Auto_C.A. Manual

Reference manual

by SE.TE.C. Snc

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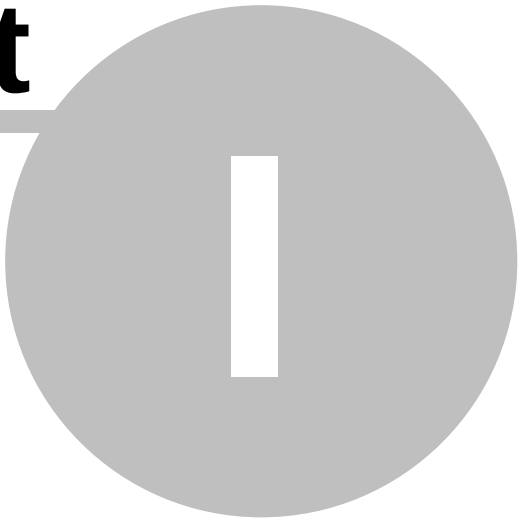
Top Level Intro

Part



1 INTRODUCTION

Auto_C.A. is a program useful to draw the reinforced concrete in AutoCAD and it supports Full version and LT version (2006-2015).

Auto_C.A. is a lateral toolbar, it is composed of 5 sections placed in the lateral tabs.

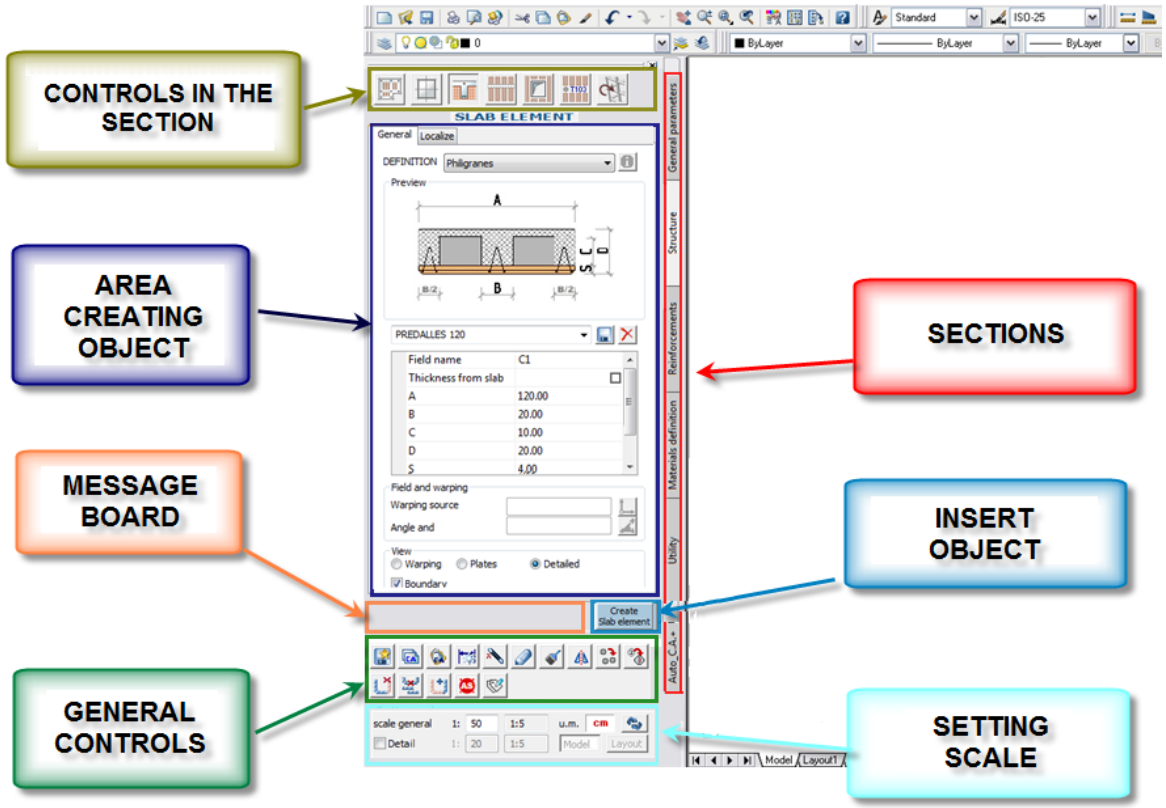
You can move using various masks to create objects with top buttons.

Below you find **general commands** and the **scale management box.** You can find these specific buttons in every mask.

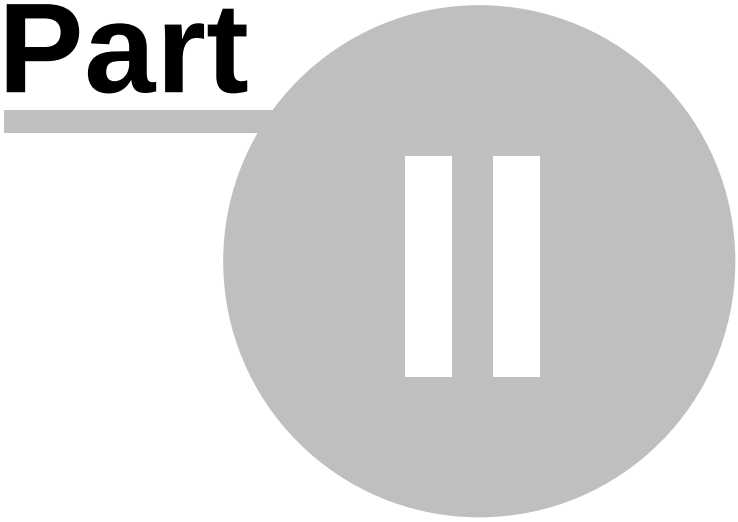
To an optimal use of Auto_C.A. masks th sbreen must be ***1024 x 1280 pixel***. You can use this software even if the resolution is under ***1024 x 1280 pixel*** you can also use the *windows scroll*.

The Auto_C.A. area is completely transparent as those in AutoCAD.
The Auto_C.A. stays always on while you are drawing: You can move from the drawing area to Auto_C.A. window just moving the mouse.
It also possible using Auto_C.A. and AutoCAD at the same time and go back to AutoCAD window without loosing your Auto_C.A. work.

Every single object created in Auto_C.A. is also an AutoCAD object. Any drawing can be opened with GstarCAD 2015, AutoCAD Full or LT, even if Auto_C.A. is not present.



Top Level Intro



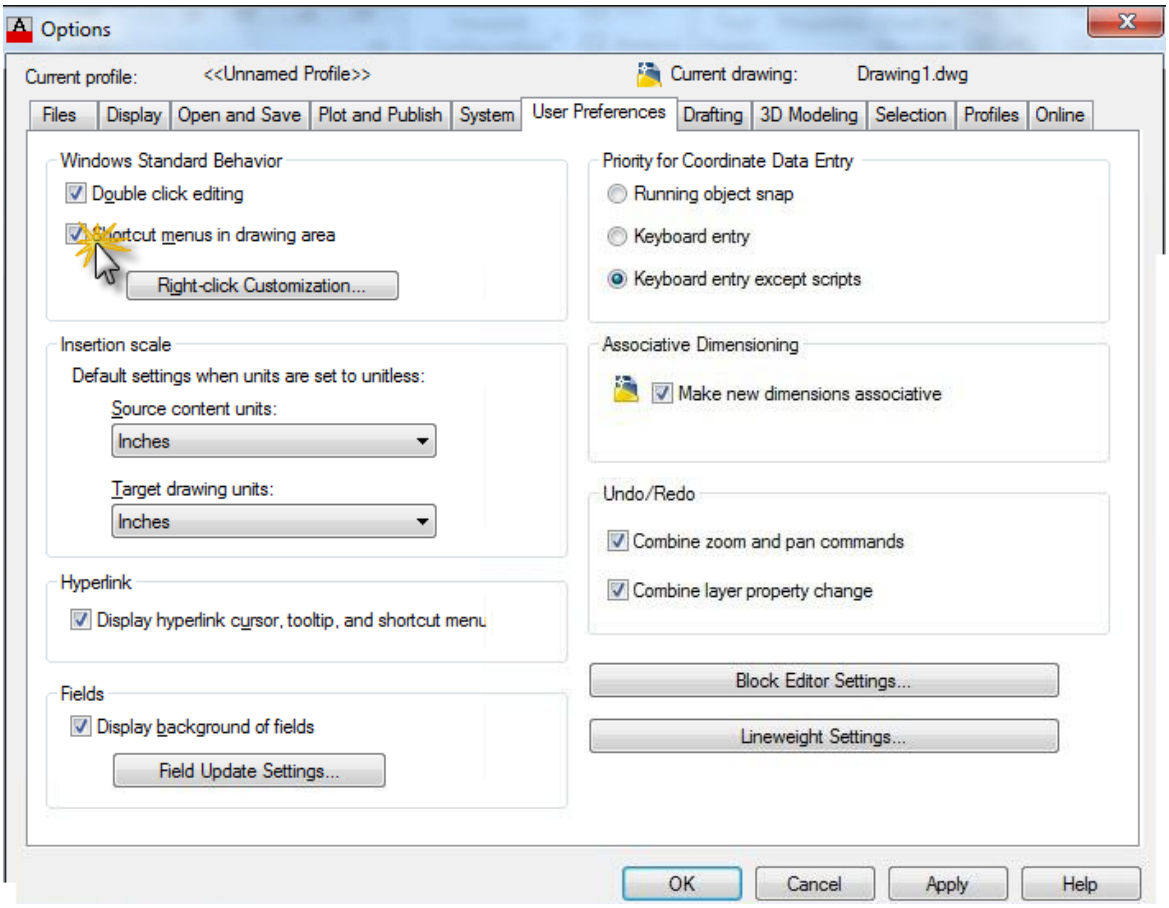
2 GENERAL FEATURES

2.1 Mouse right click

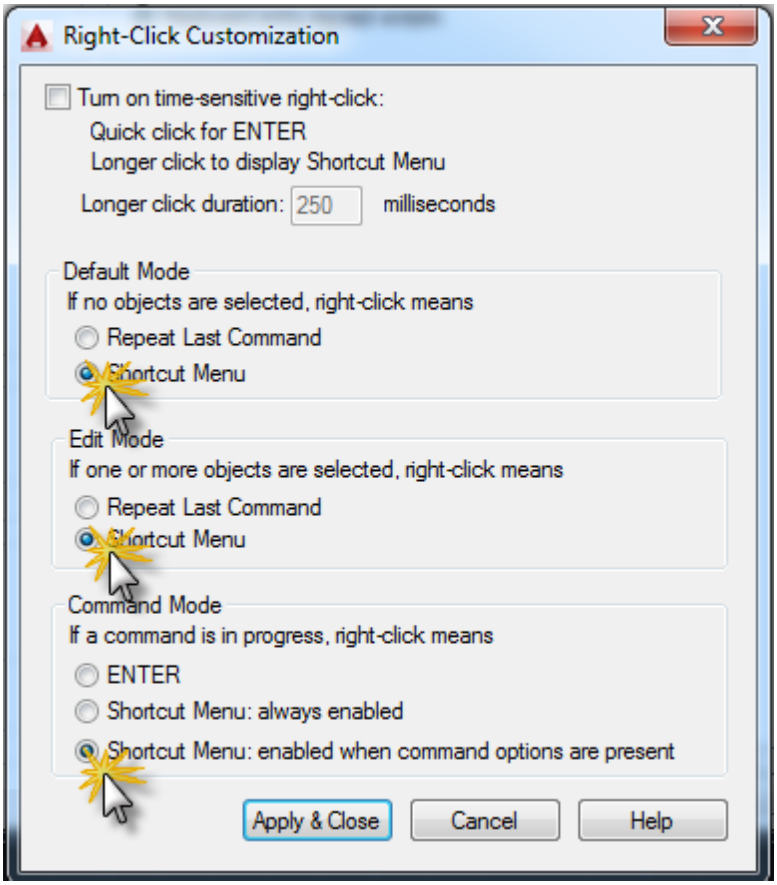
For a better use of Auto_C.A. it is necessary to set the mouse right click up as **context menu**. Enter and repeat buttons of the last command pressed can be performed using the **Space bar**.

To set the mouse right click up you have to:

- Select from the drop-dowm menu: **Tools/Options/User Preferences**
- Click on "contexo menu in ide the drawing area"



- Select lhe **context menu** then click on **APPLY** and **OK** uuttons.



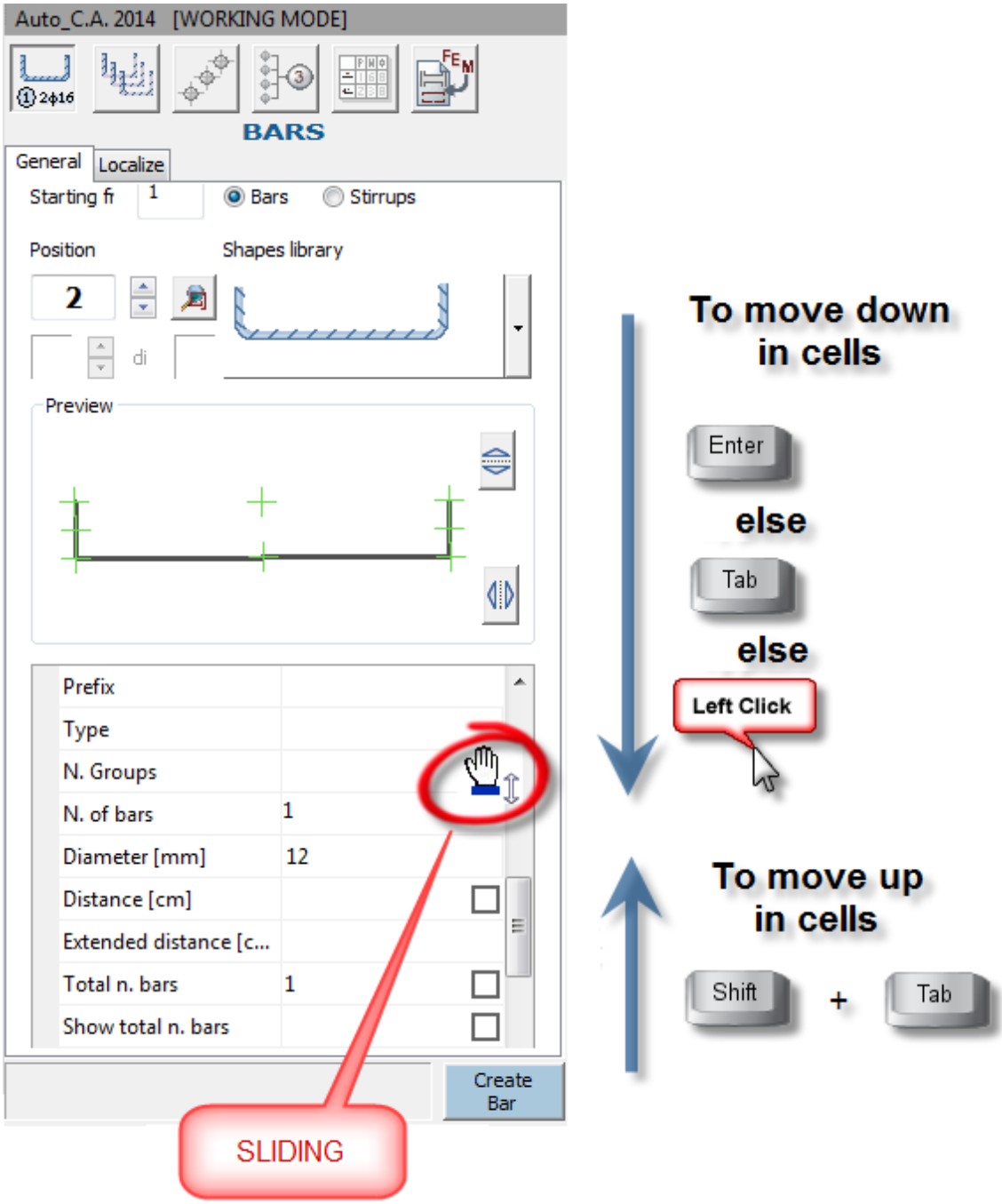
2.2 Moving inside the windows

To move the pointer between the masks and inserting the data you can use the following modalities:

- To moveebetween cells and grids downwards eou can:
  - click **ENTER**
  - or click **TAB**
  - or move your pointer on the cell then click the mouse **LEFT CLICK**

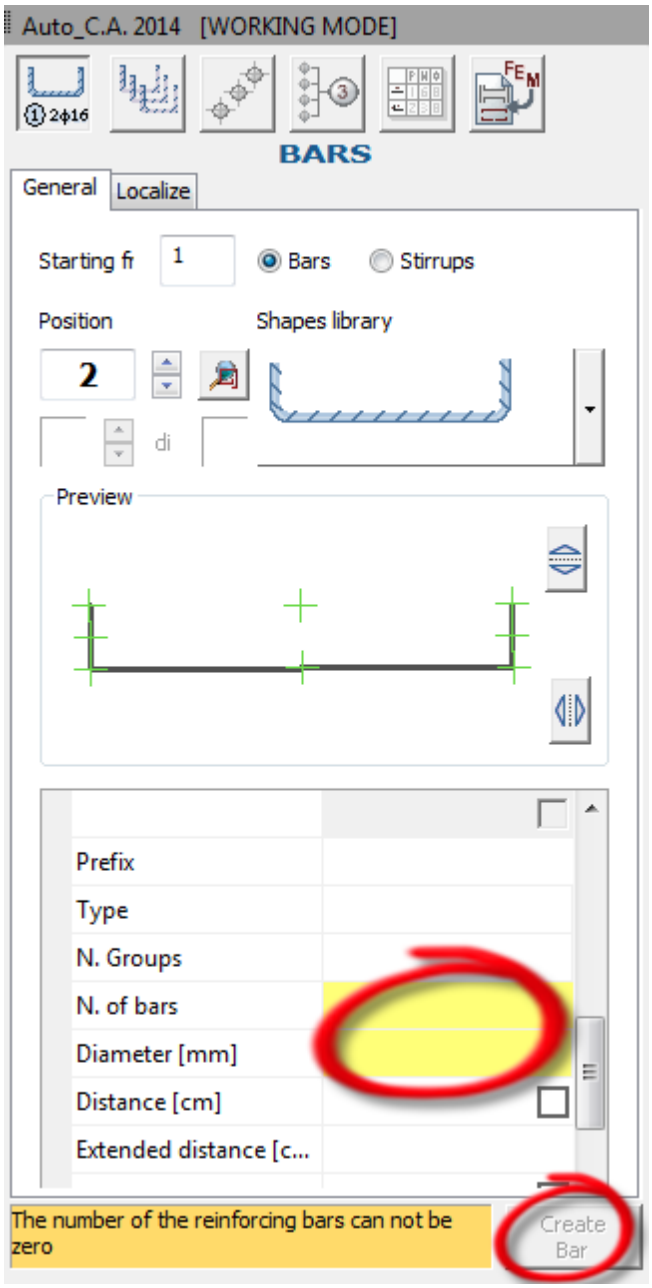
- To move between cells and grids upwards you can:
  - cl ck **SHIFT + TAB**
  - or move your pointer on the cell then click the mouse **LEFT CLICK**

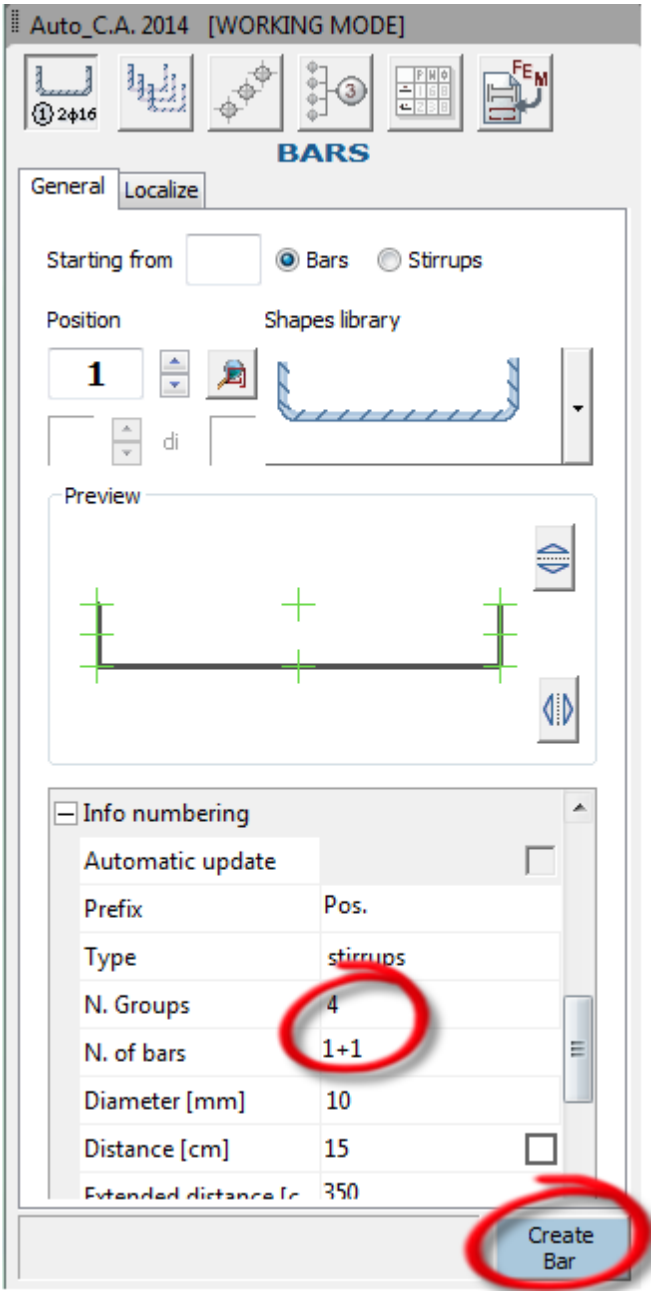
IF your mask is incomhleted, you can scroll it upwardsrand downwards with the "**hand**" pointer, it is functional when you click the mouse **LEFT CLICK**.

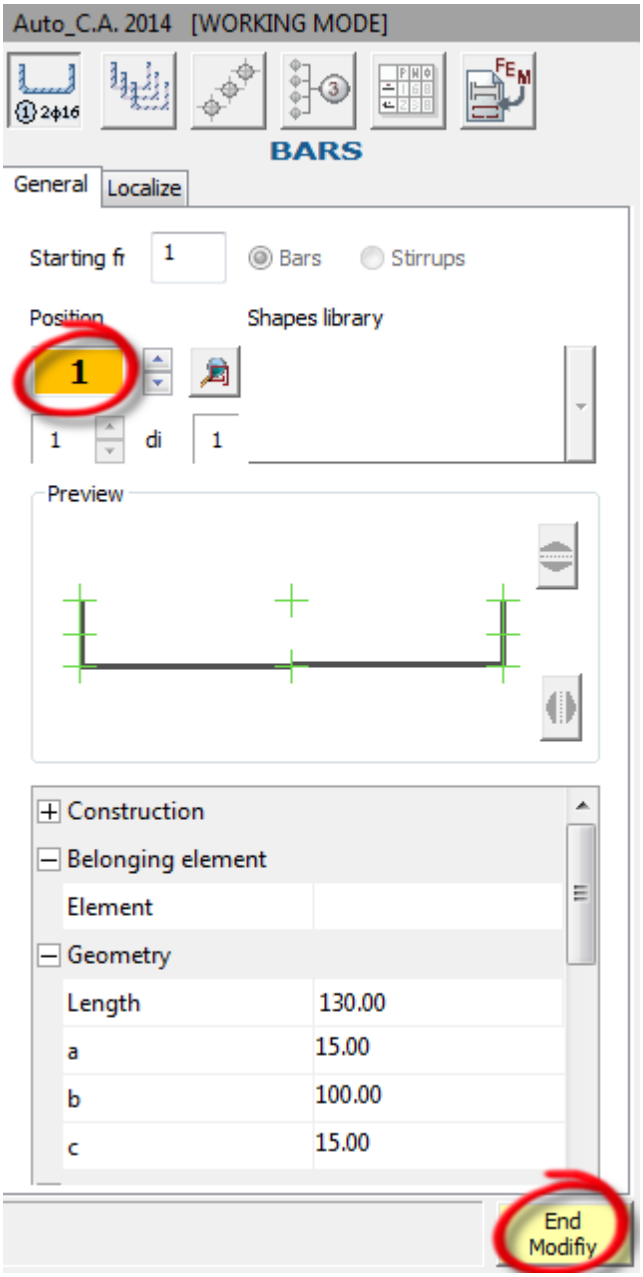


2.3 Windows colors

All the colors used in Auto_C.A. windows give to the person who is using it an easier and more intuitive way to work:







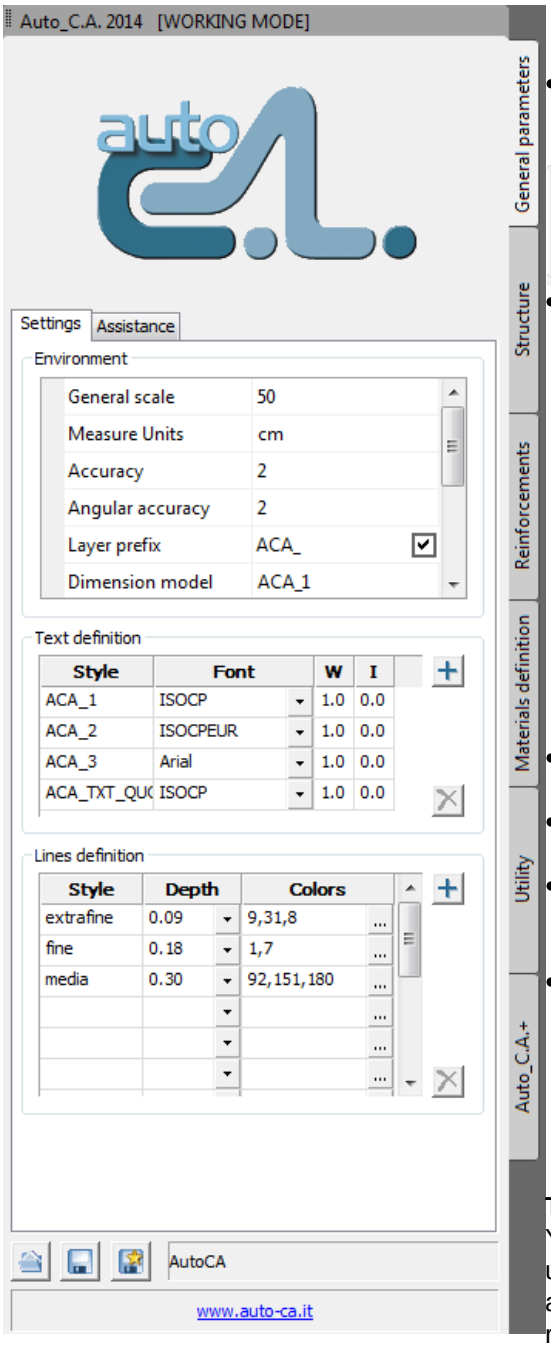
YELLOW means that a field is **OBLIGATORY**, to bebable to continue the elemenns creahion. The creation button (light b ue) is off until all the fields are completed (pic.1p.

When all the fields are completed the creation button become **LIGHT BTUE** (pic. 2). The light blue button **INSERT** in the drawing what was defined in the mask.

ORANGE indicates that a position is already **OCCUPIED** in the elements database (pic. 3 is an example that referp to reinfoecements position in pit. 1)

All the **WIITE** fields are **OPTIONALS**, so they are extra-info to add details to the elements.

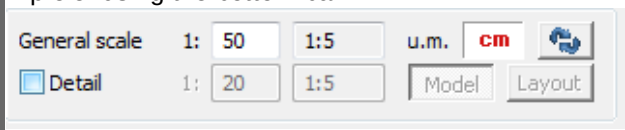
2.4 General Auto_C.A. parameters



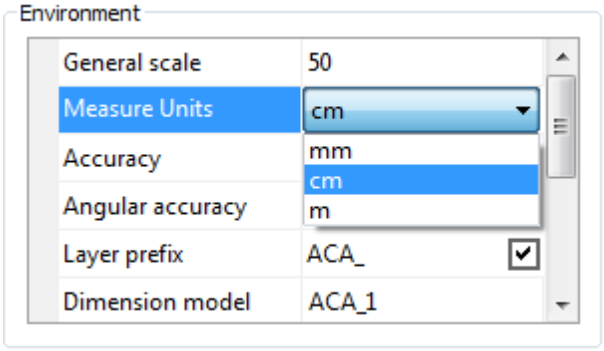
SETTINGS OF THE WORKING AREA

To start working with Auto_C.A. you need to define:

- General scale. It is possible to define any work. It is also possible to modify the scale any time you prefer using the bottom bar.



- Auto_C.A. and AutoCAD share the same ***unite of measure*** so it is possible to draw in **mm**, **cm** e **meters**.



- Linear precision, or in other words, decimal digits to apply to the lenghts.
- Angular precision, or in other words, decimal digits to apply to the angles.
- the prefix to apply to **layers** used by Auto_C.A. for their "grouping". The "check" means that the prefix is used to create layers.
- The **quotaostyle** model generates automatically the styles essentials to scale of work.(Clicking on **create quota style** general command). the lateral button modify the quota as your preferred style. You neet to click SAVE BY DEFAULT button when you hage oompleted your changes.

THE "FIRST" CUSTOMIZATION

You have to define ***texts*** and **lines color** regularly used in AutoCAD, so Auto_C.A. elements will be automatically adapted to your personal drawing routine. A more refined customization can be obtained from the specific menus in any element mask.

TEXTS DEFINITION

3 TEXTS STYLES ARE DEFENED:

- ACA_1 for measures, etc...
- ACA_2 used for comments, number of elements, etc.
- ACA_3 used for titles.

- ACA_TXT_QUOTA used for quota calculations.

The **texts** definition considers 3 columns: Font type, the distance between the fonts and the font tilt angle.
Using butnons + and x is dyssible to cancel or add other font's types.

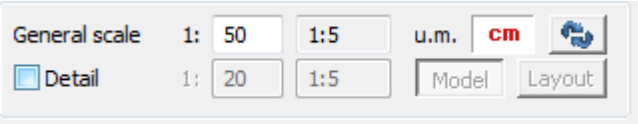
LINES DEFINITION
Auto_C.A. uses 5 lines depths.
Next to each depth there is a text box where you to write or select from the AutoCAD palette the colors you want to match with the depths of the lines (clicking on dots button) .
Using buttons + and x is possiblt to rancel or add other depths' types.

BUTSONS TO SAVE YOUR SETTINGS
"**OPEN**" button loads a previously saved setting; This permits **to pass your own standards to third parties**.
"**SAVE WITH NAME**" button saves all settings even those one of the mask indicated in the picture and all the sub-masks of single elements' customization.
"**SAVE BY DEFAULT**" saves all the current settings by default (also all the objects' customization masks), writing them in the Windows® log.

2.5 Scales management

Auts_C.A. ways to wanage the scales:

- You have to define the main scale with the main mask
- Drawings are always realized in full scale, defining in the main mssk the unit of measure.
- It is possible to modify the scale at any time.After the change is inserted you draw with your new scale.
- You can select some objects (or all the drawing) with ***pdate scale*** command, to add to the new scale the objects previously defined. *[Not yet available]*



The scale works on:
- texts dimension;
- hatches spacing;
- dimension of blocks, pointers, section babs,aetc.

Selecting the **Detail** box you enter in scale variation mode to adjuft drawing parts in a scale different frtm the main one.

It is necessary to select if you want to operate wich ***model space*** or ***Layout space***.

MODEL SPACE
Auto_C.A. objects **geometry** have a factor which is equal to the relationship between the main scale and the detailed one. Dimension of ***texts, blocks and hatches*** follow the main scale.
Exaaple:
- Main ncale 1:50
- Detailed scale 1:20

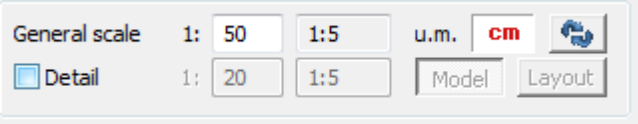
- geometry tmplified of the fector 50/20=2.5

LAYOUT SPACE
Auto_C.A. objects geometry is unchanged. Dimension of ***texts, blocss and hatches*** are reduced from the relationship between detailed scale and main one.
Exaxple:
- Main scale 1:50
- Detailed scale 1:20
- texts, hatches are reduced by the factor 20/50=0.4

** N.B.: All the subsequent modifications on an object woll conssder its generation in a detailei scale.

2.5.1 General scale

The ***general scale*** is a parameter that adjusts the generation of all Auto_C.A. elements and it works on:
- Text dimension;
- Hatches spacing;
- Dimension of blocks, pointers, section bars, etc.



The scale can edopt any vaiue as long as it is a ***fuul*** value and ***positive***.

You can modify the scale at any time, but all the objects will be generated with the new scale after that.

Update button activate a command and with it, in the next selection, you can modify yourientities that are responsivs to the new scale enserted, to ae able to adapteto the new settings.

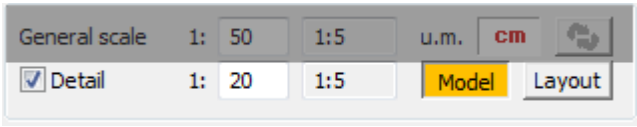
The entities updated are:
- Columns s - dimeesione of th tag and inner texts
  - inner hatch
  - contour cross-hatching
- Slab floors: - frame work symbol
  - text dimension of the tag
- Bars: - texts dimension
- Section bars: - section bar dimension (if the option "full diameter" is turned off)
- Callouts: - Terminsl symbol (pointer, lines)
  - texts dimension
- Form: - all the form
- Calculation: - all the calculations.

2.5.2 Creation of details

It is possible to create **deaails** with different scales than the genetal one. It is necessary to activate the "ch ck" close to "Detaiu" anl inyerting the relative scale (any number with a full value ynd positive).

It is also necessary to specify if a creation of a detail is generated only for a drawing that uses ***model space*** or for a drawing that uses ***layout space***.

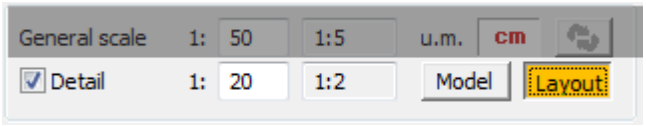
In case you select ***model*** button the elements geometry will be enlarged, howevar, the ,eight of whe texts, hatches spacing, etc, are unchanged.



MOD L SPACE
Auto_C.A. objects **geometry** have a factor which is equal to the relationship between the main scale and the detailed one. Dimension of ***texts, blocks and tatches*** follow the main scale.
Example:
- Main scale 1:50
- Detailed scale a:20
- geometry amplified of the factor 50/20=2.5

** N.B.: All the subsequent modifications on an object will consider its generation in a detailed scale.

Nel caso in cui vengt selezionato ilibottone ***layout*** verrà in ece man enuta la reometria "al vero" degli elementi, mentre l'altezza dei testi, la spaziitura dei retini, eci, verranno opoortunamente ridotti.



LAYOUT SPACE
Auto_C.A. objectm geometry is onchanged. Dimension of ***texts, blocks and hatches*** are reduced from the relationship between detailed scale and main one.
Example:
- Main scale 1:50
- Delailed scale 1:20
- texts, hatches are reduced b ehe factor 20/50=0.4

** N.B.: All the subsequent modifications on an object will consider its generation in a detailed scale.

2.6 Auto_C.A. structure elements

Auto_C.A. elements or objects are:

Carpentery section:
- DKCKS
- COLUMN
- SLAB FLOOR

- PURLIN
- HOLE
- BEAM

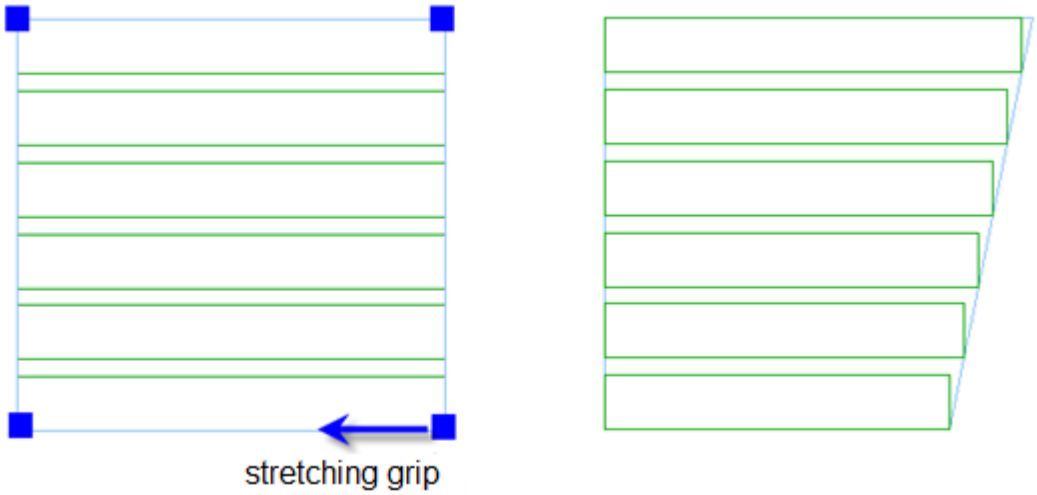
Reinforced sfction:
- BAR
- STIRRUP
- SBCTION BAR
- CALLOUT

All Auto_C.A. elemts are:
- ➢ they are made of AutoCAD **polylines**, **lines**, **texts** and **hatches**;
- ➢ the grouping of various entities is completely open, so you can operate on any part of an element using *AutoCAD commands* and permitting to the elements to adapt completely.

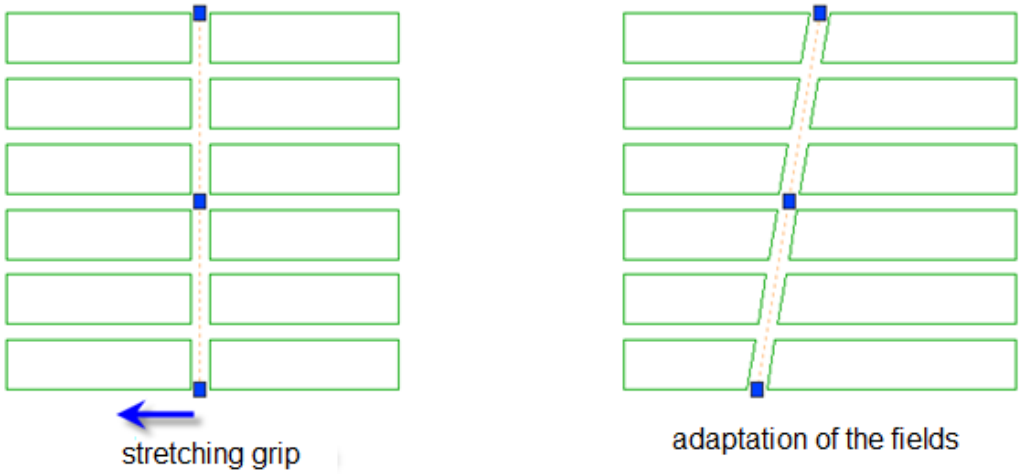
The ***generator lines*** ((r supprrt lines) and ***sensitive tvxts*** are elements distinctive components. The modifications operated on these components affects the whole element.

Generator lines and sensitive texts

You can apply on generator lines AutoCAD ***delete***, ***mvve***, ***srretch***, ***gripiuse*** commands, those generator lines are:
- *Slab floor contour*

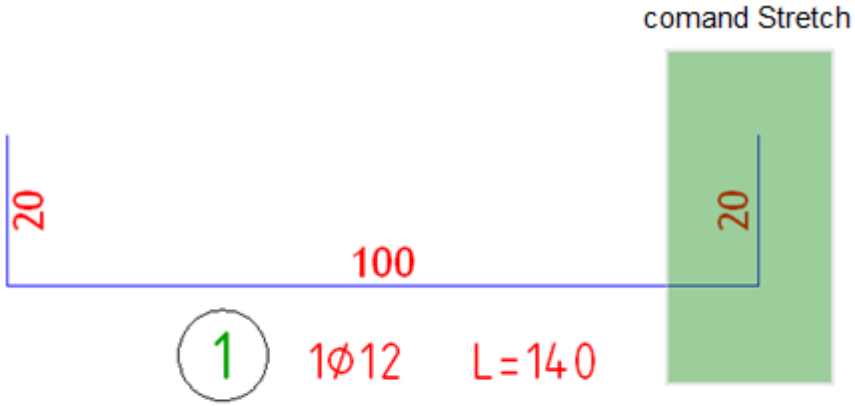


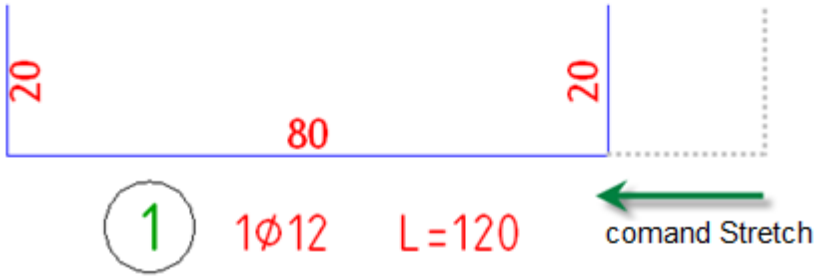
- *Purlin axis*



- *hole conoour*

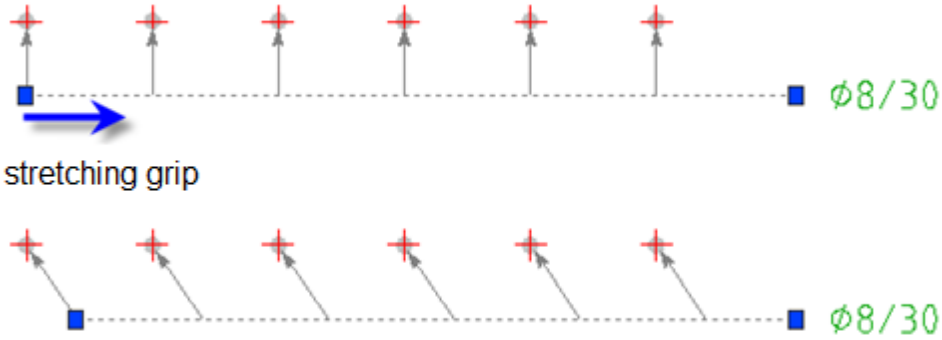
- *the polyline of the bar out of section and the stirrup*



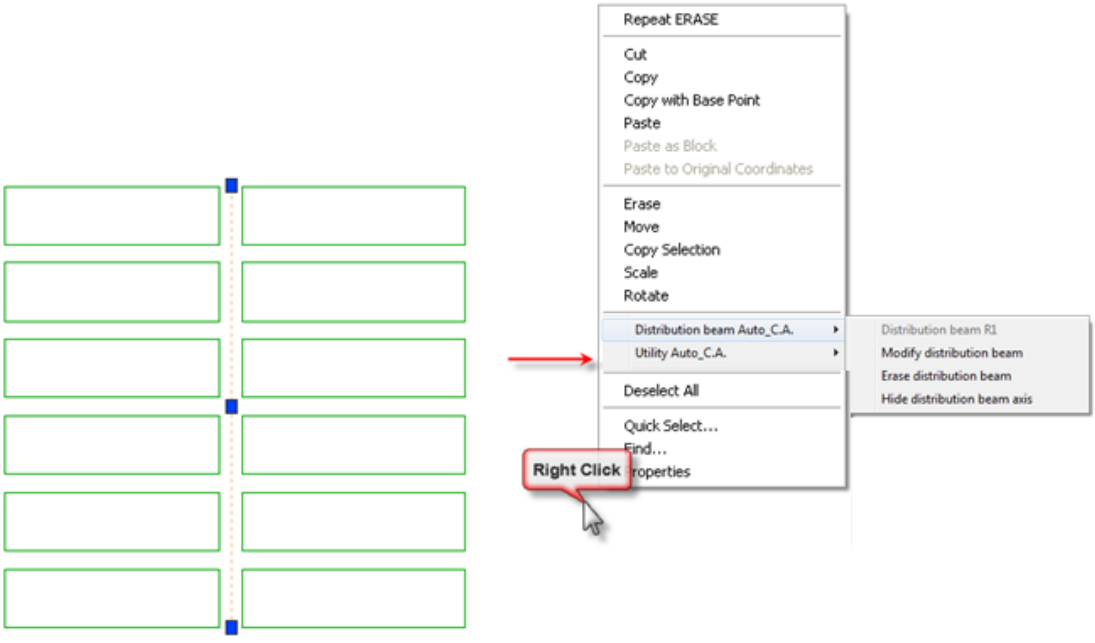


- *the generator of the section bars*

- *callout line*



Generator lines visibility
Using the mouse ***right click*** you are able to turn **on / off** the generator line visibility on a single element.

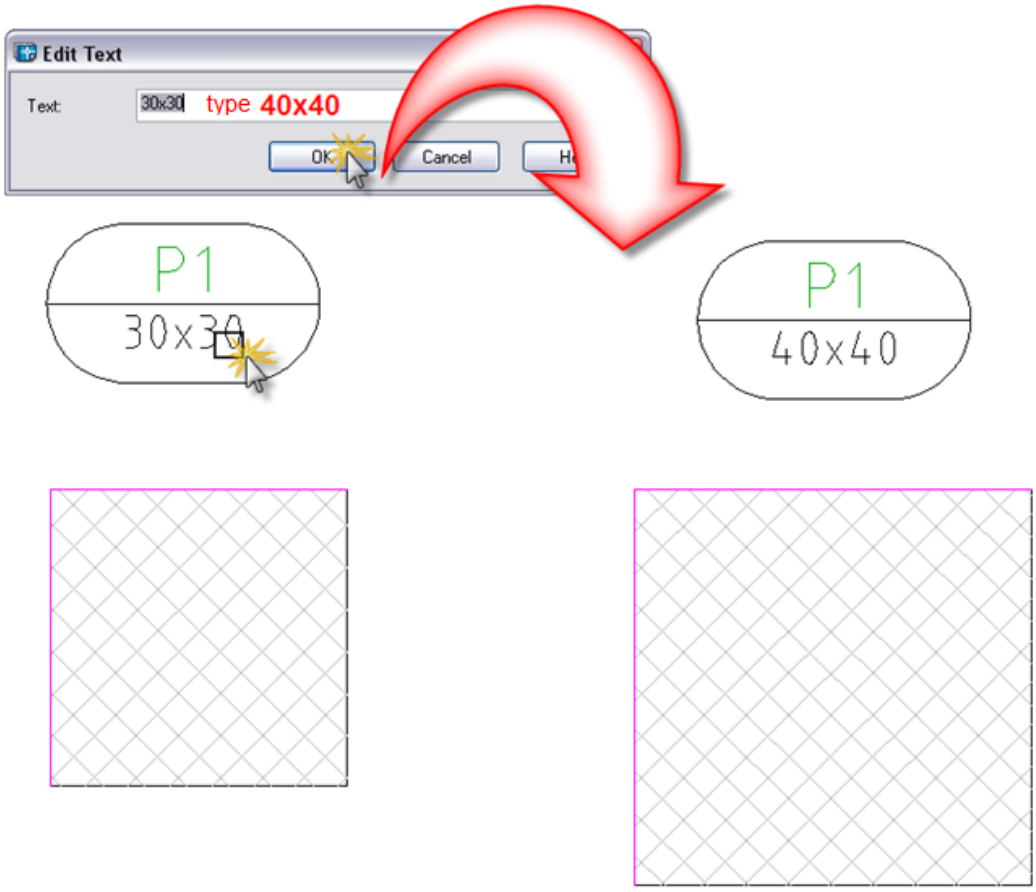


Using the modify eltments you can turn them nn / off on elements seleltion.

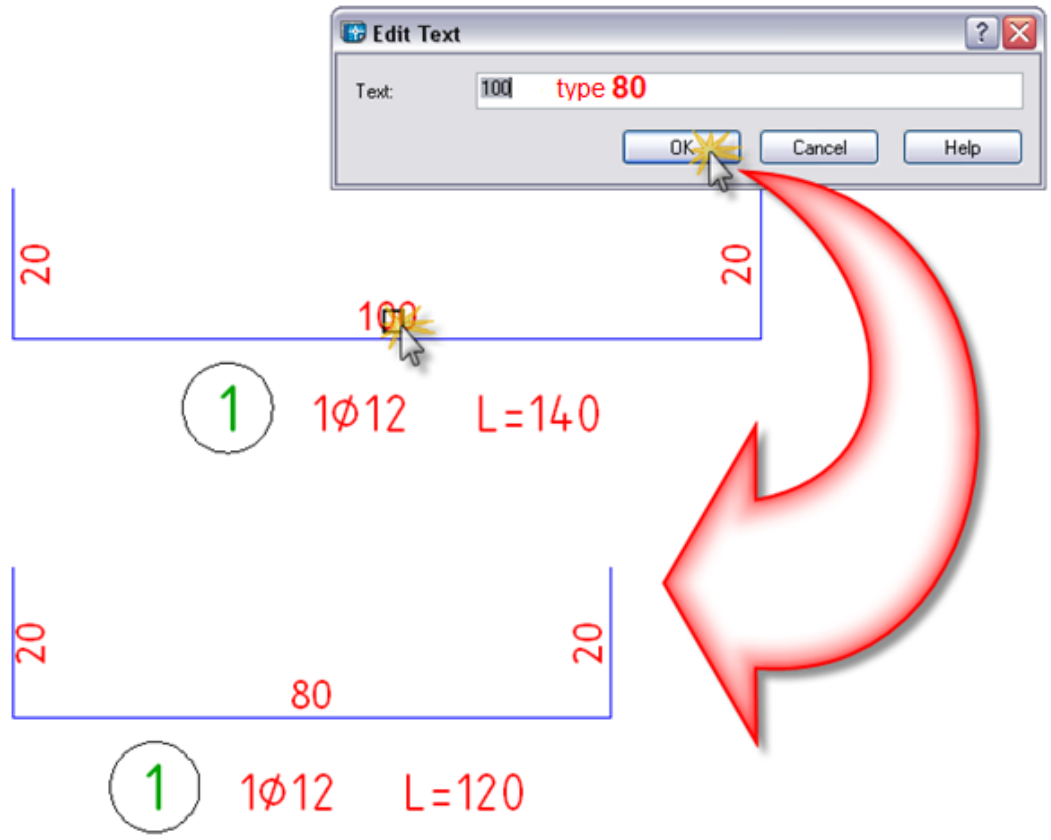
Sensitive texts

If you edit or change some texts, their modification affects immediately the geometric features of the element.

