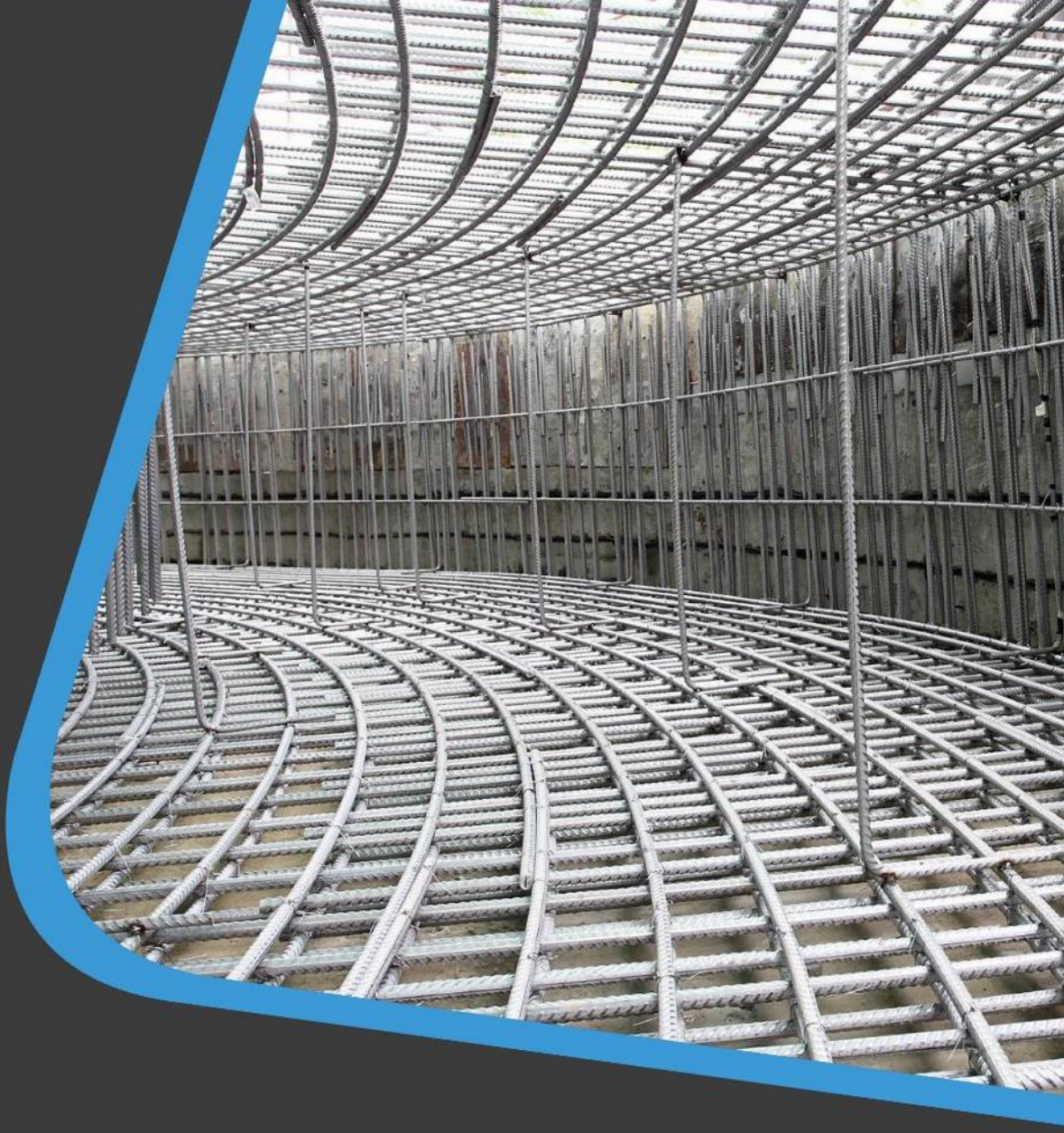


CADS Stock Bar Optimiser

Getting Started

CADS
GLOBAL CONSTRUCTION
SOFTWARE AND SERVICES

AUTODESK
Authorised Developer

Microsoft
Partner

Revision history

Date	Version	Description
24-May-18	1.1	Enhanced to support offcut tag marks and integrated with RebarCAD India 2019.0
Oct 2022	1.2	Updated for V2023.0
Mar 2023	1.3	Updated for V2023.10
Sep 2023	1.4	Updated for V2024.0
Nov 2024	1.5	Updated for V2025.0
Dec 2025	1.6	Updated for V2026.0

Contents

1 Introduction

The **CADS Stock Bar Optimiser** feature in **RebarCAD** helps you:

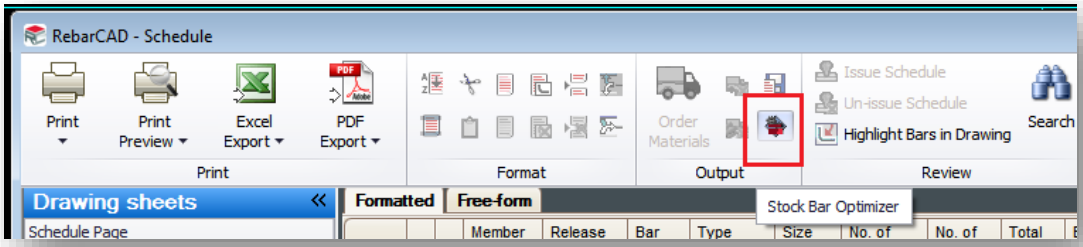
- Find out the best pattern to cut bars available in the bar bending schedule for minimum wastage.
- Utilise offcut bars effectively.
- Generate a user-friendly graphical output for the cut pattern in MS Excel format.
- Print and pass on cut pattern to your cut and bend shop for fabrication.

