

Villa Maria Bogor Regis





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1.0 Introduction

Arch Associates Limited has been commissioned by Vivid Design Studio Limited to provide a flow comparison between the predevelopment and post-development foul and stormwater flows at the Villa Maria site in Bognor Regis.

It is understood that the developer has installed a combined gravity system connecting into the existing Southern Water public foul sewer and that Southern Water have requested a flow comparison to assist their approval of the S106 application to connect.

Vivid Design Studio Limited has confirmed that the predevelopment hardstanding areas drained via gullies into the pre-development on-site combined system.

2.0 Flow Comparison

Predevelopment

Storm water Flow

Impermeable areas draining to network:

Main Building	=	244m ²
Concrete Hardstanding	=	238m ²
Outbuilding	=	17m ²
Total	=	499m²

Peak run-off for 30-minute storm duration:

1 in 1 year	=	2.56 litres/second
1 in 100 year	=	8.22 litres/second

Foul water Flow

The previous use of the building was a residential home for nuns and provided accommodation with 15 bedrooms.



Based on Southern Water's foul sewerage modelling criteria (see appendices) with a per-capita flow of 125 litres per head per day, dry weather flow peaking factor of 2.5 for storm duration of 30 to 240 minutes:

$$(2.5+0.1) \times 15\text{people} \times 125\text{litres/person/day} = 4875 \text{ litres per day.}$$
$$4875 / (24 \times 60 \times 60) = \mathbf{0.056 \text{ litres per second}}$$

Note: As storm water is being considered separately, the allowance for misconnected surface water within the Southern Water design flow calculation has been omitted.

Note: We have taken the occupancy per single bedroom as 1 person.

Post-development

Storm water Flow

Impermeable areas draining to network:

Main Building	=	256m ²
Houses	=	238m ²
Total	=	400m²

Peak run-off for 30-minute storm duration:

1 in 1 year	=	2.05 litres/second
1 in 100 year	=	6.59 litres/second

Foul water Flow

The main building has been converted to provide student accommodation with 26 bedrooms. In addition to this, 5 No. single-storey studio apartments have been constructed at the rear of the site.

Based on Note 7 from Southern Water's modelling criteria, occupancy of a single bedroom apartment can be taken as 2 i.e. number of bedrooms + 1.



$(2.5+0.1) \times (26 + 10) \text{ people} \times 125\text{litres/person/day} = 11,295 \text{ litres per day.}$

