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1.0 Design Philosophy

The design of the structural elements will be carried out in such a way to limit the impact of the structural works on the existing building construction and that of the neighbouring properties.

This structural design package is carried out in accordance with the relevant British Standards.

This is solely a Permanent Works Structural Design package and does not include any Temporary Works documentation. Temporary works remains the Contractor's responsibility unless a Temporary Works Co-ordinator is appointed.

Note: Calculations are subject to building control approval. Any works carried out prior to approval of calculations by building control are at own risk.

Deflection Limits:

Beams supporting existing masonry	= span/500 Total Load
Beams supporting new structure	= span/360 Live Load
Beams supporting new structure	= span/200 Total Load

Bearing Pressures:

A site specific geotechnical investigation has not been carried out however BGS website has indicated clay soil. Foundation depths for new trench footings have been determined considering NHBC CH4.2. An allowable bearing pressure of 100 kPa will be used in the design of foundations. Local building inspector required to confirm bearing conditions on site prior to pouring new concrete foundations.

Existing Masonry

Existing masonry is to be assessed in accordance with guidance given in CIRIA Report 111 ie, for UNFACTORED LOADS

- i) Basic brick compressive strength = 0.42 N/mm2
- ii) Enhancement under bearings = 1.5
- iii) Therefore padstones to be sized on the basis of a bearing stress of

(0.42 x 1.5 =) 0.63 N/mm2

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2.0. Loadings (Service L	<u>oads SL)</u>					
Pitched Roof						
Dood Loods						

	,
Total Dead Load	1.00 kN/m ²
Services	0.15 kN/m ²
Ceiling	0.25 kN/m ²
Boards and joists	0.25 kN/m ²
Slate and felt	0.30 kN/m ²
Dead Loads	

Imposed Load Roof (maintenance)	0.75 kN/m ²
Total Imposed Loading	0.75 kN/m ²

Timber Floors

Dead Loads	
Boards and joists	0.30 kN/m ²
Ceiling	0.15 kN/m ²
Services	0.15 kN/m ²
Total Dead Load	0.50 kN/m ²
Imposed Load	1.50 kN/m²

Walls Loads (on elevation)

Stud	Partitions	0.50 kN/m ²
225	Brickwork + Plaster	5.30 kN/m ²



ROOF

<u>TJ1</u>

Joist length = 4.1m

DL= 1 x 0.4= 0.4kN/m , IL= 0.75 x 0.4= 0.3kN/m

TIMBER BEAM ANALYSIS & DESIGN (BS5268)

TIMBER BEAM ANALYSIS & DESIGN TO BS5268-2:2002

TEDDS calculation version 1.7.03



Analysis resultsDesign moment $M = 1.3$ Total load on beam $W_{tot} = 3$ Reactions at support A R_{A_max} Unfactored dead load reaction at supportUnfactored imposed load reaction at supportUnfactored dead load reaction at support R_{B_max} Unfactored dead load reaction at support R_{B_max} Unfactored dead load reaction at support R_{B_max} Unfactored imposed load reaction at support R_{B_max} Unfactored imposed load reaction at support R_{B_max} Unfactored dead load reaction at support R_{B_max} Unfactored imposed load reaction at support R_{B_max} Unfactored dead load reaction at support R_{B_max} Unfactored dead load reactions $N = 1$ Timber strength class $C24$ Member details $R_{S1} = 4$ Length of span $L_{S1} = 4$ Length of bearing $L_{b} = 10$ The beam is part of a load-sharing systemLateral support - cl.2.10.8Permiss.depth-to-breadth ratio5.00	Struc DK Aµ DK Aµ S S 542 kNm S 3.009 kN = = 1.504 kN S ort A R upport A R upport B R	tural Calc pril 25 Support B RA_Dead = 0 RA_Imposed = RB_Dead = 0 RB_Imposed =	THIL-N10 3JR culation Package Chk'd by I Design shear RA_min = 1.504 kN 889 kN 0.615 kN RB_min = 1.504 kN 0.889 kN 0.615 kN BB content for the section Breadth of beam	Dead > Impose	h = 175 mm
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Length of bearing $L_b = 10$ The beam is part of a load-sharing syst Lateral support - cl.2.10.8 Permiss.depth-to-breadth ratio 5.00	100 mm				
The beam is part of a load-sharing syst Lateral support - cl.2.10.8 Permiss.depth-to-breadth ratio 5.00	0 mm				
Lateral support - cl.2.10.8 Permiss.depth-to-breadth ratio 5.00	em consisting o	of four or	more members		
Permiss.depth-to-breadth ratio 5.00					
Check bearing stress			Actual depth-to-b	oreadth ratio	3.72
Check bearing stress				PASS - I	Lateral support is add
Check bearing stress					
Permissible bearing stress	= 2 640 N/mm ²	2	Applied bearing	stress	$\sigma_{a,a} = 0.320 \text{ N/mm}^2$
PASS - Ann	lied compress	siva stras	s is less than no	rmissible con	norossivo stross at h
Panding negalial to and	ieu compress				
Bending parallel to grain		2			
Permissible bending stress σ_{m_adm}	= 8.754 N/mm ²	۷	Applied bending	stress	σ _{m_a} = 6.428 N/mm ²
	PASS	S - Applie	d bending stress	is less than	permissible bending
Shear parallel to grain					
Permissible shear stress $\tau_{adm} = 0$	J.781 N/mm ²		Applied shear str	ress	τa = 0.274 N/mm ²
	F	PASS - A	pplied shear stre	ess is less tha	an permissible shear
Deflection					
Permissible deflection $\delta_{-+} =$	40.000		Total deflection		δ ₂ = 12 244 mm
	12.300 mm	D	ASS - Total doflo	ction is loss	than permissible dof
	12.300 mm			00001 13 1033 1	



FLITCH BEAM

Beam length = 4.2m

DL= 1 x 2/2= 1kN/m , IL= 0.75 x 2/2= 0.75kN/m

TIMBER BEAM ANALYSIS & DESIGN (BS5268)