This document describes how to deploy and use the **CADS Stock Bar Optimiser** feature in **RebarCAD** environment.

2 CADS Stock Bar Optimiser

After installing RebarCAD in your system, go to: **RebarCAD > View Schedule**, and click on the CADS Stock Bar Optimiser icon. (Refer to the image shown below).

Please Note: CADS Stock Bar Optimiser can be invoked only if there is at least one bar in the schedule.



3 Compatibility

The graphical output (*.xlsx) format report from **CADS Stock Bar Optimiser** can be generated only if Microsoft Excel 2007 (or a later version) is installed in your system. Other features will work as long as **RebarCAD** is installed in the system.

4 Features

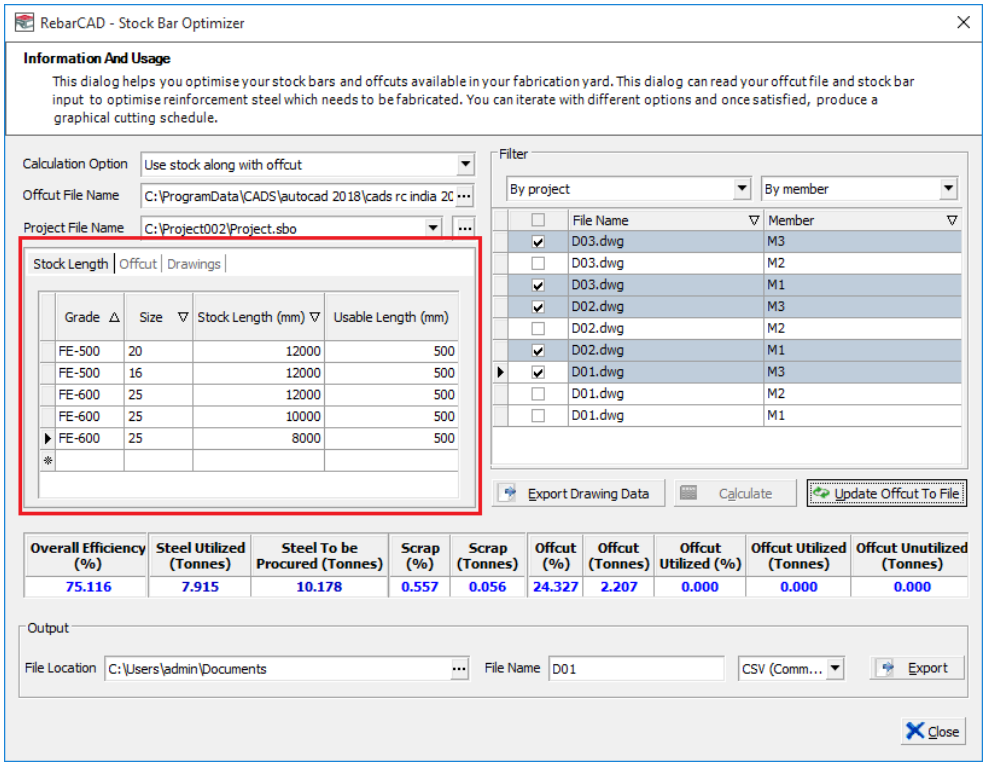
This section introduces the basic **CADS Stock Bar Optimiser** features available, and helps you to start using these features.

4.1 Rebar Stock Length

The Rebar **Stock Length** section allows you to input **Stock Length** values for bars of different grades and diameters, available in your cut and bend facility.

Please note that the **Stock Length** value is always provided in millimetres.

You can enter **Stock Length** values for different combinations of bar diameters and grades, in the grid as highlighted in the image below.



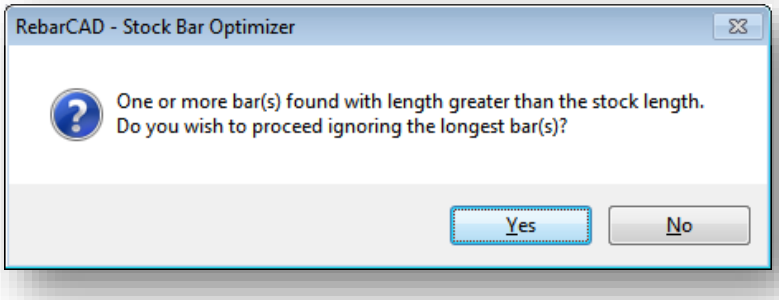
You can also enter multiple **Stock Length** values for a particular bar grade and size.

Usable length: This is the minimum length of rebar, which **CADS Stock Bar Optimiser** identifies as reusable. They are grouped as **Offcut** bars.

Bars below this length are considered unusable, and will be grouped as scrap.

Only Bar diameters and Grades *available in the drawing* will be shown in the grid.

- If the **Stock Length** value you entered is lesser than the value of the longest bar length (required for a given bar diameter and grade combination), you will get a warning message.



In the case of smaller diameter bars that come in coils, you can filter out the bar diameter from the optimisation selection set, described in the next section.