$11,295 / (24 \times 60 \times 60) = \mathbf{0.13 \text{ litres per second}}$

Comparison

Pre-development Combined Flow - 1 in 1 Year Storm – 30 Minute Duration

$2.56 + 0.056 = \mathbf{2.616 \text{ litres/second}}$

Pre-development Combined Flow - 1 in 100 Year Storm – 30 Minute Duration

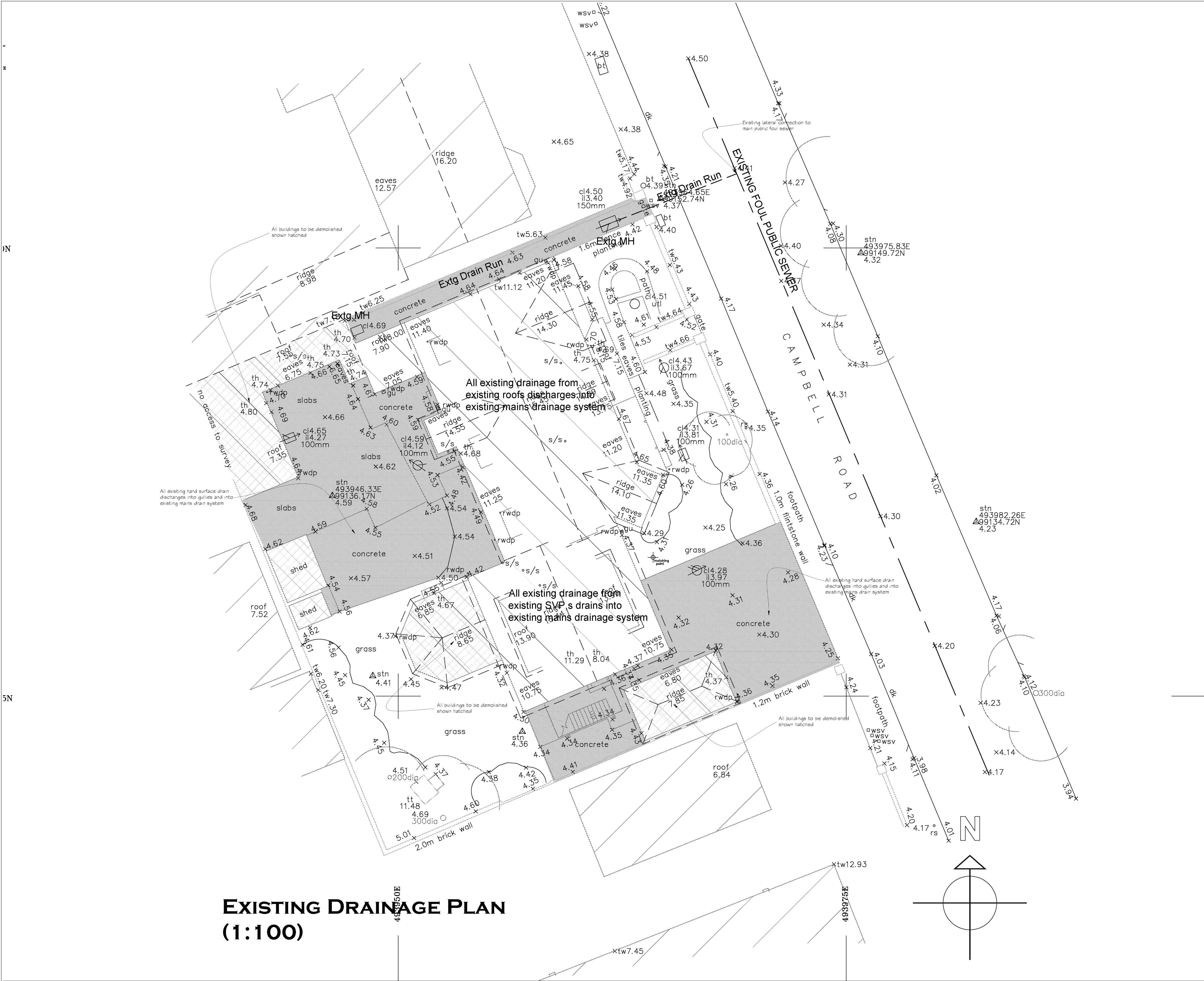
$8.22 + 0.056 = \mathbf{8.276 \text{ litres/second}}$

Post-development Combined Flow - 1 in 1 Year Storm – 30 Minute Duration

$2.05 + 0.13 = \mathbf{2.180 \text{ litres/second}}$

Post-development Combined Flow - 1 in 100 Year Storm – 30 Minute Duration

$6.59 + 0.13 = \mathbf{6.720 \text{ litres/second}}$



EXISTING DRAINAGE PLAN
(1:100)

Notes

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DIMENSIONS TO BE CHECKED ON SITE BEFORE COMMENCING WORK AND ANY DISCREPANCIES SHALL BE REPORTED TO THE DESIGNER. FIGURED DIMENSIONS MUST BE TAKEN IN PREFERENCE TO SCALED DIMENSIONS.

Rev:-	Description:-	Date:-	Chkd by:-

Schedule of Areas

Total Site Area
= 783sqm

Existing Site
Footprint of Existing Buildings
= 309sqm
Area of all Hard Surfacing
= 239sqm
Area of all Soft Surfacing
= 235sqm

Buildings that to be demolished
= 86sqm

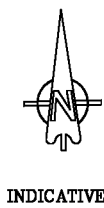
Proposed Site
Footprint of Proposed Buildings
= 401sqm
Area of all Hard Surfacing
= 136sqm
Area of Soft Surfacing
= 246sqm



