SWEPT PATH ANALYSIS PLAN - MRV
PS01-GZ40	C	SWEPT PATH ANALYSIS PLAN - B99
PS01-GZ50	B	SWEPT PATH ANALYSIS PLAN - B-TRIPLE (ROAD TRAIN)
GENERAL NOTES		
PS01-ZZ00	A	GENERAL LEGEND AND NOTES (SHEET 1)
PS01-ZZ01	A	GENERAL LEGEND AND NOTES (SHEET 2)
PS01-ZZ02	A	GENERAL LEGEND AND NOTES (SHEET 3)
PS01-ZZ03	A	GENERAL LEGEND AND NOTES (SHEET 4)

GENERAL NOTES

1 THIS PLAN IS FOR DEVELOPMENT APPLICATION PURPOSE AND NOT FOR CONSTRUCTION. DESIGN TO BE REVIEWED AND UPDATED FOR CONSTRUCTION CERTIFICATE.
2 ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH, AND THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT AUSTRALIAN STANDARDS, COUNCIL SPECIFICATIONS, AND ALL PROJECT CONSULTANT'S PLANS AND REPORTS.
3 INTERNAL SURVEY INFORMATION SHOWN BASED ON INFORMATION PROVIDED BY STEWART SURVEYS.
4 SITE BOUNDARY BASED ON INFORMATION PROVIDED BY STEWART SURVEYS.
5 LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).
6 FINAL SURFACE CONTOURS ARE BASED ON PROPOSED, EXISTING AND LIDAR SURFACE.

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
I	**MINOR AMENDMENTS**	**10/12/2020**	**PB**	**AW/AVG**	**TH**	**TH**
H	MINOR AMENDMENTS	03/11/2020	LL	AW/AVG	SL	TH
G	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
F	ADDITIONAL AND AMENDED SWEPT PATHS PROVIDED	25/08/20020	AW	AW	SL	TH
E	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
D	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH

SCALE

GRID | DATUM | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE: RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

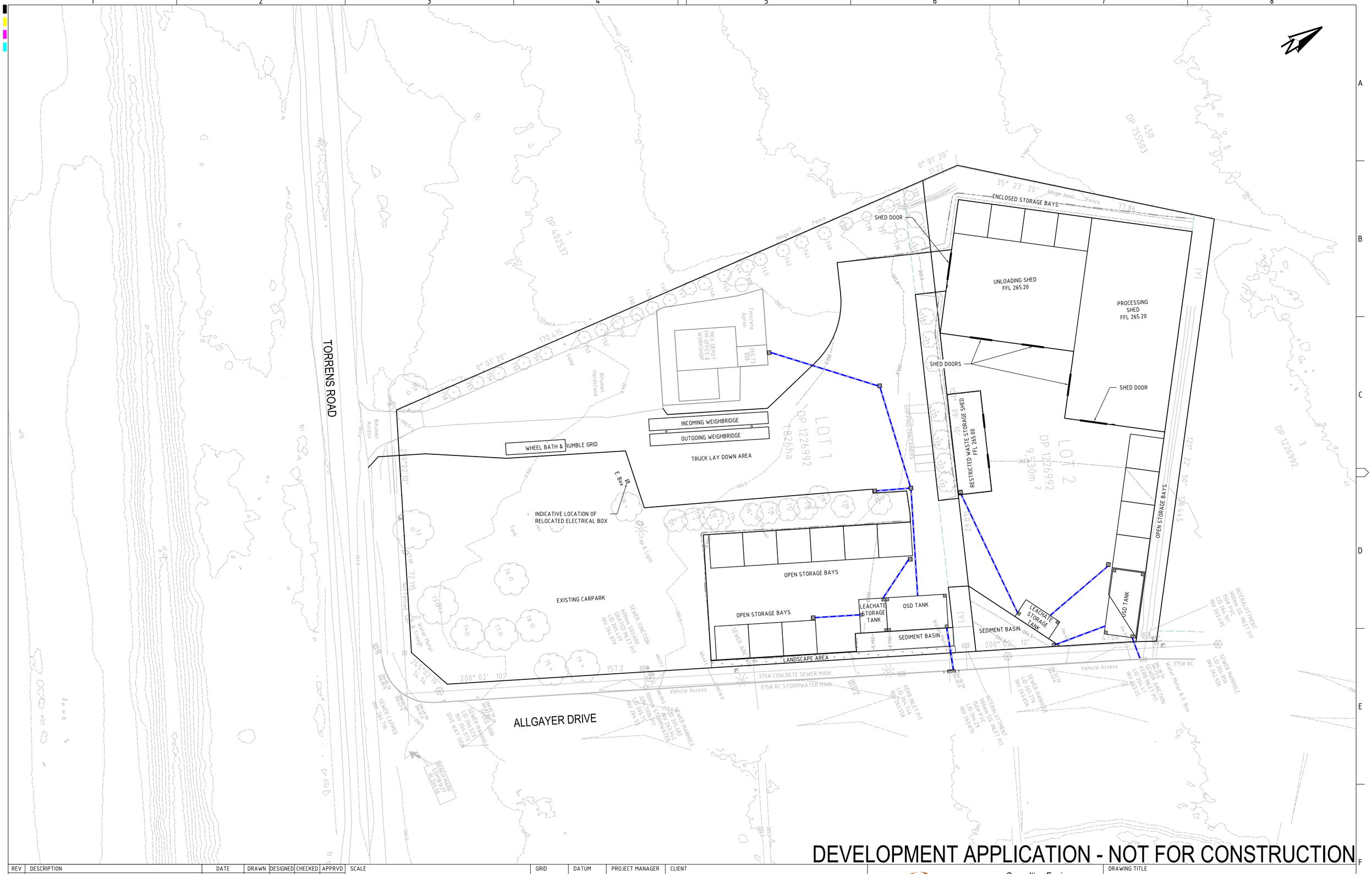
martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE: COVER SHEET

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-A000	I

DRAWING ID: P1907434-PS01-R11-A000

PRINTED: ---- USER: PBROGAN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)



DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
G	**MINOR AMENDMENTS**	**10/12/2020**	**PB**	**AW/AVG**	**TH**	**TH**
F	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
E	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
D	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

DISCLAIMER & COPYRIGHT
This plan must not be used for construction unless signed as approved by principal certifying authority.
All measurements in millimetres unless otherwise specified.
This drawing must not be reproduced in whole or part without prior written consent of Martens & Associates Pty Ltd.

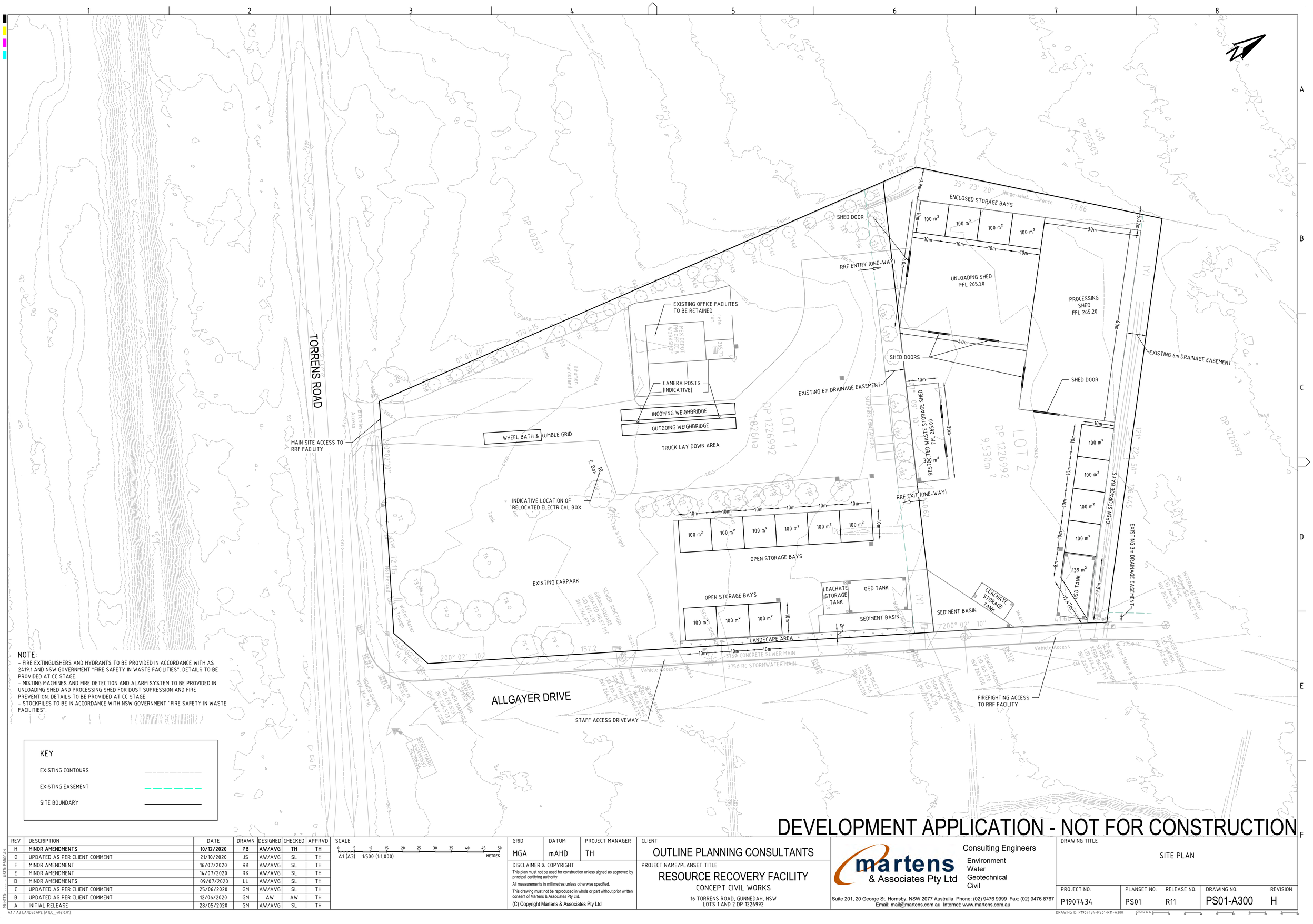
PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
DEVELOPMENT OVERVIEW PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-A050	G

PRINTED: ---- USER: PBOGAN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-A050



NOTE:
- FIRE EXTINGUISHERS AND HYDRANTS TO BE PROVIDED IN ACCORDANCE WITH AS 2419.1 AND NSW GOVERNMENT "FIRE SAFETY IN WASTE FACILITIES". DETAILS TO BE PROVIDED AT CC STAGE.
- MISTING MACHINES AND FIRE DETECTION AND ALARM SYSTEM TO BE PROVIDED IN UNLOADING SHED AND PROCESSING SHED FOR DUST SUPRESSION AND FIRE PREVENTION. DETAILS TO BE PROVIDED AT CC STAGE.
- STOCKPILES TO BE IN ACCORDANCE WITH NSW GOVERNMENT "FIRE SAFETY IN WASTE FACILITIES".

KEY

EXISTING CONTOURS

EXISTING EASEMENT

SITE BOUNDARY

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
H	**MINOR AMENDMENTS**	**10/12/2020**	**PB**	**AW/AVG**	**TH**	**TH**
G	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
F	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
E	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
D	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
C	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	12/06/2020	GM	AW	AW	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

PRINTED ---- USER PROGRAN

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

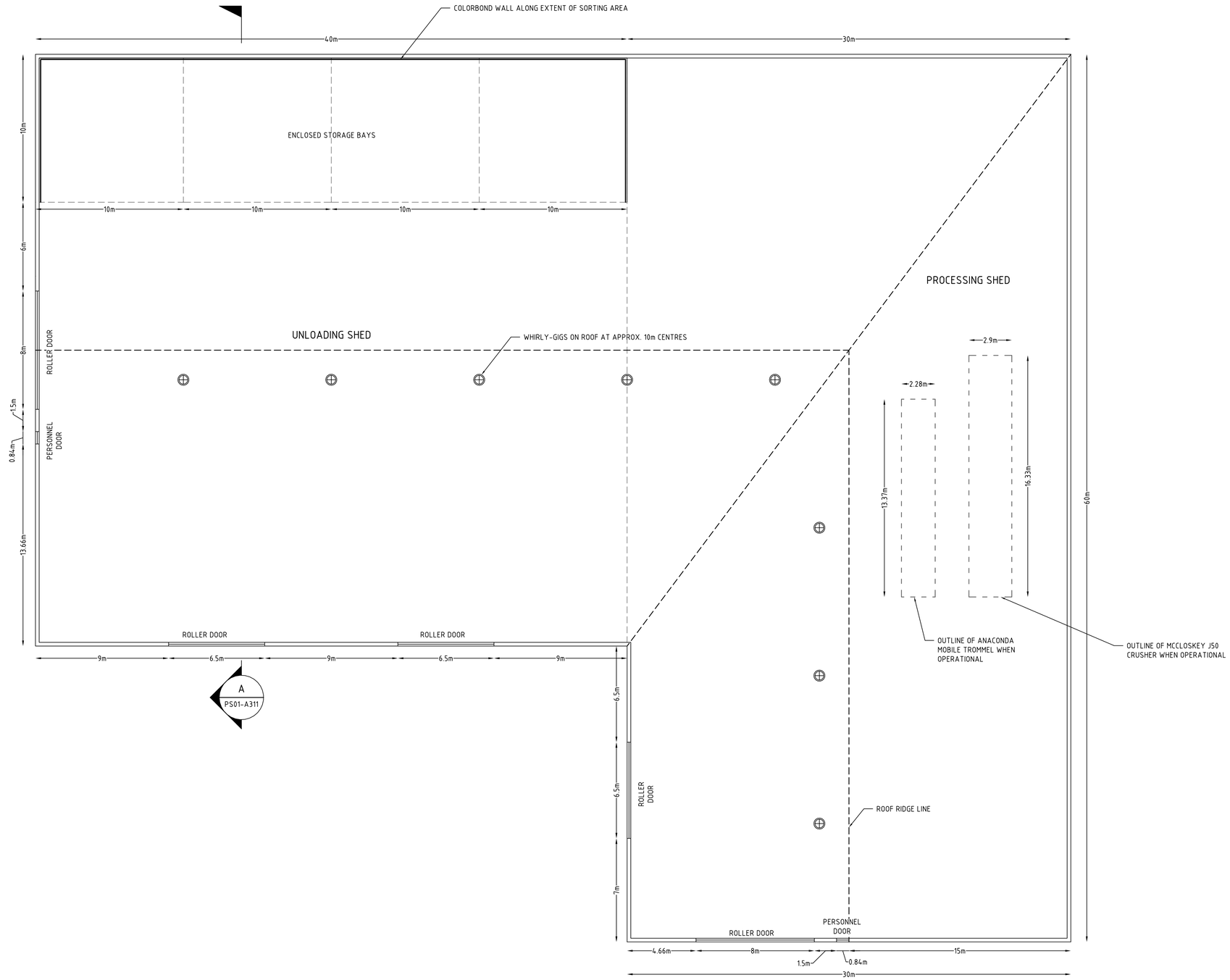
martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SITE PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-A300	H

A1 / A3 LANDSCAPE (A1LC_v02.0.01)

DRAWING ID: P1907434-PS01-R11-A300



UNLOADING & PROCESSING SHED PLAN

SCALE 1:150

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
D	**MINOR AMENDMENTS**	**09/07/2020**	**LL**	**AW/AVG**	**SL**	**TH**
C	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	12/06/2020	GM	AW	AW	TH
A	ADDED SHED DETAILS	05/06/2020	GM	AW	AW	TH

SCALE
0 1.5 3.0 4.5 6.0 7.5 9.0 10.5 12.0 13.5 15.0 METRES
A1 (A3) 1:150 (1:300)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

DISCLAIMER & COPYRIGHT

This plan must not be used for construction unless signed as approved by principal certifying authority.

All measurements in millimetres unless otherwise specified.

This drawing must not be reproduced in whole or part without prior written consent of Martens & Associates Pty Ltd.

CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

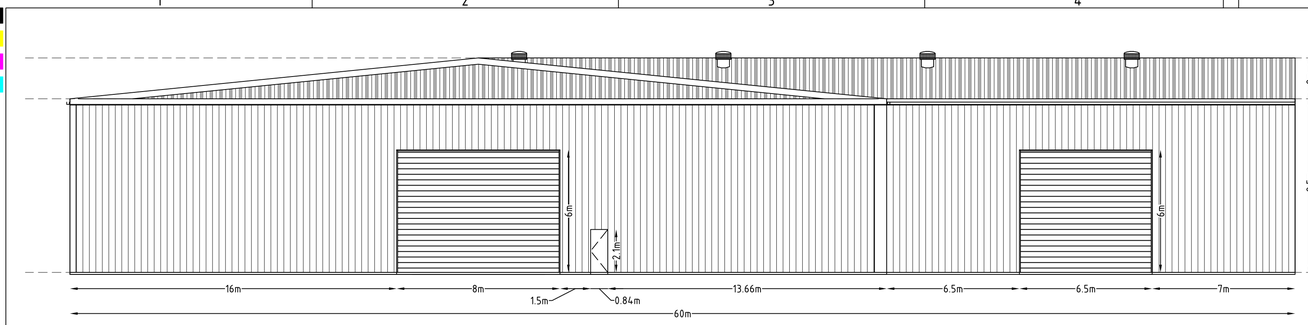
DRAWING TITLE
UNLOADING AND PROCESSING SHED PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-A310	D

DRAWING ID: P1907434-PS01-R11-A310

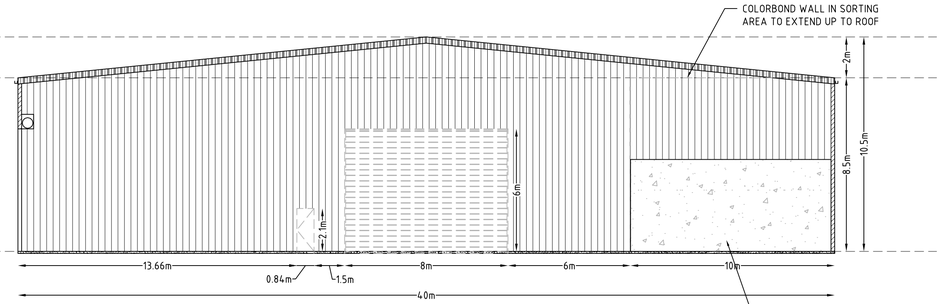
PRINTED: --- USER: PDROGAN

A1 / A3 LANDSCAPE (A1LC_v02.0.01)



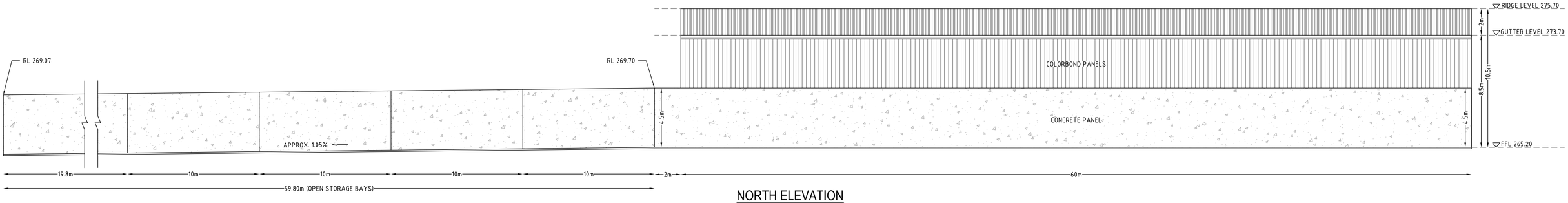
SOUTH ELEVATION

SCALE 1:150



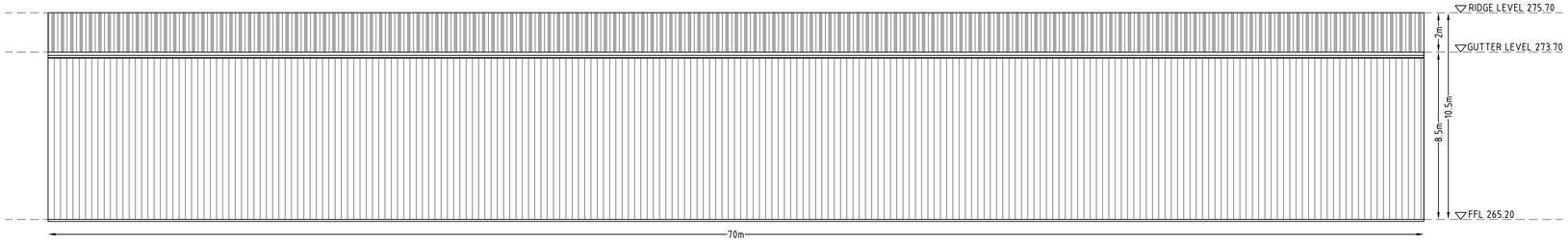
SHED SECTION A

SCALE 1:150



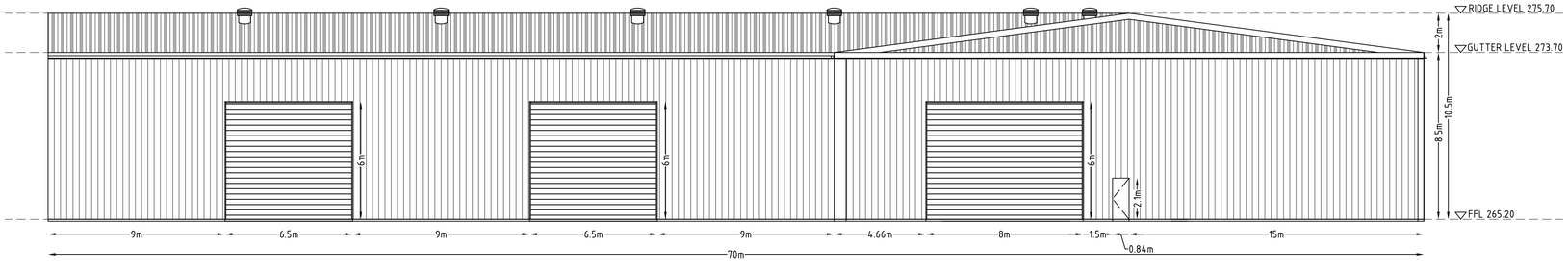
NORTH ELEVATION

SCALE 1:150



WEST ELEVATION

SCALE 1:150



EAST ELEVATION

SCALE 1:150

NOTE:

- SHEDS TO BE COLORBOND CLAD.
- STORAGE BAY WALLS TO BE CONCRETE TILT PANELS WITH COLORBOND CLAD

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	**MINOR AMENDMENT**	**14/07/2020**	**RK**	**AW/AVG**	**SL**	**TH**
D	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
C	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	12/06/2020	GM	AW	AW	TH
A	ADDED SHED DETAILS	05/06/2020	GM	AW	AW	TH

SCALE
0 1.5 3.0 4.5 6.0 7.5 9.0 10.5 12.0 13.5 15.0 METRES
A1 (A3) 1:150 (1:300)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

DISCLAIMER & COPYRIGHT

This plan must not be used for construction unless signed as approved by principal certifying authority.

All measurements in millimetres unless otherwise specified.

CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

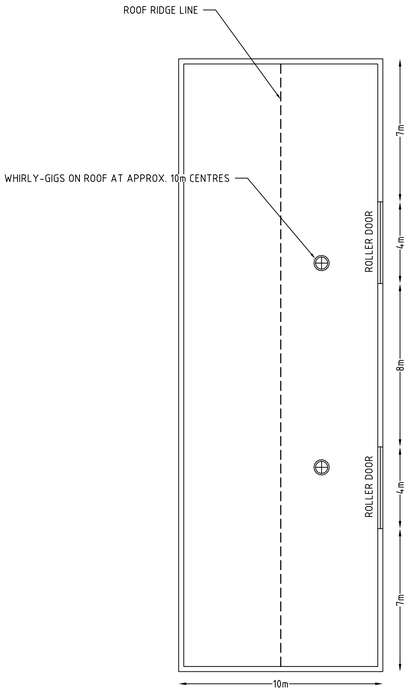
DRAWING TITLE
UNLOADING AND PROCESSING SHED ELEVATIONS AND SECTION

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-A311	E

DRAWING ID: P1907434-PS01-R11-A311

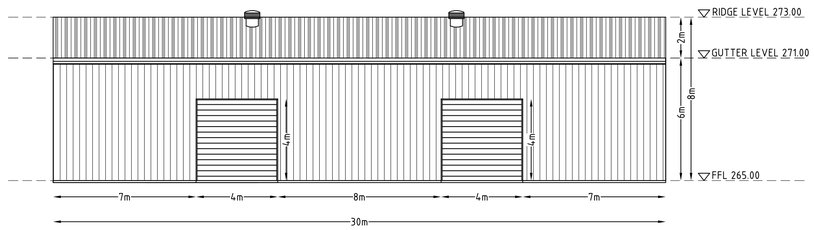
PRINTED: ---- USER: PBROGAN

A1 / A3 LANDSCAPE (A1LC_v02.0.011)



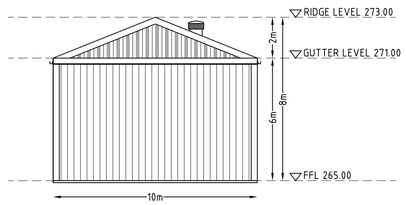
RESTRICTED WASTE STORAGE SHED PLAN

SCALE 1:150



NORTH ELEVATION

SCALE 1:150



EAST ELEVATION

SCALE 1:150

NOTE:
- SHED TO BE COLORBOND CLAD.

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	UPDATED AS PER CLIENT COMMENT	12/06/2020	GM	AW	AW	TH

SCALE
0 1.5 3.0 4.5 6.0 7.5 9.0 10.5 12.0 13.5 15.0 METRES
A1 (A3) 1:150 (1:300)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

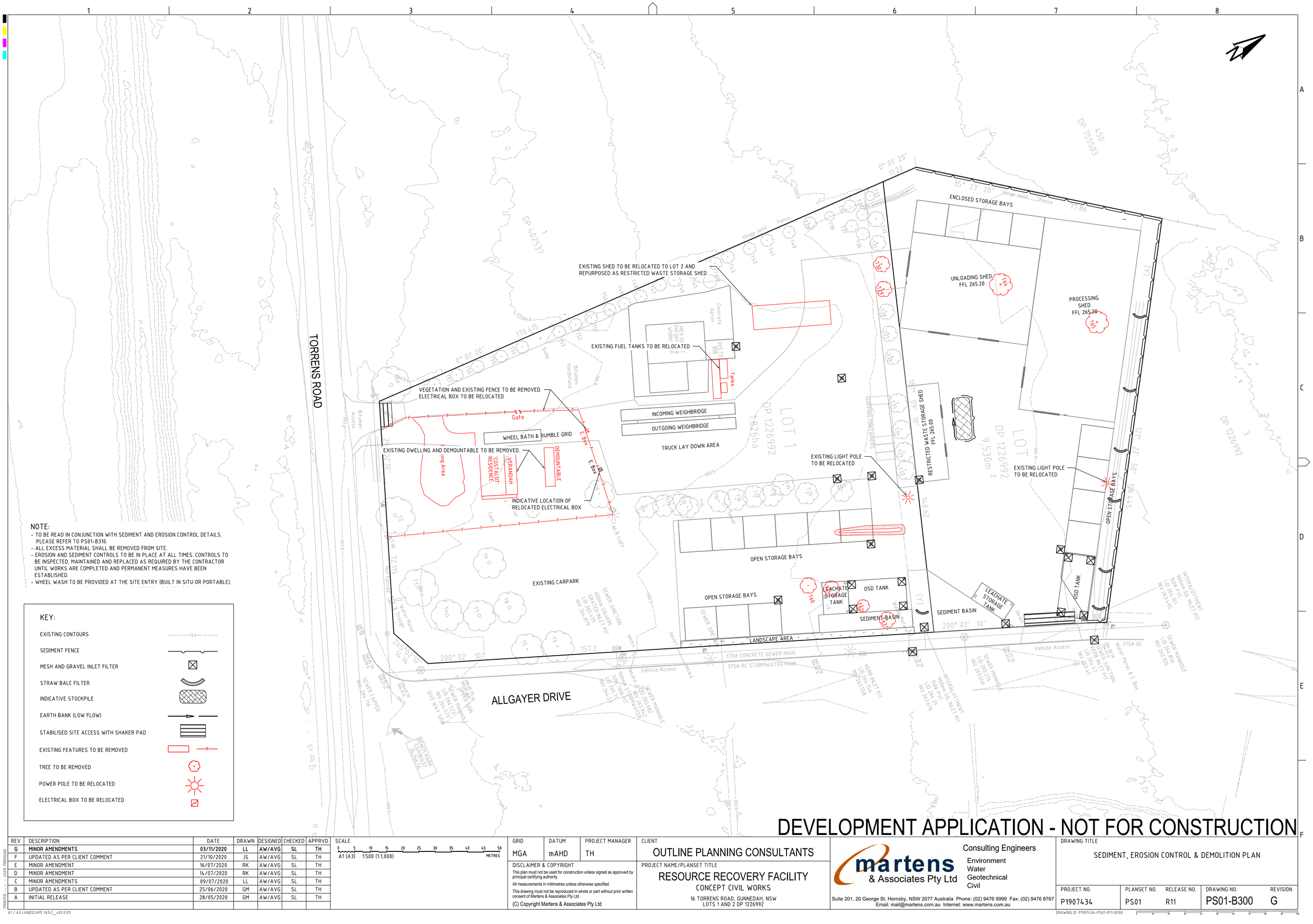
DRAWING TITLE
RESTRICTED WASTE STORAGE SHED PLAN
AND ELEVATIONS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-A312	B

DRAWING ID: P1907434-PS01-R11-A312

PRINTED: ---- - USER: PBROWN

A1 / A3 LANDSCAPE (A1LC_v02.0.01)



NOTE:
- TO BE READ IN CONJUNCTION WITH SEDIMENT AND EROSION CONTROL DETAILS. PLEASE REFER TO PS01-B310.
- ALL EXCESS MATERIAL SHALL BE REMOVED FROM SITE.
- EROSION AND SEDIMENT CONTROLS TO BE IN PLACE AT ALL TIMES. CONTROLS TO BE INSPECTED, MAINTAINED AND REPLACED AS REQUIRED BY THE CONTRACTOR UNTIL WORKS ARE COMPLETED AND PERMANENT MEASURES HAVE BEEN ESTABLISHED.
- WHEEL WASH TO BE PROVIDED AT THE SITE ENTRY (BUILT IN SITU OR PORTABLE).

KEY:

- EXISTING CONTOURS
- SEDIMENT FENCE
- MESH AND GRAVEL INLET FILTER
- STRAW BALE FILTER
- INDICATIVE STOCKPILE
- EARTH BANK (LOW FLOW)
- STABILISED SITE ACCESS WITH SHAKER PAD
- EXISTING FEATURES TO BE REMOVED
- TREE TO BE REMOVED
- POWER POLE TO BE RELOCATED
- ELECTRICAL BOX TO BE RELOCATED

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
G	**MINOR AMENDMENTS**	**03/11/2020**	**LL**	**AW/AVG**	**SL**	**TH**
F	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
E	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
D	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE: A1 (A3) 1:500 (1:1,000) — 0 5 10 15 20 25 30 35 40 45 50 METRES

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE: RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE: SEDIMENT, EROSION CONTROL & DEMOLITION PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-B300	G

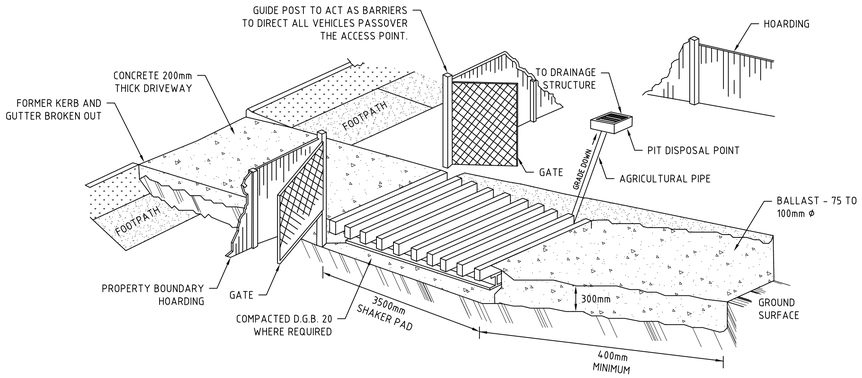
PRINTED: ---- USER: PBROWN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-B300

STABILISED ACCESS POINT

TYPE II SAP

THE TYPE II SAP DESIGN IS MORE DEFINED IN THAT IT REQUIRES AN AREA OF BALLAST WITHIN THE SITE COMBINED WITH A SHAKER PAD; ADJACENT THE SHAKER PAD AND IN THE PUBLIC WAY IS A TEMPORARY (CONCRETE) VEHICULAR CROSSING. (SEE DIAGRAM)

STABILISED ACCESS POINT - TYPE 2



IN BOTH TYPE I AND TYPE II SAP'S, THE TEMPORARY VEHICULAR CROSSING MUST:

- CONNECT TO AN EXISTING GUTTER LAYBACK (WHERE THE KERB AND GUTTER EXIST) . IF A GUTTER LAYBACK DOES NOT EXIST THEN THE CONNECTION MUST BE MADE TO THE GUTTER BY REMOVING THE ADJCENT KERB SECTION ONLY.
- CONNECT TO A DISH CROSSING (WHERE KERB AND GUTTER DOES NOT EXIST). IF A DISH CROSSING DOES NOT EXIST, THEN IT MUST BE CONSTRUCTED IN ACCORDANCE WITH DETAILS CONTAINED IN COUNCIL'S ISSUED FOOTPATH CROSSING LEVELS.

IT SHOULD BE NOTED THAT THESE TYPES OF SAPS ARE CONSIDERED TO BE APPLICABLE FOR THE MAJORITY OF ACTIVITIES HOWEVER SOME SITES MAY REQUIRE SPECIAL CONSIDERATION.

