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Doubly Pitched Building {Gable}

Structure Classification: Industrial
Structure Type: Shed Doubly Pitched Roof
Design Method: Limit State
Analysis Method: Linear Elastic

DIMENSION AND GEOMETRY

Alpha =	10.00 degrees =	0.17 radians =	Pitch 1 in 5.67				
Building Eaves Hght = he =	3.101 m	Bay Spacing (main)	3.721 m				
Height to Top = ht =	3.894 m	Number of Bays	4				
Average Height = h =	3.498 m	Number of Portal Columns	10				
Building Span	9.000 m	Building Length	17.164 m	2.280	1.140		
Long Axis Bearing	deg.	Orientation Treated as Unknown					
Length along Slope of Rafter =	4.569 m	Total Rise	0.793 m				

b/d = 1.91 d/b = 0.52 h/d = 0.34

SITE

Terrain: Developed River Side Town, Mostly Suburban, but with some large open spaces.
Topography: Flat
Shielding: None

RISK ASSESSMENT

Building Code of Austra Part B1 Structural Provisions
STRUCTURAL CATEGORY
Importance Lev 2 {Normal} Table B1.2a
Annual probability of Design Wind Event being exceeded
Strength 1/500 = 0.002 R = 500 = Mean Return Period
Serviceability 1/20 = 0.05 R = 20 = Mean Return Period

b = 9.00 m d = 17.16 m
local pressure extent a = min(0.2b,0.2d,ht) = 1.8 m a/2 = 0.9 m

Area Reduction Factors **Tributary Area**

			m²	Ka halfspan	Ka fullspan
Rafter					
Aligned	4.569 x 3.721	=	17.00	0.95	
Projected	4.500 x 3.721	=	16.74	0.96	0.89
Column					
Aligned	3.101 x 3.721	=	11.54	0.99	

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ASSESSMENT OF DESIGN WIND SPEED : SITE AND BUILDING HEIGHT AND ORIENTATION

AS1170.2:2002

ASSESSMENT OF SITE AND BUILDING HEIGHT

Importance Lev 2 {Normal} Table B1.2a

Annual probability of Design Wind Event being exceeded

Strength 1/500 = 0.002 R = 500

Serviceability 1/20 = 0.05 R = 20

Location : South Australia

Major Region A **SubRegion** 1 **Region** A1 Non-Cyclonic

sensitivity {static analysis acceptable} C[dyn] 1 46/ht = 11.81

Average Building Height = h[av 3.498 m

	N	NE	E	SE	S	SW	W	NW	
β	**0**	**45**	**90**	**135**	**180**	**225**	**270**	**315**	degrees
Tcat	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
V[R,u] =	45	45	45	45	45	45	45	45	m/s
M[d] =	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
M[z,cat] =	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
M[s] =	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
M[t] =	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
M[z,cat	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	
V[sit,β,u] =	39.15	39.15	39.15	39.15	39.15	39.15	39.15	39.15	m/s

Maximum Expected wind speed at SITE for strength limit state = **V[sit,β,u] = 39.15 m/s**

