Excel Custom Function and Macros by Anatoly Klevitsky

Reference

Trigonometry

Included in: Basic, Structural, and Bridge spreadsheets

These functions are the same as Excel functions with the same names (excluding an underscore), except they work with the angles in decimal degrees (Excel functions operate on the angles in radians)

cos_(*ang***)**
sin_(*ang***)**
tan_(*ang***)**
acos_(*number***)**
asin_(*number***)**
atan_(*number***)**
atan2_(*number1,number2***)**

Examples:

ang =	30	
num =	0.5	
sin_(ang) =	0.5	=sin_(C27)
asin_(num) =	30	=asin_(C28)
tan_(45.7) =	1.024738	=tan_(45.7)

Angles

Included in: Basic, Structural, and Bridge spreadsheets

These functions provide functionality for formatting and converting angles. Angles in deg-min-sec are text strings and should be converted to decimal degrees with the deg function for use in math operations.

ang_(*deg* , *min* , *sec***)** *enters angle in deg-min-sec format*

deg..... degree part of an angle (integer)
min..... minute part of an angle (optional positive integer < 60)
sec..... second part of an angle (optional positive decimal number < 60)

dms(*ang, num_dec***)** *converts angle in decimal degrees into a deg-min-sec text string*

ang..... angle in decimal degrees
num_dec..... optional parameter that specifies number of digits after decimal point in the second component of the deg-min-sec. If omitted, none is used. This parameter controls the precision of the conversion (*ang* being rounded off).

deg(*ang***)** *converts deg-min-sec text string into decimal degrees*

ang..... deg-min-sec text string

Examples:

ang1 =	30.1236	
ang2 =	-5°-8'-2.3"	=ang_(-5,8,2.3)
ang1+ang2 =	24.98963	=C53+deg(C54)
ang1+ang2 =	24°-59'-22.66"	=dms(C53+deg(C54),2)
12*sin(ang3) =	5.06945	=12*sin_(deg(C56))

Fractions and Feet-Inch Conversions

Included in: Basic, Structural, and Bridge spreadsheets

These functions convert/round numbers to specified format/fraction. The fraction accuracy is specified by the denominator. The resulting fraction is an equivalent fraction with the smallest denominator. For example **0.5** with specified denominator of **8** equal to **4/8** transformed to **1/2**.

fr(*num,denom***)** *rounds a decimal number to a fraction based on the specified denominator. The resulting fraction is in Excel fractional format and can be used like any other number in the spreadsheet except formulas operating on cell ranges.*

num..... decimal number

denom..... Optional positive integer equal to the fraction denominator. 16 is used if it is omitted

fi(*num, denom***)** *converts decimal number into feet-inch text string. It must be converted into a decimal number with* ***fd*** *function when used in the math operations.*

num..... decimal number

denom..... optional positive integer equal to the fraction denominator of the **inch**-part. 16 is used if it is omitted.

fd(*ft-in***)** *converts feet-inch text string into decimal number*

ft-in..... text string in feet-inch format (*ft-in* must be previously obtained using the **fi** function)

Examples:

num1 =	-30.6789	
num1_16 =	-30 11/16	=fr(C82)
num1_4 =	-30 3/4	=fr(C82,4)
num1_32 =	-30 11/16	=fr(C82,32)
num2 = .75-num1_32 =	31 7/16	=fr(0.75-C85)
A = num1_ft_in_8 =	-30'-8 1/8"	=fi(C82,8)
A-6.7 =	-37'-4 1/2"	=fi(fd(C87)-6.7)
A_dec =	-30.6771	=fd(C87)
num3 =	4'-0 7/16"	=fi(4+7/16/12)

Cell Formula

Included in: Basic, Structural, and Bridge spreadsheets

The cell formula function **pr_frm**l returns an expanded version of the cell formula with cell references replaced by the corresponding values.

Notes:

1. Range references that include a colon (:) (e.g. K219:L220) are not expanded.
2. References to external spreadsheets are expanded only if these spreadsheets are opened concurrently with the workbook containing the reference.

pr_frml(*cell_ref***)** *returns an expanded version of the formula contained in the target cell*

cell_ref..... reference to target cell (e.g. a16)

Examples:

a =	3.797	
b =	1.90	
c =	0.168755	=1.7*sin_(C105+C104)
c =	=1.7*sin_(0+0)	=pr_frml(C106)

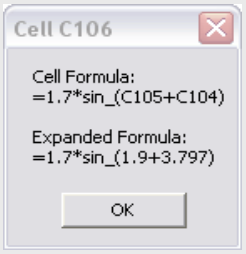
Cell Inspector (F2 key)

Included in: Basic, Structural, and Bridge spreadsheets

Press **F2** (see note 3) to display active cell formula and its expanded version with the cell references replaced by the corresponding values.

