

	A	B	C	D
1				
2				
3				
4				

# Chapter 3

# Bridge Bridge 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	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**.

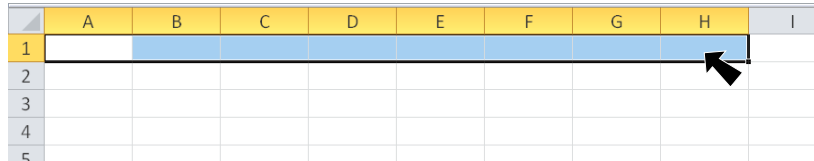
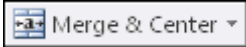


Fig. 1

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

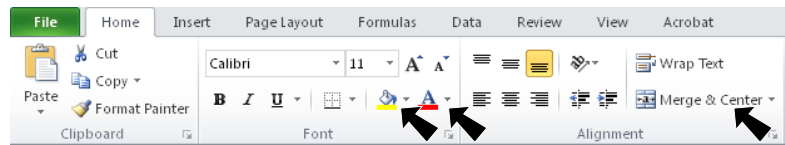



Fig. 2

- 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**.

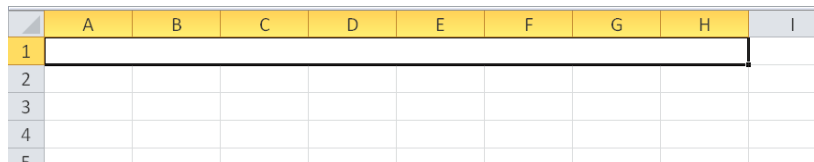



Fig. 3

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

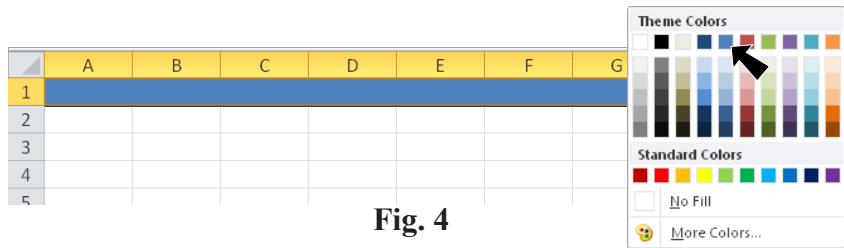


Fig. 4

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

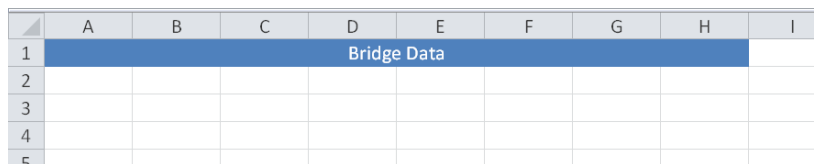


Fig. 5

## 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.

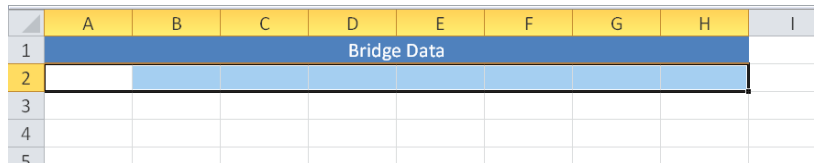


Fig. 6

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

**Format**  > **Column Width.**

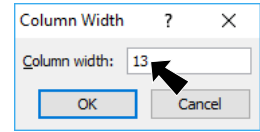


Fig. 7

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

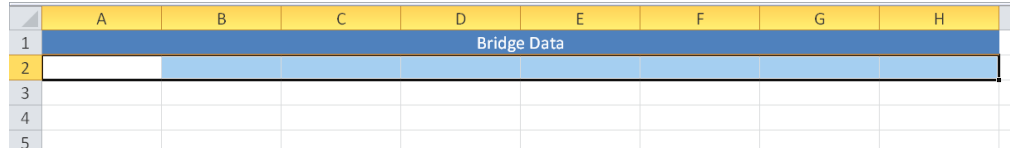


Fig. 8

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

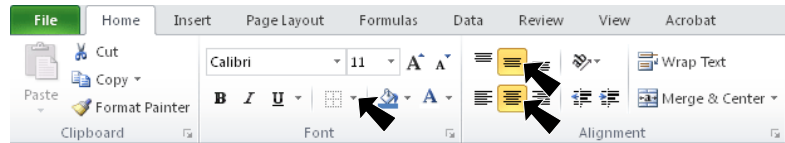



Fig. 9

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

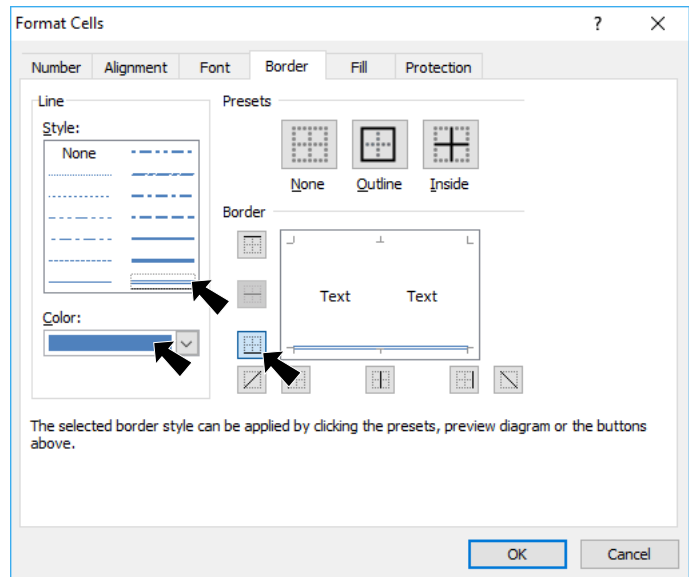


Fig. 10

**Bottom**   
 click OK, Fig. 11.

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

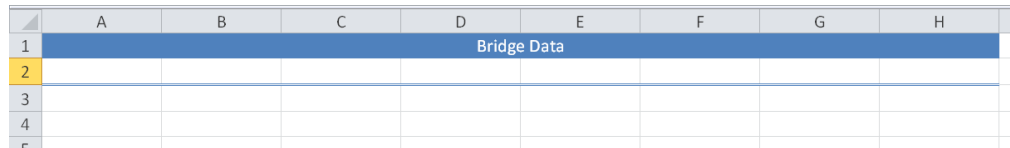


Fig. 11

## 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:

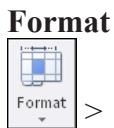
**Force Items** line break after Force, **Fig. 14**  
**Total Load (lbs.)** line break after Load  
**Structure Mass (grams)** line break after Mass  
**Efficiency**

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 Cells  
 group, click



