

HUGHES

Consulting Engineering

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Structural Calculations

Project Number: 14051

Project: Residential Development,
Yew Gardens, Waterloooville.

Client: Redrow Homes

Date: October 2016

Element: Block B parapet

Ref: 14051/calcs/Block B para

Revision: -

Wind Analysis to BS6399 - Wind Loads for Parapets

DATA ENTRY:-

Short Face 1 or 3

7.500 m

Long Face 2 or 4

21.750 m

Reference Face

Face 2 (Side)

Reference Height

5.400 m

Solidity

1.000

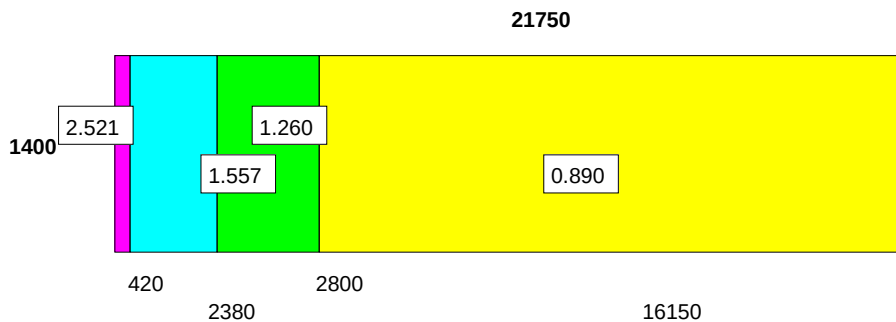
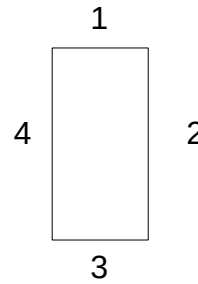
Parapet Height

1.400 m

Corner Condition

Without return corners

Reference Face



Suction/Pressure(kN/m²) On Reference Face



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MATERIAL AND DESIGN DATA

Material properties

Data item	Near leaf	Far leaf	Units
Masonry unit Properties			
Masonry unit product	Ibstock Dorset red	Hemelite solid 3.6 N/mm ²	-
Masonry unit type	Clay brick	Aggregate concrete block	-
Water absorption	> 12%	N/a	%
Unit mean compressive strength	18.0	3.6	N/mm ²
Unit minimum width as tested	102.0	100.0	mm
Unit height as tested	65.0	215.0	mm
Unit height as built	(laid normal) 65.0	(laid upright) 215.0	mm
Density of wall / leaf as built	17.1	13.9	kN/m ³
Mortar property			
Mortar selection	Designated	Designated	-
Mortar designation	M4 (iii)	M4 (iii)	-

Partial safety factors for material strength

Data item	Near leaf	Far leaf
Partial safety factors		
Reinforcement tension	1.15	1.15
Masonry flexural tension	3.00	3.00
Masonry compression	3.50	3.50
Masonry shear	2.50	2.50
Masonry ties	3.50	3.50

Calculation options

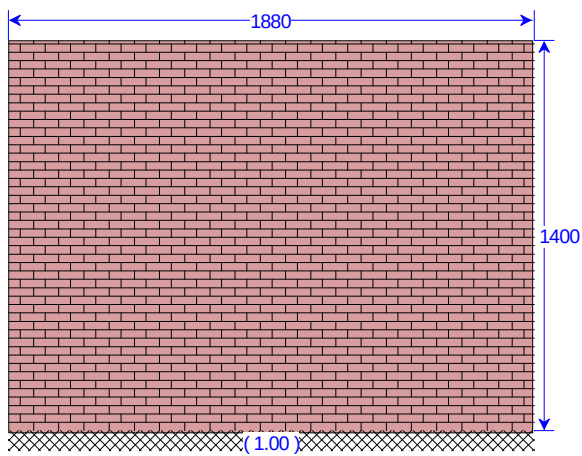
Data item	Options
Section analysis	
Vertical load capacity check	No
Include eccentricity due to slenderness	No
Section resistance moment option (Near/Far)	
Top edge	Cracked / Cracked
Mid height	Uncracked / Uncracked
Bottom edge	Uncracked / Uncracked
Opening effects	
Opening - edge influence angle	
Left / right edge (deg)	30
Top / bottom edge (deg)	30
Maximum strip width / span ratio	0.25
Maximum strip width / cantilever ratio	0.50
Dimension and deflection limits	
Design code	BS 5628-1 and 2:2005
Maximum slenderness ratio	27
Limiting dimensions check	Yes
Minimum span/deflection ratio	250
Minimum cantilever/deflection ratio	125
Maximum absolute deflection (mm)	20.00