Notes:

1. Range references that include a colon (:) (e.g. K219:L220) are not expanded.
2. References to external spreadsheets are expanded only if these spreadsheets are opened concurrently with the workbook containing reference.
3. Function key assignment can be changed in the License worksheet.



Cell Range Linker/Transformer (F3 key)

Included in: Basic, Structural, and Bridge spreadsheets

The **Cell Range Linker/Transformer** creates a new cell range that is linked to the target range. The pattern of the new range is derived from the target range based on the chosen transformation option. Press **F3** to launch the **Cell Range Linker/Transformer**, and follow the instructions.

Note: Function key assignment can be changed in the License worksheet.

Examples:

Target Range

1	5
2	6
3	7
4	8

Range linked to Target Range with Option

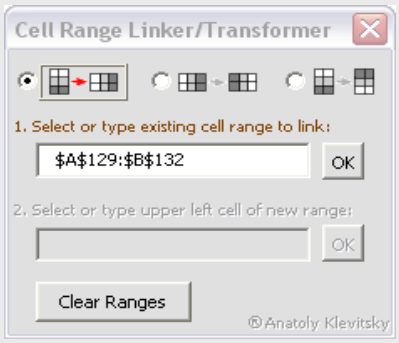
1	2	3	4
5	6	7	8

Range linked to Target Range with Option

5	1
6	2
7	3
8	4

Range linked to Target Range with Option

4	8
3	7
2	6
1	5



Spread Footing - Bearing Pressure and Contact Area

Included in: Structural spreadsheet

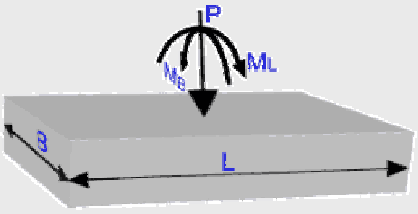
This function returns the maximum bearing pressure, contact area, and other design parameters (see below) of a spread footing loaded eccentrically about two axes. Refer to the **Technical Reference** below for the analysis methodology and input/output graphical representation.

brg_press(*P, MB, ML, B, L, output_code*)

P..... axial load in kips (sign is ignored)

MB, ML..... moments in k-ft (sign is ignored)

B, L..... footing plan dimensions in ft



The *output code* specifies the returned parameter as follow:

1 - maximum bearing pressure in ksf

2 - minimum bearing pressure in ksf

3 - contact area in %

4 - bearing pressure design case

5 - Dim1 in ft (see Technical Reference)

6 - Dim2 in ft (see Technical Reference)

brg_press can be entered via a custom form: press **ALT+F11** and follow the instructions

Note: Function key assignment may be changed in the License worksheet.

Examples:

Ftg. Width B = 18.00 ft

Ftg. Length L = 24.00 ft

Load Case	P(k)	MB(k-ft)	ML(k-ft)	Bearing Press (ksf)	Contact Area (%)	Brg. Press. Case	Dim1 (ft)	Dim2 (ft)
1	120.4	120.5	0.0	0.37	100.0	I	-	-
2	120.4	300.6	456.8	0.83	85.3	II	12.35	10.32
3	67.4	0.0	345.1	0.36	86.0	IIIa	20.64	20.64
4	50.8	400.7	160.0	1.88	16.7	IIIb	4.26	1.76
5	164.0	1200.0	1000.0	6.19	18.4	IV	6.73	23.61

=brg_press(B177,C177,D177,C169,C170,1)

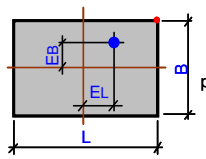
=brg_press(B177,C177,D177,C169,C170,3)

=brg_press(B177,C177,D177,C169,C170,4)

=brg_press(B177,C177,D177,C169,C170,5)

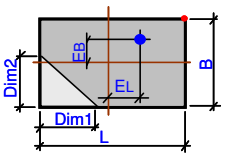
=brg_press(B177,C177,D177,C169,C170,6)