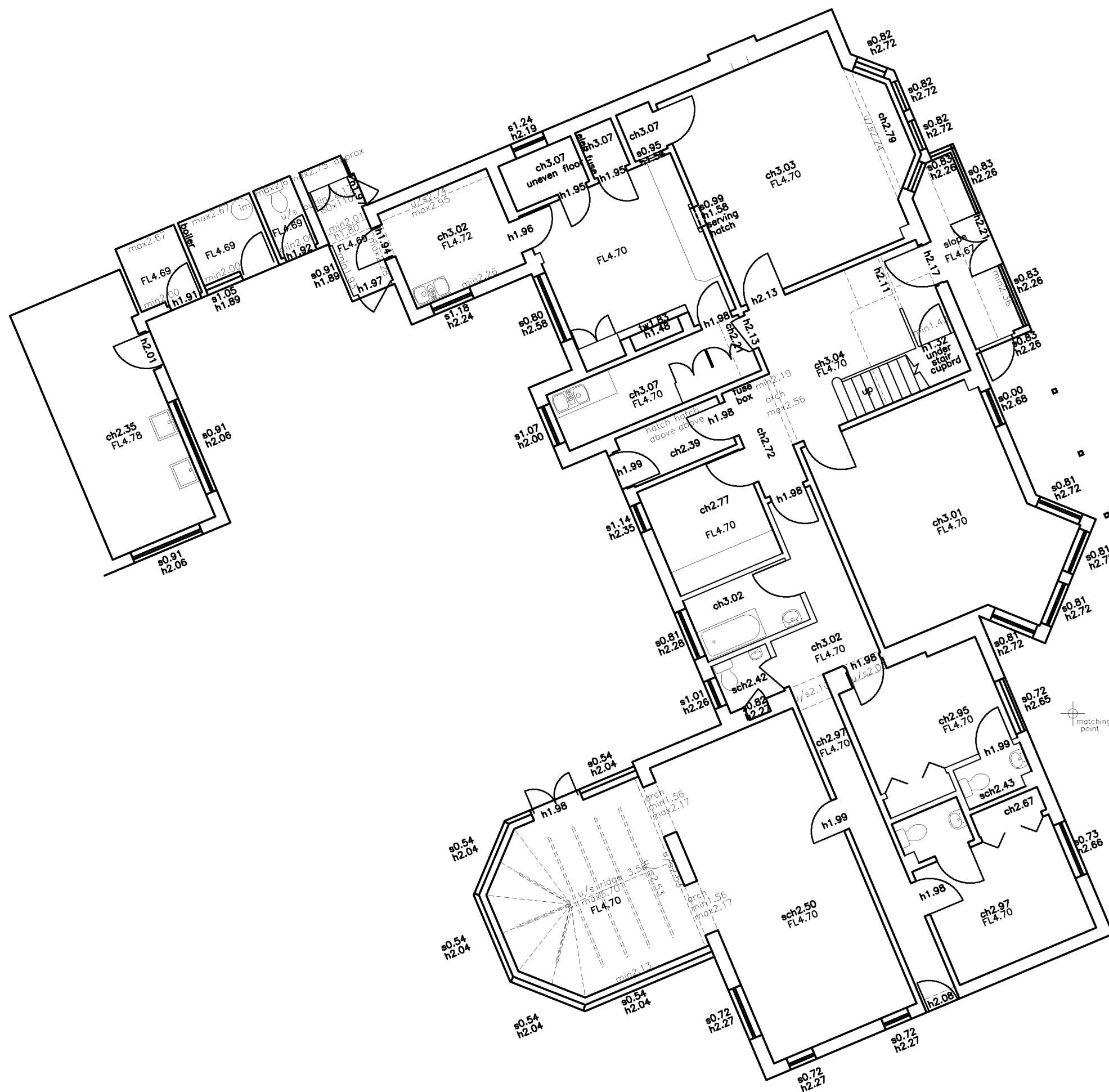
The Barn, Calcot Mount Business Park, Calcot Lane,
Curdridge, Southampton, Hampshire, SO22 2BN

