

**LEGEND**

- 100mm  $\phi$  DOWNPIPE DISCHARGE TO BOUNDARY PIT
- EXISTING DOWNPIPE DISCHARGE TO STREET
- BG1, BG2, EG BOX GUTTER - REFER DETAILS
- SPREADER
- RHD1, RHD2 RAINHEAD - REFER DETAILS
- STORMWATER PIPE FLOW DIRECTION
- PIT STORMWATER PIT
- EXISTING STORMWATER PIPE

**NOTE: ALL DRAINAGE LINES ARE INDICATIVE ONLY. LOCATION MAY VARY DUE TO CONSTRAINTS.**

NORTHERN BEACHES COUNCIL (MANLY AREA) ON SITE DETENTION SYSTEM CALCULATION SHEET	
ADDRESS: 9 & 11 DENISON STREET, MANLY	
DEVELOPMENT TYPE	ALTERATIONS AND ADDITIONS
SITE DETAILS	
TOTAL SITE AREA	270 m <sup>2</sup>
LOT 1	132 m <sup>2</sup>
LOT 2	138 m <sup>2</sup>
PRE DEVELOPMENT IMPERVIOUS AREA	254 m <sup>2</sup> ( 94% IMPERVIOUS )
POST DEVELOPMENT IMPERVIOUS AREA	203 m <sup>2</sup> ( 75% IMPERVIOUS )
LOT 1	97 m <sup>2</sup>
LOT 2	106 m <sup>2</sup>
REDUCTION	51 m <sup>2</sup>
OSD REQUIREMENT	
THE SITE IS LOCATED AT THE BOTTOM OF THE CATCHMENT, THEREFORE OSD IS NOT SUITABLE FOR THIS SITE	
SITE STORAGE REQUIREMENT	
OSD VOLUME REQUIRED	NIL
RAINWATER 'BASIX' REQUIRED	NIL (NIL PROVIDED)
OUTLET CONTROL	
METHOD OF DISCHARGE	KERB & GUTTER

**NOTE: BOX GUTTERS**  
ALL BOX GUTTER SYSTEMS SHOWN ON THESE PLANS ARE TO BE INSTALLED STRICTLY IN ACCORDANCE WITH THE ASSOCIATED DETAILS. IF ANY CHANGE TO THE BOX GUTTER CONFIGURATION IS PROPOSED, NOTIFY THE ENGINEER FOR RE-DESIGN. IF THE INSTALLED BOX GUTTER DOES NOT STRICTLY COMPLY WITH OUR DESIGN, CERTIFICATION OF THE HYDRAULIC SYSTEM MAY BE REFUSED.

**NOTE: EXISTING STORMWATER SYSTEM**  
EXISTING STORMWATER DRAINAGE SYSTEM TO BE UTILISED WHERE ADEQUATE. BUILDER TO INSPECT PRIOR TO CONSTRUCTION AND UPGRADE IF REQUIRED IN ACCORDANCE WITH AS 3500.3

**NOTE: EXCAVATION AROUND TREES**  
CARE SHOULD BE TAKEN WHEN UNDERTAKING WORKS IN THE VICINITY OF SELECTED TREES NOT TO DISTURB THE TREE ROOT SYSTEM. HAND DIGGING OF TRENCHES ETC MAY BE NECESSARY. REFER ARBORISTS REPORT.

**NOTE:**  
STORMWATER DRAWINGS DO NOT INCLUDE SUBSOIL AGRICULTURAL DRAINAGE DETAILS FOR D.A. SUBMISSION. NORTHERN BEACHES CONSULTING ENGINEERS PTY LTD MUST BE COMMISSIONED TO INCLUDE THESE DETAILS ONLY WHEN CONSTRUCTION CERTIFICATE AND/OR CONSTRUCTION DOCUMENTATION IS COMPLETE AND PROVIDED.