Technical Reference - Spread Footing



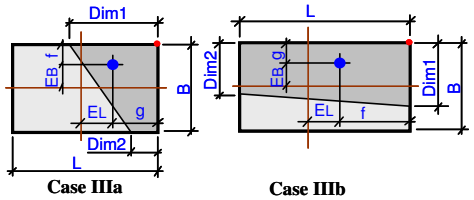
Case I

pmax = [P (1+6EL/L+6EB/B)] / [BL]



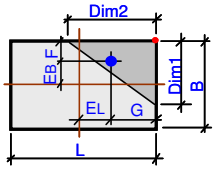
Case II

pmax = KP / BL (K from chart)
Dim1 = xL (x from chart)
Dim2 = yB (y from chart)



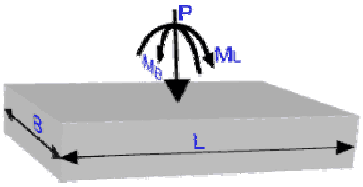
Case IIIa **Case IIIb**

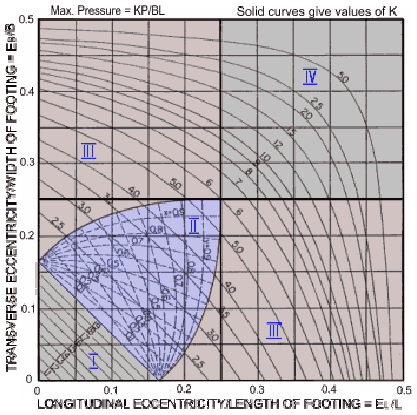
f = [L(1+2r+3r^2)] / [4(1+r+r^2)] (solve for r)
Dim1 = [4g(1+r+r^2)] / [1+r+r^2+r^3]
Dim2 = r x Dim1
pmax = 6P / [L x Dim1(1+r+r^2)]



Case IV

pmax = 3R / 8FG
Dim1 = 4F
Dim2 = 4G





Contact Pressure for Footing Loaded Eccentrically about Two Axes Modified after AREA (1980)

Rebar Properties

Included in: Structural spreadsheet

Bars are in English units (#3 thru #11, #14, # 18). Omit "#" when entering bar size.

b_area(*bar_size***)** *returns the bar area in* in^2

b_dia(*bar_size***)** *returns the bar diameter in inches*

b_wt(*bar_size***)** *returns the bar weight in lbs/ft*

min_b_size(*area_req'd***)** *returns the smallest bar # with an area ≥ area_req'd*

area_req'd..... bar area in in^2

Examples:

bar1 size # =	7	
bar1 area =	0.60	=b_area(C231)
#4 bar dia =	0.5	=b_dia(4)
bar1 wt =	2.044	=b_wt(C231)
req'd As =	5.67 in^2	
no. bars =	4	
min bar size =	11	=min_b_size(C235/C236)
As provided =	6.24 in^2	=C236*b_area(C237)

Analysis of the Reinforced Concrete Sections

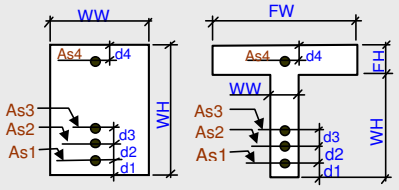
Included in: Structural spreadsheet

This group of functions enable Strength and Working Stress Analysis of the rectangular and "T" shaped reinforced concrete sections. A maximum of 20 sections may be used in the workbook.
The analysis is performed in two steps:
step1: Use **set_r_sect** or **set_t_sect** function to set up rectangular or T-section, respectively.
step2: Use **rc_ult** and **rc_strs** functions to obtain Strength and Working Stress analysis results.
Each section is referred to by the unique index (idx) which is set in step 1. The index (idx) in the **rc_ult** and **rc_strs** functions must be a reference to a cell containing **set_r_sect** or **set_t_sect** (e.g. b12).

set_r_sect(*idx, WW, WH, Fy, F'c, n, As1, As2, As3, As4, d1, d2, d3, d4*) *sets up rectangular section and returns an index = idx*

set_t_sect(*idx, FW, FH, WW, WH, Fy, F'c, n, As1, As2, As3, As4, d1, d2, d3, d4*) *sets up T-section and returns an index = idx*

idx.....	integer from 1 to 20
FW, FH, WW, WH.....	section dimensions in inches
Fy.....	reinforcing steel yield strength in ksi
F'c.....	concrete strength in ksi
n.....	=Es/Ec
As1, As2, As3, As4.....	reinforcement area in in^2
d1, d2, d3, d4.....	reinforcement location dim's in inches



set_r_sect can be entered via a custom form - press **ALT+F8** and follow the instructions

set_t_sect can be entered via a custom form - press **ALT+F9** and follow the instructions

Note: Function key assignments may be changed in the License worksheet.

