



Calculation Sheet

|                                                                                                                                              |                                                             |                         |            |      |                                  |          |
|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|-------------------------|------------|------|----------------------------------|----------|
| <b>Capital Programmes &amp; Procurement</b><br>Corporate Core<br>Manchester City Council<br>PO Box 532<br>Town Hall<br>Manchester<br>M60 2LA | Project Title<br><b>LIFESTYLE LEISURE CENTRE MANCHESTER</b> |                         |            |      | Project No.<br><b>AMP00787-1</b> |          |
|                                                                                                                                              | Calculation Title<br><b>CLADDING + CLEADER, RAILS</b>       |                         |            |      | Calculation No.<br><b>P1</b>     |          |
|                                                                                                                                              | Calculation By<br><b>J</b>                                  | Date<br><b>JAN 2021</b> | Checked By | Date | Sheet No.<br><b>1 of 2</b>       | Revision |

  

| Reference                                                          | Calculation                                                                                                                                                                                                                                                                                                                                                       | Output                                                                                                  |
|--------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
|                                                                    | <u>Design. of Cladding Rails</u> - METZEC. COLD ROLLED SECTIONS<br>- span between steel columns @ 3.7 - 4M. CRS as single span<br>- see kingspan cat. P68-69<br><u>LOADING</u> :-                                                                                                                                                                                 | SLS UDL ↓<br>$\text{KN/m}^2$<br>DL WL                                                                   |
| cwl →                                                              | utilising Kingspan Architectural Wall Panel - Type KS-600<br>- 45 or 60mm thk. weight: $11.9 \text{ kg/m}^2$<br>$= 11.9 \times 10^{-3} \times 9.81$                                                                                                                                                                                                               | - 1000 OPTIMO<br>0.18.                                                                                  |
| cw2.<br>SPAN < 4.5M.                                               | - Double span, siderails (vertical cladding)<br>Table 3.6 - Try 800mm vert CRS - 1M CRS<br><u>Pressure</u> = $0.8 \text{ kN/m}^2 \times \gamma_f 1.6 \times C_{pe} 1.3 =$<br>$\text{wind SLS} \times \Delta m(1g) \times 1M(h)$<br><u>Suction</u> = $0.8 \text{ kN/m}^2 \times \gamma_f 1.6 \times C_{pe} -1.0$<br>$\times \Delta m(1g) \times 1M(h) \text{ max}$ | $\rightarrow$<br>$\text{KN}$<br>$+ 6.6 \text{ kN}$<br>$\leftarrow$<br>$\text{KN}$<br>$- 5.2 \text{ kN}$ |
|                                                                    | - FROM TABLE 3.6 MULTIBEAM CATALOGUE<br>ADOPT. MID5065/20 RAILS @ 1M. VERT SPAN MAX                                                                                                                                                                                                                                                                               |                                                                                                         |
|                                                                    | Check Weight of rail = $2.75 \text{ kg/m} \times 9.81 \times 10^{-3} \times 4M$<br>+ cladding                                                                                                                                                                                                                                                                     | - rail<br>$= 0.1 \text{ kN}$                                                                            |
|                                                                    | KS 600-1000 = $0.12 \text{ kN/m} \times \Delta m(1g) \times 0.8 M(h) + \text{FIXINGS}$                                                                                                                                                                                                                                                                            | $= 0.38 \text{ kN}$<br>$0.5 \text{ kN SLS}$<br>$\gamma_f 1.4$<br>$0.7 \text{ kN ULS}$                   |
| <u>NOTE:</u><br>PREFER TO METZEC CATALOGUE FOR ALL FIXING DETAILS. | MID5065/20 RAILS OK<br>ALLOWABLE UDL'S<br>= PRESSURE = $11.95 \text{ kN} > 6.6 + 0.7$<br>= SUCTION = $9.33 \text{ kN} > -5.33 + 0.7$<br>METZEC. MID5065/20 @ 1M MAX CRS                                                                                                                                                                                           | OK.<br>OK.<br>satisfies                                                                                 |