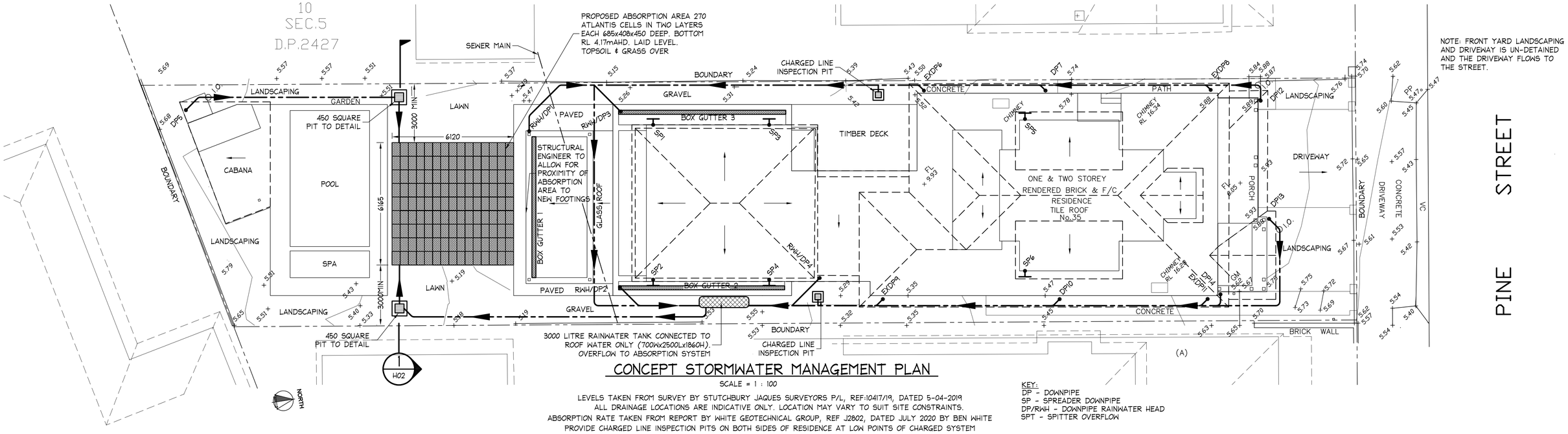


CONCEPT STORMWATER MANAGEMENT PLAN

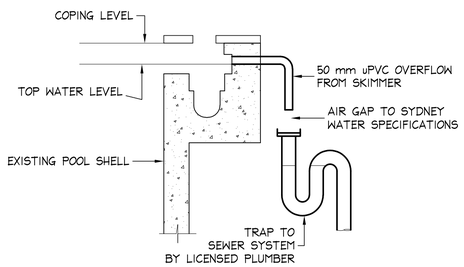
SCALE = 1 : 100

LEVELS TAKEN FROM SURVEY BY STUTCHBURY JAQUES SURVEYORS P/L, REF:10417/19, DATED 5-04-2019
ALL DRAINAGE LOCATIONS ARE INDICATIVE ONLY. LOCATION MAY VARY TO SUIT SITE CONSTRAINTS.
ABSORPTION RATE TAKEN FROM REPORT BY WHITE GEOTECHNICAL GROUP, REF J2802, DATED JULY 2020 BY BEN WHITE
PROVIDE CHARGED LINE INSPECTION PITS ON BOTH SIDES OF RESIDENCE AT LOW POINTS OF CHARGED SYSTEM

KEY:
DP - DOWNPIPE
SP - SPREADER DOWNPIPE
DP/RWH - DOWNPIPE RAINWATER HEAD
SPT - SPITTER OVERFLOW

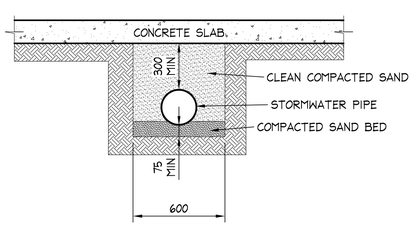
STORMWATER NOTES:

1 - ALL PIPES TO BE 100mm ϕ SEWER GRADE uPVC UNLESS NOTED OTHERWISE.
2 - ALL PIPES TO BE uPVC TO AS 1254-2002 UNLESS NOTED OTHERWISE.
3 - ALL PIPES TO BE LAID AT 1 % MINIMUM GRADE UNLESS NOTED OTHERWISE.
4 - ALL PIPES SHALL BE LAID ON A 75mm SAND BED, COMPACTED TO 100% S.M.D.D. BELOW PAVEMENTS.
(NO COMPACTION REQUIRED BELOW LANDSCAPING)
COVER TO SURFACE FROM TOP OF PIPE TO BE AS PER AS3500.
BACKFILL TO BE ADEQUATELY CONSOLIDATED AROUND PIPES BY METHOD OF RAMMING AND WATERING IN. TRENCHES TO BE FILLED WITH GRANULAR MATERIAL AS SPECIFIED.
5 - DOWN PIPE LOCATIONS ARE INDICATIVE ONLY. LOCATIONS TO BE CONFIRMED WITH ARCHITECT PRIOR TO COMMENCEMENT WITH WORK.
6 - PROVIDE CLEANING EYES AT ALL DOWNPIPES.
7 - ALL PITS TO BE PRECAST, PREFORMED OR HDPE, IN ACCORDANCE WITH LOCAL COUNCIL SPECIFICATIONS.
8 - ALL PITS GREATER THAN 1000mm DEEP SHALL HAVE STEP IRONS AS PER COUNCIL STANDARDS.
9 - ALL WORK TO BE IN ACCORDANCE WITH LOCAL COUNCIL STANDARDS AND SPECIFICATIONS.
10 - PRIOR TO COMMENCING ANY SITE WORKS THE CONTRACTOR SHALL IMPLEMENT EROSION CONTROL MEASURES TO EPA GUIDELINES AND COUNCIL SPECIFICATIONS. ALL MEASURES TO REMAIN IN PLACE UNTIL COMPLETION AND STABILIZATION OF THE SITE TO COUNCIL SATISFACTION.
11 - ALL LEVELS SHOWN ARE TO AHD
12 - ENSURE THAT ALL PITS AND STORMWATER PIPES ARE LOCATED CLEAR FROM TREE ROOT SYSTEMS.
13 - ALL EXISTING EARTHENWARE PIPES TO BE UPGRADED TO uPVC.
14 - ALL WORKS TO BE IN ACCORDANCE WITH AS 3500-2015 NATIONAL PLUMBING DRAINAGE CODE PART 3 - STORMWATER DRAINAGE. AND ALL WORKS TO BE IN ACCORDANCE WITH AS 3500-2012 NATIONAL PLUMBING DRAINAGE CODE PART 5 - HOUSING INSTALLATIONS.



POOL OVERFLOW SECTION AT SKIMMER

SCALE = 1 : 20



TYPICAL TRENCHING DETAIL

SCALE = 1 : 20

ONSITE DETENTION SYSTEM - SUMMARY NOTES NORTHERN BEACHES [MANLY] COUNCIL

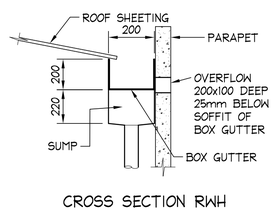
STORMWATER CONTROL ZONE	ZONE 1
RESIDENTIAL DENSITY SUB-ZONE	ZONE 3
TOTAL SITE AREA	717.7 m^2
PRE DEVELOPMENT IMPERVIOUS AREA	583.7 m^2
POST DEVELOPMENT IMPERVIOUS AREA	468.3 m^2
INCREASE [DECREASE] IN IMPERVIOUS AREA	[115.4]m^2

"BASED ON THE PLANNING & STRATEGY COMMITTEE REPORT DATED SEPTEMBER 2004, EXISTING DWELLINGS WITH ONE-OFF EXTENSIONS BEYOND THE FOOTPRINT OF THE EXISTING DWELLING UP TO 50 SQM OVER A PERIOD OF 5-YEARS SHALL BE PERMITTED WITHOUT THE REQUIREMENT FOR OSD, WITH A MAXIMUM OF 60% TOTAL IMPERVIOUS THE CUT OFF MARK." THEREFORE OSD IS REQUIRED, AS 65% IMPERVIOUS AREA.