4.2 Offcut

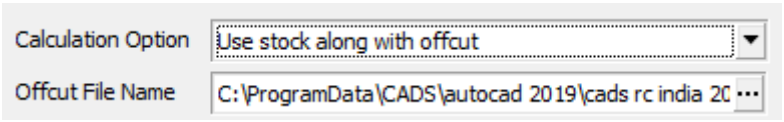
Offcut bars are the remainder bars (that qualify the minimum length criteria set under Rebar **Usable length** section) that were accumulated post bar production.

Stock Bar Optimiser allows you to utilise offcut bars effectively, by generating cut patterns from the available Offcut bars.

The offcut details are always input as *.csv files. (The output can be in *.csv or *.xlsx file format).

If you choose to use offcut, you need to configure the **Offcut** path.

Click the ⋯ button in the dialog box to browse the offcut file. (Refer to the enlarged image below).



To create *.csv file.

1. Open a new excel file.
2. The value of the first cell (A1) has to be set as ‘Offcut File Version 2.0.0’
3. Set the header for the offcut file by setting the following values:

   Cell ‘A2’ → Type

   Cell ‘B2’ → Size

   Cell ‘C2’ → Length (mm)

   Cell ‘D2’ → Quantity

   Cell ‘E2’ → Tag Mark

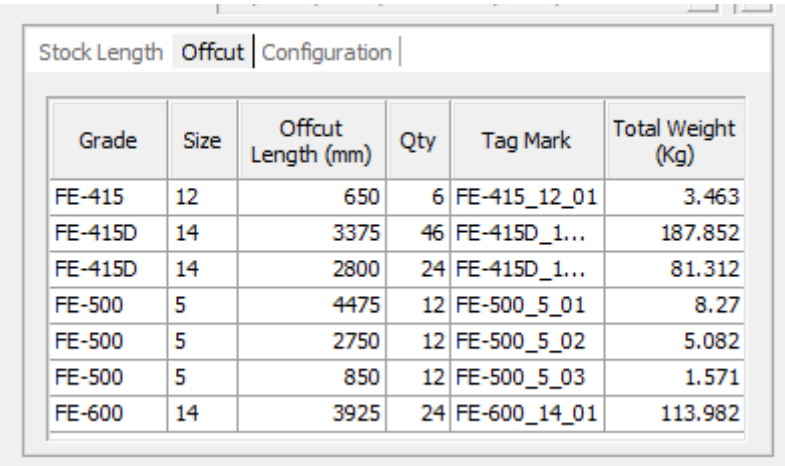
   Cell ‘F2’ → Total Weight (kg)

4. Set the appropriate values the Type, Size (diameter), Length (mm), Quantity (nos), Tag Mark (unique offcut tag mark) and the Total Wight (kg) as shown below:

	A	B	C	D	E	F
1	Offcut File Version 2.0.0					
2	Type	Size	Length(mm)	Quantity	Tag Mark	Total Weight (kg)
3	FE-415	12	650	6	FE-415_12_01	3.463
4	FE-415D	14	3375	46	FE-415D_14_02	187.852
5	FE-415D	14	2800	24	FE-415D_14_01	81.312
6	FE-500	5	4475	12	FE-500_5_01	8.27
7	FE-500	5	2750	12	FE-500_5_02	5.082
8	FE-500	5	850	12	FE-500_5_03	1.571
9	FE-600	14	3925	24	FE-600_14_01	113.982

5. Save it as a *.csv file.

When you select the **Offcut** tab after configuring a valid offcut file, the offcut bars available in the file will be displayed in the dialog box as shown below:



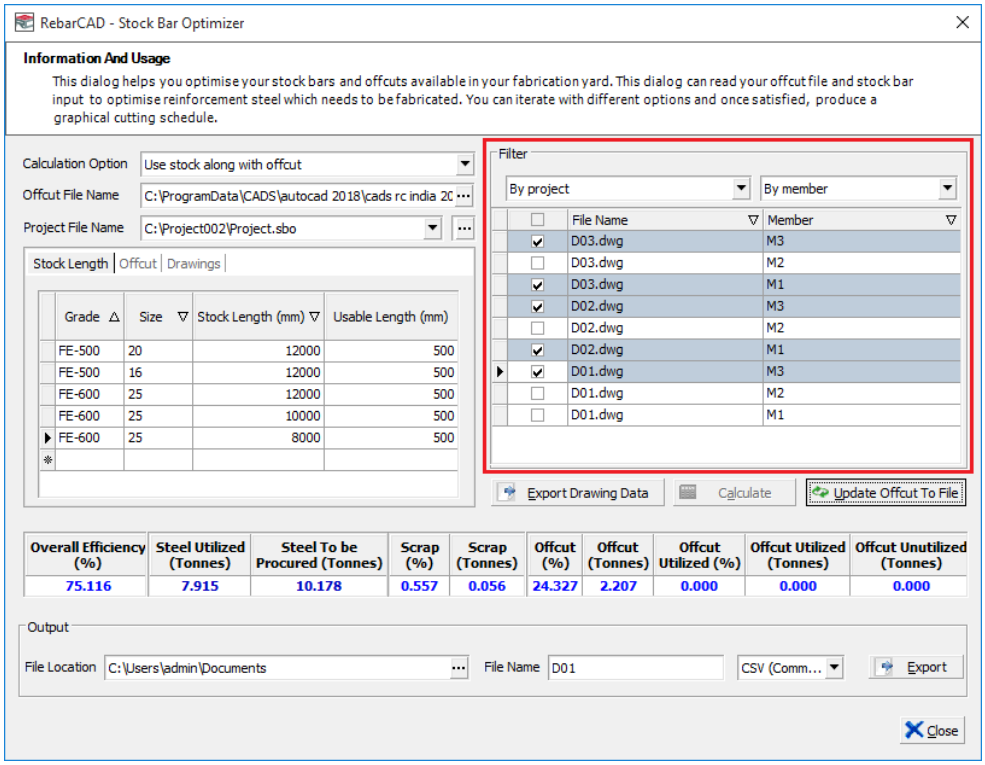
Grade	Size	Offcut Length (mm)	Qty	Tag Mark	Total Weight (Kg)
FE-415	12	650	6	FE-415_12_01	3.463
FE-415D	14	3375	46	FE-415D_1...	187.852
FE-415D	14	2800	24	FE-415D_1...	81.312
FE-500	5	4475	12	FE-500_5_01	8.27
FE-500	5	2750	12	FE-500_5_02	5.082
FE-500	5	850	12	FE-500_5_03	1.571
FE-600	14	3925	24	FE-600_14_01	113.982

