Alexandra Park

Item 5
Shear Wall Design

Shear wall design – Elev. core – GL 8 @ Ground Level

by RM Dec-07 printed on 22/01/2015
last rev. Mar-10

f'c 35 MPA

(down positive) Pf 9050 kN
(always positive) Mf 23500 kN.m

L (length) 10000 mm
b (width) 300 mm
lc (height in compression) 4000 mm

use	25M	
nb	2.7	each end
As	1330	mm2

14.2.2.1
Concrete Wall Bearing Capacity

f'c	35 MPa	α1	0.7975
k	0.8	Ag	2462766 mm2
lc	4000 mm		
h	300 mm	Pr	24442 kN
w	8209.22 mm	Br	43960 kN

ok!

2 layers
reinforcing 10M @ 200 ==>
1000 mm2/m ==> ρ 0.003

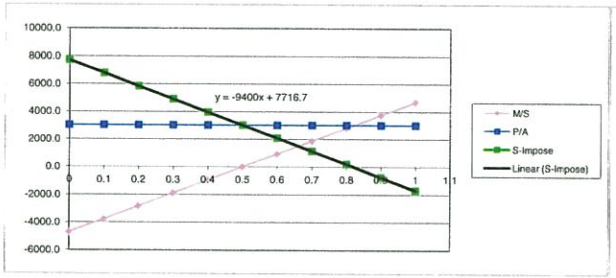
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1
P/A	3016.7	3016.7	3016.7	3016.7	3016.7	3016.7	3016.7	3016.7	3016.7	3016.7	3016.7
M/S	-4700.0	-3760.0	-2820.0	-1880.0	-940.0	0.0	940.0	1880.0	2820.0	3760.0	4700.0
	7716.7	6776.7	5836.7	4896.7	3956.7	3016.7	2076.7	1136.7	196.7	-743.3	**-1683.3**

P/A 3016.67
M/S 4700.00

P/A-M/S -1683.33 **Tension**
S 5.0000

y=ax+b
a -9400.0
b 7716.7

x 0.82 <== 0.82
y 0



Tension Stress -1.68 MPa
Compression Stress 7.72 MPa 9502 kN

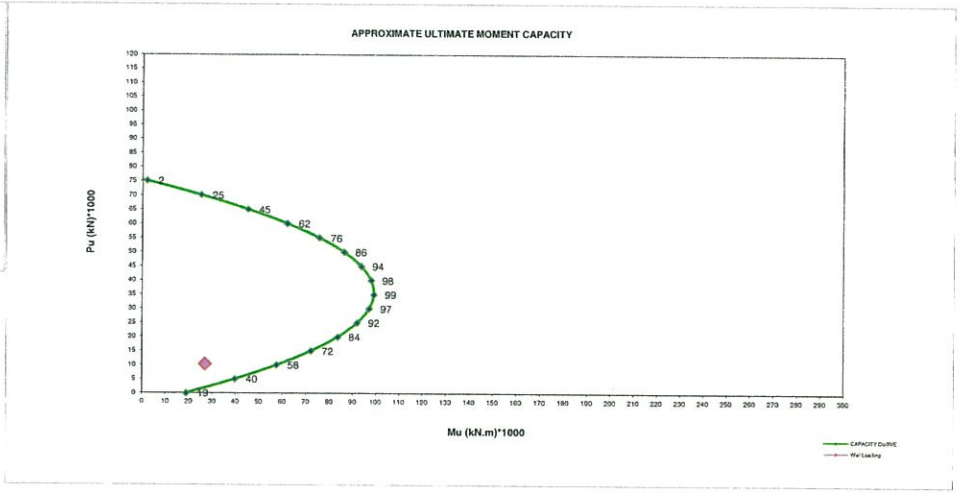
Pr (in compression) 20065 kN
ok!

