



STAB Manual

Version 2.0

Simple
Tool for
Aggregate
Blending

Salient Features



Blend upto 5 Aggregate Stockpiles



Filter Solutions by fixing one or more Stockpiles



Get Graphical Representation of chosen solutions



Save Report as .csv file.

Developed by:

- Dr. Nikhil Saboo
Faculty, Civil Engg. Dept., IIT Roorkee

- Anurag Yadav
 - Krishna Agarwal
 - Sanskar Gahoi
 - Shubhank
- UG Students, Civil Engg. Dept., IIT Roorkee



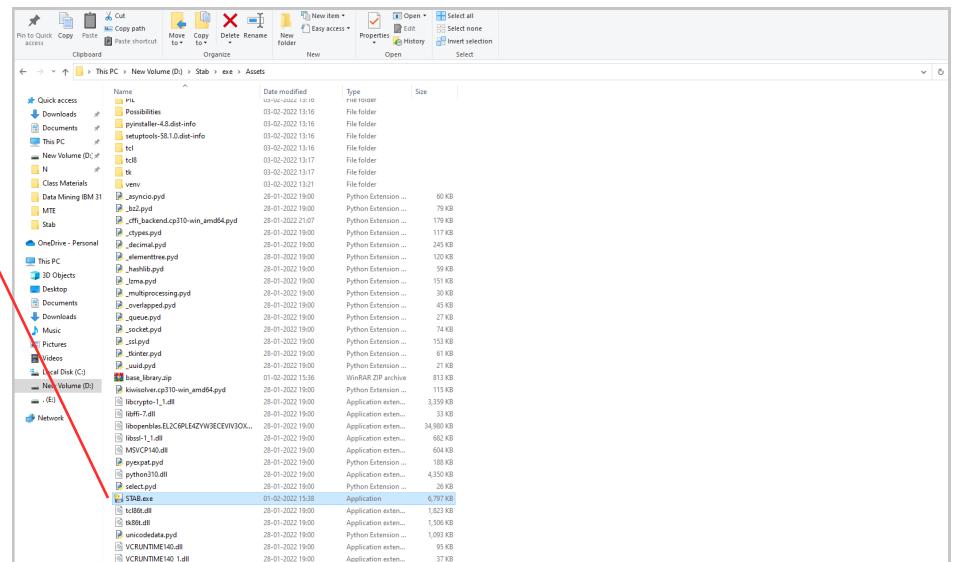
1. Download & Installation

- Download the **Stab_version_2.zip** file from civil.iitr.ac.in/TEG/About

The screenshot shows the IITR Home page with the Civil Engineering Department Indian Institute of Technology Roorkee logo. The main menu includes Home, About, Academics, Specializations, Research, People, Gallery, and Contact. Below the menu, there is a photograph of a group of people at a workshop. A purple banner at the bottom left contains the URL civil.iitr.ac.in/TEG/About. On the right side, under the 'About Us' tab, there is a section titled 'Transportation Engineering Group primarily deals with following thrust areas:' which lists four categories: Traffic engineering, Transportation Planning, Road Materials & Pavements, and Urban Roads & Highway Safety.

- Extract the .zip file to a folder. In the folder, run **STAB_version_2.exe** file.

