William Dale Consulting Engineering

Project:	47a Market Jew Street
Client:	Mr T Hudson
Author:	Mr Billy Dale
Reference:	2466 – 47a Market Jew St – Calculations
Date:	11th December 2023

William Dale Consulting Engineering
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WDCEng	Job No.	2466		Sheet No.	1	Rev.		
	Client.	Mr T Hudson						
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Client:	Mr T Hudson
Architect:	My Place Design
Local Authority:	Cornwall County Council
Structure Type:	Existing two storey stone masonry commercial property with typically duo-pitched common truss roof and assumed stone footings.
Proposed Works:	Construction of room in the roof extension and associated works.
Extent of Works:	Design and detailing of structural elements for proposed room in the roof extension.
Design Aids:	**BS 5268, BS 5628, BS 5950, BS 648, BS 5977**
Drawings:	**2466-WDCE-STR-MJSP-M2-S-0001**
Remarks:	

WDCEng	Job No.	2466	Sheet No.	2	Rev.	
	Client.	Mr T Hudson				
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STANDARD LOADINGS

Location	Unfactored Loads		Factor γf	Factored Loads	
Sloping Roofs (Measured on plan)					
Slates	0.48	kN/m^2	1.4	0.67	kN/m^2
Battens and breather membrane	0.04	kN/m^2	1.4	0.06	kN/m^2
Rafters	0.08	kN/m^2	1.4	0.11	kN/m^2
Insulation	0.05	kN/m^2	1.4	0.07	kN/m^2
Plasterboard + skim	0.20	kN/m^2	1.4	0.28	kN/m^2
Live load	0.75	kN/m^2 (max)	1.6	1.20	kN/m^2
Total	1.60	kN/m^2		2.39	kN/m^2
Roof Space					
Joists and insulation	0.20	kN/m^2	1.4	0.28	kN/m^2
soffit	0.35	kN/m^2	1.4	0.49	kN/m^2
Live load	0.25	kN/m^2	1.6	0.40	kN/m^2
Total	0.80	kN/m^2		1.17	kN/m^2
Timber Floors					
Boards and joists	0.40	kN/m^2	1.4	0.56	kN/m^2
soffit	0.25	kN/m^2	1.4	0.35	kN/m^2
Live load (Domestic)	1.50	kN/m^2	1.6	2.40	kN/m^2
Total	2.15	kN/m^2		3.31	kN/m^2
Masonry Walls					
100mm dense block	2.00	kN/m^2	1.4	2.80	kN/m^2
Plaster	0.25	kN/m^2	1.4	0.35	kN/m^2
Total	2.25	kN/m^2		3.15	kN/m^2

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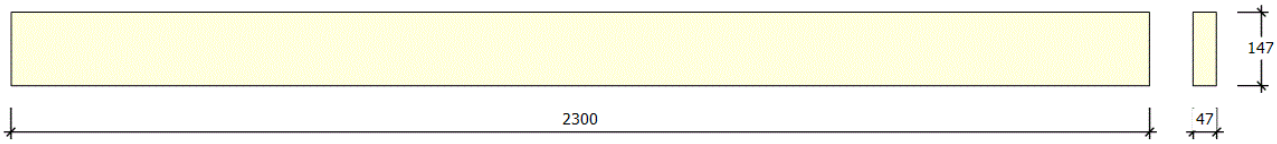
MASTERKEY : TIMBER DESIGN

JOIST DESIGN TO BS 5268 : PART 2
Timber Joist



Summary Design Data

Section Size	b = 47, h = 147, 147x47 in Strength Class C24
Section Properties (c,cm^4,cm^3)	Area 69.1, Ix 1244.1, Z 169.3
Specification	1 : Internal use in continuously heated building Medium Term loading, Load sharing
Joist data	Span 2.3 m, Spacing 0.4 m, Bearing length B 50, Distance to Bearing 25 mm
Joist loading	Dead load 0.5 kN/m², Live load 1.5 kN/m²

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{m.adm} = K_2.K_3.K_7.K_8.\sigma_m$	1.00 x 1.25 x 1.08 x 1.10 x 7.50	11.15 N/mm²
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.25 x 1.00 x 1.10 x 1.90	2.61 N/mm²
$\tau_{adm} = K_2.K_3.K_8.\tau$	1.00 x 1.25 x 1.10 x 0.71	0.98 N/mm²
$E = K_2.E_{mean}$	1.00 x 10800	10800.0 N/mm²

Design Loads

Density and Selfweight	Timber Density 420 kg/m³, Fj 0.03 kN/m	
w = (Fd+Fl).s+Fj	(0.50 + 1.50) x 0.4 + 0.03	0.83 kN/m

Bending Check

$M=w.L^2/8$	0.83 x 2.3 ² / 8	0.549 kN.m	
$\sigma_{m.a} = M/Z$	0.549 / 169.27 ≤ 11.15	3.24 N/mm²	OK

Shear and Bearing Check

Fv=w.L/2	0.83 x 2.3 / 2	0.955 kN	
$\tau_a = 1.5$ Fv / Area	1.5 x 0.955 / 69.09 ≤ 0.98	0.21 N/mm²	OK
$\sigma_{c\perp a} = Fv / (b.B)$	0.955 / (47 x 50) ≤ 2.61	0.41 N/mm²	OK

Deflection Check

$\delta_m = 5.w.L^4/(384.E.Ix)$	5 x 0.83 x 2.3^4 /(384 x 10800 x 1244.1)	2.25 mm	
$\delta_s = 12.w.L^2 / (5.E.Area)$	12 x 0.83 x 2.3² / (5 x 10800 x 69.1)	0.14 mm	
$\delta = \delta_m + \delta_s$	2.25 + 0.14 ≤ L/333 or 14mm	2.39 mm	OK

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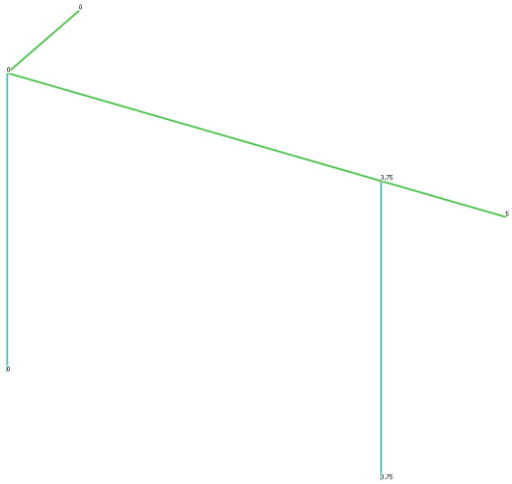
MasterFrame : Graphics



Frame Geometry - Full Frame - 3D Front View

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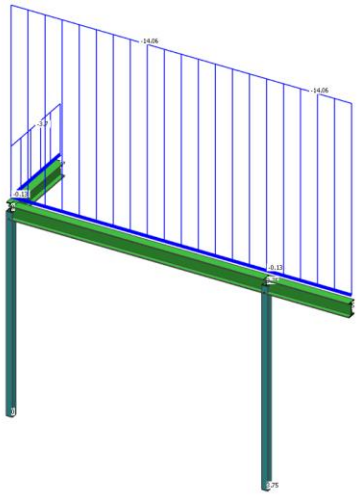
MasterFrame : Graphics



Load Diagram - 001 : Dead plus Live (Ultimate) - All Groups
Frame Geometry - Full Frame - 3D Front View

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WDcEng	Job No.	2466	Sheet No.	5	Rev.	
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	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Job Title. 47a Market Jew Street, Penzance						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Nodal Deflections Serviceability (002 : Live Only (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	-0.05	0.00	0.05	0.00	0.00	0.00	0.00
3-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-1	0.00	-0.06	0.00	0.06	0.00	0.00	0.00	0.00
5-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Nodal Deflections Serviceability (Maximum Values)

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	-0.05	0.00	0.05	0.00	0.00	0.00	0.00
3-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-1	0.00	-0.06	0.00	0.06	0.00	0.00	0.00	0.00
5-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Nodal Deflections Serviceability (Minimum Values)

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	-0.05	0.00	0.05	0.00	0.00	0.00	0.00
3-0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-1	0.00	-0.06	0.00	0.06	0.00	0.00	0.00	0.00
5-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Member Forces Ultimate (001 : Dead plus Live (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	2	0.00C	0.00	26.37	0.00	0.00	0.00	24.72		7.54
	4	0.00C	0.00	-26.37	0.00	0.00	0.00	@ 1.875		@ 1.875
1	4	0.00C	0.00	8.79	0.00	0.00	0.00	2.75		0.09
	5	0.00C	0.00	-8.79	0.00	0.00	0.00	@ 0.625		@ 0.625
0	1	29.08C	0.00	0.00	0.00	0.00	0.00			0.00
	2	28.69C	0.00	0.00	0.00	0.00	0.00			@ 0.000
0	3	35.56C	0.00	0.00	0.00	0.00	0.00			0.00
	4	35.16C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	0.00C	0.00	2.32	0.00	0.00	0.00	0.72		0.02
	6	0.00C	0.00	-2.32	0.00	0.00	0.00	@ 0.613		@ 0.625

Member Forces Ultimate (Maximum Values)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	2	0.00C	0.00	26.37	0.00	0.00	0.00	24.72		7.54
	4	0.00C	0.00	-26.37	0.00	0.00	0.00	@ 1.875		@ 1.875
1	4	0.00C	0.00	8.79	0.00	0.00	0.00	2.75		0.09
	5	0.00C	0.00	-8.79	0.00	0.00	0.00	@ 0.625		@ 0.625

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Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (Maximum Values)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
0	1	29.08C	0.00	0.00	0.00	0.00	0.00			0.00
	2	28.69C	0.00	0.00	0.00	0.00	0.00			@ 0.000
0	3	35.56C	0.00	0.00	0.00	0.00	0.00			0.00
	4	35.16C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	0.00C	0.00	2.32	0.00	0.00	0.00	0.72		0.02
	6	0.00C	0.00	-2.32	0.00	0.00	0.00	@ 0.613		@ 0.625

Member Forces Ultimate (Minimum Values)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	2	0.00C	0.00	26.37	0.00	0.00	0.00	24.72		7.54
	4	0.00C	0.00	-26.37	0.00	0.00	0.00	@ 1.875		@ 1.875
1	4	0.00C	0.00	8.79	0.00	0.00	0.00	2.75		0.09
	5	0.00C	0.00	-8.79	0.00	0.00	0.00	@ 0.625		@ 0.625
0	1	29.08C	0.00	0.00	0.00	0.00	0.00			0.00
	2	28.69C	0.00	0.00	0.00	0.00	0.00			@ 0.000
0	3	35.56C	0.00	0.00	0.00	0.00	0.00			0.00
	4	35.16C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	0.00C	0.00	2.32	0.00	0.00	0.00	0.72		0.02
	6	0.00C	0.00	-2.32	0.00	0.00	0.00	@ 0.613		@ 0.625

Support Reactions Serviceability (002 : Live Only (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-0	0.000	3.938	0.000	0.000	0.000	0.000
3-0	0.000	5.250	0.000	0.000	0.000	0.000
5-1	0.000	1.313	0.000	0.000	0.000	0.000
6-1	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	10.500	0.000	0.000	0.000	0.000

Support Reactions Serviceability (Maximum Values)

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-0	0.000	3.938	0.000	0.000	0.000	0.000
3-0	0.000	5.250	0.000	0.000	0.000	0.000
5-1	0.000	1.313	0.000	0.000	0.000	0.000
6-1	0.000	0.000	0.000	0.000	0.000	0.000
Total	0.000	10.500	0.000	0.000	0.000	0.000

Support Reactions Serviceability (Minimum Values)

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-0	0.000	3.938	0.000	0.000	0.000	0.000
3-0	0.000	5.250	0.000	0.000	0.000	0.000
5-1	0.000	1.313	0.000	0.000	0.000	0.000
6-1	0.000	0.000	0.000	0.000	0.000	0.000

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Member. Proposed room in the extension	Calc by.	BD	Date 5.12.2023	Chd by.	BD	Date 11.12.2023

Support Reactions Serviceability (Minimum Values)

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-0	0.000	3.938	0.000	0.000	0.000	0.000
Total	0.000	10.500	0.000	0.000	0.000	0.000

WDceng	Job No.	2466	Sheet No.	8	Rev.	
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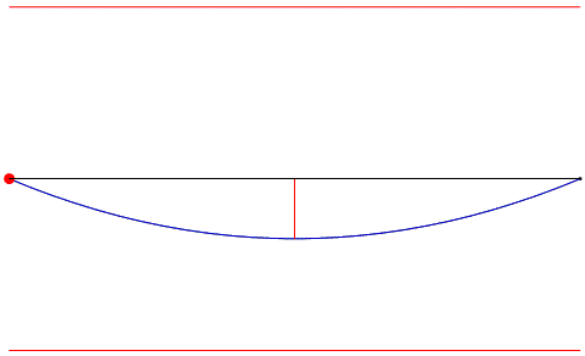
AXIAL WITH MOMENTS (MEMBER)

Member SBL1Id 1 @ Level 1 in Load Case 1 : Group Name Here

Member Loading and Member Forces
Loading Combination : 1 UT + 1.4 D1 + 1.6 L1

D1 D 077.010 (kN/m³)
D1 UDLY -002.400 (kN/m)
L1 UDLY -001.100 (kN/m)
D1 UDLY -003.200 (kN/m)
D1 UDLY -001.400 (kN/m)
L1 UDLY -000.700 (kN/m)
D1 UDLY -000.400 (kN/m)
L1 UDLY -000.300 (kN/m)



Member Forces in Load Case 1 and Maximum Deflection from Load Case 2

Member No.	Node End 1 End 2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	2	0.00C	0.00	26.37	0.00	0.00	0.00	24.72		1.13
	4	0.00C	0.00	-26.37	0.00	0.00	0.00	@ 1.875		@ 1.875

Classification and Properties (BS 5950: 2000)

Section (25.09 kg/m)	203x133 UB 25 [S 275]		
Class = Fn(b/T,d/t,py,F,Mx,My)	8.54, 30.25, 275, 0, 24.72, 0	(Axial: Non-Slender)	Plastic
Auto Design Load Cases	1		

Shear Capacity Check

Fvx/Pvx	26.373 / 191.11 =	0.138	OK

Moment Capacity Check Mc - Fully Restrained Beam

Fv/Pv	0.002 / 191.11 =	0	Low Shear
Mc = py.Sxx≤1.2 py.Zxx	275 x 257.7≤1.2 x 275 x 230.42 =	70.868 kN.m	
MA/Mc	24.72 / 70.868 =	0.349	OK

Deflection Check - Load Case 2

In-span δ ≤ Span/360	1.13 ≤ 3750 / 360	1.13 mm	OK

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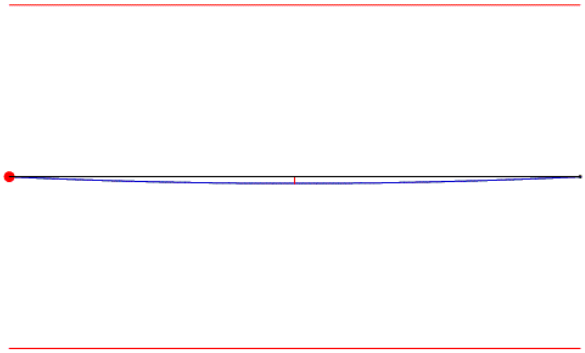
AXIAL WITH MOMENTS (MEMBER)

Member SBL1Id 2 @ Level 1 in Load Case 1 : Group Name Here

Member Loading and Member Forces
Loading Combination : 1 UT + 1.4 D1 + 1.6 L1

D1 D 077.010 (kN/m³)
D1 UDLY -002.400 (kN/m)
L1 UDLY -001.100 (kN/m)
D1 UDLY -003.200 (kN/m)
D1 UDLY -001.400 (kN/m)
L1 UDLY -000.700 (kN/m)
D1 UDLY -000.400 (kN/m)
L1 UDLY -000.300 (kN/m)



Member Forces in Load Case 1 and Maximum Deflection from Load Case 2

Member No.	Node End 1 End 2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	4	0.00C	0.00	8.79	0.00	0.00	0.00	2.75		0.01
	5	0.00C	0.00	-8.79	0.00	0.00	0.00	@ 0.625		@ 0.625

Classification and Properties (BS 5950: 2000)

Section (25.09 kg/m)	203x133 UB 25 [S 275]		
Class = Fn(b/T,d/t,py,F,Mx,My)	8.54, 30.25, 275, 0, 2.75, 0	(Axial: Non-Slender)	Plastic
Auto Design Load Cases	1		

Shear Capacity Check

Fvx/Pvx	8.79 / 191.11 =	0.046	OK

Moment Capacity Check Mc - Fully Restrained Beam

Fv/Pv	0.002 / 191.11 =	0	Low Shear
Mc = py.Sxx≤1.2 py.Zxx	275 x 257.7≤1.2 x 275 x 230.42 =	70.868 kN.m	
MA/Mc	2.745 / 70.868 =	0.039	OK

Deflection Check - Load Case 2

In-span δ ≤ Span/360	0.01 ≤ 1250 / 360	0.01 mm	OK

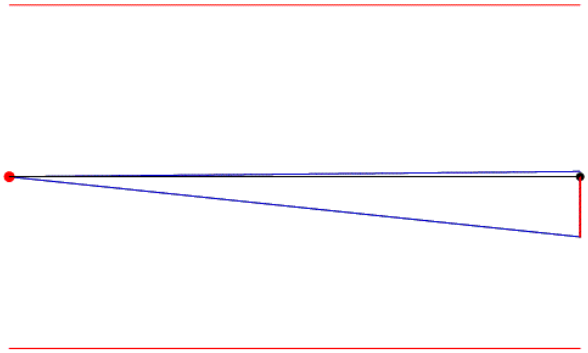
WDceng	Job No.	2466	Sheet No.	10	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

AXIAL WITH MOMENTS (MEMBER)

Member SCL1Id 3 @ Level 1 in Load Case 1 : Design group 2

Member Loading and Member Forces
Loading Combination : 1 UT + 1.4 D1 + 1.6 L1

D1 D 077.010 (kN/m³)



Member Forces in Load Case 1										
Member No.	Node End 1 End 2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
0	1	29.08C	0.00	0.00	0.00	0.00	0.00			0.00
	2	28.69C	0.00	0.00	0.00	0.00	0.00			@ 0.625

Additional Nominal Moments

MxUp, MyUp	3.824 kN.m, -0.336 kN.m		

Classification and Properties (BS 5950: 2000)

Section (9.66 kg/m)	90x90x3.6 SHS 9.66 [S 275]		
Class = Fn(b/t,d/t,py,F,Mx,My)	22, 22, 275, 29.084, 3.824, 0.336	(Axial: Non-Slender)	Plastic
Auto Design Load Cases	1		

