Road Solver Version 1.00

Solutions for Highway Geometric Engineering

Software User's Manual

Marketed By:

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INPRO IT Solutions

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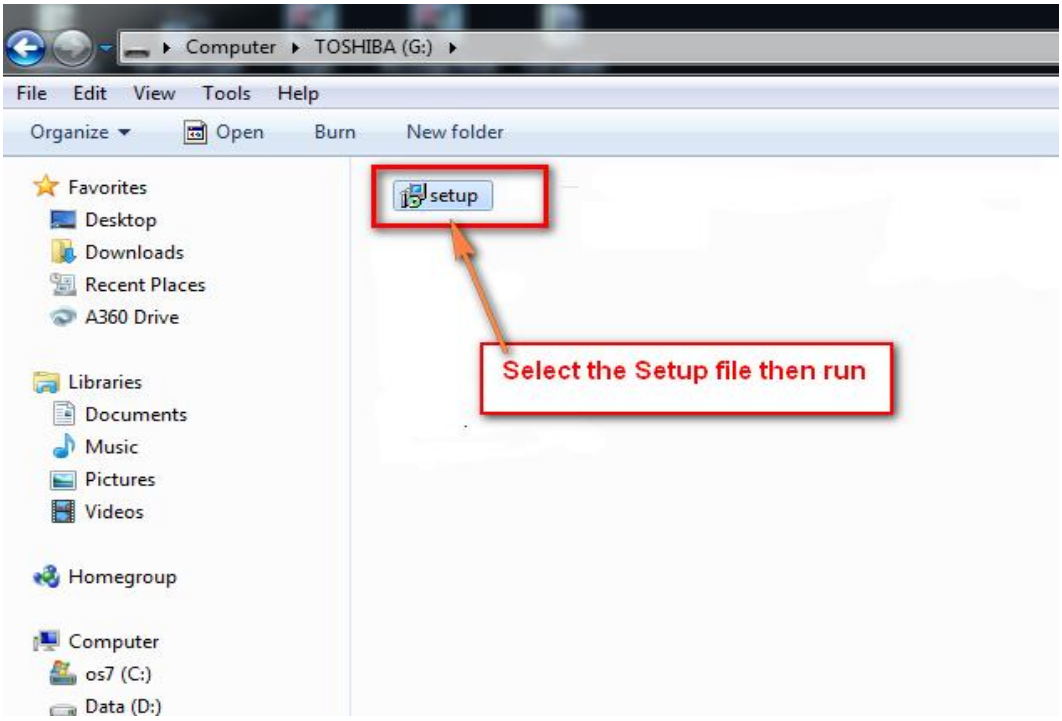
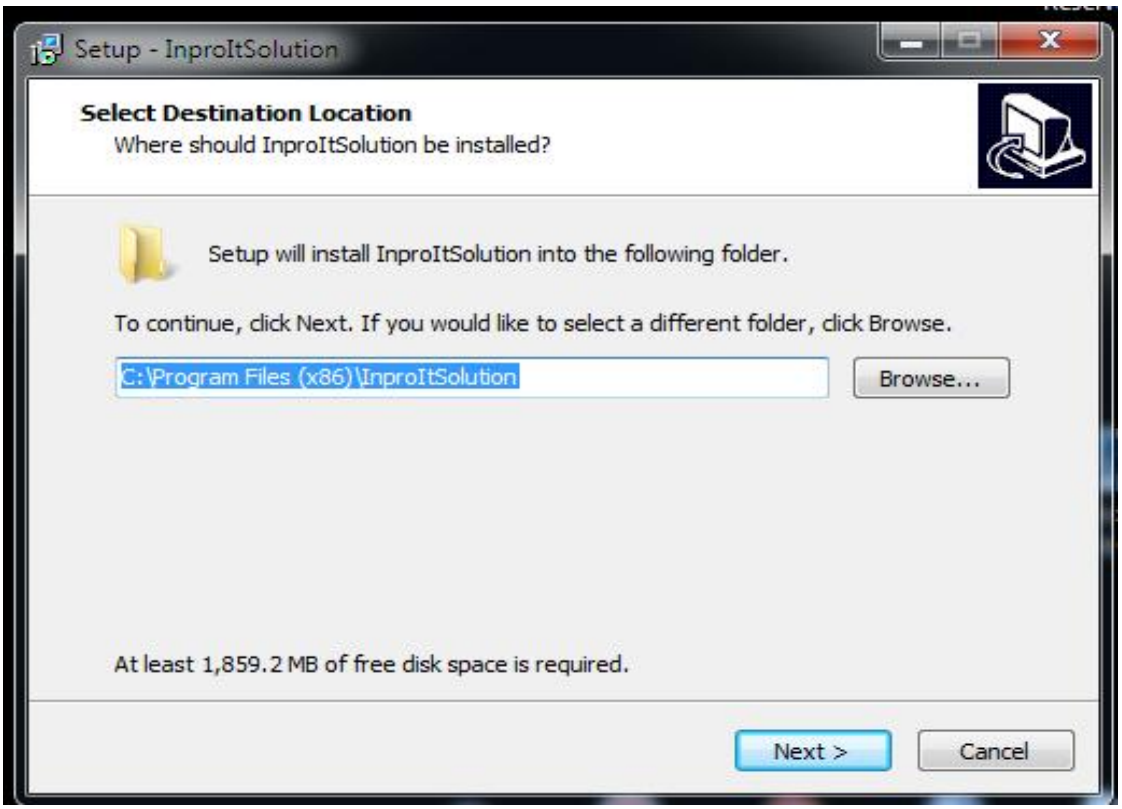
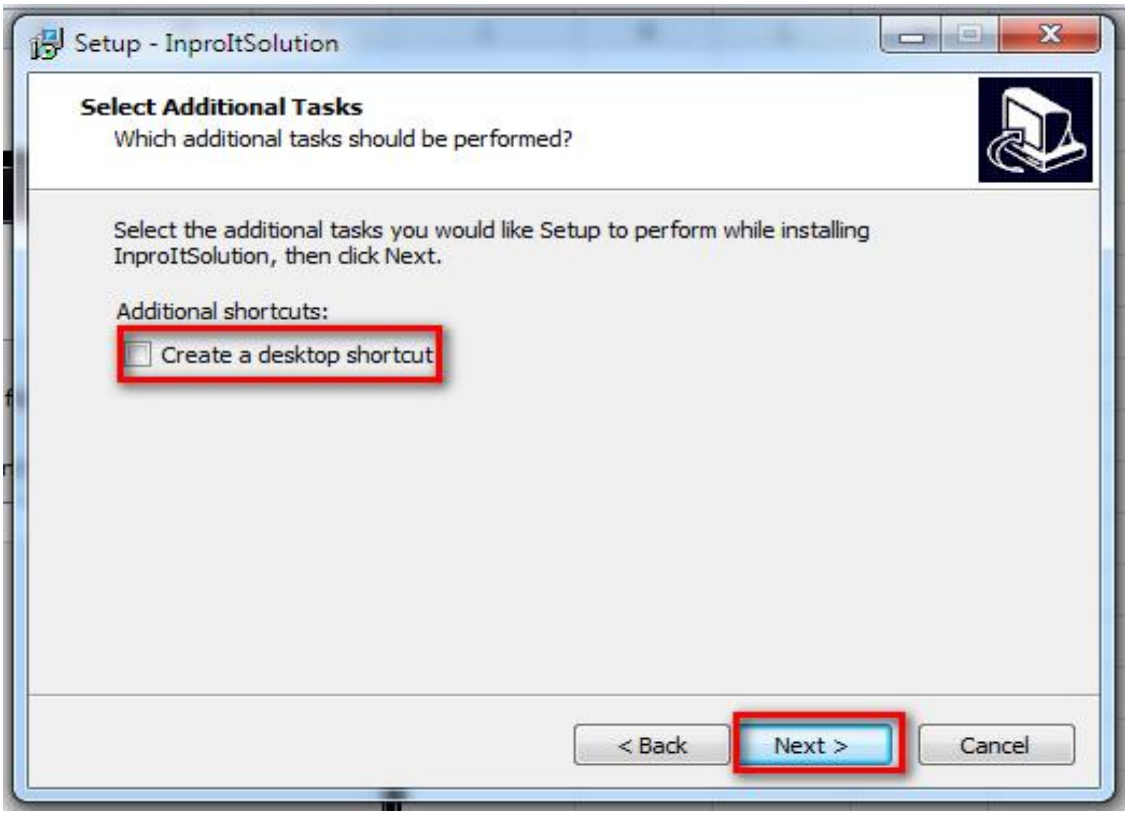
To Run the Setup file from Software installation CD …



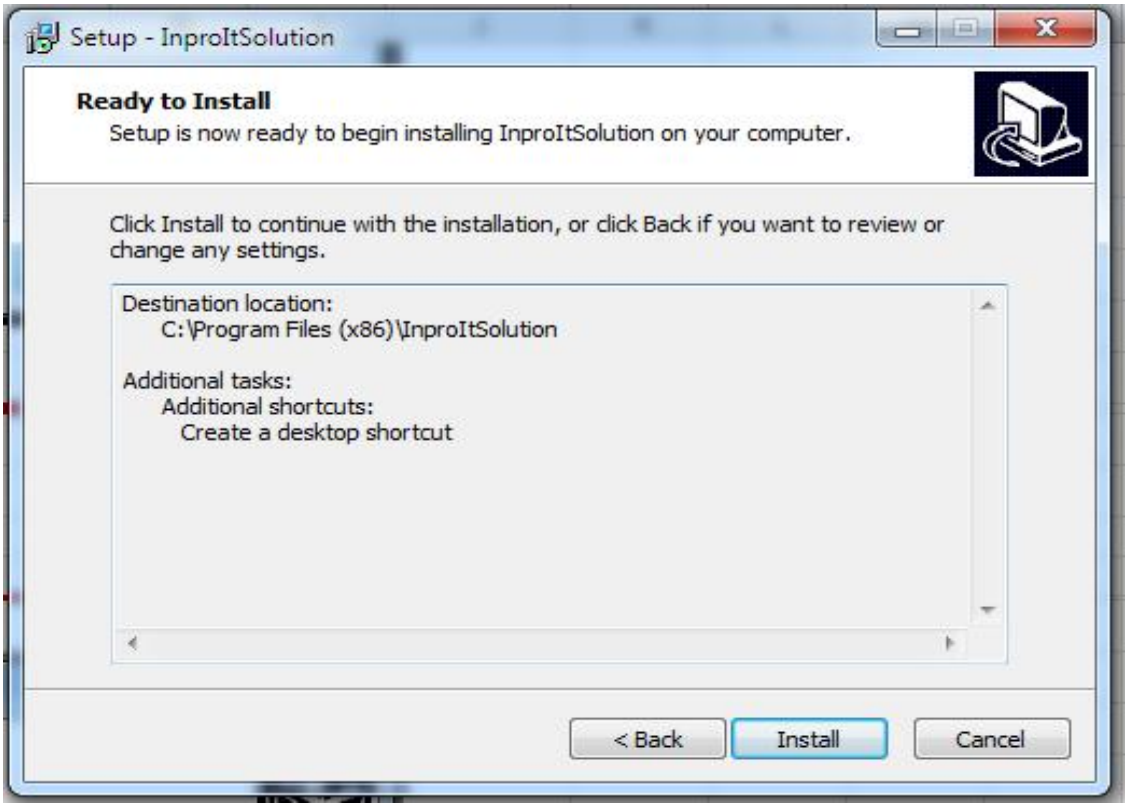
Installation continuous .. Press next…



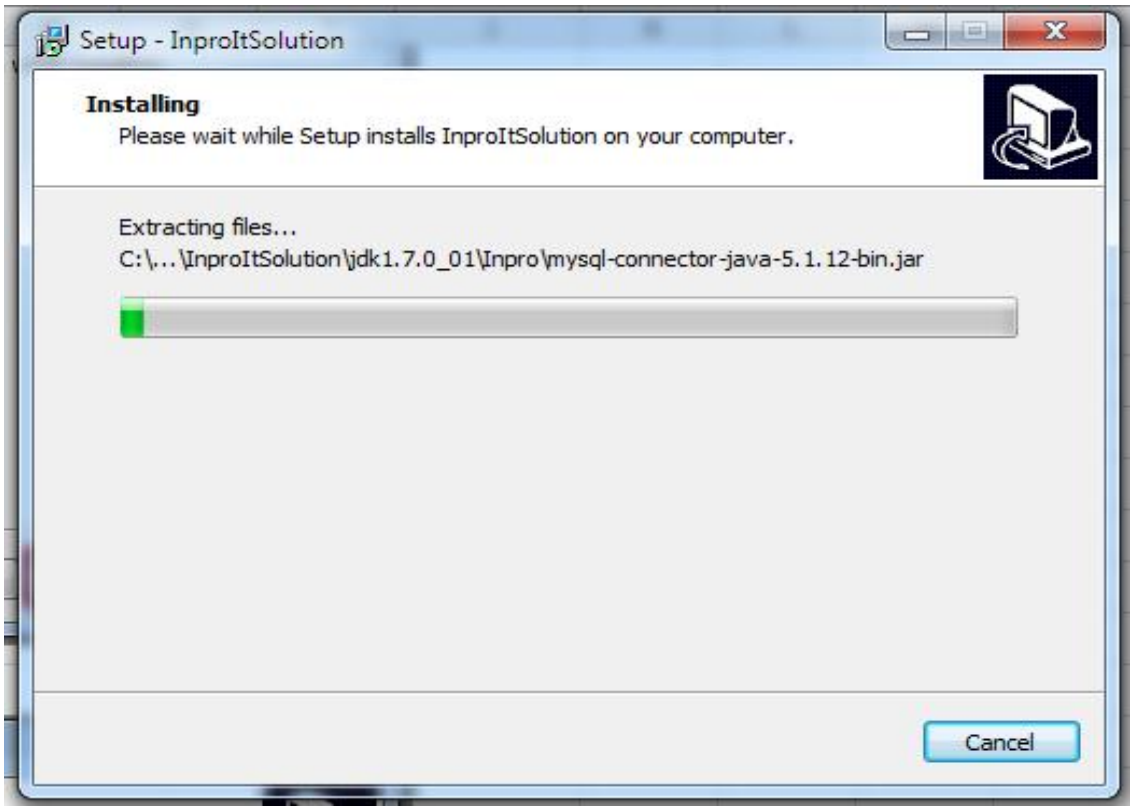
To click the Desktop shortcut option button..



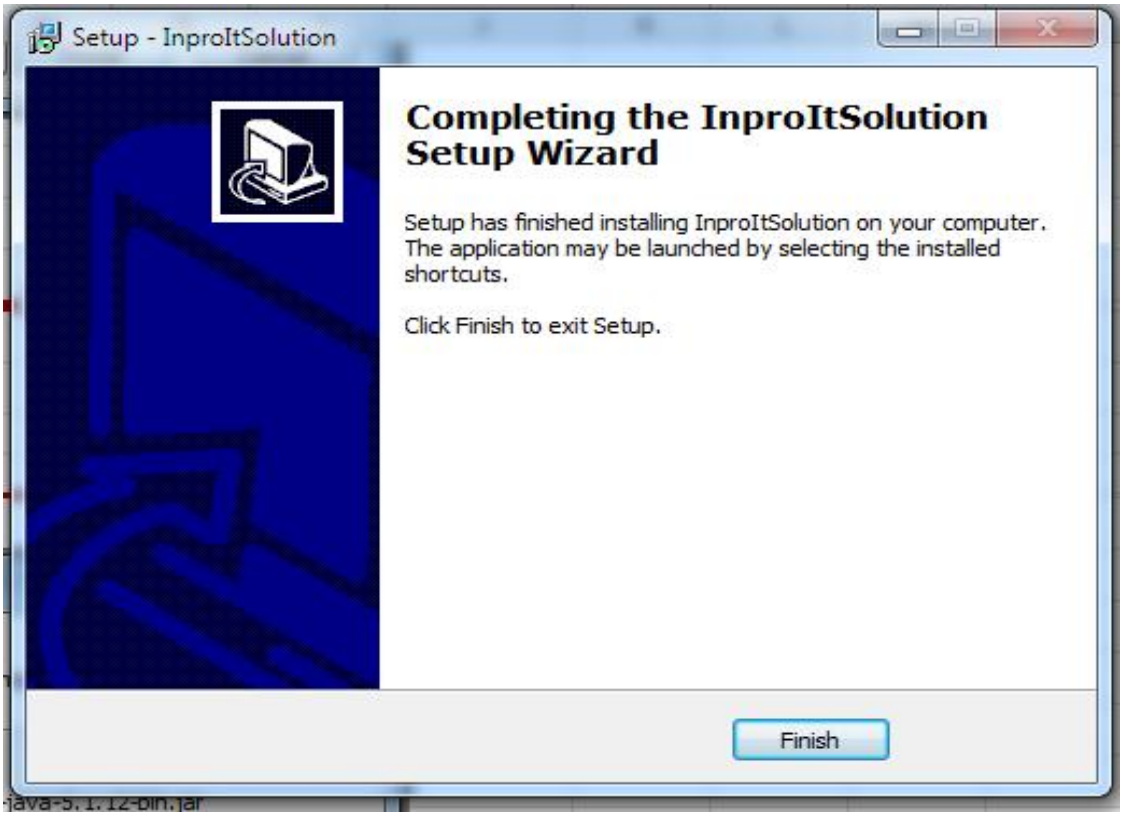
Now Ready to Install Road Solver…



Installing the Road Solver in your Computer…



Successfully Completed the Installation..,



Now Road Solver Icon appear in your desktop Screen..,

Before Start the program plugin the Dongle (Security Devise) which we provided the copy..

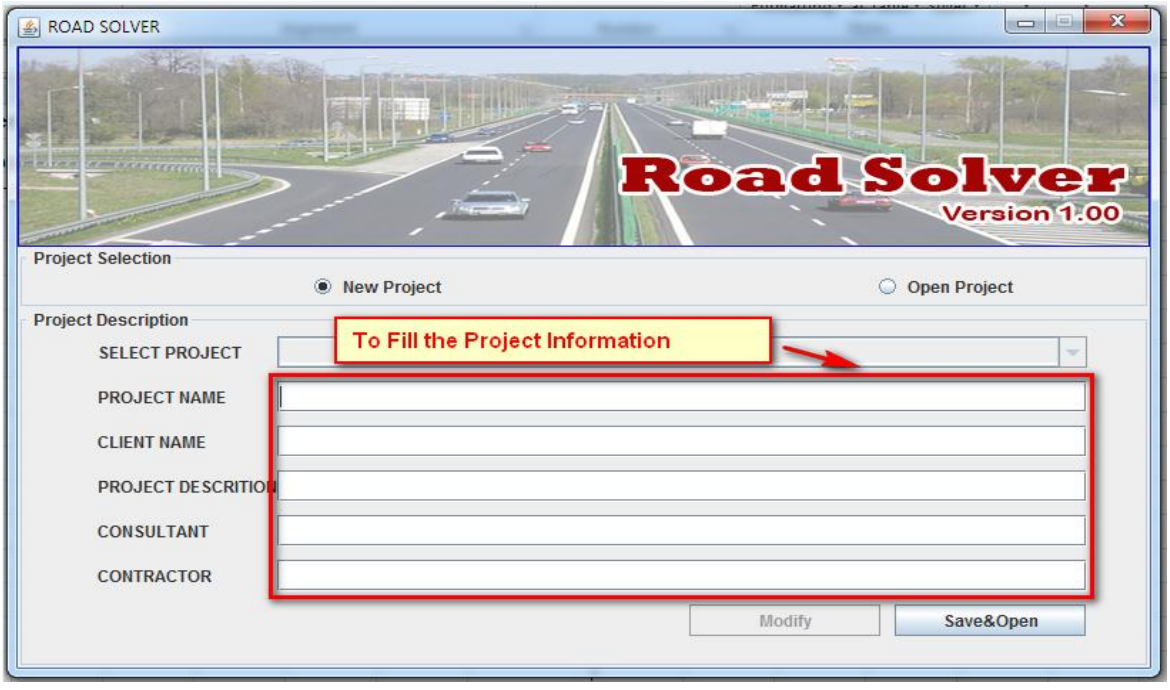
Now open the program Road Solver Project window will appear..

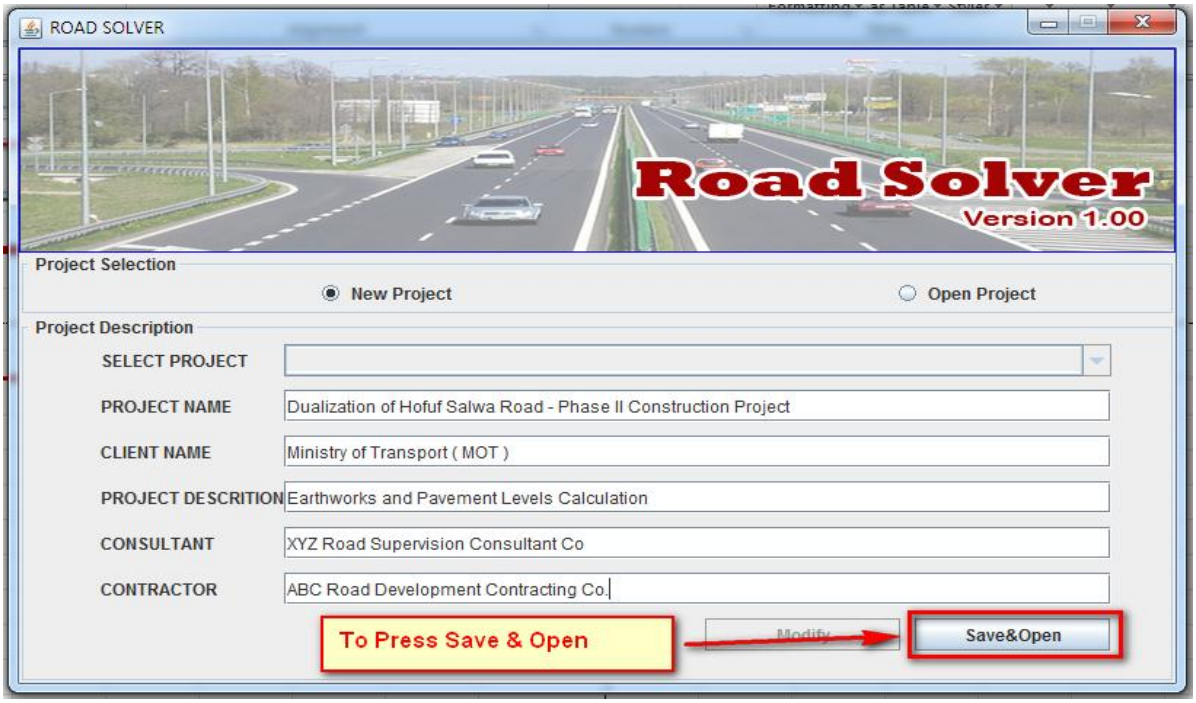
2. Creating a Project

To open the Road Solver Program Project Selection window will appear., in this window to create the new project or open an existing project .

2.1 Creating of New Project

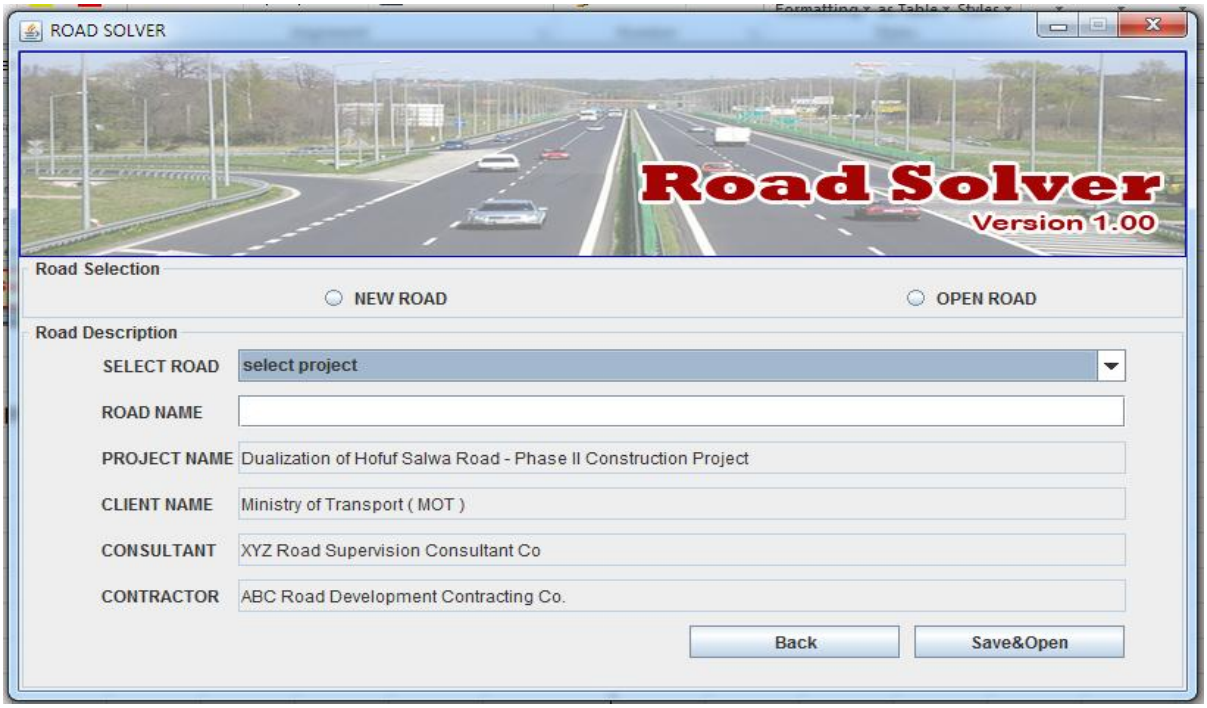
To Select the New Project option to fill the Project Name , Client Name , Project Description , Consultant and Contractor field and press the Save & open button ...,



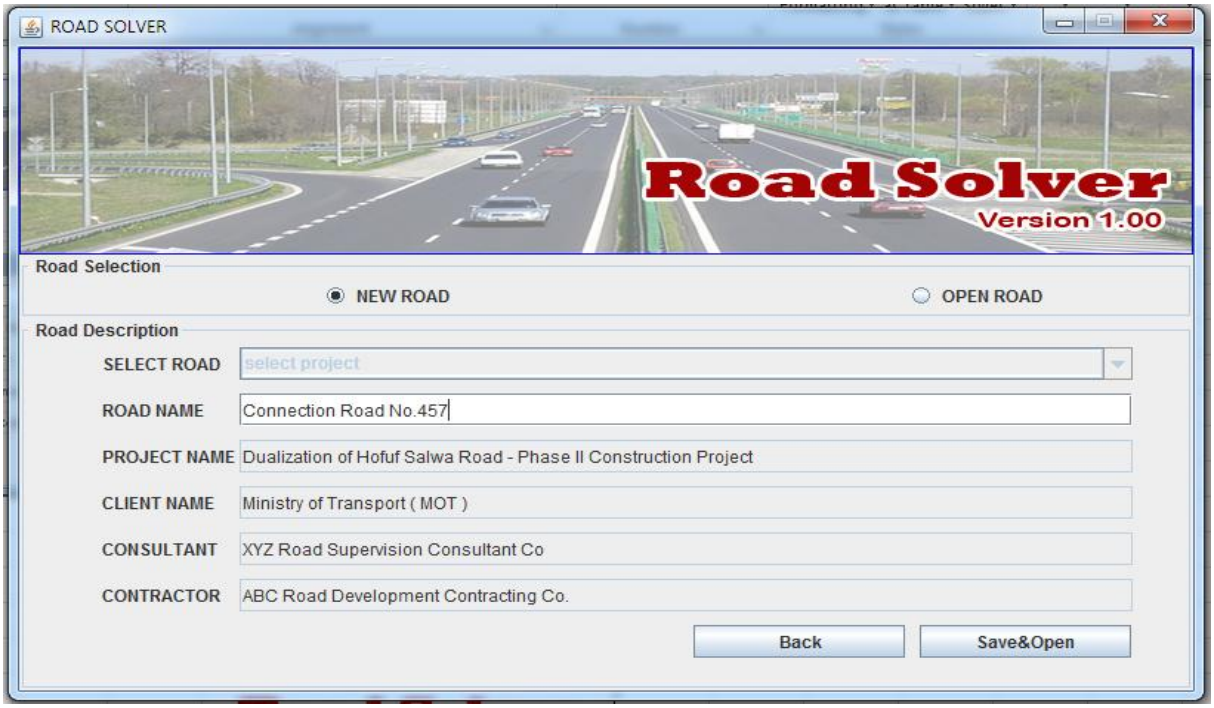


2.1 Creating of New Road

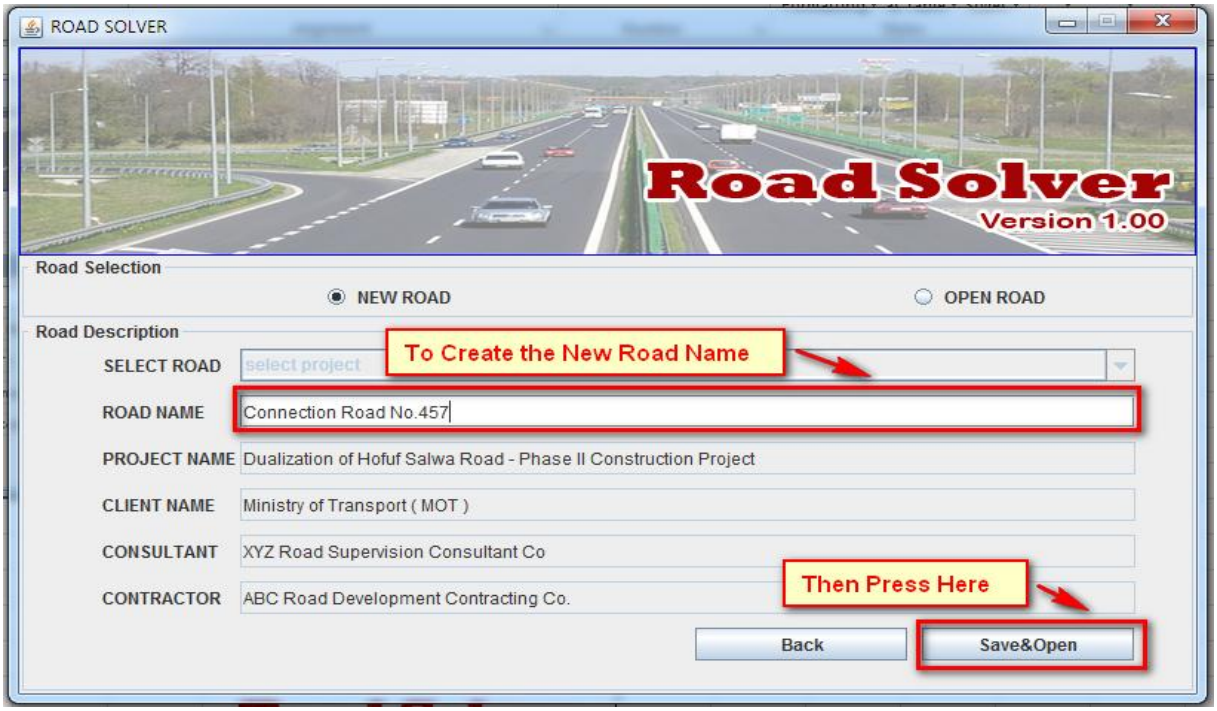
After Pressing Save & Open Button the Road Creation window will appear



To Fill the New Road Name .,

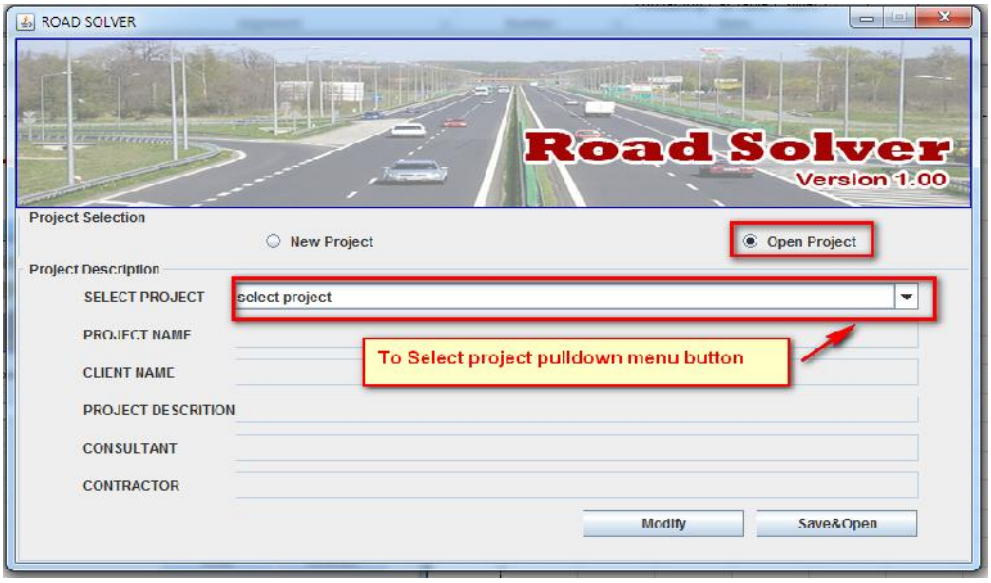


Then press Save and open .,



2.3 Opening of Existing Project and Existing Road

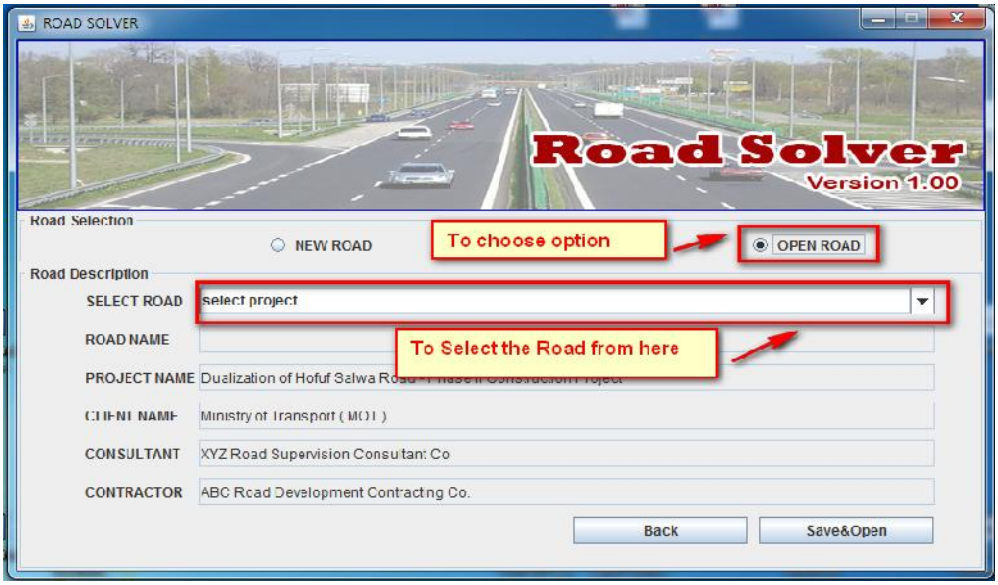
First to choose the open project option.,

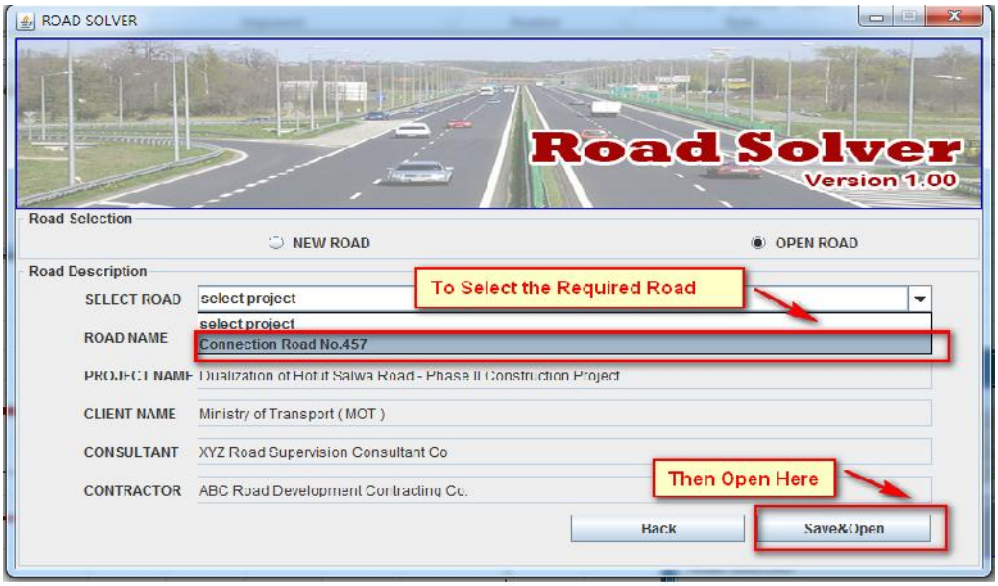


Then Select the Project from the Project selection pull-down menu.