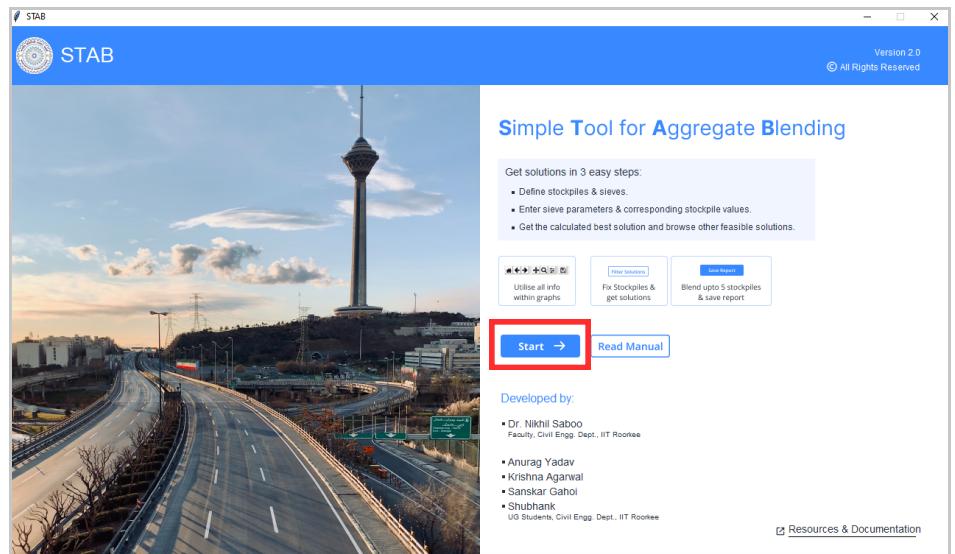
No installation required.



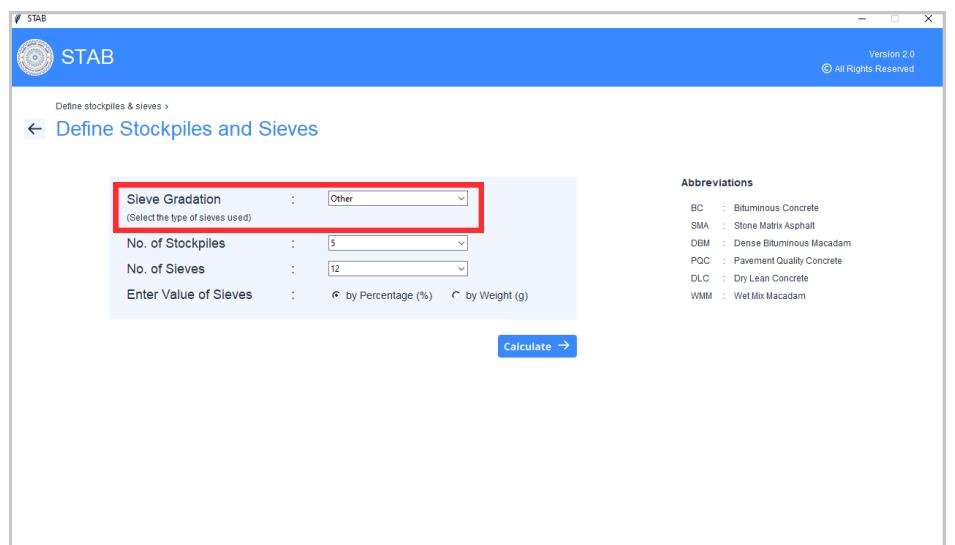


2. Using STAB

- Click **Start** to proceed



- Select the **Sieve Gradation** from the dropdown menu if you have one of the listed standard gradations, if not choose "**Other**"





2. Using STAB

- Select the **No. of Stockpiles & No. of Sieves**

Sieve Gradation : Other
Selected the type of sieves used
No. of Stockpiles : 2
No. of Sieves : 1
Enter Value of Sieves : by Percentage (%) by Weight (g)
Calculate →

- If you have any standard Sieve gradation selected, then the no. of stockpiles and no. of sieves will be fixed accordingly

Sieve Gradation : DBM - 37.5mm
(Select the type of sieves used)
No. of Stockpiles : 5
No. of Sieves : 8
Enter Value of Sieves : by Percentage (%) by Weight (g)
Calculate →

Abbreviations
BC : Bituminous Concrete
SMA : Stone Matrix Asphalt
DBM : Dense Bituminous Macadam
PQC : Pavement Quality Concrete
DLC : Dry Lean Concrete
WMM : Wet Mix Macadam

- Select the data type to be entered in the future steps:

Note: If you choose “**by Weight**” here, you will see an option to calculate **%passing** after you enter all the weight values in the next step.