SHAKER PAD (CATTLE GRID)

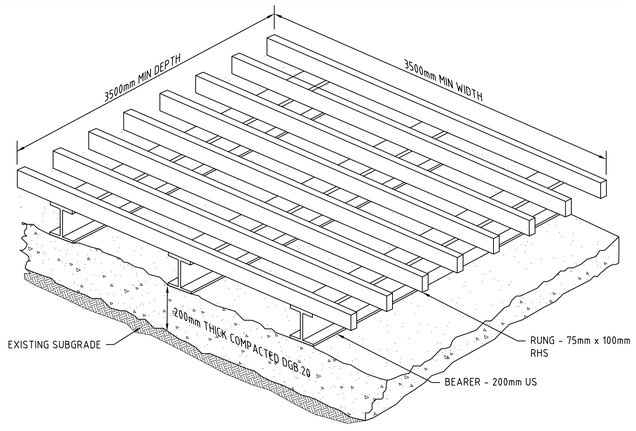
A CORRECTLY DESIGNED AND INSTALLED SHAKER PAD WILL ASSIST IN PREVENTING SEDIMENT TRANSFERE FROM A SITE. ANY STABILISED ACCESS POINT (SAP) CAN BE DESIGNED WITH A SHAKER PAD (COMPULSOPRY IN TYPE II SAP'S)

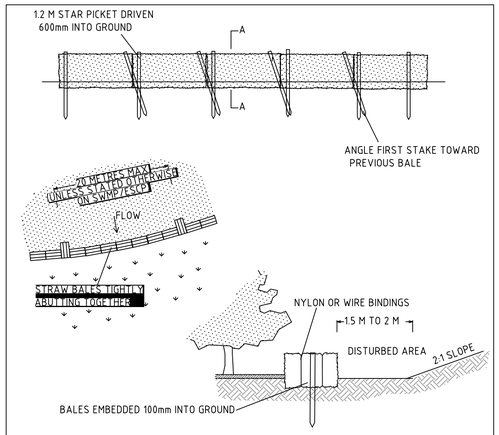
SHAKER PADS CAN BE DESIGNED AND CONSTRUCTED TO ENABLE RE-USE ON FUTURE PROJECTS.

THE SHAKER PAD:

- MUST BE DESIGNED AND CERTIFIED BY A PRACTICING STRUCTURAL ENGINEER. THE CERTIFIED DESIGN SHOULD BE SUBMITTED WITH THE RELEVENT APPLICATION.
- CAN BE CONSTRUCTED FROM ANY SUITABLE MATERIAL.
- MUST BE LOCATED ON A SUITABLY PREPARED AND COMPACTED SUB-GRADE/BASE MATERIAL.
- MUST BE SITUATED SUCH THAT THE RUNGS OF THE SHAKER PAD ARE LEVEL WITH THE ADJOINING NATURAL SURFACE.
- MUST BE A MINIMUM OF 3.5m IN LENGTH.
- MUST BE A MINIMUN OF 3.5m IN WIDTH.
- MUST HAVE CLEAR SPACING BETWEEN RUNGS OF 200 - 250mm.
- RUNGS MUST HAVE A MAXIMUM WIDTH (BEARING AREA) OF 75mm.
- MUST HAVE A MINIMUM CLEAR DEPTH OF 300mm IE FORM THE ROP OF THE RUNG TO THE FINISHED SUB-GRADE/BASE LEVEL.

THE SHAKER PAD MUST BE PROVIDED WITH SUITABLE BARRIERS AT THE SIDES TO ENSURE THAT ALL TYERS OF VEHICLES LEAVING THE SITE TRAVERSE THE DEVICE.

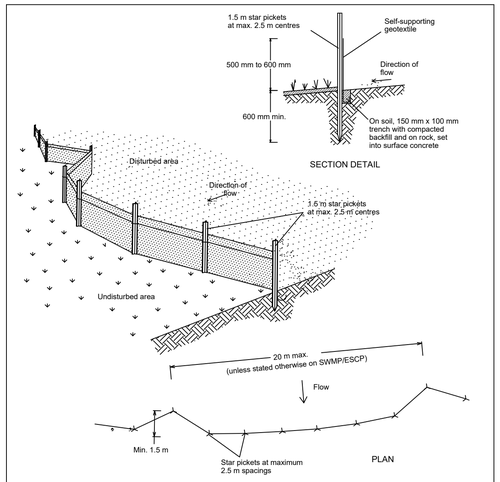




CONSTRUCTION NOTES

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 1.2 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.

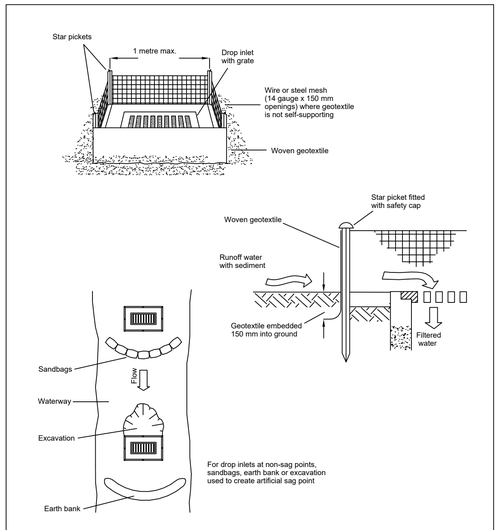
STRAW BALE FILTER SD 6-7



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 150-mm deep trench along the upslope line of the fence for the bottom of the fabric to be entrenched.
3. Drive 1.5 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 150-mm overlap.
6. Backfill the trench over the base of the fabric and compact it thoroughly over the geotextile.

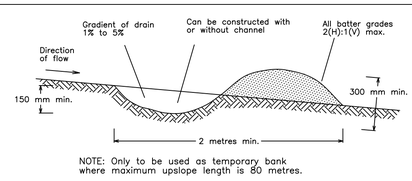
SEDIMENT FENCE SD 6-8



Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

GEOTEXTILE INLET FILTER SD 6-12

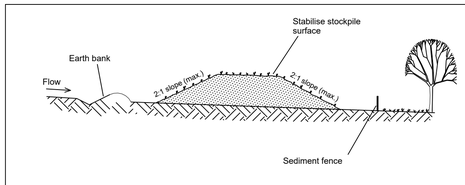


NOTE: Only to be used as temporary bank where maximum upslope length is 80 metres.

Construction Notes

1. Build with gradients between 1 percent 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.

EARTH BANK (LOW FLOW) SD 5-5



Construction 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. 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 2 metres downslope.

STOCKPILES SD 4-1

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE

GRID | DATUM | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SEDIMENT & EROSION CONTROL DETAILS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-B310	A

DRAWING ID: P1907434-PS01-R11-B310

PRINTED ---- USER: PROGRAN

A1 / A3 LANDSCAPE (A1LC_v02.0.01)

KEY

- EXISTING CONTOURS
- PROPOSED CONTOURS
- EARTHWORKS HINGE
- INTERFACE
- SITE BOUNDARY

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	**UPDATED AS PER CLIENT COMMENT**	**21/10/2020**	**JS**	**AW/AVG**	**SL**	**TH**
D	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

DISCLAIMER & COPYRIGHT
This plan must not be used for construction unless signed as approved by principal certifying authority.
All measurements in millimetres unless otherwise specified.
This drawing must not be reproduced in whole or part without prior written consent of Martens & Associates Pty Ltd.
(C) Copyright Martens & Associates Pty Ltd

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
EARTHWORKS GRADING PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-C100	E

PRINTED ---- USER: PBROWN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-C100

EARTHWORKS SUMMARY

	CUT	FILL
EARTHWORKS VOLUME (m^3)	371	4312
EARTHWORKS BALANCE (m^3)	-	3941

NOTE:
- EARTHWORKS CUT FILL ANALYSED FROM PROPOSED FINISH SURFACE TO EXISTING SURFACE BASED ON SURVEY.
- ROAD BOXING, PIPE TRENCHES, EXCAVATION, TOP SOIL STRIPPING, AND BULKING FACTOR ARE NOT CONSIDERED IN EARTHWORKS CALCULATIONS.

CUT-FILL DEPTH DESIGN TO EXISTING

LOWER THAN	-1.000	m	
-1.000	to -0.750	m	
-0.750	to -0.500	m	
-0.500	to -0.250	m	
-0.250	to -0.050	m	
-0.050	to 0.050	m	
0.050	to 0.250	m	
0.250	to 0.500	m	
0.500	to 0.750	m	
0.750	to 1.000	m	
GREATER THAN	1.000	m	

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	**UPDATED AS PER CLIENT COMMENT**	**21/10/2020**	**JS**	**AW/AVG**	**SL**	**TH**
D	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

DISCLAIMER & COPYRIGHT
This plan must not be used for construction unless signed as approved by principal certifying authority.
All measurements in millimetres unless otherwise specified.
This drawing must not be reproduced in whole or part without prior written consent of Martens & Associates Pty Ltd.

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

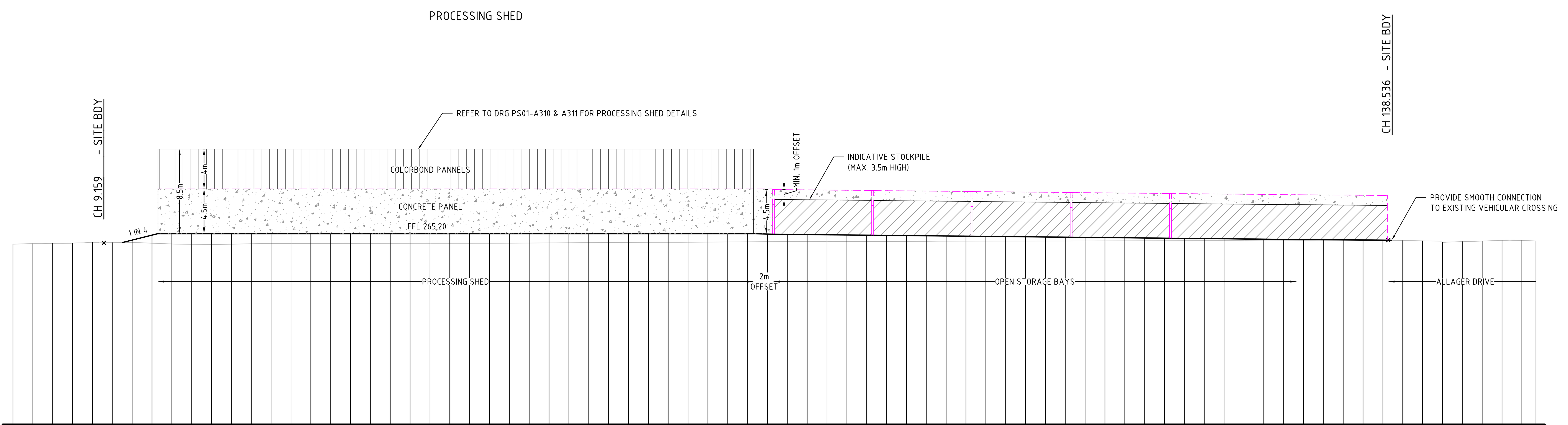
DRAWING TITLE
EARTHWORKS CUT-FILL PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-C500	E

PRINTED: --- USER: PBROGAN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-C500

NOTE :

- STORAGE BAY WALLS TO BE CONCRETE TILT PANELS WITH COLORBOND CLAD.
- STOCKPILES TO BE IN ACCORDANCE WITH NSW GOVERNMENT "FIRE SAFETY IN WASTE FACILITIES".



DATUM RL 246.000

CHAINAGE	DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS	CUT / FILL DEPTH
0.000		264.148	
2.000		264.193	
4.000		264.224	
6.000		264.246	
8.000		264.329	
10.000		264.294	
12.000	264.551	264.308	0.243
14.000	265.051	264.239	0.812
16.000	265.200	264.160	1.040
18.000	265.200	264.131	1.069
20.000	265.200	264.111	1.089
22.000	265.200	264.141	1.059
24.000	265.200	264.179	1.021
26.000	265.200	264.209	0.991
28.000	265.200	264.212	0.988
30.000	265.200	264.215	0.985
32.000	265.200	264.219	0.981
34.000	265.200	264.222	0.978
36.000	265.200	264.225	0.975
38.000	265.200	264.228	0.972
40.000	265.200	264.230	0.970
42.000	265.200	264.232	0.968
44.000	265.200	264.234	0.966
46.000	265.200	264.236	0.964
48.000	265.200	264.237	0.963
50.000	265.200	264.243	0.957
52.000	265.200	264.255	0.945
54.000	265.200	264.267	0.933
56.000	265.200	264.280	0.920
58.000	265.200	264.292	0.908
60.000	265.200	264.305	0.895
62.000	265.200	264.318	0.882
64.000	265.200	264.330	0.870
66.000	265.200	264.333	0.867
68.000	265.200	264.338	0.862
70.000	265.200	264.350	0.850
72.000	265.200	264.363	0.837
74.000	265.200	264.375	0.825
76.000	265.158	264.388	0.770
78.000	265.126	264.397	0.729
80.000	265.106	264.400	0.706
82.000	265.086	264.402	0.684
84.000	265.066	264.404	0.661
86.000	265.046	264.406	0.640
88.000	265.025	264.407	0.619
90.000	265.005	264.419	0.587
92.000	264.985	264.435	0.550
94.000	264.965	264.446	0.519
96.000	264.945	264.448	0.497
98.000	264.925	264.450	0.475
100.000	264.905	264.453	0.452
102.000	264.885	264.455	0.430
104.000	264.865	264.457	0.408
106.000	264.845	264.459	0.385
108.000	264.825	264.466	0.359
110.000	264.805	264.472	0.332
112.000	264.784	264.475	0.309
114.000	264.764	264.479	0.286
116.000	264.744	264.482	0.263
118.000	264.724	264.485	0.239
120.000	264.704	264.489	0.215
122.000	264.684	264.493	0.191
124.000	264.664	264.484	0.180
126.000	264.644	264.475	0.169
128.000	264.627	264.477	0.150
130.000	264.610	264.483	0.127
132.000	264.593	264.489	0.104
134.000	264.576	264.495	0.080
136.000	264.561	264.512	0.049
138.000	264.546	264.538	0.009
140.000		264.497	
142.000		264.474	
144.000		264.310	
146.000		264.394	
148.000		264.455	
150.000		264.517	
152.000		264.506	
153.412		264.466	

SECTION A

SCALE: HORIZONTAL - 1:250
VERTICAL - 1:250

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	**MINOR AMENDMENT**	**16/07/2020**	**RK**	**AW/AVG**	**SL**	**TH**
D	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES
A1 (A3) 1:250 (1:500)

GRID: MGA
DATUM: mAHD
PROJECT MANAGER: TH

CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

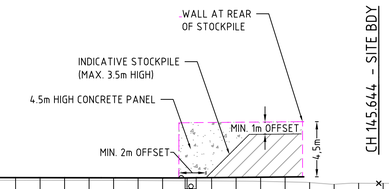
martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

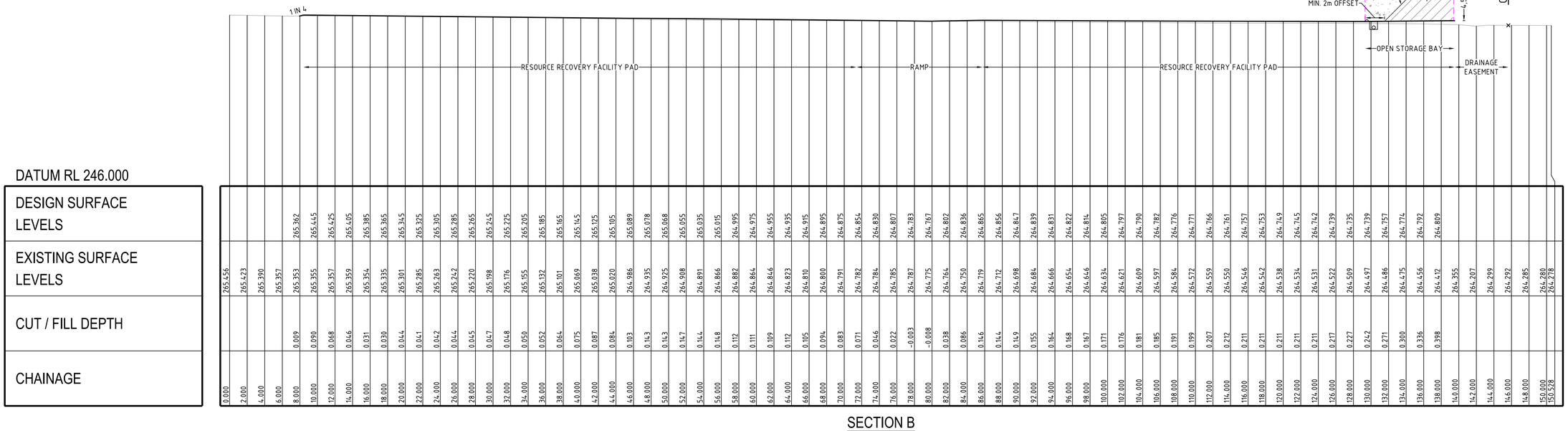
DRAWING TITLE
SITE SECTION A - PROCESSING SHED AND OPEN STORAGE BAYS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-C600	E

NOTE :

- STORAGE BAY WALLS TO BE CONCRETE TILT PANELS WITH COLORBOND CLAD.
- STOCKPILES TO BE IN ACCORDANCE WITH NSW GOVERNMENT "FIRE SAFETY IN WASTE FACILITIES".





CHAINAGE	CUT / FILL DEPTH	EXISTING SURFACE LEVELS	DESIGN SURFACE LEVELS
DATUM		RL 246.000	
0.000		265.456	
2.000		265.423	
4.000		265.390	
6.000		265.357	
8.000	0.009	265.353	265.362
10.000	0.090	265.355	265.445
12.000	0.068	265.357	265.425
14.000	0.046	265.359	265.405
16.000	0.031	265.354	265.385
18.000	0.030	265.335	265.365
20.000	0.044	265.301	265.345
22.000	0.041	265.285	265.325
24.000	0.042	265.263	265.305
26.000	0.044	265.242	265.285
28.000	0.045	265.220	265.265
30.000	0.047	265.198	265.245
32.000	0.048	265.176	265.225
34.000	0.050	265.155	265.205
36.000	0.052	265.132	265.185
38.000	0.064	265.101	265.165
40.000	0.075	265.069	265.145
42.000	0.087	265.038	265.125
44.000	0.084	265.020	265.105
46.000	0.103	264.986	265.089
48.000	0.143	264.935	265.078
50.000	0.143	264.925	265.068
52.000	0.147	264.908	265.055
54.000	0.144	264.891	265.035
56.000	0.148	264.866	265.015
58.000	0.112	264.882	264.995
60.000	0.111	264.864	264.975
62.000	0.109	264.846	264.955
64.000	0.112	264.823	264.935
66.000	0.105	264.810	264.915
68.000	0.094	264.800	264.895
70.000	0.083	264.791	264.875
72.000	0.071	264.782	264.854
74.000	0.046	264.784	264.830
76.000	0.022	264.785	264.807
78.000	-0.003	264.787	264.783
80.000	-0.008	264.775	264.767
82.000	0.038	264.764	264.802
84.000	0.086	264.750	264.836
86.000	0.146	264.719	264.865
88.000	0.144	264.712	264.856
90.000	0.149	264.698	264.847
92.000	0.155	264.684	264.839
94.000	0.164	264.666	264.831
96.000	0.168	264.654	264.822
98.000	0.167	264.646	264.814
100.000	0.171	264.634	264.805
102.000	0.176	264.621	264.797
104.000	0.181	264.609	264.790
106.000	0.185	264.597	264.782
108.000	0.191	264.584	264.776
110.000	0.199	264.572	264.771
112.000	0.207	264.559	264.766
114.000	0.212	264.550	264.761
116.000	0.211	264.546	264.757
118.000	0.211	264.542	264.753
120.000	0.211	264.538	264.749
122.000	0.211	264.534	264.745
124.000	0.211	264.531	264.742
126.000	0.217	264.522	264.739
128.000	0.227	264.509	264.735
130.000	0.242	264.497	264.739
132.000	0.271	264.486	264.757
134.000	0.300	264.475	264.774
136.000	0.336	264.456	264.792
138.000	0.398	264.472	264.809
140.000		264.355	
142.000		264.207	
144.000		264.299	
146.000		264.292	
148.000		264.285	
150.000		264.280	
150.528		264.278	

SECTION B

SCALE: HORIZONTAL - 1:250
VERTICAL - 1:250

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	**MINOR AMENDMENT**	**16/07/2020**	**RK**	**AW/AVG**	**SL**	**TH**
D	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES
A1 (A3) 1:250 (1:500)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

DISCLAIMER & COPYRIGHT
This plan must not be used for construction unless signed as approved by principal certifying authority.
All measurements in millimetres unless otherwise specified.
This drawing must not be reproduced in whole or part without prior written consent of Martens & Associates Pty Ltd.

CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

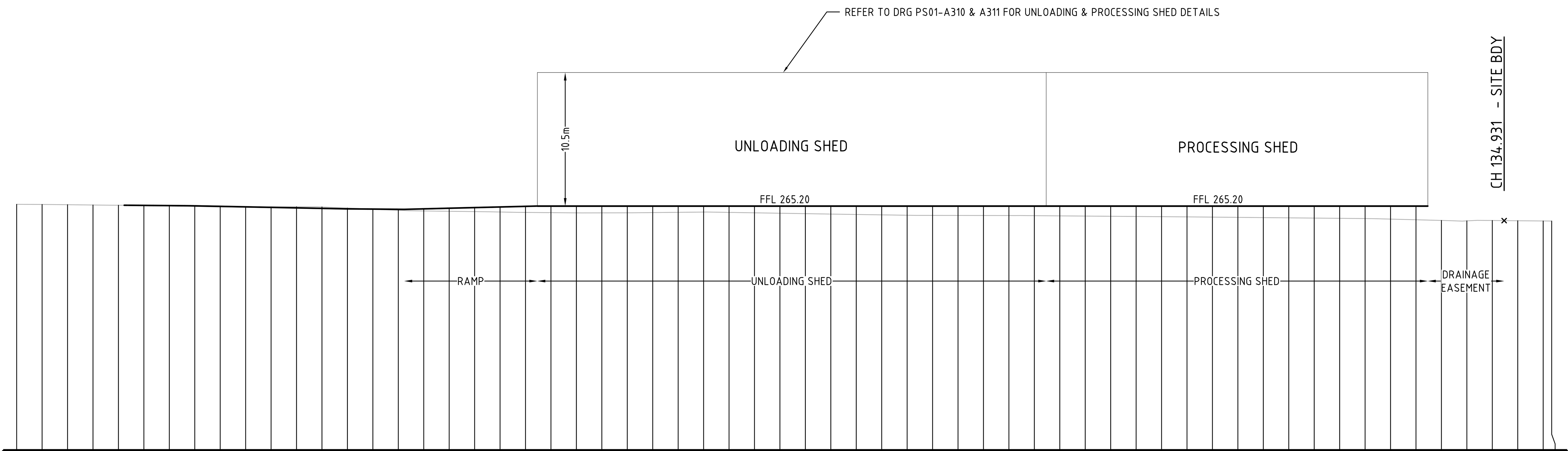
DRAWING TITLE
SITE SECTION B - OPEN STORAGE BAYS AND FACILITY PADS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-C601	E

PRINTED: --- USER: PBROGAN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-C601

NOTE :

- STORAGE BAY WALLS TO BE CONCRETE TILT PANELS WITH COLORBOND CLAD.
- STOCKPILES TO BE IN ACCORDANCE WITH NSW GOVERNMENT "FIRE SAFETY IN WASTE FACILITIES".



DATUM RL 246.000

CHAINAGE	DESIGN SURFACE LEVELS	EXISTING SURFACE LEVELS	CUT / FILL DEPTH
0.000		265.337	
2.000		265.325	
4.000		265.306	
6.000		265.283	
8.000		265.265	
10.000	265.252	265.247	0.005
12.000	265.236	265.214	0.022
14.000	265.215	265.173	0.042
16.000	265.176	265.133	0.043
18.000	265.136	265.134	0.003
20.000	265.097	265.138	-0.041
22.000	265.057	265.141	-0.084
24.000	265.017	265.128	-0.110
26.000	264.979	265.040	-0.061
28.000	264.962	264.953	0.009
30.000	264.944	264.866	0.078
32.000	264.979	264.815	0.164
34.000	265.030	264.790	0.241
36.000	265.079	264.764	0.315
38.000	265.128	264.732	0.396
40.000	265.177	264.699	0.478
42.000	265.200	264.682	0.518
44.000	265.200	264.665	0.535
46.000	265.200	264.665	0.535
48.000	265.200	264.670	0.530
50.000	265.200	264.687	0.513
52.000	265.200	264.707	0.493
54.000	265.200	264.727	0.473
56.000	265.200	264.702	0.498
58.000	265.200	264.669	0.531
60.000	265.200	264.636	0.564
62.000	265.200	264.603	0.597
64.000	265.200	264.570	0.630
66.000	265.200	264.538	0.662
68.000	265.200	264.508	0.692
70.000	265.200	264.478	0.722
72.000	265.200	264.465	0.735
74.000	265.200	264.462	0.738
76.000	265.200	264.458	0.742
78.000	265.200	264.454	0.746
80.000	265.200	264.445	0.755
82.000	265.200	264.427	0.773
84.000	265.200	264.412	0.788
86.000	265.200	264.396	0.804
88.000	265.200	264.381	0.819
90.000	265.200	264.365	0.835
92.000	265.200	264.349	0.851
94.000	265.200	264.330	0.870
96.000	265.200	264.311	0.889
98.000	265.200	264.292	0.908
100.000	265.200	264.273	0.927
102.000	265.200	264.254	0.946
104.000	265.200	264.235	0.965
106.000	265.200	264.216	0.984
108.000	265.200	264.174	1.026
110.000	265.200	264.122	1.078
112.000		264.069	0.000
114.000		264.035	
116.000		264.064	
118.000		264.044	
120.000		264.027	
120.668		264.022	

SECTION C

SCALE: HORIZONTAL - 1:250
VERTICAL - 1:250

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	**UPDATED AS PER CLIENT COMMENT**	**21/10/2020**	**JS**	**AW/AVG**	**SL**	**TH**
D	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 2.5 5.0 7.5 10.0 12.5 15.0 17.5 20.0 22.5 25.0 METRES
A1 (A3) 1:250 (1:500)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

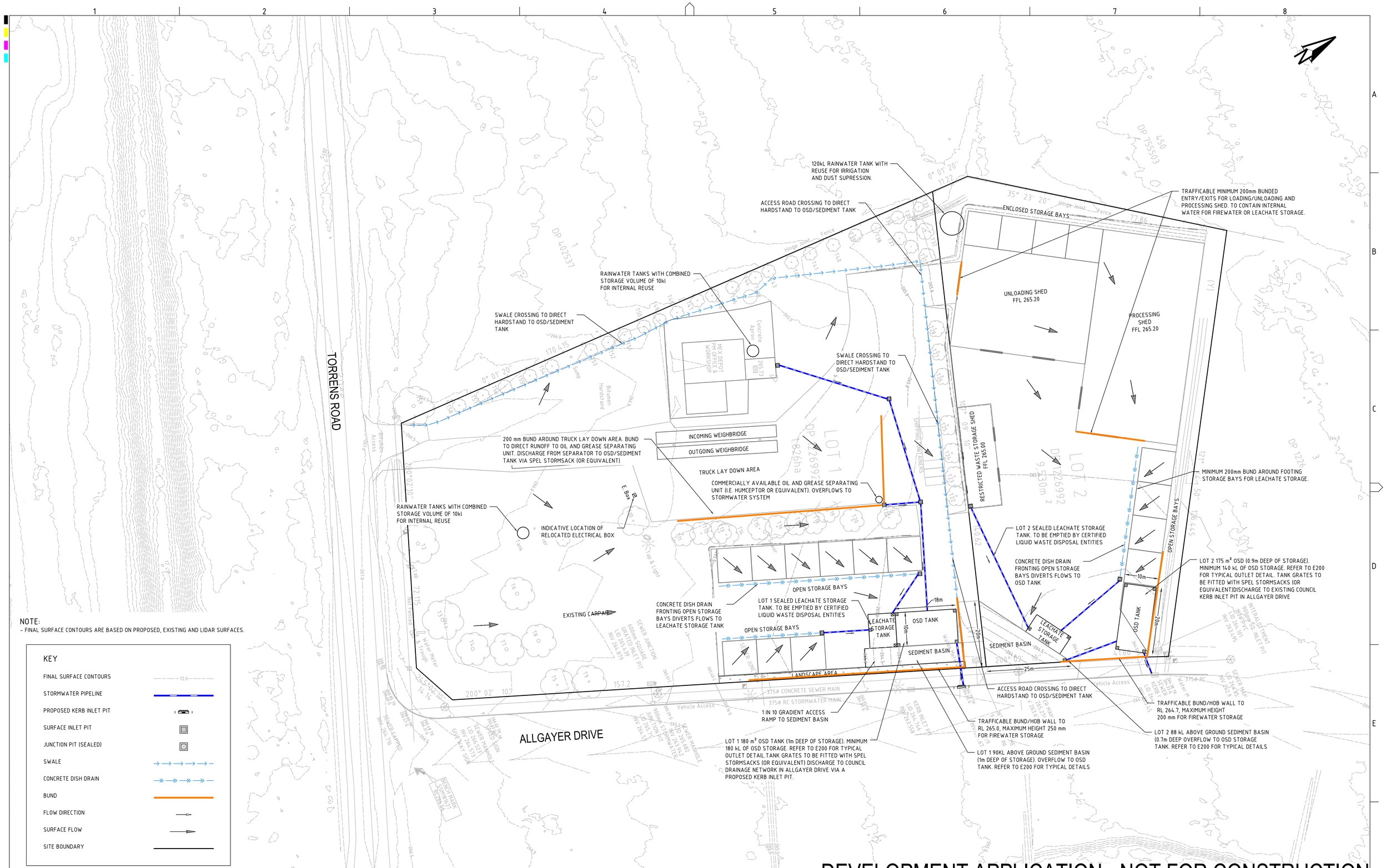
CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SITE SECTION C - UNLOADING SHED, PROCESSING SHED AND TRUCK WASH DOWN AREA

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-C602	E



NOTE:
- FINAL SURFACE CONTOURS ARE BASED ON PROPOSED, EXISTING AND LIDAR SURFACES.

KEY

- FINAL SURFACE CONTOURS
- STORMWATER PIPELINE
- PROPOSED KERB INLET PIT
- SURFACE INLET PIT
- JUNCTION PIT (SEALED)
- SWALE
- CONCRETE DISH DRAIN
- BUND
- FLOW DIRECTION
- SURFACE FLOW
- SITE BOUNDARY

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
G	**MINOR AMENDMENTS**	**03/11/2020**	LL	AW/AVG	SL	TH
F	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
E	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
D	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE: 0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

DISCLAIMER & COPYRIGHT

This plan must not be used for construction unless signed as approved by principal certifying authority.

All measurements in millimetres unless otherwise specified.

This drawing must not be reproduced in whole or part without prior written consent of Martens & Associates Pty Ltd.