Local Capacity Check

Fvx/Pvx	0 / 101.475 =	0	Low Shear
Mcx = py.Sxx≤1.2 py.Zxx	275 x 39.69≤1.2 x 275 x 33.8 =	10.915 kN.m	
Fvy/Pvy	0 / 101.475 =	0	Low Shear
Mcy = py.Syy≤1.2 py.Zyy	275 x 39.69≤1.2 x 275 x 33.8 =	10.915 kN.m	
Pz = Ag.py	12.3 x 275 =	338.25 kN	
n = F/Pz	29.084 / 338.25 =	0.086	OK
Srx = Fn(Sxx,)	39.69, 0.086	39.3 cm³	
Mrx = Srx.py	39.3 x 275	10.808 kN.m	
Sry = Fn(Syy,)	39.69, 0.086	39.3 cm³	
Mry = Sry.py	39.3 x 275	10.808 kN.m	
$(Mx/Mrx)^{Z1}+(My/Mry)^{Z2}$	$(3.824/10.808)^{1.667}+(0.336/10.808)^{1.667}$=	0.18	OK

Compression Resistance Pc

λx = Lex/rxx	100x1x3/3.52 =	85.2	OK
Pcx = Area.pcx	12.3x191.53/10 =	235.581 kN	Table 24 a
λy = Ley/ryy	100x1x3/3.52 =	85.2	OK
Pcy = Area.pcy	12.3x191.53/10 =	235.581 kN	Table 24 a

Equivalent Uniform Moment Factors mLT, mx, my and myx

$m_{LT}=0.2+(.15M_2+.5M_3+.15M_4)/M_{max}$	0.2+(.15x1+.5x2+.15x3)/4 = 0.44	0.6	Table 18
$m_y=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x0+.6x0+.1x0)/0 = .8x0/0	0.6	Table 26
$m_x=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x1+.6x2+.1x3)/4 = .8x3/4	0.6	Table 26
$m_yx=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x0+.6x0+.1x0)/0 = .8x0/0	0.6	Table 26

Lateral Buckling Check Mb

Mb = Mc	Section not susceptible to lateral torsional buckling	10.915 kN.m	

WDCEng	Job No.	2466		Sheet No.	11	Rev.		
	Client.	Mr T Hudson						
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Combined Axial Compression and Bending to Annex I

$r_b=m_{LT}.M_{LT}/M_b$	0.6x3.8/10.9	0.210	
$r_c=F_c/P_cy$	29.1/235.6	0.123	
$\lambda_r=(r_b\ \lambda_{LT}+r_c\ \lambda_y)/(r_b+r_c)$	(0.21•0+0.123•85.2)/(0.21+0.123)	31.531	
$\lambda_ro=17.15\ \varepsilon\ (2r_b+r_c)/(r_b+r_c)$	17.15•1(2•0.21+0.123)/(0.21+0.123)	27.955	
$M_{ob}=M_b(1-F_c/P_cy)$	10.915(1-29.1/235.6)	9.567	
$M_{xy}=2M_cx\ (1-F_c/P_cy)$	2•10.915(1-29.1/235.6)	19.134	
$M_{ox}=M_cx(1-F_c/P_cx)/(1+0.5F_c/P_cx)$	10.915(1-29.1/235.6)/(1+0.5•29.1/235.6)	9.011	
$M_{oy}=M_cy(1-F_c/P_cy)/(1+k_y(F_c/P_cy))$	10.915(1-29.1/235.6)/(1+0.5(29.1/235.6))	9.011	
$M_{ab}=fn(\lambda_r, \lambda_ro, \varepsilon, M_{xy}, M_{ob})$	31.531, 27.955, 1.000, 19.134, 9.567	10.731	
$M_{ax}=fn(\lambda_x, \varepsilon, M_rx, M_{ox})$	85.227, 1.000, 10.808, 9.011	9.026	
$M_{ay}=fn(\lambda_y, \varepsilon, M_ry, M_{oy})$	85.227, 1.000, 10.808, 9.011	9.026	
$m_x.M_x/M_{ax}+.5m_yx.M_y/M_cy(1-F_c/P_cx)$	0.6x3.8/9+.5x0.6x0.3/(10.9(1-29.1/235.6))	0.265	OK
$m_{LT}.M_{LT}/M_{ab}+m_y.M_y/M_{ay}$	0.6x3.8/10.7+0.6x-0.3/9	0.236	OK
$m_x.M_x/M_{ax}+m_y.M_y/M_{ay}$	0.6x3.8/9+0.6x-0.3/9	0.277	OK
Compare with Simplied to 4.8.3.3	0.392, 0.355, 0.355	0.392	
Compare with MoreExact to 4.8.3.3	0.356, 0.248, 0.277	0.356	

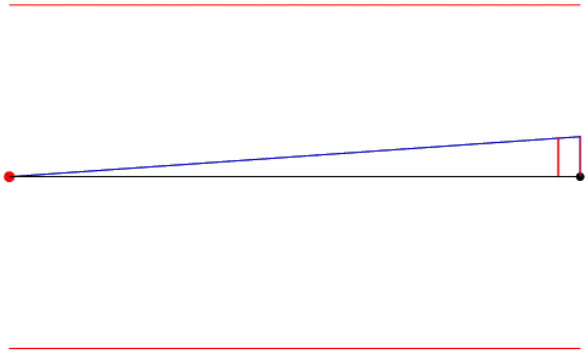
WDceng	Job No.	2466	Sheet No.	12	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

AXIAL WITH MOMENTS (MEMBER)

Member SCL1Id 4 @ Level 1 in Load Case 1 : Design group 2

Member Loading and Member Forces
Loading Combination : 1 UT + 1.4 D1 + 1.6 L1

D1 D 077.010 (kN/m³)



Member Forces in Load Case 1										
Member No.	Node End 1 End 2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
0	3	35.56C	0.00	0.00	0.00	0.00	0.00			0.00
	4	35.16C	0.00	0.00	0.00	0.00	0.00			@ 0.625

Additional Nominal Moments

MxUp	-2.549 kN.m		

Classification and Properties (BS 5950: 2000)

Section (9.66 kg/m)	90x90x3.6 SHS 9.66 [S 275]		
Class = Fn(b/t,d/t,py,F,Mx,My)	22, 22, 275, 35.559, 2.549, 0	(Axial: Non-Slender)	Plastic
Auto Design Load Cases	1		

Local Capacity Check

Fvx/Pvx	0 / 101.475 =	0	Low Shear
Mcx = py.Sxx≤1.2 py.Zxx	275 x 39.69≤1.2 x 275 x 33.8 =	10.915 kN.m	
Pz = Ag.py	12.3 x 275 =	338.25 kN	
n = F/Pz	35.559 / 338.25 =	0.105	OK
Srx = Fn(Sxx,)	39.69, 0.105	39.11 cm³	
Mrx = Srx.py	39.11 x 275	10.755 kN.m	
$(Mx/Mrx)^{Z1}+(My/Mry)^{Z2}$	$(2.549/10.755)^{1.667}+(0)^{1.667}$=	0.091	OK

Compression Resistance Pc

λx = Lex/rxx	100x1x3/3.52 =	85.2	OK
Pcx = Area.pcx	12.3x191.53/10 =	235.581 kN	Table 24 a
λy = Ley/ryy	100x1x3/3.52 =	85.2	OK
Pcy = Area.pcy	12.3x191.53/10 =	235.581 kN	Table 24 a

Equivalent Uniform Moment Factors mLT, mx, my and myx

$m_{LT}=0.2+(.15M_2+.5M_3+.15M_4)/M_{max}$	0.2+(.15x1+.5x1+.15x2)/3 = 0.44	0.6	Table 18
$m_y=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x0+.6x0+.1x0)/0 = .8x0/0	1	Table 26
$m_x=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x-1+.6x-1+.1x-2)/3 = .8x2/3	0.6	Table 26
$m_{yx}=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x0+.6x0+.1x0)/0 = .8x0/0	1	Table 26

Lateral Buckling Check Mb

Mb = Mc	Section not susceptible to lateral torsional buckling	10.915 kN.m

Combined Axial Compression and Bending to Annex I

$r_b=m_{LT}.M_{LT}/M_b$	0.6x-2.5/10.9	0.135
$r_c=F_c/P_cy$	35.6/235.6	0.151
$\lambda_r=(r_b\ \lambda_{LT}+r_c\ \lambda_y)/(r_b+r_c)$	(0.135•0+0.151•85.2)/(0.135+0.151)	45.029
$\lambda_r o=17.15\ \varepsilon\ (2r_b+r_c)/(r_b+r_c)$	17.15•1(2•0.135+0.151)/(0.135+0.151)	25.239

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	Client.	Mr T Hudson						
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

$M_{ob} = M_b(1-F_c/P_cy)$	10.915(1-35.6/235.6)	9.267	
$M_{xy} = 2M_cx\ (1-F_c\ /\ P_cy)$	2•10.915(1-35.6/235.6)	18.535	
$M_{ox} = M_cx(1-F_c/P_cx)/(1+0.5F_c/P_cx)$	10.915(1-35.6/235.6)/(1+0.5•35.6/235.6)	8.617	
$M_{oy} = M_cy(1-F_c/P_cy)/(1+k_y(F_c/P_cy))$	10.915(1-35.6/235.6)/(1+0.5(35.6/235.6))	8.617	
M_{ab}=fn(λ_r, λ_ro, ε, M_{xy}, M_{ob})	45.029, 25.239, 1.000, 18.535, 9.267	10.269	
M_{ax}=fn(λ_x, ε, M_rx, M_{ox})	85.227, 1.000, 10.755, 8.617	8.635	
M_{ay}=fn(λ_y, ε, M_ry, M_{oy})	85.227, 1.000, 10.755, 8.617	8.635	
$m_x.M_x/M_{ax}$	0.6x2.5/8.6	0.177	OK
$m_{LT}.M_{LT}/M_{ab}$	0.6x-2.5/10.3	0.143	OK
$m_x.M_x/M_{ax}$	0.6x2.5/8.6	0.170	OK
Compare with Simplied to 4.8.3.3	0.316, 0.286, 0.286	0.316	
Compare with MoreExact to 4.8.3.3	0.302, 0.218, 0.171	0.302	

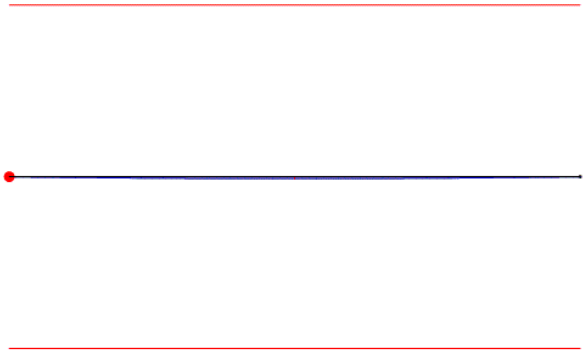
WDCEng	Job No.	2466	Sheet No.	14	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

AXIAL WITH MOMENTS (MEMBER)

Member SBL1Id 5 @ Level 1 in Load Case 1 : Group Name Here

Member Loading and Member Forces
Loading Combination : 1 UT + 1.4 D1 + 1.6 L1

D1 D 077.010 (kN/m³)
D1 UDLY -002.400 (kN/m)



Member Forces in Load Case 1										
Member No.	Node End 1 End 2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	2	0.00C	0.00	2.32	0.00	0.00	0.00	0.72		0.00
	6	0.00C	0.00	-2.32	0.00	0.00	0.00	@ 0.613		@ 0.625

Classification and Properties (BS 5950: 2000)

Section (25.09 kg/m)	203x133 UB 25 [S 275]		
Class = Fn(b/T,d/t,py,F,Mx,My)	8.54, 30.25, 275, 0, 0.72, 0	(Axial: Non-Slender)	Plastic
Auto Design Load Cases	1		

Shear Capacity Check

Fvx/Pvx	2.315 / 191.11 =	0.012	OK

Moment Capacity Check Mc - Fully Restrained Beam

Fv/Pv	0.001 / 191.11 =	0	Low Shear
Mc = py.Sxx≤1.2 py.Zxx	275 x 257.7≤1.2 x 275 x 230.42 =	70.868 kN.m	
MA/Mc	0.721 / 70.868 =	0.010	OK

WDceng	Job No.	2466		Sheet No.	15	Rev.		
	Client.	Mr T Hudson						
	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Job Title. 47a Market Jew Street, Penzance								
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

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MasterFrame : Graphics

Frame Geometry - Full Frame - X+023 Y+012 Z+000

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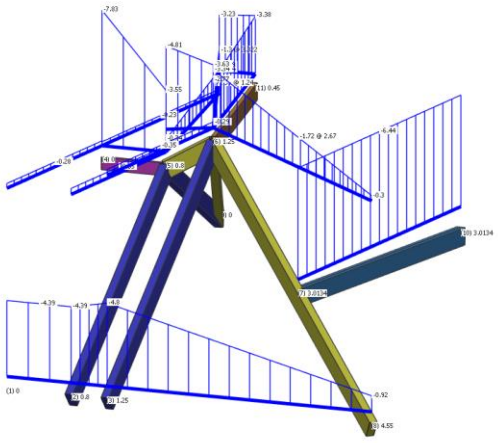
MasterFrame : Graphics



Load Diagram - 001 : Dead+Live 1.40D0+1.40D1+1.60L1 (Ultimate) - All Groups
Frame Geometry - Full Frame - X+012 Y+025 Z+000

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WDcEng	Job No.	2466	Sheet No.	16	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Nodal Deflections Serviceability (002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.06	0.01	0.06	0.03	0.03	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.37	0.00	-0.28	0.47
8-1	0.00	0.00	0.00	0.00	-0.09	0.00	0.07	0.12
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.40	0.00	-0.24	0.47
11-1	0.00	0.00	0.00	0.00	-0.21	0.00	-0.05	0.22

Nodal Deflections Serviceability (007 : Live Only 1.00L1 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.00	-0.01	0.00	0.01	0.01	0.01	0.01	0.02
6-1	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01
7-1	0.00	0.00	0.00	0.00	0.13	0.00	-0.10	0.16
8-1	0.00	0.00	0.00	0.00	-0.03	0.00	0.02	0.04
9-1	0.00	0.00	0.00	0.00	-0.02	0.00	-0.01	0.02
10-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.08	0.16
11-1	0.00	0.00	0.00	0.00	-0.07	0.00	-0.02	0.07

Nodal Deflections Serviceability (008 : Dead Only 1.00D0+1.00D1 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

Nodal Deflections Serviceability (010 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W1 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.06	0.03	0.02	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.34	0.00	-0.26	0.43
8-1	0.00	0.00	0.00	0.00	-0.08	0.00	0.07	0.11
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.37	0.00	-0.23	0.44
11-1	0.00	0.00	0.00	0.00	-0.20	0.00	-0.05	0.20

WDcEng	Job No.	2466	Sheet No.	17	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Nodal Deflections Serviceability (012 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W2 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.06	0.03	0.02	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.34	0.00	-0.26	0.43
8-1	0.00	0.00	0.00	0.00	-0.08	0.00	0.07	0.11
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.37	0.00	-0.23	0.44
11-1	0.00	0.00	0.00	0.00	-0.20	0.00	-0.05	0.20

Nodal Deflections Serviceability (014 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W3 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.06	0.03	0.02	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.34	0.00	-0.26	0.43
8-1	0.00	0.00	0.00	0.00	-0.08	0.00	0.07	0.11
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.37	0.00	-0.23	0.44
11-1	0.00	0.00	0.00	0.00	-0.20	0.00	-0.05	0.20

Nodal Deflections Serviceability (016 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W4 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.06	0.03	0.02	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.34	0.00	-0.26	0.43
8-1	0.00	0.00	0.00	0.00	-0.08	0.00	0.07	0.11
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.37	0.00	-0.23	0.44
11-1	0.00	0.00	0.00	0.00	-0.20	0.00	-0.05	0.20

Nodal Deflections Serviceability (018 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W5 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.06	0.03	0.02	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.34	0.00	-0.26	0.43
8-1	0.00	0.00	0.00	0.00	-0.08	0.00	0.07	0.11
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.37	0.00	-0.23	0.44
11-1	0.00	0.00	0.00	0.00	-0.20	0.00	-0.05	0.20

WDCEng	Job No.	2466	Sheet No.	18	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Nodal Deflections Serviceability (020 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W6 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.06	0.03	0.02	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.34	0.00	-0.26	0.43
8-1	0.00	0.00	0.00	0.00	-0.08	0.00	0.07	0.11
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.37	0.00	-0.23	0.44
11-1	0.00	0.00	0.00	0.00	-0.20	0.00	-0.05	0.20

Nodal Deflections Serviceability (022 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W7 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.06	0.03	0.02	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.34	0.00	-0.26	0.43
8-1	0.00	0.00	0.00	0.00	-0.08	0.00	0.07	0.11
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.37	0.00	-0.23	0.44
11-1	0.00	0.00	0.00	0.00	-0.20	0.00	-0.05	0.20

Nodal Deflections Serviceability (024 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W8 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.06	0.03	0.02	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.34	0.00	-0.26	0.43
8-1	0.00	0.00	0.00	0.00	-0.08	0.00	0.07	0.11
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.37	0.00	-0.23	0.44
11-1	0.00	0.00	0.00	0.00	-0.20	0.00	-0.05	0.20

Nodal Deflections Serviceability (026 : Dead+Wind 1.00D0+1.00D1+1.00W1 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

WDCEng	Job No.	2466	Sheet No.	19	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Nodal Deflections Serviceability (028 : Dead+Wind 1.00D0+1.00D1+1.00W2 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

Nodal Deflections Serviceability (030 : Dead+Wind 1.00D0+1.00D1+1.00W3 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

Nodal Deflections Serviceability (032 : Dead+Wind 1.00D0+1.00D1+1.00W4 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

Nodal Deflections Serviceability (034 : Dead+Wind 1.00D0+1.00D1+1.00W5 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

WDCEng	Job No.	2466	Sheet No.	20	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Nodal Deflections Serviceability (036 : Dead+Wind 1.00D0+1.00D1+1.00W6 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

Nodal Deflections Serviceability (038 : Dead+Wind 1.00D0+1.00D1+1.00W7 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

Nodal Deflections Serviceability (040 : Dead+Wind 1.00D0+1.00D1+1.00W8 (Serviceability))

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.05	0.01	0.05	0.02	0.02	0.02	0.04
6-1	0.00	0.00	0.00	0.00	0.03	0.00	0.01	0.03
7-1	0.00	0.00	0.00	0.00	0.24	0.00	-0.19	0.31
8-1	0.00	0.00	0.00	0.00	-0.06	0.00	0.05	0.08
9-1	0.00	0.00	0.00	0.00	-0.05	0.00	-0.03	0.05
10-1	0.00	0.00	0.00	0.00	-0.26	0.00	-0.16	0.31
11-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.03	0.15

Nodal Deflections Serviceability (Maximum Values)

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
3-1	0.00	0.00	0.00	0.00	-0.01	0.00	-0.01	0.01
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.02	-0.06	0.01	0.06	0.03	0.03	0.03	0.05
6-1	0.00	0.00	0.00	0.00	0.04	0.00	0.02	0.04
7-1	0.00	0.00	0.00	0.00	0.37	0.00	-0.28	0.47
8-1	0.00	0.00	0.00	0.00	-0.09	0.00	0.07	0.12
9-1	0.00	0.00	0.00	0.00	-0.06	0.00	-0.04	0.07
10-1	0.00	0.00	0.00	0.00	-0.40	0.00	-0.24	0.47
11-1	0.00	0.00	0.00	0.00	-0.21	0.00	-0.05	0.22