Project:-
Proposed Conversion
Villa Maria
Campbell Road
Bognor Regis

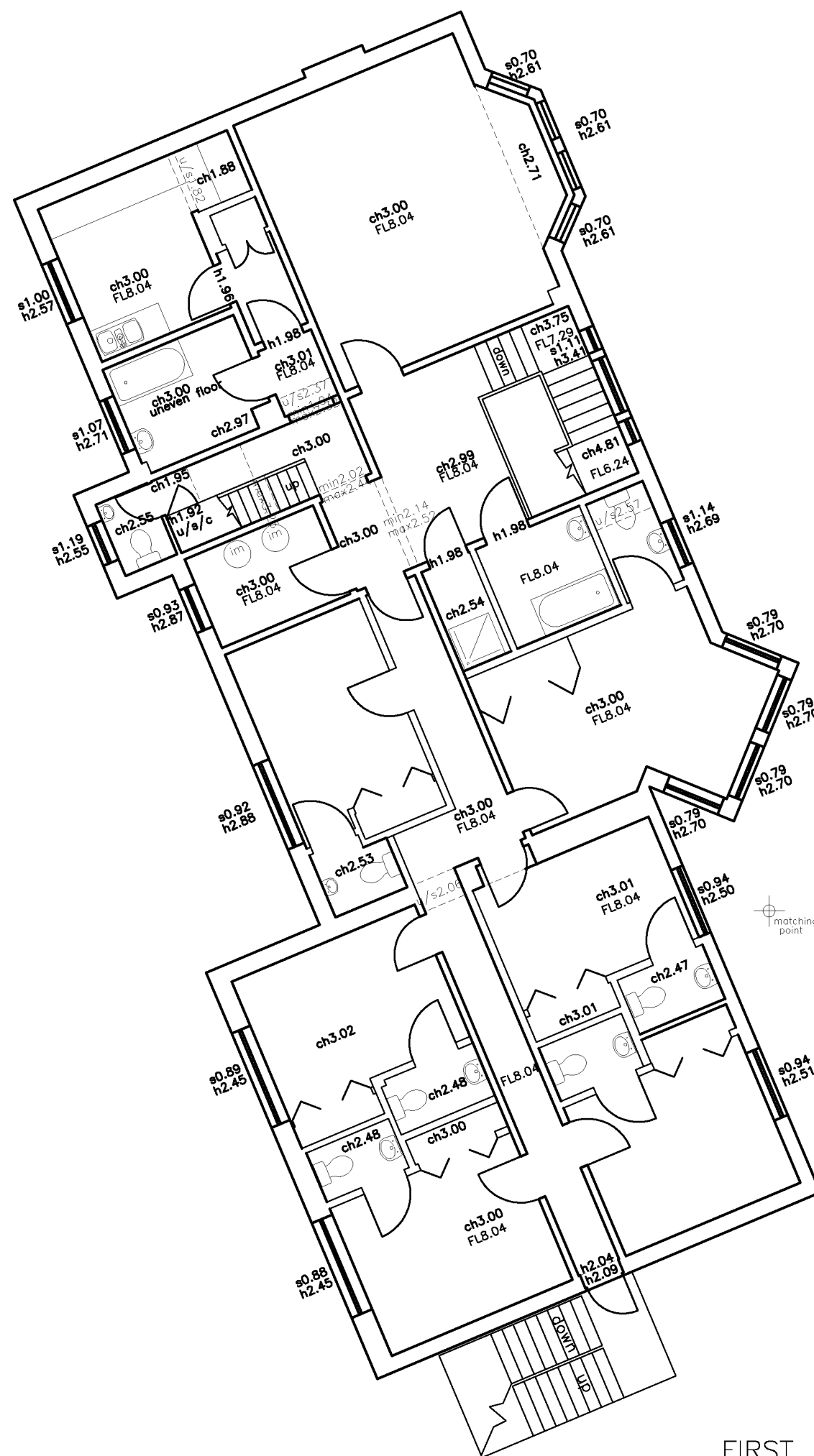
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Existing Drainage Plan			
Client:-			
SCG Properties Ltd			
Scale:-			
1:100 (@A1)			
Drawn By:-		Checked By:-	
PJD			
Date:-		Date:-	
30/10/18			
Job.No:-		Rev:-	
160035		25	



