

36 Flats Walk

Front elevation section A-A:

DL+LL:

$$\begin{aligned} \text{wall segment A: } P &= (1.2 \cdot 8.5 - (2 \cdot 1.2 + 0.9)/2) \cdot 4.40 = 37.6 \\ &+ (2 \cdot 1.2 + 0.9) \cdot 0.52 = 0.9 \\ &\underline{\hspace{1.5cm}} \\ &38.5 \text{ kN} \end{aligned}$$

$$p = 38.5 / 1.2 = 32.1 \text{ kN/m (SLS)}$$

$$\begin{aligned} \text{wall segment B: } P &= (1.9 \cdot 8.5 - (4 \cdot 1.2 + 0.9 + 1.9)/2) \cdot 4.40 = 54.3 \\ &+ (4 \cdot 1.2 + 0.9 + 1.9)/2 \cdot 0.52 = 2.0 \\ &\underline{\hspace{1.5cm}} \\ &56.3 \text{ kN} \end{aligned}$$

$$p = 56.3 / 1.5 = 37.5 \text{ kN/m (SLS)}$$

$$\begin{aligned} \text{wall segment C: } P &= (0.9 \cdot 8.5 - (2 \cdot 1.2 + 1.9)/2) \cdot 4.40 = 24.2 \\ &+ (2 \cdot 1.2 + 1.9)/2 \cdot 0.52 = 1.1 \\ &\underline{\hspace{1.5cm}} \\ &25.3 \text{ kN} \end{aligned}$$

$$p = 25.3 / 0.4 = 63.3 \text{ kN/m (SLS)}$$

The diagram is a hand-drawn architectural floor plan of a building facade, showing various structural elements and annotations. The plan is divided into several sections by vertical lines labeled "No. 32", "No. 34", "Flash Walk No. 36", and "No. 38".

Key features and annotations include:

- Top Left:** "Glazing" and "DL = 0.52 kw/m²".
- Top Right:** "New mansard" and "DL = 1.00 kw/m² (supported on p.w.s.)".
- Center:** A large rectangular area is highlighted in red, containing several windows and a central circular feature. Below this area, a section is labeled "Cavity wall" and "DL = 4.40 kw/m²".
- Bottom Left:** A section labeled "COMMUNAL GARAGE" with a car parked inside.
- Bottom Right:** A section labeled "Extra RC beam".
- Structural Details:** The plan shows various wall types (brick, stone), windows, doors, and structural elements like "Flash Walk", "Cavity wall", and "Extra RC beam".

36 Flank Wall

Rear elevation - Section A-A.

DL+LL:

$$\begin{aligned} \text{Wall segment A: } P &= (0.9 \cdot 6.0 - (2 \cdot 1.2)/2) \cdot 4.40 = 18.5 \\ &+ (2 \cdot 1.2/2) \cdot 0.52 = 0.6 \\ &= 19.1 \text{ kN} \end{aligned}$$

$$p = 19.1 / 0.9 = 21.2 \text{ kN/m (sls)}$$

$$\begin{aligned} \text{Wall segment B: } P &= (2.2 \cdot 6.0 - (4 \cdot 1.2)/2) \cdot 4.40 = 24.2 \\ &+ (4 \cdot 1.2/2) \cdot 0.52 = 1.2 \\ &= 25.4 \text{ kN} \end{aligned}$$

$$p = 25.4 / 2.2 = 11.5 \text{ kN/m (sls)}$$

$$\text{Wall segment C: } P = 19.1 \text{ kN}$$

$$p = 21.2 \text{ kN/m (sls)}$$

Notes

THIS SURVEY HAS BEEN PREPARED WITH A SCALING ACCURACY FOR A PLOT AT A SCALE OF 1/50

ALL LEVELS ARE IN METRES RELATED TO AN ORDNANCE DATUM.

THE CO-ORDINATE GRID IS RELATED TO NATIONAL GRID VALUES BY RESECTION USING ORDNANCE SURVEY DIGITAL DATA

ALL TREE HEIGHTS AND SPREADS ARE APPROXIMATE

WE HAVE TRIED TO IDENTIFY TREE TYPES, HOWEVER IF TREE SPECIES ARE CRITICAL SPECIALIST ADVICE SHOULD BE GAINED.

