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SWDA 1.2	STORMWATER MANAGE	
SWDA 1.3	EROSION & SEDIMENT C	
SWDA 1.4	STORMWATER DRAINAG	
SWDA 1.5	STORMWATER DRAINAG	
SWDA 1.6	GENERAL DETAILS	



# NEW TOWNHOUSES 14 CRAWFORD STREET BULAHDELAH, NSW 2423 RAY GUTHRIE

INGS LIST		
EMENT PLAN & GENERAL NOTES		
CONTROL PLAN AND DETAILS		
GE SITE PERMEABILITY		
GE SERVICES PROPOSED LAYOUT		

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Partridge Hydraulic Pty L ABN 71 124 297 883	ta '	
<sup>Client</sup> RAY GUTHRIE		
Architect SMART ECO GROUP		
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By App. Date

P1 PRELIMINARY ISSUE

Rev. Issue / Amendment

# STORMWATER MANAGEMENT PLAN

PARTRIDGE HYDRAULIC SERVICES WERE ENGAGED TO CARRY OUT A STORMWATER MANAGEMENT PLAN FOR THE PROPOSED DEVELO BULADELAH (LOT 4, SEC 31). THE BELOW ADDRESSES THE MANAGEMENT OF STORMWATER WITHIN THE PROPOSED SITE BOUNDARIES.

## EXISTING SITE CONTEXT

THE SUBJECT SITE CURRENTLY IS A TOTAL 1664m2 IN AREA AND CURRENTLY CONSISTS OF ONE SINGLE DWELLING, WITH THE REST O SLOPES TOWARDS THE WEST AND IS BOUND BY AN ADJACENT PRIVATE PROPERTIES TO THE NORTH, EAST AND SOUTH AND CRAWFOF PEDESTRIAN AND VEHICLE ACCESS TO THE SITE IS CURRENTLY FROM CRAWFORD STREET.

### PROPOSED DEVELOPMENT

DRIVEWAY AND CROSSOVER FROM CRAWFORD STREET.

IT IS PROPOSED TO DEMOLISH THE EXISTING DWELLING AND PROVIDE UP TO TEN TOWNHOUSES ON THE SITE, WITH ASSOCIATED LAND PEDESTRIAN AND VEHICLE ACCESS TO THE SITE IS TO CONTINUE FROM CRAWFORD STREET. A NEW VEHICULAR ACCESS TO THE SIT

#### EXISTING DRAINAGE

THERE IS AN EXISTING KERB OUTLET WHICH APPEARS TO SERVE THE EXISTING DWELLING. THERE IS NO EVIDENCE OF SUBSTAN BEYOND THE DWELLING. THERE IS NO EVIDENCE OF OSD OR STORMWATER TREATMENT DEVICES AT THE PRESENT.

#### FLOODING

THERE ARE NO AVAILABLE HISTORICAL DOCUMENTS OR RECORDS OF FLOODING WITHIN THE PROPOSED SITE.

#### PROPOSED STORMWATER PLAN

IT IS PROPOSED TO CONSTRUCT A NEW STORMWATER NETWORK ON THE FOLLOWING PRINCIPLES: • A NEW NETWORK OF PIPES AND PITS IS PROPOSED TO CONVEY THE RUNOFF FROM THE SITE PRIOR TO DISCHARGING INTO COUNCIL'S EXISTING DRAINAGE

- SYSTEM. • EACH DWELLING IS TO BE PROVIDED WITH A RAINWATER TANK, THE OVERFLOWS OF WHICH WILL DISCHARGE TO A BIORETENTION FEATURE (RAIN GARDEN) AT
- THE FRONT OF THE SITE. • ON SITE DETENTION IS PROVIDED TO LIMIT THE SITE RUNOFF TO PRE-DEVELOPMENT CONDITIONS.
- A TRASH SCREEN HAS BEEN PROPOSED IN THE ON-SITE DETENTION TANK TO PROVIDE FURTHER SEDIMENT CAPTURE PRIOR TO DISCHARGE. A FURTHER SILT TRAP IS PROPOSED PRIOR TO DISCHARGE TO THE NEW KERB INLET PIT.