FLITCH BEAM ANALYSIS & DESIGN TO BS5268-2:2002

TEDDS calculation version 1.7.03



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A						
Analysis results						
	M = 5.623 kNm		Design shear		F = 4.686 KN	
	$VV_{tot} = 9.372 \text{ KN}$					
Reactions at support A	RA_max = 4.686 Ki		RA_min = 4.686	KIN		
Unfactored dead load reaction a		RA_Dead -	- 4 900 KN			
Desctions at support P		TA_Imposed	- 1.000 KIN	LNI		
Reactions at support B	RB_max - 4.000 KI		TAB_min - 4.000	KIN		
Unfactored dead load reaction a		RB_Dead -	- 4 900 KN			
	on at support B	RB_Imposed	= 1.800 KIN			
			-ф-			
				\leq		
	- ф -					
◄ —104 — ►						
	← 100 →					
Timber section details						
Breadth of section	b = 47 mm		Depth of sectio	n	h = 175 mm	
Number of sections	N = 2					
Timber strength class	C24					
Steel section details						
Breadth of steel plate	b _s = 10 mm		Depth of steel	olate	h _s = 175 mm	
Number of steel plates in beam	Ns = 1		Steel stress		py = 165 N/mr	m²
Bolt diameter	φ _b = 12 mm		Maximum bolt	spacing	S _{max} = 400 mi	m
Mombor dotails						
Service class of timber	2		Load duration		Long torm	
Length of span	2		Load duration		Long term	
Length of bearing	$L_{s1} = 4000 \text{ mm}$					
Length of bearing						
Lateral support - cl.2.10.8						
Permiss.depth-to-breadth ratio	5.00		Actual depth-to	-breadth ratio	1.68	
				PASS - L	ateral suppor	t is adequate
Check bearing stress						
Permissible bearing stress	σc_adm = 2.400 N/	mm ²	Applied bearing	g stress	σc_a = 0.499 Ν	√mm²
PAS	S - Applied comp	ressive stre	ss is less than p	ermissible con	npressive stre	ss at bearing
Bending parallel to grain						
Permiss timber bending stress		/mm ²	Applied timber	handing stress	an - 3 882	N/mm ²
Fermiss, under bending stress		Timbor bong	Applied timber	s than normise	om_a - 3.002 i	nding stross
Permise steel bending stress	- 165 000 N/m		Applied stool b	onding stross		$\frac{10119}{2000}$
Permiss. steer bending stress	py - 105.000 N/II			ending stress	$\sigma_{m_a_s} - 100.2$	
	PAS	is - steer ber	iuniy siress is l	ess man permi	ssidie Sieel De	nung stress
Shear parallel to grain						
Permissible shear stress	τ _{adm} = 0.710 N/m	m²	Applied shear s	stress	τa = 0.142 N/r	nm²
		PASS - A	Applied shear st	ress is less tha	n permissible	shear stress
Deflection						
Permissible deflection	δ _{adm} = 13.995 mn	n	Total deflection	1	δa = 10.466 m	ım
		F	PASS - Total def	lection is less t	han permissil	ble deflection
		•				

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		•					
Flitch plate bolting requirem	nents						
Bolts required at beam end	N _{be} = 2.000		Bolts requir	ed to beam length	N _{bl} = 2.424		
- Provide a minimum of 2 No.	12 mm diameter	bolts at each su	upport				
- Provide 12 mm diameter bo	lts at a maximum	of 400 mm cer	ntres along the	e length of the bea	im		
Minimum bolt spacings							
Minimum end spacing	S _{end} = 48 mm		Minimum e	dge spacing	S _{edge} = 48 m	m	
Minimum bolt spacing	S _{bolt} = 48 mm						
Minimum washer diameter	φ _w = 36 mm		Minimum w	asher thickness	t _w = 3.0 mm		
B1-1/2/3							
Load will be the same however be	eam length varies						
B1-1= 2.9m	sam longar varios						
B1-2= 1.4m							
B1-3= 2.6m							
UDL=							
Roof							
DL= 1 x 5/2= 2.5kN/m , IL= 0.6x 5/	/2= 1.5kN/m						
2 nd Floor + 1 st floor							
DL= 0.8 x 5/2 x2= 4kN/m , IL= 1.52	x 5/2x2=7.5kN/m						
Wall selfweight							
DL= 5.3x 6.5= 34.5kN/m							
Total							
DL= 2.5+4+34.5=41kN/m , IL= 1.5	+7.5=9kN/m						
B1-1							
OTEEL DEAM ANALYOU							
STEEL BEAM ANALYSIS	5 & DESIGN	<u>(B22320)</u>					
STEEL BEAM ANALYSIS &	DESIGN (BS595)	n)					
		<u></u>					
In accordance with BS5950-	1:2000 incorpor	ating Corrigen	dum No.1			ation vorsion 2.0.09	
					1 EDDS calcul	auon version 3.0.08	
		Load Envelope - Co	mbination 1				
72.438							
0.0 J			2800				
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B1-3

STEEL BEAM ANALYSIS & DESIGN (BS5950)

STEEL BEAM ANALYSIS & DESIGN (BS5950)

In accordance with BS5950-1:2000 incorporating Corrigendum No.1

TEDDS calculation version 3.0.08 Load Envelope - Combination 1 72.438-0.0 2600 mm Bending Moment Envelope kNm 0.0 68.823 68.8 2600 67.0 mm Shear Force Envelope kΝ 67.4 67.365 16.0



Support conditions Vertically restrained Support A Rotationally free Support B Vertically restrained Rotationally free Applied loading Beam loads Dead self weight of beam $\times 1$ Dead partial UDL 41 kN/m from 1000 mm to 2600 mm Imposed partial UDL 9 kN/m from 1000 mm to 2600 mm Dead point load 29 kN at 1000 mm Imposed point load 6.3 kN at 1000 mm Load combinations Load combination 1 Support A

 $\begin{array}{l} \text{Dead} \times 1.40\\ \text{Imposed} \times 1.60\\ \text{Dead} \times 1.40\\ \text{Imposed} \times 1.60 \end{array}$