DRAINAGE PIPE SIZES HAVE BEEN MEASURED FROM THE SURFACE, CHAMBER ACCESS HAS NOT BEEN GAINED FOR SAFETY REASONS, THEREFORE SIZES SHOULD BE REGARDED AS APPROXIMATE

bl bed level
cl cover level
il invert level
tl threshold level
ut unable to lift
wl water level

FOUNDATIONS

FLASK WALK

tarmac

Permit Parking

OVERLAY CROSS

OVERLAY CROSS

Linebats and pressures at underside of new foundations.

No.32

No.34

No.38

KITCHEN

RECEPTION ROOM

PATIO

123.2 kW/m
(98.6 kW/m²)

130.8 kW/m
(104.6 kW/m²)

23.8 kW/m
(25.6 kW/m²)

118.6 kW/m
(127.5 kW/m²)

9.2 kW/m²

126.2 kW/m
(135.7 kW/m²)

1.0 0.0 1.0 2.0 3.0 4.0 5.0 6.0 7.0

Scale = 1 : 50

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job
36, FLASK WALK
LONDON
NW3 1HE

client
CHARLTON BROWN ARCHITECTS
ON BEHALF OF
IN STYLE DIRECT LIMITED

title
GROUND FLOOR PLAN
dwg no.
21857A/2

scale
1/50
date
14th NOVEMBER 2013



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36 Flask Walk

Forces at underside of new foundations

Party wall 36/38

$$\tau = 118.6 \text{ kN/m, generally}$$

$$\tau = 118.6 + (19.1 + 25.4 + 19.1) / 4.2$$

$$= 126.2 \text{ kN/m, in vicinity of rear elevation}$$

Max pressure for a 0.93 m wide foundation

$$p = 126.2 / 0.93 = 135.7 \text{ kN/m}^2 \quad \therefore \text{PASS.}$$

Party wall 36/34

$$\tau = 123.2 \text{ kN/m, generally}$$

$$\tau = 123.2 + (19.1 + 25.4 + 19.1) / 4.2$$

$$= 130.8 \text{ kN/m, in vicinity of rear elevation}$$

Max pressure for a 1.25 m wide foundation

$$p = 130.8 / 1.25 = 104.5 \text{ kN/m}^2 \quad \therefore \text{PASS.}$$

RC Slab (DL + LL)

$$p = (0.25 + 0.07) \cdot 24.0 + 1.5$$

$$= 9.2 \text{ kN/m}^2 \quad \therefore \text{PASS}$$

Box frame (supporting front elevation)

