

	A	B	C	D
1				
2				
3				
4				

Chapter 3

Bridge Bridge Data

	A	B	C	D	E	F	G	H
1								
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3	Simple Span			0.000	0.000			#DIV/0!
4	Bridge Joints			0.000	0.000			#DIV/0!
5				0.000	0.000			#DIV/0!
6				0.000	0.000			#DIV/0!
7				0.000	0.000			#DIV/0!
8								
9								

A. New File.

- Step 1. If necessary, open Excel and start a new worksheet.
Use File Menu > New > Blank Worksheet and Create.

B. Format First Row.

- Step 1. Select the **first 8 cells of first row**. To select cells, click first cell row 1 and drag cursor across 8 cells to column H, **Fig. 1**.

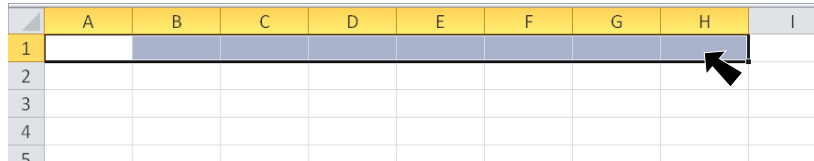



Fig. 1

- Step 2. On the Home tab in the Alignment group, click **Merge & Center**  **Fig. 2** and **Fig. 3**.

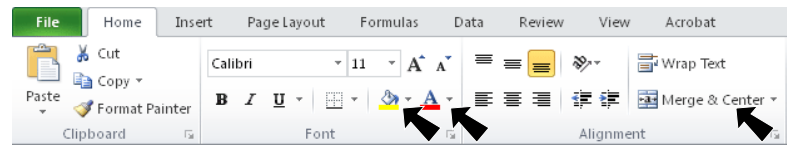


Fig. 2

- Step 3. On the Home tab in the Font group, click the arrow next to **Fill Color**



- Fig. 2** and select **Blue** for cell background color, **Fig. 3**.

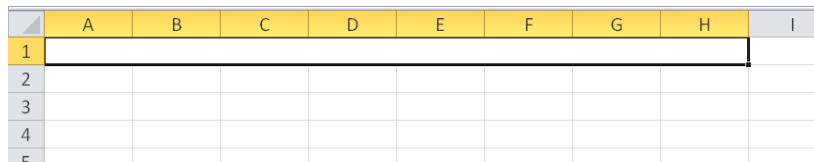



Fig. 3

- Step 4. In the Font group, click the arrow next to **Font Color**  and select **White**, **Fig. 2**.

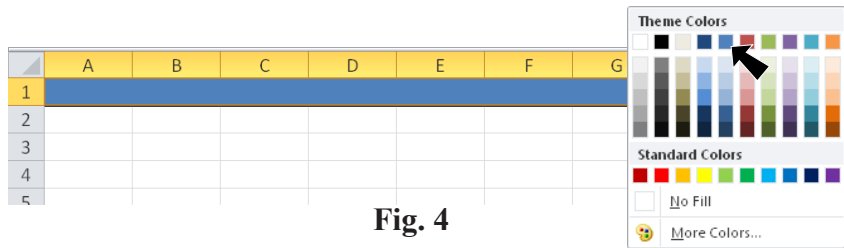


Fig. 4

- Step 5. Key-in **Bridge Data** in the merged cell, **Fig. 5**.

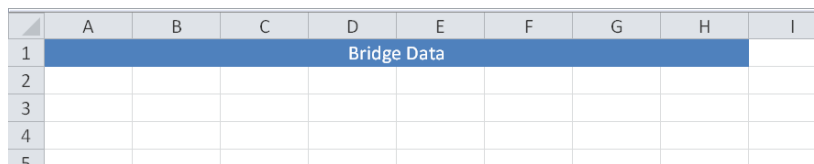


Fig. 5

C. Save as "BRIDGE DATA".

- Step 1. Click File Menu > Save As.
Step 2. Key-in **BRIDGE DATA** for the filename and press ENTER.

D. Format 2nd Row.

Step 1. Select the 7 cells under our Bridge Data blue cells in 2nd row, Fig. 6.

