BRIDGEWATER CONSULTING ENGINEERS
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CALCULATIONS FOR:

2700 W X 1900 HIGH ALUMINIUM FRAMED TOTEM SIGN

PROJECT TITLE:

THE CLAY YARD, LONDON, NW6 2EW

PROJECT NO.:

7092 - 23

CLIENT:

ROGERS WATSON

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JOB No:: ~~7092/23~~

SHEET No: 01

CALCULATIONS: THE CLAY YARD, TOTEM

OUTPUT

2700 x 1900mm TOTEM – ALUMINIUM FRAME
THE CLAY YARD, MAYGROVE RD, LONDON, NW6 2EP

SITE POSTCODE : NW6 2EW , BS 6399:2-1997

ALTITUDE = 53m AOD , DIST TO SEA = 40km , COUNTRY SITE

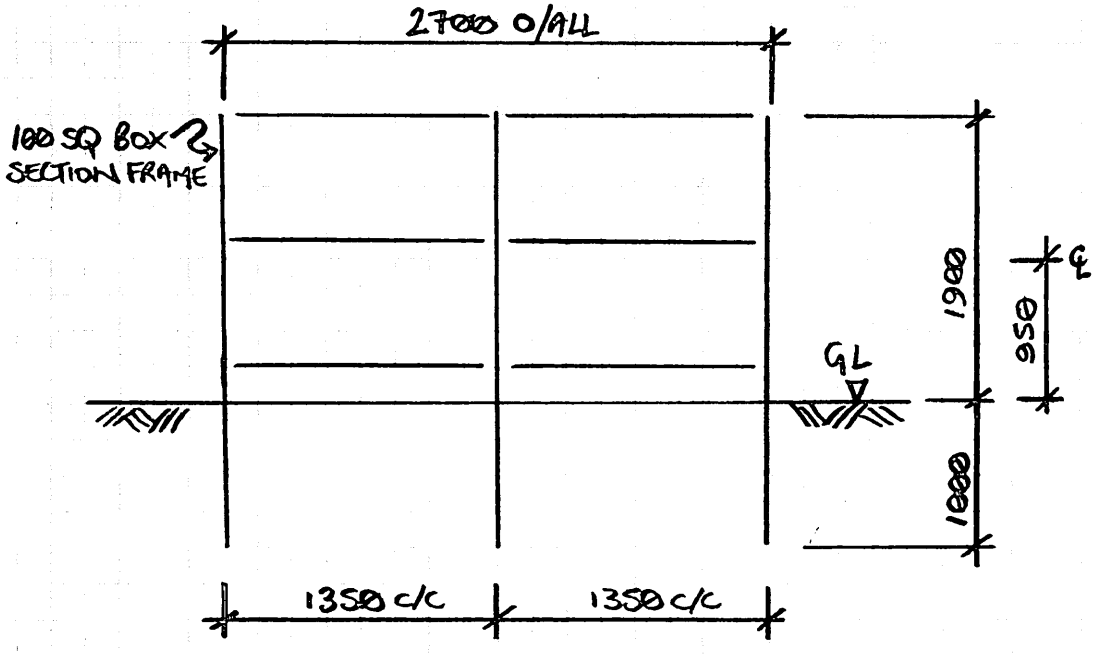
V_b = 21m/s (Fig 4) , S_a = 1.053 (Cl 2.2.2.2), S_b = 1.32 (TABLE 4), V_e = 29.19 m/s

$q_s = 0.613 \times (29.19\ m/s)^2 = 522\ N/m^2 = 0.522\ kN/m^2$

SIGN FULLY CLAD TO GROUND LEVEL ∴ C_{pe} = 3.4 (TABLE 21)

L/h = 2.7m / 1.9m = 1.42 < 3.0 ∴ REDUCTION FACTOR K = 0.6 (TABLE 21a)

WIND PRESSURE = $0.522\ kN/m^2 \times (3.4 \times 0.6) = 1.065\ kN/m^2$



PROPOSED ELEVATION
(NTS)

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JOB No:: ~~7092/23~~

SHEET No: 02

CALCULATIONS: THE CLAY YARD, TOTLEY

OUTPUT

HORIZONTAL RAILS

SPAN = 1.35m

WIND LOAD = (1.065kN/m² × 1.4) × (1.9m/2) = 1.416kN/m (ULS)

