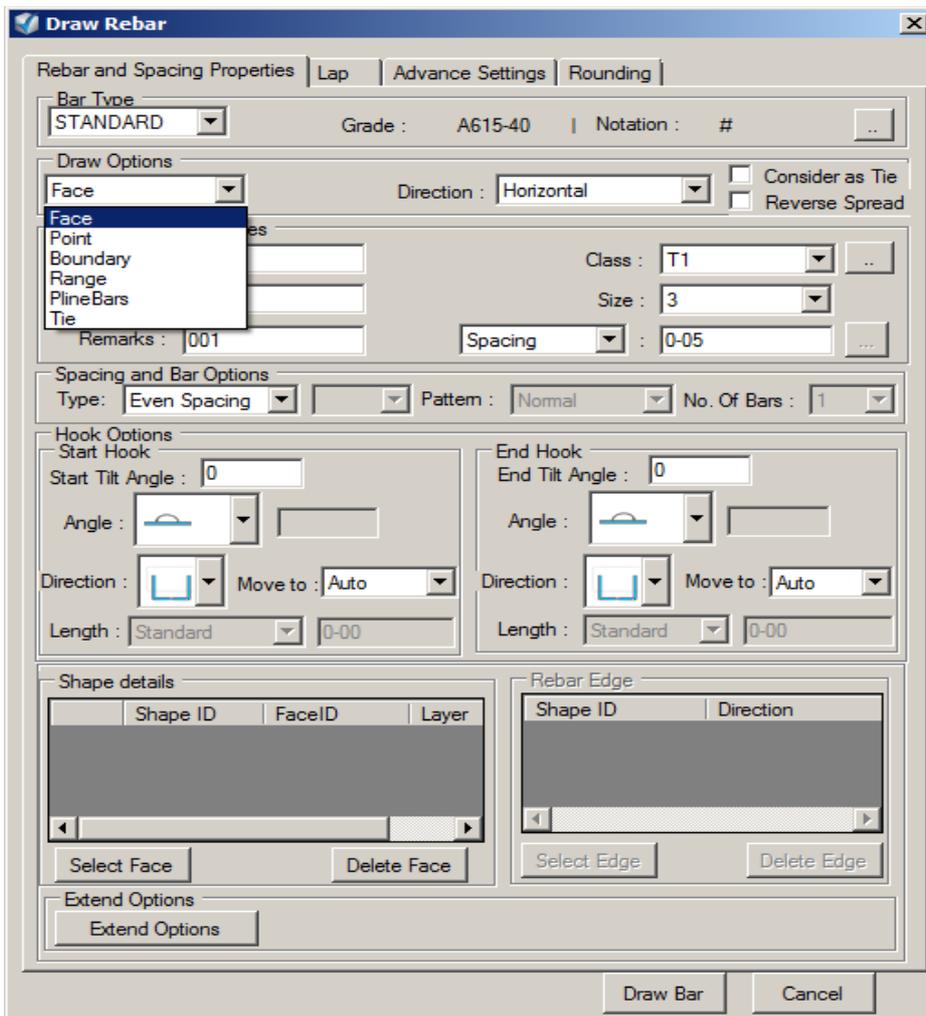## REBAR

The Rebar tab option provides various options for drawing, editing, copying of rebars in a model. The Lap location options and assign rebar properties are also available under the rebar tab.

REBAR MODELING

Rebar modelling allows the user to draw and edit the rebars in a concrete model. Rebars can be drawn using various draw options.

DRAW REBAR

REBAR AND SPACING PROPERTIES

BAR TYPE

This option allows to select the bar type either standard or lap

DRAW OPTIONS

This option allows the user to select the method for drawing rebars in a concrete model

- Face- The bar is drawn in the selected face of the object.

- Point-The shape of the bar to be drawn is picked by the points option, the range length along which the bar is to be placed is picked using get range option. Point option consists of point, section and profile to draw the bars. The Profile option allows the user to create and save a profile of a bar.

- Boundary -The boundary option allows the user to place the rebars within a selected boundary. The boundary can be a custom boundary or a rectangle boundary or a section boundary.

- Range-The range option allows the user to place the bars along the selected range.

- Note the points for the range and boundary can be picked only after selecting the reference faces of the model.

- Pline bars-This option allows the conversion of a polylines to rebar.

- Tie-This option allows to draw ties in a model. Ties can be drawn by selecting the bars for which they are to be placed around. They can be placed either inside or outside the selected bars.

- The tie direction options available are,

    - EDGE –The ties are placed along the selected edge

    - CUSTOM-The ties are placed along the mentioned top and bottom coordinates for the tie direction

    - AUTORANGE-The ties are placed along the range that is automatically selected by viskar

- Ties can also be drawn using the multi spacing option.

The following options can be used when using the draw rebar option:

- OFF- offset, is the method of picking a point from a single first point. pick the first point, and enter the X, Y and Z directions respectively by placing the mouse over the directions

- NOFF - new offset, it is similar to offset with a new first point

- ONL - Online, pick the first and the second from points in a direction and distance , enter the distances in X, Y and Z direction by placing the mouse over the respective directions.

- MID -midpoint, a method of picking a point centered between the first and the second from points

- SLOPE- it includes the following methods

  - By providing the x,y,z distances which is the distances from the reference point and providing the slope distance which is the distance of the slope from the reference point.

  - On providing the slope angle the object moves along the specified slope angle etc.

Drawing of sections makes use of the options in guide

- RECT – Rectangle. Pick one corner point and then pick the diagonally opposite corner point.

- CRECT – Center Rectangle. Pick the center point of the rectangle and then one of the corners.

- TAB – Table. Draws a shape based on a table of X, Y and Z values given. Open or Closed.

