LEARN OPTIMIZE BAR

A Software for Optimization of Reinforcements from Existing Bar Bending Schedule

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LEARN OPTIMIZE BAR IN 8 EASY STEPS

A Software for Optimizing Bar Length from BBS

INTRO & LIMITATIONS

- **Please take Print Out of Every Step, including this page before commencing Learn. Take a Yellow Marker Pen and Mark the Learning Process while Proceeding further. This is Essential for Learning. A Working example is also given on our web site. Down load the Working Example.**
  Again Practice Software using working example.

- **The software Optimizes the Reinforcement cutting Lengths, {using Bar bending Schedule (BBS)} as per the given standard Length of Bars.**

Only One Std. Length of bar shall be indicated during Project Creation.

The Software cannot Optimize using more than one Std. Lengths of Reinforcements. Usual Standard Length of bar is say 12000 MM.

Basically following steps are needed to Optimize the given BBS.

1. Create New Project.

2. Add BBS (Bar Bending Schedule) Records or Import From CSV File.
A CSV file is Comma Separated Value format obtained from EXCEL sheets.
Any Excel File can be saved as CSV format by SAVE AS option.
The Name of this File shall be same as that of File created using NEW Project option, else error will be generated.

3. Run Display / Add / Edit option and correct any errors Flagged.

4. Now Run Optimize option.

5. Under Display option, view the Optimized File.

That's all.

- **Note that Optimized bars are Grouped as per Bar Markings. It is very important to give correct Bar marks or Bar Codes. In any given SET the summation of cutting lengths of all the bars marked shall not be exceed std. length.**
  The software indicates wastages after optimization under Each category of bar diameter as well as total wastages. The wastage lengths also includes cutting Lengths greater than 2000 MM. Normally cutting Lengths exceeding 2000 MM are not included in wastages as they are consumed in Lapping or in subsequent construction.

  The gross % wastage can vary between 4 to 8.5 % depending up on file tonnage, number of records and random distributing of bar cutting lengths within the file.

  Usually for floor Slab + Beam gross wastage is around 5 %.

  Bars eligible for optimization are :-
  6, 8, 10, 12, 16, 18, 20, 22, 25, 28, 32 and 36 MM.

- **The Execution Time of optimization is normally within 5 Minutes for a BBS File containing about 5.0 tons of reinforcements (3000 Records).**
  File Containing Larger no. of Records, will consume more time. It is recommended to split files in to manageable entities such as Slabs + Beams, Columns, Footings, Piles, Pile caps, Tie Beams, Lintels + Chajjas+ Canopies, Water Tanks, RC Road, RC Drain / Trenches etc.

- **In Addition to Optimization, Waste Removal Program is also included with the software. In order to remove wastages, a waste file shall be created. An internal waste file is automatically created when Display / Create Internal Waste File option is run.**
  Facility is also provided to import external waste file in CSV Format.
  When Waste Removal is executed both the main BBS File and Waste Files are reduced to the extent the wastages are consumed.

- **Important Points Regarding Bar Bending Schedule.**

  1. Bar Nos cannot be < = 0.

  2. Bar Length cannot be < = 0 & Bar Length cannot be > 12000 MM.

  3. Same Bar Mark for Different Diameter not permitted.

  4. Same Bar Mark for Different Cut Length not permitted.

  5. Bar mark Shall be Unique, corresponding to Each bar Diameter & Length.

  6. Cutting Length of Each bar shall be in MM.

  7. Nos indicate total numbers of bars corresponding to each unique Bar mark.

- **Minimum Computer RAM memory of 2 GB is recommended.**

- **Use Laser OR Ink Jet Printer.**

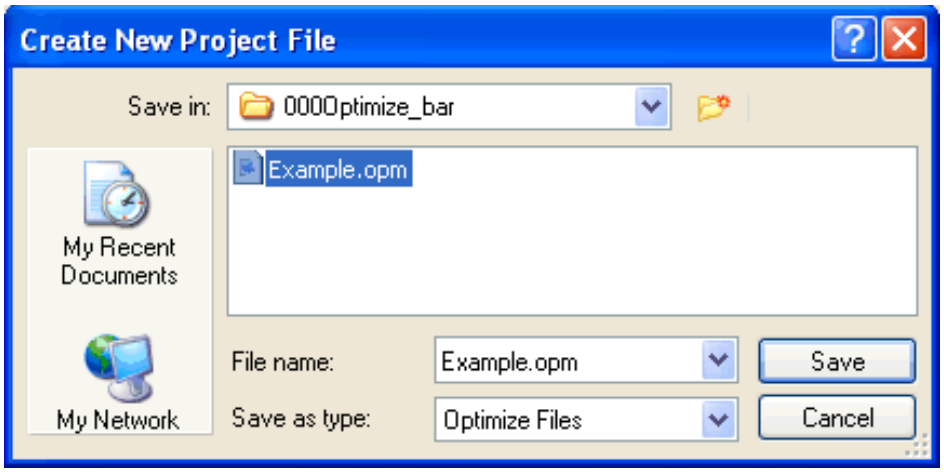
STEP NO. 1 : New Project (File) Creation + Editing

Project | Import CSV File | Display/Add/Edit Records | Optimize Records | Disply Results | Waste | Utility

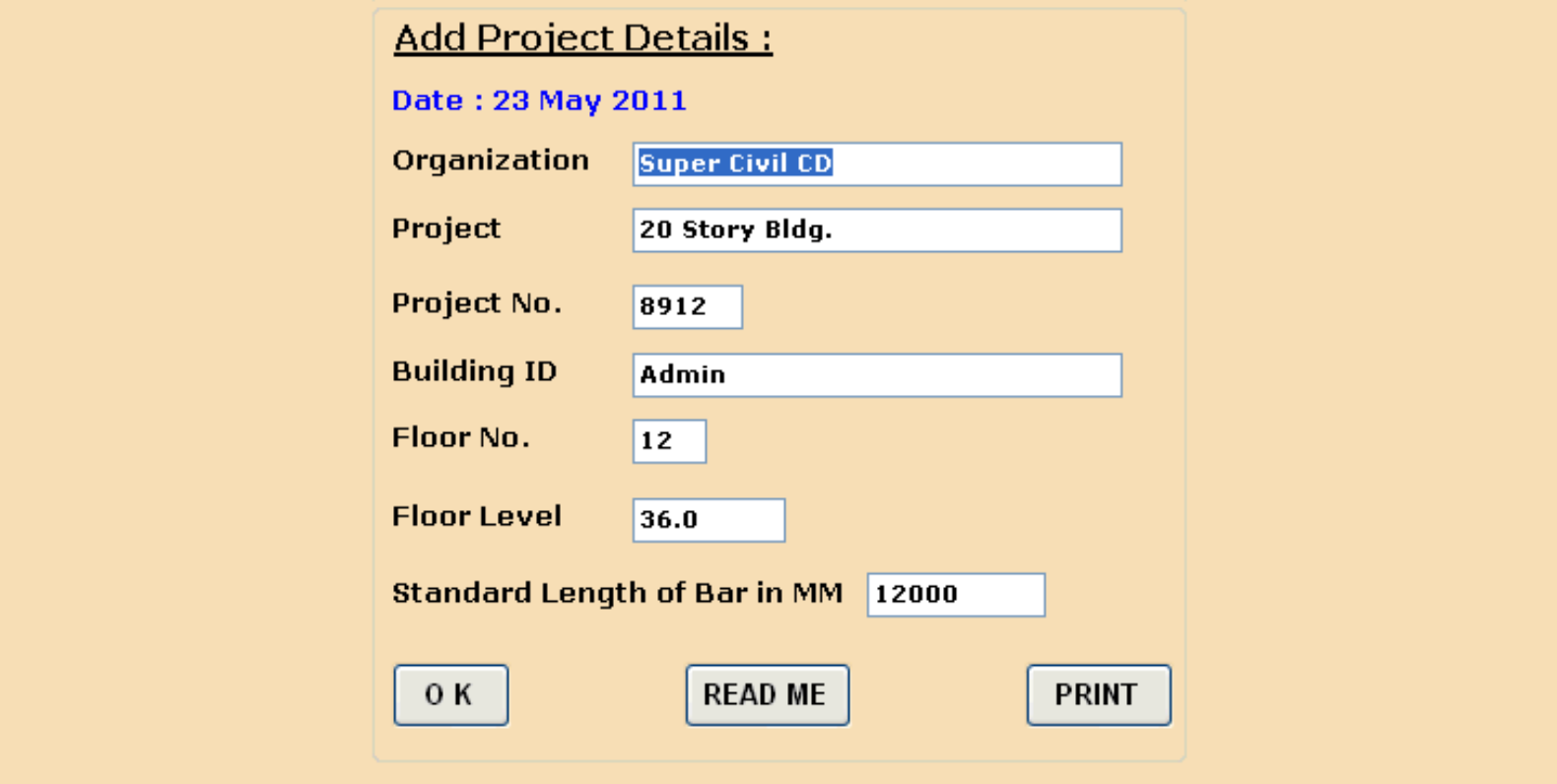
- **When Program starts, the above Menu Bar is displayed.**
  Click the Project -> Create New Project Option.

  The following window will open.

- **You must create a separate Folder / Directory to store your files.**
  I have created a Directory called " 000Optimize_bar " in D drive to store my Project files.
  When you Click Create New Project option. A Save Window Dialog Box will open up.

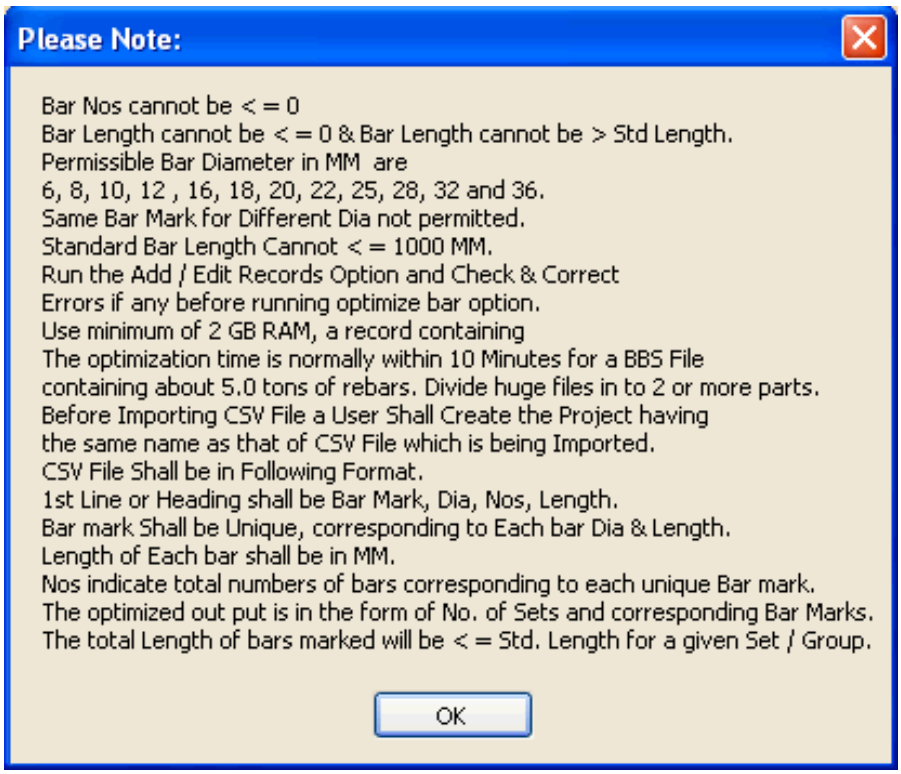


- **Go to 000Optimize_bar folder & give a file name to your project. I have given " Example " as the name of my new project file. Click the save button.**
  Note that Default Extension of Project File is opm.
  Following project window will open.