4.3 Selection Set

All the bars available in the drawing file will be selected for optimisation by default. You can select for optimisation of either **By current drawing** or **By Project.** You can also select a partial list of bars for optimisation.

For example, depending on the construction sequence and work load in your cut and bend facility, you can optimise the bars available in **Member Foundation** first, followed by **Member Grade Beams**.

The filter can be applied by **Members**, **Release** or **Drawing Sheet**, which are standard **RebarCAD** features.



4.4 Calculation option

With **CADS Stock Bar Optimiser,** you can calculate the bar cutting pattern using **Stock length** or **Offcuts**. In fact, you have three options to choose from.

- Use stock only;
- Use stock along with offcut;
- Use offcut first and then stock.

4.4.1 Use stock only

Only full stock bars are used, in this option, to generate optimised cutting patterns.

4.4.2 Use stock along with offcut

This option specifically identifies the best cutting pattern (either from **Stock length,** or from **Offcut length)**, whichever produces the least wastage. Both **Stock length** and **Offcut length** are given equal preference in optimisation.

If you select this option, **CADS Stock Bar Optimiser** will generate an optimised cutting pattern using:

- stock bars, according to the length specified in the **Stock length** column, and
- offcut bars, configured in the **Offcut** section.

In most of the cases, this option produces greater efficiency and least scrap. However, the usage of offcut bars is less, since many of the best patterns are identified from **Stock lengths**.

When you choose **Use stock along with offcut**:

- select a *.csv file from the list of *.csv files (only *.csv files can be selected) in the dialog box.
- the details of the required bars will be automatically taken from the drawing. You can as well select bars needed to generate cutting patterns (explained in the section on 'Selection Set').

4.4.3 Use offcut first and then stock

This option:

- identifies the best cutting pattern among the available offcut first, and
- use **Stock length** only for the remaining bars (i.e. bars for which the cutting pattern cannot be generated from the available offcut length).

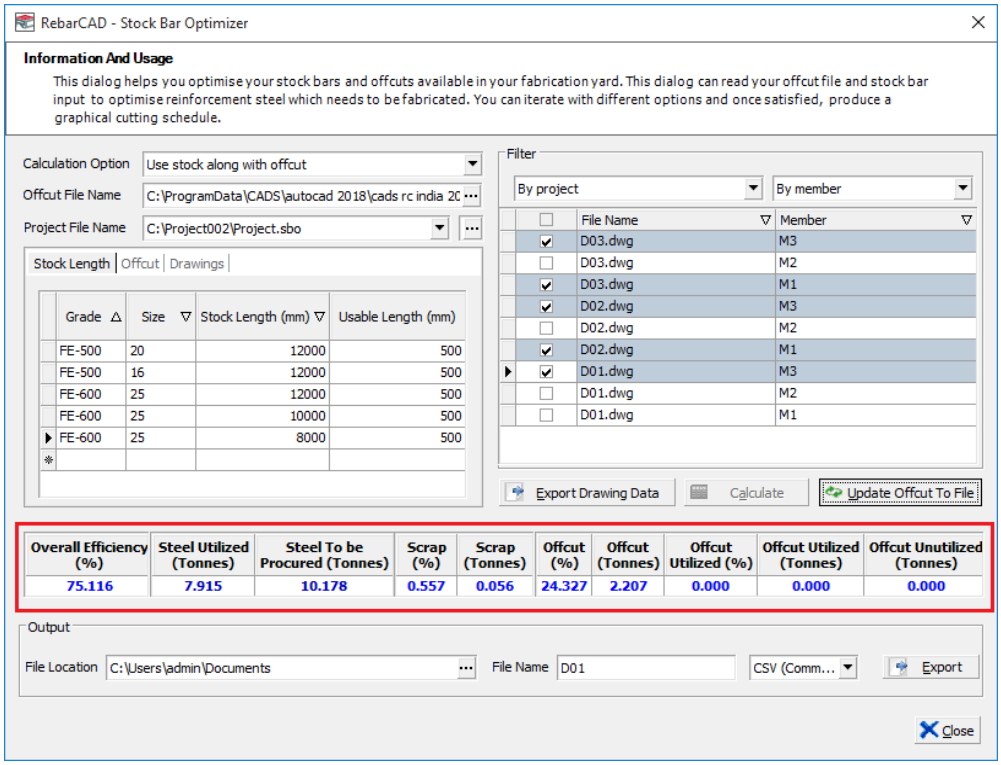
The advantage of using this option is that the offcut bars will be utilised to its maximum so that **Stock length** usage will be much less (compared to using the **Stock along with offcut** option). However, since **CADS Stock Bar Optimiser** selects the best pattern *only* from the **Offcut length** *without* considering the best patterns from the **Stock length,** the efficiency of this option is slightly lesser, compared to using **Stock along with offcut**.

