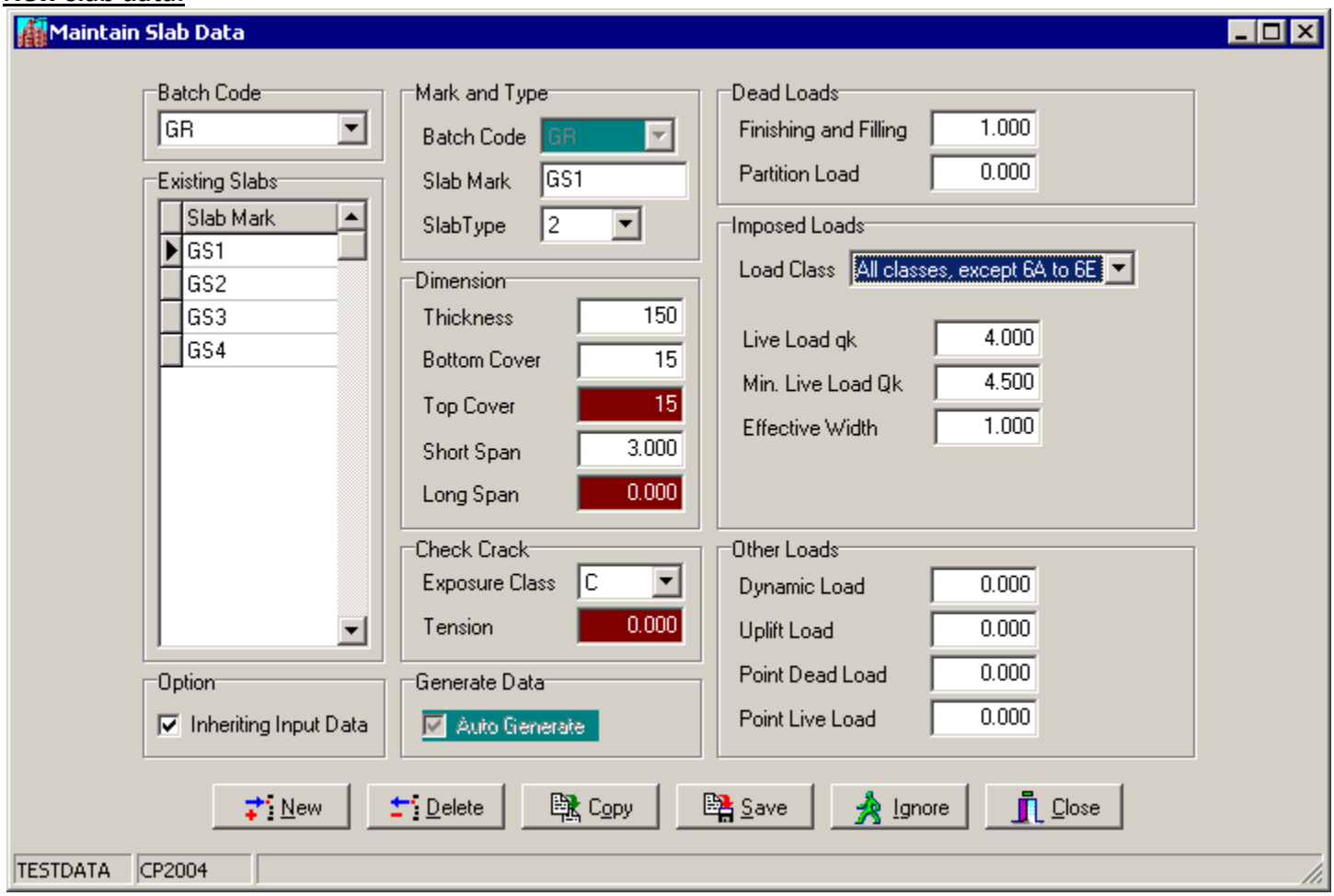
Code of Practice for Dead and Imposed Loads 2011 In SADS version 15.0

August 2012

The implementation of new load code to SADS v15

The SADS v15 includes the requirements of Code of Practice for Dead and Imposed Load 2011 (CoP 2011). This document explains the changes of SADS.

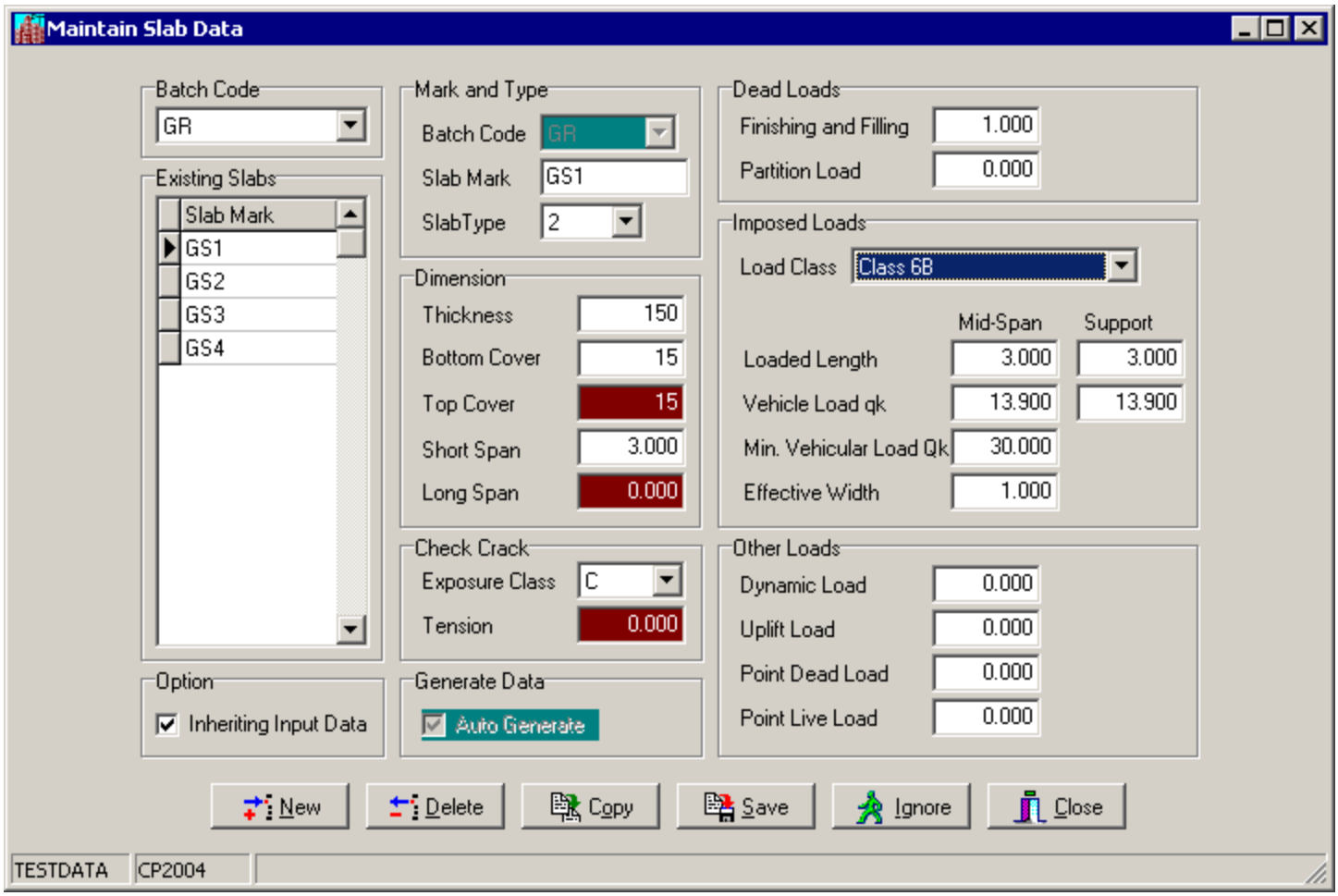
New slab data:



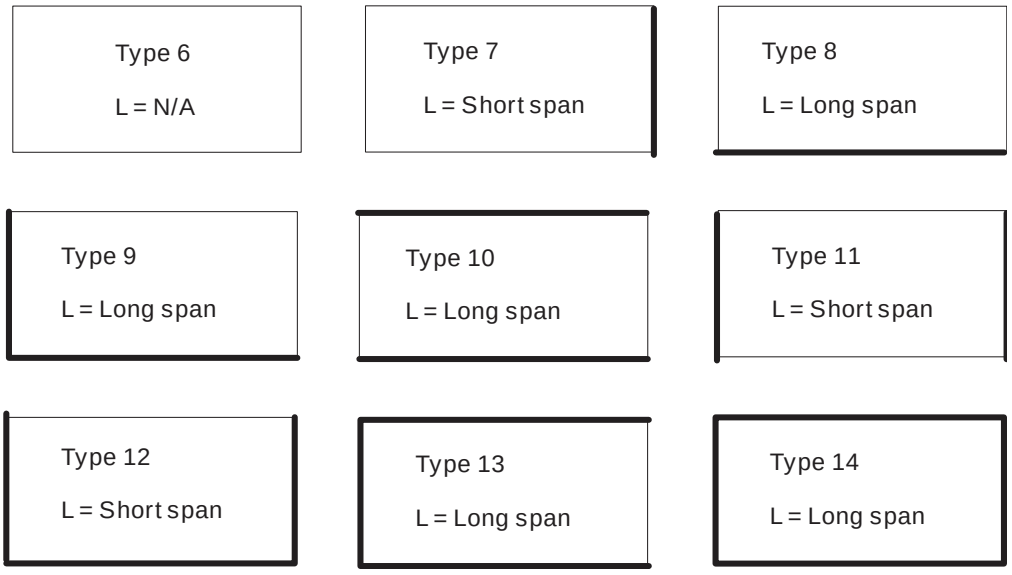
The load data for slab are divided into 3 categories, dead loads, imposed loads and other loads. The imposed loads has load class combo box. There are 6 options in the combo box.

- All classes, except 6A to 6E: it includes class 1 to 5, 7, and 8.
- Class 6A.
- Class 6B.
- Class 6C.
- Class 6D.
- Class 6E.

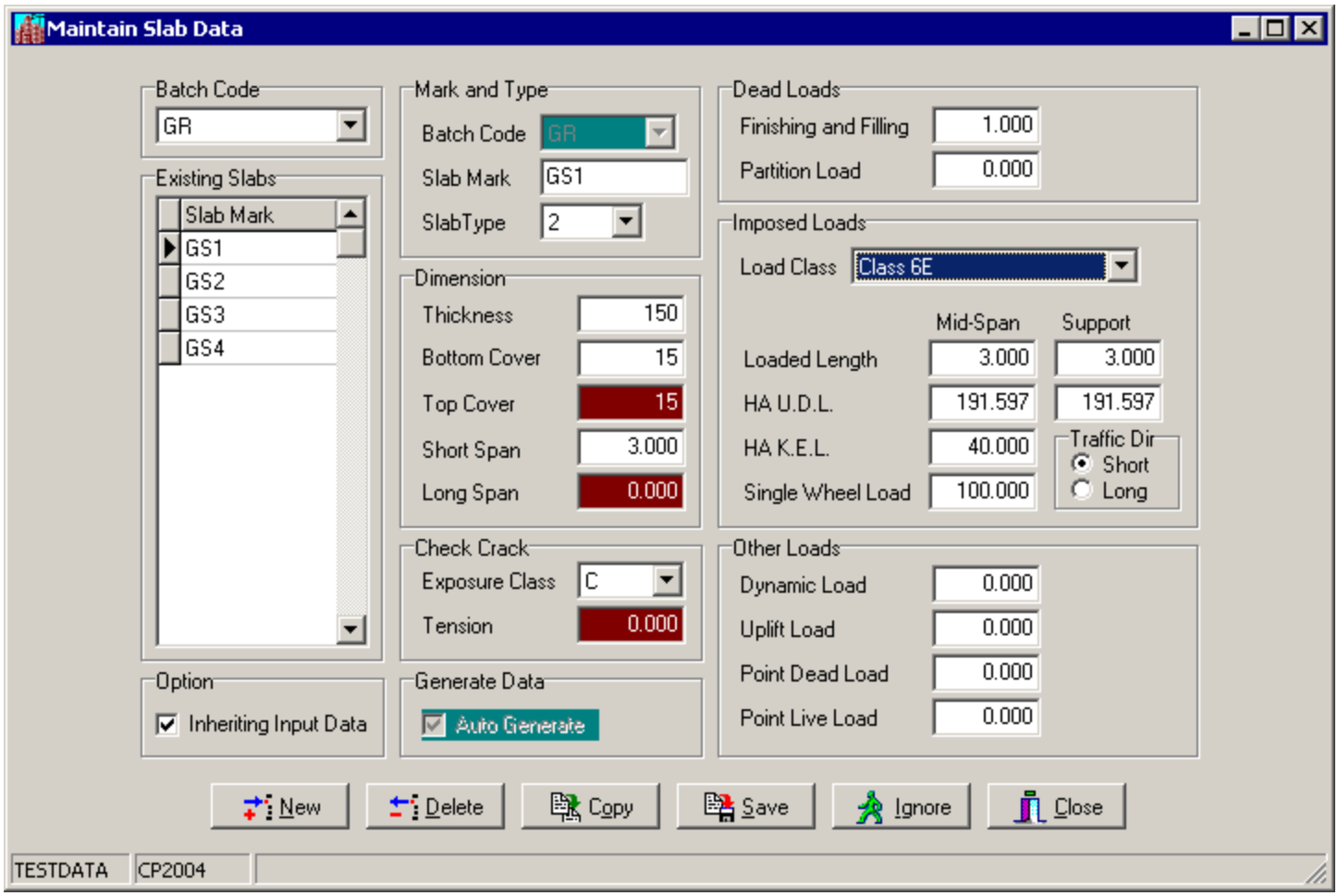
When you select first 2 options, you need to provide the data for Live Load qk, Min. Live Load Qk and Avail Width. If you select Class 6A, SADS will retrieve a default qk = 3.0 and Qk = 20.0 from Table 3.4 of CoP 2011. The default of Effective Width is 1.0. You may change the value according with Clause 6.1.3.2 (b) of CoP 2004.



If you select Class 6B, 6C and 6D, you need provide more data as shown in above screen. The default value of mid span loaded length is span of one way slab or short span of two way slab. The default value of support loaded length is shown as below.

