Our Ref: B17016 SI:si

29 June 2018

Westera Partners Pty Ltd
P 07 38524333
M 0431 803 337

Planners North
PO Box 538
Lennox Head NSW 2478

Attention: **Steve Connelly**
Email: steve@plannersnorth.com.au

Dear Steve,

RE: NORTH BYRON PARKLANDS SOUTH EAST CARPARK STORMWATER DISCHARGE STRATEGY

This letter has been prepared to provide clarification regarding the proposed method of stormwater discharge from the proposed South East Carpark of the North Byron Parklands development. Details regarding the stormwater quality treatment strategy are outlined in a separate letter by Westera Partners dated 15 May 2018. This letter specifically focuses on how stormwater will be discharged off site to replicate existing flow conditions.

Stormwater runoff shall discharge from the parking area via multiple drainage outlets towards Billinudgel Creek & Yelgun Creek, which are both located in the adjoining wetlands. Stormwater runoff from the parking areas and loop road shall be collected on site and discharged to each outlet location via vegetated swales located in alternating parking aisles and adjacent to the loop road. The final size and configuration of the swales are subject to detailed design. Stormwater quality improvement devices (SQUIDs) shall be incorporated at each outlet under the loop road as outlined in a separate letter by Westera Partners dated 15 May 2018.

The catchments draining to the north and south are proposed to replicate the existing stormwater catchments which are controlled by a natural ridge line. The small ridge line is indicated in Figure 1 below.

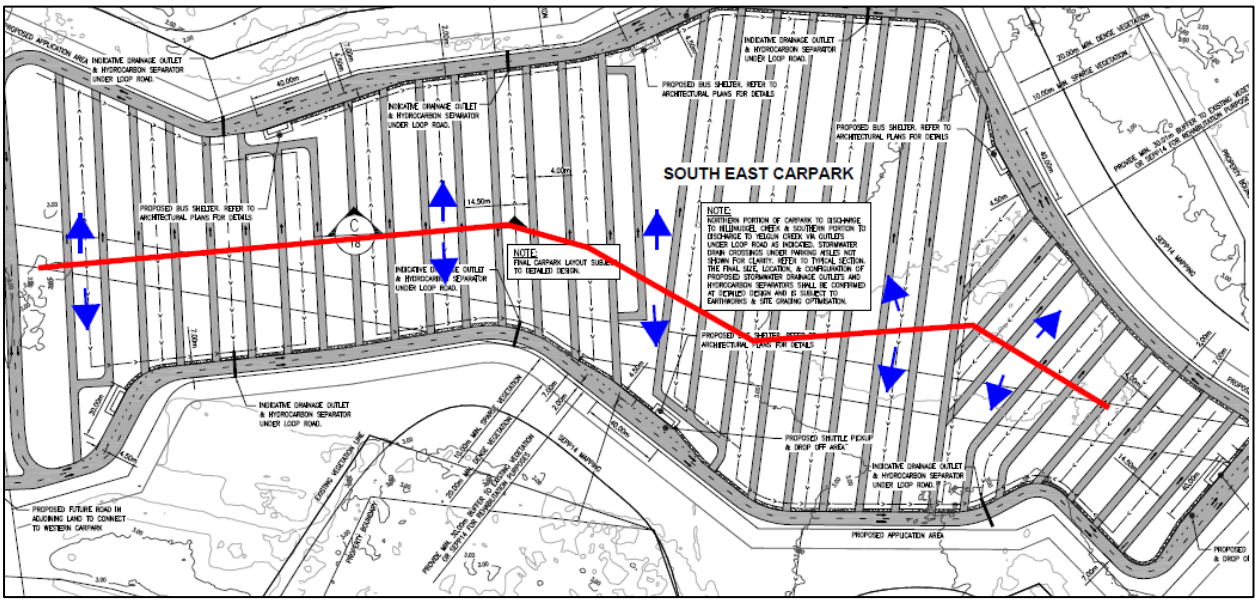


Figure 1 – Existing catchment ridge line.

As indicated by the concept engineering drawing B17/016 P 08, the swales are proposed to align with the existing ridge line to ensure the proposed works does not adversely alter the existing stormwater catchments.

The existing topography is generally quite flat without significantly concentrated flow channels. Therefore the proposed works will need to ensure the stormwater from the carpark area is returned to sheet flow in accordance with existing conditions. The concept plans indicate potentially three concentrated outfall points along the northern loop road and three along the southern loop road. These outfall points are only proposed for the minor storm events to obtain treatment through the SQUIDs located at each piped culvert under the loop road. Flows in excess of the SQUID treatment flow may discharge over the loop road at various low points along the loop road and at the culvert locations subject to detailed design. Irrespective of the outfall locations (minor or major storm), the flow paths will need to be linked and return to sheet flow before discharging off site. This shall be achieved through incorporating a level spreader swale and bund on the downslope side of the loop road as shown in Figure 2.