THIS SITE IS IN STORMWATER CONTROL ZONE 1, BUT PERFORMS SIMILARLY TO SITES IN STORMWATER CONTROL ZONE 2. THEREFORE WE HAVE DESIGNED THE WORKS AS PER STORMWATER CONTROL ZONE 2. WE HAVE OBTAINED A GEOTECHNICAL INFILTRATION TEST BY WHITE GEOTECHNICAL GROUP TO CONFIRM THE ABSORPTION RATE.

THE ABSORPTION AREA IS IN REAR YARD, CONSISTING OF ATLANTIS CELLS WITH A DESIGN INFILTRATION RATE OF 0.17 LITRES PER SQUARE METRES PER SECOND. ABSORPTION AREA IS HOLDING A TOTAL OF 30.4 CUBIC METRES. ALL IMPERVIOUS SURFACE AREAS WILL BE ABSORBED BY ADJACENT PERVIOUS AREAS. OVERFLOW FROM ABSORPTION AREA WILL RUN TO STREET. CALCULATIONS CARRIED OUT WITH DRAINS PROGRAM.

PROVIDE 3000 LITRE RAINWATER TANKS TO SATISFY THE BASIX REQUIREMENT OF 2898 LITRES FROM 265 m2 OF ROOF CONNECTED TO AN OUTDOOR TAP WITHIN 10 m OF THE POOL.



CROSS SECTION RWH

TYPICAL RAIN HEAD DETAIL

SCALE = 1 : 20

Gutter Calculations -20 & 100 yr ARI Storm
Northern Beaches [Manly] Council
Alterations & Additions to Residence at
35 Pine Street Manly
to AS 3500 - 2015 & AS 3500.5 2012 & BCA 2016

	Horizontal	Slope	Area A_c	Gutter	$^{100}I_5$	From	Downpipe	Flow in
Eaves	Area A_h	Factor		Slope	&	Figure 3.5a	From	Box Gutters
Gutters		From		steeper	$^{20}I_5$	gutter	Table 5.6.4.7.1	in
& Box		Fig 5.6.3.2		than	from	area reqd	size reqd	$^{100}I_5$
Gutters					Appendix A1			
					Page 25			
	m^2		m^2	1 in	mm/hr	mm^2	mm	L/sec
RWH/DP1	41	NA	NA	200	266	NA	100x50 or 90 dia	3.0
RWH/DP2	43.3	NA	NA	200	266	NA	100x50 or 90 dia	3.2
RWH/DP3	46.4	NA	NA	200	266	NA	100x50 or 90 dia	3.4
RWH/DP4	12.3	NA	NA	200	266	NA	100x50 or 90 dia	0.9
DP5	20	1.03	20.6	500	207	4600	100x50 or 90 dia	
EXDP6	28	1.42	39.8	500	207	7800	100x75 or 100dia	
DP7	28	1.42	39.8	500	207	7800	100x75 or 100dia	
EXDP8	28	1.42	39.8	500	207	7800	100x75 or 100dia	
EXDP9	28	1.42	39.8	500	207	7800	100x75 or 100dia	
DP10	28	1.42	39.8	500	207	7800	100x75 or 100dia	
DP11	28	1.42	39.8	500	207	7800	100x75 or 100dia	
DP12	22.6	1.42	32.1	500	207	6400	100x50 or 90 dia	
DP13	22.6	1.42	32.1	500	207	6400	100x50 or 90 dia	
DP14	5.2	1.42	7.4	500	207	3000	100x50 or 90 dia	
total	381.4							
Replace all existing Gutters with new Eaves Gutters								
to be - 150mm Lysaght Half Round -Area						9440	mm^2	
Box Gutters to Detail								
Replace Existing Downpipes with new to size as shown in table above								
Run all Downpipes to new Absorption Area via rainwater tanks								
All Spreader Downpipes to be 100x50 or 90dia								

GUTTER CALCULATIONS

A1

NOTES:

1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.

CHARTERED ENGINEERS AUSTRALIA MEMBER

DOCUMENT CERTIFICATION

Date : AUGUST 2020

Bruce Lewis .....