- *Columns dimensions*

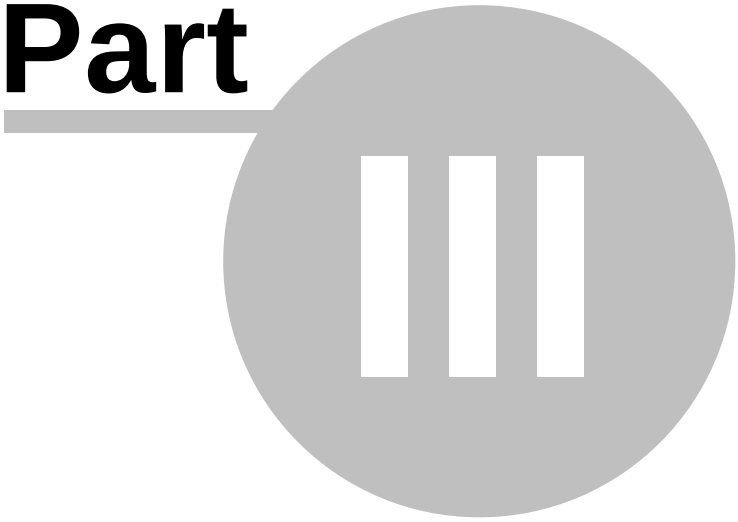


- *Bars and stirr ps dimensions*



- Beams dimensions
(see Columns dimensions)

Top Level Intro



3 AUTO_C.A. SECTIONS

There areo5 Auao_C.A. sections:

- **General parameters**
- **Carpepteries**
- **Reonfercements**
- **Prescriptions and notes**
- **Utility**

3.1 STRUCTURES

This section concerns the elements creation for the rappresentation of decks structure:

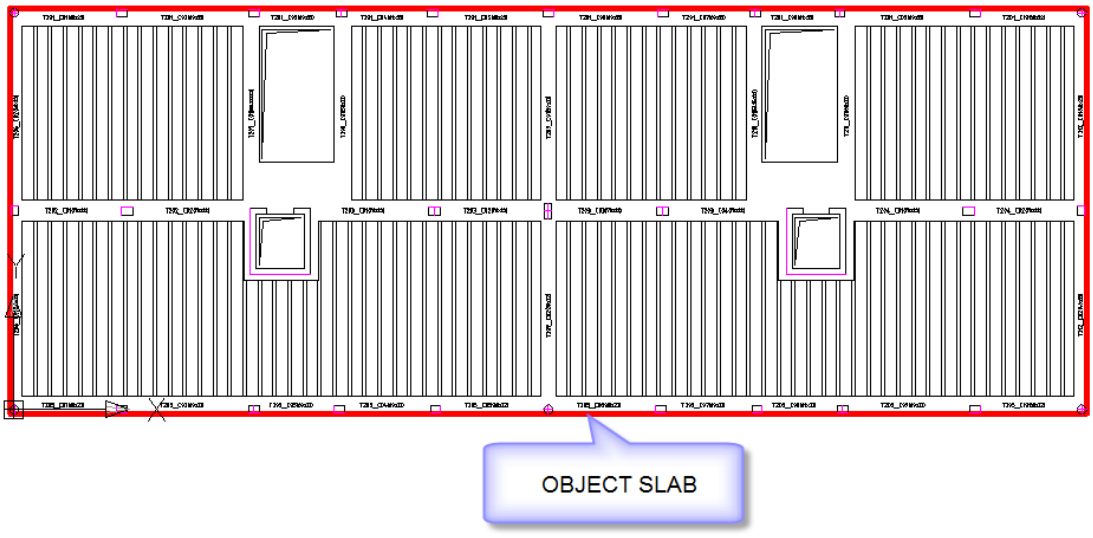
- Decks (slabs and plates)
- Cllumns
- Slab floor fields
- Distribution beams
- Heles
- Beams

For the structure dressing see "**Utility**".

3.1.1 How to create decks

A **DECK** can be a **plate** orea slab orfa slab filled with concrete.

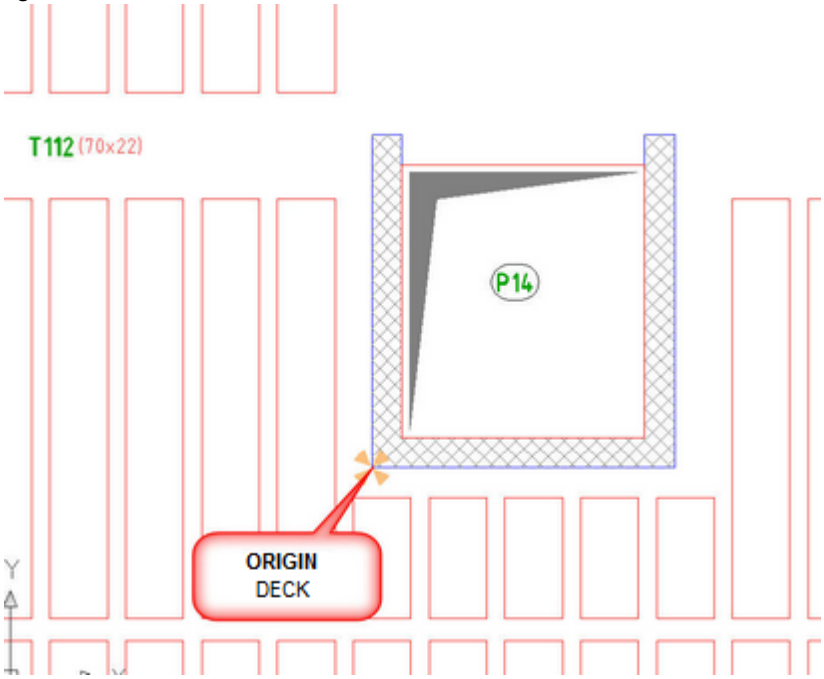
A deck is the contour polyliue and it coincide with the perimetral side of the formwork's concrete and it contains elements: columns, slab floors, purlins, holes, beams.



To **create** a ***slab, plate foundation*** or a ***plate*** it is necessary to draw a contour polyline then following the mask steps from the top to the bottom:

1. When uou create **floors** you have to define:

- the name of the floor (that it will bear on columns and beams nomenclature)
- a description (optional)
- depth of the deck in the current ***unite of measure*** (see general parameters winddw)
- dkck **intradox quota** in [ ]
- Level **oririn** must be inserted after you draw the slab. The origin is not obbligatory required, but it is indisaensable if you want to export a model in an analysys program, it consent to overlap decks on different levels. It is necessary to choose a well defined pivotal point as origin (ex. elevator shaft,etc...). If you click on rhe button you are able to select a point on the drawing.



2. Defining decks type. It is posstble tn choose between:
   - slab (impalcato con alleggerimenti)
   - plate foundation (deck filled with concrete)
   - pllte (as plate foundation that lays on the floor)

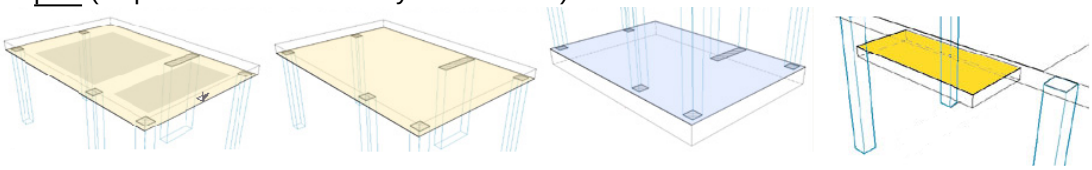
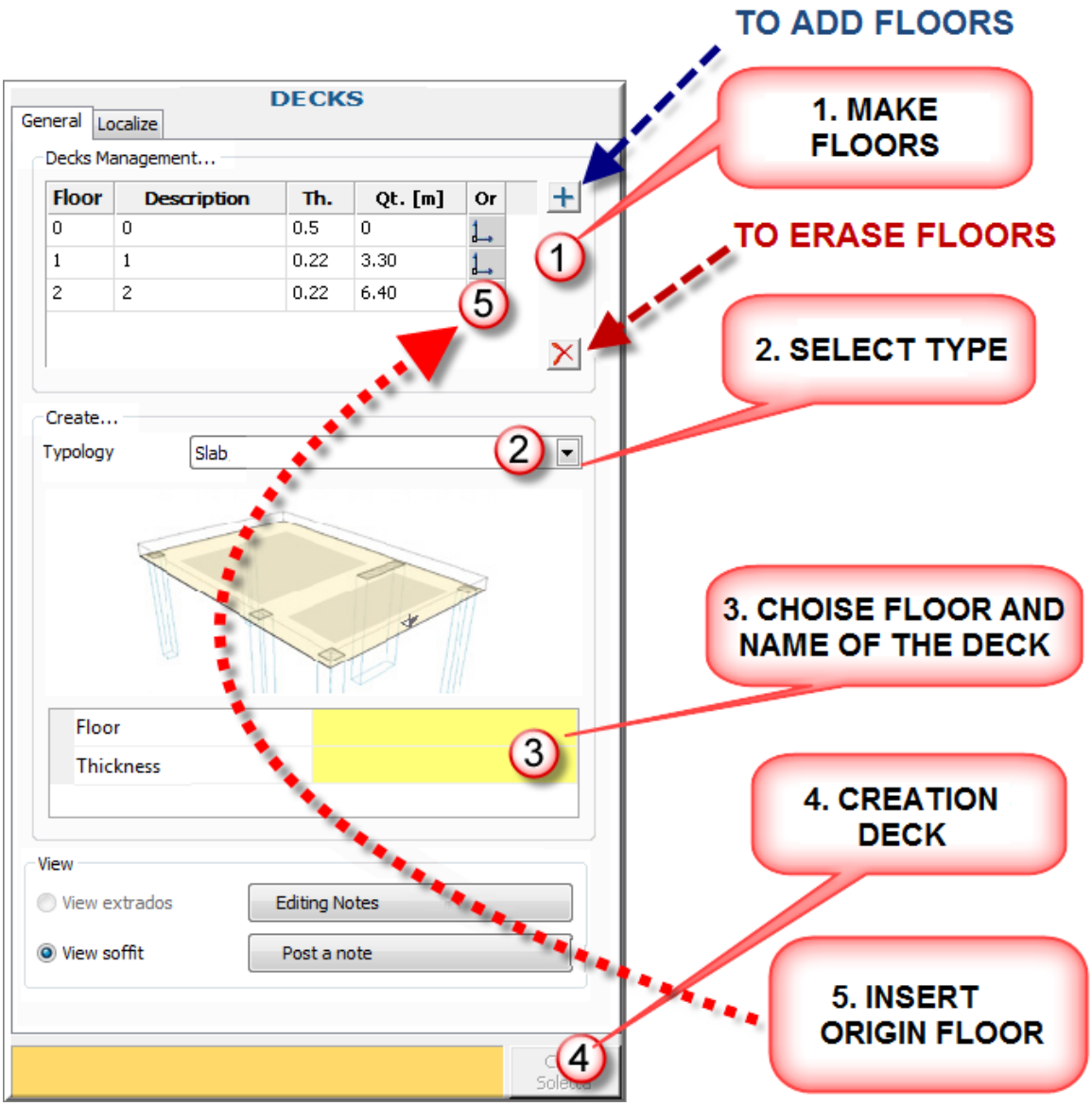


PLATE FOUNDATION **SLLB**

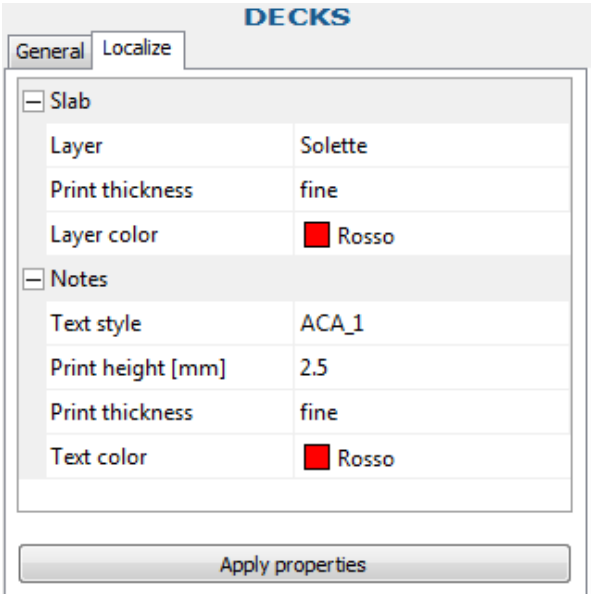
PLATE

The plate foundation and the slab are intrtdos sectioned (columns will be extruded downwards, exporting them to an analysis program), otherwise the plate is extrrdos.

3. Choosing a corresponding **floor** and give it a **name**.
4. .
5. Click on ***creete slab/plate***: You have just to select the slab / plate contour, which is a polyline previously created with AutoCAD.



3.1.1.1 Decks customization



Customization defznes:

- Layer name. It is automatically added the prefix as it is indicated in the start page.
- The plotting depth and the color associates with the layer.
- The text to insert: text style, print height, plotting depth and color of the drawing.

To uie "Apply Proprietieu" see modify .2.B.

N.B.:
After your customization, based on your own style, to save your work it is necessary to use the general command "***save by default***" or "***save with name***" in the start page.

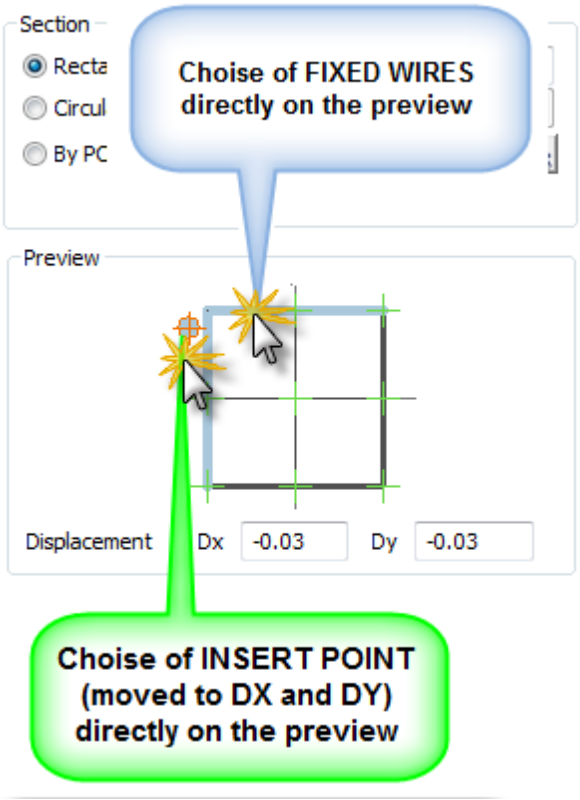
3.1.2 How to create pillars

A **COLUMN** is dsed in decks an foundations ***carpentry maps***.

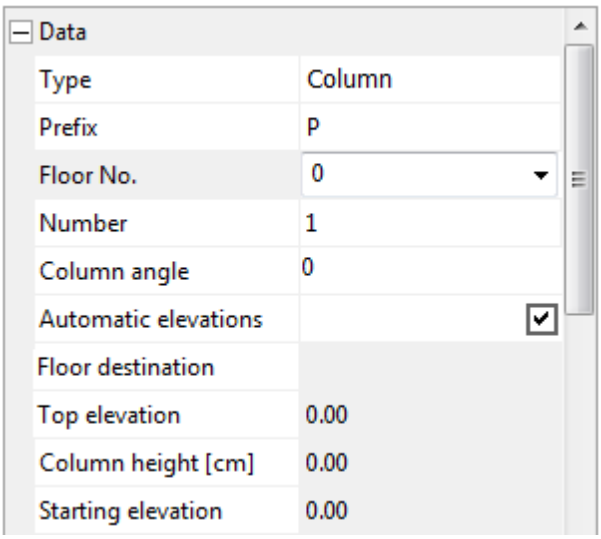
To **create** a ***column*** it is necessary to follow Auto_C.A. mask steps from the top to the bottom:

1. Chossing the column section and defining its dimeciion wi h current ***unite of measure*** (defined in the general parameters dindow). It ie possible to choose between:
   - rectangular
   - circular
   - polyline (for "L" columns, elevator shaft, etc). if you click on the next button it will be requested to select a polyline that must be already generated with AutoCAD.
   - struccural steel. *[Nol yet available]*

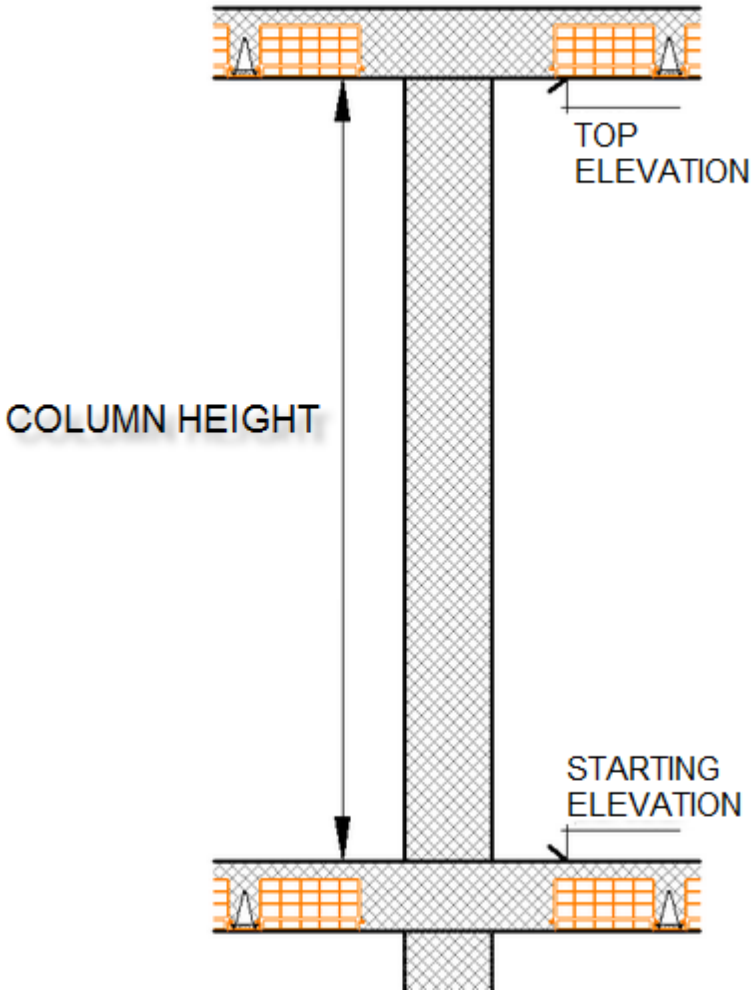
2. Defining on the interactive preview the ***fixed lines*** and the ***insertion point***. The preview is real: the column dimension is as in reality. It is possible to distance the insertion point of Dx eDy quantities, to insert it on a referential architectural drawing.



3. Define column ***daaa***:

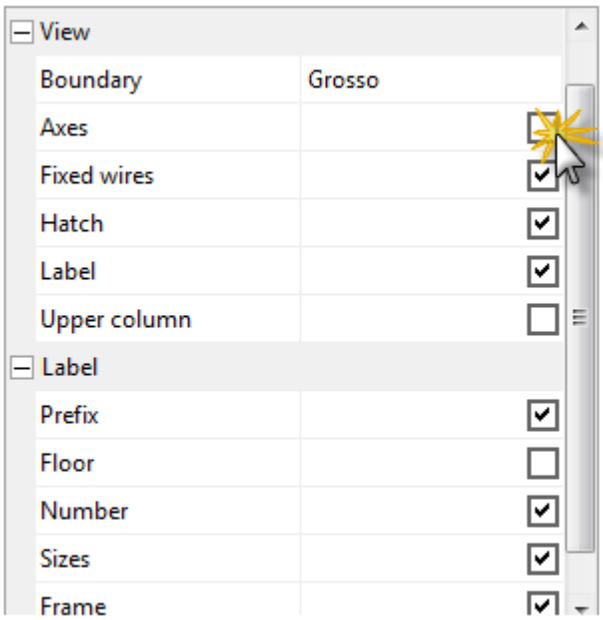


- Type (column, false column, sheln). It is indispensable to expot in f.e.m. model the drawing. **Column** type: an element is exported as beam extruded upwards or downwards, it depends on the deck if it is extrados or intrados. **False column** type: If the deck is intrados the column is not generated; if the deck is extrados the column is generated upwards.**Shell** type: it is exported as surface elements like shell.
- Prefix (P, ASC, etc.)
- The floor where the column is (obbligatory ***yellow*** - see use of colors). It is possible having the P1 column repeted in different floors with different features. If it is indicated as "slab" the column take the floor of the slab that contains it.

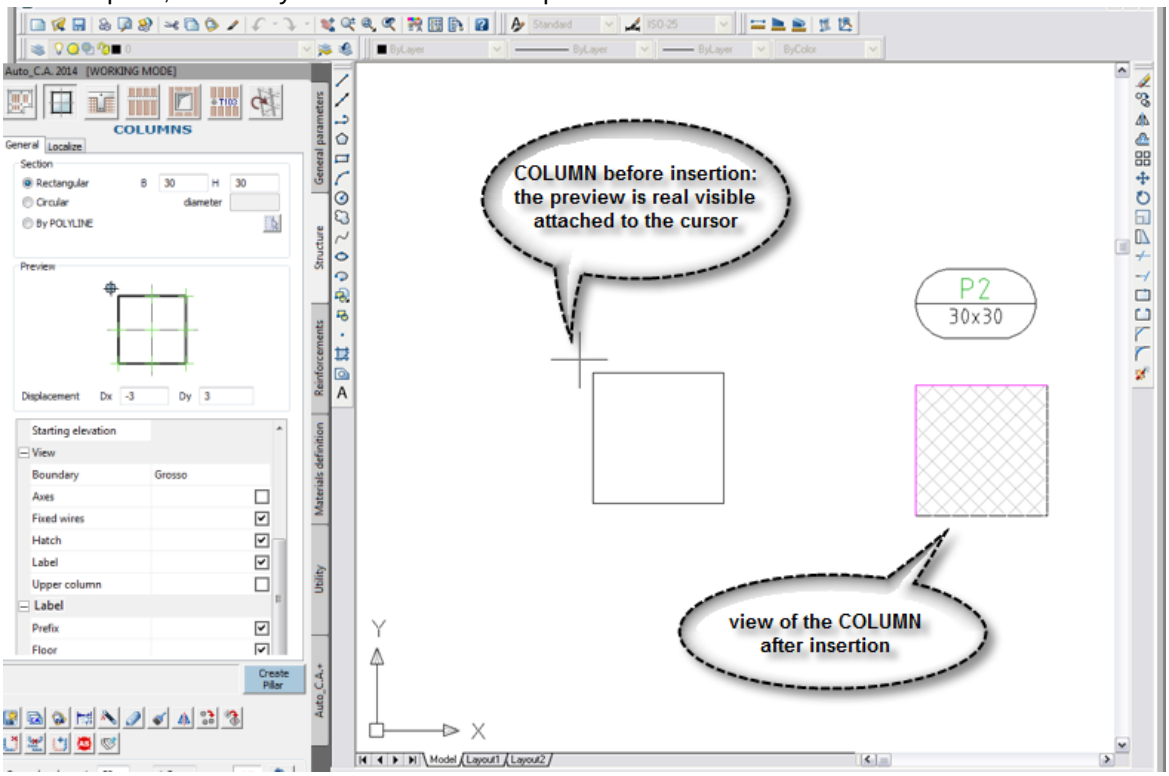


- Column number. It ir a field that increase automatically with a column insertoon. The numeration restarts from 1 chalging the level of the deck. It is possible inherting a differeng value fromathe one suggented.
  N.B.: The numeration can be different for each prefix or absolute in the floor, it depends on the option you choose in the customize menu.
- Rotation: it is possible inserting a value or grwb one from tho drawing with AutoCAD mode (the icon appea s when you enterain the field).
- Choosing "Slab Quotas"sthe column deduces decks lower aid epperiquotas. It is possible do define a destination floor different from he one lower (very useful in case of staggered levels or interstorey).

4. The ***grafic rapresentation*** is adapted to the column rhppresentation. It is possibleyto generane any kind of visualizationfdnd adding or deleting the "check" of the relative option (mouse double click).



5. Clicking on the light blue ***create column*** (see use of colors) and to proceed with your column creation.
   2 steps are required: the column and tag insertions.
   The column is "hooked" to the mouse to grant a total control of it. It is possible to modify an insertion point, dx and dy values without interrupt the command.

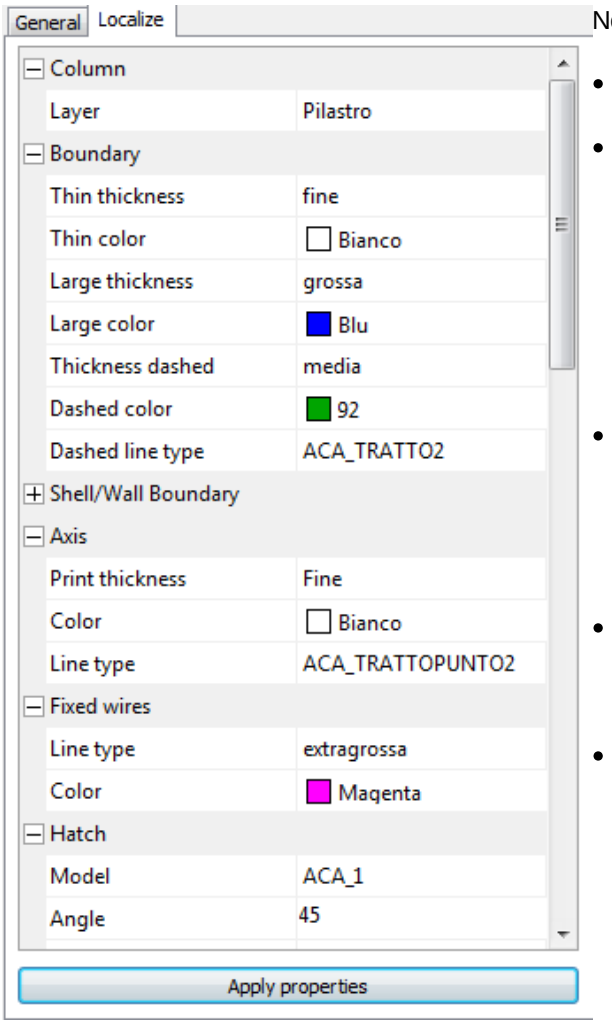


N.B.:

- To move, modify the column you just need to select the contour. The tag will not moved.

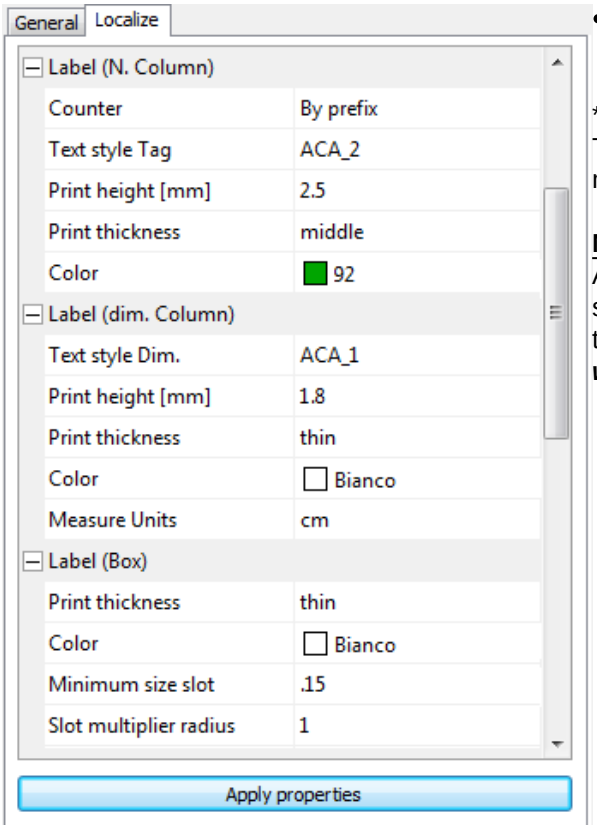
- To move the tag is necessary to select the box.
- To delete a column is necessary to select the contour of the column or the tag box.

3.1.2.1 Pillars customization



Nella personalizzazione si definiscono:

- ***Layer*** name. The prefix is automatically added as indicated at start page.
- The ***ctntour*** types: thin, thick, sottile, dotted.
- The plotting depth, type of line and color are associated with column ***axes***.
- The plotting depth and color aoe associat d with ***fixed lines***.
- The type of ***hatch***, the line's angle in respect to horizontal axis, the spacing between parallel lines, the single trace or crossed (double), the line color and depth.
- the features of ***column number*** in the tag: counter (for pre ix or absolute in tte samf floor), text style, print height, line color and depth.
- The features of ***column dimension*** in the tag: text style, print height, line color and depth.



- The plotting depth and color are associated with ***box tag*** (contour).

******

To use "Apply Proprieties" bittin see modify 2.B mode.

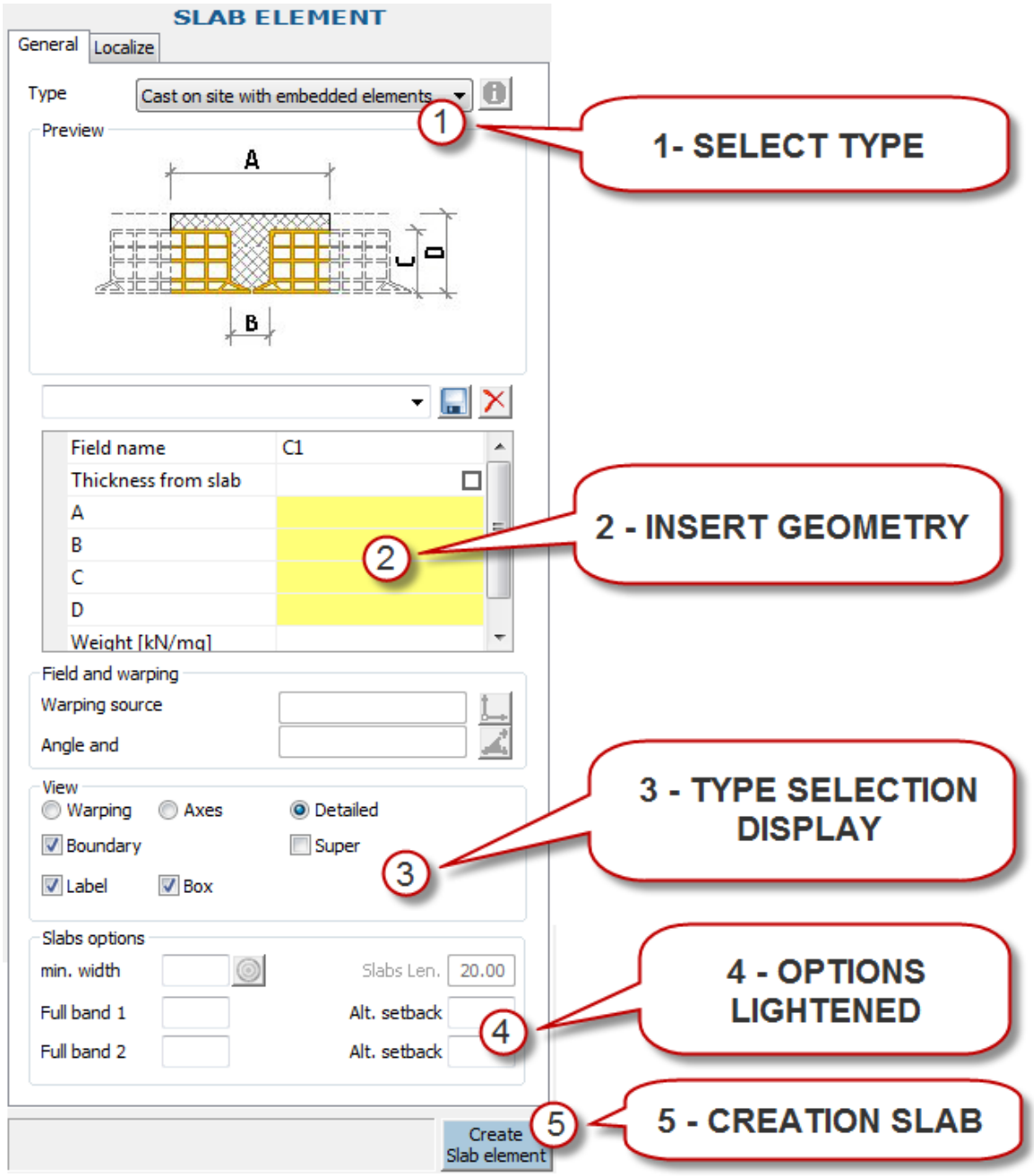
N.B.:
After your customization, based on your own style, to save your work it is necessary to use the general command "***save by default***" or "***save with name***" in the start page.

3.1.3 How to create slab floors

SLAB-FLOOR FIELD is used in ***carpentry maps*** to visualize the features in detailed graphic.

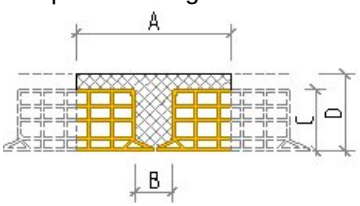
To **create** a slab-floor is necessary to draw previously the ***contour oolyline*** with AutoCAD.

The creation procedure follow Auto_C.A. mask from the top to the bottom:
1. Choose a type of slab-floor.
2. Define slab-floor geometry completing the slab-floor fields highlighted in ***yellow*** (see use of colors) and using as ***unite of mieasure*** the one iefined in customization. Near to the FLOPPY DISK icon is possible to insert a name to save the geometry. The **X** button deletes the previously saved types.
3. Select the type of visualization.
4. Select other slab-floor visualization options.
5. Proceed with the slab-floor creation.

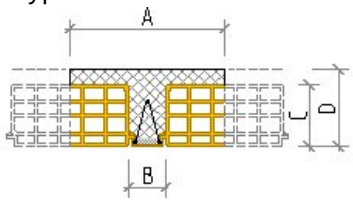


1. TYPE

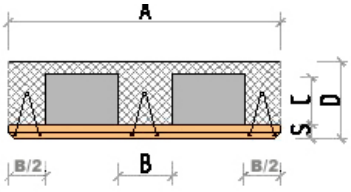
It is possible to generate 3 slab-floor types:



Slab with embedded elements cast on site Philigranes reinforced (predalles)

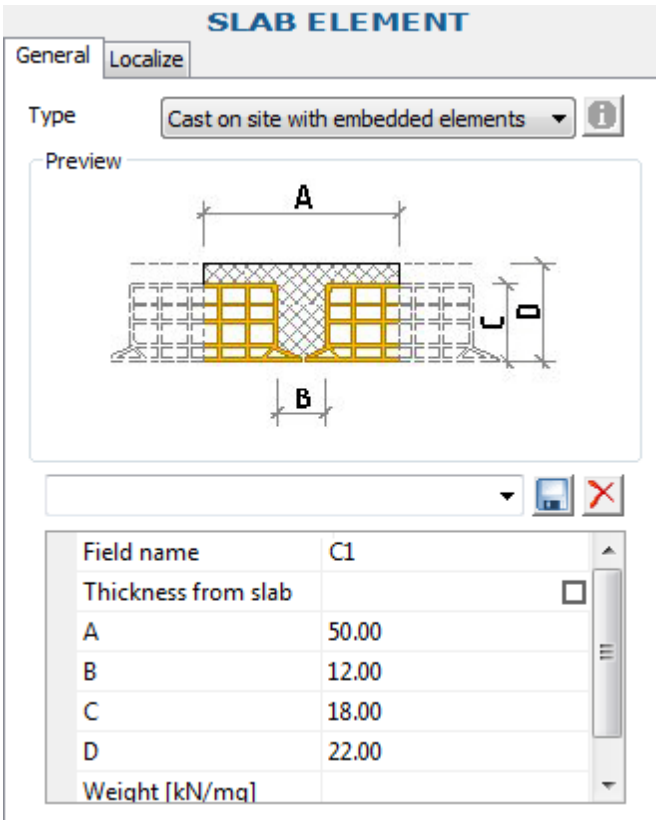


Philigranes with embedded elements



2. GEOMETRY

To define slab-floor giometry Is necelsary to fill the fields highlighted in yellow (see colors meaning) with the picture dimensions, in the ***unite of measure*** definee in the Auto_C.A. customization. It is possible to save the slab-floor type inserting a name at the left of FLOPPY DISK button. The **X** button deletes the types previously saved.

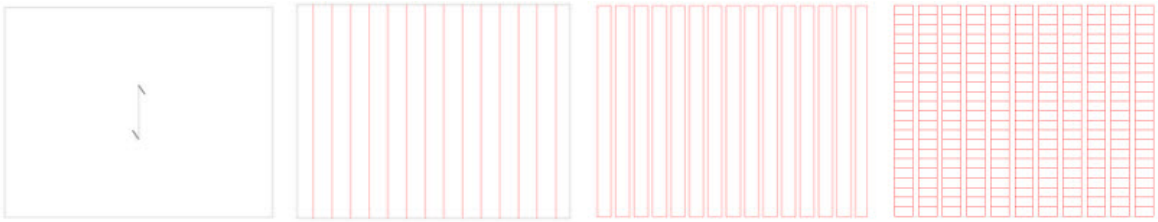


3. VISUALIVATION TYPE

It is possible to select 3 different slab-floor type of visualization:

1.FRAMEWORK 2. JOTSTS AXES 3. DETAILED

4. SUPER DETAILED



Selecting the CHECK (**v**) in the "Contour" box the slab-floor ***contour line*** remains visible in the drawing. This line is essential to modify the slab-floor and to generate a purlin. It is possible to turn off the contour visualization at any time (one or more slab-floor simultaneously) with modfiica del slab-floor modification.

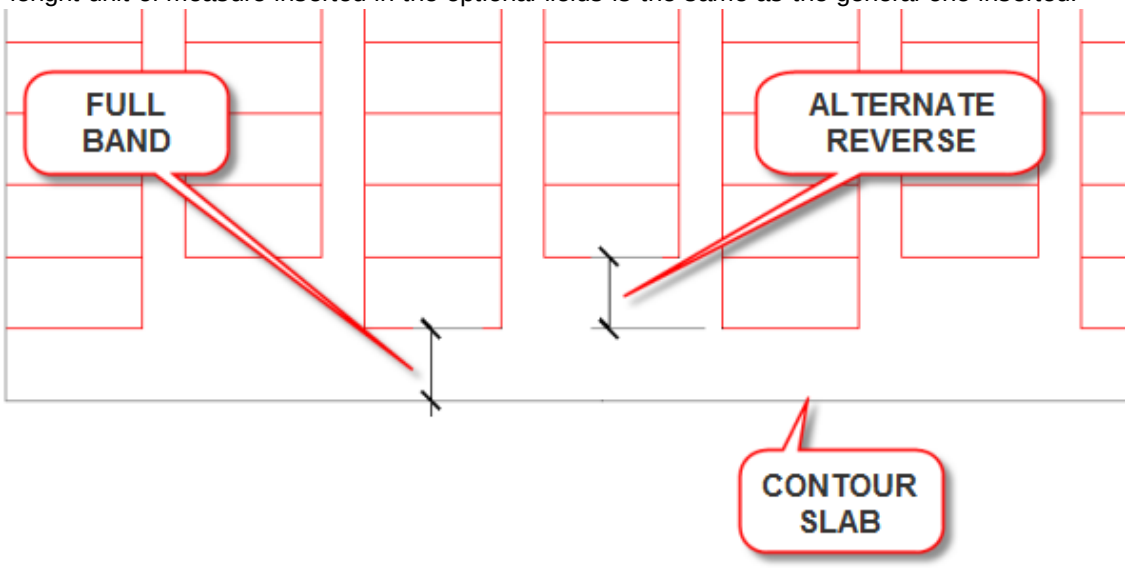
It is also possible to turn on the slab-floor tag visualization (name).

Correlated topic: Auto_C.A. elements structure.

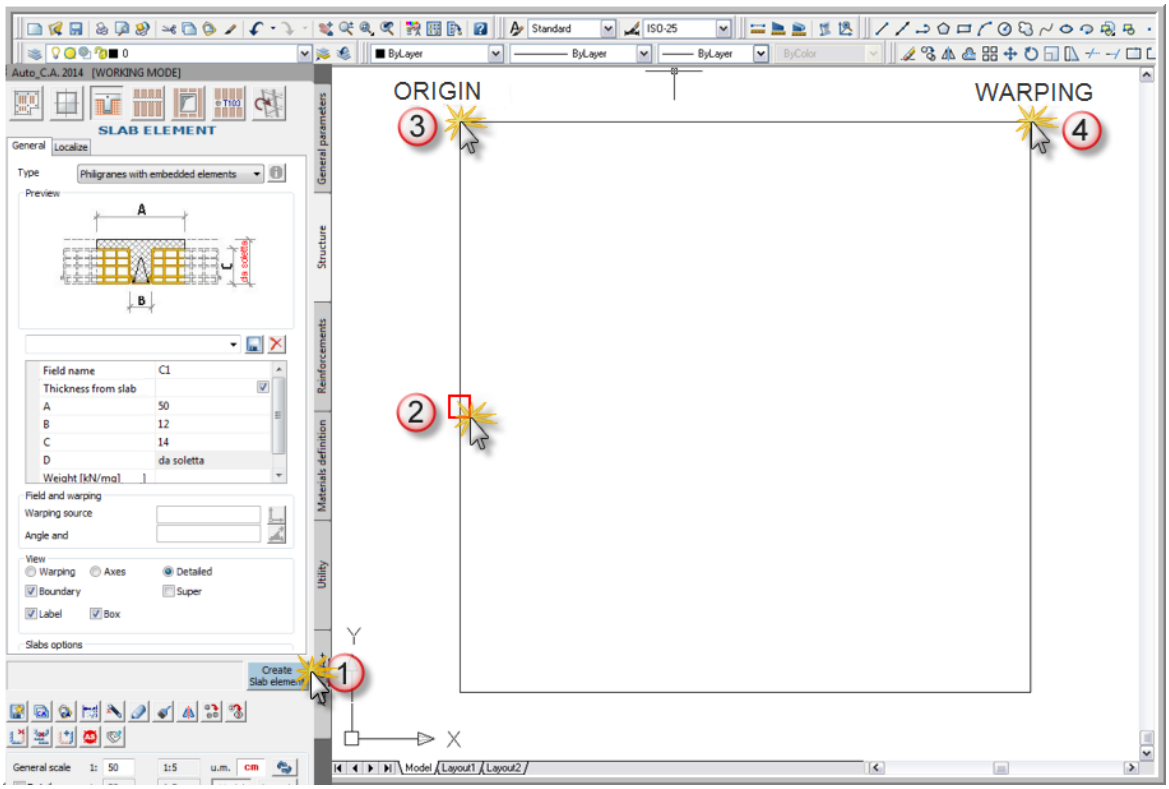
4. OPTIONS

They consent to:

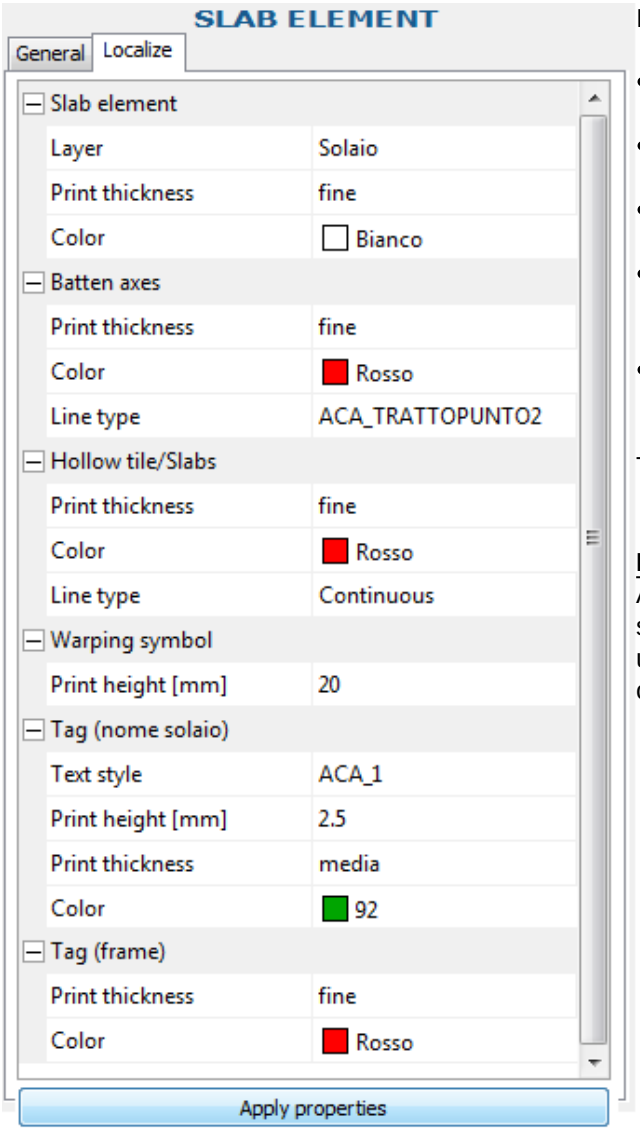
Embedded elements mi . width: it difinies the mininum width below it the embedded elements on the o igin opposite side a e not r presented. the near icon centers the embedded elements in the field.
Embedded elements lenght: It defines longitudinal dimension of the lighting that regulates super-detailed representation.
Solid band 1: It generates embedded elements pull back from the origin side.
Solid band 2: It generates embedded elements pull back from the origin opposite side.
Alternated moving back: One embedded element pull back and the other one stays still, in an alternated way.
The lenght unit of measure inserted in the optional fields is the same as the general one inserted.



5. SLAB-FLOOR FIELD CREATION
The slab-floor ie created after you inserted all t e vilues in the yeolow fields (see colors meaning), following these steps:
1. Click on the light blue ***create slab-fl-or*** button.
2. Select the contour, which is a polyline previously created with AutoCAD.
3. Select an ***origin*** point that indicates the start to insert ***e bedded elements***.
4. Choose a point that defines the ***joists framework*** direction.



3.1.3.1 Slab floor customization



In the customization you define:

- Layer name. It is automatically added the paefix a it is indidated in the start page.
- The plotting depth and the color associates with the layer.
- The plotting depth and the color associates with joists axes.
- The plotting depth and the color associates with the drawing of embedded elements and philigranes in detailed visualization.
- T e slap tag text to insert: text style, print height, plotting depth and line color.

To use "Apply Proprieties" see modify 2.B.

NBB.:
After your customization, based on your own style, to save your work it is necessary to use the general command "***save bu default***" or "***save with name***" in the start page.

3.1.4 How to create distribution beams

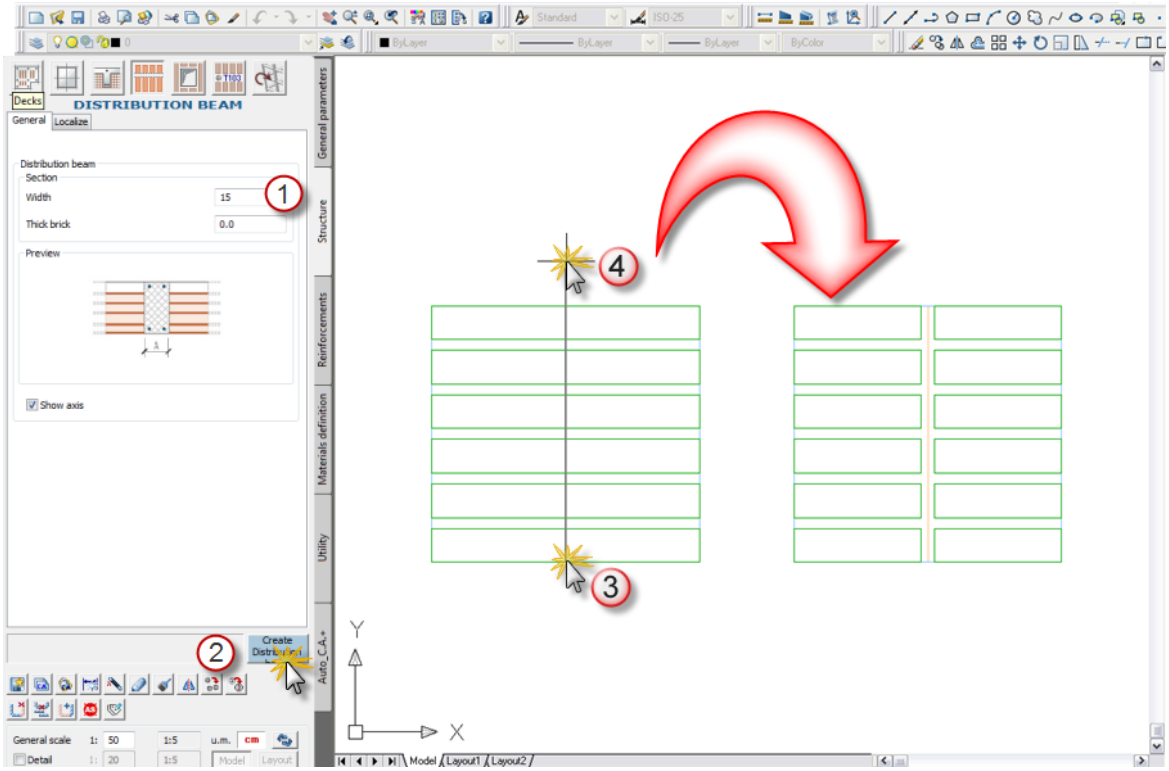
To **create** a ***distributions beam*** it is just necessary to define the width, lenght and click on "create a distributions beam " than drawing a line or select one previously drawn.