$$\tau = (38.5 + 56.3 + 25.3) / 4.0$$

$$= 30.0 \text{ kN/m} \quad \therefore \text{PASS.}$$

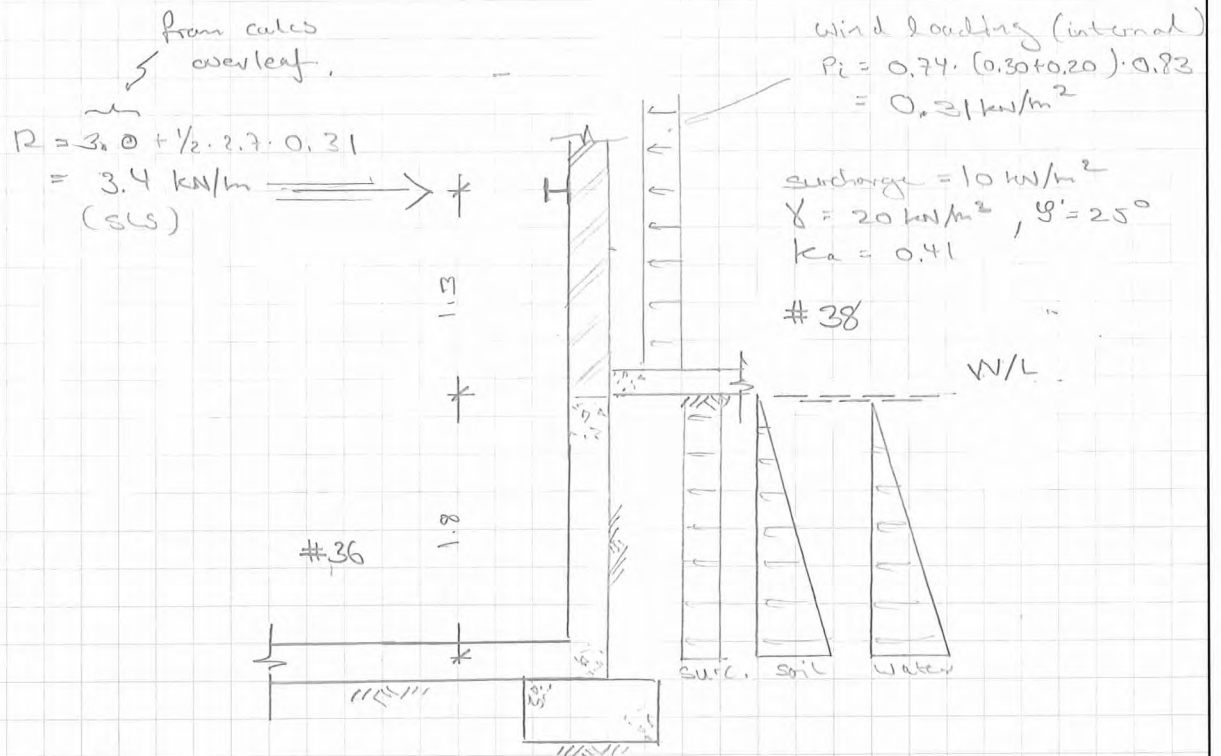
RC box ends

$$\tau = 3.3 \cdot (0.25 + 0.07) \cdot 24.0$$

$$= 23.8 \text{ kN/m} \quad \therefore \text{PASS}$$

26 Flucte Wall

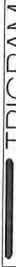
WALING BEAM



Surcharge $P_{max} = 0.41 \cdot 10 = 4.1 \text{ kN/m}^2$

Soil $P_{max} = 0.41 \cdot (20 - 10) \cdot 1.8 = 7.4 \text{ kN/m}^2$

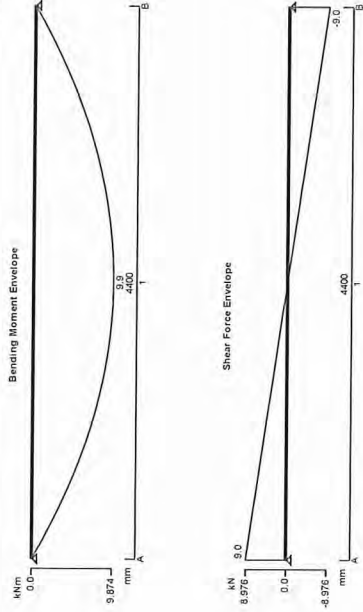
Water $P_{max} = 10 \cdot 1.8 = 18.0 \text{ kN/m}^2$

 TRIGRAM CONSULTING STRUCTURAL ENGINEERS	Project		36 Flask Walk		Job no.		4266	
	Calcs for		Waling Beam - Sizing		Start page no /Revision		1	
	Calcs by	JF	Calcs date	11/11/2015	Checked by	Checked date	Approved by	Approved date
		Trigram Partnership Harling House 47-51 Great Suffolk Street London SE1 0BS						

STEEL BEAM ANALYSIS & DESIGN (BS5950)

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

TEDDS calculation version 3.0.05



Support conditions

Support A

Vertically restrained
Rotationally free
Vertically restrained
Rotationally free

Support B

Applied loading

Beam loads

Other full UDL 3.4 kN/m

Load combinations

Load combination 1

Support A
Span 1
Support B
Support A
Span 1
Support B
Other x 1.00
Other x 1.00
Other x 1.00
Other x 1.20
Other x 1.20
Other x 1.20

Load combination 2

Analysis results

Maximum moment

Maximum shear

Deflection

Maximum reaction at support A

Unfactored other load reaction at support A

Maximum reaction at support B

Unfactored other load reaction at support B

Section details

Section type

Steel grade

UKC 152x152x37 (Tata Steel Advance)
S275

$M_{max} = 9.9$ kNm
 $V_{max} = 9$ kN
 $\delta_{max} = 3.7$ mm
 $R_{A,max} = 9$ kN
 $R_{A,Other} = 7.5$ kN
 $R_{B,max} = 9$ kN
 $R_{B,Other} = 7.5$ kN