	Tiojeet				JOD Rel.	
		64 Muswe	ll Hill-N10 3JR		P	0607
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		Support B	;	Dead >	< 1.40	
				Impose	ed × 1.60	
Analysis results						
Maximum moment		M _{max} = 68	.8 kNm	M _{min} =	0 kNm	
Maximum shear		V _{max} = 67.	.4 kN	V _{min} =	-99.9 kN	
Deflection		δ _{max} = 3.4	mm	$\delta_{\min} = 0$) mm	
Maximum reaction at support A		$R_{A} max = 6$	57.4 kN	R _A min	= 67.4 kN	
Unfactored dead load reaction	at support Δ		38.6 kN			
Unfactored imposed load reacti	ion at support A	RA_Impaged	= 8.3 kN			
Maximum reaction at support B			9 9 kN	Br	= 99 9 kN	
I Infactored dead load reaction	at support R		57 2 kN	тъ_min		
Unfactored imposed load reaction	ion at support B		- 12 4 kN			
	ion at support b	I VB_Imposed	- 12.4 KN			
Section details						
Section type	UC 203x203x40	6 (British Stee	I Section Ran	ge 2022 (BS4-1))	Steel grade	S355
	→ →					
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Classification of cross sectio			-203.6			
Classification of cross section	→ → → → → → → → → → → → → → → → → → →		-203.6	sification	Semi-compa	ct
Classification of cross section Tensile strain coefficient	⊥ ∓ ⊷ ns - Section 3.5 ε = 0.88		-203.6	sification	Semi-compa	let
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3	⊥ ∓ ⊶ ons - Section 3.5 ε = 0.88 3		-203.6 Section class	sification	Semi-compa	ict
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force	⊥ + → → → → → → → → → → → → → → → → → → →		-203.6 Section class Design shea	sification r resistance	Semi-compa P _v = 311.6 ki	ict N
Classification of cross sectio Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force	⊥ + where the section of the sec	PA	-203.6 Section class Design shea SS - Design s	sification r resistance chear resistance e	Semi-compa P _v = 311.6 kt exceeds desig	lect N In shear force
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4.		PA	-203.6 Section class Design shea SS - Design s	sification r resistance <i>hear resistance e</i>	Semi-compa P _v = 311.6 kl exceeds desig	ict N In shear force
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4. Design bending moment	⊥ + 	PA	-203.6 Section class Design shea SS - Design s Moment cap	sification r resistance chear resistance e acity low shear	Semi-compa P _v = 311.6 kl exceeds desig M _c = 175.6 kl	nct N In shear force Nm
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4. Design bending moment	$rac{1}{r}$ $rac{1}{r}$ $rac{1}{r}$ homs - Section 3.5 $ homs - Section 3.5homs = 0.88homs - 0.$	PA	- ^{203,6} Section class Design shea SS - Design s Moment cap	sification r resistance <i>hear resistance e</i> acity low shear	Semi-compa P _v = 311.6 kl exceeds desig M _c = 175.6 kl	nct N I n shear force Nm
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4. Design bending moment Buckling resistance moment	$rac{1}{2}$ $rac{$	PA	-203.6 Section class Design shea SS - Design s Moment cap	sification r resistance thear resistance of acity low shear	Semi-compa P _v = 311.6 kt exceeds desig M _c = 175.6 kt	nct N <i>In shear force</i> Nm
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4. Design bending moment Buckling resistance moment Buckling resistance moment	+ + + + + + + + + + + + + + + + + + +	PA 4	-203.6 Section class Design shea SS - Design s Moment cap M _b / m _{LT} = 1	sification r resistance thear resistance of acity low shear 75.3 kNm	Semi-compa P _v = 311.6 kM exceeds desig M _c = 175.6 kM	nct N I <i>m shear force</i> Nm
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4. Design bending moment Buckling resistance moment Buckling resistance moment	$rac{1}{2} rac{1}{2} rac{$	PA 4 PASS - Buck	-203.6 Section class Design shea SS - Design s Moment cap M _b / m _{LT} = 17 <i>ling resistanc</i>	sification r resistance <i>hear resistance e</i> acity low shear 75.3 kNm <i>e moment exceed</i>	Semi-compa P _v = 311.6 kl exceeds desig M _c = 175.6 kl ds design ben	nct N In shear force Nm Iding moment
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4. Design bending moment Buckling resistance moment Buckling resistance moment Check vertical deflection - Sec	$rac{1}{r}$ $rac{1}{r}$ $rac{1}{r}$ $\epsilon = 0.88$ s = 0.88 $F_v = 99.9 \text{ kN}$ 2.5 M = 68.8 kNm - Section 4.3.6.4 $M_b = 158.1 \text{ kNm}$ ection 2.5.2	PA 4 PASS - Buck	-203.6 Section class Design shea SS - Design s Moment cap M _b / m _{LT} = 1 <i>ling resistanc</i>	sification r resistance thear resistance of acity low shear 75.3 kNm e moment exceed	Semi-compa P _v = 311.6 kl exceeds desig M _c = 175.6 kl ds design ben	nct N In shear force Nm ding moment
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4. Design bending moment Buckling resistance moment Buckling resistance moment Check vertical deflection - Sec Consider deflection due to dead	$rac{1}{2} rac{1}{2} rac{$	PA 1 PASS - Buck	-203.6 Section class Design shea SS - Design s Moment cap M _b / m _{LT} = 1 7 <i>ling resistanc</i>	sification r resistance thear resistance of acity low shear 75.3 kNm e moment exceed	Semi-compa P _v = 311.6 kh exceeds desig M _c = 175.6 kh ds design ben	nct N In shear force Nm Inding moment
Classification of cross section Tensile strain coefficient Shear capacity - Section 4.2.3 Design shear force Moment capacity - Section 4. Design bending moment Buckling resistance moment Buckling resistance moment Check vertical deflection - Sec Consider deflection due to deare Limiting deflection	$rac{1}{2} rac{1}{2} rac{$	PA A PASS - Buck	-203.6 Section class Design shea SS - Design s Moment cap M _b / m _{LT} = 1 <i>ling resistanc</i>	sification r resistance thear resistance of acity low shear 75.3 kNm e moment exceed	Semi-compa $P_v = 311.6 \text{ km}$ exceeds desig $M_c = 175.6 \text{ km}$ ds design ben $\delta = 3.44 \text{ mm}$	nct N <i>in shear force</i> Nm d <i>ing moment</i>

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                                                    April 25
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PADSTONE
PS1
ULS= 102kN - shared between 2 padstone so each padstone will carry 51kN
  COMPLIES WITH LATEST EUROPEAN DESIGN CODES
  structural calculations for padstones
         Beam End Reaction = 51.00 kN (factored) Variable Load Safety Factor = 1.5
  Factored Load at End of Beam
                                                          Permanent Load Safety Factor = 1.35
            Characteristic strength of masonry = 2.6 N/mm<sup>2</sup> (Brickwork usually = 4.5 N/mm<sup>2</sup>)
                                                                   (3.6N Blockwork usually = 2.6 N/mm<sup>2</sup>)
            Width of beam end bearing = 100
                                                                   (A Engineering Brick = 13.2 N/mm<sup>2</sup>)
                                                   mm
          Length of beam end bearing = 100 mm
                                                                   (BEngineering Brick = 10.5 N/mm<sup>2</sup>)
                                                                   (Weak Brickwork = approx 2.8 N/mm<sup>2</sup>)
                                                                   (7.3N Blockwork usually = 4.2 N/mm<sup>2</sup>)
                                                                   (10.4N Blockwork usually = 5.4 N/mm<sup>2</sup>)
               ym = 3.0
              Bearing Factor = 1.25
  Results
             Maximum Bearing Stress = 1.08 N/mm<sup>2</sup>
                 Actual Bearing Stress = 5.10 N/mm<sup>2</sup>
                                 Padstone Required
  Padstone Results
           Characteristic strength of Padstone = 30.0 N/mm<sup>2</sup> (A Engineering Brick = 13.2 N/mm<sup>2</sup>)
                                                                   (BEngineering Brick = 10.5 N/mm<sup>2</sup>)
          Width of Padstone =
                                   140
                                                                   (Concrete C15 = 15 N/mm<sup>2</sup>)
                                           mm
         Length of Padstone =
                                   400
                                                                   (Concrete C30 = 30 N/mm<sup>2</sup>)
                                           mm
                                                                   (Concrete C40 = 40 N/mm<sup>2</sup>)
                                                                   (Steel Plate = 275 N/mm<sup>2</sup>)
            Allowable padstone stress = 12.50 N/mm<sup>2</sup>
                                                                  Therefore Padstone Stress OK
      Stress under beam end bearing = 5.10 N/mm<sup>2</sup>
             Allowable masonry stress = 1.08 N/mm<sup>2</sup>
                Stress under padstone = 0.91 N/mm<sup>2</sup>
                                                                  Therefore Masonry Stress OK
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PS2								
68kN uls								
					-0			
COMPLIES WITH LATE	ST EUROPI		JESIGI		23			
structural calculations for p	adstones							
Beam End Reaction	= 68.00 k	N (fac	tored)	Variable	Load	Safety Factor :	= 1.5	
Factored Load at End of Be	am			Permane	ent Lo	ad Safety Fact	or = 1.35	
Characteristic str	ength of mase	onry =	4.2	N/mm² (Brick	work usually =	4.5 N/mm ²))
				((3.6N	Blockwork usu	ally = 2.6 N/	/mm²)
Width of beam end	d bearing =	100	mm	((AEng	gineering Brick	:= 13.2 N/m	m²)
Length of beam end	d bearing =	100	mm	(BEng	gineering Brick	(= 10.5 N/m	m²)
				(Weak	Blockwork = a	pprox 2.8 N/	mm ²)
					(1.3N	Blockwork us	Jally = 4.2 N/	l/mm²)
				`	10.41	Diockiron do	uuny - 0.410	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
γm = 3.0								
Bearing Factor	= 1.25							
Deculto								
Results								
Maximum Bearin	ng Stress =	175	N/mm ²					
Actual Bearin	ng Stress =	6.80	N/mm ²					
	Padston	e Re	quired					
De deterre De sulte								
Padstone Results								
Characteristic stre	noth of Padet	one -	30.0	N/mm² (A End	ineering Brick	- 13 2 N/m	m²)
Unaracteristic Stie	ingui orr aust	one -	50.0	(BEn	nineering Brick	c = 10.2 N/m	m²)
Width of Padstone	= 100 m	nm			Conc	rete C15 = 15	N/mm²)	,
Length of Padstone	= 440 m	nm		Ċ	Conc	rete C30 = 30	N/mm²)	
				(Conc	rete C40 = 40	N/mm²)	
				((Steel	Plate = 275 N	/mm²)	
Allowable padstor	ne stress = 1	12.50	N/mm ²	_	_			
Stress under beam en	d bearing =	6.80	N/mm ²		Theref	ore Padstone	Stress OK	
Allowable masor	ny stress =	1.75	N/mm*		Thorof	ore Maconey 9	trace OK	
Suess under	Pausione =	1.55	19/11111		merel	ore masolity S	uess UN	