After choose the project then press the open ,.. The Road Selection window will appear..,

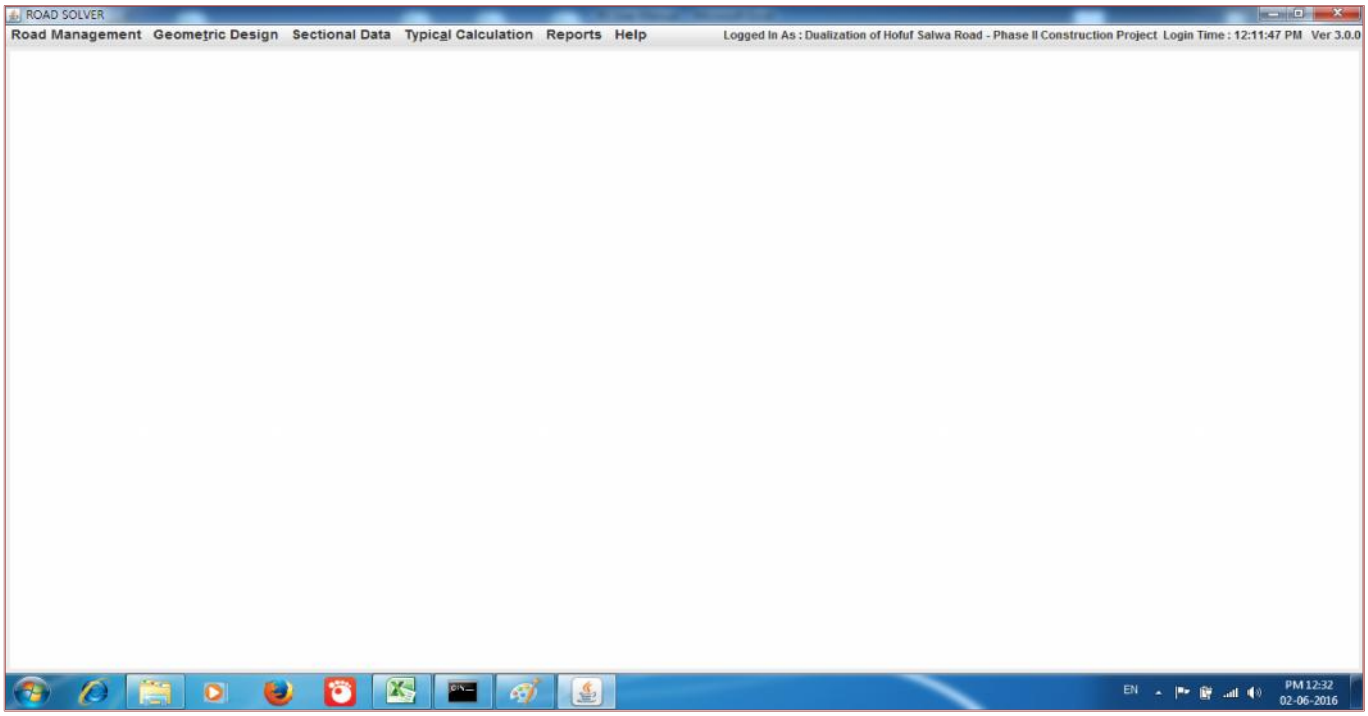
From Road Selection window to choose the open road and select the road from road selection menu..,





To Choose the road then press open button the the Road solver main program window will appear..,

The main program window will appear like as follow..,



3. Road Management

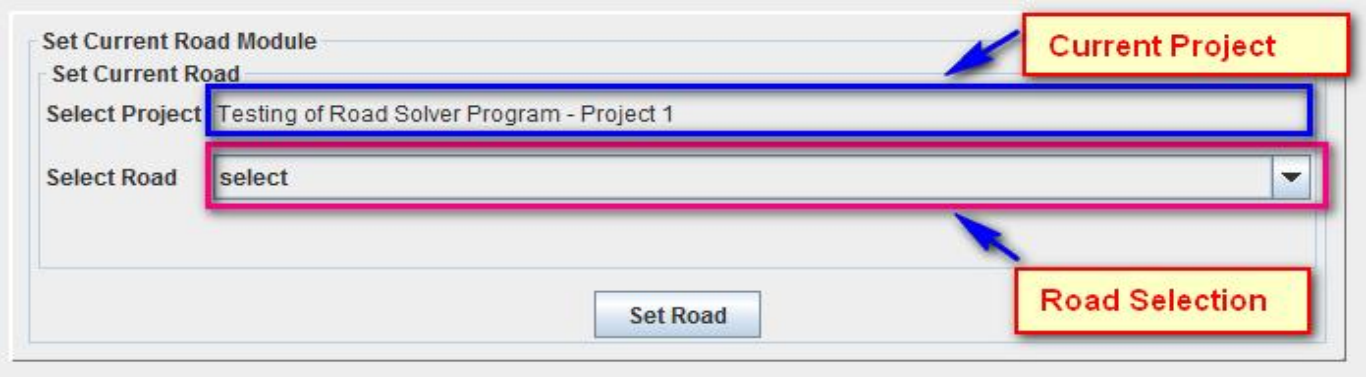
Road Management tools to manage the Project data's by setting the Road and Export and Import the project , Delete the Road with exit road solver.

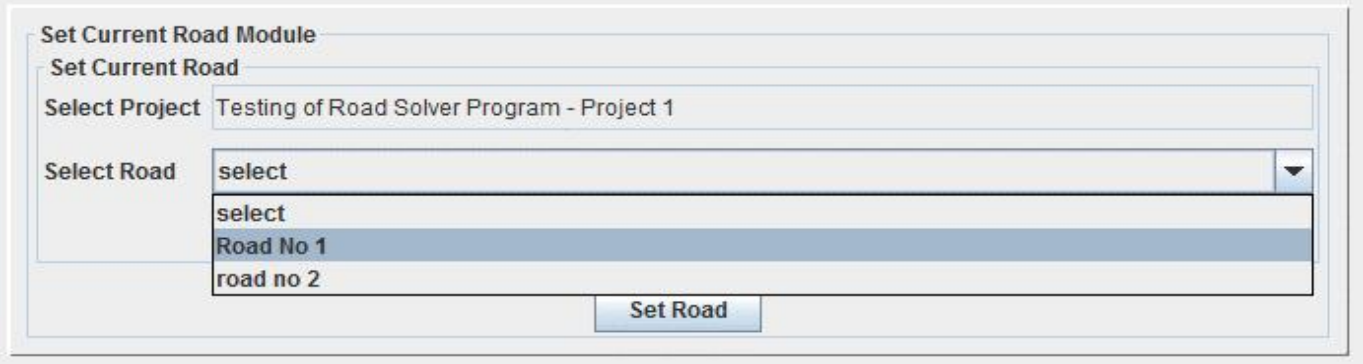
3.1 New & Open Project

Refer the Chapter No 2.

3.2 Set Current Road

Set Current Road option to choose or change the Road within the project . When select this option the following window will appear..



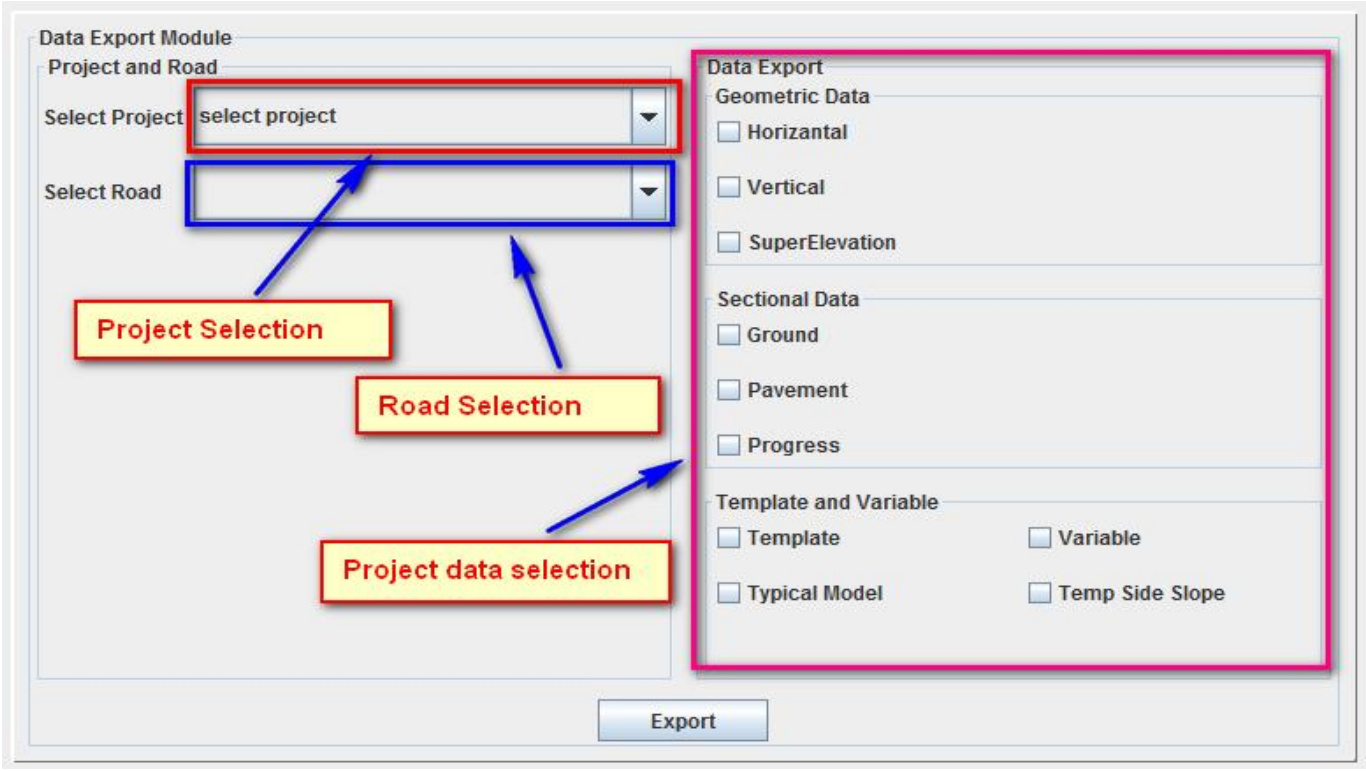


To Select the Required Road , then press set Road …

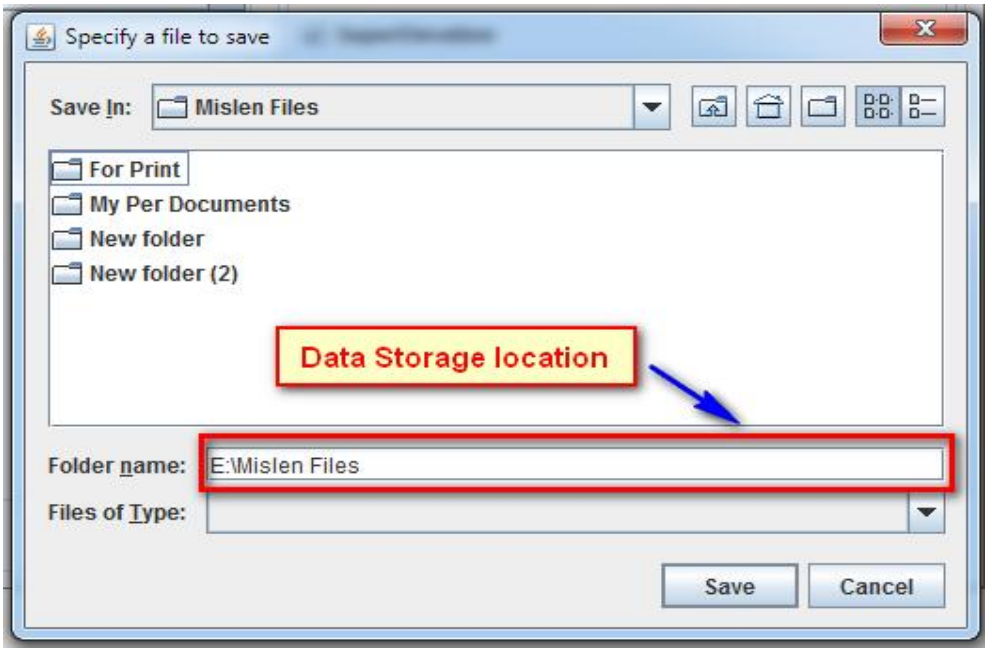
3.3 Export Project

Export Road option to copy the project data's to make the backup or transfer to other computers.

To select this control the following window will appear..,

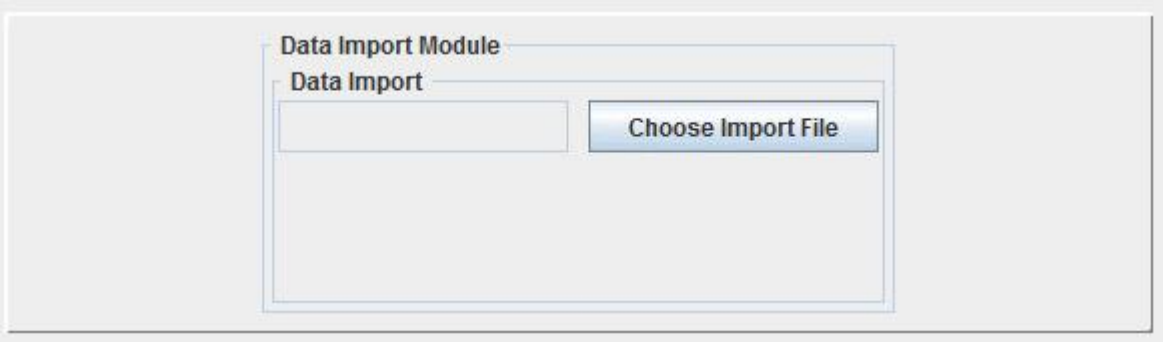


Based on Selection the data will store the required place as follows..



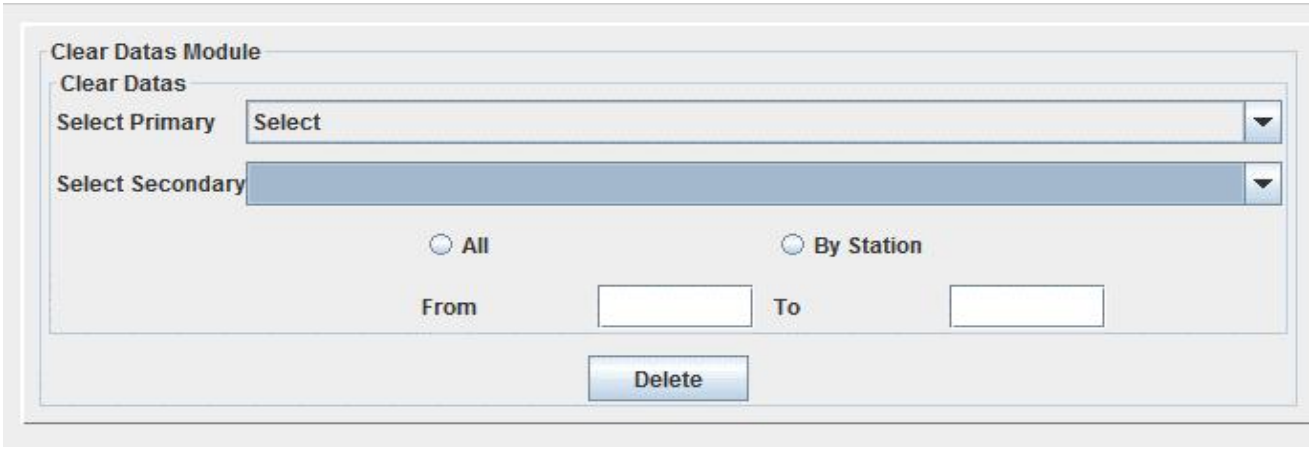
3.4 Import Project

Import Project option to import the data from backup the project database.

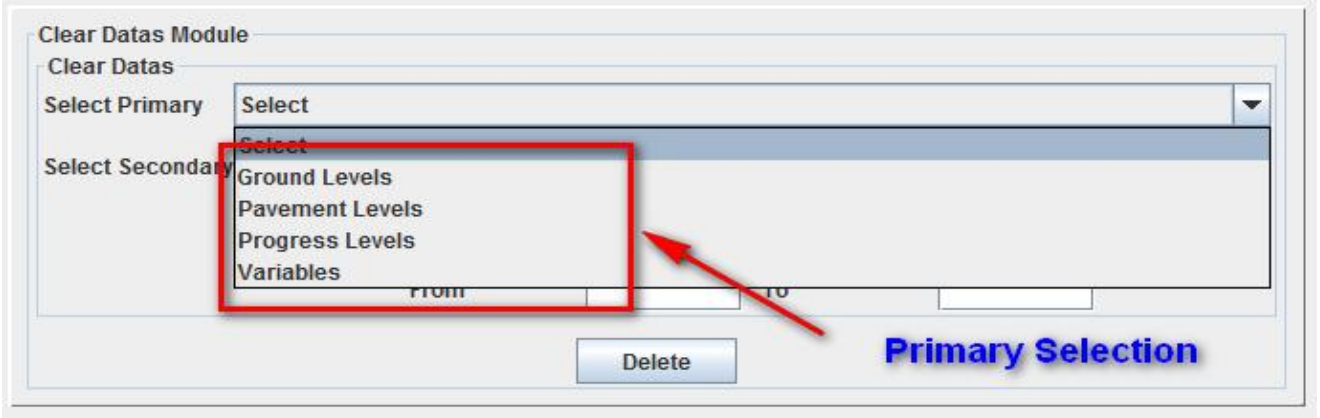


3.5 Clear Data's

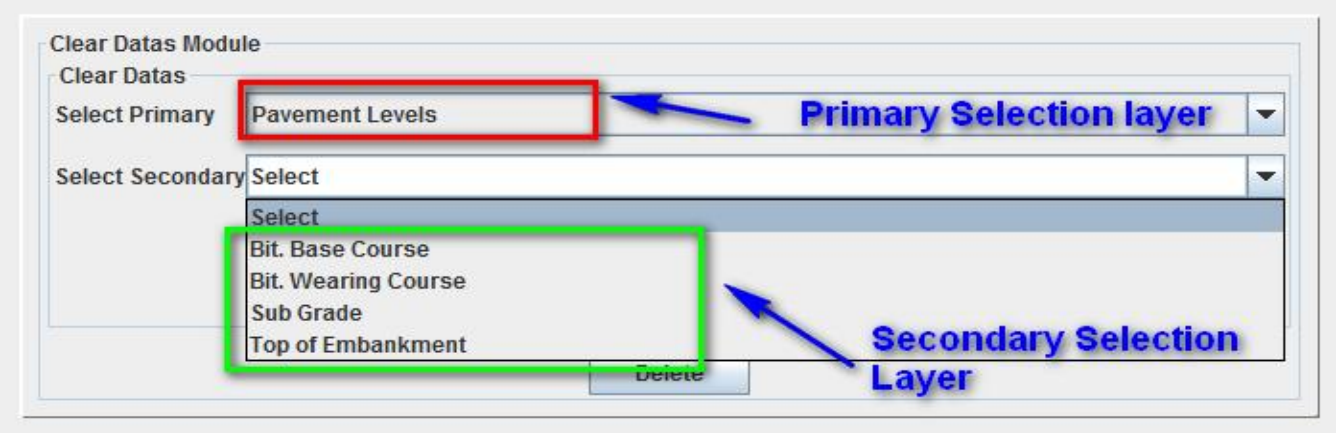
This Option is used in Road Solver to Clear the data's (Points) in any layer of road levels without delete the project or Road option. Which is imported or calculated levels from the project. For example in between the road chainage to delete the pavement or ground levels will be done by this option. When we select this option the following screen will be appear ..,



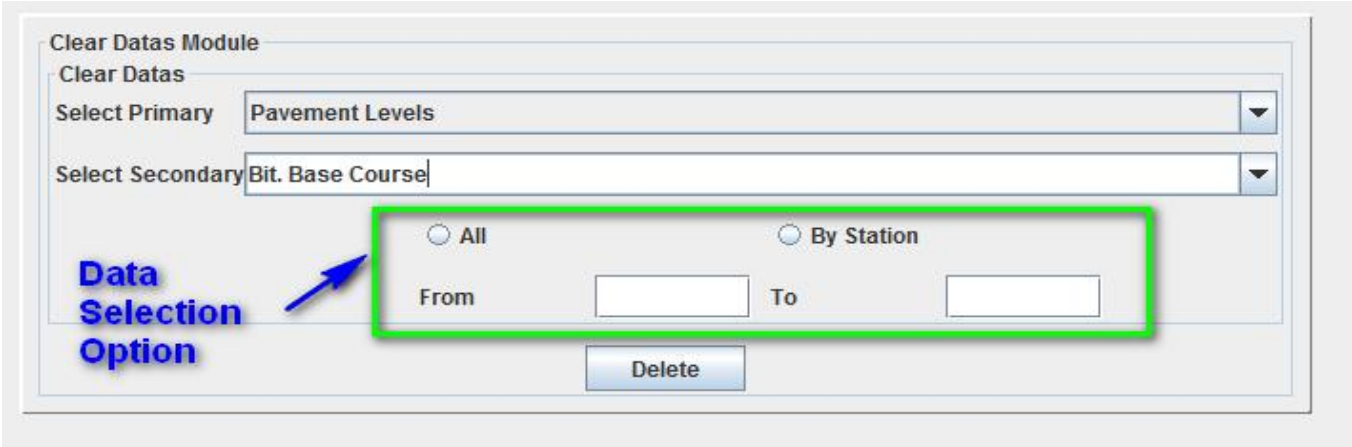
In this Screen we have two selection to choose Primary and Secondary level. First to choose the Primary Selection Layer ..,



Then to choose the Secondary Selection Layer..,

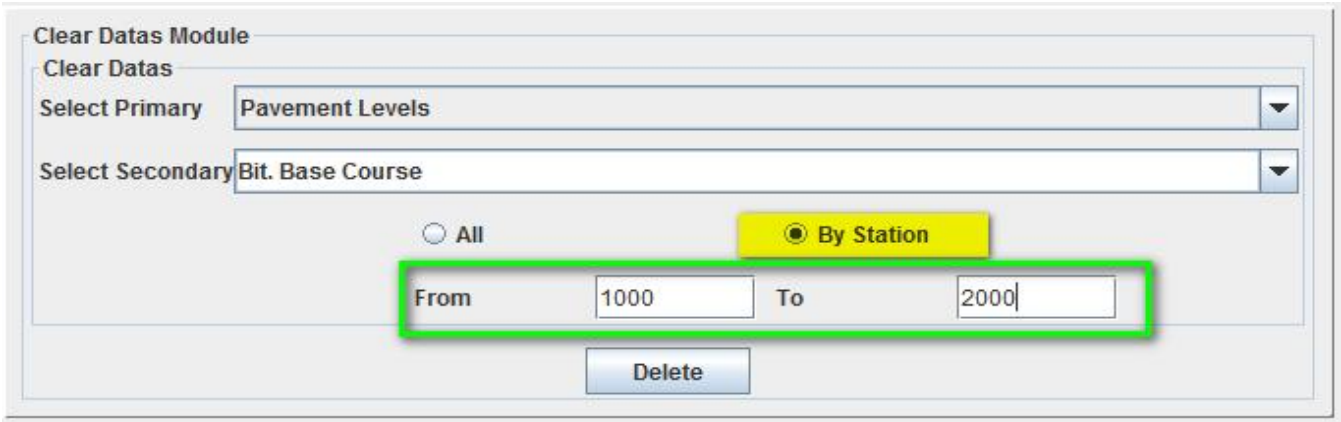


Then to choose the Secondary Selection Layer..,



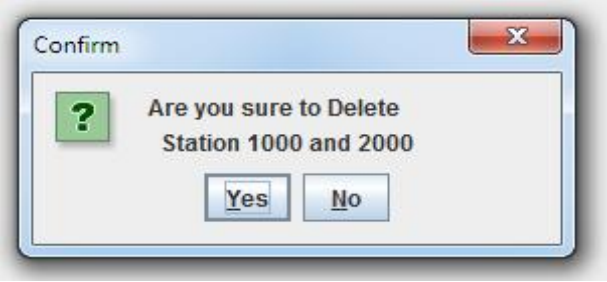
After Selecting the Secondary Layer now to choose the option of clear data by all or by Station intervals.

First we choose the by station selection method .., now we give the station intervals to be clear the data from data base .., ie from 1000 to 2000



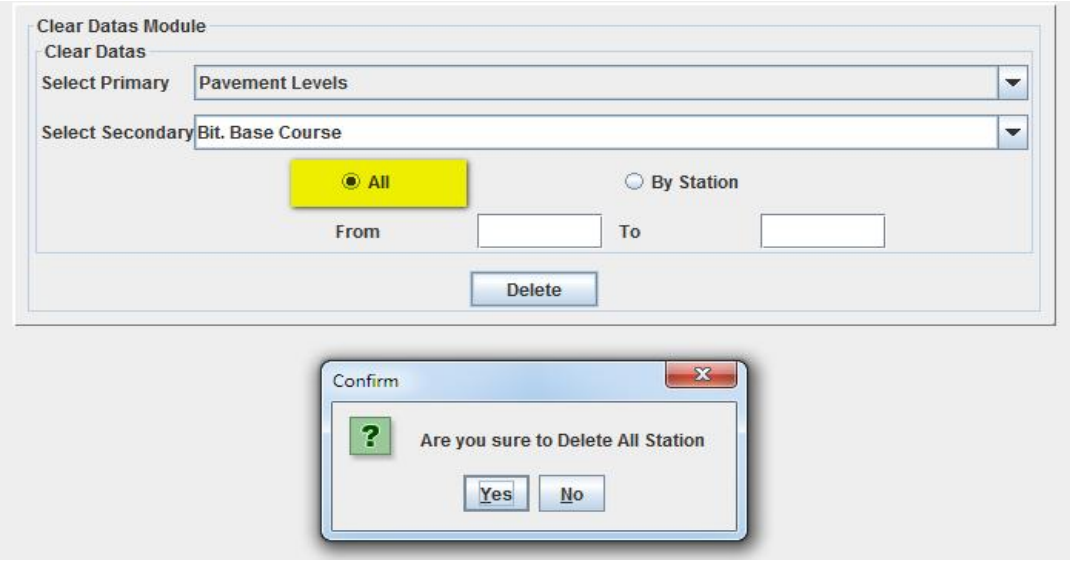
Then press the delete button..,

Before delete the confirmation box will be appear .., if we confirm the action



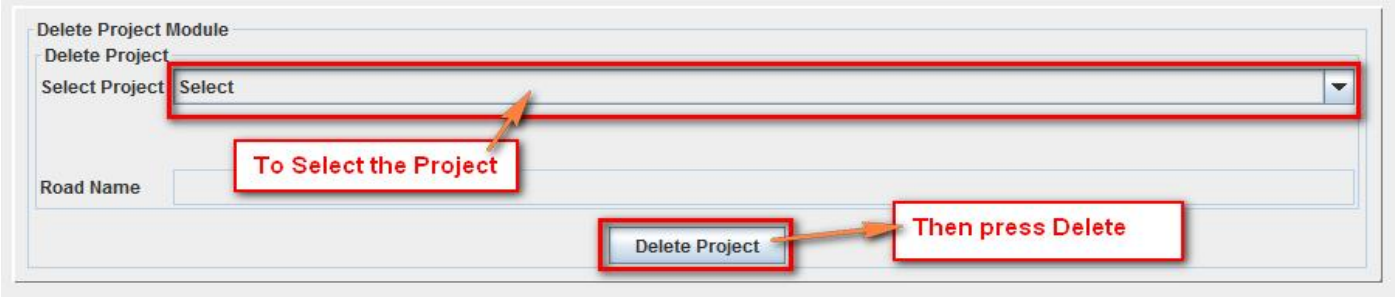
now the data will be successfully deleted from database..,

If we choose the all option the same actions will be repeated and clear all data's of selected layer will be clear from database.