- **Enter the values of relevant parameters.**

  Now Click the READ ME Button, to get vital info as follows.



- **Now Click the Project -> Edit Project Option.**
  The Edit Project Option is available to Edit the various Parameters of already created Project File.
  Note that this option is similar to the Project -> Create New Project Option.
  After Editing Click OK button.

STEP NO. 1 IS OVER.

STEP NO. 2 : IMPORT CSV FILE

Project | Import CSV File | Display/Add/Edit Records | Optimize Records | Disply Results | Waste | Utility

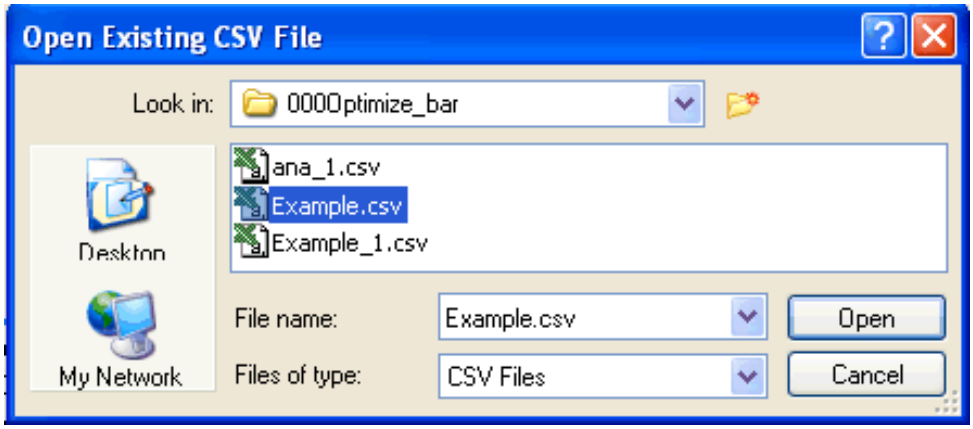
- **When Program starts, the above Menu Bar is displayed.**

  Click the " Import CSV File Option ".

  Before Importing any CSV File, 1st create Project file having the same name as that of CSV file.

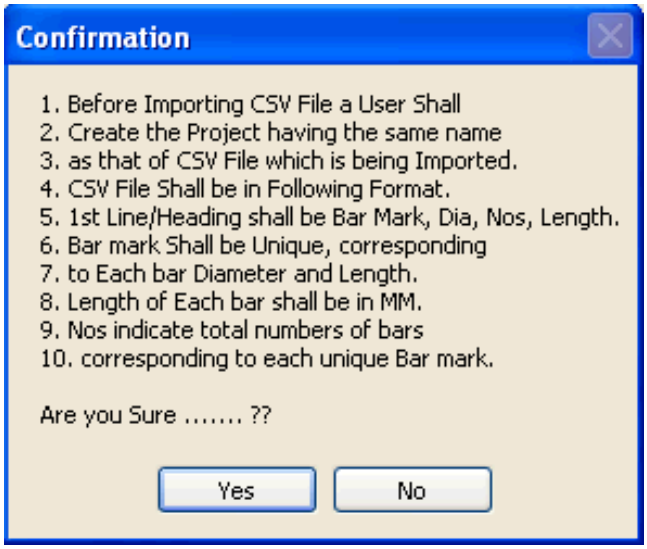
  A CSV file is Comma Separated Value format obtained from EXCEL sheets.
  Any Excel File can be saved as CSV format by SAVE AS option.

  The 1st Line shall be Heading: Bar_Mark, Dia, Nos, Length.
  Diameter and Cutting length of Bars shall be in MM.
  The following window will open.



- **Now select " Example " File & Press Open Button.**

  The following important message will be displayed.



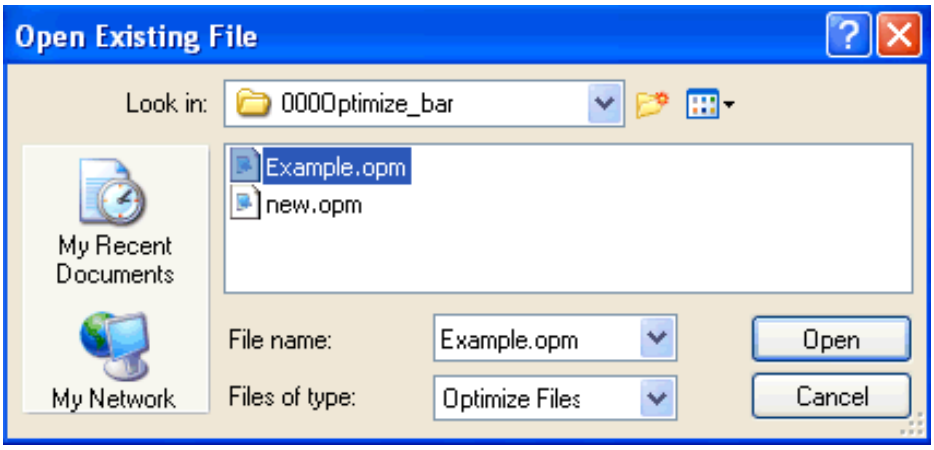
- **When you are sure click Yes, CSV file will be imported. Now Click Display / Add / Edit Records option to check for any errors in imported file.**

STEP NO. 2 IS OVER.

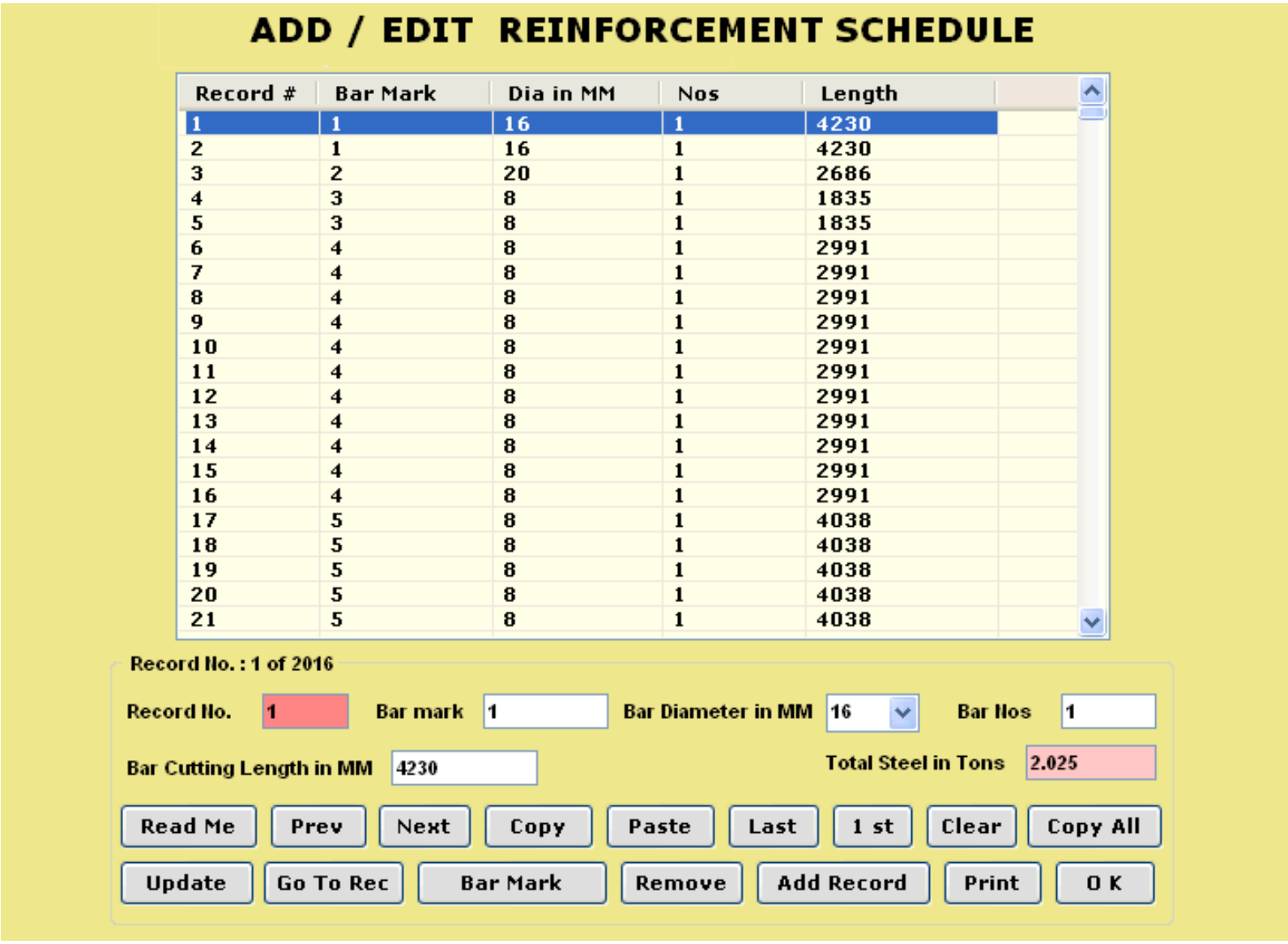
STEP NO. 3 :
DISPLAY / EDIT / ADD RECORDS

- **When Program starts, the above Menu Bar is displayed.**
  Click the " Display / Add / Edit Records " Option.

  The following window will open.



- **Select the " Example " File, following window will appear.**



- **The " Copy All " button copies data from the selected ROW to all the ROWS. Later on a user can change the values selectively.**

Use Copy & Paste Button to copy & paste values to different rows, in case the values are not same.

The " Prev ", " Next ", " Last ", " 1 st ", & " Go to Rec " Buttons are for displaying / Focusing the cursor on Previous, Next, First or required Record Number.

The Bar Mark Button will search and Display the required Bar Mark.

The " Clear " Button clears all values. The Update Button is for saving the Records intermittently.

The " Print " Button is for printing of values from the Table. Use laser OR Inkjet Printer.

The Remove Button deletes the Selected Record.

The " Add Record " button is very important one. User can add one record at a time, the Bar mark will be automatically generated as Last Bar mark no. + 1.

Length of Bars shall be nearest to 5 MM, Else program will convert the same.

In order to Sort the Values in Ascending OR Descending Order, Just Click Column Header at

Top.