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DC2								
<u>P53</u>								
51kN ULS								
					C			
COMPLIES WITH LATE	ST EUROP		JESIGI		.5			
structured as low lating a fear								
structural calculations for p	badstones							
Dears Fed Dearting	54.00			Verieter		0-64.5-44.	4.5	
Beam End Reaction	= 51.00 K	iv (fact	orea)	variable i	Load	Safety Factor	= 1.5	
Factored Load at End of Be	eam			Permane	ent Lo	ad Safety Fac	tor = 1.35	
Characteristic str	rength of mas	onry =	2.6	N/mm² (Brick	work usually =	= 4.5 N/mm ²)
				(3.6N	Blockwork us	ually = 2.6 N	l/mm²)
Width of beam en	d bearing =	100	mm	(AEn	gineering Bric	k = 13.2 N/m	nm²)
Length of beam en	d bearing =	100	mm	(B En	gineering Brid	k = 10.5 N/n	nm²)
_				(Weal	k Brickwork =	approx 2.8 N	l/mm²)
				i	7.3N	Blockwork us	ually = 4.2 N	l/mm²)
				Ċ	10.4	Blockwork us	sually = 5.4 l	N/mm ²)
						Distriction	, adding = 0.11	,
vm = 3.0								
1								
Bearing Factor	= 1.25							
Poculto								
Results								
New York Control of Co		4.00						
Maximum Bear	ng Stress =	1.08	N/mm-					
Actual Beari	ng Stress =	5.10	N/mm ⁻	•				
	-	-						
	Padston	e Re	quired	1				
Padstone Results								
Characteristic stre	ength of Padst	tone =	30.0	N/mm² (AEn	gineering Bric	k = 13.2 N/m	nm²)
				(BEn	gineering Brid	k = 10.5 N/n	nm²)
Width of Padstone	= 140 n	nm		è	Cond	crete C15 = 15	N/mm ²)	ann a' tha
Length of Padstone	= 400 m	nm		i	Conc	crete C30 = 30	N/mm ²)	
Longar of r duotone	100				Conc	rete C40 = 40	N/mm ²)	
					Steel	Plate = 275 N	l/mm²)	
Allowable padete	no stress -	12 50	N/mm	. (oteel	11 1010 - 2701	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Stress under been on	d bearing -	5 10	N/mm3		hore	fore Redeters	Stross OK	
Allowable mass	no bearing -	1.00	N/mm3	. 1	nerei	iore raustorie	OUCSS OK	
Allowable maso	nodeteno -	0.04	N/mm		hore	foro Macones (Strace OK	
Stress under	pausione =	0.91	N/IIIII	1	nerei	ore masonry s	JUESS OK	

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<u>PS4</u>								
100kN								
COMPLIES WITH LATE	STEUROP	EAN L	DESIG	N CODE	-5			
structural calculations for p	adstones							
Deers Fed Deerting	400.00	AL /6		Variable			4.5	
Beam End Reaction :	= 100.00 k	av (faci	torea)	variable	Load	Safety Factor	= 1.5	
Factored Load at End of Be	am			Perman	ent Lo	oad Safety Fac	tor = 1.35	
Characteristic stre	ength of mas	onry =	4.2	N/mm² ((Brick	work usually	= 4.5 N/mm	•)
				((3.6N	Blockwork us	sually = 2.6 I	V/mm²)
Width of beam end	l bearing =	100	mm	((AEn	gineering Brid	:k = 13.2 N/r	nm²)
Length of beam end	bearing =	100	mm	(BEn	gineering Brid	ck = 10.5 N/r	nm²)
-	-			(Wea	k Brickwork =	approx 2.8 M	V/mm²)
					(7.3N	Blockwork us	sually = 4.21	V/mm²)
					10.4	Blockwork u	sually = 5.4	N/mm ²)
						Dioolarona	0.1	,
vm = 3.0								
1								
Bearing Factor :	= 1.25							
Dog								
Deputto								
Results								
				_				
Maximum Bearin	ig Stress =	1.75	N/mm*					
Actual Bearin	ig Stress =	10.00	N/mm ^a					
	Padston	e Re	quired	ł				
Padstone Results								
Characteristic stre	noth of Pade	tone =	30.0	N/mm² (AEn	aineerina Bria	k = 13.2 N/r	nm²)
			00.0		BEn	gineering Brid	k = 10.5 M/	mm²)
Width of Podetene	- 100 -	nm			Con		5 N/mm²)	
Longth of Dedetars	- 600 -				Con	crete O 10 = 10	N/mm2)	
Length of Padstone :	- 000 r	IIII		(Con			
				(Con	crete $C40 = 40$	N/mm*)	
		10.55		. (Stee	i Plate = 275 l	v/mm+)	
Allowable padstor	ne stress =	12.50	N/mm ^a		-			
Stress under beam end	bearing =	10.00	N/mm ^a		There	fore Padstone	e Stress OK	
Allowable mason	ry stress =	1.75	N/mm ^a	-				
Stress under p	adstone =	1.67	N/mm ^a	- 1	There	fore Masonry	Stress OK	

