

PROJECT **1 GOLD LINKS AVENUE**

SUMMARY

DESCRIPTION

Unit Loading

PAVEMENT RC RETAINING WALL

RC wall ***150 mm Thick RC***

Reinforcement ***H10 - 200***

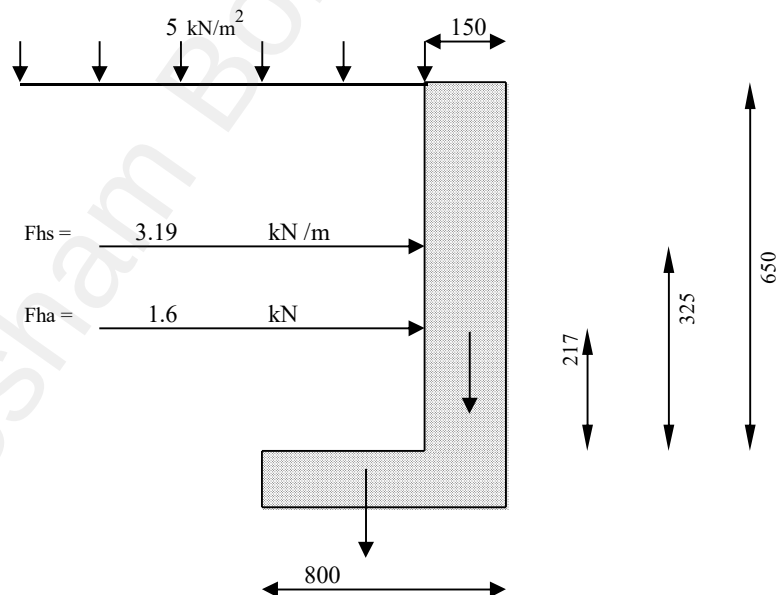
Gravesham Borough Council

PROJECT

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PAVEMENT RC RETAINING WALL

$f_y =$		460 N/mm ²	
$f_{cu} =$		35 N/mm ²	
$H(\text{effective}) =$		0.65 m	
Assume wall thickness, $D_w =$		150 mm	
Assume Base thickness, $D_b =$		150 mm	
Angle of internal friction, $\phi =$		20 °	
Dry density of soil, $\gamma_d =$		1600 Kg/m ³ =	15.7 kN/m ³
Coefficient of resistance, $\mu =$		0.45	
Angle of internal friction between soil and wall face. $\delta =$		0.00 (worst conditions of soil fully saturated)	
$K_a =$	$(1.0 - \sin 20) / (1.0 + \sin 20) =$	0.49	
Active H. Force, $F_{ah} =$	$K_a * \gamma_d * H^2 / 2 =$	$0.49 * 15.7 * 0.65^2 / 2 =$	1.63 kN ---- A
Over Turning Moment, $M1 =$	$P_{ah} * H / 3.0 =$	$1.63 * 0.65 / 3.0 =$	0.35 kN/m ---- B
Super Imposed Load, $ws =$	10.00 kN/m ²		
Active Horizontal Force, $F_{hs} =$	$K_a ws H =$	$0.49 * 10.0 * 0.65 =$	3.19 kN ---- C
Over Turning Moment, $M2 =$	$F_a * H / 2 =$	$3.19 * 0.65 / 2 =$	1.04 kNm ---- D
Total Horizontal Force, Fha =	$1.63 + 3.19 =$	4.82 kN	(B + D)
Factored force. =	$4.82 * 2 =$	9.64 kN	
Total Moment =	$0.35 + 1.04 =$	1.39 kNm	
$M_u =$	$1.39 * 2$	2.78 kNm	



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SLIDE CHECK

Self wt. of RC wall =	$0.65 * 0.15 * 24 =$	2.34 kN/m	
Wt. of wall above. =		kN/m	
Roof Load =		kN/m	
Total =		42.7 kN/m	A
Self wt. of Base slab =	$0.80 * 0.15 * 24 =$	2.88 kN/m	B
			C
Total Wt. A + B + C =		45.6 kN/m	
Frictional resistance force. =	$0.45 * 0.80 * 45.62 =$	16.423 kN	
Sliding force =		9.64 < 16.42	PASS

Additionally, floor to be resisted by the existing foundation of the rear exten.

OVERTURNING CHECK

RESTRAINING MOMENT

Due to wall =	$42.74 * 7.93 =$	338.9 kNm	
Due to Base =	$2.88 * 0.40 =$	1.2 kNm	
Due to Soil behind =	$0.00 * 0.55 =$	0.0 kNm	
Total Restraining moment =	$338.93 + 1.15 + 0.00 =$	348.0 >	2.78 PASS
Overturing Moment =			

NOTE *All horizontal forces will be neutralized with opposite forces.*

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	RC WALL
Mu kNm	2.78
Wall thickness, D _w =	150
Base Thickness, D _b =	150
f _{cu} =	35
f _y =	460
b =	1000
d =	100
b _v =	1000
K = $M / (f_{cu} * b * d^2)$	0.008
l _a = $0.5 + (0.25 - K / 0.9)^{0.5} \leq 0.95$	0.95
z = l _a * d =	95
A _{st} = $M / (0.95 * f_y * z) = \text{mm}^2$	67
Tension Reinforcement	H10 - 200
A _s Provided = mm^2	392.5 < 95 Pass
A _s Ratio = $100 * A_s / (3.14 * D^2 / 4)$	4.44
d' =	Not req.
d' / d =	Not req.
A _s ' req. = $(k - 0.156) * f_{cu} * b * d^2 / \{0.95 * f_y (d - d')\} =$	
Compression Reinforcement	
A _s ' Provided. = mm^2	
A _s ' Ratio = $100 * A_s' / (B * D) =$	
A _s ' Prov. - A _s ' req. =	
A _s Prov. - A _s req. =	
Shear V _s =	9.6
v = $V_s / (b * D) = 9,640 / (1000 * 150) =$	0.06
$100 * A_s / (b_v * d) \leq 3$	0.39
$400 / d \geq 1$	4.00
vc = $0.79 \{100 * A_s / (b_v * d)\}^{1/3} * (400/d)^{1/4} / \gamma_m$	0.82 > 0.06 PASS

Tablr 3.8

Provide;

RC wall 150 mm Thick RC

Reinforcement H10 - 200