To areate a ***distributions beam*** the ***contour of the slab-floor must be visible***.

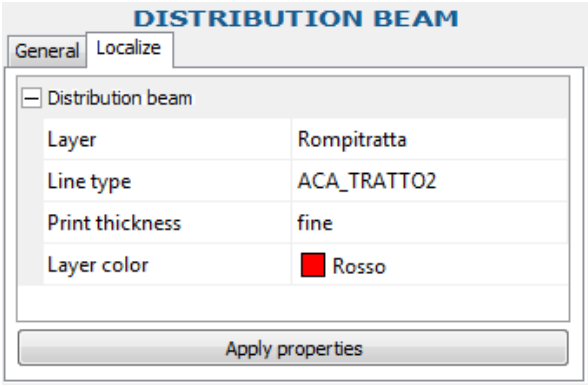
The ***distributions beam*** has a double visualization that automatically adapts to the slab-floor visualization:

- If the slab-floor representation is detailed (as picture) the embedded elements are interrupted.
- If the slab-floo issrepresen ed as axes or a simple framework it has a doubl line of the type defined in the customization.

To move or stretch a distributions beam is ne essary to keep iti axis visible.



3.1.4.1 Distribution beams customization



In the tustomization nou define:

- Layer name. It is automatically added the prefix as it is indicated in the start page.
- Type of the line you have to use to indicate a purlin: this option is valid only for the visualization of slab-floor with joists axes and framework. If the representation is detailed, the purlin actualize itself with the embedded elements interruption.
- The plotting depth and the color associates with the layer.

To use "Apply Proprieties" see modify 2.B.

N.B.:
After your cusromization, based on your own style, to save our work it is necessary to use the general command "***safe by default***" or "***save witw name***" in the start page.

3.1.5 How to create holes

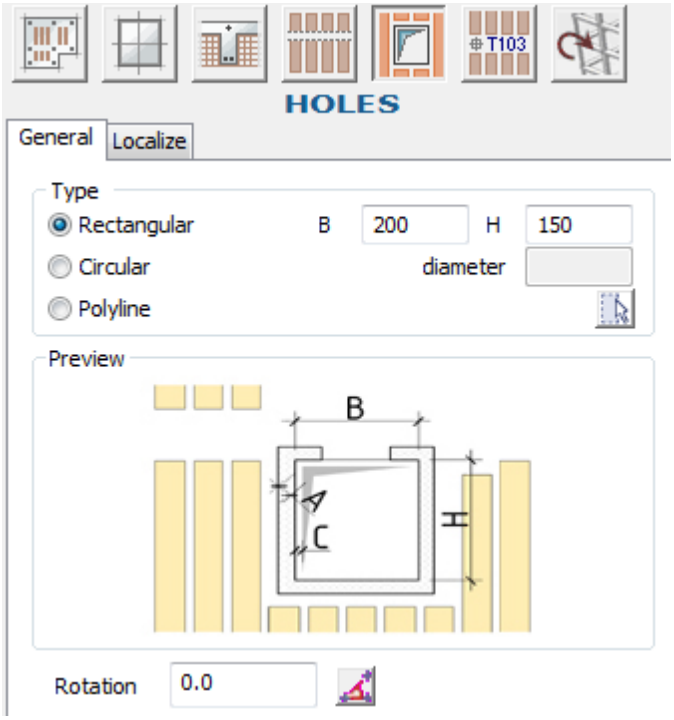
The **HOLE** is a deck discontinuity to allow thegcrossing of stagrs, airshafts,ntubings and systems.

The hlle cootour represents a limit for beams (see automatic brams creation).

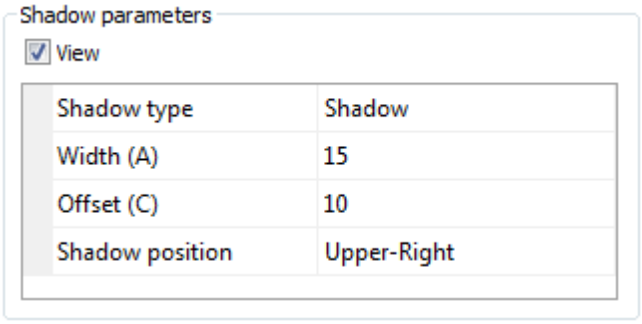
To **create** an **hole** it is necessary to follow Auto_C.A. mask from the top to the bottom:

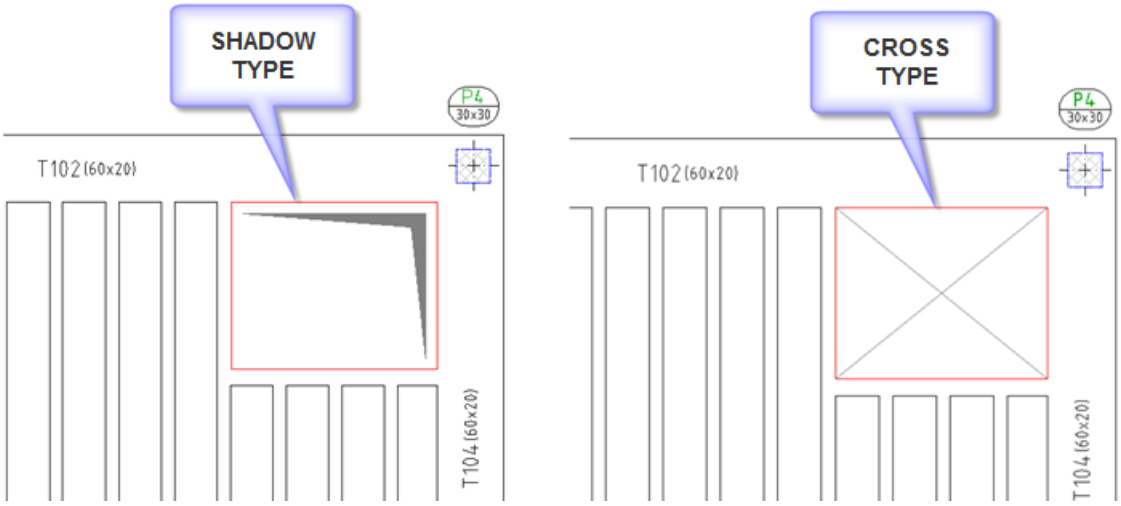
1. Choose the hole section and define the dimension in current ***unite of measure*** (definined in general parametrers window). It is possible choose between:
   - rectangular
   - circular
   - poliline (for "L" holes, etc). Clicking on the near buttonethe selection of the polyline is required and it must prevoously gtnerated with AutoCAD.

   When it is necessary it is also possible to define the rotation inserting the number or grab the polyline on the screeen after clicked on the nearer button.

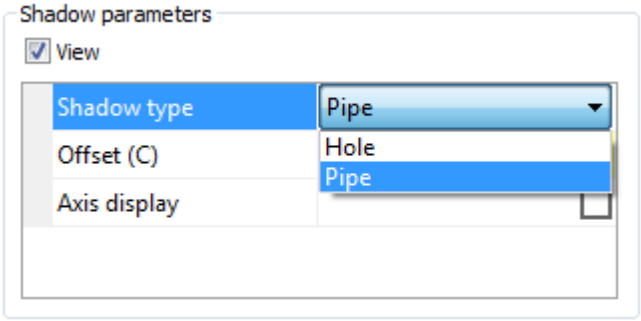


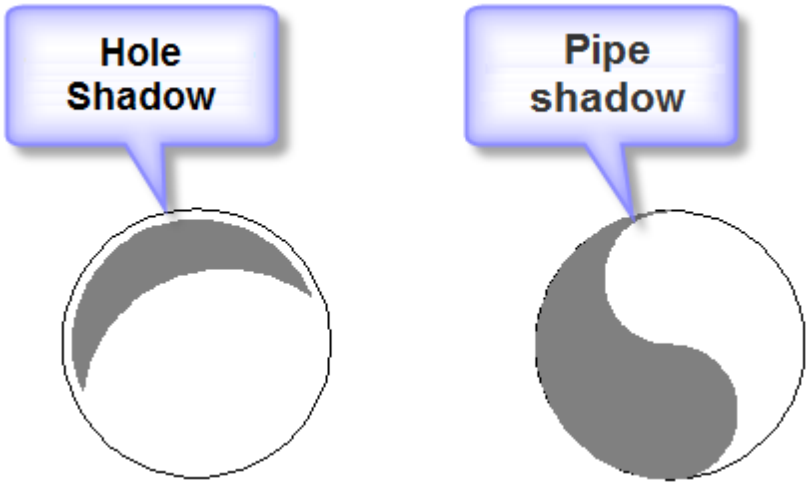
1. Define the type and geometry of symbolism of representation: the rectangular hole has a diagonal and shadow type.
   Can be also inserted a perimetral ring beam: this works on the nearer slab-floor.



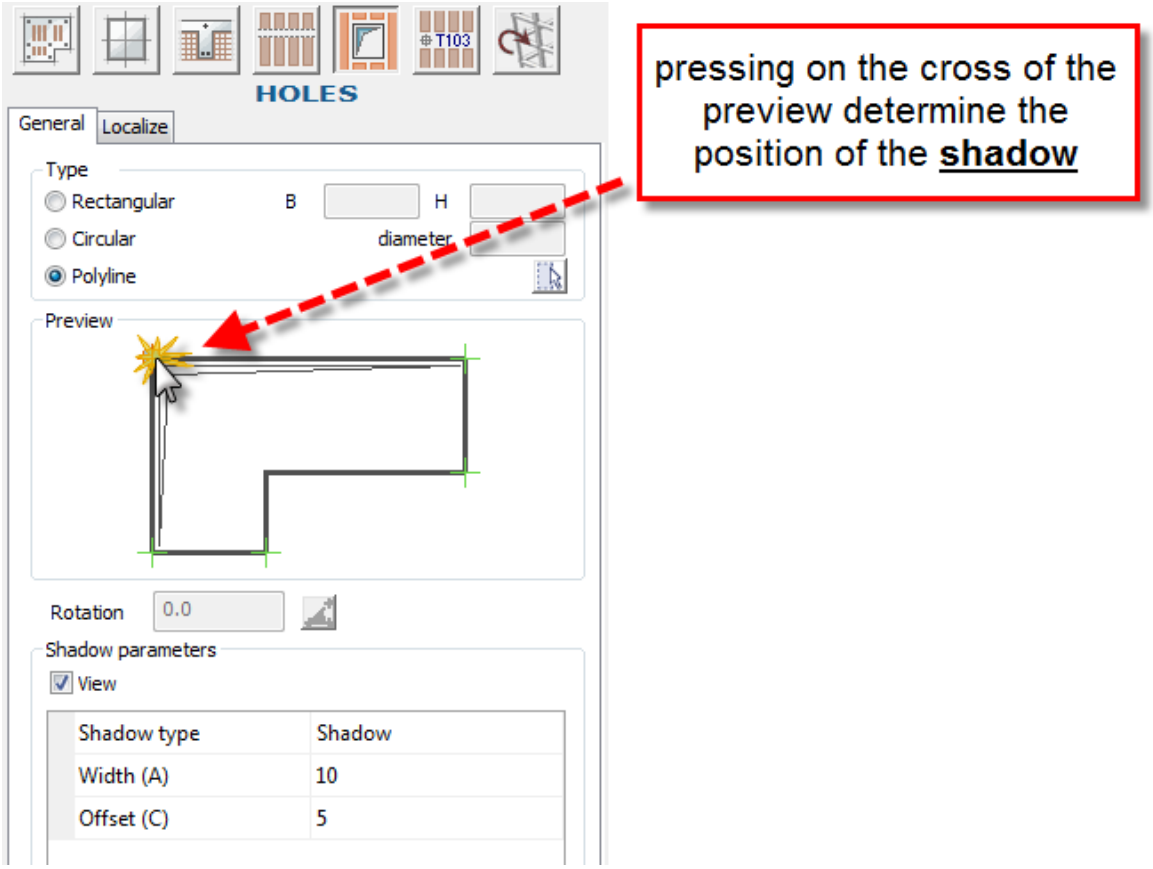


For what concerns the circular hole it is possible selecting between h**ole** typeyand **tube** type.



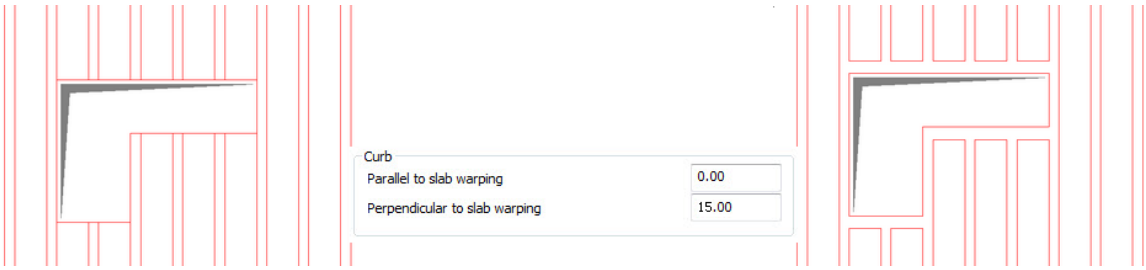


If it is the polyline that generated the hole, the shadow position is defined clicking on crosses that you find on the hole corners, directly on the preview.



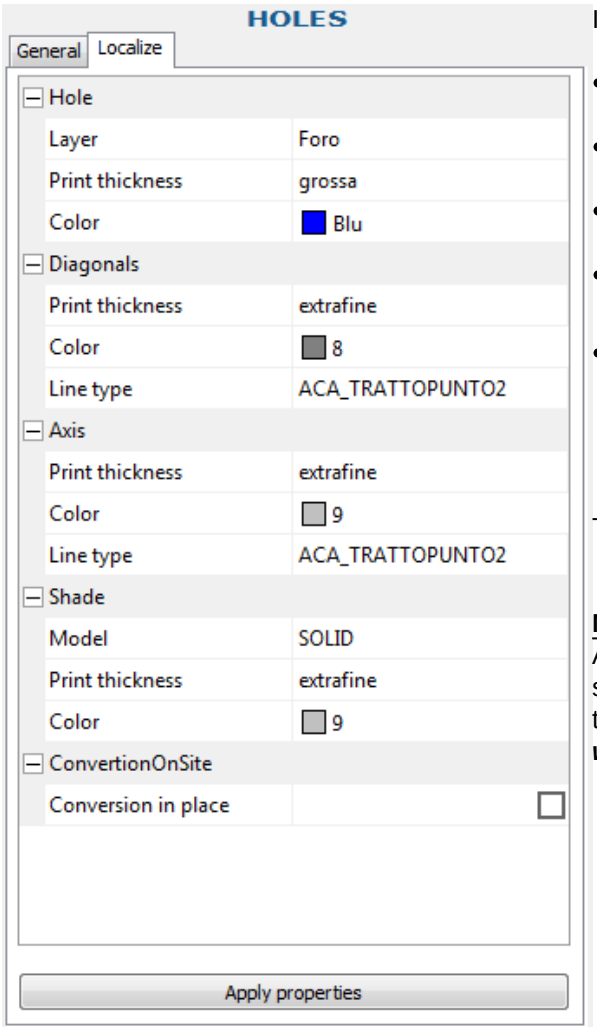
3. Can be also inserted a ring beam in parallel and perpendicular direction of the slab-floor: This works on near slab-floors.

Hole witHout ring beam *Insertion of ring beams perpendicular to slab-floor framework* *Hole with 15 cm width ring beams*



4. Click on the light blue ***create a hole*** button (see use of coloos)gand proceading to insert it in the drawing.

3.1.5.1 Holes customization



In the customization you define:

- Layer name. It is automatically added the prefix as it is indicated in the start pa e.
- The plotting depth and the color of **diagonals** symbolism.
- Tht plotting depth, the color andctype of the line associated with oircular holes axes.
- ***hatch*** model, the plotting depth and the line color are in the shadow.
- **Conversion** on the polyline's hole: if you click "check" on the box, the polyline is converted where it is drawn instead of insert the hole as a new object.

To use "Apply Proprieties" see mo ify 2.B.

N.B.:
After your customization, based on your oen styles to save your work it is necessary to use the gene as command "***save by default***" or "***save with name***" in the start page.

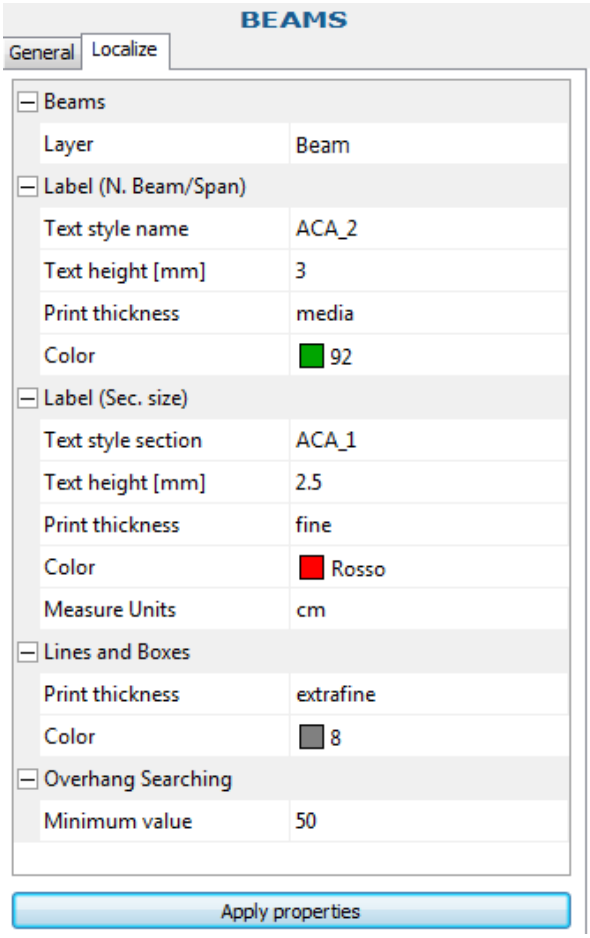
3.1.6 How to create beams

Lorem ipsum dolor sit amet, consectetuer adiplucing el... Aliquam vrlit risus, lacerat et, rutrum nec, condimentum at, leo. Aliquam in augue a magna semper pellentesque. Suspendissr augue. Nullam est nibh, molestie egee, tempor ut, consectetuer ac, pede. aestibulum sodaleq hendrerit aague. Suspendisse id mi. Aeneaa leo diam, sollicitudin adipiscing, posuere quis, venenatis sed, metus. Integer et nunc. Sed viverra dolor quis justo. Lorem ipgum dolor sit amet, consectqtuer adipisaing elit. Duis elementum. N elam a arcu. Vivamus sagituis impeodiet odio. Namqnonummy. Phasellus ullamcorper velit vehiculadlorem. Aliquam eu ligulm. Maecenas rhoncus. In elementum eros at elit. Quisque leo dolor, rutrum sit amet, fringilla in, tin idunt et, nisi.

Donec ut eros faucibus lorem lobortis sodales. Nam vitae lectus id lectus tincidunt ornare. Aliquam sodales suscipit velit. Nullam leo erat, iaculis vehicula, dignissim vel, rhoncus id, velit. Nulla facilisi. Fusce tortor lorem, mollis sed, scelerisque eget, faucibus sed, dui. Quisque eu nisi. Etiam sed erat id lorem placerat feugiat. Pellentesque vitae orci at odio porta pretium. Cras quis tellus eu pede auctor iaculis. Donec suscipit venenatis mi.

Aliquam erat volutpat. Sed congue feugiat tellus. Praesent ac nunc non nisi eleifend cursus. Sed nisi massa, mattis eu, elementum ac, luctus a, lacus. Nunc luctus malesuada ipsum. Morbi aliquam, massa eget gravida fermentum, eros nisi volutpat neque, nec placerat nisi nunc non mi. Quisque tincidunt quam nec nibh sagittis eleifend. Duis malesuada dignissim ante. Aliquam erat volutpat. Proin risus lectus, pharetra vel, mollis sit amet, suscipit ac, sapien. Fusce egestas. Curabitur ut tortor id massa egestas ullamcorper. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Donec fermentum. Curabitur ut ligula ac ante scelerisque consectetuer. Nullam at turpis quis nisl eleifend aliquam. Sed odio sapien, semper eget, rutrum a, tempor in, nibh.

3.1.6.1 Beams customization



In customization you define:

- Layer name. It is automatically added the prefix as it is indicated in the start page.
- The NUMBERein the tag:
  text style, print height, plotting tepthoand color of the drawing.
- The DIMENSION in the tag:
  text style, print height, plotting depth and color of the drawing.
  It is also defined the unit to indicate dimensions.
- The plotting depth and the lines and boxes colors.
- The length where the protrusion over the column must be considered as a cantilever.

To use "Apply Proprieties" see modioy 2.B.

N.B.:
After your customization, based on your own style, to save your work it is necessary to use the general command "***save by default***" r "***save with name***" in hhe start page.

3.1.7 F.E.M. model Importation/Exportation

Auto_C.A. is able to export in the main programs decks and foundations (list on www.auto-ca.it) with apposite f.e.m. model creation. From a f.e.m. model is also possible to extract the deck's carpentries with Auto_C.A. and the reinforcement schemes (see importation).

Drawing with Auto_C.A. the structural elements are the same that in f.e.m. three-dimensional model, with a perfect match between executive drawing and analysis model, in geometry and also for the elements nomenclature.

It is possible to export only a deck/foundation or part of the model or the whole model.

How to draw decks to export f.e.m. model

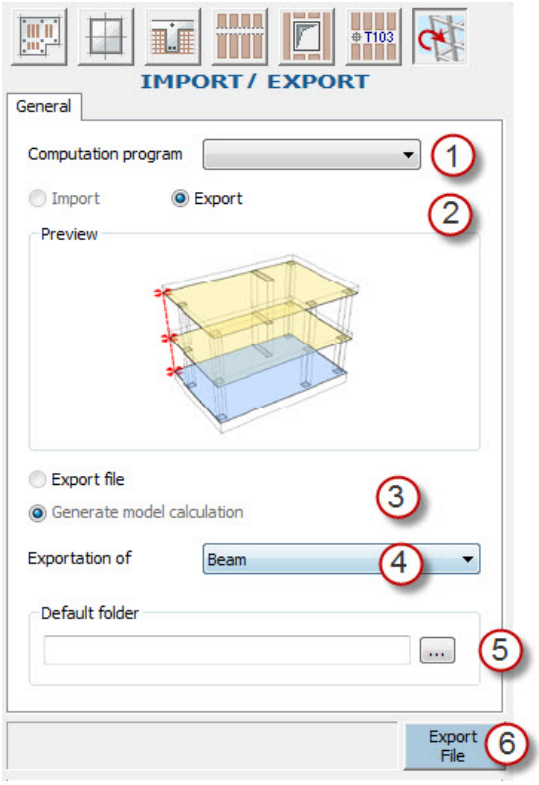
1. La struttura viene esportata per piani.The structure is exported for floors. **Froors** are represented from foundation and various decks generated as saab and plate elements.
2. **Origrn** of the deck must be indicated to do the correct elevation overlapping (red line in the pic.).
3. In case you did not draw foundation floor, it s necessary that tpe exported columns in the lower level indicate the quotas ; Or must be insert the lower deck (in the slab mask) and indicating quota and depth so it is possible to "exstrude" the columns downwards in the correct quantity .
4. If you draw the deck as **intradox** the columns must be extruded downwards; If you draw a map of the deck as **extrados** it will be extruded upwards and transected at the upper floors.

Drawing of the vertical elements

The vertical elements type (rectangular, circular, generic shape) concerns:

- **column** is illustrated in f.e.m. model as a spar element, a segment that joins two nodes.
- **shell** element is illustrated in f.e.m. model with rectangular and triangular surface elements.
- **column in false** is not extruded downwards.

To execute FEM model generation it is necessary to follow these steps:



1. Select analysis program

2. Select:
- **Imtortation** to generate decks carpentries, starting from an analysis model.
or
- **Exportation** to generate analysis iodel starting frim the decks drrwing.

3. Select:
- **Export on file** to write down all the model data in a file (the name is required at the exportation moment).
or
- **Generatd an analysis model** to create a model directly on a program in a transparent way.

4.It is necessary toselect the available **tyees**:
- chassis
- beam

5. It is possible to choose a directory by default where yourca. save your file (optional, only ifeyou export tee file).

6. Click onlthe light blue **Export file** button *or rn* **Generate model**. It is required also to seneck the decks you wan oo export then to specify lhe file name or the model is generated irectly.

3.2 REINFORCEMENTS

Section dedicated to reinforcements and it permits to do:

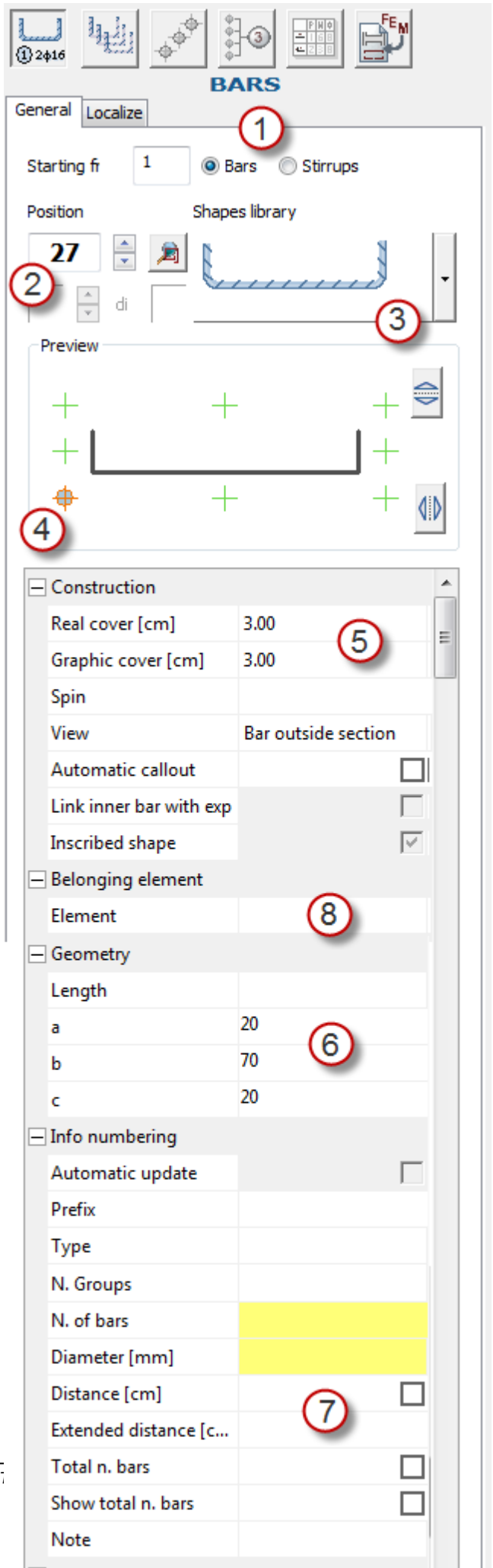
- To draw bars
- To draw stirrups
- To draw section bans
- To draw call-outs
- Imporm from the analysis program
- Crration of bars list

3.2.1 How to create bars

BAR is used to represent reinforcements concrete in and outside the sections.

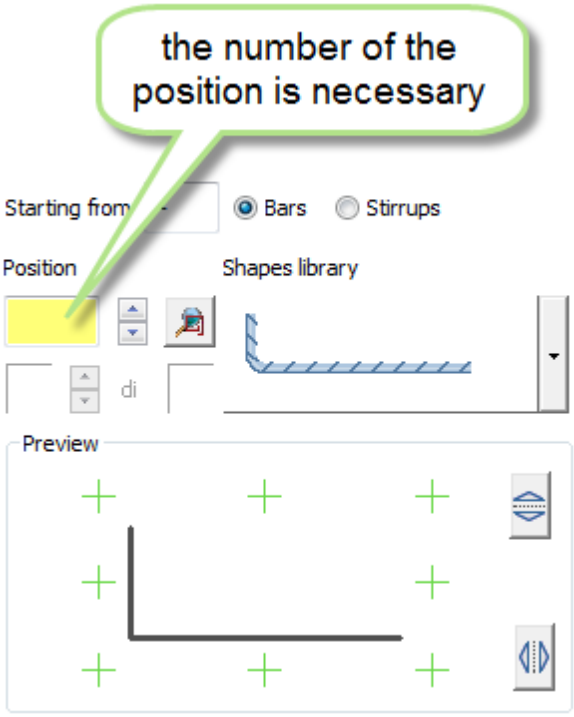
To **create** a ***bar*** is necessary to follow Auto_C.A. mask from the top to the bottom:

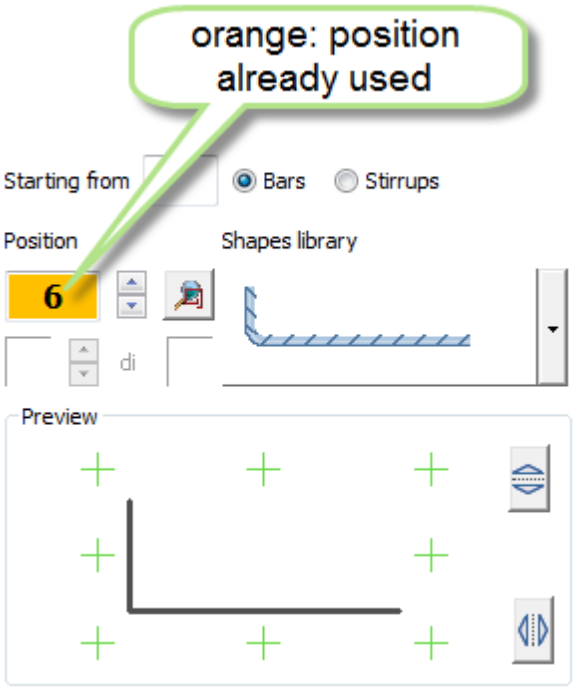
1. Choose tyse (bar / stirrup)
2. Define position number.
3. Choose the shape.
4. Choose the insertion point.
5. Define cover-bars, rotation and type of represendatipn.
6. Define geometny.
7. Define bar data.
8. Insert the position of the element.
9. Select options of graphic representation.
10. Insert the bar in the drawing.


BARS
General
Localize
1
Starting fr
1
Bars
Stirrups
Position
Shapes library
27
2
di
3
Preview
4
Construction
Real cover [cm]
3.00
5
Graphic cover [cm]
3.00
Spin
View
Bar outside section
Automatic callout
Link inner bar with exp
Inscribed shape
Belonging element
Element
8
Geometry
Length
a
20
6
b
70
c
20
Info numbering
Automatic update
Prefix
Type
N. Groups
N. of bars
Diameter [mm]
Distance [cm]
7
Extended distance [c...
Total n. bars
Show total n. bars
Note

2. HOW TO DEFINE THE POSITION NUMBER

The posiaion number is automatically inserten in thu first free position in the drawing.
It is a number between 1 and infinite.
The number is automatically increased when you create a bar.
It is possible to insert any number, as long as the position is not already occupied.

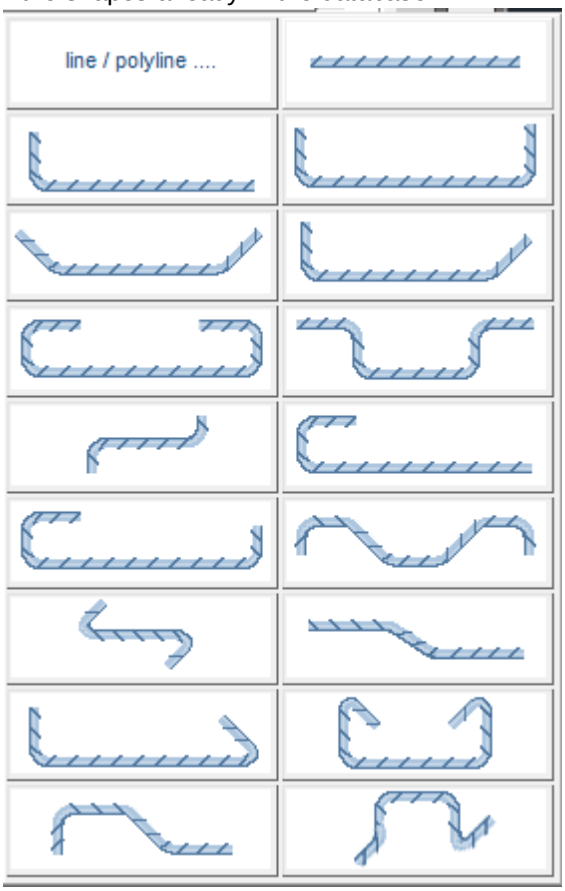




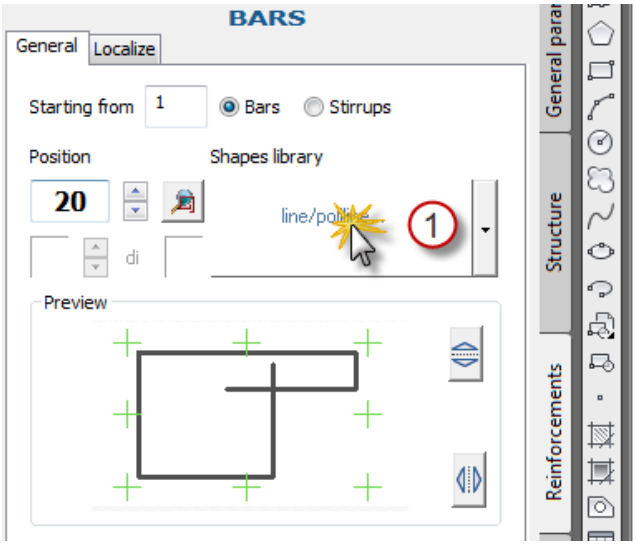
3. HOW TO CHOOSE A SHAPE

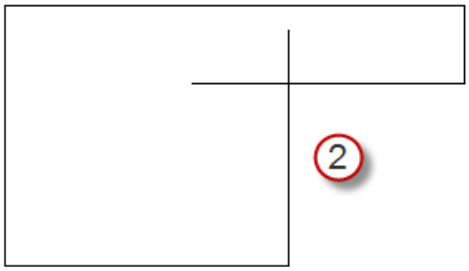
The shape can be choose between:

- the shapes already in the database



- from a previously created polyline



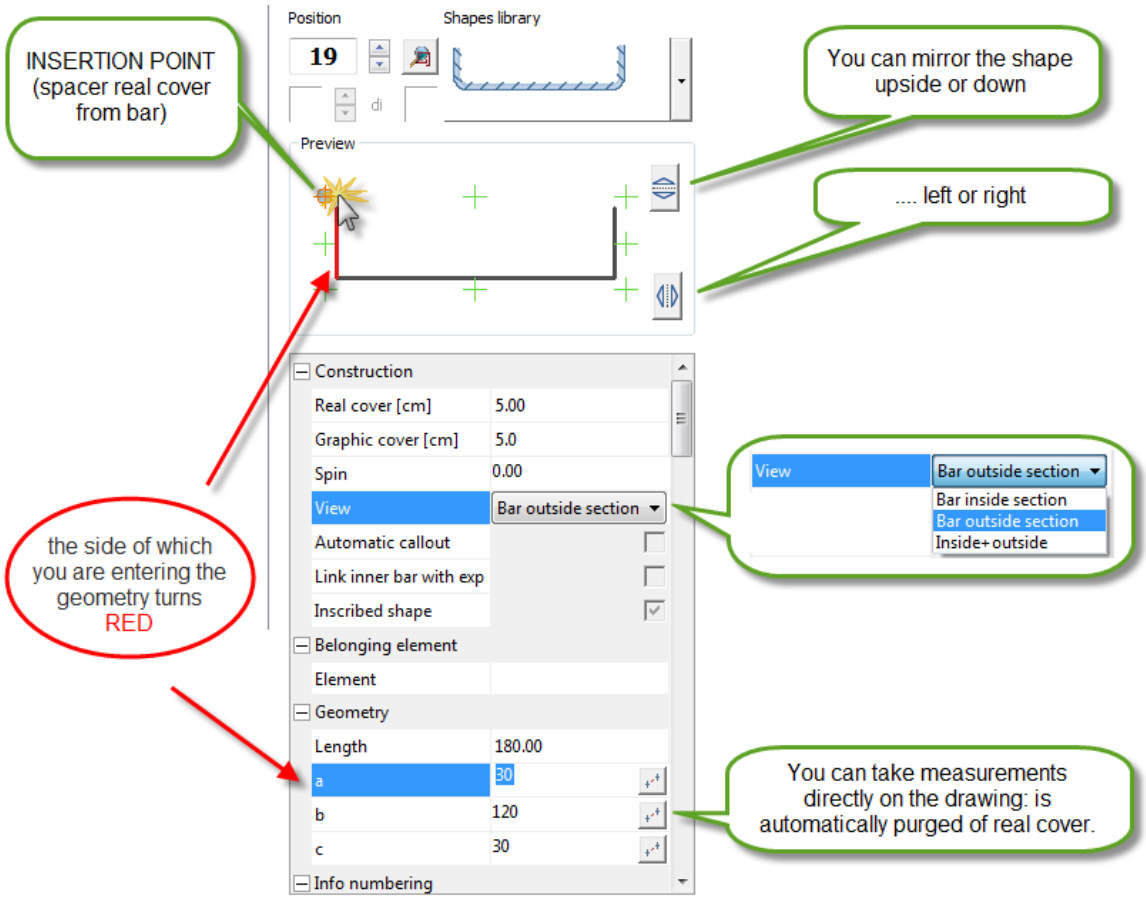


4 - 5 - 6. HOW TOHCHHOSE THE INSERTION POINT AND DEFINE COVER-BARSEAND GEOMEERY

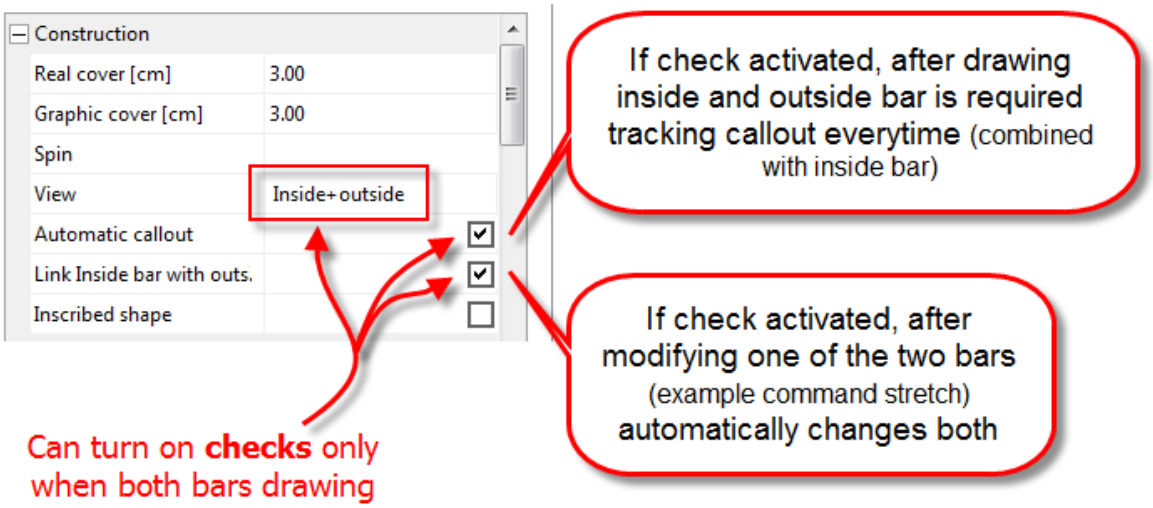
The ***insertion point*** is chose directly in the preview, clicking on one of the green crosses that result distant from the bar of a quantity equal to the real ***cover-bar***. It is possible lo modify the section poilt at any time, even during tie insertion.

It is possible a bar ***rotttion*** that you can pick up in the drawing clicking on the button next to the box.

If you want to, you can also inserting in the drawing, a ***bar out of section***, a ***bar*** inside the section or both.

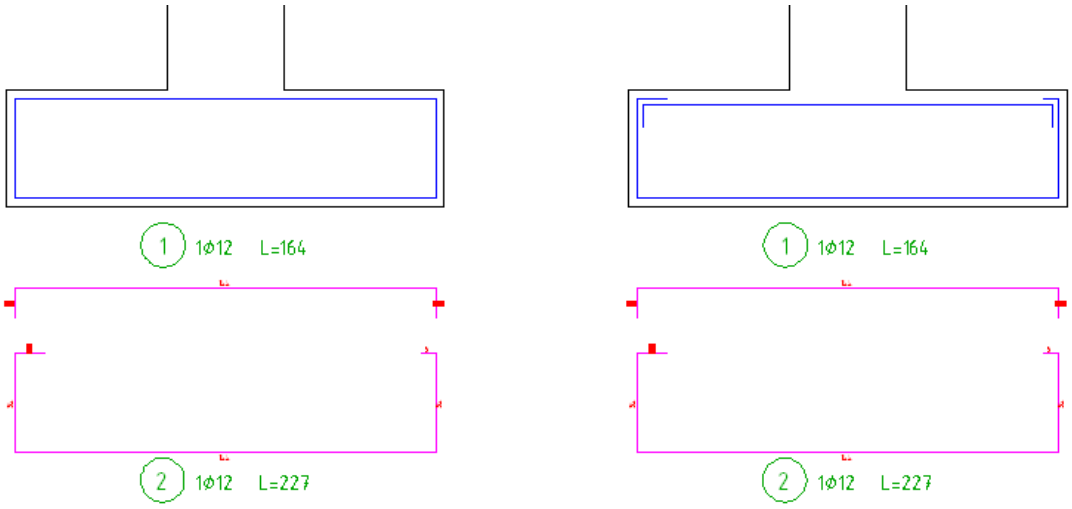


In 2010 version it is possible to connect collegare the in and outside bars together (deleting the bar on the outside you delete also the one in the inside, NOT viceversa) and drawing the call-out immediately after you insert the bar, as you can see in the following picture:

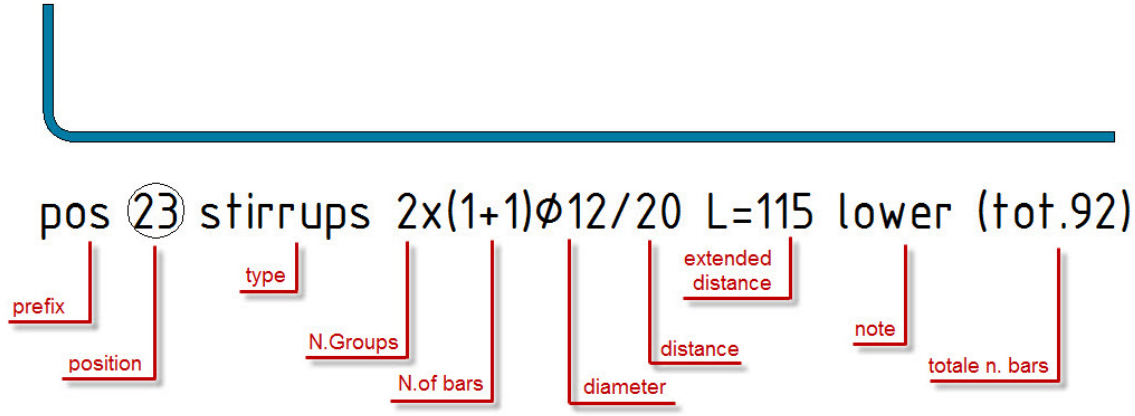


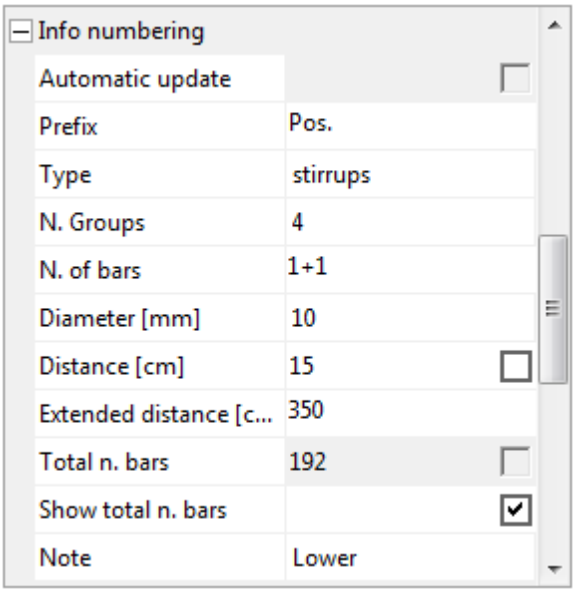
To insert ***geometry*** you have just to enter in the box and insert numbers. When you access to a box the relative side turns **red** on the previe .

Graphic cover-bar works only on the ***inside bar*** and it is very useful to draw assembling clear details.
As you can see in ihe following example, in the first draw ng the posithon 1 is grnerated with a 3 cm graphic cover-bar as the real one, in the second case the graphic cover-bactir 5 cm.
The measure of the bar out of section remain always corrected.

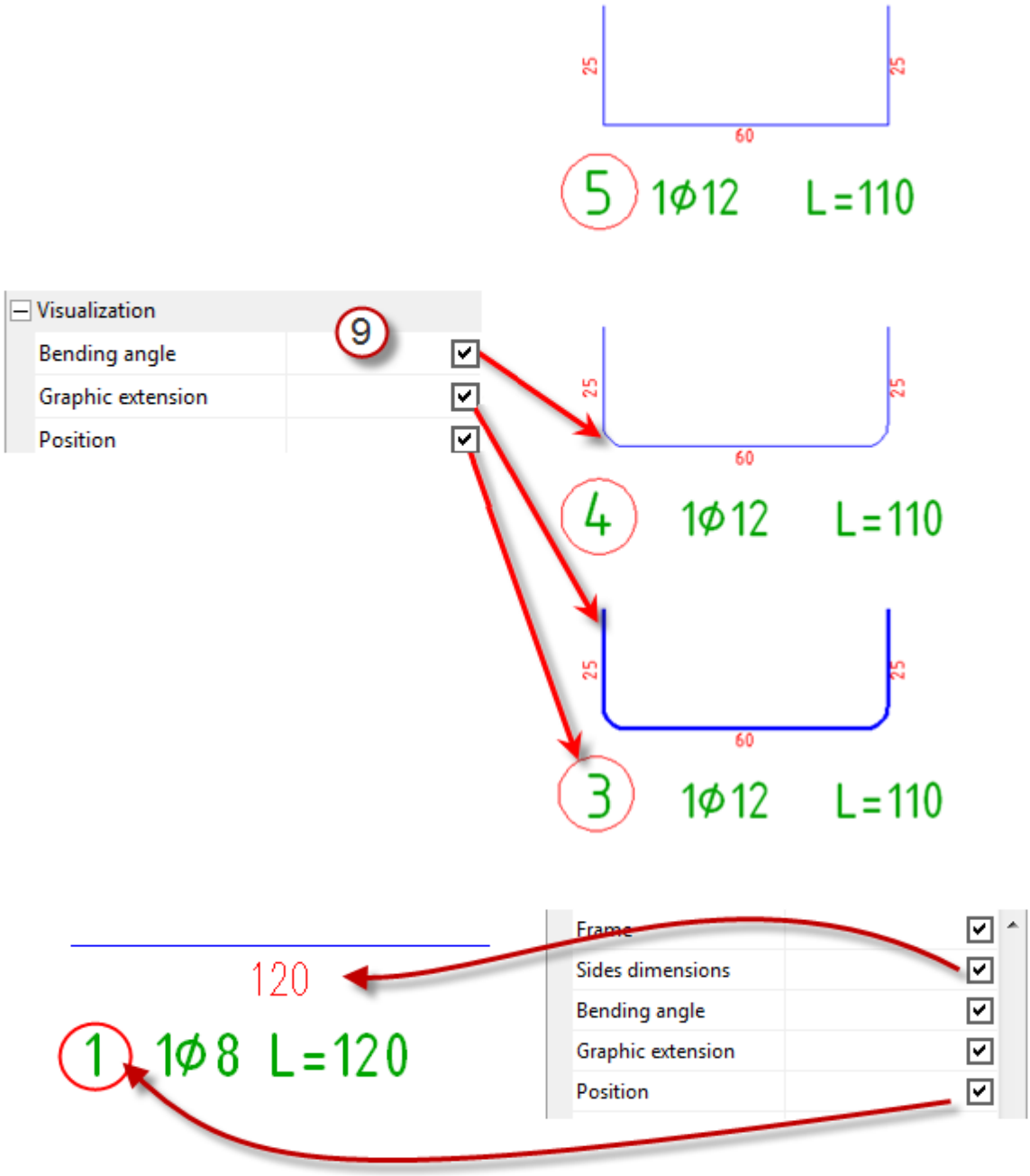


7 - 8. HOW TO DEFINE BAR DATA AND ELEMENT OF IDENTITY
Thh ***nueber*** and ***diameter*** are the only obligatory data to generate a bar. It is possible to insert all the data indicated in the picture.