4.5 Calculation

When you click **Calculate:**

- Patterns and new offcuts are generated and the summary results will be displayed in the dialog box.
- The patterns are presented in the report. (These patterns can be exported, as explained in the section on Reports).

As soon as the calculations are completed, you can view a brief summary report in the dialog.



4.5.1 Update Offcut To file

During optimisation, some of the offcuts maybe used and new offcuts may be generated. When you click **Update Offcut To File**, the used offcuts will be removed from the list and the new offcuts generated will be added to the list.

This function updates the offcut file so that it can be used for the next optimisation.

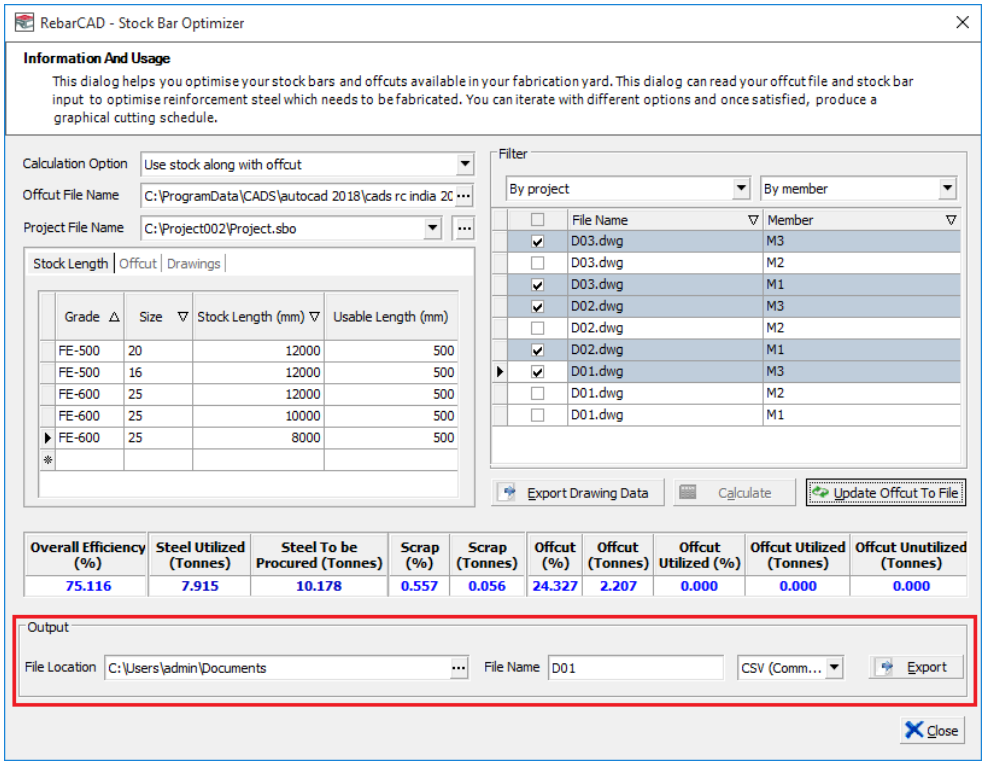
4.6 Reports

The **Optimised Report** can be generated either in Comma Separated Values (*.csv) format or in Microsoft Excel (*.xlsx) format.

Once you select the file format, the system calls in the details.

To initiate calculations, select:

- the Output File Location
- the File Name, and
- the required output format, as shown below.



The output will be generated in the location you select in the dialog box.

You can use the Comma Separated Values (*.csv) format, if you do not have Microsoft Excel 2007 or a higher version installed in your system.

The Comma Separated Values (*.csv) format can be opened in any text editing application such as Notepad or WordPad, supplied along with the Windows Operating System.

This format is also useful if you wish to send the data to your fabrication management system in electronic format.