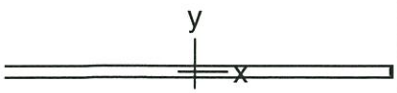
Tension Force
1790.78 mm in Tension

T 452 kN
Tf 532 kN

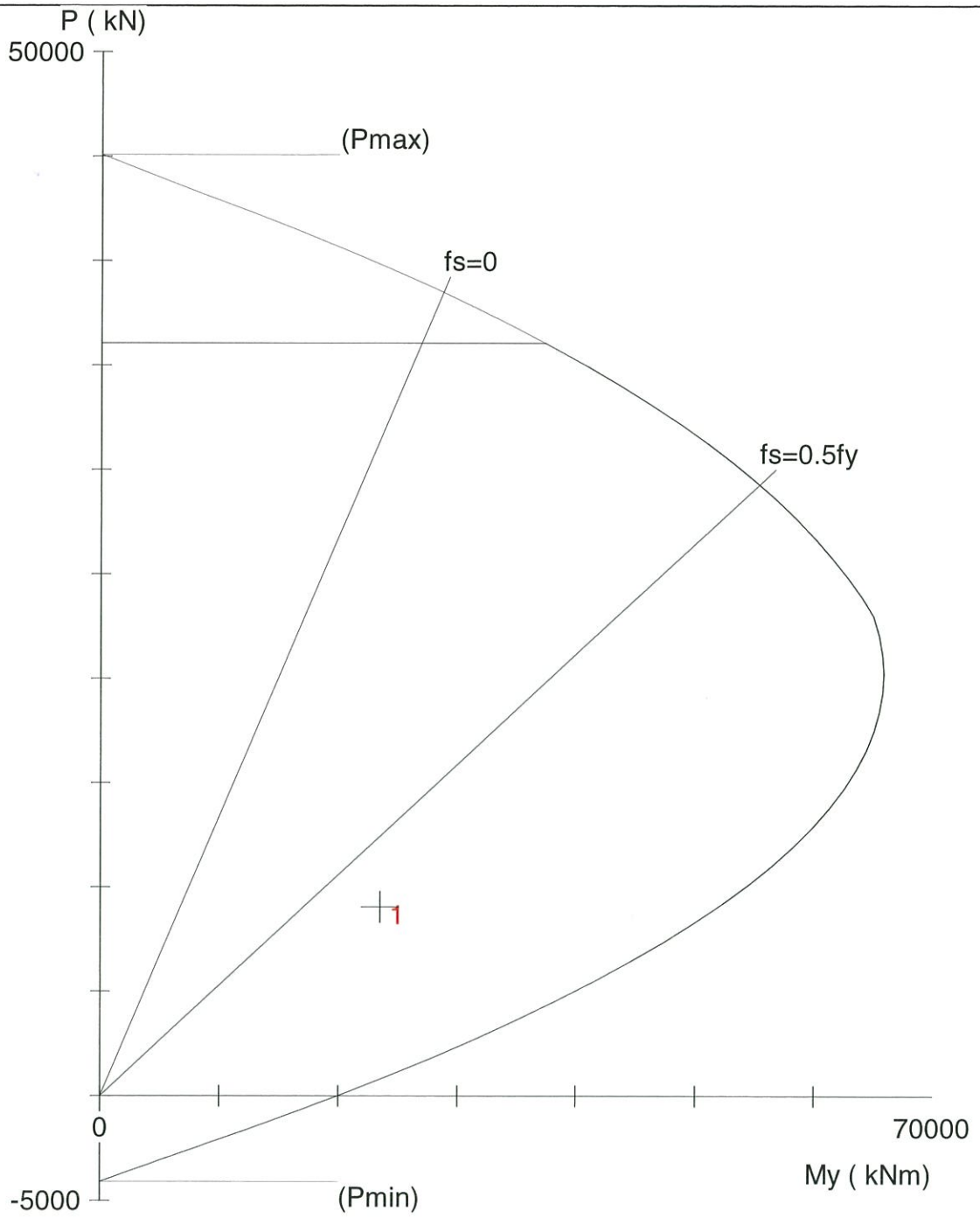
Compression Force
8209.22 mm in compression

