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Contract

15, WADHAM G.D.N.S.

Part of structure

BASEMENT.

Drg. ref.

Calc. by

[Signature]

Job ref.

Calc. sheet no.

01.

Date

APRIL 97.

Calculations

Output

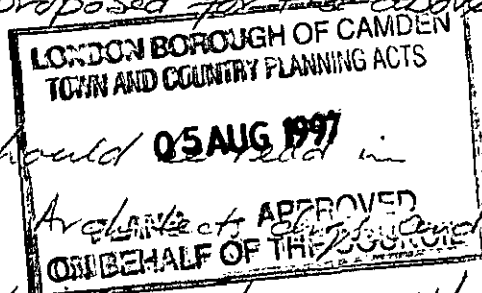
PREAMBLE.

The following calculations are of the proposed new build reinforced concrete basement structure proposed for the above property.

The calculations should be read in conjunction with the Architects drawings and have been carried out in accordance with BS 8110, BS 8004 and other relevant Codes of Practice.

Concrete has been taken as OPC grade C35 and the reinforcement high tensile, high bond deformed bars.

PE9700364



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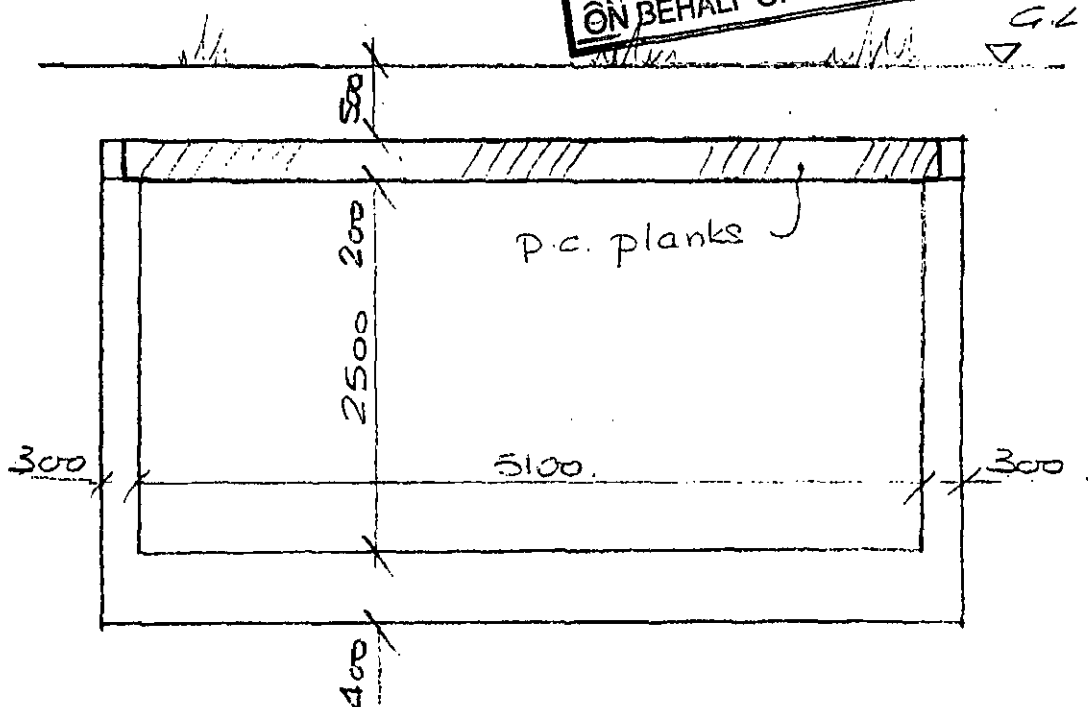
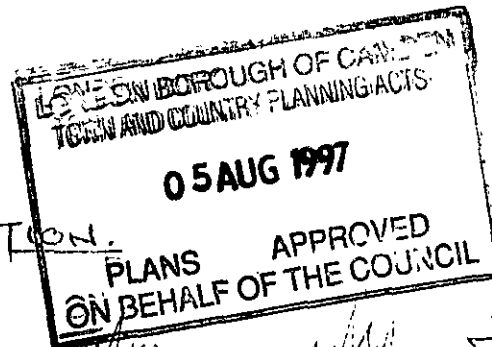
April 1997

Calculations

Output

DESIGN DATA

TYPICAL CROSS-SECTION.



Soil Density = 16.0 kN/m^3 PE9700364

Angle of Friction = 30°

K_a = 0.33

Conc strength = 35 N/mm^2 for

Cover = 40mm all faces.

Steel grade = 460 N/mm^2

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Base ment

Calc. sheet no. 3.

Drg. ref.

Calc. by

B.W.D.