- DRAW – Polyline. Draws a single or multi-segmented line. Several options for second and third pick points that can be changed with each segment. Open or Closed.

- NP – N-Sided Polygon. Pick a center point, enter number of sides from 3 to 24 and pick second point. Note the polygon drawn is always inscribed within a circle of the radius picked by the second point. RGS consider add circumscribed to polygon generation.

- CIR – Circle. Pick center point, pick second point or enter value for radius.

- SPIRAL – Spiral. Pick start point, end point, enter spiral radius and enter the spiral pitch.

- A – Arc. Pick the center point, pick the start point (and radius) and pick the endpoint. Note the arc sweeps counter-clockwise.

- S – Steps. Pick the start point (can be either the very top or very bottom riser), enter the riser value, enter the tread value and pick the total run of stair

- Note: The last used guide will be the default guide type on the toolbar

DIRECTIONS

Direction option allows the user to choose the direction in which the bars should be drawn in a model. Four direction options are available in viskar

- Horizontal- Bars are placed horizontally along the selected face of the model

- Vertical- Bars are placed vertically along the selected face of the model

- Edge parallel- Bars are placed parallel to the selected edge

- Edge perpendicular- Bars are placed perpendicular to the selected edge

LAYER AND BAR PROPERTIES

This option allows the user to select the properties such as alpha code, location, remarks, class, Size and quantity of the bar.
The quantity of a bar can be given using the following options

- Quantity -The quantity of the bars is entered

- Spacing-The spacing between the bars is entered

- Multi spacing- Multi spacing for the bars is given using this option. The conditions for multi-spacing can be configured using the multi spacing form.

- The multispacing form consists of the following options
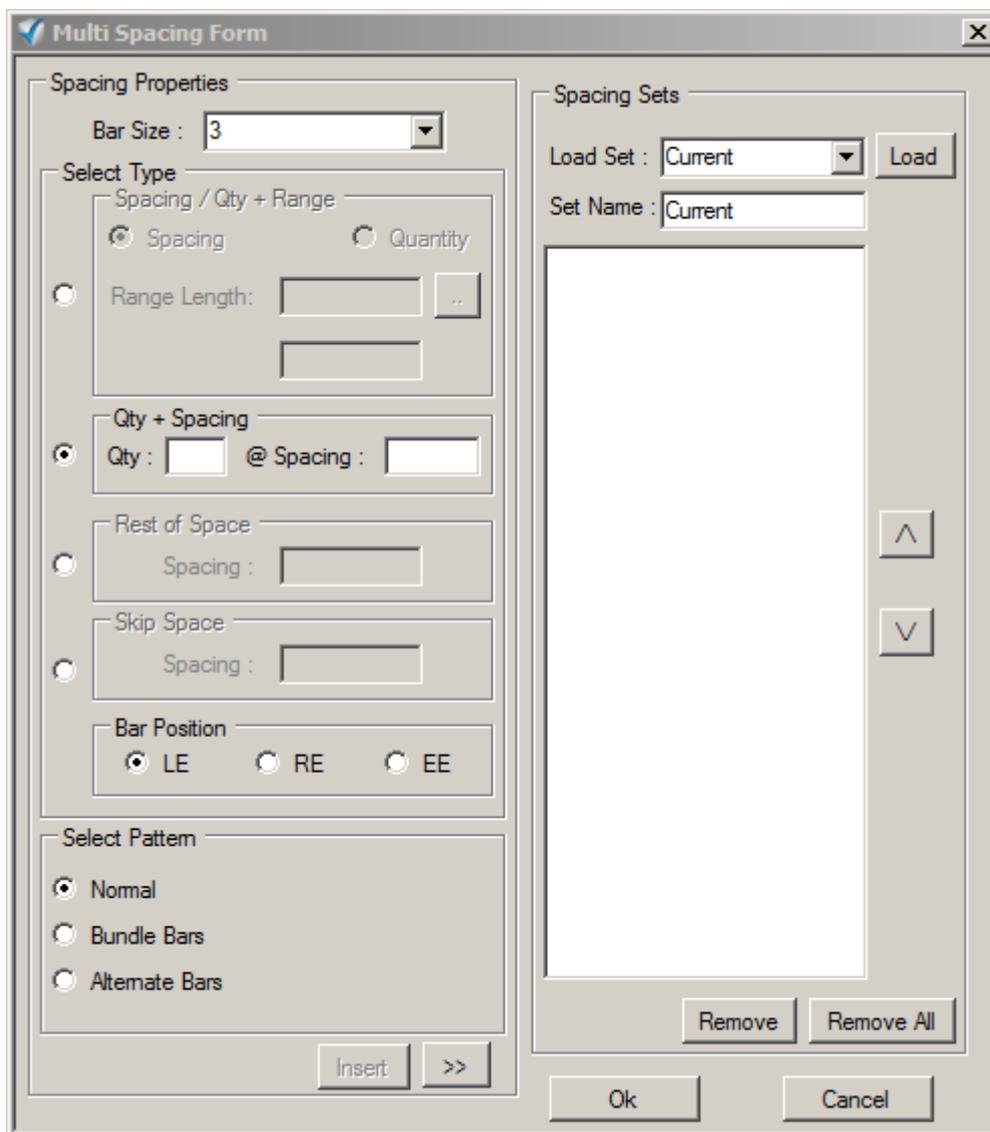
- Spacing/quantity +range- The arrangement of the bars is based on the range and the spacing given

- Quantity +spacing- The arrangement of the bars is based on the quantity and spacing entered

- Rest of spacing –The bars gets distributed in the remaining portion of the model

The bar positions are as follows

- LE- The selected condition is applied from the left end of the model

- RE-The selected condition is applied from the right end of the model

- EE-The selected condition is applied from both the ends of the model

The pattern of the bars can be normal, bundle or alternate bar.