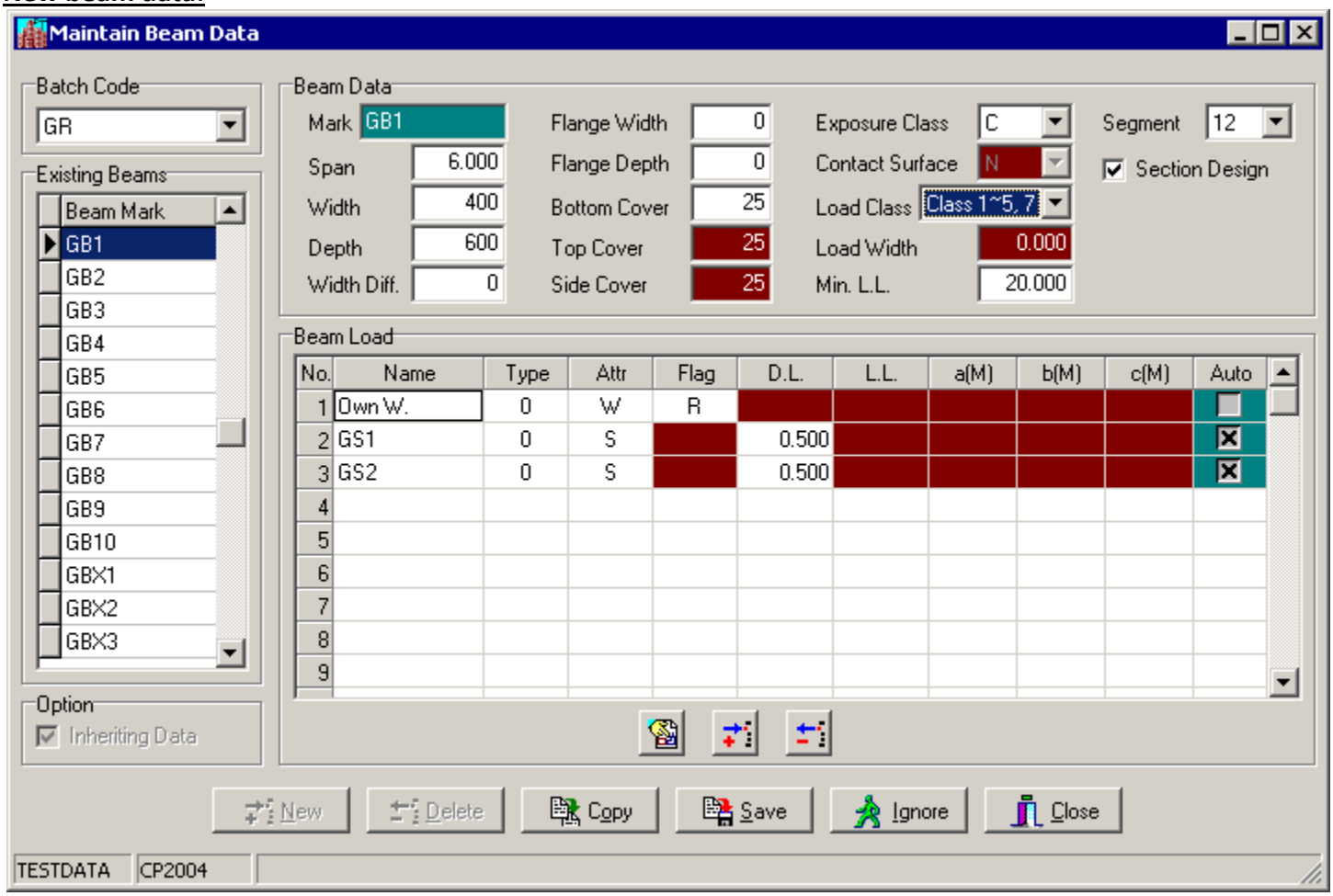


Based on loaded length, SADS calculates the qk according the Appendix C of CoP 2011 as default value. The default of Qk is taken from Table 3.5 of CoP 2011.

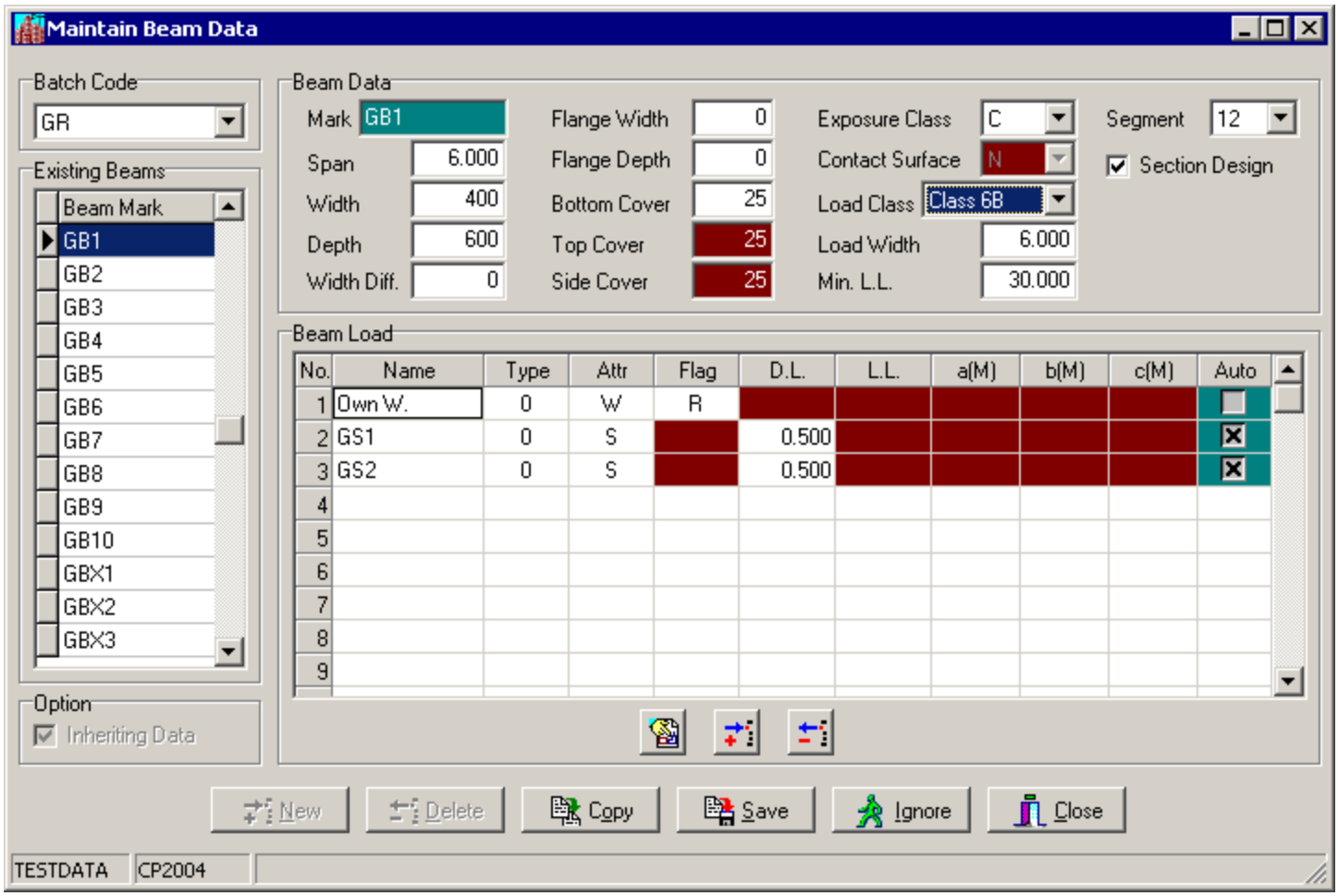


If you select Class E, the required data are shown as above. The default of loaded length is same as Class 6B to 6D. The default value of HA UDL is calculated according "Structures Design Manual for Highways and railways (SDM)". The default of KEL is 40 and single wheel load is 100. You need to indicate the direction of traffic flow, along short span or long span.

New beam data:

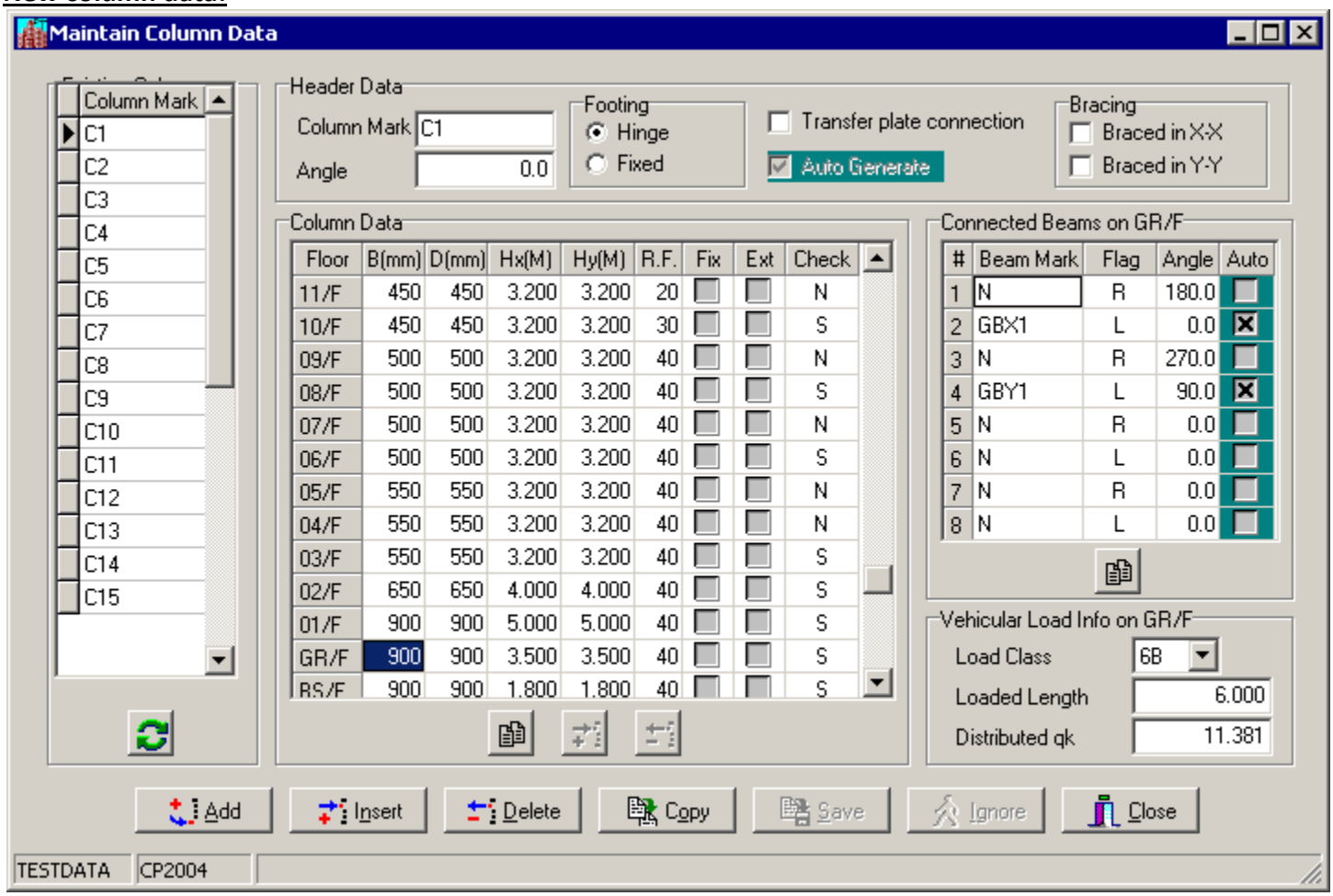


There is a load class combo box in beam data. There are 7 options in the combo box.
Class 1~5, 7.
Class 6A.
Class 6B.
Class 6C.
Class 6D.
Class 6E.
Class 8*.
When you select Class 1~5, 7 option, the load width is disabled. You need to provide the minimum live load Qk from Table 3.2 and 3.8. When you select Class 6A, the load width is disabled also and the default value of minimum live load is set to 20.0 according with Table 3.4. The Class 8* option is used for affiliated building element partially, i.e. for item #2 to 4 and item #6. SADS will consider the minimum live load in class 8* as uniformly distributed load instead of concentrated load. For item #1 and #5, you should use Class 1~5, 7 option to consider the minimum live load of the beam as concentrated load.



When you select Class 6B, 6C, and 6D, you need to provide the load width for calculating loaded length of beam at both mid-span and support. The default of minimum live load is taken from Table 3.5. For Class 6E, it is the same as Class 6B, 6C, and 6D, except the default value of minimum live load is set to 100 (single wheel load).

New column data:

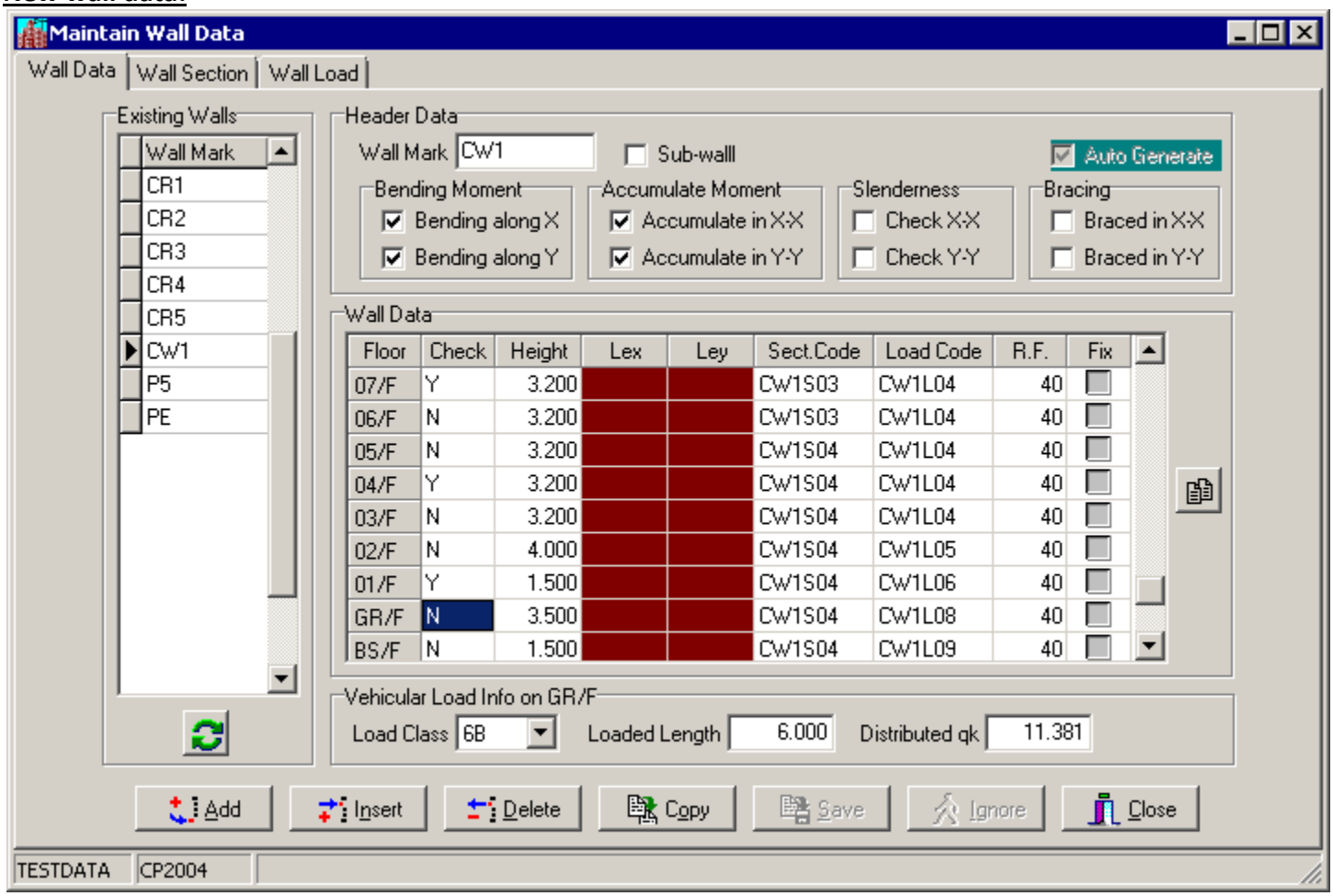


There is a load class combo box in column data and there are 5 options in the combo box.

- N/A.
- Class 6B.
- Class 6C.
- Class 6D.
- Class 6E.

When you select N/A option, no data is necessary, the loaded length and distributed qk data are disabled. When you select Class 6B to 6D, SADS searches the length of connect beams in X and Y directions and set the default value of loaded length. Also, SADS calculates the qk using formulas in Appendix C of CoP 2011 based on the loaded length. For Class 6E, it is the same as Class 6B, 6C, and 6D, except the default value of qk is calculated from formulas in SDM.

