10-16 ALBERT STREET, CASINO
STORMWATER SERVICES

LEGEND

ABBREVIATIONS

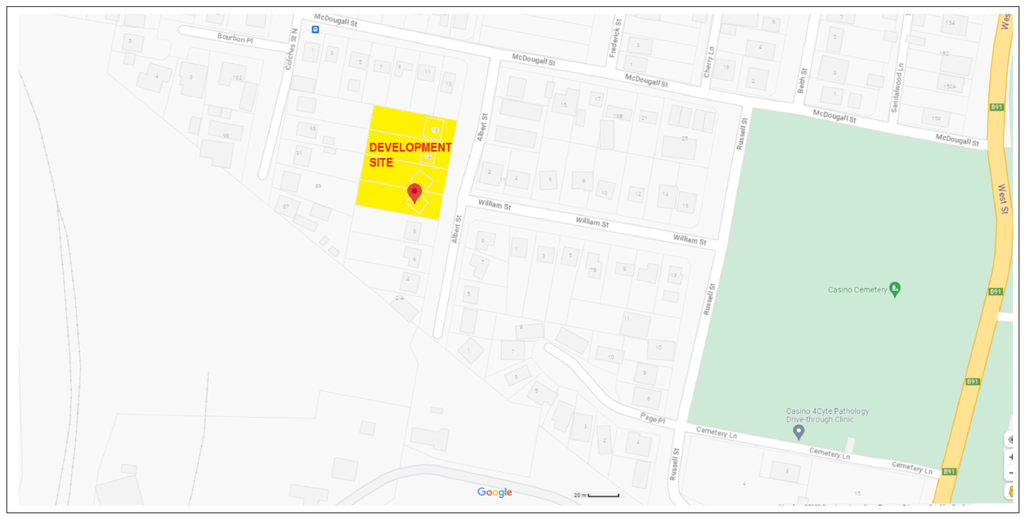
AEP	ANNUAL EXCEEDANCE PROBABILITY
ARI	AVERAGE RECURRENCE INTERVAL
CO	CLEAROUT
Ø	DIAMETER
DP	DOWNPIPE
DWG	DRAWING
e	EXISTING
GMS	GALVANISED MILD STEEL
GTD	GRATED TRENCH DRAIN
IL	INVERT LEVEL
kPa	KILOPASCALS
L	LITRES
L/s	LITRES PER SECOND
m	METRES
m2	SQUARE METRES
m3	CUBIC METRES
m/s	METRES PER SECOND
mm	MILLIMETRES
NOM	NOMINAL
OF	OVERFLOW
PVC	UNPLASTICIZED POLYVINYL CHLORIDE
Q100	QUANTITY OF FLOW FOR 100 YEAR ARI STORM
Q20	QUANTITY OF FLOW FOR 20 YEAR ARI STORM
RDP	RAINWATER DOWNPIPE
RHS	RECTANGULAR HOLLOW SECTION
RL	REDUCED LEVEL
SAC	SEWER ACCESS CHAMBER
SWP	STORMWATER PIT
UNO	UNLESS NOTED OTHERWISE

PIPE SERVICES

- E22.20 — EXISTING/NATURAL CONTOUR
- STORMWATER DRAINAGE
- EXISTING LARGE STORMWATER
- RW — RAINWATER DRAINAGE
- SUBSOIL DRAINAGE
- CATCHMENT EXTENT
- SEDIMENT FENCE
- W — EXISTING AUTHORITY WATER MAIN
- S — EXISTING AUTHORITY SEWER MAIN
- T — EXISTING AUTHORITY TELECOMMUNICATION CONDUIT

SYMBOLS

- PENETRATING PIPE
- NON-PENETRATING PIPE
- PENETRATING OFFSET
- NON-PENETRATING OFFSET
- PENETRATING TEE DROPPER
- NON-PENETRATING TEE DROPPER
- PIPE BREAK
- CAPPED SERVICE
- OPEN ENDED PIPE
- CONNECT TO EXISTING PIPE
- H — STREET HYDRANT
- SURFACE FLOW DIRECTION
- SURFACE GRADING TO DIRECT FLOW
- 10 — PIPE NETWORK NODE
- CO — CLEAR OUT
- GTD — GRATED TRENCH DRAIN
- D1 / SW100 — DETAIL — 1:20 — DETAIL NUMBER & DESCRIPTION / DRAWING REFERENCE & SCALE



STREET LOCATION PLAN

SCHEDULE OF DRAWINGS	
DRAWING No.	DRAWING TITLE
SYD23189-SW000	COVER SHEET, LEGEND & DRAWING SCHEDULE
SYD23189-SW001	EROSION & SEDIMENT CONTROL PLAN
SYD23189-SW100	STREET CONNECTION PLAN
SYD23189-SW101	GROUND FLOOR PLAN
SYD23189-SW102	FIRST FLOOR PLAN
SYD23189-SW103	ROOF PLAN
SYD23189-SW201	DETAIL SHEET 1
SYD23189-SW202	DETAIL SHEET 2
SYD23189-SW203	DETAIL SHEET 3

IMPORTANT - FOR PRINCIPAL CONTRACTOR

TO ENABLE THE ISSUE OF STORMWATER CERTIFICATION PERMITTING OCCUPATION IN ALIGNMENT WITH COUNCIL LEGISLATION, SITE INSPECTIONS MUST OCCUR. THE PRINCIPAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL STORMWATER INSPECTIONS. ABSENCE OF INSPECTION WILL PREVENT ISSUE OF STORMWATER CERTIFICATION. SITE INSPECTIONS ARE TO BE COMPLETED BY ERBAS AS FOLLOWS;

INSPECTION NO.	STORMWATER INSPECTION REQUIREMENTS	ERBAS REPRESENTATIVE		INSPECTION DATE	PASS	FAIL
		NAME	SIGNATURE		TICK ✓ OR	N/A
1	INSPECTION OF INGROUND STORMWATER DRAINAGE PRIOR TO BACKFILL (MANDATORY)					
2	INSPECTION OF ANY INGROUND STORMWATER DRAINAGE NOT VIEWED AT INSPECTION NO. 1 (OPTIONAL)					
3	INSPECTION OF INFILTRATION PIT / TANK / TRENCH PRIOR TO BACKFILL (JOB SPECIFIC)					
4	FINAL INSPECTION ON COMPLETION OF ALL LANDSCAPING & POST COMMISSIONING OF THE STORMWATER SYSTEM (MANDATORY)					
5	SURVEY OF RAINWATER & ONSITE DETENTION TANKS & WORKS AS EXECUTED STORMWATER DRAWINGS (MANDATORY) *TO BE PROVIDED TO ERBAS PRIOR TO INSPECTION					

THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWING(S)			
Discipline	Dwg. No.	Date	Revisions
ARCH PLAN		-	-
ARCH RCP			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No 1800 738 718
https://www.dpie.nsw.gov.au/land-and-housing-corporation

BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

DESIGNED: IY
CHECKED: MS
NORTH POINT

PROJECT
MULTI-DWELLING HOUSING DEVELOPMENT
10-16 ALBERT STREET,
CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

DRAWING TITLE
STORMWATER SERVICES
COVER SHEET, LEGEND & DRAWING SCHEDULE

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
-			
DATE: MAY 2023		SYD23189-SW000	P1
DRAWN: IY			

APPROXIMATE EXISTING CONTOURS BASED ON SURVEY PLAN

21 DP 36270

22 DP 36270 AREA: 963.2M²

23 DP 36270 AREA: 963.2M²

24 DP 36270 AREA: 928.8M²

25 DP 36270 AREA: 928.8M²

ONE STOREY FIBRO CLAD RESIDENCE METAL ROOF No. 8 — RIDGE: 35.99 — HEAD:34.09 SILL:32.88 — GUTTER: 34.35

ONE STOREY FIBRO CLAD RESIDENCE METAL ROOF No. 10 — RIDGE: 37.03 — GUTTER: 34.90

ONE STOREY FIBRO CLAD RESIDENCE METAL ROOF No. 12 — RIDGE: 37.03 — GUTTER: 35.48

ONE STOREY FIBRO CLAD RESIDENCE METAL ROOF No. 14 — RIDGE: 37.98 — GUTTER: 35.70 — GUTTER: 36.05

ONE STOREY FIBRO CLAD RESIDENCE METAL ROOF No. 16 — RIDGE: 36.79 — GUTTER: 33.94 — GUTTER: 36.73 — GUTTER: 36.39 — RIDGE: 37.82 — GUTTER: 36.72