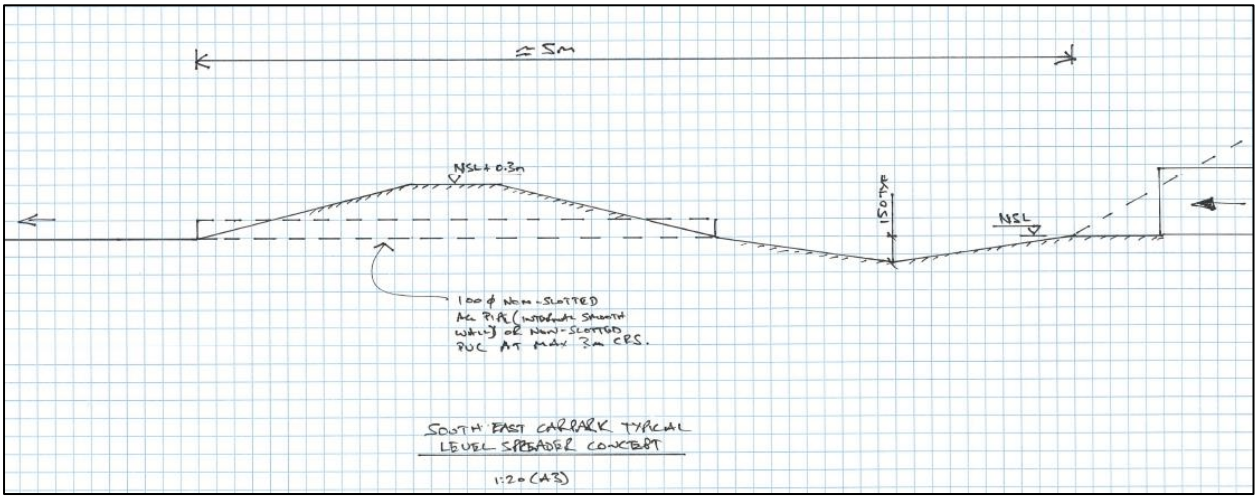


Figure 2 – *Concept level spreader detail.*

It is understood that the level spreader would be located a minimum 25m away from the wetlands (approx 5m from the loop road) but generally 50m+ as shown by the boundary lines on the concept engineering drawing. The intent of the level spreader is to follow the entire loop road to ensure sufficient length of sheet flow is achieved. Consideration is needed at detailed design to ensure the levels along the level spreader do not create an uneven distribution of flow, i.e. provide spread of flow in segments as ground levels vary.

The concept engineering drawing B17/016 P 08 Revision C has been amended to show the indicative levels and proposed level spreader and is attached to this letter for reference.