Notes:
1. *As2, As3 and As4* reinforcement (and associated d-dimensions) are optional, except *As4 is* required for sections in full tension.
2. *Fy* and *F'c* are required for strength analysis.
3. n is required for working stress analysis.
4. Use "0" in place of input parameter that isn't used (optional input field can be left blank in the custom form).

rc_ult(*idx, Pu, ϕ, output_code*) *returns the strength analysis parameter specified by the output_code*

idx..... section No. - must be a reference to a cell containing **set_r_sect** or **set_t_sect** (e.g. b12).

Pu..... factored axial load in kips (+ compression; - tension)

ϕ..... resistance (strength reduction) factor

output_code..... single code enclosed in quotations marks that specify returned parameter

Output Codes	Returned Parameters
"mcap"	moment resistance (capacity) in k-ft
"c"	distance to the neutral axis from the section top in inches
"strain1"	reinforcement *As1* strain
"cg"	distance to the section center gravity from the bottom in inches

rc_ult can be entered via a custom form - press **ALT+F10** and follow the instructions

Note: Function key assignment may be changed in the License worksheet.

rc_strs(*idx, P, M, output_code*) *returns working stress analysis parameter specified by the output_code*

idx..... section No. (must be a reference to a cell containing **set_r_sect** or **set_t_sect** (e.g. b12)).

P..... service axial load in kips (+ compression; - tension)

M..... service moment in k-ft (moment causes tension at the section bottom; moment sign is ignored)

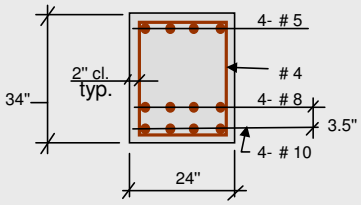
output_code..... single code enclosed in quotations marks that specify returned parameter

Output Codes	Returned Parameters
"c"	distance to the neutral axis from the section top in inches
"fs1"	stress in *As1* in ksi (+ compression; - tension)
"fs2"	stress in *As2* in ksi (+ compression; - tension)
"fs3"	stress in *As3* in ksi (+ compression; - tension)
"fs4"	stress in *As4* in ksi (+ compression; - tension)
"fc"	compressive stress in the concrete at the section top in ksi
"fc2"	compressive stress in the concrete at the section bottom in ksi (applicable for sections in full compression)
"cg"	distance to the section center gravity from the bottom in inches

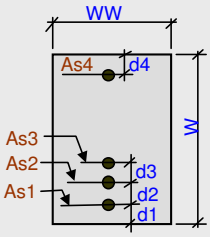
rc_strs can be entered via a custom form - press **ALT+F10** and follow the instructions

Note: Function key assignment may be changed in the License worksheet.

Examples:



F'c =	3	ksi
Fy =	60	ksi
Mu =	345	k-ft (strength)
Ms =	214	k-ft (service)



As1 =	5.08	in^2	=0*b_area(0)
As2 =	3.16	in^2	=0*b_area(0)
As4 =	1.24	in^2	=0*b_area(0)
d1 =	3.125	in	=0+b_dia(0)+b_dia(0/2)
d2 =	6.625	in	=0+0
d4 =	2.8125	in	=0+b_dia(0)+b_dia(0)/2

Consider two cases:
Case 1: include compression bars (As4)
Case 2: ignore compression bars (As4)

Set up data for two cases:

Case 1 =set_r_sect(1,B341,C341,D341,E341,F341,G341,A343,B343,C343,D343,E343,F343,G343)

Sect. No.	WW (in)	WH (in)	Fy (ksi)	F'c (ksi)	n = Es/Ec	As1 (in^2)
1	24	34	60	3	8	5.08
As2 (in^2)	As3 (in^2)	As4 (in^2)	d1 (in)	d2 (in)	d3 (in)	d4 (in)
3.16	0	1.24	3.125	6.625	0	2.8125

Case 2 =set_r_sect(2,B347,C347,D347,E347,F347,G347,A349,B349,C349,D349,E349,F349,G349)

Sect. No.	WW (in)	WH (in)	Fy (ksi)	F'c (ksi)	n = Es/Ec	As1 (in^2)
2	24	34	60	3	8	5.08
As2 (in^2)	As3 (in^2)	As4 (in^2)	d1 (in)	d2 (in)	d3 (in)	d4 (in)
3.16	0	0	3.125	6.625	0	0