Multi aspect drawing - Notepad

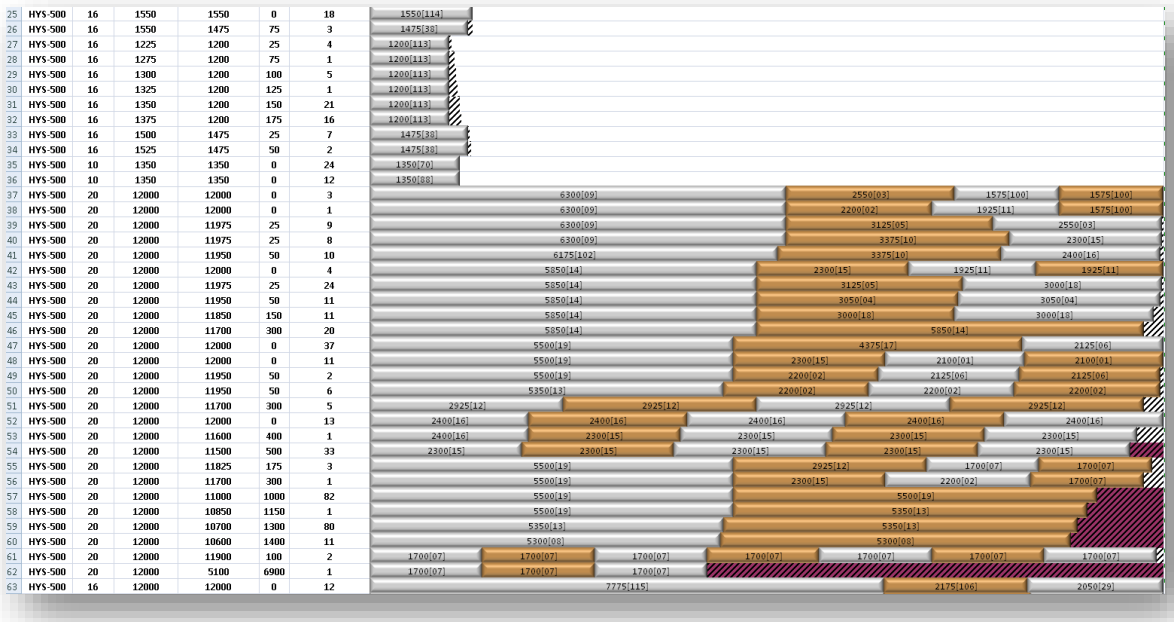
File Edit Format View Help

```
BarGrade, BarSize, StockLength, Pattern, Quantity, TotalPatternLength, ScrapLength
HYS-415, 16, 12000, 700(51) + 700(51) + 700(51) + 700(51) + 700(51) + 650(49) + 650(49) + 650(49) + 650(49) + 650(49) + 650(49) + 650(49) + 650(49) + 650(
HYS-415, 16, 12000, 700(51) + 650(52) + 550(50) + 550(50) + 550(50) + 550(50) + 550(50) + 550(50) + 550(50) + 550(50) + 550(50) + 550(54) + 550(54) + 550(54) + 550(
HYS-415, 16, 12000, 650(52) + 650(52) + 650(52) + 650(52) + 650(52) + 550(54) + 500(53) + 500(53) , 1, 4800, 7200
Total Required,28800
Total Used,36000
Efficiency,80.000

HYS-415, 16, 3600, 700(51) + 700(51) + 550(50) + 550(50) + 550(50) + 550(50) , 1, 3600, 0
Total Required,3600
Total Used,3600
Efficiency,100.000

HYS-415, 20, 12000, 2925(48) + 2925(48) + 2200(38) + 2200(38) + 1750(40) , 7, 12000, 0
HYS-415, 20, 12000, 2925(48) + 2675(35) + 1600(41) + 1600(41) + 1600(41) + 1600(41) , 1, 12000, 0
HYS-415, 20, 12000, 2775(37) + 2675(35) + 1750(40) + 1600(41) + 1600(41) + 1600(41) , 4, 12000, 0
HYS-415, 20, 12000, 2775(37) + 2775(37) + 2675(35) + 2300(36) + 1475(39) , 6, 12000, 0
HYS-415, 20, 12000, 2775(43) + 2775(43) + 2675(35) + 2300(36) + 1475(39) , 8, 12000, 0
HYS-415, 20, 12000, 2675(35) + 2300(36) + 1750(40) + 1750(40) + 1750(40) , 1, 11975, 25
HYS-415, 20, 12000, 2675(35) + 2675(35) + 2675(35) + 2200(38) + 1750(40) , 1, 11975, 25
HYS-415, 20, 12000, 2675(35) + 2675(35) + 2200(38) + 1475(39) + 1475(39) + 1475(39) , 4, 11975, 25
HYS-415, 20, 12000, 2675(35) + 2300(36) + 2300(36) + 2300(36) + 2300(36) , 1, 11875, 125
HYS-415, 20, 12000, 2300(36) + 2300(36) + 1475(39) + 1475(39) + 1475(39) + 1475(39) + 1475(39) , 1, 11975, 25
HYS-415, 20, 12000, 2300(36) + 2300(36) + 1475(39) + 1475(45) + 1475(45) + 1475(45) + 1475(45) , 1, 11975, 25
HYS-415, 20, 12000, 2300(36) + 2300(36) + 1475(45) + 1475(45) + 1475(45) + 1475(45) + 1475(45) + 1475(45) , 2, 11975, 25
HYS-415, 20, 12000, 2300(36) + 2300(42) + 1475(45) + 1475(45) + 1475(45) + 1475(45) + 1475(45) + 1475(45) , 1, 11975, 25
HYS-415, 20, 12000, 2300(42) + 2300(42) + 1475(45) + 1475(45) + 1475(45) + 1475(45) + 1475(45) + 1475(45) , 2, 11975, 25
HYS-415, 20, 12000, 2300(42) + 2300(42) + 1475(45) + 1475(45) + 1475(45) + 1475(45) + 1475(47) + 1475(47) , 1, 11975, 25
HYS-415, 20, 12000, 2300(42) + 2300(42) + 1475(47) + 1475(47) + 1475(47) + 1475(47) + 1475(47) + 1475(47) , 6, 11975, 25
HYS-415, 20, 12000, 2300(42) + 2300(42) + 2300(42) + 2300(42) + 2200(38) , 1, 11400, 600
HYS-415, 20, 12000, 2200(38) + 2200(38) + 2200(38) + 2200(38) + 2200(38) , 2, 11000, 1000
HYS-415, 20, 12000, 2200(44) + 2200(44) + 2200(44) + 2200(44) + 2200(44) , 6, 11000, 1000
HYS-415, 20, 12000, 2200(46) + 2200(46) + 2200(46) + 2200(46) + 2200(46) , 6, 11000, 1000
HYS-415, 20, 12000, 2200(46) , 1, 2200, 9800
Total Required,730975
Total Used,756000
Efficiency,96.690

HYS-415, 20, 5400, 2925(48) + 2300(36) , 1, 5225, 175
Total Required,5225
Total Used,5400
Efficiency,96.759

HYS-500, 12, 12000, 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1050(31) + 1050(31) , 1, 12000, 0
HYS-500, 12, 12000, 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(32) + 1100(33) + 1050(31) + 1050(31) , 1, 12000, 0
HYS-500, 12, 12000, 1100(33) + 1100(33) + 1100(33) + 1100(33) + 1100(33) + 1100(33) + 1100(33) + 1100(33) + 1050(31) + 1050(31) , 1, 12000, 0
HYS-500, 12, 12000, 1100(33) + 1100(33) + 1100(33) + 1050(31) + 1050(31) + 1050(31) + 1050(31) + 1050(31) + 1050(31) + 1050(31) , 1, 11700, 300
HYS-500, 12, 12000, 1050(31) + 1050(31) + 1050(34) + 1050(34) + 1050(34) + 1050(34) + 1050(34) + 1050(34) + 1050(34) , 1, 11550, 450
HYS-500, 12, 12000, 1050(34) + 1050(34) + 1050(34) + 1050(34) + 1050(34) + 1050(34) + 1050(34) , 1, 7350, 4650
Total Required,66600
Total Used,72000
Efficiency,92.500

HYS-500, 12, 2550, 1100(32) + 1100(32) , 1, 2200, 350
Total Required,2200
Total Used,2550
Efficiency,86.275
```