(Principal : Peninsula Consulting Engineers)
BE(Civil),CPEng,MIEAust.,NPER.
Institute of Engineers Membership No. 879131

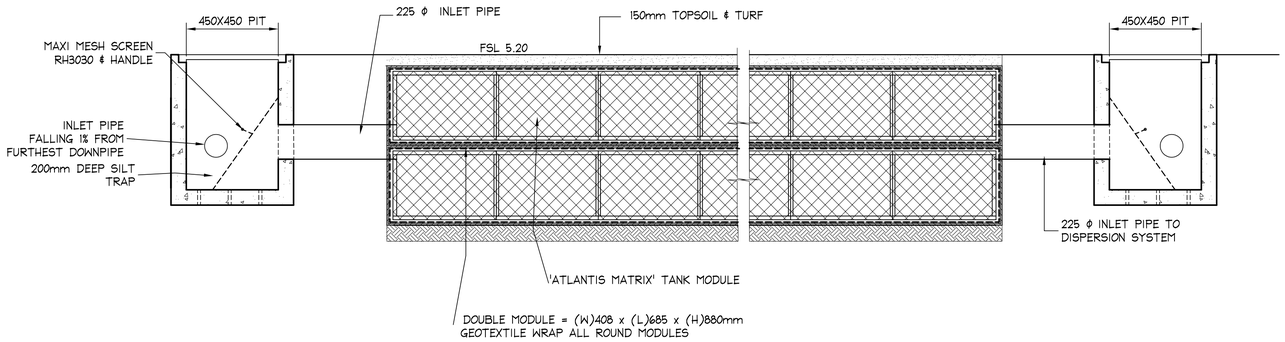
Date:	Rev:	Amendment:
27-08-2020	A	FOR COUNCIL SUBMISSION
11-08-2020	P3	DRAFT

Peninsula Consulting Engineers
PO Box 6491,
Frenchs Forest, NSW, 2086
Ph: 0424 253 818 Fax: (02) 9982 4722
E : bruce@peninsulaconsulting.com.au
A.B.N. 60 493 390 399

Project:
PROPOSED WORKS
at: 35 PINE STREET
MANLY
for: MR & MRS DUNNACHIE

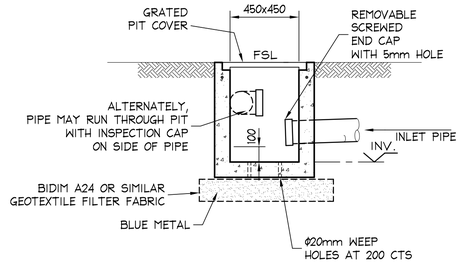
Drawing Title:
CONCEPT STORMWATER MANAGEMENT PLAN & DETAILS

Job No:	Drawing No:	Rev:
20-0614	H01	A



SECTION 1 / H01

SCALE = 1:20



PRECAST OR HDPE PIT
REFER STORMWATER NOTES

450x450 INSPECTION PIT DETAIL

SCALE = 1 : 20

Northern Beaches [Manly] Council
On Site Detention Assumptions
Alterations & Additions to Residence at
35 Pine Street Manly
DRAINS Data

PIT / NODE DETAILS			Version 13					
Name	Type	Family	Size	Ponding	Pressure	Surface		
				Volume	Change	Elev (m)		
				(cu.m)	Coeff. Ku			
N1	Node					5.19		

DETENTION BASIN DETAILS								
Name	Elev	Surf. Area	Outlet Type					
Basin1	4.17	35.8	None					
	5.05	35.8						

SUB-CATCHMENT DETAILS								
Name	Pit or	Total	Paved	Grass	Supp	Paved	Grass	Supp
	Node	Area	Area	Area	Area	Time	Time	Time
		(ha)	%	%	%	(min)	(min)	(min)
Cat1	Basin1	0.0655	65	35	0	5	5	5

OVERFLOW ROUTE DETAILS							
Name	From	To	Travel	Spill	Crest	Weir	Cross
			Time	Level	Length	Coeff. C	Section
			(min)	(m)	(m)		
OF1	Basin1	N1	0.1	5.2	2	2	4 m wide pathway