Get % Passing

- And when you are good to go, click on continue

Continue →



2. Using STAB

- On the next page, Enter the values of % passing/wt. retained corresponding to each sieve size:

The screenshot shows the 'Enter Values' screen of the STAB software. At the top, there are tabs for 'Define stockpiles & sieves' and 'Enter values'. Below the tabs is a back arrow labeled '← Enter Values'. On the right side, there are 'Calculate' and 'Reset' buttons. The main area contains two tables. The first table on the left lists sieve sizes (Sieve1 to Sieve8) with their respective lower and upper bounds. The second table on the right is a grid for entering stockpile data, with columns for Stockpile 1 through Stockpile 5. A red box highlights the entire grid area.

Sieve	Size(mm)	Lower Bound	Upper Bound	Stockpile 1	Stockpile 2	Stockpile 3	Stockpile 4	Stockpile 5
Sieve1	45	100	100					
Sieve2	37.5	95	100					
Sieve3	26.5	63	93					
Sieve4	13.2	55	75					
Sieve5	4.75	38	54					
Sieve6	2.36	28	42					
Sieve7	0.3	7	21					
Sieve8	0.075	2	8					

- If you had selected "Other" as the sieve gradation, you also need to enter the lower and upper bounds for all the sieves in the selected gradation:

The screenshot shows the 'Enter Values' screen of the STAB software. The layout is identical to the previous screenshot, but the data in the first table is different. It lists sieve sizes from Sieve1 to Sieve12, with the first four rows being empty. A red box highlights the data entry grid for Stockpile 1 through Stockpile 5.

Sieve	Lower Bound	Upper Bound	Stockpile 1	Stockpile 2	Stockpile 3	Stockpile 4	Stockpile 5
Sieve1							
Sieve2							
Sieve3							
Sieve4							
Sieve5							
Sieve6							
Sieve7							
Sieve8							
Sieve9							
Sieve10							
Sieve11							
Sieve12							



2. Using STAB

Example:

- Standard Gradation

The screenshot shows the STAB software interface with a blue header bar containing the STAB logo and the word "STAB". Below the header is a toolbar with icons for "Define stockpiles & sieves", "Enter values", "Calculate", and "Reset". The main area is titled "Enter Values" and contains a table with two sections: "Sieve" and "Stockpile".

Sieve	Size(mm)	Lower Bound	Upper Bound	Stockpile 1	Stockpile 2	Stockpile 3	Stockpile 4	Stockpile 5
Sieve1	26.5	100	100	98.34649029	100	100	100	100
Sieve2	19	90	100	72.6370129	100	100	100	100
Sieve3	13.2	59	79	12.49199915	88.02358997	100	100	100
Sieve4	9.5	52	72	2.368252614	47.05501618	100	100	100
Sieve5	4.75	35	55	0	1.035998706	40.45751634	100	100
Sieve6	2.36	28	44	0	0	4.705882353	95.39170507	100
Sieve7	1.18	20	34	0	0	0.588235294	66.359447	100
Sieve8	0.6	15	27	0	0	0.522875817	47.92626728	100
Sieve9	0.3	10	20	0	0	0.45751634	31.79723502	100
Sieve10	0.15	5	15	0	0	0.392156683	19.8156682	100
Sieve11	0.075	2	8	0	0	0.3269797386	9.677419355	97

- Or otherwise

The screenshot shows the STAB software interface with a blue header bar containing the STAB logo and the word "STAB". Below the header is a toolbar with icons for "Define stockpiles & sieves", "Enter values", "Calculate", and "Reset". The main area is titled "Enter Values" and contains a table with three sections: "Sieve", "Stockpile 1", "Stockpile 2", "Stockpile 3", and "Stockpile 4".