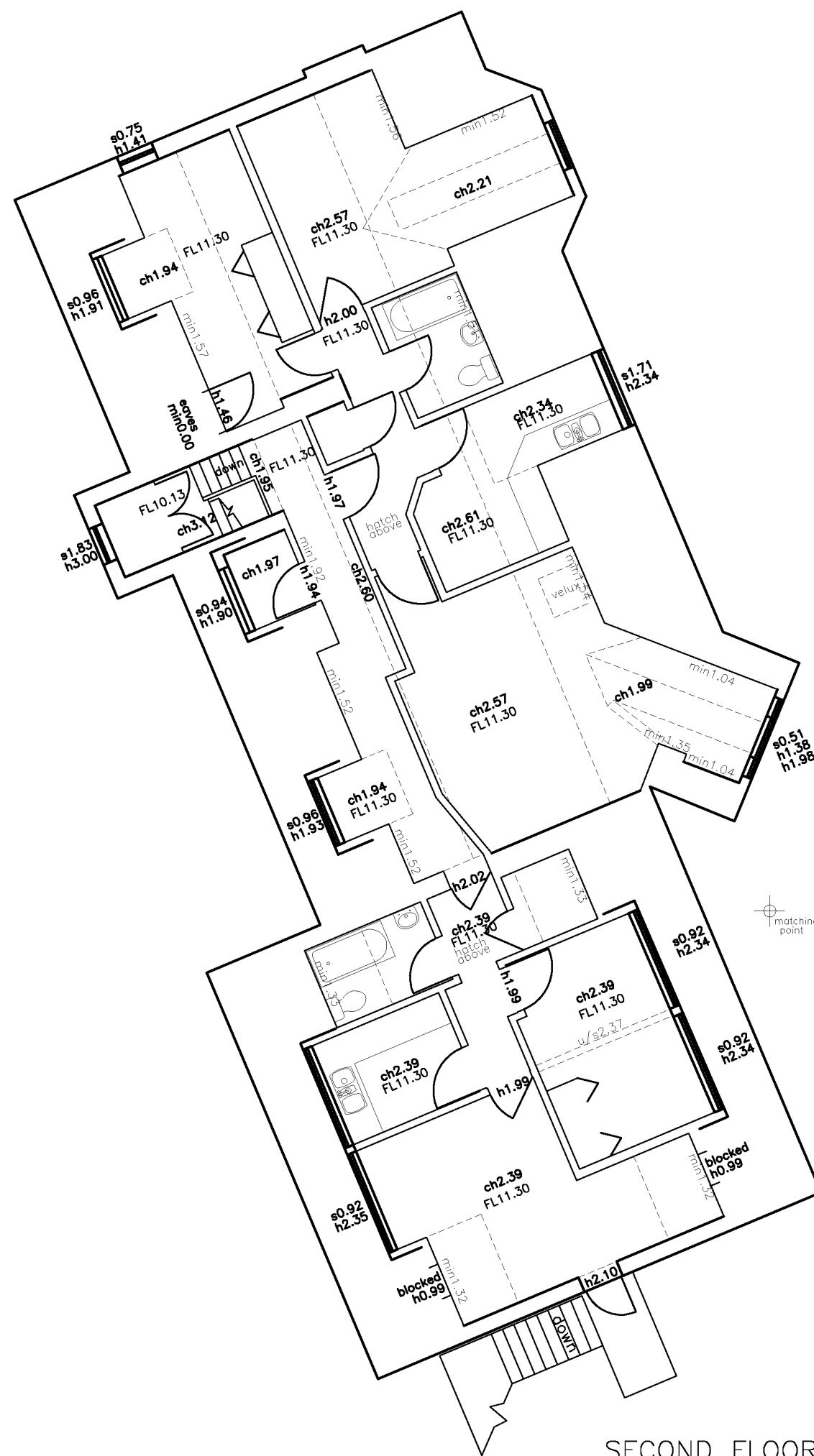
key:-	ceiling height
ch	Floor level relative to external survey
Fl	head height from floor
h	immersion heater
in	minimum height from floor
min	maximum height from floor
max	sill height from floor
s	height to underside
u/s	



