

T WARD WHITFIELD & SON

CONSULTING ENGINEERS
7 THE GREEN, GREAT CHEVERELL
DEVIZES, WILTS, SN10 5XN
TEL 01380 818197 FAX 01380 818201

File No: 8032

Sheet No: 1

Date: JUL '13

Scheme:- 77 ST EDITHS MARSH, BROMHAM

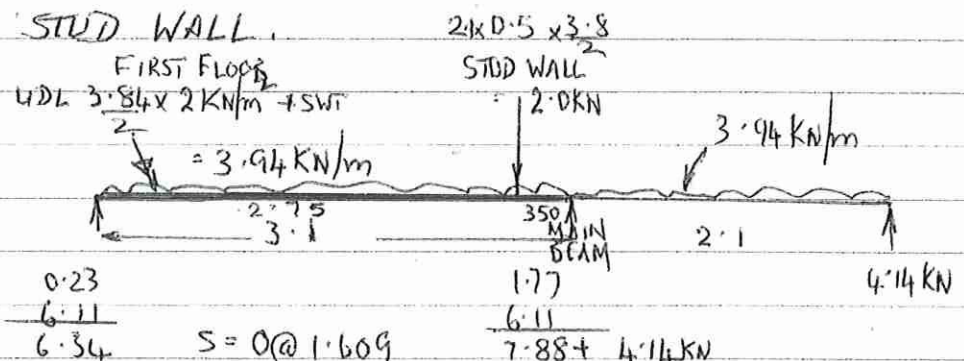
By:

CHECK EXISTING TIMBER BEAMS THAT SUPPORT
THE FIRST FLOOR ABOVE THE LOUNGE

THE MAIN BEAM SPANS FRONT TO REAR
AND ORIGINALLY HAD INTERMEDIATE SUPPORT AT
MID SPAN FROM A TIMBER POST NOW REMOVED.

FIRST CHECK THE TIMBER BEAMS AT RIGHT
ANGLES TO THE MAIN BEAM AND SUPPORTED BY IT

THE WORST CASE IS THE 3.1M SPAN BEAM
THAT IS 190mm WIDE X SAY 190mm DEEP. THE BEAM
SUPPORTS THE FIRST FLOOR JOISTS AND A POINT LOAD
FROM A STUD WALL.



190 x 190 BEAM

$Z = 1.08$

$I = 100.25$

TAKE BEAM TO BE OAK

MIN E SAY 7000

$$BM = 1.609 \times 6.34 - \frac{1.609^2 \times 3.94}{2}$$

$$= 5.1 \text{ kN-m} \Rightarrow \text{EQUIV UDL} = 4.25 \text{ kN/m}$$

$$\text{BEND/STRESS} = \frac{M}{Z} = 4.72 \text{ N/mm}^2 \checkmark$$

$$\text{DEFLECTION} = 7.28 \text{ mm} \quad 0.0234 \text{ L} \checkmark$$

EXISTING TIMBER BEAMS AT
RIGHT ANGLES TO MAIN BEAM ARE
SATISFACTORY

CHECK SHEAR IN TENON JOINT

$$\text{DESIGN } R = 7.88 \times 1.5 = 11.82 \text{ kN}$$

SHEAR STRESS

$$= \frac{11.82 \times 1000}{190 \times 75} = 0.829 \text{ N/mm}^2$$

PERMISSIBLE $2.0 \text{ N/mm}^2 \checkmark$

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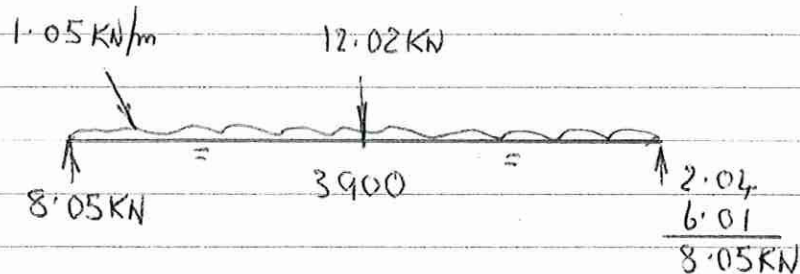
By:

NOW CONSIDER MAIN BEAM 110mm WIDE x 190mm DEEP SPAN 3.9M

MAX POINT LOAD AT MID SPAN
 $= 7.88 + 4.14 = 12.02 \text{ KN}$

UDL FROM FIRST FLOOR

ALLOW $2 \text{ KN/m}^2 \times 0.4 + \text{SWT}$ SAY 1.05 KN/m



$$Z = 0.661$$

$$I =$$

$$BM = WL/4 + WL^2/8$$

$$= 13.72 \text{ KN-m} \quad \text{EQUIV. UDL} = 7.216 \text{ KN/m}$$

$$\text{DESIGN BM} = 20.58 \text{ KN-m}$$

BY INSPECTION THE BENDING STRESS IS
FAIR TOO HIGH. THE MAIN BEAM NEEDS TO
BE STRENGTHENED

TRY USING A PARALLEL FLANGED CHANNEL

150 mm x 90 mm x 24 kg PFC.