Bar Mark shall be Integer and not alpha-numeric.

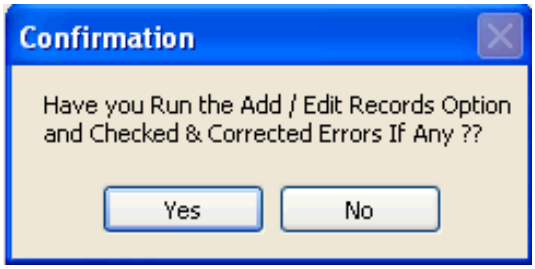
Click Read Me Button and go through the Important points.

STEP NO. 3 IS OVER.

STEP NO. 4 :
OPTIMIZE RECORDS + DISPLAY + MTO

- **When Program starts, the above Menu Bar is displayed.**

  Click the " Optimize Record " Option and Select Example File. Following Message is displayed.



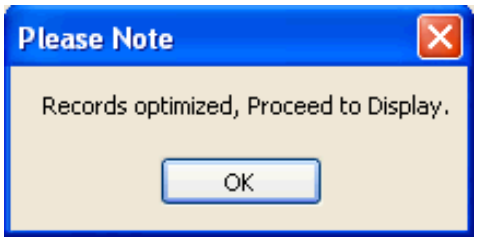
- **The above is very Important. Never Run Optimize option without running the Add / Edit Option, Else In-correct results will be obtained.**

  Click Yes if you are sure. A window will be displayed, with a message

  HOLD ON, WORK IN PROGRESS, TAKES TIME ...

  The Execution Time of optimization is normally within 5 Minutes for a BBS File containing about 5.0 tons of reinforcements (3000 Records). File Containing Larger no. of Records, will consume more time. It is recommended to split files in to manageable entities such as Slabs + Beams, Columns, Footings, Piles, Pile caps, Tie Beams, Lintels + Chajjas + Canopies, Water Tanks, RC Road,
  RC Drain / Trenches etc.

  After completion of program execution, following Message is displayed.



- **Let us Proceed to display optimized records.**
  Click Display Results. Following Menu will be displayed.

  - **Optimized Records**
  - **MTO < Material Take Off > { Summary }**
  - **Display / Create Internal Waste**

  Now click Optimized Records option. Following Optimization will be displayed.

Details of Optimization of Bars

Organization : Super Civil CD
Project : 20 Story Bldg.
Project No : 8912
Building ID : Admin
Floor Number : 12
Floor Level : 36.0
Standard Bar Length : 12000
File Name : D:\000Optimize_bar\Example.opm

For 8 MM Diameter Reinforcements :

Number of Sets : 2 : Bars Marked : 4,5,5,27
Number of Sets : 7 : Bars Marked : 4,4,4,4
Number of Sets : 1 : Bars Marked : 17,17,18,18,18,19,19,19,42,42
Number of Sets : 2 : Bars Marked : 5,5,7,9,27
Number of Sets : 1 : Bars Marked : 23,24,24,24,24,24,25,25
Number of Sets : 1 : Bars Marked : 5,5,11,16,34
Number of Sets : 1 : Bars Marked : 51,51,53,55,55
Number of Sets : 1 : Bars Marked : 66,66,66,66,67,67,68,69,84
Number of Sets : 1 : Bars Marked : 51,51,54,57,84
Number of Sets : 1 : Bars Marked : 40,40,41,41,43,43,44,44,46
Number of Sets : 1 : Bars Marked : 79,79,80,80,80,80,86
Number of Sets : 2 : Bars Marked : 16,16,17,17,17,17,17
Number of Sets : 1 : Bars Marked : 17,17,17,20,20,21,21,23
Number of Sets : 1 : Bars Marked : 24,24,25,25,26,26,27,27,28,42
Number of Sets : 1 : Bars Marked : 122,122,123,123,126,126
Number of Sets : 1 : Bars Marked : 79,80,80,80,80,80,81,84
Number of Sets : 2 : Bars Marked : 76,76,76,77,77
Number of Sets : 3 : Bars Marked : 89,89,89,90,90,90,92,95
Number of Sets : 1 : Bars Marked : 132,133,133,134,134,134,135,135,138
Number of Sets : 4 : Bars Marked : 140,140,140,140,141
Number of Sets : 1 : Bars Marked : 28,28,29,29,30,30,32
Number of Sets : 1 : Bars Marked : 40,40,40,40,40,40,40,42
Number of Sets : 1 : Bars Marked : 94,94,94,94,94,95,98,100
Number of Sets : 1 : Bars Marked : 93,93,94,94,98,99,99,133
Number of Sets : 1 : Bars Marked : 58,59,59,60,60,60,60,62,69
Number of Sets : 1 : Bars Marked : 158,161,161,161,3,3,7,18
Number of Sets : 1 : Bars Marked : 33,33,34,35,35,36,36,40,40,71
Number of Sets : 1 : Bars Marked : 70,70,70,71,72,72,73,73
Number of Sets : 1 : Bars Marked : 70,70,70,70,71,71,72,72,74,74,84
Number of Sets : 1 : Bars Marked : 40,40,40,40,40,49,57
Number of Sets : 1 : Bars Marked : 5,5,9,11,32
Number of Sets : 1 : Bars Marked : 158,158,158,158,158,4,34
Number of Sets : 1 : Bars Marked : 60,60,62,65,65,66,66,69
Number of Sets : 1 : Bars Marked : 117,117,117,117,119,121,127,133
Number of Sets : 1 : Bars Marked : 140,140,140,141,145,25
Number of Sets : 2 : Bars Marked : 94,94,94,94,94,94,95,133
Number of Sets : 1 : Bars Marked : 53,54,54,55,55,56,56
Number of Sets : 1 : Bars Marked : 50,50,50,53,55,59,84
Number of Sets : 1 : Bars Marked : 56,56,56,56,56,58,65
Number of Sets : 1 : Bars Marked : 88,89,91,91,99,100
Number of Sets : 3 : Bars Marked : 108,108,109,109,112,112

Number of Sets : 1 : Bars Marked : 51,51,56,56,59
Number of Sets : 1 : Bars Marked : 62,65,65,66,66,66,66,69
Number of Sets : 2 : Bars Marked : 145,145,145,148,148,149,149,34
Number of Sets : 1 : Bars Marked : 158,158,158,158,158,158,158,42
Number of Sets : 1 : Bars Marked : 81,85,85,86,87,87,88,99
Number of Sets : 1 : Bars Marked : 75,75,78,79,80,80,81
Number of Sets : 1 : Bars Marked : 39,40,40,40,40,42,44,84
Number of Sets : 1 : Bars Marked : 99,101,101,104,104,105,105,106
Number of Sets : 1 : Bars Marked : 158,158,158,158,158,4,36
Number of Sets : 3 : Bars Marked : 131,132,132,134,134,134,135,135
Number of Sets : 1 : Bars Marked : 158,158,158,158,158,158,161,34
Number of Sets : 1 : Bars Marked : 23,24,24,24,24,24,25,27
Number of Sets : 1 : Bars Marked : 85,85,86,86,87,87,88,88,95
Number of Sets : 1 : Bars Marked : 17,17,18,18,19,19,19,20,44
Number of Sets : 1 : Bars Marked : 158,158,4,4,17,32
Number of Sets : 1 : Bars Marked : 36,39,39,40,44,59
Number of Sets : 1 : Bars Marked : 5,5,17,20,69
Number of Sets : 1 : Bars Marked : 34,35,35,36,36,39,40,42,42
Number of Sets : 1 : Bars Marked : 36,36,39,40,40,40,41
Number of Sets : 1 : Bars Marked : 44,44,46,49,49,50,55,84
Number of Sets : 1 : Bars Marked : 58,58,60,60,66,66,67
Number of Sets : 1 : Bars Marked : 161,3,3,4,4,32
Number of Sets : 1 : Bars Marked : 145,145,145,145,145,148,148,34
Number of Sets : 1 : Bars Marked : 127,130,130,131,131,57
Number of Sets : 1 : Bars Marked : 7,9,11,17,17,17,17,32
Number of Sets : 1 : Bars Marked : 75,75,75,76,76,76,78,88
Number of Sets : 1 : Bars Marked : 51,51,56,57,67
Number of Sets : 1 : Bars Marked : 25,25,26,26,27,28,28,29,59
Number of Sets : 1 : Bars Marked : 66,66,66,66,66,66,67,69
Number of Sets : 1 : Bars Marked : 131,131,131,136,136,33
Number of Sets : 1 : Bars Marked : 31,33,35,35,40,41,41,46
Number of Sets : 1 : Bars Marked : 139,139,139,139,44,59
Number of Sets : 1 : Bars Marked : 46,49,49,50,54
Number of Sets : 1 : Bars Marked : 53,54,54,55,56,56,57
Number of Sets : 1 : Bars Marked : 30,31,31,31,31,31,33,69
Number of Sets : 1 : Bars Marked : 140,144,144,145,71
Number of Sets : 1 : Bars Marked : 5,5,21,21,81
Number of Sets : 1 : Bars Marked : 157,157,158,158,161,18,18,55
Number of Sets : 1 : Bars Marked : 80,81,81,81,84,85,85,86,86,88,88
Number of Sets : 1 : Bars Marked : 139,140,140,140,141
Number of Sets : 1 : Bars Marked : 60,66,66,66,66,67,67,71,74
Number of Sets : 1 : Bars Marked : 127,127,127,130,130,133
Number of Sets : 2 : Bars Marked : 50,50,50,50,74
Number of Sets : 1 : Bars Marked : 19,19,20,20,21,21,22,30
Number of Sets : 1 : Bars Marked : 70,70,70,70,72,72,73,81
Number of Sets : 1 : Bars Marked : 60,60,68,68,73,75,86
Number of Sets : 1 : Bars Marked : 41,43,43,50,50,56
Number of Sets : 1 : Bars Marked : 5,22,22,23,23
Number of Sets : 1 : Bars Marked : 80,80,81,81,85,85,86,87
Number of Sets : 1 : Bars Marked : 130,130,131,131,131,133
Number of Sets : 1 : Bars Marked : 122,123,123,126,126,33
Number of Sets : 1 : Bars Marked : 139,139,145,145,149,149
Number of Sets : 1 : Bars Marked : 127,127,130,130,131,57
Number of Sets : 1 : Bars Marked : 40,40,40,40,40,40,41,59
Number of Sets : 1 : Bars Marked : 131,131,132,136,136,138
Number of Sets : 1 : Bars Marked : 117,117,117,117,117,119,121,141
Number of Sets : 1 : Bars Marked : 106,107,107,113,113,113,113,119
Number of Sets : 1 : Bars Marked : 121,122,127,127,127,127,127,57
Number of Sets : 1 : Bars Marked : 99,99,99,99,99,99,100,141
Number of Sets : 1 : Bars Marked : 108,109,109,112,112,122
Number of Sets : 1 : Bars Marked : 101,104,104,105,105,105,105,88
Number of Sets : 1 : Bars Marked : 158,158,161,161,161,3,3,32
Number of Sets : 1 : Bars Marked : 5,5,18,19,100
Number of Sets : 1 : Bars Marked : 73,73,75,75,80,89,100
Number of Sets : 1 : Bars Marked : 32,33,33,39,40,40,57
Number of Sets : 1 : Bars Marked : 60,60,60,62,65,65,66,69
Number of Sets : 2 : Bars Marked : 50,51,51,101
Number of Sets : 1 : Bars Marked : 140,140,144,145,11
Number of Sets : 1 : Bars Marked : 71,72,72,73,73,74,74,75,75
Number of Sets : 1 : Bars Marked : 17,17,17,17,17,17,18,71