CLIENT: OUTLINE PLANNING CONSULTANTS

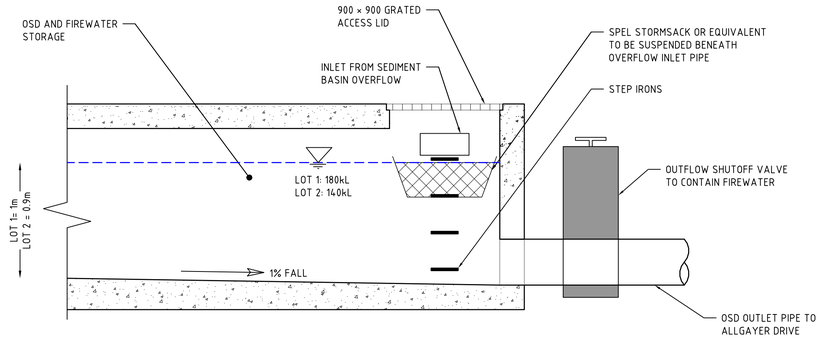
PROJECT NAME/PLANSET TITLE: RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE: DRAINAGE PLAN

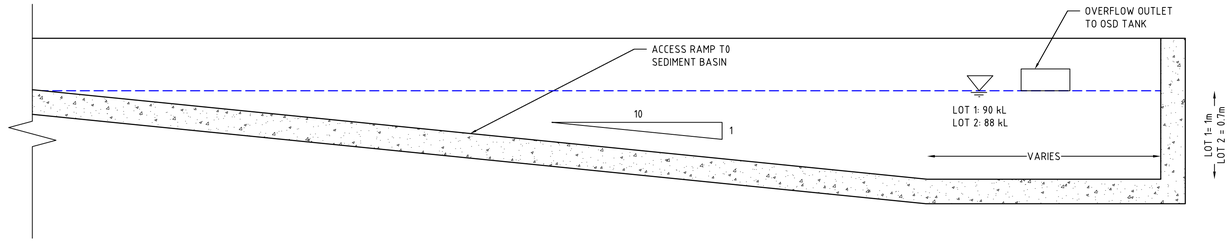
PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-E100	G

PRINTED: — USER PROGRAN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-E100



TYPICAL OSD TANK SECTION

SCALE: 1:25



TYPICAL SEDIMENT BASIN SECTION

SCALE: 1:25

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	**UPDATED AS PER CLIENT COMMENT**	**25/06/2020**	**GM**	**AW/AVG**	**SL**	**TH**
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 0.25 0.50 0.75 1.00 1.25 1.50 1.75 2.00 2.25 2.50 METRES
A1 (A3) 1:25 (1:50)

GRID | DATUM | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

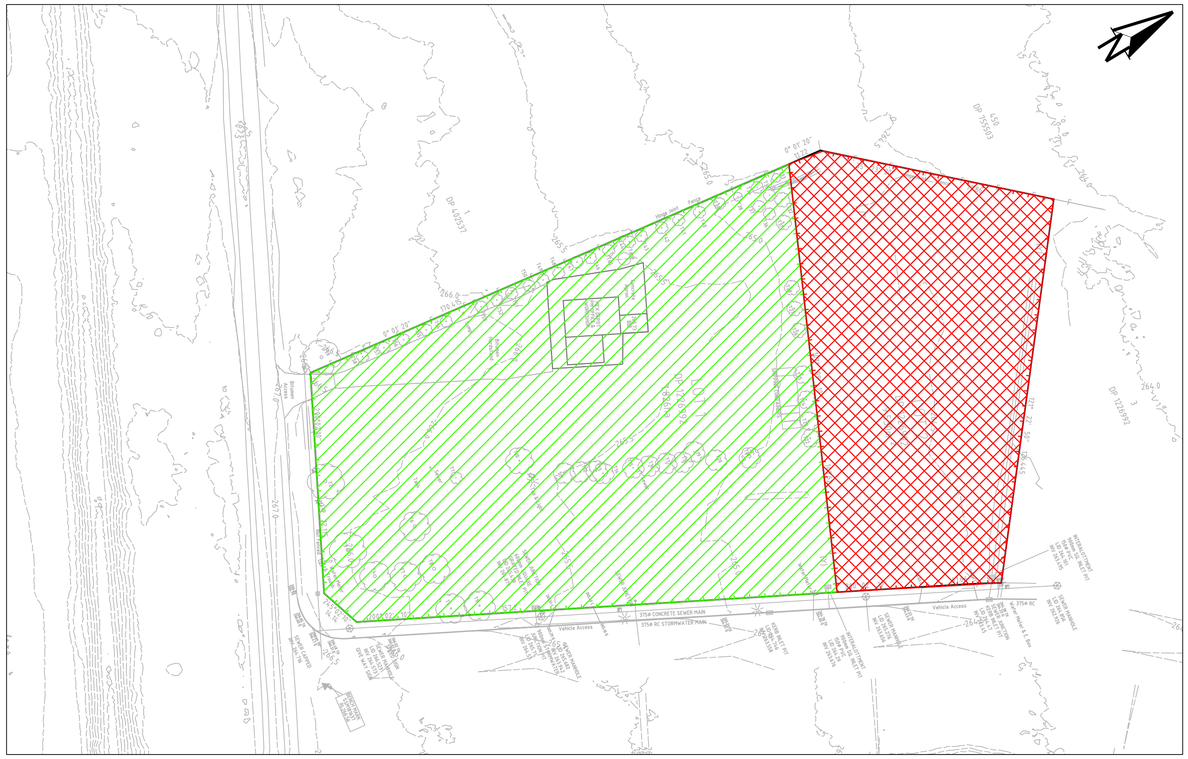
DRAWING TITLE
DRAINAGE DETAILS

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-E200	B

DRAWING ID: P1907434-PS01-R11-E200

PRINTED ---- USER: PROGRAN

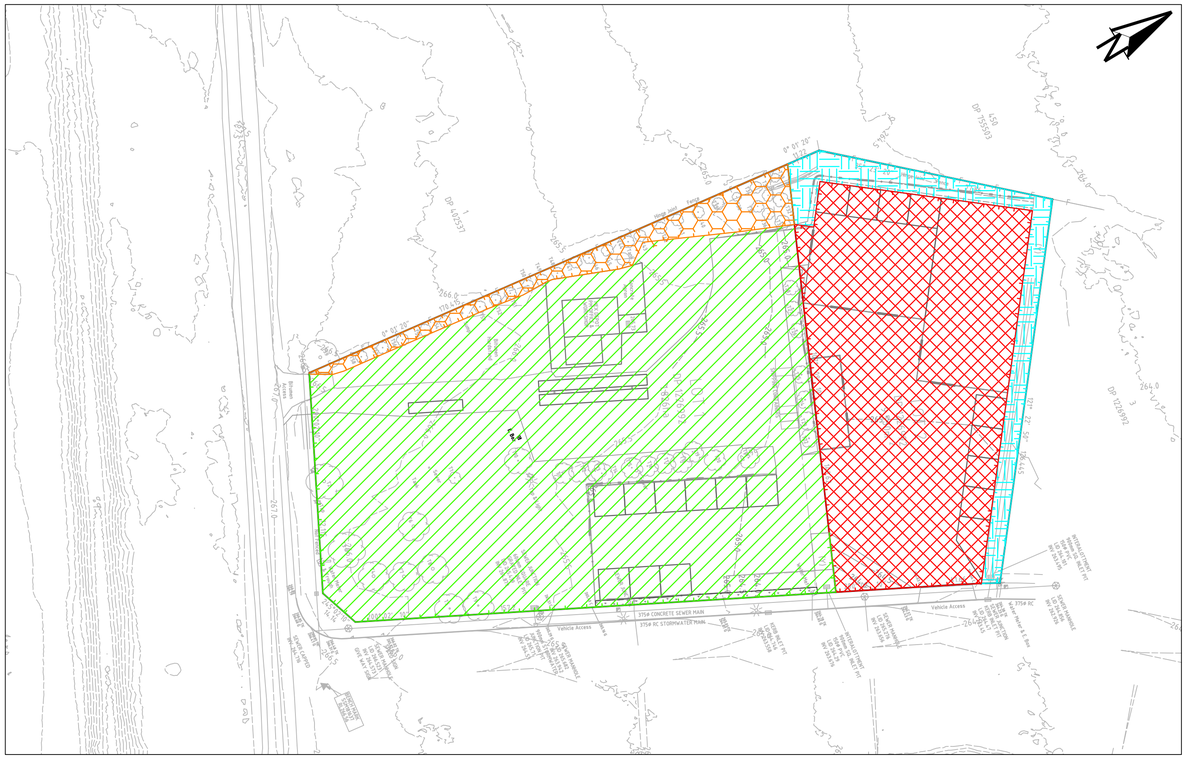
A1 / A3 LANDSCAPE (A1LC_v02.0.01)



DRAINS MODEL LAYOUT

PRE-DEVELOPMENT OSD CATCHMENT PLAN

SCALE 1:1000



POST-DEVELOPMENT OSD CATCHMENT PLAN

SCALE 1:1000

PRE-DEVELOPMENT OSD CATCHMENT DETAILS (P1907434DRN01V02)			
KEY	DRAINS NODE	AREA (ha)	% PAVED
	Cat Lot 1 Pre	1.83	0.57
	Cat Lot 2 Pre	0.95	0.81
TOTAL AREA		2.79	= 100% OF TOTAL AREA
TOTAL IMPERVIOUS AREA		1.82	= %65 OF TOTAL AREA
TOTAL PERVIOUS AREA		0.97	= %35 OF TOTAL AREA

POST-DEVELOPMENT OSD CATCHMENT DETAILS (P1907434DRN01V02)			
KEY	DRAINS NODE	AREA (ha)	% PAVED
	Cat Lot 1 Post	1.71	70%
	Cat Lot 1 Bypass	0.12	0%
	Cat Lot 2 Post	0.8	100%
	Cat Lot 2 Bypass	0.15	0%
TOTAL AREA		2.79	= 100% OF TOTAL AREA
TOTAL IMPERVIOUS AREA		1.98	= %71 OF TOTAL AREA
TOTAL PERVIOUS AREA		0.8	= %29 OF TOTAL AREA

DRAINS RESULTS

Lot 1 - P1907434DRN01V02

0.2 EY			10% AEP			5% AEP			2% AEP			1% AEP		
Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference	Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference	Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference	Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference	Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference
0.347	0.221	-0.126	0.430	0.257	-0.173	0.526	0.303	-0.223	0.649	0.348	-0.301	0.752	0.360	-0.392

Lot 2 - P1907434DRN01V02

0.2 EY			10% AEP			5% AEP			2% AEP			1% AEP		
Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference	Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference	Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference	Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference	Pre Peak Flow (m^3/s)	Post Peak Flow (m^3/s)	Difference
0.219	0.124	-0.095	0.262	0.140	-0.122	0.311	0.158	-0.153	0.383	0.202	-0.181	0.436	0.228	-0.208

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	**MINOR AMENDMENTS**	**03/11/2020**	**LL**	**AW/AVG**	**SL**	**TH**
D	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
C	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 10 20 30 40 50 60 70 80 90 100 METRES
A1 (A3) 1:1,000 (1:2,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

DISCLAIMER & COPYRIGHT
This plan must not be used for construction unless signed as approved by principal certifying authority.
All measurements in millimetres unless otherwise specified.
This drawing must not be reproduced in whole or part without prior written consent of Martens & Associates Pty Ltd.

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

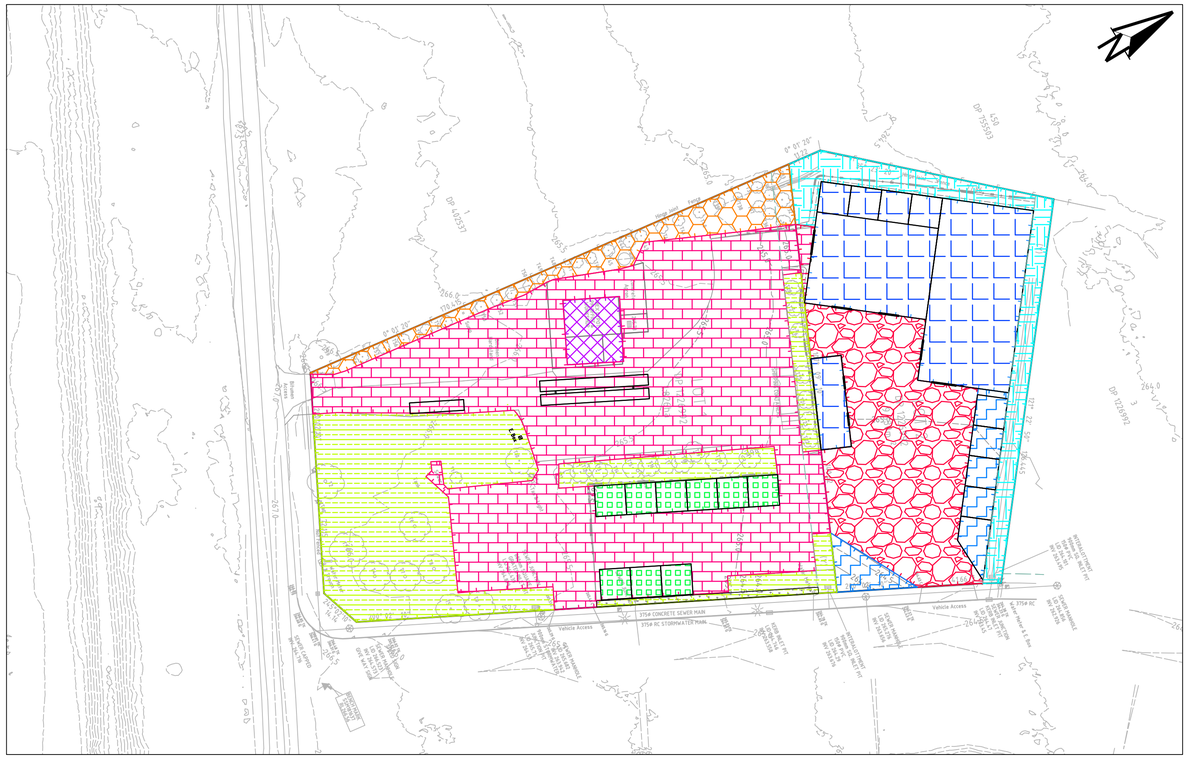
DRAWING TITLE
OSD CATCHMENT PLAN, MODEL LAYOUT & RESULT

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R10	PS01-E600	E

DRAWING ID: P1907434-PS01-R10-E600

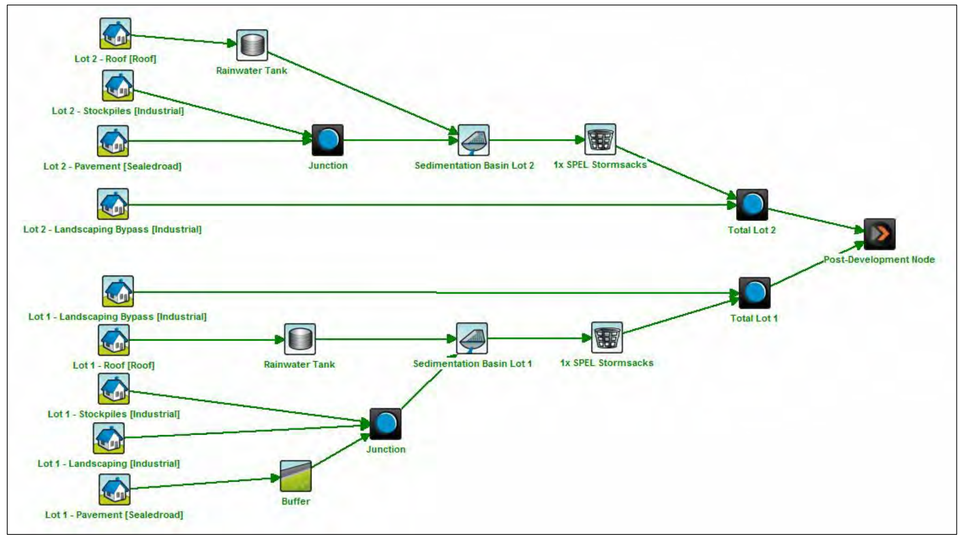
PRINTED ---- USER: PARDAN

A1 / A3 LANDSCAPE (A1LC_v02.0.01)



POST-DEVELOPMENT WATER QUALITY CATCHMENT PLAN

SCALE 1:1000



MUSIC MODEL LAYOUT (P1907434MUS01V03)

WATER QUALITY CATCHMENT DETAILS			
KEY	MUSIC NODE	AREA (ha)	% PAVED
	Lot 1 Roof	0.04	100%
	Lot 1 Pavement	1.08	100%
	Lot 1 Stockpiles	0.09	100%
	Lot 1 Landscaping	0.51	0%
	Lot 1 Landscaping Bypass	0.12	0%
	Lot 2 Roof	0.37	100%
	Lot 2 Pavement	0.35	100%
	Lot 2 Stockpiles	0.08	100%
	Lot 2 Landscaping Bypass	0.15	0%

Treatment Train Effectiveness - Total Lot 1

	Sources	Residual Load	% Reduction
Flow (ML/yr)	6.33	6.21	1.8
Total Suspended Solids (kg/yr)	2020	245	87.9
Total Phosphorus (kg/yr)	3.42	1.03	70
Total Nitrogen (kg/yr)	15	8.03	46.6
Gross Pollutants (kg/yr)	176	0	100

MUSIC MODEL RESULT LOT 1

Treatment Train Effectiveness - Total Lot 2

	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.3	3.1	27.9
Total Suspended Solids (kg/yr)	760	103	86.4
Total Phosphorus (kg/yr)	1.49	0.45	69.8
Total Nitrogen (kg/yr)	9.76	3.66	62.5
Gross Pollutants (kg/yr)	125	0	100

MUSIC MODEL RESULT LOT 2

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
F	**MINOR AMENDMENTS**	**03/11/2020**	LL	**AW/AVG**	**SL**	**TH**
E	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
D	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENTS	09/07/2020	LL	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE: 0 10 20 30 40 50 60 70 80 90 100 METRES
A1 (A3) 1:1,000 (1:2,000)

GRID: MGA | DATUM: mAHD | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE: WATER QUALITY CATCHMENT PLAN, MODEL & RESULT

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-E700	F

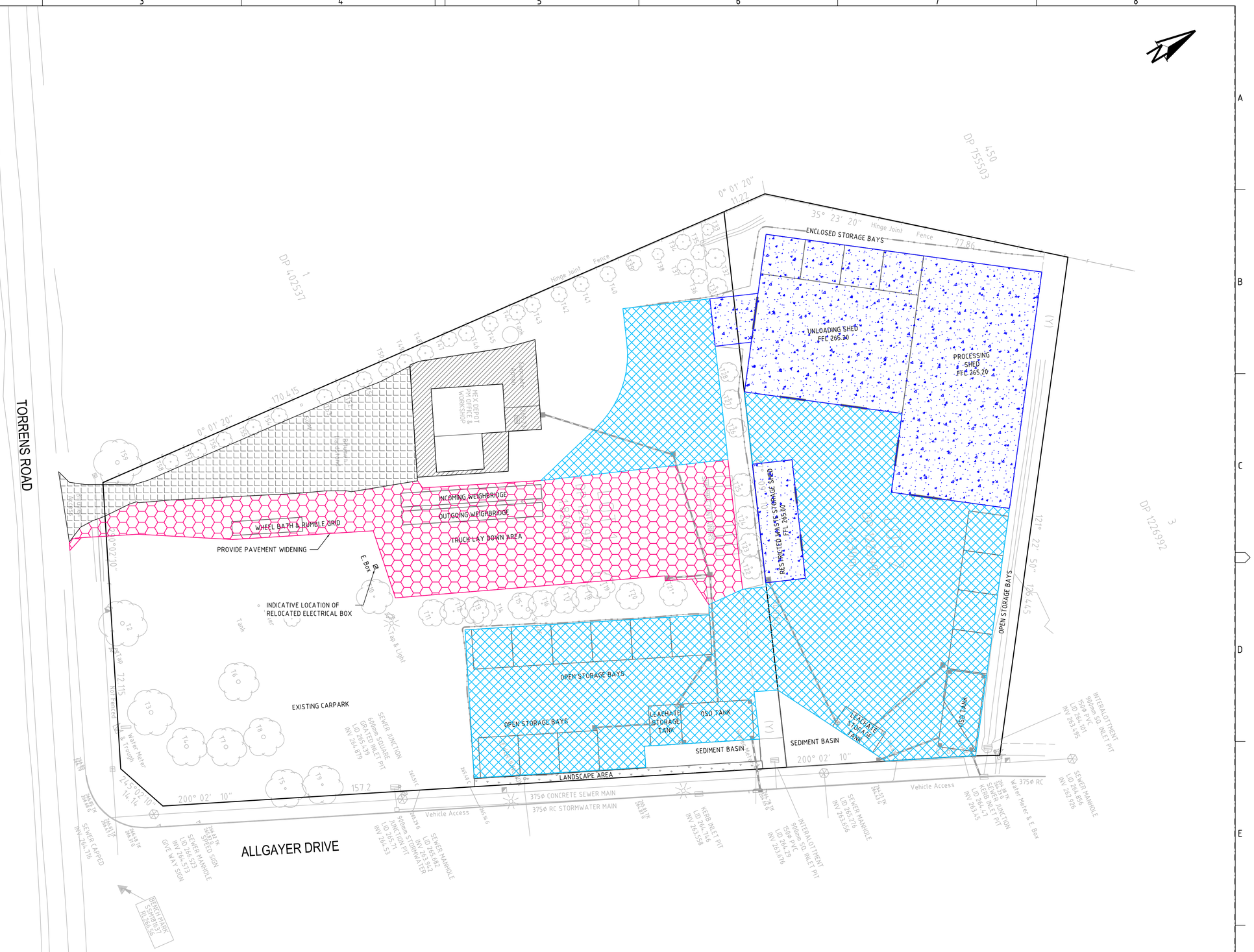
DRAWING ID: P1907434-PS01-R11-E700

PRINTED: --- USER PROGEN

A1 / A3 LANDSCAPE (A1LC_v02.0.01)

PAVEMENT DETAILS	
KEY	DESCRIPTION
	PROPOSED CONCRETE SURFACE, REFER TO PS01-C100 FOR PROPOSED GRADING
	PROPOSED ASPHALT SURFACE, REFER TO PS01-C100 FOR PROPOSED GRADING
	PROPOSED ASPHALT SURFACE, EXISTING GRADING TO BE RETAINED
	EXISTING BITUMEN SUFACE TO BE RETAINED
	EXISTING CONCRETE SUFACE TO BE RETAINED

NOTE:
- PAVEMENT DESIGN TO BE PROVIDED AT CC STAGE.



DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
E	**UPDATED AS PER CLIENT COMMENT**	**21/10/2020**	JS	**AW/AVG**	**SL**	**TH**
D	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
C	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
B	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

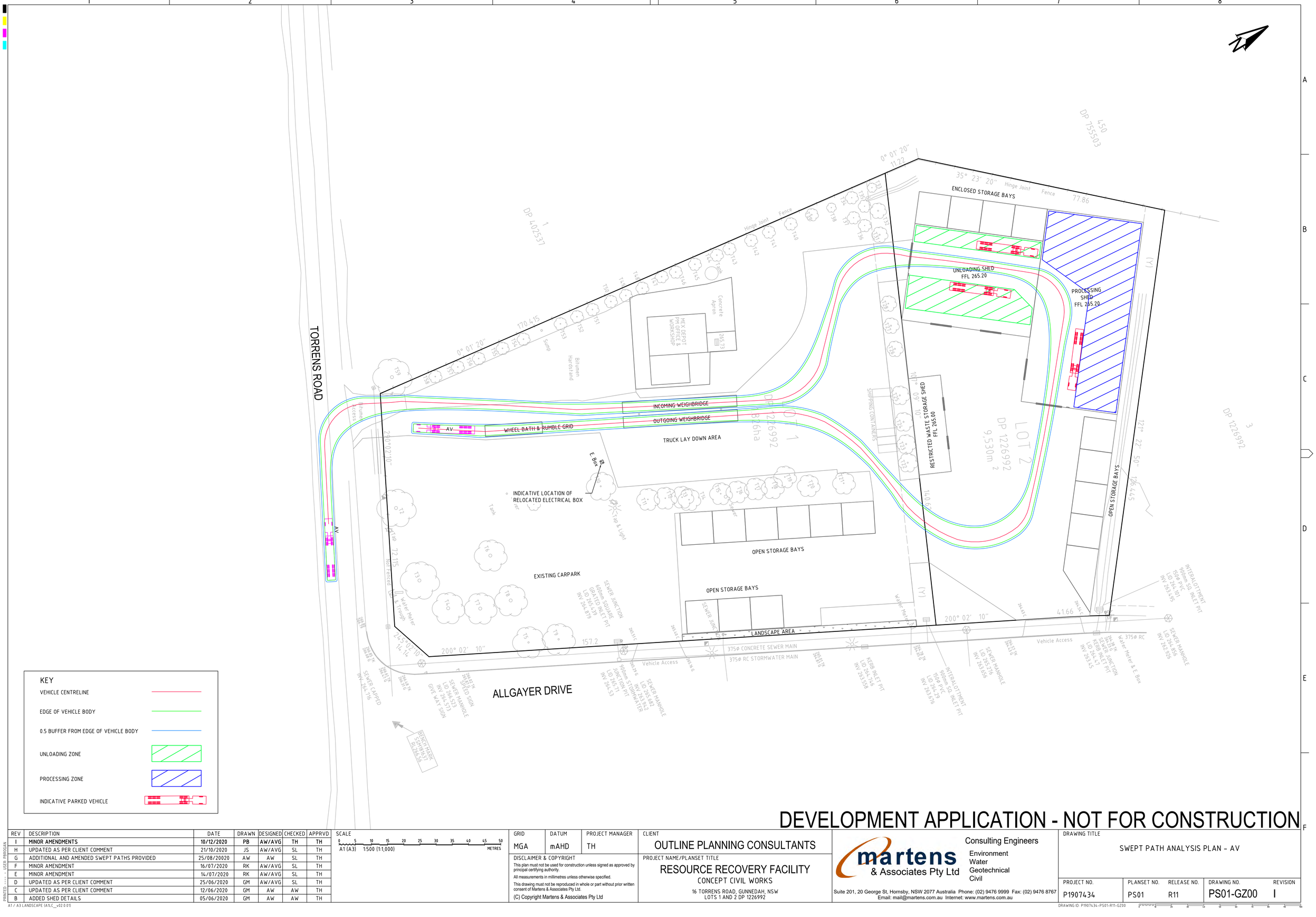
PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
PAVEMENT PLAN

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-G400	E

PRINTED ---- USER: PBROWN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-G400



DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
I	**MINOR AMENDMENTS**	**10/12/2020**	**PB**	**AW/AVG**	**TH**	**TH**
H	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
G	ADDITIONAL AND AMENDED SWEPT PATHS PROVIDED	25/08/20020	AW	AW	SL	TH
F	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
E	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
D	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
C	UPDATED AS PER CLIENT COMMENT	12/06/2020	GM	AW	AW	TH
B	ADDED SHED DETAILS	05/06/2020	GM	AW	AW	TH

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

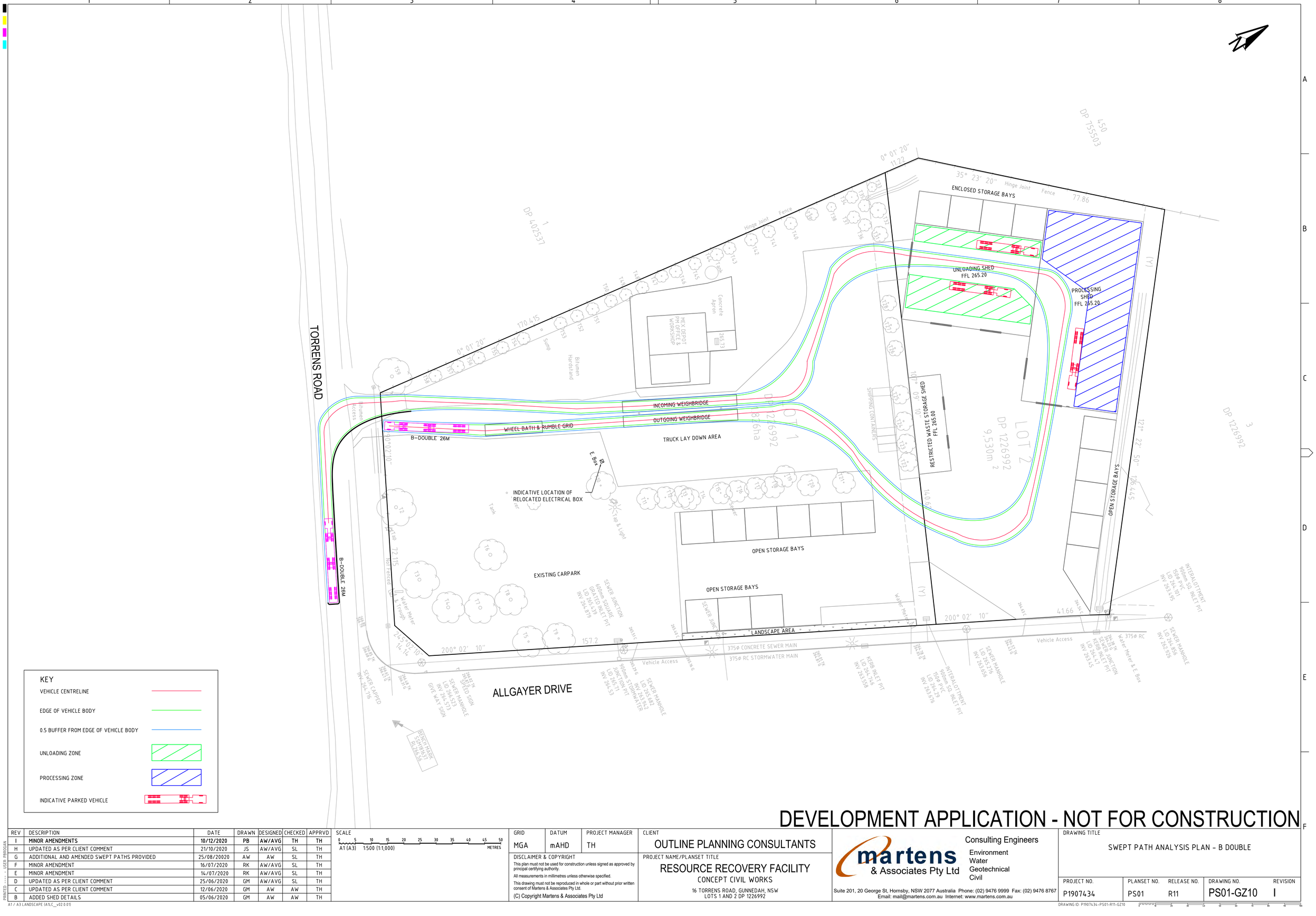
martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SWEPT PATH ANALYSIS PLAN - AV

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-GZ00	I

DRAWING ID: P1907434-PS01-R11-GZ00

PRINTED: ---- USER PROGRAM
A1 / A3 LANDSCAPE (A1LC_v02.0.01)



DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
I	**MINOR AMENDMENTS**	**10/12/2020**	**PB**	**AW/AVG**	**TH**	**TH**
H	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
G	ADDITIONAL AND AMENDED SWEPT PATHS PROVIDED	25/08/20020	AW	AW	SL	TH
F	MINOR AMENDMENT	16/07/2020	RK	AW/AVG	SL	TH
E	MINOR AMENDMENT	14/07/2020	RK	AW/AVG	SL	TH
D	UPDATED AS PER CLIENT COMMENT	25/06/2020	GM	AW/AVG	SL	TH
C	UPDATED AS PER CLIENT COMMENT	12/06/2020	GM	AW	AW	TH
B	ADDED SHED DETAILS	05/06/2020	GM	AW	AW	TH

PRINTED: ---- USER PROGRAM

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

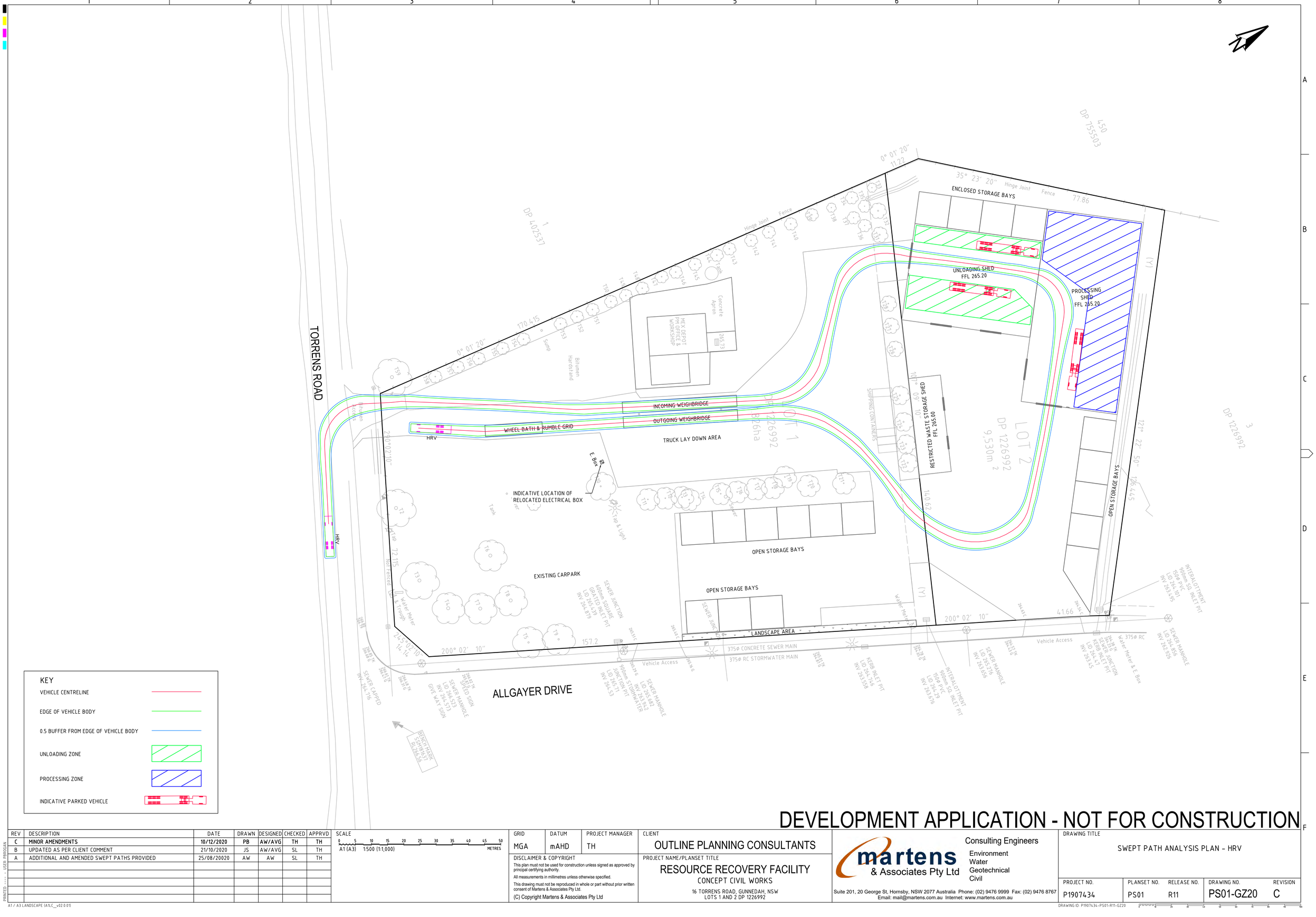
PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SWEPT PATH ANALYSIS PLAN - B DOUBLE

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-GZ10	I

A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-GZ10



DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	**MINOR AMENDMENTS**	**10/12/2020**	**PB**	**AW/AVG**	**TH**	**TH**
B	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
A	ADDITIONAL AND AMENDED SWEPT PATHS PROVIDED	25/08/20020	AW	AW	SL	TH

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

DISCLAIMER & COPYRIGHT
This plan must not be used for construction unless signed as approved by principal certifying authority.
All measurements in millimetres unless otherwise specified.
This drawing must not be reproduced in whole or part without prior written consent of Martens & Associates Pty Ltd.