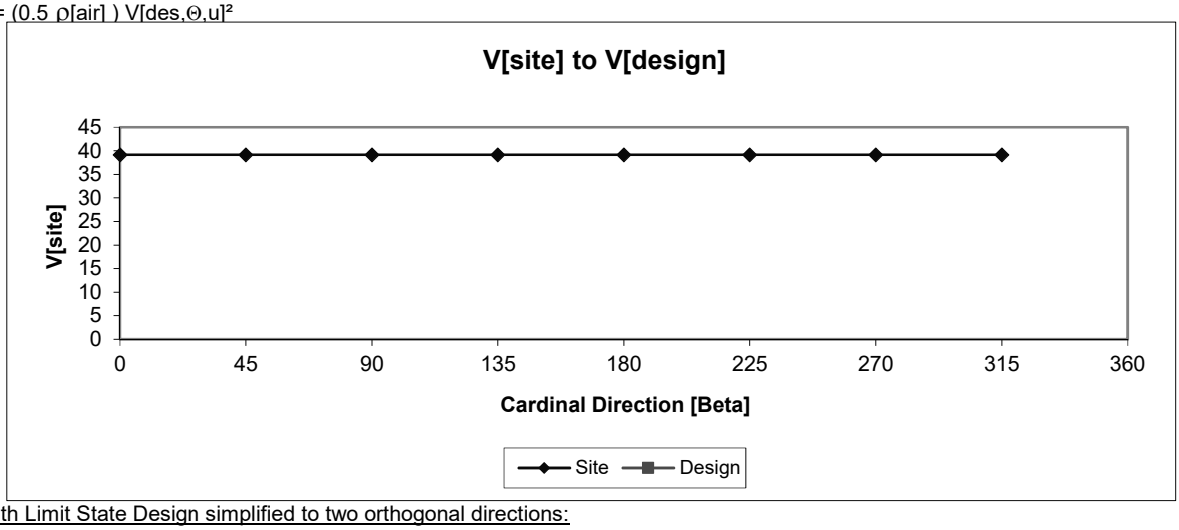
V[R,s] = 37 V[R,s]/V[R,u] 0.822 (Vs/Vu)^2 = 0.68

ASSESSMENT OF BUILDING ORIENTATION

Long Axis Bearing deg. Orientation Treated as Unknown 1

Face Bearing	0.0		0		0.0		0		degrees
Sector Bdry	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	degrees
V[sector] =	39.15	39.15	39.15	39.15	39.15	39.15	39.15	39.15	m/s
Θ	**0**		**90**		**180**		**270**		degrees
V[des,Θ,u] =	39.15		39.15		39.15		39.15		m/s
q[ref] =	0.92		0.92		0.92		0.92		kPa

q[ref] = (0.5 ρ[air]) V[des,Θ,u]²



Strength Limit State Design simplified to two orthogonal directions:

V[des,0,u] = 39.15 qz0 = 0.92

V[des,90,u] = 39.15 qz90 = 0.92

Classification of Wind Loading To AS4055:

Upper wind Class	#N/A	#N/A	Lower wind Class	#N/A	#N/A

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PRESSURE COEFFICIENTS : BUILDING

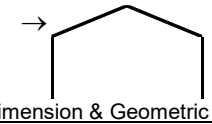
Reference Conditions
V[des,0,u] = 39.15 m/s qz0 = 0.92 kPa

Internal Pressure Coefficents
Cpi1 = -0.3 pi = -0.28 kPa
Cpi2 = 0.4 pi = 0.37 kPa

Reference Conditions
V[des,90,u] = 39.15 m/s qz90 = 0.92

Cpi1 = -0.3 pi = -0.28 kPa
Cpi2 = 0.4 pi = 0.37 kPa

Θ = 0 Transverse



Dimension & Geometric Considerations
h = 3.498 m he = 3.101 m
b = length 17.16 m d = span 9.00 m
h/d = 0.34

Table 3.4.3 α >= 10 0 1

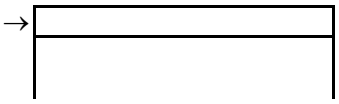
WL1 θ=0		wall W	roof U		UD		D	wall L
			0.5h 1.749	1h 3.498	2h 6.995	3h 10.493	d<3h 9.000	
Cpe		0.70	-0.81	-0.81	-0.81	-0.81	-0.41	-0.3
p[e]	[kPa]	0.64	-0.71	-0.71	-0.71	-0.71	-0.36	-0.28

NB: p[e] = Cpe . qz . Ka {for roof and side walls}

WL1 θ=0		side wall S			
		1h 3.498	2h 6.995	3h 10.493	d<3h 9.000
Cpe		-0.65	-0.5	-0.3	-0.3
p[e]	[kPa]	-0.59	-0.46	-0.27	-0.27

p = Cpe.qz p = Cpe.ka.qz {roof & side walls only}

Θ = 90 Longitudinal



h = 3.498 m ht = 3.894 m
b = span 9.000 m d = length 17.16 m
h/d = 0.23

Table 3.4.3.2(A)