Number of Sets : 1 : Bars Marked : 51,51,54,93
Number of Sets : 1 : Bars Marked : 16,17,17,17,18,18,19,67
Number of Sets : 1 : Bars Marked : 79,80,80,80,80,80,93
Number of Sets : 1 : Bars Marked : 56,56,58,58,60,66,90
Number of Sets : 1 : Bars Marked : 139,139,139,140,95
Number of Sets : 1 : Bars Marked : 31,31,31,50,50,90
Number of Sets : 1 : Bars Marked : 29,30,31,31,50,68
Number of Sets : 1 : Bars Marked : 80,80,80,87,87,89,100
Number of Sets : 1 : Bars Marked : 26,26,28,28,29,29,41
Number of Sets : 1 : Bars Marked : 131,131,131,136,136,100
Number of Sets : 1 : Bars Marked : 5,5,19,19,101
Number of Sets : 1 : Bars Marked : 117,117,117,117,119,121,122,123
Number of Sets : 1 : Bars Marked : 43,43,50,50,56,106
Number of Sets : 1 : Bars Marked : 56,56,56,58,58,60,106
Number of Sets : 1 : Bars Marked : 93,93,94,98,98,99,99,101
Number of Sets : 1 : Bars Marked : 158,4,4,4,90
Number of Sets : 1 : Bars Marked : 139,139,139,139,101
Number of Sets : 1 : Bars Marked : 35,35,40,40,51,107
Number of Sets : 1 : Bars Marked : 138,138,139,139,139,161
Number of Sets : 1 : Bars Marked : 80,89,89,89,91,92
Number of Sets : 1 : Bars Marked : 70,70,70,75,75,78,80
Number of Sets : 1 : Bars Marked : 24,24,24,50,50,106
Number of Sets : 1 : Bars Marked : 158,158,158,158,5,106
Number of Sets : 1 : Bars Marked : 79,80,80,91,99,107
Number of Sets : 1 : Bars Marked : 80,87,89,91,94,98
Number of Sets : 1 : Bars Marked : 136,136,137,139,145
Number of Sets : 1 : Bars Marked : 79,99,99,99,99,104,107
Number of Sets : 1 : Bars Marked : 117,122,122,123,123,126,127
Number of Sets : 1 : Bars Marked : 16,22,23,23,24,24,161
Number of Sets : 1 : Bars Marked : 50,50,50,68,148
Number of Sets : 1 : Bars Marked : 127,131,131,139,139,145
Number of Sets : 1 : Bars Marked : 127,127,127,139,140,148
Number of Sets : 1 : Bars Marked : 139,139,139,139,100
Number of Sets : 1 : Bars Marked : 4,4,5,16
Number of Sets : 1 : Bars Marked : 5,17,17,17,17,26
Number of Sets : 1 : Bars Marked : 22,22,26,31,31,31,32
Number of Sets : 1 : Bars Marked : 31,31,39,39
Number of Sets : 1 : Bars Marked : 49,50,50,50,74
Number of Sets : 1 : Bars Marked : 116,116,117,117,117,117,117
Number of Sets : 1 : Bars Marked : 4,5,24,24,24
Number of Sets : 1 : Bars Marked : 127,127,127,127,131,131,137
Number of Sets : 1 : Bars Marked : 50,50,50,54,81
Number of Sets : 1 : Bars Marked : 29,30,30,31,31,31,93
Number of Sets : 1 : Bars Marked : 4,28,29,31,43,43
Number of Sets : 1 : Bars Marked : 65,66,66,66,66,68,70
Number of Sets : 1 : Bars Marked : 75,75,75,75,76,76,76,81
Number of Sets : 2 : Bars Marked : 113,113,116,116,117,117,117
Number of Sets : 1 : Bars Marked : 131,131,137,139,139,20
Number of Sets : 1 : Bars Marked : 105,106,107,107,113,113,113,138
Number of Sets : 1 : Bars Marked : 144,145,145,145,145,149
Number of Sets : 1 : Bars Marked : 149,149,149,149,149,149,157
Number of Sets : 1 : Bars Marked : 127,127,137,138,139,139
Number of Sets : 1 : Bars Marked : 139,139,144,149,93
Number of Sets : 2 : Bars Marked : 149,149,149,157,157,158,158
Number of Sets : 1 : Bars Marked : 20,21,21,22,22,23,30
Number of Sets : 1 : Bars Marked : 113,113,113,113,113,113,116
Number of Sets : 1 : Bars Marked : 139,140,144,145,161
Number of Sets : 1 : Bars Marked : 145,145,145,149,157,158,158
Number of Sets : 1 : Bars Marked : 149,149,149,5,56,107
Number of Sets : 1 : Bars Marked : 105,105,113,116,117,117,117
Number of Sets : 1 : Bars Marked : 50,50,66,66,66,106
Number of Sets : 1 : Bars Marked : 66,68,68,91,94,108
Number of Sets : 2 : Bars Marked : 104,105,105,105,105,105,105
Number of Sets : 1 : Bars Marked : 117,117,117,117,131,79,98
Number of Sets : 1 : Bars Marked : 113,117,117,5,99,123
Number of Sets : 2 : Bars Marked : 51,77,77
Number of Sets : 1 : Bars Marked : 91,104,105,105,105,113
Number of Sets : 1 : Bars Marked : 144,144,145,145,158
Number of Sets : 1 : Bars Marked : 3,3,50,51,138
Number of Sets : 1 : Bars Marked : 78,80,80,80,80,99,99

Number of Sets : 1 : Bars Marked : 105,105,105,105,105,105,113
Number of Sets : 1 : Bars Marked : 113,117,117,127,127,127,94
Number of Sets : 1 : Bars Marked : 105,105,113,113,113,113,113
Number of Sets : 27 : Bars Marked : 162,162,162,162
Number of Sets : 1 : Bars Marked : 50,50,50,91
Number of Sets : 1 : Bars Marked : 99,99,99,99,99,99,105
Number of Sets : 1 : Bars Marked : 105,105,113,126,126
Number of Sets : 1 : Bars Marked : 70,105,126,127,127,158
Number of Sets : 2 : Bars Marked : 140,140,158,158,158,163
Number of Sets : 1 : Bars Marked : 149,149,149,158,158,158,158
Number of Sets : 1 : Bars Marked : 158,162,162,162,163
Number of Sets : 1 : Bars Marked : 4,49,49,50
Number of Sets : 1 : Bars Marked : 50,50,50,50
Number of Sets : 1 : Bars Marked : 94,94,94,94,94,98,98
Number of Sets : 1 : Bars Marked : 99,138,149,158,158,5
Number of Sets : 2 : Bars Marked : 5,5,158,158
Number of Sets : 1 : Bars Marked : 51,51,162
Number of Sets : 2 : Bars Marked : 51,51,163,163
Number of Sets : 15 : Bars Marked : 163,163,163,163,163,163,163

Total Nos. of Std. Length of 8 MM Bars Required = 270
Total Length of 8 MM Bars Required = 3240 M
Total Weight of 8 MM Bars = 1278.62 Kg
Total Weight of 8 MM Bars as per BBS = 1255.94 Kg
Wastage of 8 MM Bars = 1.81 %

For 10 MM Diameter Reinforcements :

Number of Sets : 1 : Bars Marked : 52,52,52,52,52,52,52
Number of Sets : 3 : Bars Marked : 111,118,118,120,120,125,125
Number of Sets : 3 : Bars Marked : 143,151,153,159,159,6,6,8
Number of Sets : 1 : Bars Marked : 118,118,120,120,125,125,143
Number of Sets : 1 : Bars Marked : 63,63,82,82,143
Number of Sets : 1 : Bars Marked : 8,10,10,13,45,45,52,61
Number of Sets : 1 : Bars Marked : 47,61,61,96,8
Number of Sets : 1 : Bars Marked : 96,10,10,13,45,45,82
Number of Sets : 1 : Bars Marked : 96,143,143,151,153,159
Number of Sets : 1 : Bars Marked : 47,61,61,63,82
Number of Sets : 1 : Bars Marked : 63,96,96,8
Number of Sets : 1 : Bars Marked : 111,10,10,13,45,45,61,82
Number of Sets : 1 : Bars Marked : 47,47,61,82,82
Number of Sets : 1 : Bars Marked : 63,63,96,82
Number of Sets : 1 : Bars Marked : 143,47,47,61
Number of Sets : 1 : Bars Marked : 6,6,8,8,10,10,13,45
Number of Sets : 1 : Bars Marked : 47,47,96
Number of Sets : 1 : Bars Marked : 45,63,63,159
Number of Sets : 1 : Bars Marked : 96

Total Nos. of Std. Length of 10 MM Bars Required = 23
Total Length of 10 MM Bars Required = 276 M
Total Weight of 10 MM Bars = 170.19 Kg
Total Weight of 10 MM Bars as per BBS = 161.91 Kg
Wastage of 10 MM Bars = 5.11 %

For 12 MM Diameter Reinforcements :