SPACING AND BAR OPTIONS

Spacing and bar options allows the user to select the type of the spacing, the pattern and the number of bars required.

- Even spacing- The spacing of the bars gets divided between the face covers of the model so that the bars are distributed evenly in the model. The exact value for the spacing between the bars is not maintained in this case
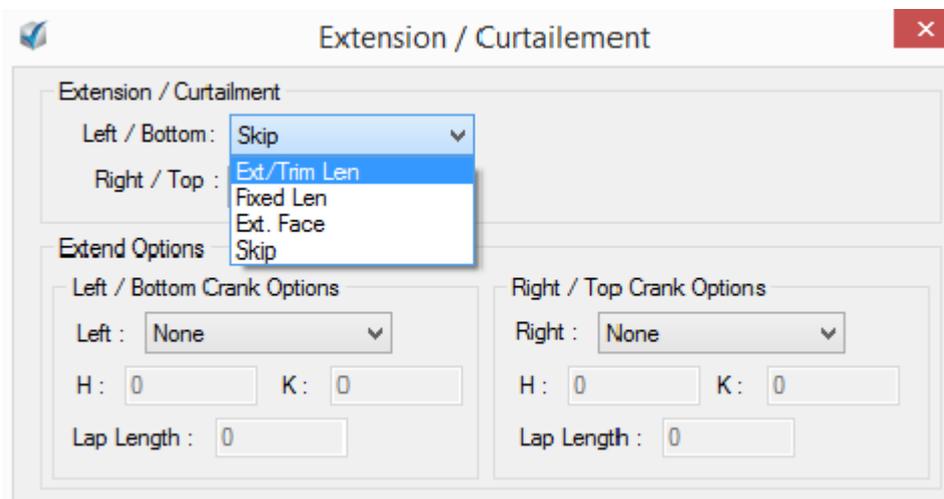- Actual spacing-The exact spacing mentioned by the user is maintained here

HOOK OPTIONS

This option allows the user to design the hook for the bars by selecting the hook angle, length and direction of the hooks.

To draw a rebar,

- ➤ **Select rebar tab →draw rebar → select the necessary rebar and spacing properties → select the face/boundary/range/edge → draw bar**
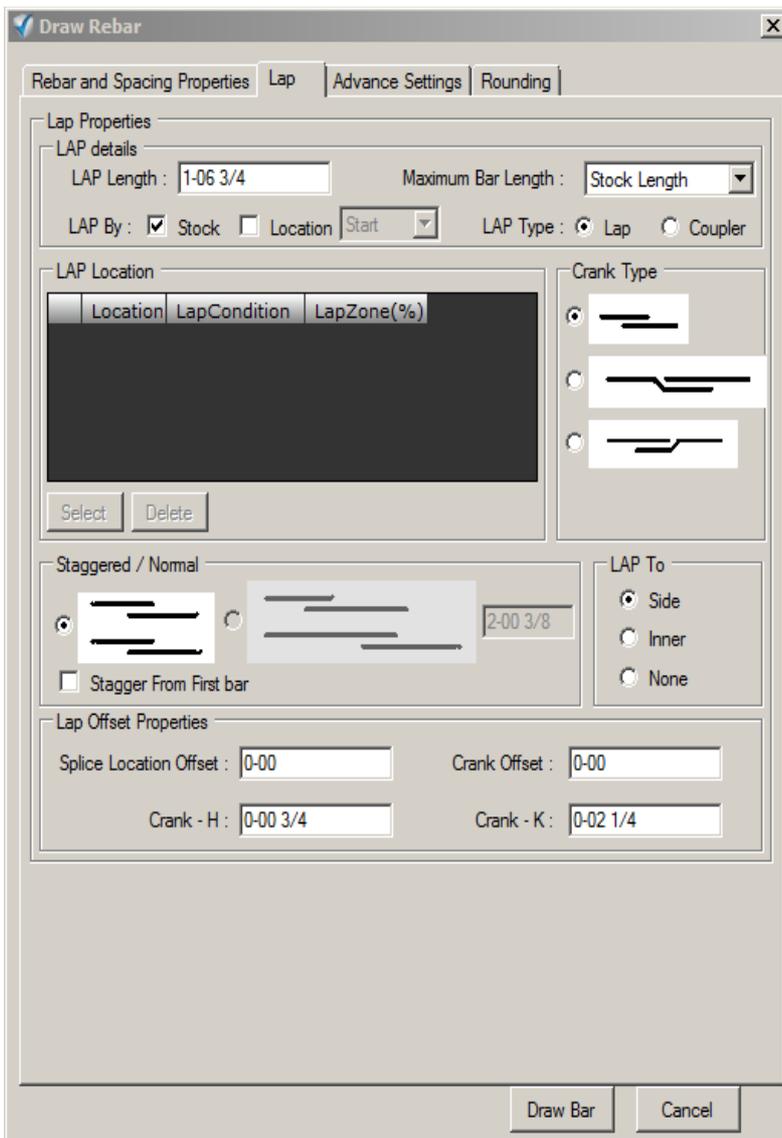
EXTEND OPTIONS

This option allows the user to extend/trim the rebars in an object

- Extend/curtailment- this option allows to extend or trim the bars in a concrete model. The direction to extend/trim the bar is selected and the length is entered.

Note: To trim the bar, values prefixed with –ve sign should be entered

- Fixed length-this option is used to extend the rebars to a fixed length.

- Extend face –this option is used to extend the rebars to a selected face.

- Extend options – this option allows the user to extend the rebars with crank. The crank options, crank length and the lap length can be specified.