DRAINS DATA

Northern Beaches [Manly] Council
On Site Detention Assumptions
Alterations & Additions to Residence at
35 Pine Street Manly
DRAINS Results

SUB-CATCHMENT DETAILS							
Name	Max	Paved	Grassed	Paved	Grassed	Supp.	Due to Storm
	Flow Q	Max Q	Max Q	Tc	Tc	Tc	
	(cu.m/s)	(cu.m/s)	(cu.m/s)	(min)	(min)	(min)	
Cat1	0.046	0.031	0.015	5	5	5	AR&R 100 year, 1.5 hours storm, average 74 mm/h, Zone 1

OVERFLOW ROUTE DETAILS						
Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width
OF1	0	0	0	0	0	0

DETENTION BASIN DETAILS					
Name	Max WL	MaxVol	Max Q	Max Q	Max Q
			Total	Low Level	High Level
Basin1	5.02	30.4	0	0	0

CONTINUITY CHECK for AR&R 100 year, 1.5 hours storm, average 74 mm/h, Zone 1

Node	Inflow	Outflow	Storage Change	Difference
	(cu.m)	(cu.m)	(cu.m)	%
Basin1	66	65.97	0	0
N1	0	0	0	0

DRAINS RESULTS

Northern Beaches [Manly] Council
On Site Detention Assumptions
Alterations & Additions to Residence at
35 Pine Street Manly

Area Calculation - Existing	m^2		Area Calculation -Proposed	m^2
Block	717.7		New Main Roofs	361.3
Main Roofs	376.7		Cabana	20
Rear Paving	14.1		Timber Deck 50% Impervious	9
Clothes Line	10.8		West Side Path	4.9
Paving	73.1		East Side Path	12.1
Front Paving & Side Paving	81.1		Driveway	22.3
Metal Building	27.9		Paving	14.7
			Pool Surround	24
All Impervious	583.7		All Impervious	468.3
Pervious	134.0		Pervious	249.4
Percent Impervious Existing	81.3		Percent Impervious Proposed	65.3
Under Manly Council Conditions, "Specification for				
On Site Stormwater Management 2003" as amended				
This property is in Density Sub Zone 3			Stormwater Zone 1	
Increase [actual decrease] in Impervious Area [m^2]	115.4			
Block falls to SE from RL 5.76 to 5.18 over	46.5	m		
Therefore slope is	1%			
4.4 Permissible Site Discharge - Peak 5 Year Predevelopment				
Existing Site Impervious Area				
Impervious Percentage	81.3	%		
From Design Graph at Appendix 7- PSD	14.0	L/sec		
Therefore OSD is required, as greater than 60% impervious				
Permitted Site Discharge -				
Areas not flowing to OSD Absorption Area - to street		m^2		
Driveway	22.2			
Paths	17			
Front Landscaping	23.2			
Total	62.4			
Net Area to OSD Adsorption Area	655	m^2		
Percent Impervious	65%			
All Downpipes will be directed to Absorption Area				
and the result determined in the *DRAINS* program				

ON SITE DETENTION ASSUMPTIONS

A1

NOTES:

1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.

CHARTERED MEMBER

DOCUMENT CERTIFICATION

Date : AUGUST 2020

Bruce Lewis .....

(Principal : Peninsula Consulting Engineers)
BE(Civil),CPEng,MIEAust.,NPER.
Institute of Engineers Membership No. 879131