 TRIGRAM CONSULTING STRUCTURAL ENGINEERS	Project		36 Flask Walk		Job no		4266	
	Calcs for		Waling Beam - Sizing		Start page no /Revision		2	
	Calcs by		JF		Approved by		Approved date	
			Calcs date		Checked date			
	Trigram Partnership		11/11/2015					
Harling House								
47-51 Great Suffolk Street								
London SE1 0BS								

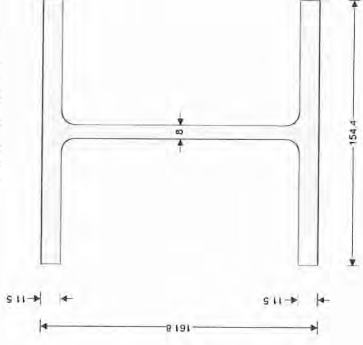
From table 9: Design strength p_y

Thickness of element

Design strength

Modulus of elasticity

$\max(T, t) = 11.5$ mm
 $p_y = 275$ N/mm²
 $E = 205000$ N/mm²



Lateral restraint

Span 1 has full lateral restraint

Effective length factors

Effective length factor in major axis

Effective length factor in minor axis

Effective length factor for lateral-torsional buckling

$K_{LTB} = 1.00$

$K_y = 1.00$

$K_x = 1.00$

$K_{LTA} = 1.00$

Classification of cross sections - Section 3.5

$\varepsilon = \sqrt{275 \text{ N/mm}^2 / p_y} = 1.00$

Internal compression parts - Table 11

Depth of section

$d = 123.6$ mm

$d/t = 15.5 \times \varepsilon \leq 80 \times \varepsilon$

Class 1 plastic

Outstand flanges - Table 11

Width of section

$b = B/2 = 77.2$ mm

$b/T = 6.7 \times \varepsilon \leq 9 \times \varepsilon$

Class 1 plastic

Section is class 1 plastic

Shear capacity - Section 4.2.3

Design shear force

$F_v = \max(\text{abs}(V_{max}), \text{abs}(V_{min})) = 9$ kN

$d/t < 70 \times \varepsilon$

Web does not need to be checked for shear buckling

$A_v = t \times D = 1294$ mm²

$P_v = 0.6 \times p_y \times A_v = 213.6$ kN

Design shear resistance

PASS - Design shear resistance exceeds design shear force

Moment capacity - Section 4.2.5

Design bending moment

$M = \max(\text{abs}(M_{A,max}), \text{abs}(M_{A,min})) = 9.9$ kNm

$M_c = \min(p_y \times S_{xx}, 1.2 \times p_y \times Z_{xx}) = 84.9$ kNm

 TRIGRAM PARTNERSHIP CONSULTING STRUCTURAL ENGINEERS	Project	36 Flask Walk		Job no	4266
	Calcs for	Waling Beam - Sizing		Start page no./Revision	3
	Calcs by	JF	Checked by	Approved by	
	Calcs date	11/11/2015	Checked date	Approved date	

Trigram Partnership
Haring House
47-51 Great Suffolk Street
London SE1 0BS

Check vertical deflection - Section 2.5.2
Consider deflection due to other loads
Limiting deflection
Maximum deflection span 1

PASS - Moment capacity exceeds design bending moment

$\delta_{lim} = \min(14 \text{ mm}, L_{s1} / 500) = 8.8 \text{ mm}$
 $\delta = \max(\delta_{max}, \delta_{min}) = 3.662 \text{ mm}$
PASS - Maximum deflection does not exceed deflection limit

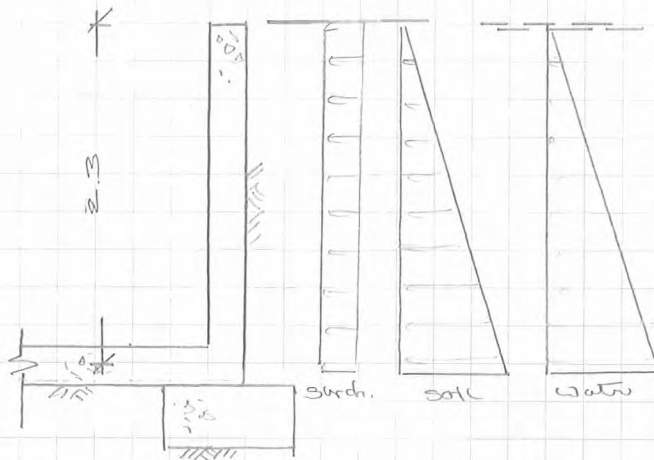
36 Flask Walk

RC RETAINING WALL

Front Light Well (worst case)