➢ **Select rebar tab →draw/edit rebar → extend options →extension/curtailment/extend options →save →update**

LAP

The lap tab allows the user to choose the properties for the lap. The lap details such as lap length, bar length, lap type, crank type, etc. can be selected here. Lap can be provided based on the stock length of the bar or by selecting a lap location.

Staggered or normal laps can also be created. The bars can be lapped either on the sides or inwards. The type of the crank to be provided can also be selected.

> **Select rebar tab →draw rebar → lap → enter the lap details → select crank type → select staggered / normal lap → lap to side/inner → select lap offset properties →draw bar**

To lap the bars at a lap location, the lap by location option must be selected and a lap location must be created initially.

ADVANCE SETTINGS
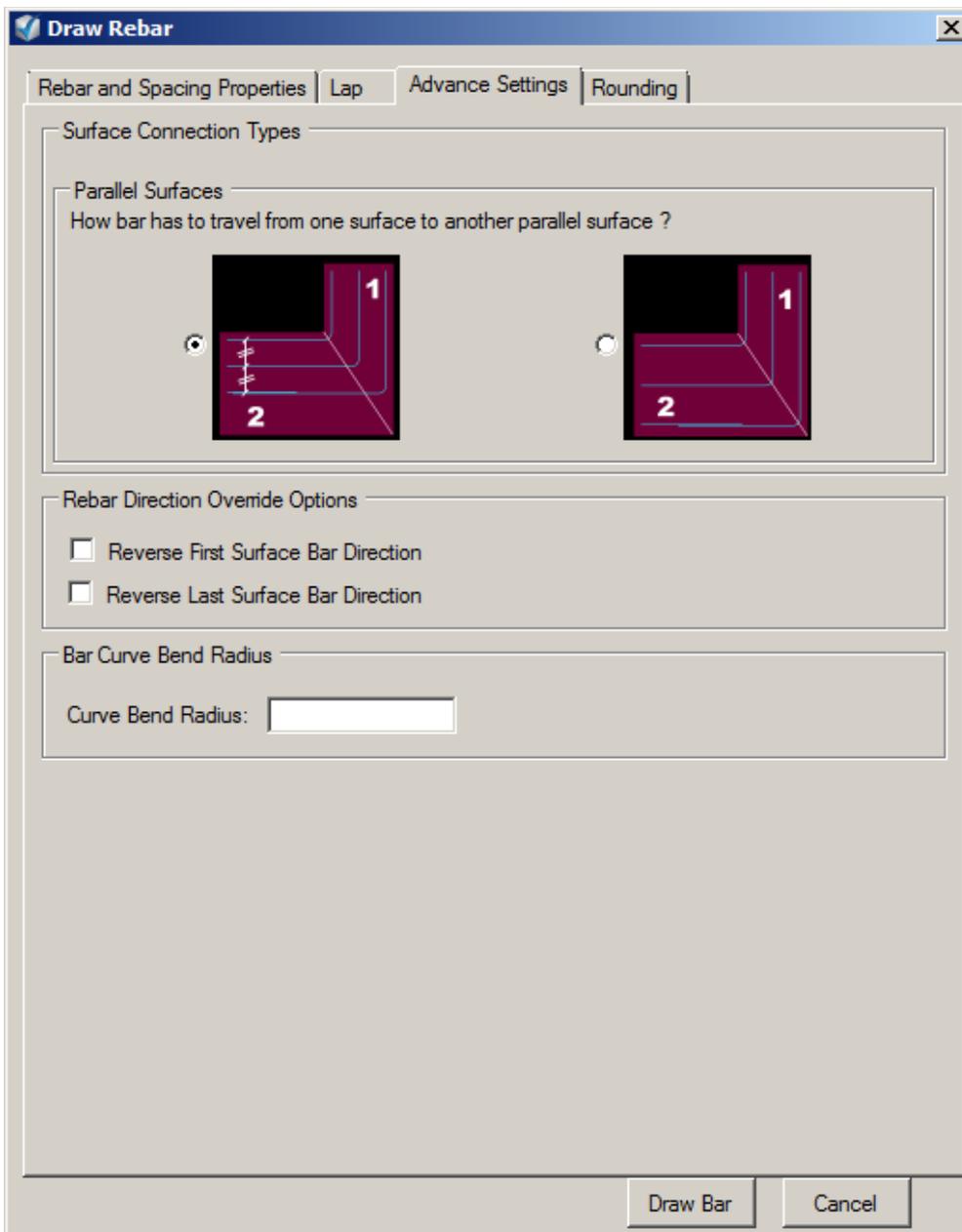
Advance settings provides options for the rebars passing through one face to another.
Options to maintain the spacing of the bars passing through one surface to another parallel surface.

- There are two options for the bars to travel. When selecting the first option, the spacing between the bars will be maintained exactly while traveling in all surfaces. The second option the spacing is ignored.

Reversal of bar directions based on surfaces

- The direction of the bar will be reversed based on the selected surface bar direction.

Option to select the bend radius for the curved bars is also available.

➢ **Select rebar tab → draw/edit rebar → advance settings → select the required options → update**

ROUNDING

The rounding option used to round the varying bars. In this varying bar rounding option 3 different types are available

➢ Set up rounding

➢ Set down rounding

➢ No rounding

If the user wants to round the varying bars, select the rebar tab → Select the rebar properties such as bardia, spacing, remarks etc. → Rounding

The above mentioned three types are available in the dialog box. The Set up rounding option allows the user to round up no of bars which entered in right side & Rounding value also available in the right of the dialog box. Based on the Rounding value & no of bars, the varying bars are grouped. Similarly, the user can choose the Set down rounding. Rounding value & no of bars must be entered.