Sieve	Lower Bound	Upper Bound	Stockpile 1	Stockpile 2	Stockpile 3	Stockpile 4
Sieve1	100	100	100	100	100	100
Sieve2	90	100	68.02358997	100	100	100
Sieve3	70	88	47.05501618	100	100	100
Sieve4	53	71	1.035998706	40.45751634	100	100
Sieve5	42	58	0	4.705882353	95.39170507	100
Sieve6	34	48	0	0.588235294	66.359447	100
Sieve7	26	38	0	0.522875817	47.92626728	100
Sieve8	18	28	0	0.45751634	31.79723502	100
Sieve9	12	20	0	0.392156683	19.8156682	100
Sieve10	4	10	0	0.3269797386	9.677419355	97

- And when you have entered all the values, click calculate:

Calculate →



2. Using STAB

- On the Results window, you get the no. of possible solutions to the given values, the detailed values & graph of the best solution & other options.

Properties of Stockpile (in % passing) **best solution***

Total number of possible integral solutions with the given values

Save all possible solutions as a .csv file to view them in Excel.

Use these options to analyze the graph by:

- Pan
- Zoom
- Scale filter
- Save graph

Find alternate solutions with constraints on one or more stockpiles.

Graph

Values

Stockpiles	Percentage(%)
Stockpile 1	37
Stockpile 2	6
Stockpile 3	52
Stockpile 4	5

Save Report

No. of possible solutions: 915

Best solution

Graph

Lower Limit Upper Limit Solution

Percentage Passing (%)

Sieve Number

Note:
Best solution:
Best solution is defined by minimizing the root mean square error from the mid point gradation.
Mid point gradation is the mean of upper bound and lower bound values.
Save report feature:
Save solution as a csv file.
Filter solutions feature:
Get alternative solutions to this search by fixing values of particular stockpiles.
You can also see the graph plotted for any particular solution by entering values for all stockpiles.

Fix

Values

Stockpiles	Percentage(%)
Stockpile 1	40
Stockpile 2	
Stockpile 3	
Stockpile 4	2

Filter by Fixing

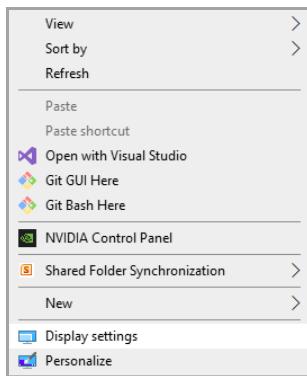
Best solution:
Best solution is defined by minimizing the root mean square error from the mid point gradation.
Mid point gradation is the mean of upper bound and lower bound values.
Save report feature:
Save solution as a csv file.
Filter solutions feature:
Get alternative solutions to this search by fixing values of particular stockpiles.
You can also see the graph plotted for any particular solution by entering values for all stockpiles.



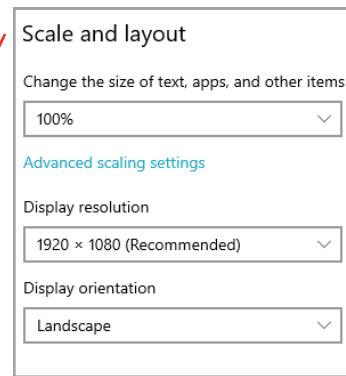
3. Help & Feedback

- In case the STAB window covers up all of your screen and/or STAB window appears to be bigger than the screen area, kindly change the display settings on your device to increase resolution.

1. Right Click

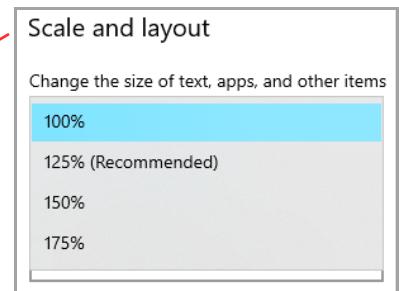


2. Go to Display settings



3. Under Scale & Layout

4. Reduce the zoom size to 100%



- For any further queries kindly contact:

Nikhil Saboo / निखिल साबू

Faculty / प्राध्यापक

Department of Civil Engineering / जानपद अभियांत्रिकी

Indian Institute of Technology, Roorkee / भारतीय प्रौद्योगिकी संस्थान, रुड़की

Roorkee-247667, Uttarakhand, India / रुड़की-२४७६६७, उत्तराखण्ड, भारत

nikhil.saboo@ce.iitr.ac.in