New wall data:

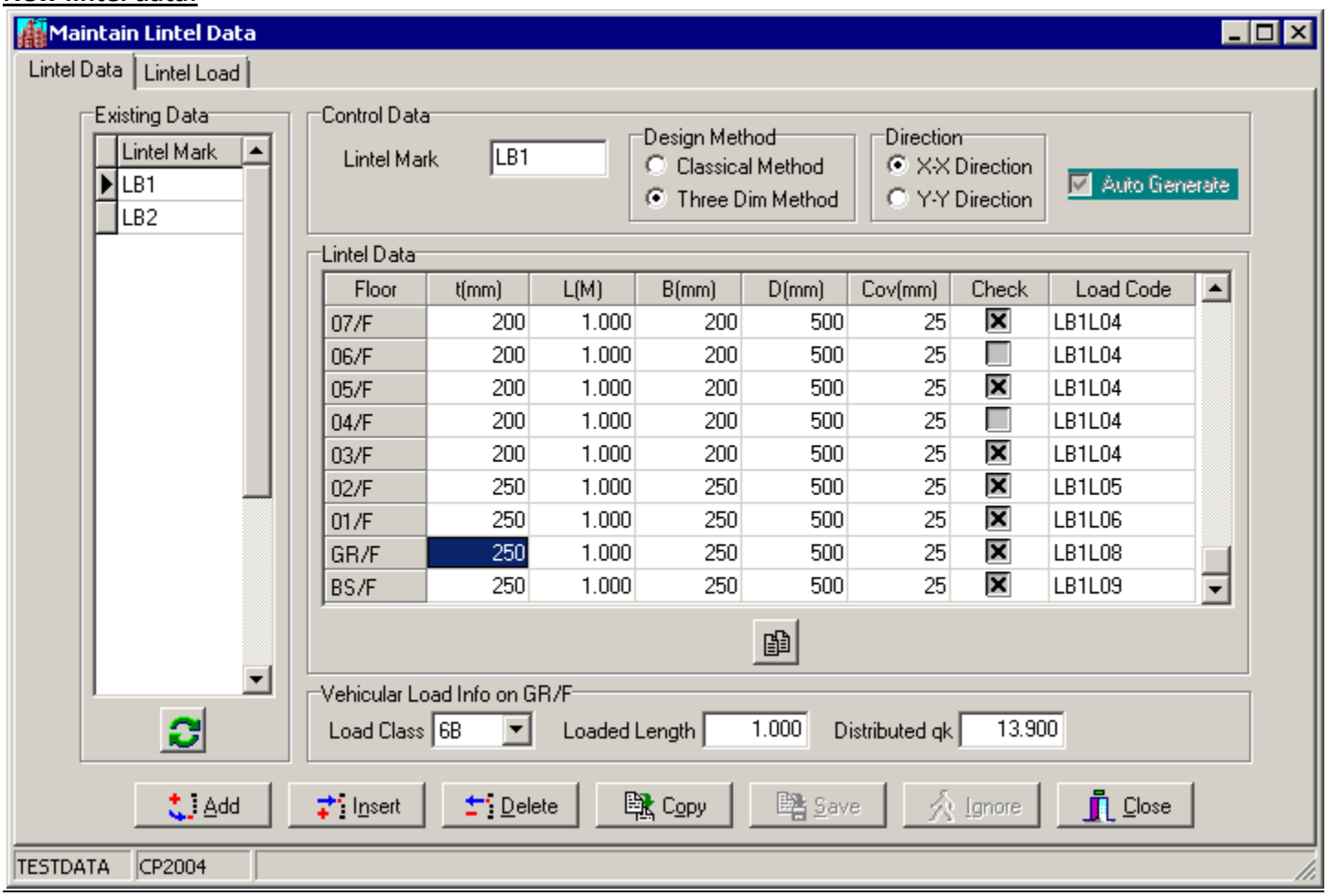


There is a load class combo box in column data and there are 5 options in the combo box.

- N/A.
- Class 6B.
- Class 6C.
- Class 6D.
- Class 6E.

When you select N/A option, no data is necessary, the loaded length and distributed qk data are disabled. When you select Class 6B to 6D, you need to provide the default value of loaded length. Then, SADS calculates the qk using formulas in Appendix C of CoP 2011 based on the loaded length. For Class 6E, it is the same as Class 6B, 6C, and 6D, except the default value of qk is calculated from formulas in SDM.

New lintel data:



There is a load class combo box in column data and there are 5 options in the combo box.

- N/A.
- Class 6B.
- Class 6C.
- Class 6D.
- Class 6E.

When you select N/A option, no data is necessary, the loaded length and distributed qk data are disabled. When you select Class 6B to 6D, SADS set the default loaded length of lintel beams as the span of lintel beam. Also, SADS calculates the qk using formulas in Appendix C of CoP 2011 based on the loaded length. For Class 6E, it is the same as Class 6B, 6C, and 6D, except the default value of qk is calculated from formulas in SDM.

Point load and line load on two way slabs:

According with the requirement of CoP 2011, the minimum live load on two way slab may be point load or line load whichever shall produce the most adverse ekkect. In CoP 2004, we can find moment coefficients of two way slab for uniformly distributed load only (Table 6.5 and 6.6). We need to derive some equations to calculate the moments of two way slab subjected point load and / or line load.

In Clause 6.1.3.3(b) of CoP 2004, the moments of simply supported two way slab can be calculated using following equations.

$$M_{sx} = \alpha_{sx} Q_k L_1^2$$
$$M_{sy} = \alpha_{sy} Q_k L_1^2$$

$$\alpha_{sx} = \frac{\alpha^4}{8[1+\alpha^4]}$$

$$\alpha_{sy} = \frac{\alpha^2}{8[1+\alpha^4]}$$

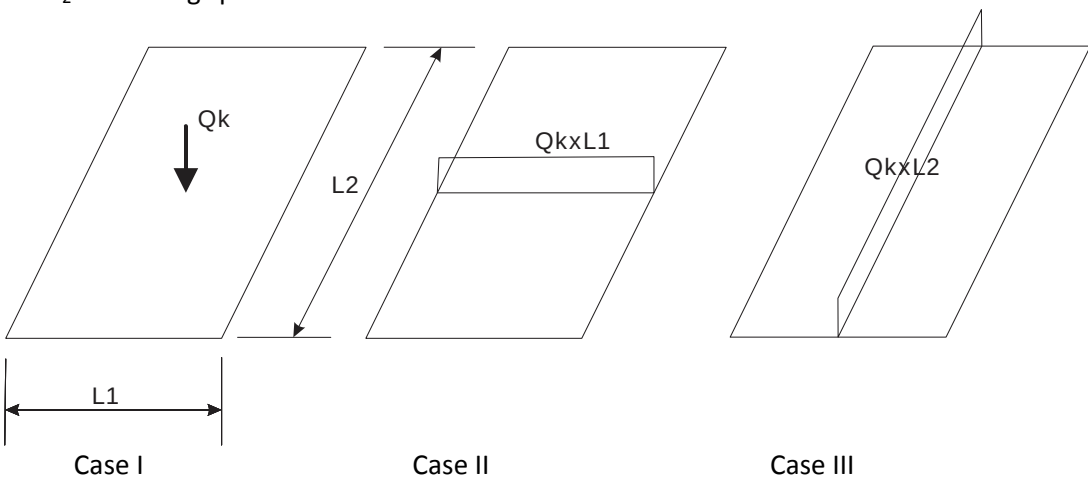
$$\alpha = \frac{L_2}{L_1}$$

Where:

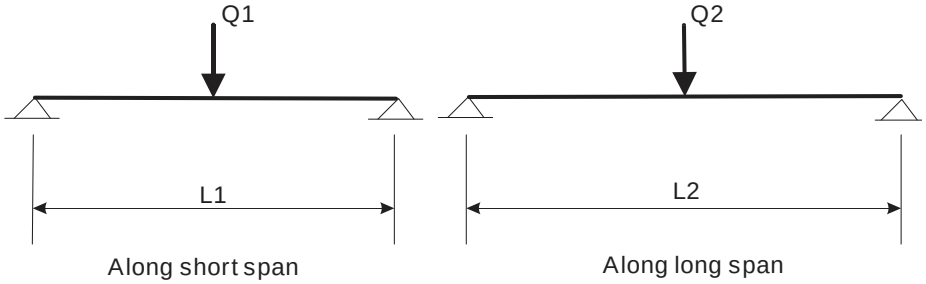
Q_k is uniformly distributed load;

L_1 is the short span;

L_2 is the long span.



Case I: Assume Q_k act on center of slab and the point load is resisted by 1 M wide strip of slab.



By equating the deformation at center of slab:

Along short span:

$$\Delta_x = \frac{Q_1 L_1^3}{48EI}$$

Along long span:

$$\Delta_y = \frac{Q_2 L_2^3}{48EI}$$

From $\Delta_x = \Delta_y$:

$$\frac{Q_1 L_1^3}{48EI} = \frac{Q_2 L_2^3}{48EI}$$

$$Q_1 L_1^3 = Q_2 L_2^3$$

$$Q_1 + Q_2 = Q_k$$

$$Q_1 = Q_2\left(\frac{L_2}{L_1}\right)^3$$

$$Q_2 + Q_2\left(\frac{L_2}{L_1}\right)^3 = Q_k$$

$$Q_2\left[1 + \left(\frac{L_2}{L_1}\right)^3\right] = Q_k$$

$$Q_2 = \frac{L_1^3}{L_1^3 + L_2^3} Q_k$$

$$Q_1 = \frac{L_2^3}{L_1^3 + L_2^3} Q_k$$

$$M_{sx} = \frac{Q_1 L_1}{4} = \frac{L_2^3 L_1}{4(L_1^3 + L_2^3)} Q_k = \frac{\alpha^3 L_1}{4(1+\alpha^3)} Q_k = \alpha_{sx} Q_k L_1$$

$$M_{sy} = \frac{Q_2 L_2}{4} = \frac{L_1^3 L_2}{4(L_1^3 + L_2^3)} Q_k = \frac{\alpha L_1}{4(1+\alpha^3)} Q_k = \alpha_{sy} Q_k L_1$$

Where:

$$\alpha = L_2/L_1$$

$$\alpha_{sx} = \frac{\alpha^3}{4(1+\alpha^3)}$$

$$\alpha_{sy} = \frac{\alpha}{4(1+\alpha^3)}$$

Equivalent UDL of point load:

$$M_{sx} = \frac{\alpha^3}{4(1+\alpha^3)} Q_k L_1$$

$$n_{sx}\alpha_{sx} L_1^2 = \frac{\alpha^3}{4L_1(1+\alpha^3)} Q_k L_1^2$$

$$n_{sx}\frac{\alpha^4}{8(1+\alpha^4)} = \frac{\alpha^3}{4L_1(1+\alpha^3)} Q_k$$

$$n_{sx} = \frac{2(1+\alpha^4)}{\alpha L_1(1+\alpha^3)} Q_k$$

$$M_{sy} = \frac{\alpha}{4(1+\alpha^3)} Q_k L_1$$

$$n_{sy}\alpha_{sy} L_1^2 = \frac{\alpha}{4L_1(1+\alpha^3)} Q_k L_1^2$$

$$n_{sy}\frac{\alpha^2}{8(1+\alpha^4)} = \frac{\alpha}{4L_1(1+\alpha^3)} Q_k$$

$$n_{sy} = \frac{2(1+\alpha^4)}{\alpha L_1(1+\alpha^3)} Q_k$$

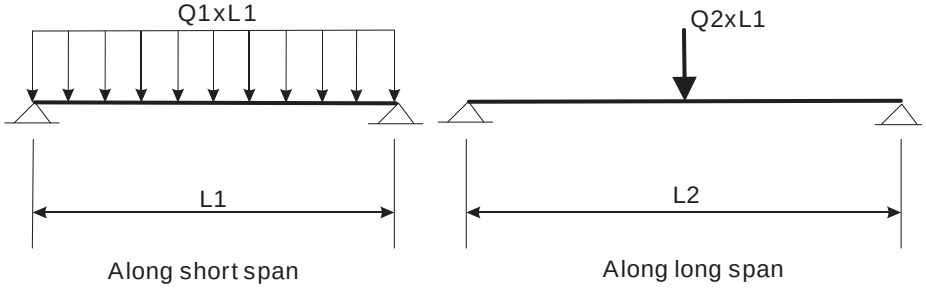
Use following equation for equivalent UDL:

$$n = \frac{2(1+\alpha^4)}{\alpha L_1(1+\alpha^3)} Q_k$$

We can use β_{sx} and β_{sy} from Table 6.6 in CoP 2004 to calculate moments of two way slab subjected point load.

$$M_{sx} = \beta_{sx} n L_1^2$$
$$M_{sy} = \beta_{sy} n L_1^2$$

Case II: Assume line load act at middle of long span and the line load is resisted by 1 M wide strip of slab.



By equating the deformation at center of slab:

Along short span:

$$\Delta_x = \frac{5Q_1L_1^4}{384EI}$$

Along long span:

$$\Delta_y = \frac{Q_2L_1L_2^3}{48EIL_1}$$

From $\Delta_x = \Delta_y$:

$$\frac{5Q_1L_1^4}{384EI} = \frac{Q_2L_2^3}{48EI}$$
$$\frac{5}{8}Q_1L_1^4 = Q_2L_2^3$$
$$Q_1 = \frac{8L_2^3}{5L_1^4}Q_2$$
$$Q_1 + Q_2 = Q_k$$
$$Q_2 + \frac{8L_2^3}{5L_1^4}Q_2 = Q_k$$
$$Q_2 = \frac{1}{\left[1+\frac{8L_2^3}{5L_1^4}\right]}Q_k$$
$$Q_1 = \frac{\frac{8L_2^3}{5L_1^4}}{\left[1+\frac{8L_2^3}{5L_1^4}\right]}Q_k$$

$$M_{sx} = \frac{Q_1 L_1^2}{8} = \frac{\frac{8L_2^3}{5L_1^4}}{1+\frac{8L_2^3}{5L_1^4}} Q_k \frac{L_1^2}{8} = \frac{L_2^3}{5L_1^4 + 8L_2^3} Q_k L_1^2 = \frac{\alpha^3}{5L_1 + 8\alpha^3} Q_k L_1^2 = \alpha_{sx} Q_k L_1^2$$

$$M_{sy} = \frac{Q_2 L_1 L_2}{4L_1} = \frac{L_2}{4\left(1+\frac{8L_2^3}{5L_1^4}\right)} Q_k = \frac{L_2 L_1^4}{4\left(L_1^4 + \frac{8}{5}L_2^3\right)} Q_k = \frac{5\alpha}{20L_1 + 32\alpha^3} Q_k L_1^2 = \alpha_{sy} Q_k L_1^2$$

Where:

$$\alpha = L_2/L_1$$

$$\alpha_{sx} = \frac{\alpha^3}{5L_1 + 8\alpha^3}$$

$$\alpha_{sy} = \frac{5\alpha}{20L_1 + 32\alpha^3}$$

Equivalent UDL of line load along short span:

$$M_{sx} = \frac{\alpha^3}{5L_1 + 8\alpha^3} Q_k L_1^2$$

$$n_{sx}\alpha_{sx} L_1^2 = \frac{\alpha^3}{5L_1 + 8\alpha^3} Q_k L_1^2$$

$$n_{sx} \frac{\alpha^4}{8(1+\alpha^4)} = \frac{\alpha^3}{5L_1 + 8\alpha^3} Q_k$$

$$n_{sx} = \frac{8(1+\alpha^4)}{\alpha(5L_1 + 8\alpha^3)} Q_k$$

$$M_{sy} = \frac{5\alpha}{20L_1 + 32\alpha^3} Q_k L_1^2$$

$$n_{sy}\alpha_{sy} L_1^2 = \frac{5\alpha}{20L_1 + 32\alpha^3} Q_k L_1^2$$

$$n_{sy} \frac{\alpha^2}{8(1+\alpha^4)} = \frac{5\alpha}{20L_1 + 32\alpha^3} Q_k$$

$$n_{sy} = \frac{10(1+\alpha^4)}{\alpha(5L_1 + 8\alpha^3)} Q_k$$

Use following equation for equivalent UDL:

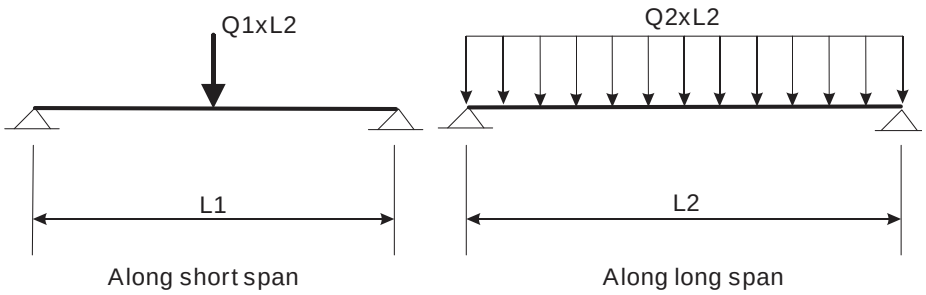
$$n = \frac{10(1+\alpha^4)}{\alpha(5L_1 + 8\alpha^3)} Q_k$$

We can use β_{sx} and β_{sy} from Table 6.6 in CoP 2004 to calculate moments of two way slab subjected point load.

$$M_{sx} = n\beta_{sx} L_1^2$$

$$M_{sy} = n\beta_{sy} L_1^2$$

Case III: Assume line load act at middle of short span and the line load is resisted by 1 M wide strip of slab.