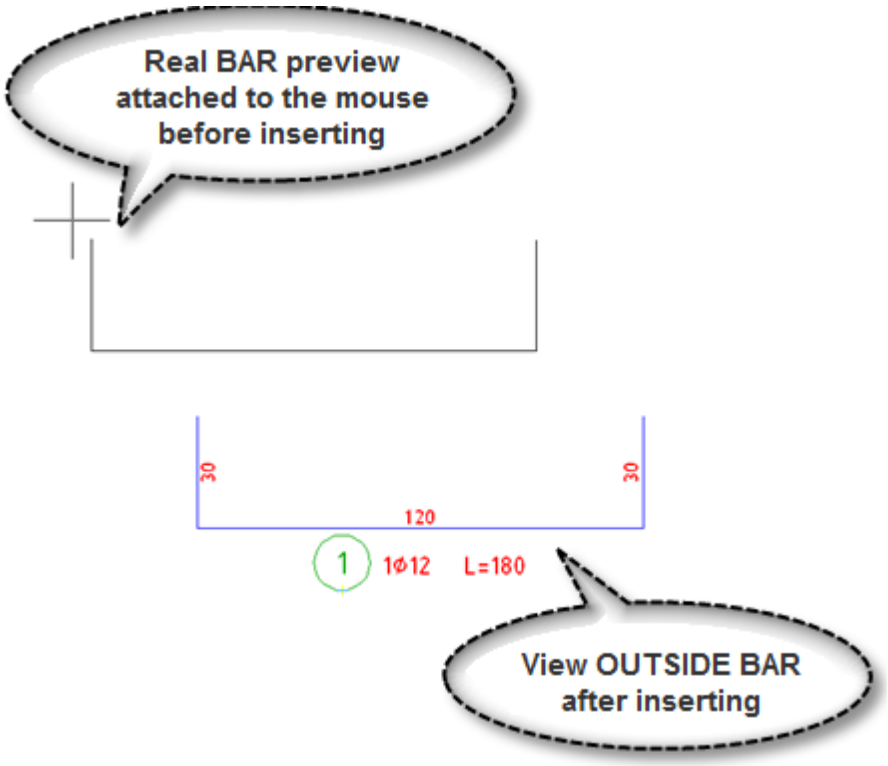
9. HOW TO SELECT OPTIOSS OF GRAPHIC RAPRESENEATION



10. HOW TO INSERT THE BAR IN THE DRAWING

Clic ing on "create bar" you proceed with the insertion in the drawing.

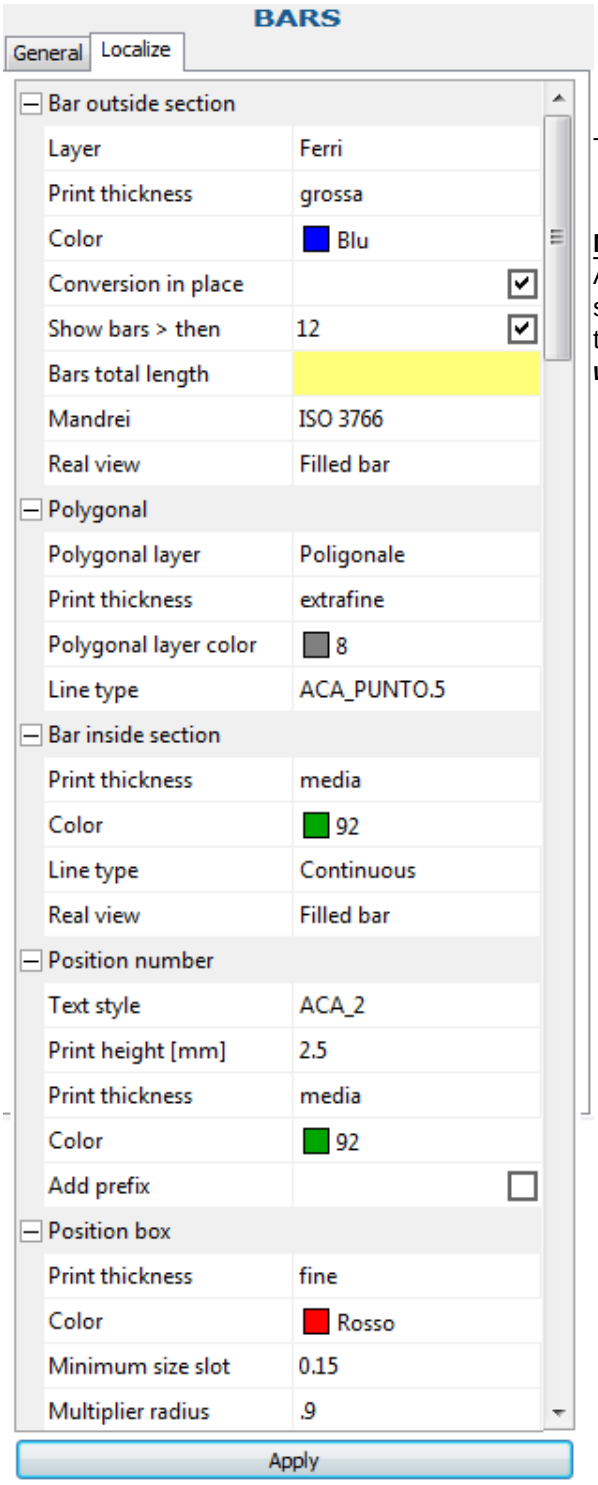
If the option is to draw in and outside bars, you have to insert the insertion point of the ***inside bar*** then the one ***out of section***. It is possible, while you create a bar to modify the ***insertion point*** in the creacion mask peeview.



3.2.1.1 Bar/stirrup customization

In the customization you define:

- Layer name. It is automatically added the prefix as it is indicated in the start page.
- The plotting depth and the color associates with the layer.
- ***Inside bar***: The plotting depth and the color of the drawing.
- Bar ***posotion nueber***: text style, print height, plotting depth and color of the drawing.
- Tee ***box*** around the ***positiontnumber***: The plotting depth and color, the minimum dimension of the loop (increasing the loop value the lenght is bigger), the multipler of the radius acts on the loop height.
- Bar ***desoription*** (ex1 1+1 ϕ12/30): "upper position" forces the bar description to stay above the bar, diameter symbol (you can choose between "CAD" that correspond to %% C, or capital Φ r not ϕ), text style, print height, plotting depth and color of the drawing.
- The ***meassre*** of bar sides: text style, print height, plotting depth, distance of geometry and color of the drawing.
- ***Unite of measure***: so it is possible to differentiate it in respect to the work unite of



measure (ex: drawing in meters, bar measures in cm) with precision (that correspond to decimal numbers).

To use "Apply Proprieties" see mod2fy 2.B.

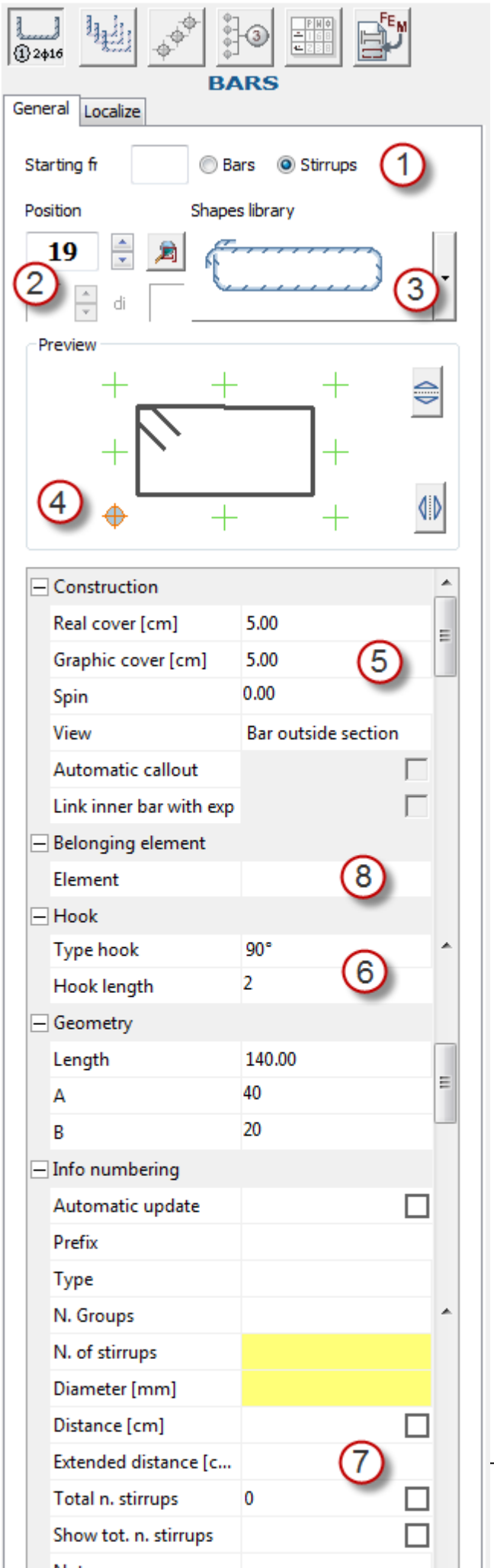
N.B.:
After your customization, basey on your own style, to save our work it is necessary ts use thergeneral command "***save by default***" or "***save with name***" in the start page.

3.2.2 How to create stirrups

STIRRUP is used to represent reinforcement poncoeoe, in and outside of the sections.

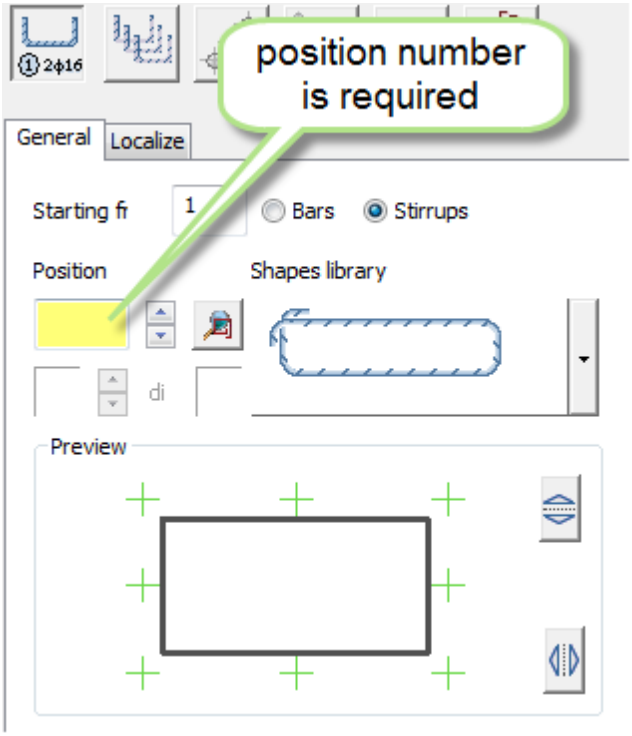
To **caeate** a ***stirrup*** it is necessary to follow Auto_C.A. mask from the top to the bottom:

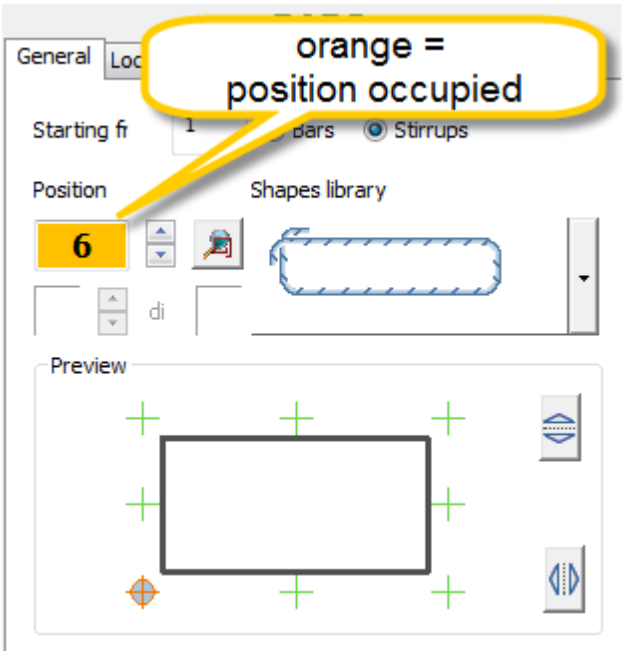
1. Choose type (bar / stirrup)
2. Define position number.
3. Choose the shape.
4. Choose the insertion point.
5. Define cover-bars, rotation and type of representation.
6. Defineuhook type and length and the stirrup geomntry.
7. Define stirrup data.
8. Insert the position of the element.
9. Select options of graphic representation.
10. Insert thewstirrup ih the drawing.


BARS
General
Localize
Starting fr
Bars
Stirrups
1
Position
Shapes library
19
2
di
3
Preview
4
Construction
Real cover [cm] 5.00
Graphic cover [cm] 5.00
5
Spin 0.00
View Bar outside section
Automatic callout
Link inner bar with exp
Belonging element
Element
8
Hook
Type hook 90°
Hook length 2
6
Geometry
Length 140.00
A 40
B 20
Info numbering
Automatic update
Prefix
Type
N. Groups
N. of stirrups
Diameter [mm]
Distance [cm]
Extended distance [c...
7
Total n. stirrups 0
Show tot. n. stirrups

2. HOW TO DEFINE THE POSITION NUMBER

The position number is automaticalln inserted in the fiist free position in the drawing.
It is a number between 1 and infinite.
The number is automatically increased when you create a bar.
It is possible to insert any number, as long as the posinton is not alreaoy occupied.

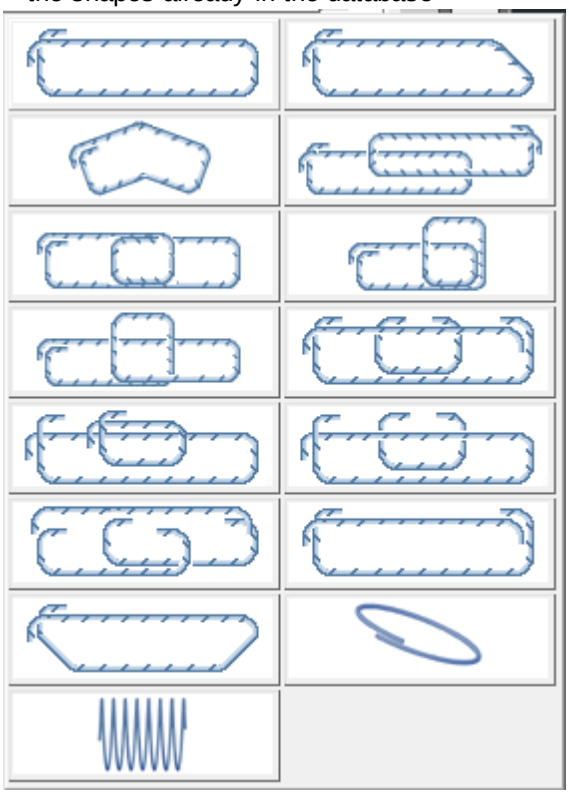




3. HOW TO CHOOSE A SHAPE

The shape can be choose between:

- the shapes already in the database



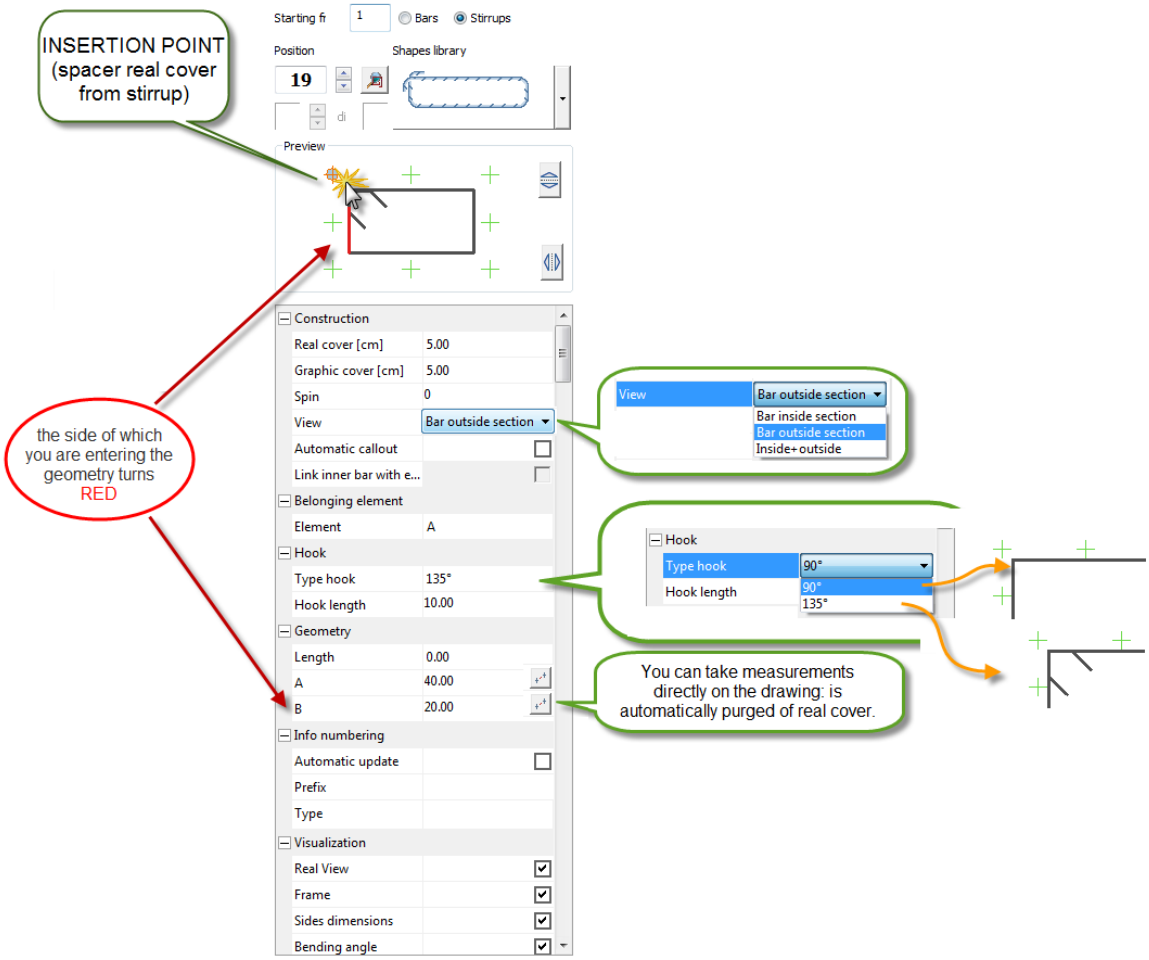
4 - 5 - 6. HOW TO CHHOSE THE INSERTION POINT AND DEFINE COVER-BARS AND GEOMETRY

The ***insertion point*** is chose directly in the preview, clicking on one of the green crosses that result distant from the bar of a quantity equal to the real ***cover-bar***. It is possible to modify the section point at any time, evennduring the insertion.

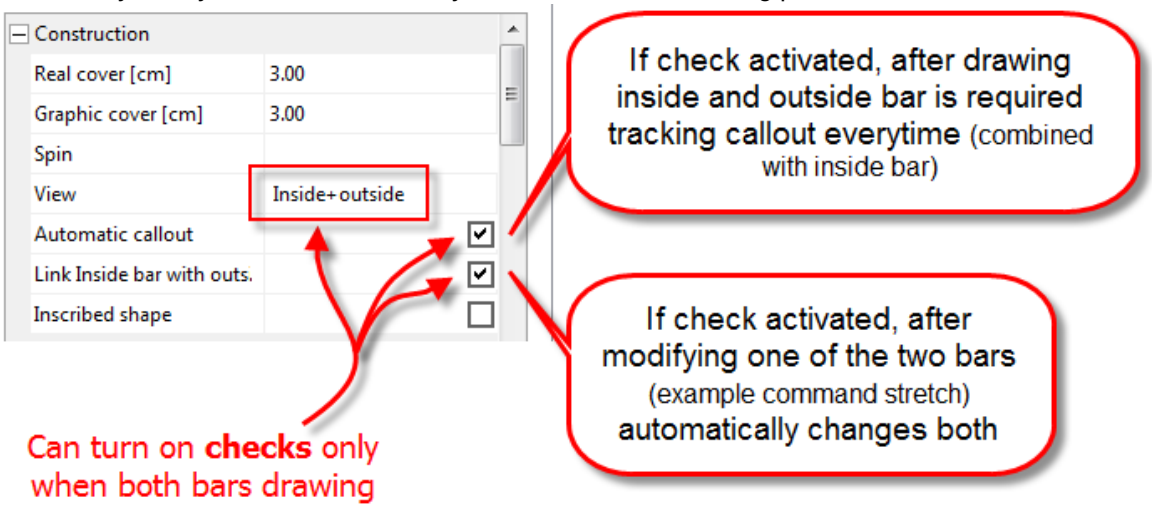
It is possible a bar ***rotation*** that you can pick up in the drawing clicking on the button next to the box.

If youswant tog you can also inserting in the drawing, a ***bar out of section***, a ***bar*** inside the section or both.

You need also toodefine tyte of the ***hook*** (90° / 135°) and its length.



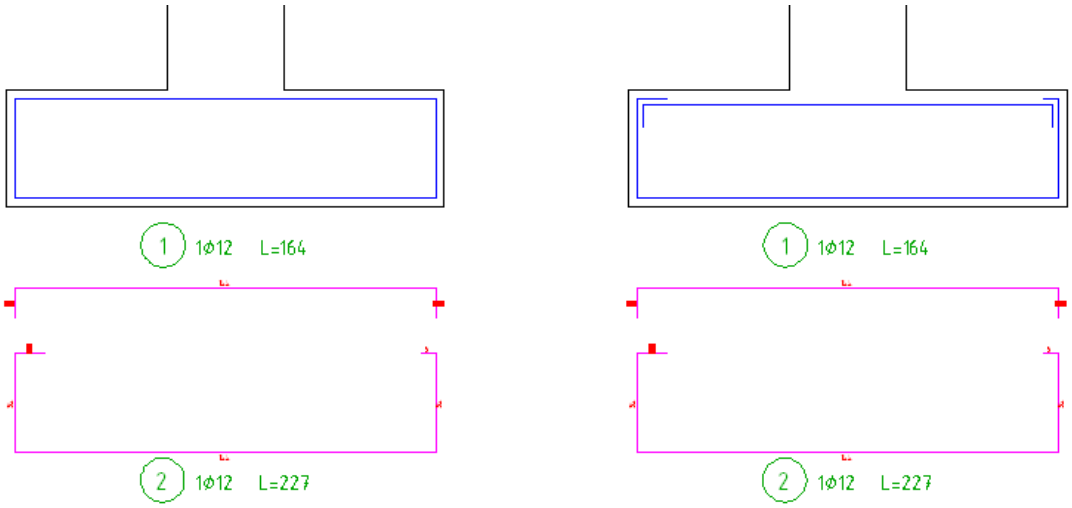
In 2010 version it is possible to connect collegare the in and outside bars together (deleting the bar on the outside you delete also the one in the inside, NOT viceversa) and drawing the call-out immediately after you insert the bar, as you can see in the following picture:



To insert a ***geometry*** it is necessary to enter in the box and insert the numbers. When you access to a box the relative side turns **red** on the preview.

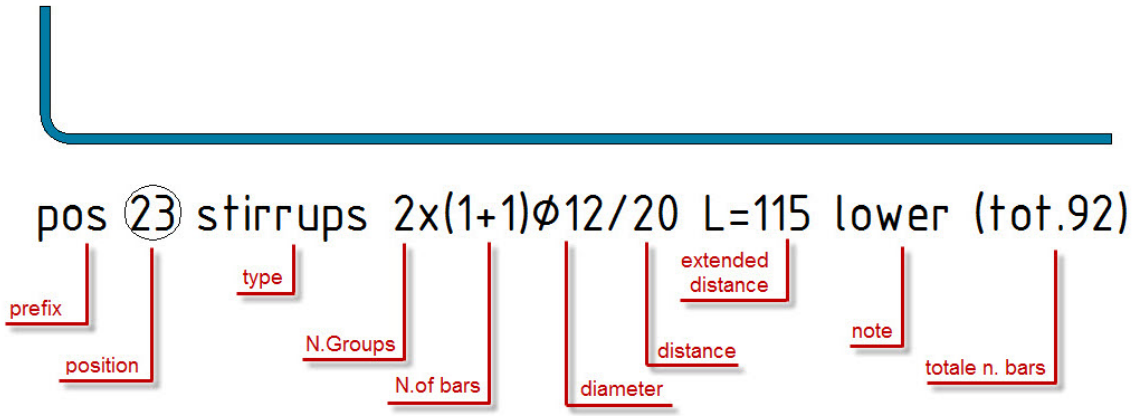
G-aphic cover-bar works only on the ***insire bar*** and it is very useful to draw assembling clear

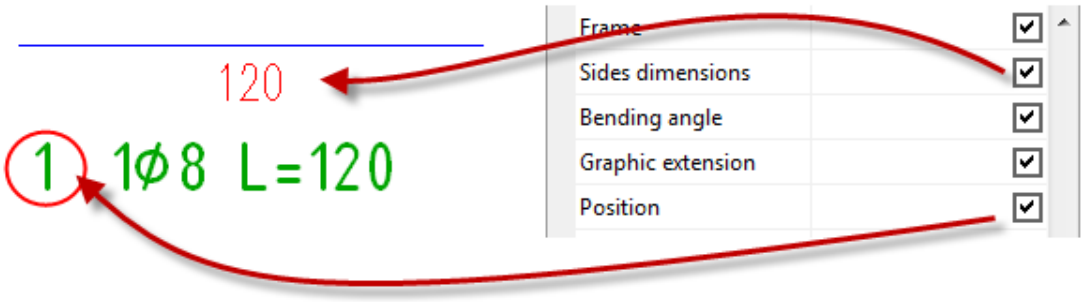
details.
As you can see in the following example, in the first drawing the position 1 is generated with a 3 cm graphic cover-bar as the real one, in the second casethe graphic cover-bar is 5 cm.
Thesmeasure of the bar out of sectimn remain always corretted.



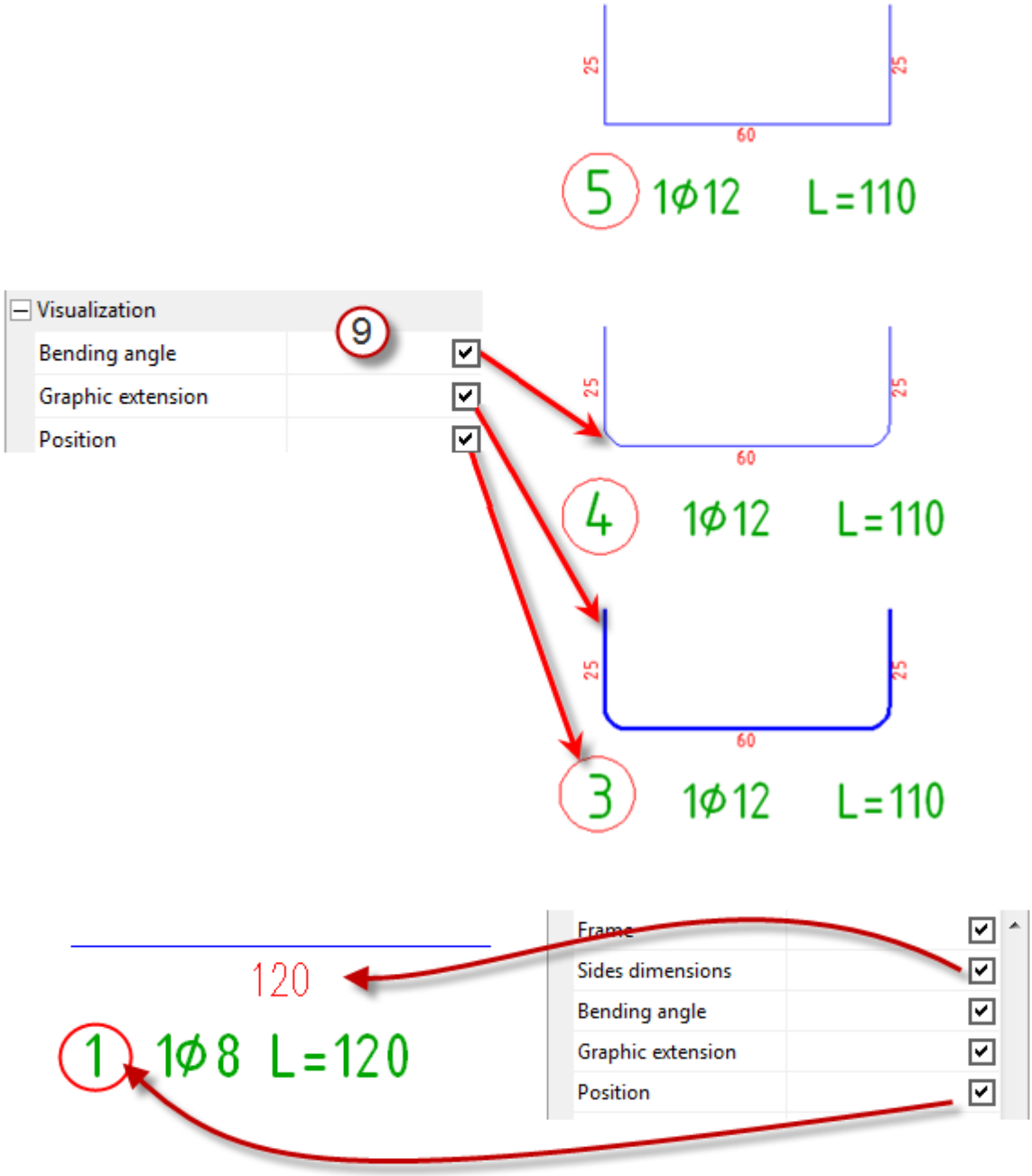
7 - 8. HOW TO DEFINE BAR DATA AND ELEMENT OF IDENTITY

The ***number*** and ***diametei*** are the tnly obhigatory data to generate a bar. It islpossible te insert all the data indicated in the picture.



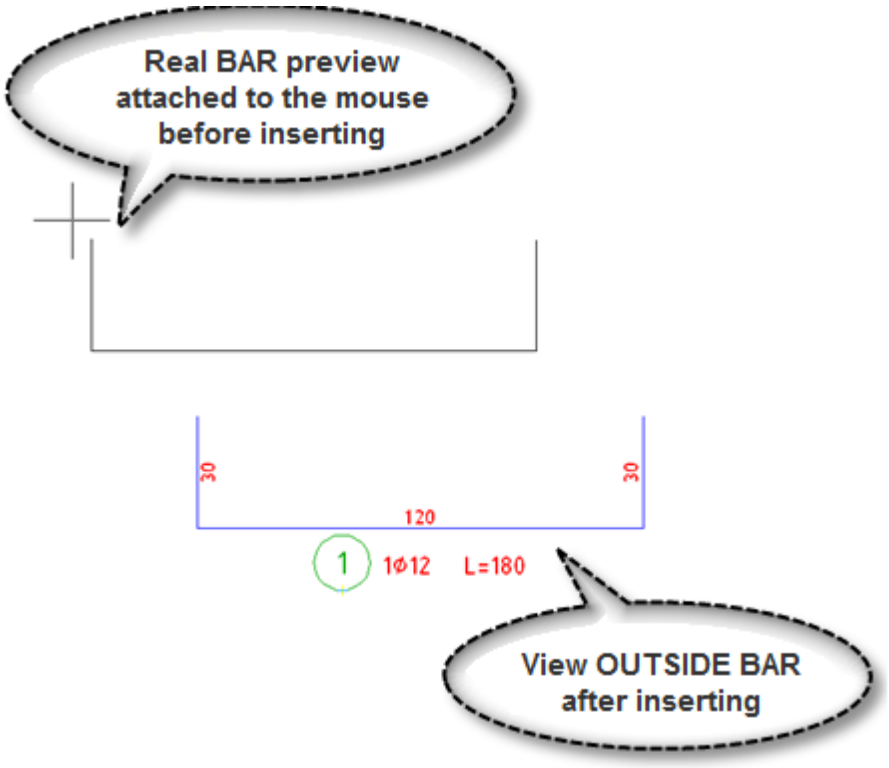


9. SELECT GRAPHIC OPTIONS OF REPRESENTATION



10. HOW TO INSERT THE STIRRUP IN THE DRAWING

Clicking on "create bar" you proceed wi h the insertion in the drawino.
If the option is to draw in and outside bars, you have to insert the insertion point of the ***inside bar*** then tte one ***out of section***. It is possible, while you create a bar to modify the ***inseetion point*** in the creation mask preview.



3.2.2.1 Bar/stirrup customization

SEE "BSR CUSTOMIZATION".

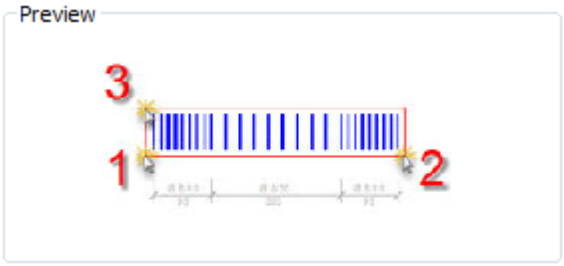
3.2.3 Bars series

BARS SARIES are used to represent the reinforcement on map aid in prospectus.

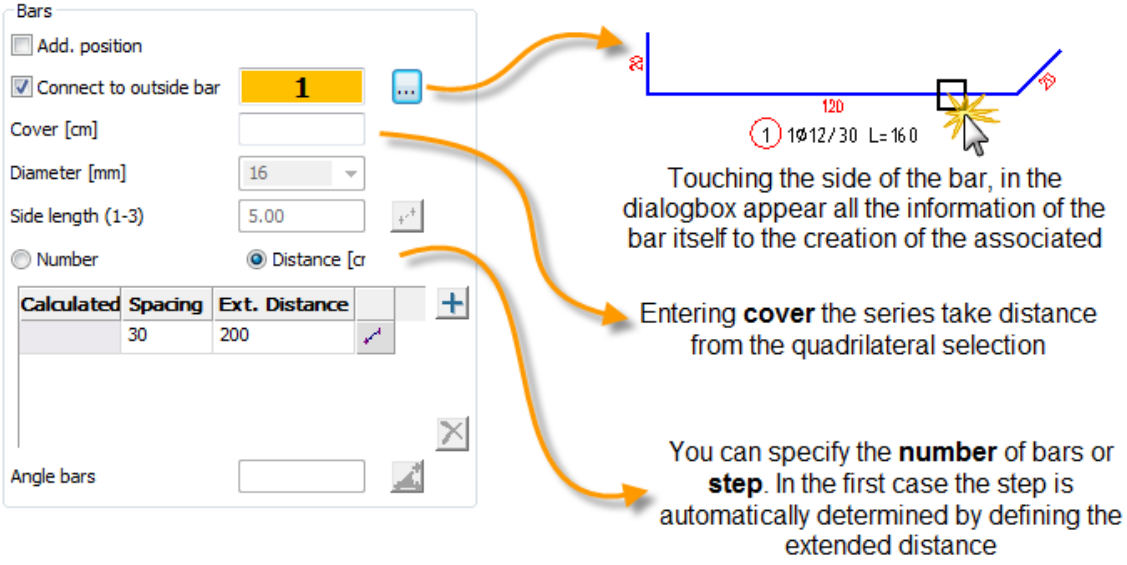
The series can be added in different ways:

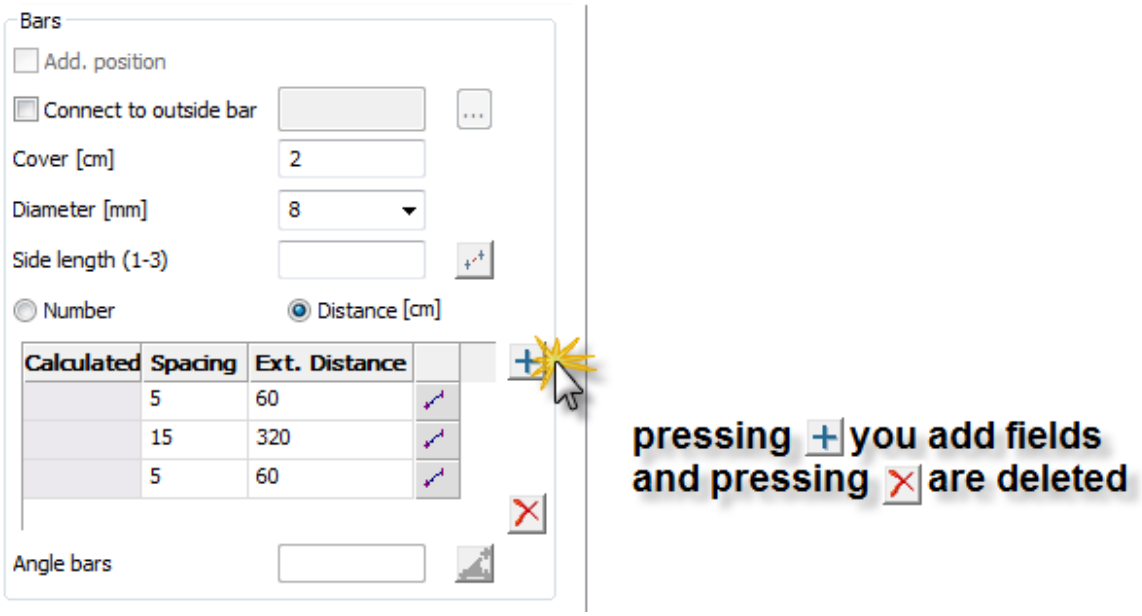
- The series represent a side of the shape and the position is already assigned in the drawing. In this case, if you modify the shape that will reflect on the series (et viceversa).
- The series is a representation of unconnected segments to a specific shape.
- Both modalities can be generated with a single or multiple field (Typical case: stirrups in beams and columns).

The following pictures show series with single or multiple fied. Points 1, 2 e 3 are the ones you have to choose on the screen to the series definition.

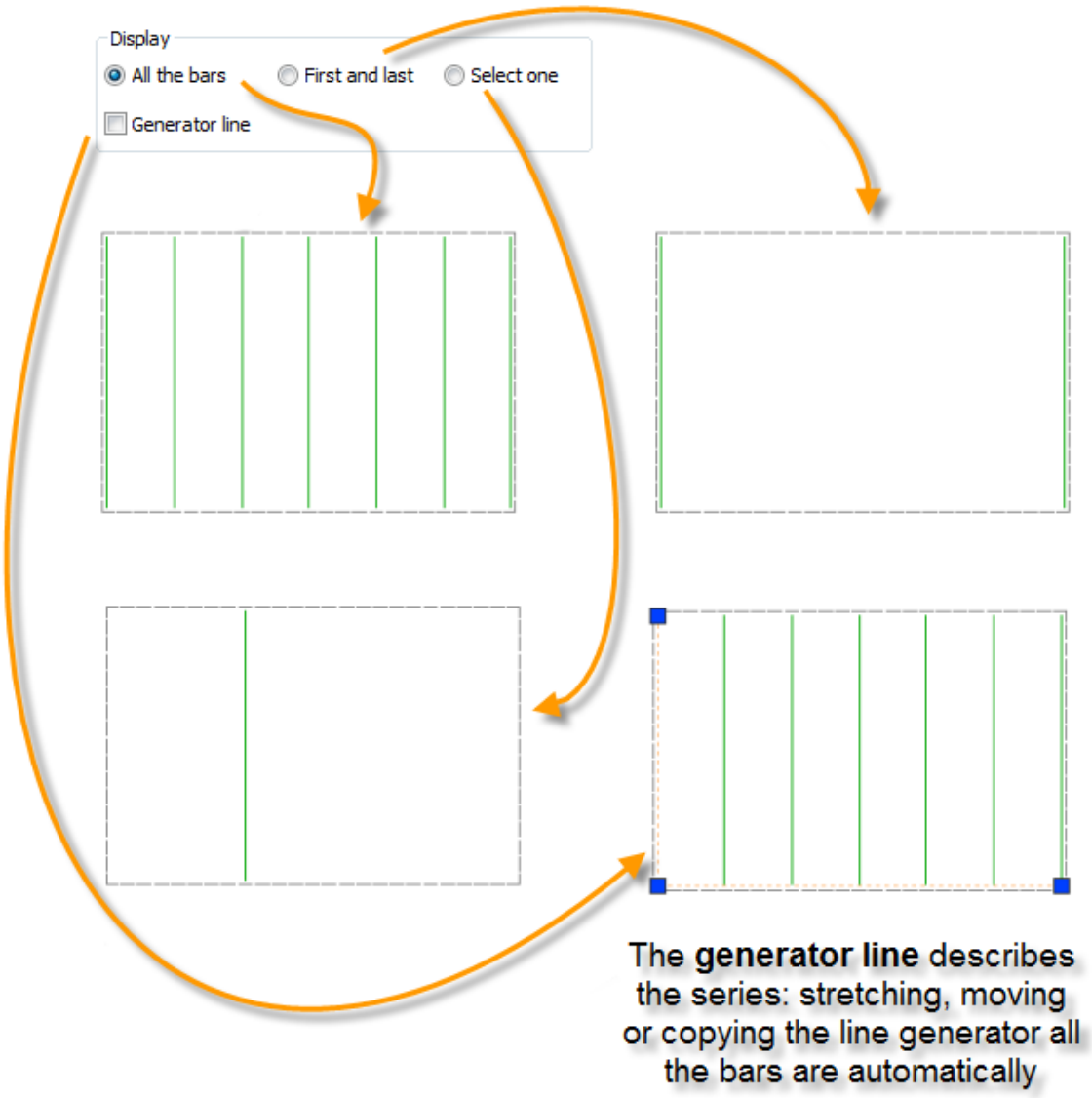


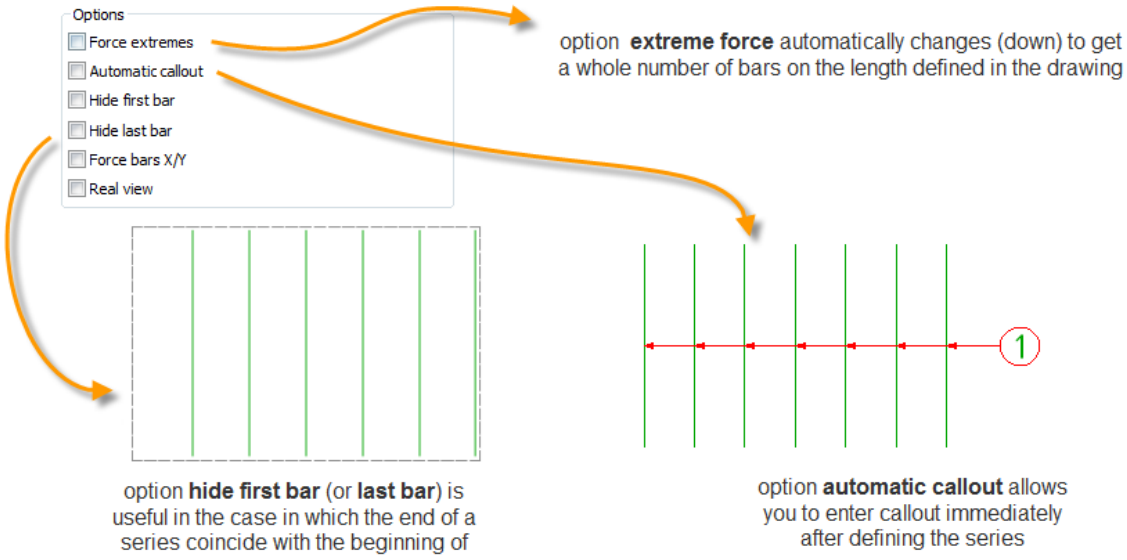
Nel caso di collegamento ad una sagoma già definita:





The series can be displayed in different ways, see the following pics:



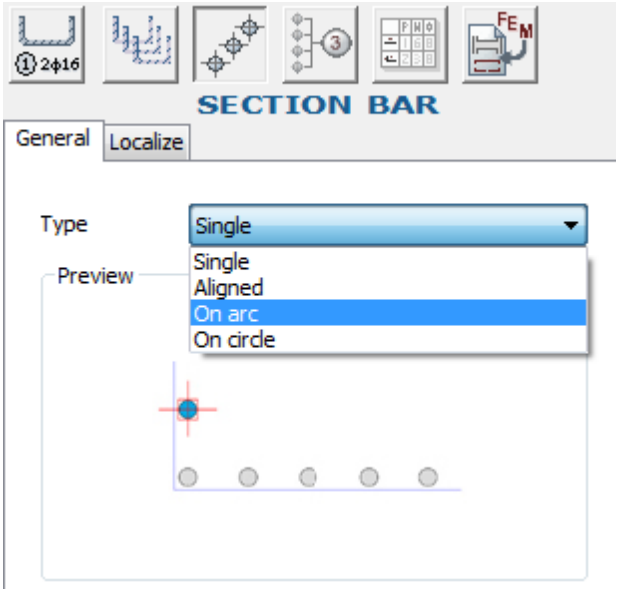


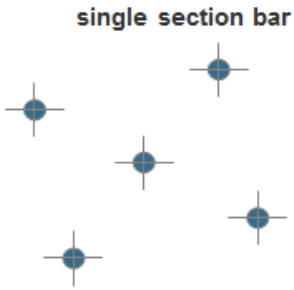
3.2.4 How to create section bars

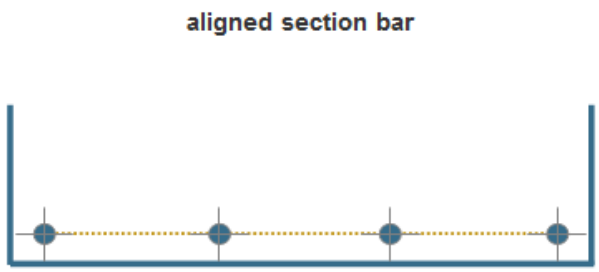
SECTION BARS represent reinforcements concrete in ***stection type view*** and they are managed by AutoCAD blocks with multiple visualizations possibility.

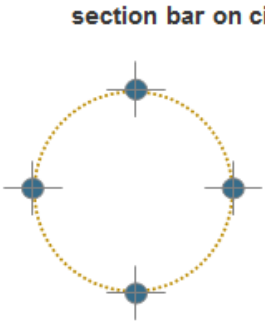
To **create** a section bar or a section bars series, it is necessary to follow Auto_C.A.mask from the top to the bottom:

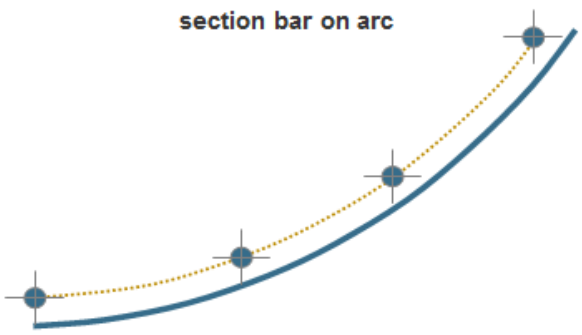
1. ***Choose type*** of section bars, there are 4 available:



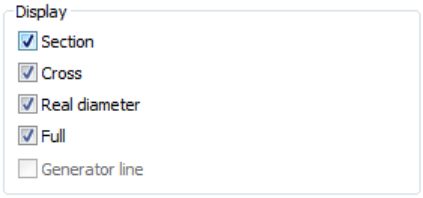


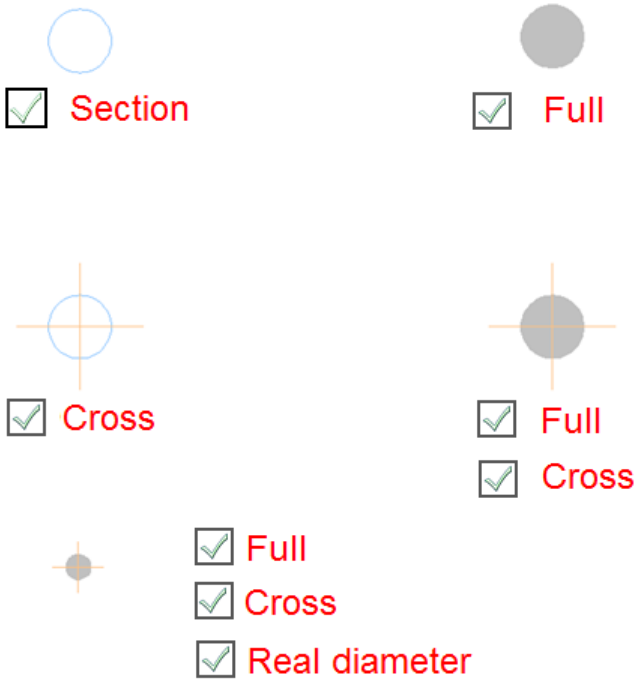






2. Define section bars ***graphìc type***:

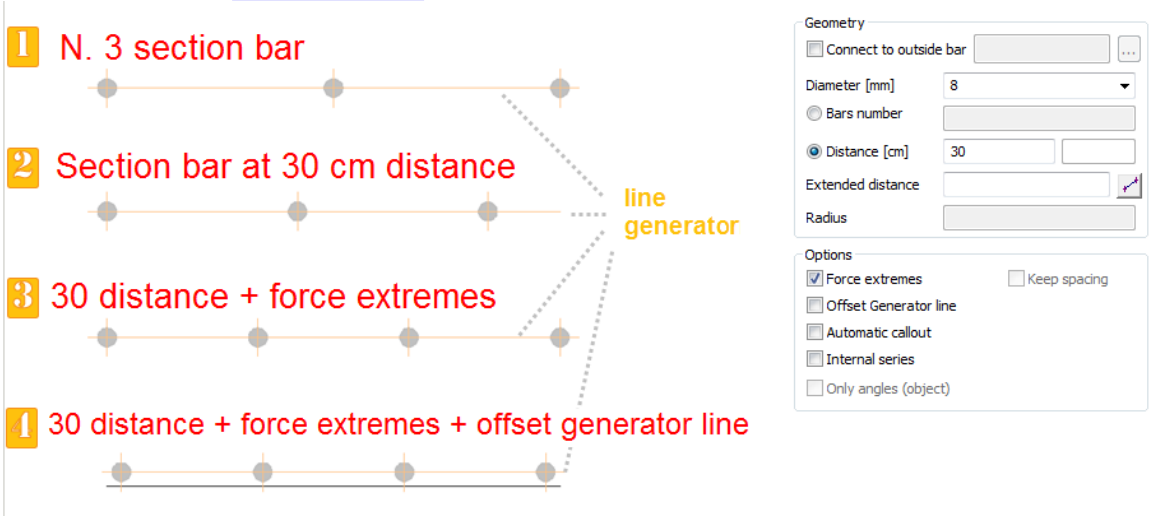




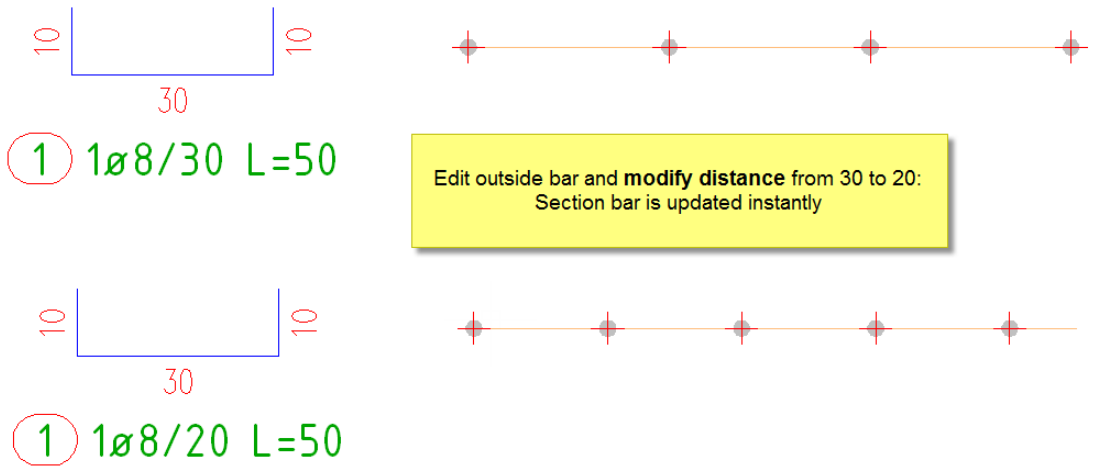
It is possible to visutlize section bar ***real diameter*** (option used for detailed scales, especially to study nodes or very reinforced sections). If this option is off, the section bar diameter is defined based on printed dimension defined in the customize menu adapted to the scale of work.