Number of Sets : 1 : Bars Marked : 14,14,15,83,83,83
Number of Sets : 2 : Bars Marked : 124,124,128,147
Number of Sets : 2 : Bars Marked : 142,142,150,150,152,152
Number of Sets : 1 : Bars Marked : 142,147,150,150,152,152,150
Number of Sets : 1 : Bars Marked : 128,142,155,150
Number of Sets : 3 : Bars Marked : 14,15,15,48
Number of Sets : 1 : Bars Marked : 147,152,152,155,160,12
Number of Sets : 1 : Bars Marked : 128,155,160,12,12,83
Number of Sets : 1 : Bars Marked : 155,12,14,97
Number of Sets : 1 : Bars Marked : 38,64,102,128
Number of Sets : 2 : Bars Marked : 64,97,102,110
Number of Sets : 1 : Bars Marked : 12,15,38,48,64
Number of Sets : 1 : Bars Marked : 97,102,102,160
Number of Sets : 1 : Bars Marked : 38,102,110,160

```
Number of Sets : 2 : Bars Marked : 110,114,114
Number of Sets : 1 : Bars Marked : 14,114,124
Number of Sets : 2 : Bars Marked : 114,114,124
Number of Sets : 1 : Bars Marked : 102,110,114
Number of Sets : 1 : Bars Marked : 12,110,114,128
Number of Sets : 1 : Bars Marked : 155,155,12,12
Number of Sets : 1 : Bars Marked : 142,142,102
Number of Sets : 1 : Bars Marked : 110,114,155
Number of Sets : 1 : Bars Marked : 14,38,124
Number of Sets : 1 : Bars Marked : 128,128,155

Total Nos. of Std. Length of Bars Required = 31
Total Length of 12 MM Bars Required = 372 M
Total Weight of 12 MM Bars = 330.31 Kg
Total Weight of 12 MM Bars as per BBS = 319.62 Kg
Wastage of 12 MM Bars = 3.34 %
-----------------------------------------------
For 16 MM Diameter Reinforcements :

Number of Sets : 4 : Bars Marked : 103,129,146,146
Number of Sets : 1 : Bars Marked : 156,1,1
Number of Sets : 1 : Bars Marked : 154,154,156,1
Number of Sets : 1 : Bars Marked : 154,156,1,154
Number of Sets : 1 : Bars Marked : 1,1,154
Number of Sets : 3 : Bars Marked : 37,37,154
Number of Sets : 1 : Bars Marked : 1,37,154
Number of Sets : 1 : Bars Marked : 37,1,154
Number of Sets : 1 : Bars Marked : 154,154,156

Total Nos. of Std. Length of Bars Required = 14
Total Length of 16 MM Bars Required = 168 M
Total Weight of 16 MM Bars = 265.19 Kg
Total Weight of 16 MM Bars as per BBS = 233.85 Kg
Wastage of 16 MM Bars = 13.4 %
-----------------------------------------------
For 20 MM Diameter Reinforcements :

Number of Sets : 2 : Bars Marked : 2,115,2,115

Total Nos. of Std. Length of Bars Required = 2
Total Length of 20 MM Bars Required = 24 M
Total Weight of 20 MM Bars = 59.2 Kg
Total Weight of 20 MM Bars as per BBS = 51.75 Kg
Wastage of 20 MM Bars = 14.4 %
-----------------------------------------------

Total Actual Weight of Reinforcements = 2.104 Ton

Total Theoretical Weight of Reinforcements as per BBS = 2.023 Ton

Total Wastage of Reinforcements = 4 %
```

- **Note that Optimized Bars are grouped diameter wise. Under Each diameter; Bars are Grouped in to no. of sets, containing optimized Bars Marked.**

  Also Displayed are Total Nos. of Std. Length of Bars Required, Total Length of Bars Required, Total Weight of Bars, Total Weight of Bars as per BBS and Wastage of Individual and Total Bars.

  Now click MTO option. Select Example File, Following window will be displayed.

SUMMARY OF REINFORCEMENTS IN KG

6 MM Dia :	0
8 MM Dia :	1255.94
10 MM Dia :	161.91
12 MM Dia :	319.62
16 MM Dia :	233.85
18 MM Dia :	0
20 MM Dia :	51.75
22 MM Dia :	0
25 MM Dia :	0
28 MM Dia :	0
32 MM Dia :	0
36 MM Dia :	0

TOTAL REINFORCEMENT IN TONS = 2.023

STEP NO. 4 IS OVER.

STEP NO. 5 :
DISPLAY / CREATE INTERNAL WASTE

Project | Import CSV File | Display/Add/Edit Records | Optimize Records | Disply Results | Waste | Utility

- **When Program starts, the above Menu Bar is displayed.**

  Click Display Results. Following Menu will be displayed.

  - **Optimized Records**
  - **MTO < Material Take Off > { Summary }**
  - **Display / Create Internal Waste**

  Now click Display / Create Internal Waste option. Select the Example File.
  Following Window will be displayed.

Details of Wastages of Reinforcements

Organization : Super Civil CD
Project : 20 Story Bldg.
Project No : 8912
Building ID : Admin
Floor Number : 12
Floor Level : 36.0
Standard Bar Length : 12000
File Name : D:\000Optimize_bar\Example.opm

Wastages For 8 MM Diameter Reinforcements :

Number of Sets : 8 : Bars Marked : 4/4/4/4 : Waste Length Per Set = 40 MM
Number of Sets : 3 : Bars Marked : 81/81/81/84/84/85/85/86/86/87/88 : Waste Length Per Set = 40 MM
Number of Sets : 4 : Bars Marked : 5/7/9/11/16/17 : Waste Length Per Set = 145 MM
Number of Sets : 3 : Bars Marked : 51/51/53/55/55 : Waste Length Per Set = 170 MM
Number of Sets : 4 : Bars Marked : 58/58/59/59/60/60/60/60 : Waste Length Per Set = 140 MM
Number of Sets : 4 : Bars Marked : 76/76/76/77/77 : Waste Length Per Set = 65 MM
Number of Sets : 4 : Bars Marked : 94/94/94/94/94/95/95/98 : Waste Length Per Set = 105 MM
Number of Sets : 3 : Bars Marked : 140/140/140/140/141 : Waste Length Per Set = 120 MM
Number of Sets : 2 : Bars Marked : 40/40/40/40/40/40/41/42/42 : Waste Length Per Set = 150 MM
Number of Sets : 2 : Bars Marked : 40/40/40/40/40/40/40/42 : Waste Length Per Set = 150 MM
Number of Sets : 1 : Bars Marked : 20/21/21/22/22/23/23 : Waste Length Per Set = 100 MM
Number of Sets : 3 : Bars Marked : 33/33/34/34/35/35/36/36/40/40 : Waste Length Per Set = 170 MM
Number of Sets : 1 : Bars Marked : 39/39/40/41/44 : Waste Length Per Set = 15 MM
Number of Sets : 3 : Bars Marked : 139/140/140/140/141 : Waste Length Per Set = 160 MM
Number of Sets : 2 : Bars Marked : 31/31/31/31/31/32/32/43 : Waste Length Per Set = 140 MM
Number of Sets : 2 : Bars Marked : 27/27/28/28/29/29/30/44 : Waste Length Per Set = 160 MM
Number of Sets : 2 : Bars Marked : 71/72/72/73/73/74/74/75/75 : Waste Length Per Set = 155 MM
Number of Sets : 3 : Bars Marked : 133/133/134/134/134/135/135/136 : Waste Length Per Set = 80 MM
Number of Sets : 2 : Bars Marked : 39/39/41/41/42/44 : Waste Length Per Set = 15 MM
Number of Sets : 1 : Bars Marked : 81/84/84/85/85/86/86/87/87/88 : Waste Length Per Set = 170 MM
Number of Sets : 2 : Bars Marked : 23/24/24/24/24/24/25/25 : Waste Length Per Set = 20 MM
Number of Sets : 2 : Bars Marked : 27/28/28/29/29/30/30 : Waste Length Per Set = 65 MM
Number of Sets : 1 : Bars Marked : 31/31/31/31/32/32/43/43 : Waste Length Per Set = 140 MM
Number of Sets : 1 : Bars Marked : 21/22/22/23/26/26/30 : Waste Length Per Set = 135 MM
Number of Sets : 1 : Bars Marked : 105/105/106/106/107/107/113/113 : Waste Length Per Set = 220 MM
Number of Sets : 1 : Bars Marked : 17/17/19/25/26/26/30/43 : Waste Length Per Set = 355 MM
Number of Sets : 1 : Bars Marked : 113/113/113/113/113/116/116 : Waste Length Per Set = 230 MM
Number of Sets : 2 : Bars Marked : 149/149/157/157/158/158/158 : Waste Length Per Set = 230 MM
Number of Sets : 4 : Bars Marked : 144/144/145/145/145 : Waste Length Per Set = 230 MM
Number of Sets : 1 : Bars Marked : 105/105/105/105/106/106/107/107 : Waste Length Per Set = 220 MM