Light well

$$\begin{aligned} \text{Surcharge} &= 10 \text{ kN/m}^2 \\ \gamma &= 20 \text{ kN/m}^3, \phi' = 25^\circ \\ K_a &= 0.41 \end{aligned}$$



Surcharge $P_{max} = 0.41 \cdot 10 = 4.1 \text{ kN/m}^2$

Soil $P_{max} = 0.41 \cdot (20 - 10) \cdot 2.3 = 9.4 \text{ kN/m}^2$

Water $P_{max} = 10 \cdot 2.3 = 23.0 \text{ kN/m}^2$

TEKLA

Tedds

Project

36 Flask Walk

Job no.

4266

Calcs for

Retaining wall - loading

Start page no / Revision

1

Calcs by

JF

Calcs date

06/11/2015

Checked by

Approved by

Approved date

23.000

Other

0.0

mm

A

2300

B

Unfactored Loads

Self weight not included

Number of spans = 1

Material Properties:

Support Conditions:

Support A

Support B

Span Definitions:

Span 1

LOADING DETAILS

Beam Loads:

Load 1

Load 2

Load 3

LOAD COMBINATIONS

Load combination 1

Span 1

Load combination 2

Span 1

Modulus of elasticity = 25 kN/mm²

Material density = 2400 kg/m³

Rotationally "Free"

Rotationally "Restrained"

Length = 2300 mm

Cross-sectional area = 250000 mm²

Moment of inertia = 1.30x10⁹ mm⁴

UDL Other load 4.1 kN/m

VDL Other load 0.0 kN/m to 9.4 kN/m

VDL Other load 0.0 kN/m to 23.0 kN/m

Load combination 1

1xOther

Load combination 2

1.2xOther

RESULTS FOR COMBINATION 1

Support Reactions and Deflections - Combination 1 :

Support A

Support B

Reaction = 0.0 kN

Reaction = -46.7 kN

Moment = 0.0 kNm

Moment = 39.4 kNm

Deflection = 1.4 mm

Deflection = 0.0 mm

Rotation = -0.04 deg

Rotation = 0.00 deg

kNm

-39.411

0.0

mm

A

2300

B

Bending Moment - Combination 1

TEKLA

Tedds

Project

36 Flask Walk

Job no.

4266

Calcs for

Retaining wall - loading

Start page no / Revision

2

Calcs by

JF

Calcs date

06/11/2015

Checked by

Approved by

Approved date

0.0

-46.690

mm

A

2300

B

Shear Force - Combination 1

RESULTS FOR COMBINATION 2

Support Reactions and Deflections - Combination 2 :

Support A

Support B

Reaction = 0.0 kN

Reaction = -56.0 kN

Moment = 0.0 kNm

Moment = 47.3 kNm

Deflection = 1.6 mm

Deflection = 0.0 mm

Rotation = -0.05 deg

Rotation = 0.00 deg

kNm

-47.303

0.0

mm

A

2300

B

Bending Moment - Combination 2

kN

0.0

-56.028

mm

A

2300

B

Shear Force - Combination 2

INPUT

Location Retaining wall

Design moment, M	47.3	kNm/m	fcu	35	N/mm ²	γ_c	1.50
β_b	1.00		f_y	460	N/mm ²	γ_s	1.05
span	2300	mm					
Height, h	250	mm	Section location	CANTILEVER			
Bar $\varnothing$	16	mm	Compression steel	NOMINAL			
cover	40	mm to these bars					

OUTPUT

Retaining wall

Compression steel = NOMINAL

(3.4.4.4) $d = 250 - 40 - 16/2 = 202.0$ mm
(3.4.4.4) $K' = 0.156 > K = 0.033$ ok
(3.4.4.1) $z = 202.0 [0.5 + (0.25 - 0.033 / 0.893)]^{1/2} = 194.3 > 0.95d = 191.9$ mm
As = 47.30E6 / 460 / 191.9 x 1.05 = 563 > min As = 325 mm²/m
PROVIDE T16 @ 250 = 804 mm²/m As increased by 35.1% for deflection
(Eqn 8) $f_s = 2/3 \times 460 \times 563 / 804 / 1.00 = 214.5$ N/mm²
(Eqn 7) Tens mod factor = $0.55 + (477 - 214.5) / 120 / (0.9 + 1.159) = 1.612$
(Equation 9) Comp mod factor = $1 + 0.13 / (3 + 0.13) = 1.042$
(3.4.6.3) Permissible L/d = $7.0 \times 1.612 \times 1.042 = 11.754$
Actual L/d = $2300 / 202.0 = 11.386$ ok