- STORMWATER NOTES:**
- ALL PIPES TO BE 100mm  $\phi$  UNLESS NOTED OTHERWISE.
  - ALL PIPES TO BE uPVC TO AS 1254-2002 UNLESS NOTED OTHERWISE.
  - ALL PIPES TO BE LAYED AT 1 % MINIMUM GRADE UNLESS NOTED OTHERWISE.
  - 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 300mm MINIMUM. BACKFILL TO BE ADEQUATELY CONSOLIDATED AROUND PIPES BY METHOD OF RAMMING AND WATERING IN. TRENCHES TO BE FILLED WITH GRANULAR MATERIAL AS SPECIFIED.
  - ALL DOWN PIPES TO BE 100mm  $\phi$  UNLESS NOTED OTHERWISE.
  - DOWN PIPE LOCATIONS ARE INDICATIVE ONLY. LOCATIONS TO BE CONFIRMED WITH ARCHITECT PRIOR TO COMMENCEMENT OF WORK.
  - PROVIDE CLEANING EYES AT ALL DOWNPIPES.
  - ALL PITS TO BE CAST INSITU OR, IF PRECAST, APPROVED BY ENGINEER. CAST INSITU PITS TO HAVE 150mm THICK CONCRETE WALLS AND BASE. WALLS TO BE REINFORCED WITH 1 N12 TOP TIE UNLESS NOTED OTHERWISE. CAST INSITU PITS GREATER THAN 900 DEEP TO BE MINIMUM 900x600 AND TO HAVE 150mm THICK CONCRETE WALLS AND BASE. WALLS TO BE REINFORCED WITH N12 AT 300 EACH WAY UNLESS NOTED OTHERWISE.
  - ALL PITS GREATER THAN 1000mm DEEP SHALL HAVE STEP IRONS AS PER COUNCIL STANDARDS.
  - THE BOUNDARY OR SILT ARRESTOR PIT SHOULD ALWAYS INCORPORATE A SUMP AND MAXI-MESH SCREEN AS PER LOCAL COUNCIL REQUIREMENTS. HOWEVER, UNLESS SPECIFICALLY REQUIRED BY COUNCILS POLICY OR IF THE SITE CONSISTS OF A CLAY OR ROCK SUBGRADE, ALL OTHER DRAINAGE PITS WILL NOT REQUIRE A SUMP.
  - ALL WORK TO BE IN ACCORDANCE WITH LOCAL COUNCIL STANDARDS AND SPECIFICATIONS.
  - PRIOR TO COMMENCING ANY SITE WORKS THE CONTRACTOR SHALL IMPLEMENT EROSION CONTROL MEASURES TO APPROVED SEDIMENT AND EROSION CONTROL PLAN, EPA GUIDELINES AND COUNCIL SPECIFICATIONS. ALL MEASURES TO REMAIN IN PLACE UNTIL COMPLETION AND STABILIZATION OF THE SITE TO COUNCIL SATISFACTION.
  - ALL LEVELS SHOWN ARE TO AHD
  - ENSURE THAT ALL PITS AND STORMWATER PIPES ARE LOCATED CLEAR FROM TREE ROOT SYSTEMS.
  - ALL EXISTING EARTHENWARE PIPES TO BE UPGRADED TO uPVC.
  - ALL WORKS TO BE IN ACCORDANCE WITH AS 3500-2003 NATIONAL PLUMBING DRAINAGE CODE PART 3 - STORMWATER DRAINAGE.
  - UNLESS NOTED OTHERWISE, SUB-SOIL DRAINS ARE TO BE INSTALLED IN ACCORDANCE WITH AS3500.3 ALONGSIDE WALLS THAT IMPEDE THE NATURAL FLOW OF GROUNDWATER. THIS MAY ALSO INVOLVE TRENCHING INTO THE CLAY OR ROCK SUBGRADE TO DIRECT GROUNDWATER AWAY FROM STRUCTURES.
  - IF NOT INDICATED ON PLANS, PROVIDE LEAF CATCHERS TO ALL DOWNPIPES OR GUTTER GUARD TO ALL EAVES GUTTERS.



**NOTE:**  
NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE.  
DEVELOPERS & EXCAVATORS MAY BE HELD FINANCIALLY RESPONSIBLE BY THE ASSET OWNER SHOULD THEY DAMAGE UNDERGROUND NETWORKS.

- CARELESS DIGGING CAN:**
- CAUSE DEATH OR SERIOUS INJURY TO WORKERS AND THE GENERAL PUBLIC
  - INCONVENIENCE USERS OF ELECTRICITY, GAS, WATER AND COMMUNICATIONS
  - LEAD TO CRIMINAL PROSECUTION AND DAMAGES CLAIMS
  - CAUSE EXPENSIVE FINANCIAL LOSSES TO BUSINESS
  - CUT OFF EMERGENCY SERVICES
  - DELAY PROJECT COMPLETION TIMES WHILE THE DAMAGE IS REPAIRED