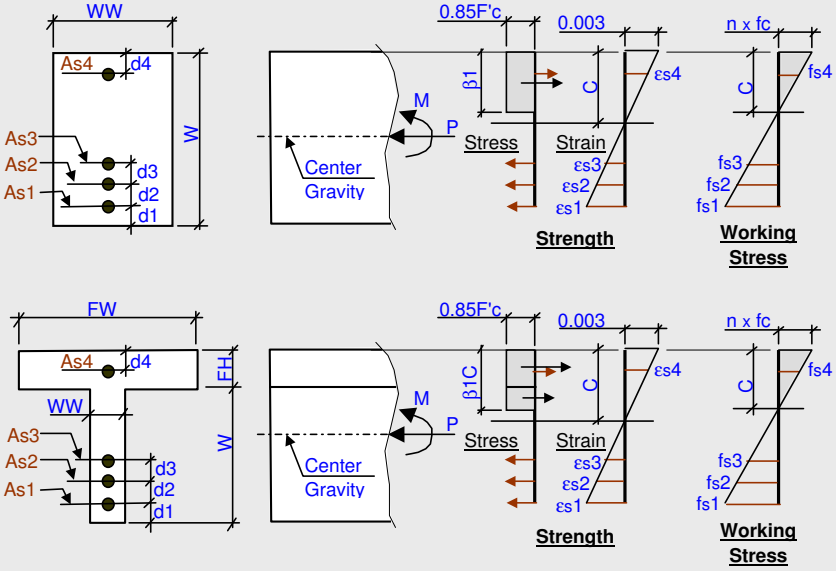
Strength

ϕ =	0.9		
Case 1 Mcap =	925.7	k-ft	=rc_ult(A341,0,C352,"mcap")
Case 2 Mcap =	900.9	k-ft	=rc_ult(A347,,C352,"mcap")
Case 1 As1 strain =	-0.0084		=rc_ult(A341,0,C352,"strain1")
Case 2 As1 strain =	-0.0067		=rc_ult(A347,0,C352,"strain1")

Stress

Case 1 fs1 =	-13.82	ksi	=rc_strs(A341,,F320,"fs1")
Case 1 fs4 =	4.58	ksi	=rc_strs(A341,,F320,"fs4")
Case 2 fs1 =	-13.89	ksi	=rc_strs(A347,0,F320,"fs1")

Reinforced Concrete Section Analysis - Technical Reference



- Strength analysis is based on an equilibrium and stress/strain compatibility as outlined in the ACI and AASHTO Codes.
- The tensile strength of the concrete is neglected.
- In strength analysis stress in reinforcement = 29000εs ≤ Fy.
- β1 = 0.85; F'c ≤ 4.0 ks;
  β1 = 0.85 - 0.05(F'c-4) ≥ 0.65; F'c > 4.0 ksi

Tension Axial Load (Pu < 0) Note:
To determine moment resistance (Mr), the spreadsheet uses formula: Mr = Mo(1-Pu/Po) for cases where a center of gravity of the reinforcement is not coincidental with the center of gravity of the concrete section.
Mo – moment resistance corresponding to Pu=0
Po - axial tensile resistance corresponding to Mu=0 (Po is based on a portion of the specified reinforcement that has the same center of gravity as the concrete section)

Vertical Curve Functions

Included in: Bridge spreadsheet

These functions return elevations, slopes, and locations of low and high points along a VC or PG. There are two groups of functions: 1) **VC-functions** that operate on individual vertical curves and 2) **PG-functions** operating on the PG that is comprised of a series of vertical curves.

VC-functions

Maximum of twenty v. curves may be specified in the workbook. Each VC must be initialized with the **vc_set** function. Following initialization, each VC is referred to in the VC functions by the index (idx) that is set by the **vc_set function**. The index (*idx*) must be a reference to a cell containing the **vc_set** function (e.g. b12) with the exception of the **vc_set** function. The location on the VC is specified by the *sta* or *lt_sta* & *rt_sta.* The tangent extension is used If any station falls outside of the VC.

vc_set(*pvi_sta, pvi_el, lvc, g1, g2, idx***)** *initializes the VC and returns index = idx*

pvi_sta..... PVI station
pvi_el..... PVI elevation
lvc..... VC length in feet
g1, g2..... slopes in % (use g1=g2 to specify tangent)
idx..... integer from 1 to 20, unique for each VC

vc_set can be entered via a custom form - press **ALT+F7** and follow the instructions

Note: Function key assignment may be changed in the License worksheet.