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Table 7	the effect	Annes B.			
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nd 1.5 14.5 18.7 18.7 18.7 15.9 14.5 12.5 12.5 12.5					
more t 22.5 2.0 a 15.0 15.0 10.5 10.5 10.5 10.5 10.5 10.5					
(betwee betwee 17.5 12.5 11.1 9.1 9.1 9.1 9.1 9.1 9.1 9.1					
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rete blo il dime 5.6 6.4 6.4 5.6 5.6 factors sonry ur					
te conc. prizonte e streng 5.2 5.2 5.2 5.0 6.0 6.0 6.0 1.4 4.4 4.4 4.4 4.4 4.4 1.4 5.0 1.5 5.0 1.5 5.0 1.5 5.0 1.5 5.0 1.5 5.0 1.5 5.0 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.2 1.5 5.0 5.0 1.5 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5.0 5		d value d value			
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Diff Store and Environment	Section Structural Calculation Package				21		
	Calc. by	Date	Chk'd by	Date	App'd by	Date	
	DK	April 25					

B+B BEAM AND BLOCK

Worst case span is 5m for standard dormstic imposed load 1.5kN/m2 a Bison Precast/Forterra IJ3 can span 5.3m therefore ok

				SPAN	S INDICATED BEL Self	OW ALLOW FOR Weight Plus 1.	CHARACTERISTI 8Kn/m² for fini	C IMPOSED LOAD Shes	PLUS
		FFFFOTUE	CHARACTERISTIC IMPOSED LOAD KN/M ²						
BISON REF	BEAM SIZE	BEAM CENTRES	WEIGHT	1.5	2.0	2.5	3	4	5
	(mm)	(MM)	KN/M ²			Clear s	pan (m)		
U1	150 x 125	525	1.86	4.10	3.90	3.75	3.60	3.35	3.10
112	150 x 125	413	1.96	4.55	4.35	4.20	4.00	3.75	3.50
-113	150 x 125	300	2.15	5.30	5.05	4.85	4.65	4.35	4.10
RDJ4	150 x 215	615	2.10	5.35	5.10	4.90	4.75	4.40	4.15
RDJ5	150 x 215	503	2.25	5.85	5.60	5.40	5.20	4.85	4.55
RDJ6	150 x 215	390	2.47	6.45	6.25	6.05	5.80	5.45	5.15
TJ1	225 x 135	535	2.30	6.45	6.15	5.90	5.70	5.35	5.00
TJ2	225 x 135	422	2.51	7.10	6.80	6.55	6.35	5.95	5.60
TJ3	225 x 135	310	2.89	7.75	7.75	7.45	7.20	6.80	6.40
				ψ. =0.7	ψ. =0.5	ψ . =0.3	Ψ .=0.7	ψ. =0.7	ψ. =0.6

Category A/B - Domestic, residential / office areas

FLOOR CATEGORY OF USE (FROM BS EN 1991-1-1:2002), USED FOR Determining the combination of actions factors

BISON PRECAST

Category C/D -

Congregation areas /shopping



Bison Precast Hoveringham, Nottingham NG14 7JX tel: 01636 832000 email: concrete@bison.co.uk

Project				Job Ref.		
	64 Muswell	Hill-N10 3JR		P00	0607	
Section				Sheet no./rev.		
Section Structural Calculation Package			•	22		
Calc. by	Date	Chk'd by	Date	App'd by	Date	
DK	April 25					

TYPICAL FOUNDATION

Roof

DL= 1 x 2.5=2.5kN/m , IL= 0.75x 2.5= 1.9kN/m

Wall

DL= 4.4x3= 13.2kN/m

Ground floor

DL= 5 x 2.5=12.5kN/m , IL= 1.5 x 2.5= 3.75kN/m

Total

L= 2.5+1.9+13.2+12.5+3.75= 33.85=34kN/m

Point load = 50kN / 5= 10kN/m

Therefore 44kN/m

STRIP FOOTING ANALYSIS & DESIGN (BS8110)

STRIP FOOTING ANALYSIS AND DESIGN (BS8110-1:1997)