FIBRO SHED

METAL SHED

METAL SHED

METAL SHED

CARPORT

CARPORT

GARDEN

GARDEN

CONCRETE SLAB

CONCRETE SLAB

CONCRETE RAMP

PROVIDE TEMPORARY GRAVEL LAYER AT VEHICULAR ENTRANCE TO PREVENT SOIL DEPOSITS ON ROADWAY DURING CONSTRUCTION:
NOMINAL 5m x 3m x 200mm THICK LAYER USING DGB20 ROADBASE OR 30mm AGGREGATE (SIMILAR PRINCIPLE TO 15m LONG ARRANGEMENT SHOWN IN STANDARD DRAWING SD6-14 ON PAGE 6-48 OF SOILS & CONSTRUCTION: MANAGING URBAN STORMWATER, 4TH EDITION, MARCH 2004 AVAILABLE FROM LANDCOM)
REFER TO DETAIL D1 ON DWG SW201

WHERE DEEMED NECESSARY:
ERECT ALL SEDIMENT FENCES PRIOR TO EXCAVATION OF EXISTING GROUND SURFACE & REMOVE WHEN NO LONGER NECESSARY TO CONTROL MOVEMENT OF SOIL & WATER ACROSS SITE
(REFER TO DETAIL D2 ON DWG SW201)

FOR EROSION & SEDIMENT CONTROL ASSESSMENT NOTES REFER TO DWG SW201

THIS EROSION & SEDIMENT CONTROL PLAN INCORPORATES PROPOSED MEASURES FOR MANAGEMENT OF SOIL & WATER MOVEMENT DURING COUNSTRUCTION

1:100

THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWINGS:

Discipline	Dwg. No.	Date	Revisions
ARCH PLAN			
ARCH RCP			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No 1800 738 718
https://www.dpie.nsw.gov.au/land-and-housing-corporation

BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

DESIGNED IY
CHECKED MS
NORTH POINT

PROJECT
MULTI-DWELLING HOUSING DEVELOPMENT
10-16 ALBERT STREET,
CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

DRAWING TITLE
STORMWATER SERVICES
EROSION & SEDIMENT CONTROL PLAN

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
1:100			
DATE			
MAY 2023		SYD23189-SW001	P1
DRAWN			
IY			

ALL EXISTING UNDERGROUND SERVICES INDICATED ON PLAN ARE BASED ON INFORMATION AVAILABLE AT THE TIME OF DESIGN & ARE SHOWN IN ASSUMED LOCATIONS ONLY. INVESTIGATE & CONFIRM ALL RELEVANT LOCATIONS & CONNECTIONS PRIOR TO INSTALLATION OF NEW PIPES & ADVISE SUPERINTENDENT OF ANY DISCREPANCIES.

INVESTIGATE LOCATION OF ALL EXISTING SERVICES AFFECTED BY NEW WORKS & DISUSE, CAP OFF, DIVERT, UPGRADE, RENEW, REINSTATE & RECONNECT SERVICES AS REQUIRED. COORDINATE ALL TEMPORARY SHUTDOWNS WITH SITE SUPERINTENDENT, PROVIDING REASONABLE & ADEQUATE ADVANCE NOTICE.

WHERE LANDSCAPED SOIL COVER IS LESS THAN 300mm: ALLOW TO INSTALL DUCTILE IRON PIPEWORK

WHERE APPLICABLE: PRIOR TO EXCAVATION CONTACT DIAL-BEFORE-YOU-DIG ON 1100 TO AVOID DAMAGE TO EXISTING SERVICES

DISCHARGE TO GRASS DRAINAGE CHANNEL IN ACCORDANCE WITH COUNCIL REQUIREMENTS. UPON COMPLETION OF WORKS RESTORE DISTURBED SURFACES TO SUIT EXISTING LANDSCAPING WHERE NECESSARY

REFER TO DWG SW203 FOR PIPE & PIT SCHEDULES

EXISTING SHALLOW VALLEY GRASS CHANNEL

ASSUMED EXISTING DRAINAGE UNDER NEIGHBOURING DRIVEWAY TO REMAIN

DRIVEWAY CROSSOVER TO BE 2/300MM CLASS 4, RRJ, RCP CONCRETE PIPES RUN AT 0.4% TERMINATED WITH SLOPING (CRASH COMPLIANT) HEADWALLS AT EITHER END WITHIN GRASSED DRAINAGE CHANNEL. COVER TO BE NOT LESS THAN 150MM INCLUSIVE OF MINIMUM 100MM CONCRETE AND 50MM OF SUITABLE SUBSTRATE.

BUILDER TO LOCALLY MODIFY GRASSED DRAINAGE CHANNEL SURFACE LEVEL TO ACCOMMODATE PROPOSED DRIVEWAY & RHS DRAINAGE CONDUITS AS REQUIRED

CONTRACTOR TO ENSURE ADEQUATE PROTECTIVE SOIL COVER OVER PIPEWORK

WHEREVER POSSIBLE: LAY PIPEWORK TO AVOID EXISTING & PROPOSED TREES (TYPICAL)

OVERFLOW FROM DETENTION TANK

STORMWATER TREATMENT UNIT EQUAL TO ECOSOL STORMPIT CLASS 2 - 10L

STORMWATER TREATMENT UNIT EQUAL TO ECOSOL GPT 4300

150mm HIGH CONCRETE KERB

PROPOSED DISH DRAIN DEPRESSION DRIVEWAY CROSSING AS REQUIRED

ALBERT STREET

WILLIAM STREET

A03 SITE PLAN

0 2 4 6 8 10 m
1:100

THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWING(S):

Discipline	Dwg. No.	Date	Revisions
ARCH PLAN	ASD	04.10.23	
ARCH RDP			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN. WORK TO FIGURED DIMENSIONS, DO NOT SCALE FROM DRAWINGS.
CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL CONTRACT DOCUMENTS.

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION
P2	05.10.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No 1800 738 718
https://www.dpie.nsw.gov.au/land-and-housing-corporation

BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

DESIGNED: IY
CHECKED: MS
NORTH POINT

PROJECT
MULTI-DWELLING
HOUSING DEVELOPMENT
10-16 ALBERT STREET,
CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

DRAWING TITLE
STORMWATER SERVICES
STREET CONNECTION PLAN

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
1:100			
DATE: MAY 2023		SYD23189-SW100	P2
DRAWN: IY			

APPROXIMATE EXISTING CONTOURS BASED ON SURVEY PLAN

WHERE PIPES PASS THROUGH FOOTING BEAMS PROVIDE 10mm COMPRESSIBLE MATERIAL AROUND PIPEWORK & COORDINATE WITH BUILDER TO AVOID REINFORCEMENT (TYPICAL)

RAINWATER TANK TO STORE MIN 10m3 BELOW GROUND FROM RL30.30 UP TO RL31.90 WITH 1.60m EFFECTIVE DEPTH (e.g. 10m x 1m x 1.60m DEPTH = 16m3) REFER TO DETAIL D4 ON DWG SW202

PROVIDE ALL SUBSOIL DRAINAGE AS REQUIRED IN CONJUNCTION WITH STRUCTURAL ENGINEER'S & LANDSCAPE ARCHITECTS DOCUMENTATION (e.g. FOR RETAINING WALLS OR PLANTER DRAINS)

STORMWATER DETENTION TANK TO STORE MIN 69m3 BELOW GROUND FROM RL31.11 UP TO RL31.80 WITH 0.62m MEAN PONDING DEPTH, 0.69m MAX HEAD & 1% FALL TO OUTLET (e.g. [17m x 3m + 11m x 5.5m] x 0.62m MEAN DEPTH = 69m3) REFER TO DETAILS D3 & D4 ON DWG SW202

FINISHED GROUND SURFACES AROUND BUILDING TO BE GENERALLY GRADED AWAY FROM AND AROUND BUILDING TO AVOID CREATING LOW POINTS WHERE WATER CAN ACCUMULATE (TYPICAL)

BUILDER TO ENSURE TYPICAL WALLS/FENCES PERMIT PASSAGE OF STORMWATER AT GROUND LEVEL FOR EMERGENCY OVERLAND FLOW DURING SEVERE STORMS (TYPICAL, RECOMMENDED 100mm HIGH GAP)

ALL EXISTING UNDERGROUND SERVICES INDICATED ON PLAN ARE BASED ON INFORMATION AVAILABLE AT THE TIME OF DESIGN & ARE SHOWN IN ASSUMED LOCATIONS ONLY. INVESTIGATE & CONFIRM ALL RELEVANT LOCATIONS & CONNECTIONS PRIOR TO INSTALLATION OF NEW PIPES & ADVISE SUPERINTENDENT OF ANY DISCREPANCIES.

