The timber will be SC3, having the following wet exposure grade stresses obtained by multiplying the dry stresses by the relevant K_2 factor from Table 2.3:

Bending stress parallel to grain	$\sigma_{m,g,par}$	$= 4.24\ N/mm^2$
Shear stress parallel to grain	r_g	$= 0.603\ N/mm^2$
Mean modulus of elasticity	E_{mean}	$= 7040\ N/mm^2$

The following modification factors will apply:

Wet exposure geometrical factor K_1 from Table 2.5:
For cross-sectional area: 1.04
For section modulus: 1.06
For second moment of area: 1.08

Load duration factor K_3 for 1 week (from Table 2.11) = 1.4

Load sharing factor $K_8 = 1.1$

Depth factor K_7 as applicable to size

Maximum depth to breadth ratio = 5

Design a typical support joist spanning 2.5 m at 450 mm centres.

Loading

Dead load: concrete $24 \times 0.125 = 3.0$
timber sheeting $= 0.1$
timber joists $= 0.12$
$3.22\ kN/m^2$

Imposed load: $1.5\ kN/m^2$

Combined load: dead 3.22
imposed 1.50
$4.72\ kN/m^2$

UDL per joist $= 4.72 \times 2.5 \times 0.45 = 5.31\ kN$

Bending

$$M = \frac{WL}{8} = \frac{5.31 \times 2.5}{8} = 1.66\ kN\,m = 1.66 \times 10^6\ N\,mm$$

Wet exposure grade bending stress $\sigma_{m,g,par} = 4.24\ N/mm^2$

K_1 wet exposure section modulus factor = 1.06

K_3 load duration factor (1 week) from Table 2.11 = 1.4

K_8 load sharing factor = 1.1

K_7 depth factor is unknown at this stage

Approximate Z_{xx} required

$$= \frac{M}{\sigma_{m,g,par} K_1 K_3 K_8} = \frac{1.66 \times 10^6}{4.24 \times 1.06 \times 1.4 \times 1.1} = 239\,837\ mm^3 = 240 \times 10^3\ mm^3$$

Maximum depth to breadth ratio for lateral stability is 5

Calculate the approximate I_{xx} required to satisfy bending deflection alone. The permissible deflection is the lesser of $0.003 \times \text{span} = 0.003 \times 2500 = 7.5$ mm or 3 mm, so will be 3 mm. From $\delta_m = (5/384)(WL^3/EI)$ and $\delta_p = 3$ mm,

Approximate I_{xx} required

$$= \frac{5}{384} \times \frac{5.31 \times 10^3 \times 2500^3}{7040 \times 3} = 51\,151\,622\,\text{mm}^4 = 51.2 \times 10^6\,\text{mm}^4$$

This can be divided by the wet exposure K_1 factor to give the second moment of area:

$$\text{Final } I_{xx} \text{ required} = \frac{51.2 \times 10^6}{1.08} = 47.4 \times 10^6\,\text{mm}$$

From Table 2.4, for a 63 mm × 225 mm sawn joist $Z_{xx} = 532 \times 10^3\,\text{mm}^3$ and $I_{xx} = 59.8 \times 10^6\,\text{mm}^4$.

Deflection

$$\text{Actual deflection } \delta_a = \delta_m + \delta_v = \frac{5}{384}\frac{WL^3}{EI} + \frac{19.2M}{AE}$$

The relevant wet exposure K_1 factors should be applied to the area and I values in this expression to give

$$\delta_a = \frac{5}{384}\frac{WL^3}{EIK_1} + \frac{19.2M}{K_1AE}$$

$$= \frac{5}{384} \times \frac{5.31 \times 10^3 \times 2500^3}{7040 \times 59.8 \times 10^6 \times 1.08} + \frac{19.2 \times 1.66 \times 10^6}{1.04 \times 14.2 \times 10^3 \times 7040}$$

$$= 2.38 + 0.31 = 2.69\,\text{mm} < 3\,\text{mm}$$

This section is adequate.

Shear unnotched

$$\text{Maximum shear } F_v = \frac{\text{UDL}}{2} = \frac{5.31}{2} = 2.66\,\text{kN} = 2.66 \times 10^3\,\text{N}$$

Wet exposure $r_g = 0.603\,\text{N/mm}^2$

$r_{adm} = r_g K_3 K_8 = 0.603 \times 1.4 \times 1.1 = 0.929\,\text{N/mm}^2$

For falsework the r_{adm} may be increased by a further factor of 1.5 in accordance with BS 5975:

$r_{adm} = 0.929 \times 1.5 = 1.39\,\text{N/mm}^2$

$$r_a = \frac{3}{2}\frac{F_v}{K_1A} = \frac{3}{2} \times \frac{2.66 \times 10^3}{1.04 \times 14.2 \times 10^3} = 0.27\,\text{N/mm}^3 < 1.39\,\text{N/mm}^2$$

Conclusion

Use 63 mm × 225 mm SC3 sawn joists.