#### AREA AND RUNOFF ANALYSIS

PRE-DEVELOPMENT CATCHMENT AREAS:

- IMPERVIOUS AREA: 193m<sup>2</sup> PERVIOUS AREA: 1471m<sup>2</sup>
- PRE-DEVELOPMENT DISCHARGE VOLUME FOR 1% AEP EVENT: 89 L/s
- POST-DEVELOPMENT CATCHMENT AREAS:
- IMPERMEABLE AREA: 1110m<sup>2</sup>
- PERMEABLE AREA: 554m<sup>2</sup> MINIMUM ON-SITE DETENTION VOLUME REQUIRED: 26.5m<sup>3</sup>

#### **OVERLAND FLOWS**

IF STORMS HIGHER THAN THE DESIGN STORM OCCUR, THE SITE IS GRADED TO ALLOW AN OVERLAND FLOW PATH TO PROTECT THE BUILDINGS. OVERLANI EXIT THE SITE ON THE WESTERN BOUNDARY AND SPILL ONTO CRAWFORD STREET. NO DAMAGE TO THE NEIGHBOURING PROPERTIES WILL OCCUR.

#### WATER SENSITIVE DESIGN STRATEGY

THE SITE IS MAPPED IN THE SEPP COASTAL ZONES AND WSD PRIORITY AREA, AND THEREFORE MUST COMPLY WITH THE FOLLOWING LOAD REDUCTION TA ACCORDANCE WITH SECTION 11.4.4 OF THE MID-COAST COUNCIL DCP:

- TOTAL SUSPENDED SOLIDS 80%
- TOTAL PHOSPHORUS 60% TOTAL NITROGEN 45%

STORMWATER QUALITY PERFORMANCE WAS ASSESSED USING EWATER MUSICX SOFTWARE, WHICH HAS BEEN FORWARDED TO COUNCIL SEPARATELY FOR ASSESSMENT. THE MODEL USES THE METEOROLOGICAL TEMPLATE CREATE BY MID-COAST COUNCIL FOR THE LGA AND A 6-MINUTE TIMESTEP OVER THE RECOMMENDED 10 YEAR PERIOD WITHIN THE TEMPLATE.

CATCHMENT AREAS WERE DELINEATD FROM THE ARCHITECTURAL SITE PLAN AS FOLLOWS.

- ROOF AREA 730m<sup>2</sup>
- LAWN/LANDSCAPE AREA 564m<sup>2</sup> DRIVEWAY AREA 330m<sup>2</sup>
- BYPASS AREA (DRIVEWAY ENTRANCE) 40m<sup>2</sup>

SITE SOILS WERE IDENTIFIED FROM THE NSW ESPADE WEBSITE AS CLAY DOMINANT SOILS, CONSISTENT WITH "SOIL TYPE C" CONDITIONS. IN LIGHT OF THI AREAS USED A SOIL STORAGE OF 100mm, FIELD CAPACITY OF 70mm AND INITIAL STORAGE OF 25%.

THE PROPOSED WSUD STRATEGY INCLUDES A 2,000kL RAINWATER TANK FOR EACH DWELLING, DRAINING ROOF CATCHMENTS OF ALL HOUSES, WITH REUS OUTDOOR IRRIGATION. RAINWATER TANK OVERFLOWS AND DRIVEWAY RUNOFF ARE DIRECTED TO A BIORETENTION AREA ON THE WESTERN EXTENT OF BIORETENTION AREA IS TO BE CONSTRUCTED IN GENERAL ACCORDANCE WITH THE RAIN GARDEN IN CLAY SOILS EXAMPLE SET OUT BY MID-COAST COUNT CONSISTENT WITH THE SPECIFICATIONS IN COUNCIL'S FACTSHEETS: FILTER MEDIA IN RAIN GARDENS AND LOCAL PLANT SELECTION FOR RAIN GARDENS. IS TO COMPRISE A MIN 500mm FILTER MEDIA DEPTH AND 200mm EXTENDED DETENTION DEPTH.

THE MUSIC MODEL DEMONSTRATES COMPLIANCE WITH THE WATER QUALITY TARGETS. PREDICTED REDUCTIONS ARE AS FOLLOWS:

- TOTAL SUSPENDED SOLIDS 83.51% • TOTAL PHOSPHORUS 60.95%
- TOTAL NITROGEN 46.24%

THESE RESULTS CONFIRM THAT THE PROPOSED TREATMENT TRAIN IS SUFFICIENT TO MEET COUNCIL AND SEPP STORMWATER QUALITY OBJECTIVES.