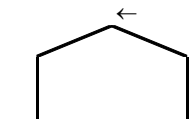
WL2 θ=90		wall W	roof U		UD		D	wall L
			0.5h 1.749	1h 3.498	2h 6.995	3h 10.493	d>3h 17.164	
Cpe		0.70	-0.90	-0.90	-0.50	-0.30	-0.20	-0.40
p[e]	[kPa]	0.64	-0.79	-0.79	-0.44	-0.26	-0.18	-0.37

NB: p[e] = Cpe . qz . Ka {for roof and side walls}

WL2 θ=90		side wall S			
		1h 3.498	2h 6.995	3h 10.493	d>3h 17.164
Cpe		-0.65	-0.5	-0.3	-0.2
p[e]	[kPa]	-0.59	-0.46	-0.27	-0.18

p = Cpe.qz p = Cpe.ka.qz {roof & side walls only}

Θ = 180 Transverse



h = 3.498 m he = 3.101 m
b = length 17.16 m d = span 9.00 m
h/d = 0.34

Table 3.4.3 0 1

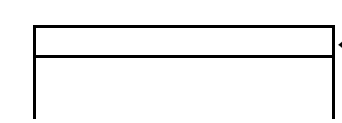
WL1 θ=0		wall W	roof U		UD		D	wall L
			0.5h 1.749	1h 3.498	2h 6.995	3h 10.493	d<3h 9.000	
Cpe		0.70	-0.81	-0.81	-0.81	-0.81	-0.41	-0.3
p[e]	[kPa]	0.64	-0.71	-0.71	-0.71	-0.71	-0.36	-0.28

NB: p[e] = Cpe . qz . Ka {for roof and side walls}

WL1 θ=0		side wall S			
		1h 3.498	2h 6.995	3h 10.493	d<3h 9.000
Cpe		-0.65	-0.50	-0.30	-0.30
p[e]	[kPa]	-0.59	-0.46	-0.27	-0.27

p = Cpe.qz p = Cpe.ka.qz {roof & side walls only}

Θ = 270 Longitudinal



h = 3.498 m ht = 3.894 m
b = span 9.000 m d = length 17.16 m
h/d = 0.23

Table 3.4.3.2(A)

WL2 θ=90		wall W	roof U		UD		D	wall L
			0.5h 1.749	1h 3.498	2h 6.995	3h 10.493	d>3h 17.164	
Cpe		0.70	-0.90	-0.90	-0.50	-0.30	-0.20	-0.40
p[e]	[kPa]	0.64	-0.79	-0.79	-0.44	-0.26	-0.18	-0.37

NB: p[e] = Cpe . qz . Ka {for roof and side walls}

WL2 θ=90		side wall S			
		1h 3.498	2h 6.995	3h 10.493	d>3h 17.164
Cpe		-0.65	-0.50	-0.30	-0.20
p[e]	[kPa]	-0.59	-0.46	-0.27	-0.18

p = Cpe.qz p = Cpe.ka.qz {roof & side walls only}

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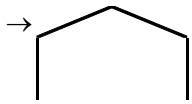
DRAG LOADING & UPLIFT : BUILDING

Θ = 0 Transverse



Cf = 0.01
Kc = 1
d/h = 2.573 no drag {long building} Cfig = 0.01
d/b= 0.524 no drag {wide building} Cdyn = 1

Frictional Drag

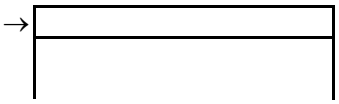
	Area	
Roof	b(d-4h)	0
Wall	2h(d-4h)	0

	Roof	Wall	
√ F1 = smooth/parallel to ribs	0.00	0.00	kN
2F1 = across corrugations	0.00	0.00	kN
4F1 = across ribs	0.00	0.00	kN

Cfig = Cf. Kc
f = (0.5 ρ[air] V[des,Θ,u]² C[fig] C[dyn]
f = q[ref] C[fig] C[dyn]

Uplift
= bd Cpn qz
Total = -115.2 kN
kN/column

Θ = 90 Longitudinal



Cf = 0.01
Kc = 1
d/h = 4.91 drag {long building} Cfig = 0.01
d/b= 1.91 no drag {wide building} Cdyn = 1