		Project				J	ob Ref.	
			64 Muswe	ll Hill-N10 3JR			P0	0607
		Section					boot no /row	
		Section					sneet no./rev.	
			Structural Ca	Iculation Packa	age			23
	a agneeng	Calc. by	Date	Chk'd by	Date	A	vd b'aa	Date
		Б,	A				++ ,	
		DK	April 25					
Soil details								
Depth of soil	over pad footing	h _{soil} = 0 mm		Density of so	bil	ρε	_{soil} = 20.0 kN	/m³
Allowable bea	aring pressure	Pbearing = 100	kN/m ²					
		Ū						
Axial loading	g on strip footing							
Dead axial loa	ad	P _G = 44.0 kN	l/m	Imposed axia	al load	P	_Q = 0.0 kN/m	1
Wind axial loc	ad		m	Total avial lo	ad	D	- 44 0 kN/m	,
	au				au	Г	- 44.0 KIN/II	1
Foundation I	loads							
Deed ourshor	and load	- 0.000	Ich I /ma 2		aharma laad	г	- 0 000	(N1/mg2
Dead surchar	rge load	⊢ _{Gsur} = 0.000	KIN/M ²	Imposed sur	charge load	F	_{Qsur} = 0.000	KIN/M²
Strip footing s	self weight	F _{swt} = 11.800) kN/m²	Soil self weig	ght	F۹	_{soil} = 0.000 k	N/m²
Total foundat	ion load	F = 7.1 kN/m						
. etai ioundut								
Calculate ba	se reaction							
Total base re	action	T = 51.1 kN/r	n	Eccentricity (of base react	ion e	r = 0 mm	
	aotion	•••••						
				Ba	ase reaction	acts wi	inin miaale	third of base
Calculate pa	d base pressures							
			N/ 2					
Raco proceilr	es	a₁ = 85.133 k	(N/m ²	q ₂ = 85.133	kN/m²			
Dase pressur	Base pressures			•				
Minimum bas	e pressure	q _{min} = 85.133	kN/m ²	Maximum ba	ise pressure	qr	_{nax} = 85.133	kN/m²
Minimum bas	se pressure	q _{min} = 85.133	kN/m ² PASS - Maximi	Maximum ba	ase pressure sure is less	q _r than allo	_{nax} = 85.133 wable beau	kN/m² ing pressure
Minimum bas	se pressure	q _{min} = 85.133	RN/m ² PASS - Maximu	Maximum ba am base press	ase pressure sure is less	q ^r than allo	_{nax} = 85.133 wable bear	kN/m² <i>ing pressure</i>
Material deta	ails	q _{min} = 85.133	B kN/m ² PASS - Maximu	Maximum ba um base pres e	ase pressure s <i>ure is less</i>	q ^r than allo	_{nax} = 85.133 wable bear	kN/m² <i>ing pressure</i>
Minimum bas Material deta	ails	q _{min} = 85.133 f _{cu} = 30 N/mr	PASS - Maximu	Maximum ba um base pres a	ase pressure sure is less	q ^r than allo	_{nax} = 85.133 owable bear	kN/m² <i>ing pressure</i>
Minimum bas Material deta Char.strength	ails	q _{min} = 85.133 f _{cu} = 30 N/mr	n ² PASS - Maximu	Maximum ba um base pres a	ase pressure sure is less	qr than allo	_{nax} = 85.133 owable bear	kN/m² <i>ing pressure</i>
Minimum bas Material deta Char.strength Calculate mi	ails n of concrete	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced	PASS - Maximu n ² strip footing	Maximum ba um base pres a	ase pressure sure is less	qr than allo	_{nax} = 85.133 owable bear	kN/m ² ing pressure
Minimum bas Material deta Char.strength Calculate mi	ails n of concrete nimum depth of t	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _u = 85.133 k	n ² strip footing	Maximum ba um base press	ise pressure sure is less	qr than allc	max = 85.133 bwable bear min = 175 mi	kN/m ² <i>ing pressure</i>
Minimum bas Material deta Char.strength Calculate mi Ave.pressure	ails n of concrete inimum depth of to left of footing	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 k	n ² strip footing (N/m ² (N/m ² (N/m ²	Maximum ba um base press Min.depth to	ise pressure sure is less	q ^r than allo ց հւ	max = 85.133 owable bear 	kN/m ² <i>ing pressure</i> m
Minimum bas Material deta Char.strength Calculate mi Ave.pressure Ave.pressure	ails n of concrete inimum depth of to left of footing to right of footing	$q_{min} = 85.133$ $f_{cu} = 30 \text{ N/mr}$ unreinforced $q_L = 85.133 \text{ H}$ $q_R = 85.133 \text{ H}$	MANN/m ² PASS - Maximu n ² strip footing KN/m ² KN/m ²	Maximum ba um base press Min.depth to Min.depth to	ise pressure sure is less left of footing right of footing	զ _r than allo g հւ ոց հլ	max = 85.133 owable beau 	kN/m ² <i>ing pressure</i> m m
Minimum bas Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth un	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	$q_{min} = 85.133$ $f_{cu} = 30 \text{ N/mr}$ unreinforced $q_L = 85.133 \text{ H}$ $q_R = 85.133 \text{ H}$ $h_{min} = 300 \text{ m}$	n ² strip footing (N/m ² (N/m ² (N/m ² m	Maximum ba um base press Min.depth to Min.depth to	ise pressure sure is less left of footing right of footing	զ _r than allo g հւ ոց հլ	max = 85.133 bwable beau umin = 175 mi Rmin = 175 m	kN/m ² <i>ing pressure</i> m m
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth un	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 H q _R = 85.133 H h _{min} = 300 m	PASS - Maximu PASS - Maximu n ² strip footing kN/m ² kN/m ² m PASS -	Maximum ba um base press Min.depth to Min.depth to Unreinforced	ise pressure sure is less left of footing right of footing strip footing	qr than allo g hi ng hi a deoth i	max = 85.133 owable bear min = 175 mi Rmin = 175 m is greater th	kN/m ² <i>ing pressure</i> m m
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 k q _R = 85.133 k h _{min} = 300 mi	PASS - Maximu PASS - Maximu n ² strip footing kN/m ² kN/m ² m PASS -	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i>	ise pressure sure is less left of footing right of footing strip footing	գր than allo ց հւ ոց հր ց depth ն	max = 85.133 pwable bear umin = 175 mi Rmin = 175 m is greater th	kN/m ² <i>ing pressure</i> m m nan minimum
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 k q _R = 85.133 k h _{min} = 300 mi	PASS - Maximu PASS - Maximu n ² strip footing strip footing strip footing strip footing m PASS -	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i>	ise pressure sure is less left of footing right of footing strip footing	զո than allo g հւ ng հր g depth ն	max = 85.133 pwable bear umin = 175 mi Rmin = 175 m is greater th	kN/m ² <i>ing pressure</i> m m nan minimum
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 H q _R = 85.133 H h _{min} = 300 m	PASS - Maximu PASS - Maximu n ² strip footing (N/m ² kN/m ² m PASS -	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i>	ise pressure sure is less left of footing right of footing strip footing	զո than allo ng հւ ng հր	max = 85.133 pwable bear min = 175 mi Rmin = 175 m is greater th	kN/m² <i>ing pressure</i> m m nan minimum
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 H q _R = 85.133 H h _{min} = 300 m	PASS - Maximu PASS - Maximu n ² strip footing (N/m ² kN/m ² m PASS -	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i>	ise pressure sure is less left of footing right of footing strip footing	զո than allo ng հա ng հր	max = 85.133 pwable bear min = 175 mi Rmin = 175 m is greater th	kN/m ² <i>ing pressure</i> m m