WDCEng	Job No.	2466	Sheet No.	21	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Nodal Deflections Serviceability (Minimum Values)

Load Case	Nodal Displacements (mm)				Nodal Rotation (degrees)			
	δX →	δY ↑	δZ ↗	δXYZ	θX →	θY ↑	θZ ↗	θXYZ
1-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4-1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5-1	0.00	-0.01	0.00	0.01	0.01	0.01	0.01	0.02
6-1	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01
7-1	0.00	0.00	0.00	0.00	0.13	0.00	-0.10	0.16
8-1	0.00	0.00	0.00	0.00	-0.03	0.00	0.02	0.04
9-1	0.00	0.00	0.00	0.00	-0.02	0.00	-0.01	0.02
10-1	0.00	0.00	0.00	0.00	-0.14	0.00	-0.08	0.16
11-1	0.00	0.00	0.00	0.00	-0.07	0.00	-0.02	0.07

Member Forces Ultimate (001 : Dead+Live 1.40D0+1.40D1+1.60L1 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.39	0.00	0.00	0.00	0.28		0.00
	2	0.00C	0.00	-1.39	0.00	0.00	0.00	@ 0.384		@ 0.000
1	2	0.00C	0.00	0.81	0.00	0.00	0.00	0.09		0.00
	3	0.00C	0.00	-0.84	0.00	0.00	0.00	@ 0.223		@ 0.000
1	3	0.00C	0.00	4.26	0.00	0.00	0.00	2.71		0.05
	8	0.00C	0.00	-2.13	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	2.14T	0.00	3.20	0.00	-0.51	0.00	0.22	0.00	0.10
	5	2.14T	0.00	-1.35	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.82C	-0.01	0.11	0.01	0.00	-0.01	0.03		0.35
	5	2.24C	0.01	-0.56	0.01	-0.75	0.02	@ 0.536		@ 2.279
1	3	0.32C	-0.01	0.13	0.01	0.00	-0.01	0.04		0.55
	6	0.32T	0.01	-0.62	0.01	-0.91	0.04	@ 0.600		@ 2.512
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.80T	0.02	-0.56	0.95	-0.09	-0.14			0.06
	6	2.80T	-0.02	-2.61	0.95	-1.07	0.43			@ 0.371
1	5	1.61C	0.01	-1.65	0.05	0.77	-0.13	-1.05		1.79
	9	2.82C	-0.01	1.49	0.05	-0.03	0.04	@ 2.054		@ 1.845
1	6	1.62T	-0.14	3.92	-0.76	-2.66	0.70	0.72	-1.33	2.29
	7	1.25C	0.14	-1.23	-0.76	0.20	-1.33	@ 1.843	@ 2.668	@ 1.788
1	7	0.64T	0.21	1.61	-0.72	-1.18	1.31			
	8	0.36C	-0.21	-0.18	-0.72	0.00	-0.37			
1	6	0.68T	0.00	-1.65	-0.01	0.79	0.01	-1.15		1.89
	9	0.86C	0.00	1.53	-0.01	0.03	-0.02	@ 1.950		@ 1.840
1	6	0.00C	0.00	-5.37	0.00	2.94	0.00	-2.06		4.38
	11	0.00C	0.00	3.67	0.00	0.00	0.00	@ 1.806		@ 1.687

WDCEng	Job No.	2466	Sheet No.	22	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (001 : Dead+Live 1.40D0+1.40D1+1.60L1 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.44T	0.00	14.56	0.03	-2.10	-0.06	14.37		13.80
	10	0.44C	0.00	-13.60	0.03	0.00	0.06	@ 2.275		@ 2.231

Member Forces Ultimate (003 : Dead+Live 1.40D0+1.40D1+1.60L1+EHL@0)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.39	0.00	0.00	0.00	0.28		0.00
	2	0.00C	0.00	-1.39	0.00	0.00	0.00	@ 0.384		@ 0.000
1	2	0.00C	0.00	0.81	0.00	0.00	0.00	0.09		0.00
	3	0.00C	0.00	-0.84	0.00	0.00	0.00	@ 0.223		@ 0.000
1	3	0.00C	0.00	4.26	0.00	0.00	0.00	2.71		0.05
	8	0.00C	0.00	-2.13	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	2.15T	0.00	3.20	0.00	-0.51	0.00	0.22	0.00	0.10
	5	2.15T	0.00	-1.35	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.82C	-0.01	0.11	0.01	0.00	-0.01	0.03		0.35
	5	2.25C	0.01	-0.56	0.01	-0.75	0.02	@ 0.536		@ 2.279
1	3	0.32C	-0.01	0.13	0.01	0.00	-0.01	0.04		0.55
	6	0.32T	0.01	-0.62	0.01	-0.91	0.04	@ 0.600		@ 2.512
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.79T	0.02	-0.56	0.95	-0.09	-0.14			0.06
	6	2.78T	-0.02	-2.61	0.95	-1.07	0.43			@ 0.371
1	5	1.61C	0.01	-1.65	0.05	0.77	-0.13	-1.05		1.79
	9	2.82C	-0.01	1.49	0.05	-0.03	0.04	@ 2.054		@ 1.845
1	6	1.62T	-0.14	3.92	-0.76	-2.66	0.70	0.72	-1.33	2.29
	7	1.25C	0.14	-1.23	-0.76	0.20	-1.33	@ 1.843	@ 2.668	@ 1.788
1	7	0.64T	0.21	1.61	-0.72	-1.18	1.31			
	8	0.36C	-0.21	-0.18	-0.72	0.00	-0.37			
1	6	0.68T	0.00	-1.65	-0.01	0.79	0.01	-1.15		1.89
	9	0.86C	0.00	1.53	-0.01	0.03	-0.02	@ 1.950		@ 1.840
1	6	0.00C	0.00	-5.37	0.00	2.94	0.00	-2.06		4.38
	11	0.00C	0.00	3.67	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000

WDceng	Job No.	2466	Sheet No.	23	Rev.	
	Client.	Mr T Hudson				
	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Job Title. 47a Market Jew Street, Penzance						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (003 : Dead+Live 1.40D0+1.40D1+1.60L1+EHL@0)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	7	0.44T	0.00	14.56	0.03	-2.10	-0.06	14.37		13.80
	10	0.44C	0.00	-13.60	0.03	0.00	0.06	@ 2.275		@ 2.231

Member Forces Ultimate (004 : Dead+Live 1.40D0+1.40D1+1.60L1+EHL@90)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.39	0.00	0.00	0.00	0.28		0.00
	2	0.00C	0.00	-1.39	0.00	0.00	0.00	@ 0.384		@ 0.000
1	2	0.00C	0.00	0.81	0.00	0.00	0.00	0.09		0.00
	3	0.00C	0.00	-0.84	0.00	0.00	0.00	@ 0.223		@ 0.000
1	3	0.00C	0.00	4.26	0.00	0.00	0.00	2.71		0.05
	8	0.00C	0.00	-2.13	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	2.14T	0.00	3.20	0.00	-0.51	0.00	0.22	0.00	0.10
	5	2.14T	0.00	-1.35	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.81C	-0.01	0.11	0.01	0.00	-0.01	0.03		0.35
	5	2.24C	0.01	-0.56	0.01	-0.75	0.02	@ 0.536		@ 2.279
1	3	0.32C	-0.01	0.13	0.01	0.00	-0.01	0.04		0.55
	6	0.32T	0.01	-0.62	0.01	-0.91	0.04	@ 0.600		@ 2.512
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.80T	0.02	-0.56	0.95	-0.09	-0.14			0.06
	6	2.79T	-0.02	-2.61	0.95	-1.07	0.43			@ 0.371
1	5	1.63C	0.01	-1.65	0.05	0.77	-0.13	-1.05		1.79
	9	2.84C	-0.01	1.49	0.05	-0.03	0.04	@ 2.054		@ 1.845
1	6	1.62T	-0.14	3.92	-0.76	-2.66	0.70	0.72	-1.33	2.29
	7	1.25C	0.14	-1.23	-0.76	0.20	-1.33	@ 1.843	@ 2.668	@ 1.788
1	7	0.64T	0.21	1.61	-0.72	-1.18	1.31			
	8	0.36C	-0.21	-0.18	-0.72	0.00	-0.37			
1	6	0.68T	0.00	-1.65	-0.01	0.79	0.01	-1.15		1.89
	9	0.86C	0.00	1.53	-0.01	0.03	-0.02	@ 1.950		@ 1.840
1	6	0.00C	0.00	-5.37	0.00	2.94	0.00	-2.06		4.38
	11	0.00C	0.00	3.67	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.44T	0.00	14.56	0.03	-2.10	-0.06	14.37		13.80
	10	0.44C	0.00	-13.60	0.03	0.00	0.06	@ 2.275		@ 2.231

WDceng	Job No.	2466	Sheet No.	24	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (005 : Dead+Live 1.40D0+1.40D1+1.60L1+EHL@180)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.39	0.00	0.00	0.00	0.28		0.00
	2	0.00C	0.00	-1.39	0.00	0.00	0.00	@ 0.384		@ 0.000
1	2	0.00C	0.00	0.81	0.00	0.00	0.00	0.09		0.00
	3	0.00C	0.00	-0.84	0.00	0.00	0.00	@ 0.223		@ 0.000
1	3	0.00C	0.00	4.26	0.00	0.00	0.00	2.71		0.05
	8	0.00C	0.00	-2.13	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	2.12T	0.00	3.20	0.00	-0.51	0.00	0.22	0.00	0.10
	5	2.12T	0.00	-1.35	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.81C	-0.01	0.11	0.01	0.00	-0.01	0.03		0.35
	5	2.24C	0.01	-0.56	0.01	-0.75	0.02	@ 0.536		@ 2.279
1	3	0.32C	-0.01	0.13	0.01	0.00	-0.01	0.04		0.55
	6	0.32T	0.01	-0.62	0.01	-0.91	0.04	@ 0.600		@ 2.512
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.82T	0.02	-0.56	0.95	-0.09	-0.14			0.06
	6	2.81T	-0.02	-2.61	0.95	-1.07	0.43			@ 0.371
1	5	1.61C	0.01	-1.65	0.05	0.77	-0.13	-1.05		1.79
	9	2.82C	-0.01	1.49	0.05	-0.03	0.04	@ 2.054		@ 1.845
1	6	1.62T	-0.14	3.92	-0.76	-2.66	0.70	0.72	-1.33	2.29
	7	1.25C	0.14	-1.23	-0.76	0.20	-1.33	@ 1.843	@ 2.668	@ 1.788
1	7	0.64T	0.21	1.61	-0.72	-1.18	1.31			
	8	0.36C	-0.21	-0.18	-0.72	0.00	-0.37			
1	6	0.68T	0.00	-1.65	-0.01	0.79	0.01	-1.15		1.89
	9	0.86C	0.00	1.53	-0.01	0.03	-0.02	@ 1.950		@ 1.840
1	6	0.00C	0.00	-5.37	0.00	2.94	0.00	-2.06		4.38
	11	0.00C	0.00	3.67	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.44T	0.00	14.56	0.03	-2.10	-0.06	14.37		13.80
	10	0.44C	0.00	-13.60	0.03	0.00	0.06	@ 2.275		@ 2.231

Member Forces Ultimate (006 : Dead+Live 1.40D0+1.40D1+1.60L1+EHL@270)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.39	0.00	0.00	0.00	0.28		0.00
	2	0.00C	0.00	-1.39	0.00	0.00	0.00	@ 0.384		@ 0.000

WDceng	Job No.	2466	Sheet No.	25	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (006 : Dead+Live 1.40D0+1.40D1+1.60L1+EHL@270)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	2	0.00C	0.00	0.81	0.00	0.00	0.00	0.09		0.00
	3	0.00C	0.00	-0.84	0.00	0.00	0.00	@ 0.223		@ 0.000
1	3	0.00C	0.00	4.26	0.00	0.00	0.00	2.71		0.05
	8	0.00C	0.00	-2.13	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	2.14T	0.00	3.20	0.00	-0.51	0.00	0.22	0.00	0.10
	5	2.14T	0.00	-1.35	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.82C	-0.01	0.11	0.01	0.00	-0.01	0.03		0.35
	5	2.25C	0.01	-0.56	0.01	-0.75	0.02	@ 0.536		@ 2.279
1	3	0.32C	-0.01	0.13	0.01	0.00	-0.01	0.04		0.55
	6	0.32T	0.01	-0.62	0.01	-0.91	0.04	@ 0.600		@ 2.512
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.81T	0.02	-0.56	0.95	-0.09	-0.14			0.06
	6	2.81T	-0.02	-2.61	0.95	-1.07	0.43			@ 0.371
1	5	1.60C	0.01	-1.65	0.05	0.77	-0.13	-1.05		1.79
	9	2.80C	-0.01	1.49	0.05	-0.03	0.04	@ 2.054		@ 1.845
1	6	1.62T	-0.14	3.92	-0.76	-2.66	0.70	0.72	-1.33	2.29
	7	1.25C	0.14	-1.23	-0.76	0.20	-1.33	@ 1.843	@ 2.668	@ 1.788
1	7	0.64T	0.21	1.61	-0.72	-1.18	1.31			
	8	0.36C	-0.21	-0.18	-0.72	0.00	-0.37			
1	6	0.68T	0.00	-1.65	-0.01	0.79	0.01	-1.15		1.89
	9	0.86C	0.00	1.53	-0.01	0.03	-0.02	@ 1.950		@ 1.840
1	6	0.00C	0.00	-5.37	0.00	2.94	0.00	-2.06		4.38
	11	0.00C	0.00	3.67	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.44T	0.00	14.56	0.03	-2.10	-0.06	14.37		13.80
	10	0.44C	0.00	-13.60	0.03	0.00	0.06	@ 2.275		@ 2.231

Member Forces Ultimate (009 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W1 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.13	0.00	0.00	0.00	0.23		0.00
	2	0.00C	0.00	-1.13	0.00	0.00	0.00	@ 0.392		@ 0.000
1	2	0.00C	0.00	0.66	0.00	0.00	0.00	0.08		0.00
	3	0.00C	0.00	-0.69	0.00	0.00	0.00	@ 0.227		@ 0.000

WDCEng	Job No.	2466	Sheet No.	26	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (009 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W1 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	3	0.00C	0.00	3.48	0.00	0.00	0.00	2.21		0.04
	8	0.00C	0.00	-1.74	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.78T	0.00	2.61	0.00	-0.42	0.00	0.18	0.00	0.08
	5	1.78T	0.00	-1.11	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.35C	-0.01	0.10	0.01	0.00	-0.01	0.03		0.28
	5	1.86C	0.01	-0.47	0.01	-0.62	0.01	@ 0.570		@ 2.313
1	3	0.27C	0.00	0.12	0.01	0.00	-0.01	0.04		0.44
	6	0.27T	0.00	-0.52	0.01	-0.76	0.04	@ 0.637		@ 2.549
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.50T	0.02	-0.45	0.78	-0.08	-0.11			0.05
	6	2.31T	-0.02	-2.13	0.78	-0.87	0.36			@ 0.371
1	5	1.35C	0.01	-1.37	0.04	0.64	-0.11	-0.87		1.48
	9	2.35C	-0.01	1.23	0.04	-0.03	0.03	@ 2.054		@ 1.845
1	6	1.33T	-0.11	3.22	-0.62	-2.18	0.57	0.59	-1.08	1.87
	7	1.03C	0.11	-1.01	-0.62	0.16	-1.08	@ 1.843	@ 2.668	@ 1.788
1	7	0.53T	0.17	1.33	-0.59	-0.97	1.07			
	8	0.30C	-0.17	-0.16	-0.59	0.00	-0.31			
1	6	0.56T	0.00	-1.37	-0.01	0.65	0.00	-0.95		1.56
	9	0.71C	0.00	1.26	-0.01	0.02	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-4.41	0.00	2.41	0.00	-1.69		3.59
	11	0.00C	0.00	3.01	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.36T	0.00	11.90	0.02	-1.72	-0.05	11.74		11.27
	10	0.36C	0.00	-11.11	0.02	0.00	0.05	@ 2.275		@ 2.231

Member Forces Ultimate (011 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W2 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.13	0.00	0.00	0.00	0.23		0.00
	2	0.00C	0.00	-1.13	0.00	0.00	0.00	@ 0.392		@ 0.000
1	2	0.00C	0.00	0.66	0.00	0.00	0.00	0.08		0.00
	3	0.00C	0.00	-0.69	0.00	0.00	0.00	@ 0.227		@ 0.000
1	3	0.00C	0.00	3.48	0.00	0.00	0.00	2.21		0.04
	8	0.00C	0.00	-1.74	0.00	0.00	0.00	@ 1.386		@ 1.584

WDCEng	Job No.	2466	Sheet No.	27	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (011 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W2 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	4	1.78T	0.00	2.61	0.00	-0.42	0.00	0.18	0.00	0.08
	5	1.78T	0.00	-1.11	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.35C	-0.01	0.10	0.01	0.00	-0.01	0.03		0.28
	5	1.86C	0.01	-0.47	0.01	-0.62	0.01	@ 0.570		@ 2.313
1	3	0.27C	0.00	0.12	0.01	0.00	-0.01	0.04		0.44
	6	0.27T	0.00	-0.52	0.01	-0.76	0.04	@ 0.637		@ 2.549
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.50T	0.02	-0.45	0.78	-0.08	-0.11			0.05
	6	2.31T	-0.02	-2.13	0.78	-0.87	0.36			@ 0.371
1	5	1.35C	0.01	-1.37	0.04	0.64	-0.11	-0.87		1.48
	9	2.35C	-0.01	1.23	0.04	-0.03	0.03	@ 2.054		@ 1.845
1	6	1.33T	-0.11	3.22	-0.62	-2.18	0.57	0.59	-1.08	1.87
	7	1.03C	0.11	-1.01	-0.62	0.16	-1.08	@ 1.843	@ 2.668	@ 1.788
1	7	0.53T	0.17	1.33	-0.59	-0.97	1.07			
	8	0.30C	-0.17	-0.16	-0.59	0.00	-0.31			
1	6	0.56T	0.00	-1.37	-0.01	0.65	0.00	-0.95		1.56
	9	0.71C	0.00	1.26	-0.01	0.02	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-4.41	0.00	2.41	0.00	-1.69		3.59
	11	0.00C	0.00	3.01	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.36T	0.00	11.90	0.02	-1.72	-0.05	11.74		11.27
	10	0.36C	0.00	-11.11	0.02	0.00	0.05	@ 2.275		@ 2.231

