Ref 0.

1 The Tideway, Littlehampton
Freestanding Dowdeswell 2.1C
4 gable 90° Apex

Sheet 1

Wind Assessment to BS6399

Data Entry:-

Site Altitude	117.000	m	Reference Height (hr)			Diagonal Dimension (a)		
Basic Wind Speed	21.000	m/s	Roof	3.000	m	Roof	0.000	m
Seasonal Factor (Ss)	1.000		Side Walls	3.000	m	Sides	0.000	m
Probability Factor(Sp)	1.000		Gables	3.000	m	Gables	0.000	m
Site ID	TQ740653							

Dynamic Pressure Results

Wind Direction (deg)		0	30	60	90	120	150	180	210	240	270	300	330
Direction Factor Sd		0.78	0.73	0.73	0.74	0.73	0.60	0.85	0.93	1.00	0.99	0.91	0.82
Topographic Location Factor s		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Altitude Factor Sa		1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117	1.117
Effective Height He (m)	Roof	1.20	1.20	1.20	1.20	1.20	1.20	3.00	1.20	1.20	3.00	3.00	3.00
	Sides	1.20	1.20	1.20	1.20	1.20	1.20	3.00	1.20	1.20	3.00	3.00	3.00
	Gable	1.20	1.20	1.20	1.20	1.20	1.20	3.00	1.20	1.20	3.00	3.00	3.00
Terrain & Building Factor Sb	Roof	1.056	1.038	1.036	1.053	1.076	1.077	1.371	1.075	1.076	1.329	1.329	1.329
	Sides	1.056	1.038	1.036	1.053	1.076	1.077	1.371	1.075	1.076	1.329	1.329	1.329
	Gable	1.056	1.038	1.036	1.053	1.076	1.077	1.371	1.075	1.076	1.329	1.329	1.329
Site Wind Speed Vs (m/s)	Roof	18.73	17.53	17.53	17.77	17.53	16.21	20.41	22.33	24.02	23.78	21.85	19.69
	Sides	18.73	17.53	17.53	17.77	17.53	16.21	20.41	22.33	24.02	23.78	21.85	19.69
	Gable	18.73	17.53	17.53	17.77	17.53	16.21	20.41	22.33	24.02	23.78	21.85	19.69
Effective Wind Speed Ve (m/s)	Roof	19.78	18.21	19.21	18.71	18.87	20.69	27.89	24.01	25.85	31.61	29.05	26.18
	Sides	19.78	18.21	19.21	18.71	18.87	20.69	27.89	24.01	25.85	31.61	29.05	26.18
	Gable	19.78	18.21	19.21	18.71	18.87	20.69	27.89	24.01	25.85	31.61	29.05	26.18
Dynamic Pressure q (kN/m²)	Roof	0.248	0.203	0.228	0.215	0.218	0.262	0.480	0.353	0.416	0.612	0.517	0.420
	Sides	0.248	0.203	0.228	0.215	0.218	0.262	0.480	0.353	0.416	0.612	0.517	0.420
	Gable	0.248	0.203	0.228	0.215	0.218	0.262	0.480	0.353	0.416	0.612	0.517	0.420
Size Effect Factor Cae	Roof	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	Sides	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	Gable	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

Consider a half brick wall with piers behind at 1.9m centres. Having clay brick units not less than 90mm thick and a mortar designation no less than that specified in Table 2a of BS 5628-1:2005.

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$Z_{req} = \frac{3328.4 \times 10^6}{113.38} = 29.34 \times 10^6 mm^3$

$Z_{beam} = \frac{3328.4 \times 10^6}{326.62} = 10.33 \times 10^6 mm^3$ ∴ take as cube case

Self wt (1.525 × 0.102 + 0.215 × 0.4) 2.2 × 1.4 = 9.02 kN

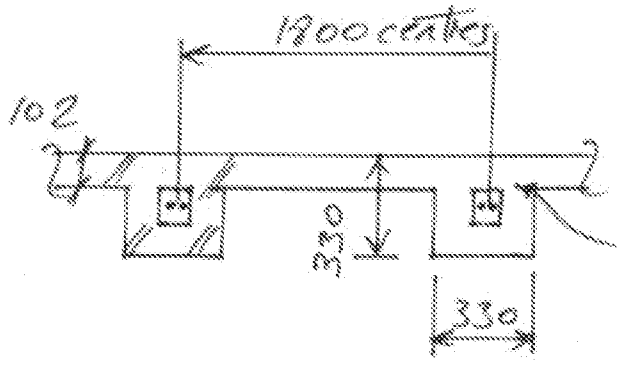
Area wall = $0.256 m^2$

$g_k = \frac{9.02 \times 10^3}{0.256 \times 10^6} = 0.035 N/mm^2$

$M_1 = \left(\frac{0.3}{3.1} + 0.035\right) 10.33 \times 10^6 / 10^6 = 1.36 kNm$

$M = 0.612 \times 1.2 \times 1.2 \times 1.8 \times 2.2^2/2 = 3.74 kNm$! too small provided not supported

(b) Try 330 × 330 piers with a 100 × 100 concrete core and reinforcement.