M = 1.42kN/m × (1.35m)²/8 = 0.323kNm

S_{PROV} By 100mm × 3.0 ALUMINIUM SHS = 41.2cm³, I_{PROV} = 177cm⁴

σ = 0.323kNm × 10³/41.2cm³ = 7.84N/mm² < 215N/mm² ∴ OK IN BENDING

$\delta = \frac{5 \times 1.6kN \times (1350mm)^3}{384 \times 69.5GPa \times 177cm^4 \times 10^4}$ = 0.417mm (SPAN/3240) ∴ OK IN DEFLECTION

∴ 100 × 3.0 SHS GR 6063-T6 ALUMINIUM SUITABLE FOR HORIZONTAL MEMBERS

VERTICAL POSTS

L = 1.9m

WIND LOAD (W/C) = (1.065kN/m² × 1.4) × (2.7m/2) × 1.9m = 3.824kN (ULS)

M_{MAX} = (3.824kN × 1.9m)/2 = 3.633kNm

σ = 3.633kNm × 10³/41.2cm³ = 88.2N/mm² < 215N/mm² ∴ OK IN BENDING

$\delta = \frac{2.8kN \times (1900mm)^3}{8 \times 69.5GPa \times 177cm^4 \times 10^4}$ = 19.52mm (SPAN/97) ∴ OK IN DEFLECTION

∴ 100 × 3.0 SHS GR6063-T6 ALUMINIUM SUITABLE FOR VERTICAL POSTS

FOUNDATION DIAMETER - BD 94/07

TRY 0.9m PLANTING DEPTH WITH ALLOWANCE FOR 0.1m COVER:

ASSUMING 'POOR' TO 'GOOD' GROUND CONDITIONS (TABLE 3)

q = 230kN/m²/m, TRY 400mm Ø × 900mm DEEP CONCRETE.

MDS = 2.8kN (0.95m + 0.05m + (1/√2 × 0.9m)) = 4.58kNm × 1.25 = 5.73kNm

Mg = 0.4m × (0.9m)³ × 230kN/m²/10 = 6.71kNm > MDS ∴ OK ✓

ADOPT: MIN 400mm Ø × 900mm DEEP FOUNDATIONS IN 'GOOD' TO 'AVERAGE' GROUND CONDITIONS - REFER DRAWING 7092/23/001 FOR SOIL DEFINITIONS

Aluminium Alloy 6063 - T6 Extrusions

aalco®

SUPPLIED FORMS

Alloy 6063 is supplied as standard extrusions including tee, channel, angle and flat bar as well as box section and tube

- Extrusions
- Tube
- Bar
- Rod

GENERIC PHYSICAL PROPERTIES

Property	Value
Density	2.70 g/cm³
Melting Point	655 °C
Thermal Expansion	23.5 x10^{-6} /K
Modulus of Elasticity	69.5 GPa
Thermal Conductivity	201 W/m.K
Electrical Resistivity	52 % IACS
Electrical Resistivity	0.033 x10^{-6} Ω .m

MECHANICAL PROPERTIES

To BS EN 755-2: 2008
Rod & Bar
Up To 150mm Dia. & A/F

Property	Value
Proof Stress	170 Min MPa
Tensile Strength	215 Min MPa
Elongation A50 mm	8 Min %
Hardness Brinell	75 HB
Elongation A	10 Min %

The Properties listed above are for material in the T6 condition

To BS EN 755-2: 2008
Rod & Bar
150mm to 200mm Dia. & A/F

Property	Value
Proof Stress	160 Min MPa
Tensile Strength	195 Min MPa
Hardness Brinell	75 HB
Elongation A	10 Min %

The Properties listed above are for material in the T6 condition

BS EN 755-2
Tube
Up To 25mm Wall Thickness

Property	Value
Proof Stress	170 Min MPa
Tensile Strength	215 Min MPa
Elongation A50 mm	8 Min %
Hardness Brinell	75 HB
Elongation A	10 Min %

The Properties listed above are for material in the T6 condition

BS EN 755-2:2008
Profiles
Up to 10mm Wall Thickness

Property	Value
Proof Stress	170 Min MPa
Tensile Strength	215 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	75 HB
Elongation A	8 Min %

The Properties listed above are for material in the T6 condition

BS EN 755-2:2008
Profiles
10mm to 25mm Wall Thickness

Property	Value
Proof Stress	160 Min MPa
Tensile Strength	195 Min MPa
Elongation A50 mm	6 Min %
Hardness Brinell	75 HB
Elongation A	8 Min %

The Properties listed above are for material in the T6 condition

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