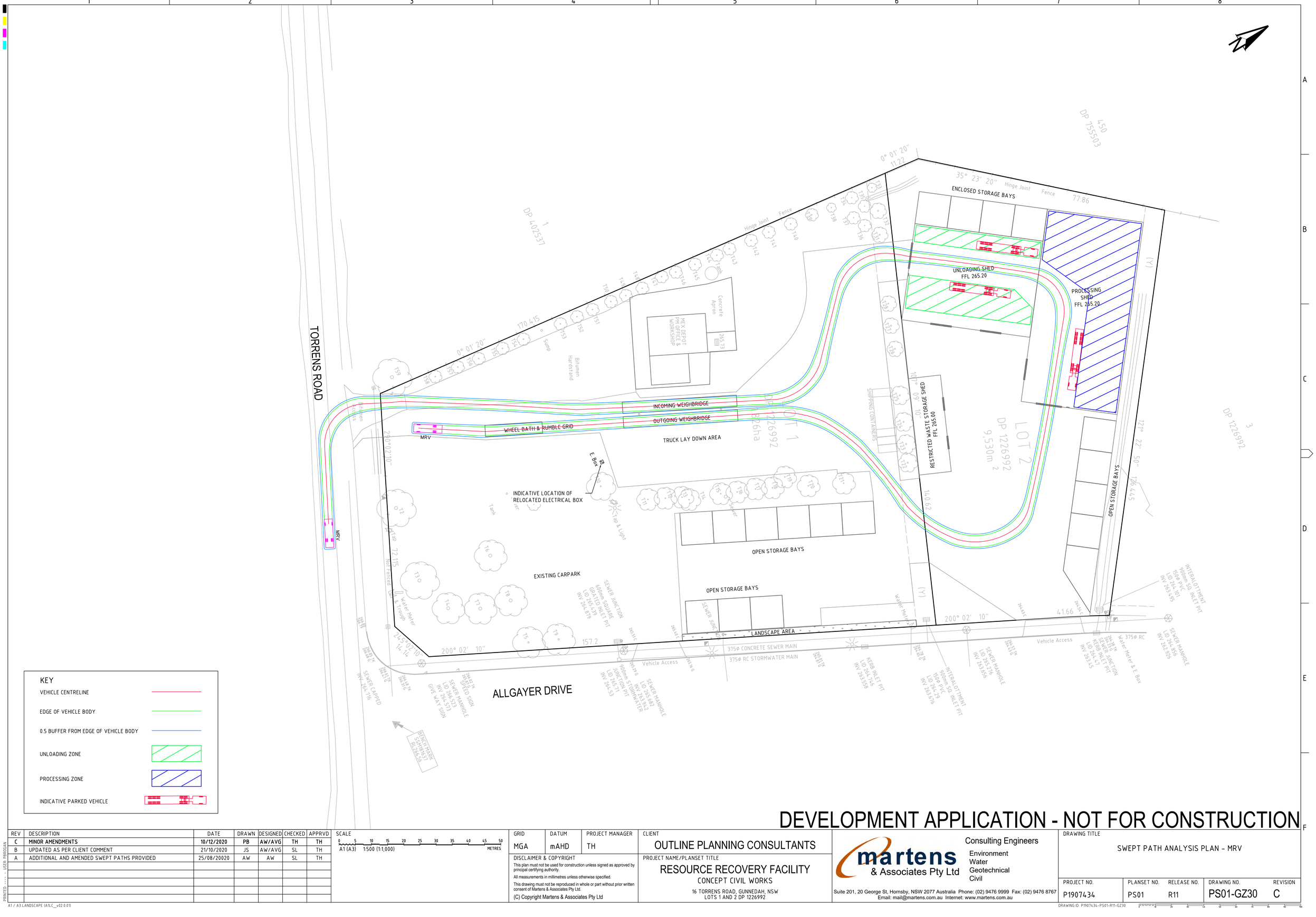
PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SWEPT PATH ANALYSIS PLAN - HRV

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-GZ20	C

PRINTED: ---- - USER PROGRAM
A1 / A3 LANDSCAPE (A1LC__v02.0.01)
DRAWING ID: P1907434-PS01-R11-GZ20



DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	**MINOR AMENDMENTS**	**10/12/2020**	**PB**	**AW/AVG**	**TH**	**TH**
B	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
A	ADDITIONAL AND AMENDED SWEPT PATHS PROVIDED	25/08/20020	AW	AW	SL	TH

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

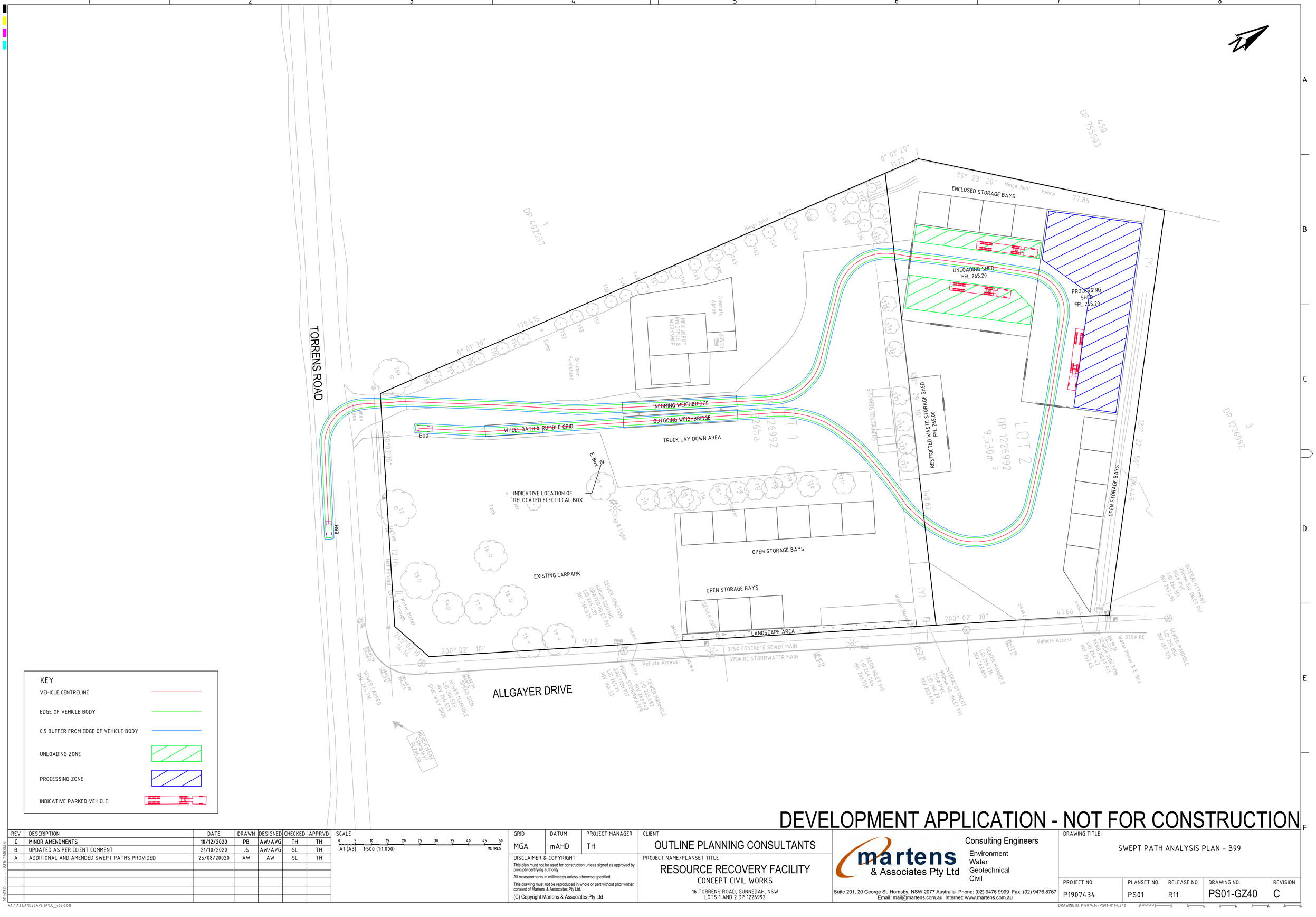
PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SWEPT PATH ANALYSIS PLAN - MRV

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-GZ30	C

PRINTED: --- - USER PROGRAM
A1 / A3 LANDSCAPE (A1LC__v02.0.01)
DRAWING ID: P1907434-PS01-R11-GZ30



KEY

- VEHICLE CENTRELINE
- EDGE OF VEHICLE BODY
- 0.5 BUFFER FROM EDGE OF VEHICLE BODY
- UNLOADING ZONE
- PROCESSING ZONE
- INDICATIVE PARKED VEHICLE

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
C	**MINOR AMENDMENTS**	**10/12/2020**	**PB**	**AW/AVG**	**TH**	**TH**
B	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH
A	ADDITIONAL AND AMENDED SWEPT PATHS PROVIDED	25/08/20020	AW	AW	SL	TH

SCALE
0 5 10 15 20 25 30 35 40 45 50 METRES
A1 (A3) 1:500 (1:1,000)

GRID	DATUM	PROJECT MANAGER
MGA	mAHD	TH

CLIENT
OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

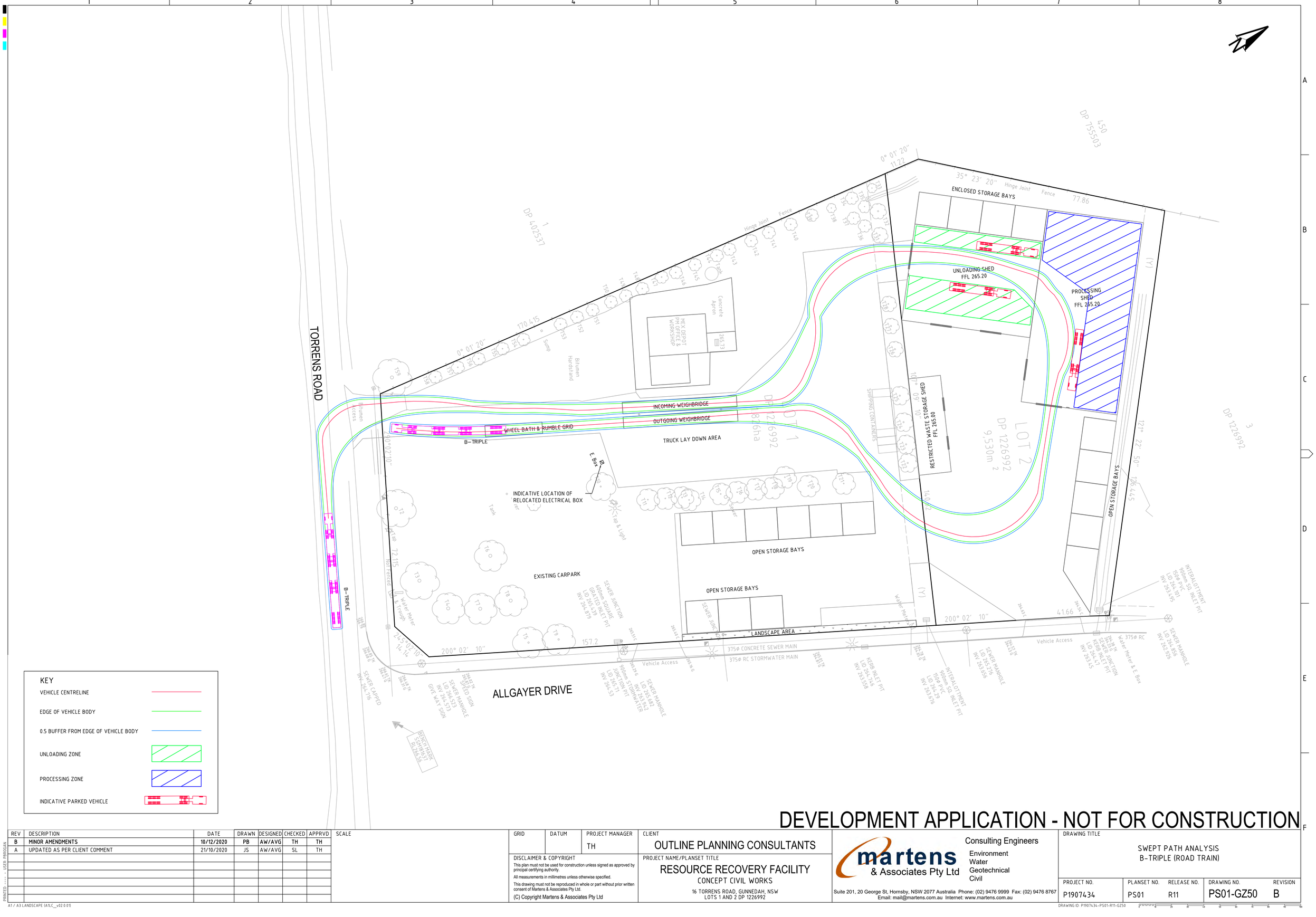
martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
SWEPT PATH ANALYSIS PLAN - B99

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-GZ40	C

DRAWING ID: P1907434-PS01-R11-GZ40

PRINTED: ---- - USER PROGRAM
A1 / A3 LANDSCAPE (A1LC__v02.0.01)



DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
B	MINOR AMENDMENTS	10/12/2020	PB	AW/AVG	TH	TH
A	UPDATED AS PER CLIENT COMMENT	21/10/2020	JS	AW/AVG	SL	TH

SCALE

GRID | DATUM | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE: RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE: SWEPT PATH ANALYSIS
B-TRIPLE (ROAD TRAIN)

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-GZ50	B

DRAWING ID: P1907434-PS01-R11-GZ50

PRINTED: --- - USER PROGGN

A1 / A3 LANDSCAPE (A1LC_v02.0.01)

GENERAL NOTES

1 ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH, AND THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THE RELEVANT AUSTRALIAN STANDARDS, WSC COUNCIL SPECIFICATIONS, AND ALL PROJECT CONSULTANT'S PLANS AND REPORTS.

2 SURVEY INFORMATION SHOWN AND DESIGN LEVELS BASED ON SURVEY INFORMATION PROVIDED BY S. MARK BOWLER & ASSOCIATES AND MATTHEW FREEBURN SURVEYORS.

3 PRIOR TO COMMENCING ANY WORKS, THE CONTRACTOR SHALL CARRY OUT A "DIAL BEFORE YOU DIG" FOR A SERVICES SEARCH. THE CONTRACTOR SHALL THEN ARRANGE FOR ALL SERVICES TO BE PHYSICALLY LOCATED, IDENTIFIED AND CLEARLY MARKED WITHIN THE WORKS AREA PRIOR TO THE COMMENCEMENT OF ANY WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGE CAUSED TO SUCH SERVICES DURING THE COURSE OF THE WORKS. ANY SERVICE LOCATION SHOWN ON THE FOLLOWING DRAWINGS ARE INDICATIVE ONLY AND THE POSITION AND DEPTH INDICATED SHOULD NOT BE RELIED UPON.

4 THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL OTHER DRAWINGS, SPECIFICATIONS AND WRITTEN INSTRUCTIONS THAT MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. THE CONTRACTOR SHALL ENSURE THAT THEY HAVE THE LATEST DRAWING REVISION PRIOR TO COMMENCING ANY WORKS.

5 IF THE CONTRACTOR HAS ANY QUESTIONS, REQUIRES CLARIFICATION ON ANY ISSUE, OR FINDS ANY DISCREPANCIES WITHIN THESE DRAWINGS, THE CONTRACTOR SHALL ADVISE THE SUPERINTENDENT BEFORE PROCEEDING.

6 ALL SET OUT DIMENSIONS SHALL BE VERIFIED BY THE CONTRACTOR ON SITE BEFORE WORK COMMENCES. DRAWINGS SHALL NOT BE SCALED FOR DIMENSIONS. ALL LEVELS ARE IN METRES AND ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.

7 LEVELS ARE TO AUSTRALIAN HEIGHT DATUM (AHD).

8 ALL MATERIALS AND WORKMANSHIP USED SHALL BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS, BY-LAWS AND ORDINANCES OF THE RELEVANT BUILDING AUTHORITIES OR GEOTECHNICAL ENGINEER'S SPECIFICATIONS, EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATIONS. WHERE THE CONTRACTOR BELIEVES THAT NECESSARY DIMENSIONS ARE NOT SHOWN, REFER THE MATTER TO THE DESIGN CONSULTANT.

9 CERTIFICATES ARE TO BE ISSUED ON COMPLETION CONFIRMING THAT THE WORKS COMPLY WITH THE CONSTRUCTION CERTIFICATE (IF ISSUED), ALL PLANS AND SPECIFICATIONS AND IN ACCORDANCE WITH THE REVIEW OF ENVIRONMENTAL FACTORS.

10 DURING CONSTRUCTION, THE WORKS SITE SHALL BE MAINTAINED DAILY IN A SAFE AND STABLE CONDITION. PERIMETER SAFETY FENCING, TEMPORARY BRACING, BENCHING OF EXCAVATIONS AND BATTERS SHALL BE PROVIDED BY THE CONTRACTOR TO KEEP THE WORKS AND EXCAVATIONS STABLE AT ALL TIMES.

11 THE CONTRACTOR IS TO NOTIFY THE SUPERINTENDENT AND ENGINEER IF IT BECOMES EVIDENT THAT CONDITIONS ON SITE (INCLUDING ENCOUNTERING OF GROUNDWATER) HAVE POTENTIAL TO NEGATIVELY IMPACT ON THE INTENDED ENGINEERING DESIGN.

12 ALL CONSTRUCTION WORK SHALL BE CARRIED OUT SO THAT AT ANY TIME THE AMENITY OF ADJOINING PROPERTIES ARE NOT COMPROMISED – I.E. DISCHARGE OF ADDITIONAL OR POLLUTED STORMWATER RUNOFF, ALL WEATHER ACCESS TO THE PROPERTY, NOISE, DUST, BUILDING WASTE ETC.

13 THE CONTRACTOR SHALL PLACE CONDUITS WHERE REQUIRED BY THE RELEVANT UTILITY SERVICE AUTHORITIES AND SHALL UNDERTAKE ALL UTILITY ADJUSTMENTS AS DIRECTED NECESSARY FOR THE COMPLETION OF THE WORKS.

14 THE CONTRACTOR SHALL MAINTAIN AND RESTORE ANY DAMAGE WHICH MAY HAVE BEEN CAUSED BY THE CONSTRUCTION OF THE "WORKS" TO EXISTING ROAD SURFACES, ROADSIDE DRAINAGE OR UTILITY SERVICES.

15 ALL DISTURBED AREAS OUTSIDE THE NOMINATED WORKS AREA SHALL BE REINSTATED BY THE CONTRACTOR TO THE DIRECTION OF THE SUPERINTENDENT.

16 THE CONTRACTOR SHALL ENSURE THAT A SMOOTH CONNECTION IS MADE TO ALL EXISTING ENGINEERING WORKS AND NATURAL SURFACES.

17 EROSION AND SEDIMENT CONTROLS IN ACCORDANCE WITH APPROVED EROSION SEDIMENT CONTROL PLAN ARE TO BE IN PLACE AT ALL TIMES. CONTROLS TO BE INSPECTED, MAINTAINED AND REPLACED AS REQUIRED BY THE CONTRACTOR UNTIL WORKS ARE COMPLETED AND PERMANENT MEASURES HAVE BEEN ESTABLISHED.

18 PROVISION IS TO BE MADE FOR MAINTAINING TRAFFIC FLOW IN PUBLIC ROADS AT ALL TIMES. TRAFFIC CONTROL MEASURES ARE TO BE IN ACCORDANCE WITH COUNCIL GUIDELINES AND ANY SPECIFIC APPROVED CONSTRUCTION TRAFFIC MANAGEMENT PLAN (CTMP) FOR THE WORKS.

19 THE CONTRACTOR IS TO ENSURE THAT NO BUILDING MATERIALS, STOCKPILES OR FILL ENCROACHES UPON ADJACENT PROPERTY OR RETAINED TREES FOR THE DURATION OF THE WORKS.

20 THE SUPERINTENDENT MUST BE NOTIFIED IMMEDIATELY, SHOULD THE PRESENCE OF ASBESTOS OR SOIL CONTAMINATION, BE IDENTIFIED DURING DEMOLITION OR CONSTRUCTION WORKS.

21 A SUFFICIENT SUPPLY OF APPROPRIATE SPILL CONTROL EQUIPMENT MUST BE KEPT ON THE PREMISES AT ALL TIMES. MATERIALS USED IN THE CLEAN UP OF A SPILL MUST BE DISPOSED OF TO AN APPROPRIATELY LICENSED WASTE FACILITY.

22 ALL ABOVE GROUND STORAGE'S OF HAZARDOUS MATERIALS, OILS, CHEMICALS OR FERTILISERS MUST BE BUNDED. THE BUND IS TO BE MADE FROM AN IMPERVIOUS MATERIAL AND MUST BE COVERED AND LARGE ENOUGH TO HOLD THE CONTENTS OF THE LARGEST CONTAINER PLUS 10%.

23 THE COST OF REPAIRING ANY DAMAGE CAUSED TO COUNCIL'S ASSETS AS A RESULT OF CONSTRUCTION WORKS ASSOCIATED WITH THE APPROVED DEVELOPMENT IS TO BE MET IN FULL BY THE CONTRACTOR PRIOR TO THE ISSUE OF A CERTIFICATE OF PRACTICAL COMPLETION.

24 TEMPORARY CLOSET ACCOMMODATION IS TO BE PROVIDED AT THE WORK SITE AT ALL TIMES AT THE RATE OF ONE CLOSET FOR EVERY 20 PERSONS AND BE LOCATED WHOLLY WITHIN THE BOUNDARIES OF THE PROPERTY. PERMANENT FACILITIES ARE TO BE PROVIDED IN ACCORDANCE WITH PART F2.1, F2.4 AND F 2.5 OF THE BUILDING CODE OF AUSTRALIA.

25 PROJECT PLANS AND SPECIFICATION TO BE READ IN CONJUNCTION WITH ALL ADVICE REGARDING THE SITE.

26 ANY VARIATIONS OR AMBIGUITY BETWEEN THIS SPECIFICATION, DESIGN DOCUMENTS, AUSTRALIAN STANDARDS AND OTHER RELEVANT DOCUMENTS SHALL BE REFERRED TO THE SUPERINTENDENT FOR APPROVAL PRIOR TO PROCEEDING WITH WORKS.

27 CONTRACTOR TO BE PROVIDED WITH A SINGLE 2D .DWG DESIGN FILE FOR CONSTRUCTION PURPOSES. PROVISION OF A DIGITAL SURFACE OR OTHER DIGITAL DATA SHOULD NOT BE ASSUMED BY THE CONTRACTOR.

28 WAE PLANS ARE TO BE PROVIDED BY THE CONTRACTOR THAT CLEARLY DELINEATES ALL ITEMS REFERRED TO IN THE DEVELOPMENT CONSENT CONDITIONS.

29 THE CONTRACTOR SHALL CONTACT COUNCIL IN WRITING A MINIMUM OF SEVEN (7) DAYS PRIOR TO COMMENCING WORK AND APPLY FOR A SECTION 138 CONSENT (SECTION 138 OF THE ROADS ACT FOR APPROVAL TO WORK ON A PUBLIC ROAD) AND INCLUDE COPIES OF CURRENT PUBLIC LIABILITY INSURANCE FOR A VALUE OF $20,000,000 AND PAYMENT OF THE CURRENT FEE. REFERENCES FOR PREVIOUS WORK EXPERIENCE MAY BE REQUESTED BY COUNCIL.

QUALITY ASSURANCE & OCCUPATIONAL HEALTH & SAFETY

1 THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN A QUALITY ASSURANCE SYSTEM WHICH COMPLIES WITH THE REQUIREMENTS OF A.S. 9001 (2000) AND AUS-SPEC COC & COS. THE QUALITY SYSTEM SHALL BE SUCH THAT RECORDS ARE KEPT OF ALL ASPECTS AND STAGES OF THE WORK.

2 THE RECORDS FOR EACH CONSTRUCTION TASK SHALL BE STAGED AND ITEMISED TO THE SATISFACTION OF THE SUPERINTENDENT. THE PRO-FORMERS SHALL BE SUBMITTED TO THE SUPERINTENDENT FOR APPROVAL PRIOR TO ANY WORK BEING COMMENCED.

3 DURING THE COURSE OF CONSTRUCTION, THE CONTRACTOR SHALL MAINTAIN ACCURATE AND UP TO DATE RECORDS (SUCH AS GOODS RECEIVED / REJECTED / RETURNED, ALL "ISSUED NOTICES / INSTRUCTIONS / CERTIFICATES", RETAIN ALL DRAWING REVISIONS, REPORTS, MARKED UP DRAWINGS OF EITHER AMENDMENTS OR "WAE"); AND SHALL MAKE SUCH RECORDS AVAILABLE TO THE SUPERINTENDENT IF REQUESTED. FAILURE TO MAINTAIN THE APPROPRIATE RECORDS MAY RESULT IN THE CONTRACTOR RE-INSPECTING COMPLETED WORKS IF INSTRUCTED BY THE SUPERINTENDENT.

4 AT COMPLETION OF EACH STAGE OF WORKS, THE CONTRACTOR SHALL CERTIFY THAT THOSE WORKS HAVE BEEN UNDERTAKEN AND COMPLETED IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, AND INSTRUCTIONS ISSUED DURING THE COURSE OF THE CONTRACT.

5 THE CONTRACTOR SHALL OBTAIN AND KEEP ON SITE AT ALL RELEVANT MATERIAL SAFETY DATA SHEETS (MSDS) THAT ARE APPLICABLE FOR MATERIALS BEING USED ON THE SITE. ALL TRANSPORTATION, STORAGE, USE OF, AND DISPOSAL OF THESE MATERIALS SHALL BE IN ACCORDANCE WITH MSDS. THE LOCATION OF THESE MSDS SHALL BE MADE KNOWN TO ALL PERSONS DURING THE SITE INDUCTION AND ARE TO BE ACCESSIBLE AT ALL TIMES TO ALL SITE PERSONNEL.

6 ATTENTION IS DRAWN TO THE WORK HEALTH AND SAFETY (WHS) ACT 2011 (NSW) AND ITS REGULATIONS, WHICH REQUIRES THAT EMPLOYERS ENSURE THE HEALTH, SAFETY AND WELFARE OF ALL PERSONS WORKING ON OR VISITING THE SITE.

7 ANY REFERENCES TO THE OH&S ACT, OHS REGULATIONS, AND OHS IN THESE SPECIFICATIONS SHALL MEAN THE OCCUPATIONAL HEALTH AND SAFETY ACT 2000, OR THE WORK HEALTH AND SAFETY ACT (WHS) 2011 FROM THE TIME OF ITS ENACTMENT, OR ANY COMPARABLE REGULATION UNDER THE WORK HEALTH AND SAFETY ACT 2011.

8 THE CONTRACTOR SHALL AT ALL TIMES EXERCISE ALL NECESSARY AND REASONABLE SAFETY PRECAUTIONS APPROPRIATE TO ENSURE THE SAFETY OF ALL PERSONS ON THE WORK SITE OR IN THE VICINITY OF THE WORKS.

9 THE CONTRACTOR SHALL IMPLEMENT A WHS SYSTEM AND MAINTAIN ALL THE REQUIREMENTS OF THE RELEVANT WHS ACT, SUCH AS LOG BOOKS RECORDING OF: PERSONNEL INDUCTIONS, PERSONNEL SIGN-IN AND SIGN-OUT, INJURIES ETC, AND FIRST AID STATIONS AND TOOL BOX MEETINGS ETC.

10 THE CONTRACTOR SHALL PROVIDE A SECURE PERIMETER FENCE AROUND THE SITE TO EXCLUDE THE PUBLIC, PLUS SAFETY FENCING AROUND EXCAVATIONS WITHIN THE SITE, AND ANY OTHER FENCING THAT IS REQUIRED TO ENSURE THE SAFETY OF SITE PERSONNEL / VISITOR PEDESTRIANS, ANIMALS AND VEHICLES.

11 THE LAND AND ADJOINING AREAS ARE TO BE KEPT IN A CLEAN AND TIDY CONDITION AT ALL TIMES. LITTER AND RUBBISH SHALL BE PLACED IN CONTAINERS AND REMOVED FROM THE SITE. A WASTE STORAGE CONTAINER IS TO BE PROVIDED AT THE COMMENCEMENT OF THE BUILDING WORK.

12 THE WORK SITE IS TO BE KEPT LIT BETWEEN SUNSET AND SUNRISE IF IT IS LIKELY TO BE A SOURCE OF DANGER TO PERSONS USING A PUBLIC PLACE OR UPON INSTRUCTION BY THE SUPERINTENDENT TO ENHANCE THE SAFETY AND SECURITY OF THE AREA IN WHICH THE WORK IS LOCATED.

13 ANY HOARDING, FENCE OR AWNING IS TO BE REMOVED WHEN NO LONGER REQUIRED.

EXISTING SERVICES

1 PRIOR TO COMMENCING ANY WORKS, THE CONTRACTOR SHALL CARRY OUT A "DIAL BEFORE YOU DIG" FOR A SERVICES SEARCH. THE CONTRACTOR SHALL THEN ARRANGE FOR ALL SERVICES TO BE PHYSICALLY LOCATED, IDENTIFIED AND CLEARLY MARKED WITHIN THE WORKS AREA PRIOR TO THE COMMENCEMENT OF ANY WORK. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OF ANY DAMAGE CAUSED TO SUCH SERVICES DURING THE COURSE OF THE WORKS.

2 ANY SERVICE LOCATION SHOWN ON THE DESIGN PLANS ARE INDICATIVE ONLY AND THE POSITION AND DEPTH INDICATED SHOULD NOT BE RELIED UPON.

3 ALL CARE IS TO BE EXERCISED WHEN EXCAVATING NEAR EXISTING UTILITY SERVICES. MANUAL EXCAVATION PARALLEL TO THE SERVICE IS RECOMMENDED AND MECHANICAL DIGGING IS NOT TO BE CARRIED OUT OVER OR NEAR ANY ELECTRICAL / TELECOMMUNICATIONS CABLES OR GAS PIPES. EXCAVATIONS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE REQUIREMENTS OF THE NSW WORK COVER CODE OF EXCAVATION 2000.

4 DURING THE EXECUTION OF WORKS, THE CONTRACTOR SHALL MAINTAIN THE INTEGRITY OF ALL EXISTING UTILITY SERVICES. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED TO THE EXISTING SERVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE RELEVANT UTILITY SERVICE PROVIDER, AT NO COST TO THE PRINCIPAL OR OTHER PROPERTY OWNER.

5 WHERE IT IS NECESSARY TO REMOVE, DIVERT OR CUT INTO ANY EXISTING UTILITY SERVICE, AND ON COMPLETION OF THE NEW "WORKS, THE CONTRACTOR SHALL GIVE AT LEAST THREE (3) DAYS NOTICE OF THE REQUIREMENTS TO THE SUPERINTENDENT, WHO WILL ADVISE WHAT ARRANGEMENTS SHOULD BE MADE FOR THE ALTERATION OF SUCH EXISTING WORKS.

6 PRIOR TO THE COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL OBTAIN THE SUPERINTENDENT'S APPROVAL OF THE PROGRAMME FOR THE RELOCATION / CONSTRUCTION OF TEMPORARY SERVICES.

7 ALL NEW OR EXCAVATED EXISTING UTILITY SERVICES THAT CROSS EXISTING AND FUTURE ROADS/PAVEMENTS SHALL HAVE APPROPRIATE WARNING TAPES AND/OR WIRES PLACED IN ACCORDANCE WITH THE RELEVANT STANDARDS AND THEN BE BACKFILLED WITH DGB20 MATERIAL TO SUBGRADE LEVEL AND COMPACTED TO 98% STANDARD DENSITY RATIO, SUBJECT TO PRIOR APPROVAL FROM THE RELEVANT AUTHORITY.

8 ON COMPLETION OF SERVICES INSTILLATION, ALL DISTURBED AREAS SHALL BE RESTORED TO THEIR ORIGINAL CONDITION, INCLUDING NATURE STRIPS, FOOTPATHS, CONCRETE AND GRAVEL AREAS, KERBS AND ROAD PAVEMENTS.

9 THE CONTRACTOR SHALL ALLOW FOR THE EXCAVATION, CAPPING OFF AND REMOVAL IF REQUIRED OF ALL EXISTING SERVICES IN AREAS AFFECTED BY THE WORKS WITHIN THE CONTRACT AREA AS SHOWN ON THE DRAWINGS UNLESS DIRECTED OTHERWISE BY THE SUPERINTENDENT. ALL SERVICES WORKS ARE TO BE COMPLETED TO REGULATORY AUTHORITY STANDARDS AND APPROVAL.

10 THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES AS REQUIRED TO MAINTAIN THAT SERVICE TO ANY PROPERTY OR BUILDING IN OPERATION DURING THE CONSTRUCTION WORKS, TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. WHEN ALL NEW WORKS / DIVERSIONS ARE COMPLETED, COMMISSIONED AND INSPECTED, THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY UTILITY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.

11 INTERRUPTION TO EXISTING UTILITY SERVICES SHALL BE CARRIED OUT SO AS NOT TO CAUSE ANY INCONVENIENCE OR DAMAGE TO ADJACENT PROPERTIES. THE CONTRACTOR IS RESPONSIBLE FOR GAINING PERMISSION OF THE SUPERINTENDENT FOR TIME OF INTERRUPTION.

12 THE CONTRACTOR SHALL MAINTAIN THE EXISTING STORMWATER DRAINAGE FLOWS THROUGH THE SITE AT ALL TIMES, AND MAKE DUE ALLOWANCE FOR ALL SUCH FLOWS AT ALL TIMES.

13 THE CONTRACTOR SHALL ENSURE THAT APPROPRIATE UTILITY SERVICES ABOVE GROUND MARKERS ARE PLACED IN ACCORDANCE WITH SERVICE PROVIDER AND COUNCIL SPECIFICATIONS.

14 ALL NEW AND REPLACEMENT UTILITY SERVICES SHALL BE LAID AT THE DEPTH AND POSITION WITHIN THE SERVICES TRENCH IN ACCORDANCE WITH RELEVANT AUTHORITY REQUIREMENTS AND SPECIFICATIONS OR AS DIRECTED IN THE DETAILED DRAWINGS.

15 SERVICES TRENCHES TO BE GRADED AT A MINIMUM OF 1% TO EITHER SUBSOIL OR STORMWATER DRAINAGE LINES.

16 THE CONTRACTOR SHALL ENSURE THAT ALL LOCATED AND NEW UTILITY SERVICES WITHIN AND OUTSIDE THE SITE ARE SURVEYED BY A DULY QUALIFIED SURVEYOR AS PART OF THE "WORK AS EXECUTED" RECORDS.

CONSTRUCTION MATERIALS

1 MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARDS, COUNCIL SPECIFICATIONS AND WITH THE BY-LAWS AND ORDINANCE REQUIREMENTS OF THE RELEVANT BUILDING AUTHORITY, EXCEPT WHERE VARIED BY THE PROJECT SPECIFICATIONS.

2 SUFFICIENT NOTICE SHALL BE GIVEN BY THE CONTRACTOR TO THE SUPERINTENDENT TO ENABLE MATERIALS THAT ARE TO BE BROUGHT ON SITE TO BE EXAMINED AND TESTED AS REQUIRED. ALL MATERIALS ARE TO BE STACKED IN A SUITABLE MANNER TO FACILITATE EXAMINATION.

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE

PRINTED --- USER PROGSAN

A1 / A3 LANDSCAPE (A1LC_v02.0.01)

GRID | DATUM | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
GENERAL LEGEND AND NOTES (SHEET 1)

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-ZZ00	A

DRAWING ID: P1907434-PS01-R11-ZZ00

3 MATERIALS SUCH AS FILL / TOPSOIL / SAND SHALL HAVE A VALIDATION CERTIFICATE FROM AN APPROVED TESTING LABORATORY IF SUCH MATERIAL IS NOT PROCURED FROM THE SITE OR SUPPLIED OR ARRANGED BY THE SUPERINTENDENT.

4 WHERE THE CONTRACTOR SUPPLIES MATERIALS OF A MIXED OR POOR QUALITY, THE SUPERINTENDENT SHALL HAVE THE AUTHORITY TO REQUIRE THE CONTRACTOR TO PICK OUT AND STACK THOSE MATERIALS WHICH IN HIS OPINION ARE SUITABLE FOR THE WORKS, AND

TO HAVE THOSE WHICH ARE UNSUITABLE REMOVED FROM THE WORKS SITE AT THE CONTRACTOR'S COST.

5 ANY MATERIAL WHICH IS BROUGHT ONTO THE SITE AND PLACED IN SITU PRIOR TO ANY APPROVAL BY THE SUPERINTENDENT / ENGINEERS OR THEIR AGENTS SHALL BE REMOVED AND THE WORKS REMEDIATED TO THEIR PRIOR CONDITION BY THE CONTRACTOR AT HIS COST.