GROUND FLOOR PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

NOTES:
LEVELS RELATE TO D.S. DATUM

P STUBBINGTON LAND SURVEYS LTD

THE MEAD
DURLEY BROOK ROAD
DURLEY
SOUTHAMPTON
HAMPSHIRE
SO32 2AR

CLIENT: - S G DEVELOPMENTS

CONTRACT: - VILLA MARIA
CAMPBELL ROAD,
BOGNOR REGIS

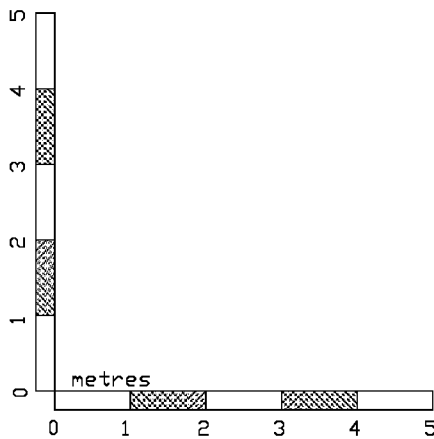
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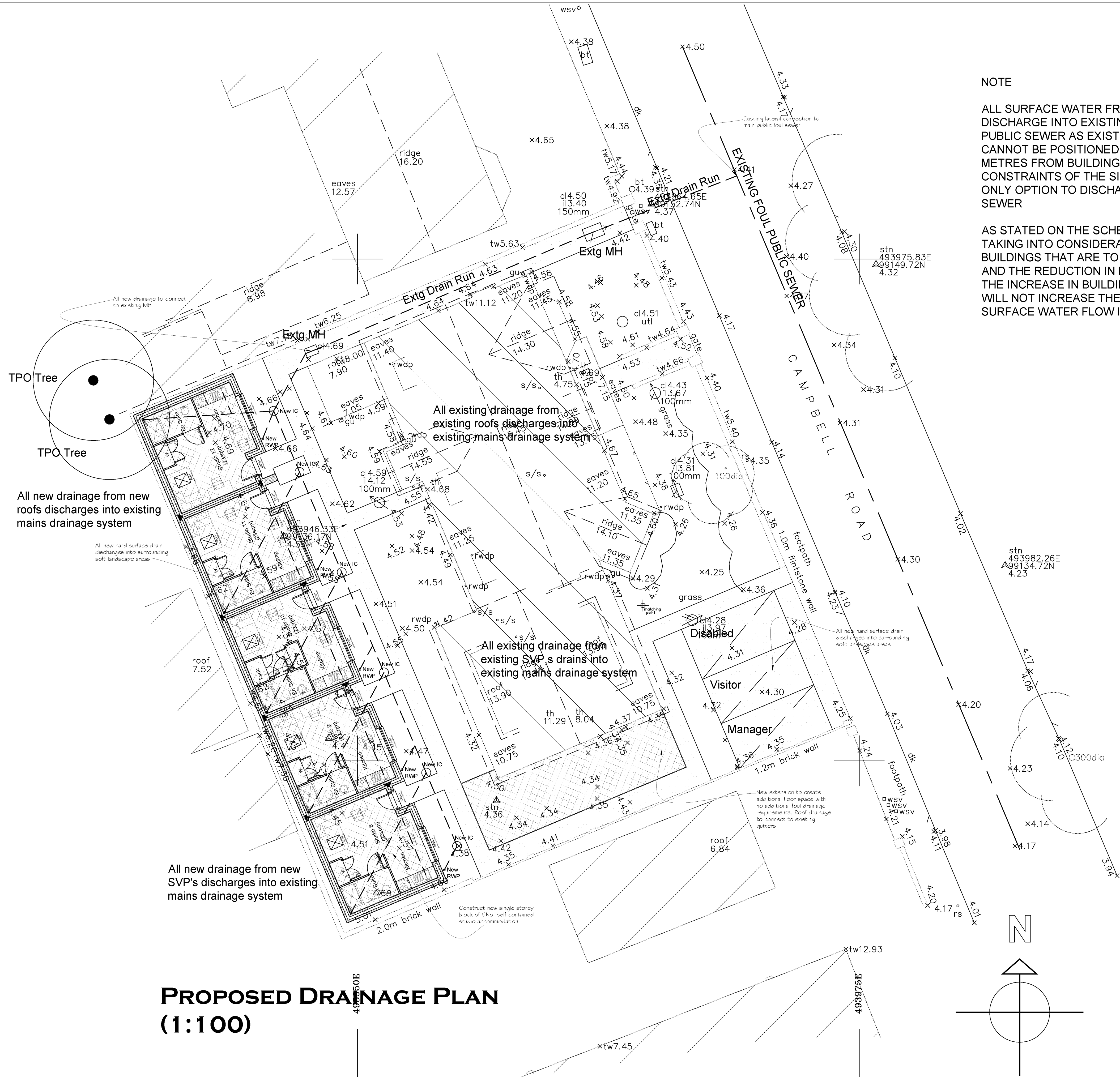
SCALE: - 1:100 @A1

DRAWING NO. 5749/02

DATE: - OCTOBER 2016

SURVEYOR: - PS





PROPOSED DRAINAGE PLAN
(1:100)