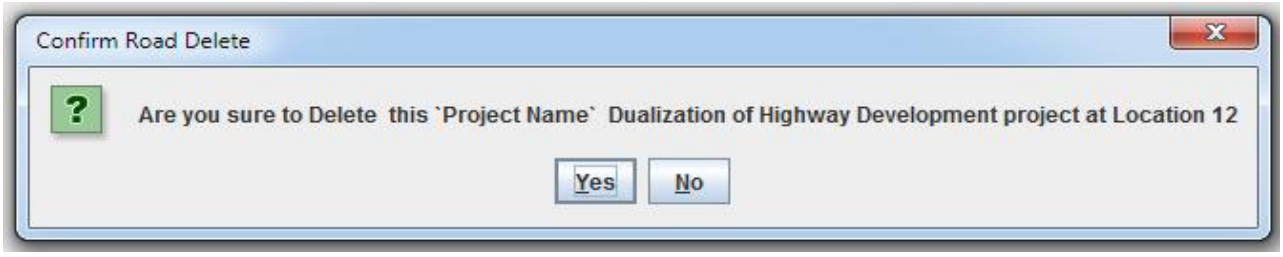


3.6 Delete Option

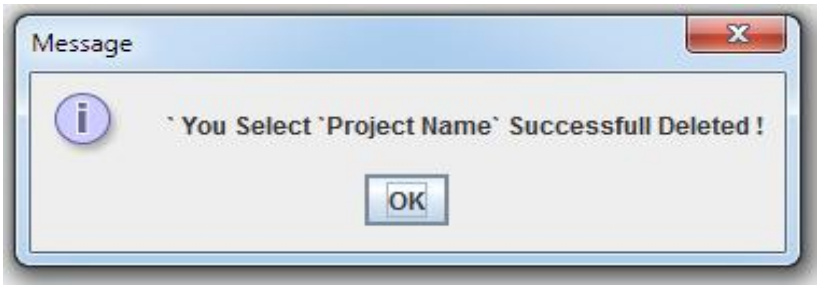
3.6.1 Delete Project



Confirm the Delete ..,

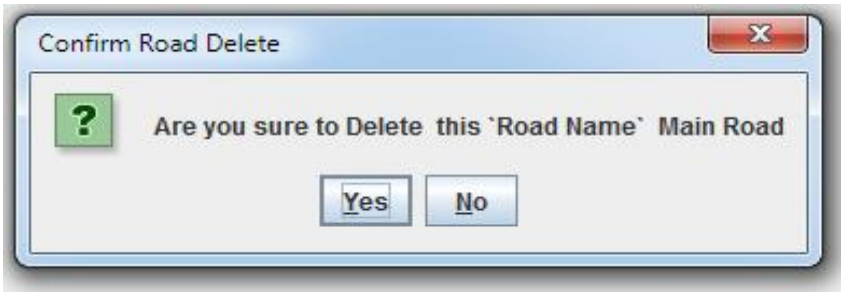


Delete the Selected Project Successfully



3.6.2 Delete Road

Confirm the Delete ..,



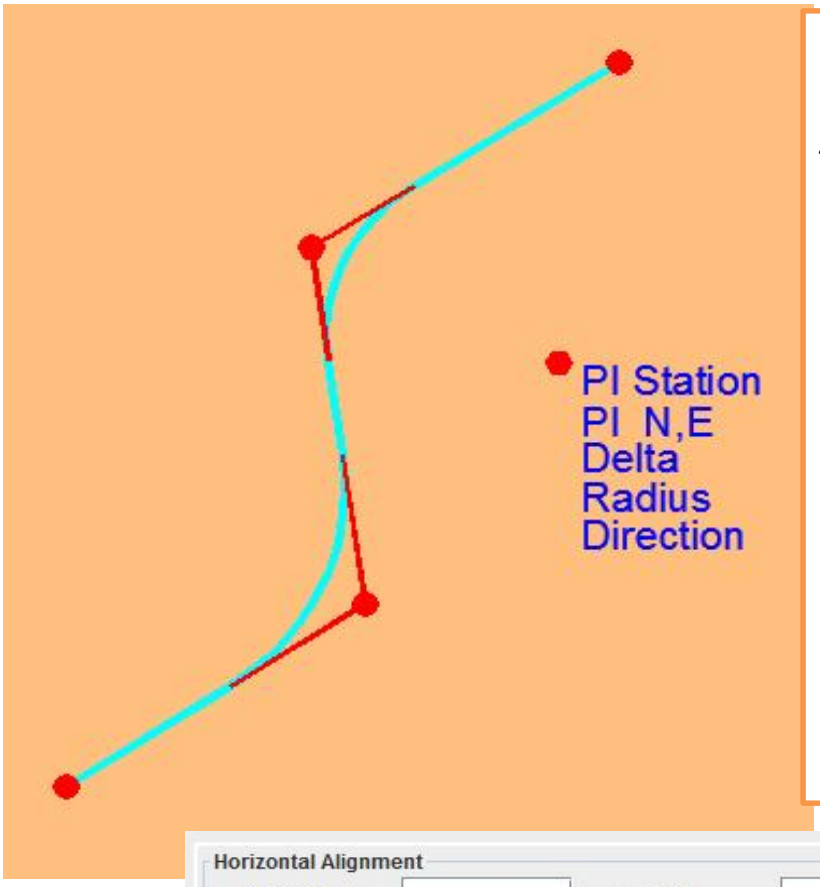
Delete the Selected Road Successfully

3.7 Exit Road Solver

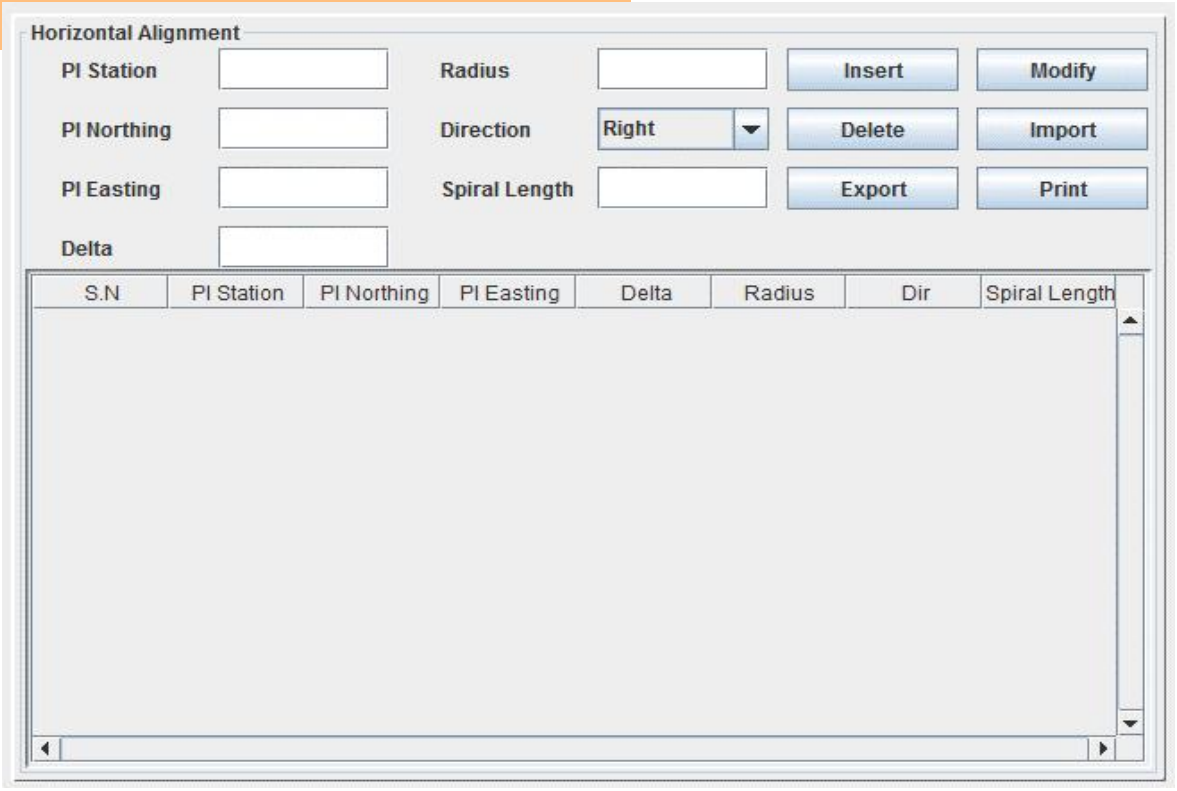
To Exit the Road Solver Program.

4.1 Horizontal Alignment

4.1.1 Horizontal Alignment - Overview input data's

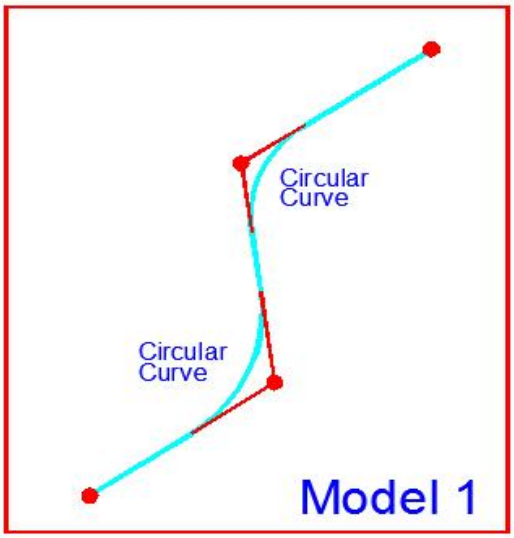


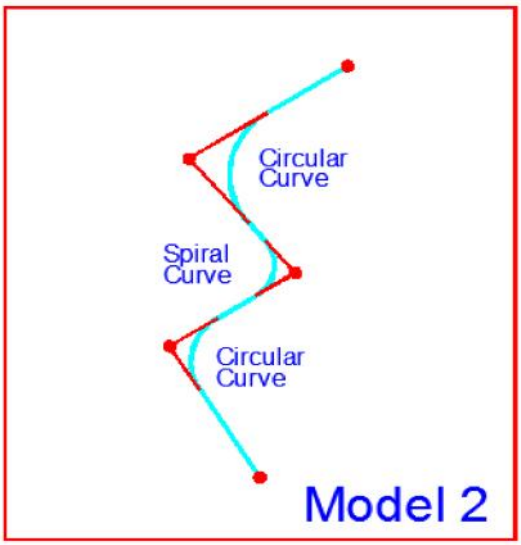
In Geometric Design of Road the Horizontal Alignment is the first step. At the initial status of any Road Construction project the Road alignment settout is the first step of work. The Design Documents the availability of chainage co ordinates are rare. If we need to

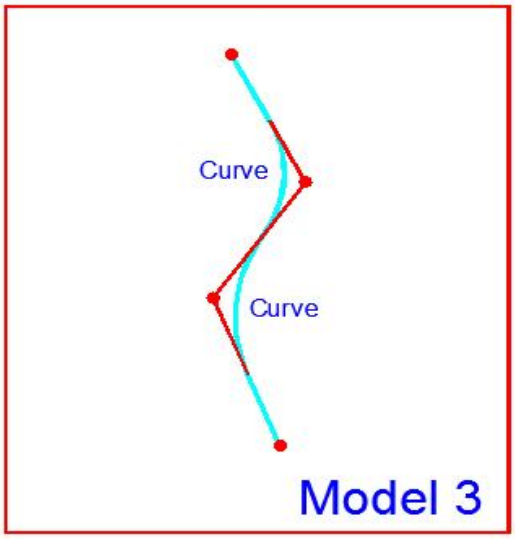


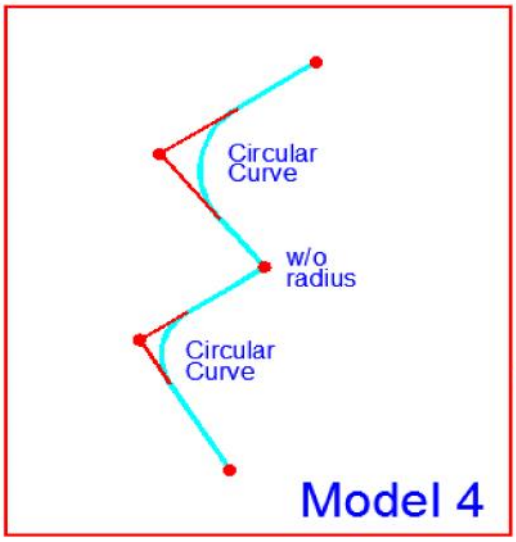
Solutions :-

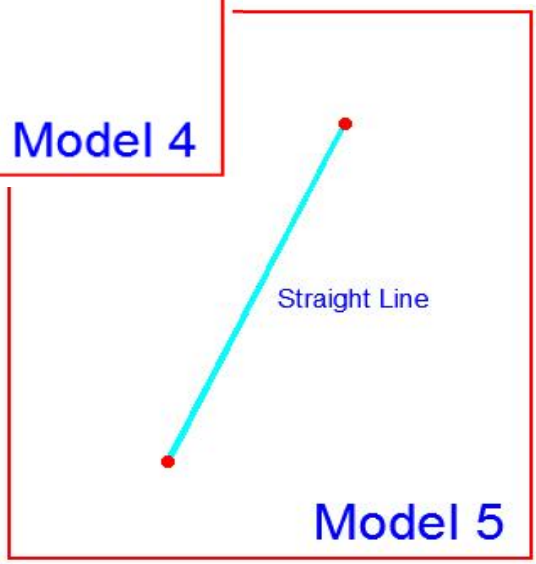
1. No of Circular Curves with Tangents.
2. No of Circular Curves including with Spiral curve and Tangents
3. Successive Circular Curves with tangents
4. No of Circular Curves with PI station (without radius) and Tangents
5. Straight Line (two PI points)



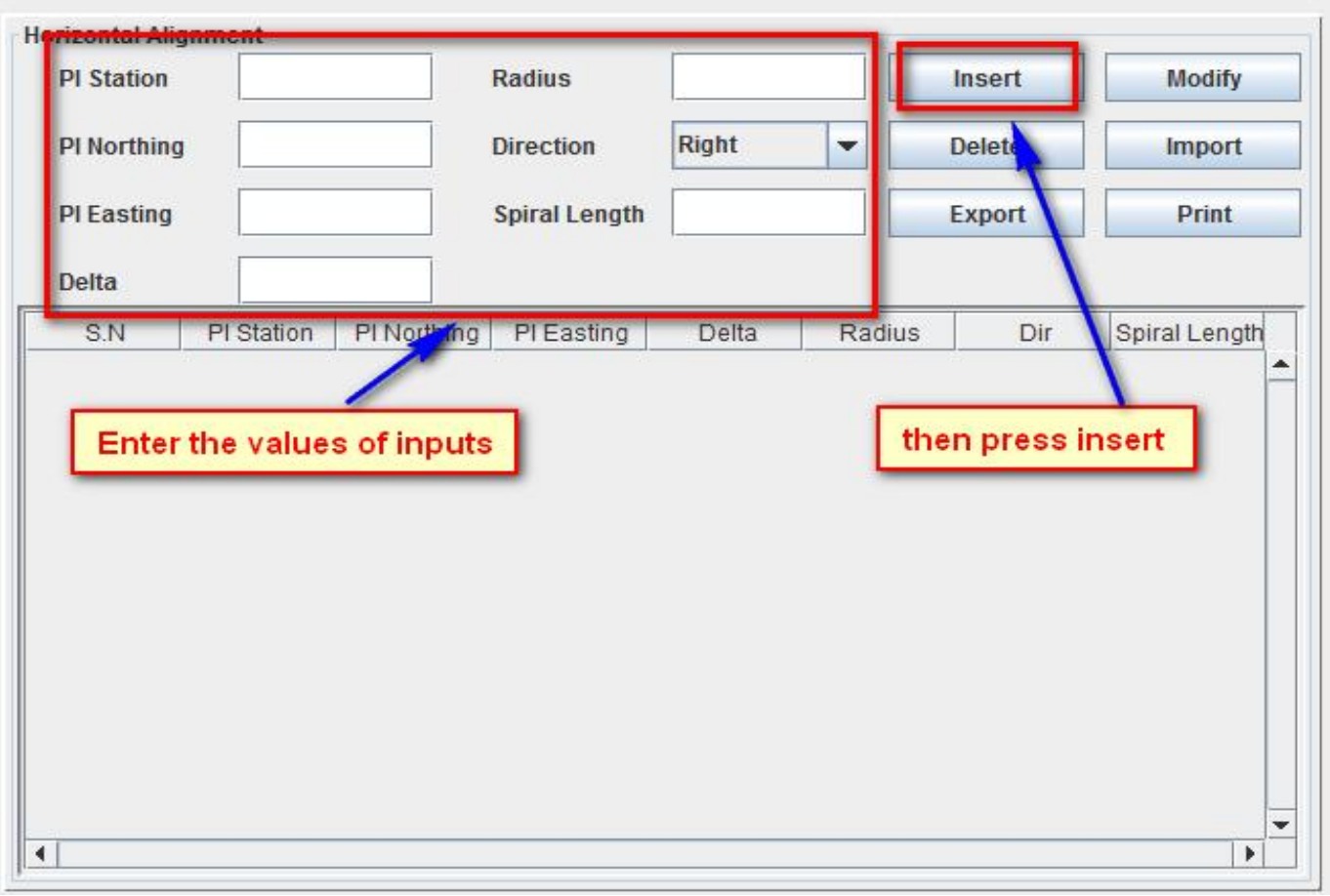








4.1.2 Insert the alignment data

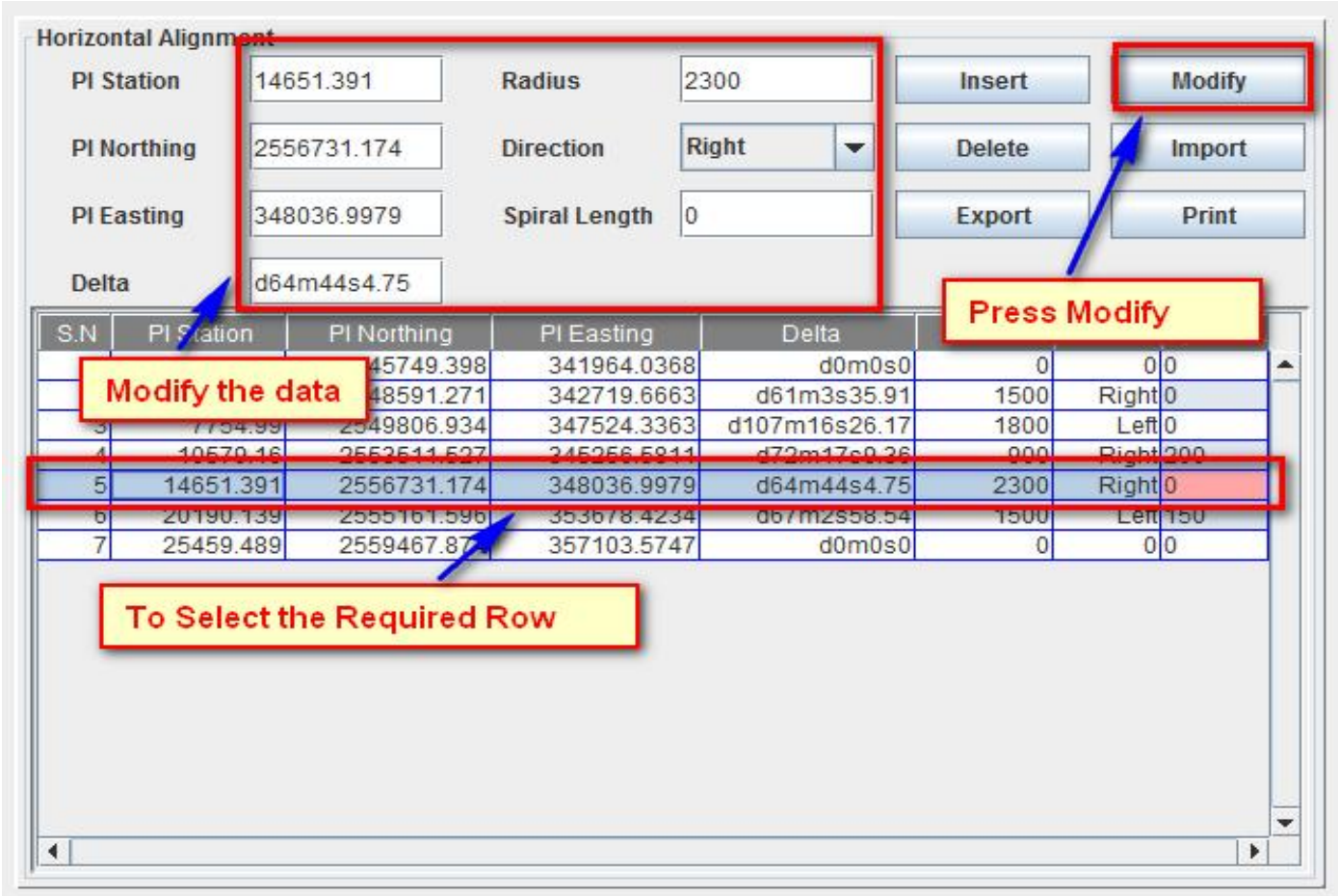


For input the Horizontal Alignment need to follow …,

1. For Beginning and End of Alignment should be PI Station and PI Northing and PI Easting should be entered.
2. For Beginning and End of Alignment the radius and direction and Spiral Length value should be " 0 " also delta will be d0m0s0.
3. In any alignment changes point without radius to use the radius value as " 0 ".
4. The Radius value for Right or Left be always note as positive.
5. The Direction of Curve is based on the linearity of Stationing along with the Road. If Road in any direction the curve direction based on the station incremental.
6. The Circular curve the spiral length data should be as " 0 ".
7. The minimum input of Alignment data should be 3 .

4.1.3 Modify the alignment data

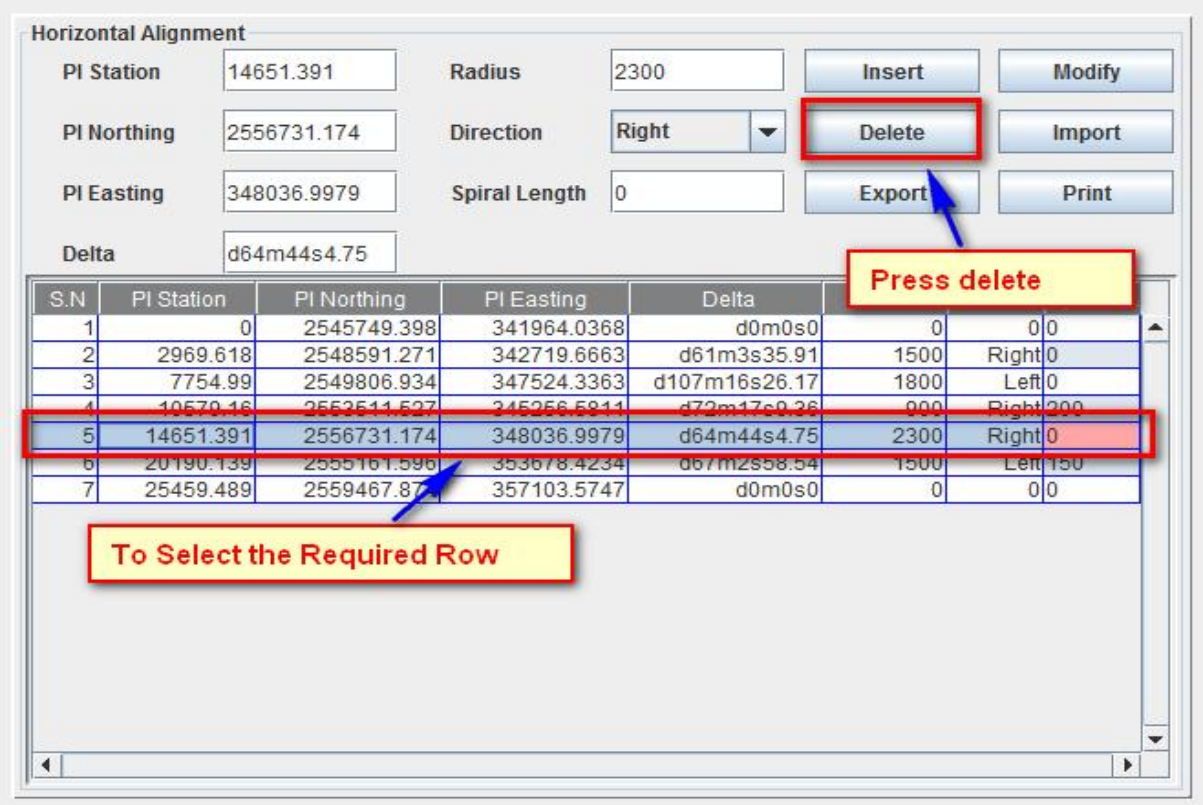
After Completion of Horizontal data's any value need to change or modify to select that data the values are appear in the input columns to change the values and press the modify button. The values are changes in the tables.



Also insert any new inputs to enter the values and insert the button. The Value will fix the ascending order of Station together with old inputs.

4.1.4 Delete the alignment data

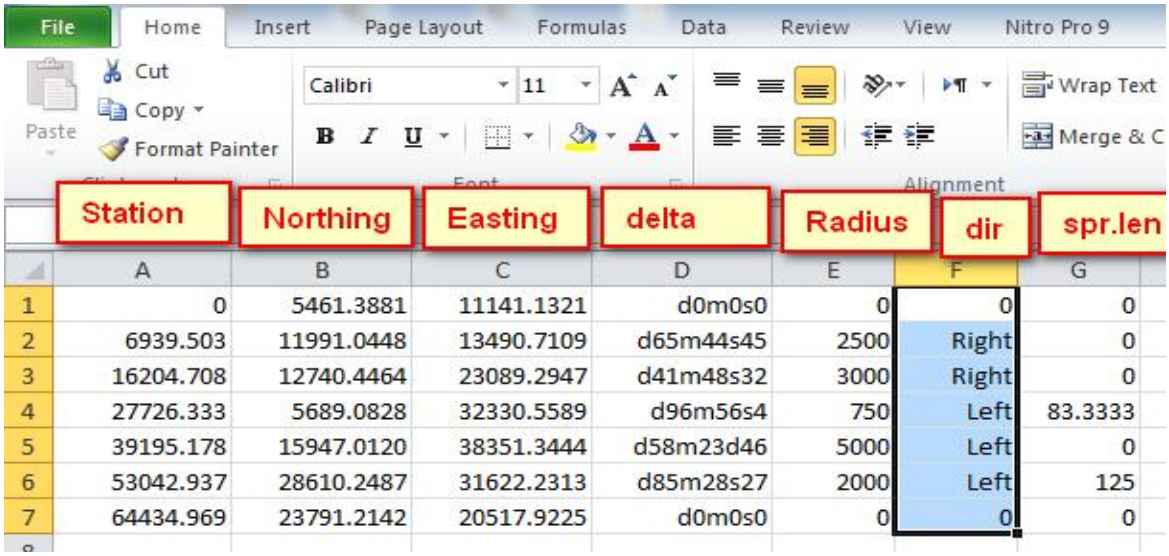
To Delete the any input data to select the rows of required inputs and press Delete Button.

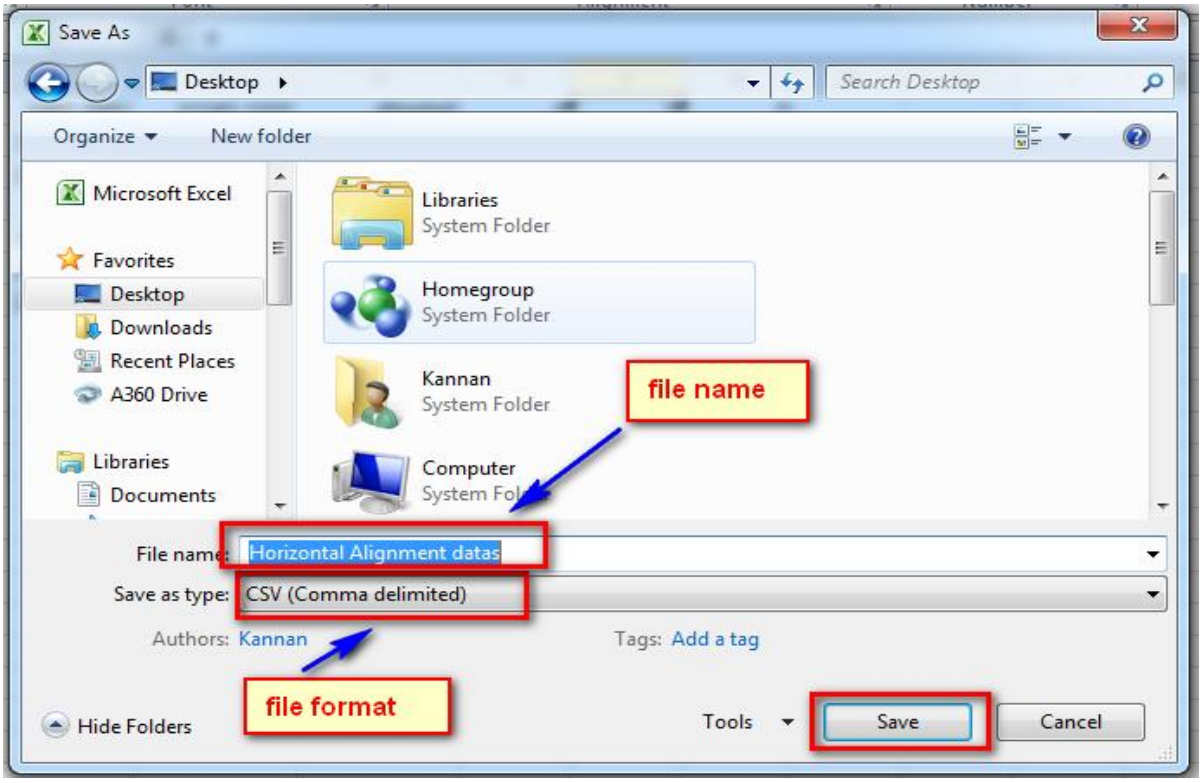


After Delete the record the values are automatically saved in database.

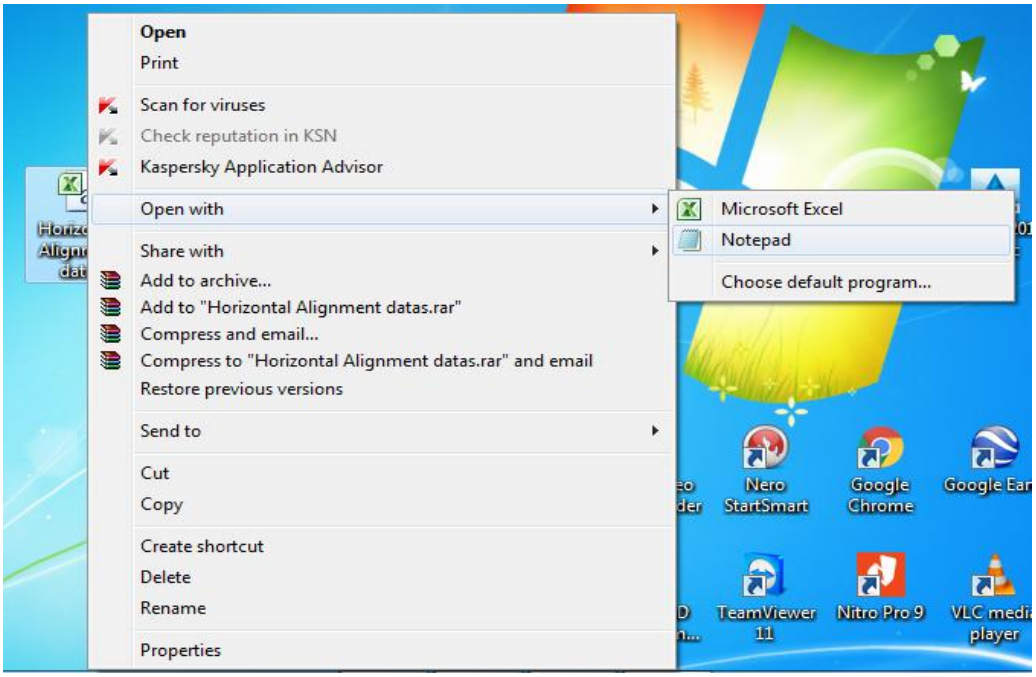
4.1.5 Import the alignment data

Horizontal alignment data's will be created in Excel and saved as csv files .. Then using import button the data's are inserted into the program.