EARTHWORKS GENERAL

1 ALL EARTHWORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE GUIDELINES FOR EARTHWORKS FOR COMMERCIAL AND RESIDENTIAL DEVELOPMENTS AS SET OUT IN A.S. 3798.

2 FILLING WORKS ARE TO BE UNDERTAKEN UNDER LEVEL 1 SUPERVISION AND CUT OPERATIONS UNDER LEVEL 2 SUPERVISION AS DEFINED IN SECTION 8 OF AS 3798 (2007) AND IN ACCORDANCE WITH THE DEVELOPMENTS CONSENT CONDITIONS. LEVEL ONE TESTING WILL REQUIRE FULL TIME INSPECTION BY THE GEOTECHNICAL TESTING AUTHORITY.

3 GEOTECHNICAL TESTING AND INSPECTION AUTHORITY (GITA) TO BE ENGAGED BY THE PRINCIPLE (NOT THE EARTHWORKS CONTRACTOR).

4 THE CONTRACTOR SHALL ENSURE THAT ALL EXCAVATION WORKS COMPLY WITH THE NSW WORK COVER 'CODE OF PRACTICE: EXCAVATION 2000' OR THAT REQUIRED IN THE STATE WHERE THIS CONTRACT IS BEING UNDERTAKEN.

5 THE CONTRACTOR SHALL TAKE ALL DUE CARE THAT ONLY THE ABSOLUTE MINIMUM OF AREA FOR CONSTRUCTION IS USED AND THAT NO UNDUE DAMAGE IS DONE TO EXISTING VEGETATION.

6 THE CONTRACTOR SHALL PROGRAMME THE EARTHWORKS OPERATION SO THAT THE WORKING AREAS ARE ADEQUATELY DRAINED DURING THE PERIOD OF CONSTRUCTION. THE SURFACE SHALL BE GRADED AND SEALED OFF TO REMOVE DEPRESSIONS, ROLLER MARKS AND SIMILAR WHICH WOULD ALLOW WATER TO POND AND PENETRATE THE UNDERLYING MATERIAL. ANY DAMAGE OR DETERIORATION IN ENGINEERING PROPERTIES OF SOIL RESULTING FROM THE CONTRACTOR NOT OBSERVING THESE REQUIREMENTS SHALL BE RECTIFIED BY THE CONTRACTOR AT HIS COST.

7 THE CONTRACTOR SHALL BE DEEMED TO HAVE INVESTIGATED THE SITE AND BE SATISFIED AS TO THE QUANTITY AND TYPE OF MATERIAL TO BE EXCAVATED AND THE SUB-SURFACE CONDITIONS LIKELY TO BE ENCOUNTERED DURING BULK EARTHWORKS.

8 WORKS AREAS SHALL BE STRIPPED OF PAVEMENTS, VEGETATION (INCLUDING ROOT AFFECTED SOILS) AND OTHER DELETERIOUS MATERIAL. TOPSOIL IS TO BE STOCKPILED ON SITE FOR RE-USE. STOCKPILE LOCATION IS TO BE CONFIRMED ON SITE BY THE SUPERINTENDENT AND IN ACCORDANCE WITH THE SECP. STOCKPILES TO BE IN ACCORDANCE WITH APPROVED PROJECT SECP.

9 ALL GENERATED WASTE AND SPOIL TO BE MANAGED IN ACCORDANCE WITH THE APPROVED SITE WASTE MANAGEMENT PLAN AND/OR RELEVANT NSW DEC GUIDELINES. ANY SPOIL OR OTHER MATERIAL SUSPECTED OF BEING CONTAMINATED IS TO BE REFERRED TO THE SUPERINTENDENT.

10 EARTHWORKS SHALL INCLUDE THE EXCAVATION, PLACING AND COMPACTION OF CUT MATERIALS TO THE LEVELS AND PROFILES AS DETAILED ON THE BULK EARTHWORKS PLANS AND AS REQUIRED TO COMPLETE THE SPECIFIED WORKS. EXCESS SPOIL IS TO BE MANAGED AS DIRECTED BY THE SUPERINTENDENT.

11 THE PRINCIPAL RESERVES THE RIGHT TO AMEND ALL LEVELS SHOWN ON THE DRAWINGS AT ANY STAGE DURING THE CONTRACT PERIOD, PRIOR TO THE GRANTING OF PRACTICAL COMPLETION, SHOULD SUCH AMENDMENT BE DEEMED BY THE OWNER'S REPRESENTATIVE / SUPERINTENDENT PRIOR TO PLACEMENT.

12 ALL BATTERS SHALL BE GRADED / SHAPED IN ACCORDANCE WITH THE DESIGN CONTOURS DETAILED ON THE PLANS. THE MAXIMUM UNSUPPORTED BATTER SHALL BE 1V:2.5H UNLESS NOTED OTHERWISE.

13 ALL CONSTRUCTED BATTERS SHALL BE FREE OF LOOSE MATERIAL AND SHALL BE NEATLY TRIMMED AND ROLLED TO SEAL THE SURFACE BY THE CONTRACTOR PRIOR TO THE GRANTING OF PRACTICAL COMPLETION (AND PRIOR TO THE PLACEMENT OF ANY TOPSOIL / GROWING MEDIUMS OR ANY REVEGETATION WORKS BY OTHERS).

14 ALL FILL BATTERS SHALL BE CONSTRUCTED BY OVER PLACEMENT OF ENGINEERED FILL AND TRIMMING BACK TO THE FINAL DESIGN PROFILE AS REQUIRED. NO ALLOWANCE HAS BEEN MADE FOR THE OVER PLACEMENT OF FILL MATERIAL IN CALCULATING THE EARTHWORKS QUANTITIES / VOLUMES REQUIRED TO COMPLETE THE WORKS.

15 PROJECT PLANS AND SPECIFICATION TO BE READ IN CONJUNCTION WITH ALL GEOTECHNICAL ENGINEERING ADVICE REGARDING THE SITE. WHERE INCONSISTENCIES ARE IDENTIFIED THEY ARE TO BE BROUGHT TO THE ATTENTION OF THE PROJECT SUPERINTENDENT PRIOR TO PROCEEDING WITH WORKS.

EXCAVATION

1 THE EXCAVATION SHALL BE CARRIED OUT IN THE LOCATIONS SHOWN AND TO THE LEVELS, WIDTHS AND BATTER SLOPES INDICATED ON THE DRAWINGS.

2 EXCAVATED MATERIAL NOT MEETING THE SPECIFICATION FOR FILL MATERIAL AND CLASSIFIED AS UNSUITABLE FOR RE-USE AS TOPSOIL OR IN LANDSCAPING SHALL BE BURIED ONSITE IN AN APPROPRIATE MANNER AND AS DIRECTED BY THE SUPERINTENDENT.

3 ALL EXCAVATED MATERIAL REMOVED FROM THE SITE MUST BE CLASSIFIED IN ACCORDANCE WITH NSW DECC (2009) ENVIRONMENTAL GUIDELINES: ASSESSMENT, CLASSIFICATION AND MANAGEMENT OF LIQUID AND NON-LIQUID WASTES PRIOR TO DISPOSAL.

4 WHERE EXCAVATION WORK IS REQUIRED IN THE VICINITY OF EXISTING UTILITY SERVICES, THE CONTRACTOR SHALL SUPPORT ALL SUCH UTILITY SERVICES DURING THE WORKS. ON COMPLETION OF EXCAVATION WORKS SUCH UTILITY SERVICES SHALL BE BACK FILLED IN SUCH A MANNER AS TO RETAIN THE UTILITY SERVICE IN ITS ORIGINAL GRADE AND POSITION TO THE SATISFACTION OF THE SUPERINTENDENT AND UTILITY SERVICE PROVIDER.

5 WHERE EXCAVATED MATERIAL IS TO BE USED FOR FILLING, THE MATERIAL SHALL BE INSPECTED AND APPROVED BY THE SUPERINTENDENT PRIOR TO USE.

6 WHERE ROCK IS EXPOSED DURING EXCAVATION, THE CONTRACTOR SHALL CEASE EXCAVATION AT THIS LOCALITY AND CONTACT THE SUPERINTENDENT WHO WILL THEN DEPENDING ON THE NATURE OF THE CONSTRUCTION, ADVISE ON THE LEVEL TO WHICH THE EXCAVATION IS TAKEN.

7 THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE MAINTENANCE OF ANY EXCAVATIONS AND IS LIABLE FOR ANY DAMAGE WHICH MAY BE CAUSED TO ANY WATER / SEWER PIPE / STORMWATER, PUBLIC UTILITY SERVICE OR STRUCTURES, CAUSED BY THE COLLAPSE OF THE EXCAVATION.

8 WHERE DIRECTED BY THE SUPERINTENDENT THE BOTTOM OF TRENCHES OR EXCAVATIONS SHALL BE COMPACTED PRIOR TO PLACING OF ANY PAVEMENT SUB-BASE, BEDDING OR CONCRETE MATERIALS. SHOULD THE FOUNDATION MATERIAL, IN THE OPINION OF THE SUPERINTENDENT, BE INCAPABLE OF EFFECTIVE COMPACTION, SUCH MATERIAL SHALL BE REMOVED AND REPLACED WITH APPROPRIATE MATERIAL.

9 STRIPPED PAVEMENT SUBGRADES MUST BE PROOF ROLLED (PRIOR TO THE ADDITION OF SUITABLE FILL) BY A MINIMUM 12 TONNE MASS SMOOTH DRUM ROLLER WITHOUT VIBRATION UNDER THE SUPERVISION OF THE GEOTECHNICAL INSPECTION AND TESTING AUTHORITY (GITA) AND/OR GEOTECHNICAL ENGINEER.

10 ROAD SUBGRADE IN ROCK IS TO BE RIPPED, SCARIFIED, SPREAD AND COMPACTED TO A MINIMUM DEPTH OF 300MM BELOW THE FINISHED SUBGRADE LEVEL.

11 IF APPROVED BY THE SUPERINTENDENT EXCAVATED MATERIAL MAY BE USED FOR BACKFILL OVER PIPES PROVIDED IT COMPLIES WITH RELEVANT BUILDING AND CONSTRUCTION CODES AND SPECIFICATIONS. THIS MATERIAL SHALL REMAIN THE PROPERTY OF THE PRINCIPAL AND ANY EXCESS SHALL BE SPOILED OR USED FOR FILLING WITHIN THE SITE AS DIRECTED BY THE SUPERINTENDENT.

12 ALL EXCAVATIONS MUST BE PROPERLY GUARDED AND PROTECTED TO PREVENT THEM FROM BEING DANGEROUS TO LIFE OR PROPERTY.

13 RETAINING WALLS OR OTHER APPROVED METHODS NECESSARY TO PREVENT THE MOVEMENT OF EXCAVATED OR FILLED GROUND, ARE TO BE CONSTRUCTED TOGETHER WITH ASSOCIATED STORMWATER DRAINAGE MEASURES PRIOR TO OCCUPATION OF THE DEVELOPMENT OR BEFORE WHERE SITE CONDITIONS REQUIRE.

14 NO BUSH ROCK IS TO BE REMOVED FROM THE SITE WITHOUT PRIOR APPROVAL FROM NSW DECC AND COUNCIL.

FILL

1 ANY IMPORTED SOILS TO THE SUBJECT SITE MUST BE VIRGIN EXCAVATED NATURAL MATERIAL (VENM) AS DEFINED IN SCHEDULE 1 OF THE PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997 UNLESS OTHERWISE APPROVED BY THE SUPERINTENDENT.

2 A LOG BOOK SHALL BE MAINTAINED TO RECORD THE DAILY TRUCK LOADS OF FILL BROUGHT TO THE SITE. THIS LOG BOOK SHALL BE MADE AVAILABLE FOR PERUSAL TO AUTHORISED COUNCIL OFFICERS UPON REQUEST.

3 MATERIAL USED AS FILL SHOULD BE UNIFORM, WELL GRADED SOIL CONTAINING NO ROCK PARTICLES GREATER THAN 100 MM UNLESS OTHERWISE SPECIFIED IN THESE DRAWINGS AND SHALL CONTAIN NO BUILDING OR OTHER FOREIGN MATERIAL. IF A MIXED RANGE OF 'CLEAN ROCK' MATERIAL IS SPECIFIED IT SHALL BE UNIFORM AND WELL GRADED.

4 UNLESS OTHERWISE APPROVED OR SPECIFIED, ALL FILL MATERIAL SHALL BE FROM A SOURCE APPROVED BY THE SUPERINTENDENT AND SHALL COMPLY WITH THE FOLLOWING:

- FREE FROM ORGANIC AND PERISHABLE MATTER AND OTHER DELETERIOUS / UNSUITABLE MATERIAL AS DEFINED BY AS 3798-2007.
- MAXIMUM PARTICLE SIZE 100 MM.
- MINIMUM CBR TO BE DETERMINED DURING CONSTRUCTION (IF REQUIRED) OR AS SPECIFIED ON THESE DRAWINGS.
- FILL TO BE COMPACTED IN 300MM THICK LOOSE LAYERS TO A MINIMUM DENSITY RATIO OF 95% STANDARD MAXIMUM DRY DENSITY (SMDD) NO WETTER/DRYER THAN – 2% SOMC OR AS SPECIFIED ELSEWHERE BY RELEVANT GEOTECHNICAL REPORT OR ON PLAN.

5 MATERIAL ACCEPTANCE AND SELECTION SHALL BE SUBJECT TO FULL TIME MONITORING BY THE GITA NOMINATED FOR THE PROJECT.

6 PRIOR TO ANY FILL BEING PLACED SUB-GRADE IS TO BE INSPECTED AND APPROVED BY THE SUPERINTENDENT.

7 WHERE FILL IS TO BE PLACED ON THE EXISTING SURFACE, THE EXISTING SURFACE WILL BE PREPARED IN ACCORDANCE WITH THIS SPECIFICATION THEN BE BENCHED TO ALLOW COMPACTION AND MATERIAL KEYING. ADJACENT BENCHES SHALL STEP NOT MORE THAN 0.4 M WITHOUT GEOTECHNICAL ENGINEERS APPROVAL.

8 DENSITY AND COMPACTION TESTING TO BE UNDERTAKEN ON EACH FILL LAYER BY A NATA REGISTERED LABORATORY AT RATES SPECIFIED BELOW.

9 SURFACE RUNOFF AND SCOUR MUST BE CONTROLLED AND THE SURFACE BETWEEN LAYERS GRADED WITH A 1% MINIMUM FREE DRAINING SLOPE.

10 DAM DECOMMISSIONING SHALL BE STAGED AND UNDERTAKEN WITH AN ECOLOGIST OR WIRES VOLUNTEER PRESENT TO ENABLE ANY AQUATIC FAUNA THAT MAY POTENTIALLY BE ULTILISING THESE AREAS AS HABITAT TO HAVE THE OPPORTUNITY TO SEEK ALTERNATIVE HABITAT OR ARE HUMANELY TRANSPORTED TO AN ALTERNATIVE SITE.

SUBGRADE PREPARATION

1 EXPOSED SUBGRADE EXHIBITING SHRINKAGE CRACKING TO BE WATERED AND ROLLED UNTIL NO SHRINKAGE CRACKS ARE EVIDENT.

2 SUBGRADE TO BE ROLLED WITH AT LEAST EIGHT PASSES OF 12 TONNE STATIC SMOOTH DRUM ROLLER.

3 FINAL PASS OF ROLLER TO BE UNDER SUPERVISION OF GEOTECHNICAL ENGINEER FOR THE DETECTION OF ANY HEAVING OR SOFT SPOTS.

4 WHERE HEAVING OR SOFT SPOTS ARE IDENTIFIED REFER TO THE GEOTECHNICAL ENGINEER FOR ADVICE.

5 TYPICALLY HEAVING AREAS SHOULD BE LOCALLY REMOVED TO A STABLE BASE AND REPLACED WITH ENGINEERED FILL TO THIS SPECIFICATION.

6 ALTERNATIVES TO THE FULL DEPTH REMOVAL OF UNSUITABLE MATERIAL MAY BE APPROVED BY THE GEOTECHNICAL ENGINEER AS REQUIRED.

7 WHERE SOIL SOFTENING OCCURS FOLLOWING RAINFALL SUBGRADE IS TO BE EXCAVATED TO A FIRM BASE AND REPLACED WITH ENGINEERED FILL AT THE CONTRACTORS EXPENSE.

EDGE COMPACTION

1 OUTER EDGE OF FILL LAYERS TO EXTEND A HORIZONTAL DISTANCE AT LEAST 1.0 M BEYOND THE DESIGN GEOMETRY.

2 ROLLER MUST EXTEND OVER THE EDGE OF EACH PLACED LAYER IN ORDER TO SEAL THE BATTER SURFACE.

3 ON COMPLETION OF FILLING, EXCESS UNDER-COMPACTED EDGE FILL TO BE TRIMMED BACK TO DESIGN GEOMETRY.

SERVICE TRENCHES

1 BACKFILLING OF SERVICE TRENCHES IS TO BE COMPLETED TO THE PROJECT ENGINEERING FILL SPECIFICATION EXCEPT AS AMENDED BELOW:

2 BACKFILL IS TO BE PLACED IN MAXIMUM 100 MM LOOSE LAYERS.

3 BACKFILL TO CONTAIN NO MATERIAL > 40 MM.

4 COMPACTION TO UTILISE TRENCH ROLLER OR A PAD FOOT ROLLER ON ATTACHMENT FITTED TO EXCAVATOR.

5 COMPACTION TESTING TO BE COMPLETED TO PROJECT SPECIFICATION.

COMPACTION TESTING

1 DENSITY TESTING IS TO BE UNDERTAKEN TO CONFIRM COMPACTION. LEVEL ONE (1) TESTING IS TO BE CARRIED OUT FOR ANY FILLING OPERATIONS CARRIED OUT IN ACCORDANCE WITH THE DEVELOPMENT CONSENT.

2 ANY FILLING SHALL BE TESTED TO ESTABLISH THE FIELD DRY DENSITY EVERY 300MM RISE IN VERTICAL HEIGHT.

3 STE FILL – THE MINIMUM COMPACTION REQUIREMENT IS 95% STANDARD COMPACTION. TEST SITES SHALL BE LOCATED RANDOMLY ACROSS THE FILL SITE WITH ONE (1) TEST PER 500M2 (MIN ONE (1) TEST PER 300MM LAYER). THIS EXCLUDES PAVEMENTS AND STRUCTURAL FILL UNDER AND AROUND STRUCTURES.

4 TRENCH BACKFILL – TESTING AT RATE OF AT LEAST 1 TEST PER TWO LAYER PER 40 LINEAR METRES OF TRENCH.

GITA REPORTING

1 A FORTNIGHTLY REPORT IS TO BE PREPARED BY THE GITA AND SUBMITTED TO THE GEOTECHNICAL ENGINEER FOR REVIEW.

2 REPORT IS TO DETAIL DAILY SITE REPORTS; NATA ENDORSED TESTING RESULTS AND COMPLETED LOT REPORTS SHOWING TESTING LOCATIONS.

3 FINAL LEVEL 1 SUPERVISION REPORT TO BE REVIEWED BY THE GEOTECHNICAL ENGINEER TO CONFIRM CONFORMITY TO PROJECT SPECIFICATION.

4 ANY NON-CONFORMANCE TO THE PROJECT SPECIFICATIONS OR PLANS TO BE RECTIFIED BY THE CONTRACTOR AT THEIR SOLE COST TO THE DIRECTION AND SATISFACTION OF THE ENGINEER AND THE SUPERINTENDENT.

PAVEMENTS – GENERAL

1 PAVEMENT MATERIAL TYPES AND LAYER THICKNESSES SHALL BE AS SHOWN IN THE DESIGN DRAWINGS AND COMPLY WITH THE REQUIREMENTS OF COUNCIL'S ROADWORKS DESIGN AND CONSTRUCTION SPECIFICATION.

2 THE CONTRACTOR SHALL SUBMIT DETAILS OF ALL CONSTITUENTS OF THE PROPOSED BASE AND SUBBASE MATERIALS, INCLUDING SOURCE OF SUPPLY AND THE PROPOSED TYPE AND PROPORTION OF ANY BINDER, TO THE SUPERINTENDENT, SUPPORTED WITH TEST RESULTS FROM A NATA REGISTERED LABORATORY CONFIRMING THAT THE CONSTITUENTS COMPLY WITH COUNCIL REQUIREMENTS.

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE

GRID | DATUM | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
GENERAL LEGEND AND NOTES (SHEET 2)

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-ZZ01	A

PRINTED: ---- - USER: PBROGAN
A1 / A3 LANDSCAPE (A1LC_v02.0.01)
DRAWING ID: P1907434-PS01-R11-ZZ01

3 THE CONTRACTOR MUST RECEIVE THE SUPERINTENDENT'S WRITTEN AUTHORITY TO PROCEED PRIOR TO DELIVERY OF PAVEMENT MATERIALS TO SITE.

4 FIELD DENSITY TESTS SHALL BE CARRIED OUT IN ACCORDANCE WITH AS1289.5.3.1, OR, WITH THE SUPERINTENDENT'S CONCURRENCE, WITH A NUCLEAR DENSITY METER IN ACCORDANCE WITH RELEVANT STANDARDS.

5 TESTING OF THE SUBGRADE SHALL BE PERFORMED BY PROOF-ROLLING, UTILISING A MINIMUM 12 TONNE STATIC MASS SMOOTH DRUM ROLLER WITHOUT VIBRATION, UNDER THE SUPERVISION OF COUNCIL. ADEQUATE COMPACTION IS INDICATED BY NO VISIBLE DEFLECTION (WITH THE HUMAN EYE) DURING

EACH PASS OF THE ROLLER. SUBGRADE PROOF-ROLLING SHALL BE SUPPLEMENTED BY COMPACTIVE TESTING AS PER AS 3798.

6 PAVEMENT MATERIAL SHALL NOT BE SPREAD UPON AN UNDERLYING SUBGRADE OR PAVEMENT LAYER THAT HAS NOT RECEIVED THE APPROPRIATE COMPACTION CERTIFICATION.

7 UNBOUND MATERIALS SHALL NOT BE SPREAD UPON AN UNDERLYING PAVEMENT LAYER WHICH HAS A MOISTURE CONTENT EXCEEDING 90%, THE LABORATORY OPTIMUM MOISTURE CONTENT OR WHICH HAS BECOME RUTTED OR MIXED WITH FOREIGN MATTER. THE UNDERLYING LAYER SHALL BE CORRECTED TO COMPLY BEFORE SPREADING THE NEXT LAYER OF PAVEMENT.

8 THE COST OF CORRECTING AN UNDERLYING LAYER TO COMPLY SHALL BE BORNE BY THE CONTRACTOR.

9 EACH LAYER OF MATERIAL SHALL BE DEPOSITED AND SPREAD IN A CONCURRENT OPERATION AND, AFTER COMPACTION, THE FINISHED SURFACE LEVELS OF THE BASE AND SUBBASE COURSES SHALL BE WITHIN THE PERMITTED TOLERANCES STATED IN COUNCILS SPECIFICATION WITHOUT SUBSEQUENT ADDITION OF MATERIAL. THE THICKNESS OF EACH COMPACTED LAYER SHALL BE NEITHER LESS THAN 100MM NOR MORE THAN 150MM FOR ALL PAVEMENT LAYER TYPES, UNLESS APPROVED BY THE SUPERINTENDENT.

10 WHEN SPREAD FOR COMPACTION PROCESS THE MOISTURE CONTENT OF THE BASE OR SUBBASE MATERIALS SHALL BE IN THE RANGE OF 60-90% OF LABORATORY OPTIMUM MOISTURE CONTENT IN ACCORDANCE WITH AS1289.5.2.

11 EACH LAYER OF THE BASE AND SUBBASE COURSES SHALL BE UNIFORMLY COMPACTED OVER ITS ENTIRE AREA AND DEPTH TO SATISFY THE REQUIREMENT OF RELATIVE COMPACTION SET OUT IN COUNCILS ROADWORKS SPECIFICATION.

12 WATERING AND COMPACTION PLANT SHALL NOT BE ALLOWED TO STAND ON THE PAVEMENT BEING COMPACTED.

13 ON SECTIONS OF PAVEMENT WITH ONE-WAY CROSSFALL, COMPACTION SHALL BEGIN AT THE LOW SIDE OF THE PAVEMENT AND PROGRESS TO THE HIGH SIDE. ON CROWNED SECTIONS, COMPACTION SHALL BEGIN AT THE SIDES AND PROGRESS TOWARDS THE CROWN. EACH PASS OF THE ROLLERS SHALL BE PARALLEL WITH THE ROADWAY CENTRELINE AND UNIFORMLY OVERLAP EACH PRECEDING PASS. THE OUTER METRE OF BOTH SIDES OF THE PAVEMENT SHALL RECEIVE AT LEAST TWO MORE PASSES BY THE COMPACTION PLANT THAN THE REMAINDER OF THE PAVEMENT.

14 AT LOCATIONS WHERE IT WOULD BE IMPRACTICABLE TO USE SELF PROPELLED COMPACTION PLANT, COMPACTION SHALL BE ACHIEVED BY HAND-OPERATED PLANT APPROVED BY THE SUPERINTENDENT.

15 IF ANY UNSTABLE AREAS DEVELOP DURING ROLLING, THE UNSTABLE MATERIAL SHALL BE REJECTED AND REMOVED FOR THE FULL DEPTH OF THE LAYER, DISPOSED OF AND REPLACED WITH FRESH MATERIAL. THIS OPERATION WILL BE AT THE COST OF THE CONTRACTOR.

16 THE PLACEMENT OF SUBSEQUENT LAYERS SHALL NOT BE ALLOWED UNTIL THE REQUISITE TESTING HAS BEEN COMPLETED AND THE TEST RESULTS FOR EACH LAYER HAVE BEEN ACCEPTED BY THE SUPERINTENDENT.

17 ANY UNBOUND MATERIAL IN A LAYER THAT HAS ATTAINED THE SPECIFIED RELATIVE COMPACTION BUT SUBSEQUENTLY BECOMES WETTED UP SHALL BE DRIED OUT AND, IF NECESSARY, UNIFORMLY RECOMPACTED AND TRIMMED TO MEET THE SPECIFIED DENSITY REQUIREMENTS AND LEVEL TOLERANCES.

18 COVER/LIVE LOADING REQUIREMENTS IN ACCORDANCE WITH AS/NZS 3725:2007. MINIMUM 500MM COMPACTED FILL REQUIRED OVER CLASS 3 PIPE PRIOR TO ACCESS BY 15TONNE EXCAVATOR AND COMPACTION WHEEL. 550MM FOR 10 TONNE VIBRATORY SMOOTH DRUM ROLLER.

19 THE CONTRACTOR IS TO UNDERTAKE ALL PAVEMENT SEALING WORKS IN ACCORDANCE WITH THE PAVEMENT DESIGN WITHIN THE CIVIL WORKS ENGINEERING PLANS AND COUNCIL'S SPECIFICATION FOR ROADWORKS.

PAVEMENT - ACCEPTANCE OF COMPACTED LAYERS

1 ACCEPTANCE OF WORK, WITH RESPECT TO COMPACTION, SHALL BE BASED ON DENSITY TESTING OF THE WORK IN 'LOTS' WITH A LOT DEFINED AS:

- COVERING A SINGLE LAYER OF WORK CONSTRUCTED UNDER UNIFORM CONDITIONS IN A CONTINUOUS OPERATION;
- FOR UNBOUND MATERIALS MAY BE EQUAL TO A DAYS OUTPUT USING THE SAME MATERIAL.

2 THE SUPERINTENDENT SHALL ASSESS COMPACTION OF EACH LOT BASED ON RANDOM SAMPLING OF TEST LOCATIONS FOR IN-SITU DRY DENSITY TESTING.

3 THE CONTRACTOR SHALL ARRANGE FOR TESTING TO ASSESS COMPACTION ON THE BASIS OF 10 TESTS PER 5000 SQ.M WITH A MINIMUM OF 6 TESTS PER LOT, AND PRESENT THE RESULTS TO THE SUPERINTENDENT FOR APPROVAL.

4 THE COSTS OF ALL TESTING FOR COMPACTION ASSESSMENT SHALL BE BORNE BY THE CONTRACTOR.

5 ACCEPTABLE COMPACTION PERFORMANCE STANDARDS ARE SUMMARISED AS FOLLOWS:

- BASE AND SUBBASE MIN 98 % MODIFIED COMPACTIVE EFFORT. REFER TO COUNCILS SPECIFICATION FOR ROADWORK & DRAINAGE ASSOCIATED WITH SUBDIVISION OR OTHER DEVELOPMENT.
- SUBGRADE TO BE 100 % STANDARD COMPACTIVE EFFORT.
- FILL TO BE 95 % STANDARD COMPACTIVE EFFORT.

PAVEMENT - PROPERTY ENTRANCE

3 CONCRETE SLAB SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING THICKNESS:

FOR MORE THAN TWO DEWELLINGS,

COMMERCIAL AND LIGHT INDUSTRIAL 32MPA CONCRETE, 150MM THICK + 1 LAYER OF F72 FABRIC ON 150MM DGB20 SUB-BASE.

4 REINFORCING SHALL HAVE APPROXIMATELY 40MM TOP COVER AND SHOULD BE SUPPORTED DURING CONSTRUCTION BY BAR CHAIRS AT 1 METER CENTRES. THE REINFORMENT SHOULD NOT BE CONTINUOUS THROUGH A CONTROL JOINT.

5 A 150MM THICK COMPACTED, GRANULAR SUB-BASE SHALL BE PROVIDED FOR ALL COMMERICAL FOOTWAY CROSSINGS. A 50MM THICK COMPACTED, GRANULAR SUB-BASE SHALL BE PROVIDED UNDER ALL OTHER CONCRETE FOOTWAY CROSSINGS.

6 MASTIC JOINTS 5MM THICK ARE TO BE PROVIDED AT THE PROPOERTY BOUNDARY AND AT THE REAR OF THE GUTTER CROSSING (LAYBACK). DUMMY JOINTS SHALL BE PROVIDED AT EITHER SIDE OF THE FOOTWAY WHERE APPLICABLE.

7 CONCRETE CROSSOVERS SHOULD USUALLY HAVE A BROOM FINISH UNLESS IT HAS A GRADIENT STEEPER THAN 1 (VERTICAL) TO 5 (HORIZONTAL) WHEN IT SHOULD BE FINSIHED WITH A WOODEN FLOAT. THE FINISH IS TO BE A UNIFORM, NON-SLIP SURFACE. ALL EDGES ARE TO BE ROUNDED WITH A 5MM EDGING TOOL.

8 ANY DAMAGED, DEFACED OR OTHERWISE UNSATISFACTORY SECTION SHALL BE REMOVED AND REPLACED.

UTILITIES

1 TELSTRA AND ELECTRICAL SERVICES LOCATIONS SHOWN ON CIVIL PLANS AND ARE INDICATIVE ONLY.

2 CONTRACTOR TO ENSURE THAT DETAILED ELECTRICAL AND SERVICE DESIGNS AND REQUIREMENTS ARE OBTAINED PRIOR TO CONSTRUCTION.

3 ALL UTILITY WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS, SERVICE PROVIDER REQUIREMENTS AND COUNCIL SPECIFICATIONS.

4 CONTRACTOR TO ENSURE THAT RELEVANT AGREEMENTS AND ARRANGEMENTS ARE IN PLACE BETWEEN REQUIRED AGENCIES AND SERVICE PROVIDERS (E.G. TELSTRA, AUSGRID, COUNCIL) FOR ALL WORKS.

5 CONTRACTOR SHALL ENSURE THAT APPROPRIATE UTILITY SERVICES ABOVE GROUND MARKERS AND BELOW GROUND PROTECTION / IDENTIFICATION MEASURES ARE PLACED IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS, SERVICE PROVIDER REQUIREMENTS AND COUNCIL SPECIFICATIONS.

6 BASE OF SERVICES TRENCHES TO BE GRADED AT A MINIMUM OF 1% TO EITHER SUBSOIL OR STORMWATER DRAINAGE LINES.

7 CONTRACTOR SHALL ENSURE THAT ALL LOCATED AND NEW UTILITY SERVICES WITHIN AND OUTSIDE THE SITE ARE SURVEYED BY A DULY QUALIFIED SURVEYOR AS PART OF THE "WORK AS EXECUTED" RECORDS.

STORMWATER

1 STORMWATER TO BE IN ACCORDANCE WITH COUNCIL REQUIREMENTS AND THE LATEST VERSION OF THE FOLLOWING APPLICABLE STANDARDS:

A AS/NZS 3500 (ALL PARTS)
B AS/NZS 2566.1
C AS/NZS 2566.2
D AS/NZS 5065
E AS1597.1 OR AS1597.2
F AS 4139
G AS 3725
H AS/NZS 1254
I AS/NZS 2032

2 ALL PIPES TO BE SPIGOT AND SOCKET, RUBBER RING JOINTED WITH MINIMUM GRADE OF SN4. CULVERTS TO BE IN ACCORDANCE WITH COUNCIL SPECIFICATIONS.

3 PIPELINES AND DRAINAGE LINES IN ROADS AND TRAFFICABLE AREAS MUST BE BACKFILLED WITH APPROVED GRANULAR MATERIAL UNLESS OTHERWISE APPROVED BY COUNCIL/ENGINEER.

4 THREE (3) METRES OF SUBSOIL DRAINAGE WRAPPED IN GEOTEXTILE STOCKING MUST BE PROVIDED TO ALL DOWNSTREAM PITS & HEADWALLS

5 ALL PITS MUST BE BENCHED AND STREAMLINED. PROVIDE SL72 REINFORCEMENT AND GALVANISED STEP IRONS IN ALL PITS OVER 1.2-METRES DEEP AS MEASURED FROM THE TOP OF GRATE TO THE PIT INVERT.

6 CONCRETE TO HAVE MINIMUM COMPRESSIVE STRENGTH OF 32MPA AT 28-DAYS UNLESS OTHERWISE APPROVED BY COUNCIL ENGINEER.

7 ADEQUATE PROVISION IS TO BE MADE TO PREVENT SCOURING AND SEDIMENTATION FOR ALL DRAINAGE WORKS IN ACCORDANCE WITH COUNCIL'S REQUIREMENTS.

8 CATCH DRAINS MUST BE CONSTRUCTED AS REQUIRED BY THE APPROVED PLANS OR PCA.

9 SOIL AND WATER MANAGEMENT PLANS ARE TO BE FOLLOWED FOR ALL DISTURBED SITES AND ADHERED TO AT ALL TIMES DURING THE CONSTRUCTION AND MAINTENANCE PERIODS.