By equating the deformation at center of slab:

Along short span:

$$\Delta_x = \frac{Q_1 L_2 L_1^3}{48EIL_2}$$

Along long span:

$$\Delta_y = \frac{5Q_2 L_2^4}{384EI}$$

From $\Delta_x = \Delta_y$:

$$\frac{Q_1 L_1^3}{48EI} = \frac{5Q_2 L_2^4}{384EI}$$

$$Q_1 L_1^3 = \frac{5}{8} Q_2 L_2^4$$

$$Q_1 = \frac{5L_2^4}{8L_1^3} Q_2$$

$$Q_1 + Q_2 = Q_k$$

$$Q_2 + \frac{5L_2^4}{8L_1^3} Q_2 = Q_k$$

$$Q_2 = \frac{1}{\left[1 + \frac{5L_2^4}{8L_1^3}\right]} Q_k$$

$$Q_1 = \frac{\frac{5L_2^4}{8L_1^3}}{\left[1 + \frac{5L_2^4}{8L_1^3}\right]} Q_k$$

$$M_{sx} = \frac{Q_1 L_2 L_1}{4L_2} = \frac{\frac{5L_2^4}{8L_1^3} L_1}{4\left(1 + \frac{5L_2^4}{8L_1^3}\right)} Q_k = \frac{L_2^4 L_1}{4\left(\frac{8}{5} L_1^3 + L_2^4\right)} = \frac{5\alpha^4}{32 + 20\alpha^4 L_1} Q_k L_1^2 = \alpha_{sx} Q_k L_1^2$$

$$M_{sy} = \frac{Q_2 L_2^2}{8} = \frac{1}{1 + \frac{5L_2^4}{8L_1^3}} Q_k \frac{L_2^2}{8} = \frac{L_1^3 L_2^2}{8L_1^3 + 5L_2^4} Q_k = \frac{\alpha^2}{8 + 5\alpha^4 L_1} Q_k L_1^2 = \alpha_{sy} Q_k L_1^2$$

Where:

$$\alpha = L_2 / L_1$$

$$\alpha_{sx} = \frac{5\alpha^4}{32 + 20\alpha^4 L_1}$$

$$\alpha_{sy} = \frac{\alpha^2}{8 + 5\alpha^4 L_1}$$

Equivalent UDL of line load along long span:

$$M_{sx} = \frac{5\alpha^4}{32 + 20\alpha^4 L_1} Q_k L_1^2$$

$$n_{sx}\alpha_{sx} L_1^2 = \frac{5\alpha^4}{32 + 20\alpha^4 L_1} Q_k L_1^2$$

$$n_{sx}\frac{\alpha^4}{8(1+\alpha^4)} = \frac{5\alpha^4}{32 + 20\alpha^4 L_1} Q_k$$

$$n_{sx} = \frac{10(1+\alpha^4)}{8 + 5\alpha^4 L_1} Q_k$$

$$M_{sy} = \frac{\alpha^2}{8 + 5\alpha^4 L_1} Q_k L_1^2$$

$$n_{sy}\alpha_{sy} L_1^2 = \frac{\alpha^2}{8 + 5\alpha^4 L_1} Q_k L_1^2$$

$$n_{sy}\frac{\alpha^2}{8(1+\alpha^4)} = \frac{\alpha^2}{8 + 5\alpha^4 L_1} Q_k$$

$$n_{sy} = \frac{8(1+\alpha^4)}{8 + 5\alpha^4 L_1} Q_k$$

Use following equation for equivalent UDL:

$$n = \frac{10(1+\alpha^4)}{8 + 5\alpha^4 L_1} Q_k$$

We can use β_{sx} and β_{sy} from Table 6.6 in CoP 2004 to calculate moments of two way slab subjected point load.

$$M_{sx} = n\beta_{sx} L_1^2$$

$$M_{sy} = n\beta_{sy} L_1^2$$

Transferring loading:

According with the requirement of CoP 2011 the load is transferred as SLAB → SECONDARY BEAM → MAIN BEAM → COLUMN & WALL processing flow. For loading in class 1 to 5, class 6A, class 7 and class 8, the minimum distributed load q_k is fixed for specific load category. The load transferring is simple and adopted in current SADS version. But, for class 6B, 6C, 6D and 6E the q_k is defined based on the loaded length of specific member and the loaded length is defined according with the dimension of specific member. According with this requirement, we need to change the value of q_k for different members on the same floor. It is much more difficult than load classes mentioned before. We are using unit q_k to solve the problem. When we transfer a vehicle load, we transfer a COEEFICIENT of unit q_k to the next level of member instead of transferring an actual value of loading. We print a set of SADS reports to demonstrate the processing.

1. In slab design report, we print the coefficient 1.500 in To Beam section to show 1.500 to be transferred to any next level members, beams or walls. Please refer to page S1.
2. In beam design report, we print the actual value of vehicle loading based on the q_k of this beam and use the actual load value for designing the section of the beam. Please refer to page B1. At the same report, we calculate the coefficients of q_k for transferring to next level members, main beams, columns and / or walls. Please refer to page B2.

3. In another design report for main beam, we print the actual value of vehicle load based on the q_k of the main beam and use the actual load to design the section of main beam. Please refer to page B4. At the same report, we calculate the coefficients of q_k for next level members, other main beams, columns and / or walls. Please refer to page B5.
4. In column take loading report, we print the actual value of vehicle loading based on the q_k of this column and use this actual load value to accumulate load to this column. Please refer to page CL3.
5. In column design report, we print the actual value of vehicle loading based on the q_k of this column and use this actual load value to design the column section. Please refer to page C1.
6. In wall take loading report, we print the actual value of vehicle loading based on the q_k of the wall and use this actual load value to accumulate load to this wall. Please refer to page WL3.
7. In lintel beam design report, there are the similar print outputs. Please refer to page LB1.

Transferring K.E.L. in class 6E:

K.E.L. has different processing method with different traffic flow. We don't transfer the K.E.L. in SLAB → SECONDARY BEAM → MAIN BEAM → COLUMN & WALL processing flow. Each member has its own K.E.L. and users need to input to desired members.

```
One Way Slab : GS1          Span L = 3.000                          Thick.= 150
Continuous(End)                                                     Conc. : C40

                Own Weight    3.600
                   Finish.    1.000
                             ----------
           Total Dead Load    4.600  Support
            Vehicular Load   13.900   13.900    Concentrated Qk: 30.000

Near to End of Slab                        Far from End of Slab
 -M = 0                                     -M*= 0.086*Q*L2+0.188*P*L = 32.057
                                             K = 0.0557
                                             Z = 112.05
                                             As= 715
                                             Provided Y10 @100 C/C

 +M*= 0.086*Q*L2+0.213*P*L = 35.657
  K = 0.0619
  Z = 111.08
  As= 802
  Provided Y10 @80 C/C
           Y8 @200 C/C (D.B.)
Span-Effective Depth Ratio : Actual = 25.00 < Allowable = 25.51   O.K.
To Beam : 6.900 (1.500qk)
--------------------------------------------------------------------------------
One Way Slab : GS2          Span L = 3.000                          Thick.= 150
Continuous(2nd)                                                     Conc. : C40

                Own Weight    3.600
                   Finish.    1.000
                             ----------
           Total Dead Load    4.600  Support
            Vehicular Load   13.900   13.900    Concentrated Qk: 30.000

Near to End of Slab                        Far from End of Slab
 -M*= 0.086*Q*L2+0.188*P*L = 32.057         -M*= 0.063*Q*L2+0.167*P*L = 27.699
  K = 0.0557                                 K = 0.0481
  Z = 112.05                                 Z = 113.20
  As= 715                                    As= 611
  Provided Y10 @100 C/C                      Provided Y10 @110 C/C

 +M*= 0.063*Q*L2+0.183*P*L = 30.003
  K = 0.0521
  Z = 112.60
  As= 666
  Provided Y10 @100 C/C
           Y8 @200 C/C (D.B.)
Span-Effective Depth Ratio : Actual = 25.00 < Allowable = 30.06   O.K.
To Beam : 6.900 (1.500qk)
--------------------------------------------------------------------------------
```

Show the transferred load as unit q_k:
$V = 0.5q_kL = 0.5x3.0q_k = 1.5q_k$

Show the transferred load as unit q_k:
$V = 0.5q_kL = 0.5x3.0q_k = 1.5q_k$

CONTINUOUS BEAMS :

Concrete : C40 fcu = 40

Main Bars: GRADE 460 fy = 460

Stirrup : GRADE 460 fvy = 460

Maximum Redistribution Factors: Hogging Moment = 10%, Sagging Moment = 0%

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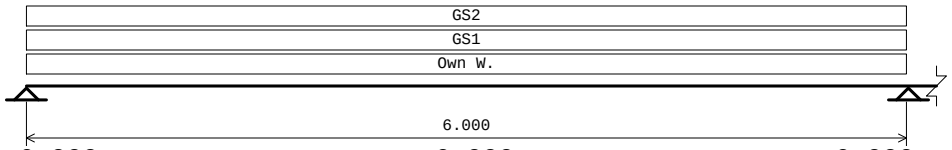
* GB1 * L = 6.000 Sec.= 400x600



Loaded L: 6.000 6.000 6.000

qk: 11.381 11.381 11.381

	Type	D.L.	Vehi	a	b	c
Own W.	Uniform	5.760	0.000	0.000	6.000	
GS1	Uniform	6.900	17.072	0.000	6.000	
GS2	Uniform	6.900	17.072	0.000	6.000	

Actual load value transferred from page S1
LL = 1.5qk = 1.5x11.381 = 17.702

Concentrated Qk: 150.00 kN

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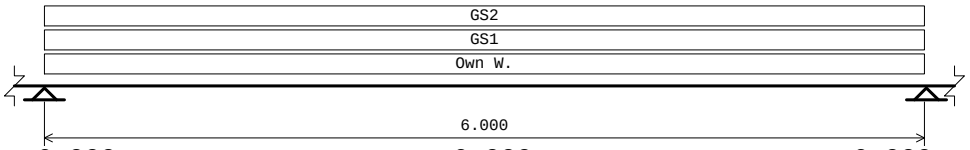
* GB2 * L = 6.000 Sec.= 400x600



Loaded L: 6.000 6.000 6.000

qk: 11.381 11.381 11.381

	Type	D.L.	Vehi	a	b	c
Own W.	Uniform	5.760	0.000	0.000	6.000	
GS1	Uniform	6.900	17.072	0.000	6.000	
GS2	Uniform	6.900	17.072	0.000	6.000	

Concentrated Qk: 150.00 kN

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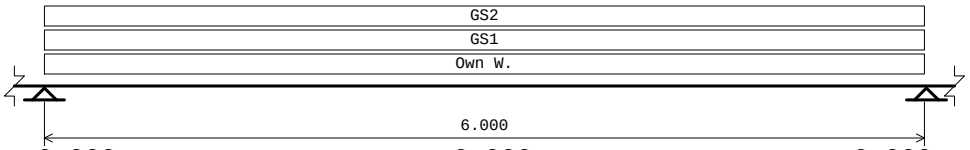
* GB3 * L = 6.000 Sec.= 400x600



Loaded L: 6.000 6.000 6.000

qk: 11.381 11.381 11.381

	Type	D.L.	Vehi	a	b	c
Own W.	Uniform	5.760	0.000	0.000	6.000	
GS1	Uniform	6.900	17.072	0.000	6.000	
GS2	Uniform	6.900	17.072	0.000	6.000	

Concentrated Qk: 150.00 kN

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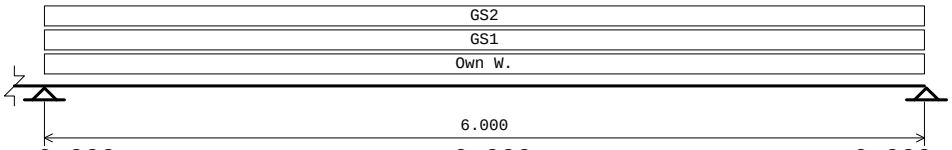
* GB4 * L = 6.000 Sec.= 400x600



Loaded L: 6.000 6.000 6.000
qk: 11.381 11.381 11.381

	Type	D.L.	Vehi	a	b	c
Own W.	Uniform	5.760	0.000	0.000	6.000	
GS1	Uniform	6.900	17.072	0.000	6.000	
GS2	Uniform	6.900	17.072	0.000	6.000	

Concentrated Qk: 150.00 kN

SUPPORT OF BEAMS :

No.	Mark	Type	Angle	B (Upper)	D (Upper)	H (Upper)	B (Lower)	D (Lower)	H (Lower)
1	GBX1	Beam					400		
2	GBX5	Beam					400		
3	GBX8	Beam					400		
4	GBX11	Beam					400		
5	P5	Hinge Wall							

TRANSFERRED SHEARS AND MOMENTS OF BEAMS :

Mark	Type	FIXED END MOMENTS (LHS)	FIXED END MOMENTS (RHS)	TRANSFERRED SHEARS (LHS)	TRANSFERRED SHEARS (RHS)
GB1	D.L.	58.680	58.680	46.106	71.254
	Vehi	9.000qk	9.000qk	7.071qk	10.929qk
GB2	D.L.	58.680	58.680	62.871	54.489
	Vehi	9.000qk	9.000qk	9.643qk	8.357qk
GB3	D.L.	58.680	58.680	54.489	62.871
	Vehi	9.000qk	9.000qk	8.357qk	9.643qk
GB4	D.L.	58.680	58.680	71.254	46.106
	Vehi	9.000qk	9.000qk	10.929qk	7.071qk

Show the transferred load as unit q_k
$V = 2x1.5q_kL^2/12 = 2x1.5x6x6/12q_k = 9.0q_k$

* GB1 * L = 6.000 400x600

Dist.(M)	0.000	0.500	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500	5.000	5.500	6.000
-Mmax						-0.36	-15.10	-34.74	-59.26	-88.67	-122.97	-203.56	-332.78
Beta						1.000	1.000	1.000	1.000	1.000	1.000	0.900	0.900
+Mmax	0.00	95.58	170.66	225.23	280.79	333.87	380.10	299.49	212.04	122.11	33.16		
Beta	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
Top : At	0	0	0	0	0	2	74	170	290	434	602	998	1696
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Bot.: At	0	468	835	1111	1408	1702	1967	1510	1042	598	162	0	0
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Vmax(kN)	287.78	170.66	140.39	126.70	113.01	99.32	-55.46	-189.16	-202.85	-216.54	-230.23	-260.50	-377.62
Av/s	800	800	800	800	800	800	800	800	800	800	800	800	1039

Span-Effective Depth Ratio : Actual = 11.163 < Allowable = 26.297 O.K.