Member Forces Ultimate (013 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W3 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.13	0.00	0.00	0.00	0.23		0.00
	2	0.00C	0.00	-1.13	0.00	0.00	0.00	@ 0.392		@ 0.000
1	2	0.00C	0.00	0.66	0.00	0.00	0.00	0.08		0.00
	3	0.00C	0.00	-0.69	0.00	0.00	0.00	@ 0.227		@ 0.000
1	3	0.00C	0.00	3.48	0.00	0.00	0.00	2.21		0.04
	8	0.00C	0.00	-1.74	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.78T	0.00	2.61	0.00	-0.42	0.00	0.18	0.00	0.08
	5	1.78T	0.00	-1.11	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464

WDCEng	Job No.	2466	Sheet No.	28	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (013 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W3 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.35C	-0.01	0.10	0.01	0.00	-0.01	0.03		0.28
	5	1.86C	0.01	-0.47	0.01	-0.62	0.01	@ 0.570		@ 2.313
1	3	0.27C	0.00	0.12	0.01	0.00	-0.01	0.04		0.44
	6	0.27T	0.00	-0.52	0.01	-0.76	0.04	@ 0.637		@ 2.549
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.50T	0.02	-0.45	0.78	-0.08	-0.11			0.05
	6	2.31T	-0.02	-2.13	0.78	-0.87	0.36			@ 0.371
1	5	1.35C	0.01	-1.37	0.04	0.64	-0.11	-0.87		1.48
	9	2.35C	-0.01	1.23	0.04	-0.03	0.03	@ 2.054		@ 1.845
1	6	1.33T	-0.11	3.22	-0.62	-2.18	0.57	0.59	-1.08	1.87
	7	1.03C	0.11	-1.01	-0.62	0.16	-1.08	@ 1.843	@ 2.668	@ 1.788
1	7	0.53T	0.17	1.33	-0.59	-0.97	1.07			
	8	0.30C	-0.17	-0.16	-0.59	0.00	-0.31			
1	6	0.56T	0.00	-1.37	-0.01	0.65	0.00	-0.95		1.56
	9	0.71C	0.00	1.26	-0.01	0.02	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-4.41	0.00	2.41	0.00	-1.69		3.59
	11	0.00C	0.00	3.01	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.36T	0.00	11.90	0.02	-1.72	-0.05	11.74		11.27
	10	0.36C	0.00	-11.11	0.02	0.00	0.05	@ 2.275		@ 2.231

Member Forces Ultimate (015 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W4 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.13	0.00	0.00	0.00	0.23		0.00
	2	0.00C	0.00	-1.13	0.00	0.00	0.00	@ 0.392		@ 0.000
1	2	0.00C	0.00	0.66	0.00	0.00	0.00	0.08		0.00
	3	0.00C	0.00	-0.69	0.00	0.00	0.00	@ 0.227		@ 0.000
1	3	0.00C	0.00	3.48	0.00	0.00	0.00	2.21		0.04
	8	0.00C	0.00	-1.74	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.78T	0.00	2.61	0.00	-0.42	0.00	0.18	0.00	0.08
	5	1.78T	0.00	-1.11	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000

WDCEng	Job No.	2466	Sheet No.	29	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (015 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W4 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	2	2.35C	-0.01	0.10	0.01	0.00	-0.01	0.03		0.28
	5	1.86C	0.01	-0.47	0.01	-0.62	0.01	@ 0.570		@ 2.313
1	3	0.27C	0.00	0.12	0.01	0.00	-0.01	0.04		0.44
	6	0.27T	0.00	-0.52	0.01	-0.76	0.04	@ 0.637		@ 2.549
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.50T	0.02	-0.45	0.78	-0.08	-0.11			0.05
	6	2.31T	-0.02	-2.13	0.78	-0.87	0.36			@ 0.371
1	5	1.35C	0.01	-1.37	0.04	0.64	-0.11	-0.87		1.48
	9	2.35C	-0.01	1.23	0.04	-0.03	0.03	@ 2.054		@ 1.845
1	6	1.33T	-0.11	3.22	-0.62	-2.18	0.57	0.59	-1.08	1.87
	7	1.03C	0.11	-1.01	-0.62	0.16	-1.08	@ 1.843	@ 2.668	@ 1.788
1	7	0.53T	0.17	1.33	-0.59	-0.97	1.07			
	8	0.30C	-0.17	-0.16	-0.59	0.00	-0.31			
1	6	0.56T	0.00	-1.37	-0.01	0.65	0.00	-0.95		1.56
	9	0.71C	0.00	1.26	-0.01	0.02	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-4.41	0.00	2.41	0.00	-1.69		3.59
	11	0.00C	0.00	3.01	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.36T	0.00	11.90	0.02	-1.72	-0.05	11.74		11.27
	10	0.36C	0.00	-11.11	0.02	0.00	0.05	@ 2.275		@ 2.231

Member Forces Ultimate (017 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W5 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.13	0.00	0.00	0.00	0.23		0.00
	2	0.00C	0.00	-1.13	0.00	0.00	0.00	@ 0.392		@ 0.000
1	2	0.00C	0.00	0.66	0.00	0.00	0.00	0.08		0.00
	3	0.00C	0.00	-0.69	0.00	0.00	0.00	@ 0.227		@ 0.000
1	3	0.00C	0.00	3.48	0.00	0.00	0.00	2.21		0.04
	8	0.00C	0.00	-1.74	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.78T	0.00	2.61	0.00	-0.42	0.00	0.18	0.00	0.08
	5	1.78T	0.00	-1.11	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.35C	-0.01	0.10	0.01	0.00	-0.01	0.03		0.28
	5	1.86C	0.01	-0.47	0.01	-0.62	0.01	@ 0.570		@ 2.313

WDCEng	Job No.	2466	Sheet No.	30	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (017 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W5 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	3	0.27C	0.00	0.12	0.01	0.00	-0.01	0.04		0.44
	6	0.27T	0.00	-0.52	0.01	-0.76	0.04	@ 0.637		@ 2.549
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.50T	0.02	-0.45	0.78	-0.08	-0.11			0.05
	6	2.31T	-0.02	-2.13	0.78	-0.87	0.36			@ 0.371
1	5	1.35C	0.01	-1.37	0.04	0.64	-0.11	-0.87		1.48
	9	2.35C	-0.01	1.23	0.04	-0.03	0.03	@ 2.054		@ 1.845
1	6	1.33T	-0.11	3.22	-0.62	-2.18	0.57	0.59	-1.08	1.87
	7	1.03C	0.11	-1.01	-0.62	0.16	-1.08	@ 1.843	@ 2.668	@ 1.788
1	7	0.53T	0.17	1.33	-0.59	-0.97	1.07			
	8	0.30C	-0.17	-0.16	-0.59	0.00	-0.31			
1	6	0.56T	0.00	-1.37	-0.01	0.65	0.00	-0.95		1.56
	9	0.71C	0.00	1.26	-0.01	0.02	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-4.41	0.00	2.41	0.00	-1.69		3.59
	11	0.00C	0.00	3.01	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.36T	0.00	11.90	0.02	-1.72	-0.05	11.74		11.27
	10	0.36C	0.00	-11.11	0.02	0.00	0.05	@ 2.275		@ 2.231

Member Forces Ultimate (019 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W6 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.13	0.00	0.00	0.00	0.23		0.00
	2	0.00C	0.00	-1.13	0.00	0.00	0.00	@ 0.392		@ 0.000
1	2	0.00C	0.00	0.66	0.00	0.00	0.00	0.08		0.00
	3	0.00C	0.00	-0.69	0.00	0.00	0.00	@ 0.227		@ 0.000
1	3	0.00C	0.00	3.48	0.00	0.00	0.00	2.21		0.04
	8	0.00C	0.00	-1.74	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.78T	0.00	2.61	0.00	-0.42	0.00	0.18	0.00	0.08
	5	1.78T	0.00	-1.11	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.35C	-0.01	0.10	0.01	0.00	-0.01	0.03		0.28
	5	1.86C	0.01	-0.47	0.01	-0.62	0.01	@ 0.570		@ 2.313
1	3	0.27C	0.00	0.12	0.01	0.00	-0.01	0.04		0.44
	6	0.27T	0.00	-0.52	0.01	-0.76	0.04	@ 0.637		@ 2.549

WDCEng	Job No.	2466	Sheet No.	31	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (019 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W6 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.50T	0.02	-0.45	0.78	-0.08	-0.11			0.05
	6	2.31T	-0.02	-2.13	0.78	-0.87	0.36			@ 0.371
1	5	1.35C	0.01	-1.37	0.04	0.64	-0.11	-0.87		1.48
	9	2.35C	-0.01	1.23	0.04	-0.03	0.03	@ 2.054		@ 1.845
1	6	1.33T	-0.11	3.22	-0.62	-2.18	0.57	0.59	-1.08	1.87
	7	1.03C	0.11	-1.01	-0.62	0.16	-1.08	@ 1.843	@ 2.668	@ 1.788
1	7	0.53T	0.17	1.33	-0.59	-0.97	1.07			
	8	0.30C	-0.17	-0.16	-0.59	0.00	-0.31			
1	6	0.56T	0.00	-1.37	-0.01	0.65	0.00	-0.95		1.56
	9	0.71C	0.00	1.26	-0.01	0.02	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-4.41	0.00	2.41	0.00	-1.69		3.59
	11	0.00C	0.00	3.01	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.36T	0.00	11.90	0.02	-1.72	-0.05	11.74		11.27
	10	0.36C	0.00	-11.11	0.02	0.00	0.05	@ 2.275		@ 2.231

Member Forces Ultimate (021 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W7 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.13	0.00	0.00	0.00	0.23		0.00
	2	0.00C	0.00	-1.13	0.00	0.00	0.00	@ 0.392		@ 0.000
1	2	0.00C	0.00	0.66	0.00	0.00	0.00	0.08		0.00
	3	0.00C	0.00	-0.69	0.00	0.00	0.00	@ 0.227		@ 0.000
1	3	0.00C	0.00	3.48	0.00	0.00	0.00	2.21		0.04
	8	0.00C	0.00	-1.74	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.78T	0.00	2.61	0.00	-0.42	0.00	0.18	0.00	0.08
	5	1.78T	0.00	-1.11	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.35C	-0.01	0.10	0.01	0.00	-0.01	0.03		0.28
	5	1.86C	0.01	-0.47	0.01	-0.62	0.01	@ 0.570		@ 2.313
1	3	0.27C	0.00	0.12	0.01	0.00	-0.01	0.04		0.44
	6	0.27T	0.00	-0.52	0.01	-0.76	0.04	@ 0.637		@ 2.549
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000

WDCEng	Job No.	2466	Sheet No.	32	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (021 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W7 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	5	1.50T	0.02	-0.45	0.78	-0.08	-0.11			0.05
	6	2.31T	-0.02	-2.13	0.78	-0.87	0.36			@ 0.371
1	5	1.35C	0.01	-1.37	0.04	0.64	-0.11	-0.87		1.48
	9	2.35C	-0.01	1.23	0.04	-0.03	0.03	@ 2.054		@ 1.845
1	6	1.33T	-0.11	3.22	-0.62	-2.18	0.57	0.59	-1.08	1.87
	7	1.03C	0.11	-1.01	-0.62	0.16	-1.08	@ 1.843	@ 2.668	@ 1.788
1	7	0.53T	0.17	1.33	-0.59	-0.97	1.07			
	8	0.30C	-0.17	-0.16	-0.59	0.00	-0.31			
1	6	0.56T	0.00	-1.37	-0.01	0.65	0.00	-0.95		1.56
	9	0.71C	0.00	1.26	-0.01	0.02	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-4.41	0.00	2.41	0.00	-1.69		3.59
	11	0.00C	0.00	3.01	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.36T	0.00	11.90	0.02	-1.72	-0.05	11.74		11.27
	10	0.36C	0.00	-11.11	0.02	0.00	0.05	@ 2.275		@ 2.231

Member Forces Ultimate (023 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W8 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.13	0.00	0.00	0.00	0.23		0.00
	2	0.00C	0.00	-1.13	0.00	0.00	0.00	@ 0.392		@ 0.000
1	2	0.00C	0.00	0.66	0.00	0.00	0.00	0.08		0.00
	3	0.00C	0.00	-0.69	0.00	0.00	0.00	@ 0.227		@ 0.000
1	3	0.00C	0.00	3.48	0.00	0.00	0.00	2.21		0.04
	8	0.00C	0.00	-1.74	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.78T	0.00	2.61	0.00	-0.42	0.00	0.18	0.00	0.08
	5	1.78T	0.00	-1.11	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.35C	-0.01	0.10	0.01	0.00	-0.01	0.03		0.28
	5	1.86C	0.01	-0.47	0.01	-0.62	0.01	@ 0.570		@ 2.313
1	3	0.27C	0.00	0.12	0.01	0.00	-0.01	0.04		0.44
	6	0.27T	0.00	-0.52	0.01	-0.76	0.04	@ 0.637		@ 2.549
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.50T	0.02	-0.45	0.78	-0.08	-0.11			0.05
	6	2.31T	-0.02	-2.13	0.78	-0.87	0.36			@ 0.371

WDceng	Job No.	2466	Sheet No.	33	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (023 : Dead+ Live+Wind 1.20D0+1.20D1+1.20L1+1.20W8 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	5	1.35C	0.01	-1.37	0.04	0.64	-0.11	-0.87		1.48
	9	2.35C	-0.01	1.23	0.04	-0.03	0.03	@ 2.054		@ 1.845
1	6	1.33T	-0.11	3.22	-0.62	-2.18	0.57	0.59	-1.08	1.87
	7	1.03C	0.11	-1.01	-0.62	0.16	-1.08	@ 1.843	@ 2.668	@ 1.788
1	7	0.53T	0.17	1.33	-0.59	-0.97	1.07			
	8	0.30C	-0.17	-0.16	-0.59	0.00	-0.31			
1	6	0.56T	0.00	-1.37	-0.01	0.65	0.00	-0.95		1.56
	9	0.71C	0.00	1.26	-0.01	0.02	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-4.41	0.00	2.41	0.00	-1.69		3.59
	11	0.00C	0.00	3.01	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.36T	0.00	11.90	0.02	-1.72	-0.05	11.74		11.27
	10	0.36C	0.00	-11.11	0.02	0.00	0.05	@ 2.275		@ 2.231

Member Forces Ultimate (025 : Dead+Wind 1.00D0+1.00D1+1.40W1 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.12	0.00	0.00	-0.01	0.05		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.771		@ 2.480
1	3	0.23C	0.00	0.13	0.01	0.00	0.00	0.06		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.900		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845

WDceng	Job No.	2466	Sheet No.	34	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (025 : Dead+Wind 1.00D0+1.00D1+1.40W1 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

Member Forces Ultimate (027 : Dead+Wind 1.00D0+1.00D1+1.40W2 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.12	0.00	0.00	-0.01	0.05		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.771		@ 2.480
1	3	0.23C	0.00	0.13	0.01	0.00	0.00	0.06		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.900		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788

WDceng	Job No.	2466	Sheet No.	35	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (027 : Dead+Wind 1.00D0+1.00D1+1.40W2 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

Member Forces Ultimate (029 : Dead+Wind 1.00D0+1.00D1+1.40W3 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.12	0.00	0.00	-0.01	0.05		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.771		@ 2.480
1	3	0.23C	0.00	0.13	0.01	0.00	0.00	0.06		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.900		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			

WDcEng	Job No.	2466	Sheet No.	36	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (029 : Dead+Wind 1.00D0+1.00D1+1.40W3 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

Member Forces Ultimate (031 : Dead+Wind 1.00D0+1.00D1+1.40W4 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.12	0.00	0.00	-0.01	0.05		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.771		@ 2.480
1	3	0.23C	0.00	0.13	0.01	0.00	0.00	0.06		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.900		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840

WDCEng	Job No.	2466	Sheet No.	37	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (031 : Dead+Wind 1.00D0+1.00D1+1.40W4 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

Member Forces Ultimate (033 : Dead+Wind 1.00D0+1.00D1+1.40W5 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.12	0.00	0.00	-0.01	0.05		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.771		@ 2.480
1	3	0.23C	0.00	0.13	0.01	0.00	0.00	0.06		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.900		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687

WDCEng	Job No.	2466	Sheet No.	38	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (033 : Dead+Wind 1.00D0+1.00D1+1.40W5 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

Member Forces Ultimate (035 : Dead+Wind 1.00D0+1.00D1+1.40W6 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.12	0.00	0.00	-0.01	0.05		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.771		@ 2.480
1	3	0.23C	0.00	0.13	0.01	0.00	0.00	0.06		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.900		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000

WDCEng	Job No.	2466	Sheet No.	39	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (035 : Dead+Wind 1.00D0+1.00D1+1.40W6 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

Member Forces Ultimate (037 : Dead+Wind 1.00D0+1.00D1+1.40W7 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.12	0.00	0.00	-0.01	0.05		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.771		@ 2.480
1	3	0.23C	0.00	0.13	0.01	0.00	0.00	0.06		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.900		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

WDCEng	Job No.	2466	Sheet No.	40	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (039 : Dead+Wind 1.00D0+1.00D1+1.40W8 (Ultimate))

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.12	0.00	0.00	-0.01	0.05		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.771		@ 2.480
1	3	0.23C	0.00	0.13	0.01	0.00	0.00	0.06		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.900		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

Member Forces Ultimate (Maximum Values)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	1.39	0.00	0.00	0.00	0.28		0.00
	2	0.00C	0.00	-1.39	0.00	0.00	0.00	@ 0.384		@ 0.000

WDCEng	Job No.	2466	Sheet No.	41	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (Maximum Values)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	2	0.00C	0.00	0.81	0.00	0.00	0.00	0.09		0.00
	3	0.00C	0.00	-0.84	0.00	0.00	0.00	@ 0.223		@ 0.000
1	3	0.00C	0.00	4.26	0.00	0.00	0.00	2.71		0.05
	8	0.00C	0.00	-2.13	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	2.15T	0.00	3.20	0.00	-0.51	0.00	0.22	0.00	0.10
	5	2.15T	0.00	-1.35	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.464
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	2.82C	-0.01	0.12	0.01	0.00	-0.01	0.05		0.35
	5	2.25C	0.01	-0.56	0.01	-0.75	0.02	@ 0.771		@ 2.279
1	3	0.32C	-0.01	0.13	0.01	0.00	-0.01	0.06		0.55
	6	0.32T	0.01	-0.62	0.01	-0.91	0.04	@ 0.900		@ 2.512
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	1.82T	0.02	-0.56	0.95	-0.09	-0.14			0.06
	6	2.81T	-0.02	-2.61	0.95	-1.07	0.43			@ 0.371
1	5	1.63C	0.01	-1.65	0.05	0.77	-0.13	-1.05		1.79
	9	2.84C	-0.01	1.49	0.05	-0.03	0.04	@ 2.054		@ 1.845
1	6	1.62T	-0.14	3.92	-0.76	-2.66	0.70	0.72	-1.33	2.29
	7	1.25C	0.14	-1.23	-0.76	0.20	-1.33	@ 1.843	@ 2.668	@ 1.788
1	7	0.64T	0.21	1.61	-0.72	-1.18	1.31			
	8	0.36C	-0.21	-0.18	-0.72	0.00	-0.37			
1	6	0.68T	0.00	-1.65	-0.01	0.79	0.01	-1.15		1.89
	9	0.86C	0.00	1.53	-0.01	0.03	-0.02	@ 1.950		@ 1.840
1	6	0.00C	0.00	-5.37	0.00	2.94	0.00	-2.06		4.38
	11	0.00C	0.00	3.67	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	-0.01	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.44T	0.00	14.56	0.03	-2.10	-0.06	14.37		13.80
	10	0.44C	0.00	-13.60	0.03	0.00	0.06	@ 2.275		@ 2.231