10 REFER TO COUNCIL'S STANDARD DRAWING WSC.D5.6 AND WSC.D5.11 FOR CONSTRUCTION DETAIL.

REVEGETATION OF DISTURBED AREAS

1 ALL EARTHWORK AREAS ARE TO BE REINSTATED BY THE CONTRACTOR TO THE DIRECTION AND SATISFACTION OF THE SUPERINTENDENT. AS A MINIMUM, ALL AREAS EXCLUDING PAVEMENT AND ROCK LINED AREAS OR OTHER AREAS NOMINATED FOR SPECIFIC LANDSCAPING ARE TO BE FINISHED WITH 150 MM THICK LAYER OF SITE SOURCED (OR APPROVED EXTERNAL SUPPLY TOPSOIL) AND SPRAY GRASSED OR TURFED ASAP FOLLOWING COMPLETION OF WORKS IN ANY ONE AREA.

2 ALL TRAFFIC IS TO BE EXCLUDED FROM NEWLY RE-VEGETATED AREAS BY THE ERECTION OF SUITABLE TEMPORARY BARRIER FENCING.

3 SITE SEDIMENT AND EROSION CONTROL MEASURES ARE TO BE MAINTAINED UNTIL THE VEGETATION IS ESTABLISHED OR OTHERWISE DIRECTED BY THE SUPERINTENDENT OR ENGINEER.

4 THE CONTRACTOR IS RESPONSIBLE FOR THE REVEGETATED AREAS FOR THE PERIOD SPECIFIED IN THE CONTRACT.

TREES

1 ALL TREE PROTECTION REQUIREMENTS IF OUTLINED IN A PROJECT BIODIVERSITY AND CONSERVATION MANAGEMENT PLAN (BCMP) OR VEGETATION MANAGEMENT PLAN (VMP) ARE TO BE COMPLIED WITH ALONG WITH THE REQUIREMENTS OF THE PROJECT REF.

2 A TREE RETENTION PLAN IS TO BE KEPT ON SITE INDICATING TREES TO BE RETAINED AND AREAS LEFT UNDISTURBED THAT ARE TO BE CORDONED OFF FROM CONSTRUCTION WORKS.

3 PRIOR TO WORK COMMENCING, TREE PROTECTION FENCING MUST BE ERECTED AROUND THE TREES THAT ARE TO BE RETAINED AT A 3M SETBACK. THE TREE FENCING MUST BE CONSTRUCTED OF 1.8 METRE CYCLONE CHAINMESH FENCE'. THE TREE PROTECTION FENCING MUST BE MAINTAINED IN GOOD WORKING ORDER UNTIL THE COMPLETION OF ALL BUILDING OR DEVELOPMENT WORKS. A STATEMENT OF COMPLIANCE FROM A QUALIFIED TREE SURGEON OR ENVIRONMENTAL CONSULTANT SHALL BE SUBMITTED TO THE PCA PRIOR TO THE ISSUE OF THE CONSTRUCTION CERTIFICATE. PENALTIES APPLY FOR NON-COMPLIANCE.

4 TO PREVENT DAMAGE TO TREE ROOTS, EXCAVATION (FOR SERVICES AND OTHER WORKS), CHANGE OF SOIL LEVEL (CUT OR FILL), PARKING (VEHICLES OR PLANT), OR PLACEMENT OF BUILDING MATERIALS (INCLUDING DISPOSAL OF CEMENT SLURRY AND WASTE WATER) WITHIN THE SPECIFIED TREE PROTECTION SETBACKS, AND WITHIN 3M OF ALL OTHER TREES TO BE RETAINED ONSITE, IS STRICTLY FORBIDDEN. NO TREE ROOTS LOCATED WITHIN THE SPECIFIED TREE SETBACK/S, SHALL BE SEVERED OR INJURED IN THE PROCESS OF ANY SITE WORKS DURING THE CONSTRUCTION OR LANDSCAPING PHASES OF THE APPROVED PROJECT. THE APPLICANT SHALL ENSURE THAT ALL UNDERGROUND SERVICES (I.E. WATER, DRAINAGE, GAS, AND SEWER) SHALL NOT BE LAID WITHIN 3M OF ANY TREE LOCATED ON THE PROPERTY PROTECTED UNDER COUNCIL'S TREE PRESERVATION ORDER OR LISTED FOR PROTECTION IN THE APPROVED PROJECT BCMP/VMP.

SIGNAGE & LINE MARKING

1 ON-SITE SIGNAGE IS REQUIRED TO CLEARLY IDENTIFY THE PCA AND THE PRINCIPAL CONTRACTOR (THE COORDINATOR OF THE BUILDING WORK) PURSUANT TO THE ENVIRONMENTAL PLANNING AND ASSESSMENT AMENDMENT (QUALITY OF CONSTRUCTION).

2 ALL SIGNAGE REQUIREMENTS AS SPECIFIED IN THE CTMP ARE TO BE IMPLEMENTED PRIOR TO AND DURING CONSTRUCTION WORKS.

3 WHERE TEMPORARY SIGNS ARE TO BE REUSED THEY ARE TO BE WASHED AND CLEANED WHERE REQUIRED.

4 ALL EXISTING SIGNS WHICH ARE DAMAGED AND NON LEGIBLE ARE TO BE REPLACED.

5 PERMANENT ROAD SIGNPOSTING AND LINE MARKING SHALL CONFORM TO AS1742.2 'TRAFFIC CONTROL DEVICES FOR GENERAL USE'. RAISED RETRO-REFLECTIVE PAVEMENT MARKERS TO CONFORM TO AS1906 'RETRO-REFLECTIVE MATERIALS AND DEVICES FOR ROAD TRAFFIC CONTROL PURPOSES'. ALL APRONS AND KERB FACES ON ISLANDS TO BE DELINEATED BY REFLECTIVE WHITE MARKING. INSTALLATION TO BE IN ACCORDANCE WITH PLAN APPROVED BY LOCAL TRAFFIC COMMITTEE AND TO COUNCIL SPECIFICATIONS.

6 CONTRACTOR TO INSTALL STREET SIGNS TO COUNCIL STANDARD.

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE

GRID | DATUM | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE
RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE
GENERAL LEGEND AND NOTES (SHEET 3)

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-ZZ02	A

DRAWING ID: P1907434-PS01-R11-ZZ02

PRINTED: --- USER: PBROGAN

A1 / A3 LANDSCAPE (A1LC_v02.0.01)

SOIL AND WATER MANAGEMENT (SEDIMENT AND EROSION CONTROL PLAN)

1 TEMPORARY SEDIMENTATION AND EROSION CONTROLS (SEC) ARE TO BE CONSTRUCTED PRIOR TO COMMENCEMENT OF ANY WORK TO ELIMINATE THE DISCHARGE OF SEDIMENT FROM THE SITE. THE CONTROLS ARE TO BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF LANDCOM'S "MANAGING URBAN STORMWATER: SOILS AND CONSTRUCTION", VOLUME 1, 4TH EDITION, MARCH 2004, (THE BLUE BOOK).

2 THE CONTRACTOR IS TO INFORM ALL SUBCONTRACTORS OF THEIR RESPONSIBILITIES IN RELATION TO SEC.

3 THE CONTRACTOR SHALL REGULARLY MAINTAIN SEC DEVICES AND REMOVE ACCUMULATED SILT FROM SUCH DEVICES BEFORE NO MORE THAN 60% OF THEIR SEDIMENT STORAGE CAPACITY IS LOST. ALL THE SILT REMOVED SHALL BE DISPOSED OF AS DIRECTED BY THE SUPERINTENDENT.

4 NO SILT IS TO BE PLACED OUTSIDE THE LIMIT OF WORKS. THE PERIOD FOR MAINTAINING THESE DEVICES SHALL BE AT LEAST UNTIL ALL DISTURBED AREAS ARE REVEGETATED AND FURTHER AS MAY BE DIRECTED BY THE SUPERINTENDENT OR ENGINEER.

5 AREAS OF SITE DISTURBANCE ARE TO BE MINIMISED AT ANY ONE TIME WITH DEVELOPMENT STAGED SUCH THAT A NEW AREA IS NOT TO COMMENCE UNTIL THE PREVIOUS DISTURBED AREA IS FULLY STABILISED.

6 ALL WORKS MUST BE PERFORMED IN ACCORDANCE WITH THE EROSION AND SEDIMENT CONTROL PLAN.

7 THE CONTRACTOR SHALL PROTECT OVERLAND FLOW PATHS, DRAINS, ADJOINING LAND AND DOWNSTREAM WATER QUALITY FROM SEDIMENTATION. ACCORDINGLY, SEDIMENT AND EROSION CONTROL MEASURES MUST BE IMPLEMENTED PRIOR TO EXCAVATION, AND MAINTAINED DURING CONSTRUCTION.

8 ACCESS TO AND EXIT FROM THE SITE SHALL BE RESTRICTED TO ONE DESIGNATED APPROVED AREA. INCLUDE ADEQUATE MEASURES TO REMOVE SOIL FROM VEHICLES LEAVING THE SITE SO AS TO MAINTAIN PUBLIC ROADS IN A CLEAN CONDITION.

9 VEGETATION NOT DIRECTLY AFFECTED BY THE PROPOSAL MUST BE PROTECTED BY A "NO GO" BOUNDARY TO FACILITATE THE FILTRATION AND COLLECTION OF RUNOFF POLLUTION EMANATING FROM THE WORKS. CONTRACTOR TO ENSURE THAT NO SPOIL OR FILL ENCROACHES UPON ADJACENT BUSHLAND FOR THE DURATION OF THE WORKS.

10 ALL DISTURBED AREAS ARE TO BE STABILISED BY TURFING, MULCHING, PAVING OR OTHERWISE SUITABLY STABILISED WITHIN 30 DAYS OF COMPLETION.

11 DISTURBED AREAS OUTSIDE THE SPECIFIED WORKS AREAS SHALL BE REHABILITATED/REINSTATED BY THE CONTRACTOR USING APPROVED METHODS OF EROSION MITIGATION SUCH AS MULCHING WITH INDIGENOUS PLANT SPECIES OR OTHER SUITABLE APPROVED STABILISING PROCESSES WITHIN SEVEN DAYS AS DIRECTED BY THE SUPERINTENDENT.

12 TOPSOIL IS TO BE LIGHTLY ROLLED TO AVOID EROSION.

13 THE FOLLOWING SEDIMENT CONTROL MEASURES ARE REQUIRED TO BE PROVIDED IN CONJUNCTION WITH THE ATTACHED SEDIMENT AND EROSION CONTROL PLAN.

B ALL RUNOFF AND EROSION CONTROLS ARE TO BE INSTALLED BEFORE ANY WORKS ARE CARRIED OUT AT THE SITE.

C ALL CONTAMINATED SURFACE WATERS AND DEBRIS FROM THE SITE MUST BE SCREENED, COLLECTED AND POLLUTANTS CAPTURED WITHIN THE SITE.

D STORMWATER INLETS AND DRAINS RECEIVING STORMWATER MUST BE PROTECTED AT ALL TIMES DURING WORK ON SITE.

E MOVEMENT OF WATER MUST BE CONTROLLED BY DIVERTING UPSLOPE CLEAN SURFACE RUNOFF (VIA DIVERSION DRAINS AND SEDIMENT FENCING) AROUND THE DISTURBED AREAS.

F CONTAMINATION OF SURFACE WATERS ON DOWNSLOPE LANDS MUST BE MITIGATED BY INSTALLING SEDIMENT CONTROL FENCES DOWNSLOPE OF THE DISTURBED AREAS TO CAPTURE SEDIMENT AND DEBRIS ESCAPING FROM THE SITE.

G GEOFABRIC SEDIMENT FENCING MUST BE INSTALLED PARALLEL TO THE PROPOSED WORKS OR ALONG THE NATURAL CONTOURS OF THE SITE.

H SEDIMENT FENCING MUST BE SECURED BY POST (WHERE METAL STAR PICKETS ARE USED, PLASTIC SAFETY CAPS SHALL BE USED) AT TWO-METRE INTERVALS WITH THE GEOTEXTILE FABRIC EMBEDDED 200MM INTO SOIL. ONE METRE RETURNS MUST BE INSTALLED AT TWENTY-METRE INTERVALS ALONG THE SEDIMENT FENCING.

I STOCKPILES OF TOPSOIL, SAND, AGGREGATE, SPOIL OR OTHER MATERIAL SHALL BE STORED CLEAR OF ANY DRAINAGE PATH OR EASEMENT, NATURAL WATERCOURSE, FOOTPATH, KERB OR ROAD SURFACE AND SHALL HAVE MEASURES IN PLACE TO THE SATISFACTION OF THE SUPERINTENDENT ACTING REASONABLY, TO PREVENT THE MOVEMENT OF SUCH MATERIAL OFF SITE.

J DRIVEWAY ACCESS PATHS MUST BE STABILISED WITH NEEDLE-PUNCHED GEOTEXTILE COVERED BY A MINIMUM 150MM THICK LAYER OF COARSE GRAVEL, AGGREGATE, OR RECYCLED CRUSHED CONCRETE.

K SEDIMENT TRAPS ARE TO BE INSTALLED DOWNSLOPE OF THE SITE TO FACILITATE THE CAPTURE OF SEDIMENT.

L STREET SWEEPING MUST BE UNDERTAKEN AS REQUIRED DURING AND AFTER EXCAVATION AND CONSTRUCTION UNTIL THE SITE IS FULLY ESTABLISHED.

M THE CONTRACTOR SHALL MAINTAIN DUST CONTROL UNTIL FINAL COMPLETION OF WORKS.

N DURING WINDY WEATHER, LARGE, DISTURBED, UNPROTECTED AREAS SHALL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.

O EROSION AND SEDIMENT CONTROL MEASURES MUST BE MAINTAINED IN GOOD WORKING ORDER, AND BE REPAIRED OR REPLACED THROUGHOUT THE COURSE OF WORKS ON SITE.

P THE CONTRACTOR'S RESPONSIBILITY IS TO ENSURE ALL NECESSARY MEASURES ARE TAKEN SO AS TO PROTECT ALL DISTURBED AREA. ALL ADDITIONAL COSTS ARE TO BE REFLECTED IN THE CONTRACT PRICE EVEN IF SUCH MEASURES ARE NOT INDICATED ON THE SEDIMENT AND EROSION CONTROL PLAN.

Q THE CONTRACTOR MUST COMMENCE REHABILITATION IMMEDIATELY FOLLOWING ANY SITE DISTURBANCE INCLUDING REGRADING, FORMATION AND REVEGETATION WORKS.

R THE CONTRACTOR SHALL REGULARLY WATER REVEGETATED AREAS UNTIL EFFECTIVE COVER HAS PROPERLY ESTABLISHED AND VEGETATION IS GROWING VIGOROUSLY. MAINTENANCE IS TO CONTINUE UNTIL ALL VEGETATION IS WELL ESTABLISHED AND INDEPENDENT OF FURTHER WATER APPLICATIONS.

S KIKUYU NOT TO BE USED FOR TURFING OF ANY DISTURBED AREA.

GEOTEXTILES

1 GEOTEXTILES SHALL BE NON-WOVEN, NEEDLE PUNCHED, CONTINUOUS FILAMENT AND POLYESTER.

2 ALL GEOTEXTILE USED ARE TO COMPLY WITH AS 3706.

3 GEOTEXTILES WITH THE FOLLOWING MINIMUM PROPERTIES TO RTA R63 SHALL BE USED WHERE SPECIFIED WITHIN THE PLANS:-

CLASS	GRAB TENSILE STRENGTH (N) Q	TRAPEZOIDAL TEAR STRENGTH (N) Q	CBR BURST STRENGTH (N)	G RATING (-) Q	PORE SIZE (UM) MEAN	FLOW RATE (L/M²/S) MEAN
A	500	180	1720	900	≤ 120	>50
B	700	250	2250	1350	≤ 120	>50
C	900	350	3200	2000	≤ 120	>50
D	1200	450	4400	3000	≤ 120	>50
E	1600	650	6400	4500	≤ 120	>50

4 GEOTEXTILE MUST BE DELIVERED TO THE SITE AT LEAST 14 DAYS PRIOR TO COMMENCEMENT OF INSTALLATION.

5 CONTRACTOR TO PROVIDE A CERTIFICATE OF COMPLIANCE THAT THE GEOTEXTILE COMPLIES WITH TEST RESULTS REPORTED ON NATA ENDORSED TEST DOCUMENTS; THE CERTIFICATE MUST NOT BE MORE THAN 12 MONTHS OLD.

6 AT ALL JOINS GEOTEXTILES ARE TO BE LAPPED BY NOT LESS THAN 300 MM OR GREATER IF SPECIFIED BY MANUFACTURER. WHERE UNDERLYING MATERIAL IS < CBR 2 LAP IS TO BE INCREASED AS SPECIFIED BY ENGINEER OR SUPPLIER.

7 WHERE INITIAL LAYER OVER GEOTEXTILE HAS D50<150 MM THE INITIAL LAYER OF PLACED LOOSE MATERIAL IS TO BE A MINIMUM OF 300 MM OR 3 TIMES THE D50 (WHICHEVER THE GREATER).

8 WHERE INITIAL LAYER OVER GEOTEXTILE HAS D50>150 MM THE INITIAL LAYER OF PLACED LOOSE MATERIAL IS TO BE A MINIMUM OF 500 MM OR 2 TIMES THE D50 (WHICHEVER THE GREATER).

9 PLANT AND EQUIPMENT ARE NOT TO TRAVERSE PLACED GEOTEXTILE WITHOUT SUPERINTENDENTS PERMISSION UNTIL FIRST LAYER OF COVER MATERIAL IS PLACED.

PRE-COMMENCEMENT BRIEFING

1 A PRE-CONSTRUCTION MEETING IS TO BE HELD BETWEEN PROJECT ENGINEERS, THE SUPERINTENDENT AND CONTRACTOR SO ALL PARTIES INVOLVED UNDERSTAND EARTHWORK REQUIREMENTS AND POTENTIAL DIFFICULTIES.

2 LINES OF COMMUNICATION ARE TO BE CLEARLY DEFINED AT THIS MEETING.

HERITAGE

1 SHOULD ANY POTENTIAL ARCHAEOLOGICAL DEPOSIT LIKELY TO CONTAIN ABORIGINAL ARTEFACTS BE IDENTIFIED DURING THE PLANNING OR HISTORICAL ASSESSMENT STAGE, APPLICATION SHALL BE MADE BY A SUITABLY QUALIFIED ARCHAEOLOGIST TO THE NATIONAL PARKS AND WILDLIFE SERVICE (NPWS) FOR AN EXCAVATION PERMIT FOR ABORIGINAL RELICS.

2 THE APPLICANT SHALL COMPLY WITH THE CONDITIONS AND REQUIREMENTS OF ANY EXCAVATION PERMIT REQUIRED, AND ARE TO ENSURE THAT ALLOWANCE FOR COMPLIANCE WITH THESE CONDITIONS AND REQUIREMENTS INTO THE DEVELOPMENT PROGRAM.

3 SHOULD ANY HISTORICAL RELICS BE UNEXPECTEDLY DISCOVERED IN ANY AREAS OF THE SITE, THEN ALL EXCAVATION OR DISTURBANCE TO THE AREA IS TO STOP IMMEDIATELY AND THE HERITAGE COUNCIL OF NSW SHOULD BE INFORMED IN ACCORDANCE WITH SECTION 146 OF THE HERITAGE ACT 1977.

4 SHOULD ANY ABORIGINAL RELICS BE UNEXPECTEDLY DISCOVERED IN ANY AREAS OF THE SITE, THEN ALL EXCAVATION OR DISTURBANCE TO THE AREA IS TO STOP IMMEDIATELY AND THE NATIONAL PARK AND WILDLIFE SERVICE (NPWS) SHOULD BE INFORMED IN ACCORDANCE WITH SECTION 91 OF THE NATIONAL PARK AND HERITAGE ACT, 1974.

5 IN THE UNLIKELY EVENT THAT SKELETAL REMIANS ARE IDENTIFIED, WORK MUST CEASE IMMEDIATELY IN THE VICINITY OF THE REMAINS AND THE AREA CORDONED OFF. THE PROPONENT WILL NEED TO CONTACT THE NSW POLICE CORONER TO DETERMINE IF THE MATERIAL IS OF ABORIGINAL ORIGIN. IF DETERMINED TO BE ABORIGINAL, THE PROPONENT MUST CONTACT THE OEH ENVIROLINE 131555, A SUITABLY QUALIFIED ARCHAEOLOGIST AND REPRESENTATIVES OF THE LOCAL REGISTERED ABORIGINAL PARTIES TO DETERMINE AN ACTION PLAN FOR THE MANAGEMENT OF SKELETAL REMAINS, FORMULATE MANAGEMENT RECOMMENDATIONS AND TO ASCERTAIN WHEN WORK CAN RECOMMENCE.

DEVELOPMENT APPLICATION - NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	DRAWN	DESIGNED	CHECKED	APPRVD
A	INITIAL RELEASE	28/05/2020	GM	AW/AVG	SL	TH

SCALE

GRID | DATUM | PROJECT MANAGER: TH

CLIENT: OUTLINE PLANNING CONSULTANTS

PROJECT NAME/PLANSET TITLE: RESOURCE RECOVERY FACILITY
CONCEPT CIVIL WORKS
16 TORRENS ROAD, GUNNEDAH, NSW
LOTS 1 AND 2 DP 1226992

martens & Associates Pty Ltd
Consulting Engineers
Environment
Water
Geotechnical
Civil
Suite 201, 20 George St, Hornsby, NSW 2077 Australia Phone: (02) 9476 9999 Fax: (02) 9476 8767
Email: mail@martens.com.au Internet: www.martens.com.au

DRAWING TITLE: GENERAL LEGEND AND NOTES (SHEET 4)

PROJECT NO.	PLANSET NO.	RELEASE NO.	DRAWING NO.	REVISION
P1907434	PS01	R11	PS01-ZZ03	A

DRAWING ID: P1907434-PS01-R11-ZZ03

PRINTED: --- USER PROGRAM

A1 / A3 LANDSCAPE (A1LC_v02.0.01)

Outline Planning Consultants

Waste Management Plan
Resource Recovery Facility
16 Torrens Road,
Gunnedah, NSW

P1907434JR01V03
November 2020

Limitations Statement

The sole purpose of this report and the associated services performed by Martens & Associates Pty Ltd is to prepare a Waste Management Plan in accordance with the scope of services set out in the contract / quotation between Martens & Associates Pty Ltd and Outline Planning Consultants (hereafter known as the Client). That scope of works and services were defined by the requests of the Client, by the time and budgetary constraints imposed by the Client, and by the availability of access to the site.

Martens & Associates Pty Ltd derived the data in this report primarily from a number of sources which may include for example site inspections, correspondence regarding the proposal, examination of records in the public domain, interviews with individuals with information about the site or the project, and field explorations conducted on the dates indicated. The passage of time, manifestation of latent conditions or impacts of future events may require further examination / exploration of the site and subsequent data analyses, together with a reevaluation of the findings, observations and conclusions expressed in this report.

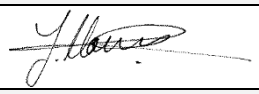
In preparing this report, Martens & Associates Pty Ltd may have relied upon and presumed accurate certain information (or absence thereof) relative to the site. Except as otherwise stated in the report, Martens & Associates Pty Ltd has not attempted to verify the accuracy of completeness of any such information (including for example survey data supplied by others).

The findings, observations and conclusions expressed by Martens & Associates Pty Ltd in this report are not, and should not be considered an opinion concerning the completeness and accuracy of information supplied by others. No warranty or guarantee, whether express or implied, is made with respect to the data reported or to the findings, observations and conclusions expressed in this report. Further, such data, findings and conclusions are based solely upon site conditions, information and drawings supplied by the Client *etc*. in existence at the time of the investigation.

This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the provisions of the agreement between Martens & Associates Pty Ltd and the Client. Martens & Associates Pty Ltd accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report by any third party.

Head Office
Suite 201, 20 George St
Hornsby, NSW 2077, Australia
ACN 070 240 890 ABN 85 070 240 890
Phone: +61-2-9476-9999
Fax: +61-2-9476-8767
Email: mail@martens.com.au
Web: www.martens.com.au

Document and Distribution Status

Author(s)	Reviewer(s)	Project Manager	Signature
Mark Laidlaw	Terry Harvey, Stanley Leung	Terry Harvey	

Revision No.	Description	Status	Release Date	Document Location			
				File Copy	Client		Void
1	For client review	Draft	16/06/2020	1E,1E, 1H	1H		
2	For client review	Draft	29/07/2020	1E,1E, 1H	1H		
3	For client review	Draft	22/09/2020	1E,1E, 1H	1H		
4	For submission	Final	30/10/2020	1P	1P		

Distribution Types: F = Fax, H = hard copy, P = PDF document, E = Other electronic format. Digits indicate number of document copies.

All enquiries regarding this project are to be directed to the Project Manager.

Contents

Tables

1 Proposed Waste Facility

1.1 Regional Context and Site Description

The proposed name of the site is the Torrens Road Waste Recycling and Transfer Facility (the Site). The site is located within a recently constructed industrial estate located to the west of Gunnedah, in the Gunnedah local government area (LGA). Gunnedah Shire is located in the North West Slopes Region of north-west New South Wales, about 450 kilometres north of the Sydney CBD, and about 650 kilometres south of the Brisbane CBD.

Gunnedah Shire is bounded by Narrabri Shire in the north, the Tamworth Regional Council area in the east, Liverpool Plains Shire in the south, and Warrumbungle Shire in the west. The Gunnedah LGA has an estimated (ABS 2018) population of 12,661 persons. The township of Gunnedah comprises the largest settlement with the LGA, having an estimated (ABS 2018) population of 10,101 persons. The surrounding rural area of this LGA has an estimated (ABS 2018) population of 2,479 persons.

1.2 Site Details & Context

The Site comprises Lots 1 and 2 in Deposited Plan (DP) 1226992 at No.16 Torrens Road, Gunnedah, having a combined area of 2.779 ha with a frontage to Torrens Road of approximately 75 metres and to Allgayer Drive of just over 200 metres. The land has a depth from Allgayer Drive ranging from about 75 m to 140 m. Lots 1 and 2 both have drainage easements 6m wide along their northern boundaries. Lot 1 has an area of 1.826 ha and Lot 2 has an area of 0.9530 ha. A map showing the site location is presented in Attachment A (Map 01).

1.3 Scope and Objectives

The purpose of this Waste Management Plan (WMP) is to provide information on the key waste management requirements for the Site, including the following:

- Details of the classification and quantity of waste that would be accepted, handled and transferred;
- Waste classification and incoming waste quality plan;
- Description of how waste would be stored and managed on site, including transport of waste to and from the site;
- Details of the waste monitoring program;

- Details regarding leachate control; and
- Details regarding plant and equipment.

2 Overview – Proposed Waste Facility

Development consent is sought for a waste management facility, including resource recovery and waste transfer facility ("waste facility") handling up to 250,000 tonnes per annum of waste for separating and sorting, processing or treating, temporary storage, or transfer or sale of recovered resources ("the Project") as set out in the following:

- **Excavated natural material that meet the CT1 thresholds as per the NSW EPA (2014c) guidelines**: Excavated natural materials are not pre-classified waste types. Building and demolition projects are likely to include excavated natural materials which are typically generated during bulk earthworks and road and infrastructure repair. This would include Virgin Natural Excavated Material (VENM along with Excavated Natural Material (ENM) and topsoils including but not limited to sand, clay, naturally occurring rock, shale and sandstone. This may include larger rocks and stones that would be suitable for production of road base and other products after processing at the Torrens Road facility. The guideline's CT1 thresholds identify the requirements for 'general solid waste' (GSW) and are commonly referred to in EPLs to aid in the definition of the waste type-a reasonable standard for defining the waste type. It is tentatively estimated that CT1 material would comprise about 50% of the intended waste stream ie. 125,000 tonnes per annum. [NOTE: Only soils and excavated natural material that meet the CT1 thresholds per the EPA's guidelines will be accepted].

- **Contaminated soils:** A smaller amount of waste to be accepted will be acid sulphate soils (PASS, ASS). It is tentatively estimated that this waste material would comprise up to about 10% of the intended waste stream ie. 25,000 tonnes per annum.

- **Co-mingled and segregated Construction and Demolition (C&D) waste**, tentatively estimated to comprise about 25-30% of the intended waste stream ie. 62,500-75,000 tonnes per annum. This type of waste includes but not limited to bricks, concrete, tiles, suitable slags and concrete batching waste, asphalt (including recycled asphalt profilings), rock/rail ballast spoils, and any other material meeting the definition of Construction and Demolition waste as defined in the EPA Waste Classification Guidelines Part 1: Classifying Waste (NSW EPA, 2014c).

- **Commercial and Industrial (C&I) waste**, tentatively estimated to comprise about 15% of the intended waste stream i.e. 37,500 tonnes per annum. This type of waste includes but not limited to

paper/ cardboard, plastics, rubber, plasterboard, cement fibre board, ceramics, glass, styrene, and metal

- It is anticipated that small quantities only of appropriately sealed asbestos waste will be delivered to the proposed waste facility- up to about 1,000 tonnes per annum. The aim will be to store this waste on site in separate, secured storage facilities until sufficient quantity is achieved (about 33-38 tonnes) in order that it be economically trucked to an authorised asbestos waste disposal facility elsewhere. Any unexpected finds asbestos will also be stored on site in a secure storage.

- It is proposed to receive and to store lithium batteries derived from waste received- a hazardous waste. It will be stored on site in a secure storage shed until sufficient quantity is achieved in order that it be trucked to an authorised waste disposal or recycling facility elsewhere. It is anticipated that very small quantities only of this waste will be delivered to the proposed waste facility- up to about 0.5 tonnes.

- Processed waste to be transported from the site for either the purpose of reuse or landfill disposal.

- No other types of hazardous or special waste will be accepted at the site. No garden (green) waste, household waste or timber/wood waste, tyres, liquid waste, chemical waste or putrescible waste will be accepted by the proposed waste facility.

- The recycled materials able to be produced including but not limited to soils and mulched material suitable for landscaping or rehabilitation and civil construction applications, aggregates, road-base, drainage material, dry paper/cardboard and metals.

- The aim of the recycling process will be to produce end recycled products that meet EPA resource recovered orders while recovering a range of materials that may otherwise be disposed to landfill. All of the materials brought onto the site are taken from the site as products or as rejects for disposal at a licensed landfill.

- The recycled materials able to be produced include soils suitable for landscaping or rehabilitation purposes, and road-base.

- The aim of the recycling process will be to produce end recycled products that meet recycled material specifications while recovering a range of materials that may otherwise be disposed to landfill. All of the materials brought onto the site are taken from the site as products or as rejects for disposal at a licensed landfill.

No materials are land-filled or otherwise disposed anywhere within the site. With the exception of asbestos waste all other waste destined to landfill will be directed to a licensed landfill.

- Material would be transported to the site by MEX or contractors and the general public. Prior to processing, delivered material would be inspected and unwanted items such as fuel, oil and other motor fluid from motor vehicles would be removed.

- The proposed waste facility can utilise other existing facilities already owned and used by Mackellar Group, including but not limited to diesel fuel tanks, heavy vehicles used to transport waste and recycled material to and from the site, office and staff amenities, parking, and stormwater detention, as well as crushing andscreening plant- the latter from MacKellar Excavations' Mount Mary quarry operation. Processing would be undertaken with the above equipment.

- A summary of the waste stream received sources and percentage of total waste, classification, treatment/processing and destination of wastes is presented in Table 1.

Table 1: Estimated Waste Stream Summary at the Site

Received Source	Percentage of Total Waste	Classifications	Treatment/Processing	Destination
Soils and Spoil from Civil Construction Projects	50%	Topsoil (organics)	Screening/Amelioration/Validation	Engineered Fill / Mine Site Rehabilitation / Daily Cover
		VENM		
		ENM		
		Acid Sulfate Soil (10%)	Lime Stabilisation / Validation	
		GSW/RSW	Blending / Contaminant Removal / Immobilisation / Bioremediation / Validation	Engineered Fill / Daily Cover / Landfill
Construction and Demolition Waste	25-30%	Concrete / Brick / Tiles	Crushing / Screening	Engineered Fill / Recycled Road Base
		Asphalt-Recycled Asphalt Profilings	Crushing / Screening	Engineered Fill / Recycled Asphalt Profiling - Asphalt Plant
		Rock / Railway Ballast	Crushing / Screening	Engineered Fill / Recycled Road Base
		Asbestos (sealed containers)	Storage and Bulk Disposal	Landfill
C & I Waste	15%	Metal / Rubber / Timber / Styrene / Plastic / Glass / Cardboard / Paper / Lithium batteries	Segregation / Separation / Shredding / Compacting / Crushing / Bailing / Storage	Recycling / Re-processing / Reuse Facilities

GSW = general solid waste; RSW = restricted solid waste; ENM = excavated natural material; VENM = virgin excavated natural materia

3 Waste Process Proposed at Facility

3.1 Waste Management Flow Charts

Waste management flow charts for the following materials are provided in Attachment B:

- Construction and demolition (C & D) waste, commercial and Industrial (C& I).
- Acid sulfate soils (ASS)and potential acid sulfate soils (PASS).
- Virgin excavated natural material (VENM) and excavated natural material (ENM) that meet the CT1 threshold.
- Lithium batteries.
- Asbestos.

3.2 Waste classification and Incoming Waste Quality Plan

Wastes to be accepted at the site are listed above. These wastes will be classified according to the Waste Classification Guidelines - Part 1: Classification of Waste (EPA 2014c).

The following wastes will not be accepted at the proposed waste facility:

- Special waste (including clinical waste, asbestos-contaminated C&D or C&I waste) but excluding sealed asbestos.
- Anything classified as special waste under an EPA gazettal notice, as defined in EPA (2014c) Step 1.
- Liquid waste as defined in EPA (2014c) Step 2 eg. solvents, oils and greases.
- Wastes pre classified as hazardous waste as defined in EPA (2014c) Step 3 eg. paints, dyes, pesticides[NOTE: with the exception of lithium batteries, which will be collected and stored until there is a sufficient quantity for transporting to a facility licensed to either process or dispose to landfill, or bituminous products (such as road sealing and asphalt) which are capable of recycling and re-use].
- General solid waste (putrescible) as defined in EPA (2014c) Step 3.

- Waste possessing hazards as defined in EPA (2014c) Step 4.
- Waste that requires chemical assessment to determine its classification as defined in EPA (2014c) Step 5.
- Waste that readily decays under standard conditions or does emits offensive odours or is capable of attracting vermin or other vectors or decaying waste is not to be accepted as defined in EPA (2014c) Step 6.