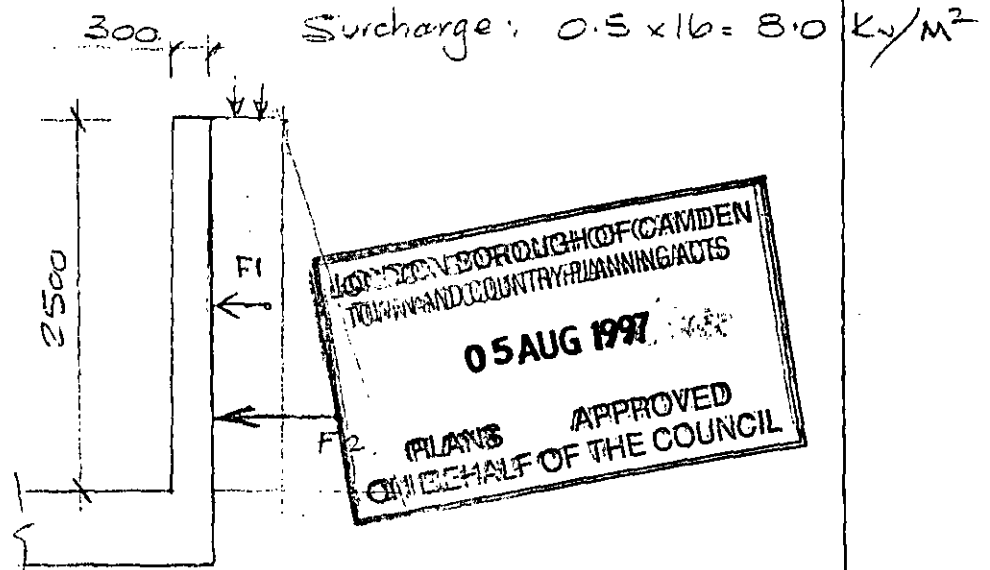
Date

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Calculations

Output

Design of wall:- (Consider 1.0m length).
in Temp. state.



$$F_1 = 8.0 \times 0.33 \times 2.5 = 6.60$$

$$F_2 = 16.0 \times 0.33 \times \frac{2.5^2}{2} = 16.50$$

$$\text{Bending } M_t = \left(1.6 \times 6.6 \times \frac{2.5}{2}\right) + \left(1.4 \times 16.5 \times \frac{2.5}{3}\right)$$

$$= 13.2 + 19.25 = 32.45 \text{ kN.m}$$

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15 Wadhwa 9dms.

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4.

Drg. ref.

Calc. by

[Signature]

Date

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Calculations

Output

$$k = 0.2 \quad ; \quad Z = 0.95$$

$$A_s = \frac{32.45 \times 10^6}{187 \times 460 \times 0.95 \times 250} = 341 \text{ mm}^2 / \text{m width}$$

$$\text{Min } A_s = 0.13 \times 10^3 \times 300 \times 10^{-2} = 390 \text{ mm}^2 \text{ e.w.}$$

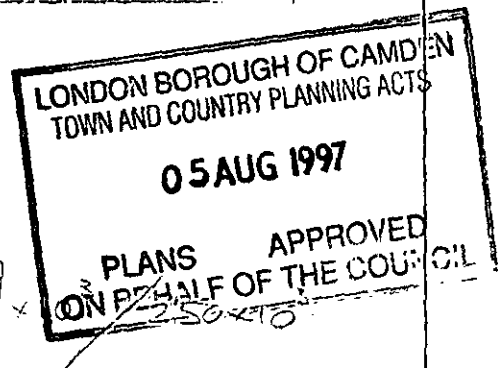
Provide — 12mm Φ @ 275% e.w. — e.f.

Shear:-

$$v = \left[(6.6 \times 1.6) + (16.6 \times 1.4) \right] \times \frac{1}{250 \times 10}$$

$$= 0.13$$

$$100 A_s / b d = 0.156 \quad \text{— Shear reinforcement not requ.}$$



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Deflection.

Consider wall as a cantilevered beam.

$$\text{So } \text{Span} / d = 2500 / 300 = 8.3, > 7.0$$

$$\text{Length } k = 390 \quad f_s = 260$$

$$\text{Mod. factor} = 1.6, \text{ So Allowable } s/d = 7 \times 1.6$$

$$= 11.2$$

OK

Design of Base. (1.0M length).

Consider total load.

$$\text{Soil Backfill} = 16 \times 0.5 \times 5.7 = 45.60$$

$$\text{P.C. Roof} = 3.0 \times 5.7 = 17.10$$

$$\text{Walls} = 24 \times 0.3 \times 2.5 = 18.00$$

$$\text{Base} = 24 \times 0.4 \times 5.7 = 54.72$$

$$\underline{135.42 \text{ Kv.}}$$

$$\text{Line Load on Base} = 2.5 \text{ Kv/m}^2$$

Bearing Pressure under Base =

$$(2.5 \times 1.6) + (135.42 \times 1.4 / 5.7) = \underline{57.30 \text{ Kv/m}^2}$$

$$\text{Approx Midspan M} = \frac{57.3 \times 5.7^2}{10} = \underline{121.2 \text{ Kv.m}}$$