Frictional Drag

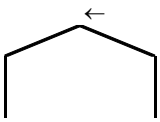
	Area	
Roof	b(d-4h)	28.56
Wall	2h(d-4h)	22.2

	Roof	Wall	
F1 = smooth/parallel to ribs	0.26	0.20	kN
2F1 = across corrugations	0.53	0.41	kN
√ 4F1 = across ribs	1.05	0.82	kN

Cfig = Cf. Kc
f = (0.5 ρ[air] V[des,Θ,u]² C[fig] C[dyn]
f = q[ref] C[fig] C[dyn]

Uplift
= bd Cpn qz
Total = -127.9 kN
kN/column

Θ = 180 Transverse



Cf = 0.01
Kc = 1
d/h = 2.573 no drag {long building} Cfig = 0.01
d/b= 0.524 no drag {wide building} Cdyn = 1

Frictional Drag

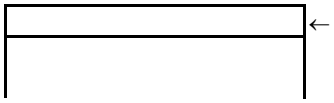
	Area	
Roof	b(d-4h)	0
Wall	2h(d-4h)	0

	Roof	Wall	
√ F1 = smooth/parallel to ribs	0.00	0.00	kN
2F1 = across corrugations	0.00	0.00	kN
4F1 = across ribs	0.00	0.00	kN

Cfig = Cf. Kc
f = (0.5 ρ[air] V[des,Θ,u]² C[fig] C[dyn]
f = q[ref] C[fig] C[dyn]

Uplift
= bd Cpn qz
Total = -115.2 kN
kN/column

Θ = 270 Longitudinal



Cf = 0.01
Kc = 1
d/h = 4.91 drag {long building} Cfig = 0.01
d/b= 1.91 no drag {wide building} Cdyn = 1

Frictional Drag

	Area	
Roof	b(d-4h)	28.56
Wall	2h(d-4h)	22.2

	Roof	Wall	
F1 = smooth/parallel to ribs	0.26	0.20	kN
2F1 = across corrugations	0.53	0.41	kN
√ 4F1 = across ribs	1.05	0.82	kN

Cfig = Cf. Kc
f = (0.5 ρ[air] V[des,Θ,u]² C[fig] C[dyn]
f = q[ref] C[fig] C[dyn]

Uplift
= bd Cpn qz
Total = -127.9 kN
kN/column

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FRAME LOADING

Loadcase Number		Thickness mm	Span m	Width m	Area m²	kg/m³	kg/m²	kg/m	kg	kPa = kN/m²	kN/m	kN
10	**SWT = Self weight**											
	Determined by the frame analysis software (Microstran/MultiFrame) for the members analysed.											
20	**DL = DeadLoad**											
	Roof											
	Cladding									0.04		
	Purlins									0.02		
21	**Total Roof DL**			3.721					∑DL	0.06	0.21	
	Ceiling											
	Cladding											
	Battens											
22	**Total Ceiling DL**			3.721					∑DL	0.00	0.00	
	Wall											
	Cladding									0.04		
	Girts									0.01		
23	**Total Wall DL**			3.721					∑DL	0.05	0.20	
	Internal Wall Lining											
	Cladding											
	Battens											
24	**Total Internal Wall Lining**			3.721					∑DL	0.00	0.00	
	Floor											
	Decking											
	Joists											
	Partitions											
25	**Total Floor**			3.721					∑DL	0.00	0.00	
30	**LL = LiveLoad**								↓↓↓↓↓↓↓			
	Roof (Non-Trafficable Roof)			LL= (1.8/A + 0.12) EQ4.8.1.1								
	Roof		9	3.721	33.49			{on plan projec	LL =	0.25	0.93	
			{distributed along rafter} Fy{global, Y-axis}, Fy = LL cos (alpha) =								0.916	
	Floor											
	LL =			3.721						0	0	
40	**PL = Occassional Point Load**											
	Roof											
	PL	=										1.4
	Floor											
	PL	=										
50	**Plant Loads**											
	Air Conditioning											
		ACU							0	NONE		0
		R/A Duct							0	NONE		0
		S/A Duct							0	NONE		0
51	**Total Air Conditioning**								0	NONE		0
52	Over Head Electric Traveling Crane							SWL =	0	NONE		0

