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Project: W.C. FACILITY, LIBRARY CAR PARK, STORRINGTON, RH20 4PA

Project No. JRS/378. **Date** MAR 2018. **Sheet** 01

THE PROPOSALS INVOLVE THE CONSTRUCTION OF A SINGLE STOREY DETACHED BUILDING TO FORM A NEW PUBLIC W.C. FACILITY FOR THE STORRINGTON AND SULLINGTON PARISH COUNCIL. THESE CALCULATIONS AND DETAILS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTS DRAWINGS AND SPECIFICATION.

LOADING DATA:

PITCHED ROOF. (40° ROOF PITCH).

D.L.	Tiles		0.65 kN/m²
	Felt + Battens		0.10 "
	Rafters, etc		0.15 "
		Slope	0.90 kN/m²
		plan	1.20 kN/m²
	Insulation		0.10 "
	Ceiling Joists, etc		0.15 "
	Ceiling + Plaster Skim		0.15 "
			1.60 kN/m²
L.L.	$0.60\left(\frac{60-40}{30}\right)+0.25$		0.65 "
			2.25 kN/m².

EXTERNAL WALL.

D.L.	Brick	2.20 kN/m²
	Block + Insul^{n}	1.10 "
		3.30 kN/m².

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ROOF STRUCTURE.

RAFTERS. - Max^m Design Span taken as 1.90m (plan)

Load/Rafter : $(1.20+0.40)\,kN/m^2 \times 0.4 \times 1.90 = 1.22\,kN$

Max^m Mt : $1.22 \times 1.9/8 = 0.29\,kN.m$; Try C16 Timber

$\therefore$ Z Req'd $0.29\times10^6 / 5.3\times1.1\times1.25 = 40\times10^3\,mm^3$

Try 47x100(C16) - Z $78\times10^3\,mm^3$ O.K.

- I $3.9\times10^6\,mm^4$

Defn $\frac{5\times1.22\times1900^3\times10^3}{384\times8800\times3.9\times10^6} = 3.2mm < 0.003\times1900 (5.7mm)$ O.K.

$\therefore$ USE 47x100(C16) RAFTERS AT 400CRS.

CEILING JOISTS. - Max^m Design Span taken as 2.0m

Load/Joist : $(0.40+0.25)\,kN/m^2 \times 0.4 \times 2.0 = 0.52kN$

Max^m Mt : $0.52\times2.0/8 = 0.13\,kN.m$; Try C16 Timber

$\therefore$ Z Req'd $0.13\times10^6 / 5.3\times1.1 = 22.3\times10^3\,mm^3$

$\therefore$ BY INSPECTION USE 47x100(C16) CEILING JOISTS AT 400CRS.

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ROOF STRUCTURE - CONT'D.

PURLINS. - Max^m Design Span taken as 2.30m.

Loading : Pitched Roof (1.20 + 0.40) kN/m² x 1.3/2 = 1.52 kN/m
Ceiling (0.40 + 0.25) " x 2.0/2 = 0.65 "
2.17 kN/m

Reactions : 2.17 x 2.3/2 = 2.5 kN

Max^m M_f : 2.17 x 2.3²/8 = 1.43 kN.m ; Try C16 Timber

∴ Z Req'd 1.43 x 10⁶ / 5.3 x 1.25 = 216 x 10³ mm³

Try 47x200 (C16) - Z 313 x 10³ mm³ O.K.
- I 31.3 x 10⁶ mm⁴

Def^n 5 x 2.17 x 2.3 x 2300³ x 10³ / 384 x 5800 x 31.3 x 10⁶ = 4.35 mm < 0.003 x 2300 (6.9 mm) O.K.

∴ USE 47x200 (C16) PURLINS.