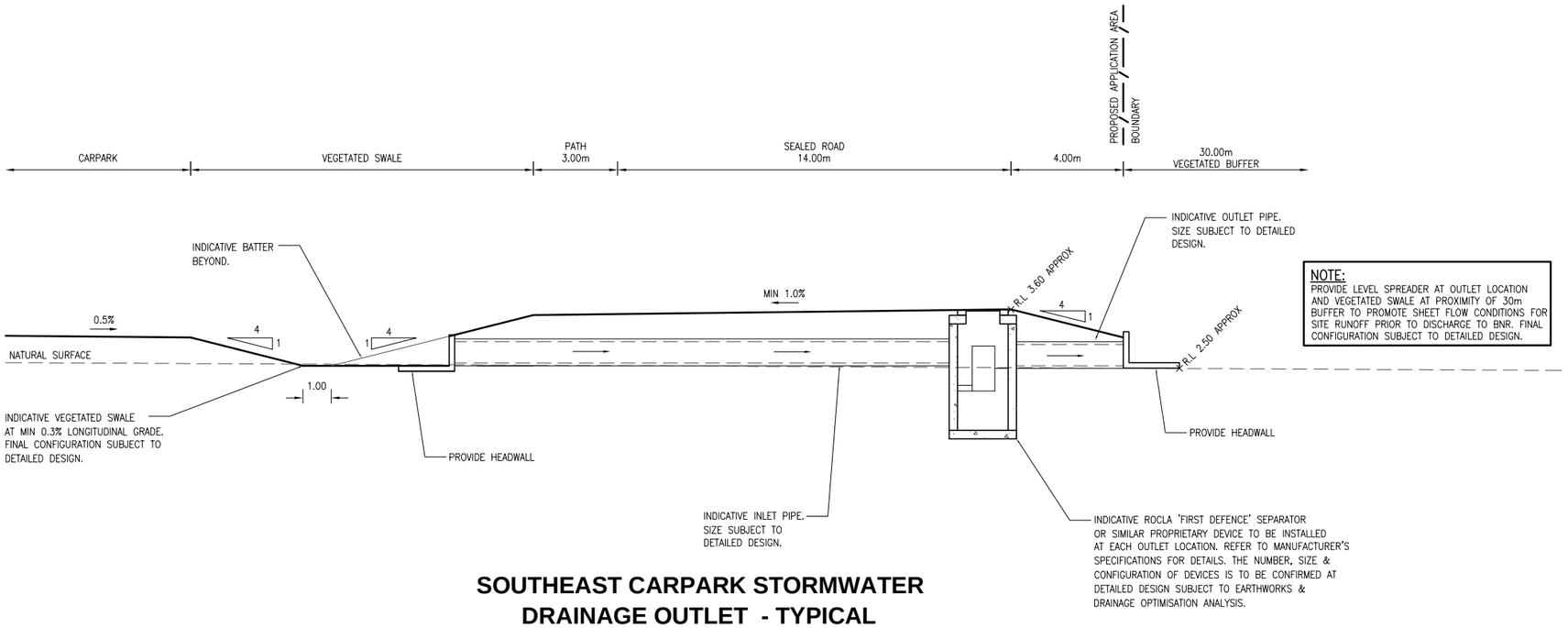
Please don't hesitate to contact me should you have any queries regarding the concept stormwater discharge strategy.

Yours faithfully,

Samuel Ide CPEng | RPEQ 12231 | NER 2901822

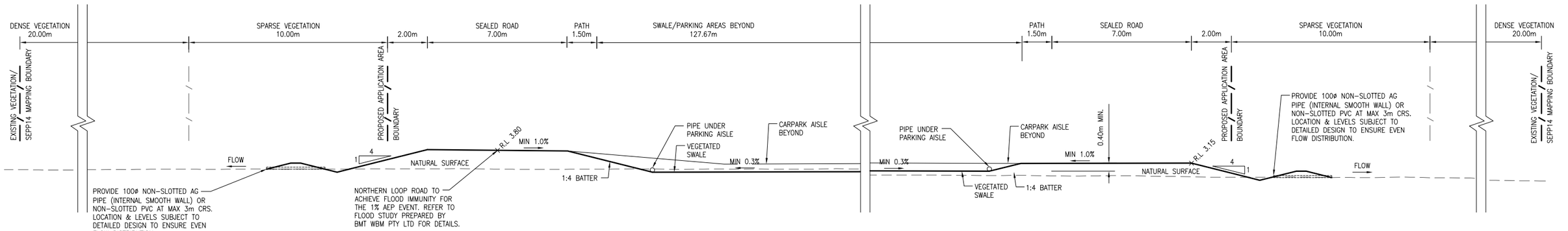
Partner | Civil Manager

Western Partners Pty Ltd



SOUTHEAST CARPARK STORMWATER DRAINAGE OUTLET - TYPICAL

SCALE 1:50 (A1 SIZE)



SECTION A

SCALE 1:100

P-08

PRELIMINARY

NOT FOR CONSTRUCTION

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2/22 Moss St, Kingscliff
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SURVEYOR: LIDAR
DATUM

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE, IF A DISCREPANCY ARISES CHECK WITH THE PROJECT ENGINEER AND/OR SUPERVISING AUTHORITY. DO NOT WORK FROM REDUCED SCALE DRAWINGS (A1-A3 SIZE PAPER). COPYRIGHT OF ALL DRAWINGS & WORKS EXECUTED FROM THEM IS VESTED IN WESTERA PARTNERS AND USE OF THERE FORE WITHOUT PERMISSION IS STRICTLY PROHIBITED! IT IS THE BUILDERS RESPONSIBILITY TO ENSURE ALL WORKS ARE CARRIED OUT WITH DUE CARE AND DILIGENCE TO COMPLY WITH THE CONTRACT DOCUMENTS.