$$EFF/L \text{ MAX } 5.82$$

$$I = 1160$$

$$M_b = 29 \text{ KN-m} > 20.58 \checkmark$$

$$\text{DEFLECTION} = 9.14 \text{ mm} \quad L/426 \checkmark$$

$$R = 8.05 \text{ KN} \quad \text{DESIGN} = 12.1 \text{ KN}$$

USE 100 mm x 300 mm x 150 mm DEEP

CONCRETE PADSTONES.

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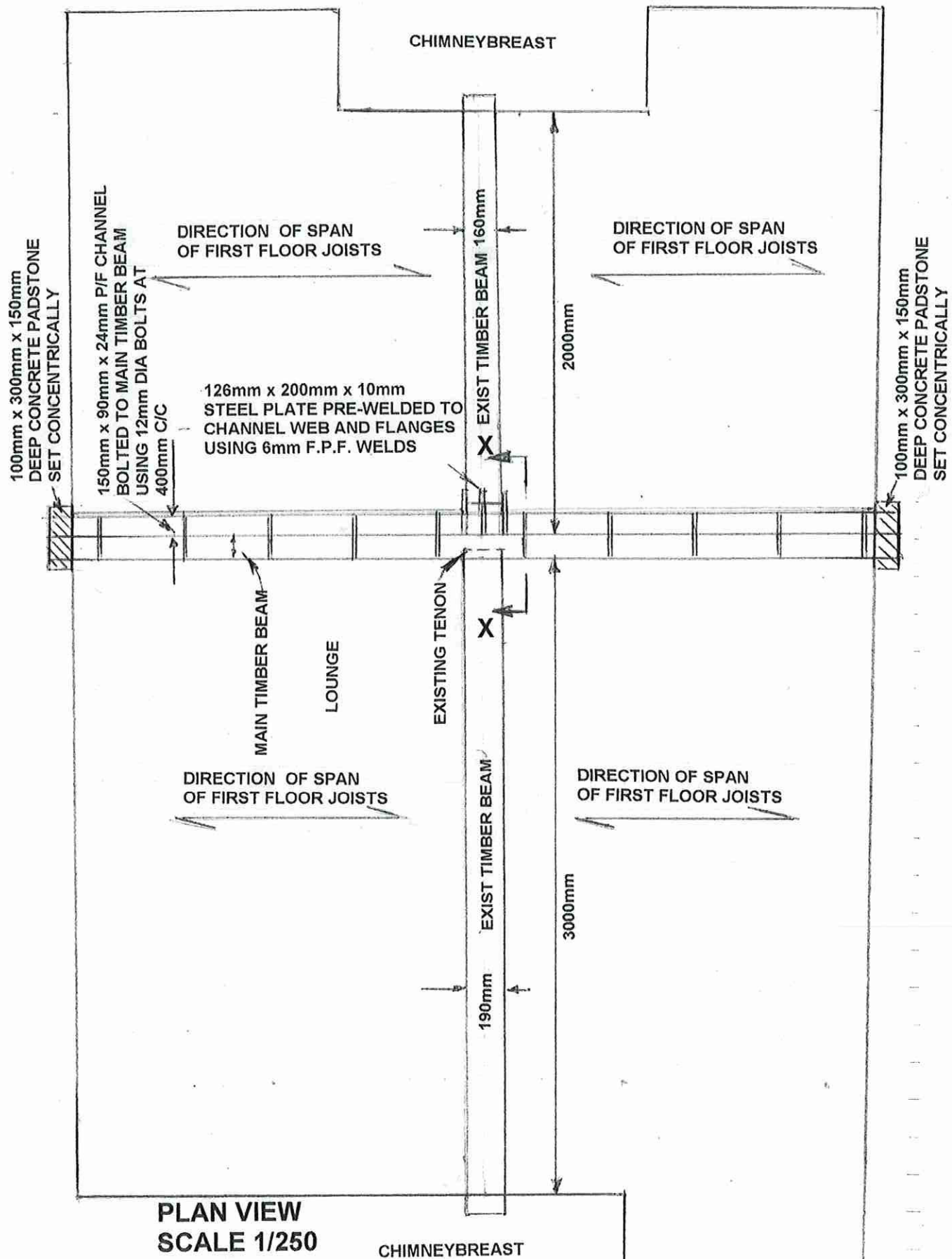
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Sheet No: SK01

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Scheme:- 77 ST EDITHS MARSH, BROMHAM

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Sheet No: **SK02**

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Scheme:- **77 ST EDITHS MARSH, BROMHAM**

By: [REDACTED]