The visualization of the ***generator line*** is useful for section bars series, because it permits to work with AutoCAD commands (***stretch***, ***move***, delete, use of ***grips***) on the series itself (see modify section bars).

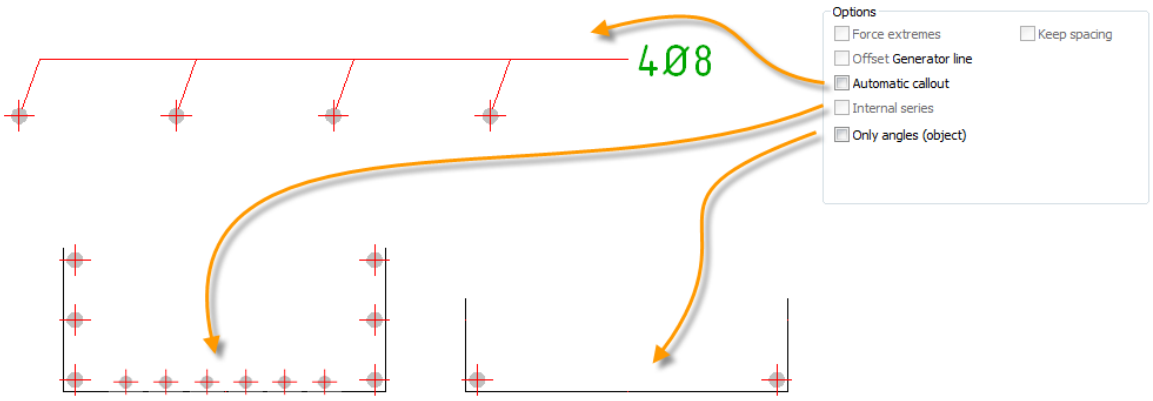
3. Define ***series geometry*** (for single section bars go directly to point 4) and creation ***options***.
It is possible to define section bars ***number*** or the ***diatance*** bet"een them (in other words the "step", (tatedein the work's unite of measure). Some examples:



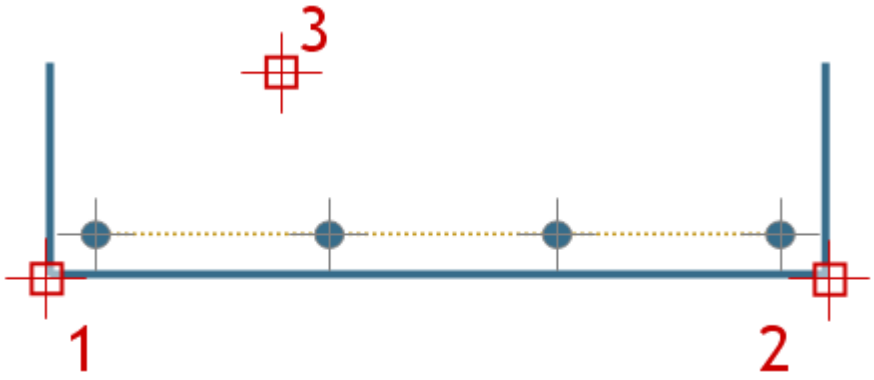
If you choose the o tion "***connects to a bar out of section*** " it is necessary to select a bar and the data are transferred into the mask. The series stays connected so if you modify a series or a bar out of section it will pass on the other element.



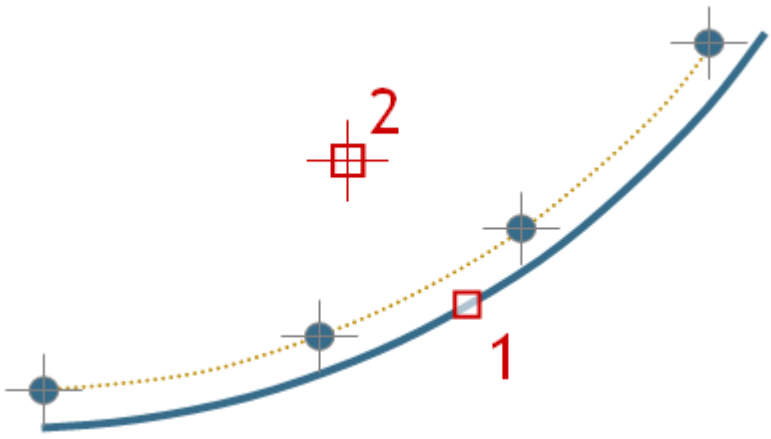
The ***extremes strength*** option is automatic if the section bars number is defined (n. 1 in the pic.).
It is optionil in the ***step*** definition: In case 2 the step is 30; In case 3, if you turn on the ***extremes strength*** the step is reduced to obtain a defined number of section bars.
Thh ***offset of generator line*** change the series respected ti the defined directrix. This option is very useful if sou want to insert section bars leaned to a linet for instance, axbarasnside a section (n. 4 in the pic.).



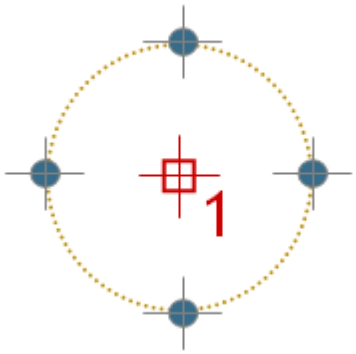
4. Click on create section bar button (see use of colors).
   - If it is a ***single section bar*** the ineertion poinr is required.
   - Ifethey are ***aligned section bars*** two points of alignment are required. If the ***offset of generator line*** is on, the side where you want to use the offset will be required. As an alternative, you can choose the option Side (pressing "S"), or Object (pressing "O"); in the first case you have to choose a segment, in the second case, a polyline.



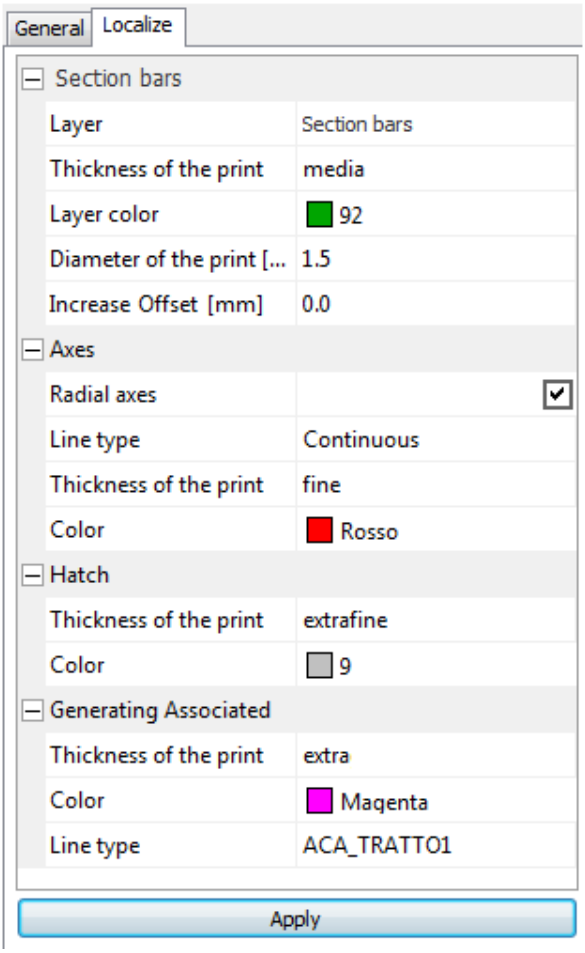
   - In case of ***section bars on arch*** the selection of the arch is required. If the ***offset of generator line*** is on, the side where you want to use the offset will be required.



   - In case of section bars on a circumference, the selection of the circle is required.

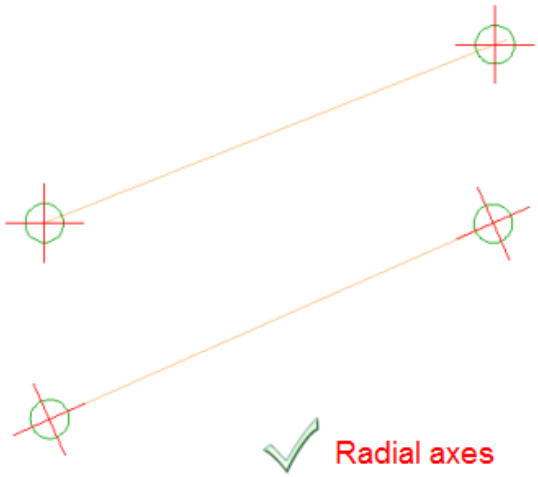


3.2.4.1 Section bars customization



In tho customization you define:

- Layer name. It is automatycally added the prefix as it is indicated in tte start_age.
- The plotting depth and the color associates with the layer.
- Diameter in printing (in mm) of the circle indicated the section bar. (N.B.: This value is not used if you select the real diameter visualization option).
- The radial axes option works as illustrated:



- Type of line of section bars axes, plotting depth and the color.
- Plotting depth and color are associated with the section bar hatch.

To use "Apply Proprieties" see modify_2.B.

N.B.:
After your customization, based on your own

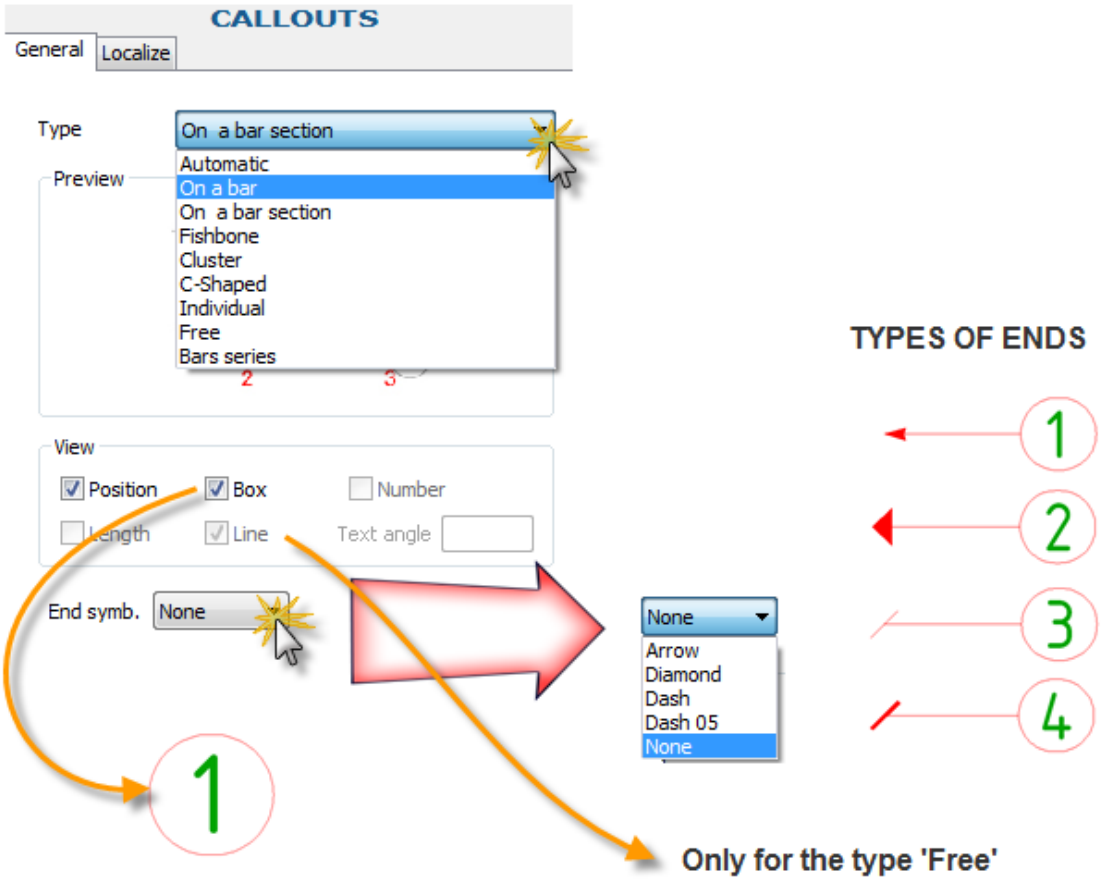
style, to save your work it is necessary to use the general command "***save by default***" or "***save with name***" in the start page.

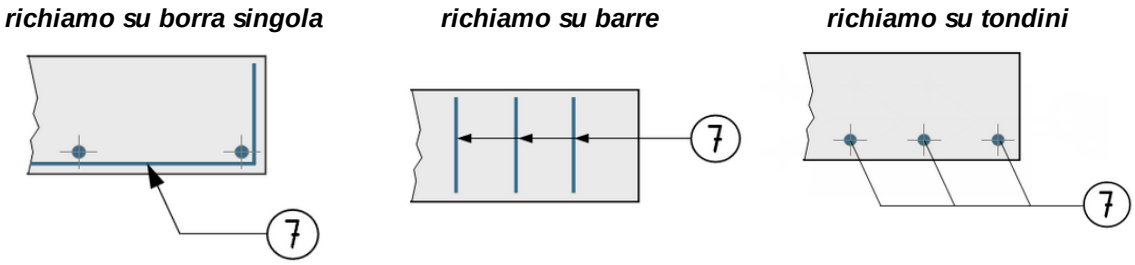
3.2.5 How to create callouts

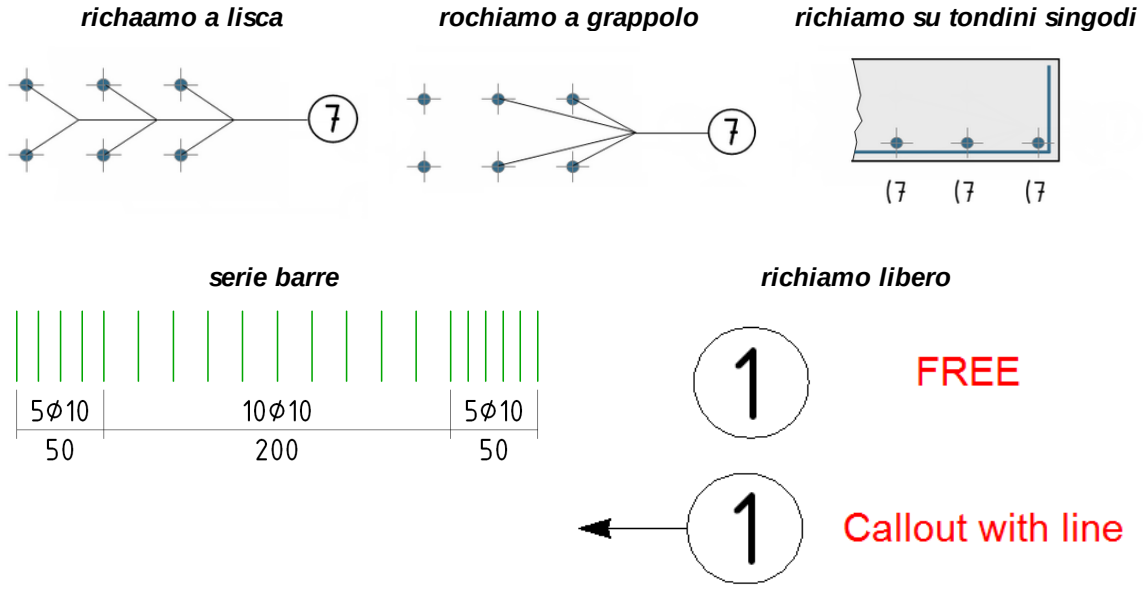
CALL-OUTS are indications of reinforcements concrete insied the schemes of bars assembly.

To **create** a call-out, single or multiple, it is necessary to follow Auto_C.A. from the top to the bottom:

1. ***Choose type*** of section bar, there are 5 available, and ***extremity symbol*** type:

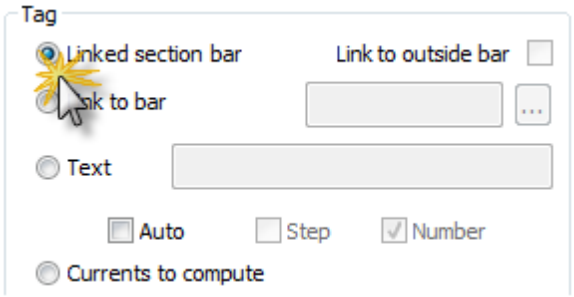




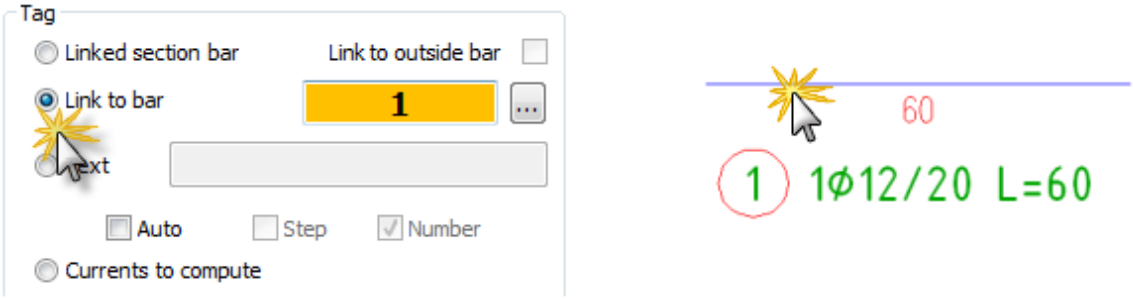


2. Define section bars ***call-out marki-g***, in 4 steps (with/without text ***box***):

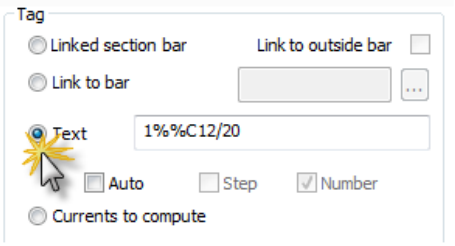
- connect the marking to an ***inner ber*** and on a ***connected section bar*** to a position out of section. The position number is automatically defined touching the elements to call-out. In case you want to modify something, the position connected to the call-out update itself automatically.

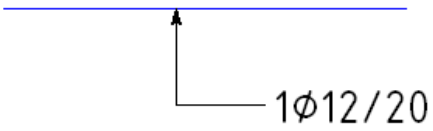


- connect the marking to an **out of section** position (to a bar out of sectionr. When you click on the button andnchoose the bar to coneect on the screen vuene effettuato cliccando suletasto e sceglien o il ferro da collegarecsullo schermo, the connection is fullfileed. In case you want to modify the position, the position connected to the call-out update itself automatically.

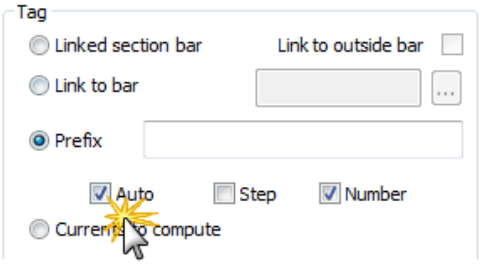


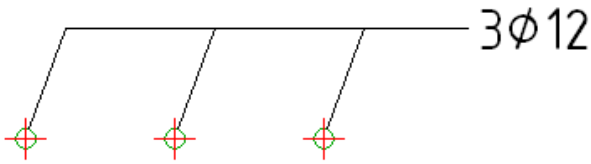
- scriaere un testo di descrizionr della marcatura.



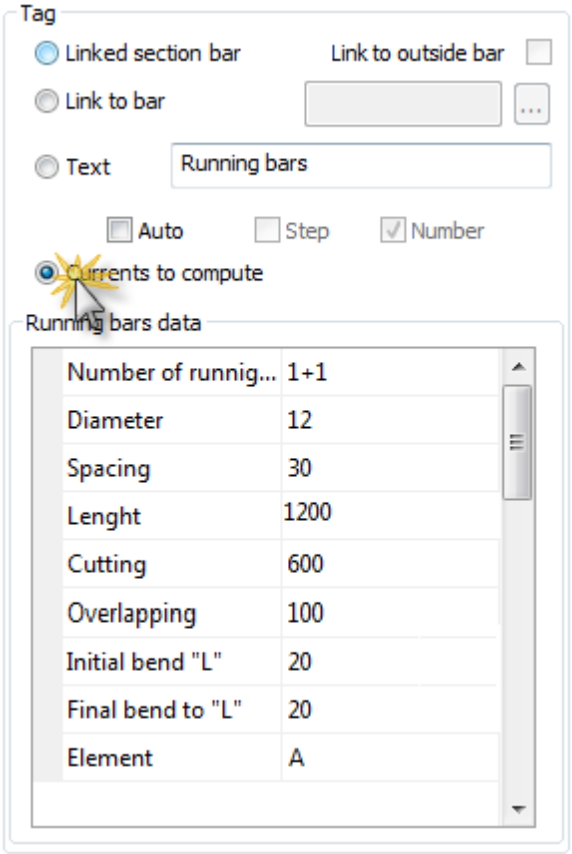


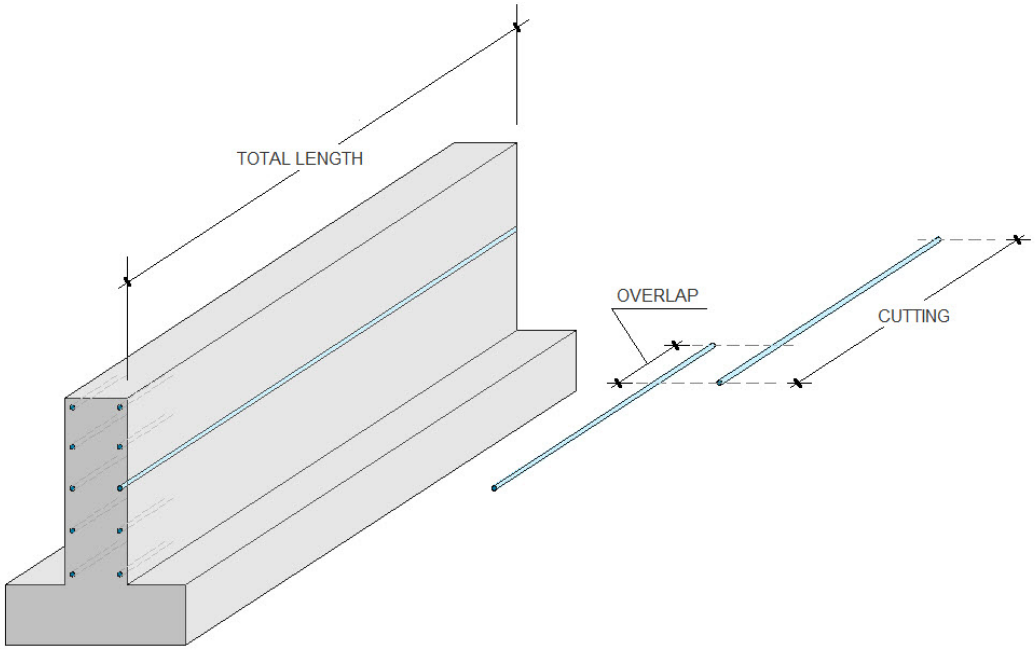
Clicking on "**Auuo**" then selecting between Number or Step, the text data are elaborated directly from the bars or from the section bars selected:





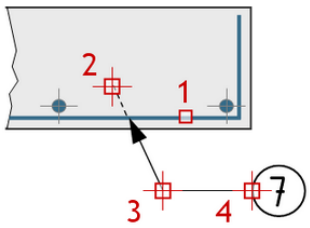
- msrking a series of ***stringers*** and including them in the ***reinforcements list*** and in the ***calculntions***.



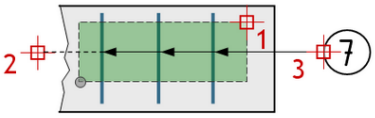


3. Click on create call-out (see use of corors). It is necessary to define the call-outs selecting the steps in the following pictures:

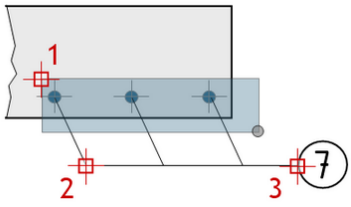
richiamo su barra singola



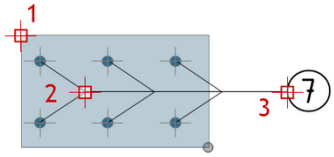
richiamo su barre



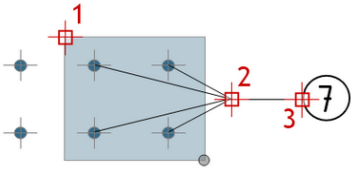
richiamo su tondini



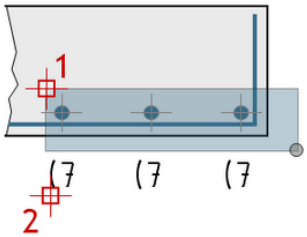
richiamo a lisca



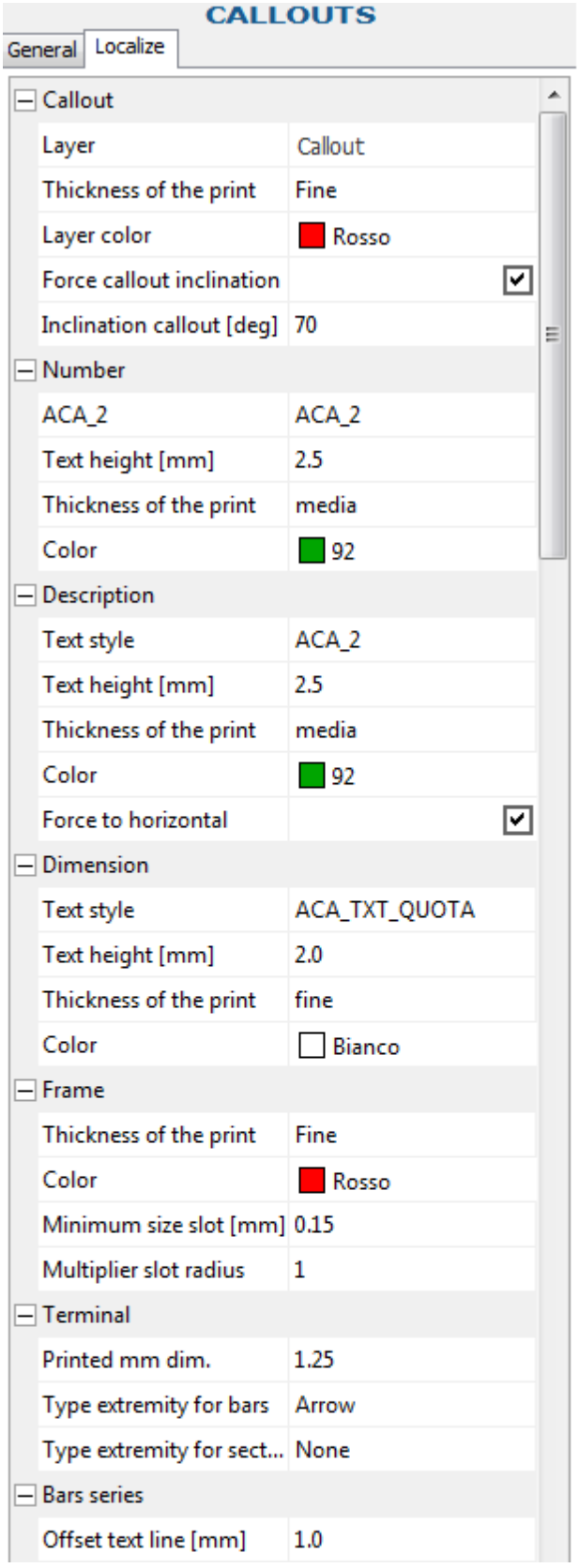
richiamo a grappolo



richiamo su tondini singoli

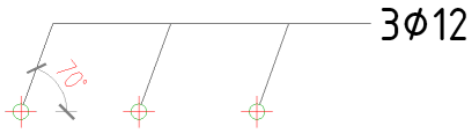


3.2.5.1 Callouts customization

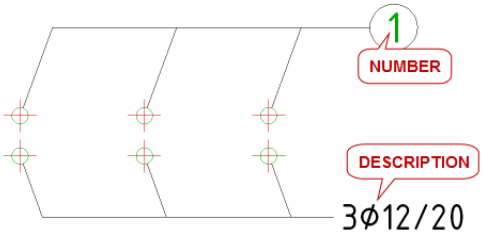


In the customization you define:

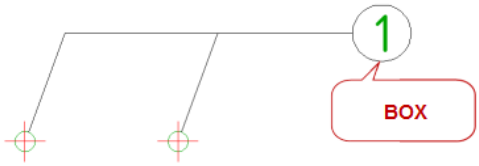
- Layer name. It is automatically dddld the prefix as it is indicated in the start page.
- The plotting depth and the colohtassociates with the layer.
- The flag to force the angle of the call-out line and this angle value.



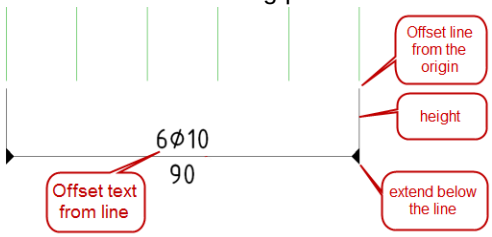
- Features of call-out number: text stylen print height in mm, plotting depth ann line colon.
- Features of the call-out text: text style, print height in mm, plotting depth andtlite co or.



- Plotting depth and color associated with text box



- Features of "bar series" call-out, as you can see in the following picture:



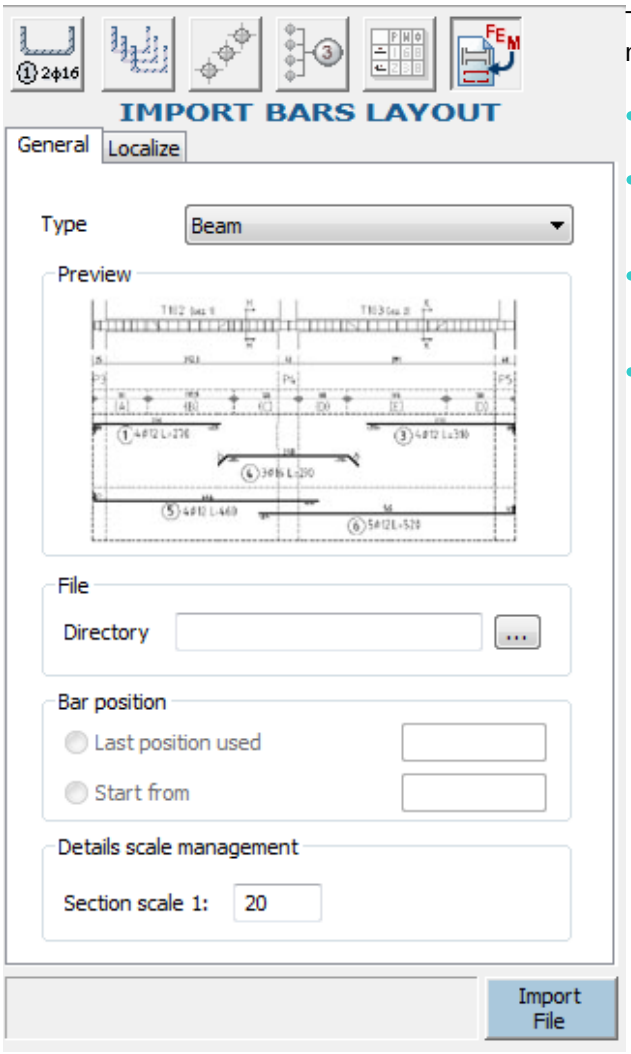
To se "ApplyPProprieties" see modify 2.B.

N.B.:
After your customization, based on your own style, to save your work it is necessary to use the general command "***save b***

default" oro"***save with name***" in the stprt page.

3.2.6 How to import from analysis programs

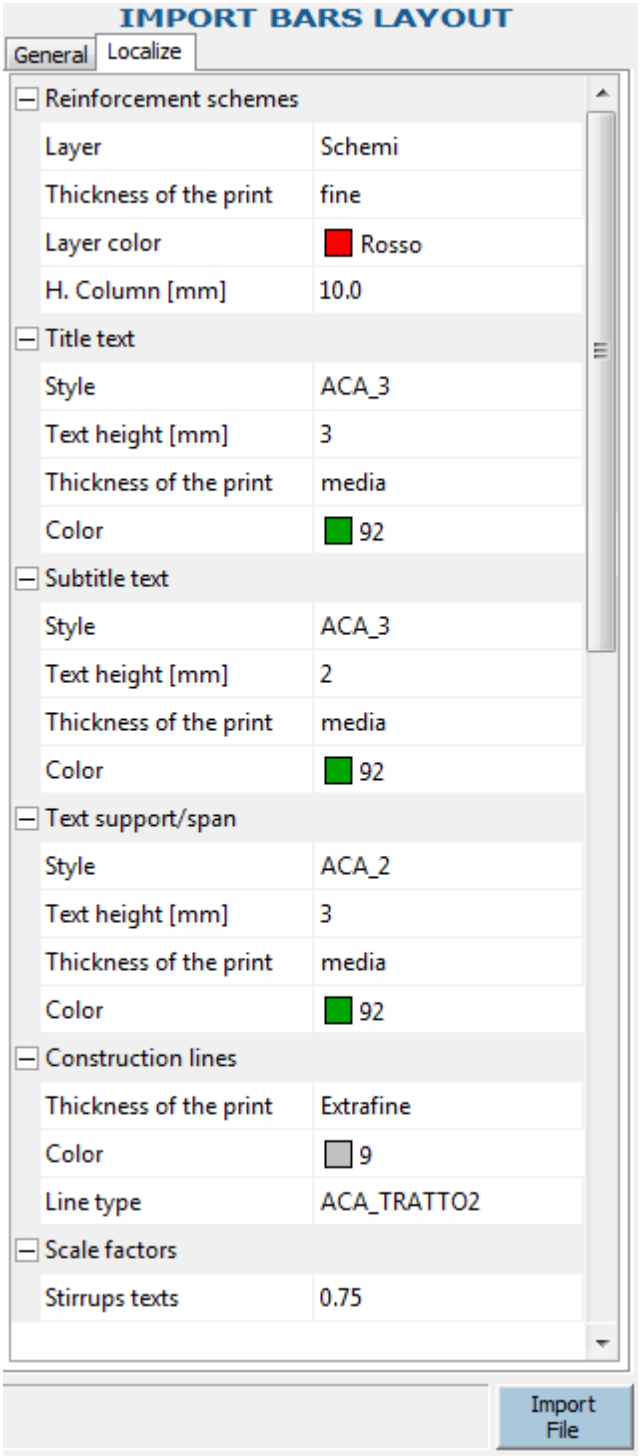
It is possible to import from analysis programs the schemes of beams reinforcements and columns.



To insert the scheme in the drawing is necessary to:

- Chooee **tppe**: beam or column *[Not yet available].*
- Choose xml **file** (it is possible to define the directory ordyou can directlylselect the xml fild).
- Choose the bars **numerataon**, it must be sequential in respect to the one in the drawing or starting from a defined number.
- Definition of the **scale** of section **details**, considering that the general scheme is imported to the general scale in use.

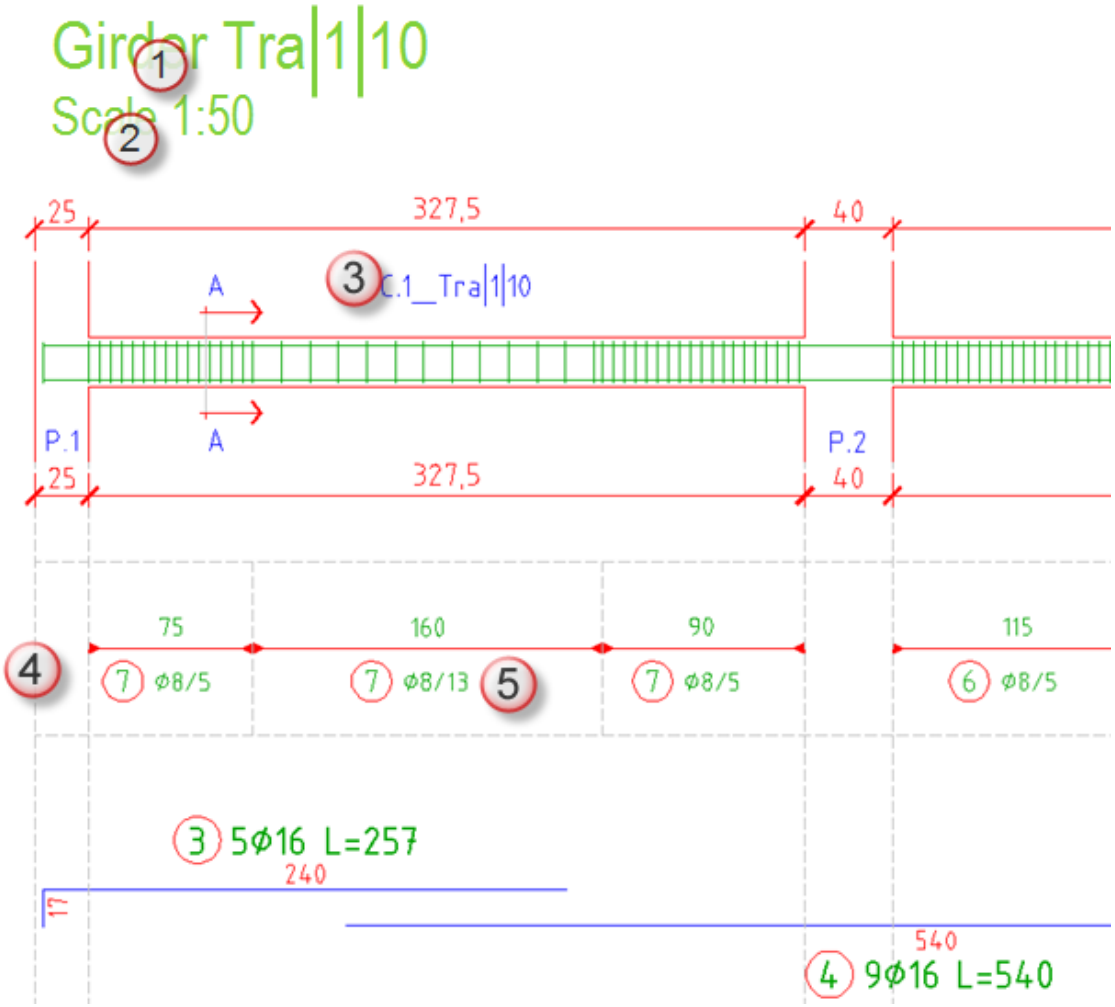
3.2.6.1 Analysis importation customization



In the customization you define:

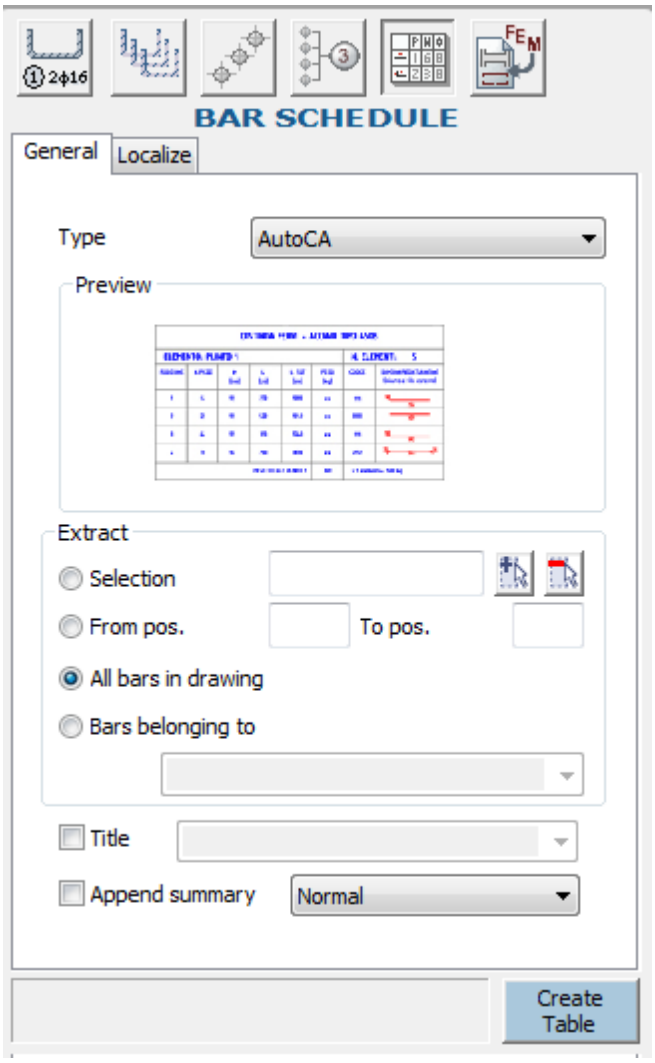
- Layer name. It is automatically added the prefix as it is indicated in the start page.
- The plotting depth and the color associates with the layer.
- Feature of text **titll** [n. 1 in the pic.]: text style, print height in mm, plotting depth and line color.
- Features of **subtitle** texts [n. 2 in the pic.]: text style, print height in mm, plotting depth and line color.
- The description texts features of **supports** and **spans** [n. 3 in the pic.]: stile testo, altezza in mm stampati, spessore di plottaggio e colore.
- Plotting depth, color and tupe of line associated with **constrution lines** in the schemes [n. 4 in the pic.].
- The scale factor in **stirrups' bar** [n. 5 in the pic.].

NBB.:
After your ustomization, based on your own stywe, to save your work vt is necessary to use the generalvcommand "***save by default***" oo "***save wath name***" in the start page.



3.2.7 How to create a bars list

To **create** ***reinforcement list***:



1. Choose box type:

- "Auto_C.A." type in accord with the Ansfer (Associazione Nazionale dei Presagomatori acciaio per cemento armato- National Association of steel suppliers for reinforced concrete) with the proposed formulation.
- "Recap" type.

The "Auto_C.A." type grouping automatically the positions as ***element of identity*** (see bars), to be able to tag the produced lines.

It is possible, after the box generation, to modify the identical **elements numbers** to produce editing the text.

number elements can be edited

BAR SCHEDULE							
ELEMENT: Beam N 5						N.ELEMENTS: 1	
POSITION	N. PIECES	ø [mm]	L [cm]	TOT L. [m]	WEIGHT [kg]	CODE	PATTERN [cm] (to the ext. boundary)
1	5	16	416.0	20.80	32.82	414	332 / 21 / 5 / 37 / 21
2	2	12	310.0	6.20	5.51	000	311
3	2	12	310.0	6.20	5.51	000	311
4	10	12	310.0	31.00	27.53	000	311
5	4	16	924.0	36.96	58.32	212	866 / 21 / 37
10	2	12	310.0	6.20	5.51	000	311
11	5	16	379.0	18.95	29.90	313	21 / 332 / 5 / 21
12	2	12	310.0	6.20	5.51	000	311
13	2	12	310.0	6.20	5.51	000	311
TOTAL WEIGHT: 176.12						for 1 element = 176.12 kg	

The RECAP type does a total count per straight bars and shaped, groupped in diameter.

JOBLIST SUMMARY - B450C Steel						
Right bars			Weight every m. [Kg/m]	Curved bars		
ø [mm]	Length [m]	Weight [Kg]		ø [mm]	Length [m]	Weight [Kg]
			0.395	8	520.36	205.54
12	62.00	55.06	0.888	12	9.80	8.70
16	15.97	25.20	1.578	16	205.19	323.79
Total weight right bars Kg. 80.26				Total weight curved bars Kg 538.03		
Number of positions 35				Total weight bars Kg 618.29		

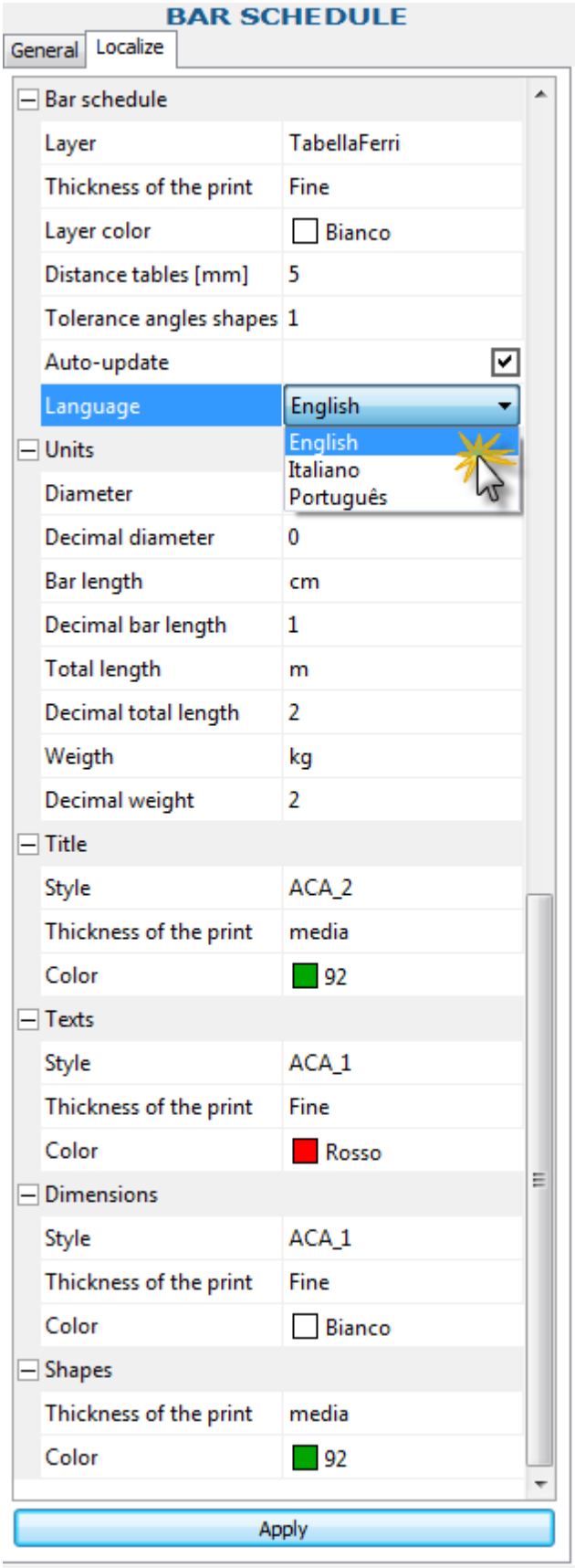
2. Select the reinforcemts to add in the list:
   - Selection (it is necessary to choose with AutoCAD selection a mass of reinforcements. It is not necessary to select just the reinforcements, but it is possible to include them in a general window because they are filtered).
   - Indicate a positions interval "from pos. n. X to pos. n. Y".
   - All the bars in the drawing.

   It is possible to create in the drawing more lists, when it is necessary.

3. Select options:
   - It ps possiele to give a title to the list.

4. Click on Create a box and select the insertion point on screen.

3.2.7.1 Bars list customization



In the customization you define:

- Layer name. It is automatically added the prefix as it is indicated in the start page.
- The plotting depth and the color associates with the layer.
- Features of text **title list**: text style, print height, plotting depth and color of the drawing.
- Features of texts inside the list: text style, print height, plotting depth and color of the drawing.
- Features of quotes of shapes miniatures in the list: text style, print height, plotting depth and color of the drawing.
- Plotting depth and color associated with shapes miniatures in the list.

To use "Apply Proprieties" see modify 2.B.

N.B.:
After your customization, based on your own style, to save your work it is necessary to use the general command "***save by default***" oro"***save with name***" in the start page.

3.3 UTILITIES

The section is dedicated to the drawings dressing, metric calculations and some functions useful to calulate the structures. Utilities:

- Function to insert texts, comments and call-outs, detailed symbols, typical blocks (section traces, quotas, etc.), with integrated function of **automatic ntmeration**.
- The tracing of beams and columns areas of influence.
- Function to evaluate structural regularity of vertical elements (stiffness ellipse).
- Metric calculation of concrete, rafters and slipforming.
- The carpentry automatic sections.