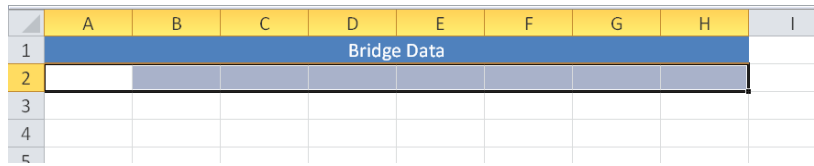


Fig. 6

Step 2. On the Home tab in the Format group, click

Format  > **Column Width.**



Fig. 7

Step 3. Key-in 13 in the Format Column width dialog box and click OK, Fig. 7 and Fig. 8.

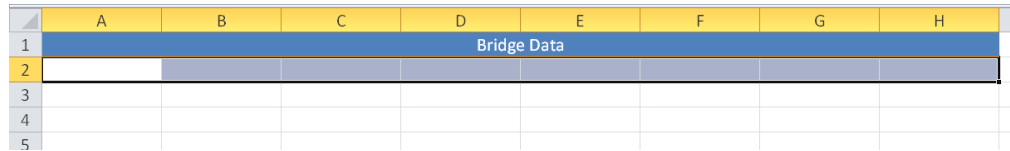


Fig. 8

Step 4. In the Alignment group, click **Middle Align** , Fig. 9.

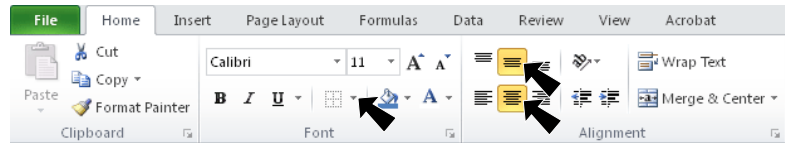



Fig. 9

Step 5. In the Alignment group, click **Center** , Fig. 9.

Step 6. In the Font group, click arrow next to **Borders**  > **More Borders**, Fig. 9.

Step 7. In the Format Cell dialog:
 under Line Style, Fig. 10
 select **Double Border**
 under Color
 click drop down arrow and
 select **Blue**
 under Border

Bottom 
 click OK, Fig. 11.

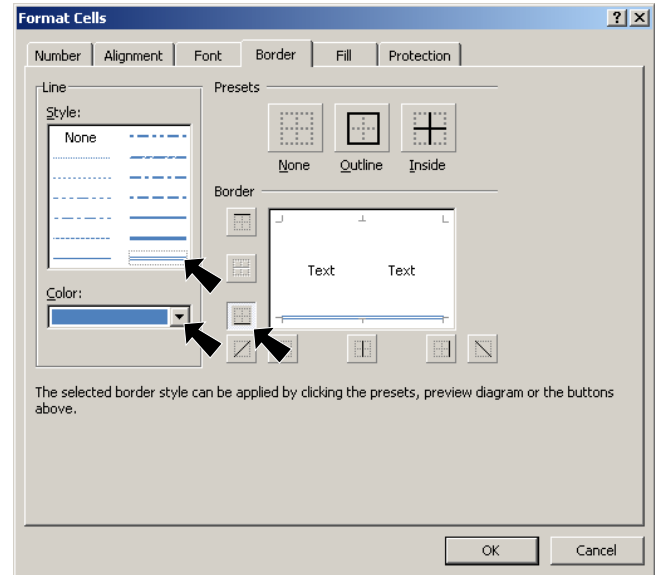


Fig. 10

Step 8. Save. Use **Ctrl-S.**

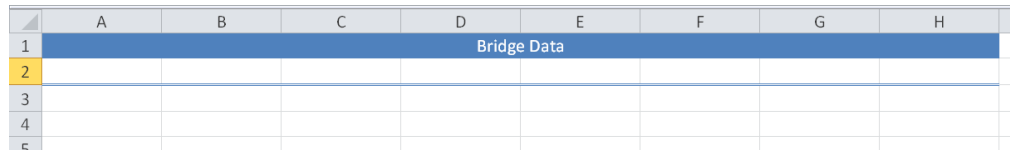


Fig. 11

E. Enter Text.

Step 1. In the first three cells, row 2 key-in:

Configuration
Current Force
Current FOS

Use the Tab key to move to the next cell,
Fig. 12.

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS					
3								
4								
5								

Fig. 12

Step 2. In cell D2, key-in **Safe Force per Item** with a line break after Force.

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item				
3								
4								

Fig. 13

To insert line break use **Alt-Enter**. So, key-in Safe Force, press **Alt-Enter** and key-in per Item, **Fig. 13**. Use the Tab key to move to the next cell.