INVESTIGATE LOCATION OF ALL EXISTING SERVICES AFFECTED BY NEW WORKS & DISUSE, CAP OFF, DIVERT, UPGRADE, RENEW, REINSTATE & RECONNECT SERVICES AS REQUIRED. COORDINATE ALL TEMPORARY SHUTDOWNS WITH SITE SUPERINTENDENT, PROVIDING REASONABLE & ADEQUATE ADVANCE NOTICE.

WHERE LANDSCAPED SOIL COVER IS LESS THAN 300mm: ALLOW TO INSTALL DUCTILE IRON PIPEWORK

WHERE APPLICABLE: PRIOR TO EXCAVATION CONTACT DIAL-BEFORE-YOU-DIG ON 1100 TO AVOID DAMAGE TO EXISTING SERVICES

DISCHARGE TO GRASS DRAINAGE CHANNEL IN ACCORDANCE WITH COUNCIL REQUIREMENTS. UPON COMPLETION OF WORKS RESTORE DISTURBED SURFACES TO SUIT EXISTING LANDSCAPING WHERE NECESSARY

REFER TO DWG SW203 FOR PIPE & PIT SCHEDULES

APPROXIMATE LOCATION OF EXISTING AUTHORITY SEWER MAIN

TWO 250x150 RHS

STORMWATER TREATMENT UNIT EQUAL TO ECOSOL STORMPIT CLASS 1 - 7L

STORMWATER TREATMENT UNIT EQUAL TO ECOSOL STORMPIT CLASS 1 - 7L WITH COVER IN BIN STORE

THREE x 250x150 RHS

CONTRACTOR TO ENSURE ADEQUATE PROTECTIVE SOIL COVER OVER PIPEWORK

WHEREVER POSSIBLE: LAY PIPEWORK TO AVOID EXISTING & PROPOSED TREES (TYPICAL)

OVERFLOW FROM DETENTION TANK

STORMWATER TREATMENT UNIT EQUAL TO ECOSOL GPT 4300

TANK BASE RL31.20

TANK BASE RL31.18

TANK BASE RL31.11

COMMON OPEN AREA

One Storey Fibro Clad Residence Metal Roof No. 8

RIDGE: 35.99

THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWING(S):			
Discipline	Dwg. No.	Date	Revisions
ARCH PLAN	A02	04.10.23	
ARCH RCP			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION
P2	06.10.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No: (02) 8837 7187
https://www.dpie.nsw.gov.au/land-and-housing-corporation

BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

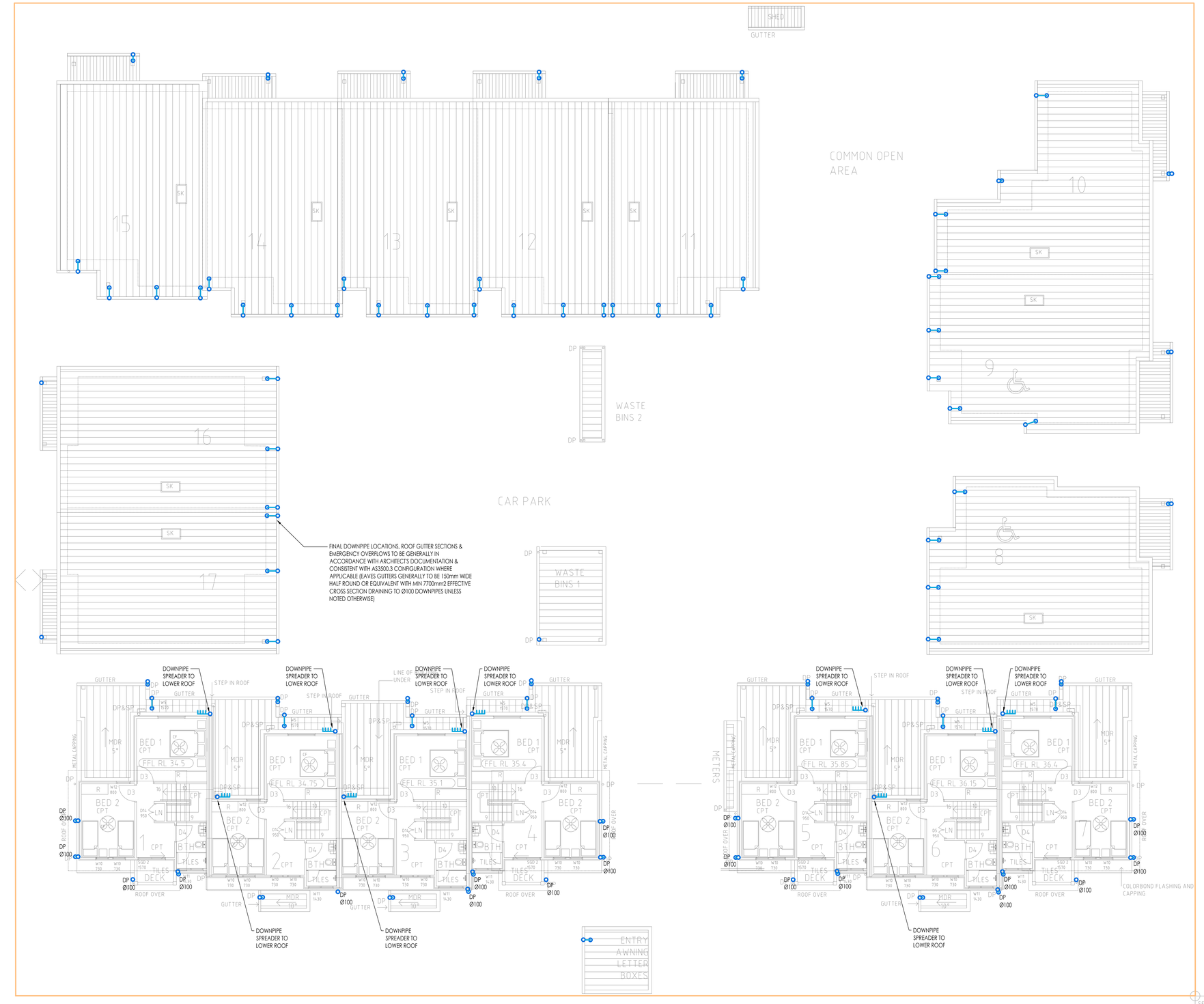
DESIGNED IY
CHECKED MS
NORTH POINT

PROJECT
MULTI-DWELLING HOUSING DEVELOPMENT
10-16 ALBERT STREET, CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

DRAWING TITLE
STORMWATER SERVICES GROUND FLOOR PLAN

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
1:100			
DATE			
MAY 2023		SYD23189-SW101	P2
DRAWN IY			

0 2 4 6 8 10 m
1:100



THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWINGS:			
Discipline	Dwg. No.	Date	Revisions
ARCH PLAN	ADA	04.10.23	-
ARCH RCP			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION
P2	06.10.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No 1800 738 718
https://www.dpie.nsw.gov.au/land-and-housing-corporation

