

Design Calculations

Job Information

Client	[REDACTED]
Client Reference	[REDACTED]
Report Date	[REDACTED]
Address	Garlands, Billinghurst, RH14 9BH

Scope

To design mass concrete traditional underpinning to cater for loads applied from existing single storey extension at the property address of Garlands, Billingham, West Sussex, RH14 9BH.

Design

Consider applied line load from single storey brick built extension :

Load Case 1

Element	Unfact. Dead Load kN/m Run			Unfact. Live Load kN/m Run			Total Unfactored Load kN/m Run	Total Factored Load kN/m Run
Lean to Roof	1.60	x	1.10	1.60	x	1.00	3.36	5.02
Wall	3.50	x	4.20	N/A			14.70	20.58
Ground Floor (Conc)	0.20	x	24.00	1.60	x	1.50	7.20	10.56
Sf Wt of Trad. Underpin	1.00	x	24.00	N/A			24.00	33.60

Total Service Load (kN/m) 49.26

Total Ultimate Load (kN/m) 69.76

From site investigation report produced by Auger, Ref: 159973.1.USI, Very Stiff CLAY is present at 2.20m, with a compressive strength of 120kN/m². Therefore, $FoS = (120 \times 0.67) / 49.26 = 1.63$. In practice, FoS likely to be greater.



WILLIAM
HUNT
CONSULTING

Contract GARLANDS, BILLINGHURST,
RH14 9BH

Job Reference
20915 (OPTERA)