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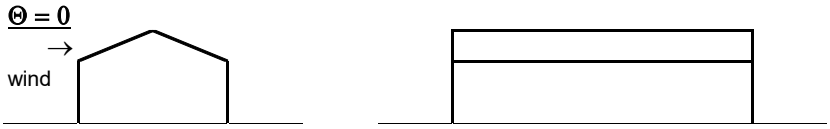
FRAME LOADING: Θ = 0

equivalent bending moments used to average distributed pressure coefficients

WL[t,j,k] t = direction code [1.. 8] j = Cpe code [1..2] k = Cpi code [0..2]

t=1 {theta=0}, t=2 (theta=45}, t=3 {theta=90}, t = 4 {theta=135}, t=5 {theta=180}, t=6 {theta=225}, t=7 {theta=270}, t=8 {theta=315}

Use Bending Moments for averaging theta=0 stepped wind pressures **1**

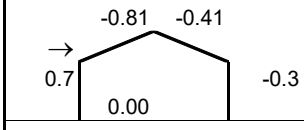


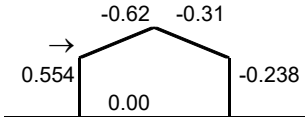
Direct'n

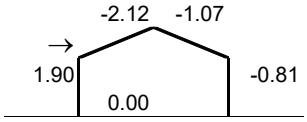
qz = 0.92 kPa

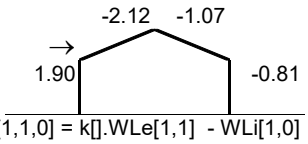
Load Width = 3.721 m

θ=0	1	Raw Coefficients	Cfig	wall	roof	Loads [kN/m]
			ka =	0.99	0.955	
			kc =	0.8	0.8	
			kl =	1	1	
			kp =	1	1	



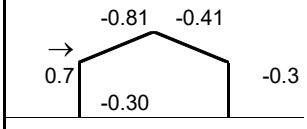


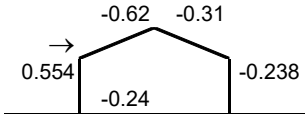


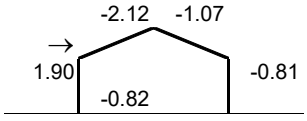


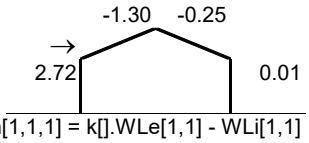
WLn[1,1,0] = k[].WLe[1,1] - WLi[1,0]

			ka =	0.99	0.955	
			kc =	0.8	0.8	
			kl =	1	1	
			kp =	1	1	



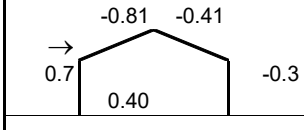


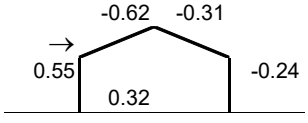


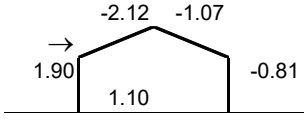


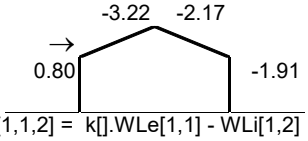
WLn[1,1,1] = k[].WLe[1,1] - WLi[1,1]

			ka =	0.99	0.955	
			kc =	0.8	0.8	
			kl =	1	1	
			kp =	1	1	









WLn[1,1,2] = k[].WLe[1,1] - WLi[1,2]

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FRAME LOADING: Θ = 90

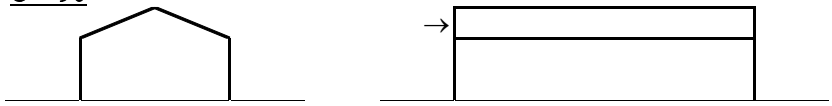
equivalent bending moments used to average distributed pressure coefficients