## REFERENCES

THE ABOVE ASSESSMENT HAS BEEN PREPARED AND BASED ON PUBLISHED TOPOGRAPHIC MAPS, PHYSICAL LAND SURVEY, HYDRAULIC AND HYDROLOGIC CALCULATIONS, AVAILABLE AERIAL PHOTOGRAPHY OF THE SITE AND IN ACCORDANCE WITH RELEVANT AUSTRALIA STANDARDS AND DEVELOPMENT CONTROL PLANS BELOW:

- AS 3500 PLUMBING AND DRAINAGE
- MID-COAST COUNCIL DCP
- MID-COAST COUNCIL SITE STORMWATER DRAINAGE GUIDELINES
- MID-COAST COUNCIL GUIDELINES FOR WATER SENSITIVE DESIGN STRATEGIES

# **GENERAL NOTES**

LOPMENT AT 14 CRAWFORD STREET, S.	1.	THIS IS A STORMWATER DRAINAGE PLAN ONLY, REFER TO ARCHITECTURAL DRAWINGS FOR ALL SETOUT INFORMATION.
	2.	ALL STORMWATER RUNOFF FROM SURFACE, PITS, SUMPS AND UNDERGROUND PIPE NETWORK TO BE COLLECTED VIA ON-SITE DRAINAGE SYSTEM PRIOR TO DISCHARGE FROM THE SITE.
OPEN GRASS. THE SITE GENERALLY	3.	ALL PIPES ARE TO BE 100DIA UPVC LAID AT 1.0% MIN GRADE. UPVC PIPES TO BE SOLVENT WELDED JOINTS U.N.O
ORD STREET TO THE WEST.	4.	ALL PIPES ARE TO BE PROPRIETARY PRE-CAST ITEMS, COVER LEVELS TO MATCH U.N.O
	5.	ALL GRATED DRAINS TO HAVE BASE GRADED 1.0% MIN WITH HEAVY DUTY GRATES.
	6.	IT IS THE BUILDER'S RESPONSIBILITY TO LAY ALL PIPES IN ACCORDANCE WITH ALL RELEVANT AUTHORITY REQUIREMENTS (EG. COUNCIL, EPA, SYDNEY WATER).
NDSCAPING AND DRIVEWAYS. SITE IS PROPOSED VIA A CONCRETE	7.	THE CONTRACTOR SHALL LOCATE EXISTING SERVICES ON SITE PRIOR TO CONSTRUCTION AND SHALL TAKE EXTREME CAUTION DURING CONSTRUCTION.
	8.	ALL WORKS ARE TO BE UNDERTAKEN IN ACCORDANCE WITH THE LOCAL AUTHORITY'S CIVIL SPECIFICATION AND STANDARDS TO THE SATISFACTION OF THE LOCAL AUTHORITY OR PRIVATE CERTIFYING AUTHORITY'S REPRESENTATIVE. ANY DISCREPANCY, VARIATION OR ADDITIONAL WORKS SHALL BE APPROVED BY THE BUILDER'S REPRESENTATIVE BEFORE COMMENCEMENT OF WORKS.
ANTIAL DRAINAGE INFRASTRUCTURE	9.	THE LOCAL AUTHORITY OR PRIVATE CERTIFYING AUTHORITY'S INSPECTION OF WORKS SHALL BE NOTIFIED AT LEAST 48 HOURS BEFORE INSPECTOR'S INSPECTION SCHEDULE REQUIREMENTS AND ENSURE THAT EACH IDENTIFIED STAGE OF WORKS IN ACCORDINGLY INSPECTED.
	10.	THESE DRAWINGS ARE DIAGRAMMATIC REPRESENTATION OF WORKS TO BE CARRIED OUT ONLY AND ARE NOT TO BE SCALED OFF.
	11.	ALL LEVELS SHALL BE OBTAINED FROM ESTABLISHED BENCH MARKS ONLY. DATUM USED ON THESE DRAWINGS IN AUSTRALIA HEIGHT DATUM (AHD) UNLESS NOTED OTHERWISE.