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 H q _R = 85.133 H h _{min} = 300 m	PASS - Maximu PASS - Maximu n ² strip footing «N/m ² «N/m ² m PASS -	Maximum ba um base press Min.depth to Min.depth to Unreinforced	ise pressure sure is less left of footing right of footing strip footing	զո than allo ng հա ng հր	max = 85.133 pwable bear min = 175 mi Rmin = 175 m is greater th	kN/m² ing pressure m m
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 H q _R = 85.133 H h _{min} = 300 m	PASS - Maximu PASS - Maximu n ² strip footing «N/m ² kN/m ² m PASS -	Maximum ba um base press Min.depth to Min.depth to Unreinforced	ise pressure sure is less left of footing right of footing strip footing	զո than allo ng հա ng հր	max = 85.133 pwable bear umin = 175 mi Rmin = 175 m is greater th	kN/m² <i>ing pressure</i> m m
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 H q _R = 85.133 H h _{min} = 300 m	PASS - Maximu PASS - Maximu n ² strip footing (N/m ² kN/m ² m PASS - ncon WP2 140x7/	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i>	ise pressure sure is less left of footing right of footing strip footing	զո than allo ng հա ng հր	max = 85.133 bwable beau min = 175 mi Rmin = 175 m is greater th	kN/m ² <i>ing pressure</i> m m
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni Min.depth uni L= 0.7 x 8/4= 2.8k	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 H q _R = 85.133 H h _{min} = 300 m	PASS - Maximu PASS - Maximu n ² strip footing KN/m ² kN/m ² m PASS - ncon WP2 140x70	Maximum ba um base press Min.depth to Min.depth to Unreinforced	Ise pressure sure is less left of footing right of footing strip footing	զո than allo ng հր ng h ր	max = 85.133 bwable bear min = 175 mi min = 175 m is greater th	kN/m ² <i>ing pressure</i> m m
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni WINDPOST L= 0.7 x 8/4= 2.8k	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing	q _{min} = 85.133 f _{cu} = 30 N/mr unreinforced q _L = 85.133 H q _R = 85.133 H h _{min} = 300 m	PASS - Maximu PASS - Maximu n ² strip footing KN/m ² kN/m ² m PASS - ncon WP2 140x70	Maximum ba um base press Min.depth to Min.depth to Unreinforced	ise pressure sure is less left of footing right of footing strip footing	գր than allo g հւ ng հր g depth ն	max = 85.133 bwable bear min = 175 mi min = 175 m is greater th	kN/m ² <i>ing pressure</i> m m
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth und <u>WINDPOST</u> L= 0.7 x 8/4= 2.8k	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing (kN/m x3= 8.4kN S ¹) of WP2 Windposts f	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 m WL, Use an A	PASS - Maximu PASS - Maximu n ² strip footing (N/m ² kN/m ² m PASS - ncon WP2 140x70	Maximum ba um base press Min.depth to Min.depth to Unreinforced	Ise pressure sure is less left of footing right of footing strip footing	զո than allo g հւ ng հր g depth i	max = 85.133 pwable bear min = 175 mi min = 175 m is greater th	kN/m ² <i>ing pressure</i> m m
Minimum bas Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni <u>WINDPOST</u> L= 0.7 x 8/4= 2.8k Performance	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing (KN/m x3= 8.4kN S) of WP2 Windposts for Size	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 m WL, Use an A to Eurocode 3 Tota	PASS - Maximu PASS - Maximu n ² strip footing (N/m ² kN/m ² m PASS - ncon WP2 140x70 I Uniformly Distributed I	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4	left of footing right of footing strip footing	qr than allo g hi ng hi g depth i	max = 85.133 pwable bear min = 175 mi min = 175 m is greater th is greater th sumpost Span	kN/m ² ing pressure m m an minimum
Minimum bas Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni <u>WINDPOST</u> L= 0.7 x 8/4= 2.8k Performance	ails a of concrete ainmum depth of to left of footing to right of footing reinforced footing (N/m x3= 8.4kN S) of WP2 Windposts Size a x b x t 125x70x4	$q_{min} = 85.133$ $f_{cu} = 30 \text{ N/mr}$ unreinforced $q_L = 85.133 \text{ H}$ $q_R = 85.133 \text{ H}$ $h_{min} = 300 \text{ m}$ wL, Use an A to Eurocode 3 Tota 2.5m 3 9.46	A kN/m ² PASS - Maximu m ² strip footing kN/m ² kN/m ² m PASS - m PASS - ncon WP2 140x70 Uniformly Distributed I 0m 3.5m 207 5.46	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4 <u>4.00</u>	left of footing right of footing strip footing strip footing 3.48	qr than allo g hi ng hi g depth i g depth i 2.86	max = 85.133 <i>pwable bear</i> min = 175 mi amin = 175 m <i>is greater th</i> <i>is greater th</i> <i>is greater th</i> <i>is greater th</i>	kN/m ² <i>ing pressure</i> m m <i>nan minimum</i> <i>s</i> <u>6.0m</u>
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth und WINDPOST L= 0.7 x 8/4= 2.8k Performance	ails a of concrete ainmum depth of a to left of footing to right of footing reinforced footing (N/m x3= 8.4kN S ¹) s of WP2 Windposts for Size a x b x t 125x70x4 140x70x4	qmin = 85.133 f _{cu} = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 m WL, Use an A to Eurocode 3 Tota 2.5m 3 9.46 1 12.28	B kN/m² PASS - Maximu m² strip footing kN/m² kN/m² m PASS - ncon WP2 140x70 Luniformly Distributed L .0m .07 5.46 .25	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4 0x4 0x4	left of footing right of footing strip footing strip footing strip 3.48	۹r than all g h ng h g depth i g depth i 5.0m 2.86 3.84	max = 85.133 <i>pwable bear</i> min = 175 mi amin = 175 m <i>is greater th</i> <i>is greater th</i> <i>is greater th</i> <i>is 3.38</i> 3.21	kN/m ² <i>ing pressure</i> m m <i>nan minimum</i> <i>an minimum</i> <i>a.</i> <i>6.0m</i> 2.01 2.72
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni <u>WINDPOST</u> L= 0.7 x 8/4= 2.8k Performance	ails a of concrete inimum depth of the to left of footing to right of footing reinforced footing converses convers	$q_{min} = 85.133$ $f_{cu} = 30 \text{ N/mr}$ unreinforced $q_L = 85.133 \text{ H}$ $q_R = 85.133 \text{ H}$ $h_{min} = 300 \text{ m}$ wL, Use an A to Eurocode 3 1000000000000000000000000000000000000	B kN/m² PASS - Maximu m² strip footing kN/m² kN/m² m PASS - ncon WP2 140x70 Uniformly Distributed L .0m .25 .26 .26 .26 .26 .26 .26 .26 .26 .26 .26 .26 .26 .26 .26 .27 .26 .27 .28 .29	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4 0x4 6.80	left of footing right of footing strip footing strip footing 3.48 4.66 5.54	۹r than all g hi ng hi g depth i g depth i 5.0m 2.86 3.84 4.59	max = 85.133 <i>pwable bear</i> min = 175 mi Rmin = 175 m <i>is greater th</i> <i>is greater th</i> <i>is greater th</i> <i>is 32</i> 2.38 2.38	kN/m ² <i>ing pressure</i> m m <i>n</i> <i>n</i> <i>n</i> <i>n</i> <i>n</i> <i>n</i> <i>n</i> <i>n</i>