330 × 330 piers encasing a 100 × 100 concrete core with 2 T10 centre/bars (10mm agg. to concrete)

PLAN

From BS5628 Part 2 Clause 22.4.2.1

$M_D = \frac{A_s f_y z}{\gamma_{ms}}$ but $> \frac{0.4 f_k b d^2}{\gamma_m}$

$z = d\left(1 - \frac{0.5 A_s f_y \gamma_m}{b d f_k \gamma_{ms}}\right)$ $\gamma_m = 2.3$ (assumed)

$\gamma_{ms} = 1.15$

Try $z = 0.8d = 0.8 \times 165 = 132 mm$

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$M_D = \frac{157 \times 460 \times 132 \times 10^{-6}}{1.15} = 8.29 kNm$

Check $M_D \geq \frac{0.4 \times 5.0 \times 165^2 \times 330 \times 10^{-6}}{2.3} = 7.91 kNm$

∴ both exceed the 3.84kNm design moment

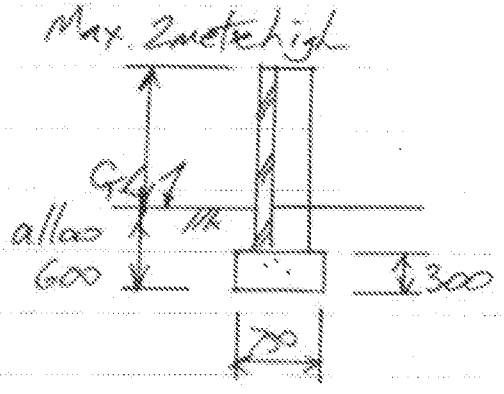
∴ Satisfactory

Ensure wall ties provided between core and masonry.
Any movement joints to be provided centrally in 102 block.
Ends of wall to terminate with a designed pier.

Check assumed lever arm $\left(1 - \frac{0.5 \times 157 \times 460 \times 2.3}{330 \times 165 \times 5.0 \times 1.15}\right) = 0.93$

Say OK

Foundation 750 × 300 thick min^m strip



$M = 0.612 \times 1.2 \times 2.0 \times 1.6 = 2.35 kNm/m$

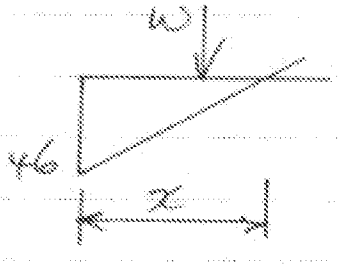
Soil wall (with 330² piers) $= \frac{9.51}{1.8} = 5.28 kN/m$

Conc. 23 × 0.75 × 0.3 = 5.18

$10.46 kN/m$

$e = \frac{2.35}{10.46} = 0.225m$ outside middle 1/3

$p = \frac{4 \times 10.46}{3 \times 1.0(0.75 - 0.45)} = 46 kN/m^2$ Check suitability of ground on site



Length of heavy $x = \frac{2 \times 10.46}{46} = 0.45m$

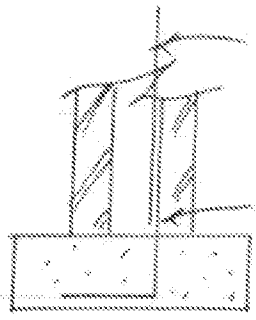
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Sheet 5

Check cantilever M at movement joint position

$M = 0.612 \times 1.2 \times 1.2 \times 0.9 \times \frac{3}{2} = 0.36 kNm < 0.5 kNm$

∴ Satisfactory

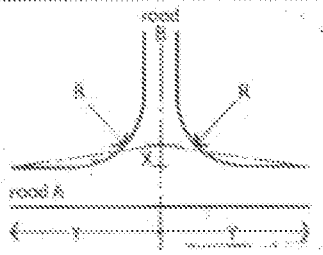


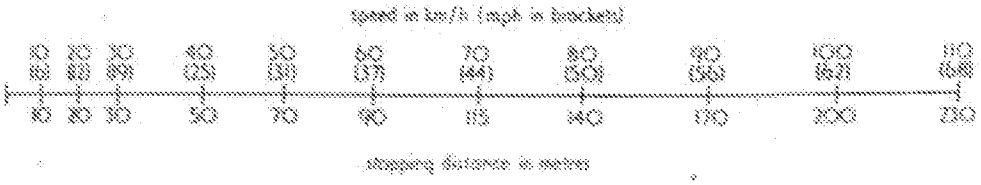
2 T10 bars in pier cap plan in cache.

800 x 450 T10 stirrup bars in pairs out of 750 x 300 concrete base on ground capable of 50 kN/m².