12. UTILITY INFORMATION SHOWN ON THE PLANS IS NOT INTENDED TO DEPICT MORE THAN THE PRESENCE OF ANY SERVICES. ACTUAL LOCATIONS SHOULD BE VERIFIED BY HAND EXCAVATION PRIOR TO CONSTRUCTION.

13. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PROVIDED WHERE SHOWN ON THE DRAWINGS, IN ACCORDANCE WITH THE SPECIFICATION AND THE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (IF APPLICABLE).

	LEGEND			
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ND FLOWS WILL	RW RW	RAINWATER DRAINAGE		
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		SEDIMENT FENCE LINE	AHD	AUSTRALIAN HEIG
		PROPERTY BOUNDARY	AP	ACCESS PANEL
	( ( ( ( ( ( (	SWALE	BG	BOX GUTTER
FOR	ວ	DROPPER	DP	DOWNPIPE
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	——— ТВ ———— ТВ ————	TURBIDITY BARRIER	FFL	FINISHED FLOOR L
		PIPE REDUCER	GIP	GRATED INLET PIT
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	o DP	DOWN PIPE	HFB	HIGH FLOW BYPAS
	• RDP	ROOF DOWN PIPE	HL	HIGH LEVEL IN CE
	<b>©</b> РВО	PLANTER BOX OUTLET	HP	HIGH POINT
THIS PERVIOUS	@RWO/BO	RAIN WATER OUTLET / BALCONY OUTLET	IL	INVERT LEVEL
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	SWP	STORMWATER PIT (RWO IN BASE)	O/F	OVERFLOW
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		PIPE CONNECTION POINT	RWT	RAINWATER TANK
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**RAY GUTHRIE** 