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth uni <u>WINDPOST</u> L= 0.7 x 8/4= 2.8k Performance	ails a of concrete inimum depth of to left of footing to right of footing reinforced footing cN/m x3= 8.4kN S ¹ of WP2 Windposts Size a x b x t 125x70x4 140x70x4 150x70x4 130x70x6	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 ml WL, Use an A to Eurocode 3 <u>5.60</u> <u>9.46</u> 12.28 <u>14.21</u> 1 15.83 1	a kN/m² PASS - Maximu m² strip footing kN/m² kN/m² m PASS - ncon WP2 140x70 Uniformly Distributed L 0m 3.5m 7.07 5.46 0.25 7.20 0.86 8.49 1.93 9.30	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4 0x4 <u>4.32</u> 5.74 6.80 7.42	left of footing right of footing strip footing strip footing 3.48 4.66 5.54 6.03	۹r than all g hi ng hi g depth i g depth i 2.86 3.84 4.59 4.98	max = 85.133 <i>pwable bear</i> min = 175 mi Rmin = 175 m <i>is greater th</i> <i>is greater th</i> 2.38 3.21 3.85 4.17	kN/m ² <i>ing pressure</i> m m <i>n</i> <i>n</i> <i>n</i> <i>n</i> <i>n</i> <i>n</i> <i>n</i> <i>n</i>
Minimum bas Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth und <u>WINDPOST</u> L= 0.7 x 8/4= 2.8k Performance	ails n of concrete inimum depth of to left of footing to right of footing reinforced footing converses	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 ml WL, Use an A to Eurocode 3 <u>Tota</u> <u>2.5m 3 9.46 7 12.28 <u>5</u> 14.21 1 15.83 1 17.92 1</u>	A kN/m ² PASS - Maximu n ² strip footing (N/m ² kN/m ² m PASS - ncon WP2 140x70 1 Uniformly Distributed L 0m 3.5m 7.07 5.46 0.25 7.20 0.86 8.49 1.93 9.30 4.48 11.41	Maximum ba Min.depth to Min.depth to Min.depth to Unreinforced 0x4 0x4 0x4 0x4 0x4 0x4 0x4 0x4	left of footing right of footing strip footing strip footing 3.48 4.66 5.54 6.03 7.56	۹r than all g hi ng hi g depth i g depth i 2.86 3.84 4.59 4.98 6.30	max = 85.133 <i>pwable bear</i> min = 175 mi Rmin = 175 m <i>is greater th</i> <i>is greater th</i> 2.38 3.21 3.85 4.17 5.31	kN/m ² <i>ing pressure</i> m m <i>nan minimum</i> <i>san minimum</i> <i>san san minimum</i> <i>san san minimum</i>
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth und WINDPOST L= 0.7 x 8/4= 2.8k Performance	ails of concrete inimum depth of to left of footing to right of footing reinforced footing control footing reinforced footing control footing control footing reinforced footing control footing contr	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 ml WL, Use an A to Eurocode 3 <u>7046</u> <u>712.28</u> <u>14.21</u> 15.83 1 17.92 1 20.33 1	A kN/m ² PASS - Maximu n ² strip footing (N/m ² kN/m ² m PASS - ncon WP2 140x70 1 Uniformly Distributed L 000 3.5m 7.07 5.46 0.25 7.20 0.86 8.49 1.93 9.30 4.48 11.41 5.94 12.54	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4 0x4 0x4 0x4 0x4 0x4 0x4	left of footing right of footing strip footing 3.48 4.66 5.54 6.03 7.56 8.30	qr than all g hi ng hi g depth i g depth i 2.86 3.84 4.59 4.98 6.30 6.91	max = 85.133 <i>pwable bear</i> <i>pwable bear</i> <i>pwable</i>	kN/m ² <i>ing pressure</i> m m <i>nan minimum</i> <i>s</i> <i>6.0m</i> 2.01 2.72 3.26 3.53 4.53 4.96
Minimum base Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth und WINDPOST L= 0.7 x 8/4= 2.8k Performance	ails of concrete ails of concrete ainmum depth of to left of footing to right of footing reinforced footing reinforced footing size a x b x t 125x70x4 140x70x4 150x70x6 170x70x4 150x70x6 150x70x6 150x70x6	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 ml WL, Use an A to Eurocode 3 <u>9.46</u> 12.28 <u>§</u> 14.21 1 15.83 1 17.92 1 20.33 1 21.90 1	A kN/m ² PASS - Maximu n ² strip footing (N/m ² kN/m ² kN/m ² m PASS - ncon WP2 140x70 1 Uniformly Distributed L 000 3.5m 7.07 5.46 3.25 7.20 0.86 8.49 1.93 9.30 4.48 11.41 5.94 12.54 6.64 13.09 200 14 14	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4 0x4 0x4 0x4 0x4 0x4 0x4	left of footing right of footing strip footing 3.48 4.66 5.54 6.03 7.56 8.30 8.64 9.62	qr than all g hi ng hr g depth i g depth i 2.86 3.84 4.59 4.98 6.30 6.91 7.19	max = 85.133 <i>pwable bear</i> <i>pwable bear</i> <i>pwable</i>	kN/m ² <i>ing pressure</i> m m <i>nan minimum</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>contemporal</i> <i>cont</i>
Minimum bas Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth und Min.depth und MINDPOST L= 0.7 x 8/4= 2.8k Performance	ails a of concrete ails of concrete ainmum depth of to left of footing to right of footing reinforced footing control footing reinforced footing control footing cont	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 ml WL, Use an A to Eurocode 3 7.12.28 5 14.21 1 15.83 1 17.92 1 20.33 1 21.90 1 22.76 7	A kN/m ² PASS - Maximu n ² strip footing (N/m ² kN/m ² kN/m ² m PASS - ncon WP2 140x70 1 Uniformly Distributed L 000 3.5m 7.07 5.46 125 7.20 0.86 8.49 1.93 9.30 4.48 11.41 5.94 12.54 6.64 13.09 8.29 14.44 0.80 46.49	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4 0x4 0x4 0x4 0x4 0x4 0x4	left of footing right of footing strip footing strip footing 3.48 4.66 5.54 6.03 7.56 8.30 8.64 9.63 11.05	qr than allo g hu ng hr g depth i 2.86 3.84 4.59 4.98 6.30 6.91 7.19 8.04 9.26	max = 85.133 <i>pwable bear</i> <i>pwable bear</i> <i>pwable</i>	kN/m ² <i>ing pressure</i> m m <i>nan minimum</i> <i>an minimum</i> <i>2.01</i> <i>2.72</i> <i>3.26</i> <i>3.53</i> <i>4.53</i> <i>4.96</i> <i>5.15</i> <i>5.80</i> <i>6.72</i>
Minimum bas Material deta Char.strength Calculate mi Ave.pressure Ave.pressure Min.depth und Min.depth und E 0.7 x 8/4= 2.8k Performance	ails of concrete ails of concrete ainmum depth of f to left of footing to right of footing reinforced footing control footing reinforced footing control footing cont	qmin = 85.133 fcu = 30 N/mr unreinforced qL = 85.133 H qR = 85.133 H hmin = 300 m WL, Use an A to Eurocode 3 Tota 2.5m 14.21 1 15.83 1 17.92 1 20.33 1 21.90 1 22.75 1 24.76 2	A kN/m ² PASS - Maximu n ² strip footing (N/m ² kN/m ² kN/m ² m PASS - ncon WP2 140x70 1000 3.5m 7.07 5.46 3.25 7.20 0.86 8.49 1.93 9.30 4.48 11.41 5.94 12.54 6.64 13.09 8.29 14.44 0.80 16.48 2.59 17.76	Maximum ba <i>um base press</i> Min.depth to Min.depth to <i>Unreinforced</i> 0x4 0x4 0x4 0x4 0x4 10.11 10.54 11.69 13.37 14.31	left of footing right of footing strip footing strip footing 3.48 4.66 5.54 6.03 7.56 8.30 8.64 9.63 11.05 11.74	qr than allo g hu ng hr g depth i 2.86 3.84 4.59 4.98 6.30 6.91 7.19 8.04 9.77	max = 85.133 <i>pwable bear</i> <i>pwable bear</i> <i>pwable</i>	kN/m ² <i>ing pressure</i> m m <i>nan minimum</i> <i>s</i> <i>6.0m</i> 2.01 2.72 3.26 3.53 4.53 4.96 5.15 5.80 6.72 7.01

170x80x8 180x80x8 23.81 27.15 15.96 18.31 Note: Table based on tie spacing of 225mm, no vertical movement joint and long leg restrained by the masonry. Figures in **bold** indicate capacity limited by tie capacity.

19.31

22.09

11.33 13.07

9.70

11.22

13.37

15.38

24.76

24.76

29.26

29.26

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