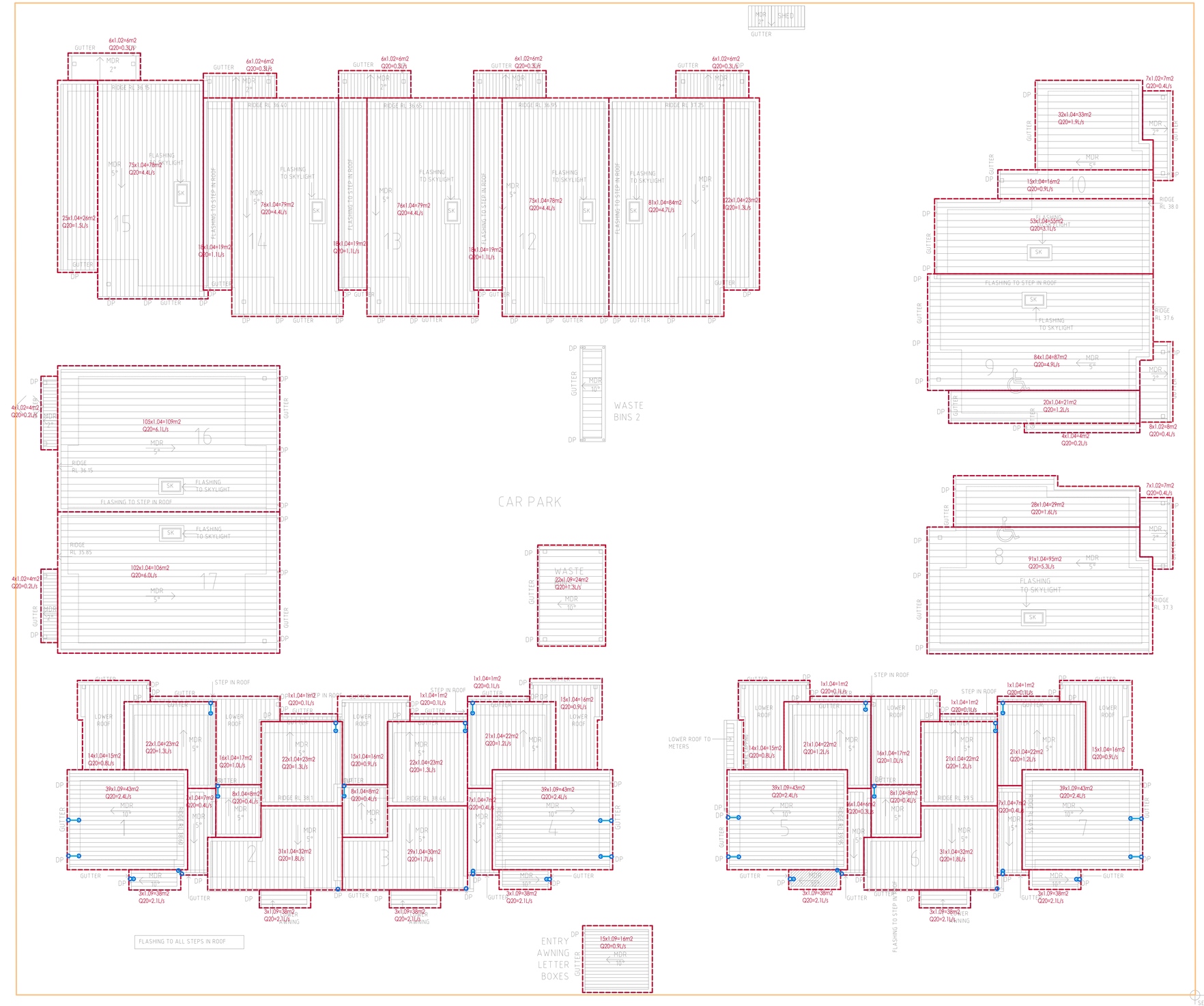
BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

DESIGNED IY
CHECKED MS
NORTH POINT

PROJECT
MULTI-DWELLING
HOUSING DEVELOPMENT
10-16 ALBERT STREET,
CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

DRAWING TITLE
STORMWATER SERVICES
FIRST FLOOR PLAN

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
1:100			
DATE			
MAY 2023		SYD23189-SW102	P2
DRAWN			
IY			



THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWING(S):			
Discipline	Dwg. No.	Date	Revisions
ARCH PLAN	A05	04.10.23	-
ARCH REF			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION
P2	06.10.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No 1800 738 718
https://www.dpie.nsw.gov.au/land-and-housing-corporation

BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

DESIGNED: IY
CHECKED: MS
NORTH POINT

PROJECT
MULTI-DWELLING
HOUSING DEVELOPMENT
10-16 ALBERT STREET,
CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

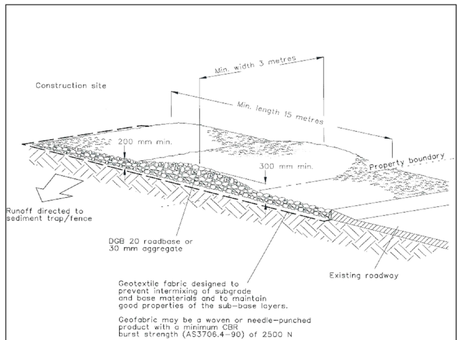
DRAWING TITLE
STORMWATER SERVICES
ROOF PLAN

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
1:100			
DATE: MAY 2023			
DRAWN: IY		SYD23189-SW103	P2

EROSION & SEDIMENT CONTROL ASSESSMENT

Based on Soils and Construction: Managing Urban Stormwater - 4th Edition - March 2004

Assumed area of Soil Disturbance	=	3784	m2 =	0.3784 ha
Rainfall Erosivity Factor R	=	3400	for	CASINO from APPENDIX B: MAP 2 ON PAGE B-4
Take Site Slope	=	4	%	
Indicative Erosion Hazard is		LOW		based on Section 4.4.1 Figure 4.6 on page 4-10
Use Revised Universal Soil Loss Equation (RUSLE) to check:				
Soil Erodibility Factor K	=	0.060	for	CASINO from www.environment.nsw.gov.au/espade2webapp
Slope Length/Gradient Factor Ls	=	0.91	from APPENDIX A: USING 80m LENGTH IN TABLE A1 ON PAGE A-9	
Erosion Control Practice Factor P	=	1.3	from APPENDIX A: TABLE A2 ON PAGE A-11	
Ground Cover & Management Factor C	=	1.0	from APPENDIX A: FIGURE A5 ON PAGE A-12	
Soil Loss	=	241	t/ha/yr	
Soil Loss Class	=	3	for	SOIL LOSS BETWEEN 226 & 350t/ha/yr based on SECTION 4.4.2 TABLE 4.2 ON PAGE 4-13
Erosion Hazard is therefore		LOW-MODERATE		AND THERE ARE NO SEASONAL RESTRICTIONS ON SITE ACTIVITY
For 1.0 t/m3 density, Average Annual Soil Loss	=	241	m3/yr	SINCE THIS IS GREATER THAN THAN 150m3/yr, A SEDIMENT BASIN WOULD BE CONSIDERED NECESSARY UNLESS INDIVIDUAL SOIL DISTURBANCE AREAS CAN BE LIMITED TO 2500m2 OR LESS FOR THE AREA TO BE DISTURBED ON THIS SITE, SEDIMENT FENCES ARE CONSIDERED SATISFACTORY based on SECTION 6.3.2(d) ON PAGE 6-8
10yr 5min RAINFALL INTENSITY	=	186	mm/h	Refer to SECTION 2.1 ON PAGE 2-1, SECTION 4.4.1(a) ON PAGE 4-9 & SECTION 4.3.2(h)(iv) ON PAGE 4-4
10yr 1hr RAINFALL INTENSITY	=	55.8	mm/h	LENGTHS OF SEDIMENT FENCING SHOULD BE ARRANGED TO LIMIT SUBCATCHMENT FLOWS TO 50L/s Refer to SECTION 6.3.7 (e) ON PAGE 6-34 & SECTION 2.3.1(e) ON PAGE 2-4
A fully pervious area of up to		1800	m2 can be accommodated by one length of sediment fencing	

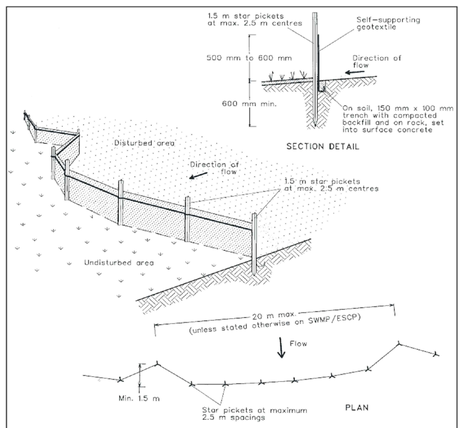


Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200-mm thick pad over the geotextile using road base or 30-mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

STABILISED SITE ACCESS **SD 6-14**

D1 SW001 STABILISED SITE ACCESS
NOT TO SCALE



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**

D2 SW001 SEDIMENT FENCE
NOT TO SCALE

STORMWATER MANAGEMENT PLAN INFORMATION

DEVELOPMENT AUTHORITY: Richmond Valley Council

SITE ADDRESS: 10-16 Albert Street, Casino NSW

DEVELOPMENT GUIDELINES
- Richmond Valley Council - Development Control Plan 2021 - Part A-8 Multi Dwelling Housing
- Richmond Valley Council - Development Control Plan 2021 - Part I-9 Water Sensitive Design

EXISTING SITE CHARACTERISTICS
- Site area = 3784m2
- Existing impervious area = 671m2 (18% of site)
- Proposed impervious area = 2732m2 (72% of site)
- Four existing single dwelling residential lots
- Located beside intersection of Albert Street and William Street, on west side of Albert Street.
- Survey plan prepared by RPS Australia East Pty Ltd - Drawing Reference 151687 [Rev 1] - dated 06/09/2022 indicates Australian Height Datum (AHD) site surface contours ranging from a localised high point of about RL34.13 at the northwest corner of the site down to about RL30.89 at the southeast corner of the site. The average site slope is observed to be about 4%.