Architect **SMART ECO GROUP** 

Project **NEW TOWNHOUSES 14 CRAWFORD STREET** 

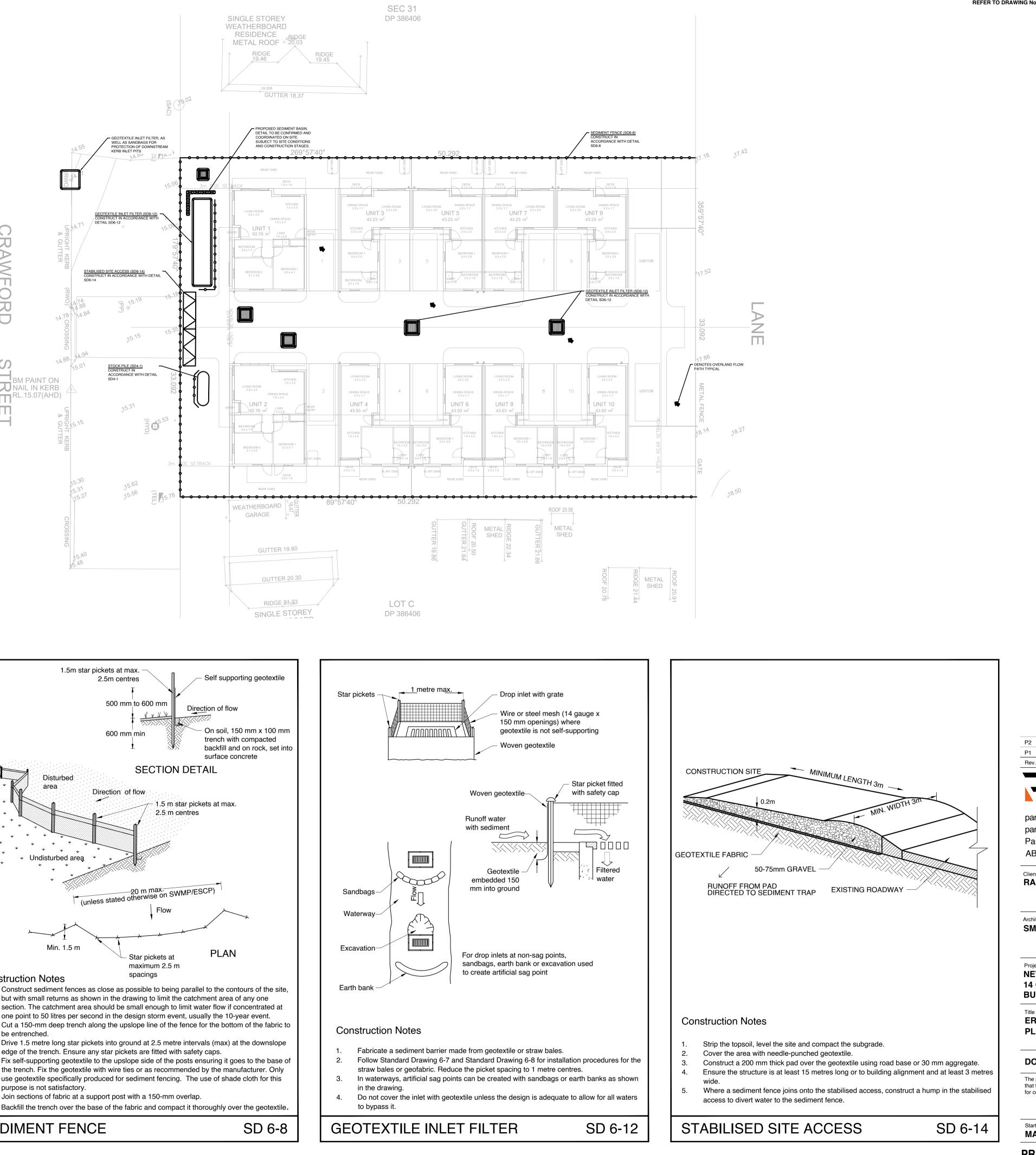
**BULAHDELAH, NSW 2423** 

STORMWATER MANAGEMENT PLAN & GENERAL NOTES

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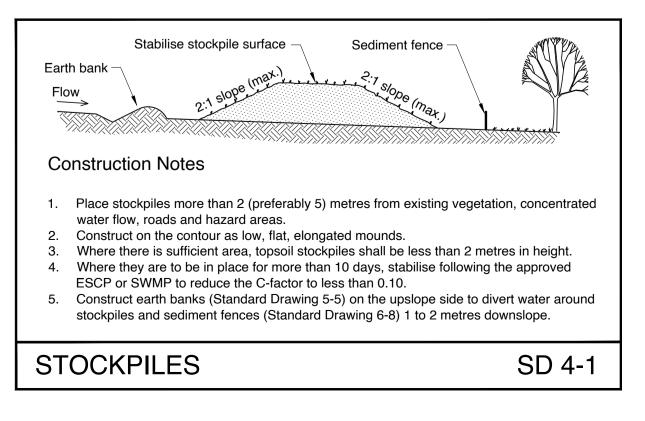
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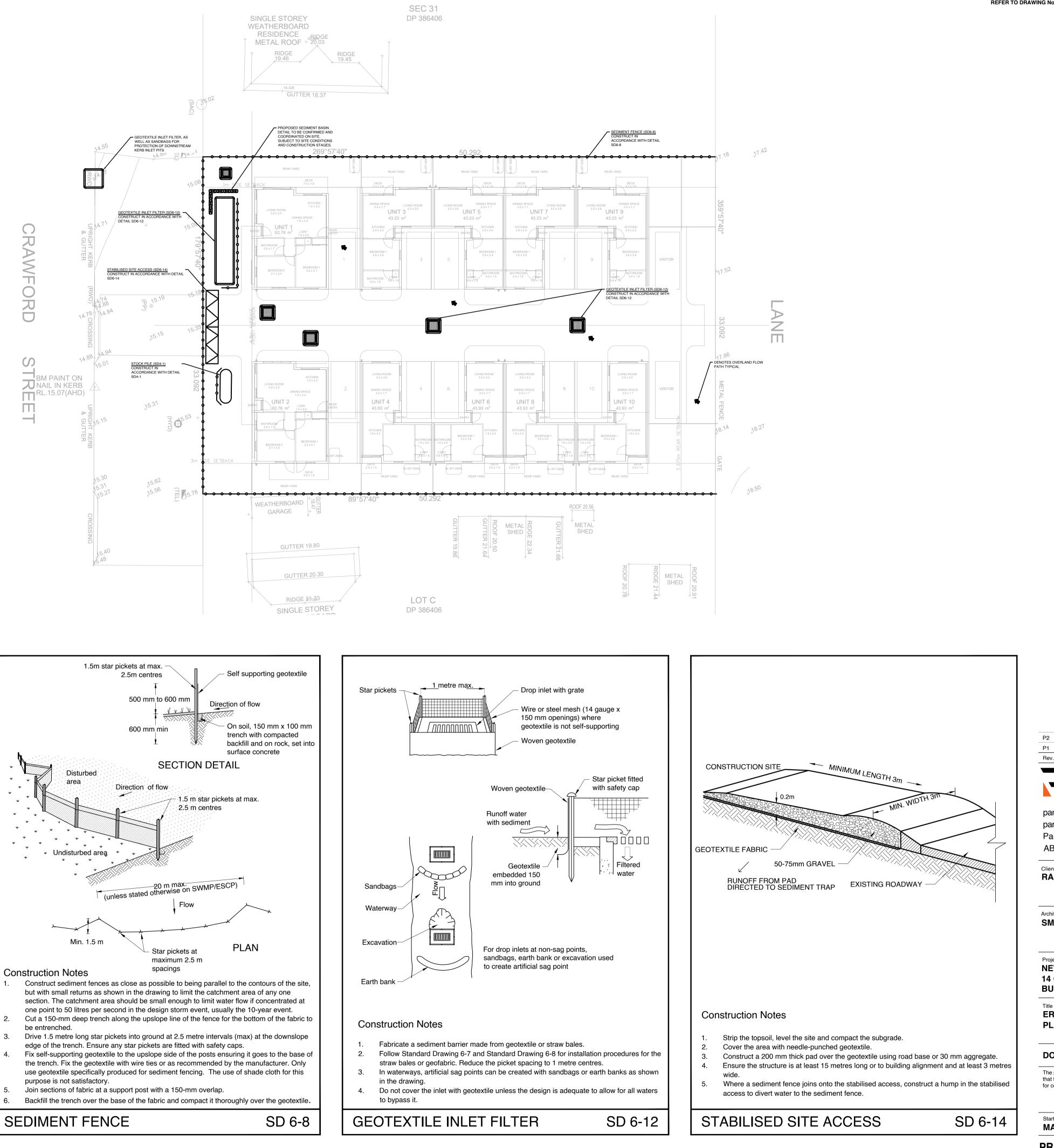
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#### **EROSION AND SEDIMENT CONTROL PLAN**