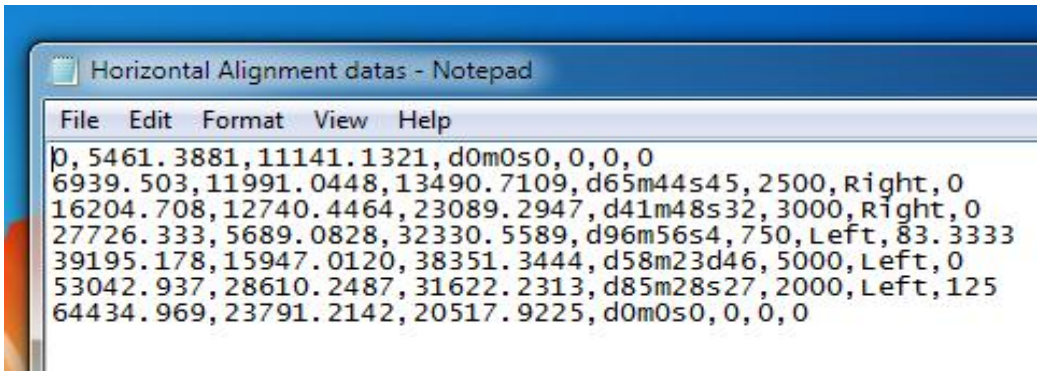


Now the data's are stored into desktop as csv file format..

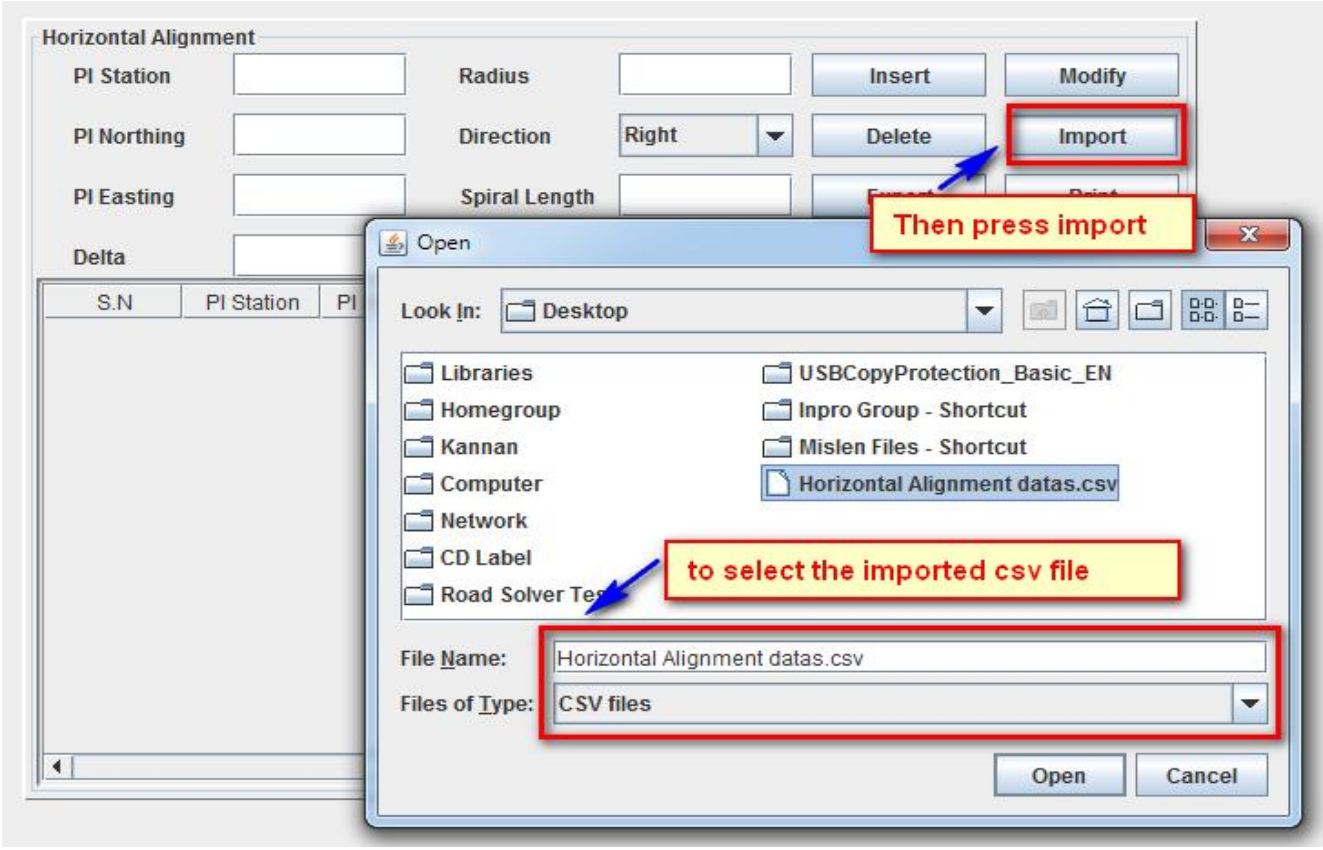


After save the data , to select the file then right click to open the file in note pad …

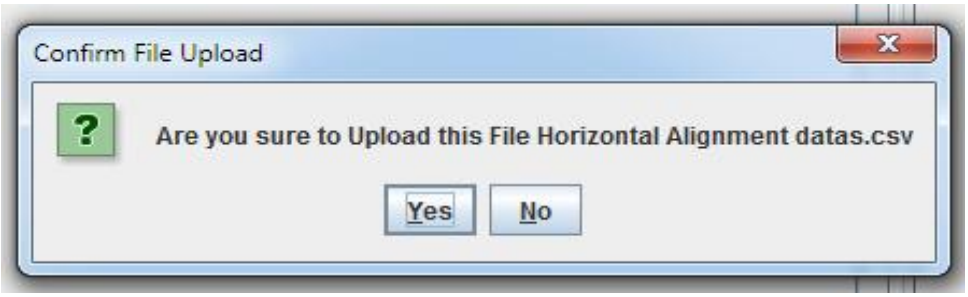
Now the data will appear as follows…,



After successful completion of csv file now the file can import to road solver..



When click the open the confirmation window will appear .. To make yes…



After successful import the message will appear as follows..,

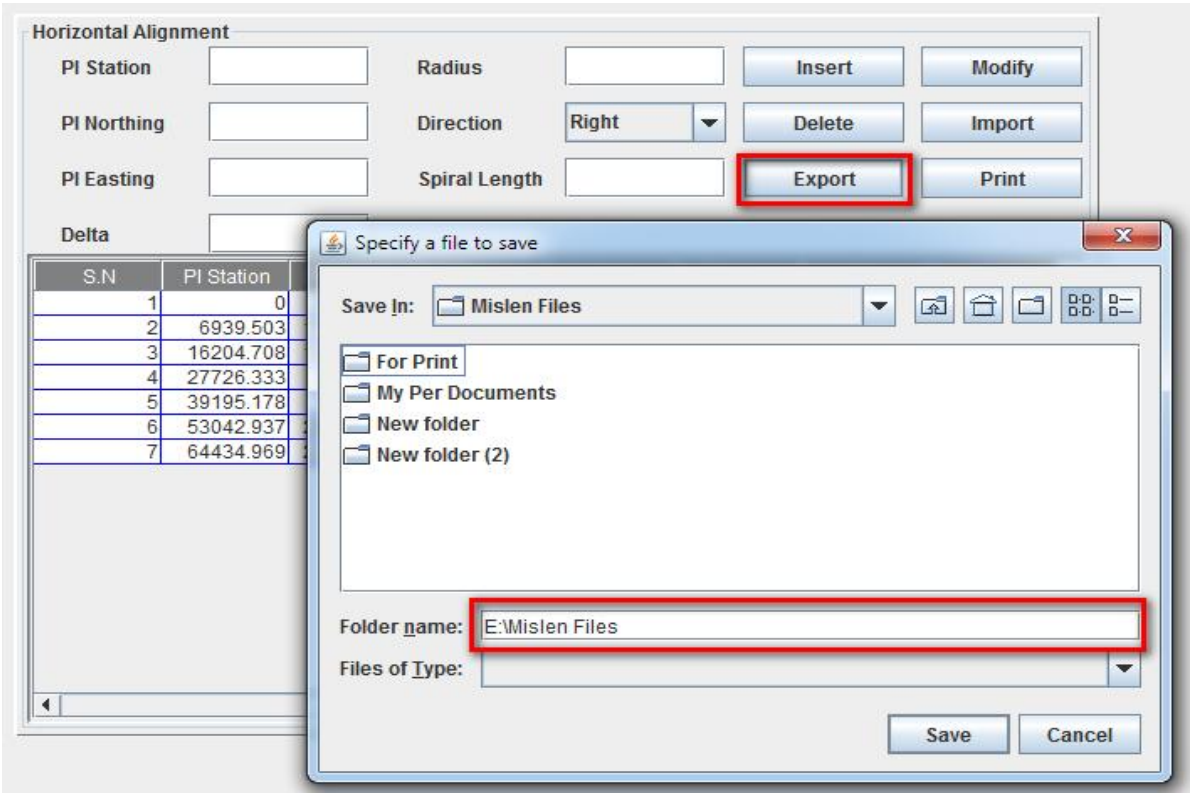
Now in table the Horizontal data will appear like this..,

S.N	PI Station	PI Northing	PI Easting	Delta	Radius	Dir	Spiral Length
1	0	5461.3881	11141.1321	d0m0s0	0	0	0
2	6939.503	11991.0448	13490.7109	d65m44s45	2500	Right	0
3	16204.708	12740.4464	23089.2947	d41m48s32	3000	Right	0
4	27726.333	5689.0828	32330.5589	d96m56s4	750	Left	83.3333
5	39195.178	15947.012	38351.3444	d58m23d46	5000	Left	0
6	53042.937	28610.2487	31622.2313	d85m28s27	2000	Left	125
7	64434.969	23791.2142	20517.9225	d0m0s0	0	0	0

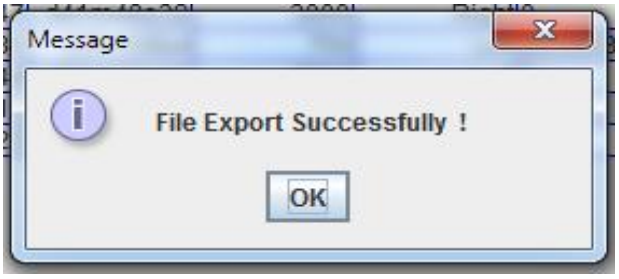
4.1.6 Export the alignment data

Horizontal alignment data need to export the csv file to press the Export Button..

After pressing export button the file location window will appear..



To press save button the message window will appear..



The file will created as csv format with following name

4.1.7 Print the alignment data

The input Horizontal data need to print press print button..,
the Data's will printed in pdf file.. As look as follows..

Project Name :Testing of Road Solver Program - Project 1

Description :Testing of program **Consultant :XYZ consultant**

Client :Ministry of Communication **Contractor :ABC Contracting Co**

Road ID : RD0001 **Road Name : Road No 1**

Horizontal Alignment

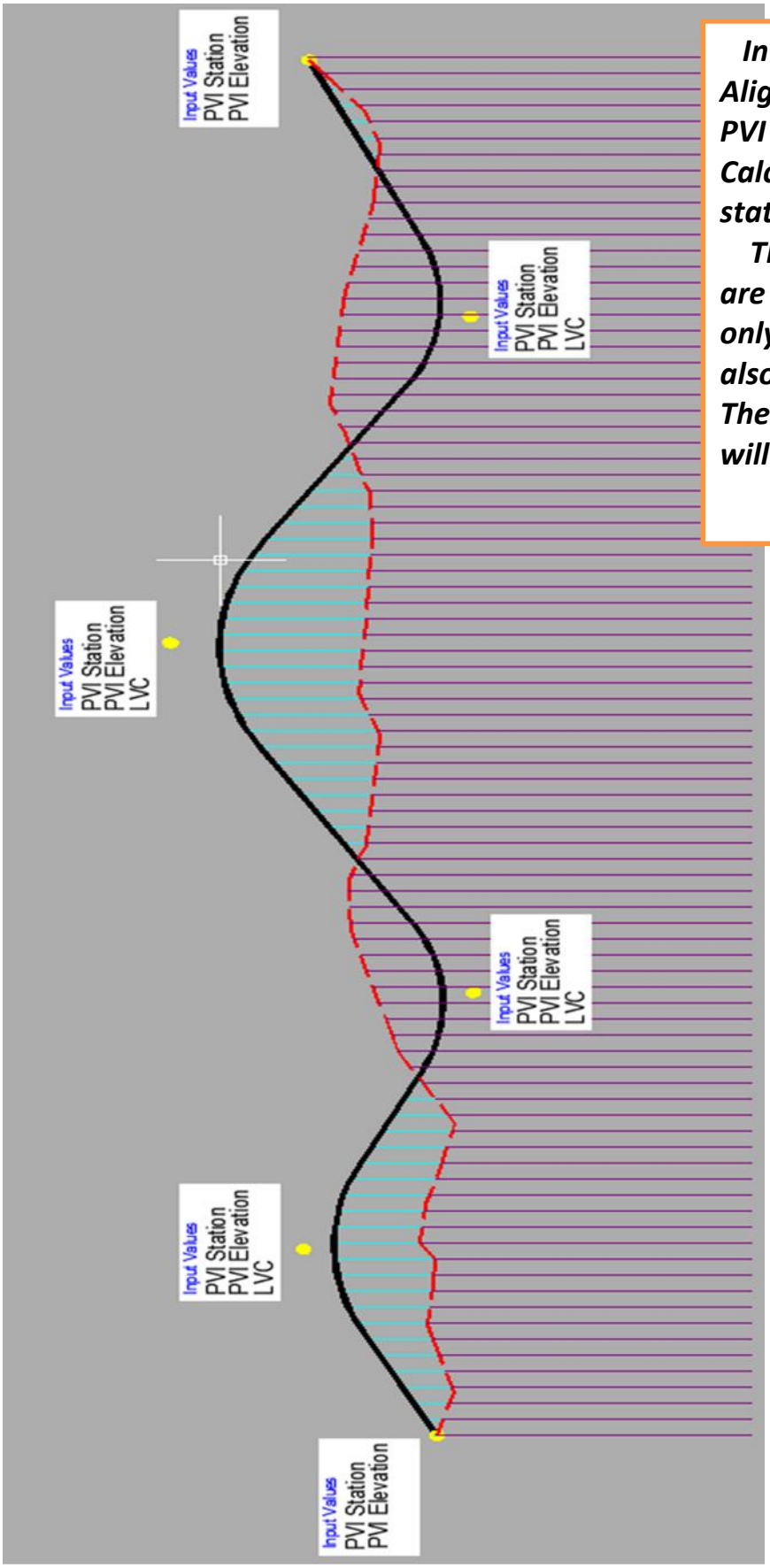
PI Station	PI Northing	PI Easting	Delta	Radius	Dir	Spiral Length
0	2545749.398	341964.0368	d0m0s0	0	0	0
2969.618	2548591.271	342719.6663	d61m3s35.91	1500	Right	0
7754.99	2549806.934	347524.3363	d107m16s26.17	1800	Left	0
10579.16	2553511.527	345256.5811	d72m17s9.36	900	Right	200
14651.391	2556731.174	348036.9979	d64m44s4.75	2300	Right	0
20190.139	2555161.596	353678.4234	d67m2s58.54	1500	Left	150
25459.489	2559467.874	357103.5747	d0m0s0	0	0	0

4.1.7 Output Reports from Horizontal Alignment

Refer Chapter no 7 with sub headings of 7.1 and 7.2

4.2 Vertical Alignment

4.2.1 Vertical Alignment - Overview input data's



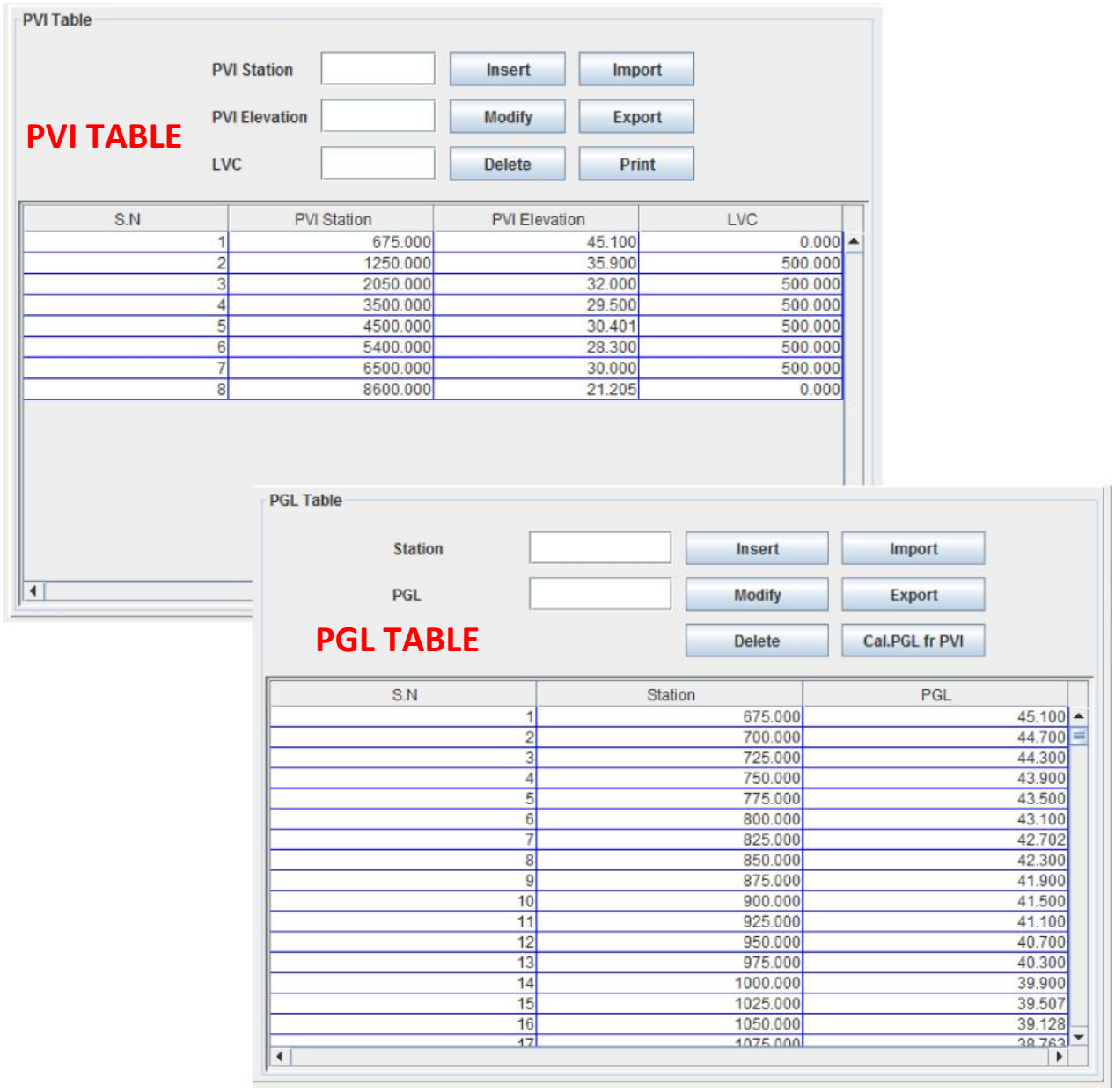
In Road Solver the Vertical Alignment is to Calculate PGL from PVI data input or from Direct. This Calculation based on ground input stations.

The Basic inputs of PVI data's are PVI Station , Elevation and LVC only. If LVC is Zero the calculation also possible.

The method of Inputs and output will be explain as follows..,

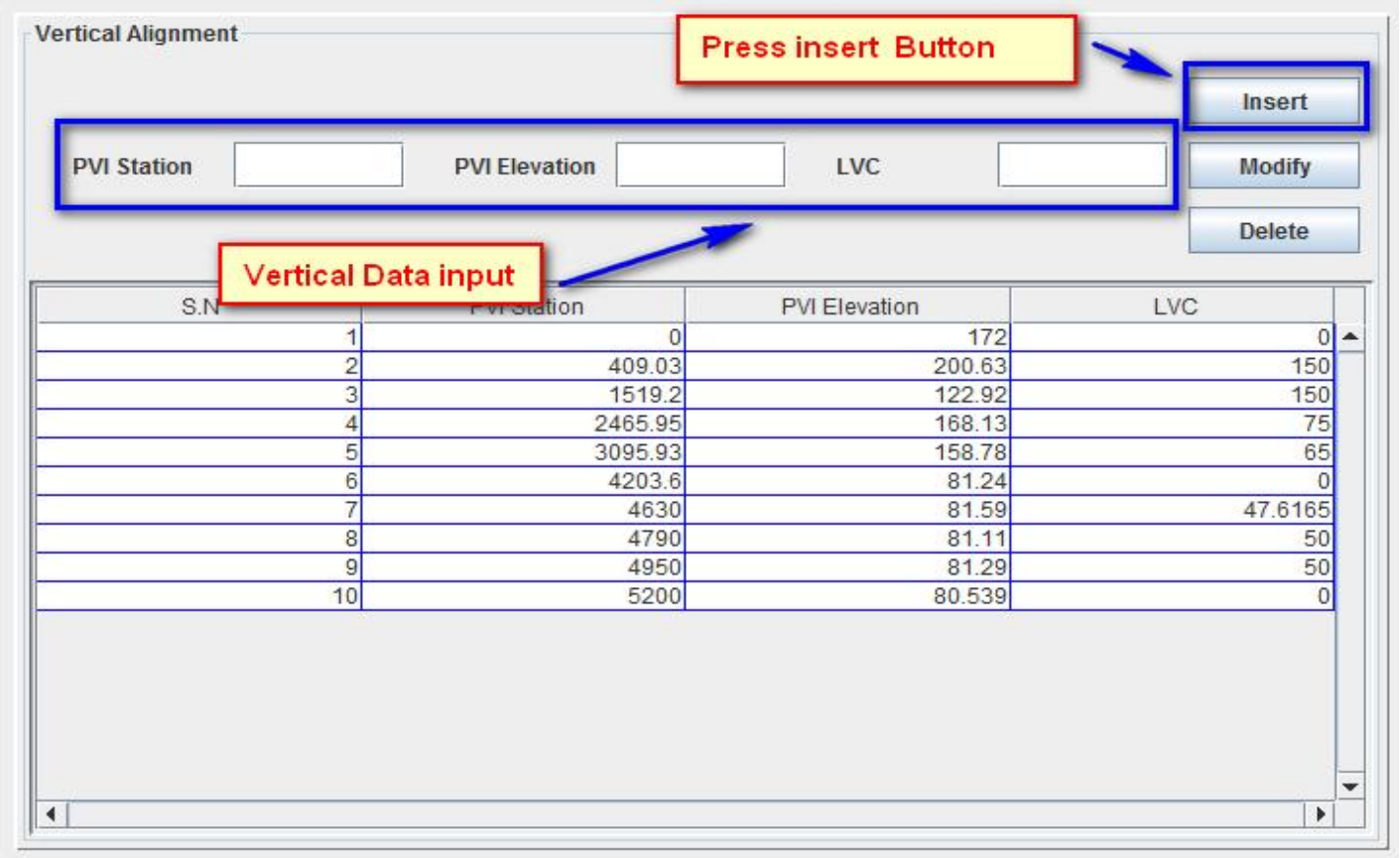
4.2.2 PGL Calculation Concept

In vertical Alignment calculation screen have two tables will be available. One is PVI Table another is PGL Table. The Road Solver templates will take the PGL levels from PGL table only. So the PGL will be calculated in two ways ie from PVI data's or by direct input of PGL levels. The PGL from PVI data's will be calculated based on the ground input stations only. So before calculate the PGL first input the ground levels in Road Solver. After to press the " Calc. from PVI datas" button then PGL levels will be calculated and appear in screen. The Screen shot will be as follow of 2 tables..,



4.2.3. PVI Table

4.2.3.1 Insert the PVI alignment data



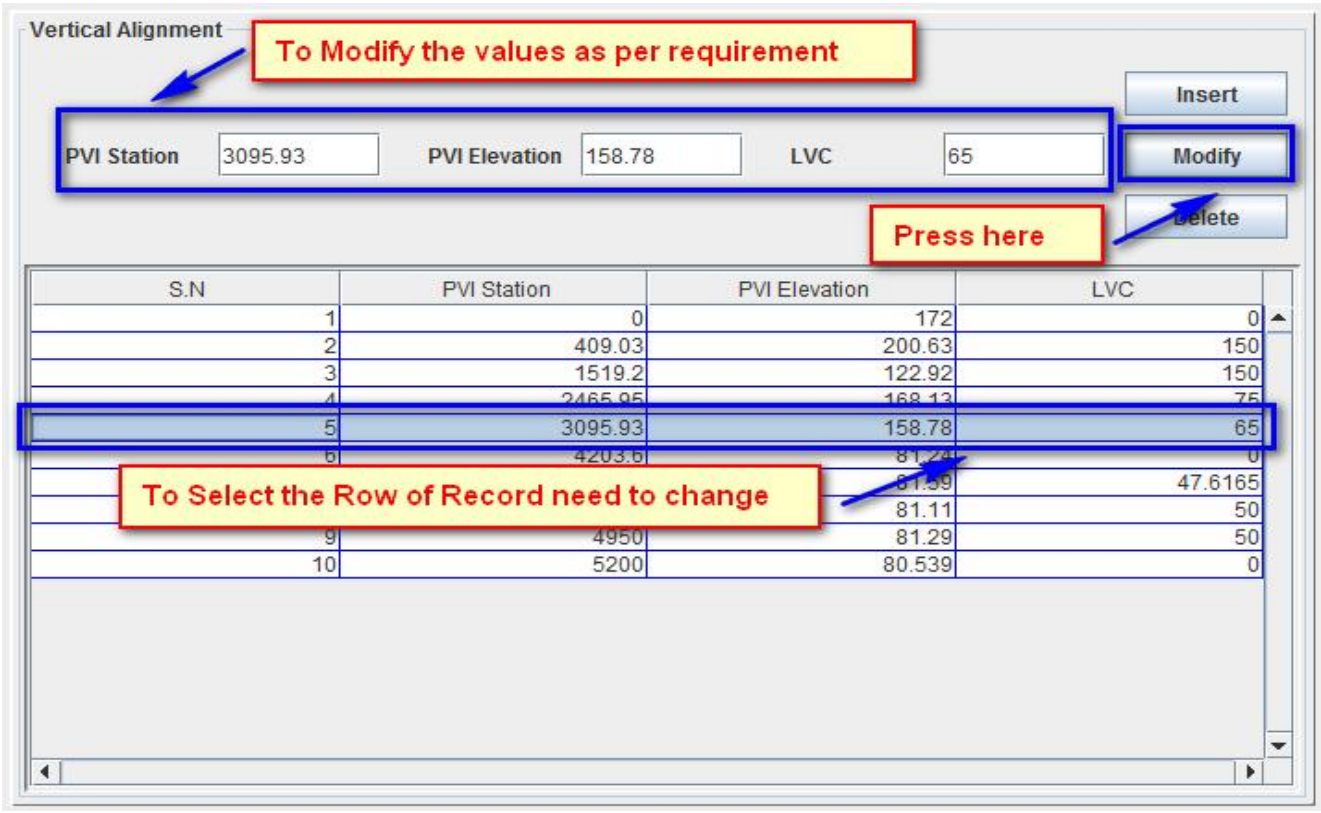
S.N	PVI Station	PVI Elevation	LVC
1	0	172	0
2	409.03	200.63	150
3	1519.2	122.92	150
4	2465.95	168.13	75
5	3095.93	158.78	65
6	4203.6	81.24	0
7	4630	81.59	47.6165
8	4790	81.11	50
9	4950	81.29	50
10	5200	80.539	0

For input the Vertical Alignment need to follow …,

1. For Beginning and End of Alignment should be PVI Station and PVI Elevation and LVC should be "0"
2. In vertical profile to change the gradient without LVC to keep the LVC value to be " 0 ".

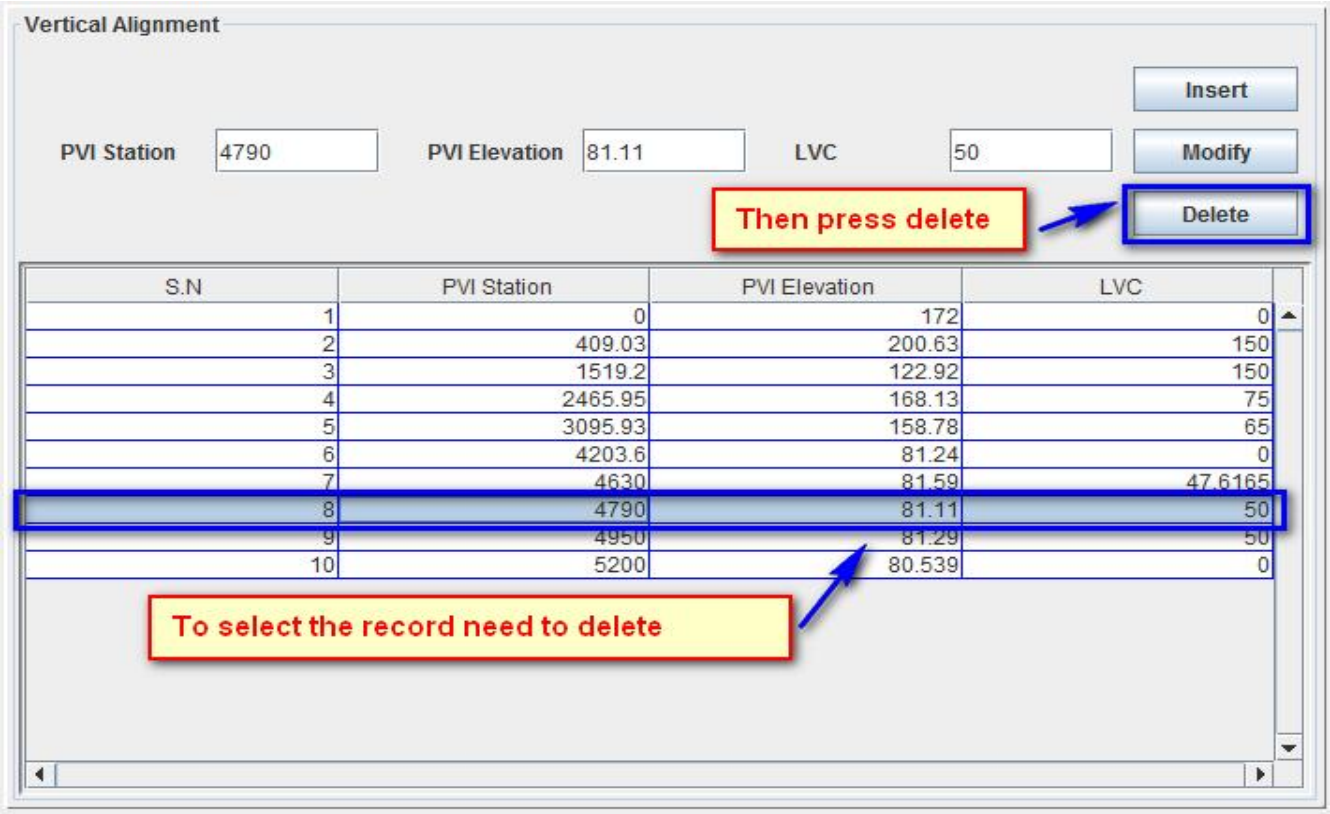
4.2.3.2 Modify the PVI alignment data

After Completion of Vertical data's any value need to change or modify to select that data the values are appear in the input columns to change the values and press the modify button. The values are changes in the tables.



4.2.3.3 Delete the PVI alignment data

To Delete the any input data to select the rows of required inputs and press Delete Button.