8598





10000 x 300 mm



Code: CSA A23.3-04

Units: Metric

Run axis: About Y-axis

Run option: Investigation

Slenderness: Not considered

Column type: Architectural

Bars: CSA G30.18

Date: 01/22/15

Time: 17:53:47

File: E:\Projects\13015-Alexandra Park\City\wall.col

Project: Alexandra Park

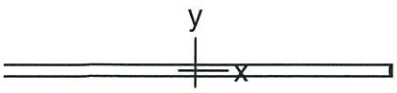
Column: Wall - Elev

Engineer: HP

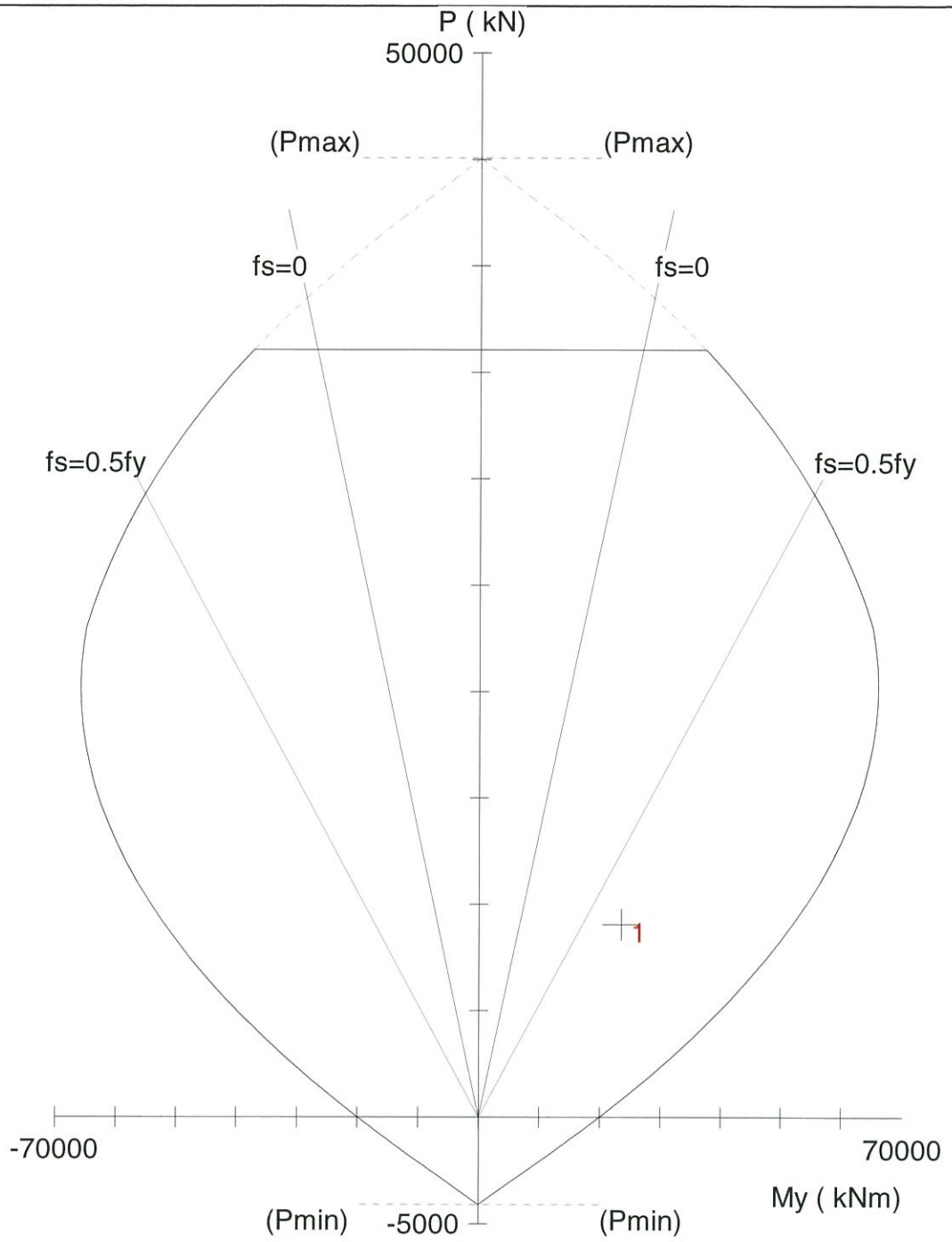
f'c = 35 MPa	fy = 413.7 MPa	Ag = 3e+006 mm^2	90 bars
Ec = 28165 MPa	Es = 199955 MPa	As = 15400 mm^2	rho = 0.51%
fc = 27.9125 MPa		Xo = 0 mm	Ix = 2.25e+010 mm^4
e_u = 0.0035 mm/mm		Yo = 0 mm	Iy = 2.5e+013 mm^4
Beta1 = 0.8825		Min clear spacing = -1 mm	Clear cover = 36 mm