- 1. MEASURES PROVIDED WILL BE TO THE SATISFACTION OF THE PRINCIPAL'S REPRESENTATIVE IN ACCORDANCE WITH THE LOCAL AND STATUTORY REQUIREMENTS UNLESS NOTED OTHERWISE. ALL WORKS SHALL BE ERECTED AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE 'BLUE BOOK'- MANAGING URBAN STORMWATER (MUS): SOILS AND CONSTRUCTION, LANDCOM (VOL 1) AND DECCW (VOL 2) AND COUNCIL'S DEVELOPMENT CONTROL PLAN (DCP).
- 2. ALL EXCAVATION WORKS ARE TO BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT, IF AVAILABLE, AND THE STRUCTURAL ENGINEER'S DRAWINGS.
- 3. INSTALL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS.
- 4. MESH AND GRAVEL INLET FILTERS (SD 6-12) TO BE INSTALLED UPSTREAM OF PROPOSED STORMWATER PITS AS WELL AS EXISTING STORMWATER PITS DOWNSTREAM OF DISTURBED AREAS.
- 5. TOP SOIL WILL BE STRIPPED AND STOCKPILED (SD 4-1) FOR LATER USE IN LANDSCAPING.
- 6. ALL STOCKPILES TO BE CLEAR FROM DRAINS, GUTTERS AND FOOTPATHS.
- 7. TOP SOIL WILL BE RE SPREAD AND ALL DISTURBED AREAS WILL BE REHABILITATED WITHIN 20 WORKING DAYS OF THE COMPLETION OF WORKS.
- 8. ALL SEDIMENT TO BE STORED AND COLLECTED BY A LIQUID WASTE COMPANY FOR DISPOSAL AT A LICENSED TREATMENT FACILITY.
- 9. ROADS AND FOOTWAYS TO BE SWEPT AT THE END OF THE DAY.
- 10. ALL EROSION AND SEDIMENT CONTROLS WILL BE CHECKED AT LEAST WEEKLY AND AFTER RAINFALL EVENTS TO MAKE SURE THEY ARE MAINTAINED TO A FULLY FUNCTIONAL CONDITION.