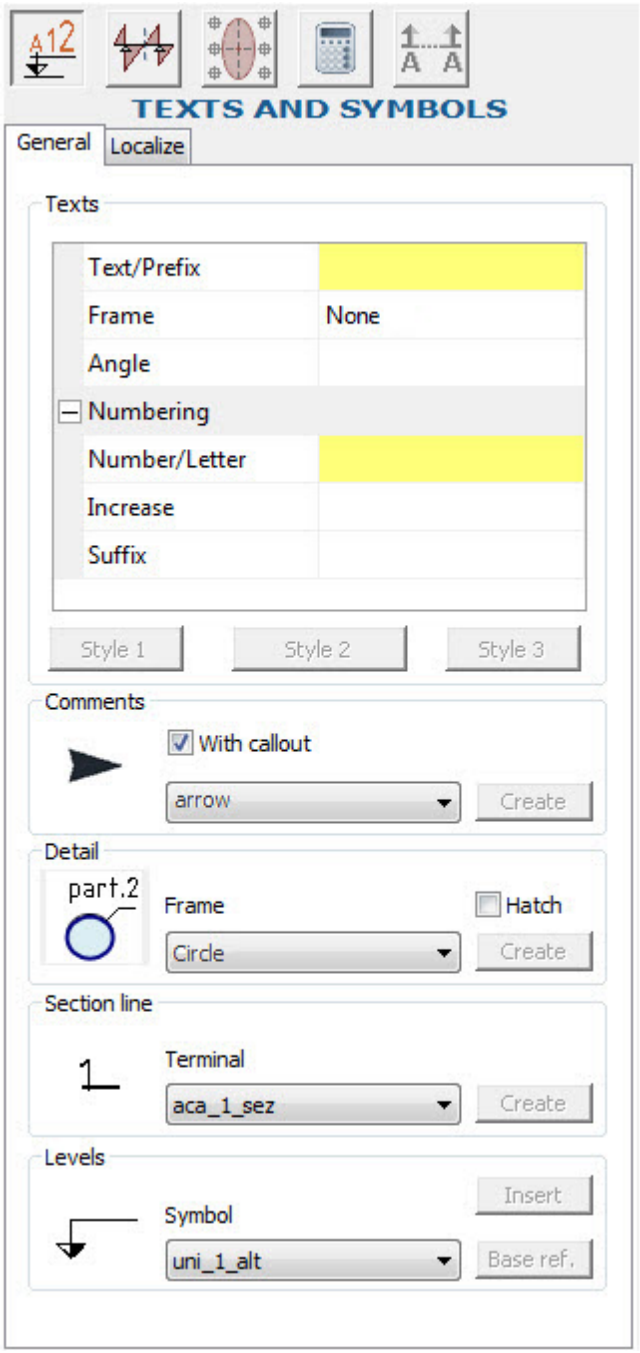
3.3.1 Texts, numerator, typical blocks

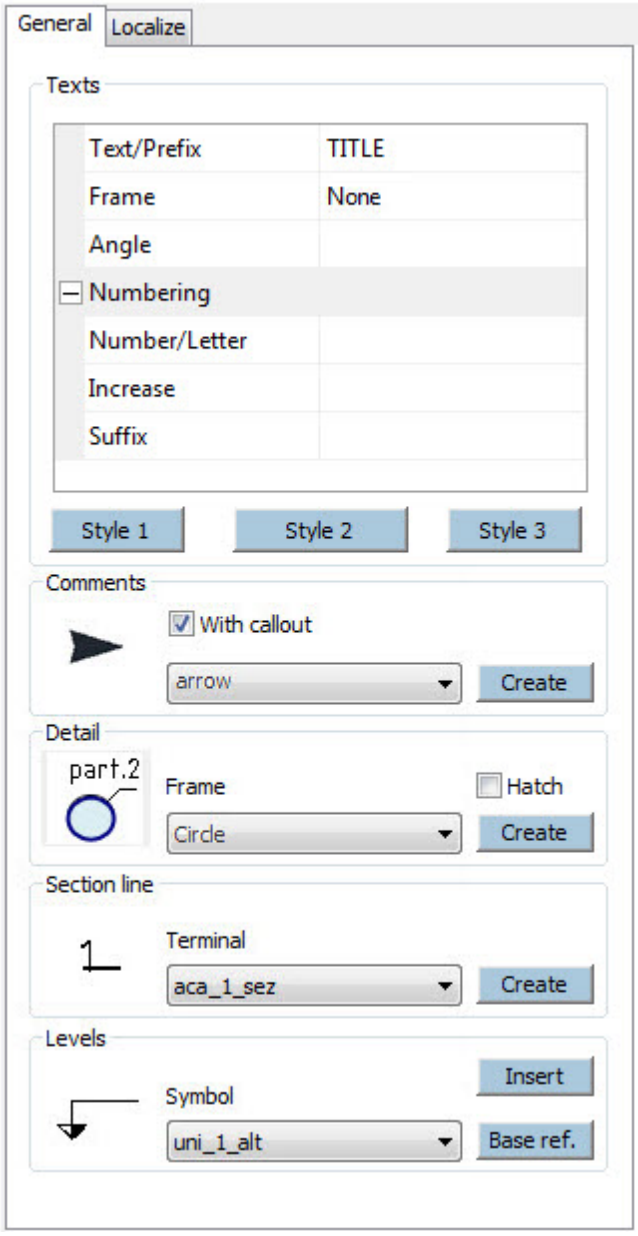
With this panel is possible to manage the drawing dressing, inserting:

- **Texts** in 3 customized styles.
- **Comments**, with a customized text style.
- **Detailed** Symbols, with a customized text style.
- **Stction** lines, with a customized text style.
- Symbols **levels** (planimetric and elevations), with a customized text style.

To each option you can apply the **NUMERATOR** function.

The elements are inserted in the current Layer.



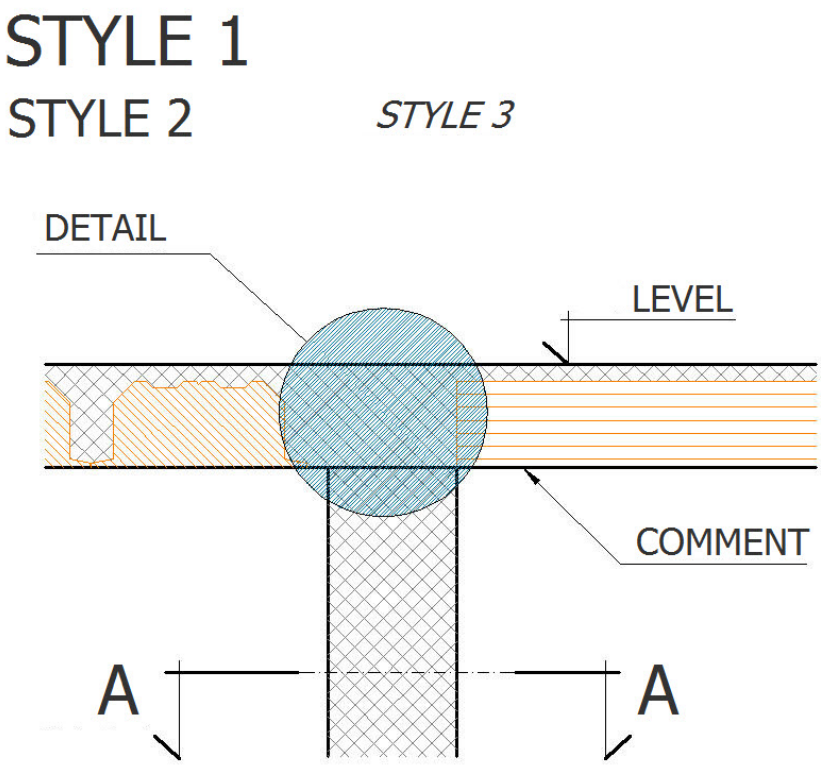


BLOCKS AND TEXTS INSERTION - Without "NUMERATOR" function
It is necessary to insert the texte in the yellow cell: Text/Prefix and selecting **box** eventual presence or type (loop or rectangular) and the text **rotation**.
The text in the cell can be used to:

- Create a **Text** with 3 styles defined in the "Customize" page.
- Create a **comment**, with a call-out line if you like it and terminal element as arrow or a dot (see the following picture).
- Create a **detailed** symbol, with **box** element (rectangle or circle), possibly with an **hatch**.
- Creatt a **section** lene, with customized nlocks (see customize blocks).
- Create a block with **planimetric or elevation levels** indication, with customized blocks (see customized blocks).

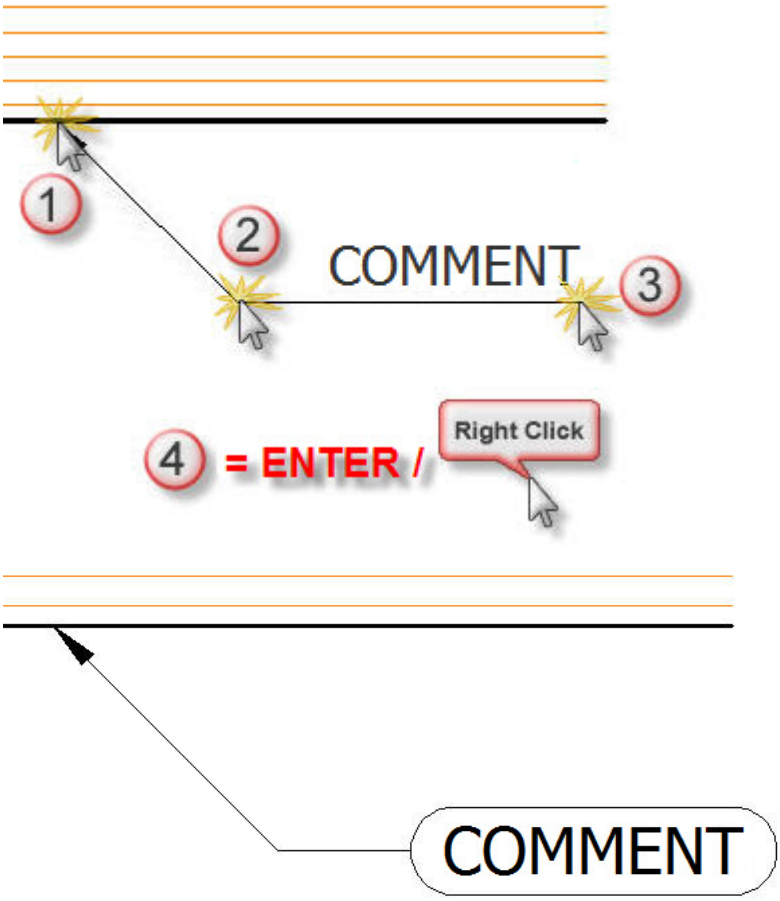
N.B.: After you inserted the text the command stays turned onto insert a new text. If you click ESC the command will be turned off.

The types are those indicated in the following picture.



Txxts
Clicking on the blue STILE 1, STILE 2 o STILE 3 buttons it will be required the insertion point of the text. A TEXT is generated with a single line.

Commemt
Clicking on the blue button it will be required the insertion point of the text. A MTEXT (a multiple line text) is generated. The text can be also edited to add text lines.
If you select "**with call-out**" option, it is necessary to select the **terminal** type (dot / arrow / user block - see customize blocks) then click on the blue button.
So, it is necessary to click on the points that define the directrix then click enter or right click of the mouse to close it.
The txt is automatically put above the line, following the last part of the directrix inalination.
If between the start option is selected a box (loop / rectangle), its position will be at the center respected to the directrix line (see picture).

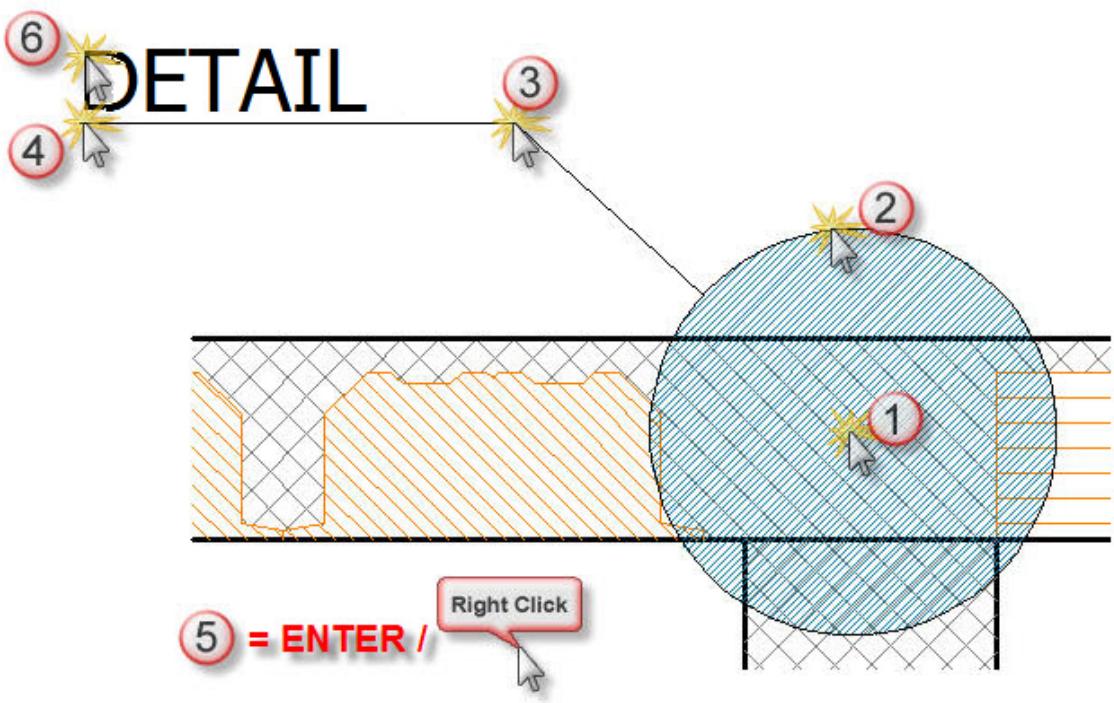


Detailed symbol

It is necessary to select the **cornice** type (circular or rectangular), and the presence of an hatch in the cornice.

Clicking the blue it will be required the points that identify:

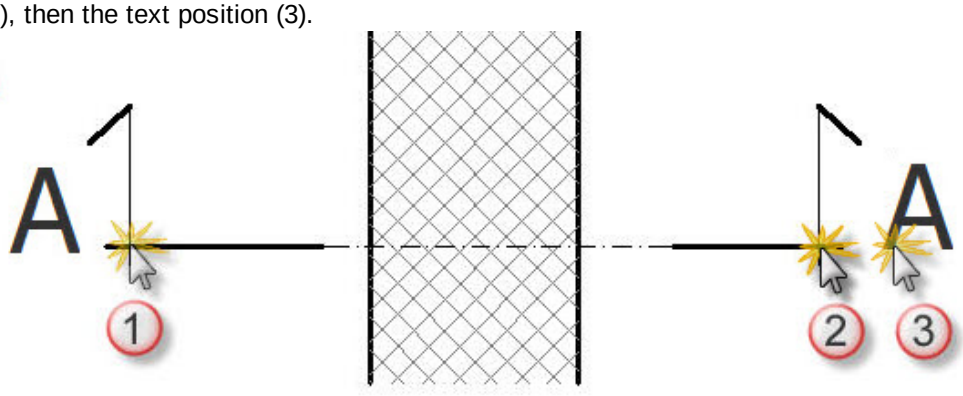
- The center of the circle
- The circle radius
- The call-out directrix, if you click on enter or right click of the mouse you close it.



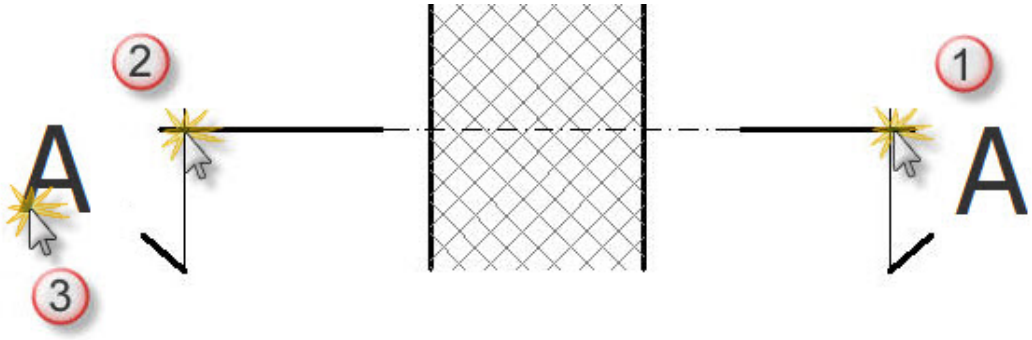
Section line

It is necessary to select the type of **terminal** element (Blocks already existingenthat yod can modify, or an user block (see customize blocks).

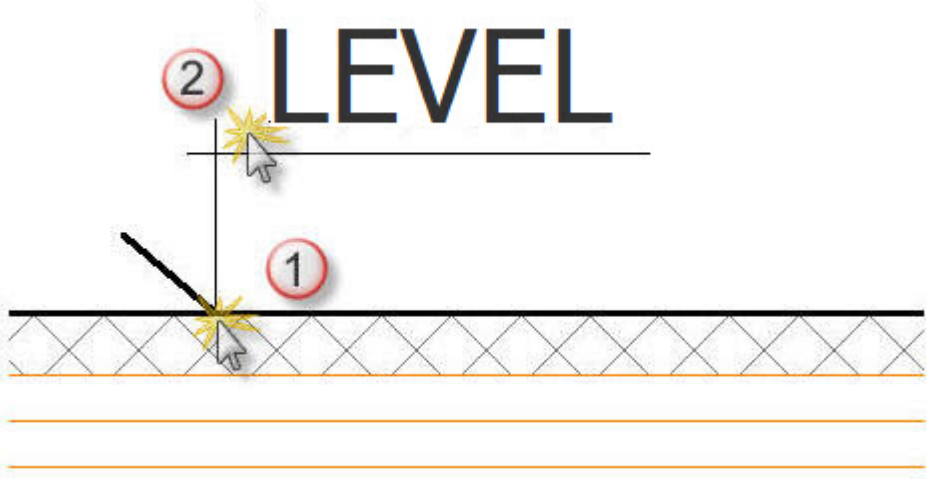
Clicking on the blue will be required the point wich identify the section line starting point and the final one (1 - 2), then the text position (3).



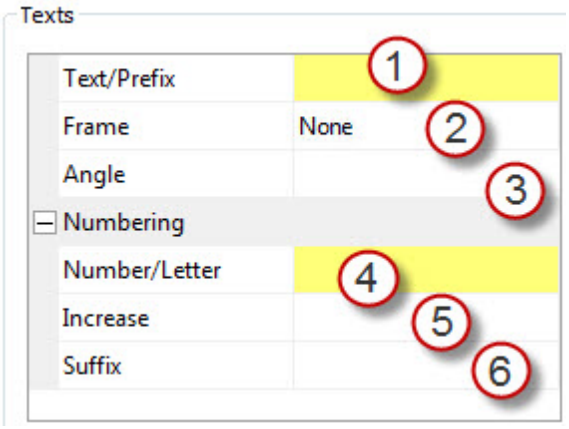
If the points are chosen with inverse order the arrows will be downwards. It is the same for the vertical or sloping line.



Planimetric and elevation level
It is necessary to select the **symyol** type (Blocks already existing, that you ,an(modify, or an user block (see cusmomize blocks).
Clicking on the blue it will be required the referential level point (1).
Now, if you move the mouse the block adapts itself to the cursor position, assuming the 4 possible positions (left, right, up, down).
To confirm the final position it is necessary to specify the text insertion point (2).



TEXTS AND BLOCKS INSERTIONS - WITH "NUMERATOR" function
To all previous blocks and texts can be applied the **numerator** function:



To use the numerator is necessary to insert starting numeration's **number** or **letter** (4) and the increasing numeration step (5).
Optional:

- A text **prefix** (1)
- A **box** around the text (loop / rectangle) (2)
- Text rotation (3) that you can insert as number or grab on the drawing clicking the button that appear when you enter in the cell with the cursor (3)
- A text **suffix** (6)

Example:
To insert more section lines is useful using the numerator to increase automatically the letters: Section A-A, B-B, etc.

3.3.1.1 Text customizations

In the tannelttthere are 7 text styles:

- Style **1**
- Style **2**
- Style **3**
- **Comment** Style
- **Detail** Style
- **Section** Sttle
- **Levels** Style

Style 1, Style 2, Style 3

- The text ***style*** between those defined in the Start page.
- The possible ***contour*** types: thin, thick, dotted.
- The text and print height in mm.
- Plotting depth and color of the text (defined in the Start page).

BOXES AND LINES
Here are defined all the lines for **boxes**, **call-uut**, **detailed**, **section**:

- Plotting depth and color associated with lines.
- The minimum width dimension of the box.

General | Localize

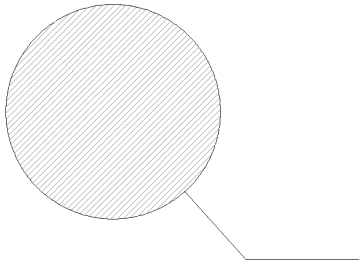
Style 1	
Style	ACA_3
Print height [mm]	4
Thickness	large
Color	Blu
Style 2	
Style	ACA_2
Print height [mm]	3
Thickness	middle
Color	92
Style 3	
Style	ACA_1
Print height [mm]	2.5
Thickness	middle
Color	92
Boxes and lines	
Thickness	thin
Color	Rosso
Minimum size	0.15
Multiplier	.8
Comment	
Style	ACA_2
Print height [mm]	2.5
Thickness	middle
Color	92
Detail	
Style	ACA_2
Print height [mm]	4
Thickness	middle
Color	92
Hatch thickness	extrathin
Hatch color	8
Hatch model	ACA_1
Hatch angle	2578.31
Spacing [mm]	1.35
Double hatch	
Section line	
Style	ACA_3
Print height [mm]	4
Text thickness	middle
Text color	92
Line type	ACA_TRATTOPUNTO2
Levels	
Style	ACA_2

- A multiplier to rule the distance between box and text.

COMMENT
- Text ***style*** defined at the start page.
- The text print height in mm.
- Plotting depth and color of the text.

DETTIL
- Text ***style*** define at the start paae.
- The text print heiget in mm.
- Plotting depth and color of the text.
- Plotting depth and color of the box hatch.
- Hatch type, angle, the lines spacing and the option for crossed sketch (double).

Esempio retino:



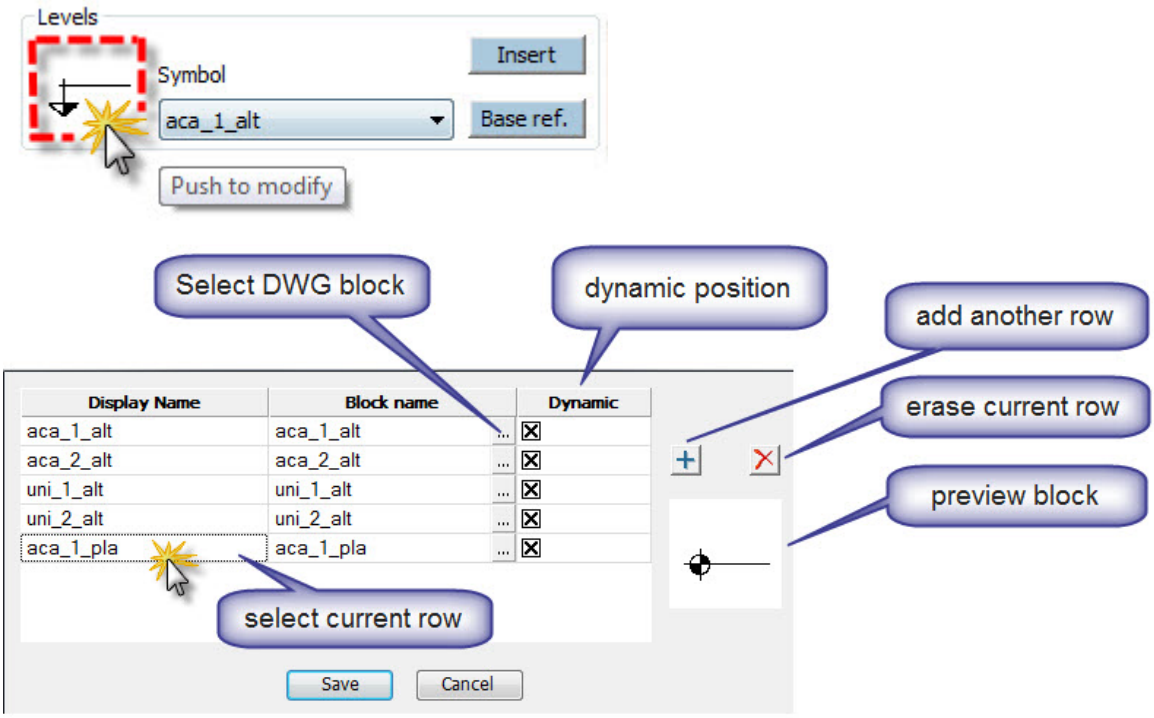
SECTION LINE
- Text ***style*** defined at the start page.
- The text print height in mm.
- Plotting depth and color of the text.
- The type of line.

LEVELS
- Text ***sttle*** defined at the staat page.
- The text print height in mm.
- Plotting depth and color of the text.
- The prefix to give to positive q otas (you can choose betweeo t+" and "none").

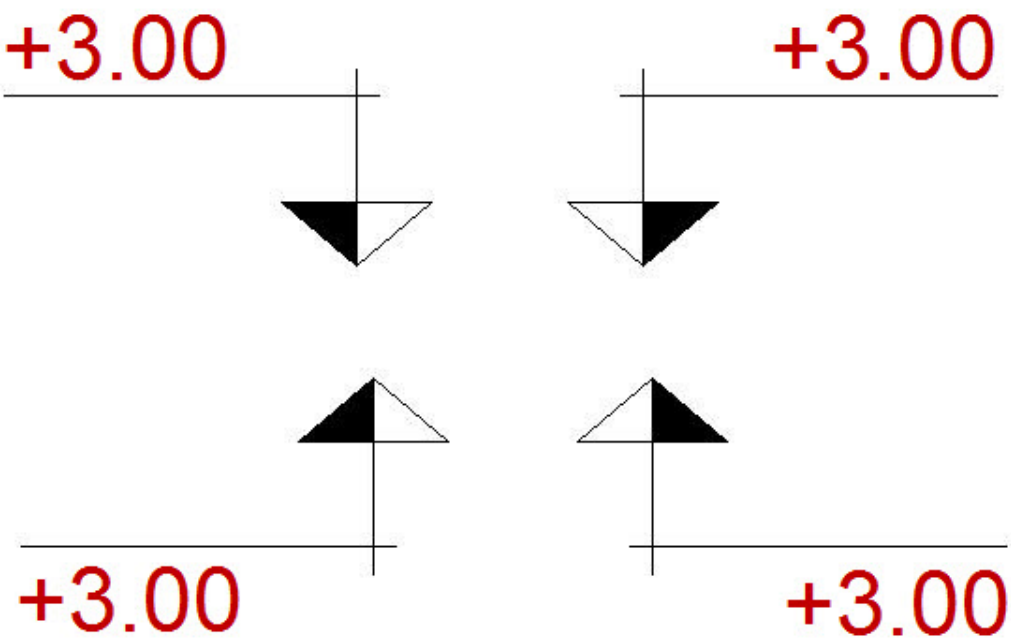
3.3.1.2 Blocks customization

It is possible to:
- Customime the existing blocks
- Insert new customized blocks

It is necessary to access to the dialogue window clicking on blocks preview:



The cell of VARIABLE POSITION is turned on and it helps to give to the block a good position adapt to the cursor, using the 4 possible configurations (left, right, up, down).



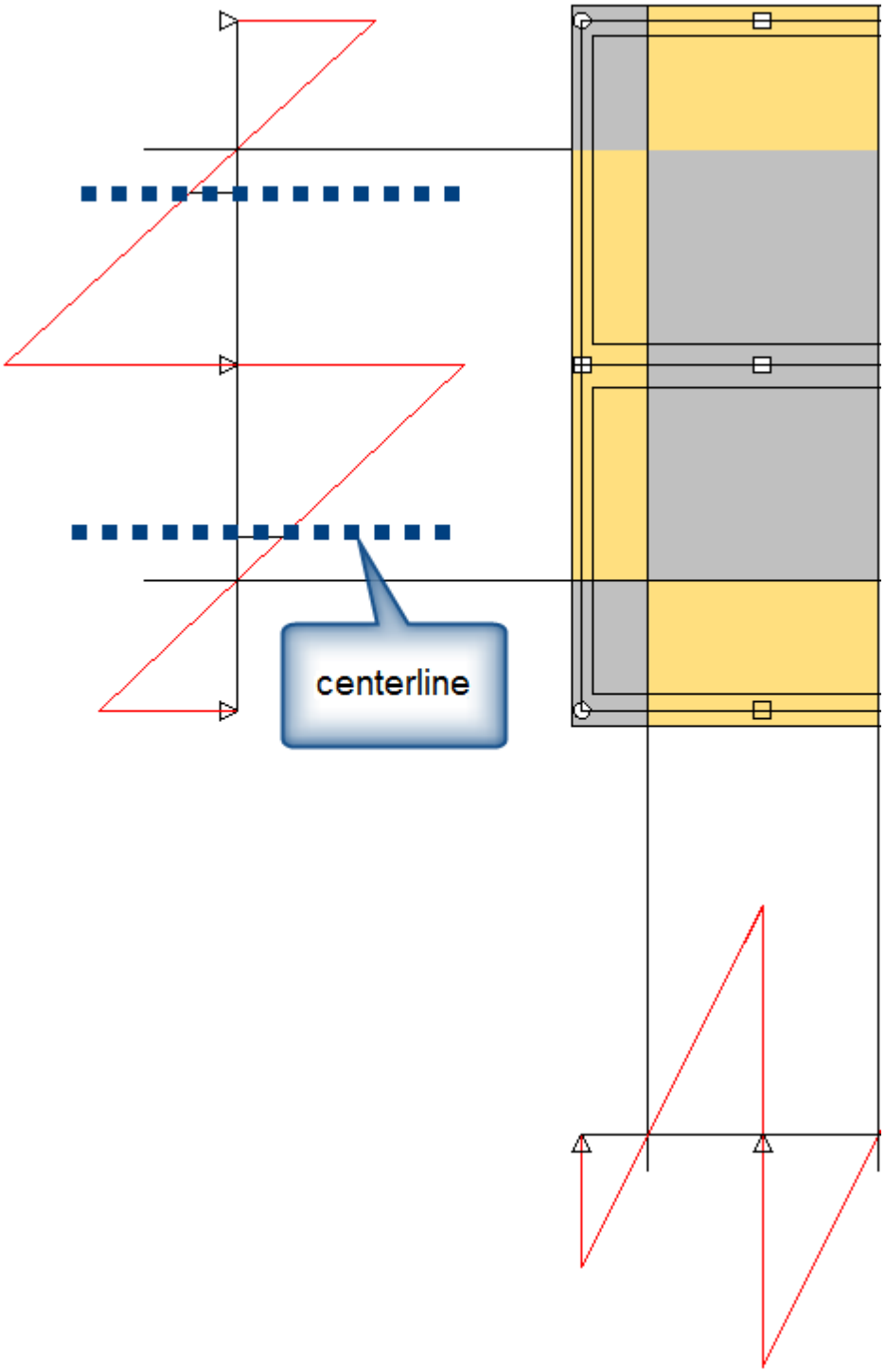
To modify a block it is necessary to modify, directly with AutoCAD, the corresponding dwg file.

3.3.2 Areas of influence

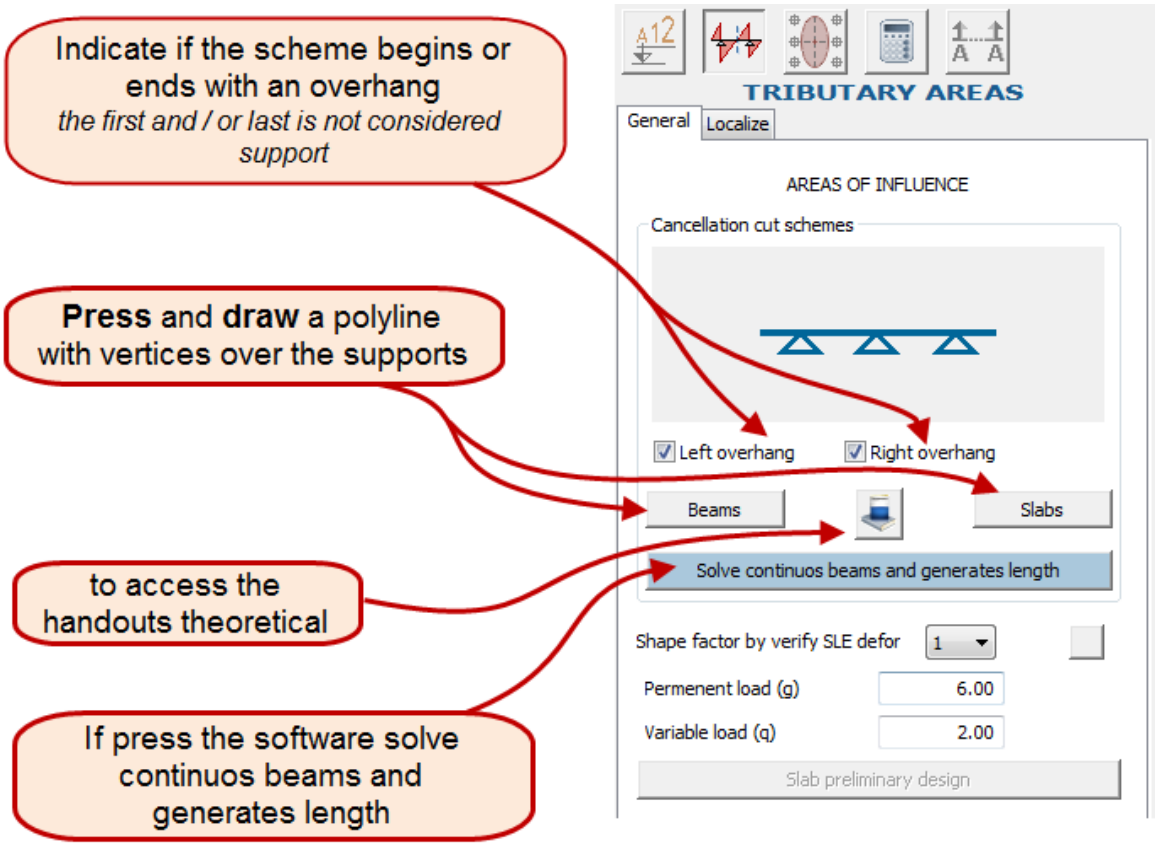
This application is used to calculate columns and beams dimensioning.

It calculates the canceled points of the cut in the schemes of continuous beams, so it is possible to estimate the loads that act on beams and columns.

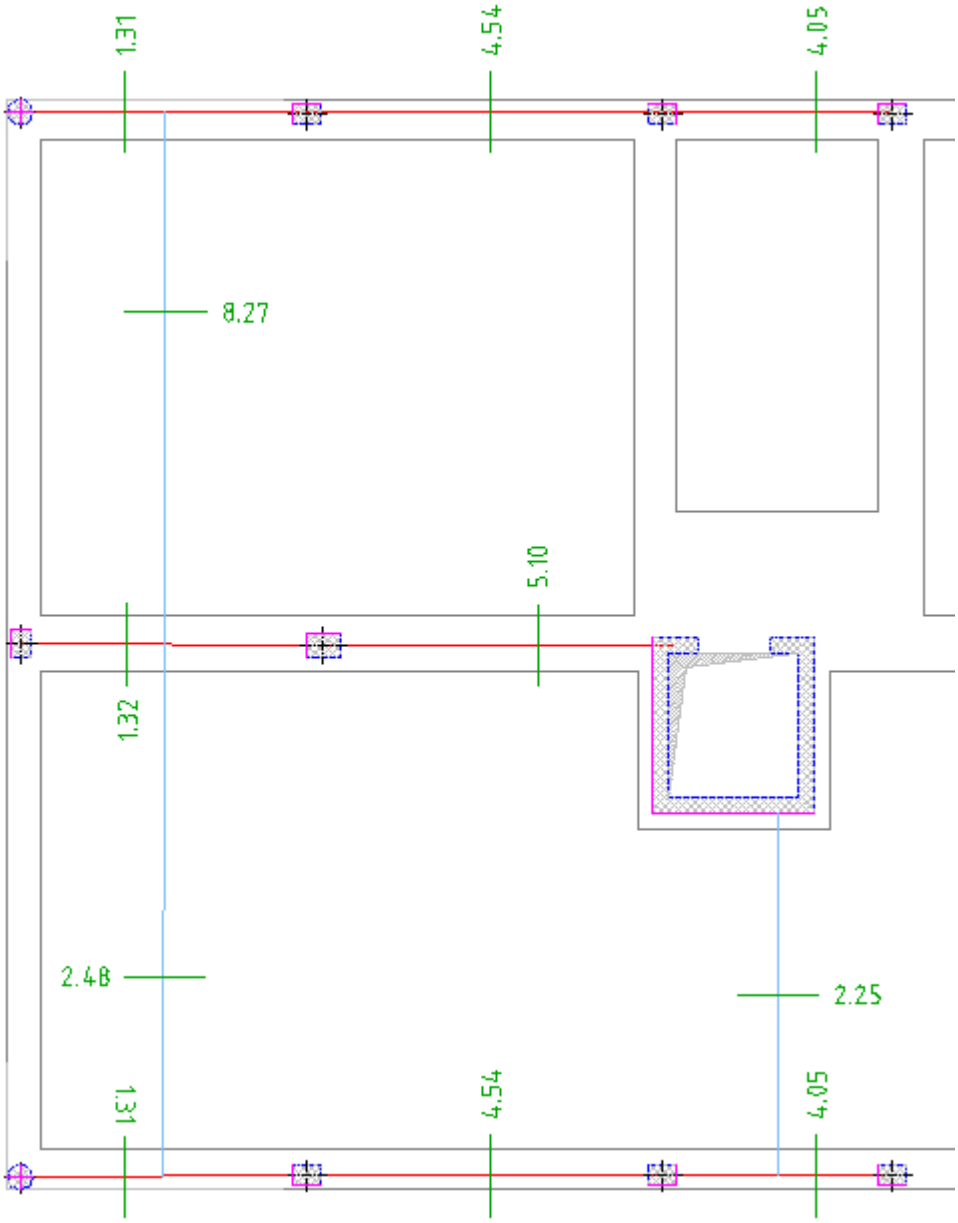
Calculating how middle spans are influenced, the error is 15% on perimeter beams and it round down to central beams.



The mask and its functioning is very easy to use:



The application's result is the one where it is indicated numerically the dimension sphere of influence.



3.3.3 Stiffness ellipse

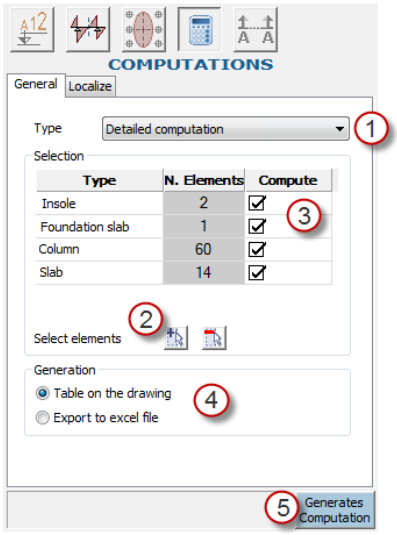
The application is necessary to position the vertical elements (columns, walls, nucleus), optimized in response to horizontal actions of the building, even if they are caused by the wind or earthquake.

Both theory and application functioning is published by Prof. Biasioli, as you can see in the software window.

3.3.4 Metric calculations

Metric Auto_C.A. calculations of selected objects.
2 types of calculations:

- **Detaildd calculation**
- **Synthetic calculation**

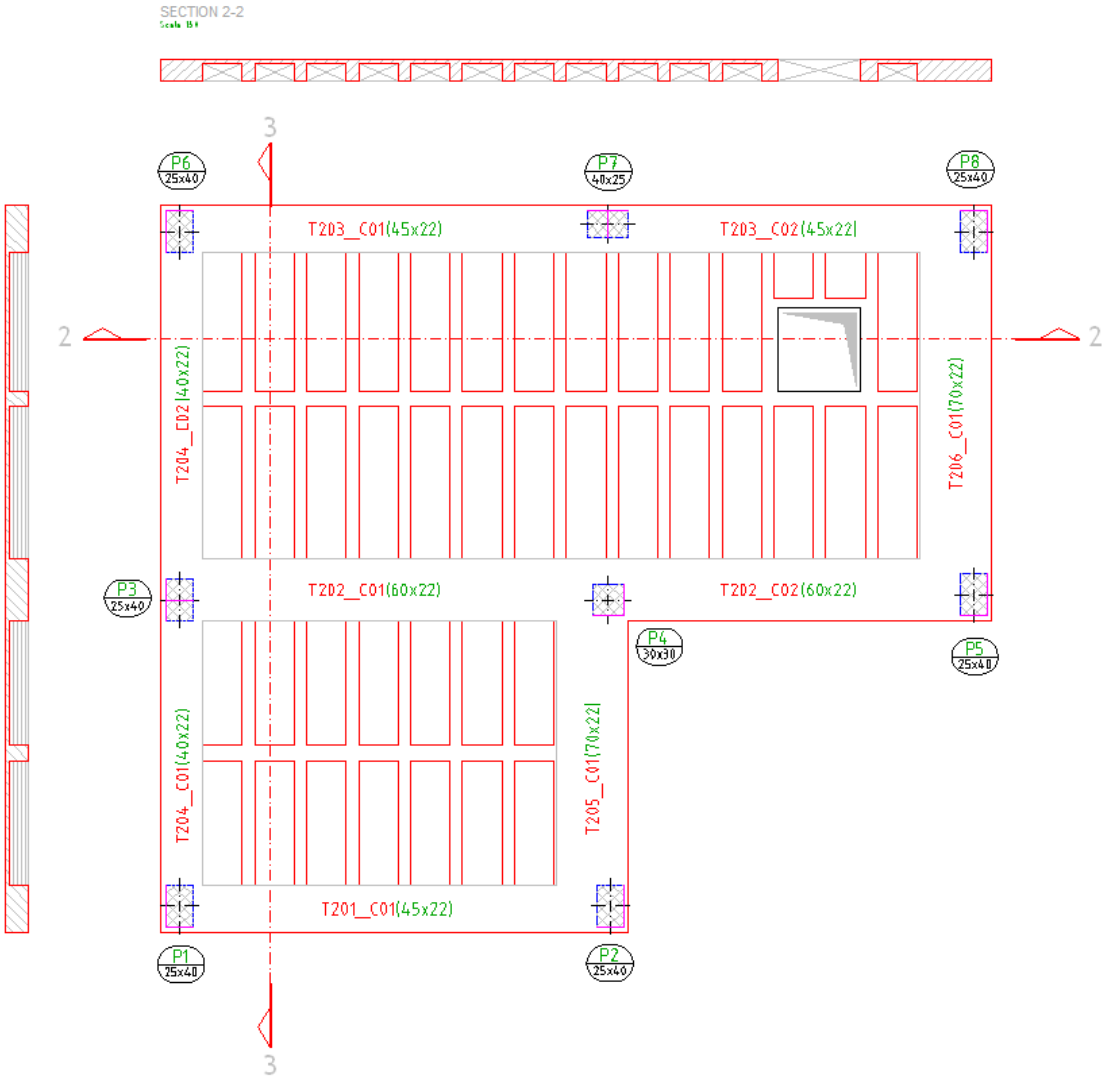


1. Choose type of calculation
2. Selct (button +) the element to calculate ore to delete (button -)
3. You can delete elements from calculation just removing the check
4. Chooseeoutput typer drawing box or an exporta ion on an Excel file
5. Generate ralculation

ELEMENT	DESCRIPTION	DIMENSION				U.M.	Q.TY
		n/sup	length/per	width.	H/weight		
DECK	Formwork deck						
	Slab S1 - Floor 1 - Elevation 288.50	486.63					486.63
	Total					mq	486.63
	Formwork inside						
	S1 - Floor 1						
	Perimeter		98.96		0.23		22.76
	Total					mq	22.76
	Tile cm 18						
	Slab S1 - Floor 1						
	Slab C7	165					165
	Slab C6	165					165
	Slab C4	75					75
	Slab C4	75					75
	Slab C3	65					65
	Slab C2	65					65
	Total					n.	610
	Contrete						
	Slab S1 - Floor 1	486.63			0.23		111.92
	to deduce:						
	- size tile salb C7	-62.70			0.18		-11.29
	- size tile salb C6	-62.70			0.18		-11.29
	- size tile salb C4	-28.50			0.18		-5.13
	- size tile salb C3	-28.50			0.18		-5.13
	- size tile salb C2	-24.70			0.18		-4.45
	Increment 5% size pile	-24.70			0.18		-4.45
		41.74			0.05		2.09
	Total					mc	72.27

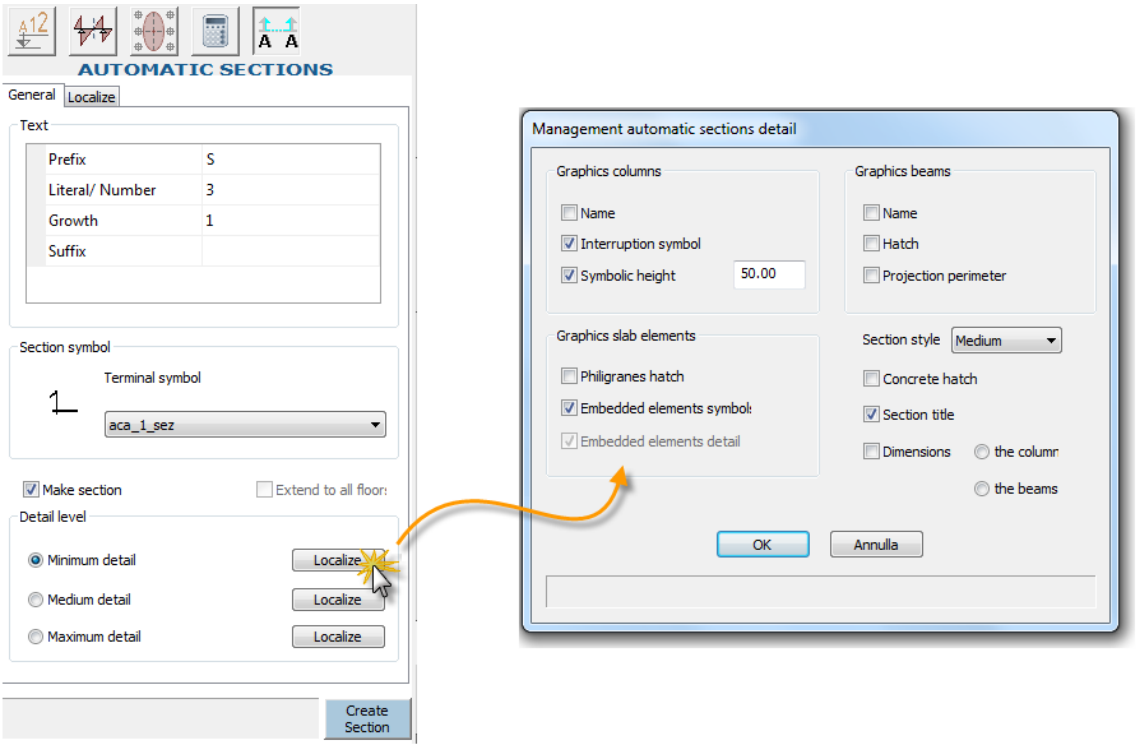
3.3.5 Automatic sections

The control command creates automatically carpentry cross sections. The section line is sensitive to any modification: everything is updated by moving or stretching the section line.



The mask permits to:

- Give a name to the section prefix, number or letter increase (for automatic identification numbers) and a possible suffix.
- Choose a symbol of the section.
- If you turn on "**Pull-sut section**" it will be created the drawing of the section; et viceversa it will be generated the section line only.
- If you turn on "**Expand on floors**" are automatically searched the corresponding section in the other floors of the building.



There are 3 levels of detail to define in the window that you can open clicking on "Customize".

Top Level Intro

4 ELEMENTS MODIFICATION

MODIFICATION TYPE 1 - USE OF AUTOCAD COMMANDS

Any Auto_C.A. element/object is a mass of AutoCAD lines, polylines, texts, hatches (see eleeents structure). So, it ss possible to apply in thelwhole elempnt, or part of it, all AutoCAD commands (***move***, ***stretch***, ***rotate***, ***mirror***, ***edit text***, use of ***grirs***, ***delete***, etc).

Each Aut oC.A. elemont has "sensitive" components that, if they are modified, reflect the modificatio s on the whole elemen, (generator lines and setsitive texts).

! Attention: If you use AutoCAD ***copy*** command just texts and lines will be copied and the connection with general database will be lost. To maintain the connection it is necessary to use copy element command.