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**IF IN DOUBT ASK**

DOCUMENT CERTIFICATION				Architect:		Project:		Date:	Design:	Drawn:
Date: 17-06-2019				KORSA		ALTERATIONS AND ADDITIONS HOUSES 9 & 11 DENISON STREET, MANLY		JUNE 2019	CF	MC
Issue:				By:		Drawing Title:		Job No:	Drawing No:	Issue:
A				MC LG		STORMWATER MANAGEMENT DRAINAGE PLAN		190572	DOI	A
Description:				Review:		CHARLIE HAYNES AND SAMANTHA MORTON				

DOCUMENT CERTIFICATION  
Date: 17-06-2019  
Rick G Wray  
BE(Civil), CPENG, MIEAust., NER., RPEQ. 00218.  
(Director NB Consulting Engineers)  
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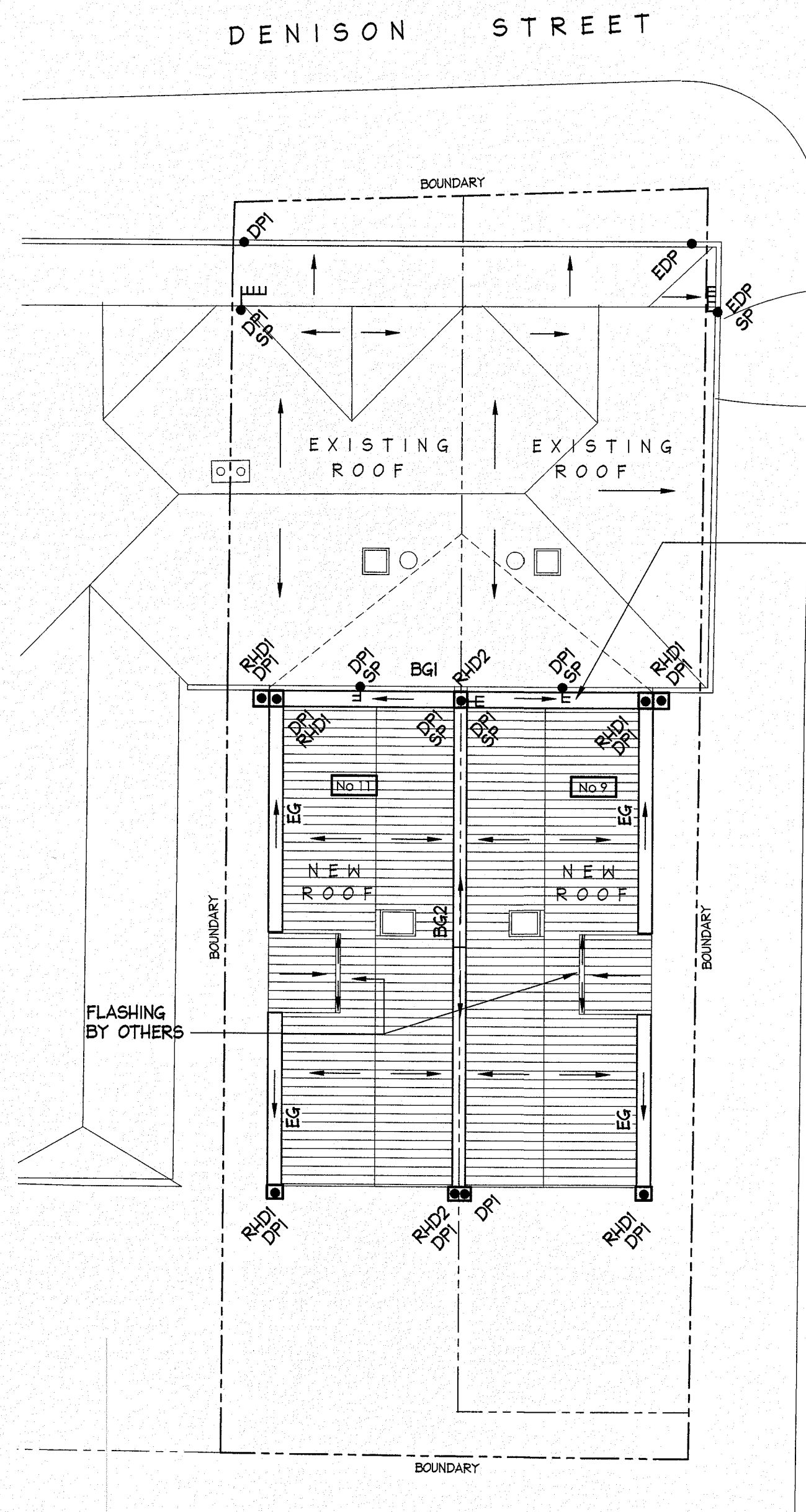
**NB Consulting Engineers**  
STRUCTURAL - CIVIL - STORMWATER - REMEDIAL  
A.C.N. 076 121 616 A.B.N. 24 076 121 616  
Sydney: Ph: (02) 9984 7000  
Suite 207, 30 Fisher Road Dee Why N.S.W. 2099  
Gold Coast: Ph: (07) 5631 4744  
Unit 8, 1726 Gold Coast Highway Burleigh Heads QLD 4220  
E: nb@nbconsulting.com.au W: www.nbconsulting.com.au