INPUT

Location Retaining wall

fcu	35	N/mm ²	γ_c	1.50
f_y	460	N/mm ²	γ_s	1.05

Main Steel	Link	Legs	Side cover	Shear V	UDL
5	16	10	35	56.0	0.0
No	mm $\varnothing$	mm $\varnothing$	mm	kN	kN/m

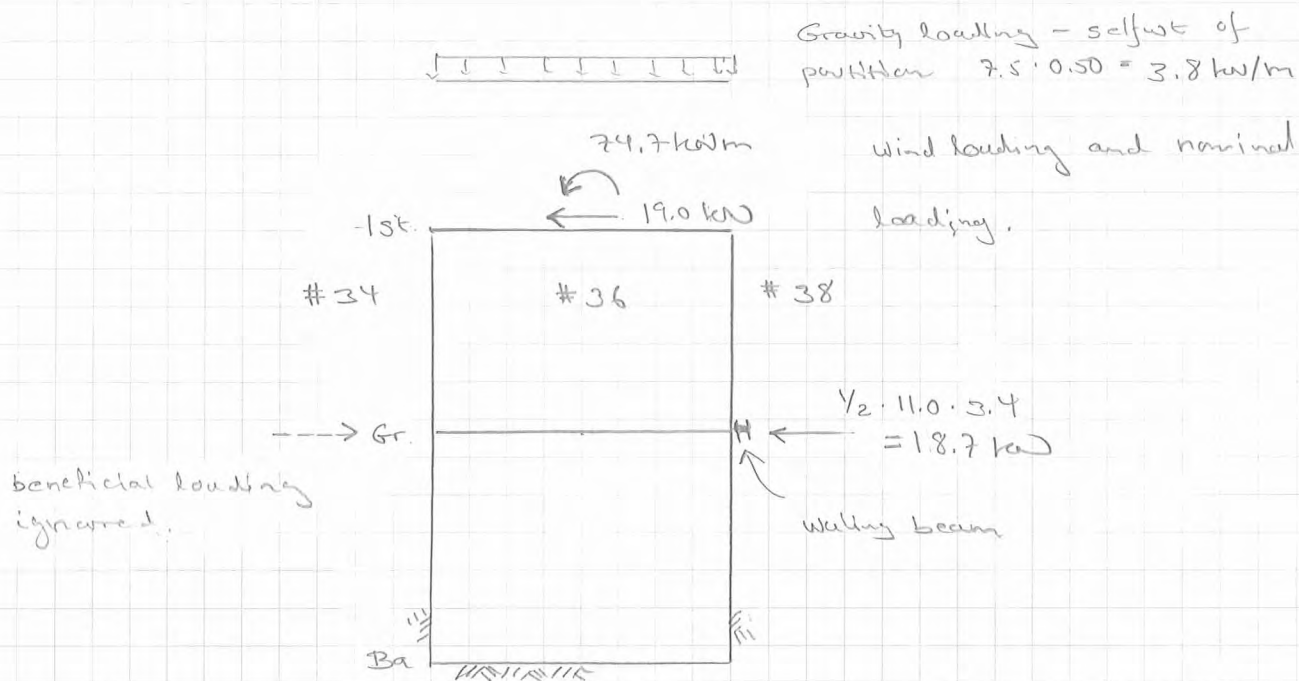
OUTPUT Retaining wall

As = 1005 N/mm² = 0.498%
(Eqn 3) $v = 56.0 \times 10^3 / 1,000 / 202 = 0.277$ N/mm²
(Table 3.8) $vc = 0.665$ N/mm², from table 3.8
No links needed

#DIV/0!

36 Fluke Wall

CENTRAL FRAME



View - Exact deformation(s), Cases: 11 (1.0Gravity+1.0Wind)