Note: If the user wants the rebar without any round up & round down , choose the no rounding option.
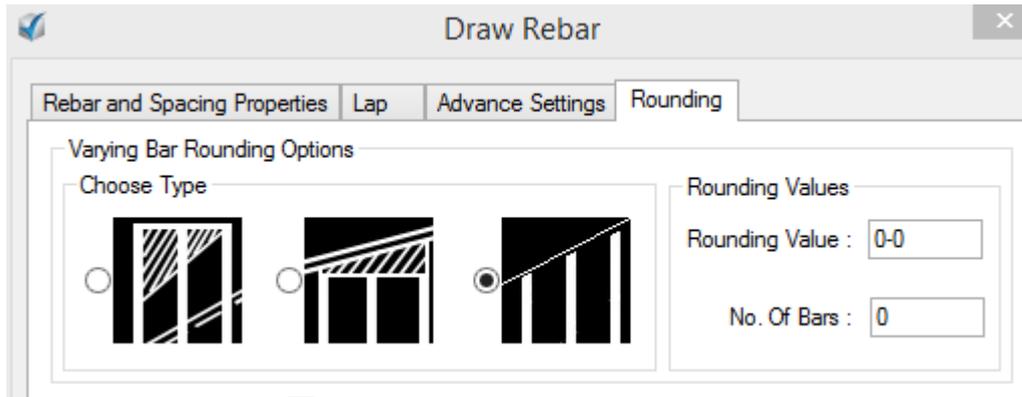
EDIT REBAR

This option allows the user to edit the properties of the bars in a concrete model. The bars can be updated after editing them.

> **Select rebar tab → edit rebar → select rebar to update → update**
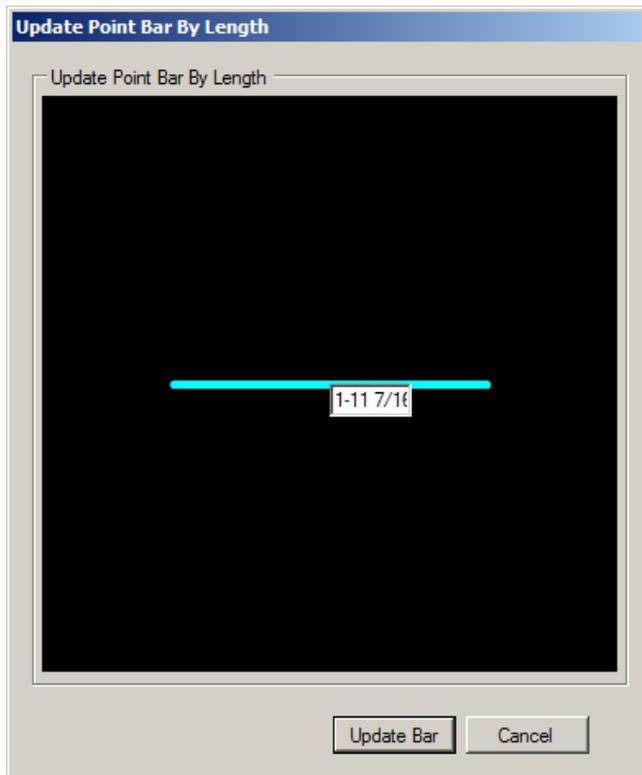
EDIT MULTIPLE REBAR

This option allows the user to edit a single run bar or a single bar in a set of bars. Clear single run bars overridden property and clear single bar overridden property allows the user to undo the changes that was made to the bar using the edit option.

> **Select rebar tab → edit multiple rebar → select rebar to update → single un bars/single bars → update**

EDIT POINT BAR

This option allows the user to edit the point bars. The length of the point bar can also be updated.

- **Select rebar tab → edit point bar → select the point bar → update point bar**

DELETE OPTIONS

DELETE REBAR

This allows to delete the whole set of rebars in a concrete model.

➢ **Select rebar tab → delete rebar → select rebar → delete whole set**

DELETE MULTIPLE REBAR

This option allows the user to delete the selected rebar or rebars in run.

➢ **Select rebar tab → delete multiple rebar → select rebars to delete → delete selected rebar or rebars in run**

Note this option is not available for point bar and tie bar.

FACE COVER

This option allows the user to change the cover value of for the faces of a concrete model.

> ➢ **Select rebar tab →face cover →select the face →enter cover value → ok**

LAP LOCATION OPTIONS

Lap location option allows the user to create locations for the bars to be lapped, to edit lap properties, to modify a lap location and edit the lap location.

CREATE LAP LOCATIONS

This option allows the user to create lap location for both conditional and non-conditional lap.

> ➢ **Select rebar tab → create lap location→ create→ select objects →select lap points →select face for lap location**

EDIT LAP PROPERTIES

This option allows the user to edit the lap location created by the user.
> ➢ **Select rebar tab → edit lap properties→ select lap location→ update**

MODIFY LAP LOCATION

This option allows the user to edit the provided lap location by moving the grip points of the lap location. The grip points can be moved in the desired direction. To move the entire lap location, pick the centre grip point of the lap location and move it.
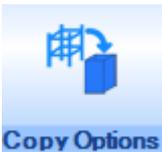
DELETE LAP LOCATION

This option allows the user to delete a lap location created.