EAVES BEAM. - Max^m Design Span taken as 2.40m

Loading : Pitched Roof (1.20 + 0.40) kN/m² x 1.1/2 = 0.88 kN/m
Ceiling 0.3 kN/m² x 1.1/2 = 0.17 "
1.05 kN/m

Reactions : 1.05 x 2.4/2 = 1.26 kN

Max^m M_f : 1.05 x 2.4²/8 = 0.76 kN.m ; Try C16 Timber

∴ Z Req'd 0.76 x 10⁶ / 5.3 x 1.25 = 115 x 10³ mm³

Try 47x150 (C16) - Z 176 x 10³ mm³ O.K.
- I 13 x 10⁶ mm⁴

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EAVES BEAM - CONT^D.

Def^n $\frac{5 \times 1.05 \times 2.4 \times 2400^3 \times 10^3}{384 \times 5200 \times 13 \times 10^6} = 6.0\text{mm} < 0.003 \times 2400 (7.2\text{mm})$ O.K.

∴ USE 457 x 152 (C16) EAVES BEAM.

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FOUNDATIONS.

The British Geological Survey (BGS) map of the area in the vicinity of the Library Car Park, Storrington indicates that the expected subsoils consist silty clayey fine to Medium Sand with Sandstone at Depth (Fiskestone Formation). Therefore provisionally form trench fill foundations 0.8m the below existing ground level in the silty clayey fine to medium sand for which an allowable ground bearing pressure of 75 kN/m² will be adopted.

EXTERNAL WALLS.

Max^m Loading :

Pitched Roof	2.25 kg/m² x 2.8 /2	=	2.6 kN/m
External Load	3.30 " x 3.6 avg	=	11.9 "
S/Lst Founda^n	(24-16) kN/m³ x 0.6 x 0.6	=	2.9 "
			17.4 kN/m

∴ Actual G.B. Pressure 17.4 / 0.6 = 29 kN/m² < 75 kN/m² OK

∴ USE 600 WIDE MASS CONCRETE TRENCH FILL FOUNDATIONS.

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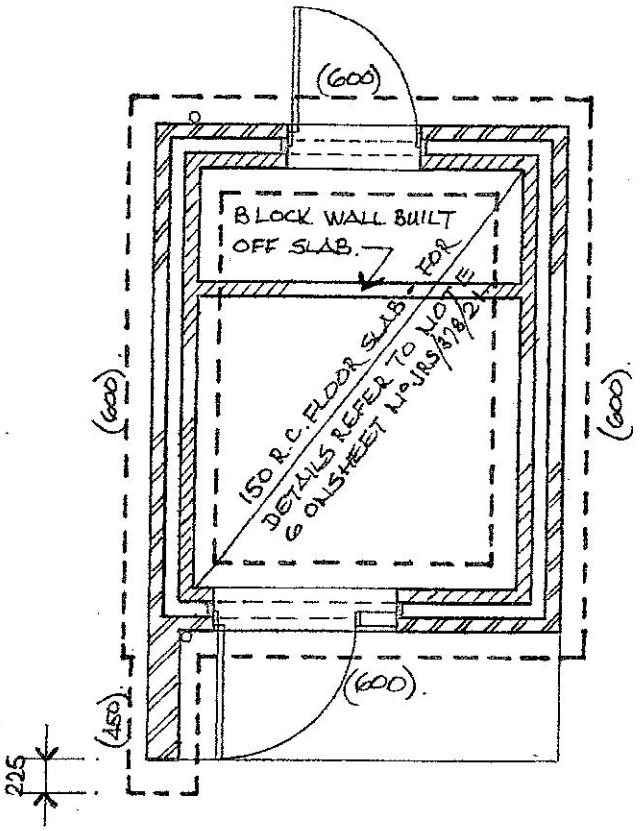

Foundation and Ground Floor Plan
To New Public W.C Facility.
(For Notes refer to sheet no JRS/378/21).

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Project No. JRS/378. **Date** MAR 2018. **Sheet** 21.

Notes.