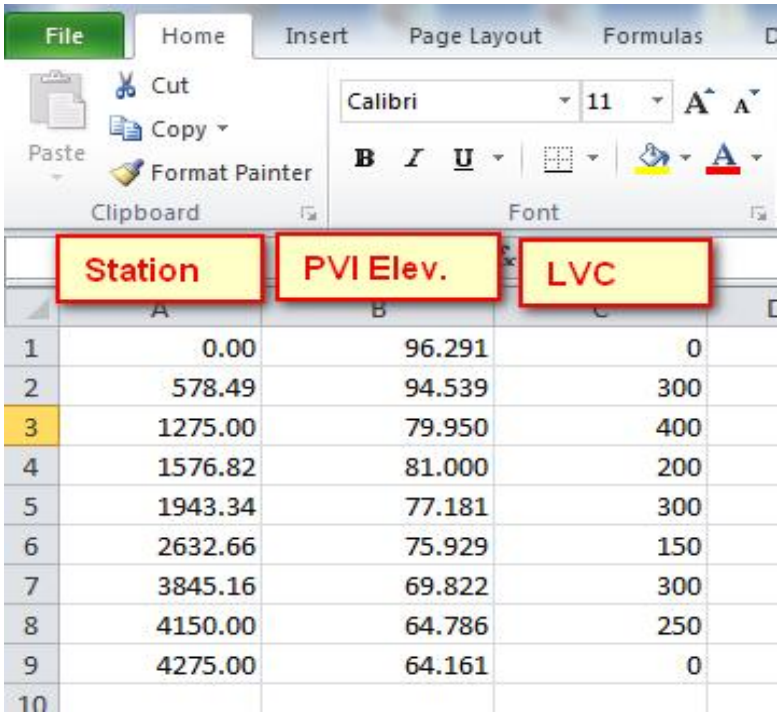


After Delete the record the values are automatically saved in database.

4.2.3.4 Import the PVI alignment data

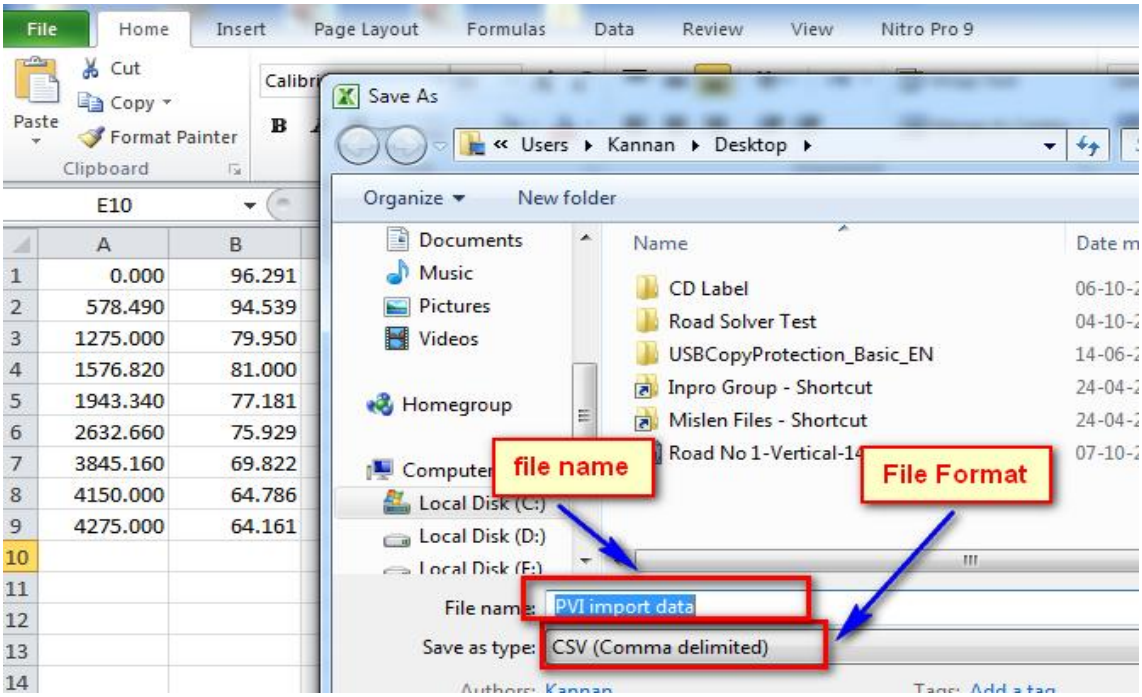
Using Import option the Vertical alignment data from csv files created from Excel program.

First the PVI data will created same as the following format..



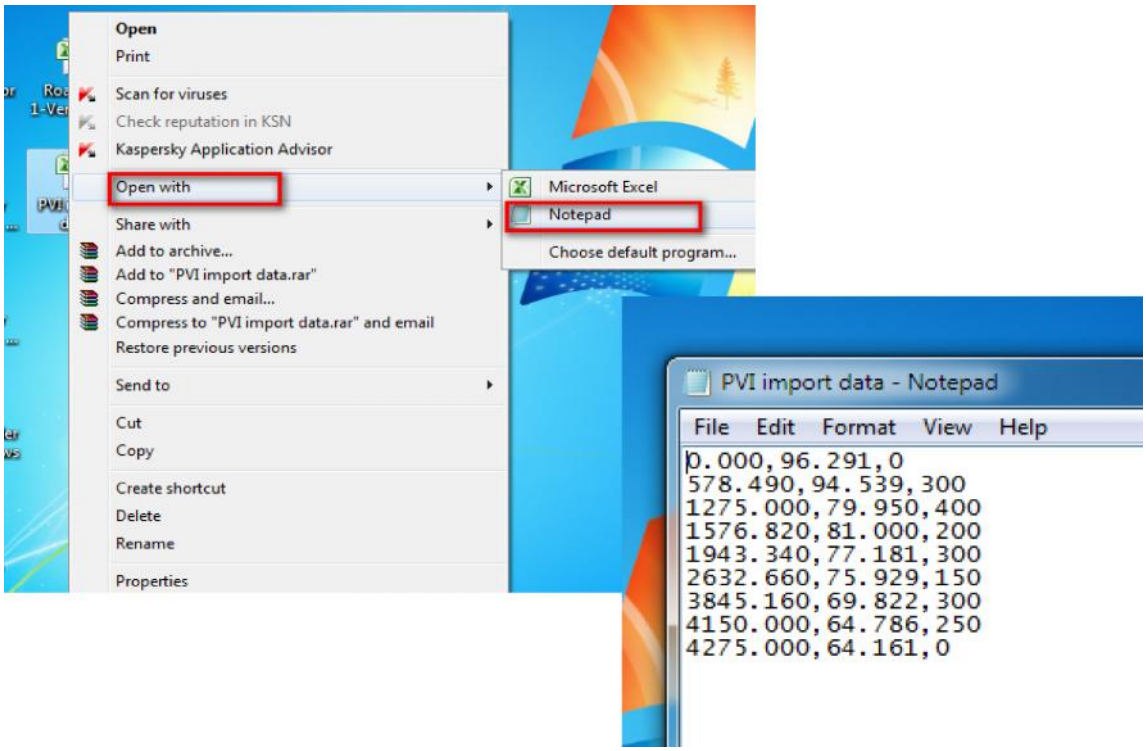
	A	B	C
1	0.00	96.291	0
2	578.49	94.539	300
3	1275.00	79.950	400
4	1576.82	81.000	200
5	1943.34	77.181	300
6	2632.66	75.929	150
7	3845.16	69.822	300
8	4150.00	64.786	250
9	4275.00	64.161	0
10			

After completing the data select " Save as " command then type the file name which is required location to be stored.

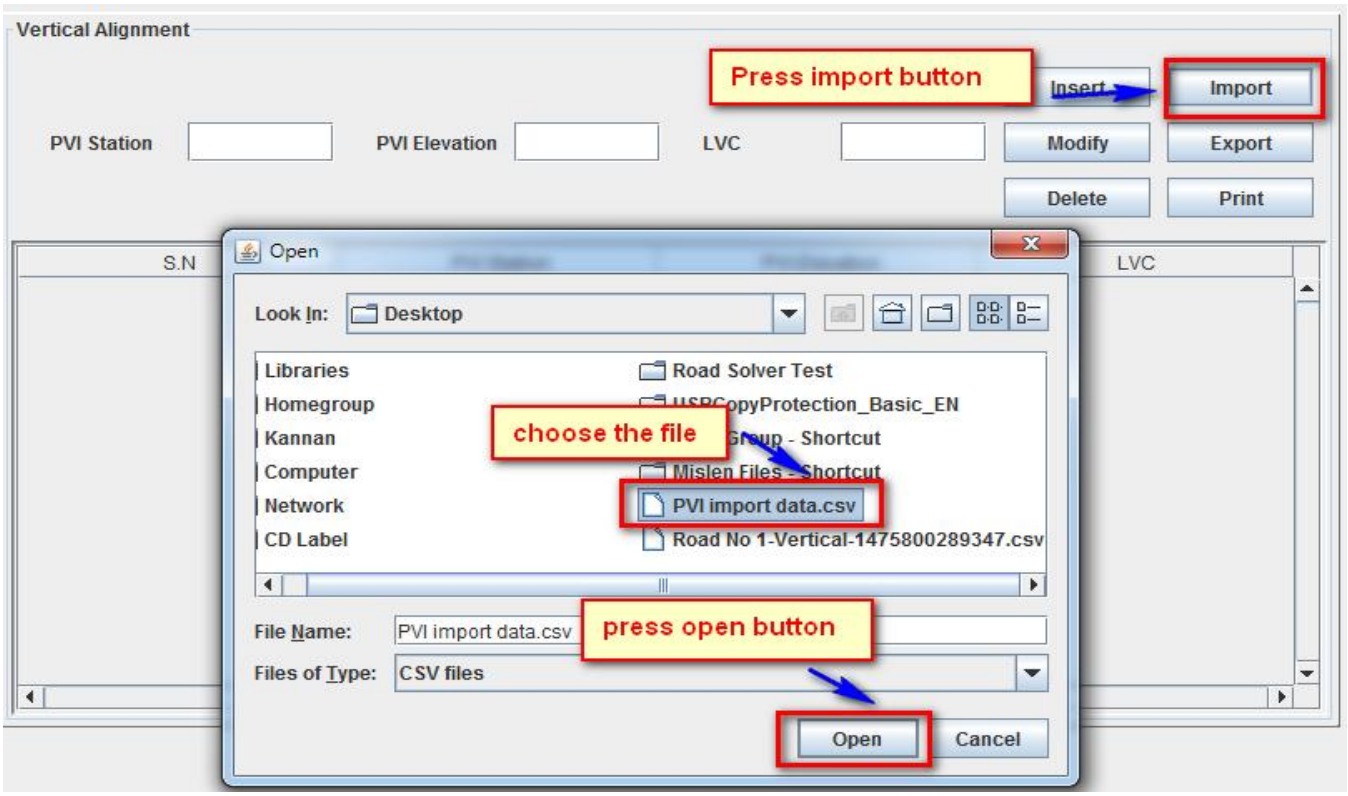


	A	B
1	0.000	96.291
2	578.490	94.539
3	1275.000	79.950
4	1576.820	81.000
5	1943.340	77.181
6	2632.660	75.929
7	3845.160	69.822
8	4150.000	64.786
9	4275.000	64.161
10		
11		
12		
13		
14		

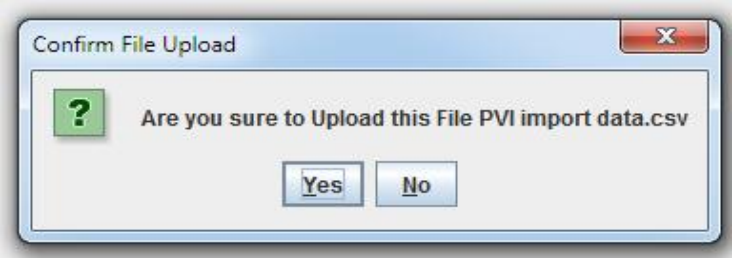
Now data will stored in desktop and click that file to open from note pad which is look as follows..



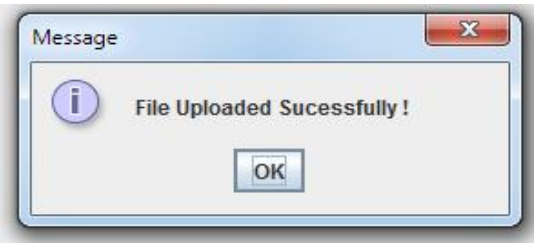
Now press the import button then select the file …click open…



Make sure confirmation



File loaded successfully

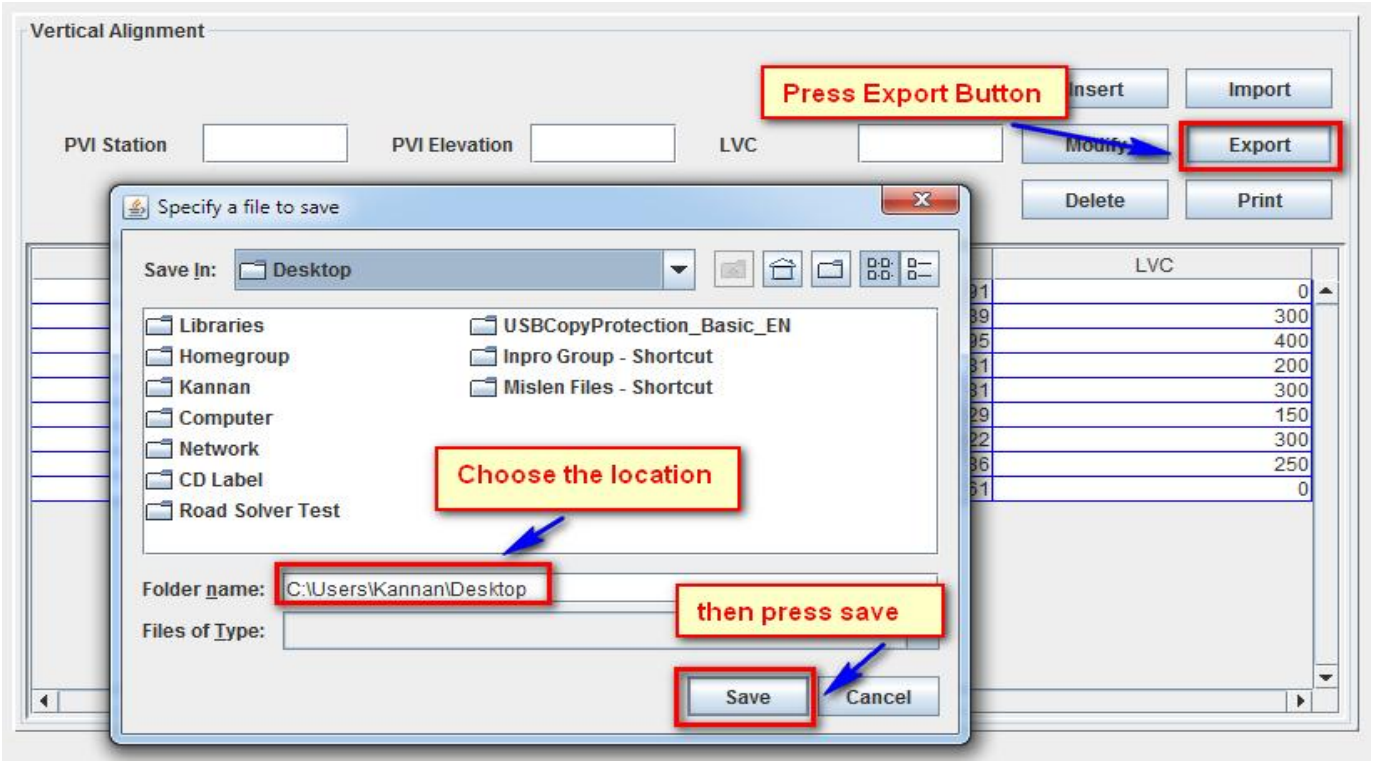


Now the data will appear in table as follows..,

S.N	PVI Station	PVI Elevation	LVC
1	0	96.291	0
2	578.49	94.539	300
3	1275	79.95	400
4	1576.82	81	200
5	1943.34	77.181	300
6	2632.66	75.929	150
7	3845.16	69.822	300
8	4150	64.786	250
9	4275	64.161	0

4.2.3.5 Export the PVI alignment data

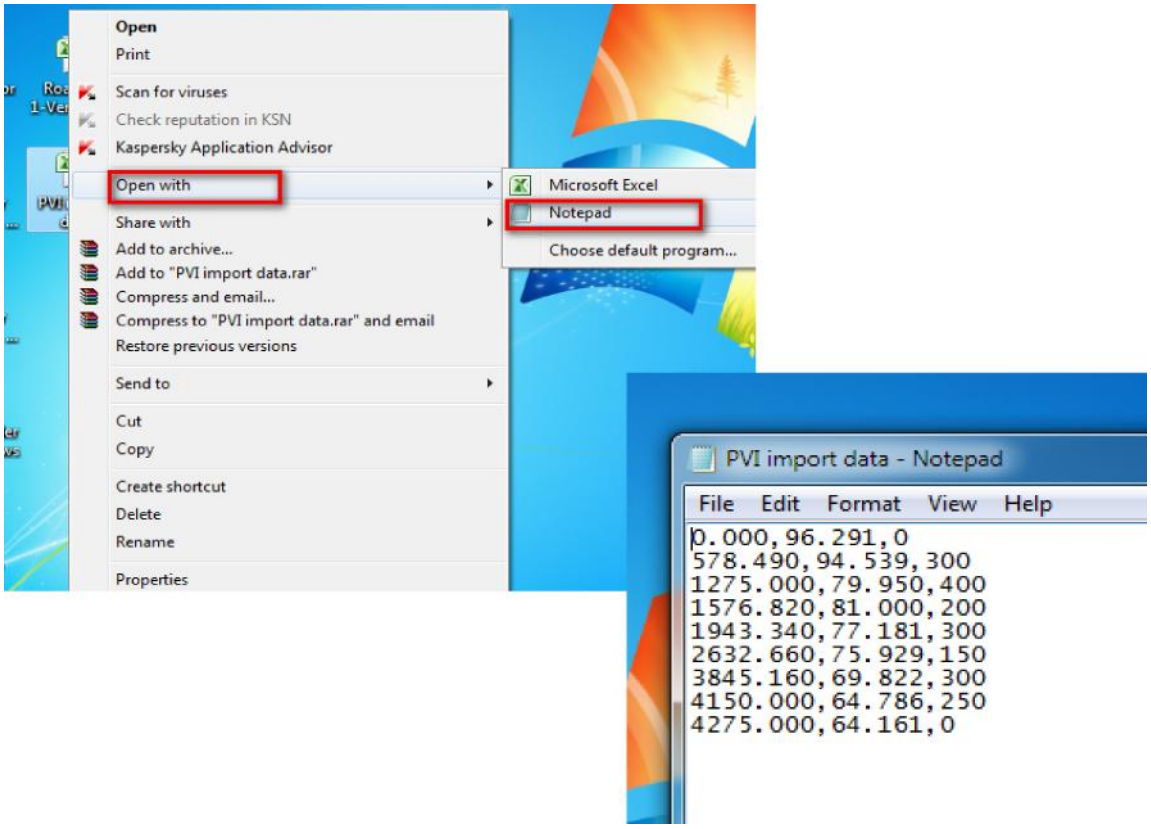
Using Export option the Vertical alignment data can be stored as a backup of CSV file format



Export confirmation ..

file look like..,

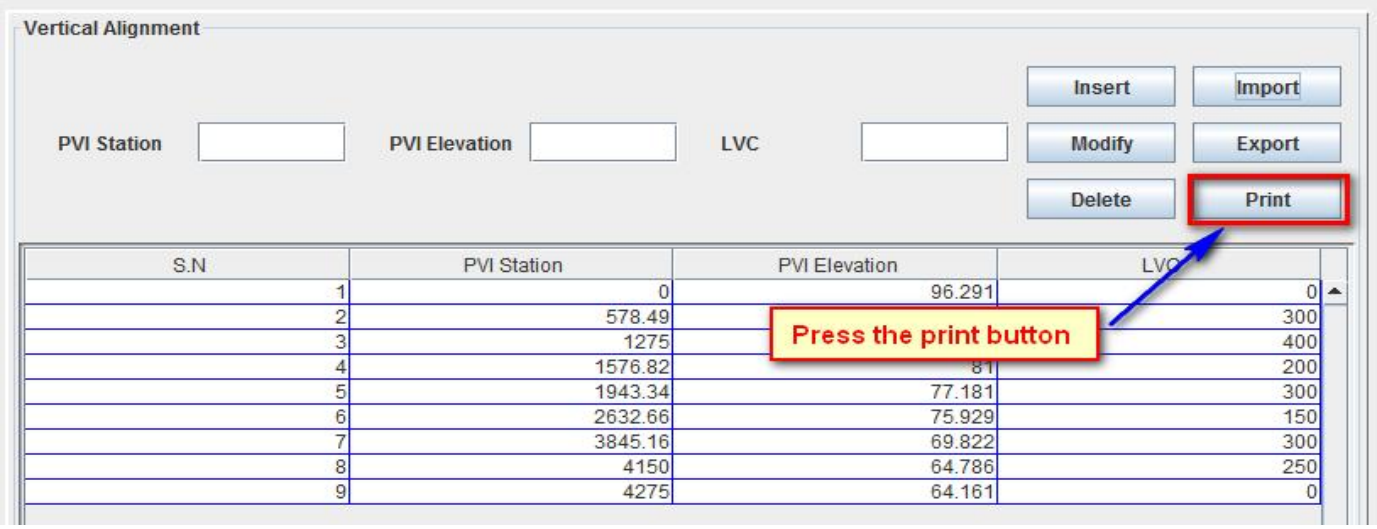
Now data will stored in desktop and click that file to open from note pad which is look as follows..



4.2.3.6 Print the PVI alignment data

Using Print the Vertical Alignment data will be printed in pdf file format..

Choose the print button..



S.N	PVI Station	PVI Elevation	LVC
1	0	96.291	0
2	578.49		300
3	1275		400
4	1576.82	81	200
5	1943.34	77.181	300
6	2632.66	75.929	150
7	3845.16	69.822	300
8	4150	64.786	250
9	4275	64.161	0

the printed report like …,

Project Name :Testing of Road Solver Program - Project 1

Description :Testing of program **Consultant :XYZ consultant**

Client :Ministry of Communication **Contractor :ABC Contracting Co**

Road ID : RD0001 **Road Name : Road No 1**

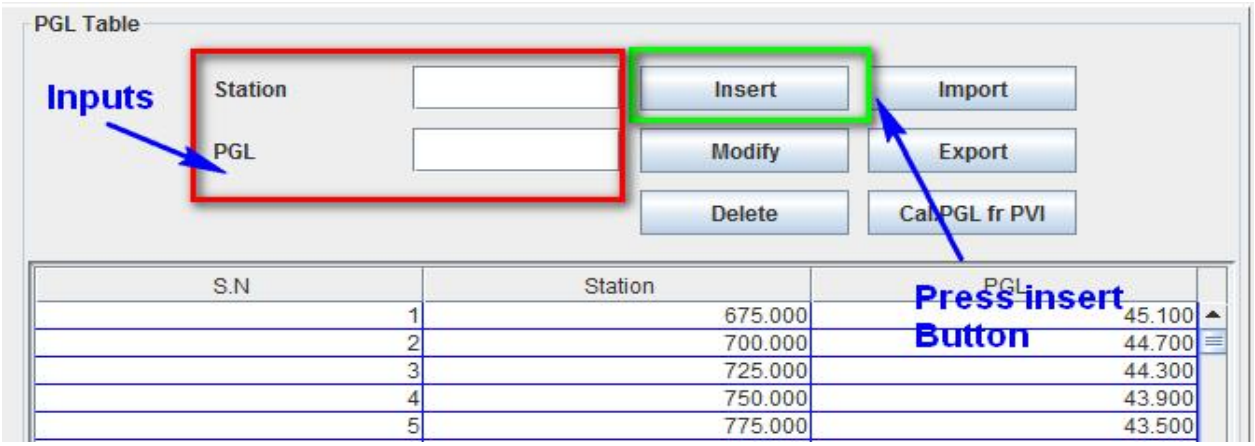
Vertical Alignment

PVI Station	PVI Elevation	LVC
0	96.291	0
578.49	94.539	300
1275	79.95	400
1576.82	81	200
1943.34	77.181	300
2632.66	75.929	150
3845.16	69.822	300
4150	64.786	250
4275	64.161	0

4.2.4. PGLTable

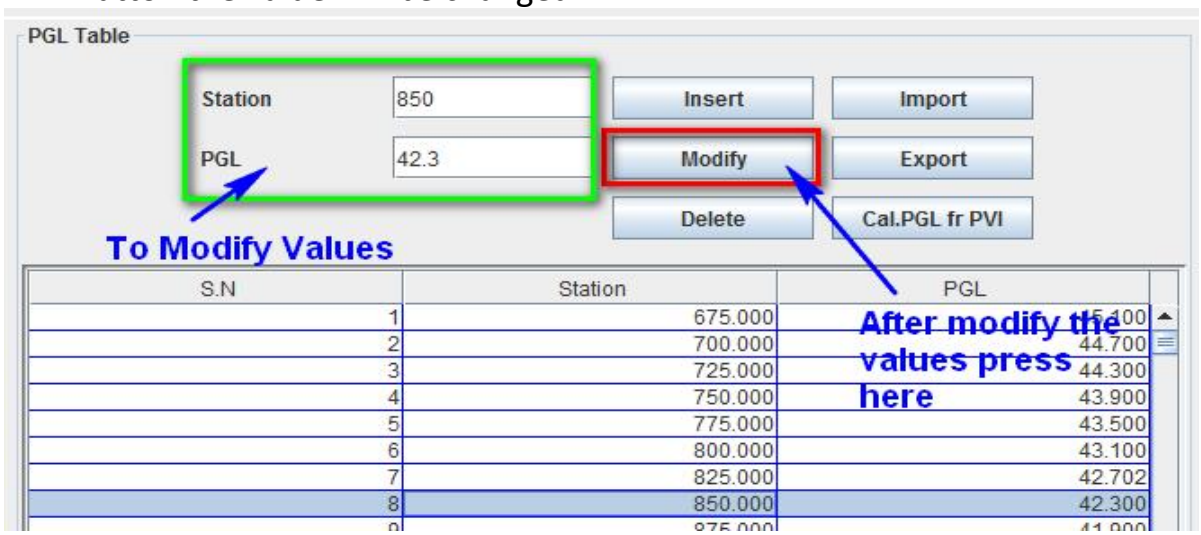
4.2.3.1 Insert the PGL data

In this option to Insert the PGL data with station values. After the insert the values press " Insert " Button. The following screen will be explain ..,



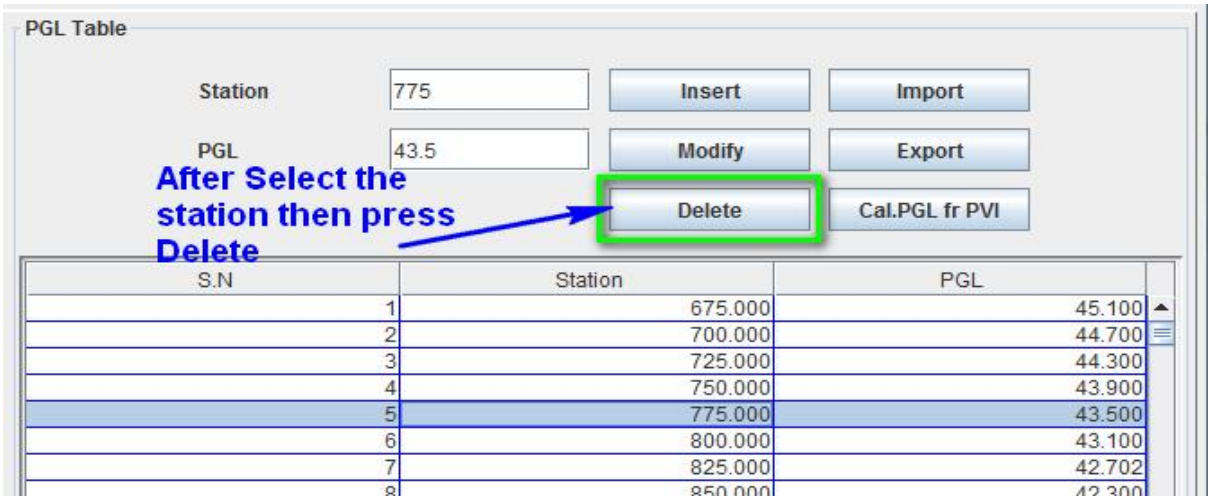
4.2.3.2 Modify PGL data

Using this option to modify the values of PGL as per this command. First to select the value which we want change.., the station and PGL will appear in the text Box , from that the change the values PGL then press Modify Button the value will be changed.



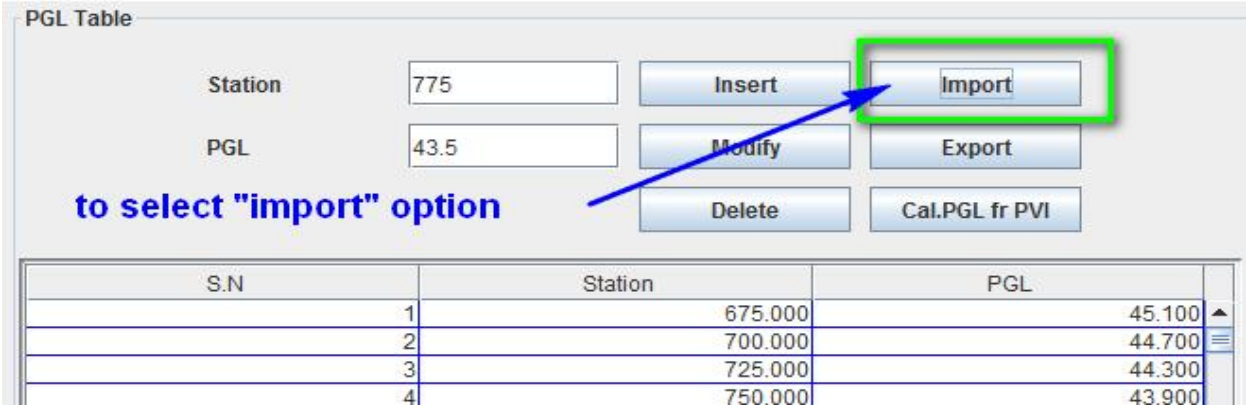
4.2.3.3 Delete PGL data

After select the required delete station to select and press " Delete Button "

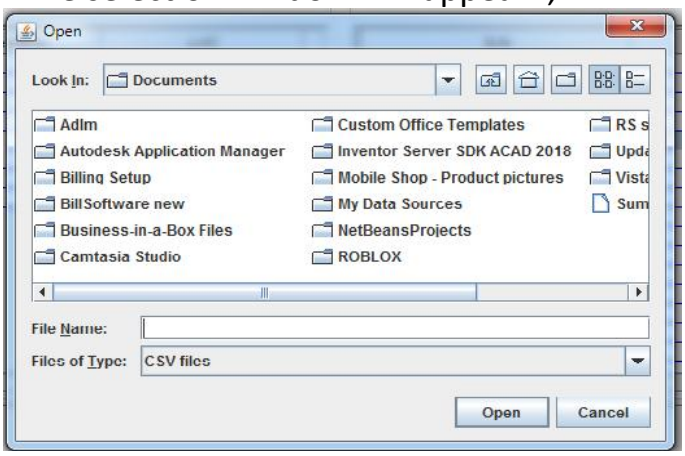


4.2.3.4 Import PGL data

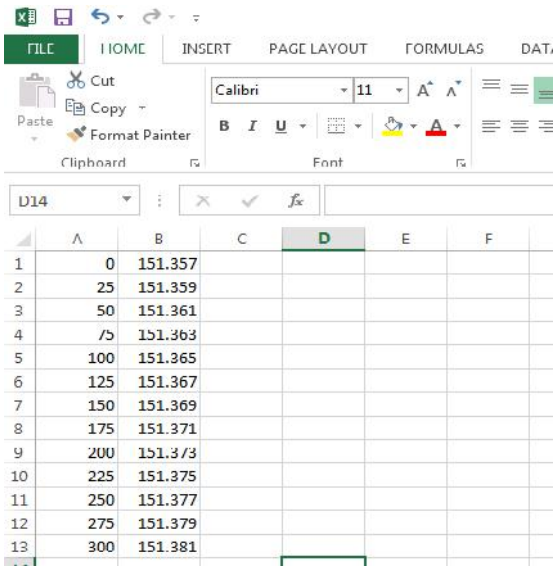
In this option to import the PGL manaually from the Excel file.. First to press the Import Button..,



The CSV file selection window will appear..,

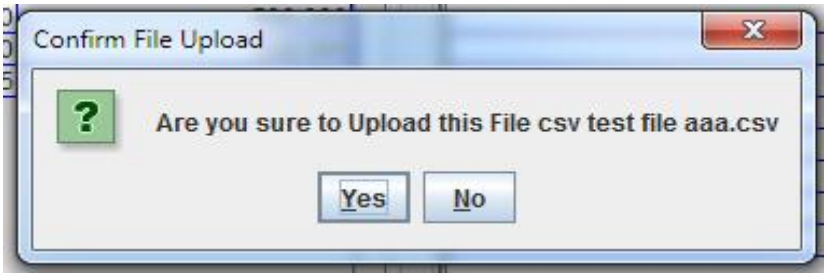


Before select the file to type the values of station and PGL values in excel as per the following figure.,,



After complete the data then make save as CSV (Comma Deliminated) format..,

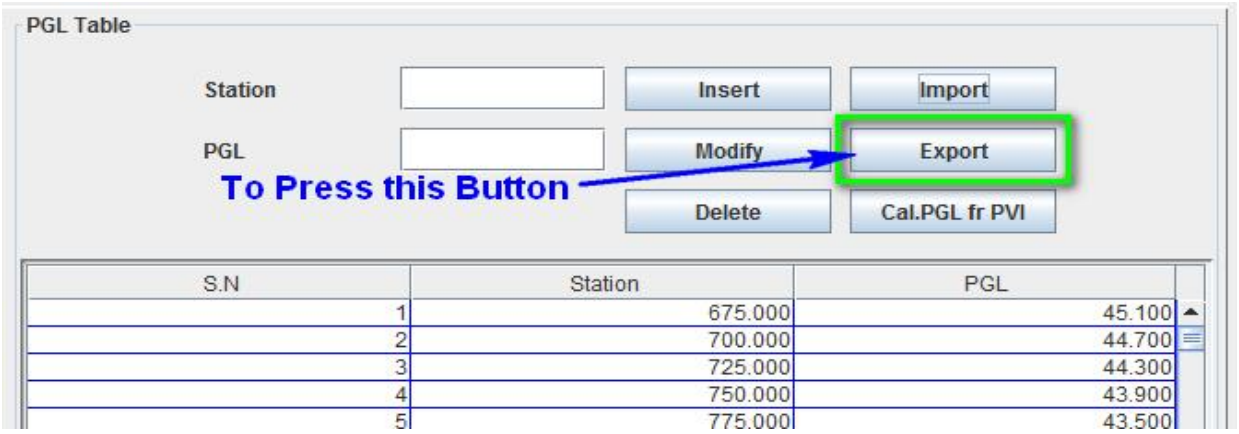
now select that file press open the confirmation screen will appear..,



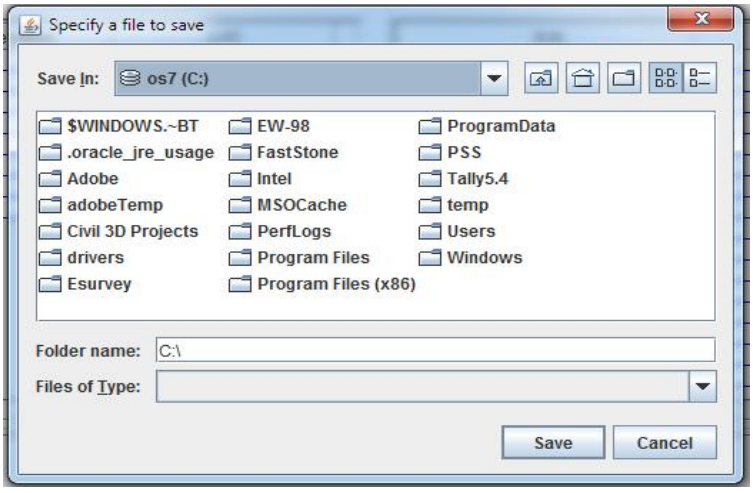
In that screen press yes the data will be imported to PGL table and database..,

4.2.3.5 Export PGL data

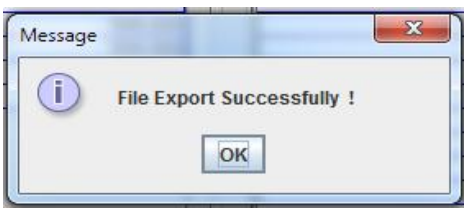
In this option to be used for export the PGL values to Excel format file..