Elev(*sta, idx***)** *calculates elevation @ sta on PG having index = idx*

vc_slope(*sta, idx***)** *calculates slope in ft/ft @ sta on PG having index = idx*

vc_high_pt(*lt_sta, rt_sta, idx***)** *returns a station of the highest elevation within VC segment bounded by lt_sta and rt_sta.* VC index = *idx*

vc_low_pt(*lt_sta, rt_sta, idx***)** *returns a station of the lowest elevation within VC segment bounded by lt_sta and rt_sta.* VC index = *idx*

PG-functions

Vertical curves that comprise PG must be set with **vc_set** prior to using these functions. Comprising vertical curves must be consecutive and indexed in ascending order from left to right in increments of 1 (e.g. 2, 3, 4). A maximum of five PGs with maximum of ten VCs per each can be defined in the workbook (the total number of all VCs should not exceed 20).
PG is defined with the **pg_set** function. Following the definition, each PG is referred to in the PG functions by the unique number set by the **pg_set**. The number (*pg_no*) must be a reference to a cell containing **pg_set** (e.g. b12) in all functions except the **pg_set**. The location on the PG is specified by the *sta* or *lt_sta* & *rt_sta*. The tangent extension is used If any station falls outside of the defined PG.

pg_set(*pg_no, idx1, idx2***)** *defines PG and returns text: "pg_no (vc idx1 to vc idx2)"*

pg_no..... integer from 1 to 5, unique for each PG
idx1, idx2..... indexes of the beginning and ending VCs comprising PG. Must be a references to the cells containing the corresponding **vc_set** (e.g. c11). Number or VCs shouldn't exceed 10.

pg_elev(*sta, pg_no***)** *calculates elevation @ sta on PG having No.= pg_no*

pg_slope(*sta, pg_no***)** *calculates slope in ft/ft @ sta on PG having No.= pg_no*

pg_high_pt(*lt_sta, rt_sta, pg_no***)** *returns a station of the highest elevation within PG segment bounded by lt_sta and rt_sta. PG No. = pg_no*

pg_low_pt(*lt_sta, rt_sta, pg_no***)** *returns a station of the lowest elevation within PG segment bounded by lt_sta and rt_sta. PG No.= pg_no*

	A	B	C	D	E	F	G	H	I
452	*Vertical Curve Examples*								
453									
454		PVI Sta	PVI El	VCL	G1(%)	G2(%)			
455	1	800.00	350.00	200.00	2.00	-3.00			
456	2	3100.00	281.00	600.00	-3.00	-1.00			
457	3	7500.00	237.00	1000.00	-1.00	2.5			
458		=vc_set(B455,C455,D455,E455,F455,1)							
459		=vc_set(B456,C456,D456,E456,F456,2)							
460		=vc_set(B457,C457,D457,E457,F457,3)							
461									
462	Define PG No:		1 (vc1 to vc3)		=pg_set(1,A455,A457)				
463									
464	Sta	Elev	**VC-**functions		Elev	**PG-**functions			
465	500.00	344.00	=Elev(A465,A455)		344.00	=pg_elev(A465,C462)			
466	850.00	348.19	=Elev(A466,A455)		348.19	=pg_elev(A466,C462)			
467	2950.00	285.88	=Elev(A467,A456)		285.88	=pg_elev(A467,C462)			
468	7500.00	241.38	=Elev(A468,A457)		241.38	=pg_elev(A468,C462)			
469	8000.00	249.50	=Elev(A469,A457)		249.50	=pg_elev(A469,C462)			
470									
471	Sta	Slope			Slope				
472	500.00	0.0200	=vc_slope(A472,A455)		0.0200	=pg_slope(A472,C462)			
473	850.00	-0.0175	=vc_slope(A473,A455)		-0.0175	=pg_slope(A473,C462)			
474	2950.00	-0.0250	=vc_slope(A474,A456)		-0.0250	=pg_slope(A474,C462)			
475	7500.00	0.0075	=vc_slope(A475,A457)		0.0075	=pg_slope(A475,C462)			
476	8000.00	0.0250	=vc_slope(A476,A457)		0.0250	=pg_slope(A476,C462)			
477									
478	Lt_sta	Rt_sta							
479	500.00	4000.00			**VC-**functions				
480	Hi pt between Lt_sta & Rt_sta is @			sta 7+80.00	=vc_high_pt(A479,B479,A455)				
481	Hi pt Elev =			348.80	=Elev(D480,A455)				
482									
483	Low pt El between Rt_sta & Lt_sta =			272.00	=Elev(D484,A456)				
484			@ sta =	sta 40+00.00	=vc_low_pt(A479,B479,A456)				
485									
486					**PG-**functions				
487	Hi pt between Lt_sta and Rt_sta is @			sta 7+80.00	=pg_high_pt(A479,B479,C462)				
488	Hi pt Elev =			348.80	=pg_elev(D487,C462)				
489									
490	Low pt El between Rt_sta & Lt_sta =			272.00	=pg_elev(pg_low_pt(A479,B479,C462),C462)				
491			@ sta =	sta 40+00.00	=pg_low_pt(A479,B479,C462)				
492									
493									