No.	DATE	REVISIONS
A	29.06.2018	SECTION A ADDED

SHEET	SOUTHEAST CARPARK STORMWATER DRAINAGE OUTLET
PROJECT	'NORTH BYRON PARKLANDS'
LOCATION	LOT 1 DP1145020; LOTS 46, 402-404 & 410 DP755687; LOTS 2 & 12 DP848618; LOT 101 DP856767; LOT 30 DP880376; LOTS 100 & 101 DP1178907; LOTS 101, 102 & 107 DP1001878; LOTS 12 & 14 DP875112; LOT 21 DP1169952 TWEED VALLEY WAY & JONES ROAD, YELGUN
CLIENT	NORTH BYRON PARKLANDS

APPROVED

For and on behalf of WESTERA PARTNERS PTY. LTD.

DESIGNED	S.J.I
DRAWN	J.H.C
DATE DRAWN	JUNE 2018
FILE NAME	PRE_Typ_Drainage_P1.dwg

SHEET NUMBER	1 OF 1
REVISION	A
PROJECT NUMBER	B17/016 D

LOCALITY PLAN

NOT TO SCALE

LEGEND

	EXISTING ROAD (SEALED)		EXISTING STORMWATER LINE
	PROPOSED ROAD (FUTURE SEAL)	× 23.49	NATURAL SURFACE LEVEL
	EXISTING ROAD (FUTURE SEAL)	2C	STORMWATER NUMBER
	PROPOSED ACCESS PATH		WATER RETICULATION U.P.V.C.
	EXISTING STORMWATER CHANNEL		WATER RETICULATION D.I.C.L.
	PROPOSED STORMWATER CHANNEL	C	WATER RETICULATION CONDUIT
	PROPOSED SEWER MANHOLE	FH	GATE VALVE
	EXISTING SEWER MANHOLE		FIRE HYDRANT
S	EXISTING SEWER		WATER METER
S	PROPOSED SEWER	FH	DUAL OUTLET HYDRANT
2 / S	SEWER MANHOLE NUMBER	SFH	SWABBING FIRE HYDRANT
	ON GRADE GULLY PIT	W W	WATER SERVICE FITTING
	SAG GULLY PIT	T	TELEPHONE
	600 x 600 FIELD INLET	E	ELECTRICITY
	900 x 600 FIELD INLET		EDGE OF BITUMEN
	1500 DIA FIELD INLET		FENCE
	STORMWATER LINE	21.00	NATURAL CONTOURS
	STORMWATER HEADWALL	× 22.00	FINISHED SURFACE LEVEL
		V	OVERHEAD POWER

BILLINUDGEL CREEK

BILLINUDGEL NATURE RESERVE

SOUTH EAST CARPARK

BILLINUDGEL NATURE RESERVE

YELGUN CREEK

REFER TO SHEET 7 FOR CONTINUATION

PROPERTY BOUNDARY

PROPOSED APPLICATION AREA

EXISTING VEGETATION LINE

SEPP14 MAPPING

PROVIDE MIN. 30.00m BUFFER TO EXISTING VEGETATION OR SEPP14 FOR REHABILITATION PURPOSES

20.00m MIN. DENSE VEGETATION

10.00m MIN. SPARSE VEGETATION

INDICATIVE LEVEL SPREADER REFER TO SECTION

INDICATIVE DRAINAGE OUTLET & HYDROCARBON SEPARATOR UNDER LOOP ROAD.

PROPOSED SHUTTLE PICKUP & DROP OFF AREA

PROPOSED BUS SHELTER. REFER TO ARCHITECTURAL PLANS FOR DETAILS

PROPOSED FUTURE ROAD IN ADJOINING LAND TO CONNECT TO WESTERN CARPARK

SOUTHERN PORTION OF SOUTH WEST CARPARK TO

NOTE:
FINAL CARPARK LAYOUT SUBJECT TO DETAILED DESIGN.

NOTE:
NORTHERN PORTION OF CARPARK TO DISCHARGE TO BILLINUDGEL CREEK & SOUTHERN PORTION TO DISCHARGE TO YELGUN CREEK VIA OUTLETS UNDER LOOP ROAD AS INDICATED. STORMWATER DRAIN CROSSINGS UNDER PARKING AISLES NOT SHOWN FOR CLARITY. REFER TO TYPICAL SECTION. THE FINAL SIZE, LOCATION, & CONFIGURATION OF PROPOSED STORMWATER DRAINAGE OUTLETS AND HYDROCARBON SEPARATORS SHALL BE CONFIRMED AT DETAILED DESIGN AND IS SUBJECT TO EARTHWORKS & SITE GRADING OPTIMISATION.