> ➤ **Select rebar tab → delete lap location → select lap location → YES/NO**

COPY OPTIONS

This option allows the user to copy the rebars from source object to destination object by selecting a source type. The source types are object, face, object, point bar, tie. The bars get adapted from the source object to the destination object.
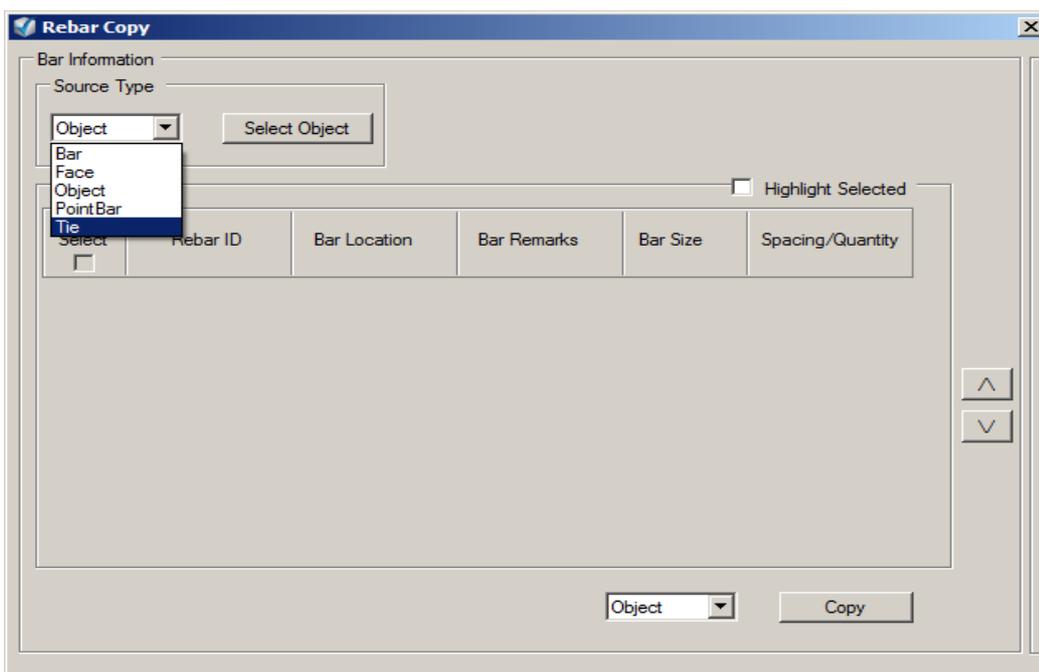
Note for object and face options the reference face is indicated by an object with blinking face in the bottom right corner of the work space.

Note copying of point bars requires options like OFF, NOFF, MID, ONL which are similar as mentioned earlier

> **Select rebar tab → select source type→ copy → select destination**

SECTION OPTIONS

The section option allows the user to copy the selected set of rebar to an object. Rebar sections for footing, beam, column, etc. are available as inbuilt sections. A section can be added, renamed and deleted.
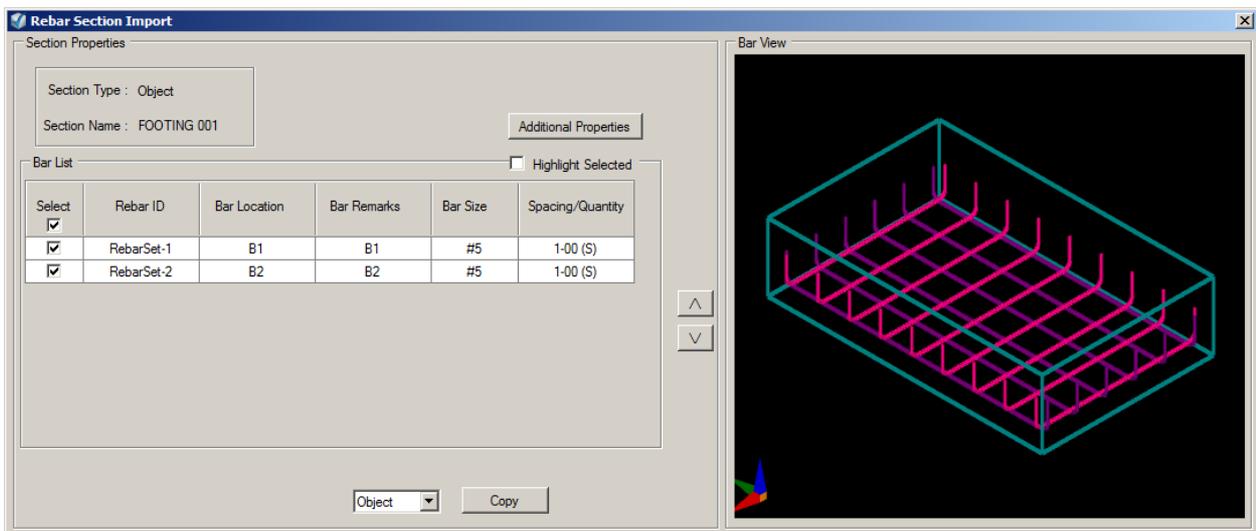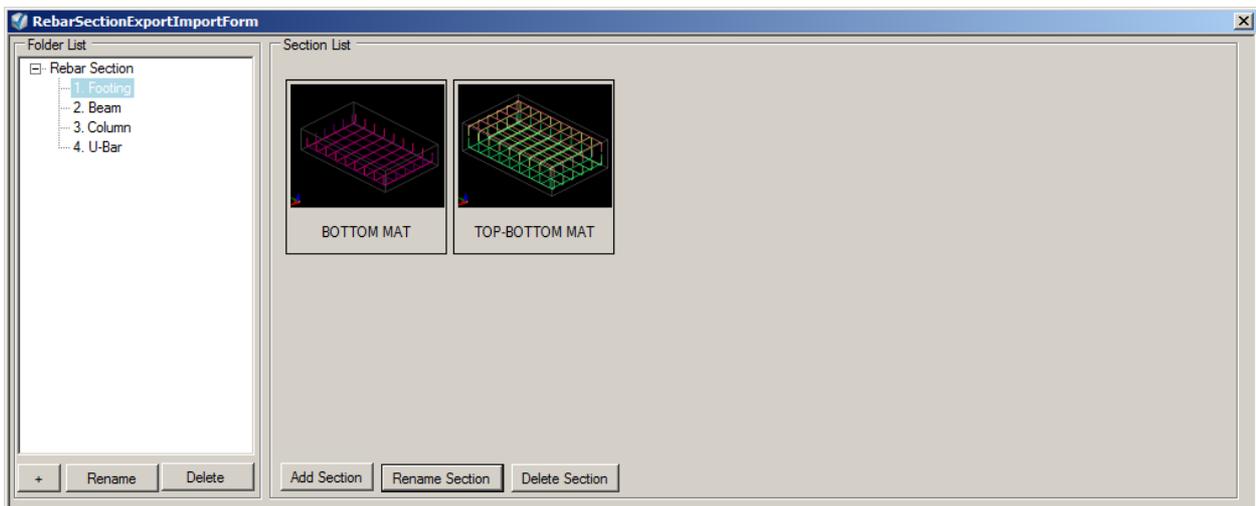
To copy rebar to an object