1. These Notes are to be read in conjunction with the relevant Architects Drawings and Specification, together with sheet no JRS/378/20.
   For setting out refer to the Architects Drawings.

2. Foundations have been designed for an allowable ground bearing pressure of 75kN/sq.m at a provisional formation level (PFL) of at least 900mm below existing ground level. If the sub grade at this level is not suitable to achieve 75kN/sq.m contact the Engineer for further instructions. PFL to be at least 300mm below any root growth.

3. Foundation excavations should be cleaned and levelled prior to concreting. Excavation sides shall be kept vertical and excavations should be kept free of water by suitable means of sumps and pumps.

4. Concrete Mixes: Foundations - Mix ref GEN 3 or equivalent.
   Ground Floor Slab - Mix ref C30 or equivalent.

5. **(600)**, etc indicates minimum width of trench filled foundations. All foundations unless noted otherwise are to be centred on the wall that they support.

6. Ground Floor Slab to be 150mm thick concrete reinforced with1 layer of BS mesh ref A142 (50mm top cover) on 150mm minimum of well compacted HA Type 2 fill or equivalent, with sand blinded finish on **proof rolled formation**. Soft spots to be infilled with HA Type 2 fill or equivalent, well compacted.
   Damp proof membrane to Architects details.

7. Unless noted otherwise all blockwork below ground level is to have a minimum crushing strength of 7.3N/sq.mm, and laid in 1:1:6 mortar.

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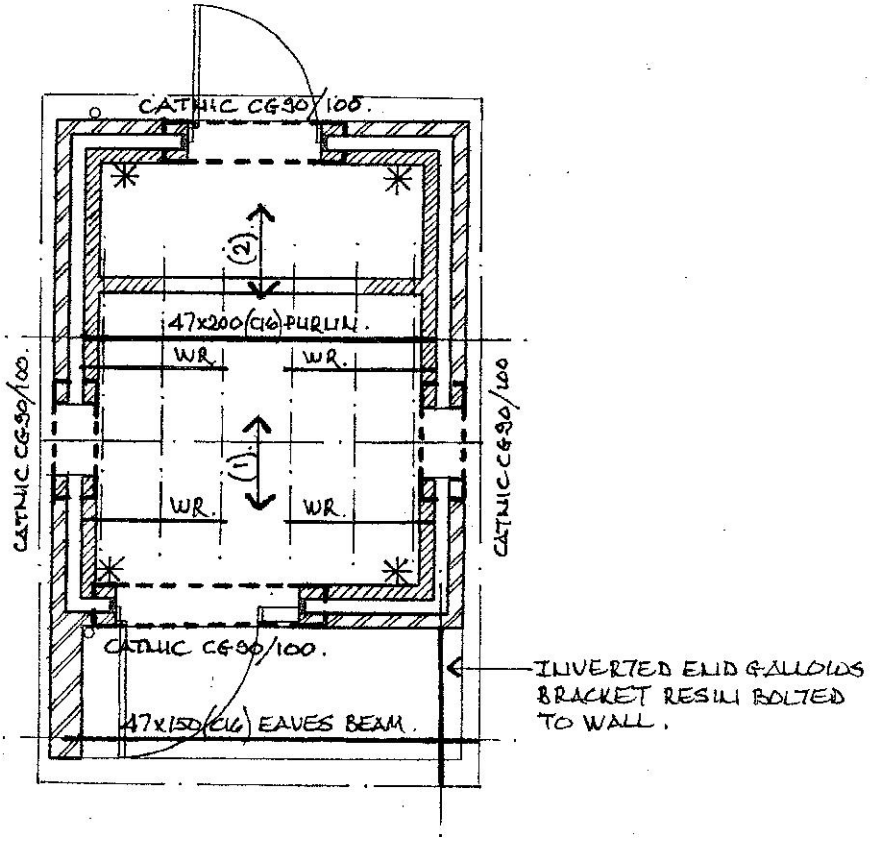

Ground Floor Plan To New Public W.C Facility Showing Roof Structure Over.