The facility will adopt an Incoming Waste Quality Plan, to include the following key elements:

- Advising of the wastes to be accepted at the Torrens Road waste facility- refer to list above.
- Advising of the wastes that will not be accepted at the Torrens Road waste facility- refer to list above.
- Related to the above, a notice to staff will be given immediately if hazardous materials or conditions are found onsite that are in unprotected environments including the following:
  - Flammable or explosive liquids or gases.
  - Toxic materials.
  - Noxious or explosive chemicals.
- Installation of suitable warning signage at the Torrens Road entry to the site advising of the above restrictions regarding waste accepted and not accepted at the waste facility.
- Training staff who will be working on the site on waste inspection and asbestos awareness and management, as well as involving those staff in education programs at material source locations to minimise the risk of unwanted waste entering the waste supply chain and being accepted onto the premises. As part of any site induction and training staff will be trained in waste processing generally including the following:
  - Waste tracking.
  - Waste identification and classification.
  - Procedures for dealing with non-confirming waste.

- This training ensures that staff receive adequate training to be able to recognise and handle any hazardous or other prohibited waste.

- Setting down of contingency actions if unacceptable waste materials is identified, including preparation of a rejected load register and reporting to the EPA, or for other contingency events, including fires, spills or equipment failures.

- Empowering waste inspectors to reject loads considered 'suspect' or odourous.

- Products produced for direct sale will be tested in accordance with requirements of the relevant resource recovery exemption.

- Waste monitoring and reporting. Each weigh-bridge will record details of incoming and outgoing waste truck traffic including the following:

  - Date.

  - Vehicle Registration.

  - Customer.

  - Waste type including nature and origin of the waste, certification.

  - Gross and Tare Weight.

3.3 Resource Recovery Wastes

The resource recovery processes that would occur on the site are described below according to the waste type. On average, 905 tonnes per day of waste would be delivered to the Torrens Road Gunnedah site in a range of vehicles including 0.5-tonne domestic trailer loads, 8-tonne rigid trucks and 30 tonnes + heavy articulated trucks. Trucks are inspected and weighed on arrival (and departure, with the difference in weight being the waste payload). The trucks are then directed to unload in the covered unloading area where waste will be sorted, processed and prepared for transfer to the processing shed for further processing.

- **Excavated material that meets CT1 thresholds**

  This material would be mechanically sorted and shredded by front-end loader in the unloading shed prior to either crushing and/or screening in the processing shed. Then it would be mechanically screened by the trommel in the processing shed and blended for re-use, followed by transfer to the onsite storage

bins. Any contaminated residue would be removed for landfilling at a licensed facility.

- **Contaminated soils (ASS and PASS)**

  Acid sulfate soils (ASS) would be blended with lime on site, verified such that it is capable of reverting to GSW and ultimately disposed to landfill (unless an Exemption is granted), in accordance with the EPA's neutralising techniques outlined in the *ASS Manual (NSW ASSMAC, 1998)* and *Waste classification guidelines: Part 4: Acid Sulfate soils* requirements (NSW EPA, 2014d). Following neutralisation, the waste must be chemically assessed to determine whether there are any other contaminants that may affect how the waste is classified for disposal. Any landfill will be informed that the actual ASS has been treated in accordance with the neutralising techniques outlined in the ASS Manual (NSW ASSMAC, 1998) and that the waste has also been classified in accordance with Part 1 of the *Waste Classification Guidelines* (NSW EPA, 2014c). Potential acid sulfate soils (PAAS) will be treated in accordance with the same EPA requirements. Potential ASS must be kept wet at all times during excavation and subsequent handling, transport and storage, until they can be disposed of safely.

- **Construction and Demolition (C&D) waste**

  This material would be mechanically sorted and shredded by front-end loader in the unloading shed prior to either crushing and/or screening in the processing shed in accordance with the NSW EPA Minimum Standards for Managing Construction and Demolition Waste in NSW (NSW EPA, 2016). The resultant material would be separated into various components and stockpiled for either resale as a recycled product with material not suited to recycling removed to a licensed facility. Waste including concrete, bricks and tiles would be crushed on a campaign basis before being mechanically screened and stockpiled in the storage bins as aggregate, sand and road base for sale.

- **Commercial and Industrial (C&I) waste**

  The waste would be mechanically sorted and shredded by front-end loader in the unloading shed prior to either crushing and/or screening in the processing shed. The resultant material would be separated into its various components and stockpiled for either resale as a recycled product with material not suited to recycling removed for landfilling at a licensed facility. Bricks, concrete and tiles would be crushed on a campaign basis before being

mechanically screened and stockpiled as aggregate, sand and road base for sale.

- **Asbestos and lithium batteries**

  These materials will be suitably stored in a stand-alone restricted waste storage facility. It is estimated that no more than about 33-38 tonnes of asbestos waste and about 0.5tonne of lithium batteries will be stored on site at any one time.

3.4 Resource Recovery Products

The proposed waste facility will unlock value by transforming the above waste into materials capable of use for a wide range of applications, including but not limited to the following:

- **Road base (crushed concrete**): Suitable for use on roads where tradition quarried products would be applied. The material is compliant to Council specifications and RMS specification RMS 3051 for the supply of material as either a base course (DGB20) or sub-base (DGS40, DGS20) layer in pavements.

- **Road base (crushed concrete/brick/tile/asphalt (Rap)/ Cement fibre board):** Suitable for use on roads with a traffic loading of less than 1x106 ESA as either a base course or sub-base.

- **Recovered railway ballast**.

- **General fill soil (ENM) or topsoil.**

- **Select Fill (capable of using all wastes including blends of material to comply with council and RMS specifications):** Material placed directly on the sub-grade to improve sub-grade performance. Can also be used as engineering fill to raise site levels, particularly in road embankments or beneath buildings. Engineered fill should have a CBR of at least 5%. This product could also be used as a capping material used for railway pavement applications.

- **Bedding Material (crushed concrete/brick/cement fibre board/ screened gravelly soil):** Screened material with about a 7mm maximum particle size used as a support for paving blocks, pipe bedding, concrete under slab fill, retaining walls, block infill, cycleways or on lightly trafficked access-ways.

- **Drainage medium (crushed concrete/brick):** Backfilling material for stormwater pipes, sewer pipes or sub-surface drainage lines.

- **General fill – Hardstand material:** All recycled materials crushed and screened to a sizing requirement for specific applications can

be utilised as a general or engineered fill in road making applications. This includes soils/clay that have been processed screen to meet the requirements of NSW EPA recovered Fines or meet the definition of Excavated public road material.

The recycled material above will be compliant with applicable NSW EPA orders including but not limited to the following:

- Cement Fibre Board.
- Coal ash.
- Excavated Natural Material (ENM).
- Excavated public road material.
- Mulch.
- Plasterboard.
- Reclaimed asphalt pavement.
- Recovered Aggregate.
- Recovered Fines.
- Recovered railway ballast.
- Recovered glass sand.

3.5 Transportation of Waste

Waste will be delivered to site by a variety of small and heavy vehicles, ranging from car and trailer up to a 'truck and dog' and other multiple axle heavy vehicles, the latter carrying loads in excess of 32 tonnes per load.

Vehicles will access the site from the Oxley Highway, Kamilaroi Highway Quia Road and Torrens Road, all of these routes being suitable for heavy vehicles. Trucks are not expected to remain on the site for any extended period of time as the trucks would be processed as they come in. Therefore, parking for trucks would not be required. Furthermore, the site layout has been designed using *AustRoads Design Vehicles and Turning Path Templates* (Austroads, 2013*)* and to accommodate worst case queuing of trucks entering the site. A map showing the truck turning templates for the largest truck likely to use the site - a B double, is presented in Attachment A – (Drawing PS01-GZ10).

It is estimated that delivery of waste to the site should take between an estimated 14-16 minutes, which allows for an incoming vehicle entering the site and be weighed and checked, travel to the unloading area, weighing and invoicing at the outgoing weigh bridge and departing the site. Similarly, it should take between an estimated 14-16 minutes for the dispatching of waste loads, including allowance for an incoming empty vehicle entering the site and weighing at the weigh bridge, loading of material from the stockpile bays, and weighing of outgoing vehicles.

3.6 Inspection and unloading of unprocessed waste

The layout of the proposed waste facility is illustrated in Attachment A – (Drawing PS01-A300). Vehicles transporting waste would enter the project site from the Torrens Road entry and make their way to the weigh-bridge for weighing and inspection and classification, prior to unloading. There will be two main screening points for identification of the type of waste received at the waste facility:

- At the weigh-bridge. The operator of the weigh-bridge will seek details from the waste truck driver as to contents of load, certification of the incoming waste material if required, as well as a visual inspection of the load, if necessary, before directing the vehicle to enter the unloading facility. All incoming waste will be inspected against a proposed incoming waste quality management plan prior to being accepted.

- In the initial unloading area, the operator of the frontend loader will inspect the waste as it is discharged from the waste truck, to check for non-conforming waste and easily extractable, bulk recyclable waste.

The weigh-bridge will be the primary source within the waste facility for tracking waste, including monitoring the quantity, type and source of waste received on site, and the quantity, type and quality of the outputs produced on site.

The driver will then deliver the waste to the nominated waste unloading or storage area where it will be tipped and further inspected prior to the load being accepted and the vehicle being directed back to the weigh-bridge area. All operations, including stockpiling, screening, picking, pre-sorting, and sorting of unprocessed waste will occur within these covered sheds.

At the site entry all loads will be inspected by trained staff who will conduct a preliminary inspection for contaminants (e.g. asbestos). If these loads are initially accepted and contaminated asbestos material is found after unloading the contaminated material will be transferred

direct to a secure shed for storage and ultimate disposal to a landfill licensed to accept such material.

If a load of non-conforming waste is identified prior to unloading, the vehicle would be directed to an appropriate disposal facility elsewhere. Trucks would then exit the project site accessing a proposed new weigh-bridge and wheel-wash facility before exiting the project site. Trucks exiting the site will be re-weighed as they leave the site to determine the mass of the load delivered. Any rejected loads will be immediately reloaded for removal from the site and recorded in a 'rejected load' register.

A range of mobile plant (eg. screen/trommel, crushing plant, excavator, front-end loader) and a screening/ picking line, will be used to handle and process the waste for each waste type.

Some waste will not able to be recycled onsite. This waste material will be stockpiled prior being sent for further offsite recycling or disposal at a licensed facility. Recycled products generally will be dispatched by heavy vehicle for sale or further processing at another facility. Non-recyclable residues will generally be dispatched to a licensed landfill by heavy vehicle. Waste processing will include sorting, screening and blending (of soil).

3.7 Main Processing Area

With the exception of tyres and asbestos waste, all other sorted material will then be processed in the main processing shed using a mobile, diesel-powered trommel. A trommel is a mechanical screening machine used to separate materials, including the solid-waste processing industries. It consists of a perforated cylindrical drum that is normally elevated at an angle at the feed end which will screen waste to various specifications depending on intended final use.

Trommel screens are widely used for wood chips, soil, solid waste, rock and aggregates accurate sizing and separation.

Unprocessed waste material is initially fed by front-end loader into the feed chute of the trommel (refer Photograph 3.1), where it then enters the drum screen, and due to the inclination and rotation of the roller device, the material on the screen surface will turn over and roll, so that the qualified (processed) end product will be discharged through the outlet at the bottom of the drum, with the unqualified (reject) material discharged through the outlet at the side of the drum.

Different screen materials can be used according to intended end-use requirements. The roller device adopts an effective fully sealed structure, which is dust-free.

A crusher will be brought in from the Mackellar group's Marys Mount quarry on a campaign basis to crush waste material when required.

3.8 Waste Management

Only sealed asbestos will be accepted on site. Minimal quantities only of asbestos is expected, save for unexpected finds- the latter activating asbestos handling protocols. It is difficult to determine how much asbestos will be handled in any one year, most likely something of the order of 1-5 tonnes.

Similarly, the quantity of lithium ion batteries would be expected to be minimal, most likely something of the order of 1 tonnes pa.

Much will depend on the market for either waste material, which will only be determined once the waste facility commences. To set upon some absolute minimum or maximum tonnage would be most premature.

4 Surface Water and Groundwater Management

4.1 Storm Water

All of the operating waste facility will have a sealed surface: the truck movement areas having an asphalt seal, with the processing, unloading and storage areas having a concrete surface. Lots 1 and 2 both have drainage easements 6m wide along their northern boundaries.

Two (2) on-site detention (OSD) sediment basins are planned, one collecting stormwater runoff from the proposed waste facilities on Lot 2, the other collecting stormwater runoff from the proposed waste facilities on Lot 1. The site will be graded to allow runoff from the external hardstand areas to flow overland to the two OSD pits. Clean runoff from the roof of the processing and unloading area will be collected into water reuse tank storage.

Following site construction and implementation of the site stormwater retention system, the quality of the water leaving the site is expected to have a negligible impact on water quality of the downstream environment.

4.2 Fire Water

Proposed bunds and OSD sediment basins on lot 1 and 2 will be fitted with a manual shut-off valve on the outlet pipe. In the event of a firefighting emergency, the shut-off valve will activate, preventing water being released from the sediment basins and ensuring no release of fire hydrant water from the site. The proposed site storage volume is sufficient to contain 576 KL of fire hydrant water based on a hydrant flow of 40 L/sec (four hydrants simultaneously) for at least 4 hours. Fire hydrant water stored within the site basins and bunds area is to be collected by a licensed wastewater contractor following a fire event.

4.3 Groundwater Assessment

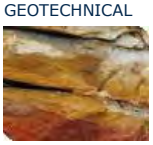
Review of NSW government public record (NRATLAS) revealed there are two bores within 2.5 km to the site which contain groundwater data or standing water level information. Results are summarised in Table 2.

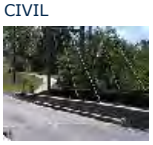
Table 2: Groundwater Bore Search

Bore Identification	Record Date	Standing Water Level (mbgl)	First Water Bearing Zone (mbgl) and Substrate	Distance and Direction from IA
GW901507	1998	9.0	2.0 – 10 clay	1,900 m north west
GW969668	2011	8.5	1 – 11 clay	2,068 m north west

Outline Planning Consultants

Concept Stormwater Management Plan: Resource Recovery Facility - 16 Torrens Road, Gunnedah, NSW





P1907434JR03V03
November 2020

Limitations Statement

The sole purpose of this report and the associated services performed by Martens & Associates Pty Ltd is to prepare a Concept Stormwater Management Plan in accordance with the scope of services set out in the contract / quotation between Martens & Associates Pty Ltd and Outline Planning Consultants (hereafter known as the Client). That scope of works and services were defined by the requests of the Client, by the time and budgetary constraints imposed by the Client, and by the availability of access to the site.

Martens & Associates Pty Ltd derived the data in this report primarily from a number of sources which may include for example site inspections, correspondence regarding the proposal, examination of records in the public domain, interviews with individuals with information about the site or the project, and field explorations conducted on the dates indicated. The passage of time, manifestation of latent conditions or impacts of future events may require further examination / exploration of the site and subsequent data analyses, together with a re-evaluation of the findings, observations and conclusions expressed in this report.

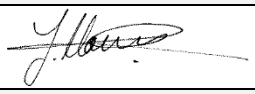
In preparing this report, Martens & Associates Pty Ltd may have relied upon and presumed accurate certain information (or absence thereof) relative to the site. Except as otherwise stated in the report, Martens & Associates Pty Ltd has not attempted to verify the accuracy of completeness of any such information (including for example survey data supplied by others).

The findings, observations and conclusions expressed by Martens & Associates Pty Ltd in this report are not, and should not be considered an opinion concerning the completeness and accuracy of information supplied by others. No warranty or guarantee, whether express or implied, is made with respect to the data reported or to the findings, observations and conclusions expressed in this report. Further, such data, findings and conclusions are based solely upon site conditions, information and drawings supplied by the Client *etc*. in existence at the time of the investigation.

This report has been prepared on behalf of and for the exclusive use of the Client, and is subject to and issued in connection with the provisions of the agreement between Martens & Associates Pty Ltd and the Client. Martens & Associates Pty Ltd accepts no liability or responsibility whatsoever for or in respect of any use of or reliance upon this report by any third party.

Head Office
Suite 201, 20 George Street
Hornsby, NSW 2077, Australia
ACN 070 240 890 ABN 85 070 240 890
Phone: +61-2-9476-9999
Fax: +61-2-9476-8767
Email: mail@martens.com.au
Web: www.martens.com.au

Document and Distribution Status

Author(s)	Reviewer(s)	Project Manager	Signature
A. van Gogh	Stanley Leung	Terry Harvey	

Revision No.	Description	Status	Release Date	Document Location			
				File Copy	Outline Planning Consultants		
1	Development Application	Draft	03/06/2020	1P, 1E, 1 H	1P		
2	Development Application	Final	23/09/2020	1P, 1E, 1 H	1P		
3	Development Application	Final	03/11/2020	1P, 1E, 1 H	1P		

Distribution Types: F = Fax, H = hard copy, P = PDF document, E = Other electronic format. Digits indicate number of document copies.

All enquiries regarding this project are to be directed to the Project Manager.

Contents

1 Introduction

1.1 Overview

This report has been prepared to support a state significant development application (SSDA) for a proposed resource recovery facility at 16 Torrens Road, Gunnedah, NSW. It provides an assessment of the proposed development with respect to stormwater quantity and quality management and a water balance assessment.

This report is to be read in conjunction with the drawings by Martens and Associates (MA) planset P1907434PS01 which demonstrates the proposed development works and stormwater management system for the purpose of DA.

1.2 Scope

This report outlines the following:

- Evidence of compliance with Secretary's Environmental Assessment Requirements (SEARs) SSD 1380 as they relate to stormwater management and runoff.
- Documentation of results of a water quality assessment for the site.
- Treatment train specification to achieve nominated water quality objectives.
- Documentation of a water balance assessment completed for the site.
- Assessment of on-site detention (OSD) requirements for the site.
- Details of the firewater management system.

1.3 Relevant Planning Controls and Design Principles

The following planning and engineering controls and design principles have been used:

- Gunnedah Shire Council (GSC) (2012) Development Control Plan (DCP).
- GSC (2013) Engineering Guidelines for Subdivisions and Developments.
- Fire and Rescue NSW (2019) Fire safety in waste facilities.

2 Site Description

2.1 Regional Context and Site Description

The proposed name of the site is the Torrens Road Waste Recycling and Transfer Facility. The site is located within a recently constructed industrial estate located to the west of Gunnedah, in the Gunnedah local government area (LGA). Gunnedah Shire is located in the North West Slopes Region of north-west New South Wales, about 450 kilometres north of the Sydney CBD, and about 650 kilometres south of the Brisbane CBD.

Gunnedah Shire is bounded by Narrabri Shire in the north, the Tamworth Regional Council area in the east, Liverpool Plains Shire in the south, and Warrumbungle Shire in the west. The Gunnedah LGA has an estimated (ABS 2018) population of 12,661 persons. The township of Gunnedah comprises the largest settlement with the LGA, having an estimated (ABS 2018) population of 10,101 persons. The surrounding rural area of this LGA has an estimated (ABS 2018) population of 2,479 persons.

2.2 Site Details & Context

The Site comprises Lots 1 and 2 in Deposited Plan (DP) 1226992 at No.16 Torrens Road, Gunnedah, having a combined area of 2.779 ha with a frontage to Torrens Road of approximately 75 metres and to Allgayer Drive of just over 200 metres. The land has a depth from Allgayer Drive ranging from about 75 m to 140 m. Lots 1 and 2 both have drainage easements 6m wide along their northern boundaries. Lot 1 has an area of 1.826 ha and Lot 2 has an area of 0.9530 ha.

3 Stormwater Quality Assessment

3.1 Water Quality Objectives

NSW EPA stormwater retention targets have been adopted for the site. The following water quality objectives are to be achieved by the development when comparing the developed site with and without integration of water quality treatment measures:

- 85% reduction in total suspended solids (TSS).
- 65% reduction in total phosphorus (TP).
- 45% reduction in total nitrogen (TN).

3.2 Modelling Methodology

3.2.1 Overview

The Model for Urban Stormwater Improvement Conceptualisation (*MUSIC*, Version 6.3) developed by the CRC for Catchment Hydrology was utilised to evaluate treatment train effectiveness (TTE) and post development pollutant generation from the site.

Modelling has been undertaken in accordance with BMT WBM (2015) guidelines with the developed site based on design briefs and water quality treatment devices included to achieve adopted objectives.

The adopted objectives were achieved individually by each lot of the development. The MUSIC model layout is provided in MA planset P1907434PS01 drawing PS01-E700.

The MUSIC model was also used to conduct a water balance assessment across the site.

3.2.2 Approach

To achieve adopted objectives, an iterative approach was used for post development modelling to determine appropriate types, sizes and locations of stormwater treatment devices. Each lot was considered individually.

The following modelling scenarios were considered:

- Post development (untreated) – the developed site without any water quality improvement devices included.
- Post development (treated) – the developed site with water quality improvement devices included to achieve stormwater quality objectives.

At source and end-of-line treatment structures were assessed to determine the most effective treatment option.

3.2.3 Climate Data

Rainfall climate data was sourced from the Bureau of Meteorology (BOM) weather station located at the Gunnedah Research Centre (Station No. 055024). The data was run on a 6-minute timestep from 30/04/1946 – 31/07/2010.

3.2.4 Input Parameters

Refer to Attachment A for listed input parameters.

3.2.5 Model Parameters

Base and storm flow concentration inputs were adopted based on BMT WBM (2015) source node guidelines and MUSIC defaults for the different land uses.

3.2.6 Catchment Area

Post development catchment areas are provided in MA planset P1907434PS01 drawing PS01-E700.

3.3 Treatment Train Philosophy

The stormwater treatment strategy for the site aims to provide at source and end of line controls, in accordance with the principles of WSUD, to satisfy treatment objectives. Major treatment components include:

- Rainwater tanks
- Buffer strips
- Gross pollutant traps (GPTs)
- Sediment tanks

The proposed treatment train is shown schematically in MA planset P1907434PS01 drawing PS01-E700.

Individual stormwater quality improvement devices (SQIDs) included in conceptual modelling are outlined in the following sub-sections.

3.3.1 Rainwater Tanks

Rainwater tanks for each lot shall be included to capture roof water for reuse.

The rainwater tanks on Lot 1 will require a minimum capacity of 10 kL with water to be reused internally. Internal reuse is based on a total of 10 staff, requiring approximately 40 L/person/day, this rate accounts for non-potable uses such as toilet flushing.

The rainwater tanks on Lot 2 are proposed to contain 120 kL with water to be reused for dust suppression and irrigation. Dust suppression is estimated to require 0.25 L/m^2/day (applied to hardstand areas), while irrigation has been calculated based of a rate of 800 kL/year for the entire site.

3.3.2 Buffer Strips

Vegetated areas are proposed to treat sheet flow runoff from pavement on Lot 1, acting as buffer strips. The buffer strips will filter coarse matter and reduce pollutant loads to downstream treatment devices.

Extents of buffer strips shall be confirmed at detailed design stage. Refer to MA planset P1907434PS01 drawing PS04-E100 for buffer strip location and grading.

3.3.3 Gross Pollutant Traps (GPTs)

GPTs are devices proposed to treat and capture coarse pollutants in stormwater to prevent them from travelling further downstream. GPTs function by filtering the water as it passes through the device.

SPEL Stormsacks were modelled in MUSIC to treat water prior to entry to the OSD. The modelled treatment efficiency of the device is based on the manufacturer's specifications, equivalent pit inserts from other suppliers could be substituted.

3.3.4 Sediment Basin

A sediment basin is proposed within each lot (to be configured to be combined with an OSD basin), allowing contaminants in the runoff to settle to the base of the basin. An OSD tank is proposed to be linked to the sediment tank overflow.

This basin will require water to be pumped out to maintain the storage volume after significant rainfall events. Sediment collecting in the base will be removed on a regularly basis.

Location of the sediment basins is shown on MA planset P190434PS01 drawing PS01-E100 with additional details on drawing PS01-E200.

3.4 MUSIC Water Quality Results

Results of the post development site with no treatment devices modelled against the post development site with treatment devices are provided in MA planset P1907434PS01 drawing PS01-E700.

The results demonstrate that the pollutant reduction targets are achieved for each lot. Proposed water quality controls are able to reduce the developed site pollutant loads to the treatment target objectives.

3.5 MUSIC Water Balance Assessment

The MUSIC model used to model water quality was also used to perform a water balance for each lot.

3.5.1 Lot 1 Water Balance

The water balance model results are summarised below in Table 1.

Table 1: Lot 1 Water balance results.

Surface	Average Annual Water Volume (ML/yr)
Ground surface runoff to drainage system	5.99
Roof runoff to drainage system	0.22
Roof runoff harvested and reused	0.12
Total	6.33

The water demands for Lot 1 are based of non-potable reuses of water within the office buildings, this accounts for elements such as toilet flushing. The demands per person are estimated as 43 L/person/day. Assuming, on average, 10 people are present at the site the water demand is 0.43 kL/day.

The water demands for operation of the site for Lot 1 total approximately 0.17 ML/yr, of this 0.12 ML/yr (approximately 70%) is supplied by captured roof water.

This leaves approximately 6.21 ML/yr to be released to the receiving environment.

The existing site is largely impervious and only a minor increase in impervious area is proposed by the development. There will likely slightly increase the volume of stormwater runoff produced by the site, however it is offset by stormwater reuse.

3.5.2 Lot 2 Water Balance

The water balance model results are summarised below in Table 1.

Table 2: Lot 2 Water balance results.

Surface	Average Annual Water Volume (ML/yr)
Ground surface runoff to drainage system	2.22
Roof runoff to drainage system	0.88
Roof runoff harvested and reused	1.20
Total	4.30

The water demands for Lot 2 include dust suppression of the roads and storage areas (across both lots) and for irrigation of the gardens. The dust suppression has been estimated at 0.125 L/m^2/day, to be applied to an area of 1.89 ha. This provides a daily rate of 2.36 kL. Additionally, water is to be reused to irrigate 50% of the landscaped areas. A rate of 2000 kL/ha/year was assumed and with total landscaping on the site equal to 0.8 ha, this provides another 800 kL of water demand a year.

The water demands for operation of the site for Lot 1 total approximately 1.66 ML/yr, of this 1.20 ML/yr (approximately 70%) is supplied by captured roof water. This leaves approximately 3.10 ML/yr to be released to the receiving environment.

The existing site is largely impervious and previously all runoff was discharged to Council's drainage infrastructure. The development is not proposed to significantly increase the amount of impervious surface on the site and in conjunction with proposed stormwater reuse system will likely significantly reduce the volume of outflows from the site. Approximately 25% of all stormwater runoff is captured and reused on Lot 2.

3.5.3 Site Discharge Frequency

The discharge frequency for the entire is presented visually in MA planset P1907434PS01 drawing PS01-E700.

Over the modelling period, which covered 23469 days, inflows to the model were recorded on 5047 days or approximately 21.5% of all days. The proposed treatment train slightly reduces the frequency of discharge, due to the magnitude of the stormwater reuse. Outflows were recorded on 4495 days or approximately 19.2% of the modelling period.

3.6 Leachate Management

A separate drainage system has been designed to capture and store any leachate, ensuring it is not mixed in with the general stormwater system.

Stormwater runoff from all open storage bays with potential leachate will be collected by a separate drainage system and discharged to the proposed leachate tanks. The processing shed and enclosed restricted waste shed, being roofed, are expected to require only a minimal amount of leachate storage, as water from dust suppression is unlikely to form runoff. Any residual internal runoff would be contained by a proposed bund at the access point and collected by a sump pit connecting to the external leachate storage tanks.

It is recommended that during the first 12 months of operation the leachate tanks are monitored to determine what contaminates, if any, are found within the leachate. The leachate tanks should be emptied only by certified entities. After the data has been collected and analysed other potential disposal avenues may be explored.

3.7 Conclusion

A water balance assessment has been conducted for the site in accordance with the SEARs requirements. MUSIC modelling results indicate that post development water quality objectives will be met by the proposed stormwater treatment train. The proposed stormwater treatment train includes:

- Rainwater tanks
- Buffer strips
- Gross pollutants traps
- Sediment tanks

Further refinement of the model at detailed design stage may alter the sizes and locations of proposed treatment structures; however, performance outcomes of the final design are to achieve specification provided in this report.

4 Stormwater Quantity Assessment

4.1 Onsite Detention and Firewater Objectives

Site stormwater quantity performance objectives are consistent with GSC Engineering Design Specifications (2013). Objectives are outlined below:

- OSD is to be provided to maintain the peak pre development discharge from the site for all storms from the 0.2 exceedances yearly (EY) event to the 1% annual exceedance probability (AEP) event.
- System to be designed to carry all flow during minor storm events, up to and including the 10% AEP, by way of a pit and pipe network.
- System to be designed to carry all flows during major storm events, up to and including the 1% AEP, by way of the pit and pipe network and overland flow paths.

In addition to Council OSD requirements there are also firefighting and firewater containment requirements as detailed in Fire and Rescue NSW's Fire Safety in Waste Facilities document, which requires that:

- The fire water runoff containment volume must have capacity for the total hydraulic demand of fire safety systems.
- The waste facility to have an effective and automatic means of containing fire water runoff.

4.2 OSD Modelling Methodology

4.2.1 Overview

DRAINS hydrological and hydraulic modelling package was used with the ILSAX engine to determine preliminary site storage requirements to ensure peak post development discharge is less than or equal to peak pre-development discharge for the site.

4.2.2 Approach

Sizing of the OSD was completed through iterative modelling to achieve compliance with site objectives. Modelling was undertaken for all durations of the following storms:

- 0.2 EY.
- 10% AEP.
- 5% AEP.
- 2% AEP.
- 1% AEP.

The proposed OSD storage is to be sufficient to control post-development peak discharge rates to pre-development peak levels.

The minor drainage system has been designed to cater for flows up to the minor storm event, thus flow rates less than the peak minor storm event are assumed to be appropriately contained and conveyed within the minor drainage network.

4.2.3 IFD Data

Intensity Frequency Duration (IFD) parameters were obtained from BOM and storm temporal patterns from the AR&R 2016 datahub.

4.2.4 Catchment Areas

Catchment delineation was developed using survey data and based on the proposed design. See MA planset P1907434PS01 drawing PS01-E600 for the catchment plan. Impervious fractions were based on aerial photography for existing conditions model and consistent with the proposed design for the post development model.

4.3 OSD Results

OSD storage has been modelled to limit post development peak discharge for storms up to the 1% AEP. Results are provided in MA planset P1907434PS01 drawing PS01-E600.

DRAINS modelling indicates that Lot 1 requires approximately 290 m^3 of storage and Lot 2 requires approximately 160 m^3 of storage to appropriately contain the 1% AEP storm event. This storage has been proposed within underground tanks, refer to MA planset P1907434PS01 drawing PS01-E200 for details.

4.4 Fire Water Assessment

Australian Standard 2419 details the minimum water supply that is required for fire fighting purposes. This is the minimum volume of storage that must be proposed to contain potentially contaminated fire water runoff.

The required firewater supply for the site was calculated based on access to four fire hydrants able to flow simultaneously and the numbers below from AS 2419:

- Clause 4.2 – requires the minimum capacity of water supply to last for a duration of at least 4 hours.
- Clause 2.3.1 – requires the minimum flow rate from fire hydrants to be no less than 10 L/s,

The above numbers require that a minimum 576 kL of water is required to be supplied for fire fighting purposes. Thus, this volume has been adopted as the containment volume required for the total hydraulic demand of the fire safety systems.

Each of the combined OSD/sediment tanks is proposed to be fitted with an automatic shut-off valve on the OSD outlet. In the event of a firefighting emergency the shut-off valve will prevent any water being released from the OSD/sediment tanks and they will act as firewater storage tanks.

The firewater storage tanks alone will not have sufficient capacity for firewater containment. Bunds are proposed around the lowest corners of each lot and around the processing shed and the storage areas. The combined volumes of these bunded areas and the storage tanks is sufficient to ensure there is a minimum of 576 kL of firewater storage across the two lots. Refer to MA planset P1907434PS01 drawing PS01-E100 for bund locations.

4.5 Groundwater Assessment

Review of NSW government public record (NRATLAS) revealed there are two bores within 2.5 km to the site which contain groundwater data or standing water level information. Results are summarised in Table 3.

Table 3: Groundwater Bore Search

Bore Identification	Record Date	Standing Water Level (mbgl)	First Water Bearing Zone (mbgl) and Substrate	Distance and Direction from IA
GW901507	1998	9.0	2.0 – 10 clay	1,900 m north west
GW969668	2011	8.5	1 – 11 clay	2,068 m north west

The proposed development shall have a negligible impact on groundwater as:

- Standing water depth from the local ground bore search is greater than 8 m deep. The proposed excavation and grading are within -0.25 to +0.25 m from existing levels. Apart from the excavations for the proposed sedimentation basins (approximately 1 to 1.5 m deep), no significant excavation is proposed. No proposed work will intercept the anticipated deep site groundwater table.

- The highly compacted nature of site surface and paved area shall limit infiltration across the site and prevent significant drainage to groundwater. The proposed surface will be largely impermeable and infiltration of surface water or potential contaminants is not expected to occur.

- Site operation shall not introduce significant potential contaminants to the site. The primary site 'pollutant' is sediment, which poses no risk to groundwater. Other possible pollutants include fuel and lubricants associated with site equipment and leachate. Proposed leachate tank and soil and grease separating unit are considered appropriate for protection of local groundwater.

4.6 Conclusion

Preliminary hydraulic modelling indicates that provision of storage achieves water quantity objectives and firewater objectives. Detailed design of the site drainage system and OSD structures including sizes, locations, dimensions, outlet controls, overflow weirs and final volumes will need to be undertaken during the detailed design stage of the development.

5 References

Gunnedah Shire Council (WSC) (2012) Development Control Plan (DCP).

GSC (2013) Engineering Guidelines for Subdivisions and Developments.

Fire and Rescue NSW (2019) Fire safety in waste facilities.

Standards Australia (2005) Fire hydrant installations – Part 1: System design, installation and commissioning, NSW, Australia.

6 Attachment A – MUSIC Model Inputs

Table 4: Treatment node inputs.