* GB2 * L = 6.000 Sec.= 400x600

Dist.(M)	0.000	0.500	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500	5.000	5.500	6.000
-Mmax	-332.78	-210.60	-145.89	-123.05	-105.09	-92.03	-83.85	-80.57	-82.18	-88.67	-100.06	-168.03	-280.71
Beta	0.900	0.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.900	0.900
+Mmax			10.24	87.73	166.20	242.20	311.35	253.66	189.12	122.11	56.08		
Beta			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
Top : At	1696	1034	714	602	514	450	410	394	402	434	490	822	1407
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Bot.: At	0	0	50	429	813	1200	1576	1262	925	598	274	0	0
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Vmax(kN)	361.97	244.85	214.58	200.89	187.20	173.51	39.81	-153.37	-167.06	-180.75	-194.45	-224.71	-341.83
Av/s	966	800	800	800	800	800	800	800	800	800	800	800	872

Span-Effective Depth Ratio : Actual = 11.163 < Allowable = 31.945 O.K.

* GB3 * L = 6.000 Sec.= 400x600

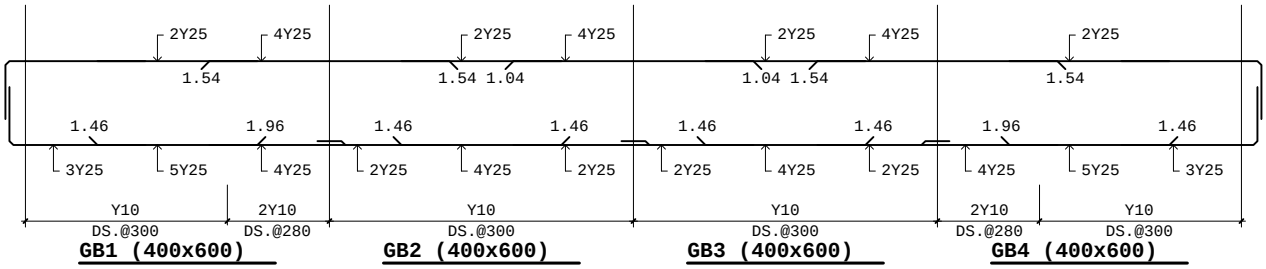
Dist.(M)	0.000	0.500	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500	5.000	5.500	6.000
-Mmax	-280.71	-168.03	-100.06	-88.67	-82.18	-80.57	-83.85	-92.03	-105.09	-123.05	-145.89	-210.60	-332.78
Beta	0.900	0.900	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	0.900	0.900
+Mmax			56.08	122.11	189.12	253.66	311.35	242.20	166.20	87.73	10.24		
Beta			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
Top : At	1407	822	490	434	402	394	410	450	514	602	714	1034	1696
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Bot.: At	0	0	274	598	925	1262	1576	1200	813	429	50	0	0
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Vmax(kN)	341.83	224.71	194.45	180.75	167.06	153.37	-39.81	-173.51	-187.20	-200.89	-214.58	-244.85	-361.97
Av/s	872	800	800	800	800	800	800	800	800	800	800	800	966

Span-Effective Depth Ratio : Actual = 11.163 < Allowable = 31.945 O.K.

* GB4 * L = 6.000 Sec.= 400x600

Dist.(M)	0.000	0.500	1.000	1.500	2.000	2.500	3.000	3.500	4.000	4.500	5.000	5.500	6.000
-Mmax	-332.78	-203.56	-122.97	-88.67	-59.26	-34.74	-15.10	-0.36					
Beta	0.900	0.900	1.000	1.000	1.000	1.000	1.000	1.000					
+Mmax			33.16	122.11	212.04	299.49	380.10	333.87	280.79	225.23	170.66	95.58	0.00
Beta			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
Top : At	1696	998	602	434	290	170	74	2	0	0	0	0	0
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Bot.: At	0	0	162	598	1042	1510	1967	1702	1408	1111	835	468	0
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Vmax(kN)	377.62	260.50	230.23	216.54	202.85	189.16	55.46	-99.32	-113.01	-126.70	-140.39	-170.66	-287.78
Av/s	1039	800	800	800	800	800	800	800	800	800	800	800	800

Span-Effective Depth Ratio : Actual = 11.163 < Allowable = 26.297 O.K.


2Y25
4Y25
1.54
1.46
1.96
3Y25
5Y25
4Y25
Y10
DS.@300
2Y10
DS.@280
GB1 (400x600)
2Y25
4Y25
1.54 1.04
1.46
1.46
2Y25
4Y25
2Y25
Y10
DS.@300
GB2 (400x600)
2Y25
4Y25
1.04 1.54
1.46
1.46
2Y25
4Y25
2Y25
Y10
DS.@300
GB3 (400x600)
2Y25
1.54
1.96
1.46
4Y25
5Y25
3Y25
2Y10
DS.@280
Y10
DS.@300
GB4 (400x600)

CONTINUOUS BEAMS :
   Concrete : C40   fcu = 40
   Main Bars: GRADE 460   fy = 460
   Stirrup : GRADE 460   fvy = 460
   Maximum Redistribution Factors: Hogging Moment = 10%, Sagging Moment = 0%

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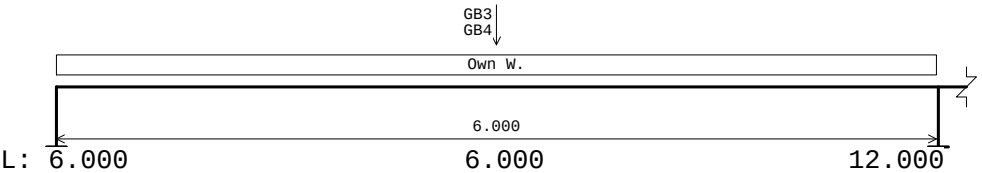
* GBX11 *   L = 6.000   Sec.= 400x600



Loaded L:	6.000			6.000		12.000
qk:	11.381			11.381		6.014
	Type	D.L.	Vehi	a	b	c
Own W.	Uniform	5.760	0.000	0.000	6.000	
GB3	Concen.	62.871	109.746	3.000		
GB4	Concen.	71.254	124.379	3.000		

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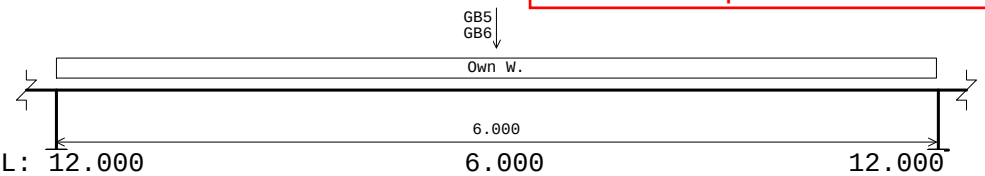
* GBX12 *   L = 6.000

Actual load value transferred from page B2
Vehi = 9.643qk = 9.643x11.381 = 109.746



Loaded L:	12.000			6.000		12.000
qk:	6.014			11.381		6.014
	Type	D.L.	Vehi	a	b	c
Own W.	Uniform	5.760	0.000	0.000	6.000	
GB5	Concen.	62.871	109.746	3.000		
GB6	Concen.	71.254	124.379	3.000		

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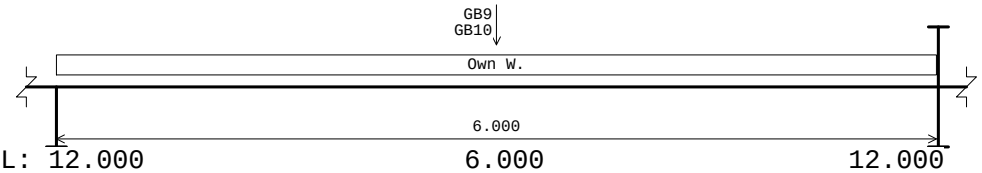
* GBX13 *   L = 6.000   Sec.= 400x600



Loaded L:	12.000			6.000		12.000
qk:	6.014			11.381		6.014
	Type	D.L.	Vehi	a	b	c
Own W.	Uniform	5.760	0.000	0.000	6.000	
GB9	Concen.	62.871	109.746	3.000		
GB10	Concen.	71.254	124.379	3.000		

