SIDEBOTTOM RICHARDSON CHENG LTD
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Project No.	31221	
Sheet No.	1	Rev
Date	AUG. '21	
Designer	JL	

PROJECT:

Project - **Proposed Extension & Alterations**

Location - **Daintree Farm, Daintree Road**

Ramsey St Mary, Huntingdonshire

Client - **Huntingdonshire County Council**

Project Ref - 31221

Prepared By - **J. Lawrence**

Checked By - **J. A. Richardson**

Date - **Aug. '21**

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Project No.	31221	
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PROJECT:

Loadings

Roof

Roof Tiles	=	0.60 kN/m²
Battens & Felt	=	0.04 kN/m²
Trusses	=	0.20 kN/m²
Insulation	=	0.02 kN/m²
Plasterboard & Skim	=	0.16 kN/m²
		1.02 kN/m²
Roof Imposed	=	0.60 kN/m²

Ground Floor

225 mm Thick Ground Bearing Slab	=	1.35 kN/m²
Domestic Ground Floor Imposed	=	2.50 kN/m²
	=	3.85 kN/m²

Wall

Brickwork	=	2.20 kN/m²
Blockwork	=	1.40 kN/m²
Render & Skim	=	0.35 kN/m²
		3.95 kN/m²

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Project No.	31221	
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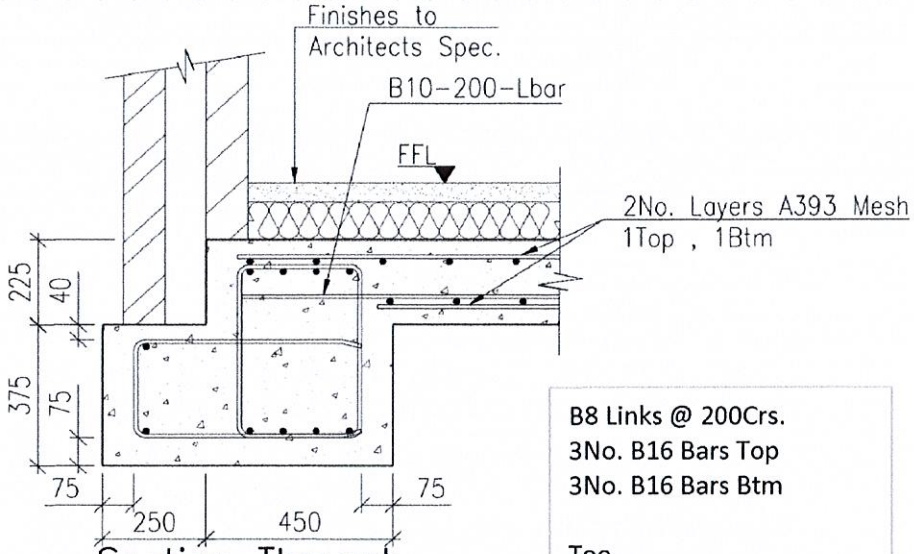
PROJECT:

Proposed Sections



Section Through Permiter Edge Beam

B8 Links @ 200Crs.
3No. B16 Bars Top
3No. B16 Bars Btm

Toe
B12 UBars @ 200Crs.
1No. B12 Bar Top
1No. B12 Bars Btm.

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Project No.	31221	
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PROJECT:

LOADINGS

ROOF

(D) = 17.877m² × 1.02 KN/m² = 18.23 KN
(I) = 17.877m² × 0.60 KN/m² = 10.73 KN

SLAB

(D) = 17.877m² × 1.35 KN/m² = 24.13 KN
(I) = 17.877m² × 2.50 KN/m² = 44.69 KN

WALLS

2 × 2.2m × 3.03m × 3.95 KN/m² = 52.66 KN
1 × 3.4m × 5.90m × 3.95 KN/m² = 79.28 KN
131.94 KN

TOTAL DEAD = 174.30 KN × 1.4 = 244.02 KN

TOTAL IMPOSED = 55.42 KN × 1.6 = 88.67 KN
229.72 KN 332.69 KN

LOAD / AREA

$\frac{229.72\,KN}{17.877\,m^2} = 12.85\,KN/m^2$

$\frac{332.69\,KN}{17.877\,m^2} = 18.61\,KN/m^2$

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Project No.	31221	
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PROJECT:

SLAB DESIGN

PANEL = 3.03m (Lx) × 5.90m (Ly) ∴ $\frac{Ly}{Lx}$ = 1.94

∴ αS_x = 0.090

∴ M_{Sx} = 0.090 × 18.61 × 3.03^2 = 15.37 KN/m

d = 225 − 40 − 10 − $\frac{10}{2}$ = 170mm $K = \frac{15.37 \times 10^6}{35 \times 1000 \times 170^2}$ = 0.015

z = 0.95 × 170 = 161.5

$A_S = \frac{15.37 \times 10^6}{0.95 \times 460 \times 161.5}$ = 217.78 mm^2

MINIMUM STEEL = 225 × 1000 × $\frac{0.013}{100}$ = 292.5 mm^2

∴ PROVIDE A393 MESH TOP + BTM

CHECK SHEAR

V = 18.61 × $\frac{5.90}{2}$ = 54.89 KN

v = $\frac{54.89 \times 10^3}{170 \times 1000}$ = 0.32 N/mm^2

$\frac{100 \times 393}{170 \times 1000}$ = 0.23% ∴ V_c = 0.46 N/mm^2 × 1.12 = 0.52 N/mm^2

∴ V < Vc ∴ OK FOR SHEAR IN SLAB

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Project No.	31221	
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PROJECT:

BEAM THICKENING

$W = 18.61 \times 5.90 = 109.799$ KN/m

$\therefore M_{sc} = \frac{109.799 \times 3.03^2}{8} = 126.00$ KNm

$d = 600 - 40 - 10 - 10 - 8 - \frac{16}{2} = 524$ mm

$K = \frac{126.00 \times 10^6}{35 \times 450 \times 524^2} = 0.029$

$z = 0.95 \times 524 = 497.8$mm

$A_s = \frac{126.00 \times 10^6}{0.95 \times 460 \times 497.8} = 579.2\ mm^2$

MINIMUM STEEL $= 450 \times 600 \times \frac{0.13}{100} = 351\ mm^2$

3NO. B16 BARS $= 603.19 mm^2$ $\therefore$ OK ✓

CHECK SHEAR

$V = 109.799 \times \frac{3.03}{2} = 166.34$ KN

$v = \frac{166.34 \times 10^3}{524 \times 450} = 0.71\ N/mm^2$

$\frac{100 \times 603.19}{524 \times 450} = 0.26\%$ $\therefore V_c = 0.40\ N/mm^2 \times 1.12 = 0.448\ N/mm^2$

$0.5 \times V_c < V$ $\therefore$ PROVIDE MINIMUM LINKS

TRY LINKS @ 200 Crs

$A_{sv} = \frac{0.4 \times 450 \times 200}{0.95 \times 460} = 82.38\ mm^2$

WITH 8mm LINKS $A_{SV} = 101 mm^2 > 82.38 mm^2$

$\therefore$ PROVIDE B8 LINKS @ 200 Crs.

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JOB NO 31221
SHEET NO 7
DATE AUG.'21
PREPARED APW

FOUNDATION SPECIFICATION.

1. All strip / base foundations are to be placed within undisturbed natural strata at a depth to be agreed with the Building Inspector.

2. All topsoil and vegetation is to be stripped and removed from full building footprint.

3. It is the contractors responsibility to report any condition found on site during excavation which, in any way, may affect the present design (such as dubious ground, existing foundations , drains , trees, pits and shafts , etc.)

4. It is the contractors responsibility to determine the presence of sulphates or other deleterious material on site and to use an appropriately resistant cement.

5. A 50mm blinding layer of lean mix concrete should be placed into the bottom of foundation excavations as soon as is practical. Should surface / ground water enter the excavations prior to blinding with concrete, then the bottoms are to be reformed to the satisfaction of the engineer.

6. Reinforced concrete foundations to be minimum Grade C28/35 with a minimum O.P.C content of 300 Kg/m^3 and a water cement ratio of 0.6

7. Mass concrete foundations to be Grade C25/30 with a minimum O.P.C. content of 275 Kg/m^3, a maximum water cement ratio of 0.65 and 20mm nominal size aggregate.

8. Reinforcing bars (grade 460B), and Mesh Fabric to be High Yield Bar with a minimum yield strength of 460N/mm^2 in accordance with BS 4449, BS 4483 and BS 8666 respectively.

9. Minimum lap to reinforcing bars to be 40 times bar dia.

10. Minimum lap to mesh fabric to be 350mm.

11. All concrete to be compacted using an immersion vibrator to expell trapped air and form a consistent dense material.

12. No concrete to be poured if the ambient temperature is less than 5 degrees centigrade.