LOCAL FLOODING EFFECTS
Based on the Casino Floodplain Hazard Categories map the subject property at is NOT considered to be affected by flooding.

EXISTING STREET DRAINAGE
Based on site survey of the existing property undertaken on 6 SEP 2022, it was observed that no existing formal underground street drainage or kerb inlet pit is available for connection along the frontage of Albert Street. Surface runoff currently appears to drain along shallow valley grass channels on each side of the street, towards the south. It is observed that some existing residential driveway widths accommodate a short length pipe length to convey stormwater below the driveway surface, while other driveways often have no underground pipe concealed below, but are simply depressed to allow flow across the lowest part of the driveway.

PROPOSED CONNECTION
It is proposed that site drainage from the new development will be directed to the existing ground surface beside Albert Street. This conceptual arrangement is also the preferred approach recommended by Richmond Valley Council engineering email advice (obtained on 20 APR 2023 from Travis Eggins).

RAINWATER STORAGE
Based on Richmond Valley Council - Development Control Plan 2021 - Part A-8 Multi Dwelling Housing, Section A-8.1.2 recommends Council advice should be obtained in the early stages of the design process. Council engineering advice was obtained on 20 APR 2023 and underground pipe discharge from the site was not recommended as a suitable option. Therefore, multiple shallow outlets from rainwater and detention tank storage are proposed.
Rainwater storage requirements for new residential dwellings are also typically provided to satisfy State Environmental Policy Building Sustainability Index (BASIX) assessment requirements. It is proposed that at least 10000L rainwater storage will be provided for the development.

STORMWATER QUALITY
Based on Richmond Valley Council - Development Control Plan 2021 - Part I-9 Water Sensitive Design, Table I-9.1 requires specific stormwater quality targets to be achieved. Based on the Model for Urban Stormwater Improvement Conceptualisation (MUSIC), it is proposed that treatment products equal to Urban Stormwater Assets (Ecosol products) will be provided to address water quality improvement parameters in a satisfactory manner.

STORMWATER GENERATION
Based on Richmond Valley Council - Development Control Plan 2021 - Part I-9 Water Sensitive Design, Table I-9.4 for residential lots requires either
- a minimum 5000L rainwater tank to capture at least 50% of total roof area OR
- an infiltration/absorption system to capture at least 80% of total roof area OR
- a bioretention system to capture at least 80% of total roof area

Council engineering advice obtained on 20 APR 2023 indicates infiltration and bioretention would not be considered efficient options for the site.
It is proposed that more than 5000L rainwater storage capturing more than 50% of total roof area will be provided for the development, in addition to a stormwater detention tank reducing site discharge to the street drainage system.

TEMPORARY EROSION & SEDIMENT CONTROL MEASURES
Based on Richmond Valley Council - Development Control Plan 2021 - Part I-9 Water Sensitive Design, Section I-9.7 requires erosion and sediment control measures to be implemented. During construction works the management of soil and water movement requiring erosion and sediment control is to be undertaken in accordance with the Landcom publication *Soils and Construction: Managing Urban Stormwater 4th Edition, March 2004* (also known as "the Blue Book").
Temporary construction measures to be undertaken include:
- Sediment fencing on the low side of earthmoving operations
- A gravel layer at the construction vehicle access point into the area of works
- Regular monitoring of soil movement characteristics and cleaning of sediment deposits as required during construction
- Security fencing around the area of construction works

CONCLUSION
This Stormwater Management Plan identifies and addresses the following items relating to anticipated engineering assessment by Richmond Valley Council :
- Mainstream flooding effects are not considered to be applicable to the site of proposed works
- Council recommends surface discharge along Albert Street (although there is no existing concrete kerb, but only a depressed grass channel)
- Minimum 10000L or 10m3 rainwater storage is proposed
- Stormwater quality and generation are to be addressed by rainwater storage, detention storage and treatment measures
- Erosion and sediment movement is to be controlled during construction with suitable measures to prevent undesirable soil deposits around the works area

DRAINS SOFTWATER MODELLING RESULT SUMMARY

STORMWATER DETENTION CALCULATION SUMMARY

Project: 10-16 ALBERT STREET, CASINO

Effective detention storage up to RL 31.80 (lowest connected grate)

	5 YEAR ARI					20 YEAR ARI					100 YEAR ARI				
Storm Duration	Existing Runoff L/s	Detained Flow L/s	Overflow L/s	Total Outflow L/s	Max Water RL m	Existing Runoff L/s	Detained Flow L/s	Overflow L/s	Total Outflow L/s	Max Water RL m	Existing Runoff L/s	Detained Flow L/s	Overflow L/s	Total Outflow L/s	Max Water RL m
5min	99	82		82	31.34	168	100		100	31.45	250	118		118	31.59
10min	113	91		91	31.39	166	115		115	31.56	243	139		139	31.76
15min	108	90		90	31.39	182	116		116	31.57	217	139		139	31.76
20min	116	91		91	31.39	161	115		115	31.56	220	139		139	31.77 max
25min	99	86		86	31.36	154	112		112	31.54	208	137		137	31.75
30min	105	84		84	31.35	143	107		107	31.50	181	131		131	31.69
45min	104	84		84	31.35	121	94		94	31.41	161	122		122	31.62
1.0hr	79	71		71	31.28	129	100		100	31.45	139	113		113	31.55
1.5hr	70	65		65	31.25	103	81		81	31.33	126	95		95	31.42
2.0hr	68	64		64	31.24	104	77		77	31.31	133	100		100	31.45

ORIFICE DIAMETER =	300 mm
MINIMUM INTERNAL TANK AREA =	111 m2
REQUIRED STORAGE VOLUME =	69 m3
SITE AREA =	3784 m2
EXISTING IMPERVIOUS PROPORTION =	18 %
PROPOSED IMPERVIOUS PROPORTION =	72 %

THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWINGS:

Discipline	Dwg. No.	Date	Revisions
ARCHITAN			
ARCH ROF			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No: 1800 738 718
https://www.dpie.nsw.gov.au/land-and-housing-corporation

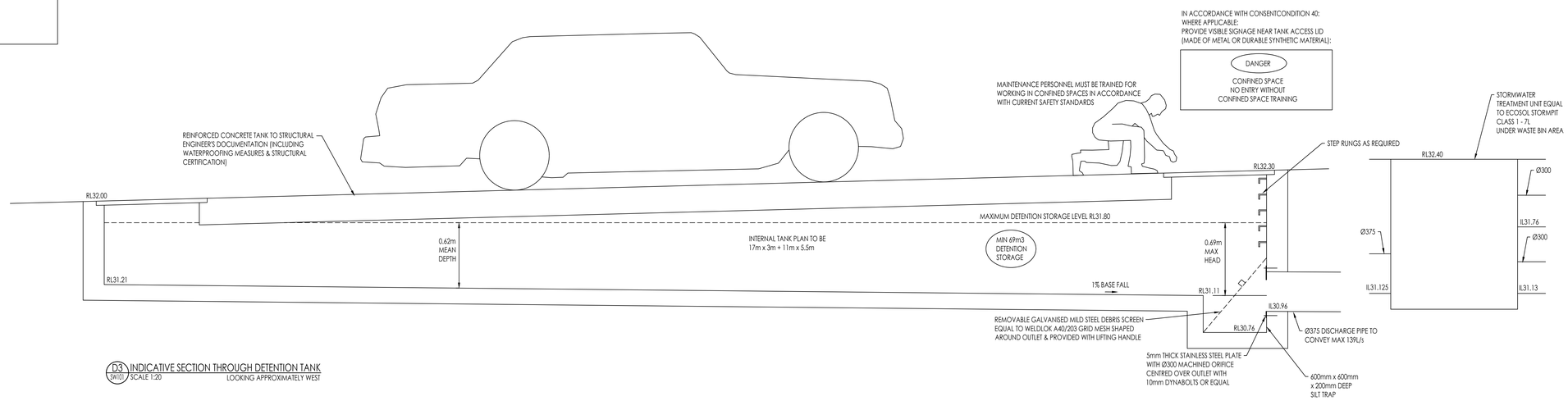
BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