**Format**  
**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 the asterisk key entered in cell D3. 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 the formula completed in cell D3. 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.**

	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.**

	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		=D3		
4								
5								

**Fig. 23**

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

	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		=D3*		
4								
5								

**Fig. 24**

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

	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		=D3*E3		
4								
5								

**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.**

	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. 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.

The screenshot shows the same Excel spreadsheet as Fig. 27, but with cell F3 selected. The formula bar shows **=F3**.

Fig. 28

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

The screenshot shows the same Excel spreadsheet as Fig. 28, but with cell H3 selected. The formula bar shows **=(F3\*4.54)/**.

Fig. 29

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

The screenshot shows the same Excel spreadsheet as Fig. 29, but with cell G3 selected. The formula bar shows **=(F3\*4.54)/G3**.

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.

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	6	18	10	8.172
4								
5								

Fig. 31

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

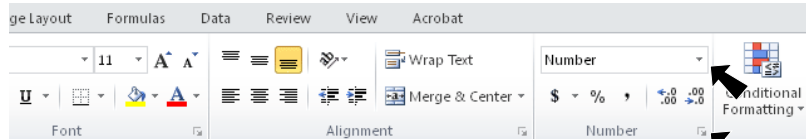
# I. Format Numbers and Format General.

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								

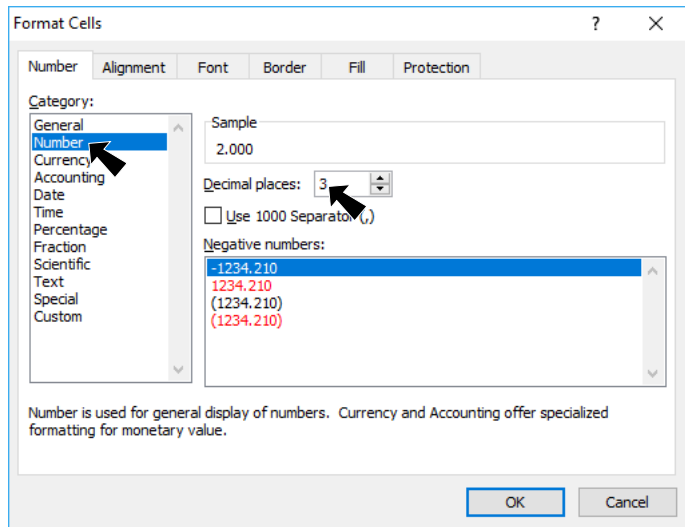
**Fig. 32**

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, 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** > **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**