Notes:

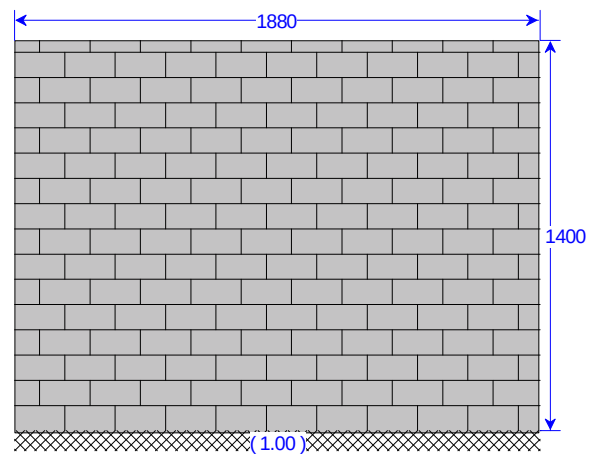


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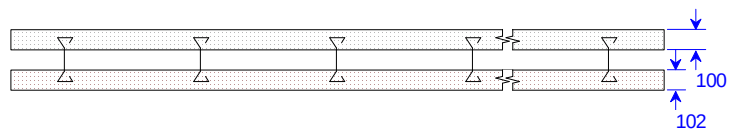
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Near leaf



Far leaf



Sectional plan

Note: Figures in brackets eg: (1.00) shown in elevation indicate user defined proportional fixity/continuity factor applied before allowing for openings.



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Data item				Near		Far		
Bed joint reinforcement				No		No		
DPC - top				No		No		
DPC - bottom				No		No		
Note: 1.For details of masonry units, bed joint reinforcement and damp proof course refer to 'Material and design data' 2.For details of wall ties (if specified) refer to 'Concise' or 'Detailed' report.								
Masonry characteristic strengths								
Description	Near	Far	Units	Description	Near	Far	Units	
Design code	BS 5628-1 and 2:2005			Shear				
Compression				Shear without compression	0.15	0.15	N/mm ²	
Narrow brick wall factor	1.15	1.00	-	Shear friction coefficient	0.60	0.60	-	
Compression on bed joints	5.43	3.50	N/mm ²	Limiting shear	1.40	1.40	N/mm ²	
Compression // bed joints	5.43	3.50	N/mm ²	Vertical shear- bonded	0.50	0.35	N/mm ²	
Flexure				Elastic modulus				
Horizontal span	0.90	0.45	N/mm ²	Short term	4.25	3.15	kN/mm ²	
Vertical span	0.30	0.25	N/mm ²	Long term	2.12	1.05	kN/mm ²	
Characteristic vertical loads				Characteristic lateral wind pressure				
Load category name	Near		Far		Category name	Pres. top kN/m ²	Pres. Bottom kN/m ²	
	Load (kN/m)	Ecc. mm	Load (kN/m)	Ecc. mm	Lateral pressure	0.900	0.900	
					Characteristic lateral line load			
					Category name	Load kN/m	Height from bottom mm	
Note: For details of more than two loads please refer detailed report								
Summary results (critical load combinations)								
Description	Wall	Status	Units	Description	Near	Far	Status	Units
Lateral load capacity	0.215	Fail	kN/m ²	Max. slenderness	27	27	Pass	
Design uniform load	1.260		kN/m ²	Actual	20.792	20.792		
Utilisation	5.860		Utilisation	0.770	0.770			
Load combination	0.90D+1.40Lp							
Limiting dimension / area								
Allowable	1616		mm					
Actual	1400		mm					
Utilisation	0.866	Pass						



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MATERIAL AND DESIGN DATA

Material properties

Data item	Near leaf	Far leaf	Units
Masonry unit Properties			
Masonry unit product	Ibstock Dorset red	Hemelite solid 3.6 N/mm ²	-
Masonry unit type	Clay brick	Aggregate concrete block	-
Water absorption	> 12%	N/a	%
Unit mean compressive strength	18.0	3.6	N/mm ²
Unit minimum width as tested	102.0	100.0	mm
Unit height as tested	65.0	215.0	mm
Unit height as built	(laid normal) 65.0	(laid upright) 215.0	mm
Density of wall / leaf as built	17.1	13.9	kN/m ³
Mortar property			
Mortar selection	Designated	Designated	-
Mortar designation	M4 (iii)	M4 (iii)	-

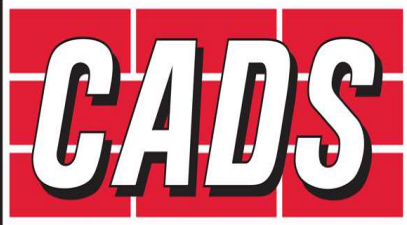
Partial safety factors for material strength