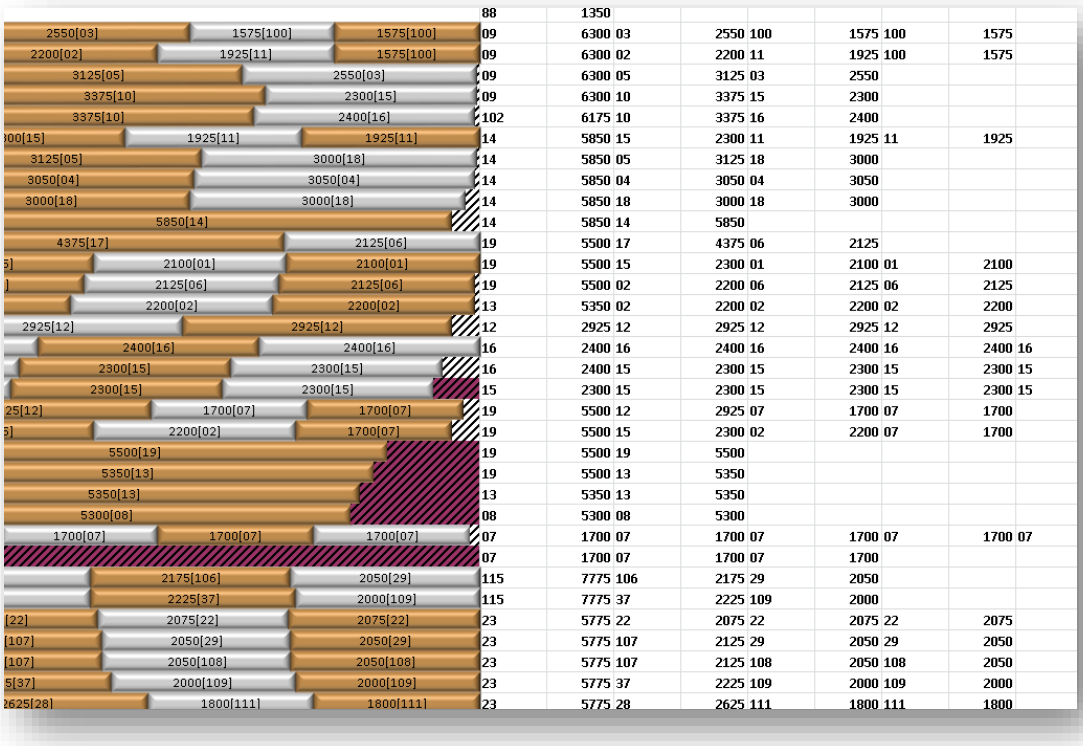
The **Pattern** column shows the way in which bars can be cut from the available **Offcut** and **Stock length**.

The **Bar Mark** is shown in brackets next to the **Bar Length** (in mm) value.

