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STRUCTURAL ENGINEERS
www.marshdesign.co.uk

Project

CHIP SHOP HOUSE

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Calcs for

PARAPET WALL RISK ASSESSMENT

1

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CHIP SHOP HOUSE, RISK ASSESSMENT FOR PARAPET WALL

A 6024 WOODHEAD ROAD, HOLMBRIDGE

IN ACCORDANCE WITH DFT "GUIDEANCE ON DESIGN, ASSESSMENT
AND STRENGTHENING OF MASONRY PARAPETS ON HIGHWAYS"

HEIGHT MINIMUM 900mm ABOVE HIGHWAY

THICKNESS = 420mm.

VEHICLE SPEED TAKEN AS 80 km/h (50 mph)

FIGURE 2a) - "PARAPET PERFORMANCE CHART"

VEHICLE CONTAINED - LOW UNIT MORTAR BOND STRENGTH

DEBRIS EXIT VELOCITY = 5.5 m/s

NB,, THERE ARE NO KERBSTONES IN FRONT OF
THE PARAPET THEREFORE THE RISK OF OVER
TOPPING THE WALL IS REDUCED FOR WALL
LESS THAN 1000mm HIGH.

FIGURE 5 - "EXTEND OF VEHICLE SPREAD"

HEIGHT ABOVE DATUM = 8.0m

∴ SPREAD = 14.0m



$$\text{RISK} = \text{LIKELIHOOD} \times \text{CONSEQUENCE}$$

LIKELIHOOD

$$T_0 = f(\text{AADT}) * (\text{EF})$$

EF = ENVIRONMENTAL FACTORS

ROAD ALIGNMENT (HORR)	=	3
ROAD ALIGNMENT (VERT)	=	1
SPEED	=	5
VERGES / FOOTPATHS	=	3
OTHER HAZARDS	=	5
		<u>17</u>

$$\text{AADT} = 5 \quad (1501 - 5000)$$

$$T_0 = K (35 - \text{EF}) / \text{AADT SCORE}$$

$$K = 5$$

$$T_0 = 5 \times (35 - 17) / 5 = 18$$

CONSEQUENCE

$$\text{Spacing} = \left(\frac{\text{Speed}}{\text{AADT}/24} \right) = \frac{80}{5/24} = 384 \text{ m.}$$

$$N_{\text{direct}} = \left(\frac{\text{Spread}}{\text{Spacing}} \right) = \frac{14}{384} = 0.036$$

$$\text{FOR } 80 \text{ km/h} \Rightarrow \text{TOTAL SLOWING SPEED} = 40.8$$

$$N_{\text{indirect}} = \frac{40.8}{384} = 0.106$$

$$\text{Total } N = 0.036 + 0.106 = 0.142$$

NB, N_{errant} = 0 Since vehicle is contained.



FATAL ACCIDENT RATE (FAR)

$$\begin{aligned} \text{FAR} &= 100,000,000 / [(365 \times 24 \times T_6) / N_{\text{TOT}}] \\ &= 100,000,000 / [(365 \times 24 \times 18) / 0.142] \\ &= 90 \end{aligned}$$

THEREFORE THE RISK OF DEATH FROM A VEHICLE IMPACTING THE EXISTING PARAPET IS SIGNIFICANTLY LESS THAN THE RISK OF DEATH FROM TRAVELLING ON A MOTORBIKE. (FAR = 300)

WE CONSIDER THIS TO BE ACCEPTABLE.

FURTHERMORE, BY INCREASING THE HEIGHT OF THE PARAPET TO 1100mm HIGH, THIS REDUCES THE FAR TO 87.

THIS IMPROVES THE SAFETY ON THE ROAD AND IS THEREFORE ACCEPTABLE.

RISK ASSESSMENT FOR 1100mm HIGH PARAPET:

FIGURE 2a): Debris Exit Speed = 4.5m/s

FIGURE 5): Spread = 12m

$$T_0 = 18$$

$$Spac = 384$$

$$N_{\text{direct}} = 12 / 384 = 0.031$$

$$N_{\text{indirect}} = 0.106$$

$$\therefore N_{\text{TOTAL}} = 0.106 + 0.031 = 0.137$$

$$\therefore \text{FAR} = 100 \times 10^6 / (365 \times 24 \times 18 / 0.137) = 87$$