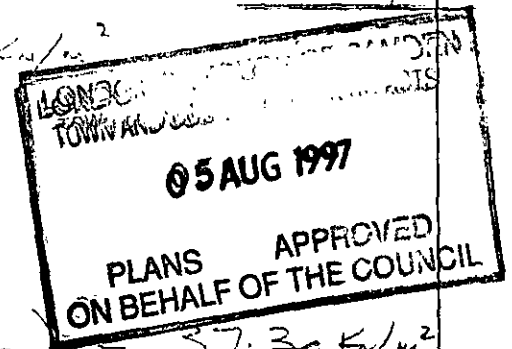
$$A_s = \frac{121.2 \times 10^6}{0.87 \times 460 \times 0.95 \times 350} = 910 \text{ mm}^2$$

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Provide 16 Φ @ 200/c

$$\text{Min steel Ar} = 0.2 \times 460 \times 10^3 \times 10^{-2} = 300$$

Provide 16 Φ @ 300/c each way, Bot.

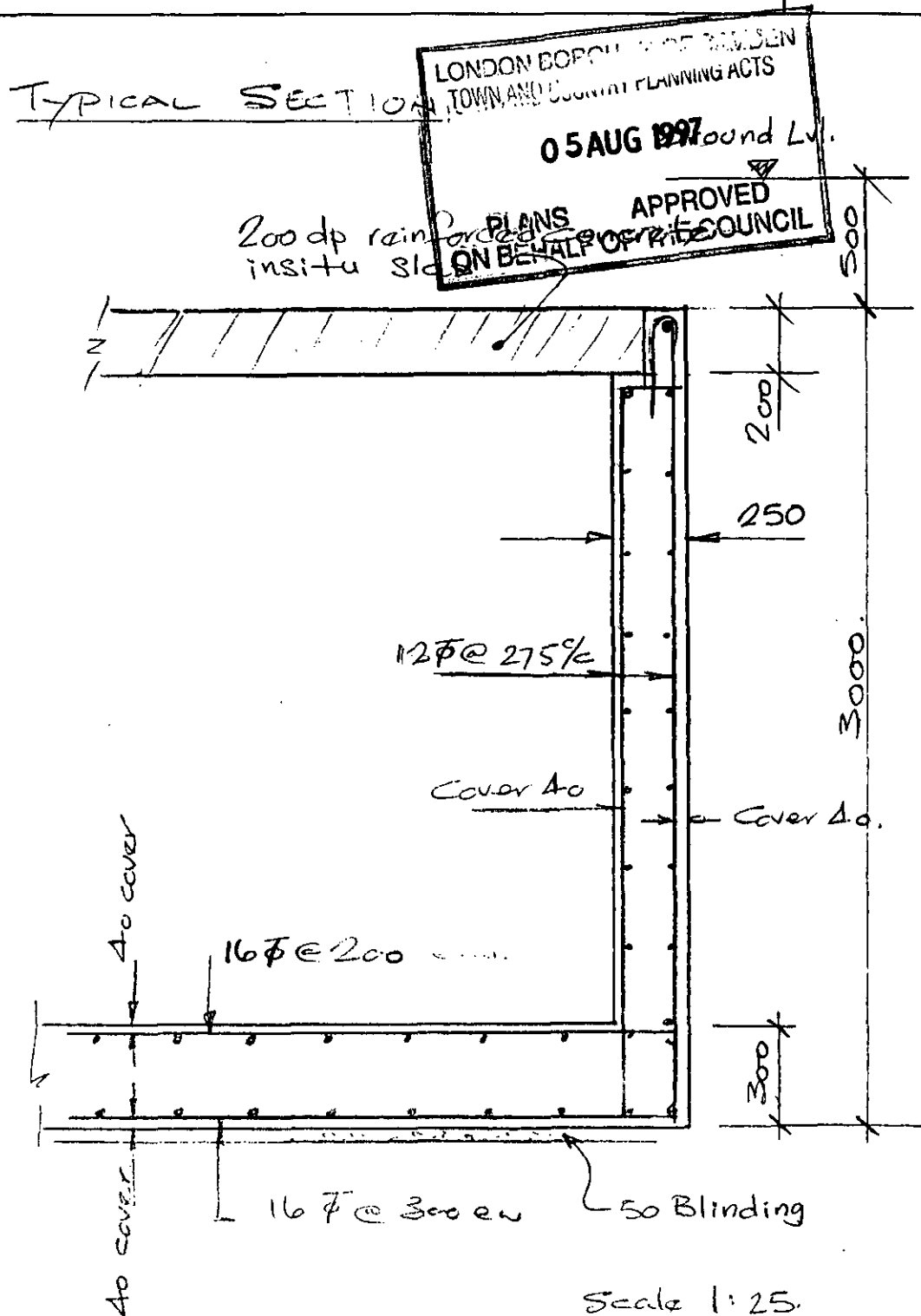


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