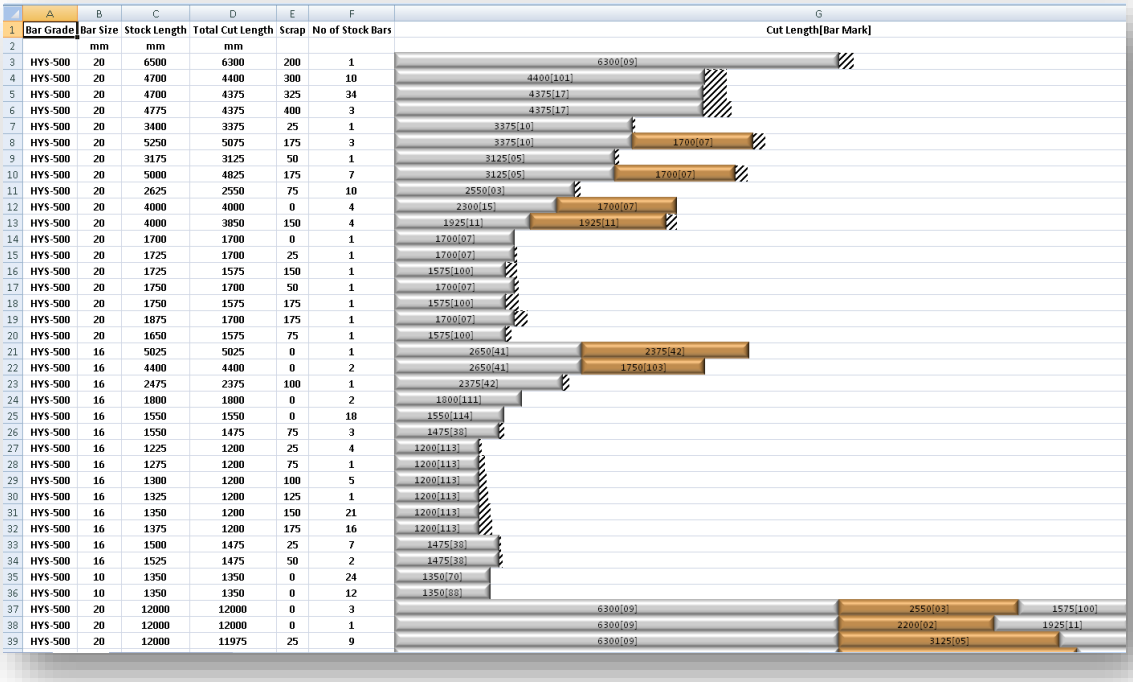
You can output the optimisation report in Microsoft Excel 2007 or a higher (*.xlsx) format to view a graphical representation of the cutting schedule. Please refer to the image below.



In the graphical representation of the patterns, the required bar lengths are represented as pieces in gold and silver alternatively. The offcut bars generated are indicated in slanted magenta and black, and the scraps are displayed in slanted black and white.



The Microsoft Excel 2007 or higher versions (*.xlsx) format also contains individual piece lengths and corresponding **Bar Marks** in tabular form. If required, this data can be used for electronic data transfer.



	A	B	C	D	E	F	G
1	Bar Grade	Bar Size	Stock Length	Total Cut Length	Scrap	No of Stock Bars	Cut Length[Bar Mark]
2		mm	mm	mm			
3	HYS-500	20	6500	6300	200	1	6300[09]
4	HYS-500	20	4700	4400	300	10	4400[101]
5	HYS-500	20	4700	4375	325	34	4375[17]
6	HYS-500	20	4775	4375	400	3	4375[17]
7	HYS-500	20	3400	3375	25	1	3375[10]
8	HYS-500	20	5250	5075	175	3	3375[10] 1700[07]
9	HYS-500	20	3175	3125	50	1	3125[05]
10	HYS-500	20	5000	4825	175	7	3125[05] 1700[07]
11	HYS-500	20	2625	2550	75	10	2550[03]
12	HYS-500	20	4000	4000	0	4	2300[15] 1700[07]
13	HYS-500	20	4000	3850	150	4	1925[11] 1925[11]
14	HYS-500	20	1700	1700	0	1	1700[07]
15	HYS-500	20	1725	1700	25	1	1700[07]
16	HYS-500	20	1725	1575	150	1	1575[100]
17	HYS-500	20	1750	1700	50	1	1700[07]
18	HYS-500	20	1750	1575	175	1	1575[100]
19	HYS-500	20	1875	1700	175	1	1700[07]
20	HYS-500	20	1650	1575	75	1	1575[100]
21	HYS-500	16	5025	5025	0	1	2650[41] 2375[42]
22	HYS-500	16	4400	4400	0	2	2650[41] 1750[103]
23	HYS-500	16	2475	2375	100	1	2375[42]
24	HYS-500	16	1800	1800	0	2	1800[111]
25	HYS-500	16	1550	1550	0	18	1550[114]
26	HYS-500	16	1550	1475	75	3	1475[38]
27	HYS-500	16	1225	1200	25	4	1200[113]
28	HYS-500	16	1275	1200	75	1	1200[113]
29	HYS-500	16	1300	1200	100	5	1200[113]
30	HYS-500	16	1325	1200	125	1	1200[113]
31	HYS-500	16	1350	1200	150	21	1200[113]
32	HYS-500	16	1375	1200	175	16	1200[113]
33	HYS-500	16	1500	1475	25	7	1475[38]
34	HYS-500	16	1525	1475	50	2	1475[38]
35	HYS-500	10	1350	1350	0	24	1350[70]
36	HYS-500	10	1350	1350	0	12	1350[88]
37	HYS-500	20	12000	12000	0	3	6300[09] 2550[03] 1575[100]
38	HYS-500	20	12000	12000	0	1	6300[09] 2200[02] 1925[11]
39	HYS-500	20	12000	11975	25	9	6300[09] 3125[05]

4.7 Optimise multiple drawings in a project

You can export the drawing data of multiple drawings to a centralised project file and then run the optimisation for multiple drawings in one go.

To optimise multiple drawings at a time,

- Open the required drawing file;
- Open the **Stock Bar Optimiser**;
- Set the Filter option to **By project**;
- Set the required partial filters;
- Set the appropriate **Project File Name**;
- Export the drawing to project file, by clicking on the **Export Drawing Data** button;
- Similarly open all the required drawings in the project and **Export Drawing Data**;
- Click on the **Calculate** button to get the optimisation results;