Architect: KORSA  
Client: CHARLIE HAYNES AND SAMANTHA MORTON

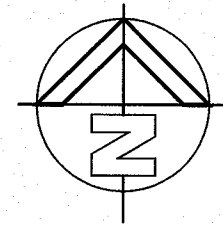
Project: ALTERATIONS AND ADDITIONS HOUSES 9 & 11 DENISON STREET, MANLY  
Drawing Title: STORMWATER MANAGEMENT DRAINAGE PLAN

Date: JUNE 2019  
Design: CF  
Drawn: MC  
Job No: 190572  
Drawing No: DOI  
Issue: A

**NB Consulting Engineers**

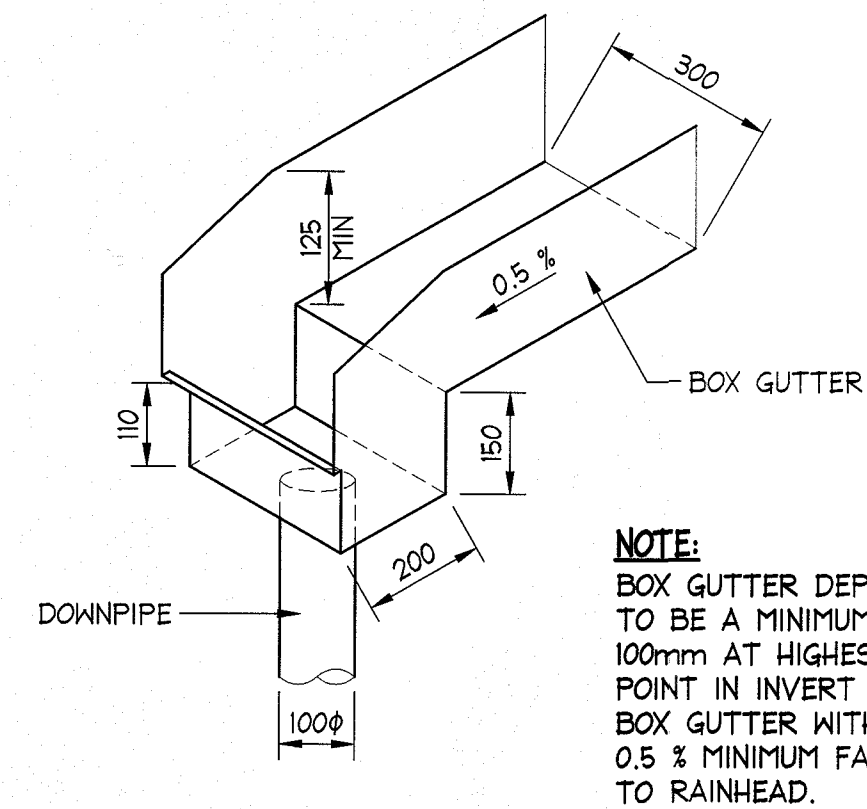


**ROOF DRAINAGE PLAN**  
SCALE = 1 : 100

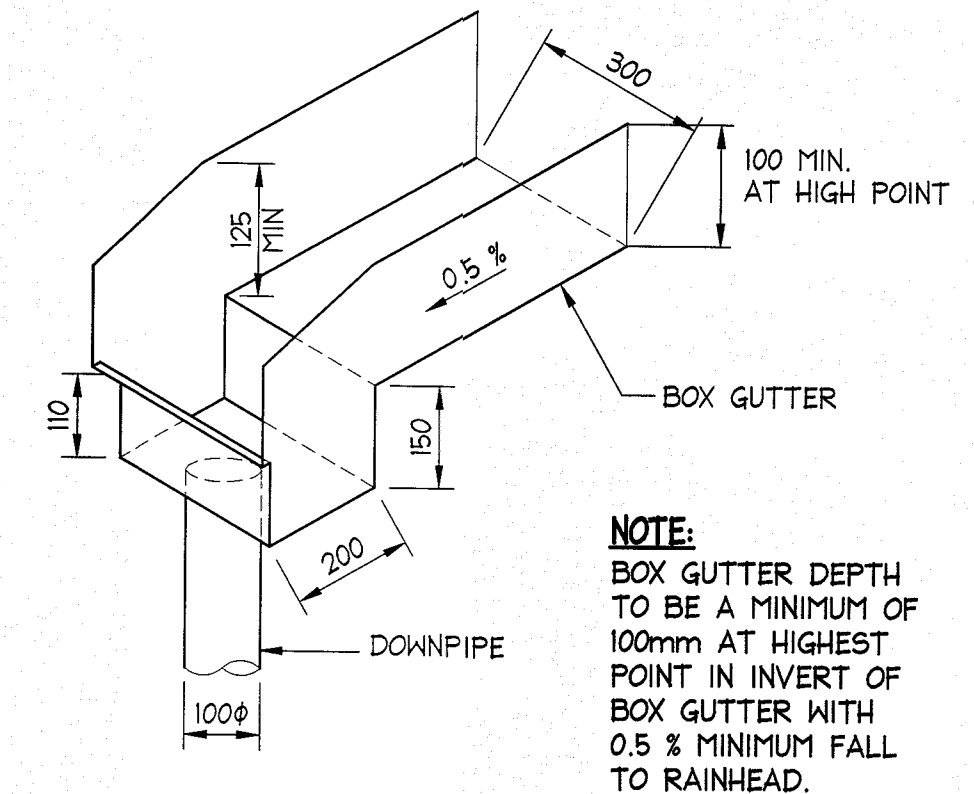


SPREADERS TO NOT BLOCK GUTTER FLOWS. CLEARANCE OF MIN. 150 TO BE MAINTAINED FROM BOX GUTTER SOFFIT

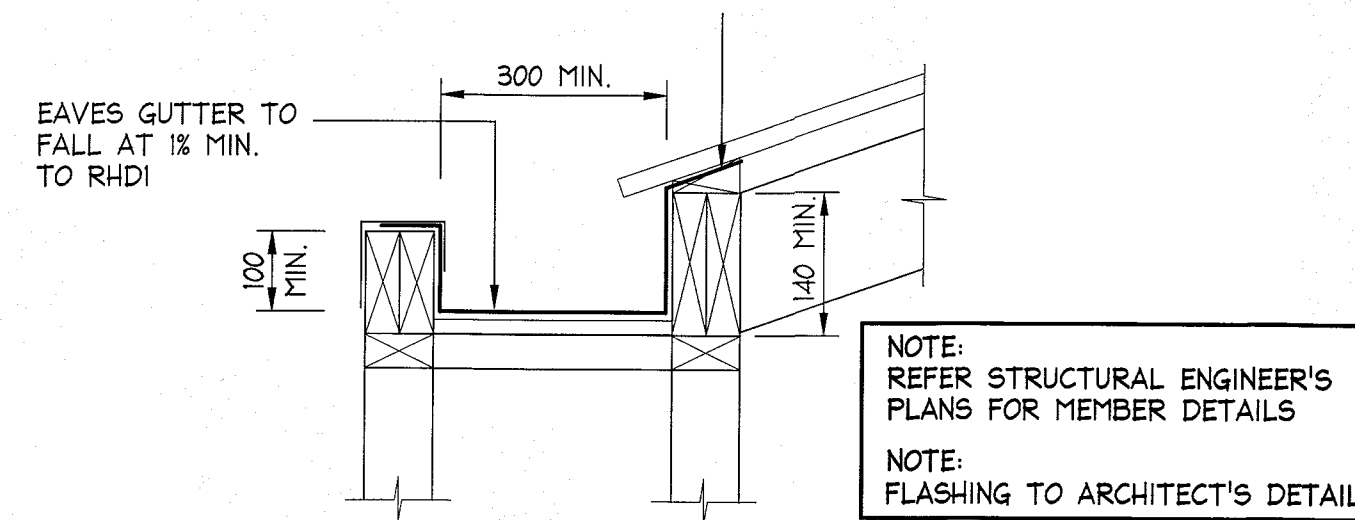
WHISTLER STREET