DESIGNED IY
CHECKED MS
NORTH POINT

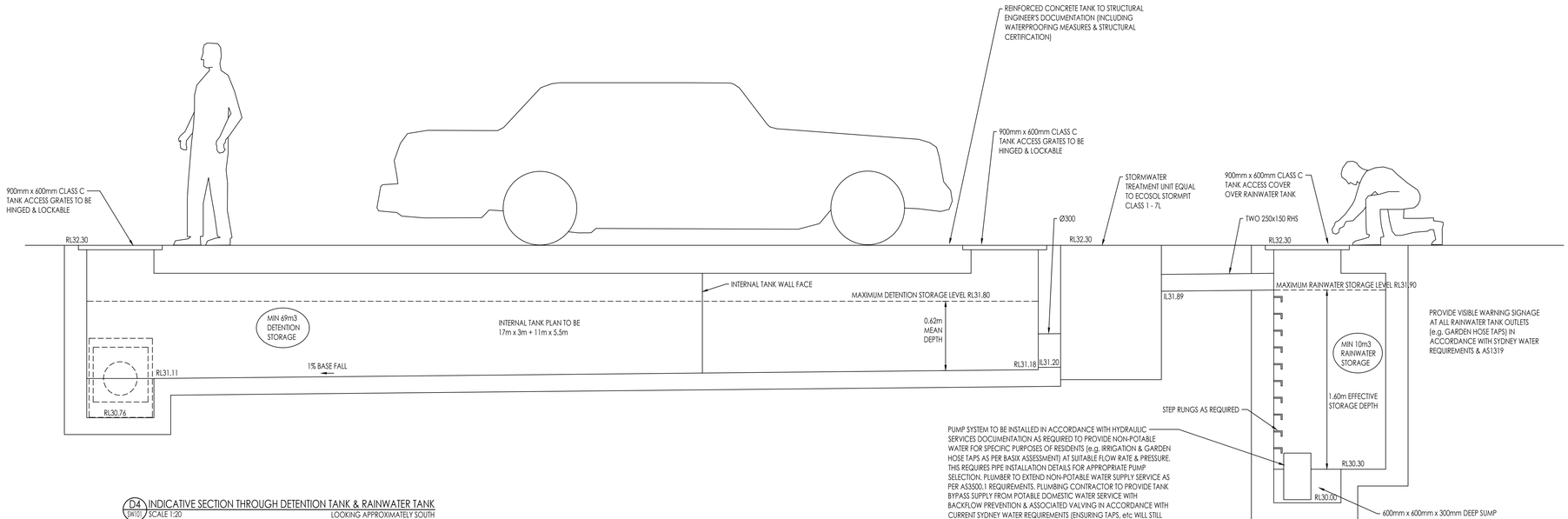
PROJECT
MULTI-DWELLING
HOUSING DEVELOPMENT
10-16 ALBERT STREET,
CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

DRAWING TITLE
STORMWATER SERVICES
DETAIL SHEET 1

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
-			
DATE			
MAY 2023			
DRAWN IY		SYD23189-SW201	P1



D3 SW101 INDICATIVE SECTION THROUGH DETENTION TANK
SCALE 1:20 LOOKING APPROXIMATELY WEST



D4 SW102 INDICATIVE SECTION THROUGH DETENTION TANK & RAINWATER TANK
SCALE 1:20 LOOKING APPROXIMATELY SOUTH

THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWING(S):

Discipline	Dwg. No.	Date	Revisions
BASIX PLAN		-	-
AREA HELP			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN. WORK TO FIGURED DIMENSIONS. DO NOT SCALE FROM DRAWINGS.
CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL CONTRACT DOCUMENTS.

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No 1800 738 718
https://www.dpie.nsw.gov.au/land-and-housing-corporation

BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

DESIGNED IY
CHECKED MS
NORTH POINT

PROJECT
MULTI-DWELLING HOUSING DEVELOPMENT
10-16 ALBERT STREET,
CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

DRAWING TITLE
STORMWATER SERVICES DETAIL SHEET 2

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
-			
DATE			
MAY 2023		SYD23189-SW202	P1
DRAWN IY			

STORMWATER PIPE SCHEDULE

STORMWATER PIPE SIZING BY RATIONAL FORMULA & COLEBROOK-WHITE EQUATION
Coefficient of runoff determined in accordance with Ch. 14 of AR & R (1987)

PROJECT: 10-16 ALBERT ST CASINO

Design rainfall intensity = 278.00 mm/h Pipe roughness k = 0.015 mm
ARI = 100 years Fy = 1.20 10 year 1 hour intensity = 55.80 mm/h

