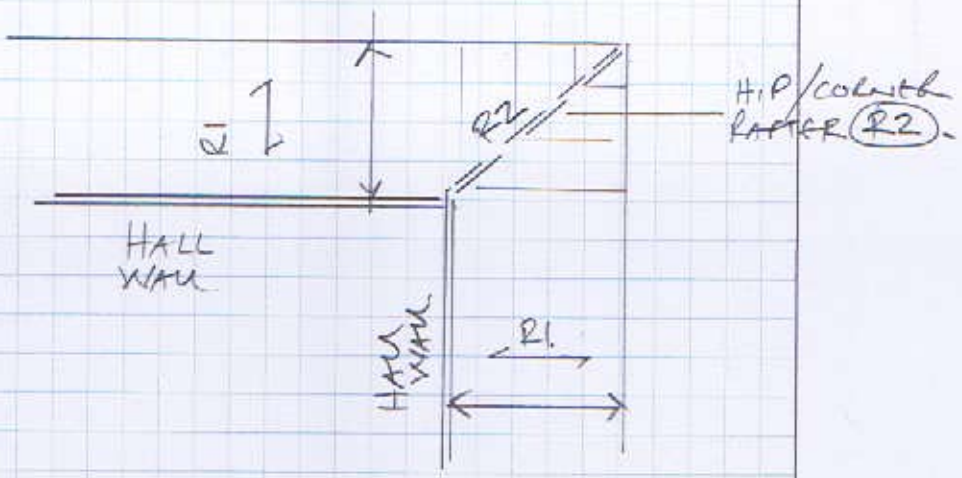
CONCEPT STRUCTURAL DESIGN LTD	Project	SHANLANDS PRIMARY		Job Ref
	Section	LEAN TO ROOF - REMEDIAL		24-CS-118.
	Calc By	Date	Checked	Date	Sht No.

Ref		Output

CORNER SUPPORT - FLAT ROOF.



(R1 = 100x50 GR C16 RAFTERS @ 400 c/c).

R2 SPAN = 2.26m.

∴ PROVIDE.

2NO. 125 x 50 GR C16 SECTIONS BOLTED TOGETHER

(R2)

	Project: Shawlands Primary School, Barnsley				Job Ref 24-CS-118	
CONCEPT	Section: Glass Roof Remedials				Sht Ref	
	Calc by	Date	Checked	Date	App	Date
	IT	Feb-25	IT	Feb-25		

Design of Flat Roof Corner Rafters - R2

Roof loads : Dead = 0.9 kN/m²
Imposed = 0.75 kN/m²

Member Span 2.3 m — Roof Span 1 1.6 m
x =(0.5774 x L) 1.328 m — Roof Span 2 1.6 m

W (Total) = **3.04** kN
Moment App = **0.90** kN.m

Member size — Width, b 100 mm — (2No. 50mm Sections)
Depth, d 125 mm

Section Modulus , Z = 260.416667 cm³

Applied bending stress = 3.44 N/mm² (M/Z)

Permissible Bending Stress BS 5268 Tables 8 - 15

Timber grade **C16**
Bending stress 5.4 N/mm²

Modification factors

K3 =	1.00	Load duration cl 2.8	(1-long, 1.25-med, 1.5-short)
K7 =	1.1011	Depth mod factor 2.10.6	
K8 =	1.00	Load Sharing cl 2.9	(4 or more @ 610 max c/c)

Modified Permissible Bending Stress = 5.95 N/mm²
Bending Stress OK

Deflection

E = 8800
I = 16276041.67 mm^4
W = **1.38** kN (From Above)

Imposed Load Deflection = 1.53 mm

Allowable = 6.9 mm **Deflection OK**

Provide Min Sections - Corner - R2

2No. 125 x 50 Grade C16 Rafters

	Project	SHAWLANDS PRIMARY.			Job Ref
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WALL PT.

ADOPT 125x 50 SECTION BOLTED TO EXISTING WALL

CHECK FIXING SPACING.

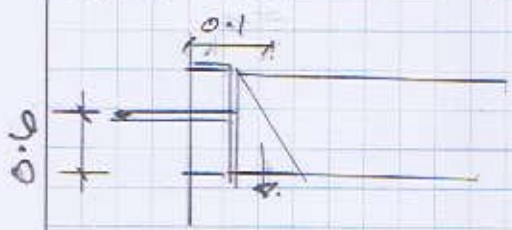
Roof LOAD = $(0.9\times1.4)+(0.75\times1.6)\times\frac{1\frac{1}{6}}{2}$ = 1.97kN/M

SAY 2kN/M.

∴ FOR FIXINGS IN WALL PT AT 400 c/c

∴ 2.5 FIXINGS ⇒ 2 FIXINGS/M.

EACH WOULD TAKE 2/2 = 1kN (SHEAR)



∴ PULL OUT = $1/0.6$ = 1.67 kN (ULT) TENSION

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	∴ FOR M10 FIXING (135 LG) REC LOAD (UNFACTORED) SHEAR & TENSION = 2.9kN ∴ REC LOAD > APPLIED. USE MIN - M10 RAWLBOLT SHIELD ANCHOR FIXINGS - 135mm LG. Ø11 HOLE IN FIXTURE. Ø16 HOLE IN WALL. * RAFTERS BIRDSMOUTHED ONTO WALL PL OR SECURED ON JOIST HANGERS.	