After press the export button the file location screen will appear.., in that screen choose the location to store that file

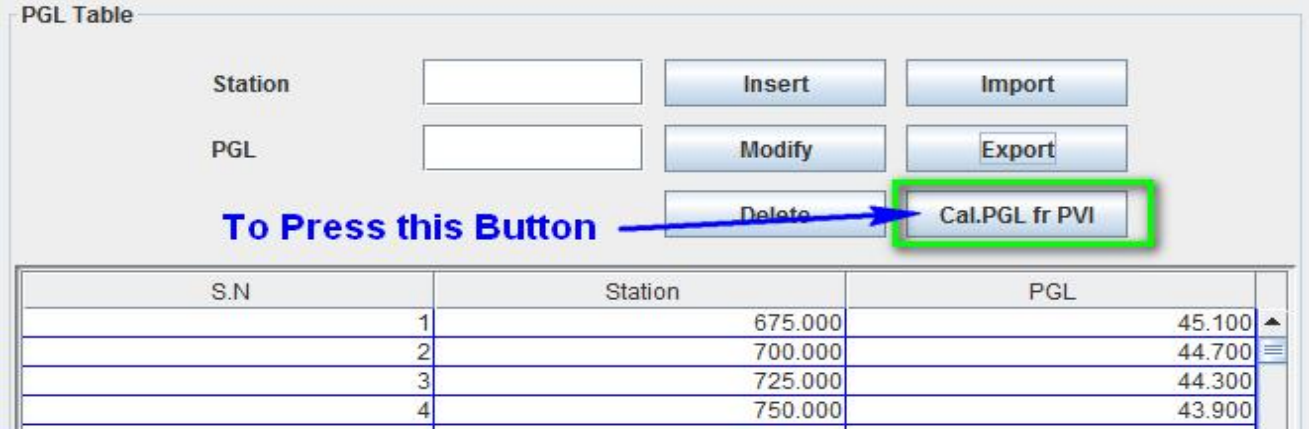


then press Save file will stored and confirmation message box will appear as figure..,



4.2.3.6 Calculate PGL from PVI Data

In this option to calculate PGL from PVI data's will be worked based on the ground levels stations. Before you make this option import or enter the ground levels first.



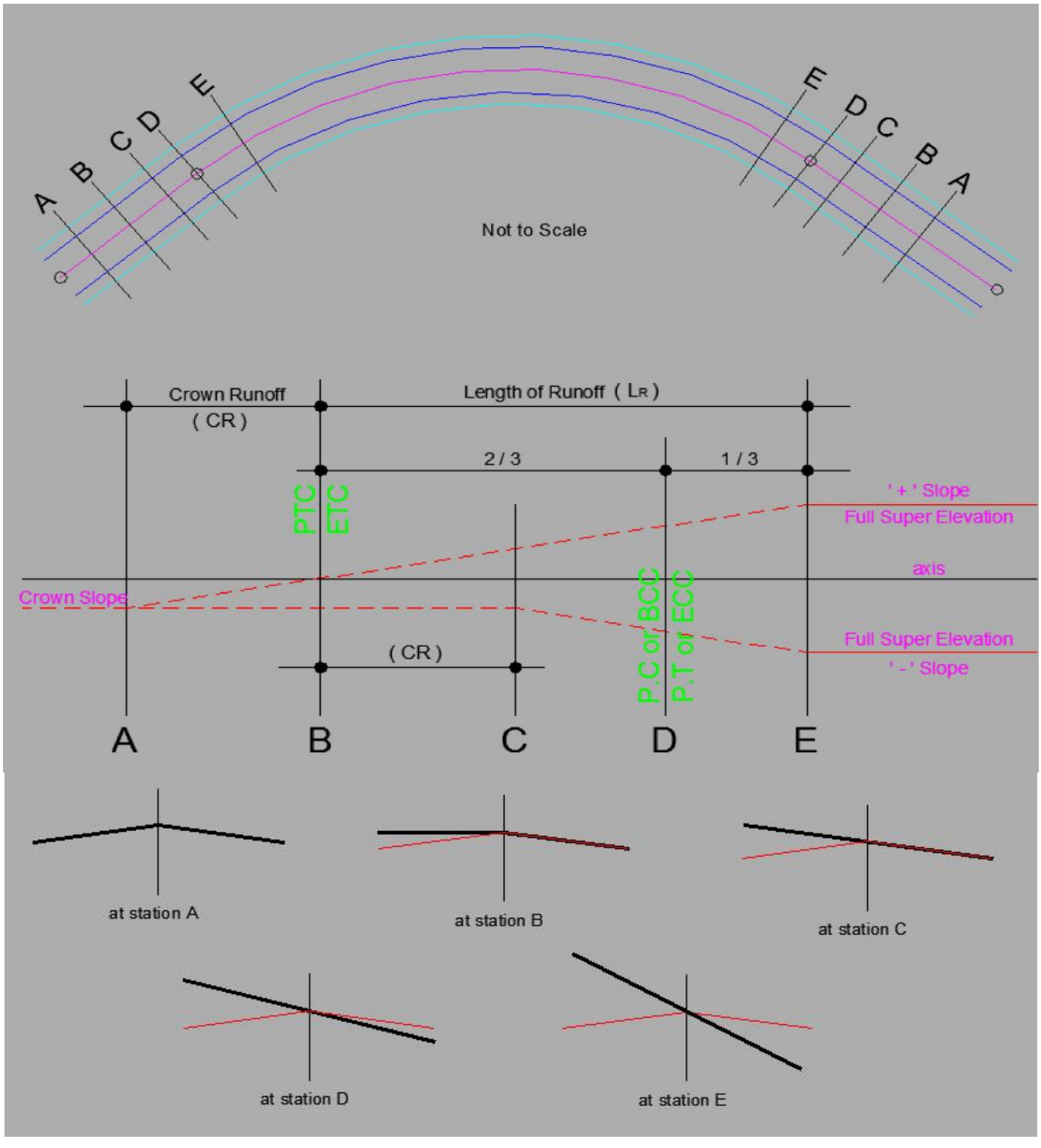
If your road length is more ..,please wait until process will be completed..,

After successful calculation you can insert or modify delete whatever actions will be made.

4.3 Super Elevation

4.3.1 Superelevation - Overview input data's

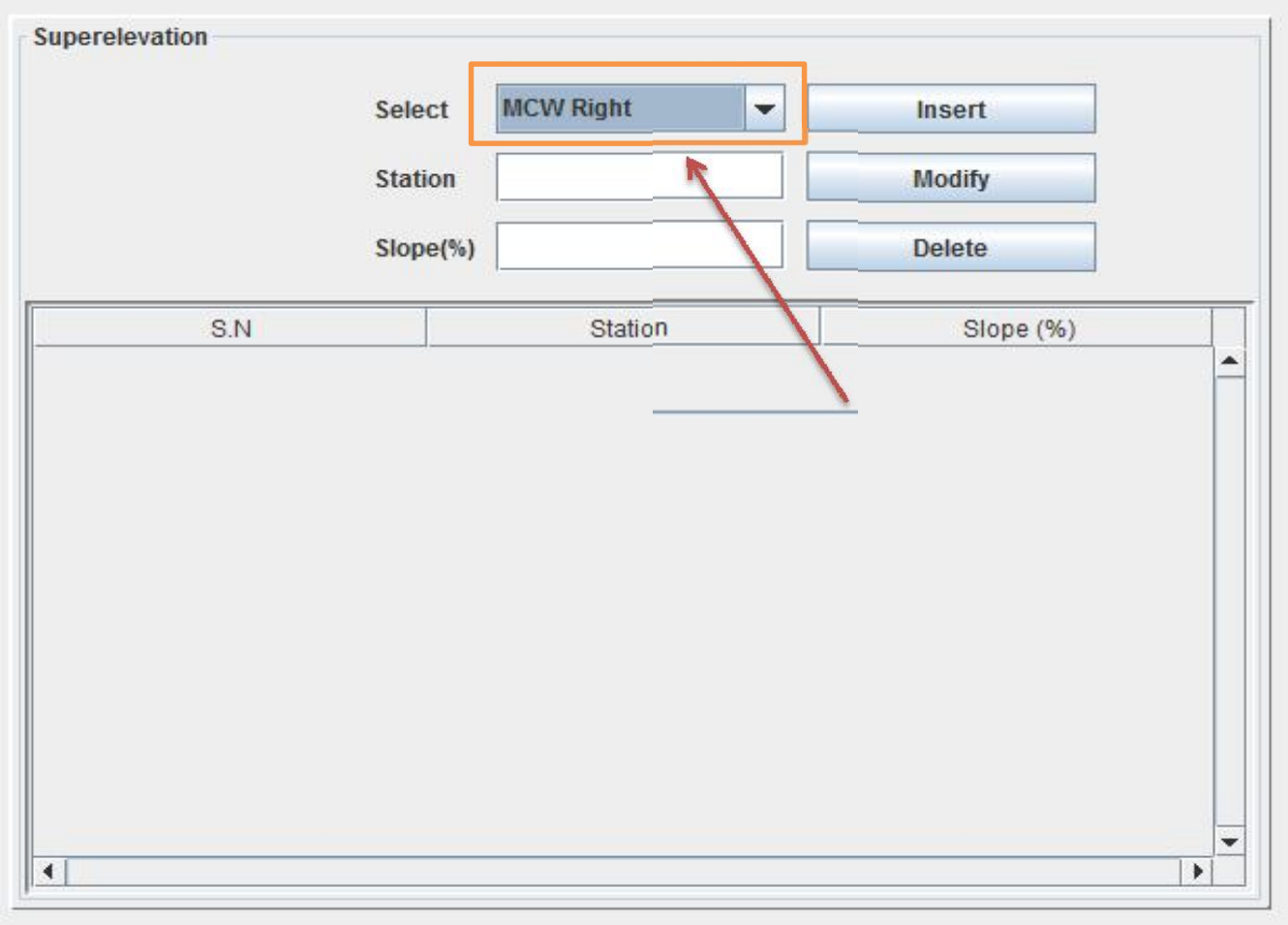
The Basic of Road Superelevation data's are as follows. In this details the values of super elevation are changes in each direction and where the transi--tion stations are located.



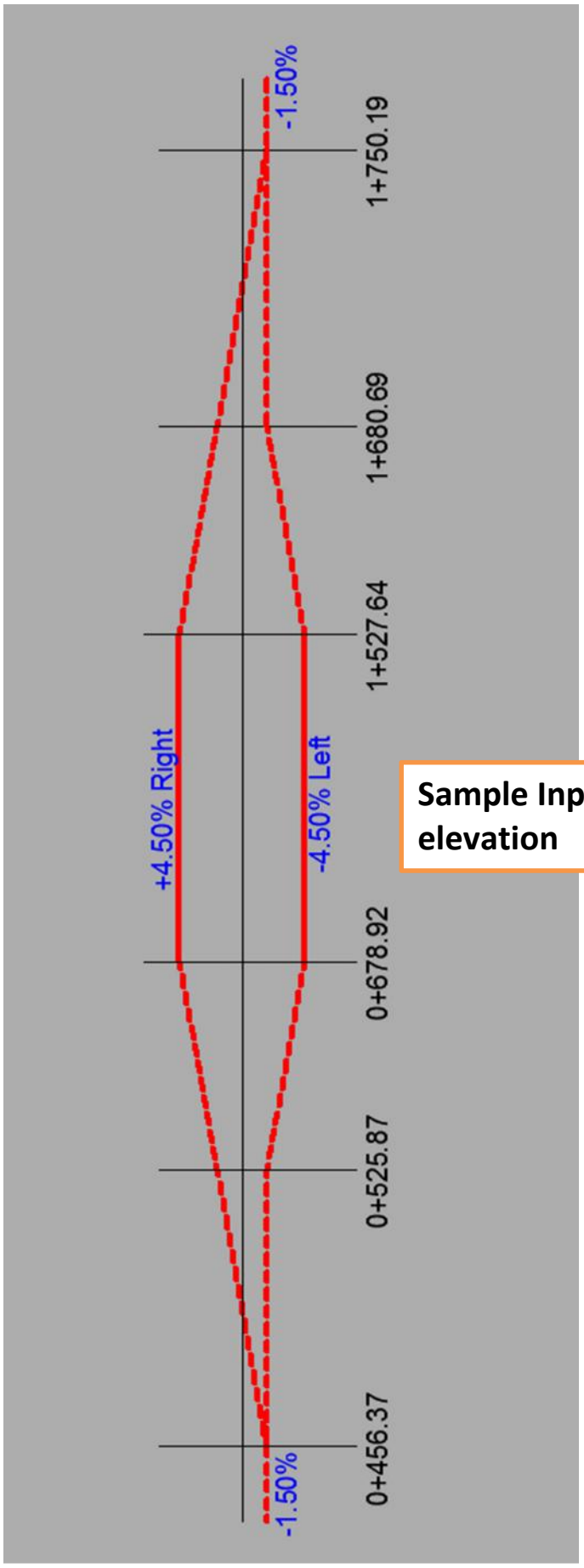
In this Road Solver software support the solutions of following variables for Superelevation data's.

1. MCW Right (MR) - Main Carriage Way Right
2. MCW Left (ML) - Main Carriage Way Left
3. ISH Right (IR) - Inner Shoulder Right
4. ISH Left (IL) - Inner Shoulder Left
5. OSH Right (OR) - Outer Shoulder Right
6. OSH Left (OL) - Outer Shoulder Left

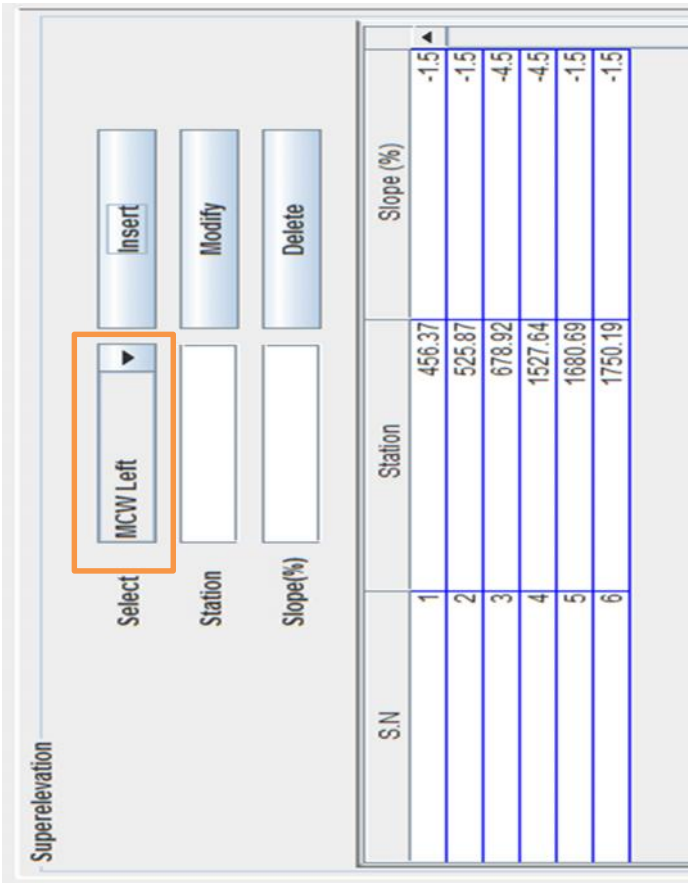
The notations which is mentioned A,B,C,D,E and F are used in the Template calculation for Same as the reference factor..



To Selection the Superelevation value where the changes which is in gradient to be entered to in inputs. Sample data refer to following diagram..

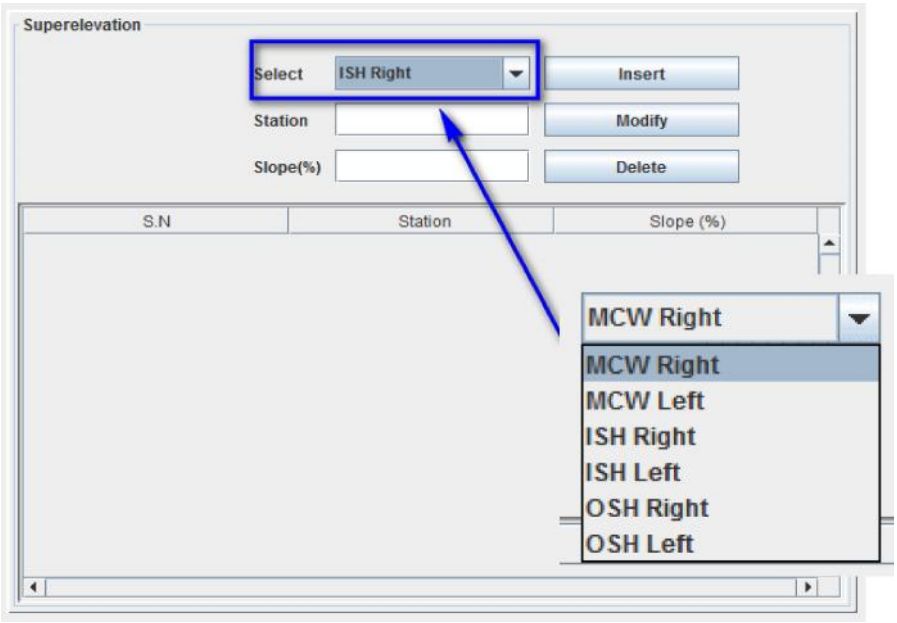


Sample Input data's for Super elevation



4.3.2 Selection of Superelevation Variables

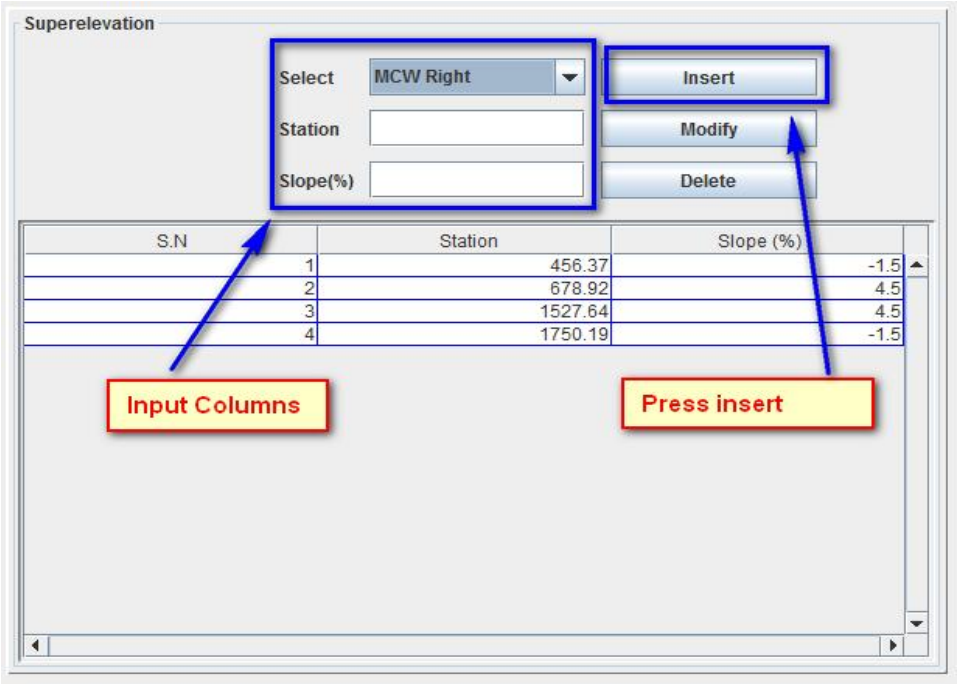
Before input the superelevation data to select the variable which is suitable for the inputs.



In the above diagram shows the variables of superelevation data which is used for our calculation. If any variable should be data which will be used for our calculation or template .

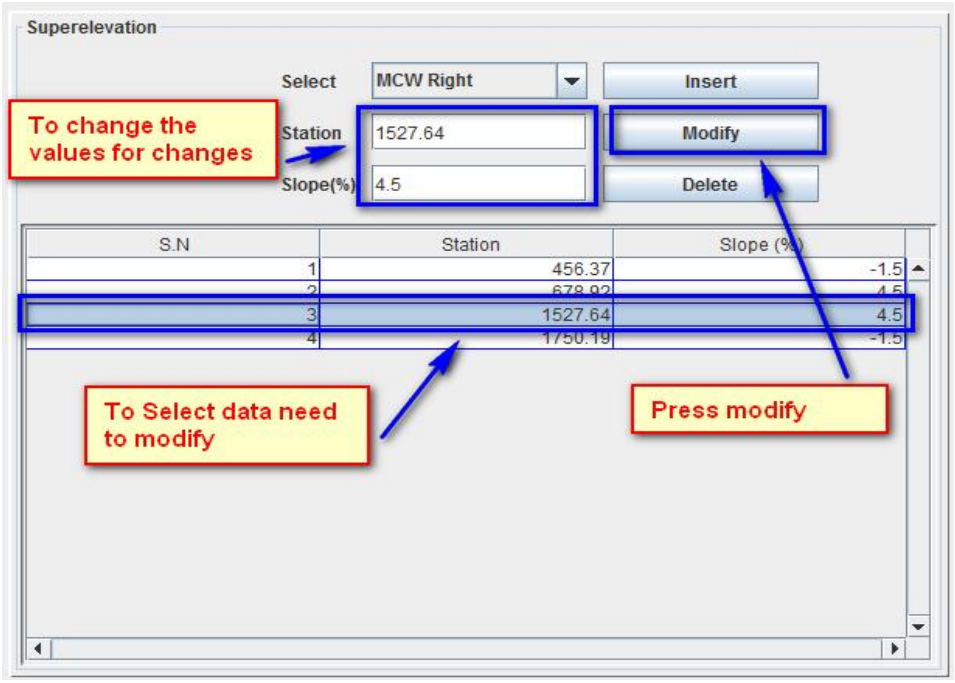
4.3.3 Insert the Superelevation data

First select the superelevation variable which is need to input value. The Values of station and Slope is entered in the input box then press insert button. The Slope will always entered by the percentage (%) value only.



After finished the data's need to insert the any new input in between any station , Type the value and insert . The values are saved in same place which is ascending order of Station.

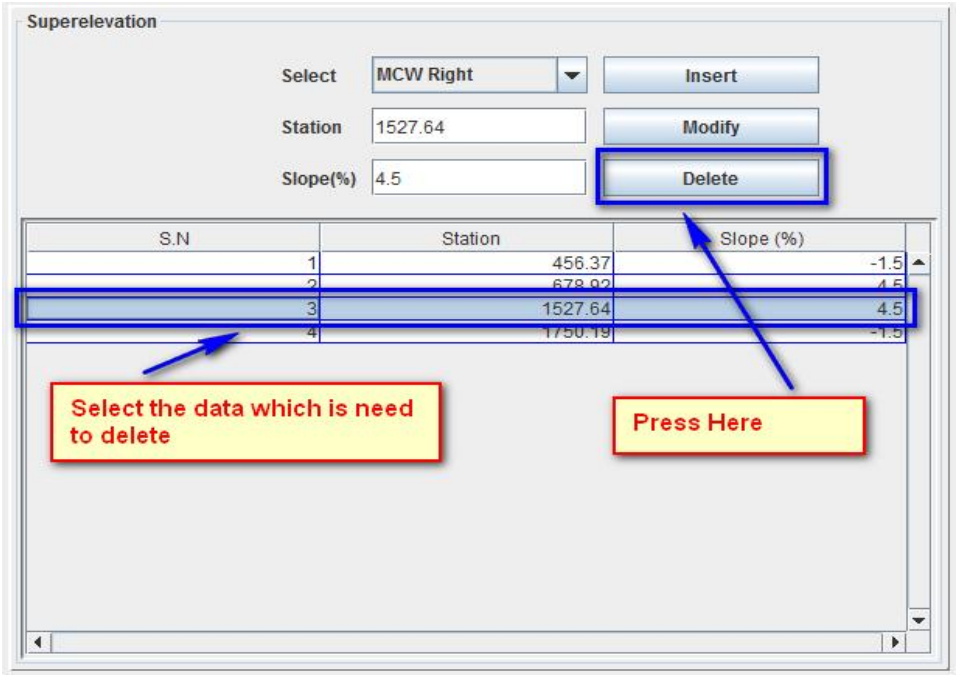
4.3.4 Modify the Superelevation data



After Completion of Superelevation data's any value need to change or modify to select that data the values are appear in the input columns to change the values and press the modify button. The values are changes in the tables.

4.3.5 Delete the Superelevation data

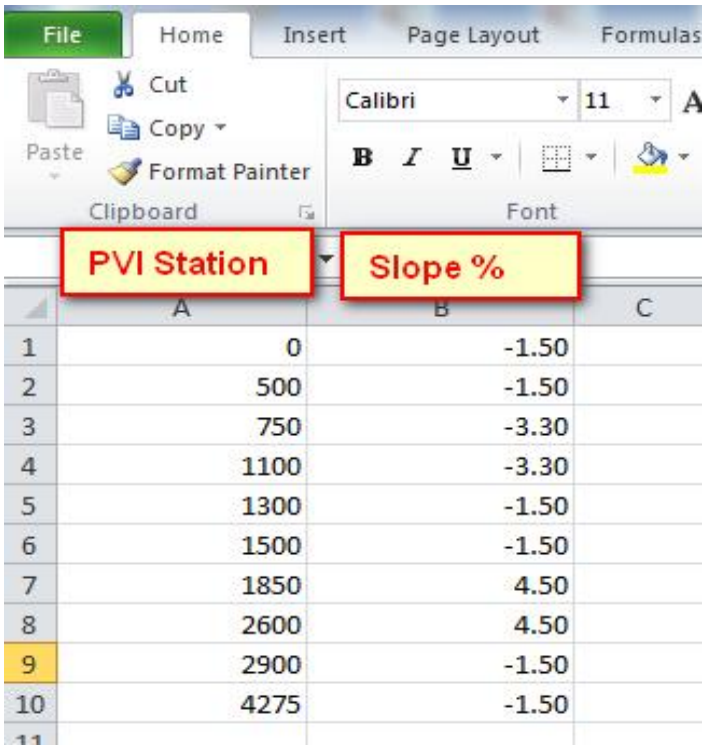
To Delete the any input data to select the rows of required inputs and press Delete Button.



4.3.6 Import the Superelevation data

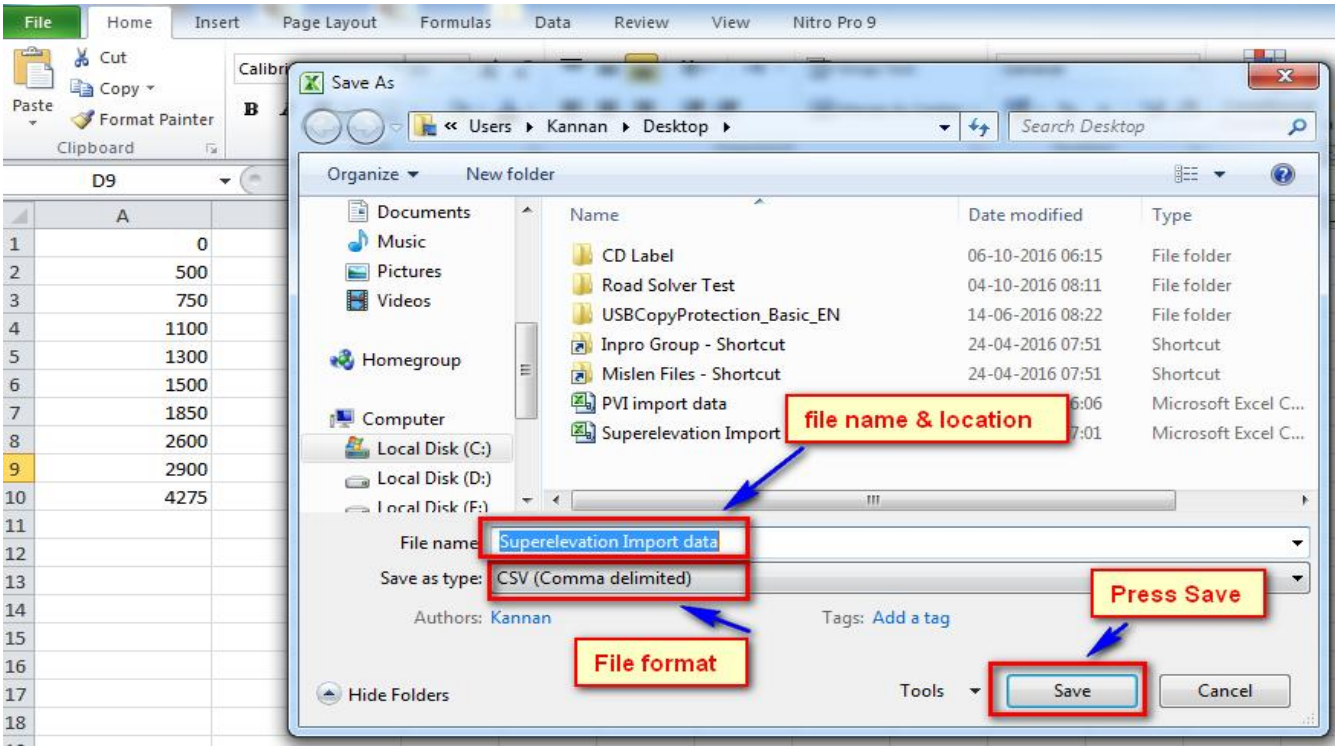
Using Import option the Superelevation data from csv files created from Excel program.