- ➢ **Select rebar tab → section options→ double click on the section → copy → select destination object→ select reference side → OK**

To add a new section

- ➢ **Select rebar tab → section options→ Add section →enter section name →select the object to be added →save**

To rename a section

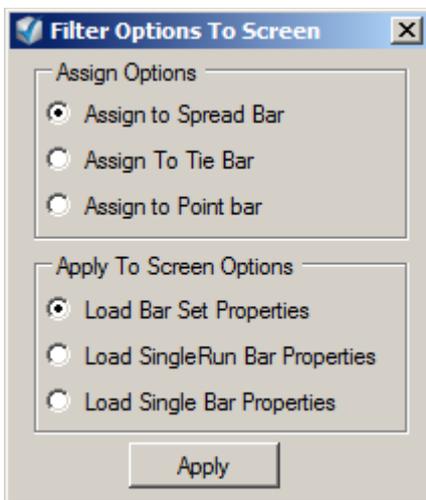- ➢ **Select rebar tab → section options→ Select the section → rename →ok**

To delete a section

- ➢ **Select rebar tab → section options→ Select the section → delete →ok**

ASSIGN OPTIONS

This option allows the user to assign the properties of one bar to another. Assign option allows the user to choose the bars from which the properties are to be assigned. Apply to screen option allows the user to choose the type of bar to which the property is to be applied to. The properties from the source bar can be applied to the entire set of bars or to the single run bar or to a single bar.

- ➢ **Select rebar tab → assign options→ apply the filter options → apply→ select rebars to get details for assign properties→ select the properties to be assigned → next →apply to → select the bar to apply properties → apply filter →select bar→ apply**

OTHER OPTIONS

REBAR LENGTH INFO

This option allows the user to view the details of a selected rebar. The blink object option blinks the object in which the selected rebar is placed.

➢ **Select rebar tab → rebar length info → select a bar**

REASSIGN BAR MARK

Selecting this option will reassign the bar marks of the rebars. Reassigning can be done for all the bars or for a particular bar set or for the selected bars.

➢ **Select rebar tab → reassign bar mark → yes/no**

STANDEE

This option allows the user to model a standee for the selected object. Automatic & manual option are available for bar dia. Based on the object's height the bar dia of the standee is automatically calculated.

The following screen opens when selecting the Standee option.
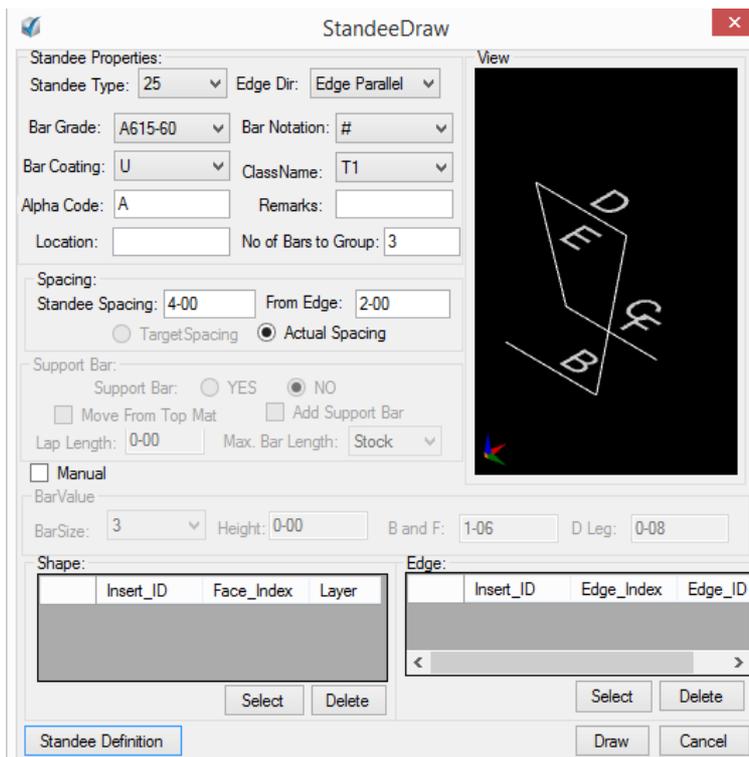
The following option allows the user to model the standee in the selected object

- ➤ Select rebar tab → Standee

- ➤ Select the standee properties such as standee type, bar grade, coating, alpha code

- ➤ Standee Spacing can be entered in the spacing check box.

- ➤ User can choose the distance from edge of the object to place the standee

- ➤ Standee can be modelled manually.

The standee properties available are

- Standee type – Select the required Standee type
- Edge Direction – The edge direction can be either edge parallel or edge perpendicular.

Note: The edge is to be selected with reference to the position of the "D".