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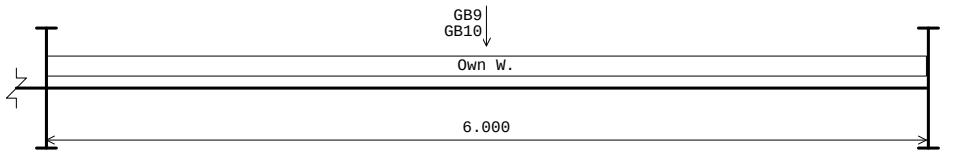
* GBX14 *   L = 6.000   Sec.= 400x600



```
  Loaded L: 12.000                    6.000                    6.000
       qk: 6.014                     11.381                   11.381
                 Type       D.L.     Vehi     a       b      c
  Own W.        Uniform     5.760    0.000   0.000   6.000
  GB9           Concen.    62.871  109.746   3.000
  GB10          Concen.    71.254  124.379   3.000
--------------------------------------------------------------------------------
SUPPORT OF BEAMS :
 No.   Mark      Type    Angle      B     D      H        B     D      H
-----------------------------------( Upper )------------( Lower )-----
  1    C9        Col.     0.0             None            550   550   3.500
  2    C10       Col.     0.0             None            600   600   3.500
  3    C11       Col.     0.0             None            550   550   3.500
  4    C12       Col.     0.0      550    550   3.500    550   550   3.500
  5    C13       Col.     0.0      550    550   3.500    550   550   3.500
--------------------------------------------------------------------------------

TRANSFERRED SHEARS AND MOMENTS OF BEAMS :
Mark       Type          FIXED END MOMENTS          TRANSFERRED SHEARS
---------------------(LHS)--------(RHS)---------(LHS)--------(RHS)-
GBX11      D.L.         117.874      117.874       74.844       93.842
           Vehi        15.429qk     15.429qk      9.042qk     11.529qk
GBX12      D.L.         117.874      117.874       85.439       83.247
           Vehi        15.429qk     15.429qk     10.429qk     10.142qk
GBX13      D.L.         117.874      117.874       83.699       84.986
           Vehi        15.429qk     15.429qk     10.201qk     10.370qk
GBX14      D.L.         117.874      117.874       90.203       78.482
           Vehi        15.429qk     15.429qk     11.053qk      9.519qk
--------------------------------------------------------------------------------

FLOOR MARK : BASEMENT

* GBX11 *                  L = 6.000                                Sec.= 400x600
    Soil Load:  Dirc.    Ms(LHS)    Ms(RHS)        Vs
                 ---       0.466     -0.460     -0.171
    Wind Load:  Dirc.    Mw(LHS)    Mw(RHS)        Vw
                 X-X      23.460    -26.666     -9.240
                 Y-Y      -3.140      4.104      1.335
                 U-U     -20.095     23.245      7.989
                 V-V      20.497    -22.747     -7.971
    Dyna.Load:  Dirc.    Mn(LHS)    Mn(RHS)        Vn
                 X-X      22.961    -26.633     -9.142
                 Y-Y      -2.864      3.719      1.213
                 U-U     -18.518     21.817      7.435
                 V-V      13.948    -15.842     -5.491
--------------------------------------------------------------------------------------------------------------
Dist.(M)   0.183   0.651   1.119   1.587   2.056   2.524   2.992   3.460   3.928   4.396   4.864   5.332   5.800
-Mmax    -275.08 -140.45  -21.82                                                  -45.04  -97.15 -177.08 -324.81
 Beta      0.900   0.900   1.000                                                   1.000   1.000   0.900   0.930
+Mmax              11.32   69.68  198.68  325.91  451.38  581.07  458.25  328.98  197.94   65.13
 Beta              1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000   1.000

Top : At    1377     687     107       0       0       0       0       0       0     220     475     867    1651
      Ac       0       0       0       0       0       0       0       0       0       0       0       0       0
      d2    62.5    62.5    62.5    62.5    62.5    62.5    62.5    62.5    62.5    62.5    62.5    62.5    62.5
      ..........................................................................................................
Bot.: At       0      55     341     973    1657    2555    3496    2601    1674     969     319       0       0
      Ac       0       0       0       0       0       0       0       0       0       0       0       0       0
      d2    62.5    62.5    62.5    62.5    62.5    87.5    87.5    87.5    62.5    62.5    62.5    62.5    62.5

Vmax(kN)  314.52  310.74  306.97  303.19  299.42  295.64  291.87 -308.98 -312.76 -316.53 -320.31 -324.08 -327.86
Av/s         800     800     800     800     800     800     800     800     800     800     800     800     807

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FOR DEVELOPING APPLICATION        TESTDATA     CP2004     11/13/2012     Page: B6
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Show the transferred load as unit q_k for transferring to next level members.

Span-Effective Depth Ratio : Actual = 11.707 < Allowable = 19.395 O.K.

To Beam-column Joint:	-Mlmax	+Mlmax	-Mrmax	+Mrmax
Dead+Live	-211.799	-43.686	-248.746	-150.081
DL+LL(With Wind)	0.000	0.000	0.000	0.000
Dead Only	-74.952	-53.910	-135.528	-117.017

* GBX12 * L = 6.000 Sec.= 400x600

Soil Load:	Dirc.	Ms(LHS)	Ms(RHS)	Vs
	---	0.415	-0.367	-0.144
Wind Load:	**Dirc.**	**Mw(LHS)**	**Mw(RHS)**	**Vw**
	X-X	6.159	-7.258	-2.473
	Y-Y	2.752	0.160	-0.478
	U-U	-2.572	5.563	1.499
	V-V	9.050	-7.151	-2.986
Dyna.Load:	**Dirc.**	**Mn(LHS)**	**Mn(RHS)**	**Vn**
	X-X	2.197	-2.897	-0.939
	Y-Y	2.667	-0.134	-0.516
	U-U	0.629	1.936	0.241
	V-V	3.736	-2.159	-1.087

Dist.(M)	0.200	0.668	1.136	1.604	2.072	2.540	3.008	3.476	3.945	4.413	4.881	5.349	5.817
-Mmax	-290.24	-153.10	-88.38	-49.37	-11.61				-2.83	-35.33	-69.54	-120.43	-252.48
Beta	0.900	0.900	1.000	1.000	1.000				1.000	1.000	1.000	0.900	0.900
+Mmax			53.05	192.21	329.60	465.56	595.19	465.10	333.27	199.75	64.91		
Beta			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		
Top : At	1459	749	433	242	57	0	0	0	14	173	340	589	1255
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Bot.: At	0	0	260	941	1678	2651	3608	2648	1698	978	318	0	0
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	87.5	87.5	87.5	62.5	62.5	62.5	62.5	62.5
Vmax(kN)	320.87	317.10	313.32	309.55	305.78	302.00	-287.22	-290.99	-294.77	-298.54	-302.32	-306.09	-309.86
Av/s	800	800	800	800	800	800	800	800	800	800	800	800	800

Span-Effective Depth Ratio : Actual = 11.707 < Allowable = 23.600 O.K.

To Beam-column Joint:	-Mlmax	+Mlmax	-Mrmax	+Mrmax
Dead+Live	-254.775	-155.224	-221.297	-129.298
DL+LL(With Wind)	0.000	0.000	0.000	0.000
Dead Only	-134.616	-103.517	-121.876	-101.512

* GBX13 * L = 6.000 Sec.= 400x600

Soil Load:	Dirc.	Ms(LHS)	Ms(RHS)	Vs
	---	0.540	-0.544	-0.199
Wind Load:	**Dirc.**	**Mw(LHS)**	**Mw(RHS)**	**Vw**
	X-X	31.122	-30.517	-11.310
	Y-Y	1.828	-2.388	-0.774
	U-U	-22.227	21.350	7.996
	V-V	33.349	-33.245	-12.219
Dyna.Load:	**Dirc.**	**Mn(LHS)**	**Mn(RHS)**	**Vn**
	X-X	32.435	-31.548	-11.740
	Y-Y	3.247	-3.842	-1.301
	U-U	-20.486	19.549	7.346
	V-V	25.376	-25.059	-9.254

Dist.(M)	0.183	0.653	1.122	1.592	2.061	2.531	3.000	3.469	3.939	4.408	4.878	5.347	5.817
-Mmax	-299.63	-159.66	-102.86	-58.11	-14.63				-13.46	-57.06	-101.93	-186.43	-331.40
Beta	0.900	0.900	1.000	1.000	1.000				1.000	1.000	1.000	0.900	0.900
+Mmax			102.26	228.14	352.24	474.56	595.15	466.20	336.94	205.90	73.08		
Beta			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000		

Top : At	1511	781	503	284	72	0	0	0	66	279	499	912	1688
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Bot.: At	0	0	500	1126	1806	2713	3607	2655	1719	1010	358	0	0
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	87.5	87.5	87.5	62.5	62.5	62.5	62.5	62.5
Vmax(kN)	325.79	322.00	318.22	314.43	310.65	306.86	-314.03	-317.81	-321.60	-325.38	-329.17	-332.95	-336.74
Av/s	800	800	800	800	800	800	800	800	800	800	813	831	849

Span-Effective Depth Ratio : Actual = 11.707 < Allowable = 23.601 O.K.

To Beam-column Joint:	-Mlmax	+Mlmax	-Mrmax	+Mrmax
Dead+Live	-220.228	-134.918	-251.674	-134.876
DL+LL(With Wind)	0.000	0.000	0.000	0.000
Dead Only	-121.932	-103.305	-130.165	-100.513

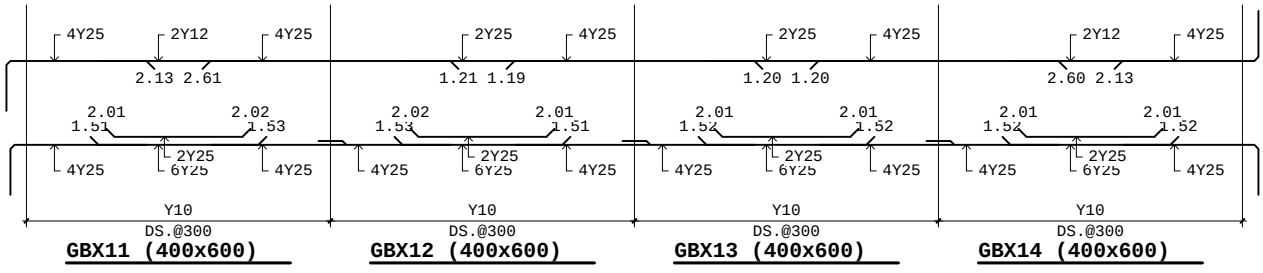
* GBX14 * L = 6.000 Sec.= 400x600

Soil Load:	Dirc.	Ms(LHS)	Ms(RHS)	Vs
	---	0.360	-0.425	-0.144
Wind Load:	**Dirc.**	**Mw(LHS)**	**Mw(RHS)**	**Vw**
	X-X	21.138	-25.629	-8.581
	Y-Y	-2.549	1.603	0.762
	U-U	-17.890	20.591	7.061
	V-V	18.727	-24.243	-7.884
Dyna.Load:	**Dirc.**	**Mn(LHS)**	**Mn(RHS)**	**Vn**
	X-X	20.021	-24.784	-8.221
	Y-Y	-1.501	0.424	0.353
	U-U	-15.468	17.994	6.140
	V-V	12.842	-17.051	-5.485

Dist.(M)	0.183	0.653	1.122	1.592	2.061	2.531	3.000	3.469	3.939	4.408	4.878	5.347	5.817
-Mmax	-309.62	-162.88	-80.51	-31.34							-53.04	-190.63	-329.82
Beta	0.948	0.900	1.000	1.000							0.900	0.900	0.900
+Mmax			48.75	177.77	305.01	430.70	561.83	432.17	300.72	167.50	32.50	1.40	
Beta			1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	
Top : At	1566	797	394	153	0	0	0	0	0	0	260	933	1679
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5	62.5
Bot.: At	0	0	239	870	1541	2417	3347	2426	1517	820	159	7	0
Ac	0	0	0	0	0	0	0	0	0	0	0	0	0
d2	62.5	62.5	62.5	62.5	62.5	87.5	87.5	87.5	62.5	62.5	62.5	62.5	62.5
Vmax(kN)	315.60	311.82	308.03	304.25	300.46	296.67	-300.81	-304.60	-308.38	-312.17	-315.95	-319.74	-323.52
Av/s	800	800	800	800	800	800	800	800	800	800	800	800	800

Span-Effective Depth Ratio : Actual = 11.707 < Allowable = 19.949 O.K.

To Beam-column Joint:	-Mlmax	+Mlmax	-Mrmax	+Mrmax
Dead+Live	-248.637	-140.389	-262.211	-58.453
DL+LL(With Wind)	0.000	0.000	0.000	0.000
Dead Only	-131.897	-112.589	-93.575	-68.685



GBX11 (400x600) **GBX12 (400x600)** **GBX13 (400x600)** **GBX14 (400x600)**

CONTINUOUS BEAM :
   Concrete : C40   fcu = 40
   Main Bars: GRADE 460   fy = 460
   Stirrup : GRADE 460   fvy = 460
   Maximum Redistribution Factors: Hogging Moment = 10%, Sagging Moment = 0%

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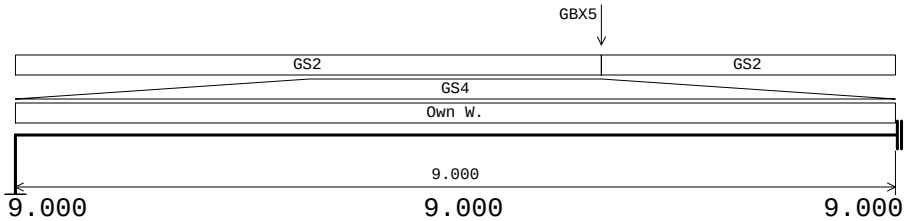
* GBY5 *   L = 9.000   Sec.= 400x650



Loaded L:	9.000		9.000		9.000	
qk:	7.682		7.682		7.682	
	Type	D.L.	Vehi	a	b	c
Own W.	Uniform	6.240	0.000	0.000	9.000	
GS4	Trapez.	19.200	23.045	0.000	9.000	3.000
GS2	Uniform	6.900	11.522	6.000	3.000	
GS2	Uniform	6.900	11.522	0.000	6.000	
GBX5	Concen.	66.226	59.584	6.000		

Actual load value transferred from page S1
LL = 1.5qk = 1.5x7.682 = 11.523

Concentrated Qk: 30.00 kN

SUPPORT OF BEAMS :

No.	Mark	Type	Angle	B	D	H	B	D	H
				(Upper)			(Lower)		
1	C2	Col.	0.0	None			600	600	3.500
2	CR3	Fixed End							

TRANSFERRED SHEARS AND MOMENTS OF BEAMS :

Mark	Type	FIXED END MOMENTS (LHS)	FIXED END MOMENTS (RHS)	HOGGING MOMENTS (LHS)	HOGGING MOMENTS (RHS)	TRANSFERRED SHEARS (LHS)	TRANSFERRED SHEARS (RHS)
GBY5	D.L.	238.445	282.596	-179.333	-312.152	124.048	175.638
	Vehi	31.796qk	36.967qk	-23.914qk	-40.909qk	16.447qk	22.810qk

---

Show the transferred load as unit q_k for transferring to next level members.

FLOOR MARK : BASEMENT

* GBY5 *   L = 9.000

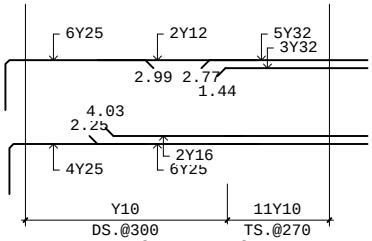
Soil Load:	Dirc.	Ms(LHS)	Ms(RHS)	Vs	Range
	---	0.919	-0.671	-0.279	(0.300~6.000)
	---	1.114	-2.152	-1.089	(6.000~9.000)
Wind Load:	Dirc.	Mw(LHS)	Mw(RHS)	Vw	Range
	X-X	-23.115	20.179	7.595	(0.300~6.000)
	Y-Y	44.964	-35.377	-14.095	(0.300~6.000)
	U-U	50.886	-41.523	-16.212	(0.300~6.000)
	V-V	22.446	-16.193	-6.779	(0.300~6.000)
	X-X	-5.281	10.695	5.325	(6.000~9.000)
	Y-Y	44.084	-94.009	-46.031	(6.000~9.000)
	U-U	36.674	-77.834	-38.169	(6.000~9.000)
	V-V	39.931	-84.665	-41.532	(6.000~9.000)
Dyna.Load:	Dirc.	Mn(LHS)	Mn(RHS)	Vn	Range
	X-X	-19.931	15.701	6.251	(0.300~6.000)
	Y-Y	37.939	-29.303	-11.797	(0.300~6.000)
	U-U	43.667	-35.275	-13.849	(0.300~6.000)

V-V	15.484	-13.075	-5.010 (0.300~6.000)
X-X	2.259	-0.415	-0.891 (6.000~9.000)
Y-Y	37.489	-82.685	-40.058 (6.000~9.000)
U-U	28.372	-63.104	-30.492 (6.000~9.000)
V-V	31.566	-63.690	-31.752 (6.000~9.000)

					<----Top Bars---->			<-----Bot.Bars---->				
Dist.	-Mmax	Beta	+Mmax	Beta	At	Ac	d2		At	Ac	d2	Vmax	Av/s
0.200	-495.676	0.900			2393	0	66.0	:	0	0	62.5	394.575	890
0.640	-344.034	0.900			1593	0	66.0	:	0	0	62.5	374.444	804
1.080	-201.178	0.900	19.663	1.000	906	0	66.0	:	88	0	62.5	350.198	800
1.520	-68.738	0.900	76.033	1.000	310	0	66.0	:	340	0	62.5	321.837	800
1.960	-3.052	1.000	190.979	1.000	14	0	66.0	:	855	0	62.5	289.363	800
2.400			290.730	1.000	0	0	66.0	:	1319	0	62.5	252.774	800
2.840			373.477	1.000	0	0	66.0	:	1730	0	62.5	212.071	800
3.280			438.108	1.000	0	0	66.0	:	2065	0	62.5	168.085	800
3.720			493.913	1.000	0	0	66.0	:	2365	0	62.5	123.828	800
4.160			538.662	1.000	0	0	66.0	:	2614	0	62.5	79.570	800
4.600			563.937	1.000	0	0	66.0	:	2929	0	87.5	35.312	800
5.040			569.737	1.000	0	0	66.0	:	2965	0	87.5	-53.655	800
5.480			556.064	1.000	0	0	66.0	:	2880	0	87.5	-99.494	800
5.920			522.917	1.000	0	0	66.0	:	2677	0	87.5	-142.170	800
6.360			376.283	1.000	0	0	66.0	:	1839	0	87.5	-416.169	1005
6.800			185.624	1.000	0	0	66.0	:	868	0	87.5	-455.004	1125
7.240	-100.789	0.900	18.689	1.000	454	0	66.0	:	87	0	87.5	-489.725	1210
7.680	-305.545	0.900			1401	0	66.0	:	0	0	87.5	-520.331	1341
8.120	-521.607	0.900			2739	0	98.0	:	0	0	87.5	-546.824	1420
8.560	-747.345	0.900			4325	0	98.0	:	0	0	87.5	-569.201	1521
9.000	-981.130	0.900			5618	0	98.0	:	0	2809	87.5	-587.465	1604

Span-Effective Depth Ratio : Actual = 16.000 < Allowable = 20.582 O.K.

To Beam-column Joint:	-Mlmax	+Mlmax	-Mrmax	+Mrmax
Dead+Live	-390.589	-142.739	-845.822	-312.152
DL+LL(With Wind)	-312.211	-142.739	-676.507	-312.152
Dead Only	-179.851	-124.363	-393.312	-280.937



GBY5 (400x650)

*** COLUMN LOADING ***

	C9	C10	C11	C12
RF/F	RBX11 58.51(18.55)	RBX11 70.57(22.59)	RBX12 58.51(18.55)	
	RBY3 36.96(9.23)	RBX12 70.57(22.59)	RBY9 37.03(9.25)	
	RBY4 44.56(11.13)	RBY6 49.28(18.49)	RBY10 44.56(11.13)	
		RBY7 59.31(22.25)		
	COL.W. 15.55	COL.W. 15.55	COL.W. 15.55	
	155.59(38.90)	265.29(85.94)	155.66(38.92)	
	Upper 0.00(0.00)	Upper 0.00(0.00)	Upper 0.00(0.00)	
	-0% 0.00	-0% 0.00	-0% 0.00	
	155.59(38.90)	265.29(85.94)	155.66(38.92)	
13/F	13BX9 65.92(24.26)	13BX9 73.45(27.17)	13BX10 65.92(24.26)	
	13BY3 51.71(11.43)	13BX10 73.45(27.17)	13BY9 51.76(11.44)	
	13BY4 63.19(13.97)	13BY6 53.36(22.88)	13BY10 63.19(13.97)	
		13BY7 65.14(27.93)		
	COL.W. 15.55	COL.W. 15.55	COL.W. 15.55	
	196.37(49.66)	280.95(105.16)	196.42(49.67)	
	Upper 155.59(38.90)	Upper 265.29(85.94)	Upper 155.66(38.92)	
	-0% 0.00	-0% 0.00	-0% 0.00	
	351.96(88.56)	546.23(191.09)	352.08(88.59)	
12/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 15.55	COL.W. 15.55	COL.W. 15.55	
	214.39(49.66)	293.99(105.16)	214.44(49.67)	
	Upper 351.96(88.56)	Upper 546.23(191.09)	Upper 352.08(88.59)	
	-10% 9.93	-10% 21.03	-10% 9.93	
	566.35(128.28)	840.22(275.22)	566.52(128.32)	
11/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 15.55	COL.W. 15.55	COL.W. 15.55	
	214.39(49.66)	293.99(105.16)	214.44(49.67)	
	Upper 566.35(138.22)	Upper 840.22(296.25)	Upper 566.52(138.25)	
	-20% 29.79	-20% 63.09	-20% 29.80	
	780.74(158.08)	1134.21(338.31)	780.96(158.12)	
10/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 15.55	COL.W. 15.55	COL.W. 15.55	
	214.39(49.66)	293.99(105.16)	214.44(49.67)	
	Upper 780.74(187.87)	Upper 1134.21(401.40)	Upper 780.96(187.92)	
	-30% 59.59	-30% 126.19	-30% 59.60	
	995.12(177.94)	1428.20(380.37)	995.40(177.99)	
09/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 19.20	COL.W. 19.20	COL.W. 19.20	
	218.04(49.66)	297.64(105.16)	218.09(49.67)	
	Upper 995.12(237.53)	Upper 1428.20(506.56)	Upper 995.40(237.59)	
	-40% 99.31	-40% 210.31	-40% 99.33	
	1213.16(187.87)	1725.84(401.40)	1213.49(187.92)	

*** COLUMN LOADING ***

	C9	C10	C11	C12
08/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 19.20	COL.W. 19.20	COL.W. 19.20	
	218.04(49.66)	297.64(105.16)	218.09(49.67)	
	Upper 1213.16(287.18)	Upper 1725.84(611.71)	Upper 1213.49(287.25)	
	-40% 119.17	-40% 252.37	-40% 119.20	
	1431.19(217.67)	2023.48(464.50)	1431.58(217.72)	
07/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 19.20	COL.W. 19.20	COL.W. 19.20	
	218.04(49.66)	297.64(105.16)	218.09(49.67)	
	Upper 1431.19(336.84)	Upper 2023.48(716.87)	Upper 1431.58(336.92)	
	-40% 139.04	-40% 294.43	-40% 139.07	
	1649.23(247.46)	2321.11(527.59)	1649.66(247.52)	
06/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 19.20	COL.W. 19.20	COL.W. 19.20	
	218.04(49.66)	297.64(105.16)	218.09(49.67)	
	Upper 1649.23(386.50)	Upper 2321.11(822.02)	Upper 1649.66(386.59)	
	-40% 158.90	-40% 336.50	-40% 158.93	
	1867.27(277.25)	2618.75(590.68)	1867.75(277.32)	
05/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 23.23	COL.W. 23.23	COL.W. 23.23	
	222.07(49.66)	301.67(105.16)	222.12(49.67)	
	Upper 1867.27(436.15)	Upper 2618.75(927.18)	Upper 1867.75(436.25)	
	-40% 178.76	-40% 378.56	-40% 178.80	
	2089.33(307.05)	2920.42(653.77)	2089.87(307.12)	
04/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 23.23	COL.W. 23.23	COL.W. 23.23	
	222.07(49.66)	301.67(105.16)	222.12(49.67)	
	Upper 2089.33(485.81)	Upper 2920.42(1032.33)	Upper 2089.87(485.92)	
	-40% 198.62	-40% 420.62	-40% 198.67	
	2311.40(336.84)	3222.09(716.87)	2311.99(336.92)	
03/F	TBX11 71.75(24.26)	TBX11 79.97(27.17)	TBX12 71.75(24.26)	
	TBY3 57.20(11.43)	TBX12 79.97(27.17)	TBY9 57.25(11.44)	
	TBY4 69.89(13.97)	TBY6 53.36(22.88)	TBY10 69.89(13.97)	
		TBY7 65.14(27.93)		
	COL.W. 23.23	COL.W. 23.23	COL.W. 23.23	
	222.07(49.66)	301.67(105.16)	222.12(49.67)	
	Upper 2311.40(535.46)	Upper 3222.09(1137.49)	Upper 2311.99(535.59)	
	-40% 218.49	-40% 462.68	-40% 218.53	
	2533.47(366.63)	3523.76(779.96)	2534.11(366.72)	

*** COLUMN LOADING ***

	C9	C10	C11	C12
02/F	2BX11 67.44(24.84)	2BX11 71.93(26.58)	2BX12 67.65(24.93)	
	2BY3 51.42(11.37)	2BX12 71.72(26.50)	2BY9 51.38(11.36)	
	2BY4 63.35(14.00)	2BY6 52.97(22.72)	2BY10 63.37(14.01)	
		2BY7 65.34(28.02)		
	COL.W. 29.04	COL.W. 29.04	COL.W. 29.04	
	211.24(50.21)	291.00(103.82)	211.45(50.29)	
	Upper 2533.47(585.12)	Upper 3523.76(1242.64)	Upper 2534.11(585.25)	
	-40% 238.57	-40% 504.21	-40% 238.65	
	2744.71(396.76)	3814.76(842.25)	2745.56(396.90)	
01/F		1BX13 56.41(20.72)	1BX14 83.80(31.91)	1BX15 79.20(29.88)
		1BX14 78.72(29.81)	1BX15 83.32(31.83)	1BX16 42.52(12.31)
		1BY6 58.66(27.67)	1BY10 58.66(27.67)	1BY15 56.34(26.48)
		1BY7 70.84(33.42)	1BY11 70.84(33.42)	1BY16 38.48(14.40)
		COL.W. 36.30	COL.W. 36.30	COL.W. 10.89
		300.93(111.61)	332.91(124.82)	227.42(83.08)
		Upper 3814.76(1346.46)	Upper 2745.56(635.55)	Upper 0.00(0.00)
		-40% 548.85	-40% 288.58	-0% 0.00
		4115.69(909.22)	3078.47(471.79)	227.42(83.08)
01/A				WBX1 55.26(45.00)
				WBY1 47.34(45.00)
				COL.W. 25.41
				128.01(90.00)
				227.42(83.08)
				0.00
				355.43(173.08)
GR/F	Load L: 6.0 qk: 11.381	Load L: 12.0 qk: 6.014	Load L: 12.0 qk: 6.014	Load L: 12.0 qk: 6.014
	GBX11 74.84(102.91)	GBX11 93.84(69.34)	GBX12 83.25(61.00)	GBX13 84.99(62.37)
	GBY3 63.11(52.97)	GBX12 85.44(62.72)	GBX13 83.70(61.35)	GBX14 90.20(66.47)
	GBY4 75.20(63.12)	GBY6 60.38(55.69)	GBY9 60.74(56.03)	GBY13 59.00(54.42)
		GBY7 72.50(66.88)	GBY10 72.32(66.71)	GBY14 61.60(56.82)
	COL.W. 25.41	COL.W. 30.24	COL.W. 25.41	COL.W. 25.41
	238.57(219.00)	342.40(254.63)	325.41(245.09)	321.20(240.08)
	Upper 0.00(0.00)	Upper 4115.69(1458.07)	Upper 3078.47(760.37)	Upper 355.43(173.08)
	-40% 0.00	-40% 548.85	-40% 288.58	-10% 9.00
	238.57(219.00)	4458.09(1163.85)	3403.88(716.88)	676.63(404.16)
BS/F	BBX11 105.77(47.43)	BBX11 122.57(55.43)	BBX12 113.51(51.11)	BBX13 114.98(51.81)
	BBY3 84.37(23.03)	BBX12 114.83(51.74)	BBX13 113.36(51.04)	BBX14 122.41(55.36)
	BBY4 102.07(27.86)	BBY6 85.07(45.84)	BBY9 85.50(46.07)	BBY13 83.94(45.22)
		BBY7 103.62(55.83)	BBY10 103.41(55.72)	BBY14 87.77(47.29)
	COL.W. 13.07	COL.W. 15.55	COL.W. 13.07	COL.W. 13.07
	305.28(98.31)	441.65(208.84)	428.85(203.94)	422.17(199.68)
	Upper 238.57(219.00)	Upper 4458.09(1712.70)	Upper 3403.88(1005.46)	Upper 676.63(413.16)
	-40% 39.32	-40% 632.39	-40% 370.16	-20% 57.94
	543.85(277.99)	4899.74(1289.16)	3832.74(839.24)	1098.79(554.91)

Actual load value transferred from page B6
P = 9.042qk = 9.042x11.381 = 102.907

Actual load value transferred from page B6
M = 15.429qk = 15.429x11.381 = 175.597