**RAINHEAD 'RHD1' AND BOX GUTTER 'BG1' DETAIL**  
SCALE = NTS

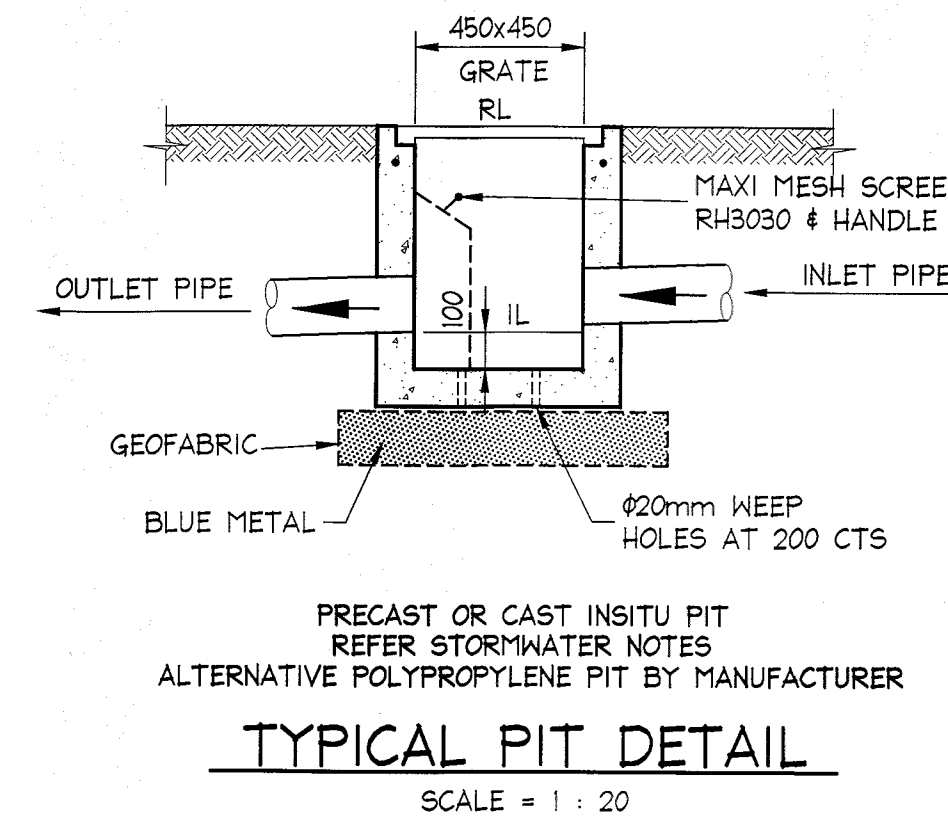


**RAINHEAD 'RHD2' AND BOX GUTTER 'BG2' DETAIL**  
SCALE = NTS



**SOFFIT EAVES GUTTER 'EG' DETAIL**  
SCALE = NTS

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**TYPICAL PIT DETAIL**  
SCALE = 1 : 20



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**NB Consulting Engineers**

A1					
17-06-2019	A	ISSUED FOR DA SUBMISSION	MC	LG	
Date:	Issue:	Description:	By:	Review:	

**DOCUMENT CERTIFICATION**  
Date: JUNE 19  
Rick G Wray  
BE(Civil), CPENG, MIEAust., NER., RPEQ: 08663  
(Director NB Consulting Engineers)

**NB Consulting Engineers**  
STRUCTURAL - CIVIL - STORMWATER - REMEDIAL  
A.C.N. 076 121 616 A.B.N. 24 076 121 616  
Sydney: Ph: (02) 9984 7000  
Suite 207, 30 Fisher Road Dee Why N.S.W. 2099  
Gold Coast: Ph: (07) 5631 4744  
Unit 8, 1726 Gold Coast Highway Burleigh Heads QLD 4220  
E: nb@nbconsulting.com.au W: www.nbconsulting.com.au

Architect:  
**KORSA**  
Client:  
**CHARLIE HAYNES AND SAMANTHA MORTON**

Project: **ALTERATIONS AND ADDITIONS HOUSES 9 & 11 DENISON STREET, MANLY**  
Drawing Title: **STORMWATER MANAGEMENT DRAINAGE PLANS**

Date: JUNE 2019 Design: CF Drawn: MC  
Job No: **190572** Drawing No: **D02** Issue: **A**