PROPOSED REHABILITATION AREA

CIVIL WORKS PLAN

SCALE 1:1000 (A1 SIZE) 0 10 20 30 40 50

PRELIMINARY
NOT FOR CONSTRUCTION

WESTERA PARTNERS
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SURVEYOR
LIDAR

DATUM

No.	DATE	REVISIONS
C	29.06.2018	LEVELS ADDED TO PLAN
B	15.05.2018	STORMWATER DRAINAGE AMENDED & VEGETATION SETBACK ADDED
A	16.11.2017	LOT NUMBERS & SOUTHEAST CARPARK AMENDED

USE FIGURED DIMENSIONS ONLY. DO NOT SCALE. IF A DISCREPANCY ARISES CHECK WITH THE PROJECT ENGINEER AND/OR SUPERVISING AUTHORITY. DO NOT WORK FROM REDUCED SCALE DRAWINGS (A1-A3 SIZE PAPER). COPYRIGHT OF ALL DRAWINGS & WORKS EXECUTED FROM THEM IS VESTED IN WESTERA PARTNERS AND USE OF THERE FORE WITHOUT PERMISSION IS STRICTLY PROHIBITED! IT IS THE BUILDERS RESPONSIBILITY TO ENSURE ALL WORKS ARE CARRIED OUT WITH DUE CARE AND DILIGENCE TO COMPLY WITH THE CONTRACT DOCUMENTS.

SHEET	CIVIL WORKS PLAN 4 OF 13
PROJECT	'NORTH BYRON PARKLANDS'
LOCATION	LOT 1 DP1145020; LOTS 46, 402-404 & 410 DP755687; LOTS 2 & 12 DP848618; LOT 101 DP856767; LOT 30 DP880376; LOTS 100 & 101 DP1178907; LOTS 101, 102 & 107 DP1001878; LOTS 12 & 14 DP875112; LOT 21 DP1169952 TWEED VALLEY WAY & JONES ROAD, YELGUN
CLIENT	NORTH BYRON PARKLANDS

APPROVED
S. IDE NER 29018122
For and on behalf of WESTERA PARTNERS PTY. LTD.

DESIGNED	S.J.I
DRAWN	J.H.C
DATE DRAWN	FEBRUARY 2017
FILE NAME	Pre_Civilwks_P1.dwg

SHEET NUMBER	8 OF 21
REVISION	C
PROJECT NUMBER	B17/016 P

15 May 2018

Westera Partners Pty Ltd

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Planning & Environment
NSW Government

Transmitted online as an electronic submission

State Significant Development Application Ref SSD 8169

RE: PROPOSED STORMWATER MANAGEMENT STRATEGY FOR THE SOUTHEAST PARKING AREA PROPOSED AS PART OF THE NORTH BYRON PARKLANDS CULTURAL EVENTS DEVELOPMENT

This letter has been prepared to address the NSW Office of Environment & Heritage's (OEH's) request for further information regarding the management of hydrocarbons including fuels & oils from the southeast carpark proposed as part of the North Byron Parklands Cultural Events development.

The development involves the construction of new parking area in the southeast corner of the site. The parking area consists of turfed parking bays and a sealed loop road and parking aisles with a combined length of approximately 7km. The proposed parking area adjoins the Billinudgel Nature Reserve (BNR), an ecological wetland under the State Environmental Planning Policy No. 14 – Coastal Wetlands (SEPP14). A 30m vegetated buffer is proposed between the proposed parking area & the SEPP14 wetland boundary.

It is proposed to discharge stormwater runoff from the parking area via multiple drainage outlets to Billinudgel Creek & Yelgun Creek, which are both located in the adjoining wetlands. Stormwater runoff from the parking areas and loop road shall be collected on site and discharged to each outlet location via vegetated swales located in alternating parking aisles and adjacent to the loop road. The final size and configuration of the swales are subject to detailed design.

It is proposed to incorporate Rocla "First Defense High Capacity" hydrocarbon & TSS separators (or similar proprietary device) at each drainage outlet in order to remove any fuels & oils from stormwater runoff prior to site discharge. The devices shall be located under the proposed loop road upstream of the outlet headwall. The entirety of stormwater runoff in the minor event shall be treated by a separator prior to discharging to the wetlands as per existing conditions and a level spreader shall be provided downstream of each headwall to promote a return to sheet flow. Stormwater runoff in the major event shall discharge to the wetlands as overland flow, bypassing the proposed separators.

The preliminary civil works plan incorporating the carpark layout has been revised and a sketch showing the typical outlet configuration has been prepared. Both have been submitted to accompany this letter.

The number, size, and final configuration of outlets and treatment devices shall be confirmed at the detailed design stage, and shall be subject to an earthworks & site grading optimization analysis.

Please don't hesitate to contact Sam Ide should there be any questions regarding this response.

Kind Regards,

Samuel J. Ide **CPEng NER 2901822**

Partner

Westera Partners Pty Ltd