Member Forces Ultimate (Minimum Values)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	1	0.00C	0.00	0.61	0.00	0.00	0.00	0.12		0.00
	2	0.00C	0.00	-0.61	0.00	0.00	0.00	@ 0.376		@ 0.000
1	2	0.00C	0.00	0.36	0.00	0.00	0.00	0.04		0.00
	3	0.00C	0.00	-0.37	0.00	0.00	0.00	@ 0.209		@ 0.000

WDceng	Job No.	2466	Sheet No.	42	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Member Forces Ultimate (Minimum Values)

Load Case	Node End1 End2	Axial Force (kN)	Torque Moment (kNm)	Shear Force (kN)		Bending Moment (kNm)		Maximum Moment (kNm @ m)		Max Def (mm @ m)
				x-x	y-y	x-x	y-y	x-x	y-y	
1	3	0.00C	0.00	1.88	0.00	0.00	0.00	1.19		0.02
	8	0.00C	0.00	-0.94	0.00	0.00	0.00	@ 1.386		@ 1.584
1	4	1.17T	0.00	1.43	0.00	-0.23	0.00	0.10	0.00	0.04
	5	1.17T	0.00	-0.60	0.00	0.00	0.00	@ 0.480	@ 0.000	@ 0.472
1	1	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	4	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	2	1.56C	-0.01	0.10	0.00	0.00	-0.01	0.03		0.13
	5	1.16C	0.01	-0.36	0.00	-0.42	0.01	@ 0.570		@ 2.480
1	3	0.23C	0.00	0.12	0.01	0.00	0.00	0.04		0.21
	6	0.23T	0.00	-0.40	0.01	-0.50	0.02	@ 0.637		@ 2.737
1	4	0.00C	0.00	0.00	0.00	0.00	0.00			0.00
	9	0.00C	0.00	0.00	0.00	0.00	0.00			@ 0.000
1	5	0.96T	0.01	-0.19	0.45	-0.06	-0.06			0.03
	6	1.42T	-0.01	-1.14	0.45	-0.47	0.20			@ 0.371
1	5	0.96C	0.00	-0.87	0.02	0.42	-0.06	-0.53		0.89
	9	1.58C	0.00	0.75	0.02	-0.01	0.02	@ 2.054		@ 1.845
1	6	0.76T	-0.06	1.83	-0.34	-1.24	0.31	0.33	-0.59	1.03
	7	0.60C	0.06	-0.61	-0.34	0.06	-0.59	@ 1.816	@ 2.668	@ 1.788
1	7	0.32T	0.09	0.80	-0.32	-0.56	0.59			
	8	0.20C	-0.09	-0.14	-0.32	0.00	-0.17			
1	6	0.36T	0.00	-0.87	0.00	0.43	0.00	-0.57		0.92
	9	0.43C	0.00	0.76	0.00	0.01	-0.01	@ 1.950		@ 1.840
1	6	0.00C	0.00	-2.50	0.00	1.37	0.00	-0.96		2.03
	11	0.00C	0.00	1.70	0.00	0.00	0.00	@ 1.806		@ 1.687
1	9	0.00C	0.00	0.00	0.00	0.00	0.00	0.00		0.00
	11	0.00C	0.00	0.00	0.00	0.00	0.00	@ 0.000		@ 0.000
1	7	0.20T	0.00	6.53	0.01	-0.94	-0.03	6.44		6.18
	10	0.20C	0.00	-6.10	0.01	0.00	0.03	@ 2.275		@ 2.231

Support Reactions Serviceability (002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.944	0.000	0.000	0.000	0.000
2-1	0.000	2.828	1.433	0.000	-0.012	0.000
3-1	0.000	3.697	0.109	0.000	0.000	0.000
4-1	-1.482	2.176	0.000	0.000	0.000	0.347
6-1	1.054	10.702	-0.662	0.000	0.165	0.000
7-1	-0.142	12.257	0.149	0.000	1.408	0.000
8-1	0.205	1.685	0.474	0.000	0.292	0.000
9-1	0.361	2.871	-1.492	0.000	0.019	0.000
10-1	0.019	9.267	-0.010	0.000	-0.040	0.000
11-1	0.000	2.522	0.000	0.000	0.000	0.000

WDCEng	Job No.	2466	Sheet No.	43	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Support Reactions Serviceability (002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.944	0.000	0.000	0.000	0.000
Total	0.015	48.949	0.000	0.000	1.831	0.347

Support Reactions Serviceability (007 : Live Only 1.00L1 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.332	0.000	0.000	0.000	0.000
2-1	0.000	0.756	0.318	0.000	0.000	0.000
3-1	0.000	1.194	0.022	0.000	0.000	0.000
4-1	-0.316	0.749	0.000	0.000	0.000	0.116
6-1	0.229	3.201	-0.284	0.000	0.064	0.000
7-1	-0.050	4.045	0.053	0.000	0.481	0.000
8-1	0.074	0.528	0.158	0.000	0.099	0.000
9-1	0.061	0.724	-0.263	0.000	0.000	0.000
10-1	0.000	3.168	0.000	0.000	-0.014	0.000
11-1	0.000	0.811	0.000	0.000	0.000	0.000
Total	-0.002	15.508	0.004	0.000	0.631	0.116

Support Reactions Serviceability (008 : Dead Only 1.00D0+1.00D1 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (010 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W1 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
2-1	0.000	2.677	1.370	0.000	-0.012	0.000
3-1	0.000	3.458	0.105	0.000	0.000	0.000
4-1	-1.418	2.026	0.000	0.000	0.000	0.323
6-1	1.008	10.062	-0.605	0.000	0.152	0.000
7-1	-0.132	11.448	0.138	0.000	1.312	0.000
8-1	0.190	1.579	0.442	0.000	0.272	0.000
9-1	0.349	2.726	-1.439	0.000	0.018	0.000
10-1	0.017	8.633	0.000	0.000	-0.037	0.000
11-1	0.000	2.360	0.000	0.000	0.000	0.000
Total	0.014	45.848	0.010	0.000	1.705	0.323

Support Reactions Serviceability (012 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W2 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
2-1	0.000	2.677	1.370	0.000	-0.012	0.000
3-1	0.000	3.458	0.105	0.000	0.000	0.000

WDCEng	Job No.	2466	Sheet No.	44	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Support Reactions Serviceability (012 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W2 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
4-1	-1.418	2.026	0.000	0.000	0.000	0.323
6-1	1.008	10.062	-0.605	0.000	0.152	0.000
7-1	-0.132	11.448	0.138	0.000	1.312	0.000
8-1	0.190	1.579	0.442	0.000	0.272	0.000
9-1	0.349	2.726	-1.439	0.000	0.018	0.000
10-1	0.017	8.633	0.000	0.000	-0.037	0.000
11-1	0.000	2.360	0.000	0.000	0.000	0.000
Total	0.014	45.848	0.010	0.000	1.705	0.323

Support Reactions Serviceability (014 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W3 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
2-1	0.000	2.677	1.370	0.000	-0.012	0.000
3-1	0.000	3.458	0.105	0.000	0.000	0.000
4-1	-1.418	2.026	0.000	0.000	0.000	0.323
6-1	1.008	10.062	-0.605	0.000	0.152	0.000
7-1	-0.132	11.448	0.138	0.000	1.312	0.000
8-1	0.190	1.579	0.442	0.000	0.272	0.000
9-1	0.349	2.726	-1.439	0.000	0.018	0.000
10-1	0.017	8.633	0.000	0.000	-0.037	0.000
11-1	0.000	2.360	0.000	0.000	0.000	0.000
Total	0.014	45.848	0.010	0.000	1.705	0.323

Support Reactions Serviceability (016 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W4 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
2-1	0.000	2.677	1.370	0.000	-0.012	0.000
3-1	0.000	3.458	0.105	0.000	0.000	0.000
4-1	-1.418	2.026	0.000	0.000	0.000	0.323
6-1	1.008	10.062	-0.605	0.000	0.152	0.000
7-1	-0.132	11.448	0.138	0.000	1.312	0.000
8-1	0.190	1.579	0.442	0.000	0.272	0.000
9-1	0.349	2.726	-1.439	0.000	0.018	0.000
10-1	0.017	8.633	0.000	0.000	-0.037	0.000
11-1	0.000	2.360	0.000	0.000	0.000	0.000
Total	0.014	45.848	0.010	0.000	1.705	0.323

Support Reactions Serviceability (018 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W5 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
2-1	0.000	2.677	1.370	0.000	-0.012	0.000
3-1	0.000	3.458	0.105	0.000	0.000	0.000
4-1	-1.418	2.026	0.000	0.000	0.000	0.323
6-1	1.008	10.062	-0.605	0.000	0.152	0.000
7-1	-0.132	11.448	0.138	0.000	1.312	0.000
8-1	0.190	1.579	0.442	0.000	0.272	0.000
9-1	0.349	2.726	-1.439	0.000	0.018	0.000
10-1	0.017	8.633	0.000	0.000	-0.037	0.000
11-1	0.000	2.360	0.000	0.000	0.000	0.000
Total	0.014	45.848	0.010	0.000	1.705	0.323

Support Reactions Serviceability (020 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W6 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
2-1	0.000	2.677	1.370	0.000	-0.012	0.000
3-1	0.000	3.458	0.105	0.000	0.000	0.000
4-1	-1.418	2.026	0.000	0.000	0.000	0.323
6-1	1.008	10.062	-0.605	0.000	0.152	0.000
7-1	-0.132	11.448	0.138	0.000	1.312	0.000
8-1	0.190	1.579	0.442	0.000	0.272	0.000
9-1	0.349	2.726	-1.439	0.000	0.018	0.000
10-1	0.017	8.633	0.000	0.000	-0.037	0.000
11-1	0.000	2.360	0.000	0.000	0.000	0.000
Total	0.014	45.848	0.010	0.000	1.705	0.323

Support Reactions Serviceability (022 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W7 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
2-1	0.000	2.677	1.370	0.000	-0.012	0.000
3-1	0.000	3.458	0.105	0.000	0.000	0.000
4-1	-1.418	2.026	0.000	0.000	0.000	0.323
6-1	1.008	10.062	-0.605	0.000	0.152	0.000
7-1	-0.132	11.448	0.138	0.000	1.312	0.000
8-1	0.190	1.579	0.442	0.000	0.272	0.000
9-1	0.349	2.726	-1.439	0.000	0.018	0.000
10-1	0.017	8.633	0.000	0.000	-0.037	0.000
11-1	0.000	2.360	0.000	0.000	0.000	0.000
Total	0.014	45.848	0.010	0.000	1.705	0.323

Support Reactions Serviceability (024 : Dead+ Live+Wind 1.00D0+1.00D1+0.80L1+0.80W8 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.877	0.000	0.000	0.000	0.000
2-1	0.000	2.677	1.370	0.000	-0.012	0.000
3-1	0.000	3.458	0.105	0.000	0.000	0.000
4-1	-1.418	2.026	0.000	0.000	0.000	0.323
6-1	1.008	10.062	-0.605	0.000	0.152	0.000
7-1	-0.132	11.448	0.138	0.000	1.312	0.000
8-1	0.190	1.579	0.442	0.000	0.272	0.000
9-1	0.349	2.726	-1.439	0.000	0.018	0.000
10-1	0.017	8.633	0.000	0.000	-0.037	0.000
11-1	0.000	2.360	0.000	0.000	0.000	0.000
Total	0.014	45.848	0.010	0.000	1.705	0.323

Support Reactions Serviceability (026 : Dead+Wind 1.00D0+1.00D1+1.00W1 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000

WDCEng	Job No.	2466	Sheet No.	46	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Support Reactions Serviceability (026 : Dead+Wind 1.00D0+1.00D1+1.00W1 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (028 : Dead+Wind 1.00D0+1.00D1+1.00W2 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (030 : Dead+Wind 1.00D0+1.00D1+1.00W3 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (032 : Dead+Wind 1.00D0+1.00D1+1.00W4 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (034 : Dead+Wind 1.00D0+1.00D1+1.00W5 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000

WDCEng	Job No.	2466	Sheet No.	47	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Support Reactions Serviceability (034 : Dead+Wind 1.00D0+1.00D1+1.00W5 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (036 : Dead+Wind 1.00D0+1.00D1+1.00W6 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (038 : Dead+Wind 1.00D0+1.00D1+1.00W7 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (040 : Dead+Wind 1.00D0+1.00D1+1.00W8 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
2-1	0.000	2.072	1.115	0.000	0.000	0.000
3-1	0.000	2.503	0.087	0.000	0.000	0.000
4-1	-1.165	1.427	0.000	0.000	0.000	0.231
6-1	0.825	7.501	-0.378	0.000	0.101	0.000
7-1	-0.091	8.212	0.095	0.000	0.927	0.000
8-1	0.131	1.157	0.316	0.000	0.192	0.000
9-1	0.299	2.147	-1.229	0.000	0.015	0.000
10-1	0.012	6.099	0.000	0.000	-0.026	0.000
11-1	0.000	1.711	0.000	0.000	0.000	0.000

WDCEng	Job No.	2466	Sheet No.	48	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

Support Reactions Serviceability (040 : Dead+Wind 1.00D0+1.00D1+1.00W8 (Serviceability))

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.612	0.000	0.000	0.000	0.000
Total	0.011	33.441	0.007	0.000	1.209	0.231

Support Reactions Serviceability (Maximum Values)

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.944	0.000	0.000	0.000	0.000
2-1	0.000	2.828	1.433	0.000	-0.012	0.000
3-1	0.000	3.697	0.109	0.000	0.000	0.000
4-1	-1.482	2.176	0.000	0.000	0.000	0.347
6-1	1.054	10.702	-0.662	0.000	0.165	0.000
7-1	-0.142	12.257	0.149	0.000	1.408	0.000
8-1	0.205	1.685	0.474	0.000	0.292	0.000
9-1	0.361	2.871	-1.492	0.000	0.019	0.000
10-1	0.019	9.267	-0.010	0.000	-0.040	0.000
11-1	0.000	2.522	0.000	0.000	0.000	0.000
Total	0.015	48.949	0.010	0.000	1.831	0.347

Support Reactions Serviceability (Minimum Values)

Load Case	Directional Reactions (kN)			Moment Reactions (kNm)		
	Rx → (kN)	Ry ↑ (kN)	Rz ↗ (kN)	Mx → (kN)	My ↑ (kN)	Mz ↗ (kN)
1-1	0.000	0.332	0.000	0.000	0.000	0.000
2-1	0.000	0.756	0.318	0.000	0.000	0.000
3-1	0.000	1.194	0.022	0.000	0.000	0.000
4-1	-0.316	0.749	0.000	0.000	0.000	0.116
6-1	0.229	3.201	-0.284	0.000	0.064	0.000
7-1	-0.050	4.045	0.053	0.000	0.481	0.000
8-1	0.074	0.528	0.158	0.000	0.099	0.000
9-1	0.061	0.724	-0.263	0.000	0.000	0.000
10-1	0.000	3.168	0.000	0.000	-0.014	0.000
11-1	0.000	0.811	0.000	0.000	0.000	0.000
Total	-0.002	15.508	0.000	0.000	0.631	0.116

WDceng	Job No.	2466	Sheet No.	49	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date 5.12.2023	Chd by.	BD	Date 11.12.2023

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MASTERKEY : TIMBER DESIGN

AXIAL LOAD WITH MOMENT DESIGN TO BS 5268 : PART 2
Member TBL1Id 2 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 38, h = 147, 147x38 in Strength Class C24, No wane at bearing
Section Properties (c,cm³,cm)	Area 55.9, Zx 136.9, Zy 35.4, rx 4.24, ry 1.1
Specification	1 : Internal use in continuously heated building Long term loading
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Member Details	F = -1.482 kN, L = 0.8 m, Lx = 0.8 m, Ly = 0.8 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{mx.adm} = K_2.K_3.K_{7x}.K_8.\sigma_m$	1.00 x 1.00 x 1.08 x 1.00 x 7.50	8.11 N/mm²
$\sigma_{my.adm} = K_2.K_3.K_{7y}.K_8.\sigma_m$	1.00 x 1.00 x 1.17 x 1.00 x 7.50	8.78 N/mm²
$\sigma_{t.adm} = K_2.K_3.K_8.K_{14}.\sigma_t$	1.00 x 1.00 x 1.00 x 1.08 x 4.50	4.87 N/mm²
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.00 x 2.40	2.74 N/mm²
$\tau_{adm} = K_2.K_3.K_8.\tau$	1.00 x 1.00 x 1.00 x 0.71	0.71 N/mm²
$E = K_2.E_{mean}$	1.00 x 10800	10800.0 N/mm²

Tensile Resistance

$\sigma_{t.a}$ = F/Area	1.482 / 55.86 ≤ 4.87	0.27 N/mm²	OK

Axial Load with Moments Check

Critical Design Location	X = 0.000		
$\sigma_{mx.a}$ = Mx/Zx	0.347 / 136.86 ≤ 8.11	2.54 N/mm²	OK
$\sigma_t/\sigma_{t.adm}+\sigma_{mx}/\sigma_{mx.adm}$	0.27/4.87+2.54/8.11	0.368	OK

Shear and Bearing Check

Critical Design Location	X = 0.000		
τ_a = 1.5 Fv / Area	1.5 x 2.176 / 55.86 ≤ 0.71	0.58 N/mm²	OK
$\sigma_{c\perp ax}$ = Fvx / (b.Bx)	2.176 / (38 x 75) ≤ 2.74	0.76 N/mm²	OK

Deflection Check (Shear Deflection NOT Included)

Critical Load Case 002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)

$\delta = \delta_m$	In-span 0.07 ≤ L/333	0.07 mm	OK

WDCEng	Job No.	2466		Sheet No.	50	Rev.		
	Client.	Mr T Hudson						
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

MASTERKEY : TIMBER DESIGN

AXIAL LOAD WITH MOMENT DESIGN TO BS 5268 : PART 2
Member TBL1Id 12 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 94, h = 200, 200x94 in Strength Class C24, No wane at bearing
Section Properties (c,cm³,cm)	Area 188, Zx 626.7, Zy 294.5, rx 5.77, ry 2.71
Specification	1 : Internal use in continuously heated building Long term loading, 2 pieces of softwood, Load sharing
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Member Details	F = 1.956 kN, L = 3.352 m, Lx = 3.352 m, Ly = 3.352 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{mx.adm} = K_2.K_3.K_{7x}.K_8.\sigma_m$	1.00 x 1.00 x 1.05 x 1.10 x 7.50	8.63 N/mm²
$\sigma_{my.adm} = K_2.K_3.K_{7y}.K_8.\sigma_m$	1.00 x 1.00 x 1.14 x 1.10 x 7.50	9.37 N/mm²
$\sigma_{c.adm} = K_2.K_3.K_8.\sigma_c$	1.00 x 1.00 x 1.10 x 7.90	8.69 N/mm²
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.10 x 2.40	3.01 N/mm²
$\tau_{adm} = K_2.K_3\_.K_8.\tau$	1.00 x 1.00 x 1.10 x 0.71	0.78 N/mm²
E = $K_2.K_20.E_m$ean (Compression)	1.00 x 1.00 x 10800	8208.0 N/mm²
E = $K_2.E_m$ean (Deflection)	1.00 x 10800	10800.0 N/mm²