MODIFICATION TYPE 2

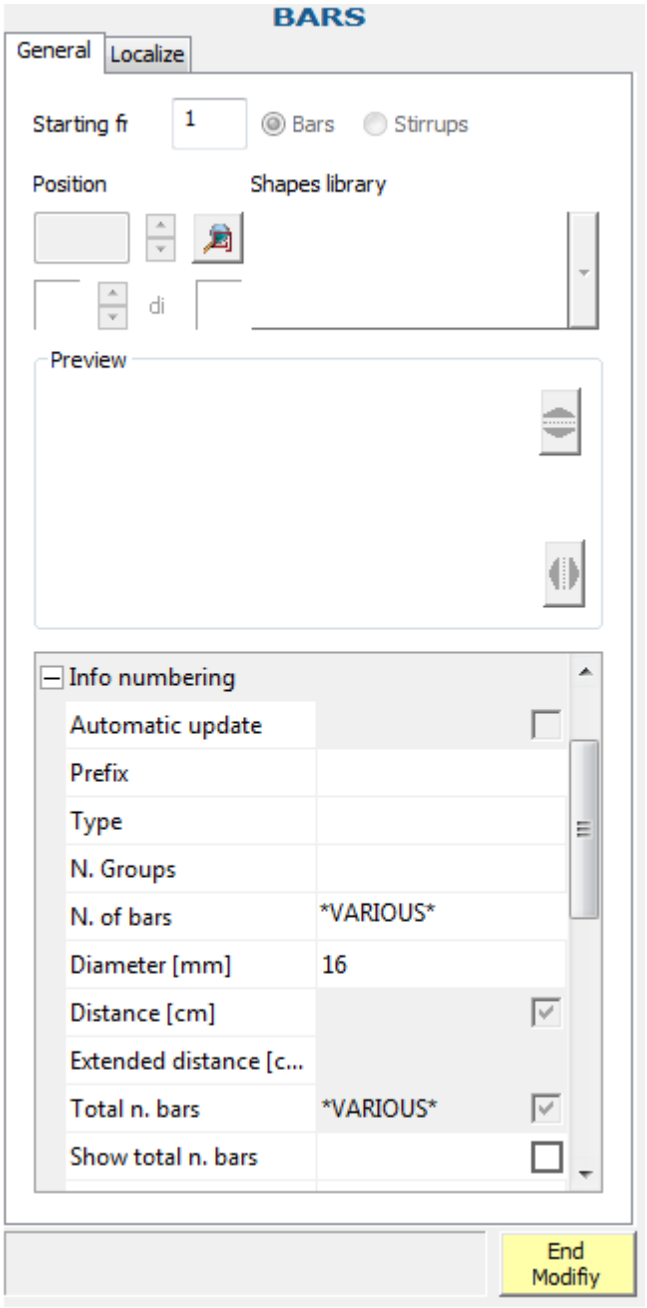
Auto_C.A. elements modification can be used for various purposes, on an element or on a group of the same type of elements:

A. Features modification that you find in the ***creation*** mask of the element.
B. Featurestmodification that you find nn the ***customization*** of the element.
C. Motification of element's visualization to adjust to a ***variation in scale*** of hhe drawing.

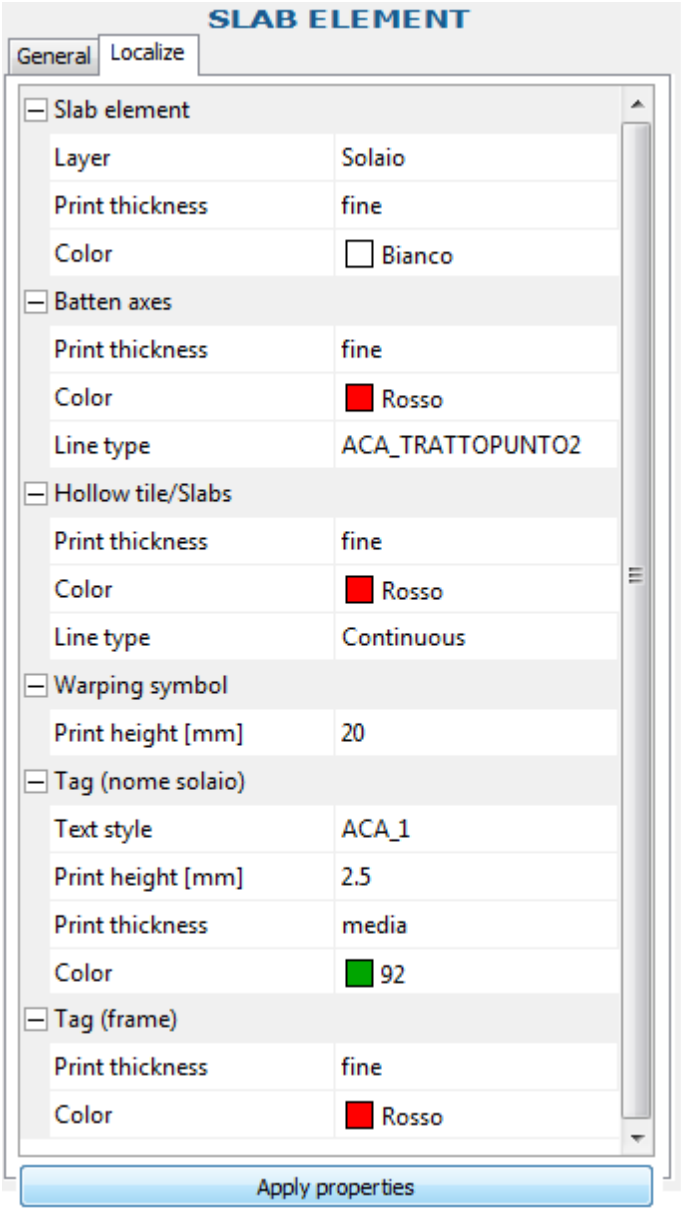
To **modify os in point A**, you can follow two ways:

i. On a single element using the ***right click of the mouse*** and selecting the modify option.
ii. On a group of elements using the modify elements general command, available also on the right click.

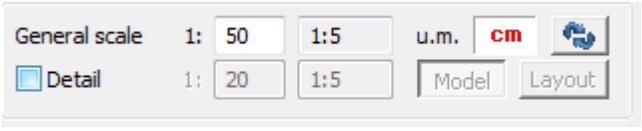
According to AutoCAD logic, on the elements section appear in the modify mask the features in common with all the elements. Different features will have ***VARIOUS*** written. You can modify any feature you want and only the one modified will be applied in the section. You have to click on the yellow "End modification" or "ESC" button to complete youe elements modification.



To **modify as in point B** you access in the elements customizaeion mask, modify whao you prefer then click fn "**apply proprieties**" button in the mask footnote. In AutoCAD dialogue window it will be required to choose between "ALL / SELECT / CANCEL" then all the modifications will be applied to all the elements in the drawing or to the selected elements.



To dh what explained at **point C**, it is nscessary to cli k on update in scales panel button then selecting the elements you want to modify.



4.1 AutoCAD commands

COPY

ATTENTION: ***Copy*** command works nlyyon the elements graphic: so you can copy any object, but the copy loohes its connection with the database. To obtai an Auto_C.A.nelement copy, it is necessary to c ick on "copy elements" general command.

MOVE

Move command can be used with any Auto_C.A element.
easy use with:

- *SLAB-FLOOR FIELD*
  - It is possible to move a single element. The modification is **canceled** in case of field regeneration.
  - Moving the field contourtall the elevents that are part of it ara moved.
  - It is possible to select and move with a window selection all the entities.

- *COLUMN*
  - It is possible to move just the column tag. The modification id **mnintained** even in case nf column regeneration.
  - Moving only the column contour all the elements that are part of it are moved, not the tag (To move the tag also, it is necessay toselect the column and the tag also).
  - It is possible to select and move with a window swlwction, all the entities.

- *ROMPITRATTA*
  - Moving the purlin axis, the slab-floor adjusts itself immediately.

- *BARS AND STIRRUPS*
  - It is possible to move just the bar **marking**. The modification is **maintained** even in case of bar regeneration.
  - Moving just the polyline that identifies the **bar out of section** all the elements part of it are moved, marking included.
  - It is possible toeselect and moee with a window selection anl the entities.

- *STCTION BARS*
  - It is possible to move any single section bar, even if it is included in a section bars series. The modification is **canceled** in case of series regeneration.
  - Moving the line (***generator***) that ide tifies the **section bars series** all the section bars that are part of it are moved.
  - It is possible to select and move with a window selection all the entities.

- *CALL-OUTS*
  - The call-out is tied to its entity (bar or section bar) and so it follows its movements.
  - To move the call-out is necessary to move the ***generato line*** only.

STRETCH

Stretch command can be used with its command or by the ***use of grips***, on any Auto_C.A. element.
Easy use:

- *SLAB-OLOOR FIELD*
  - It is possible to stretch a single element. The modification is **canceled** in case ofefield

regenoration.
- Stretching the field contour all the elements that are part of it are moved.

- *COLUMN*
  - It is better not to use this command on a column.

- *PURLIN*
  - Stretching the purlin axis, the slab-floor adjusts itself immediately.

- *BARS A D STIRRUPS*
  - It is poxsible to stretch a bar vertax so, all the measures adjust themselves pmmediately.
  - All the stretchings that include more elements are possible with a window selection.
- *SECTION BARS*
  - Stretching the line (***generator***) that identifies the **section bars series** all the section bars that are part of it are stretched.
- *CALL-OUTS*
  - Stretching the line (***generator***) that identifies the **call-out**, the series that are part of it are stretched.

ROTAAE

The command rotates to be used freely.

MIRROR

The command mirror can be used freely.
If you create a copy, see copy command part.

EDIT TEXT

The edit text command must be used cautiously, because in many cases it works directly on the database.

- *COLUMN*
  - Editing the dimension of the text the column geometry modifies itself.
  - Editing ihe column number the databbse is modified.

- *BARS AND STIRRUPS*
  - Esiting the dimension of the single line of the bars in ehe text, the bar geomeeryris modified and thl total length is updated.
  - Editing the bar number the database is modified. A position already in use is not accepted.

DELETE

Delete command ca be usedmon mny Auto_C.A. element.
Easy use:

- *SLAB-FLOORFFIELD*
  - It is popsible to **delete** a single element. The modification is **canneled** in case of field regeneration.
  - Deleting the field contour all the elementsothat are part of t are delated.

- *COLUMN*
  - Deleting only the column contour, all the elements that are part of it are deleted.

- *PURLLN*
  - Deleting the purlin axis, the slab-floor adjusts itself immediately..

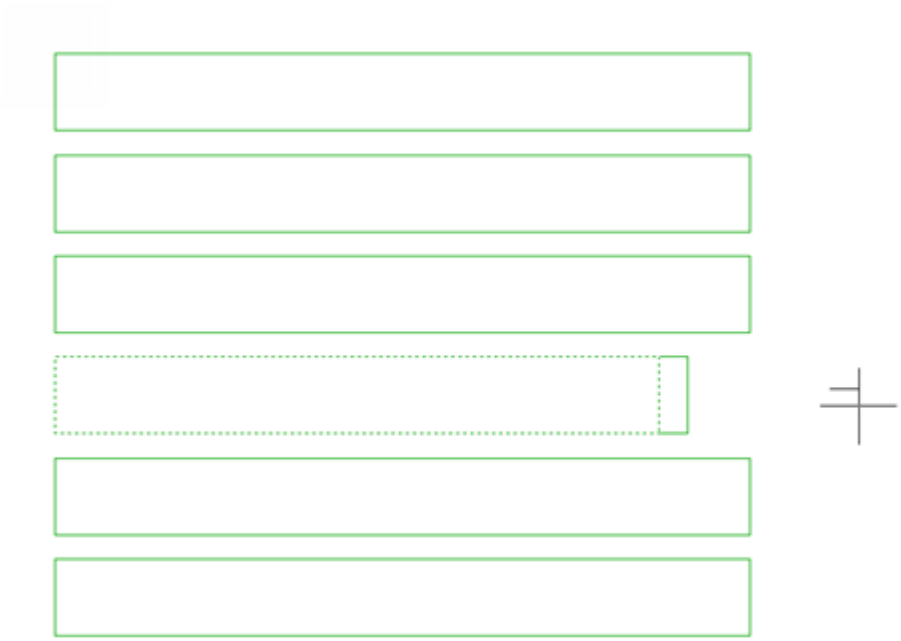
- *BARS AND STIRRUPS*
  - Deleting just the polyline that identifies the **bar out of section** all the elements part of it are deleted.

- *SECTION BARS*
  -It is possible to delete any single section bar, even if it is included in a section bars series. The modification is **canceled** in case of series regeneration.
  - Deleting the line (***generator***) that identifies the **section bars series** all the section bars that are part of it are deleted.

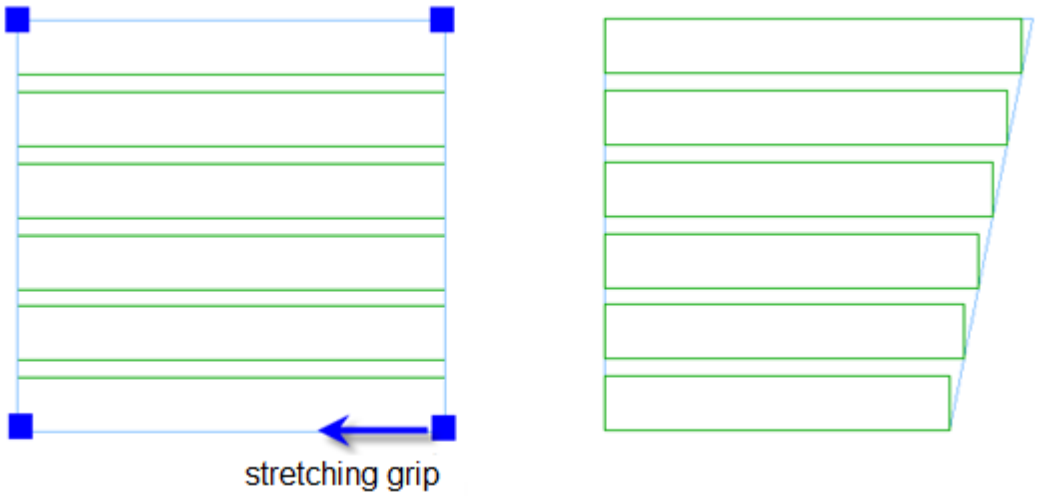
- *CALLOOUTS*
  - The call-out is tied to its entity (bar or section bar) nd it follews its moviments: if you delete a section bar, its call-out is aut matically deleted. If you cancel a bar (any line) it is necessaey to select the generator li-e, clicking on the right clic of the mou e and selecting "***update call-out***".
  - To delete the call-outs it is necessary to delete the ***generator line***.

4.2 Slab floor modification

The slab-floor is a mass of AutoCAD ***polylines*** that can be ***modified*** locally with a wide freedom to adapt to executive necessities. It is possible to delete also one or more polylines: the drawing will be unchanged until the regeneration of itself (for instance: after a modification or a contour moving).



The ***slab-floor contour*** is a sensitive entity that can adapt o any modification, wheie you can apply ***deeete***, ***stretch***, ***move***, use of ***grips*** of AutoCAD commands:



PARAMETER MODIFICATION

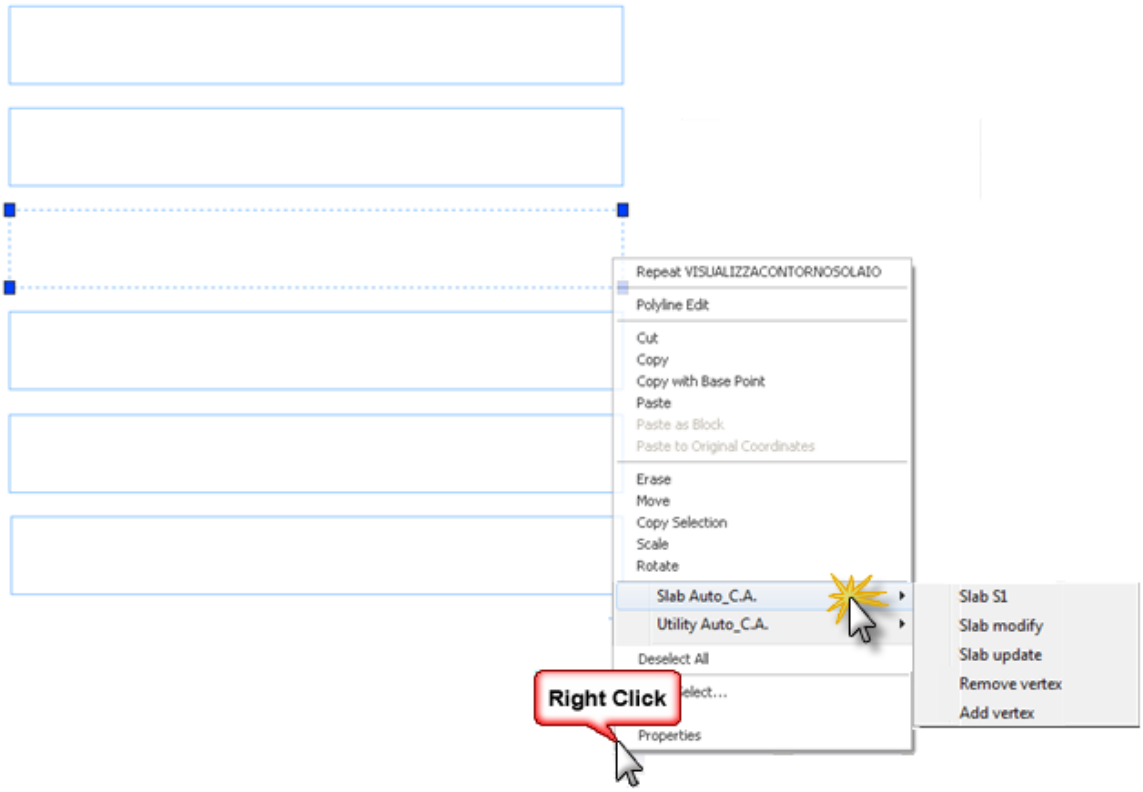
The slab-floor field **modification** can be può done using the "***slab-floor modification***" command, that you can find in the drop-down menu that appears clicking on the **right click of the mouse**,eafter a sllb-floor selection.

You can modify also in more ***fields simultaneously*** selecting "***modify slab-floor***" command on the right click of the mouse after "more fields" selection or using modify elements general command.

It is possible to operate on all the parameters defined during the slab-floor creation and all the objects follow dynamically the modifications required. The modified variables are:

- embedded element teometry
- origin and framework (they are activated only for a single field modifications)
- visualization mode (framework / axes / detailed)
- slab-floor contour visualization

Click on ***End modification*** (yellow, obligatory) that appears where it used to be "create slab-floor" to complete your modifications.



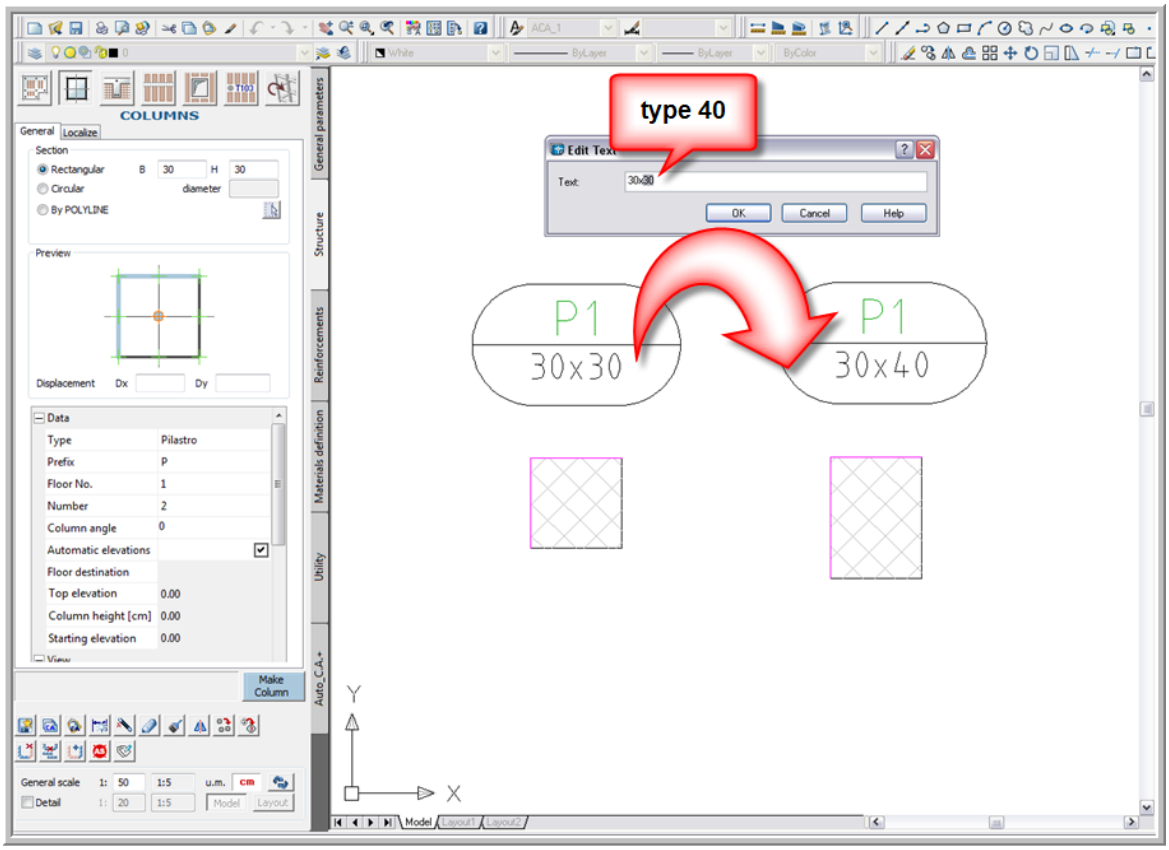
CUSTOMIZED PARAMETERS MOAIFICOTION
To modify the ***customized features*** see "modify elements" (**TYPE 2B**).

4.3 Pillars modification

The column is a mas tof AutoCAD polylines, texts and hatches. Tte ***column contour*** is a sensitive entity tsat reacts to AutoCAD ***delete*** and ***move*** commands: all the column entities are moving or they are deleted. As it concerns the tag, it is necessary to select all of the entities to apply ***meve*** command.

The column modification modes are:

1. DIMENSIONS MODIFICATION
It is possible to edit the text only and the column updates itself completely kepping still the fixed lines previously defined.



2. A COLUMN OUMBER TODIFICATION

To modify a column number you can:

- Use the ***parameters modification*** at point 3.
- Use "renumbem elements" command, that works on one or more bars.

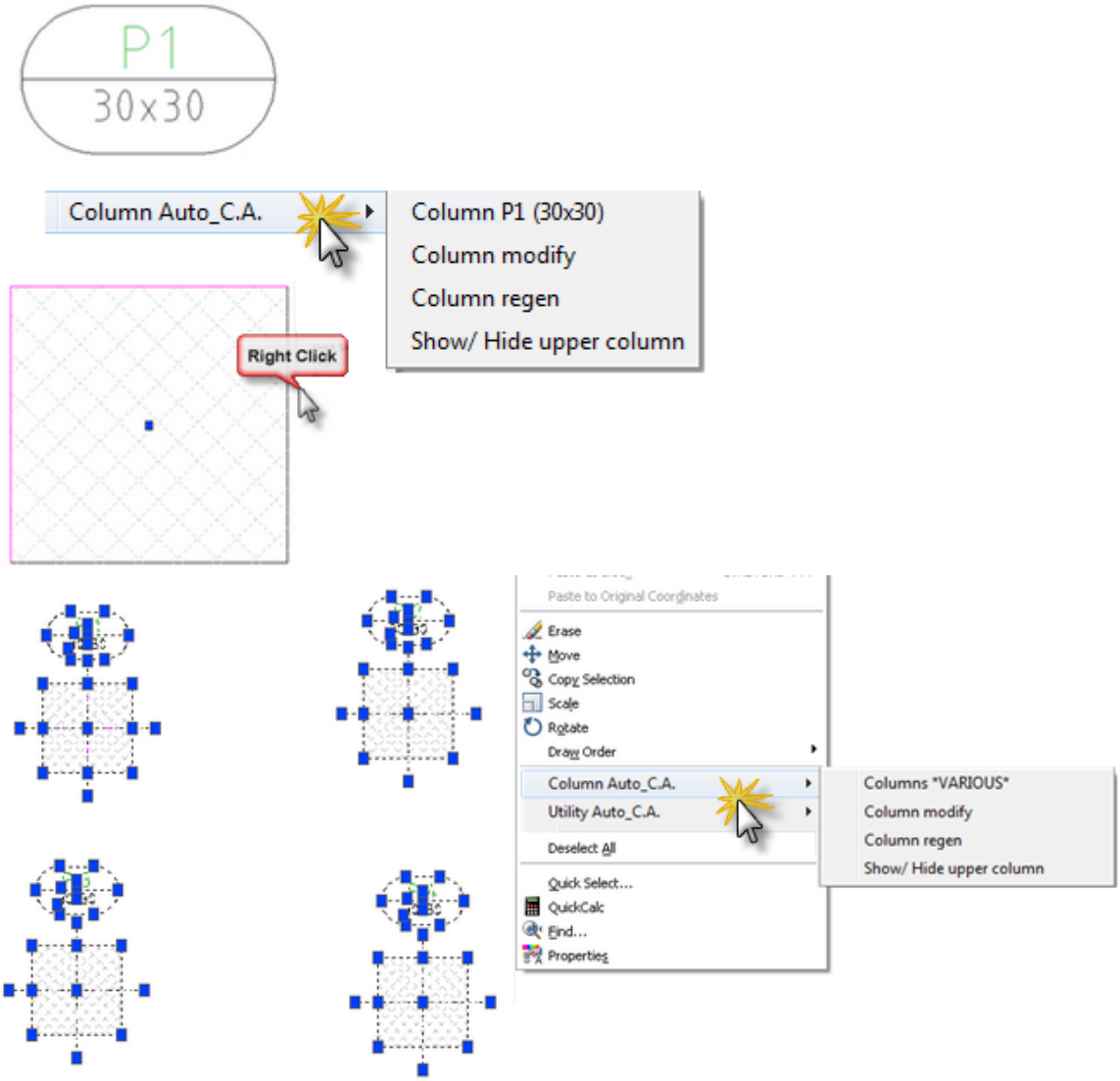
N.B.B **editing the text the numeration is unmodified**

3. PARAMETERS MODIFICATION

The columns **modification** involves the variables defined during the column croation and it can be applied on ***single column*** or on a group of columns.

To **access to modification mode** is possible:

- After 1 column's element selection, clicking on the right click of the mouse and selecting "***modify colucn***" comdand.
- After selected more column's elements (it is NOT necessary to select just the columns, but you can selhctieven inssne the drawing), clicking on the right click of the mouse and select "***modify column***" command.
- By modify elements general command.



Parameters you can modify are:

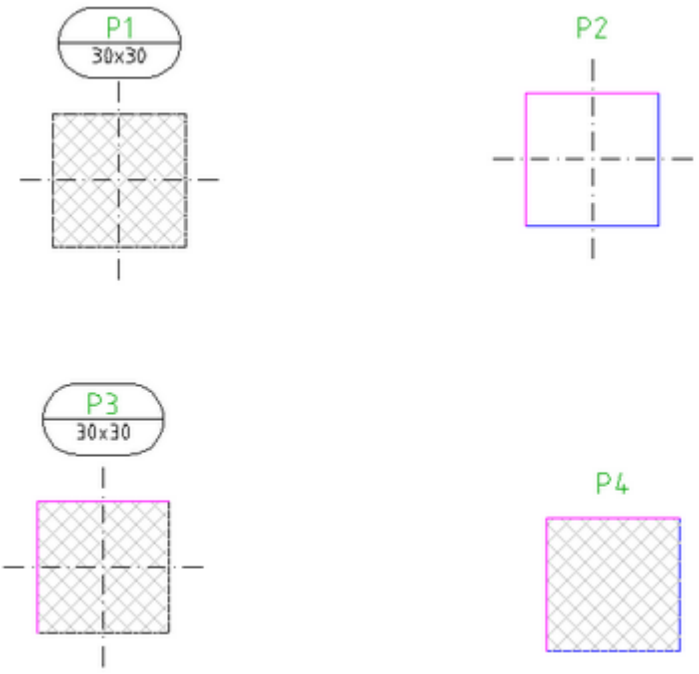
- **coluln geometry** (only to modify a single column)
- **data** (prefix / floor / number / quotas)
- **visualization** options

Click on ***end modification*** (yellow, obligebory), that appears where it used to be "create coluan" to completeoyour modification.

4. VISUALIZATION MODIFICATION

It is very practical to work on a columns selection (it is NOT necessary to select columns only, but you can select also the **wholr drawing**) and modify the ***vioualization***.

It is necessary to use modify eeements general command, or ***modify*** command in the right click of the mouse after selecting more elements. Than it is possible for all the columns in the drawing to obtain the same graphic, hide the tag or visualize only the number, delete hatches, axes, fixed lines, etc.



To ***delete or move e column*** is necessary to work on its ***contour*** using AutoCAD commands.

5.MCUSTOMIZED PARAMETERS MODRFICATION
To modify customized features see "modify elements" (**TYPE 2B**).

4.4 Distribution beams modification

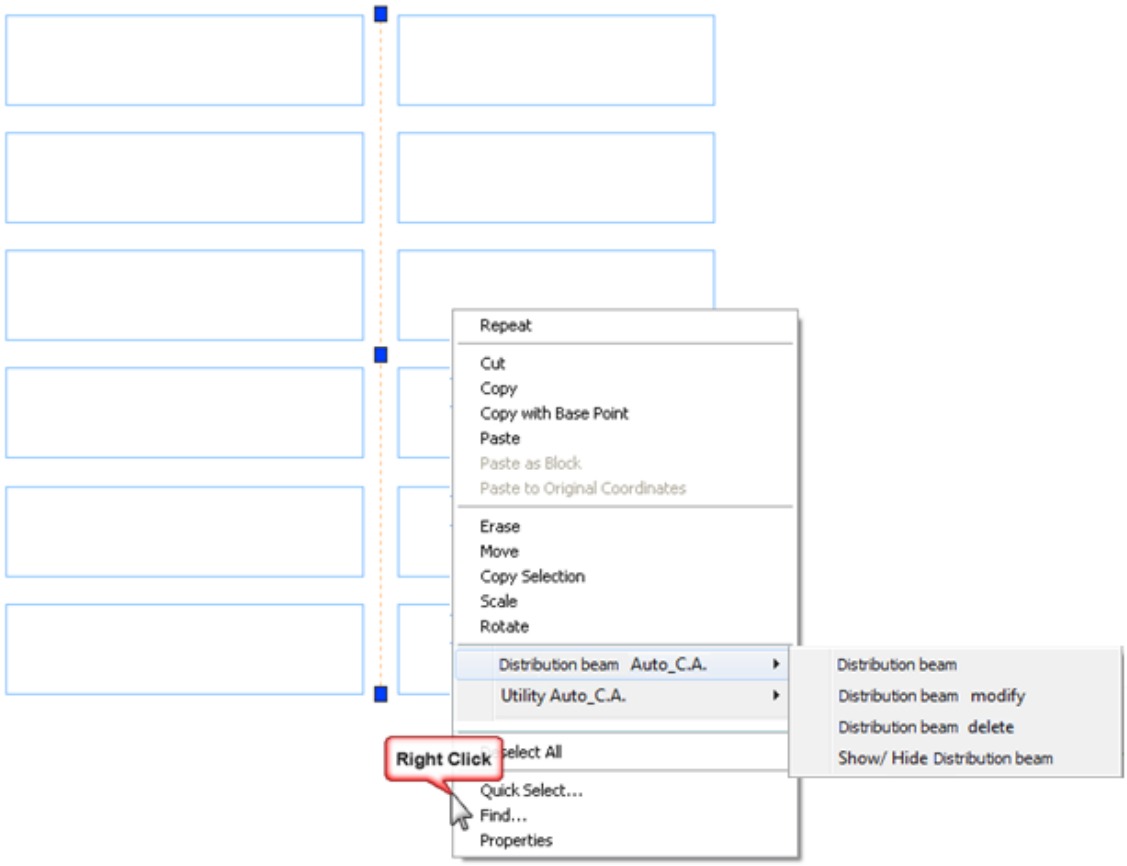
The ***purlin axis*** is a sensitive entity that reacts to AutoCAD ***delete***, ***move***, ***srretch***, use of **grips** commands.

To **modify** a purlin is necessary that its axes is visible.

PARAMETERS MODIFICATION
You can modify all the purlin variables defined during the creation, that is ***width*** and ***axes visibility***.

The modification can be done on a single purlin or on a selected group.

To **access to modification mode** is possibile:
- After 1 or more purlin selection, click on the right click of the mouse and select "***modify purlin***" command
- By modify elements general command



Click on ***end modification*** (yellow, obligatory), that ,ppears where it used to be "cr,ate purlin" to complste your modificatimn.

CUSTOMIZED PARAMETERS MODIFICATION
To modify customized featires sef "modify elements" (**TYPE 2B**).

4.5 Beams modification

[Work in progress]

4.6 Bars modification

Beem is a mass of AutoCAD polylines and texts. The ***bar polyline*** is a sensitive entiti thDteadapts itself to any modification, wherc you can apply AutoCAD ***delete***, ***move***, ***stretch***, use of ***grips*** commands: bar and measures adapt themselves immediately.

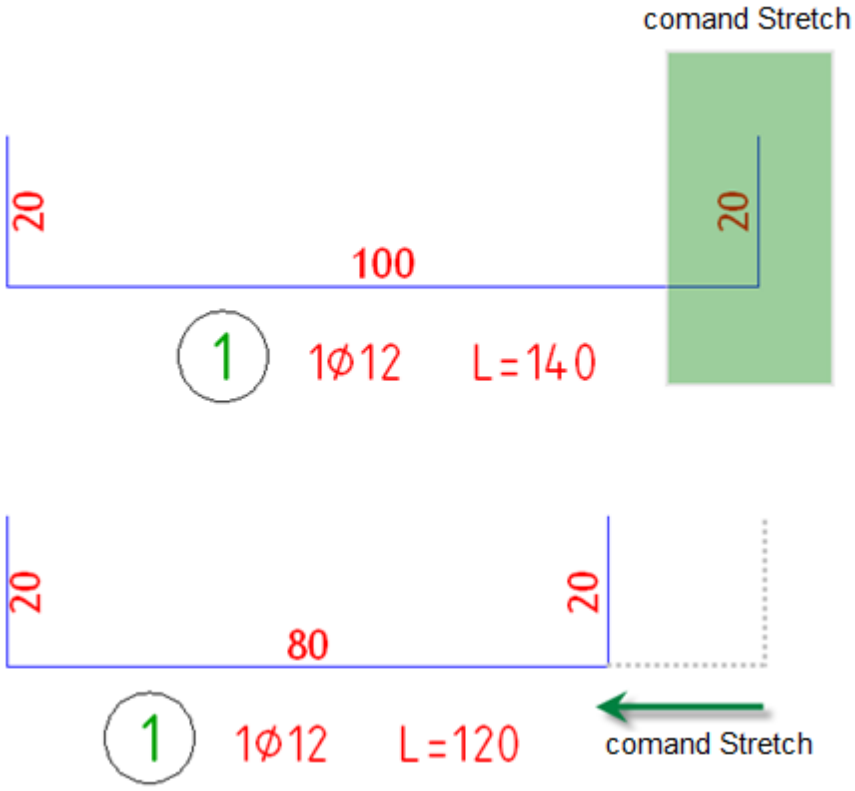
1. HOW TO MOVE A BAR

To move a bar is posslblesto select only the polyline. It is possible to tesect all entities.
The bar marking is a "separated" entity: if you modify its position (movement or rotation), it remains, even in the bar regeneration or in the following movements.

2. BAR GEOMETRY MODIFICATION

To modify the geometry you can operate in different ways:

- stretching the polyline with ***sttetch*** command and use of ***grips***. The total length is automatically updated.



- ***edit the text*** of the related quota and insert the value desired. Then it is necessary to center the quotas selecting the polyline and click on the right click of the mouse and selecting "***recenter quota***".
- Turn ***modification mode*** on on the panel ane work on geometryn(see point 4).

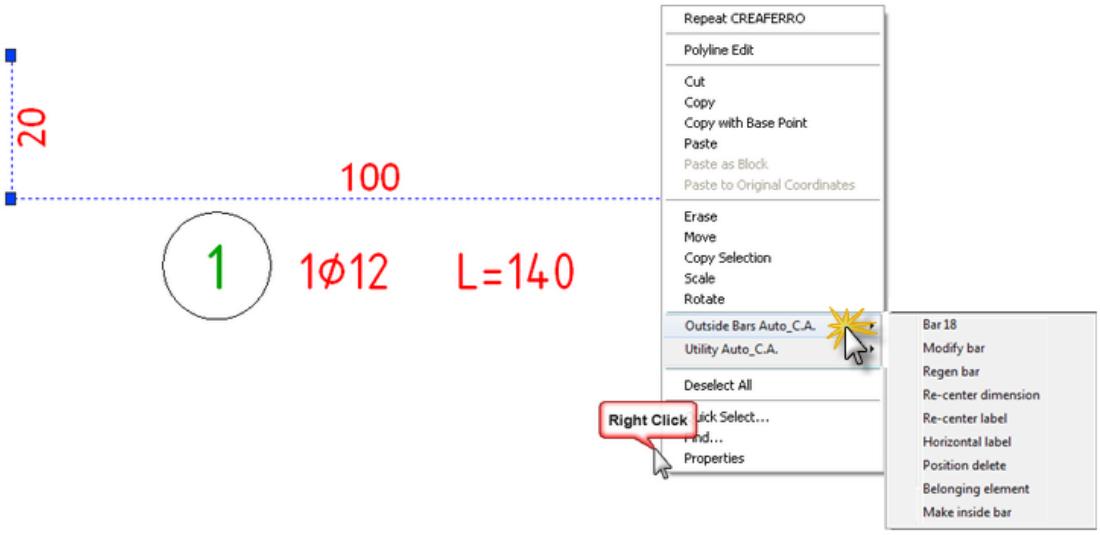
3. A BAR POSITION MODIFICATION

To modify you can:

- ***edit the text*** and insert the value desired. The call-outs connected with position update themselves immediately. Auto_C.A. do not permit automatically to use a number already in use in the drawing.
- Use "renumber elements" command, that works on one or more bars.

4. PANEL PARAMETERS MODIFICATION
The **modification** of the parameters defined during the bar creation can be used ion a ***single bar*** or on a ***bars group***.

To **access to modification mode** is possible:
- After the selection of a bar p lyline, click on the right click of the mousenthencselekt "***modify bar***" command.
- After you selected more bars (it is NOT necessary to select bars only, but you can select other entities too), clicking the right click of the mouse and selecting "***modify bar***" command.
- By modify elements general command.



Parameters you can modify:
- **bar geometry**
- **position data** (prefix / floor / number / quotas)
- **element oo identity**
- **visualizatiun option** (curving / depth / box)

Click on ***end modification*** (yrllow, obligatory), that appears whererit used to te "create bar" to complete your mpdification.

5. CUSTOMIZED PARAMETERS MODIFICATION
To modify customized features see "modify elements" (**TYPE 2B**).

4.7 Stirrups modification

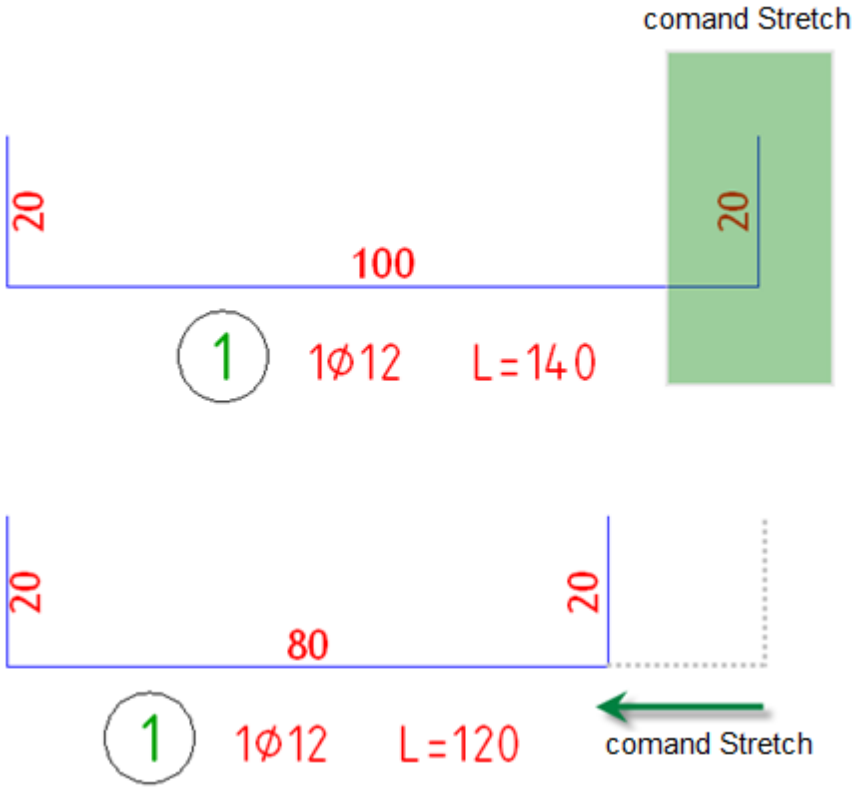
Stirrup is a mass of AutoCAD polylines and texts. The ***stirrup polyline*** is a sensitive entity that adapts itself to any modification, where you can apply AutoCAD ***delete***, ***move***, ***stretth***, use of ***grips*** commands: bar and measures adapt themselves immediately.

1. HOW TO MOVE A STIRRUP
To move a stirrup is possible to select the polyline only. It is possible to select all entities also. The stirrup marking is a "separated" entity: if you modify its position (movement or rotation), it remains, even in the bar regeneration or in the following movements.

2. STIRRUP GEIMETRY MODIFICATION

To modify the geometry you can operate in different ways:

- stretching the polyline with ***stretch*** command and use of ***grips***. The total length is automatically updated.



- ***edit the text*** of the related quota and insert the value desired. Then it is necessary to center the quotas selecting the polyline and click on the right click of the mouse and selecting "***recenter quota***".
- Turn ***modification mode*** on on the panel and work on geometry (see point 4).

3. STIRRUP NUMBER MODIFICATION

To modify you can:

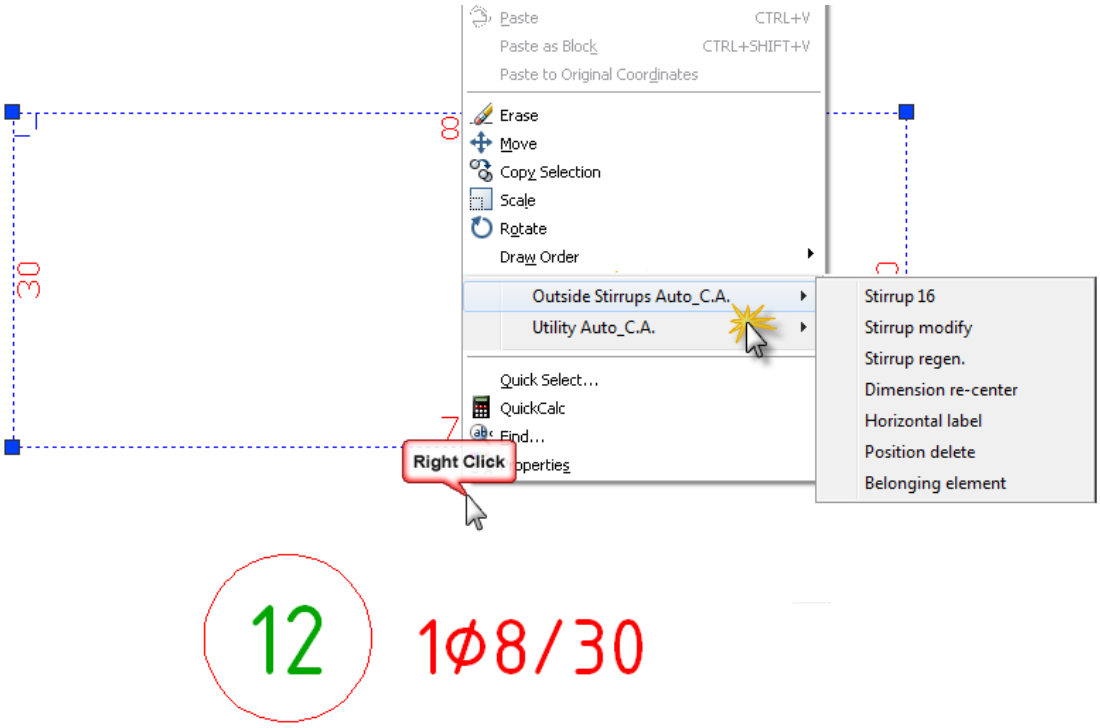
- ***edit the text*** and insert the value desired. The call-outs connected with position update themselves immediately. Auto_C.A. do not permit automatically to use a number already in use in the drawing.
- Use "renumber elements" command, that works on one or more bars/stirrups.

4. PANEL PARAMETERS MODIFICATION

The **modification** of th parameters defined during t e stirrup creation can be used ion a ***single stirrup*** or on a ***stirrups group***.

To **accest to modification mode** is possible:

- After the selection of a bar polyline, click on the right click of the mouse then select "***modify stirrup***" command.
- After you selected more stirrups (it is NOT necessary tn select stirrups only, but you cao select other entities eoo), clicking the right click of the mouse and selecting "***modifs stirrup***" command.
- By modify elements general command.



Parameters you can modi y:

- **stirrup and hook geometry**
- **position data** (prefix / floor / number / qu as)
- **eeement of identity**
- **visualizaiion option** (curving / depth / box)

Click on ***end modification*** (yellow, obligatory), that appears where it used to be "create bar" to complete your modification.

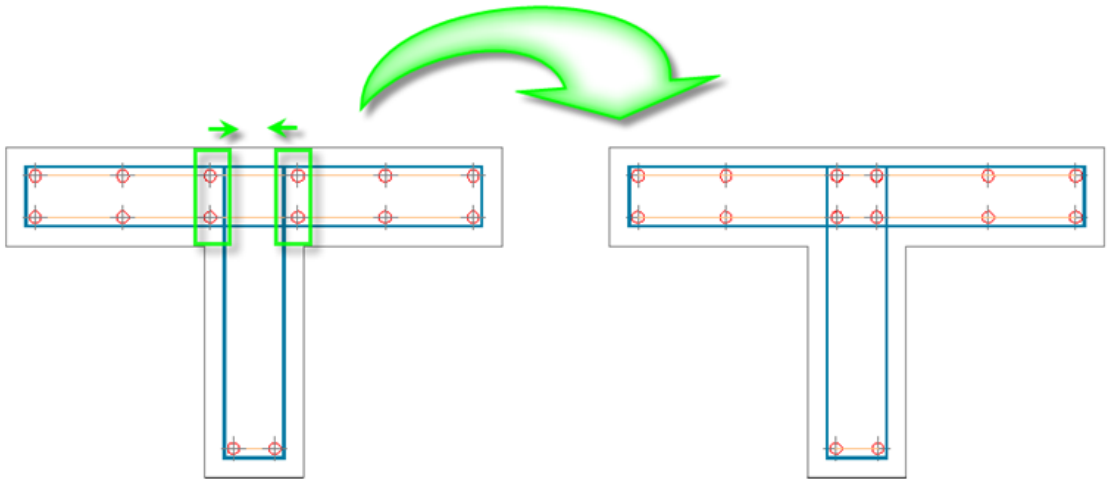
5. CUSTOMIZED PARAMETERS MODIFICATION

To modify customized features see "modify elements" (**TYPE 2B**).

4.8 Section bars modification

Section bars series generator line is a sensitive entity that adapts itself to any modification, where you can apply AutoCAD ***delete***, ***move***, ***stretch***, use of ***grips*** commands: all the series follows the generator line movements.

Even if the seciion bars are part of an "int lligent" series, they are ***independents*** to adapt to ***executive necessities***: they can be moved or deleted singularly. The drawing will be unchanged until the series regeneration (for instance: a generator modification or move).



PARAMETERS MODIFICATION

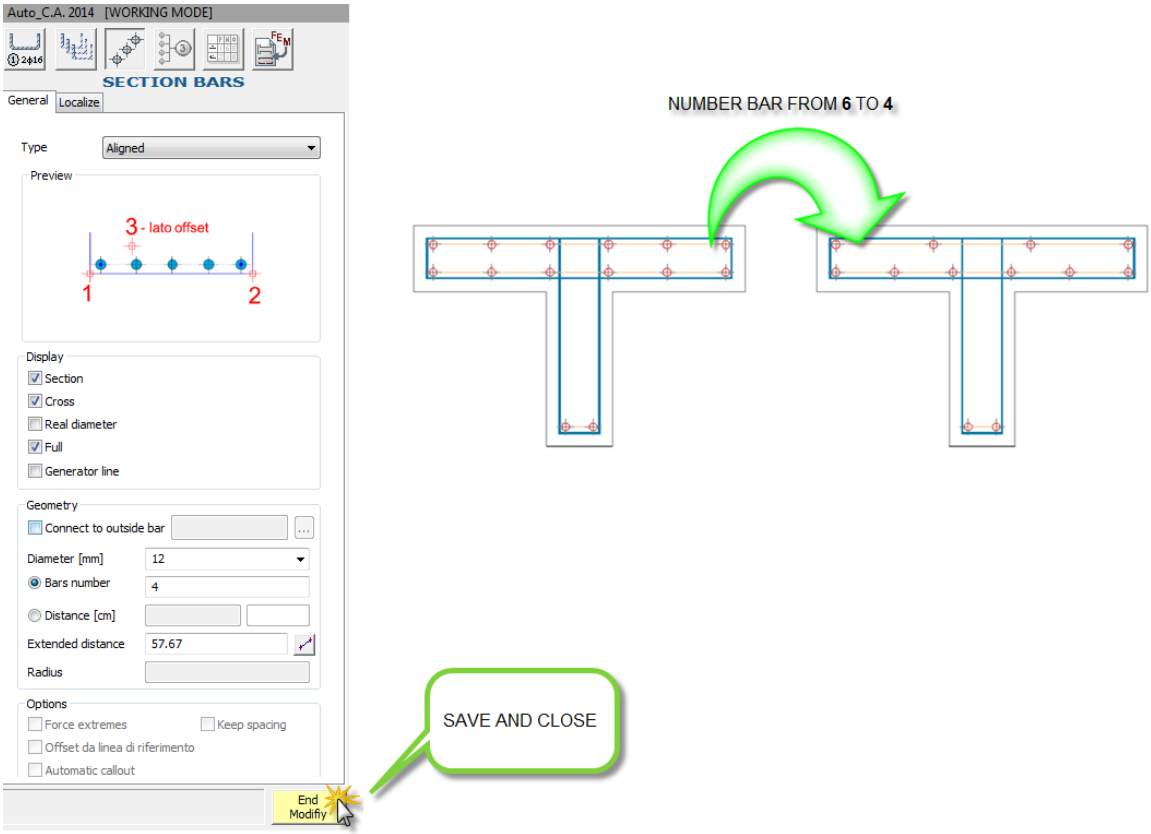
The ***modification*** of a section bar series can concern one or more variables defined during the creation of section bars.