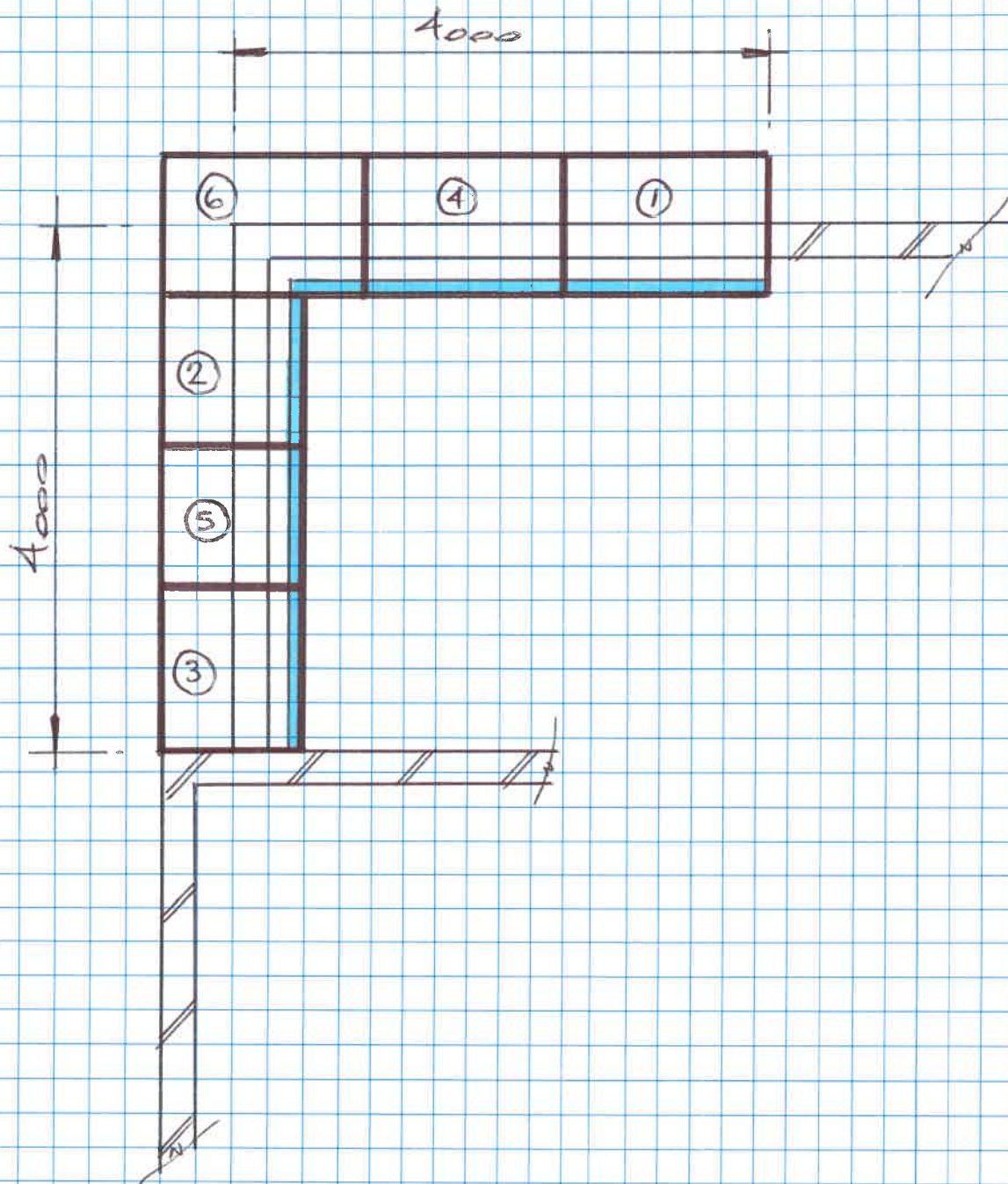
Title TRADITIONAL UNDERPINNING LAYOUT

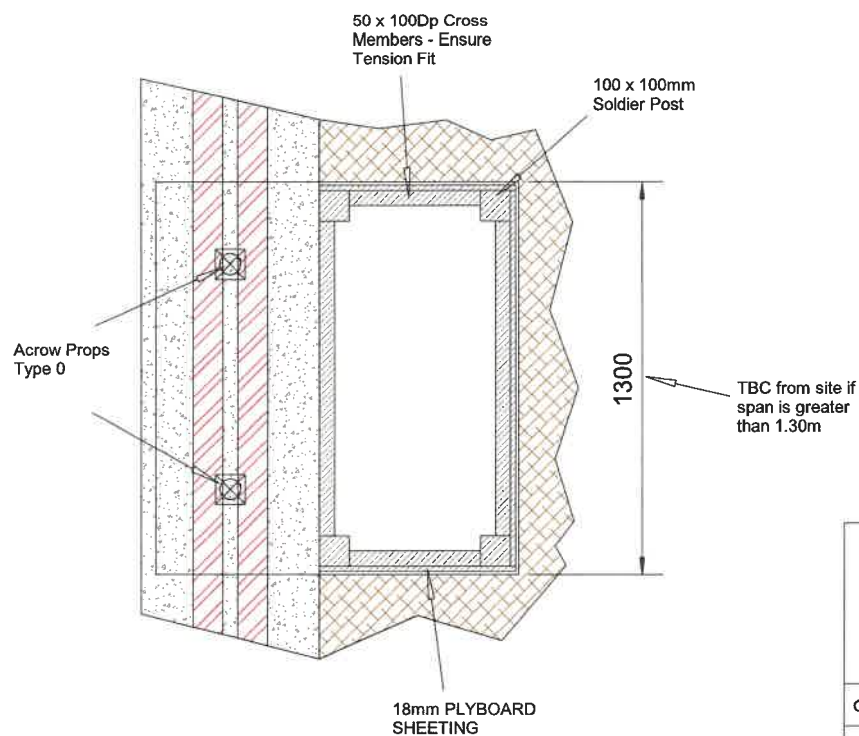
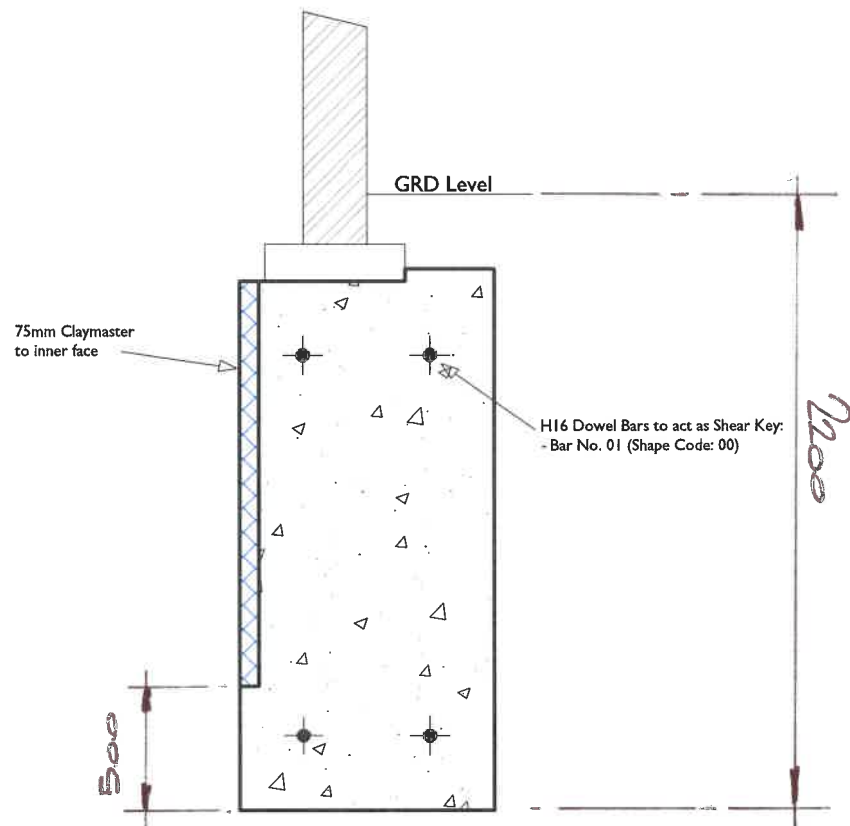
Ref
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Client Ref:	20915		
WHC Ref:	21231		
Address:	Garlands, Billinghurst, RH14 9BH		
Drawn By:	JJG	Date:	16/06/2026
Dwg No:	WHC/21231/DC/001		

Optera Job Ref: 20915 - Mass Concrete Traditional Underpinning

Member	Bar No.	Bar Dia.	No. of Members	No. of Bars / Member	Total No.	Shape Code	Total Length of Bar (mm)	A (mm)	B (mm)	C (mm)	D (mm)
Shear Key Reinforcement	01	16	5	4	20	00	1000	1000			