U/S NODE	D/S NODE	AREA m2	IMPERV %	COEF	SLOPE %	INFLOW L/s	PIPEFLOW L/s	CAP L/s	SIZE mm	U/S NODE	D/S NODE	AREA m2	IMPERV %	COEF	SLOPE %	INFLOW L/s	PIPEFLOW L/s	CAP L/s	SIZE mm	
										< TABULAR VALUES CONTINUED >										
1	2	6	100	1.00	1.00	0.5	0.5	8.0	100	81	82	23	100	1.00	1.00	1.8	4.9	8.0	100	
2	3	6	100	1.00	1.00	0.5	0.9	8.0	100	82	83	23	100	1.00	1.00	1.8	6.7	8.0	100	
3	4	6	100	1.00	1.00	0.5	1.4	8.0	100	83	84	23	100	1.00	1.00	1.8	8.5	23.7	150	
4	5	6	100	1.00	1.00	0.5	1.9	8.0	100	84	85	23	100	1.00	1.00	1.8	10.3	23.7	150	
5	6	6	100	1.00	1.00	0.5	2.3	8.0	100	85	86	22	100	1.00	1.00	1.7	12.0	23.7	150	
6	7	22	100	1.00	1.00	1.7	4.0	8.0	100	86	87	15	100	1.00	1.00	1.2	13.1	23.7	150	
7	8	27	100	1.00	1.00	2.1	6.1	8.0	100	87	88	22	100	1.00	1.00	1.7	14.8	23.7	150	
8	9	27	100	1.00	1.00	2.1	8.2	23.7	150	88	89	0	100	1.00	1.00	0.0	47.4	69.3	225	
9	10	27	100	1.00	1.00	2.1	10.3	23.7	150	89	90	0	100	1.00	1.00	0.0	74.4	148.1	300	
10	11	25	100	1.00	1.00	1.9	12.2	23.7	150	90	101	0	100	1.00	1.00	0.0	130.2	148.1	300	50% FLOW TO 2 OUTLETS (65.1L/s EACH)
11	12	25	100	1.00	1.00	1.9	14.1	23.7	150	91	92	45	33	0.77	1.00	2.7	2.7	23.7	150	
12	13	25	100	1.00	1.00	1.9	16.1	23.7	150	92	93	35	17	0.69	1.00	1.9	4.5	23.7	150	
13	14	18	100	1.00	1.00	1.4	17.5	23.7	150	93	94	35	17	0.69	1.00	1.9	6.4	23.7	150	
14	15	25	100	1.00	1.00	1.9	19.4	23.7	150	94	95	26	23	0.72	1.00	1.4	7.9	23.7	150	
15	16	25	100	1.00	1.00	1.9	21.3	23.7	150	95	96	14	57	0.88	1.00	1.0	8.8	23.7	150	
16	17	25	100	1.00	1.00	1.9	23.2	23.7	150	96	97	13	85	1.00	1.00	1.0	9.8	23.7	150	
17	18	18	100	1.00	1.00	1.4	24.6	69.3	225	97	122	32	75	0.96	1.00	2.4	12.2	23.7	150	
18	19	25	100	1.00	1.00	1.9	26.6	69.3	225	98	99	255	4	0.63	1.00	12.4	12.4	23.7	150	
19	25	25	100	1.00	1.00	1.9	28.5	69.3	225	99	100	150	5	0.64	1.00	7.4	19.8	23.7	150	
20	21	25	100	1.00	1.00	1.9	1.9	8.0	100	100	101	143	45	0.82	1.00	9.1	28.9	69.3	225	
21	22	25	100	1.00	1.00	1.9	3.9	8.0	100	101	119	0	100	1.00	1.00	0.0	94.0	148.1	300	
22	23	25	100	1.00	1.00	1.9	5.8	8.0	100	102	103	16	50	0.85	1.00	1.0	1.0	23.7	150	
23	24	43	100	1.00	1.00	3.3	9.1	23.7	150	103	104	10	50	0.85	1.00	0.7	1.7	23.7	150	
24	25	25	100	1.00	1.00	1.9	11.0	23.7	150	104	105	17	53	0.86	1.00	1.1	2.8	23.7	150	
25	26	0	100	1.00	1.00	0.0	39.5	69.3	225	105	106	13	100	1.00	1.00	1.0	3.8	23.7	150	
26	27	4	100	1.00	1.00	0.3	39.8	69.3	225	106	118	10	60	0.89	1.00	0.7	4.5	23.7	150	
27	28	35	100	1.00	1.00	2.7	42.5	69.3	225	107	108	63	81	0.99	1.00	4.8	4.8	8.0	100	
28	33	35	100	1.00	1.00	2.7	45.3	69.3	225	108	109	11	55	0.87	1.00	0.7	5.6	8.0	100	
29	30	34	100	1.00	1.00	2.6	2.6	8.0	100	109	117	39	21	0.71	1.00	2.1	7.7	8.0	100	
30	31	34	100	1.00	1.00	2.6	5.3	8.0	100	110	111	51	14	0.68	1.00	2.7	2.7	8.0	100	
31	32	34	100	1.00	1.00	2.6	7.9	8.0	100	111	112	264	70	0.94	0.50	19.2	21.8	101.9	300	
32	33	35	100	1.00	1.00	2.7	10.6	23.7	150	112	116	36	64	0.91	0.50	2.5	24.4	101.9	300	
33	90	0	100	1.00	1.00	0.0	55.8	69.3	225	113	114	31	13	0.67	0.50	1.6	1.6	101.9	300	
34	35	7	100	1.00	1.00	0.5	0.5	8.0	100	114	115	5	10	0.66	0.50	0.3	1.9	101.9	300	
35	36	8	100	1.00	1.00	0.6	1.2	8.0	100	115	116	15	100	1.00	0.50	1.2	3.0	101.9	300	
36	37	7	100	1.00	1.00	0.5	1.7	8.0	100	116	117	0	100	1.00	0.50	0.0	27.4	101.9	300	
37	38	4	100	1.00	1.00	0.3	2.0	8.0	100	117	118	0	100	1.00	0.50	0.0	35.1	101.9	300	
38	45	20	100	1.00	1.00	1.5	3.6	8.0	100	118	119	0	100	1.00	0.50	0.0	39.6	101.9	300	
39	40	32	100	1.00	1.00	2.5	2.5	8.0	100	119	122	0	100	1.00	0.50	0.0	133.6	183.7	375	
40	41	15	100	1.00	1.00	1.2	3.6	8.0	100	120	121	10	50	0.85	1.00	0.7	0.7	23.7	150	
41	42	27	100	1.00	1.00	2.1	5.7	8.0	100	121	122	25	76	0.97	1.00	1.9	2.5	23.7	150	
42	43	55	100	1.00	1.00	4.2	10.0	23.7	150	122	123	734	52	0.86	0.50	48.5	MAX139.0	183.7	375	FROM OSD
43	44	28	100	1.00	1.00	2.2	12.1	23.7	150	123	124	0	100	1.00	0.50	0.0	139.0	183.7	375	
44	45	28	100	1.00	1.00	2.2	14.3	23.7	150	124	125	0	100	1.00	0.50	0.0	139.0	142.8	3x225	
45	50	0	100	1.00	1.00	0.0	17.8	23.7	150	125	126	8	10	0.66	0.50	0.4	139.4	142.8	3x225	
46	47	30	100	1.00	1.00	2.3	2.3	8.0	100	126	132	0	100	1.00	0.50	0.0	139.4	152.7	3x250x150	RHS
47	48	30	100	1.00	1.00	2.3	4.6	8.0	100	127	128	17	47	0.83	1.00	1.1	1.1	23.7	150	
48	49	30	100	1.00	1.00	2.3	6.9	8.0	100	128	129	32	91	1.00	1.00	2.5	3.6	23.7	150	
49	50	28	100	1.00	1.00	2.2	9.1	23.7	150	129	130	16	50	0.85	1.00	1.0	4.6	23.7	150	
50	89	0	100	1.00	1.00	0.0	27.0	69.3	225	130	131	10	60	0.89	1.00	0.7	5.3	23.7	150	
51	52	22	100	1.00	1.00	1.7	1.7	8.0	100	131	132	10	100	1.00	1.00	0.8	6.1	23.7	150	
52	53	15	100	1.00	1.00	1.2	2.9	8.0	100	132	1000	74	73	0.95	1.00	5.5	151.0	152.7	3x250x150	RHS
53	54	22	100	1.00	1.00	1.7	4.6	8.0	100											
54	55	24	100	1.00	1.00	1.9	6.4	8.0	100											
55	56	22	100	1.00	1.00	1.7	8.1	23.7	150											
56	77	14	100	1.00	1.00	1.1	9.2	23.7	150											
57	58	20	100	1.00	1.00	1.5	1.5	8.0	100											
58	59	20	100	1.00	1.00	1.5	3.1	8.0	100											
59	60	3	100	1.00	1.00	0.2	3.3	8.0	100											
60	61	38	100	1.00	1.00	2.9	6.3	8.0	100											
61	62	3	100	1.00	1.00	0.2	6.5	8.0	100											
62	63	6	100	1.00	1.00	0.5	6.9	8.0	100											
63	64	3	100	1.00	1.00	0.2	7.2	8.0	100											
64	65	20	100	1.00	1.00	1.5	8.7	23.7	150											
65	76	20	100	1.00	1.00	1.5	10.3	23.7	150											
66	67	22	100	1.00	1.00	1.7	1.7	8.0	100											
67	68	22	100	1.00	1.00	1.7	3.4	8.0	100											
68	69	3	100	1.00	1.00	0.2	3.6	8.0	100											
69	70	7	100	1.00	1.00	0.5	4.2	8.0	100											
70	71	3	100	1.00	1.00	0.2	4.4	8.0	100											
71	72	31	100	1.00	1.00	2.4	6.8	8.0	100											
72	73	3	100	1.00	1.00	0.2	7.0	8.0	100											
73	74	36	100	1.00	1.00	2.8	9.8	23.7	150											
74	75	3	100	1.00	1.00	0.2	10.0	23.7	150											
75	76	40	100	1.00	1.00	3.1	13.1	23.7	150											
76	77	0	100	1.00	1.00	0.0	23.4	23.7	150											
77	88	0	100	1.00	1.00	0.0	32.6	69.3	225											
78	79	4	100	1.00	1.00	0.3	0.3	8.0	100											
79	80	14	100	1.00	1.00	1.1	1.4	8.0	100											
80	81	23	100	1.00	1.00	1.8	3.2	8.0	100											

1. COLEBROOK-WHITE ROUGHNESS k = 0.015mm FOR POLYVINYL CHLORIDE PIPE (PVC).
2. COLEBROOK-WHITE ROUGHNESS k = 0.150mm FOR GALVANISED MILD STEEL (GMS) FOR RHS.
3. A MINIMUM PIPE SLOPE OF 0.50% OR 1.0% IS ASSUMED FOR CALCULATION PURPOSES.
4. SURFACE LEVELS BASED ON ARCHITECTURAL & SURVEY DRAWINGS.
5. CONFIRM PRACTICALITY OF PIPE INSTALLATION & ADVISE OF ANY DISCREPANCY PRIOR TO CONSTRUCTION.
6. SUSPENDED STORMWATER DRAINAGE TO BE SEWER GRADE UPVC WITH SOLVENT WELDED JOINTS SUPPORTED AS PER AS3500.3 CLAUSE 4.9.6.2.
7. STORMWATER DRAINAGE TO BE SEWER GRADE UPVC WITH SOLVENT WELDED JOINTS LAID ON GRANULAR BEDDING TO AS3500.3 CLAUSE 6.3.1.2.
8. SUBSOIL DRAINAGE (WHERE REQUIRED) TO BE SLOTTED UPVC WITH FILTER SOCK LAID IN FREE-DRAINING GRANULAR MATERIAL TO AS3500 CLAUSE 6.3.1.2.
9. CONFIRM ALL SUBSOIL DRAINAGE REQUIREMENTS PRIOR TO CONSTRUCTION & COORDINATE WITH FOOTING LEVELS WHERE APPLICABLE.
10. ALL DRAINAGE TO BE MIN Ø100 UNLESS NOTED OTHERWISE. ENSURE PIPE BENDS GENERALLY DO NOT EXCEED 45 DEGREES IN PLAN.
11. THE ENTIRE DRAINAGE INSTALLATION SHALL COMPLY WITH THE RELEVANT PROVISIONS OF AS3500.3.
12. ALL GMS RHS CONDUITS TO BE MIN 4mm THICK.
13. WATERTIGHT INSPECTION OPENINGS OR PITS TO BE PROVIDED FOR CLEANING PURPOSES AT MAXIMUM 30m INTERVALS & IN ACCORDANCE WITH AS3500.3 CLAUSE 7.4.1.
14. BUILDER TO PROVIDE 'AS BUILT' DRAWINGS OF ALL RELEVANT DRAINAGE WORKS AS REQUIRED FOR CERTIFICATION PURPOSES. IN SOME CASES COUNCIL MAY REQUIRE APPROVED PLANS TO BE MARKED WITH RED INK TO INDICATE CHANGES TO THE ORIGINAL DESIGN LAYOUT.
15. FINAL DRAINAGE LAYOUT SHALL BE MARKED ON AS-BUILT DRAWINGS AS REQUIRED FOR CERTIFICATION & REFERENCE PURPOSES.
16. WHERE APPLICABLE, BUILDER TO PAY ALL ROAD OPENING & COUNCIL FEES ASSOCIATED WITH REQUIRED CONSTRUCTION.
17. SITE INSPECTIONS SHOULD BE ARRANGED IN ACCORDANCE WITH CONSENT CONDITIONS & CERTIFIER'S REQUIREMENTS. WITH REASONABLE ADVANCE NOTICE BEING GIVEN & WRITTEN CONFIRMATION FROM THE RELEVANT PARTY THAT THE CURRENT HOURLY RATE FEE WILL BE PAID.
18. AS-BUILT DRAWING/SURVEY OF COMPLETED WORKS SHOULD BE MADE AVAILABLE TO VIEW PRIOR TO ARRANGING FOR FINAL SITE INSPECTION.
19. ALL DOWNPIPES DRAINING TO THE STORAGE SYSTEM SHALL BE MADE WATERTIGHT BELOW THE MAXIMUM WATER STORAGE LEVEL.
20. ANY PROPOSED CHANGE TO DETENTION DISCHARGE CONTROL SHALL BE SUBMITTED TO CONSULTANT FOR APPROVAL PRIOR TO INSTALLATION.
21. ALL REQUIRED EASEMENTS, POSITIVE COVENANTS OR OTHER LEGAL INSTRUMENTS TO BE ARRANGED & REGISTERED BY SURVEYOR OR OTHER APPROVED AGENT.