Compression Resistance

λ = Max(Lex/rx, Ley/ry)	Max(335/5.774, 335/2.714) ≤ 180	123.5	OK
K_{12} = fn(λ , $K_3.\sigma_c$, E)	123.53, 7.90, 8208	0.319	
$\sigma_{c.adm} = K_{12}$. $\sigma_{c.adm}$	0.319 x 8.69	2.77 N/mm²	
$\sigma_{c.a}$ = F/Area	1.956 / 188 ≤ 2.77	0.10 N/mm²	OK

Axial Load with Moments Check

Critical Design Location	X = 3.352		
$\sigma_{mx.a}$ = Mx/Zx	0.520 / 626.67 ≤ 8.63	0.83 N/mm²	OK
$\sigma_{my.a}$ = My/Zy	0.011 / 294.53 ≤ 9.37	0.04 N/mm²	OK
$\sigma_{mx.adm}=\sigma_{mx.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	8.63 (1-1.5x0.319x0.10/5.31)	8.55 N/mm²	
$\sigma_{my.adm}=\sigma_{my.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	9.37 (1-1.5x0.319x0.10/5.31)	9.29 N/mm²	
$\sigma_c/\sigma_{c.adm}+\sigma_{mx}/\sigma_{mx.adm}+\sigma_{my}/\sigma_{my.adm}$	0.10/2.77+0.83/8.55+0.04/9.29	0.139	OK

Shear and Bearing Check

Critical Design Location	X = 2.807		
τ_a = 1.5 $\sqrt{(Fvx^2+Fvy^2)}$ / Area	1.5 $\sqrt{(0.317^2+0.006^2)}$ / 188 ≤ 0.78	0.03 N/mm²	OK
$\sigma_{c\perp ax}$ = Fvx / (b.Bx)	0.317 / (94 x 75) ≤ 3.01	0.04 N/mm²	OK
$\sigma_{c\perp ay}$ = Fvy / (h.By)	0.006 / (200 x 75) ≤ 3.01	0.00 N/mm²	OK

Deflection Check (Shear Deflection NOT Included)

Critical Load Case 002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)

$\delta = \delta_m$	In-span 0.23 ≤ L/333	0.23 mm	OK

WDCEng	Job No.	2466		Sheet No.	51	Rev.		
	Client.	Mr T Hudson						
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

MASTERKEY : TIMBER DESIGN

AXIAL LOAD WITH MOMENT DESIGN TO BS 5268 : PART 2
Member TBL1Id 15 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 94, h = 200, 200x94 in Strength Class C24
Section Properties (c,cm³,cm)	Area 188, Zx 626.7, Zy 294.5, rx 5.77, ry 2.71
Specification	1 : Internal use in continuously heated building Long term loading, 2 pieces of softwood, Load sharing
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Member Details	F = 0.229 kN, L = 3.749 m, Lx = 3.749 m, Ly = 3.749 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{mx.adm} = K_2.K_3.K_{7x}.K_8.\sigma_m$	1.00 x 1.00 x 1.05 x 1.10 x 7.50	8.63 N/mm²	
$\sigma_{my.adm} = K_2.K_3.K_{7y}.K_8.\sigma_m$	1.00 x 1.00 x 1.14 x 1.10 x 7.50	9.37 N/mm²	
$\sigma_{c.adm} = K_2.K_3.K_8.\sigma_c$	1.00 x 1.00 x 1.10 x 7.90	8.69 N/mm²	
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.10 x 1.90	2.38 N/mm²	
$\tau_{adm} = K_2.K_3\_.K_8.\tau$	1.00 x 1.00 x 1.10 x 0.71	0.78 N/mm²	
E = $K_2.K_20.E_m$ean (Compression)	1.00 x 1.00 x 10800	8208.0 N/mm²	
E = $K_2.E_m$ean (Deflection)	1.00 x 10800	10800.0 N/mm²	

Compression Resistance

λ = Max(Lex/rx, Ley/ry)	Max(375/5.774, 375/2.714) ≤ 180	138.2	OK
K_{12} = fn(λ , $K_3.\sigma_c$, E)	138.16, 7.90, 8208	0.268	
$\sigma_{c.adm} = K_{12}$. $\sigma_{c.adm}$	0.268 x 8.69	2.33 N/mm²	
$\sigma_{c.a}$ = F/Area	0.229 / 188 ≤ 2.33	0.01 N/mm²	OK

Axial Load with Moments Check

Critical Design Location	X = 3.749		
$\sigma_{mx.a}$ = Mx/Zx	0.630 / 626.67 ≤ 8.63	1.01 N/mm²	OK
$\sigma_{my.a}$ = My/Zy	0.030 / 294.53 ≤ 9.37	0.10 N/mm²	OK
$\sigma_{mx.adm}=\sigma_{mx.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	8.63 (1-1.5x0.268x0.01/4.24)	8.62 N/mm²	
$\sigma_{my.adm}=\sigma_{my.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	9.37 (1-1.5x0.268x0.01/4.24)	9.36 N/mm²	
$\sigma_c/\sigma_{c.adm}+\sigma_{mx}/\sigma_{mx.adm}+\sigma_{my}/\sigma_{my.adm}$	0.01/2.33+1.01/8.62+0.10/9.36	0.133	OK

Shear and Bearing Check

Critical Design Location	X = 2.953		
τ_a = 1.5 $\sqrt{(Fvx^2+Fvy^2)}$ / Area	1.5 $\sqrt{(0.32^2+0.009^2)}$ / 188 ≤ 0.78	0.03 N/mm²	OK
$\sigma_{c\perp ax}$ = Fvx / (b.Bx)	0.32 / (94 x 75) ≤ 2.38	0.05 N/mm²	OK
$\sigma_{c\perp ay}$ = Fvy / (h.By)	0.009 / (200 x 75) ≤ 2.38	0.00 N/mm²	OK

Deflection Check (Shear Deflection NOT Included)

Critical Load Case 002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)

$\delta = \delta_m$	In-span 0.37 ≤ L/333	0.37 mm	OK

WDceng	Job No.	2466		Sheet No.	52	Rev.		
	Client.	Mr T Hudson						
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

MASTERKEY : TIMBER DESIGN

AXIAL LOAD WITH MOMENT DESIGN TO BS 5268 : PART 2
Member TBL1Id 7 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 94, h = 200, 200x94 in Strength Class C24, No wane at bearing
Section Properties (c,cm³,cm)	Area 188, Zx 626.7, Zy 294.5, rx 5.77, ry 2.71
Specification	1 : Internal use in continuously heated building Long term loading, 2 pieces of softwood
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Member Details	F = -1.925 kN, L = 0.601 m, Lx = 0.601 m, Ly = 0.601 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{mx.adm} = K_2.K_3.K_{7x}.K_8.\sigma_m$	1.00 x 1.00 x 1.05 x 1.00 x 7.50	7.84 N/mm²	
$\sigma_{my.adm} = K_2.K_3.K_{7y}.K_8.\sigma_m$	1.00 x 1.00 x 1.14 x 1.00 x 7.50	8.52 N/mm²	
$\sigma_{t.adm} = K_2.K_3.K_8.K_{14}.\sigma_t$	1.00 x 1.00 x 1.00 x 1.05 x 4.50	4.71 N/mm²	
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.00 x 2.40	2.74 N/mm²	
$\tau_{adm} = K_2.K_3\_.K_8.\tau$	1.00 x 1.00 x 1.00 x 0.71	0.71 N/mm²	
$E = K_2.E_m$ean	1.00 x 10800	10800.0 N/mm²	

Tensile Resistance

$\sigma_{t.a}$ = F/Area	1.925 / 188 ≤ 4.71	0.10 N/mm²	OK

Axial Load with Moments Check

Critical Design Location	X = 0.601		
$\sigma_{mx.a}$ = Mx/Zx	0.728 / 626.67 ≤ 7.84	1.16 N/mm²	OK
$\sigma_{my.a}$ = My/Zy	0.297 / 294.53 ≤ 8.52	1.01 N/mm²	OK
$\sigma_t/\sigma_{t.adm}+\sigma_{mx}/\sigma_{mx.adm}+\sigma_{my}/\sigma_{my.adm}$	0.10/4.71+1.16/7.84+1.01/8.52	0.288	OK

Shear and Bearing Check

Critical Design Location	X = 0.570		
$\tau_a = 1.5\sqrt{(Fvx^2+Fvy^2)}$ / Area	1.5 √(1.713²+0.65²) / 188 ≤ 0.71	0.15 N/mm²	OK
$\sigma_{c\perp ax}$ = Fvx / (b.Bx)	1.713 / (94 x 75) ≤ 2.74	0.24 N/mm²	OK
$\sigma_{c\perp ay}$ = Fvy / (h.By)	0.65 / (200 x 75) ≤ 2.74	0.04 N/mm²	OK

Deflection Check (Shear Deflection NOT Included)

Critical Load Case 002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)			
$\delta = \delta_m$	In-span 0.04 ≤ L/333	0.04 mm	OK

WDCEng	Job No.	2466	Sheet No.	53	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date 5.12.2023	Chd by.	BD	Date 11.12.2023

MASTERKEY : TIMBER DESIGN

AXIAL LOAD WITH MOMENT DESIGN TO BS 5268 : PART 2
Member TBL1Id 8 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 94, h = 200, 200x94 in Strength Class C24, No wane at bearing
Section Properties (c,cm³,cm)	Area 188, Zx 626.7, Zy 294.5, rx 5.77, ry 2.71
Specification	1 : Internal use in continuously heated building Long term loading, 2 pieces of softwood, Load sharing
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Member Details	F = 1.96 kN, L = 3.481 m, Lx = 3.481 m, Ly = 3.481 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{mx.adm} = K_2.K_3.K_{7x}.K_8.\sigma_m$	1.00 x 1.00 x 1.05 x 1.10 x 7.50	8.63 N/mm²
$\sigma_{my.adm} = K_2.K_3.K_{7y}.K_8.\sigma_m$	1.00 x 1.00 x 1.14 x 1.10 x 7.50	9.37 N/mm²
$\sigma_{c.adm} = K_2.K_3.K_8.\sigma_c$	1.00 x 1.00 x 1.10 x 7.90	8.69 N/mm²
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.10 x 2.40	3.01 N/mm²
$\tau_{adm} = K_2.K_3\_.K_8.\tau$	1.00 x 1.00 x 1.10 x 0.71	0.78 N/mm²
$E = K_2.K_20.E_m$ean (Compression)	1.00 x 1.00 x 10800	8208.0 N/mm²
$E = K_2.E_m$ean (Deflection)	1.00 x 10800	10800.0 N/mm²

Compression Resistance

λ = Max(Lex/rx, Ley/ry)	Max(348/5.774, 348/2.714) ≤ 180	128.3	OK
K_{12} = fn(λ , $K_3.\sigma_c$, E)	128.28, 7.90, 8208	0.301	
$\sigma_{c.adm} = K_{12}$. $\sigma_{c.adm}$	0.301 x 8.69	2.61 N/mm²	
$\sigma_{c.a}$ = F/Area	1.96 / 188 ≤ 2.61	0.10 N/mm²	OK

Axial Load with Moments Check

Critical Design Location	X = 1.958		
$\sigma_{mx.a}$ = Mx/Zx	0.718 / 626.67 ≤ 8.63	1.15 N/mm²	OK
$\sigma_{my.a}$ = My/Zy	0.023 / 294.53 ≤ 9.37	0.08 N/mm²	OK
$\sigma_{mx.adm}=\sigma_{mx.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	8.63 (1-1.5x0.301x0.10/4.92)	8.54 N/mm²	
$\sigma_{my.adm}=\sigma_{my.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	9.37 (1-1.5x0.301x0.10/4.92)	9.28 N/mm²	
$\sigma_c/\sigma_{c.adm}+\sigma_{mx}/\sigma_{mx.adm}+\sigma_{my}/\sigma_{my.adm}$	0.10/2.61+1.15/8.54+0.08/9.28	0.183	OK

Shear and Bearing Check

Critical Design Location	X = 0.000		
$\tau_a = 1.5\ \sqrt{(Fvx^2+Fvy^2)}$ / Area	1.5 √(1.141²+0.034²) / 188 ≤ 0.78	0.09 N/mm²	OK
$\sigma_{c\perp ax}$ = Fvx / (b.Bx)	1.141 / (94 x 75) ≤ 3.01	0.16 N/mm²	OK
$\sigma_{c\perp ay}$ = Fvy / (h.By)	0.034 / (200 x 75) ≤ 3.01	0.00 N/mm²	OK

Deflection Check (Shear Deflection NOT Included)

Critical Load Case 002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)

$\delta = \delta_m$	In-span 1.23 ≤ L/333	1.23 mm	OK

WDceng	Job No.	2466	Sheet No.	54	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date 5.12.2023	Chd by.	BD	Date 11.12.2023

MASTERKEY : TIMBER DESIGN

AXIAL LOAD WITH MOMENT DESIGN TO BS 5268 : PART 2
Member TBL1Id 9 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 94, h = 200, 200x94 in Strength Class C24, No wane at bearing
Section Properties (c,cm³,cm)	Area 188, Zx 626.7, Zy 294.5, rx 5.77, ry 2.71
Specification	1 : Internal use in continuously heated building Long term loading, 2 pieces of softwood
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Member Details	F = 0.858 kN, L = 4.995 m, Lx = 4.995 m, Ly = 4.995 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{mx.adm} = K_2.K_3.K_{7x}.K_8.\sigma_m$	1.00 x 1.00 x 1.05 x 1.00 x 7.50	7.84 N/mm²	
$\sigma_{my.adm} = K_2.K_3.K_{7y}.K_8.\sigma_m$	1.00 x 1.00 x 1.14 x 1.00 x 7.50	8.52 N/mm²	
$\sigma_{c.adm} = K_2.K_3.K_8.\sigma_c$	1.00 x 1.00 x 1.00 x 7.90	7.90 N/mm²	
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.00 x 2.40	2.74 N/mm²	
$\tau_{adm} = K_2.K_3\_.K_8.\tau$	1.00 x 1.00 x 1.00 x 0.71	0.71 N/mm²	
E = $K_2.K_20.E_m$ean (Compression)	1.00 x 1.00 x 10800	8208.0 N/mm²	
E = $K_2.E_m$ean (Deflection)	1.00 x 10800	10800.0 N/mm²	

Compression Resistance

λ = Max(Lex/rx, Ley/ry)	Max(500/5.774, 500/2.714) ≤ 180	184.1	Warning
K_{12} = fn(λ , $K_3.\sigma_c$, E)	184.08, 7.90, 8208	0.165	
$\sigma_{c.adm} = K_{12}$. $\sigma_{c.adm}$	0.165 x 7.90	1.30 N/mm²	
$\sigma_{c.a}$ = F/Area	0.858 / 188 ≤ 1.30	0.05 N/mm²	OK

Axial Load with Moments Check

Critical Design Location	X = 0.000		
$\sigma_{mx.a}$ = Mx/Zx	1.819 / 626.67 ≤ 7.84	2.90 N/mm²	OK
$\sigma_{my.a}$ = My/Zy	0.476 / 294.53 ≤ 8.52	1.62 N/mm²	OK
$\sigma_{mx.adm}=\sigma_{mx.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	7.84 (1-1.5x0.165x0.05/2.39)	7.81 N/mm²	
$\sigma_{my.adm}=\sigma_{my.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	8.52 (1-1.5x0.165x0.05/2.39)	8.48 N/mm²	
$\sigma_c/\sigma_{c.adm}+\sigma_{mx}/\sigma_{mx.adm}+\sigma_{my}/\sigma_{my.adm}$	0.05/1.30+2.90/7.81+1.62/8.48	0.598	OK

Shear and Bearing Check

Critical Design Location	X = 0.000		
τ_a = 1.5 √(Fvx²+Fvy²) / Area	1.5 √(2.68²+0.517²) / 188 ≤ 0.71	0.22 N/mm²	OK
$\sigma_{c\perp ax}$ = Fvx / (b.Bx)	2.68 / (94 x 75) ≤ 2.74	0.38 N/mm²	OK
$\sigma_{c\perp ay}$ = Fvy / (h.By)	0.517 / (200 x 75) ≤ 2.74	0.03 N/mm²	OK

Deflection Check (Shear Deflection NOT Included)

Critical Load Case 002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)

δ = δ_m	In-span 1.56 ≤ L/333	1.56 mm	OK

WDCEng	Job No.	2466		Sheet No.	55	Rev.		
	Client.	Mr T Hudson						
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

MASTERKEY : TIMBER DESIGN

AXIAL LOAD WITH MOMENT DESIGN TO BS 5268 : PART 2
Member TBL1Id 10 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 94, h = 200, 200x94 in Strength Class C24, No wane at bearing
Section Properties (c,cm³,cm)	Area 188, Zx 626.7, Zy 294.5, rx 5.77, ry 2.71
Specification	1 : Internal use in continuously heated building Long term loading, 2 pieces of softwood
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Member Details	F = 0.592 kN, L = 3.458 m, Lx = 3.458 m, Ly = 3.458 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{mx.adm} = K_2.K_3.K_{7x}.K_8.\sigma_m$	1.00 x 1.00 x 1.05 x 1.00 x 7.50	7.84 N/mm²
$\sigma_{my.adm} = K_2.K_3.K_{7y}.K_8.\sigma_m$	1.00 x 1.00 x 1.14 x 1.00 x 7.50	8.52 N/mm²
$\sigma_{c.adm} = K_2.K_3.K_8.\sigma_c$	1.00 x 1.00 x 1.00 x 7.90	7.90 N/mm²
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.00 x 2.40	2.74 N/mm²
$\tau_{adm} = K_2.K_3\_.K_8.\tau$	1.00 x 1.00 x 1.00 x 0.71	0.71 N/mm²
E = $K_2.K_20.E_m$ean (Compression)	1.00 x 1.00 x 10800	8208.0 N/mm²
E = $K_2.E_m$ean (Deflection)	1.00 x 10800	10800.0 N/mm²

Compression Resistance

λ = Max(Lex/rx, Ley/ry)	Max(346/5.774, 346/2.714) ≤ 180	127.4	OK
K_{12} = fn(λ , $K_3.\sigma_c$, E)	127.43, 7.90, 8208	0.304	
$\sigma_{c.adm} = K_{12}$. $\sigma_{c.adm}$	0.304 x 7.90	2.40 N/mm²	
$\sigma_{c.a}$ = F/Area	0.592 / 188 ≤ 2.40	0.03 N/mm²	OK