Confinement: Tied

phi(a) = 0.8, phi(s) = 0.85, phi(c) = 0.65, phi(rho) = 0.76



10000 x 300 mm



Code: CSA A23.3-04

Units: Metric

Run axis: About Y-axis

Run option: Investigation

Slenderness: Not considered

Column type: Architectural

Bars: CSA G30.18

Date: 01/22/15

Time: 17:40:05

File: E:\Projects\13015-Alexandra Park\City\wall.col

Project: Alexandra Park

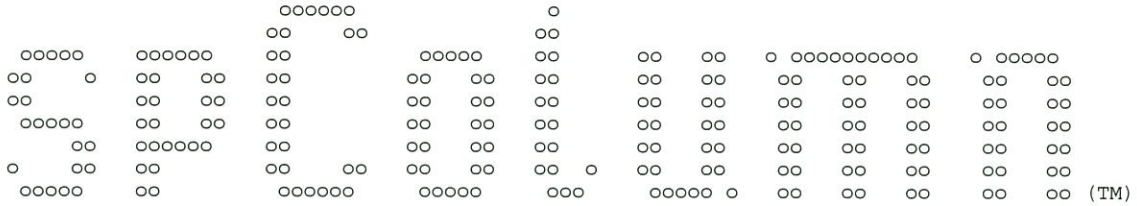
Column: Wall - Elev

Engineer: HP

f'c = 35 MPa	fy = 413.7 MPa	Ag = 3e+006 mm^2	90 bars
Ec = 28165 MPa	Es = 199955 MPa	As = 15400 mm^2	rho = 0.51%
fc = 27.9125 MPa		Xo = 0 mm	Ix = 2.25e+010 mm^4
e_u = 0.0035 mm/mm		Yo = 0 mm	Iy = 2.5e+013 mm^4
Beta1 = 0.8825		Min clear spacing = -1 mm	Clear cover = 36 mm

Confinement: Tied

phi(a) = 0.8, phi(s) = 0.85, phi(c) = 0.65, phi(rho) = 0.76



spColumn v4.81 (TM)
Computer program for the Strength Design of Reinforced Concrete Sections

General Information:
==========
File Name: E:\Projects\13015-Alexandra Park\City\wall.col
Project: Alexandra Park
Column: Wall - Elev Engineer: HP
Code: CSA A23.3-04 Units: Metric

Run Option: Investigation Slenderness: Not considered
Run Axis: Y-axis Column Type: Architectural

Material Properties:
==========
f'c = 35 MPa fy = 413.7 MPa
Ec = 28164.7 MPa Es = 199955 MPa
Ultimate strain = 0.0035 mm/mm
Beta1 = 0.8825

Section:
==========
Rectangular: Width = 10000 mm Depth = 300 mm

Gross section area, Ag = 3e+006 mm^2
Ix = 2.25e+010 mm^4 Iy = 2.5e+013 mm^4
rx = 86.6025 mm ry = 2886.75 mm
Xo = 0 mm Yo = 0 mm

Reinforcement:
==========
Bar Set: CSA G30.18

Size	Diam (mm)	Area (mm^2)	Size	Diam (mm)	Area (mm^2)	Size	Diam (mm)	Area (mm^2)
# 10	11	100	# 15	16	200	# 20	20	300
# 25	25	500	# 30	30	700	# 35	36	1000
# 45	44	1500	# 55	56	2500			

Confinement: Tied; #10 ties with #55 bars, #15 with larger bars.
phi(a) = 0.8, phi(s) = 0.85, phi(c) = 0.65, phi(rho) = 0.76

Layout: Rectangular
Pattern: Sides Different (Cover to transverse reinforcement)
Total steel area: As = 15400 mm^2 at rho = 0.51% (Note: rho < 1.0%)
Minimum clear spacing = -1 mm

	Top	Bottom	Left	Right
Bars	37 #10	37 #10	8 #25	8 #25
Cover(mm)	25	25	25	25

Factored Loads and Moments with Corresponding Capacities:
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No.	Pf kN	Mfy kNm	Mry kNm	Mr/Mf	NA depth mm	Dt depth mm	eps_s
1	9050.00	23500.00	51896.37	2.208	2751	9958	0.00917

*** End of output ***