- Bar Grade – Select the bar grade for the standee.
- Bar Notation – Select a notation the standee is to be represented with.
- Bar Coating – Select the type of coating required for the standee.
- Class Name – Select the class name for the standee.
- Alpha code, Location and Remarks for the standee is to be entered.
- The minimum number of bars to be grouped is also to be entered.

Standee Spacing – The center to center spacing between each standees is to be entered here.

From Edge – The spacing distance from which the standees are to be placed from the selected edge of the face.

Note:
- Select the bottom face of the object when modeling standees.

- Select the reference edge from the selected bottom face of the object.

STANDEE DEFINITION:

This option is used to define the default standee properties. A predefined standee can be selected from the standee type drop down box. A new standee type can be added by selecting the new button. The standee leg data are to be entered and saved to set the default standee properties. The following is to be done to define the leg data.

- Select the required bar size according to the height of the standee. For a standee of height within 1 feet, select the bar size as #3. For a standee of height 1feet to 2 feet, select the bar size as #4.
- Enter the from and to distance to limit the height of the standee to the selected bar size.
- Enter the leg1 length manually (B and F value)

- Enter the Leg2 length manually (D value)
- Select the add button to add the given leg data.

Similarly, repeat the process for the other bar sizes. Click save to save the given leg data. Select draw to model the standees. The standees are placed with respect to the height of the object.

NOTE: The leg data must be manually calculated and entered.

To draw standees manually, check the manual check box. The bar size can be selected and the leg data for the given bar size are displayed in the respective text boxes. The leg data can be manually edited if required.
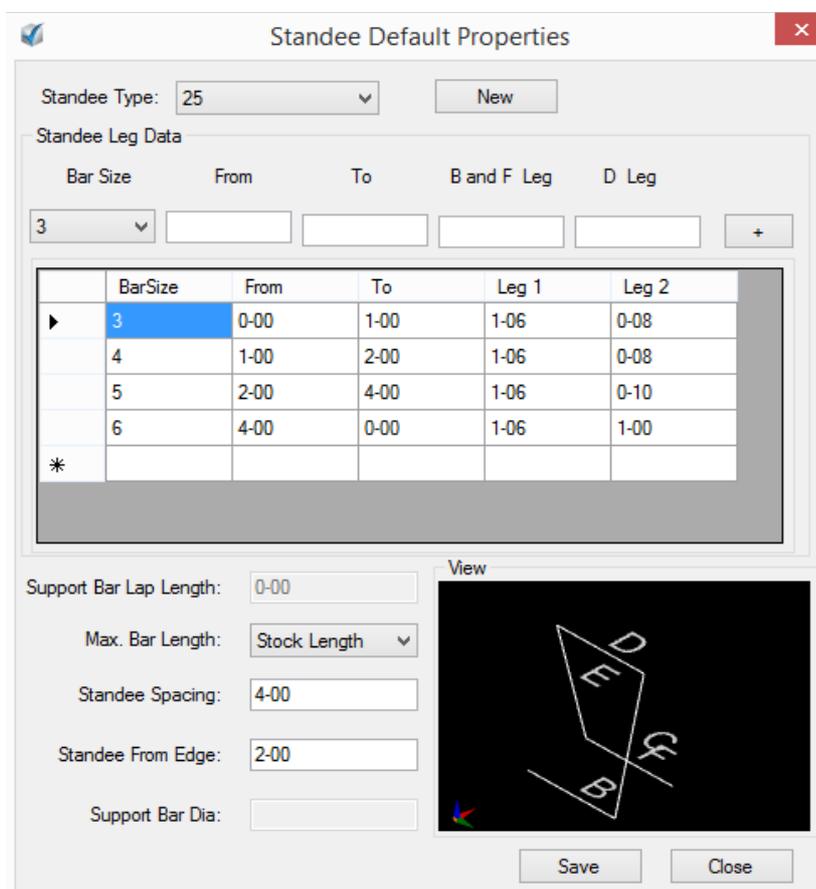
NOTE:

When modeling standees manually, The standees are not placed with respective to the height of the object but to the selected bar size. The bar size of the standees will be the same even is of varying height.

To add a new standee type, draw the standee model using the guides option. Now, **Select rebar tab → Standee → Standee Definition → New → Click select** to select the drawn guideline.
The standee type can be named in the **file name** text box. Click **Save** to save the standee type.

EXERCISE

1.Model a rectangular footing(F1) and use the face option to model T1 & T2 layer bars, using the edge perpendicular and edge parallel direction options respectively. Similarly, model B1 & B2 layer bars using the horizontal and vertical rebar directions respectively.

2.Draw a standee type 26 in a guide line & Convert the guide line into rebar using pline bars available in draw option.

3.Model a beam (B1)2-00x1-00 with clear span 20'-00, using multi spacing option model a tie with the following specification

      a. 4#6 T1 & 4#6 B1
      b. #3@8"EE, Rest@11" ties

4.Model a slab 80-00 X 30-00 with 1-00 thick, #5@11" T&B BW & lap the rebars using following options

    a) Create a lap location & staggered the rebar with different distance
    b) Move the lap position using modify lap location
    c) Staggered the rebar with crank
    d) Using mill length & stock length lap the rebar

5.Model the Trapezoidal footing (F3) & round down the varying bars. The no of bars is 3 & Rounding values is 3"

6.Model a rectangular footing and assign the following cover values

      a. Top/bottom cover – 0'-3"
      b. Side cover – 0'-2"

7.Using the cover option Change the top cover of B1

8. Copy the rebars of B1 to B2 by the following options using copy option,

a) Object
b) Bars
c) Ties

8.Import the rebar of rectangular footing to F2 using section option

9.Using assign properties option, assign the beam(B1) properties to footing (F1)

10.Model a Standee with different bend type for the F1& change the depth of the footing. Is the bar size changed when depth is varying?