```
* C9 *                GRD. FLOOR TO BASEMENT                          X-X : Unbraced
                                                                      Y-Y : Unbraced
     Loaded Length: 6.000  Distributed qk: 11.381

                Mark      Type  Span  Section     Ang       F.E.M.
     Top Beam : GBX11       1   6.000  400x600     0.0  117.874( 175.594)
                GBY3        1   6.000  400x600   270.0   61.020(  52.969)
                GBY4        1   6.000  400x600    90.0   61.020(  51.215)
     Bot.Beam : BBX11       1   6.000  400x650     0.0  161.897(  77.143)
                BBY3        1   6.000  400x650   270.0   82.440(  22.500)
                BBY4        1   6.000  400x650    90.0   82.440(  22.500)

     Colm.Pro.:  Hux   Huy   Section   Hcx   Hcy   Section   Hlx   Hly   Section
               0.000 0.000           3.500 3.500   550x550 1.800 1.800   550x550

     Slender  : Lex= 5.172   Lamx= 9.40 < 10  Ley= 4.023   Lamy= 7.32 < 10

     Vert.Load: DL.= 213.156(25.410)          LL.= 218.999
          Top :+Mdx= 92.422   -Mdx= -0.000   +Mdy= 39.348   -Mdy= -39.348
               +Mlx= 0.000    -Mlx= 0.000    +Mly= 0.000    -Mly= 0.000
          Bot.:+Mdx= 0.000    -Mdx= -57.646  +Mdy= 26.100   -Mdy= -26.100
               +Mlx= 0.000    -Mlx= -27.468  +Mly= 7.123    -Mly= -7.123

     Soil Load:        Mstx       Msty         Ps       Msbx       Msby
           ---       -0.642     -1.955     -1.505     -0.189      1.971

     Wind Load:        Mwtx       Mwty         Pw       Mwbx       Mwby
           X-X      -13.700     21.778    -38.455     24.742    -31.937
           Y-Y       -1.315    -68.587    -35.095      0.196     85.907
           U-U        9.393    -67.365      3.174    -18.580     87.886
           V-V      -15.187    -49.931    -76.030     25.183     57.371

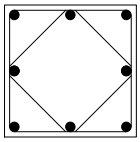
     Dyna.Load:        Mntx       Mnty         Pn       Mnbx       Mnby
           X-X      -13.223     12.365    -50.057     23.674    -18.726
           Y-Y       -1.027    -55.026    -26.174      0.465     69.280
           U-U        8.554    -56.741     11.626    -16.464     72.474
           V-V      -10.144    -39.257    -59.155     17.010     45.996

     Concrete : C50            Fcu= 50        Ec = 27700     Cover = 25
     Steel    : GRADE 460      Fy = 460.0     Es = 200000

     Assume   : Asx= 1210      Asy= 1210       r = 0.800%
     Nu = 0.35*Fcu*(Ac-Asc)+0.67*Fy*Asc = 5997.244 > 779.038 O.K.
     Vxmax =   18.835  Vs = 0.067  Vc = 0.504  O.K.
     Vymax =    9.468  Vs = 0.034  Vc = 0.519  O.K.