Step 3. In the next 3 cells key-in:

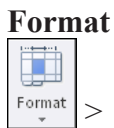
Force Items line break after Load, **Fig. 14**
Total Load (lbs.) line break after Load
Structure Mass (grams) line break after Mass
Efficiency

Step 4. Click **Row 2 Header** to select the row, **Fig. 15.**

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass (grams)	Efficiency
3								
4								

Fig. 14

Step 5. On the Home tab in the Format group, click



Auto Fit Column Width, Fig. 16.

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass (grams)	Efficiency
3								
4								

Fig. 15

	A	B	C	D	E	F	G	H	I	J	K
1	Bridge Data										
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency			
3											
4											

Fig. 16

Step 6. Save. Use **Ctrl-S**.

F. Safe Force Formula.

Current Force * Current FOS

Step 1. Click in cell **D3** under **Safe Force per Items** and key-in = (equal sign), **Fig. 17**.

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3				=				
4								
5								

Fig. 17

Step 2. Click in cell **B3** under **Current Force**, **Fig. 18**.

The screenshot shows the same Excel spreadsheet as Fig. 17, but with cell B3 selected. The formula bar at the top shows "=B3".

Fig. 18

Step 3. Key-in * in cell **D3**, **Fig. 19**.

The screenshot shows the same Excel spreadsheet as Fig. 18, but with cell D3 selected. The formula bar at the top shows "=B3*".

Fig. 19

Step 4. Click in cell **C3** under **Current FOS** and press ENTER, **Fig. 20**.

The screenshot shows the same Excel spreadsheet as Fig. 19, but with cell C3 selected. The formula bar at the top shows "=B3*C3".

Fig. 20

Step 5. Confirm the formula is correct, key-in 2 in cell **B3** and 1.5 in cell **C3**. The results should be 2 * 1.5 or 3, **Fig. 21**.

The screenshot shows the final Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2	1.5	3				
4								
5								

Fig. 21

G. Total Load Formula.

Safe Force per Item * Force Items

Step 1. Click in cell **F3** under **Total Load** and key-in = **Fig. 22.**

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2	1.5	3		=		
4								
5								

Fig. 22

Step 2. Click in cell **D3** under **Safe Force per Item**, **Fig. 23.**

The screenshot shows the same Excel spreadsheet as Fig. 22, but with cell D3 selected. The formula bar at the top shows "=D3".

Fig. 23

Step 3. Key-in * in cell **F3**, **Fig. 24.**

The screenshot shows the same Excel spreadsheet as Fig. 23, but with cell F3 selected. The formula bar at the top shows "=D3*".

Fig. 24

Step 4. Click in cell **E3** under **Force Items** and press ENTER, **Fig. 25.**

The screenshot shows the same Excel spreadsheet as Fig. 24, but with cell E3 selected. The formula bar at the top shows "=D3*E3".

Fig. 25

Step 5. Confirm the formula is correct, key-in 6 in cell **E3** under **Force Items** and press ENTER. The results should be 3 * 6 or 18, **Fig. 26.**

The screenshot shows the final state of the Excel spreadsheet. Cell E3 now contains the value 6, and cell F3 contains the result 18.

Fig. 26

H. Efficiency Formula.

Total Load in lbs. * 4.54 / Structure Mass in grams

Step 1. Click in cell **H3** under **Efficiency** and key-in **=** **Fig. 27.**

The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2	1.5	3	6	18		=
4								
5								

Fig. 27

Step 2. Click in cell **F3** under **Total Load**, **Fig. 28.**

Step 3. Key-in ***4.54)/** in cell **H3**, **Fig. 29.**

Step 4. Click in cell **G3** under **Structure Mass** and press **ENTER**, **Fig. 30.**

Step 5. Confirm the formula, key-in **10** in cell **G3** under **Structure Mass** and press **ENTER**. The results should be **8.172**, **Fig. 31.**

Step 6. Save. Use **Ctrl-S**.