WL[t,j,k] t = direction code [1.. 8] j = Cpe code [1..2] k = Cpi code [0..2]

t=1 {theta=0}, t=2 (theta=45}, t=3 {theta=90}, t = 4 {theta=135}, t=5 {theta=180}, t=6 {theta=225}, t=7 {theta=270}, t=8 {theta=315}

Use Bending Moments for averaging theta=0 stepped wind pressures **1**

Θ = 90



Direct'n

qz = 0.92 kPa

wall roof Load Width = 3.721 m

Typical Frame (2nd Frame in from end)

θ=90 3

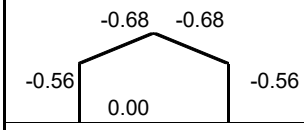
Raw Coefficients

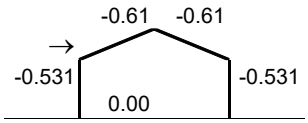
n= 1 0.00 0

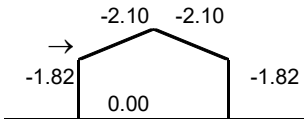
Cfig

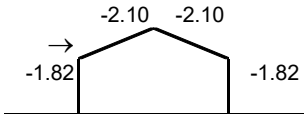
Loads [kN/m]

ka = 0.99 0.955
kc = 0.95 0.95
kl = 1 1
kp = 1 1



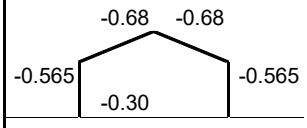


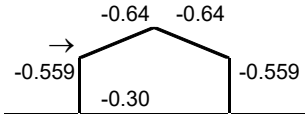


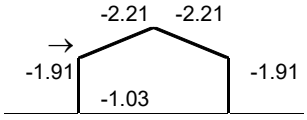


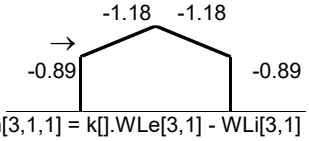
WLn[3,1,0] = k[].WLe[3,1] - WLi[3,0]

ka = 0.99 0.955
kc = 1 1
kl = 1 1
kp = 1 1



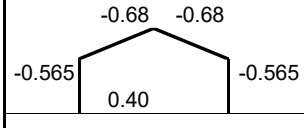


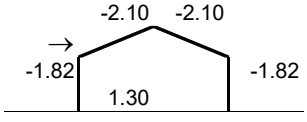


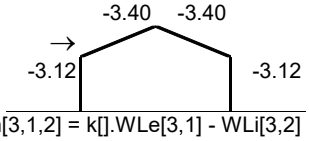


WLn[3,1,1] = k[].WLe[3,1] - WLi[3,1]

ka = 0.99 0.955
kc = 0.95 0.95
kl = 1 1
kp = 1 1







WLn[3,1,2] = k[].WLe[3,1] - WLi[3,2]

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FRAME III (Kleinlogel) Doubly Pitched : Fully Fixed { Based on C200's for centreline dimensions } Clr Hgt 2.793

Frame Data — Frame Centres = 3.721 m

Height	**h**	2.904	m	he	3.101	m	**k**	1.41	**C**	3.52	**R**	-0.50	
Total Roof Rise	**f**	0.758	m	ht	3.894	m	**phi**	0.26	**K1**	10.53	**N1**	31.0	
Span	**L**	8.593	m	rise	0.793	m	**m**	1.26	**K2**	2.96	**N2**	10.48	
rafter length	**s**	4.363	m	alpha	0.175	rad	**B**	6.24					
				Pitch	10.00	deg							
Columr C200-19		**I1**		5E-06	m^4	phi.Ms	15.56	0.82	**ok!**				
Rafter C250-24		**I2**		1E-05	m^4	phi.Ms	27.75	0.46	**ok!**				
Minimum Strength Section Suitable:				C150-24		phi.Ms	13.13	0.97					