First the Superelevation data will created same as the following format..

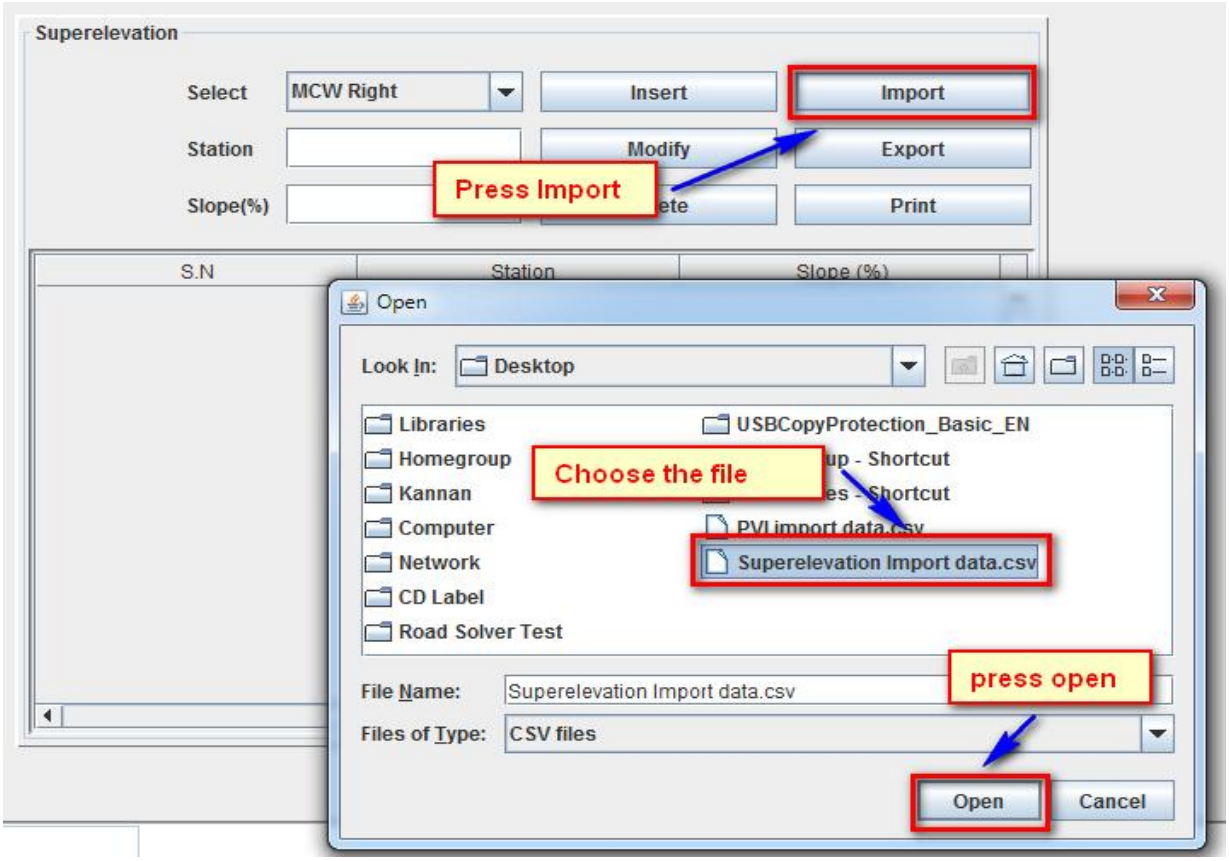


	A	B	C
1	0	-1.50	
2	500	-1.50	
3	750	-3.30	
4	1100	-3.30	
5	1300	-1.50	
6	1500	-1.50	
7	1850	4.50	
8	2600	4.50	
9	2900	-1.50	
10	4275	-1.50	

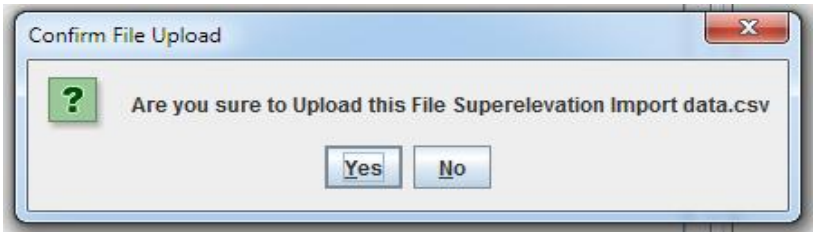
Then "Save as " option to save the csv file in required location



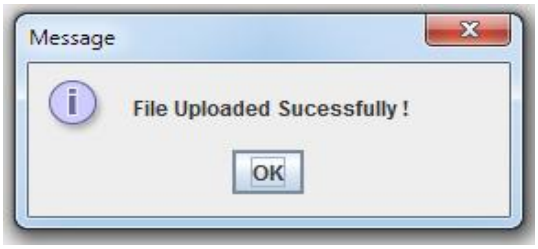
To press import button the file open window will appear .., then choose the file .., press open..



confirm the import..



Successful import..



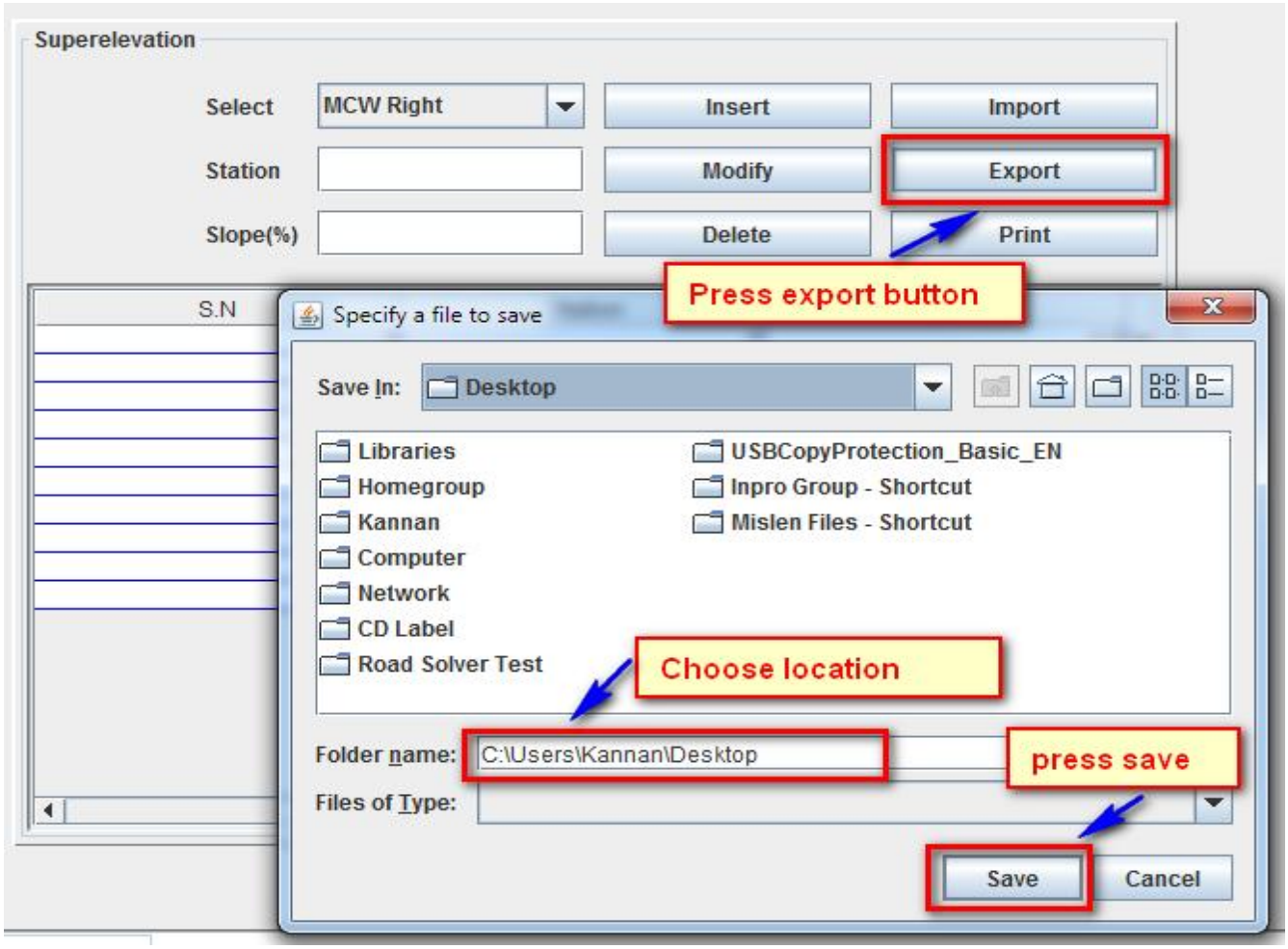
Super elevation data will appear in table as follows..

S.N	Station	Slope (%)
1	0	-1.5
2	500	-1.5
3	750	-3.3
4	1100	-3.3
5	1300	-1.5
6	1500	-1.5
7	1850	4.5
8	2600	4.5
9	2900	-1.5
10	4275	-1.5

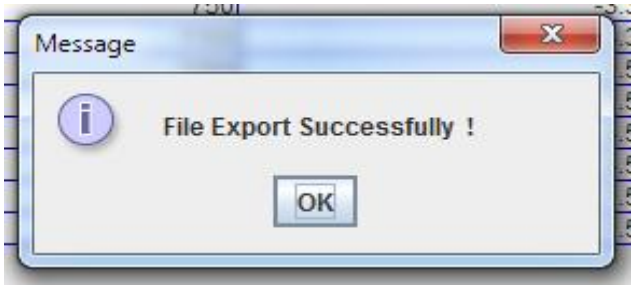
4.3.7 Export the Superelevation data

Existing Superelevation data need to take backup to choose the export option

The Exported file will be stored in csv file format .. To be open in excel program..

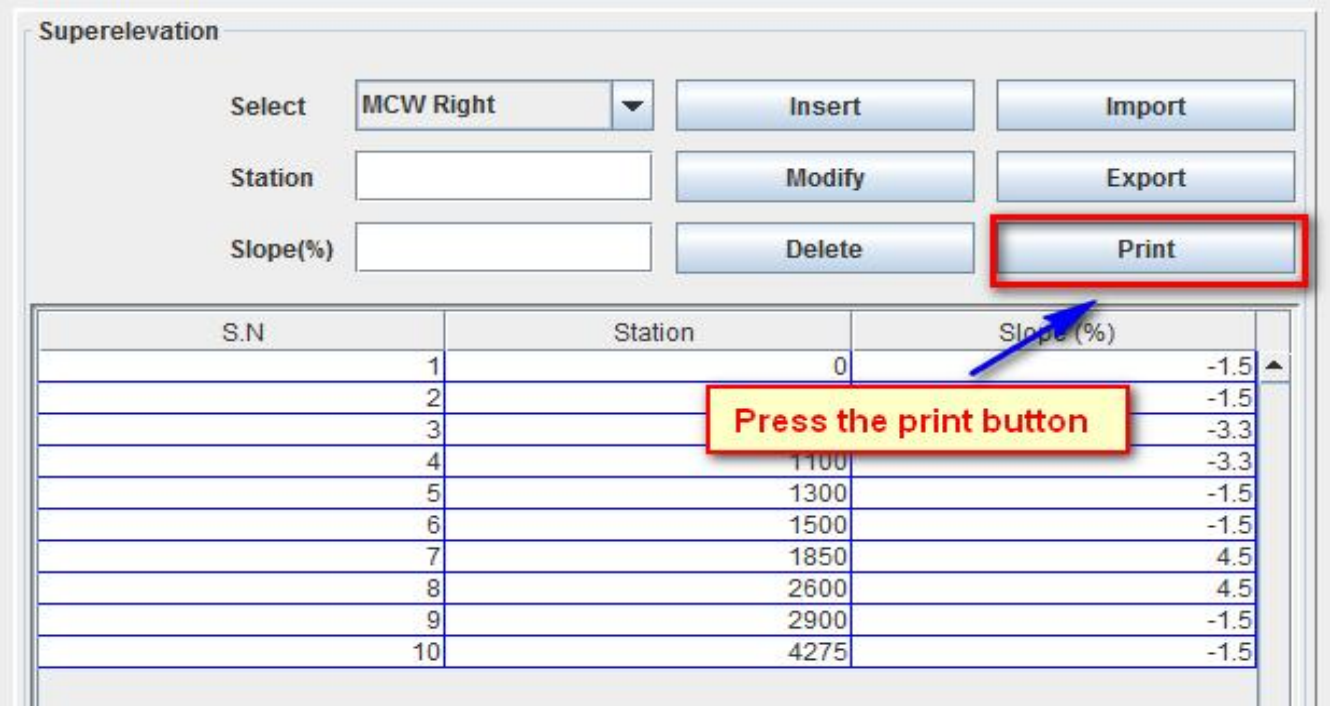


File export done successfully..,



4.3.8 Print the Superelevation data

The Superelevation data to be print .., press the button..



S.N	Station	Slope (%)
1	0	-1.5
2		-1.5
3		-3.3
4	1100	-3.3
5	1300	-1.5
6	1500	-1.5
7	1850	4.5
8	2600	4.5
9	2900	-1.5
10	4275	-1.5

the data will printed in pdf format .. Same as follow..

Project Name :Testing of Road Solver Program - Project 1
Description :Testing of program **Consultant :XYZ consultant**
Client :Ministry of Communication **Contractor :ABC Contracting Co**

Road ID : RD0001 **Road Name : Road No 1**

Super Elevation Alignment
MCW Right

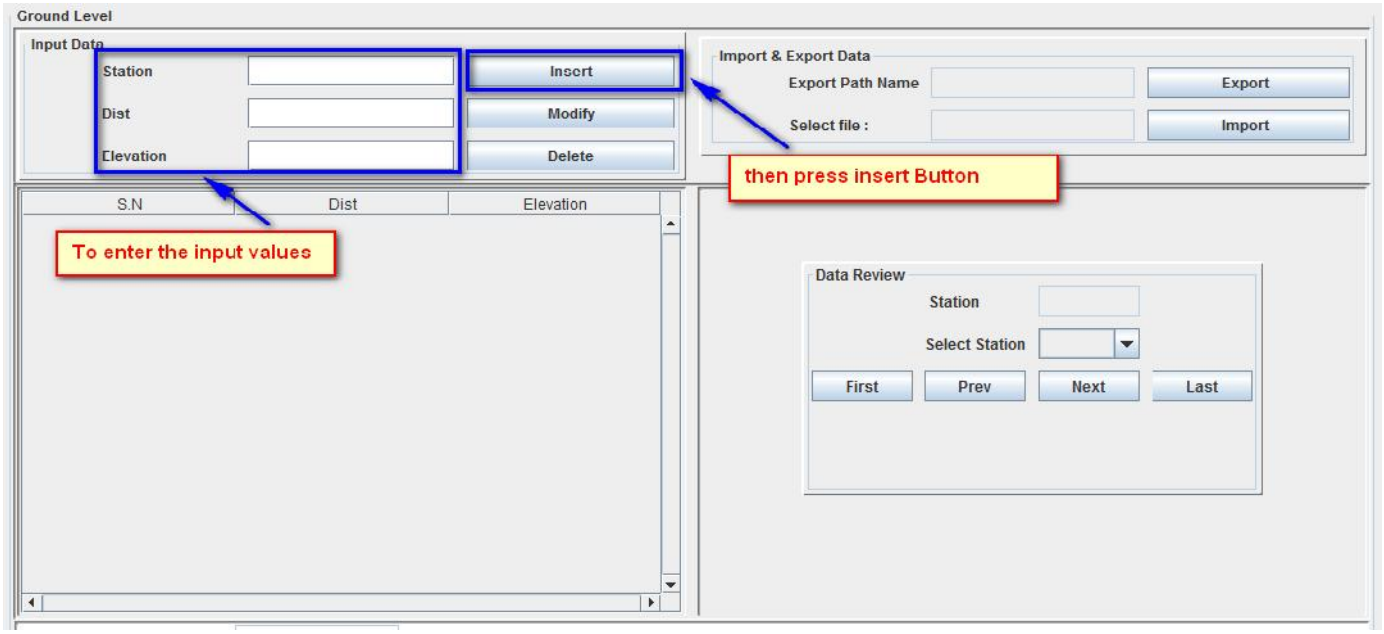
S.N	Station	Slope (%)
1	0	-1.5
2	500	-1.5
3	750	-3.3
4	1100	-3.3
5	1300	-1.5
6	1500	-1.5
7	1850	4.5
8	2600	4.5
9	2900	-1.5
10	4275	-1.5

5. Sectional Data's

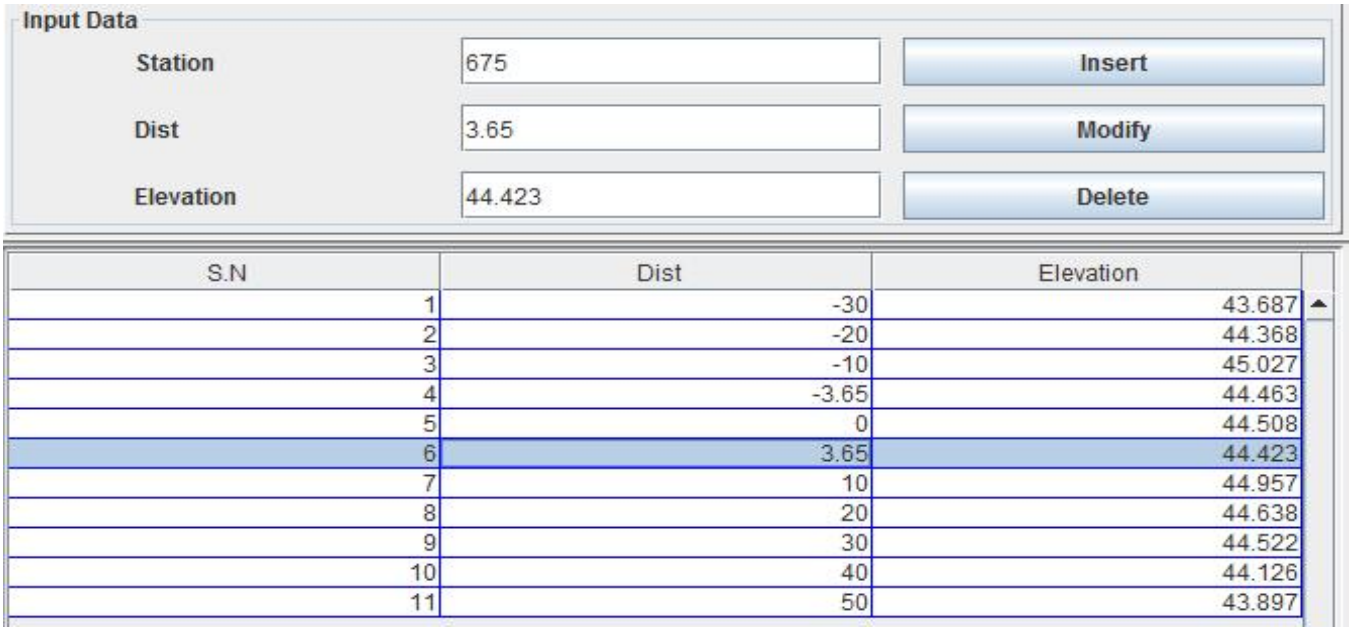
5.1 Ground Levels

5.1.1 Insert Ground Levels

To enter the values of station , Distance and Elevation in the input boxes then press " Insert " Button.



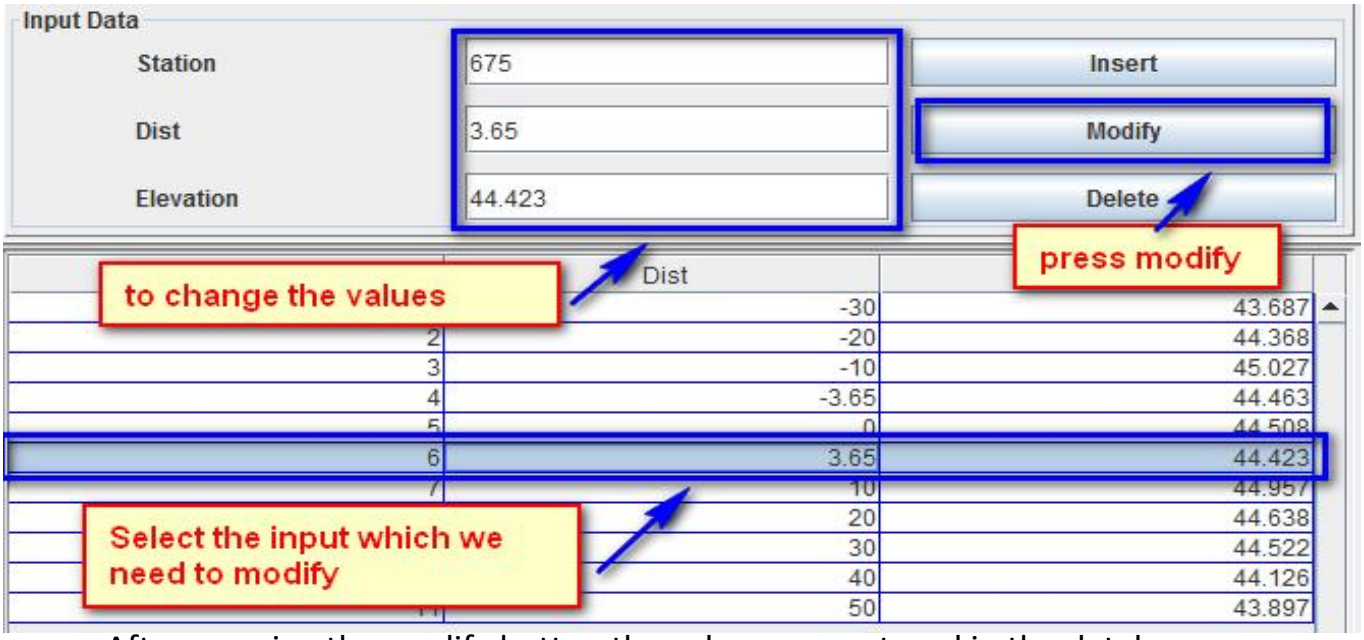
The Input values we can enter in any manner. Program will arrange the input data's arranged by ascending order based on Distance value. Whenever the input values inserted in the table the values are automatically saved in data base.



S.N	Dist	Elevation
1	-30	43.687
2	-20	44.368
3	-10	45.027
4	-3.65	44.463
5	0	44.508
6	3.65	44.423
7	10	44.957
8	20	44.638
9	30	44.522
10	40	44.126
11	50	43.897

5.1.2 Modify Ground Levels

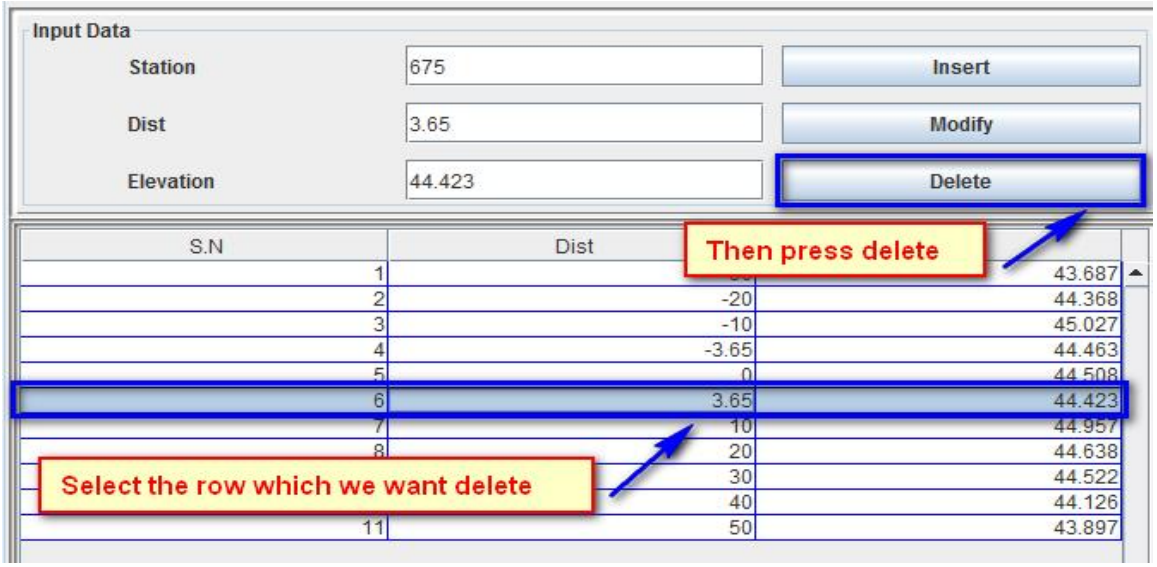
To Modify the Ground Levels by selecting the values in the table to change the values from input boxes then press " Modify ".



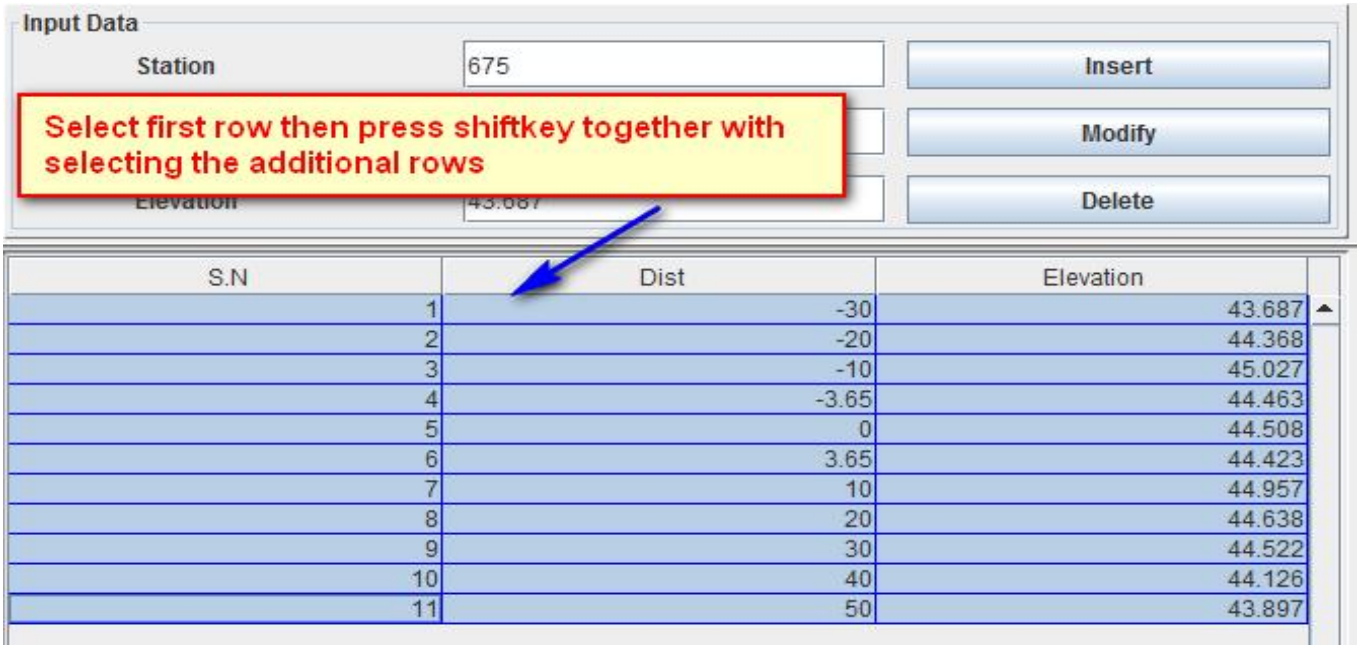
After pressing the modify button the values are restored in the databases.

5.1.3 Delete Ground Levels

To delete the any record in data base to select the row then press the delete button.

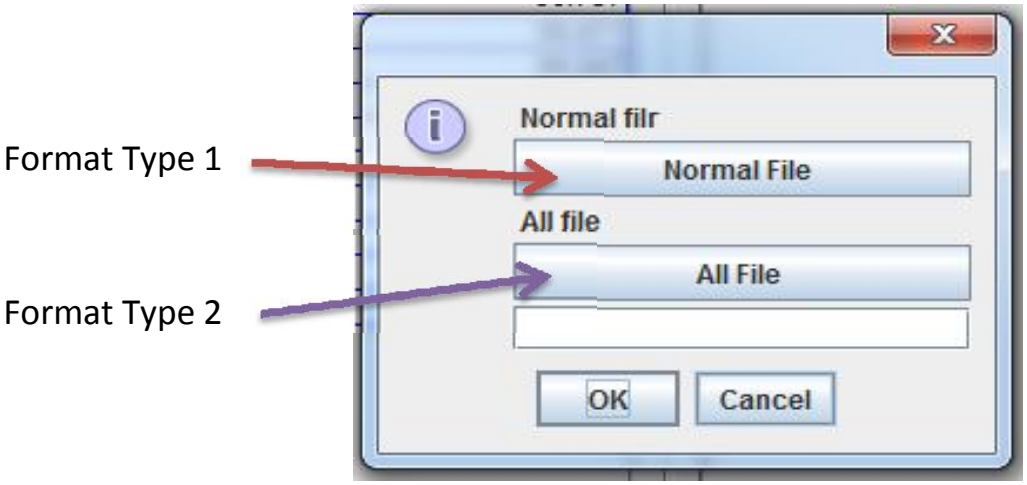


To delete the multiple selection select one row and press " Shift Key + to select the additional rows " and press delete.. If we delete the all the records in one station , the station will remove automatically from the data bases.



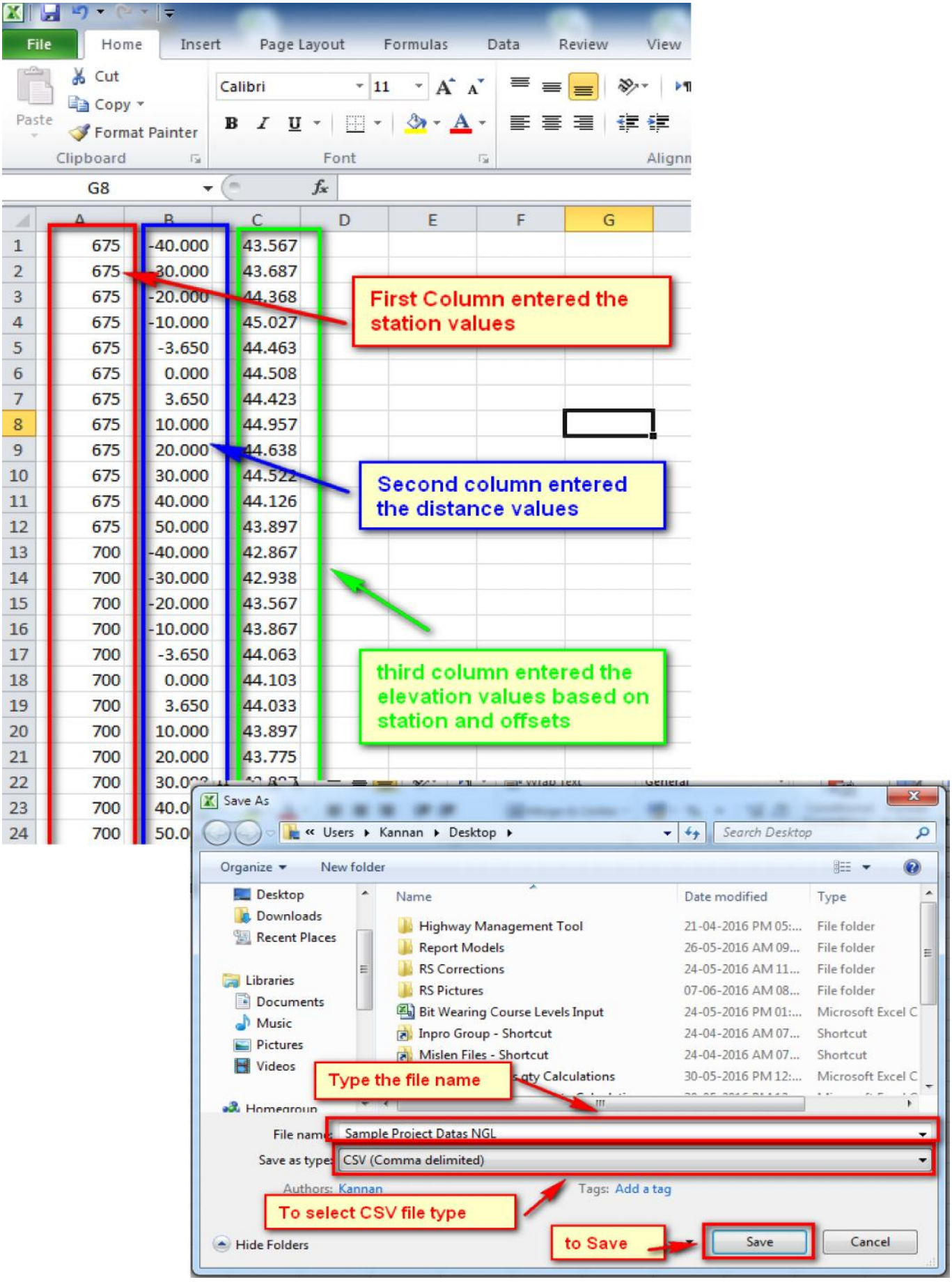
5.1.4 Import the Ground Levels

By the method of Import we can insert the ground levels from the CSV file format. For the Ground import Road Solver program accepted two type of input format . To press the import button the following window will appear..,



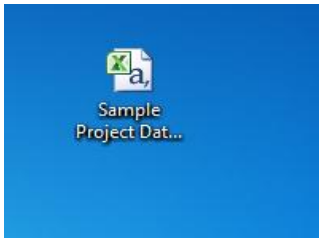
First we create the ground data values in " Excel program" for the format type 1 ..