Number of Sets : 2 : Bars Marked : 149/149/149/157/157/158/158 : Waste Length Per Set = 230 MM
Number of Sets : 1 : Bars Marked : 16/17/17/46/49/49 : Waste Length Per Set = 255 MM
Number of Sets : 4 : Bars Marked : 100/101/101/104/104/105/105/105 : Waste Length Per Set = 185 MM
Number of Sets : 3 : Bars Marked : 54/56/56/56/56/56/57 : Waste Length Per Set = 290 MM
Number of Sets : 3 : Bars Marked : 67/67/68/68/69/69/70/70/71 : Waste Length Per Set = 205 MM
Number of Sets : 2 : Bars Marked : 66/66/70/70/75/75/78 : Waste Length Per Set = 165 MM
Number of Sets : 1 : Bars Marked : 24/24/24/24/24/25/25/26 : Waste Length Per Set = 300 MM
Number of Sets : 1 : Bars Marked : 31/31/31/31/32/32/33/33/34 : Waste Length Per Set = 290 MM
Number of Sets : 1 : Bars Marked : 105/105/105/106/106/107/107/113 : Waste Length Per Set = 220 MM
Number of Sets : 3 : Bars Marked : 113/113/113/113/113/113/116 : Waste Length Per Set = 340 MM
Number of Sets : 3 : Bars Marked : 116/117/117/117/117/117/117 : Waste Length Per Set = 340 MM
Number of Sets : 1 : Bars Marked : 158/158/158/161/161/161/162 : Waste Length Per Set = 265 MM
Number of Sets : 3 : Bars Marked : 139/140/145/145/145/148 : Waste Length Per Set = 115 MM
Number of Sets : 3 : Bars Marked : 139/139/145/148/149/149 : Waste Length Per Set = 155 MM
Number of Sets : 2 : Bars Marked : 139/139/149/149/149/158 : Waste Length Per Set = 20 MM
Number of Sets : 1 : Bars Marked : 16/21/21/22/22/23/27 : Waste Length Per Set = 320 MM
Number of Sets : 2 : Bars Marked : 139/139/158/158/158/158 : Waste Length Per Set = 20 MM
Number of Sets : 1 : Bars Marked : 68/68/69/69/70/70/70/71/71 : Waste Length Per Set = 210 MM
Number of Sets : 1 : Bars Marked : 131/131/132/132/133/133/134/134 : Waste Length Per Set = 320 MM
Number of Sets : 1 : Bars Marked : 107/107/113/117/117/117/119/121 : Waste Length Per Set = 30 MM
Number of Sets : 1 : Bars Marked : 131/131/131/134/135/135/136 : Waste Length Per Set = 330 MM
Number of Sets : 1 : Bars Marked : 80/80/80/80/80/80/81/88 : Waste Length Per Set = 210 MM
Number of Sets : 1 : Bars Marked : 81/89/89/89/89/90/90/90 : Waste Length Per Set = 315 MM
Number of Sets : 1 : Bars Marked : 80/91/91/92/93 : Waste Length Per Set = 165 MM
Number of Sets : 1 : Bars Marked : 79/80/93/94/94/98/99 : Waste Length Per Set = 200 MM
Number of Sets : 1 : Bars Marked : 139/139/149/149/158/158 : Waste Length Per Set = 20 MM
Number of Sets : 1 : Bars Marked : 66/67/67/70/72/72/73/73 : Waste Length Per Set = 40 MM
Number of Sets : 1 : Bars Marked : 66/74/74/75/75/75/75/78 : Waste Length Per Set = 275 MM
Number of Sets : 1 : Bars Marked : 130/131/136/137/138/138 : Waste Length Per Set = 65 MM
Number of Sets : 1 : Bars Marked : 127/127/130/139/139 : Waste Length Per Set = 305 MM
Number of Sets : 1 : Bars Marked : 21/21/22/22/23/23/26 : Waste Length Per Set = 100 MM
Number of Sets : 1 : Bars Marked : 39/39/40/40 : Waste Length Per Set = 290 MM
Number of Sets : 1 : Bars Marked : 66/66/66/70/70/71/72/72/74 : Waste Length Per Set = 225 MM
Number of Sets : 1 : Bars Marked : 140/140/140/141/141/145 : Waste Length Per Set = 240 MM
Number of Sets : 1 : Bars Marked : 65/66/66/66/66/66/73 : Waste Length Per Set = 55 MM
Number of Sets : 1 : Bars Marked : 57/62/65/73/74/75/75/75 : Waste Length Per Set = 210 MM
Number of Sets : 11 : Bars Marked : 162/162/162/163/163 : Waste Length Per Set = 180 MM
Number of Sets : 1 : Bars Marked : 51/54/75/78/80 : Waste Length Per Set = 260 MM
Number of Sets : 3 : Bars Marked : 51/51/79/80 : Waste Length Per Set = 45 MM
Number of Sets : 1 : Bars Marked : 50/50/51/79 : Waste Length Per Set = 150 MM
Number of Sets : 1 : Bars Marked : 140/140/145/145/145/148 : Waste Length Per Set = 75 MM
Number of Sets : 1 : Bars Marked : 140/140/148/149/149/149 : Waste Length Per Set = 75 MM
Number of Sets : 2 : Bars Marked : 94/94/98/99/99/99/99 : Waste Length Per Set = 585 MM
Number of Sets : 1 : Bars Marked : 90/91/91/92/93 : Waste Length Per Set = 495 MM
Number of Sets : 1 : Bars Marked : 117/117/117/117/117/117/117 : Waste Length Per Set = 450 MM
Number of Sets : 2 : Bars Marked : 51/51/54/57 : Waste Length Per Set = 470 MM
Number of Sets : 2 : Bars Marked : 66/66/66/66/66/66/80 : Waste Length Per Set = 450 MM
Number of Sets : 3 : Bars Marked : 131/131/131/131/131/131/132 : Waste Length Per Set = 510 MM
Number of Sets : 2 : Bars Marked : 130/130/132/136/138 : Waste Length Per Set = 190 MM
Number of Sets : 1 : Bars Marked : 66/66/66/66/66/66/99 : Waste Length Per Set = 450 MM
Number of Sets : 3 : Bars Marked : 158/158/158/158/158/158/158 : Waste Length Per Set = 450 MM
Number of Sets : 1 : Bars Marked : 80/80/80/80/80/80/80 : Waste Length Per Set = 450 MM
Number of Sets : 1 : Bars Marked : 51/62/65/65/79/88 : Waste Length Per Set = 440 MM
Number of Sets : 1 : Bars Marked : 138/161/161/161/3/3/4 : Waste Length Per Set = 145 MM
Number of Sets : 1 : Bars Marked : 89/89/89/90/90/93/99/100 : Waste Length Per Set = 195 MM
Number of Sets : 1 : Bars Marked : 89/99/99/105/105/105/105 : Waste Length Per Set = 450 MM
Number of Sets : 1 : Bars Marked : 62/65/65/79/99/99/99 : Waste Length Per Set = 290 MM
Number of Sets : 1 : Bars Marked : 51/79/87/117/117 : Waste Length Per Set = 310 MM
Number of Sets : 2 : Bars Marked : 127/127/127/127/127/127/127 : Waste Length Per Set = 450 MM
Number of Sets : 1 : Bars Marked : 51/99/99/100/105/105 : Waste Length Per Set = 250 MM
Number of Sets : 1 : Bars Marked : 16/21/31/46/49/49 : Waste Length Per Set = 555 MM
Number of Sets : 1 : Bars Marked : 50/50/50/113/117 : Waste Length Per Set = 330 MM
Number of Sets : 1 : Bars Marked : 51/117/117/119/121/127 : Waste Length Per Set = 235 MM
Number of Sets : 1 : Bars Marked : 56/56/56/57/57/62/65/65 : Waste Length Per Set = 545 MM
Number of Sets : 1 : Bars Marked : 127/127/127/127/127/127/132 : Waste Length Per Set = 510 MM
Number of Sets : 1 : Bars Marked : 130/130/136/137/138 : Waste Length Per Set = 10 MM
Number of Sets : 1 : Bars Marked : 26/26/43/44/46/49/49 : Waste Length Per Set = 465 MM
Number of Sets : 1 : Bars Marked : 50/138/161/161/161/3/3 : Waste Length Per Set = 345 MM
Number of Sets : 1 : Bars Marked : 91/92/93/93/94/94 : Waste Length Per Set = 425 MM
Number of Sets : 1 : Bars Marked : 98/99/99/99/99/99/99 : Waste Length Per Set = 585 MM

Number of Sets : 1 : Bars Marked : 127/127/127/127/127/158/158 : Waste Length Per Set = 450 MM
Number of Sets : 1 : Bars Marked : 5/5/16/27/34 : Waste Length Per Set = 540 MM
Number of Sets : 1 : Bars Marked : 105/106/106/158/158/161/161/161 : Waste Length Per Set = 575 MM
Number of Sets : 1 : Bars Marked : 5/31/35/35/36/36/41 : Waste Length Per Set = 215 MM
Number of Sets : 1 : Bars Marked : 5/5/40/43/44 : Waste Length Per Set = 55 MM
Number of Sets : 1 : Bars Marked : 43/44/46/49/49/50 : Waste Length Per Set = 375 MM
Number of Sets : 17 : Bars Marked : 162/162/162/162 : Waste Length Per Set = 400 MM
Number of Sets : 1 : Bars Marked : 137/4/4/5 : Waste Length Per Set = 215 MM
Number of Sets : 1 : Bars Marked : 50/50/4/4 : Waste Length Per Set = 440 MM
Number of Sets : 1 : Bars Marked : 51/80/80/80/80/88 : Waste Length Per Set = 600 MM
Number of Sets : 1 : Bars Marked : 50/80/80/80/80/80/88 : Waste Length Per Set = 195 MM
Number of Sets : 1 : Bars Marked : 80/87/89/89/89/89/90 : Waste Length Per Set = 310 MM
Number of Sets : 1 : Bars Marked : 50/50/50/80/89 : Waste Length Per Set = 330 MM
Number of Sets : 1 : Bars Marked : 149/158/158/158/158/158/158 : Waste Length Per Set = 450 MM
Number of Sets : 1 : Bars Marked : 91/92/93/93/99/99 : Waste Length Per Set = 425 MM
Number of Sets : 1 : Bars Marked : 51/90/90/91/99 : Waste Length Per Set = 315 MM
Number of Sets : 1 : Bars Marked : 4/4/4/50 : Waste Length Per Set = 240 MM
Number of Sets : 1 : Bars Marked : 50/50/100/105/105/105 : Waste Length Per Set = 355 MM
Number of Sets : 1 : Bars Marked : 3/3/5/5 : Waste Length Per Set = 260 MM
Number of Sets : 1 : Bars Marked : 90/90/90/91/99/100/105 : Waste Length Per Set = 265 MM
Number of Sets : 1 : Bars Marked : 140/162/162/162 : Waste Length Per Set = 570 MM
Number of Sets : 1 : Bars Marked : 105/105/50/50/50 : Waste Length Per Set = 330 MM
Number of Sets : 1 : Bars Marked : 89/89/89/105/105/117/117 : Waste Length Per Set = 450 MM
Number of Sets : 1 : Bars Marked : 139/162/163/163/163/163 : Waste Length Per Set = 170 MM
Number of Sets : 2 : Bars Marked : 139/139/163/163/163/163 : Waste Length Per Set = 380 MM
Number of Sets : 1 : Bars Marked : 50/50/50/87/119 : Waste Length Per Set = 120 MM
Number of Sets : 1 : Bars Marked : 117/121/137/138/139/139 : Waste Length Per Set = 500 MM
Number of Sets : 3 : Bars Marked : 50/50/50/50 : Waste Length Per Set = 840 MM
Number of Sets : 1 : Bars Marked : 3/4/4/4 : Waste Length Per Set = 1195 MM
Number of Sets : 5 : Bars Marked : 5/5/50 : Waste Length Per Set = 1140 MM
Number of Sets : 1 : Bars Marked : 5/50/50/119 : Waste Length Per Set = 995 MM
Number of Sets : 1 : Bars Marked : 50/50/50/4 : Waste Length Per Set = 640 MM
Number of Sets : 11 : Bars Marked : 163/163/163/163/163/163/163 : Waste Length Per Set = 1080 MM
Number of Sets : 1 : Bars Marked : 3/5/5/121 : Waste Length Per Set = 705 MM
Number of Sets : 1 : Bars Marked : 5/5/139 : Waste Length Per Set = 1240 MM
Number of Sets : 1 : Bars Marked : 5/5/163 : Waste Length Per Set = 2370 MM
Number of Sets : 1 : Bars Marked : 5/5 : Waste Length Per Set = 3930 MM
Number of Sets : 1 : Bars Marked : 5 : Waste Length Per Set = 7965 MM

Total Waste Length of 8 MM Bars in M = 93.46
Total Wastage of 8 MM Bars in Kg = 36.88

Wastages For 10 MM Diameter Reinforcements :

Number of Sets : 1 : Bars Marked : 52/52/52/52/52/52/52 : Waste Length Per Set = 30 MM
Number of Sets : 2 : Bars Marked : 111/118/118/120/120/125/125 : Waste Length Per Set = 70 MM
Number of Sets : 2 : Bars Marked : 118/120/120/125/125/143/151 : Waste Length Per Set = 160 MM
Number of Sets : 1 : Bars Marked : 8/8/10/10/13/45/45/52 : Waste Length Per Set = 175 MM
Number of Sets : 1 : Bars Marked : 63/63/82/82/143 : Waste Length Per Set = 310 MM
Number of Sets : 2 : Bars Marked : 47/61/61/63/82 : Waste Length Per Set = 265 MM
Number of Sets : 1 : Bars Marked : 96/96/143/8/10 : Waste Length Per Set = 200 MM
Number of Sets : 2 : Bars Marked : 45/45/47/63/82 : Waste Length Per Set = 215 MM
Number of Sets : 1 : Bars Marked : 96/111/118/143/153/159 : Waste Length Per Set = 185 MM
Number of Sets : 1 : Bars Marked : 63/63/82/82/111 : Waste Length Per Set = 310 MM
Number of Sets : 1 : Bars Marked : 47/61/61/96/151 : Waste Length Per Set = 355 MM
Number of Sets : 1 : Bars Marked : 159/6/6/8/8/10/10/13 : Waste Length Per Set = 345 MM
Number of Sets : 1 : Bars Marked : 47/61/61/96/118 : Waste Length Per Set = 265 MM
Number of Sets : 1 : Bars Marked : 159/6/6/47/96 : Waste Length Per Set = 60 MM
Number of Sets : 1 : Bars Marked : 6/6/8/8/10/10/13/10 : Waste Length Per Set = 385 MM
Number of Sets : 1 : Bars Marked : 13/96/45/45/47 : Waste Length Per Set = 65 MM
Number of Sets : 1 : Bars Marked : 96/143/153/159/143/153 : Waste Length Per Set = 275 MM
Number of Sets : 1 : Bars Marked : 159/159 : Waste Length Per Set = 9040 MM