Data item	Near leaf	Far leaf
Partial safety factors		
Reinforcement tension	1.15	1.15
Masonry flexural tension	3.00	3.00
Masonry compression	3.50	3.50
Masonry shear	2.50	2.50
Masonry ties	3.50	3.50

Calculation options

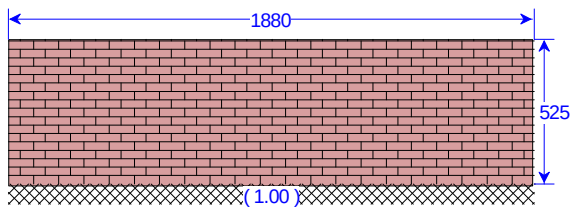
Data item	Options
Section analysis	
Vertical load capacity check	No
Include eccentricity due to slenderness	No
Section resistance moment option (Near/Far)	
Top edge	Cracked / Cracked
Mid height	Uncracked / Uncracked
Bottom edge	Uncracked / Uncracked
Opening effects	
Opening - edge influence angle	
Left / right edge (deg)	30
Top / bottom edge (deg)	30
Maximum strip width / span ratio	0.25
Maximum strip width / cantilever ratio	0.50
Dimension and deflection limits	
Design code	BS 5628-1 and 2:2005
Maximum slenderness ratio	27
Limiting dimensions check	Yes
Minimum span/deflection ratio	250
Minimum cantilever/deflection ratio	125
Maximum absolute deflection (mm)	20.00

Notes:

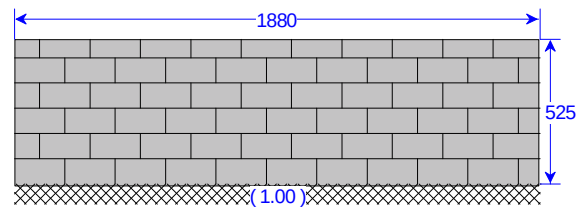


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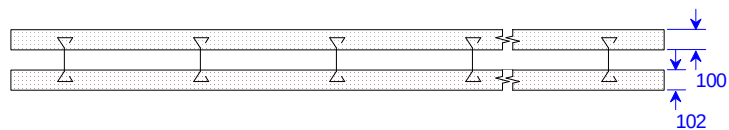
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Near leaf



Far leaf



Sectional plan

Note: Figures in brackets eg: (1.00) shown in elevation indicate user defined proportional fixity/continuity factor applied before allowing for openings.



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Data item				Near		Far		
Bed joint reinforcement				No		No		
DPC - top				No		No		
DPC - bottom				No		No		
Note: 1.For details of masonry units, bed joint reinforcement and damp proof course refer to 'Material and design data' 2.For details of wall ties (if specified) refer to 'Concise' or 'Detailed' report.								
Masonry characteristic strengths								
Description	Near	Far	Units	Description	Near	Far	Units	
Design code	BS 5628-1 and 2:2005			Shear				
Compression				Shear without compression	0.15	0.15	N/mm ²	
Narrow brick wall factor	1.15	1.00	-	Shear friction coefficient	0.60	0.60	-	
Compression on bed joints	5.43	3.50	N/mm ²	Limiting shear	1.40	1.40	N/mm ²	
Compression // bed joints	5.43	3.50	N/mm ²	Vertical shear- bonded	0.50	0.35	N/mm ²	
Flexure				Elastic modulus				
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Vertical span	0.30	0.25	N/mm ²	Long term	2.12	1.05	kN/mm ²	
Characteristic vertical loads				Characteristic lateral wind pressure				
Load category name	Near		Far		Category name	Pres. top kN/m ²	Pres. Bottom kN/m ²	
	Load (kN/m)	Ecc. mm	Load (kN/m)	Ecc. mm	Lateral pressure	0.900	0.900	
					Characteristic lateral line load			
					Category name	Load kN/m	Height from bottom mm	
Note: For details of more than two loads please refer detailed report								
Summary results (critical load combinations)								
Description	Wall	Status	Units	Description	Near	Far	Status	Units
Lateral load capacity	1.361	Pass	kN/m ²	Max. slenderness	27	27		
Design uniform load	1.260		kN/m ²	Actual	7.797	7.797		
Utilisation	0.926		Utilisation	0.289	0.289	Pass		
Load combination	0.90D+1.40Lp							
Limiting dimension / area								
Allowable	1616		mm					
Actual	525		mm					
Utilisation	0.325	Pass						