(For Notes refer to sheet no JRS/378/26).

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Project No. JRS/378. **Date** MAR 2018. **Sheet** 26.

Notes.

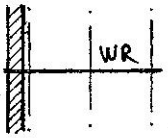
1. These Notes are to be read in conjunction with the relevant Architects Drawings and Specification, together with sheet nos JRS/378/25, 27, etc.
   For setting out of the building refer to the Architects drawings.

2. All bolting to be grade 8.8 with zinc plated finish.

3. ←(1)→ Indicates span of 47x100(C16) rafters and ceiling joists @ 400mm centres.

4. ←(2)→ Indicates span of 47x100(C16) rafters @ 400mm centres.

5. All structural timbers are to be treated with preservative.

6. 

   Indicates 30x5mm galvanized mild steel wall restraint straps fixed to block inner skin and ceiling joists at 1.8metre maximum centres, complete with solid timber noggins.

7. ✳ Indicates 30x2.5mm galvanized mild steel holding down straps fixed to wall plate and block inner skin @ 1.8 metre maximum centres.

8. External wall lintels to be taken from the range manufactured by Catnic Lintels or similar approved, 150mm minimum wall bearing unless noted otherwise.

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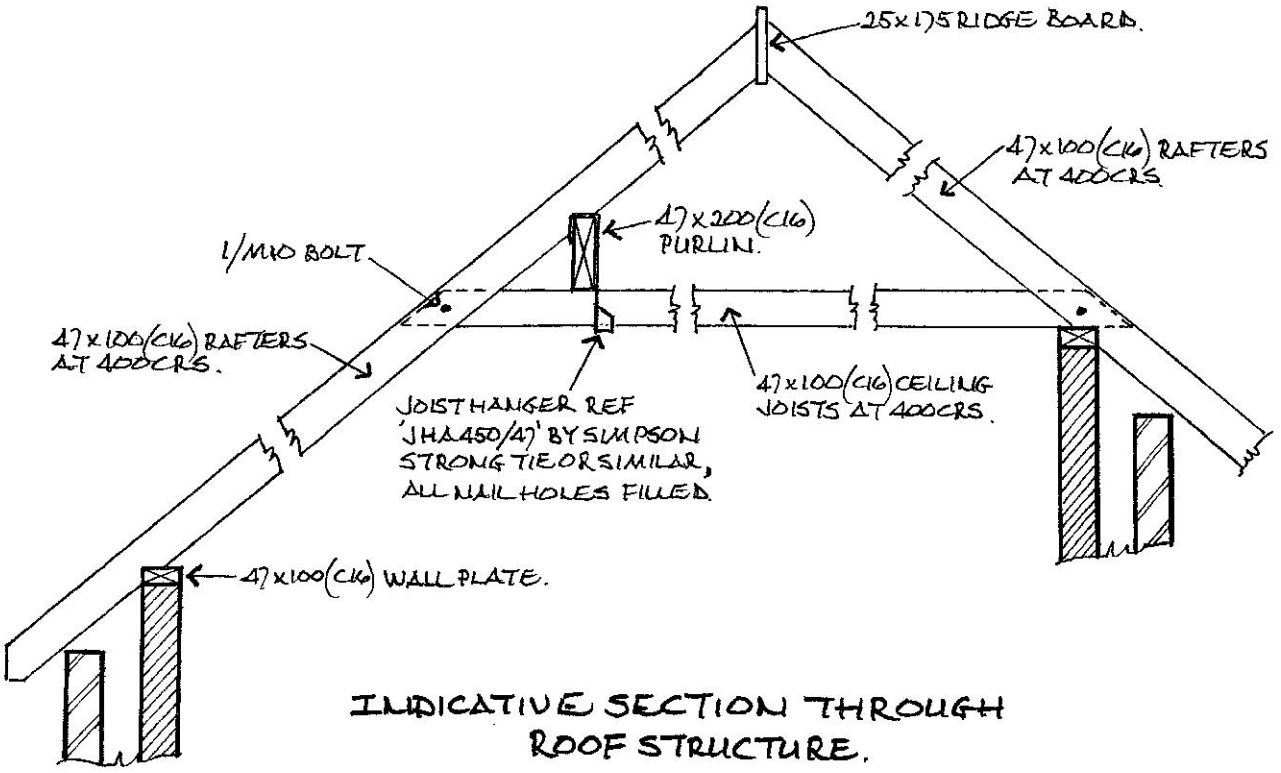
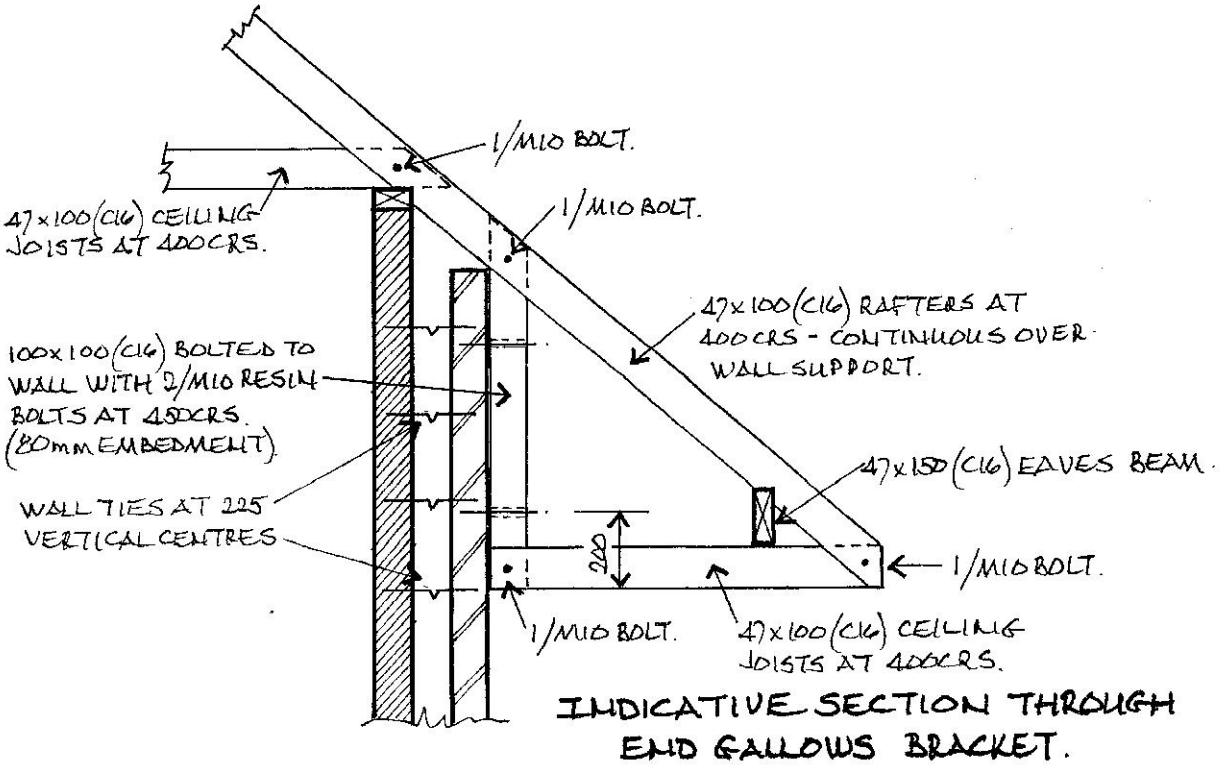


INDICATIVE SECTION THROUGH ROOF STRUCTURE.



INDICATIVE SECTION THROUGH END GALLOWS BRACKET.