Axial Load with Moments Check

Critical Design Location	X = 2.032		
$\sigma_{mx.a}$ = Mx/Zx	0.789 / 626.67 ≤ 7.84	1.26 N/mm²	OK
$\sigma_{my.a}$ = My/Zy	0.006 / 294.53 ≤ 8.52	0.02 N/mm²	OK
$\sigma_{mx.adm}=\sigma_{mx.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	7.84 (1-1.5x0.304x0.03/4.99)	7.82 N/mm²	
$\sigma_{my.adm}=\sigma_{my.adm}(1\text{-}1.5\ K_{12}.\sigma_{c.a}/\sigma_e)$	8.52 (1-1.5x0.304x0.03/4.99)	8.50 N/mm²	
$\sigma_c/\sigma_{c.adm}+\sigma_{mx}/\sigma_{mx.adm}+\sigma_{my}/\sigma_{my.adm}$	0.03/2.40+1.26/7.82+0.02/8.50	0.177	OK

Shear and Bearing Check

Critical Design Location	X = 0.000		
τ_a = 1.5 √(Fvx²+Fvy²) / Area	1.5 √(1.142²+0.004²) / 188 ≤ 0.71	0.09 N/mm²	OK
$\sigma_{c\perp ax}$ = Fvx / (b.Bx)	1.142 / (94 x 75) ≤ 2.74	0.16 N/mm²	OK
$\sigma_{c\perp ay}$ = Fvy / (h.By)	0.004 / (200 x 75) ≤ 2.74	0.00 N/mm²	OK

Deflection Check (Shear Deflection NOT Included)

Critical Load Case 002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)			
δ = δ_m	In-span 1.30 ≤ L/333	1.30 mm	OK

WDceng	Job No.	2466		Sheet No.	56	Rev.		
	Client.	Mr T Hudson						
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001						
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

MASTERKEY : TIMBER DESIGN

AXIAL LOAD WITH MOMENT DESIGN TO BS 5268 : PART 2
Member TBL1Id 18 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 47, h = 200, 200x47 in Strength Class C24, No wane at bearing
Section Properties (c,cm³,cm)	Area 94, Zx 313.3, Zy 73.6, rx 5.77, ry 1.36
Specification	1 : Internal use in continuously heated building Long term loading
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Member Details	F = 0.0 kN, L = 2.96 m, Lx = 2.96 m, Ly = 2.96 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{mx.adm} = K_2.K_3.K_{7x}.K_8.\sigma_m$	1.00 x 1.00 x 1.05 x 1.00 x 7.50	7.84 N/mm²
$\sigma_{my.adm} = K_2.K_3.K_{7y}.K_8.\sigma_m$	1.00 x 1.00 x 1.17 x 1.00 x 7.50	8.78 N/mm²
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.00 x 2.40	2.74 N/mm²
$\tau_{adm} = K_2.K_3.K_8.\tau$	1.00 x 1.00 x 1.00 x 0.71	0.71 N/mm²
$E = K_2.E_{mean}$	1.00 x 10800	10800.0 N/mm²

Axial Load with Moments Check

Critical Design Location	X = 0.000		
$\sigma_{mx.a} = Mx/Zx$	2.008 / 313.33 ≤ 7.84	6.41 N/mm²	OK
$\sigma_{mx}/\sigma_{mx.adm}$	6.41/7.84	0.817	OK

Shear and Bearing Check

Critical Design Location	X = 0.000		
τ_a = 1.5 Fv / Area	1.5 x 3.671 / 94 ≤ 0.71	0.59 N/mm²	OK
$\sigma_{c\perp ax}$ = Fvx / (b.Bx)	3.671 / (47 x 75) ≤ 2.74	1.04 N/mm²	OK

Deflection Check (Shear Deflection NOT Included)

Critical Load Case 002 : Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)

$\delta = \delta_m$	In-span 2.99 ≤ L/333	2.99 mm	OK

WDcEng	Job No.	2466	Sheet No.	57	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date 5.12.2023	Chd by.	BD	Date 11.12.2023

MASTERKEY : TIMBER DESIGN

FLITCH BEAM DESIGN TO BS 5268 : PART 2
Member TBL1Id 21 @ Level 1

Summary Design Data

Design Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Deflection Cases Covered	2, 7-8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38 & 40
Section Size	b = 47, h = 200, (2) 47 x 200 in Strength Class C24 , no wane at bearing
Steel Plates Section Size	b = 10, h = 200, (1) 10 x 200 in Grade S 275
Section Properties (cm^2,cm^3,cm)	Area 94, Zx 1892.1, Zy 366.3, rx 5.77, ry 1.83
Steel Properties (cm^2,cm^4)	Area 20, Ix 12654.3, Iy 31.6
Specification	1 : Internal use in continuously heated building Long Term loading, 2 pieces of softwood
Integrated Design Critical Case	: Dead+Live 1.00D0+1.00D1+1.00L1 (Serviceability)
Steel Design Factor, γ_{ult}	All steel design forces factored by the user defined Ult/Serv factor of 1.2
Member Details	F = 0.303 kN, L = 4.375 m, Lx = 4.375 m, Ly = 4.375 m, Lex = 1.0 Lx, Ley = 1.0 Ly Bearing length B 75, Distance to Bearing 150 mm

Grade and Admissible Stresses (Strength Class C24)

$\sigma_{m.adm} = K_2.K_3.K_7.K_8.\sigma_m$	1.00 x 1.00 x 1.05 x 1.00 x 7.50	7.84 N/mm²	
$\sigma_{c.adm} = K_2.K_3.K_8.\sigma_c$	1.00 x 1.00 x 1.00 x 7.90	7.90 N/mm²	
$\sigma_{c\perp.adm} = K_2.K_3.K_4.K_8.\sigma_{c\perp}$	1.00 x 1.00 x 1.14 x 1.00 x 2.40	2.74 N/mm²	
$\tau_{adm} = K_2.K_3\_.K_8.\tau$	1.00 x 1.00 x 1.00 x 0.71	0.71 N/mm²	
$E = K_2.K_20.E_mean$ (Compression)	1.00 x 1.00 x 10800	8208.0 N/mm²	
$E = K_2.E_mean$ (Deflection)	1.00 x 10800	10800.0 N/mm²	

Compression Resistance

$\lambda = Max(L_{ex} / r_x, L_{ey} / r_y)$	Max(4375 / 57.74, 4375 / 18.32) = 250	238.83	OK
$K_{12} = fn(\lambda, \sigma_c, E)$	238.83, 7.9, 7632	0.092	
$\sigma_{c,\,adm} = K_{12} \bullet \sigma_{c,\,adm}$	0.092 x 7.9	0.73 N/mm²	
$\sigma_{c,\,a} = F / Area$	0.303 / 188 = 0.73	0.016 N/mm²	OK

Bending Stresses in Timber

$\sigma_{t,x} = M_x / Z_t$	9.78 / 1892.1 = 7.84	5.17 N/mm²	OK
$\sigma_{t,y} = M_y / Z_t$	0.001 / 366.3 = 8.78	0.003 N/mm²	OK
$\sigma_{mx,\,adm} \bullet (1-1.5 \bullet K_{12} \bullet \sigma_{c,\,a}/\sigma_e)$	7.84 x (1 - 1.5 x 0.092 x 0.016) / 1.25	7.83 N/mm²	
$\sigma_{my,\,adm} \bullet (1-1.5 \bullet K_{12} \bullet \sigma_{c,\,a}/\sigma_e)$	8.78 x (1 - 1.5 x 0.092 x 0.016) / 1.25	8.76 N/mm²	
$U_{comb} = U_c + U_{mt,\,x} + U_{mt,\,y}$	0.016/0.73 + 5.17/7.83 + 0.003/8.76	0.683	OK

Bending Stresses in Steel

$\sigma_{s,x} = \gamma_{ult}.mr \bullet M_x / Z_s$	(1.2 x 18.98 x 9.78) / 1892.09 = 275	117.72 N/mm²	OK
$\sigma_{s,y} = \gamma_{ult}.mr \bullet M_y / Z_s$	(1.2 x 18.98 x 0.001) / 3809.49 = 275	0.006 N/mm²	OK
$U_{comb} = U_{ms,\,x} + U_{ms,\,y}$	0.428 + 0	0.428	OK

Shear and Bearing Check

$\tau_{a,\,x} = \sqrt{(f_{vx} \bullet Fv_x / A_t)^2 + (f_{vy} \bullet Fv_y / A_t)^2}$	$\sqrt{(0.497x9.92^2 + 1.32x0.019^2)}$	0.262 N/mm²	OK
$\sigma_{ca} = Fv / (b.B.No_t)$	9.92 / (47 x 75 x 2) = 2.74	1.41 N/mm²	OK
$\sigma_{ca} = Fv / (b.B.No_t)$	0.019 / (200 x 10) = 2.4	0.01 N/mm²	OK

Deflection

9.39 = L / 333		9.39 mm	OK

Minimum Bolt Capacity

Basic Data	dia = 12 mm, baspar = 3.12 kN, K_{46} = 1.25, K_{56} = 1, K_{57} = 1	
Permissible Shear & Bearing Stress	pbss = 160 N/mm², pbbs = 460 N/mm²	
Load for bolt from Annex G BS 5268-2		
$P_{blt,90} = baspar \bullet K_{46} \bullet K_{56} \bullet K_{57}$	Perpendicular to grain, 3.12 x 1.25 x 1 x 1	4.15 kN
$P_{blt,0} = baspar \bullet K_{46} \bullet K_{56} \bullet K_{57}$	Parallel to grain, 4.44 x 1.25 x 1 x 1	5.54 kN
Bearing, $P_{bb} = d \bullet t_p \bullet p_{bb}$	(12 x 10 x 460) / 1000	55.2 kN
Shear, $P_s = p_s \bullet A_s$	(160 x 84) / 1000	13.44 kN
Bearing, $P_{bs} = k_{bs} \bullet d \bullet t_p \bullet p_{bs}$	1 x 12 x 10 x 410	49.2 kN

Check $P_{bs} < 0.5 \bullet k_{bs} \bullet e \bullet t_p \bullet p_{bs}$	49.2 < 0.5 x 1 x 55 x 10 x 410	112.75	OK
Bolt Capacity = Min($N_{pln}.P_{blt}$,$N_{pln}.P_s$,$N_{plt}.P_{bs}$)	min(2x4.15, 2x13.44, 1x55.2)	4.15 kN	

Minimum Number Of Bolts Along Length

$P_{stl,x} = UDL \bullet L \bullet I_{eff,s} / I_{cmb}$	5.29 x 4.38 x 12.7e3 / 18.9e3	15.47 kN	
$P_{stl,y} = \gamma_{ult}.Fv \bullet A_{eff,s} \bullet y'_s / I_{cmb,y} \bullet L$	100 x 0.023 x 94 x 2.85 / 1904.74 x 4.38	1.4 kN	
$P_{stl,Total} = Sqrt(P_{stl,x}/N_{pln}^2 + P_{stl,y}^2)$	$Sqrt(15.47/2^2 + 1.4^2)$	7.86 kN	
Max Bolt Spc. = Min($2.5 \bullet h_t$, 600)	Min(2.5 x 200, 600)	500 mm	
N_{bmin} = L/Max Spacing	4375 / 500	9	
No. Bolts=Max(N_{bmin} ,P_{stl} / $Bolt_{cap}$))	max(9, 7.86 / 4.15)	9	
Bolt load = P_{stl} / Num Bolts	7.86 / 9	0.874 kN	
Ut_{blt} = Bolt Load / Bolt Capacity	0.874 / 4.15	0.211	OK

Minimum Number Of Bolts At Ends

Proportion of load in steel plates			
$P_{stl} = Fv \bullet I_{eff,s} / I_{cmb}$	(11.9 x 12.7e3 / 18.9e3)	7.96 kN	
Num Bolts = Max(P_{stl} / P_{blt}, 2)	Max(7.96 / 4.15, 2)	2	

Minimum Bolt Spacing

Spacing = 4 • dia	4 x 12	48 mm

Bolt Summary

Minimum requirement for supports: 2 No. 12 mm diameter Grade 4.6 bolts.

Minimum requirement for beam: 9, 12 mm diameter Grade 4.6 bolts, placed at 500 mm centres, alternately staggered 50 mm above and below the centre line.

WDceng	Job No.	2466	Sheet No.	59	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date 5.12.2023	Chd by.	BD	Date 11.12.2023

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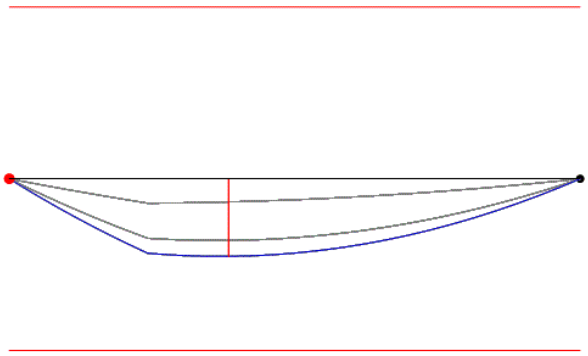
AXIAL WITH MOMENTS (MEMBER)
Member SBL1Id 1 @ Level 1 in Load Case 5

Member Loading and Member Forces
Loading Combination : 1 UT + 1.4 D0 + 1.4 D1 + 1.6 L1

D1 D 077.010 (kN/m³)
D1 UDLY -001.100 (kN/m)
L1 UDLY -003.200 (kN/m)
D1 PY -008.200 1.165 (kN,m)
L1 PY -004.100 1.165 (kN,m)



Member Forces in Load Case 5 and Maximum Deflection from Load Case 2

Member No.	Node End 1 End 2	Axial Force (kN)	Shear Force (kN)	Bending Moment (kNm)	Maximum Moment (kNm)	Maximum Deflection (mm @ m)
1	1	0.097C	30.473	0.000	32.049	10.532
	2	0.097C	-21.189	0.000	@ 1.763	@ 2.302

Classification and Properties (BS 5950: 2000)

Section (25.09 kg/m)	203x133 UB 25 [S 275]		
Class = Fn(b/T,d/t,py,F,Mx,My)	8.54, 30.25, 275, 0.1, 32.04, 0	(Axial: Non-Slender)	Plastic
Auto Design Load Cases	1, 3-6, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37 & 39		

Shear Capacity Check

Fvx/Pvx	30.473 / 191.11 =	0.159	OK

Local Capacity Check

Fvx/Pvx	0.501 / 191.11 =	0.003	Low Shear
Mcx = py.Sxx≤1.2 py.Zxx	275 x 257.7≤1.2 x 275 x 230.42 =	70.868 kN.m	
Pz = Ag.py	31.96 x 275 =	878.9 kN	
n = F/Pz	0.097 / 878.9 =	0.000	OK
Srx = Fn(Sxx,)	257.7, 0	257.7 cm³	
Mrx = Srx.py	257.7 x 275	70.868 kN.m	
$(Mx/Mrx)^{Z1}+(My/Mry)^{Z2}$	$(32.028/70.868)^2+(0)^1$=	0.204	OK

Compression Resistance Pc

λx = Lex/rxx	100x1x4.8/8.56 =	56.1	OK
Pcx = Area.pcx	31.96x244.338/10 =	780.903 kN	Table 24 a
λy = Ley/ryy	100x1x4.8/3.11 =	154.3	OK
Pcy = Area.pcy	31.96x70.8/10 =	226.267 kN	Table 24 b

Equivalent Uniform Moment Factors mLT, mx, my and myx

$m_{LT}=0.2+(.15M_2+.5M_3+.15M_4)/M_{max}$	0.2+(.15x31+.5x31+.15x20)/32 = 0.44	0.919	Table 18
$m_y=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x0+.6x0+.1x0)/0 = .8x0/0	1	Table 26
$m_x=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x31+.6x31+.1x20)/32 = .8x32/32	0.934	Table 26
$m_yx=0.2+(.1M_2+.6M_3+.1M_4)/M_{max}$	0.2+(.1x0+.6x0+.1x0)/0 = .8x0/0	1	Table 26

Lateral Buckling Check Mb

Le = 1.00 L	1 x 4.8 =	4.8 m	
λ = Le/ryy	4.8 / 3.11	154.34	OK
v = Fn (x,Le,ryy,λ)	25.404, 4.8, 3.11, 154.34	0.77	Table 19
λ_{LT} = u.v.λ.√β_W	0.878 x 0.77 x 154.34 √ 1	104.32	
pb = Fn (py,λ_{LT})	275, 104.32	117.73 N/mm²	Table 16

Mb = Sxx.pb ≤ Mc	257.7 x 117.73 ≤ 70.868 =	30.338 kN.m	

Simplified Approach

py.Zx	275x230.42	63.366 kN.m	
F/Pc+mx.Mx/py.Zx	0.097/226.267+0.934x32/63.4	0.473	OK
F/Pcy+m_{LT}.M_{LT}/Mb	0.097/226.267+0.919x32/30.3	0.970	OK

More Exact Approach

Max=Mcx/(1+.5F/Pcx)	70.9/(1+.5x0.1/780.9)	70.863 kN.m	
F/Pcx+mx.Mx/Max	0.1/780.9+0.934x32/70.9	0.423	OK
F/Pcy+m_{LT}.M_{LT}/Mb	0.1/226.3+0.919x32/30.3	0.970	OK

Deflection Check - Load Case 2

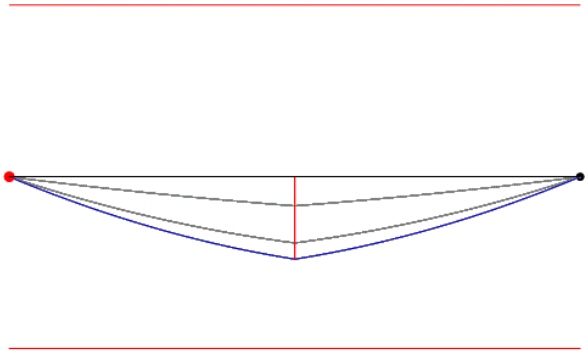
In-span δ ≤ Span/360	10.53 ≤ 4800 / 360	10.53 mm	OK

WDceng	Job No.	2466	Sheet No.	61	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date	5.12.2023	Chd by.	BD	Date	11.12.2023

AXIAL WITH MOMENTS (MEMBER)
Member SBL1Id 2 @ Level 1 in Load Case 5

Member Loading and Member Forces
Loading Combination : 1 UT + 1.4 D0 + 1.4 D1 + 1.6 L1

D1 D 077.010 (kN/m³)
D1 UDLY -000.800 (kN/m)
L1 UDLY -002.400 (kN/m)
D1 PY -007.500 2.400 (kN,m)
L1 PY -003.200 2.400 (kN,m)



Member Forces in Load Case 5 and Maximum Deflection from Load Case 2

Member No.	Node End 1 End 2	Axial Force (kN)	Shear Force (kN)	Bending Moment (kNm)	Maximum Moment (kNm)	Maximum Deflection (mm @ m)
1	3	0.103C	20.541	0.000	34.021	10.099
	4	0.103C	-20.541	0.000	@ 2.400	@ 2.400