Table VI Recommended standards in junction design

Junction type		Radius (m)	Minimum Junction Spacing (m)		Sightlines (m)	
Road A	Road B	R	Adjacent	Opposite	X	Y
Local distributor	Any other road	10	80	40	3	60 in 30 mph zone 80 in 40 mph zone 100 in 50 mph zone
Minor access road	Major access road	6			2·4	40
Minor access road	Minor access road	6	25	8	2·4	40
Minor access road	entrance to mews or garage court	4·2	25	8	2·4	40
Right-of-way road	entrance to mews or garage court	6 & 5 Offset	25	8	Junctions must be intervisible	
Mews or garage court	entrance to mews or garage court	4·2			2·4	10

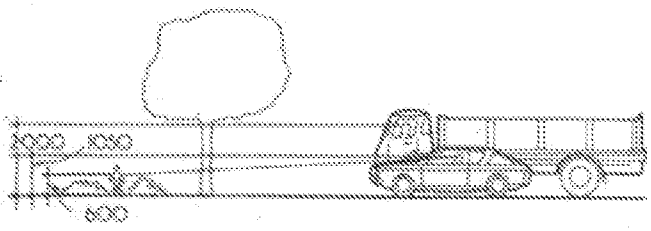




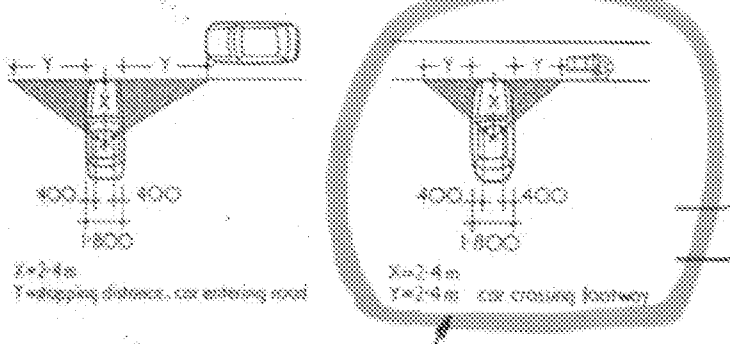
7.8 Design stopping distances

Figure 7.8 gives the design stopping distances for speeds up to 110 km/h (approx 70 mph). These distances are about 2½ times the stopping distances given in the Highway Code for vehicles with good brakes in ideal conditions. This is to allow for reduced brake performance, poor weather conditions and impaired visibility.

When emerging from a side road onto a through road, the vehicle driver must be able to see a vehicle on the through road a distance away of that vehicle's stopping distance. When crossing a footway, the driver should be able to see 2·4 m along the footway. Where small children are to be expected this visibility should be to within 600 mm high from the ground; but where there are no children (such as in industrial areas) 185 mm will be sufficient. Figures 7.9 and 7.10 indicate the areas that must be free of obstruction, and table VI gives some recommended standards in residential areas.



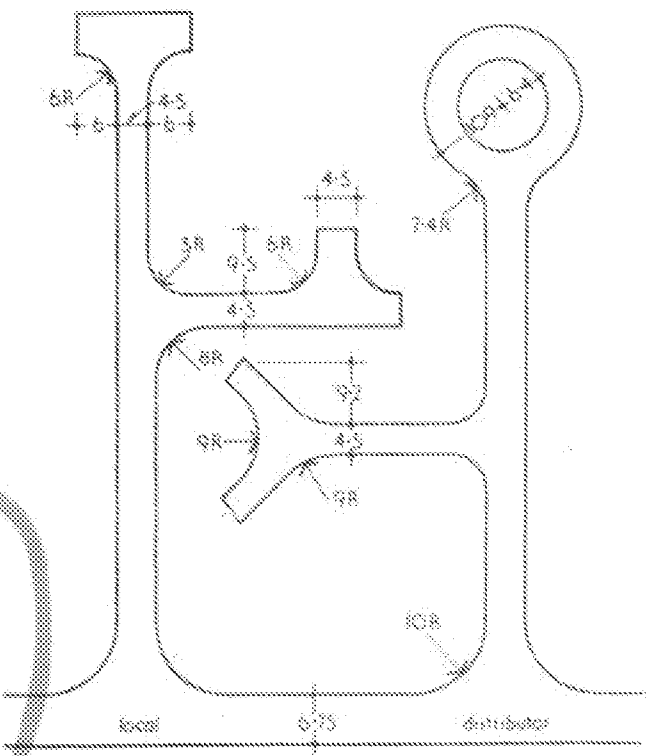
7.9 Required heights for unobstructed visibility



7.10 Required distances for unobstructed visibility

3.87 Turn-round areas

Where more conventional arrangements are used in turn-round areas in mews courts and housing squares, the minimum standards in fig 7.11 can be employed. Some local authorities, however, lay down more generous minimum standards to accommodate refuse collection and fire-fighting vehicles. In cases of doubt use the specimen vehicle track diagrams, 7.3.



7.11 Typical recommended dimensions for use in urban areas

PROPOSED VISIBILITY SPLAY
SLIGHTLY BETTER THAN THIS STANDARD

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