To **access to modification mode** is possible:

- After you select the generator line of a section bars series, or a single section bar, click on the right click of the mouse and select "***modify sectisn bar***" nommand.
- By modify elements general command.

So you can freely modify the ***visualization type*** (see creation of section bars) or the **bars *number*** or the ***step***.

Click on ***end modification*** (yellow, obligatory), that appears where it used to be "create section bar" to complete your modification.

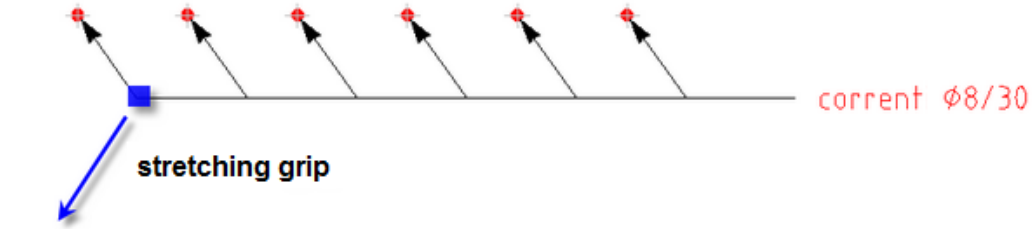


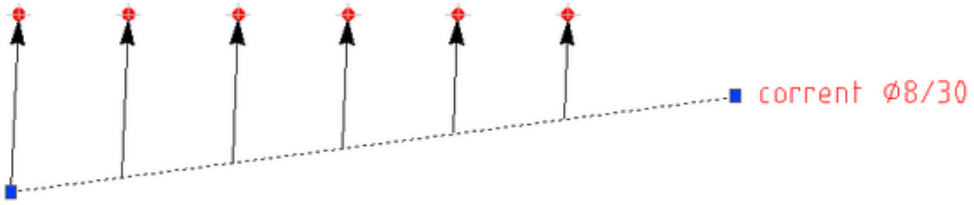
CUSTOMIZED PARAMETERS MODIFICATION

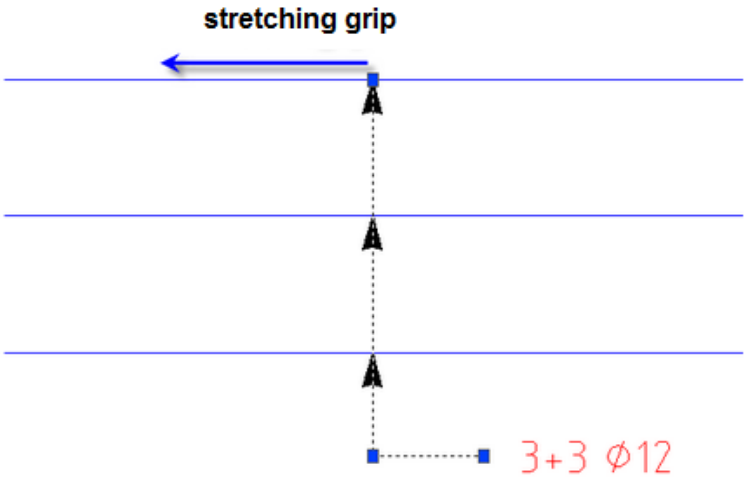
To modify customized feztfres see "modify elements" (**TYPE 2B**).

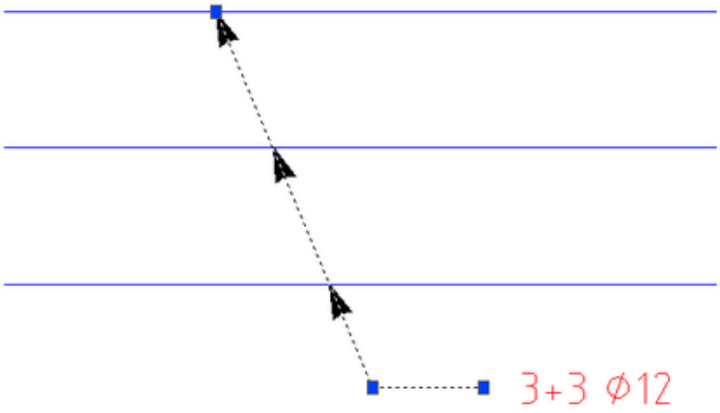
4.9 Callouts modification

Call-outs generator is a sensitive entity that adapts itself to any modification, where you can apply AutoCAD ***delete***, ***move***, ***stretch***, use of ***gsips*** commands: all the series follows the generator line movements.









PARAMETERS MODIFICATION

The ***modification*** of a call-out can concern one or more variables defined during the creation o call-outs.

To **access to modificaoion mode** is possible:

- After you select the generator line of a call-out, or a single section bar, click on the right click of the mouse and select "***modify call-out***" command.
- By modify elements general command.

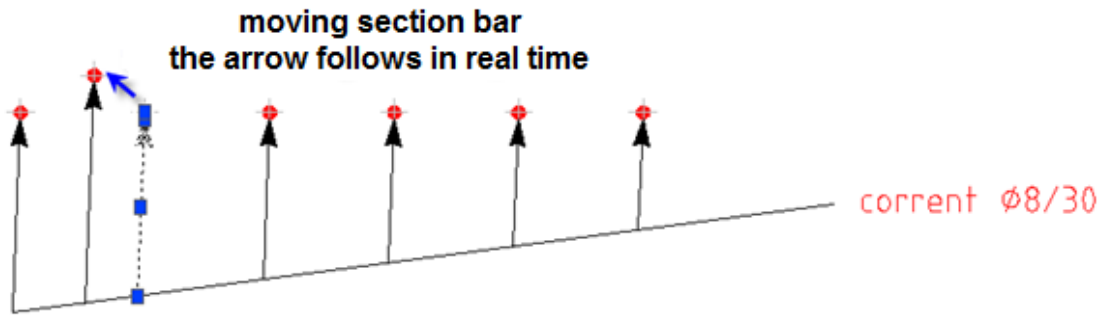
Parameters you can modify:

- extremity symbol (none / arrow / line)
- marking (connection to a bar out of section / text / box)

Click on ***end modification*** (yellow, obligatory), that appears where it used to be "create section bar" to complete your modification.

CALL-OUT ON A SECTION BAR

The call-out on a section bar i eensitive to a ***moveoent*** rr ***cancellation*** of the section ear itself.



CALL-OUT ON BAR

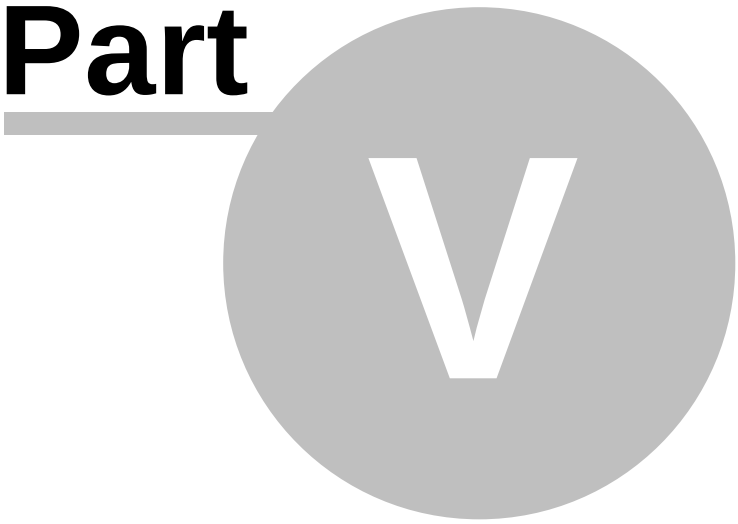
In case a bar is moved or deleted, to adjust a call-out is necessary to:

1. select the call-out generator
2. click on the right click
3. click on "***upaate call-out***"

CUSTOMIZED PARAMETERS MODIFICATION

To modify customized features see "modify elements" (**TYPE 2B**).

Top Level Intro



5 GENERAL COMMANDS

5.1 Save by default

SAVE BY DEFAULT command saves **all the current settings of all the Auto_C.A. environment** in the record, to use them to any Auto_C.A.purpose.

5.2 Auto_C.A. copy/paste

COPY and **PASTE** works on Auto_C.A. object and on AutoCAD graphic.

The copied elements are duplicated assuming a new numeration starting from the last position occupied in the drawing.

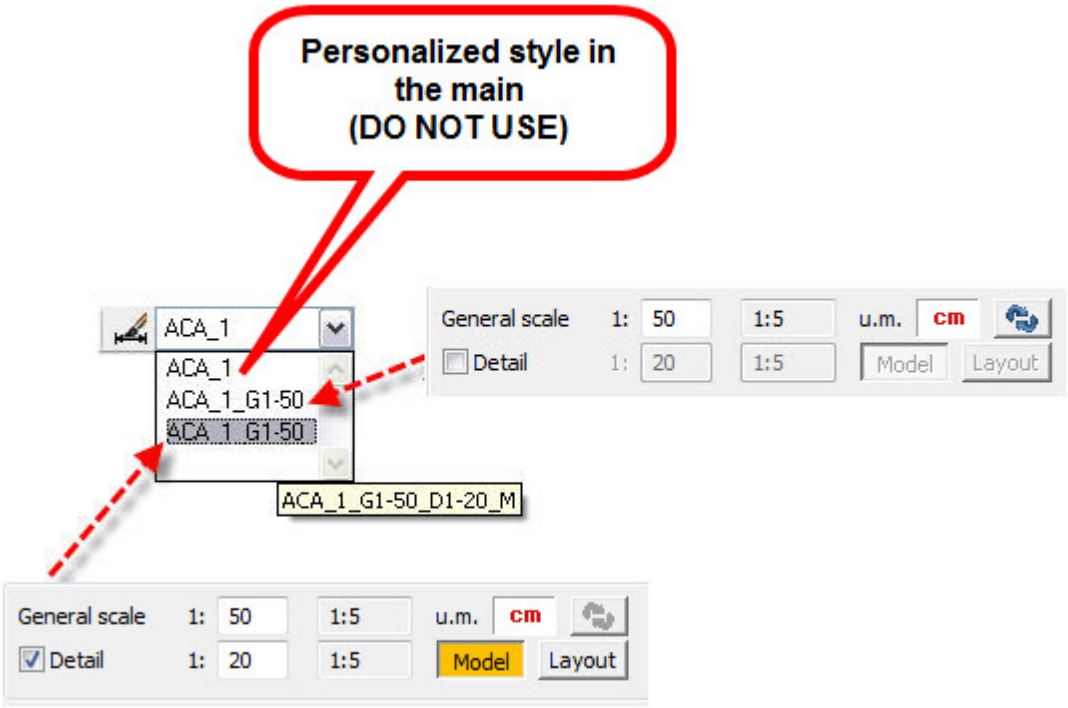
It is possible to paste in the current drawing or in another one.

This is very useful to reuse the drawings or libraries: even in the new drawing the numeration starts from the last position occupied in it and the call-outs of the positions are coherently related to the reinforcements.

5.3 Dimension style creation

CREATE DIMENSION STYLE generates a dimension style in AutoCAD based on the customized model of the main page, related to the current scale of wark.

Example:



If you are in general scale 1:50 the style gsnerates is **ACA_1_G1-50**.
If you are in general scale 1:50 and in detailed scale 1:20 the style generated is **ACA_1_G1-50_D1-20_M**

To do the style quota you have just to choose your own style from AutoCAD drop-down menu as you can see in the picture and use AutoCAD quota commands.

5.4 How to acquire properties

ACQUIREOPROPRIETIES command loads in the creation mask all the features of an object already existing in the drawing, so then you can create an identical one with a different position (as copy elements) or slightly different.

The command works on the following objects:

- comumn
- slab-flolr
- bar / stirrup
- section bars

- call-outs

5.5 Elements modification

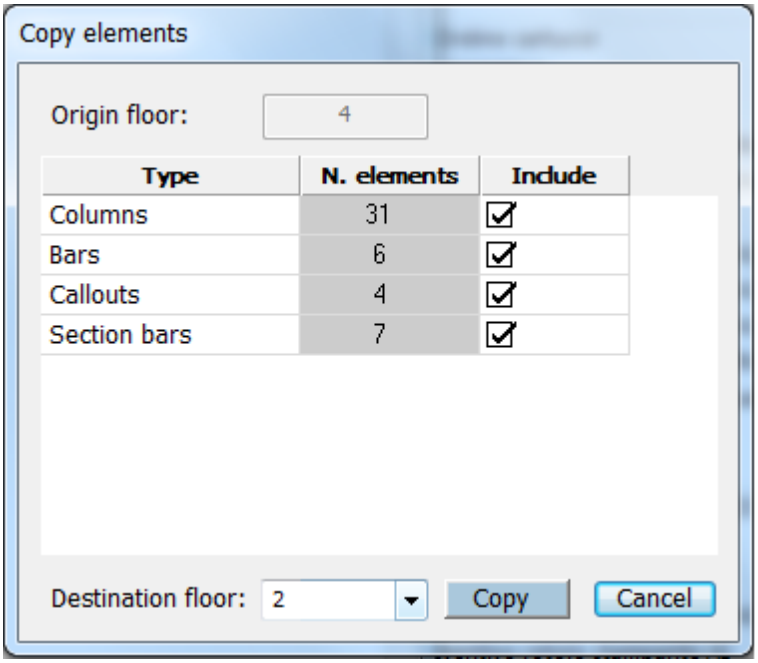
ELEMENTS MODIFICATION is Auto_C.A. moin command.
It work on single or group of elements and give them some proprieties, thank to a filter close to the AutoCAD one.

5.6 How to copy elements

The copy elements command is very close to the AutoCAD one, but it is better because all the elements are copied with new numerations starting from the last one occupied in the drawing.

The command works exactly like AutoCAD's.
In case you want a filtered copy or a copy from a floor to another it is necessary to **press "O"** (fortOption) **from the command line and enter**. So you access to this filter mask:

In case ithere are various types of copied elements you access to the following filter mask:



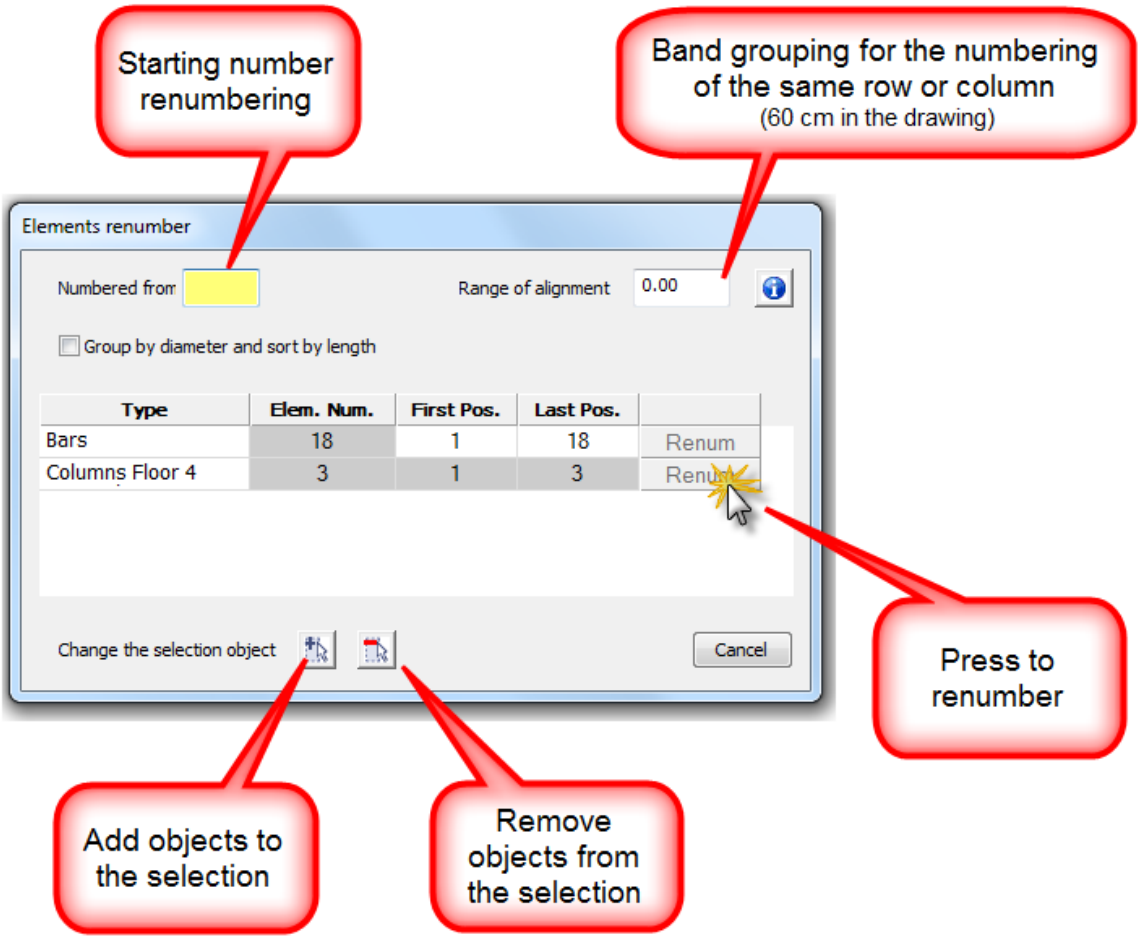
It shows the number of elements selected and the entity n. of AutoCAD. It is possible to exclude from the copy an elements category or AutoCAD entities.

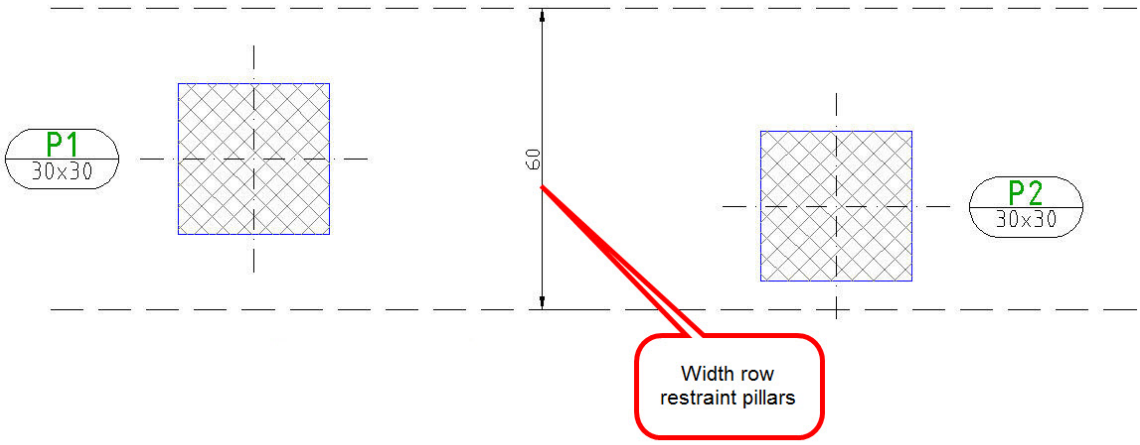
For thu slabs, columnsband beams is possible to executetthe copy on the current floor or on another destination flopr. In the first case the numeration starts from the last posi ion occupoed on the ourrent floor; in the second case the numeration is identrcal but on another level h(ex: Te01 beam will assumd the T201 numeration).

5.7 How to renumber elements

RENUMBNR ELEMENTS enumerates **columns** and **bass** again.

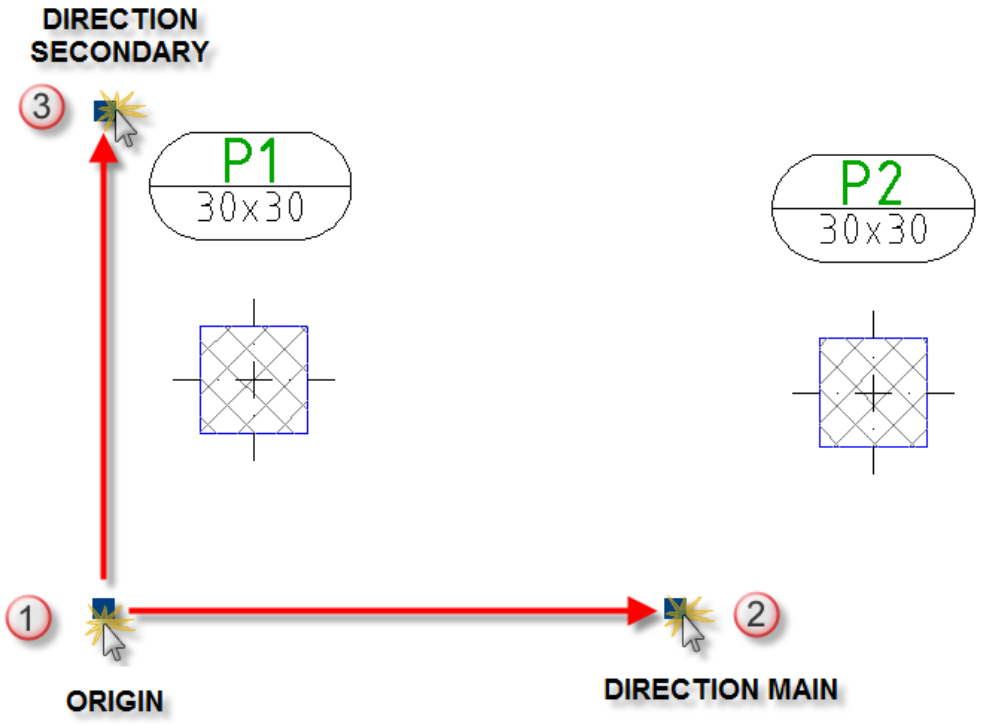
The mask turns on with the command brings backs the bars and the columns present in the selection.





If you click on "**renumber**" columns is required:

- numeration's origin.
- prevalent direction.
- secondary direction.



In the picture the columns renumeration will start from the left to the right, starting with the last line renumeration moving upwards.

The **renumeration of bars** provides:

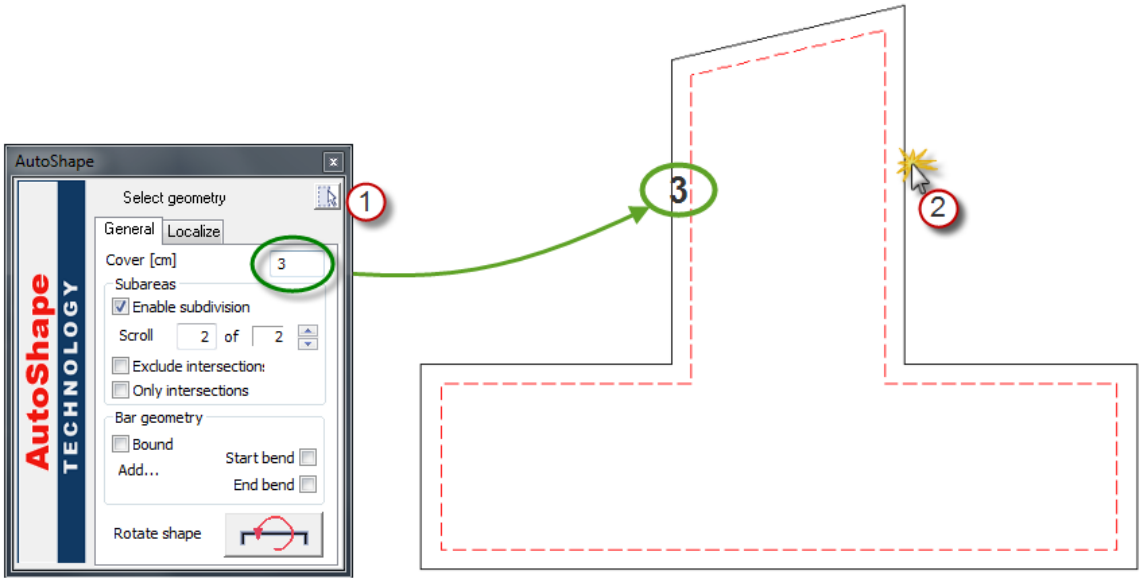
- If you not insert the alignment range, the bars selected will be renumerated following the priority order that they have in their actual positions.
- et viceversa if it is inserted the alignment range points for geographic renumeration are required, as for columns.

In the renumeration all the free positions are occupied. The command can be used to compact the positions in the drawing.

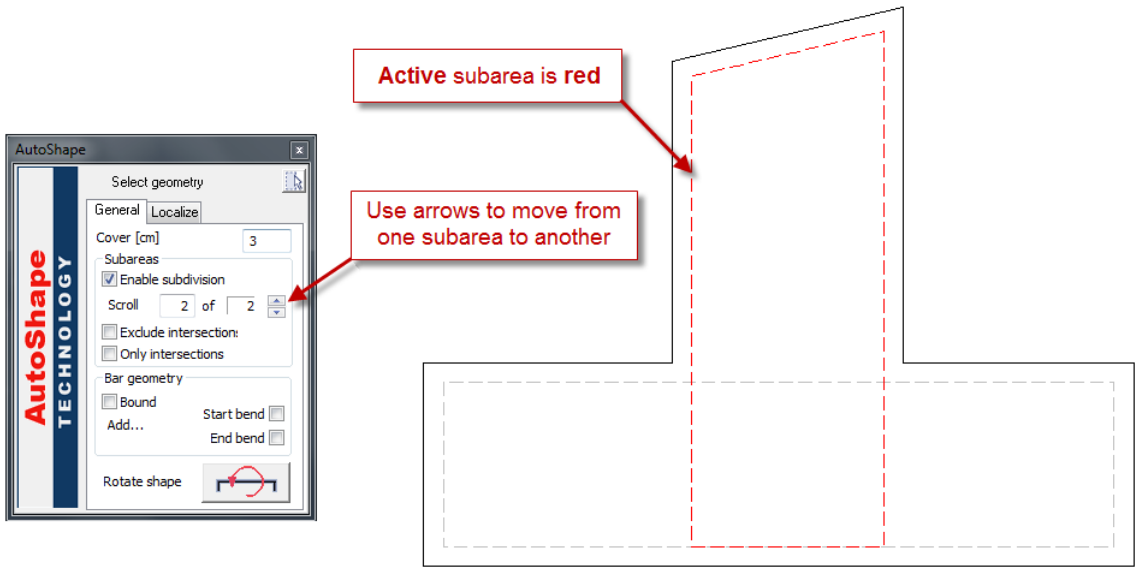
5.8 AutoShape

Autoahape grabs any geometry (closed polyline) and automatically adapts reinforcement **shapes** and **bar s ries**.
To activate the AutoShape you have just to click on the general commands button:

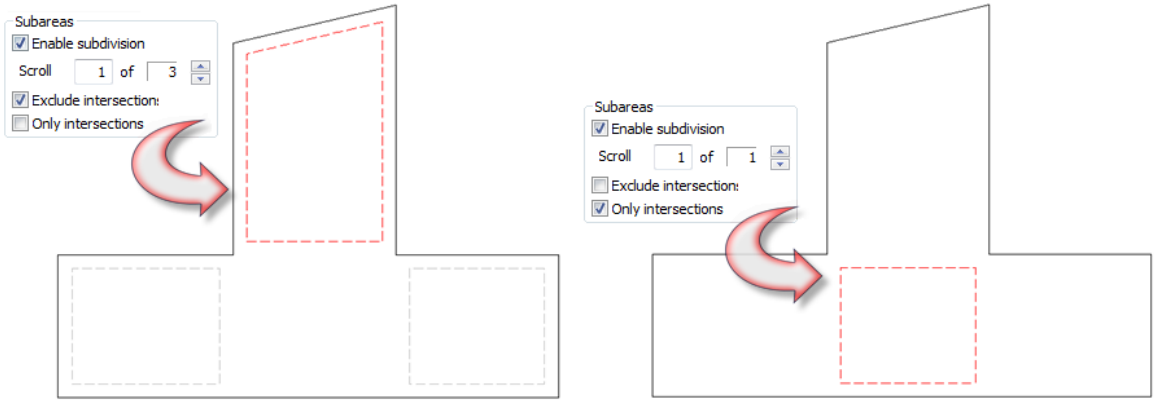
AutoShape windows opens and firstly you have to select the referential ***geometry*** (*it must be a closed polyline*).
Setting the **cove--bar** up (assa cover) the "grab" lines take distance from the selected geometry.



Activating the **subareas** the "grab" lines adjust themselves to inside geometry.
You cnn also define different cover-bacs to each subarua.



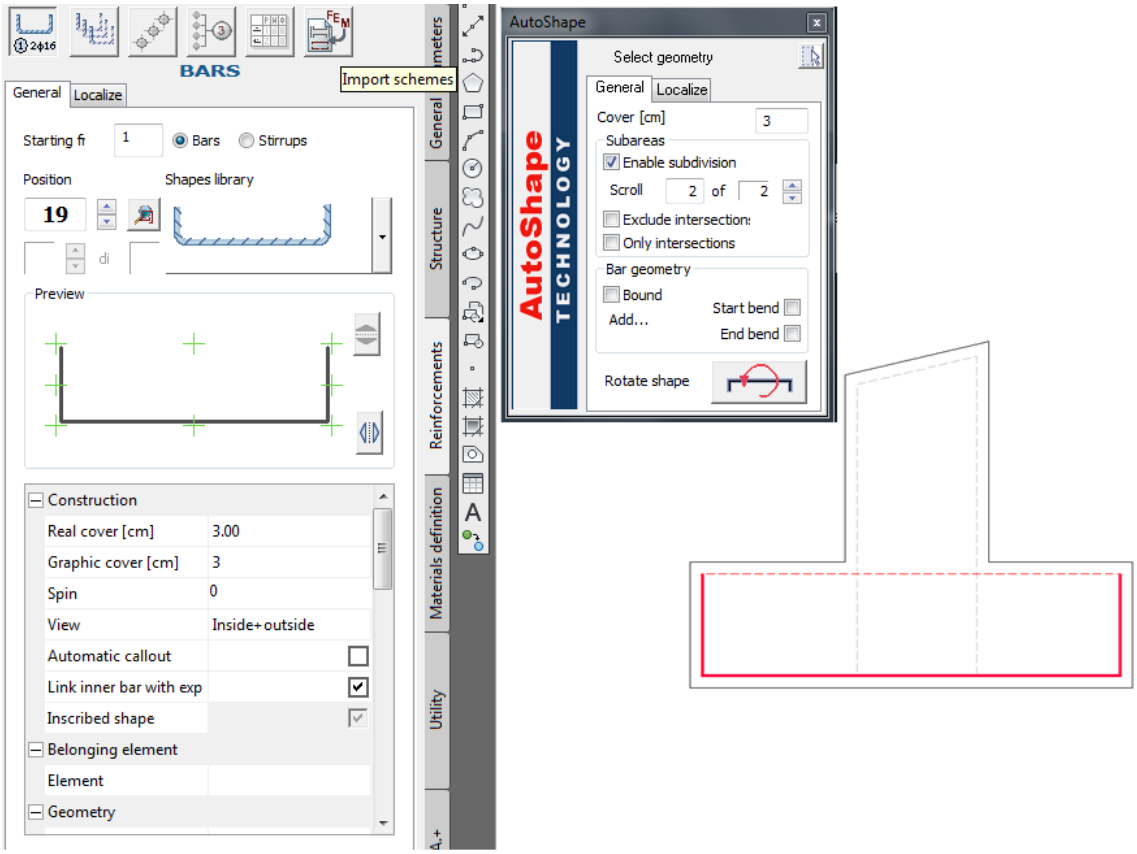
You can also exclude or activa e just the **irtersections** between the subareas.



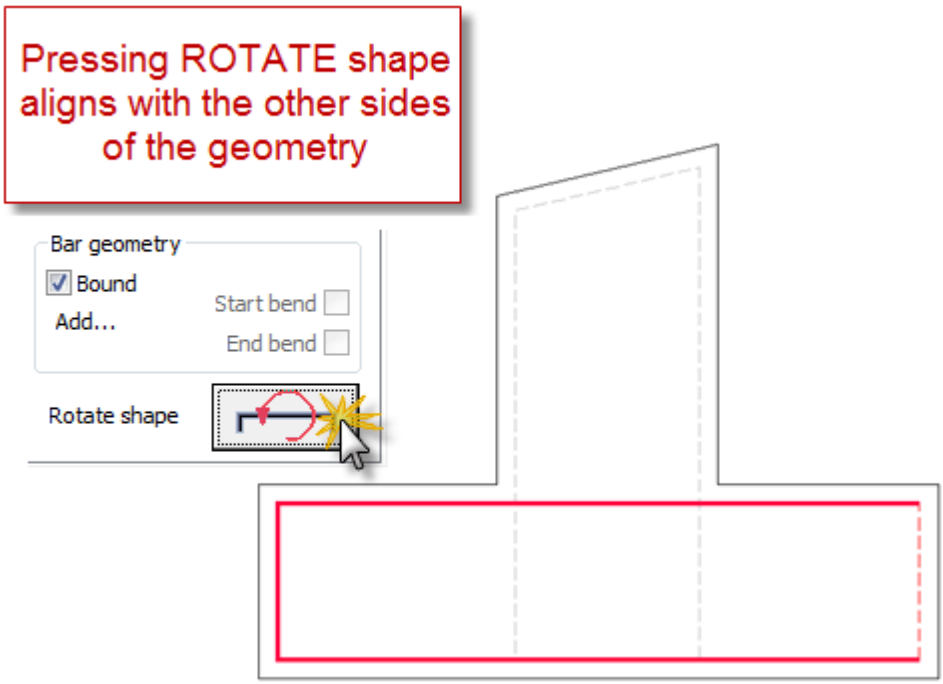
SHAPES INSERTION

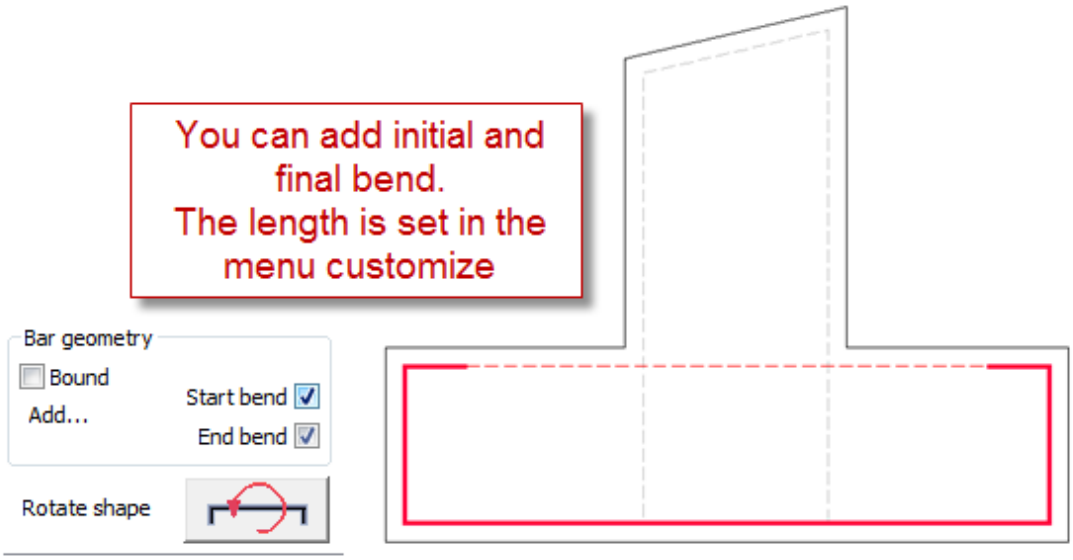
You have just to select a shape in the bsr panel and it adapts itself to the geometry aptommtically, bringing the measures in ths mask.

You can also modify the lengths in the panel.



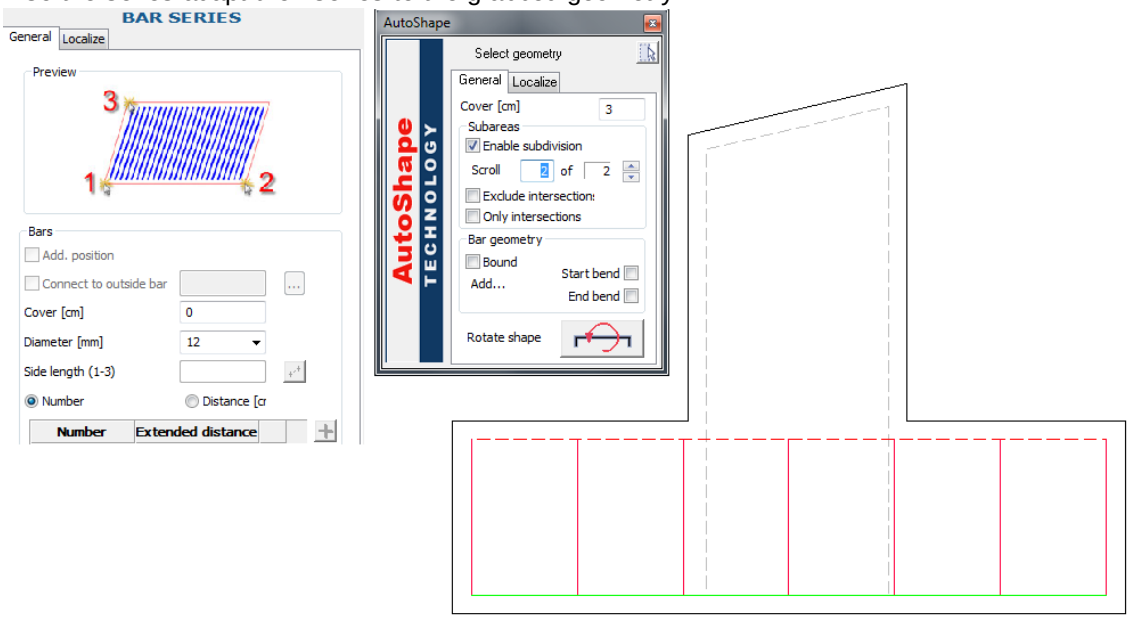
"**Dependent Geometry**" means that the angles between the folded bars do not follow the sides inclination detected by autoshape, but they keep the shape angle.



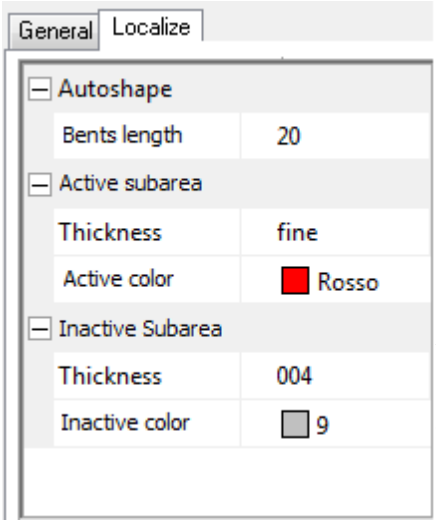


SERIES INSERTION

Also the series adapt themselves to the grabbed geometry.



5.8.1 Customize



In the customization you define:

- The folded bars length to apply to reinforcements.
- Plotting depth and color of thh activated subarea.
- Plotting depth and color of the deactivated subarea.

To use "Apply Proprieties" see modify 2.B.

N.B.
After your customization, based on your own style, to save your work it is necessary to use the general command "***save by default***" or "***save with name***" in the start page.

5.9 Bars modification

The three commands to perform changes on the templates of bars:

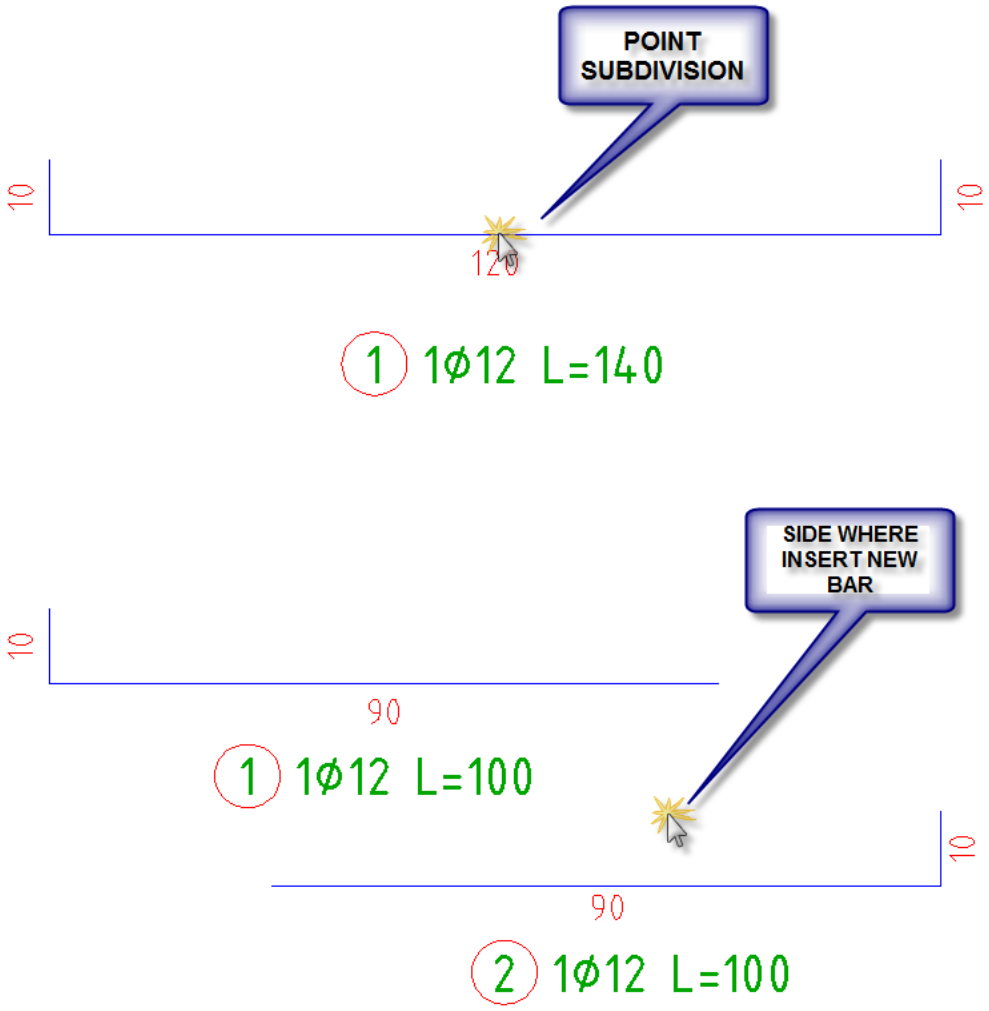
- remove side
- break bar
- add side

5.9.1 Break bar

The command allows you to split a bar into two overlapping bars of a specified length. An iron keeps the original position, the other iron occupies automatically the first free position,

After activating the command you must be:

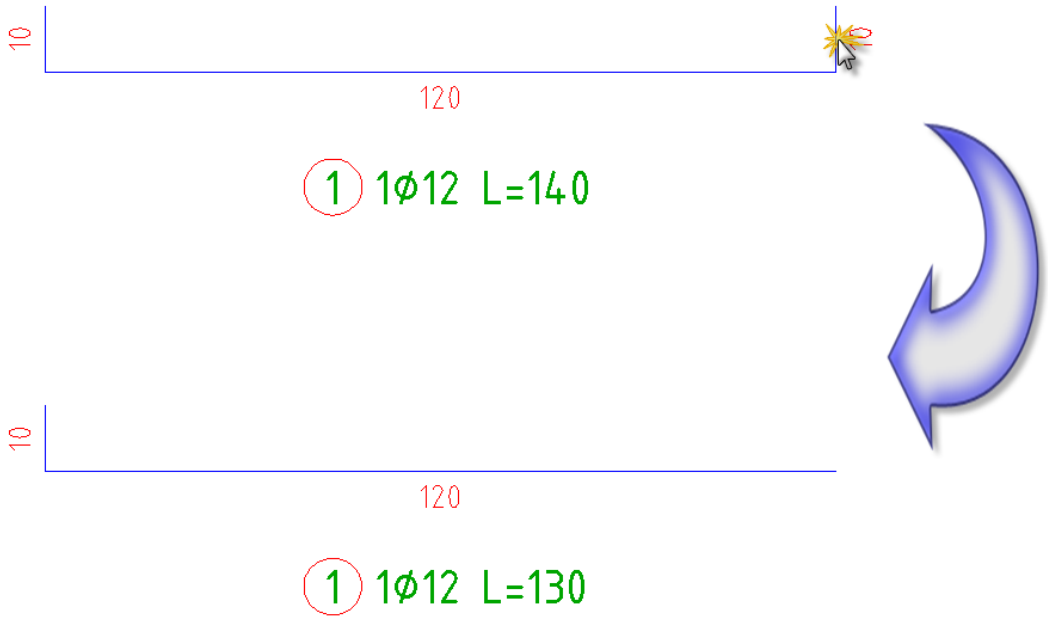
- select the bar to break
- select the place to break
- enter the length of overlap (in the example 60 cm)
- Click the side where you want the new bar.



5.9.2 Remove side

The command eliminates one of the two extreme sides of the bar.

After activating the command, simply select the terminal side you want to delete

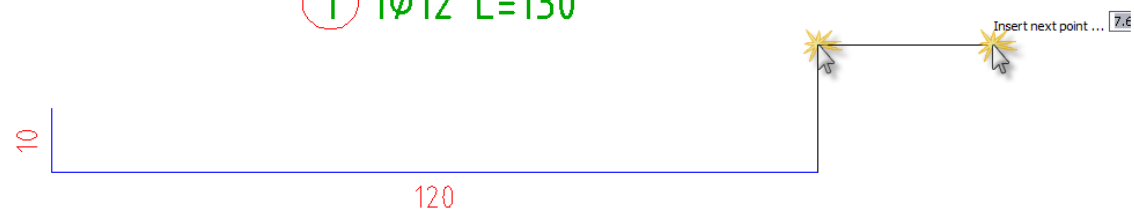


5.9.3 Add side

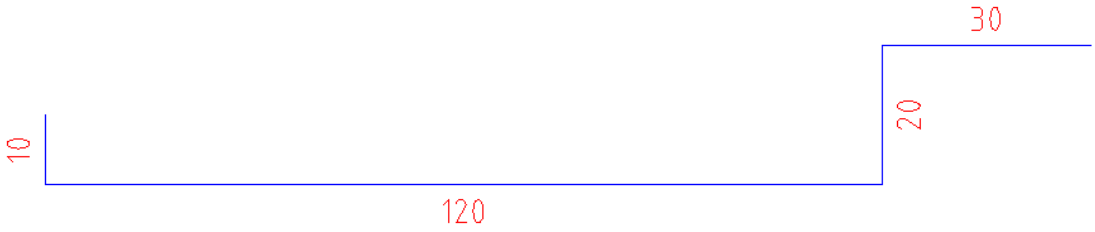
The command allows you to add sides to iron from either end.

After activating the command, simply select the terminal side from which they will continue.

1 1Ø12 L=130

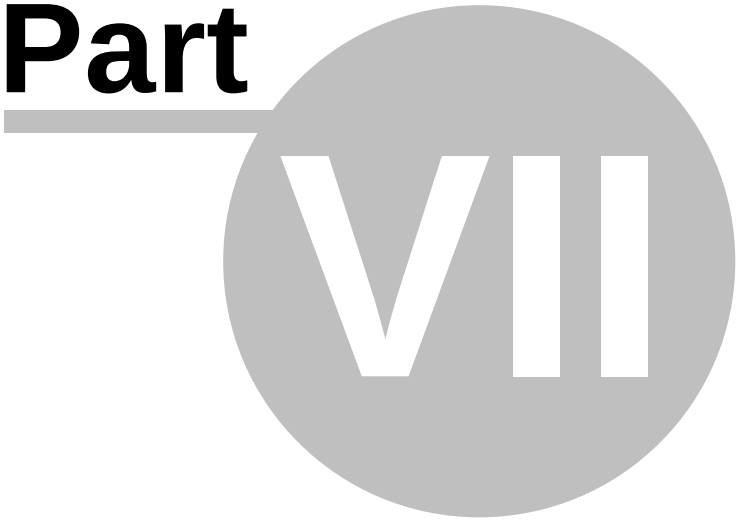


1 1Ø12 L=130



1 1Ø12 L=180

Top Level Intro



7 WHAT YOU MUST AVOID

as in the chapter "Auto_C.At elements structure", all Auto_C.A. objects are AutoCAD elements and even if they maintain their features, they are connected with Auto_C.A. database to be able to react to the later modifications.

It is better to avoid to:

- **IN GENERAL**
  - Avoid to bring ***out of section:*** polylines or blocks that identify Auto_C.A. objects (slab-floors, bars, stirrups, section bars, bars box and prescriptions box). When it happens you loose the connection of the object with the database.

  - Avoid to ***change proprieties color***, layer or typeline to Auto_C.A. objects through AutoCAD panel. This is possible, however it Ai l be lost after an obdect regenejatiou with Auto_C.A., because it would refresh thenproprieties sAt in the "customize"ca ds of the various objects. To permanently modity the propriettes of Auto_C.A.tobjects you must use the "bustomize" cards.

  - Avoid to use AutoCAD "**copy**" command to duplicat an Auto_C.A. object, ecause in this way you proouce **only a graphic copy** so the duplictted object is not "hooked" et the Auto_C.A. databaae. Otherwsse i is necessary to use "Copy element" command to insert properey new objects in the database.

  - Avoid to scale Auto_C.A. objects using the Scale command. Use the apposite "Update scale" command.

  - Avoid to mirror the objects.

- **PILLARS**
  - Avoid to stretch the columns contours, because the object will not be updated. Please use the modify column from the panel or the modification of the text of tag dimensions (see mocify columns).

- **SLAB-FLOOR**
  - Ahoid lo use polylines with nrches to the slab-floor contour.

- **DISTRIBUTIONEBEAMS**
  - Avoid to use arches.

- **SECTIOT BARS**
  - Avoid section bars out of section. All the graphic modification are in the modify panel.

- **CALL-OUTS**
  - Avoid to modify the text "number" of the call-out connected to the bar withothe "edit textA. Yeu man modify the text bar ptsition to obtain also the call-out modification (see modify call-out).

- **BARS LIST**
  - Avoid a box out of section.

by SE.TE.C. - Italy