Total Waste Length of 10 MM Bars in M = 13.42
Total Wastage of 10 MM Bars in Kg = 8.28

Wastages For 12 MM Diameter Reinforcements :

Number of Sets : 4 : Bars Marked : 128/142/142/147 : Waste Length Per Set = 35 MM
Number of Sets : 4 : Bars Marked : 14/15/15/48 : Waste Length Per Set = 140 MM

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Number of Sets : 3 : Bars Marked : 155/160/12/12/38/83 : Waste Length Per Set = 350 MM
Number of Sets : 3 : Bars Marked : 14/64/97/110 : Waste Length Per Set = 45 MM
Number of Sets : 1 : Bars Marked : 155/102/110 : Waste Length Per Set = 455 MM
Number of Sets : 2 : Bars Marked : 102/114/124 : Waste Length Per Set = 580 MM
Number of Sets : 1 : Bars Marked : 14/38/64/83/97 : Waste Length Per Set = 460 MM
Number of Sets : 2 : Bars Marked : 102/102/110 : Waste Length Per Set = 580 MM
Number of Sets : 1 : Bars Marked : 110/114/114 : Waste Length Per Set = 580 MM
Number of Sets : 2 : Bars Marked : 114/114/124 : Waste Length Per Set = 580 MM
Number of Sets : 1 : Bars Marked : 150/152/152/114/114 : Waste Length Per Set = 120 MM
Number of Sets : 1 : Bars Marked : 124/128/150/150/152/152 : Waste Length Per Set = 415 MM
Number of Sets : 1 : Bars Marked : 150/152/152/155/110 : Waste Length Per Set = 590 MM
Number of Sets : 1 : Bars Marked : 150/124/128/150/150/150 : Waste Length Per Set = 415 MM
Number of Sets : 1 : Bars Marked : 12/114/124/128 : Waste Length Per Set = 45 MM
Number of Sets : 1 : Bars Marked : 124/102/128/152 : Waste Length Per Set = 280 MM
Number of Sets : 1 : Bars Marked : 152/155/114/160 : Waste Length Per Set = 1100 MM
Number of Sets : 1 : Bars Marked : 12/155/155 : Waste Length Per Set = 2215 MM

Total Waste Length of 12 MM Bars in M = 12.04
Total Wastage of 12 MM Bars in Kg = 10.69
-----------------------------------------------------------
Wastages For 16 MM Diameter Reinforcements :

Number of Sets : 4 : Bars Marked : 103/129/146/146 : Waste Length Per Set = 505 MM
Number of Sets : 1 : Bars Marked : 156/1/1 : Waste Length Per Set = 980 MM
Number of Sets : 2 : Bars Marked : 154/154/156/1 : Waste Length Per Set = 1190 MM
Number of Sets : 1 : Bars Marked : 1/1/154 : Waste Length Per Set = 1530 MM
Number of Sets : 2 : Bars Marked : 37/37/154 : Waste Length Per Set = 1500 MM
Number of Sets : 1 : Bars Marked : 154/37/37 : Waste Length Per Set = 1500 MM
Number of Sets : 1 : Bars Marked : 154/1/37 : Waste Length Per Set = 1515 MM
Number of Sets : 1 : Bars Marked : 37/154/1 : Waste Length Per Set = 1515 MM
Number of Sets : 1 : Bars Marked : 154/154/156 : Waste Length Per Set = 5420 MM

Total Waste Length of 16 MM Bars in M = 19.86
Total Wastage of 16 MM Bars in Kg = 31.35
-----------------------------------------------------------
Wastages For 20 MM Diameter Reinforcements :

Number of Sets : 2 : Bars Marked : 2/115/2/115 : Waste Length Per Set = 1510 MM

Total Waste Length of 20 MM Bars in M = 3.02
Total Wastage of 20 MM Bars in Kg = 7.45
-----------------------------------------------------------