C / B D / A E

distance x		
B	**C**	**D**
4.363	0.000	4.363
0.000	4.363	0.000

				w	W	Support Reactions				Bending Moments					AXIAL EFFECTS		
										0.000	2.904	7.267	11.630	14.534			
				[kN/m]	[kN]	**HA**	**VA**	**HE**	**VE**	**MA**	**MB**	**MC**	**MD**	**ME**	**B**	**C**	**D**
		DL		0.21													
	+↓	DL		0.22		0.3	0.7	0.3	0.2	0.2	-0.5	0.3	-0.4	0.3	0.4	0.2	0.3
	+↓	DL		0.22		0.3	0.2	0.3	0.7	0.3	-0.4	0.3	-0.5	0.2	0.3	0.2	0.4
						0.5	**0.9**	**0.5**	**0.9**	**0.6**	**-0.9**	**0.7**	**-0.9**	**0.6**	**0.7**	**0.4**	**0.7**
	+↓	PL		-	1.4	**0.6**	**0.7**	**0.6**	**0.7**	**0.7**	**-1.0**	**1.5**	**-1.0**	**0.7**	**0.7**		**0.7**
	+↓	LL		0.93		**2.2**	**4.0**	**2.2**	**4.0**	**2.5**	**-3.9**	**3.0**	**-3.9**	**2.5**	**2.9**	**2.2**	**2.9**
LHS w	→+	WL0/1		2.72		-6.6	-0.4	1.3	0.4	-5.8	1.7	-0.8	-1.4	2.5	1.3	1.3	1.4
LHS r	–↑	WL0/1		-1.30		-1.6	-4.3	-1.6	-1.3	-1.5	3.0	-2.1	2.4	-2.1	-2.3	-1.3	-1.8
LHS r	←–	WL0/1		-1.30		0.5	0.2	-0.5	-0.2	0.9	-0.6	0.1	0.5	-0.8	0.5	-0.4	-0.5
RHS r	–↑	WL0/1		-0.25		-0.3	-0.3	-0.3	-0.8	-0.4	0.5	-0.4	0.6	-0.3	-0.3	-0.3	-0.4
RHS r	→–	WL0/1		-0.25		-0.1	0.0	0.1	0.0	-0.2	0.1	0.0	-0.1	0.2	-0.1	-0.1	0.1
RHS w	→–	WL0/1		0.01		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
						-8.0	**-4.7**	**-0.9**	**-1.9**	**-7.0**	**4.7**	**-3.2**	**2.1**	**-0.5**	**-0.9**	**-0.8**	**-1.2**
LHS w	→+	WL0/2		0.80		-1.9	-0.1	0.4	0.1	-1.7	0.5	-0.2	-0.4	0.7	0.4	0.4	0.4
LHS r	–↑	WL0/2		-3.22		-3.8	-10.5	-3.8	-3.3	-3.7	7.5	-5.2	6.1	-5.1	-5.6	-3.2	-4.4
LHS r	←–	WL0/2		-3.22		1.3	0.4	-1.2	-0.4	2.2	-1.5	0.3	1.3	-2.0	1.3	-1.1	-1.2
RHS r	–↑	WL0/2		-2.17		-2.6	-2.2	-2.6	-7.1	-3.4	4.1	-3.5	5.0	-2.5	-2.9	-2.2	-3.8
RHS r	→–	WL0/2		-2.17		-0.8	-0.3	0.9	0.3	-1.4	0.9	0.2	-1.0	1.5	-0.8	-0.7	0.9
RHS w	→–	WL0/2		-1.91		-0.9	-0.3	4.6	0.3	-1.8	0.9	0.6	-1.2	4.1	-1.0	-1.0	-0.9
						-8.8	**-13.0**	**-1.7**	**-10.2**	**-9.8**	**12.4**	**-7.8**	**9.8**	**-3.3**	**-8.6**	**-7.8**	**-8.9**
LHS w	←–	WL90/1		-0.89		2.1	0.1	-0.4	-0.1	1.9	-0.6	0.3	0.4	-0.8	-0.4	-0.4	-0.4