The screenshot shows the formula being built in cell H3:

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2	1.5	3	6	18		=F3
4								
5								

Fig. 28

The screenshot shows the formula being updated in cell H3:

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2	1.5	3	6	18		=F3*4.54)
4								
5								

Fig. 29

The screenshot shows the formula being completed in cell H3:

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2	1.5	3	6	18		=F3*4.54)/G3
4								
5								

Fig. 30

The screenshot shows the final result in cell H3:

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2	1.5	3	6	18	10	8.172
4								
5								

Fig. 31

I. Format Numbers and Format General.

Step 1. Select range of cells from B3 under Current Force across to Efficiency and down 4 rows. To select range, click cell B3 (under Current Force) drag across and down, **Fig. 32**.

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2	1.5	3	6	18	10	8.172
4								
5								
6								
7								
8								
9								

Fig. 32

Step 2. On the Home tab in the Number group, click the **Dialog Box Launcher** next to Number, **Fig. 33**.

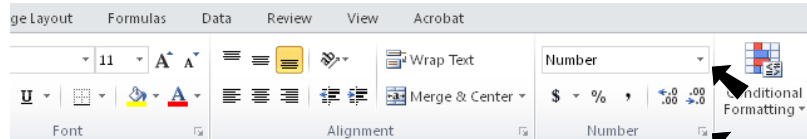


Fig. 33

Step 3. In the Format Cell dialog: under Category, **Fig. 34** select **Number** set **Decimal places 3** click OK.

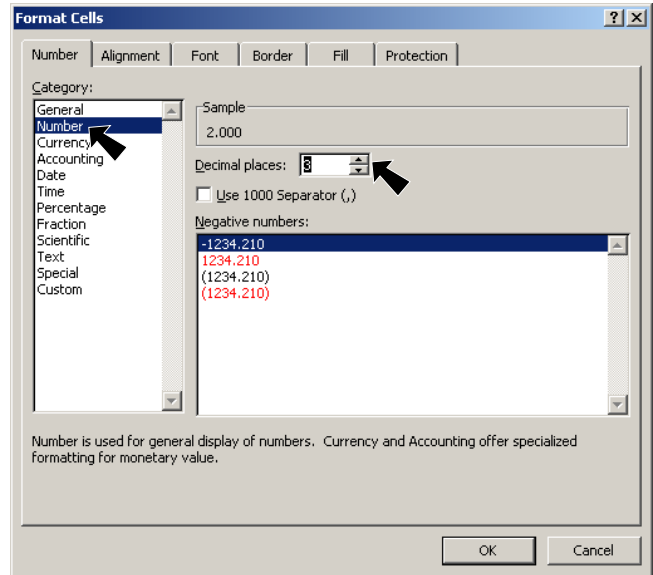


Fig. 34

Step 4. Click **Column E Header** to select the column, **Fig. 35**.

Step 5. On the Home tab in the Number group, click arrow next to **Number** **Number** > **General**, **Fig. 33** and **Fig. 36**.

Step 6. Save. Use **Ctrl-S**.

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2.000	1.500	3.000	6.000	18.000	10.000	8.172
4								
5								

Fig. 35

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2.000	1.500	3.000	6	18.000	10.000	8.172
4								
5								

Fig. 36

J. Delete Test Data.

Step 1. Select the 4 cells that contain the test numbers and delete. To delete, Ctrl click the 2, 1.5, 6 and 10 and press the Delete key, **Fig. 37** and **Fig. 38**.

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3		2.000	1.500	3.000	6	18.000	10.000	8.172
4								
5								

Fig. 37

K. Fill Down.

Step 1. Select range of cells from **D3** under **Safe Force** across **Efficiency** and down 4 rows. To select range, click cell D3 (under Safe Force) drag across and down, **Fig. 38**.

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3				0.000		0.000		#DIV/0!
4								
5								
6								
7								
8								

Fig. 38

Step 2. Use **Ctrl-D** to Fill down, **Fig. 38**.

L. Key-in Configurations.

Step 1. Key-in **Simple Span** and **Bridge Joints** in Configuration column, **Fig. 39**.

Step 2. Save. Use **Ctrl-S**.

	A	B	C	D	E	F	G	H
1	Bridge Data							
2	Configuration	Current Force	Current FOS	Safe Force per Item	Force Items	Total Load (lbs.)	Structure Mass	Efficiency
3	Simple Span			0.000		0.000		#DIV/0!
4	Bridge Joints			0.000		0.000		#DIV/0!
5				0.000		0.000		#DIV/0!
6				0.000		0.000		#DIV/0!
7				0.000		0.000		#DIV/0!
8								

Fig. 39