Note :
(1) A Waste File is Created as D:\000Optimize_bar\Example.wst
(2) Use this File to Remove available Waste Lengths from future BBS File.
```

- **Note that Wastages of bars are displayed in the same manner as that of Optimized Bars in step no. 4.**

  The Waste Includes the Cutting Length above 2000 MM also. Normally cutting Lengths exceeding 2000 MM are not included in wastages as they are consumed in Lapping or in subsequent construction.

  When a user executes this option, an Internal waste file is created automatically with wst extension. In our case file name is Example.wst

  Use this File to Remove available Waste Lengths from future BBS File. Refer Waste option.

STEP NO. 5 IS OVER.

STEP NO. 6 :
CREATE / DISPLAY / IMPORT EXTERNAL CSV WASTE FILE

- **When Program starts, the above Menu Bar is displayed.**

  Click the " Waste " Option. Following menu is displayed.

- **Note that Create External Waste is similar to Creating Project file.** **Refer Step no. 1.**

  Importing CSV Waste File is similar to Importing Project CSV file. **Refer Step no. 2.**

  Display / Add / Edit Waste File is similar to Display / Add / Edit Project File. **Refer Step no. 3.**

STEP NO. 6 IS OVER.

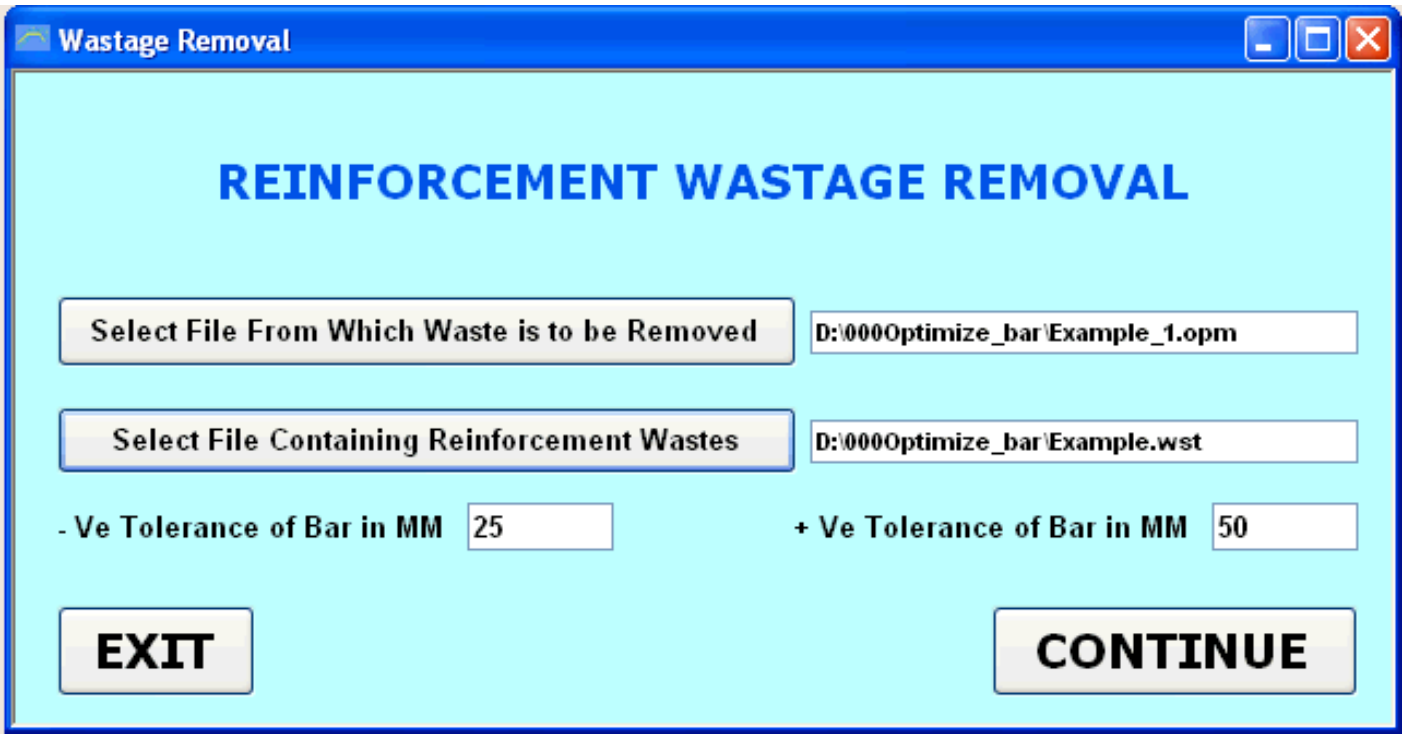
STEP NO. 7 :
REMOVE / DISPLAY WASTAGES

- **When Program starts, the above Menu Bar is displayed.**

  Click the " Waste " Option. Following menu is displayed.

- **Removes waste From File option takes 2 Files, compares them and remove waste from them.**
  The 1st File shall be main BBS file from which waste is to be removed, considering the available waste, which is in 2nd file called waste file.

  Now Click Remove waste From File option. Following window will open up.



- **Select File from which Waste is to be Removed (Example_1.opm), next Select File Containing Reinforcement Wastes (Example.wst).**

  Note that Example_1.opm is the BBS file of the Next Floor, and Example.wst is the waste generated by the Current Floor (Step 5).

  Give - ve and + ve Tolerance of Bar in MM. A user can give very high + ve tolerance say 1000 MM,

  if Lots of wastages are to be consumed.

  Click the Continue button. Possible Wastages will be Removed from Example_1.opm file.

  Note that after wastage removal, records of both the files (Example_1.opm & Example.wst) will get reduced to the extent wastage removal was feasible.

  Now Click display Matched Wastes option. Following Waste Removal Report is generated.

Details of Wastages Removed from BBS File

BBS File Name : D:\000Optimize_bar\Example_1.opm
Waste File Name : D:\000Optimize_bar\Example.wst
- ve Bar Tolerance in MM : 25
+ ve Bar Tolerance in MM : 50

Bar Marked Matched and Removed from BBS File : 25
Corresponding Bar Marked Removed from Waste File : 239

Bar Marked Matched and Removed from BBS File : 25
Corresponding Bar Marked Removed from Waste File : 240

Bar Marked Matched and Removed from BBS File : 32
Corresponding Bar Marked Removed from Waste File : 233

Bar Marked Matched and Removed from BBS File : 33
Corresponding Bar Marked Removed from Waste File : 251

Bar Marked Matched and Removed from BBS File : 34
Corresponding Bar Marked Removed from Waste File : 236

Bar Marked Matched and Removed from BBS File : 36
Corresponding Bar Marked Removed from Waste File : 250

Bar Marked Matched and Removed from BBS File : 42
Corresponding Bar Marked Removed from Waste File : 71

Bar Marked Matched and Removed from BBS File : 42
Corresponding Bar Marked Removed from Waste File : 76

Bar Marked Matched and Removed from BBS File : 44
Corresponding Bar Marked Removed from Waste File : 145

Bar Marked Matched and Removed from BBS File : 44
Corresponding Bar Marked Removed from Waste File : 165

Bar Marked Matched and Removed from BBS File : 59
Corresponding Bar Marked Removed from Waste File : 178

Bar Marked Matched and Removed from BBS File : 59
Corresponding Bar Marked Removed from Waste File : 182

Bar Marked Matched and Removed from BBS File : 64
Corresponding Bar Marked Removed from Waste File : 307

Bar Marked Matched and Removed from BBS File : 67
Corresponding Bar Marked Removed from Waste File : 229

Bar Marked Matched and Removed from BBS File : 67

Corresponding Bar Marked Removed from Waste File : 230

Bar Marked Matched and Removed from BBS File : 72
Corresponding Bar Marked Removed from Waste File : 241

Bar Marked Matched and Removed from BBS File : 72
Corresponding Bar Marked Removed from Waste File : 242

Bar Marked Matched and Removed from BBS File : 81
Corresponding Bar Marked Removed from Waste File : 232

Bar Marked Matched and Removed from BBS File : 81
Corresponding Bar Marked Removed from Waste File : 234

Bar Marked Matched and Removed from BBS File : 81
Corresponding Bar Marked Removed from Waste File : 235

Bar Marked Matched and Removed from BBS File : 83
Corresponding Bar Marked Removed from Waste File : 285

Bar Marked Matched and Removed from BBS File : 84
Corresponding Bar Marked Removed from Waste File : 77

Bar Marked Matched and Removed from BBS File : 84
Corresponding Bar Marked Removed from Waste File : 79

Bar Marked Matched and Removed from BBS File : 95
Corresponding Bar Marked Removed from Waste File : 243

Bar Marked Matched and Removed from BBS File : 95
Corresponding Bar Marked Removed from Waste File : 244

Bar Marked Matched and Removed from BBS File : 100
Corresponding Bar Marked Removed from Waste File : 237

Bar Marked Matched and Removed from BBS File : 135
Corresponding Bar Marked Removed from Waste File : 245

Bar Marked Matched and Removed from BBS File : 135
Corresponding Bar Marked Removed from Waste File : 246

Bar Marked Matched and Removed from BBS File : 25
Corresponding Bar Marked Removed from Waste File : 247

Bar Marked Matched and Removed from BBS File : 25
Corresponding Bar Marked Removed from Waste File : 248

Bar Marked Matched and Removed from BBS File : 42
Corresponding Bar Marked Removed from Waste File : 80

Bar Marked Matched and Removed from BBS File : 42
Corresponding Bar Marked Removed from Waste File : 83

Bar Marked Matched and Removed from BBS File : 44
Corresponding Bar Marked Removed from Waste File : 186

Bar Marked Matched and Removed from BBS File : 44
Corresponding Bar Marked Removed from Waste File : 206

Bar Marked Matched and Removed from BBS File : 59
Corresponding Bar Marked Removed from Waste File : 220

Bar Marked Matched and Removed from BBS File : 72
Corresponding Bar Marked Removed from Waste File : 249

Bar Marked Matched and Removed from BBS File : 83
Corresponding Bar Marked Removed from Waste File : 287

Bar Marked Matched and Removed from BBS File : 84
Corresponding Bar Marked Removed from Waste File : 85

Bar Marked Matched and Removed from BBS File : 84
Corresponding Bar Marked Removed from Waste File : 86

Bar Marked Matched and Removed from BBS File : 42
Corresponding Bar Marked Removed from Waste File : 89

Bar Marked Matched and Removed from BBS File : 42
Corresponding Bar Marked Removed from Waste File : 96

Bar Marked Matched and Removed from BBS File : 83
Corresponding Bar Marked Removed from Waste File : 289

Bar Marked Matched and Removed from BBS File : 84
Corresponding Bar Marked Removed from Waste File : 97

Bar Marked Matched and Removed from BBS File : 84
Corresponding Bar Marked Removed from Waste File : 98

Bar Marked Matched and Removed from BBS File : 42
Corresponding Bar Marked Removed from Waste File : 101

Bar Marked Matched and Removed from BBS File : 42
Corresponding Bar Marked Removed from Waste File : 106

Bar Marked Matched and Removed from BBS File : 84
Corresponding Bar Marked Removed from Waste File : 115

Bar Marked Matched and Removed from BBS File : 84
Corresponding Bar Marked Removed from Waste File : 118

Total Wastages Consumed in Kg : 14.85
Reinforcement Saved : 0.73 %

STEP NO. 7 IS OVER.

LEARN OPTIMIZE BAR STEPS BY STEP

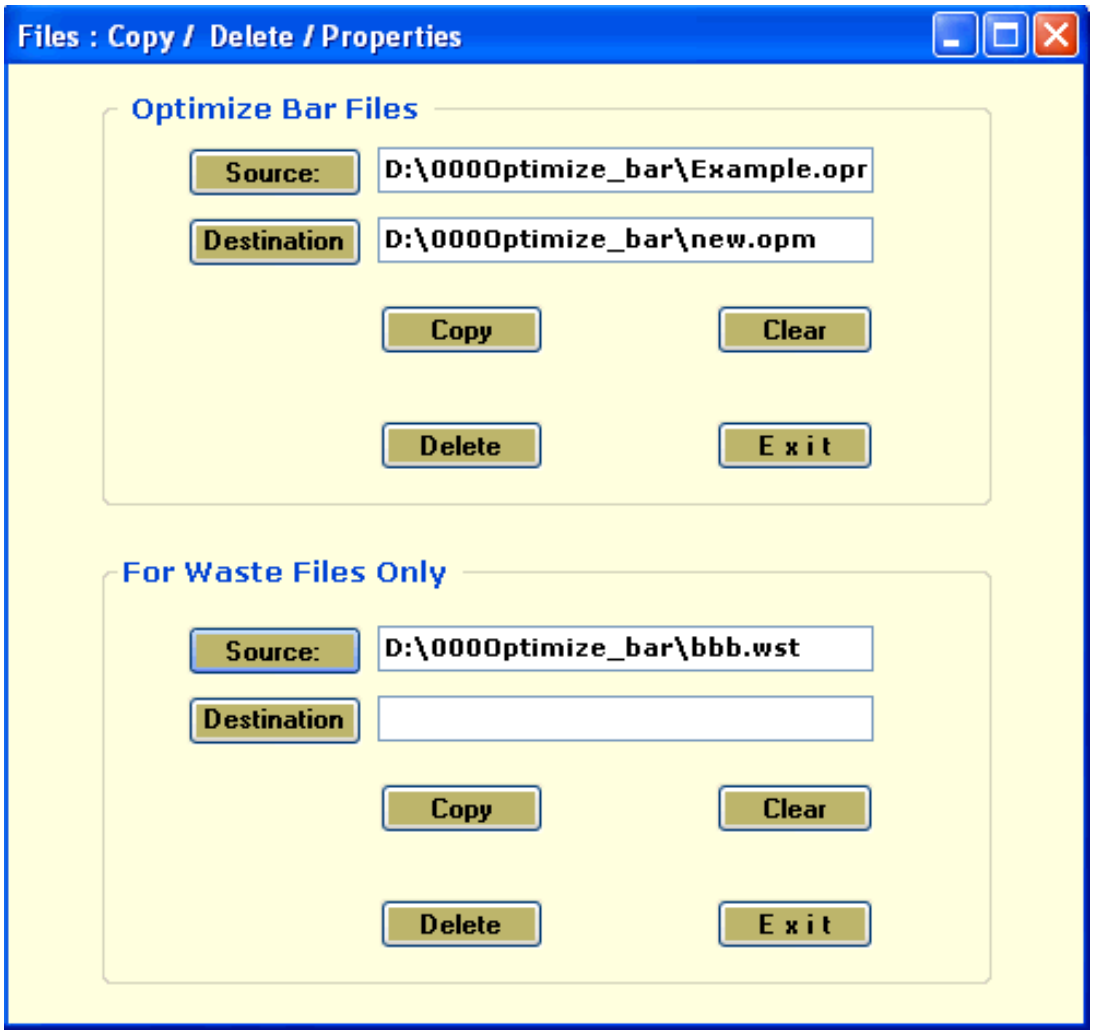
STEP NO. 8 : UTILITY: FILE COPY AND DELETE

Project | Import CSV File | Display/Add/Edit Records | Optimize Records | Disply Results | Waste | Utility

- **When Program starts, the above Menu Bar is displayed.**

  Click the " Utility Option ".

  The following window will open.



- **Two separate options are provided, one for Optimize Bars and another for Waste Files. These options are for Copying and Deleting of Optimize Bar and Waste Files respectively. Indicate both Source and Destination File for Copying and Indicate only Source File for Deleting all Optimize Bar and Waste Files.**

STEP NO. 8 IS OVER.

OTHER SOFTWARES:

SUPER CIVIL CD - Single Point Solution To Your Civil Engineering Needs

SUPER RATE ANALYSIS - Rate Analysis Of 1299 Nos. Of Civil Engineering Items

2D FRAME ANALYSIS - Discover The Beauty Of Structural Analysis

R C F - A Software for Analysis, Design, Estimation & Costing of RCC Floors

S S F - Analysis, Design, Estimation & Costing of Steel Buildings, revised as per IS 800 : 2007

Q T Y - Quantity Estimation & Cost, Project Control

SUPER REAL VALUATION - A Software For Immovable Properties

ROADS - Pavement Design & Rate Analysis Of Road Items

ROAD ESTIMATE - Quantity Estimation & Cost, Project Control For Road

ELECTRIC COST - Costing, Project Control & MDS For Electrical Projects

HVAC COST - Costing, Project Control & Design For HVAC Engineers

BILLING JI - A Database Management Software For General Billing

RA BILL - A Database Management Software For Item Rate Contract Billing

BUILDERS BILL - A Database Management Software for Billing of Lump sum Contracts

BID ANALYSIS - A Software For Technical & Commercial Tender Analysis

RAFT FOUNDATION - Analysis, Design, Estimation, Costing & Drawing of RCC Raft Foundation

STEEL 2007 - Limit State design of Steel as per IS 800 : 2007

SITE CONTROL - A Management Software for Resource Control At Site.

COMPOSITE - A Software for Analysis, Design, Costing & Drawing of Composite Floor Buildings

DESIGN & DRAWING CONTROL - A DBM Software for Control of Design & Drawing Manhours.

INSTA COST - A Software for Estimating Project Cost & Tender SOQ Instantly

FLAT SLAB - A Software for Analysis, Design, Estimation, Costing & Drawings of Flat Slabs

FLAT RAFT - A Software for Analysis, Design, Estimation, Costing & Drawings of Rigid RCC Flat Rafts

OPTIMIZE STEEL - A Software for Optimization of Steel Sections from Existing Fabrication Drawing

AutoQty - A Software for Automatic Quantity & Cost Estimation from AutoCAD Drawings