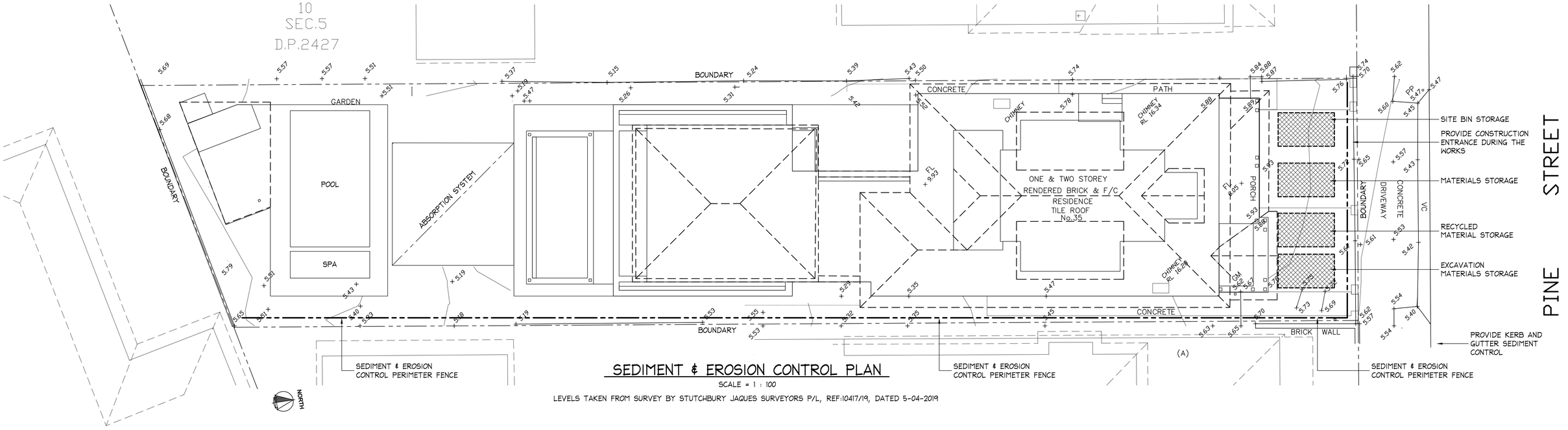
Date:	Rev:	Amendment:
27-08-2020	A	FOR COUNCIL SUBMISSION
23-07-2020	P2	DRAFT

Peninsula Consulting Engineers
PO Box 6491,
Frenchs Forest, NSW, 2086
Ph: 0424 253 818 Fax: (02) 9982 4722
E : bruce@peninsulaconsulting.com.au
A.B.N. 60 493 390 399

Project:
PROPOSED WORKS
at: 35 PINE STREET
MANLY
for: MR & MRS DUNNACHIE

Drawing Title:
CONCEPT STORMWATER
CALCULATIONS & DETAILS

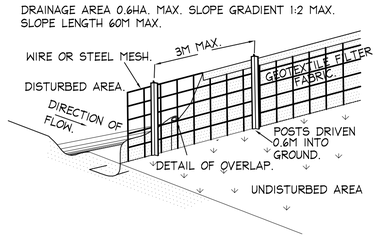
Job No:	Drawing No:	Rev:
20-0614	H02	A



SEDIMENT & EROSION CONTROL PLAN

SCALE = 1 : 100

LEVELS TAKEN FROM SURVEY BY STUTCHBURY JAQUES SURVEYORS P/L, REF:10417/19, DATED 5-04-2019



SEDIMENT FENCE

CONSTRUCTION NOTES:

CONSTRUCT SEDIMENT FENCE AS CLOSE AS POSSIBLE TO PARALLEL TO THE CONTOURS OF THE SITE.

DRIVE 1.5 METRE LONG STAR PICKETS INTO GROUND, 3 METRES APART.

DIG A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.

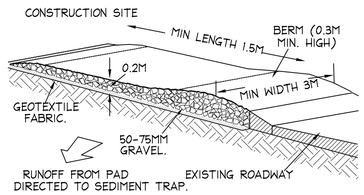
BACKFILL TRENCH OVER BASE OF FABRIC.

FIX SELF-SUPPORTING GEOTEXTILE TO UPSLOPE SIDE OF POSTS WITH WIRE TIES or AS RECOMMENDED BY GEOTEXTILE MANUFACTURER.

JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.