LHS r	–↑	WL90/1		-1.18		-1.4	-3.9	-1.4	-1.2	-1.4	2.7	-1.9	2.2	-1.9	-2.1	-1.2	-1.6
LHS r	←–	WL90/1		-1.18		0.5	0.2	-0.4	-0.2	0.8	-0.6	0.1	0.5	-0.8	0.5	-0.4	-0.4
RHS r	–↑	WL90/1		-1.18		-1.4	-1.2	-1.4	-3.9	-1.9	2.2	-1.9	2.7	-1.4	-1.6	-1.2	-2.1
RHS r	→–	WL90/1		-1.18		-0.4	-0.2	0.5	0.2	-0.8	0.5	0.1	-0.6	0.8	-0.4	-0.4	0.5
RHS w	→–	WL90/1		-0.89		-0.4	-0.1	2.1	0.1	-0.8	0.4	0.3	-0.6	1.9	-0.4	-0.4	-0.4
						-1.1	**-5.1**	**-1.1**	**-5.1**	**-2.1**	**4.8**	**-3.0**	**4.8**	**-2.1**	**-4.5**	**-4.0**	**-4.5**
LHS w	←–	WL90/2		-3.12		7.5	0.4	-1.5	-0.4	6.7	-2.0	0.9	1.6	-2.9	-1.4	-1.4	-1.6
LHS r	–↑	WL90/2		-3.40		-4.1	-11.1	-4.1	-3.5	-3.9	7.9	-5.5	6.4	-5.4	-5.9	-3.4	-4.6
LHS r	←–	WL90/2		-3.40		1.4	0.5	-1.2	-0.5	2.3	-1.6	0.3	1.4	-2.2	1.4	-1.1	-1.3
RHS r	–↑	WL90/2		-3.40		-4.1	-3.5	-4.1	-11.1	-5.4	6.4	-5.5	7.9	-3.9	-4.6	-3.4	-5.9
RHS r	→–	WL90/2		-3.40		-1.2	-0.5	1.4	0.5	-2.2	1.4	0.3	-1.6	2.3	-1.3	-1.1	1.4
RHS w	→–	WL90/2		-3.12		-1.5	-0.4	7.5	0.4	-2.9	1.6	0.9	-2.0	6.7	-1.6	-1.6	-1.4
						-2.0	**-14.6**	**-2.0**	**-14.6**	**-5.3**	**13.6**	**-8.4**	**13.6**	**-5.3**	**-13.4**	**-12.0**	**-13.4**
1.2 DL + 1.5 PL						**1.5**	**2.2**	**1.5**	**2.2**	**1.8**	**-2.6**	**3.1**	**-2.6**	**1.8**	**1.9**	**0.5**	**1.9**
1.2 DL + 1.5 LL						**4.0**	**7.1**	**4.0**	**7.1**	**4.5**	**-7.0**	**5.3**	**-7.0**	**4.5**	**5.1**	**3.8**	**5.1**
0.9 DL + WL0/1						**-7.5**	**-3.9**	**-0.4**	**-1.1**	**-6.5**	**3.9**	**-2.5**	**1.3**	**0.0**	**-0.3**	**-0.4**	**-0.6**
0.9 DL + WL0/2						**-8.3**	**-12.1**	**-1.3**	**-9.3**	**-9.3**	**11.6**	**-7.2**	**8.9**	**-2.8**	**-8.0**	**-7.4**	**-8.3**
0.9 DL + WL90/1						**-0.6**	**-4.2**	**-0.6**	**-4.2**	**-1.6**	**3.9**	**-2.4**	**3.9**	**-1.6**	**-3.9**	**-3.6**	**-3.9**
0.9 DL + WL90/2						**-1.5**	**-13.8**	**-1.5**	**-13.8**	**-4.8**	**12.8**	**-7.8**	**12.8**	**-4.8**	**-12.8**	**-11.7**	**-12.8**
Maxima	**Moments**		**12.8**							**9.3**	**12.8**	**7.8**	**12.8**	**4.8**			
	Horizontal		**8.3**	**8.3**		**4.0**											
	Axial		**13.8**		**13.8**		**13.8**								**12.8**	**11.7**	**12.8**