Form Input - Keyboard Shortcuts

Note: Function key assignments may be changed in the License worksheet.

Set Vertical Curve (assemble vc_set function)

1. Fill in Data | OK | Clear Data | Include Headings

VC No.	PVI STA.	PVI EL.	VCL	G1 %	G2 %
2	3100	281.00	600.00	-3.00	-1.00

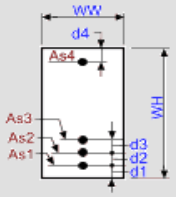
2. Select first cell of destination range (range will be highlighted) | Cancel | OK

Alt + F7

Reinforced Concrete Rectangular Section (assemble set_r_sect function)

1. Enter input values or cell references containing input values. (Cell reference can be entered by clicking the cell) | OK | Clear Data

Sect. No.			WW (in)	WH (in)	Fy (ksi)	F'c (ksi)	n = Es/Ec
As1 (in^2)	As2 (in^2)	As3 (in^2)	As4 (in^2)	d1 (in)	d2 (in)	d3 (in)	d4 (in)



2. Select first cell of destination range (range will be highlighted) | Cancel | OK

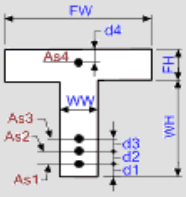
- As2, As3 and As4 reinforcement (and associated d-dimensions) are optional, except As4 is required for sections in full tension;
- Fy and F'c are required for strength analysis;
- n is required for working stress analysis;

Alt + F8

Reinforced Concrete T-section (assemble set_t_sect function)

1. Enter input values or cell references containing input values. (Cell reference can be entered by clicking the cell) | OK | Clear Data