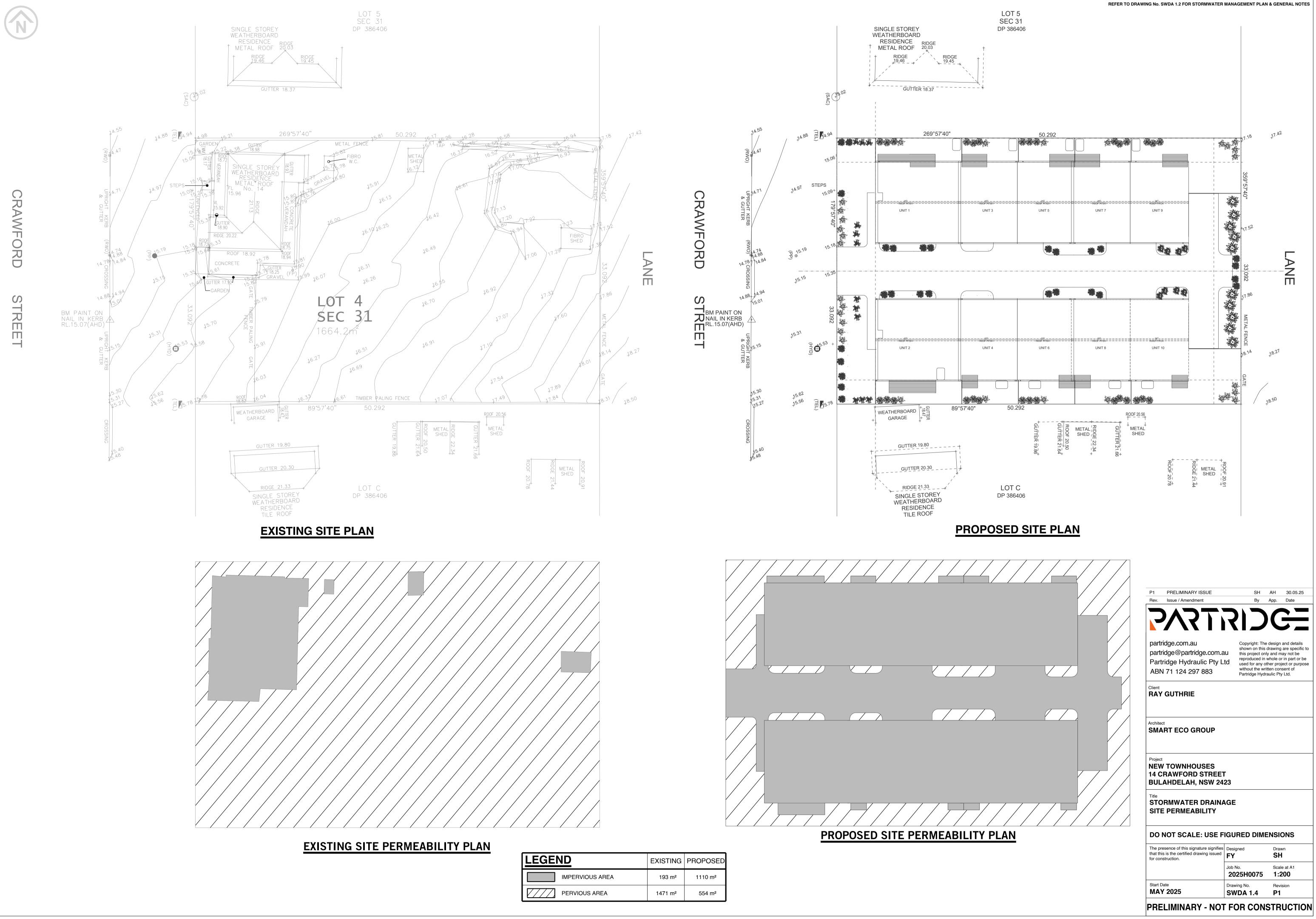




REFER TO DRAWING No. SWDA1.2 FOR STORMWATER MANAGEMENT PLAN &	GENERAL	NOTES

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LEGEND	EXISTING	PROPOSED
IMPERVIOUS AREA	193 m²	1110 m²
PERVIOUS AREA	1471 m²	554 m²