Classification and Properties (BS 5950: 2000)

Section (25.09 kg/m)	203x133 UB 25 [S 275]		
Class = Fn(b/T,d/t,py,F,Mx,My)	8.54, 30.25, 275, 0.1, 34.02, 0	(Axial: Non-Slender)	Plastic
Auto Design Load Cases	1, 3-6, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37 & 39		

Shear Capacity Check

Fvx/Pvx	20.541 / 191.11 =	0.107	OK

Local Capacity Check

Fvx/Pvx	7.81 / 191.11 =	0.041	Low Shear
Mcx = py.Sxx≤1.2 py.Zxx	275 x 257.7≤1.2 x 275 x 230.42 =	70.868 kN.m	
Pz = Ag.py	31.96 x 275 =	878.9 kN	
n = F/Pz	0.103 / 878.9 =	0.000	OK
Srx = Fn(Sxx,)	257.7, 0	257.7 cm³	
Mrx = Srx.py	257.7 x 275	70.868 kN.m	
$(Mx/Mrx)^{Z1}+(My/Mry)^{Z2}$	$(34.021/70.868)^{2}+(0)^{1}$=	0.23	OK

Compression Resistance Pc

λx = Lex/rxx	100x1x4.8/8.56 =	56.1	OK
Pcx = Area.pcx	31.96x244.338/10 =	780.903 kN	Table 24 a

Lateral Buckling Check Mb

Mb = Mc	Fully Restrained	70.868 kN.m	

Simplified Approach

py.Zx	275x230.42	63.366 kN.m	
F/Pc+mx.Mx/py.Zx	0.103/780.903+0.922x34/63.4	0.495	OK
$F/Pcy+m_{LT}.M_{LT}/Mb$	0.103/878.9+0.884x34/70.9	0.424	OK

More Exact Approach

Max=Mcx/(1+.5F/Pcx)	70.9/(1+.5x0.1/780.9)	70.863 kN.m	
F/Pcx+mx.Mx/Max	0.1/780.9+0.922x34/70.9	0.443	OK
$F/Pcy+m_{LT}.M_{LT}/Mb$	0.1/878.9+0.884x34/70.9	0.424	OK

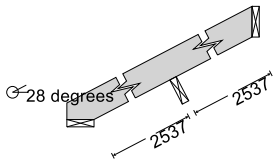
Deflection Check - Load Case 2

In-span δ ≤ Span/360	10.1 ≤ 4800 / 360	10.1 mm	OK

WDCEng	Job No.	2466	Sheet No.	62	Rev.	
	Client.	Mr T Hudson				
Job Title. 47a Market Jew Street, Penzance	Drgs.	2466-WDCE-STR-MJSP-M2-S-0001				
Member. Proposed room in the extension	Calc by.	BD	Date 5.12.2023	Chd by.	BD	Date 11.12.2023

TIMBER RAFTER DESIGN (BS5268-2:2002)

TEDDS calculation version 1.0.03



Rafter details

Breadth of timber sections; b = **47** mm

Depth of timber sections; h = **175** mm

Rafter spacing; s = **400** mm

Rafter slope; α = **27.5** deg

Clear span of rafter on horizontal; L_{clh} = **2250** mm

Clear span of rafter on slope; $L_{cl} = L_{clh} / \cos(\alpha)$ = **2537** mm

Rafter span; **Continuous**

Timber strength class; **C24**

Section properties

Cross sectional area of rafter; $A = b \times h$ = **8225** mm^2

Section modulus; $Z = b \times h^2 / 6$ = **239896** mm^3

Second moment of area; $I = b \times h^3 / 12$ = **20990885** mm^4

Radius of gyration; $r = \sqrt{(I / A)}$ = **50.5** mm

Loading details

Rafter self weight; $F_j = b \times h \times \rho_{char} \times g_{acc}$ = **0.03** kN/m

Dead load on slope; F_d = **1.10** kN/m^2

Imposed load on plan; F_u = **0.75** kN/m^2

Imposed point load; F_p = **0.90** kN

Modification factors

Section depth factor; $K_7 = (300\ mm / h)^{0.11}$ = **1.06**

Load sharing factor; K_8 = **1.10**

Consider long term load condition

Load duration factor; K_3 = **1.00**

Total UDL perpendicular to rafter; $F = F_d \times \cos(\alpha) \times s + F_j \times \cos(\alpha)$ = **0.415** kN/m

Notional bearing length; $L_b = F \times L_{cl} / [2 \times (b \times \sigma_{cp1} \times K_8 - F)]$ = **4** mm

Effective span; $L_{eff} = L_{cl} + L_b$ = **2541** mm

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Check bending stress at purlin

Bending stress parallel to grain; σ_m = **7.500** N/mm^2

Permissible bending stress; $\sigma_{m\_adm} = \sigma_m \times K_3 \times K_7 \times K_8$ = **8.754** N/mm^2

Applied bending stress; $\sigma_{m\_max} = F \times L_{eff}^2 / (8 \times Z)$ = **1.397** N/mm^2

PASS - Applied bending stress within permissible limits

Check compressive stress parallel to grain at purlin

Compression stress parallel to grain; σ_c = **7.900** N/mm^2

Minimum modulus of elasticity; E_{min} = **7200** N/mm^2

Compression member factor; K_{12} = **0.73**

Permissible compressive stress; $\sigma_{c\_adm} = \sigma_c \times K_3 \times K_8 \times K_{12}$ = **6.371** N/mm^2

Applied compressive stress; $\sigma_{c\_max} = 3 \times F \times L_{eff} \times (\cot(\alpha) + 8 \times \tan(\alpha) / 3) / (8 \times A)$ = **0.159** N/mm^2

PASS - Applied compressive stress within permissible limits

Check combined bending and compressive stress parallel to grain at purlin

Euler stress; $\sigma_e = \pi^2 \times E_{min} / \lambda^2$ = **28.091** N/mm^2

Euler coefficient; $K_{eu} = 1 - (1.5 \times \sigma_{c\_max} \times K_{12} / \sigma_e)$ = **0.994**

Combined axial compression and bending check; $\sigma_{m\_max} / (\sigma_{m\_adm} \times K_{eu}) + \sigma_{c\_max} / \sigma_{c\_adm}$ = **0.186**; **< 1**

PASS - Combined compressive and bending stresses are within permissible limits

Check bending stress in lower portion of rafter

Bending stress parallel to grain; σ_m = **7.500** N/mm^2

Permissible bending stress; $\sigma_{m\_adm} = \sigma_m \times K_3 \times K_7 \times K_8$ = **8.754** N/mm^2

Applied bending stress; $\sigma_{m\_max} = 9 \times F \times L_{eff}^2 / (128 \times Z)$ = **0.786** N/mm^2

PASS - Applied bending stress within permissible limits

Check compressive stress parallel to grain in lower portion of rafter

Compression stress parallel to grain; σ_c = **7.900** N/mm^2

Minimum modulus of elasticity; E_{min} = **7200** N/mm^2

Compression member factor; K_{12} = **0.73**

Permissible compressive stress; $\sigma_{c\_adm} = \sigma_c \times K_3 \times K_8 \times K_{12}$ = **6.371** N/mm^2

Applied compressive stress; $\sigma_{c\_max} = 3 \times F \times L_{eff} \times (\cot(\alpha) + 13 \times \tan(\alpha) / 3) / (8 \times A)$ = **0.201** N/mm^2

PASS - Applied compressive stress within permissible limits

Check combined bending and compressive stress parallel to grain in lower portion of rafter

Euler stress; $\sigma_e = \pi^2 \times E_{min} / \lambda^2$ = **28.091** N/mm^2

Euler coefficient; $K_{eu} = 1 - (1.5 \times \sigma_{c\_max} \times K_{12} / \sigma_e)$ = **0.992**

Combined axial compression and bending check; $\sigma_{m\_max} / (\sigma_{m\_adm} \times K_{eu}) + \sigma_{c\_max} / \sigma_{c\_adm}$ = **0.122**; **< 1**

PASS - Combined compressive and bending stresses are within permissible limits

Check shear stress

Shear stress parallel to grain; τ = **0.710** N/mm^2

Permissible shear stress; $\tau_{adm} = \tau \times K_3 \times K_8$ = **0.781** N/mm^2

Applied shear stress; $\tau_{max} = 15 \times F \times L_{eff} / (16 \times A)$ = **0.120** N/mm^2

PASS - Applied shear stress within permissible limits

Check deflection

Permissible deflection; $\delta_{adm} = 0.003 \times L_{eff}$ = **7.623** mm

Bending deflection; $\delta_b = F \times L_{eff}^4 / (185 \times E_{mean} \times I)$ = **0.413** mm

Shear deflection; $\delta_s = 12 \times F \times L_{eff}^2 / (5 \times E_{mean} \times A)$ = **0.072** mm

Total deflection; $\delta_{max} = \delta_b + \delta_s$ = **0.485** mm

PASS - Total deflection within permissible limits

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Consider medium term load condition

Load duration factor; K_3 = **1.25**

Total UDL perpendicular to rafter; $F = [F_u \times \cos(\alpha)^2 + F_d \times \cos(\alpha)] \times s + F_j \times \cos(\alpha)$ = **0.651** kN/m

Notional bearing length; $L_b = F \times L_{cl} / [2 \times (b \times \sigma_{cp1} \times K_8 - F)]$ = **7** mm

Effective span; $L_{eff} = L_{cl} + L_b$ = **2543** mm

Check bending stress at purlin

Bending stress parallel to grain; σ_m = **7.500** N/mm^2

Permissible bending stress; $\sigma_{m\_adm} = \sigma_m \times K_3 \times K_7 \times K_8$ = **10.942** N/mm^2

Applied bending stress; $\sigma_{m\_max} = F \times L_{eff}^2 / (8 \times Z)$ = **2.195** N/mm^2

PASS - Applied bending stress within permissible limits

Check compressive stress parallel to grain at purlin

Compression stress parallel to grain; σ_c = **7.900** N/mm^2

Minimum modulus of elasticity; E_{min} = **7200** N/mm^2

Compression member factor; K_{12} = **0.71**

Permissible compressive stress; $\sigma_{c\_adm} = \sigma_c \times K_3 \times K_8 \times K_{12}$ = **7.739** N/mm^2

Applied compressive stress; $\sigma_{c\_max} = 3 \times F \times L_{eff} \times (\cot(\alpha) + 8 \times \tan(\alpha) / 3) / (8 \times A)$ = **0.250** N/mm^2

PASS - Applied compressive stress within permissible limits

Check combined bending and compressive stress parallel to grain at purlin

Euler stress; $\sigma_e = \pi^2 \times E_{min} / \lambda^2$ = **28.037** N/mm^2

Euler coefficient; $K_{eu} = 1 - (1.5 \times \sigma_{c\_max} \times K_{12} / \sigma_e)$ = **0.990**

Combined axial compression and bending check; $\sigma_{m\_max} / (\sigma_{m\_adm} \times K_{eu}) + \sigma_{c\_max} / \sigma_{c\_adm}$ = **0.235**; **< 1**

PASS - Combined compressive and bending stresses are within permissible limits

Check bending stress in lower portion of rafter

Bending stress parallel to grain; σ_m = **7.500** N/mm^2

Permissible bending stress; $\sigma_{m\_adm} = \sigma_m \times K_3 \times K_7 \times K_8$ = **10.942** N/mm^2

Applied bending stress; $\sigma_{m\_max} = 9 \times F \times L_{eff}^2 / (128 \times Z)$ = **1.235** N/mm^2

PASS - Applied bending stress within permissible limits

Check compressive stress parallel to grain in lower portion of rafter

Compression stress parallel to grain; σ_c = **7.900** N/mm^2

Minimum modulus of elasticity; E_{min} = **7200** N/mm^2

Compression member factor; K_{12} = **0.71**

Permissible compressive stress; $\sigma_{c\_adm} = \sigma_c \times K_3 \times K_8 \times K_{12}$ = **7.739** N/mm^2

Applied compressive stress; $\sigma_{c\_max} = 3 \times F \times L_{eff} \times (\cot(\alpha) + 13 \times \tan(\alpha) / 3) / (8 \times A)$ = **0.315** N/mm^2

PASS - Applied compressive stress within permissible limits

Check combined bending and compressive stress parallel to grain in lower portion of rafter

Euler stress; $\sigma_e = \pi^2 \times E_{min} / \lambda^2$ = **28.037** N/mm^2

Euler coefficient; $K_{eu} = 1 - (1.5 \times \sigma_{c\_max} \times K_{12} / \sigma_e)$ = **0.988**

Combined axial compression and bending check; $\sigma_{m\_max} / (\sigma_{m\_adm} \times K_{eu}) + \sigma_{c\_max} / \sigma_{c\_adm}$ = **0.155**; **< 1**

PASS - Combined compressive and bending stresses are within permissible limits

Check shear stress

Shear stress parallel to grain; τ = **0.710** N/mm^2

Permissible shear stress; $\tau_{adm} = \tau \times K_3 \times K_8$ = **0.976** N/mm^2

Applied shear stress; $\tau_{max} = 15 \times F \times L_{eff} / (16 \times A)$ = **0.189** N/mm^2

PASS - Applied shear stress within permissible limits

Check deflection

Permissible deflection; $\delta_{adm} = 0.003 \times L_{eff}$ = **7.630** mm

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Bending deflection; $\delta_b = F \times L_{eff}^4 / (185 \times E_{mean} \times I) =$ **0.650** mm

Shear deflection; $\delta_s = 12 \times F \times L_{eff}^2 / (5 \times E_{mean} \times A) =$ **0.114** mm

Total deflection; $\delta_{max} = \delta_b + \delta_s =$ **0.764** mm

PASS - Total deflection within permissible limits

Consider short term load condition

Load duration factor; $K_3 =$ **1.50**

Total UDL perpendicular to rafter; $F = F_d \times \cos(\alpha) \times s + F_j \times \cos(\alpha) =$ **0.415** kN/m

Notional bearing length; $L_b = [F \times L_{cl} + F_p \times \cos(\alpha)] / [2 \times (b \times \sigma_{cp1} \times K_8 - F)] =$ **7** mm

Effective span; $L_{eff} = L_{cl} + L_b =$ **2544** mm

Check bending stress at purlin

Bending stress parallel to grain; $\sigma_m =$ **7.500** N/mm^2

Permissible bending stress; $\sigma_{m\_adm} = \sigma_m \times K_3 \times K_7 \times K_8 =$ **13.131** N/mm^2

Applied bending stress; $\sigma_{m\_max} = F \times L_{eff}^2/(8 \times Z)+3 \times F_p \times \cos(\alpha) \times L_{eff}/(32 \times Z) =$ **2.194** N/mm^2

PASS - Applied bending stress within permissible limits

Check compressive stress parallel to grain at purlin

Compression stress parallel to grain; $\sigma_c =$ **7.900** N/mm^2

Minimum modulus of elasticity; $E_{min} =$ **7200** N/mm^2

Compression member factor; $K_{12} =$ **0.69**

Permissible compressive stress; $\sigma_{c\_adm} = \sigma_c \times K_3 \times K_8 \times K_{12} =$ **9.001** N/mm^2

Applied compressive stress; $\sigma_{c\_max} = 3 \times F \times L_{eff} \times (\cot(\alpha)+8 \times \tan(\alpha)/3)/(8 \times A)+F_p \times \sin(\alpha)/A =$ **0.210** N/mm^2

PASS - Applied compressive stress within permissible limits

Check combined bending and compressive stress parallel to grain at purlin

Euler stress; $\sigma_e = \pi^2 \times E_{min} / \lambda^2 =$ **28.019** N/mm^2

Euler coefficient; $K_{eu} = 1 - (1.5 \times \sigma_{c\_max} \times K_{12} / \sigma_e) =$ **0.992**

Combined axial compression and bending check; $\sigma_{m\_max} / (\sigma_{m\_adm} \times K_{eu}) + \sigma_{c\_max} / \sigma_{c\_adm} =$ **0.192**; **< 1**

PASS - Combined compressive and bending stresses are within permissible limits

Check bending stress in lower portion of rafter

Bending stress parallel to grain; $\sigma_m =$ **7.500** N/mm^2

Permissible bending stress; $\sigma_{m\_adm} = \sigma_m \times K_3 \times K_7 \times K_8 =$ **13.131** N/mm^2

Applied bending stress; $\sigma_{m\_max} = F \times L_{eff}^2/(16 \times Z)+13 \times F_p \times \cos(\alpha) \times L_{eff}/(64 \times Z) =$ **2.420** N/mm^2

PASS - Applied bending stress within permissible limits

Check compressive stress parallel to grain in lower portion of rafter

Compression stress parallel to grain; $\sigma_c =$ **7.900** N/mm^2

Minimum modulus of elasticity; $E_{min} =$ **7200** N/mm^2

Compression member factor; $K_{12} =$ **0.69**

Permissible compressive stress; $\sigma_{c\_adm} = \sigma_c \times K_3 \times K_8 \times K_{12} =$ **9.001** N/mm^2

Applied compressive stress; $\sigma_{c\_max} = 3 \times F \times L_{eff} \times (\cot(\alpha)+4 \times \tan(\alpha))/(8 \times A)+F_p \times \sin(\alpha)/A =$ **0.243** N/mm^2

PASS - Applied compressive stress within permissible limits

Check combined bending and compressive stress parallel to grain in lower portion of rafter

Euler stress; $\sigma_e = \pi^2 \times E_{min} / \lambda^2 =$ **28.019** N/mm^2

Euler coefficient; $K_{eu} = 1 - (1.5 \times \sigma_{c\_max} \times K_{12} / \sigma_e) =$ **0.991**

Combined axial compression and bending check; $\sigma_{m\_max} / (\sigma_{m\_adm} \times K_{eu}) + \sigma_{c\_max} / \sigma_{c\_adm} =$ **0.213**; **< 1**

PASS - Combined compressive and bending stresses are within permissible limits

Check shear stress

Shear stress parallel to grain; $\tau =$ **0.710** N/mm^2

Permissible shear stress; $\tau_{adm} = \tau \times K_3 \times K_8 =$ **1.172** N/mm^2

Applied shear stress; $\tau_{max} = 15 \times F \times L_{eff} / (16 \times A) + 3 \times F_p \times \cos(\alpha) / (2 \times A) =$ **0.266** N/mm^2

PASS - Applied shear stress within permissible limits

Check deflection

Permissible deflection; $\delta_{adm} = 0.003 \times L_{eff} =$ **7.632** mm

Bending deflection; $\delta_b = L_{eff}^3 \times (F \times L_{eff} / 185 + 0.015 \times F_p \times \cos(\alpha)) / (E_{mean} \times I) =$ **1.285** mm

Shear deflection; $\delta_s = 12 \times L_{eff} \times (F \times L_{eff} + 2 \times F_p \times \cos(\alpha)) / (5 \times E_{mean} \times A) =$ **0.182** mm

Total deflection; $\delta_{max} = \delta_b + \delta_s =$ **1.467** mm

PASS - Total deflection within permissible limits

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