Element	Factor	Input	Source
Setup	Climate File	Gunnedah Research Centre mlb file	eWater
Source Nodes	Rainfall Threshold	Based on surface type specified in Table 5-4	BMT WBM (2015)
	Base & Stormflow Properties	As per Table 5-6 & 5-7	BMT WBM (2015)
	Estimation Method	Stochastically generated	BMT WBM (2015)
Rainwater tank (Lot 1)	Low Flow By-Pass	0 m^3/s	By design
	High Flow By-Pass	1.0 m^3	No bypass
	Volume Below Overflow	10 kL	By design
	Surface Area	5 m^2	By design
	Overflow Pipe Diameter	50 mm	By design
	Re-use	Daily demand of 0.43 kL	By design
Buffer strip (Lot 1)	Percentage of upstream buffered	75%	By design
	Buffer area (% of upstream area)	10%	By design
	Exfiltration rate	0 mm/hr	By design
Gross Pollutant Trap (SPEL Stormsack)(Lot 1)	Low Flow By-Pass	0 m^3/s	SPEL MUSIC node
	High Flow By-Pass	100 m^3/s	SPEL MUSIC node
	Treatment Efficiency	As per manufacturer's specification	SPEL MUSIC node
Sediment Tank (Lot 1)	Low Flow By-Pass	0 m^3/s	By design
	High Flow By-Pass	100 m^3/s	No bypass
	Extended Detention Depth	1.0 m	By design
	Surface Area	180 m^2	By design
	Permanent Volume	90 m^2	By design
	Initial Volume	0.0 m^3	By design
	Exfiltration Rate	0 mm/hr	By design
	Evaporative Loss	0%	By design
	Outlet Pipe	375 mm	By design
	Overflow Weir	2.5 m	By design
Rainwater tank (Lot 2)	Low Flow By-Pass	0 m^3/s	By design
	High Flow By-Pass	1.0 m^3	No bypass
	Volume Below Overflow	120 kL	By design
	Surface Area	40 m^2	By design

Element	Factor	Input	Source
	Overflow Pipe Diameter	50 mm	By design
	Re-use	Daily demand of 2.36 kL and annual demand of 800 kL/year	By design
Gross Pollutant Trap (SPEL Stormsack)(Lot 2)	Low Flow By-Pass	0 m^3/s	SPEL MUSIC node
	High Flow By-Pass	100 m^3/s	SPEL MUSIC node
	Treatment Efficiency	As per manufacturer's specification	SPEL MUSIC node
Sediment Tank (Lot 2)	Low Flow By-Pass	0 m^3/s	By design
	High Flow By-Pass	100 m^3/s	No bypass
	Extended Detention Depth	0.8 m	By design
	Surface Area	175 m^2	By design
	Permanent Volume	88 m^2	By design
	Initial Volume	0.0 m^3	By design
	Exfiltration Rate	0 mm/hr	By design
	Evaporative Loss	0%	By design
	Outlet Pipe	300 mm	By design
	Overflow Weir	2.5 m	By design

The proposed development shall have a negligible impact on groundwater as:

- Standing water depth from the local ground bore search is greater than 8 m deep. The proposed excavation and grading are within -0.25 to +0.25 m from existing levels. Apart from the excavations for the proposed sedimentation basins (approximately 1 to 1.5 m deep), no significant excavation is proposed. No proposed work will intercept the anticipated deep site groundwater table.

- The highly compacted nature of site surface and paved area shall limit infiltration across the site and prevent significant drainage to groundwater. The proposed surface will be largely impermeable and infiltration of surface water or potential contaminants is not expected to occur.

- Site operation shall not introduce significant potential contaminants to the site. The primary site 'pollutant' is sediment, which poses no risk to groundwater. Other possible pollutants include fuel and lubricants associated with site equipment and leachate. Proposed leachate tank and soil and grease separating unit are considered appropriate for protection of local groundwater.

4.4 Leachate Management

A separate drainage system has been designed to capture and store any leachate, ensuring it is not mixed in with the general stormwater system.

Stormwater runoff from all open storage bays with potential leachate will be collected by a separate drainage system and discharged to the proposed leachate tanks. The processing shed and enclosed restricted waste shed, being roofed, are expected to require only a minimal amount of leachate storage, as water from dust suppression is unlikely to form runoff. Any residual internal runoff would be contained by a proposed bund at the access point and collected by a sump pit connecting to the external leachate storage tanks.

It is recommended that during the first 12 months of operation the leachate tanks are monitored to determine what contaminates, if any, are found within the leachate. The leachate tanks should be emptied only by certified entities. After the data has been collected and analysed other potential disposal avenues may be explored.

5 National and State Waste Policy

5.1 NSW Waste Policy

The NSW strategic policy framework for waste management incorporates policy to drive waste reduction and resource recovery. The framework has been strengthened with the enactment of legislation to streamline development of waste management infrastructure and a strategy to provide for increasing resource recovery. The project aligns well with these overall principles. Waste legislation that currently applies to NSW includes the Waste Avoidance and Resource Recovery Act 2001 (NSW EPA, 2001) and associated Strategy 2014-21 (NSW EPA, 2014a).

Reducing waste generation and keeping materials circulating within the economy as priorities for NSW are outlined as a part of the NSW 2021: A plan to make NSW number one 10-year State Government plan for NSW (NSW Government, 2011). The latest strategy is outlined in the NSW Waste Avoidance and Resource Recovery Strategy 2014-21 (NSW EPA, 2014b), which provides the framework for maximising conservation of natural resources and minimising environmental harm from waste management and disposal of solid waste. The Strategy aims to support investment in infrastructure, encourage innovation and improve recycling behaviour. It will also promote the development of new markets for recycled materials. Support from the Government for the waste management industry and councils will in-turn create more jobs and build better communities. The NSW 20-Year-Waste Strategy Discussion Paper is expected to be released for consultation in 2020, with a draft strategy to follow. These phases will be accompanied by stakeholder engagement which will inform the final strategy.

The proposed waste facility, in conjunction with the proposed landfill facility at nearby Marys Mount quarry, would assist the State in reducing waste to landfill as well as and creating local job opportunities.

5.2 National Waste Policy

The 2018 National Waste Policy provides a framework for collective action by businesses, governments, communities and individuals until 2030 (Australian Government, 2018). According to the (Commonwealth) Department of Environment website the policy identifies five overarching principles underpinning waste management in a circular economy. These include:

- Avoid waste.
- Improve resource recovery.

- Increase use of recycled material and build demand and markets for recycled products. Better manage material flows to benefit human health, the environment and the economy.

- Improve information to support innovation, guide investment and enable informed consumer decisions.

The proposed waste facility would assist in resource recovery of waste, as well as managing waste as a resource to deliver economic, environmental and social benefits to the Gunnedah region generally. The proposed waste facility will accept a range of waste products, including contaminated soils, but not domestic waste - the latter the responsibility of the local council. Any waste not capable of recycling will be transported off-site to a licensed landfill facility. [NOTE: A development application has been lodged for the establishment of a landfill within the quarry void at Marys Mount quarry to be run by a related Mackellar family company, Gunnedah Quarry Products Pty Ltd.]

The 2018 National Waste Policy will guide continuing collaboration between all Australian governments, business and industry. It does not remove the need for governments, businesses and industries to implement tailored solutions in response to local and regional circumstances.

The overall objectives of the National Waste Policy are that all wastes, including hazardous wastes, are managed in a way that is consistent with Australia's international obligations, to protect human health and the environment. The policy also seeks to ensure that risks associated with waste are understood and managed to minimise intergenerational legacy issues.

The proposed waste facility, in conjunction with the proposed landfill facility at Marys Mount quarry, would be consistent with the aims and objectives of the National Waste Policy in terms of the following:

- Managing waste as a resource and improving resource recovery.

- Protecting human health and the environment. The proposed waste facility adopts a range of environmental management measures appropriate to the risks posed, ensuring that the project's impact on the local environment is minimised to a satisfactory degree.

- Deliver economic benefits in terms of income generation and employment opportunities, as well as ensuring the protection of the environment and local amenity.

6 References

Australian Government (2018). National Waste Policy: Less Waste, More Resources. Accessed on 27 February 2020 https://www.environment.gov.au/system/files/resources/d523f4e9-d958-466b-9fd1-3b7d6283f006/files/national-waste-policy-2018.pdf

Austroads (2013). Austroads Design Vehicles and Turning Path Templates. https://austroads.com.au/publications/road-design/ap-g34

NSW ASSMAC (NSW Acid Sulfate Soil Management Advisory Committee) (1998) Acid Sulfate Soil Manual. https://www.environment.nsw.gov.au/resources/epa/Acid-Sulfate-Manual-1998.pdf

NSW EPA (2001). NSW Waste Avoidance and Resource Recovery Act 2001.

NSW EPA (2014a). Protocol for managing asbestos during resource recovery of construction and demolition waste. Accessed on 3 March 2020 https://www.environment.nsw.gov.au/resources/waste/140345-asbestos-draft.pdf

NSW EPA (2014b). NSW Waste Avoidance and Resource Recovery Strategy 2014-2. Accessed on 27 February 2019. https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/wastestrategy/140876-WARR-strategy-14-21.ashx

NSW EPA (2014c). Waste Classification Guidelines Part 1: Classifying waste. Accessed 3 March 2020. https://www.epa.nsw.gov.au/-/media/epa/corporate-site/resources/wasteregulation/140796-classifywaste.pdf?la=en&hash=604056398F558C9DB6818E7B1CAC777E17E78233

NSW EPA (2014d). Waste Classification Guidelines - Part 4: Acid Sulfate soils. https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/wasteregulation/140798-acid-sulfate-soils.ashx

NSW EPA (2016). Consultation paper: New Minimum standards for managing construction and demolition waste in NSW. https://www.epa.nsw.gov.au/~/media/EPA/Corporate%20Site/resources/wasteregulation/nsw-managing-construction-demolition-waste-minimum-standards-160545.ashx

NSW Government (2011). NSW 2021: A Plan to Make NSW Number One. https://media.opengov.nsw.gov.au/pairtree_root/c6/a6/e2/3f/a0/52/42/ed/be/3b/47/cd/80/5a/ca/b8/obj/110906_NSW2021.pdf

NSW Government (2004). *Managing Urban Stormwater- Soils and Construction.* *https://www.environment.nsw.gov.au/research-and-publications/publications-search/managing-urban-stormwater-soils-and-construction-volume-1-4th-editon*

NSW Government (2020). Fire safety in waste facilities. https://www.fire.nsw.gov.au/gallery/files/pdf/guidelines/guidelines_fire_safety_in_waste_facilities.pdf

7 Attachment A – Figures

Project No: P1907434 Map Set: MS01-R01 Projection: MGA

0 10 20 30 40 50 m

1:1500 @ A3

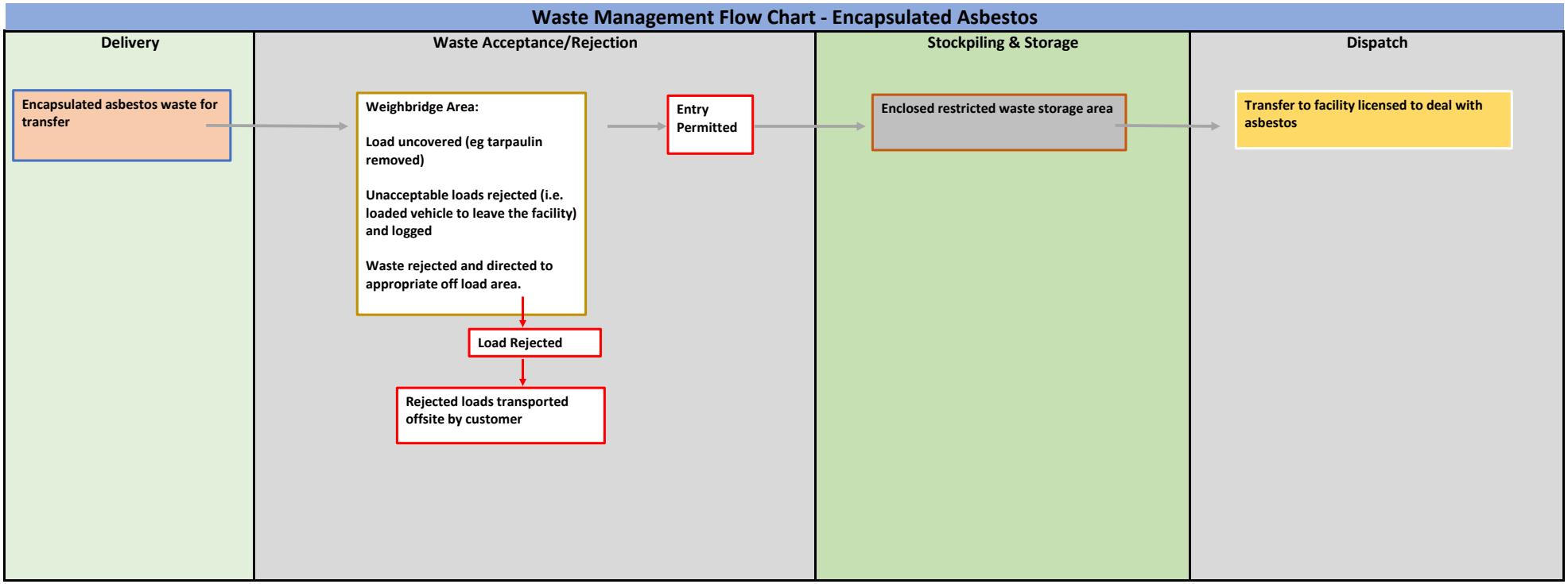
Map Title / Figure:

Site Location Map

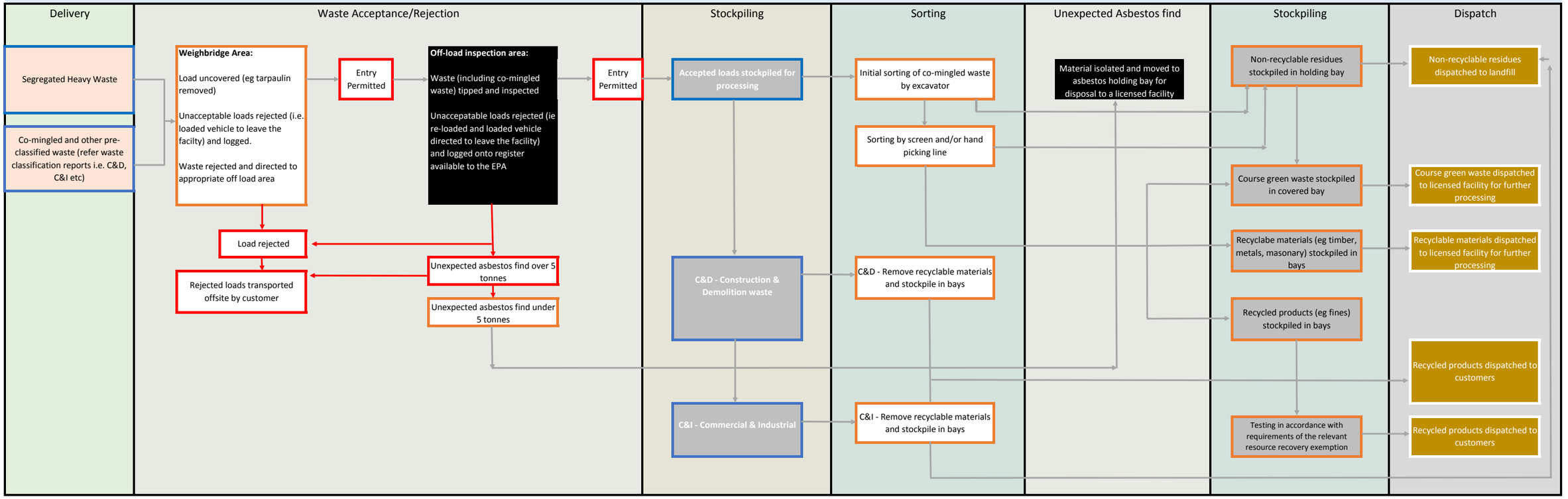
martens
Environment | Water | Geotechnics | Civil | Projects

Map 01	Map
16 Torrens Road, Gunnedah, NSW	Site
Resource Recovery Facility	Project
	Sub-Project
Outline Planning Consultants Pty Ltd	Client
05/06/2020	Date

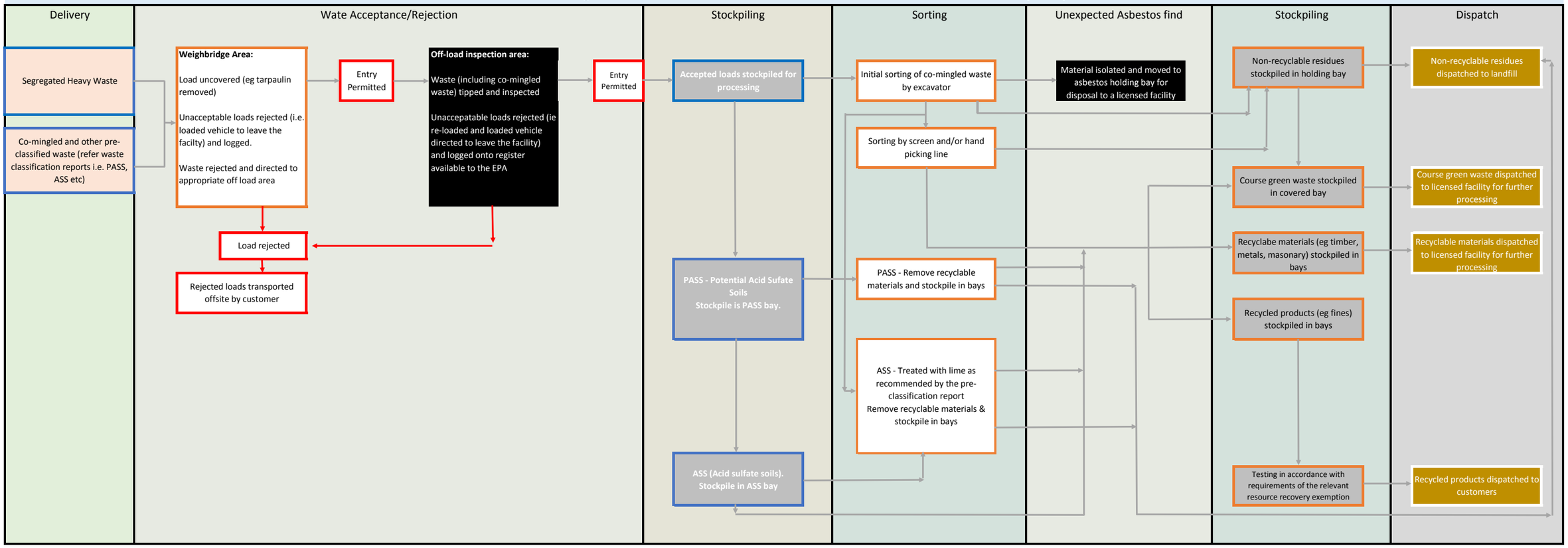
8 Attachment B – Waste Management Flow Charts


Waste Management Flow Chart - Encapsulated Asbestos
Delivery
Waste Acceptance/Rejection
Stockpiling & Storage
Dispatch
Encapsulated asbestos waste for transfer
Weighbridge Area:
Load uncovered (eg tarpaulin removed)
Unacceptable loads rejected (i.e. loaded vehicle to leave the facility) and logged
Waste rejected and directed to appropriate off load area.
Load Rejected
Rejected loads transported offsite by customer
Entry Permitted
Enclosed restricted waste storage area
Transfer to facility licensed to deal with asbestos

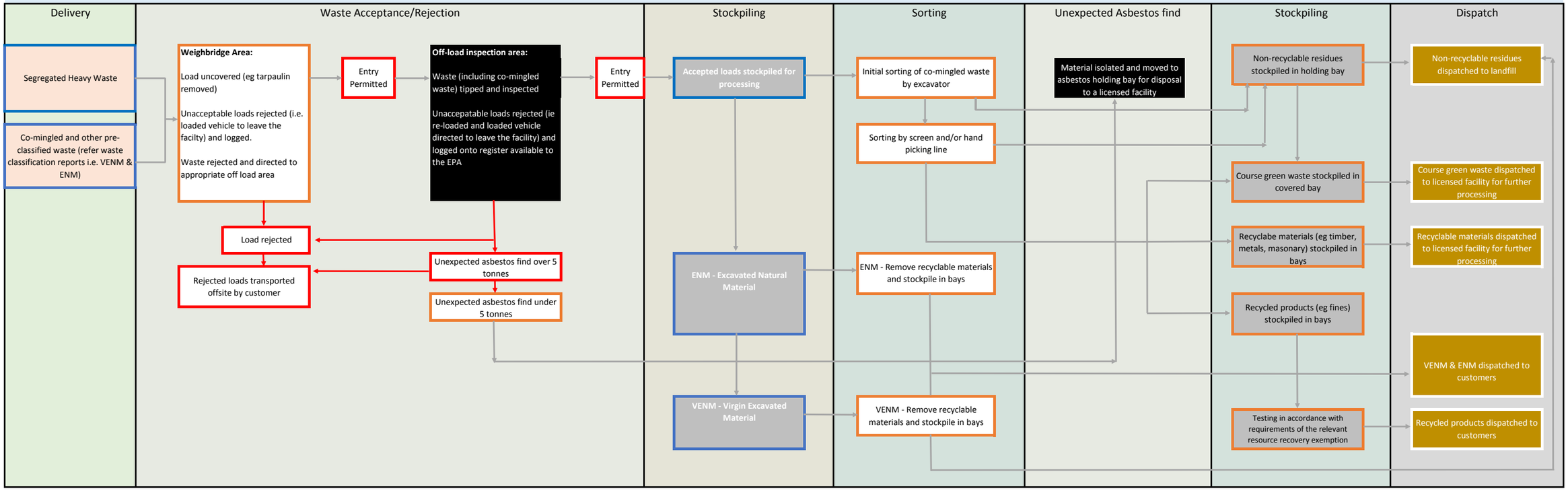
Waste Management Flow Chart - Construction & Demolition (C&D) Waste , Commercial & Industrial (C&I) Waste

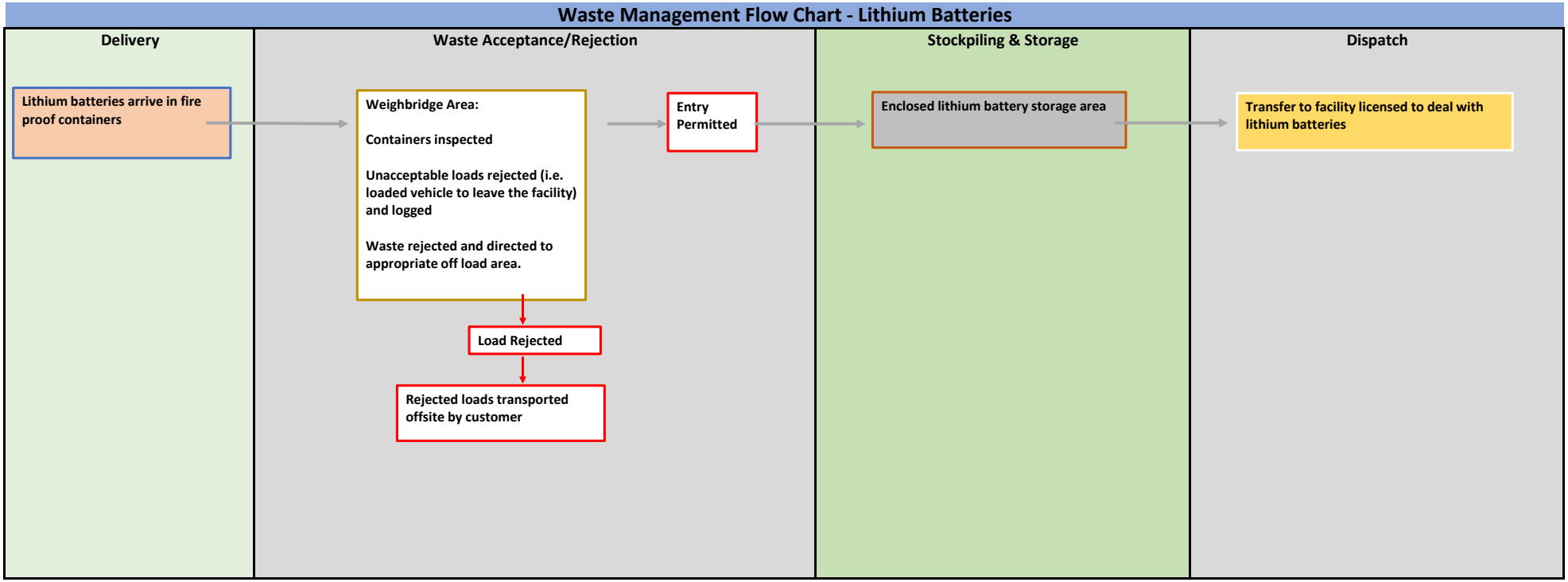


Waste Management Flow Chart - Acid Sulfate Soils & Potential Acid Sulfate Soils (PASS)



Waste Management Flow Chart - Virgin Excavated Natural Material (VENM) & Excavated Natural Material (ENM) that meet the CT1 threshold




Waste Management Flow Chart - Lithium Batteries
Delivery
Waste Acceptance/Rejection
Stockpiling & Storage
Dispatch
Lithium batteries arrive in fire proof containers
Weighbridge Area:
Containers inspected
Unacceptable loads rejected (i.e. loaded vehicle to leave the facility) and logged
Waste rejected and directed to appropriate off load area.
Entry Permitted
Load Rejected
Rejected loads transported offsite by customer
Enclosed lithium battery storage area
Transfer to facility licensed to deal with lithium batteries

EXISTING ELEMENTS LEGEND

- EXISTING BUILDING
- CONCRETE SURFACE
- BITUMEN SURFACE
- TREE TO BE RETAINED

PROPOSED RESOURCE RECOVERY FACILITY LEGEND

- PROPOSED HARDSTAND AREA
- UNLOADING SHED
- PROCESSING SHED
- ENCLOSED WASTE STORAGE
- OPEN WASTE STORAGE BAYS
- TRUCK WASHDOWN AREA
- SEDIMENT BASIN
- UNDERGROUND TANK
- (L) LEACHATE STORAGE AREA
- LANDSCAPING AREA
- PROPOSED NATIVE TREE

N
W E
S

10 00 10 20 30 40 50 60 70 80 90

REDUCTION RATIO

PROPOSED RESOURCE RECOVERY FACILITY - 16 TORRENS ROAD, GUNNEDAH LOTS 1 & 2 IN DP1226992

N

W E

S

10 00 10 20 30 40 50 60 70 80 90

REDUCTION RATIO

LEGEND

TREE TO BE RETAINED

PROPOSED NATIVE TREE

WESTERN BUFFER PLANTING IN ACCORDANCE WITH TYPICAL DETAIL

NORTH BUFFER PLANTING IN ACCORDANCE WITH TYPICAL DETAIL

ALLGAYER DRIVE PLANTING IN ACCORDANCE WITH TYPICAL DETAIL

OTHER PLANTING AREA IN ACCORDANCE WITH TYPICAL DETAIL

NOTES

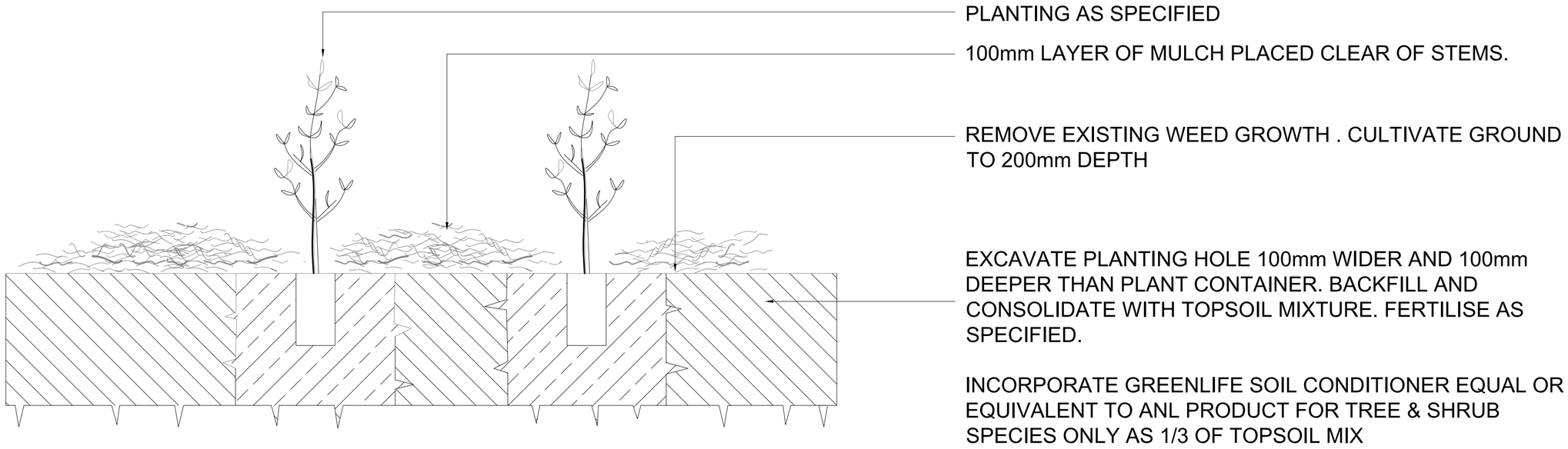
LANDSCAPING HAS BEEN DOCUMENTED AS INSTRUCTED BY OUTLINE PLANNING CONSULTING.

PLANS SHOULD BE READ IN CONJUNCTION WITH MARTENS & ASSOCIATES ENGINEERING PLANS

Stewart Surveys
Local people Local knowledge
Surveying, Environmental & Landscape Architecture

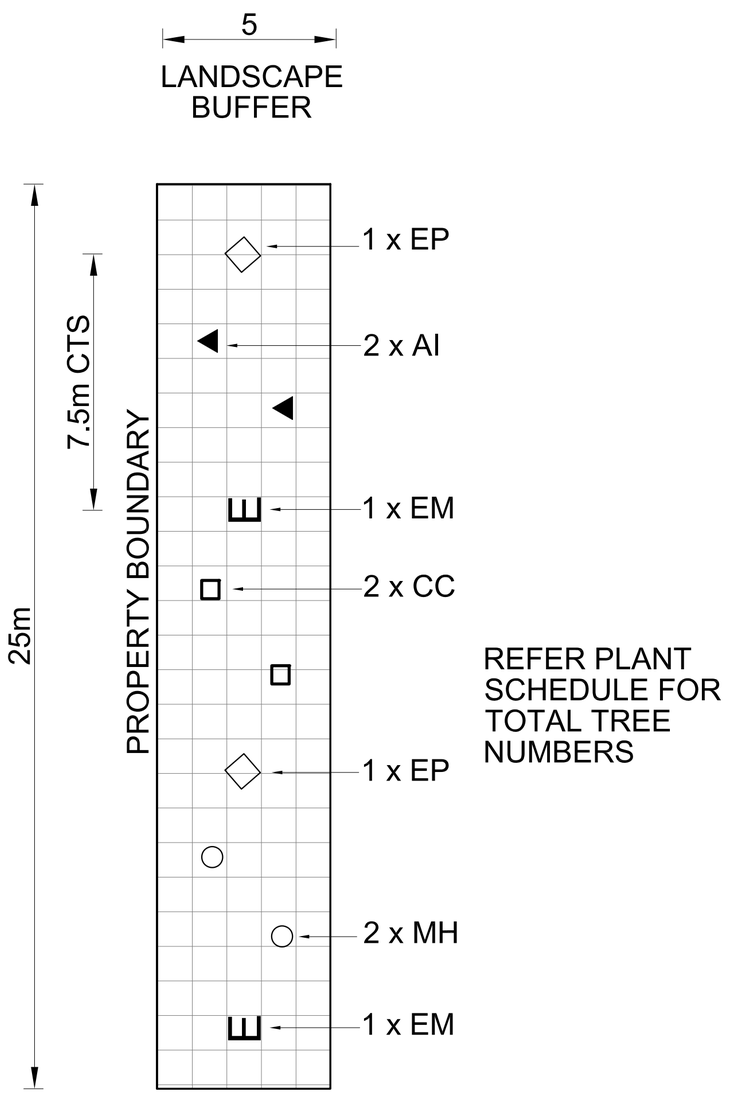
STEWART SURVEYS
Pty Ltd Inc in NSW ABN 65 002 886 508
109 Conadilly Street
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966 F 02 67420684
E office@stewartsurveys.com

CLIENT: MACKELLAR EQUIPMENT HIRE			TITLE: PROPOSED RESOURCE RECOVERY FACILITY 16 TORRENS ROAD, GUNNEDAH LANDSCAPE PLAN	
PROJECT: LOT 1 & 2 IN DP1226992				
DRAWN BY: KY	OUR REFERENCE: 5179	DATE: 16 NOVEMBER 2020	REDUCTION RATIO: SHOWN	DRAWING: Sheet 1 of 2



0 100 200 500mm

1 TYPICAL PLANTING DETAIL



2 TYPICAL WESTERN BOUNDARY PLANTING DETAIL TO BE REPEATED

WESTERN BUFFER PLANT SCHEDULE

SYMBOL	BOTANICAL NAME	COMMON NAME	MATURE HEIGHT	POT SIZE	WESTERN BUFFER QUANTITY	NORTH BUFFER QUANTITY	ALLGAYER DRIVE QUANTITY	OTHER AREAS QUANTITY	TOTAL QUANTITY
TREES									
EC	Eucalytpus crebra	Ironbark	14	200mm	-	5	2	3	10
EM	Eucalytpus melliodora	Yellow Box	16	200mm	8	5	2	-	15
EP	Eucalytpus populnea	Bimble Box	12	200mm	8	5	2	-	15
SHRUBS									
AI	Acacia itraphylla	Willow-leaf Wattle	2	50x50x90	12	-	-	-	12
CC	Callistemon citrinus	Red Bottlebrush	2	50x50x90	12	-	-	-	12
MH	Melaleuca hypericifolia	Red Flowering Paper Bark	3	50x50x90	12	-	-	-	12
STRAP LEAVED PLANTS									
LL	Lomandra longifolia	Lomandra / Matt Rush	1	50x50x90	-	-	65	-	65
LT	Lomandra 'Tanika'	Dwarf Lomandra	1	50x50x90	-	10	-	10	20

STEWART SURVEYS
Pty Ltd Inc in NSW ABN 65 002 886 508
109 Conadilly Street
P.O. Box 592
GUNNEDAH NSW 2380
T 02 67422966 F 02 67420684
E office@stewartsurveys.com
Surveying, Environmental & Landscape Architecture

CLIENT: MACKELLAR EQUIPMENT HIRE			TITLE: PROPOSED RESOURCE RECOVERY FACILITY 16 TORRENS ROAD, GUNNEDAH LANDSCAPE DETAILS
PROJECT: LOT 1 & 2 IN DP1226992			
DRAWN BY: KY	OUR REFERENCE: 5179	DATE: 16 NOVEMBER 2020	REDUCTION RATIO: SHOWN / DRAWING: Sheet 2 of 2