     Crack Width: Pmin/fcu/Ac = 0.009 > 0.000  The calculation is not required.
-------------------------------------------------------------------------------
Load Case                P(kN)       Mx(kN-M)      My(kN-M)        Load Fraction
D+L+S(Top)              646.710       128.425        19.050        4.67187439620
D+L+S+Wu(Bot)           551.081       128.392       143.189        2.43281488443
D+L-Wy(Bot)             591.192       102.577       137.814        2.94745485925
D+L+S+Nu(Bot)           700.886       155.714       164.549        2.13196618769
D+L-Ny(Bot)             726.269       125.667       155.168        2.58018866571
D+S+Wu(Top)             215.493       145.662       136.040        1.65652906709
D-Wy(Top)               262.289       131.452       134.330        1.88294645206
D+S+Nu(Top)             229.651       146.288       131.409        1.71042007306
D-Ny(Top)               255.034       131.282       124.534        1.96126907317
-------------------------------------------------------------------------------
FOR DEVELOPING APPLICATION        TESTDATA    CP2004     11/13/2012     Page: C1
```

Reinforcement : Vert.Bar: 8Y25 Link: Y8 @300 Sec. = 550x550



Critical Region of Column
Case: 1.0D+1.6Nx(T) (X-X)
Hs =3.500 N = 133.064
Mtop = 102.074 Mbot = 36.153
Mmax = 90.226 Mmin = 23.318
S = N/Ag/fcu = 0.009, Case 1
H1 = 0.550 M = 76.692
Hc = 2.875 Hm = 0.343
Critical Region H = 0.550 Provide: Y8 @130

Check column splice location in X-X

Upper column:	Lower column:
B = 550 D = 550	B = 550 D = 550
fcu = 50 Cov = 25.0	fcu = 50 Cov = 25.0
Bars along B: 6Y25	Bars along B: 3Y25
Bars along D: 6Y25	Bars along D: 3Y25
Max N case: 1.4D+1.6L+1.6Nv	Min N case: 1.0D-1.4S-1.4Wv
Nmax = 4981.902	Nmin = 104.607
Mc = 974.86	Mc = 405.348

Beam (RHS): GBX11
B = 400 D = 600
fcu = 40 Cov = 50.0
Sagging moment capacity:
Compression zone:
3Y25
Tension zone:
4Y25
Mb = 386.69

$\sum$Mc = 974.86+405.348 = 1380.208
1.2x$\sum$Mb = 386.69x1.2 = 464.028
$\sum$Mc >= 1.2$\sum$Mb

Check column splice location in Y-Y

Upper column:	Lower column:
B = 550 D = 550	B = 550 D = 550
fcu = 50 Cov = 25.0	fcu = 50 Cov = 25.0
Bars along B: 6Y25	Bars along B: 3Y25
Bars along D: 6Y25	Bars along D: 3Y25
Max N case: 1.4D+1.6L+1.6Nv	Min N case: 1.0D-1.4S-1.4Wv
Nmax = 4981.902	Nmin = 104.607
Mc = 974.86	Mc = 405.348

Beam (LHS): GBY3	Beam (RHS): GBY4
B = 400 D = 600	B = 400 D = 600
fcu = 40 Cov = 50.0	fcu = 40 Cov = 50.0
Hogging moment capacity:	Sagging moment capacity:
Compression zone:	Compression zone:
2Y25	3Y25

Tension zone:	Tension zone:
3Y25	3Y25
Mb = 293.823	Mb = 293.884

$\sum$Mc = 974.86+405.348 = 1380.208

1.2x$\sum$Mb = (293.823+293.884)x1.2 = 705.249

$\sum$Mc >= 1.2$\sum$Mb, Checking in both direction have been satisfied, splice joint can be located just above floor level.

WALL LOADING

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* CW1 * UPPER ROOF

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X L.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y L.L.
US1	9.563	4.500	1.500	0.000	14.344	6.750	0.000	0.000
US1	9.563	4.500	4.500	0.000	43.031	20.250	0.000	0.000
US1	9.563	4.500	1.500	3.000	14.344	6.750	28.688	13.500
US1	9.563	4.500	4.500	3.000	43.031	20.250	28.688	13.500
US1	9.563	4.500	0.000	1.500	0.000	0.000	14.344	6.750
US1	9.563	4.500	6.000	1.500	57.375	27.000	14.344	6.750
UB1	13.163	4.500	3.000	0.000	39.488	13.500	0.000	0.000
UB1	13.163	4.500	3.000	3.000	39.488	13.500	39.488	13.500
WALL W.	276.480		3.000	1.500	829.440		414.720	
TOTAL	360.180	36.000			1080.540	108.000	540.270	54.000

* CW1 * ROOF FLOOR

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X L.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y L.L.
RS4	49.050	18.000	3.000	0.000	147.150	54.000	0.000	0.000
RS2	19.125	9.000	0.000	1.500	0.000	0.000	28.688	13.500
RS3	19.125	9.000	6.000	1.500	114.750	54.000	28.688	13.500
RBX8*	59.282	18.358	0.000	3.000	-86.573	-28.359	177.847	55.075
RBX9*	33.706	6.473	6.000	3.000	243.733	48.406	101.118	19.418
RBY6*	46.656	17.507	0.000	3.000	0.000	0.000	185.309	69.534
RBY5*	142.992	46.092	0.000	0.000	-0.000	-0.000	-256.764	-83.352
RB5*	44.544	16.714	3.000	3.000	133.631	50.143	174.748	65.571
RBY9*	35.057	8.753	6.000	3.000	210.345	52.521	139.242	34.767
RBY8*	139.630	45.069	6.000	0.000	837.779	270.416	-250.537	-81.458
WALL W.	291.840		3.000	1.658	875.520		483.840	
TOTAL	881.007	194.967			2476.335	501.126	812.177	106.555

* The end moment of beam is included.

* CW1 * 13TH. FLOOR

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X L.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y L.L.
13S4	53.550	22.500	3.000	0.000	160.650	67.500	0.000	0.000
13S2	21.375	11.250	0.000	1.500	0.000	0.000	32.063	16.875
13BX6*	61.567	22.075	0.000	3.000	-89.052	-33.705	184.700	66.226
13BX7*	29.020	0.000	6.000	3.000	202.637	0.000	87.059	0.000
13BY6*	51.581	22.119	0.000	3.000	0.000	0.000	205.433	88.093
13BY5*	147.631	55.007	0.000	0.000	-0.000	-0.000	-259.929	-97.494
13B5*	48.722	20.893	3.000	3.000	146.166	62.679	191.141	81.964
13BY9*	50.032	11.059	6.000	3.000	300.194	66.356	199.267	44.047
13BY8*	75.073	23.723	6.000	0.000	450.440	142.338	-136.015	-44.919
WALL W.	291.840		3.000	1.658	875.520		483.840	
TOTAL	830.391	188.626			2046.556	305.168	987.558	154.793

* The end moment of beam is included.

* CW1 * 12TH. FLOOR to 10TH. FLOOR

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X L.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y L.L.
TS4	53.550	22.500	3.000	0.000	160.650	67.500	0.000	0.000
TS2	21.375	11.250	0.000	1.500	0.000	0.000	32.063	16.875
TS3	21.375	11.250	6.000	1.500	128.250	67.500	32.063	16.875
TBX8*	66.865	22.075	0.000	3.000	-97.142	-33.705	200.595	66.226
TBX9*	50.169	8.223	6.000	3.000	360.983	61.565	150.508	24.669
TBY6*	51.581	22.119	0.000	3.000	0.000	0.000	205.433	88.093
TBY5*	154.068	55.549	0.000	0.000	-0.000	-0.000	-272.980	-99.120
TB5*	53.736	20.893	3.000	3.000	161.209	62.679	210.812	81.964
TBY9*	55.341	11.059	6.000	3.000	332.045	66.356	220.409	44.047
TBY8*	152.946	55.257	6.000	0.000	917.679	331.544	-270.918	-98.584
WALL W.	291.840		3.000	1.658	875.520		483.840	
TOTAL	972.847	240.175			2839.194	623.439	991.823	141.045

* The end moment of beam is included.

* CW1 * 9TH. FLOOR to 6TH. FLOOR

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X L.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y L.L.
TS4	53.550	22.500	3.000	0.000	160.650	67.500	0.000	0.000
TS2	21.375	11.250	0.000	1.500	0.000	0.000	32.063	16.875
TS3	21.375	11.250	6.000	1.500	128.250	67.500	32.063	16.875
TBX8*	66.865	22.075	0.000	3.000	-97.142	-33.705	200.595	66.226
TBX9*	50.169	8.223	6.000	3.000	360.983	61.565	150.508	24.669
TBY6*	51.581	22.119	0.000	3.000	0.000	0.000	205.433	88.093
TBY5*	154.068	55.549	0.000	0.000	-0.000	-0.000	-272.980	-99.120
TB5*	53.736	20.893	3.000	3.000	161.209	62.679	210.812	81.964
TBY9*	55.341	11.059	6.000	3.000	332.045	66.356	220.409	44.047
TBY8*	152.946	55.257	6.000	0.000	917.679	331.544	-270.918	-98.584
WALL W.	328.320		3.000	1.658	984.960		544.320	
TOTAL	1009.327	240.175			2948.634	623.439	1052.303	141.045

* The end moment of beam is included.

WALL LOADING

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* CW1 * 5TH. FLOOR to 3RD. FLOOR

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X L.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y L.L.
TS4	53.550	22.500	3.000	0.000	160.650	67.500	0.000	0.000
TS2	21.375	11.250	0.000	1.500	0.000	0.000	32.063	16.875
TS3	21.375	11.250	6.000	1.500	128.250	67.500	32.063	16.875
TBX8*	66.865	22.075	0.000	3.000	-97.142	-33.705	200.595	66.226
TBX9*	50.169	8.223	6.000	3.000	360.983	61.565	150.508	24.669
TBY6*	51.581	22.119	0.000	3.000	0.000	0.000	205.433	88.093
TBY5*	154.068	55.549	0.000	0.000	-0.000	-0.000	-272.980	-99.120
TB5*	53.736	20.893	3.000	3.000	161.209	62.679	210.812	81.964
TBY9*	55.341	11.059	6.000	3.000	332.045	66.356	220.409	44.047
TBY8*	152.946	55.257	6.000	0.000	917.679	331.544	-270.918	-98.584
WALL W.	364.800		3.000	1.658	1094.400		604.800	
TOTAL	1045.807	240.175			3058.074	623.439	1112.783	141.045

* The end moment of beam is included.

* CW1 * 2ND. FLOOR

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X L.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y L.L.
2S4	58.950	22.500	3.000	0.000	176.850	67.500	0.000	0.000
2S2	21.375	11.250	0.000	1.500	0.000	0.000	32.063	16.875
2S3	21.375	11.250	6.000	1.500	128.250	67.500	32.063	16.875
2BX8*	59.881	21.437	0.000	3.000	-85.681	-32.428	179.643	64.312
2BX9*	48.631	8.316	6.000	3.000	349.687	62.311	145.892	24.949
2BY6*	51.967	22.284	0.000	3.000	0.000	0.000	207.366	88.922
2BY5*	151.436	53.695	0.000	0.000	-0.000	-0.000	-264.330	-94.209
2B5*	48.722	20.893	3.000	3.000	146.166	62.679	191.141	81.964
2BY9*	50.407	11.142	6.000	3.000	302.444	66.853	201.142	44.461
2BY8*	150.720	53.564	6.000	0.000	904.321	321.383	-261.725	-93.504
WALL W.	456.000		3.000	1.658	1368.000		756.000	
TOTAL	1119.465	236.332			3290.038	615.798	1219.254	150.645

* The end moment of beam is included.

WALL LOADING

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* CW1 * 1ST. FLOOR

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X L.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y L.L.
1S5	52.200	27.000	3.000	0.000	156.600	81.000	0.000	0.000
1S4	20.700	13.500	0.000	1.500	0.000	0.000	31.050	20.250
1S4	20.700	13.500	6.000	1.500	124.200	81.000	31.050	20.250
1BX9*	67.431	24.449	0.000	3.000	-92.446	-36.362	202.293	73.346
1BX10*	65.533	23.625	6.000	3.000	481.847	176.464	196.599	70.875
1BY6*	55.823	26.332	0.000	3.000	0.000	0.000	221.876	104.658
1BY5*	156.842	61.657	0.000	0.000	-0.000	-0.000	-270.816	-107.758
1B10*	53.151	25.071	3.000	3.000	159.454	75.214	208.517	98.357
1BY10*	55.823	26.332	6.000	3.000	334.939	157.990	221.876	104.658
1BY9*	153.309	61.916	6.000	0.000	919.857	371.498	-260.062	-106.671
WALL W.	171.000		3.000	1.658	513.000		283.500	
TOTAL	872.513	303.382			2597.451	906.805	865.882	277.966

* The end moment of beam is included.

Actual load value transferred from page S4
VL = 1.5qkx3.0 = 1.5x11.381x3.0 = 51.215

* CW1 * GRD. FLOOR Loaded Length: 6.0 qk: 11.381

LOAD NAME	D.L. (kN)	V.L. (kN)	LEVER ARM Lx(M)	LEVER ARM Ly(M)	MOMENT ALONG X-X D.L.	MOMENT ALONG X-X V.L.	MOMENT ALONG Y-Y D.L.	MOMENT ALONG Y-Y V.L.
GS4	57.600	102.430	3.000	0.000	172.800	307.289	0.000	0.000
GS2	20.700	51.215	0.000	1.500	0.000	0.000	31.050	76.822
GS3	20.700	51.215	6.000	1.500	124.200	307.289	31.050	76.822
GBX8*	73.211	97.192	0.000	3.000	-101.898	-146.827	219.633	291.575
GBX9*	68.297	90.112	6.000	3.000	501.855	673.336	204.892	270.335
GBY6*	56.983	99.467	0.000	3.000	0.000	0.000	226.233	394.904
GBY5*	175.638	259.597	0.000	0.000	-0.000	-0.000	-312.152	-465.584
GB5*	54.489	95.113	3.000	3.000	163.466	285.340	213.763	373.137
GBY9*	56.623	98.839	6.000	3.000	339.737	593.032	224.434	391.764
GBY8*	161.158	237.883	6.000	0.000	966.946	1427.297	-277.769	-413.879
WALL W.	399.000		3.000	1.658	1197.000		661.500	
TOTAL	1144.398	1183.061			3364.106	3446.757	1222.634	995.896

* The end moment of beam is included.

Actual load value transferred from page B8
VL = 22.810x11.381 = 259.601

Actual load value transferred from page B8
My = 259.597x0.0-40.909x11.381 = -465.585

WALL LOADING

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* CW1 * BASEMENT

LOAD NAME	D.L. (kN)	L.L. (kN)	LEVER ARM		MOMENT ALONG X-X		MOMENT ALONG Y-Y	
			Lx(M)	Ly(M)	D.L.	L.L.	D.L.	L.L.
BS4	75.600	45.000	3.000	0.000	226.800	135.000	0.000	0.000
BS2	32.400	22.500	0.000	1.500	0.000	0.000	48.600	33.750
BS3	32.400	22.500	6.000	1.500	194.400	135.000	48.600	33.750
BBX8*	97.321	42.272	0.000	3.000	-137.145	-63.650	291.964	126.815
BBX9*	93.065	40.296	6.000	3.000	687.024	301.478	279.196	120.889
BBY6*	81.967	44.163	0.000	3.000	0.000	0.000	326.314	175.816
BBY5*	223.671	109.328	0.000	0.000	-0.000	-0.000	-390.440	-192.677
BB5*	77.554	41.786	3.000	3.000	232.663	125.357	304.251	163.928
BBY9*	81.535	43.931	6.000	3.000	489.212	263.584	324.157	174.653
BBY8*	214.541	103.813	6.000	0.000	1287.248	622.876	-367.410	-179.741
WALL W.	171.000		3.000	1.658	513.000		283.500	
TOTAL	1181.056	515.588			3493.203	1519.645	1148.731	457.183

* The end moment of beam is included.

WALL UPLIFT LOADING

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* CW1 * BASEMENT

LOAD NAME	P(kN)	Lx(M)	Ly(M)	Mx(kN-M)	My(kN-M)
BS4	-180.000	3.000	0.000	-540.000	-0.000
BS2	-90.000	0.000	1.500	-0.000	-135.000
BS3	-90.000	6.000	1.500	-540.000	-135.000
TOTAL	-360.000			-1080.000	-270.000

* The end moment of beam is included.

ACCUMULATED WALL LOADING

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* CW1 *

FLOOR MARK	L.L.R.F.(%)	LOAD TYPE	AXIAL LOAD (kN)	MOMENT ALONG X-X (kN-M)	MOMENT ALONG Y-Y (kN-M)	SECTION CENTER Cx(M)	SECTION CENTER Cy(M)	GRAVITY M. ALONG X-X (kN-M)	GRAVITY M. ALONG Y-Y (kN-M)
UR/F	0	D.L.	360.180	1080.540	540.270	3.000	1.500	-0.000	-0.000
		L.L.	36.000	108.000	54.000			0.000	0.000
RF/F	0	D.L.	1241.187	3556.875	1352.447	3.000	1.658	-166.686	-705.441
		L.L.	230.967	609.126	160.555			-83.775	-222.388
13/F	10	D.L.	2071.578	5603.431	2340.005	3.000	1.658	-611.303	-1094.671
		L.L.	381.234	833.665	289.213			-310.037	-342.872
12/F	20	D.L.	3044.425	8442.625	3331.828	3.000	1.658	-690.650	-1715.829
		L.L.	535.014	1251.786	375.914			-353.257	-511.139
11/F	30	D.L.	4017.272	11281.819	4323.651	3.000	1.658	-769.997	-2336.986
		L.L.	640.760	1545.220	434.407			-377.060	-627.974
10/F	40	D.L.	4990.119	14121.013	5315.474	3.000	1.658	-849.344	-2958.143
		L.L.	698.471	1713.967	464.690			-381.446	-693.375
09/F	40	D.L.	5999.446	17069.647	6367.777	3.000	1.658	-928.691	-3579.304
		L.L.	842.576	2088.030	549.317			-439.697	-847.674
08/F	40	D.L.	7008.773	20018.281	7420.080	3.000	1.658	-1008.038	-4200.466
		L.L.	986.681	2462.093	633.944			-497.949	-1001.973
07/F	40	D.L.	8018.100	22966.915	8472.383	3.000	1.658	-1087.385	-4821.627
		L.L.	1130.786	2836.157	718.571			-556.201	-1156.272
06/F	40	D.L.	9027.427	25915.549	9524.686	3.000	1.658	-1166.732	-5442.788
		L.L.	1274.891	3210.220	803.198			-614.452	-1310.571
05/F	40	D.L.	10073.234	28973.623	10637.469	3.000	1.658	-1246.079	-6063.953
		L.L.	1418.996	3584.284	887.825			-672.704	-1464.870
04/F	40	D.L.	11119.041	32031.697	11750.252	3.000	1.658	-1325.426	-6685.118
		L.L.	1563.101	3958.347	972.452			-730.955	-1619.169
03/F	40	D.L.	12164.848	35089.771	12863.035	3.000	1.658	-1404.773	-7306.283
		L.L.	1707.206	4332.410	1057.079			-789.207	-1773.468
02/F	40	D.L.	13284.313	38379.809	14082.289	3.000	1.658	-1473.130	-7943.102
		L.L.	1849.005	4701.889	1147.466			-845.126	-1918.184
01/F	40	D.L.	14156.826	40977.260	14948.171	3.000	1.658	-1493.218	-8523.847
		L.L.	2031.034	5245.972	1314.245			-847.130	-2053.209
GR/F	40	D.L.	15301.224	44341.366	16170.805	3.000	1.658	-1562.306	-9198.624
		L.L.	3214.095	8692.729	2310.141			-949.556	-3018.828
BS/F	40	D.L.	16482.280	47834.569	17319.536	3.000	1.658	-1612.271	-10008.084
		L.L.	3523.448	9604.516	2584.451			-965.828	-3257.426
		U.L.	-360.000	-1080.000	-270.000	3.000	1.658	-0.000	326.880