SEDIMENT CONTROL:

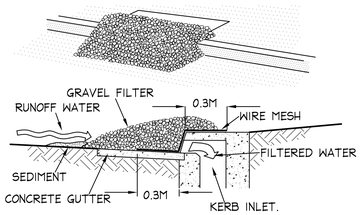
1. INSTALL SEDIMENT CONTROL STRUCTURES IN LOCATIONS INDICATED ON DRAWINGS AND AS OTHERWISE REQUIRED TO CONTROL SEDIMENT DURING ALL EXCAVATIONS AND WHILST AREAS OF THE SITE ARE EXPOSED TO EROSION.
2. CONTROL STRUCTURES TO BE AS DETAILED OR AS OTHERWISE REQUIRED BY CERTIFYING AUTHORITY.
3. REVIEW CONTROL MEASURES AND MAINTAIN STRUCTURES DURING CONSTRUCTION.
4. IF ADDITIONAL MEASURES ARE REQUIRED FOR EROSION CONTROL OR BY COUNCIL REQUIREMENTS REFER TO "URBAN EROSION AND SEDIMENT CONTROL" GUIDELINES PREPARED BY THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT.



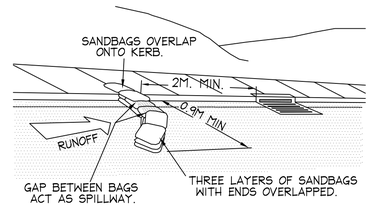
TYPICAL TEMPORARY CONSTRUCTION ENTRY/EXIT DETAIL

CONSTRUCTION NOTES:

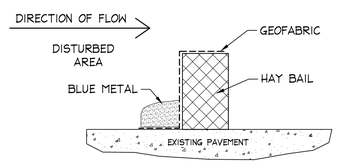
1. STRIP TOPSOIL AND LEVEL SITE.
2. COMPACT SUBGRADE.
3. COVER AREA WITH NEEDLE-PUNCHED GEOTEXTILE.
4. CONSTRUCT 200mm THICK PAD OVER GEOTEXTILE USING ROADBASE or 30mm AGGREGATE. MINIMUM LENGTH 15 METRES OR TO BUILDING ALIGNMENT. MINIMUM WIDTH 3 METRES.
5. CONSTRUCT HUMP IMMEDIATELY WITHIN BOUNDARY TO DIVERT WATER TO A SEDIMENT FENCE or OTHER SEDIMENT TRAP.



GRAVEL KERB INLET SEDIMENT TRAP

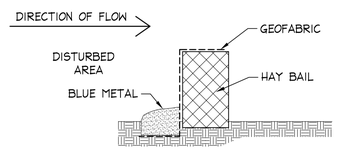


SANDBAG KERB INLET SEDIMENT TRAP



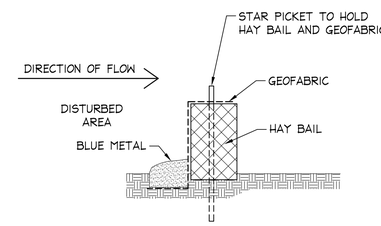
REMOVABLE HAY BAIL DETAIL

SCALE = N.T.S.



REMOVABLE HAY BAIL DETAIL

SCALE = N.T.S.



SILT FENCE DETAIL - OPTION 2

SCALE = N.T.S.

A1

NOTES:

1. ALL DIMENSIONS TO BE VERIFIED ON SITE BEFORE COMMENCING WITH WORK.
2. FOR GENERAL NOTES AND DRAWING SCHEDULE REFER TO DRAWING NUMBER: S01.

CHARTERED PROFESSIONAL ENGINEERS MEMBER

DOCUMENT CERTIFICATION

Date : AUGUST 2020

Bruce Lewis .....

(Principal : Peninsula Consulting Engineers)
BE(Civil),CPEng,MIEAust.,NPER.
Institute of Engineers Membership No. 879131

Date:	Rev:	Amendment:
27-08-2020	A	FOR COUNCIL SUBMISSION
23-07-2020	P1	DRAFT

Peninsula Consulting Engineers
PO Box 6491,
Frenchs Forest, NSW, 2086
Ph: 0424 253 818 Fax: (02) 9982 4722
E : bruce@peninsulaconsulting.com.au
A.B.N. 60 493 390 399

Project:
PROPOSED WORKS
at: 35 PINE STREET
MANLY
for: MR & MRS DUNNACHIE

Drawing Title:
SEDIMENT & EROSION CONTROL PLAN & DETAILS, INCL WASTE MGMT

Job No:	Drawing No:	Rev:
20-0614	H03	A