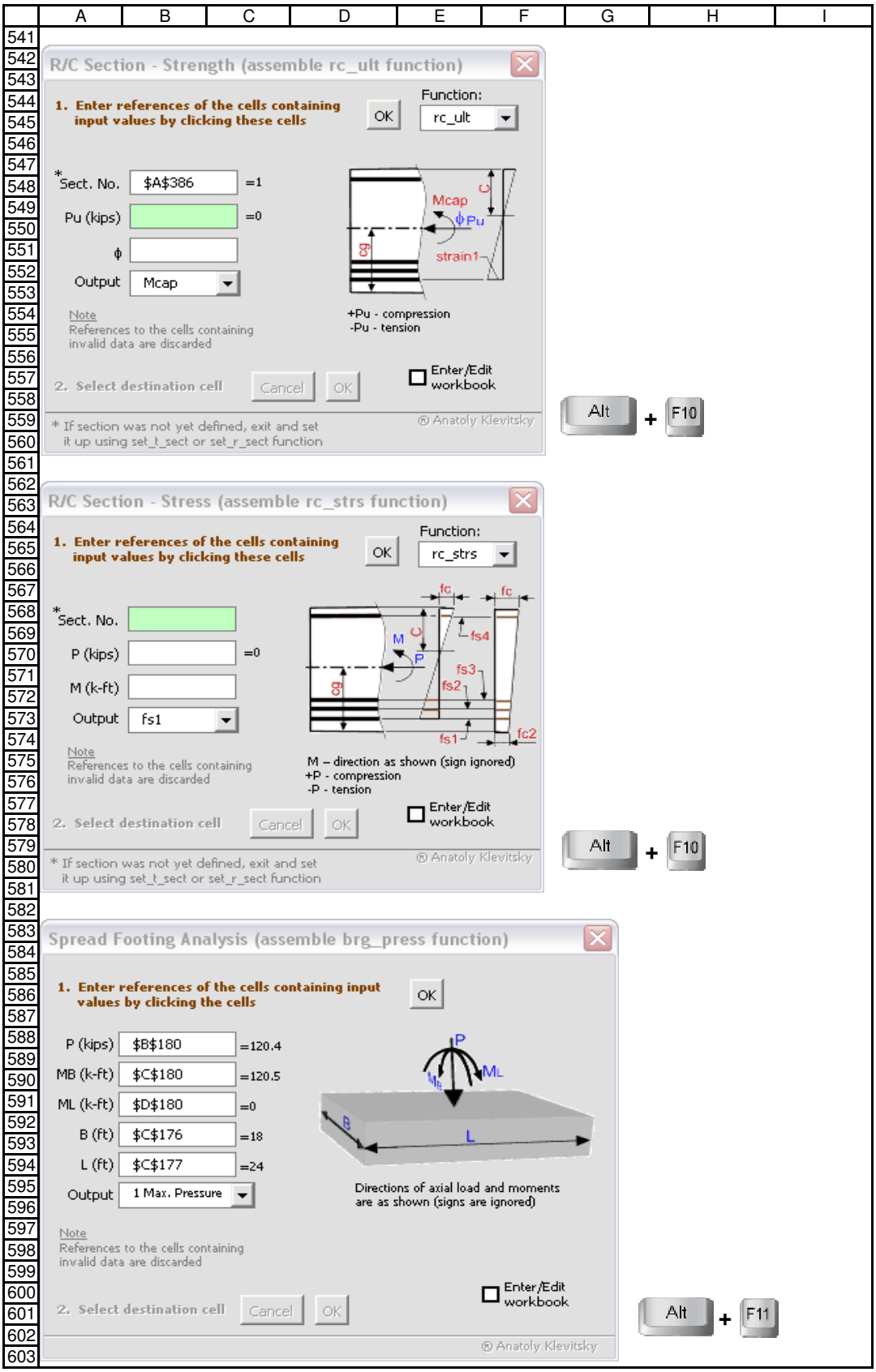
Sect. No.	FW (in)	FH (in)	WW (in)	WH (in)	Fy (ksi)	F'c (ksi)	n = Es/Ec
1							
As1 (in^2)	As2 (in^2)	As3 (in^2)	As4 (in^2)	d1 (in)	d2 (in)	d3 (in)	d4 (in)



2. Select first cell of destination range (range will be highlighted) | Cancel | OK

- As2, As3 and As4 reinforcement (and associated d-dimensions) are optional, except As4 is required for sections in full tension;
- Fy and F'c are required for strength analysis;
- n is required for working stress analysis;

Alt + F9


R/C Section - Strength (assemble rc_ult function)
1. Enter references of the cells containing input values by clicking these cells
OK
Function:
rc_ult
*Sect. No.
A386
=1
Pu (kips)
=0
ϕ
Output
Mcap
Note
References to the cells containing invalid data are discarded
Mcap
ϕPu
strain1
+Pu - compression
-Pu - tension
2. Select destination cell
Cancel
OK
Enter/Edit workbook
* If section was not yet defined, exit and set it up using set_t_sect or set_r_sect function
® Anatoly Klevitsky
Alt + F10
R/C Section - Stress (assemble rc_strs function)
1. Enter references of the cells containing input values by clicking these cells
OK
Function:
rc_strs
*Sect. No.
P (kips)
=0
M (k-ft)
Output
fs1
Note
References to the cells containing invalid data are discarded
fc
fs4
fs3
fs2
fs1
fc2
M
P
M – direction as shown (sign ignored)
+P - compression
-P - tension
2. Select destination cell
Cancel
OK
Enter/Edit workbook
* If section was not yet defined, exit and set it up using set_t_sect or set_r_sect function
® Anatoly Klevitsky
Alt + F10
Spread Footing Analysis (assemble brg_press function)
1. Enter references of the cells containing input values by clicking the cells
OK
P (kips)
B180
=120.4
MB (k-ft)
C180
=120.5
ML (k-ft)
D180
=0
B (ft)
C176
=18
L (ft)
C177
=24
Output
1 Max. Pressure
Note
References to the cells containing invalid data are discarded
P
ML
MB
B
L
Directions of axial load and moments are as shown (signs are ignored)
2. Select destination cell
Cancel
OK
Enter/Edit workbook
® Anatoly Klevitsky
Alt + F11