STORMWATER PIT SCHEDULE

Label	No:	Pit Size	Surface RL	Outlet IL	Pit Depth	Lid Type	Load Class
SWP	1	900x600	31.30	30.70	600	Cover	A
SWP	2	900x600	31.90	30.77	1130	Cover	A
SWP	3	450x450	31.25	30.82	430	Grate	A
SWP	4	450x450	31.35	30.84	510	Grate	A
SWP	5	450x450	31.60	31.05	550	Grate	A
SWP	6	450x450	31.90	31.40	500	Grate	A
SWP	7	450x450	32.20	31.70	500	Grate	A
SWP	8	450x450	32.70	32.20	500	Grate	A
SWP	9	450x450	33.00	32.50	500	Grate	A
SWP	10	450x450	33.20	32.64	560	Grate	A
SWP	11	450x450	33.25	32.75	500	Grate	A
SWP	12	600x600	32.80	32.10	700	Grate	C
SWP	13	450x450	32.20	31.70	500	Grate	A
SWP	14	450x450	32.40	31.90	500	Grate	A
SWP	15	450x450	32.60	32.10	500	Grate	A
SWP	16	450x450	33.00	32.50	500	Grate	A
SWP	17	450x450	33.50	33.00	500	Grate	A
SWP	18	450x450	33.70	33.20	500	Grate	A
GTD	1	300 WIDE	31.00	30.61	390	Grate	C
GTD	2	150 WIDE	31.50	VERTICAL	MIN 100	Grate	A
GTD	3	300 WIDE	31.80	31.29	510	Grate	A
GTD	4	150 WIDE	32.15	VERTICAL	MIN 100	Grate	A
GTD	5	300 WIDE	32.15	31.25	900	Grate	C
GTD	6	150 WIDE	32.60	VERTICAL	MIN 100	Grate	A
GTD	7	150 WIDE	33.00	VERTICAL	MIN 100	Grate	A
GTD	8	150 WIDE	33.25	VERTICAL	MIN 100	Grate	A
GTD	9	150 WIDE	33.20	VERTICAL	MIN 100	Grate	A
GTD	10	150 WIDE	31.75	VERTICAL	MIN 100	Grate	A
GTD	11	150 WIDE	32.19	VERTICAL	MIN 100	Grate	A
GTD	12	150 WIDE	32.90	VERTICAL	MIN 100	Grate	A
GTD	13	150 WIDE	32.10	VERTICAL	MIN 100	Grate	A
GTD	14	150 WIDE	32.20	VERTICAL	MIN 100	Grate	A
GTD	15	150 WIDE	32.23	VERTICAL	MIN 100	Grate	A

1. PITS TO BE IN ACCORDANCE WITH AS3500.3
2. GRATES GENERALLY TO BE HINGED GALVANISED MILD STEEL EQUAL TO BR DURHAM & SONS (ADOPT HEELPROOF STYLE WHERE APPLICABLE)
3. COORDINATE REBATE & CHANNEL DIMENSIONS WITH SLAB CONSTRUCTION TO SUIT TRENCH DRAIN DIMENSIONS AS NECESSARY (WITH STRUCTURAL ENGINEER'S APPROVAL/SUPERVISION)
4. FALL BASE OF TRENCH DRAINS TO OUTLET AT MIN 1%.
5. LIAISE WITH BUILDER TO ENSURE CONCRETE WORKS ASSOCIATED WITH PIT/TRENCH LOCATIONS ARE ACCURATELY COORDINATED AS REQUIRED.
6. GENERALLY GRADE SURROUNDING SURFACES TO DIRECT STORMWATER INTO GRATES.
7. MINIMUM LOAD CLASS RATINGS ARE PROVIDED. IF A SPECIFIC LOAD CLASS IS NOT COMMERCIALLY AVAILABLE, ADOPT THE NEXT HIGHER LOAD CLASS.
8. PROVIDE STEP RUNGS WHERE PIT DEPTH EXCEEDS 1.2m.

MODEL FOR URBAN STORMWATER IMPROVEMENT CONCEPTUALISATION (MUSIC) RESULT SUMMARY

URBAN® ASSET SOLUTIONS — SUPPLIER OF ECOSOL PRODUCTS
urbanassetsolutions.com.au

Treatment Train Effectiveness - Receiving Node

	Sources	Residual Load	% Reduction	
Flow (ML/yr)	3.05	3.01	1.2	
Total Suspended Solids (kg/yr)	293	16.4	94.4	MIN 80% REQUIRED
Total Phosphorus (kg/yr)	0.762	0.198	74.1	MIN 45% REQUIRED
Total Nitrogen (kg/yr)	7.28	3.89	46.6	MIN 45% REQUIRED
Gross Pollutants (kg/yr)	75.5	0	100	MIN 70% REQUIRED

THIS DRAWING HAS BEEN PREPARED IN CONJUNCTION WITH THE FOLLOWING DRAWING(S):

Discipline	Dwg. No.	Date	Revisions
ARCH PLAN			
ARCH RCP			
STRUCTURAL			
MECHANICAL			
ELECTRICAL			
CIVIL			
LANDSCAPE			

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN. WORK TO FIGURED DIMENSIONS, DO NOT SCALE FROM DRAWINGS.
CHECK ALL DIMENSIONS ON SITE PRIOR TO CONSTRUCTION. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL CONTRACT DOCUMENTS.

ISSUE	DATE	AMENDMENT
P1	17.05.23	DEVELOPMENT APPLICATION

ARCHITECT
Barry Rush & Associates Pty Ltd
Architects. Nominated Architect: Barry John Rush
ARB Registration No 3753
Suite 25A, 2 Beattie Street, Balmain, NSW
Phone: (02) 9555 8028 Email: info@barryrush.com.au
www.barryrush.com.au

CLIENT
NSW GOVERNMENT
LOCKED BAG 5022
PARRAMATTA NSW 2124
PHONE No 1800 738 718
https://www.dpie.nsw.gov.au/land-and-housing-corporation

BUILDING SERVICES ENGINEER
erbas™
Sydney Melbourne Manila
L1, 15 Atchison Street, St Leonards NSW 2065
Ph: (02) 9437 1022 general@erbas.com.au
www.erbas.com.au

DESIGNED: IY
CHECKED: MS
NORTH POINT

PROJECT
MULTI-DWELLING
HOUSING DEVELOPMENT
10-16 ALBERT STREET,
CASINO NSW
(RICHMOND VALLEY COUNCIL)
CLIENT PROJECT REFERENCE: BGZDZ

DRAWING TITLE
STORMWATER SERVICES
DETAIL SHEET 3

SCALE at B1	PROJECT No.	DRAWING No.	ISSUE
-			
DATE: MAY 2023			
DRAWN: IY	SYD23189	SW203	P1