NOTE

ALL SURFACE WATER FROM ROOFS TO DISCHARGE INTO EXISTING MANHOLE INTO PUBLIC SEWER AS EXISTING. SOAKAWAYS CANNOT BE POSITIONED MORE THAN 5 METRES FROM BUILDINGS DUE TO THE CONSTRAINTS OF THE SITE THEREFORE ONLY OPTION TO DISCHARGE INTO MAIN SEWER

AS STATED ON THE SCHEDULE OF AREAS TAKING INTO CONSIDERATION THE BUILDINGS THAT ARE TO BE DEMOLISHED AND THE REDUCTION IN HARD SURFACING THE INCREASE IN BUILDING FOOTPRINT WILL NOT INCREASE THE AMOUNT OF SURFACE WATER FLOW INTO THE SEWER

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The Barn, Calcot Mount Business Park, Calcot Lane,
Cumnor, South Oxon, Reading, RG4 7AT

Project:-
Proposed Conversion
Villa Maria
Campbell Road
Bognor Regis

Title:-
Proposed Drainage Plan

Client:-
SCG Properties Ltd

Scale:-
1:100 (@A1)

Drawn By:- PJD Checked By:-

Date:- 30/10/18 Date:-

Job.No:- 160035 Drg.No:- 26 Rev:-

Developer Services

Foul Sewerage Modelling Criteria:

Southern Water continues to review its modelling procedures and design standards. Our current update on the impact of a new development on the public sewer network is as below:

Item			
Development Size – Number of units	N		
Per Capita Flow -Litres/ head / day	G	125	(see note 4)
Infiltration – Percentage	I	10	(see note 5)
Occupancy – Persons/Dwelling	O	2.4	(see notes 6 & 7)
Dry Weather Flow multiplier (PF - Peaking Factor) (SD –Storm Duration– minutes)	SD		PF
	30 to 240		2.5
	240 to 480		2.0
	Above 480		1.4
Allowance for misconnected surface water		1.4 Square Metres per Dwelling (see note 8)	
Population – Number of people	P	N x O	

Hence: Design flow = (PF + 0.1) PG (foul flow element) plus the impact of 1.4 x N sq. m. (allowance for misconnected surface water)

Note that the above criteria applies subject to:

- 1) Only to the case of new domestic foul flow.
- 2) No proposed discharge of surface water into the foul sewer.
- 3) Southern Water supports the Hierarchy of H3 of Building Regulations with regards to the disposal of Surface Water.
- 4) Compliance with G2 of Building Regulations; that reasonable provision must be made by the installation of fittings and fixed appliances that use water efficiency for the prevention of undue consumption of water.
- 5) That upstream sewers are designed and constructed with materials and method fully compliant with Sewers for Adoption and Southern Water published addendum and corrigendum, in order to ensure that the infiltration of groundwater is minimised to the low rate of 10% of base flow.

- 6) That unless we are advised otherwise, we will assume the occupancy rate of 2.4 persons per property to be appropriate and in accordance with survey data that Southern Water has for development within its area.
- 7) Should the makeup of development be known and advised to Southern Water, with regards to the number of 1-bedroom, 2-bedroom units etc. then the modelling can be revised on the basis of:
- Number of bedrooms + 1, as the occupancy for each unit type.
 - This level of information may not be available for initial Capacity Check assessments and in this case the default figure of 2.4 persons/dwelling is considered appropriate.
- 8) Should the density of the development be known, (where development density is calculated based on the number of expected new addresses divided by the area of the proposed site development) and advised to Southern Water, then the allowance for misconnected surface water can be adjusted to the following:

Development Density (Properties / 4Ha)	Misconnected surface water allowance m ² /property
<=100	2.1
120	1.6
140	1.1
180	0.6
>=200	0.3

Flats, housing association, and commercial property addresses will have no misconnected surface water allowance applied.

- 9) With regards to the allowance for misconnected surface water, reference is made to published guidance or studies including LASOO, CIRIA, DEFRA, and UKWIR.
- 10) With regards to any proposed pumped flow rates.
- For the hydraulic design of pumping stations (and associated rising mains) we are guided by Sewers for Adoption and in the case of Edition 7, by clauses D4.6 and D5.3.1.
 - This has a range of velocity of discharge in the rising main between 0.75 to 1.8 m/s, when the pump is operating. Our preference would be for a higher velocity than the minimum.
 - If however the discharge is by gravity, then we would seek flows within the pipe capacity and self cleansing range.