To type the Station , Dist and Elevation based on the following format ..

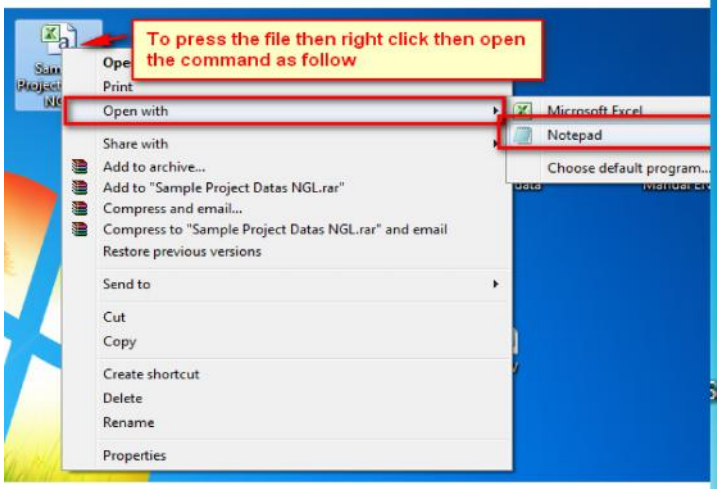


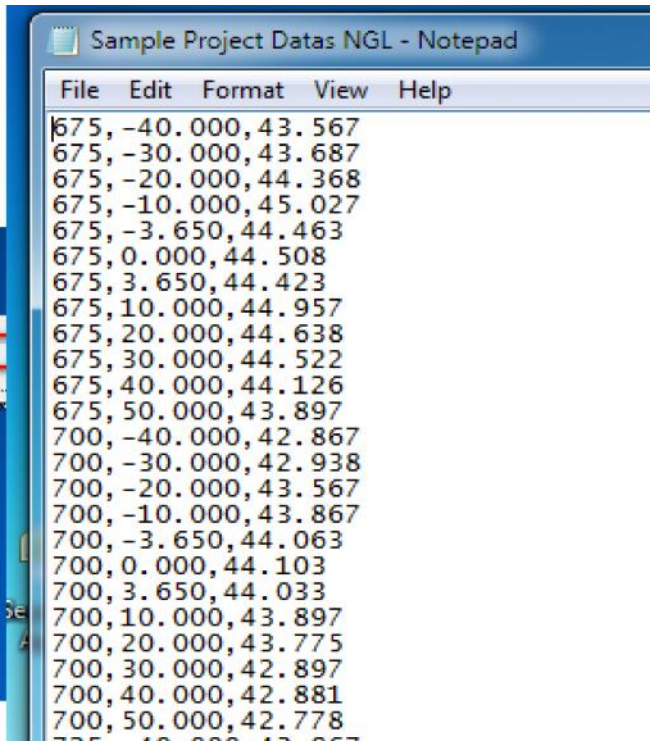
	A	B	C
1	675	-40.000	43.567
2	675	-30.000	43.687
3	675	-20.000	44.368
4	675	-10.000	45.027
5	675	-3.650	44.463
6	675	0.000	44.508
7	675	3.650	44.423
8	675	10.000	44.957
9	675	20.000	44.638
10	675	30.000	44.522
11	675	40.000	44.126
12	675	50.000	43.897
13	700	-40.000	42.867
14	700	-30.000	42.938
15	700	-20.000	43.567
16	700	-10.000	43.867
17	700	-3.650	44.063
18	700	0.000	44.103
19	700	3.650	44.033
20	700	10.000	43.897
21	700	20.000	43.775
22	700	30.0	
23	700	40.0	
24	700	50.0	

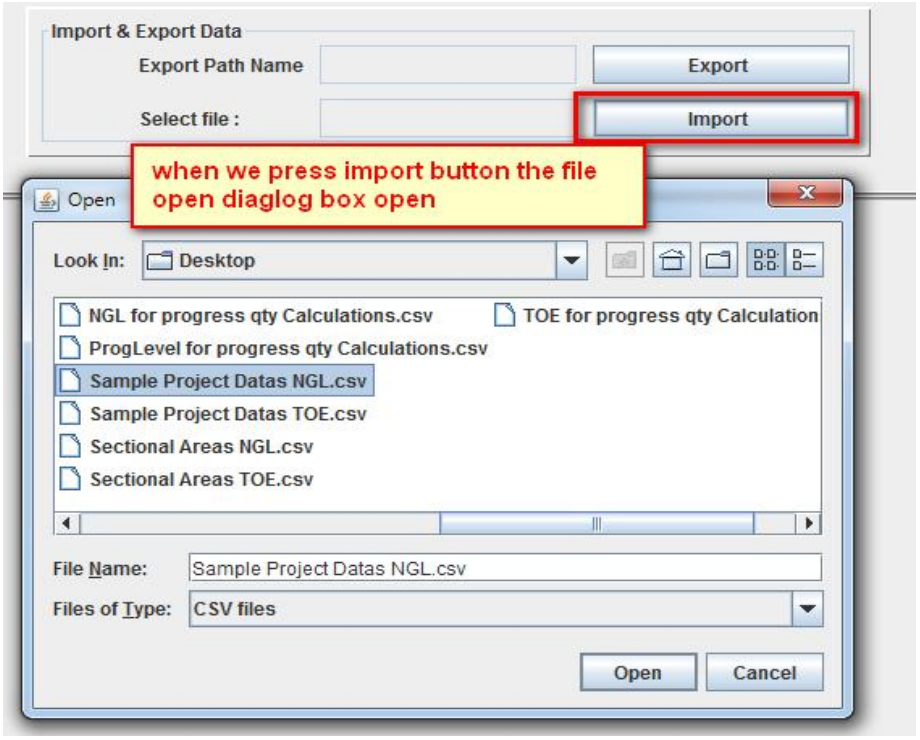
After successful completion of ground levels inputs in excel then save the excel file to CSV file format… Now to see the file in desktop for your computer as same as following figure..



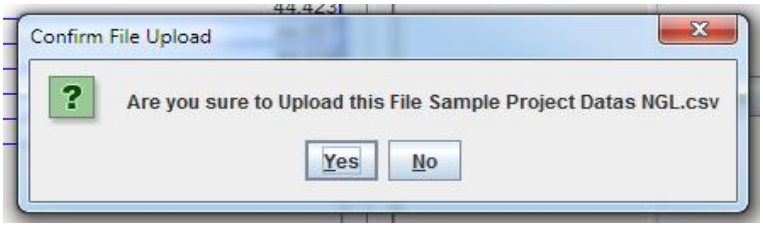
To view the file by opening the the csv file in notepad , the see the data like this .



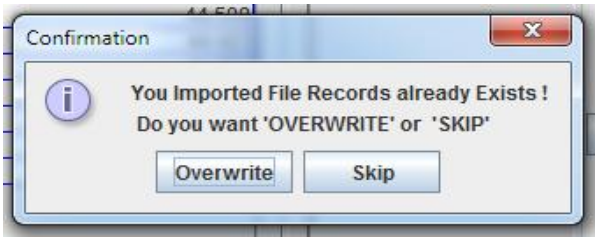




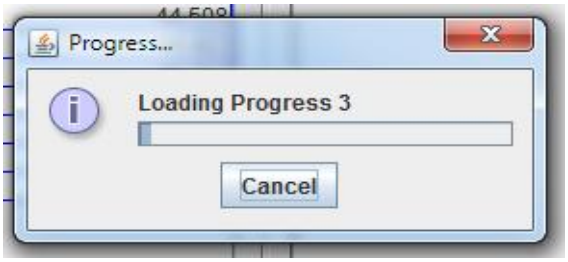
To open the file to confirm the file upload..,



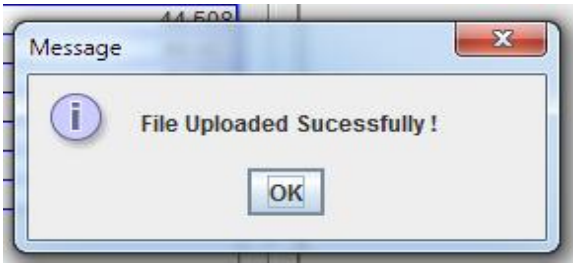
After confirmation if any data in data base to confirm the " overwrite or skip"



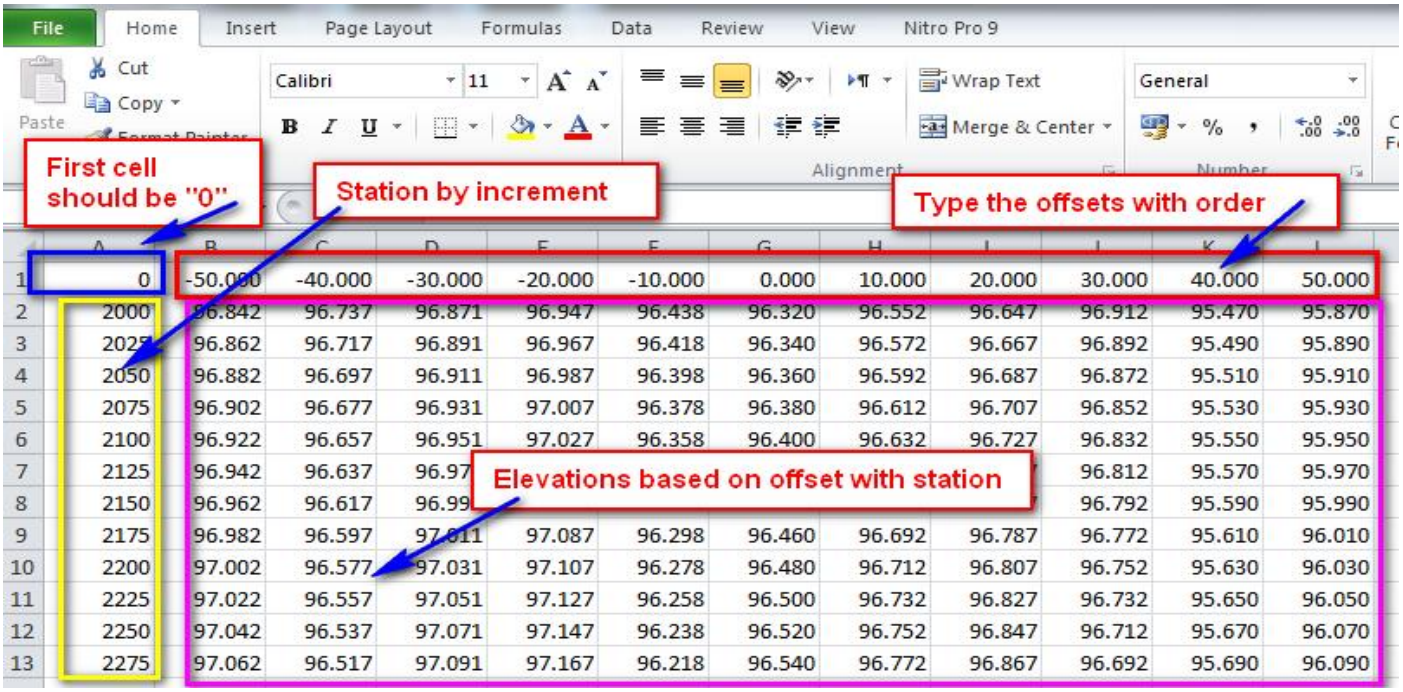
When the loading the data the progress bar updating the datas input…



When the data's are successfully loaded the message box will confirm the loading..

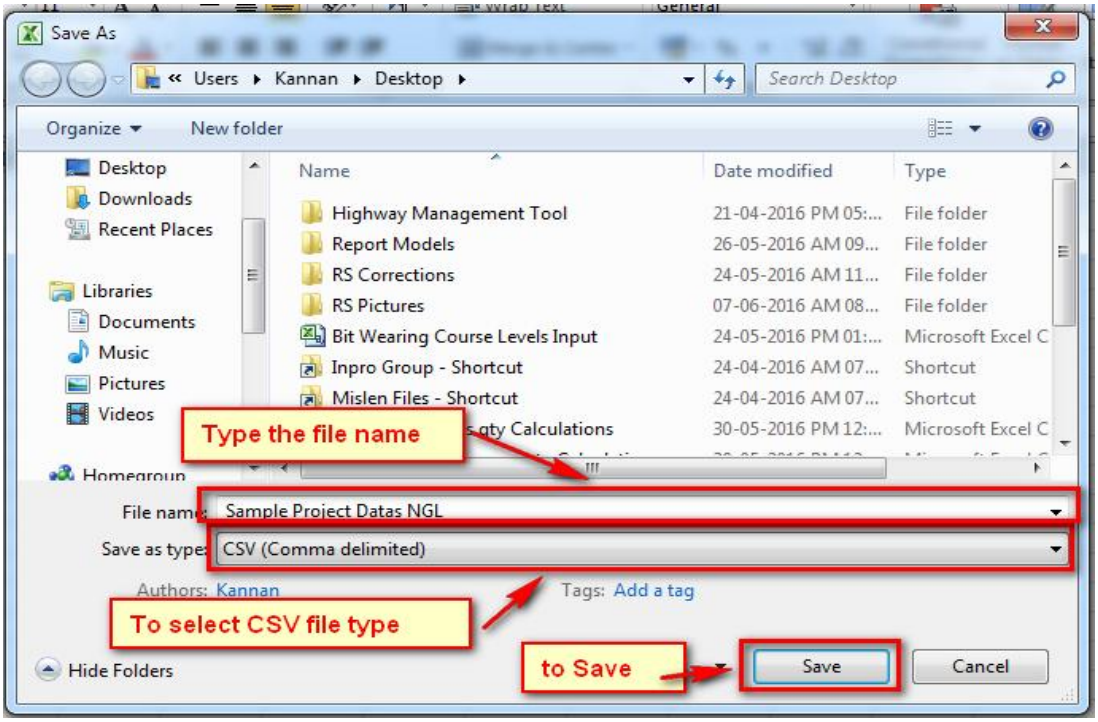


For Type 2 Format to create the NGL based on the following..,

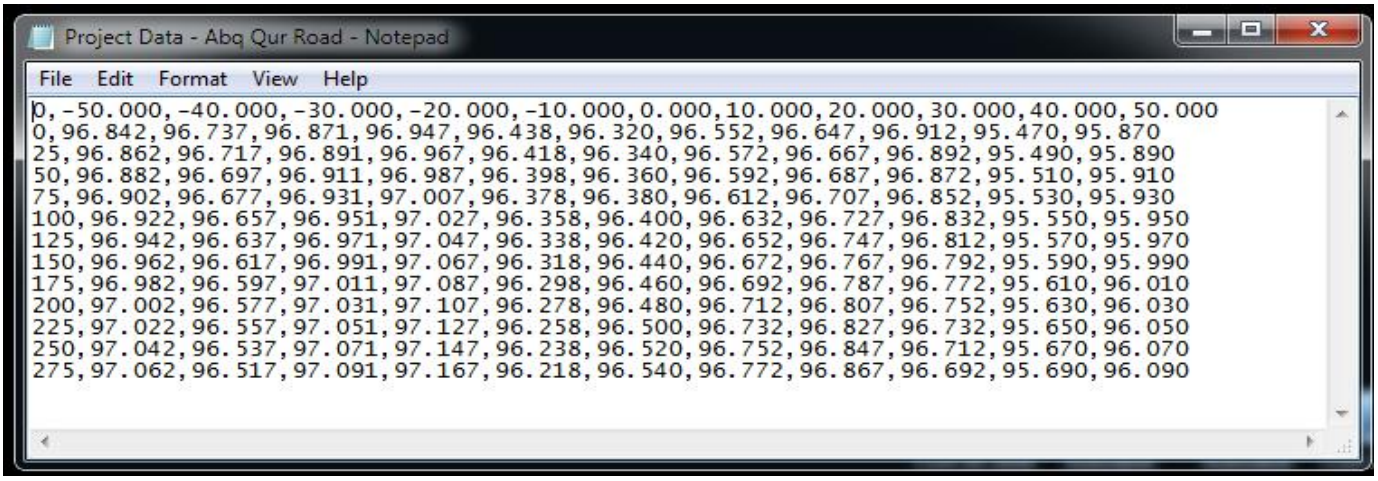


	A	B	C	D	E	F	G	H	I	J	K	L
1	0	-50.000	-40.000	-30.000	-20.000	-10.000	0.000	10.000	20.000	30.000	40.000	50.000
2	2000	96.842	96.737	96.871	96.947	96.438	96.320	96.552	96.647	96.912	95.470	95.870
3	2025	96.862	96.717	96.891	96.967	96.418	96.340	96.572	96.667	96.892	95.490	95.890
4	2050	96.882	96.697	96.911	96.987	96.398	96.360	96.592	96.687	96.872	95.510	95.910
5	2075	96.902	96.677	96.931	97.007	96.378	96.380	96.612	96.707	96.852	95.530	95.930
6	2100	96.922	96.657	96.951	97.027	96.358	96.400	96.632	96.727	96.832	95.550	95.950
7	2125	96.942	96.637	96.97						96.812	95.570	95.970
8	2150	96.962	96.617	96.99						96.792	95.590	95.990
9	2175	96.982	96.597	97.011	97.087	96.298	96.460	96.692	96.787	96.772	95.610	96.010
10	2200	97.002	96.577	97.031	97.107	96.278	96.480	96.712	96.807	96.752	95.630	96.030
11	2225	97.022	96.557	97.051	97.127	96.258	96.500	96.732	96.827	96.732	95.650	96.050
12	2250	97.042	96.537	97.071	97.147	96.238	96.520	96.752	96.847	96.712	95.670	96.070
13	2275	97.062	96.517	97.091	97.167	96.218	96.540	96.772	96.867	96.692	95.690	96.090

To save the file in CSV format



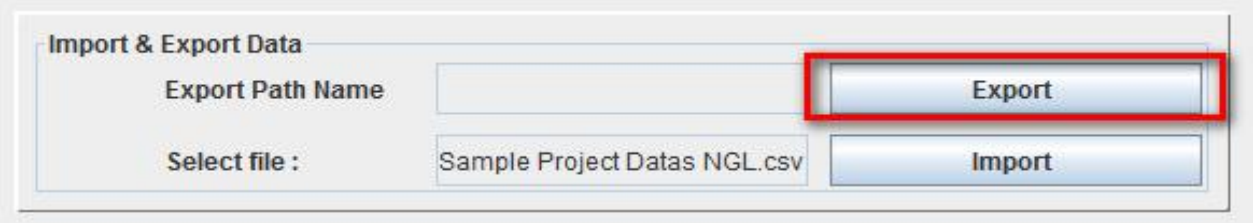
The file look like as follow..,



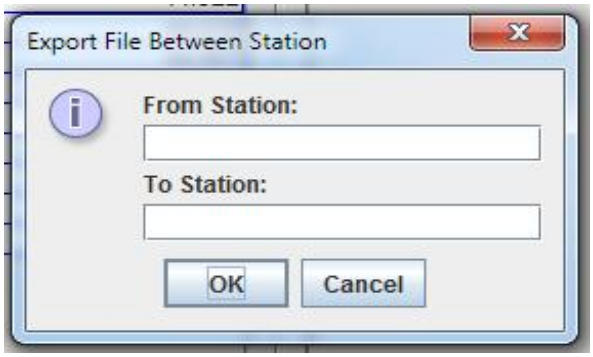
The Remaining actions same as format type 1 ...

5.1.5 Export the Ground Levels

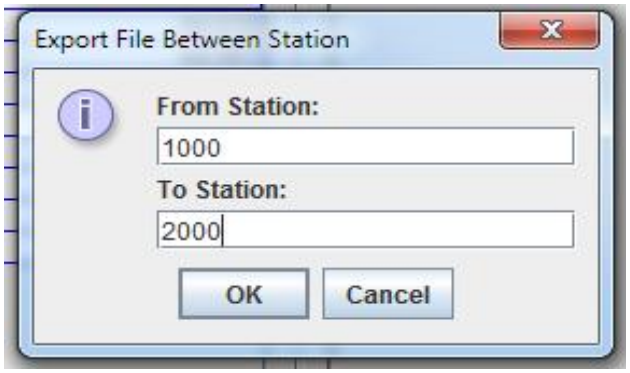
The ground data's need to export to select the export button..,



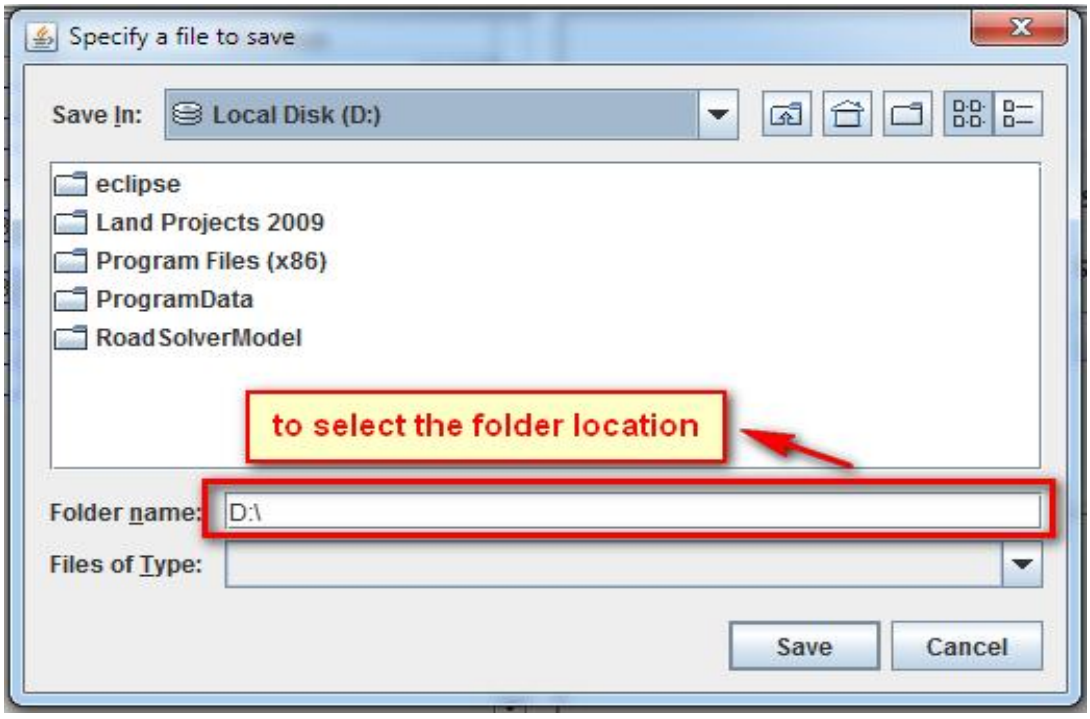
After selection the station reference window will appear



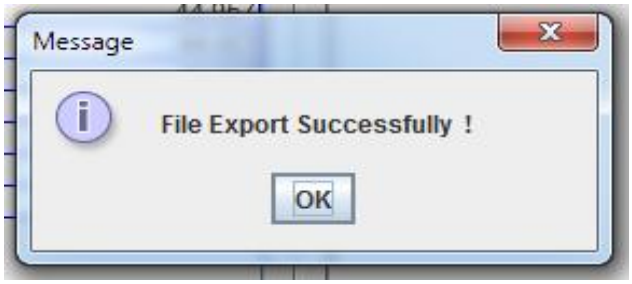
To enter the required station intervals which we want to export..,



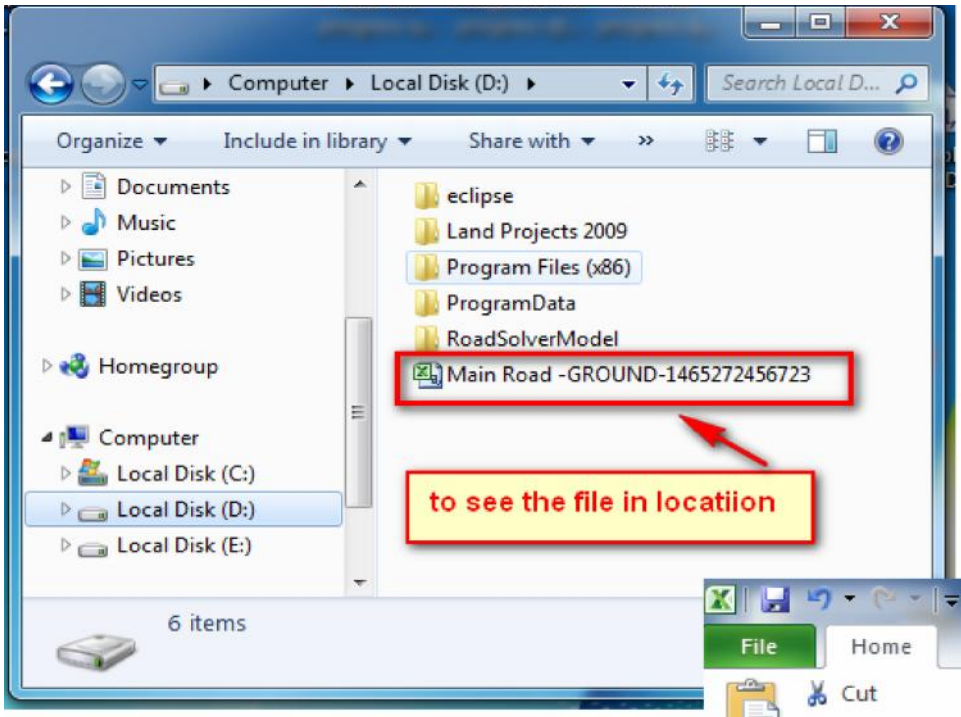
Then select the location which we want to store the file…



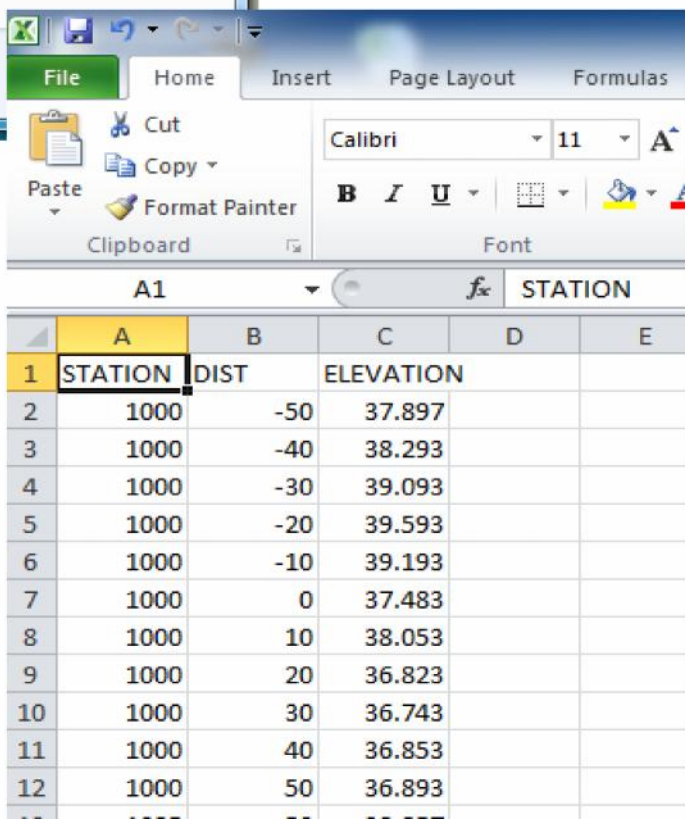
After successful completion of export the message box will appear..



to check the file which we stored that location…,



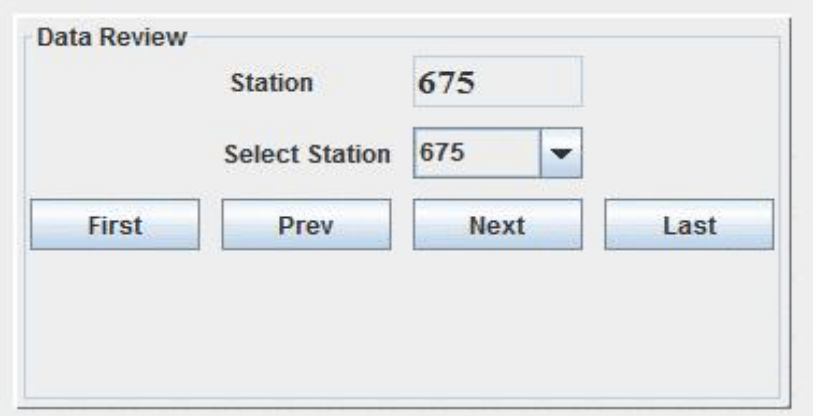
to open that file in excel the datas will appear same as figure.



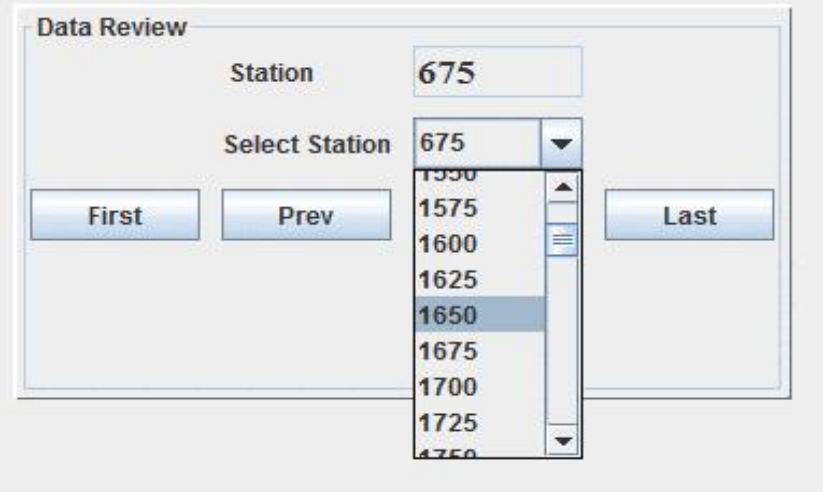
	A	B	C	D	E
1	STATION	DIST	ELEVATION		
2	1000	-50	37.897		
3	1000	-40	38.293		
4	1000	-30	39.093		
5	1000	-20	39.593		
6	1000	-10	39.193		
7	1000	0	37.483		
8	1000	10	38.053		
9	1000	20	36.823		
10	1000	30	36.743		
11	1000	40	36.853		
12	1000	50	36.893		

5.1.6 Data's Review

Data review option to review the data's which is in the database file…



If we press " First Button " the first station record will appear
If we press " Last Button " the Last station record will appear
To Press " Prev " or " Next " buttons to review the records in front or back.

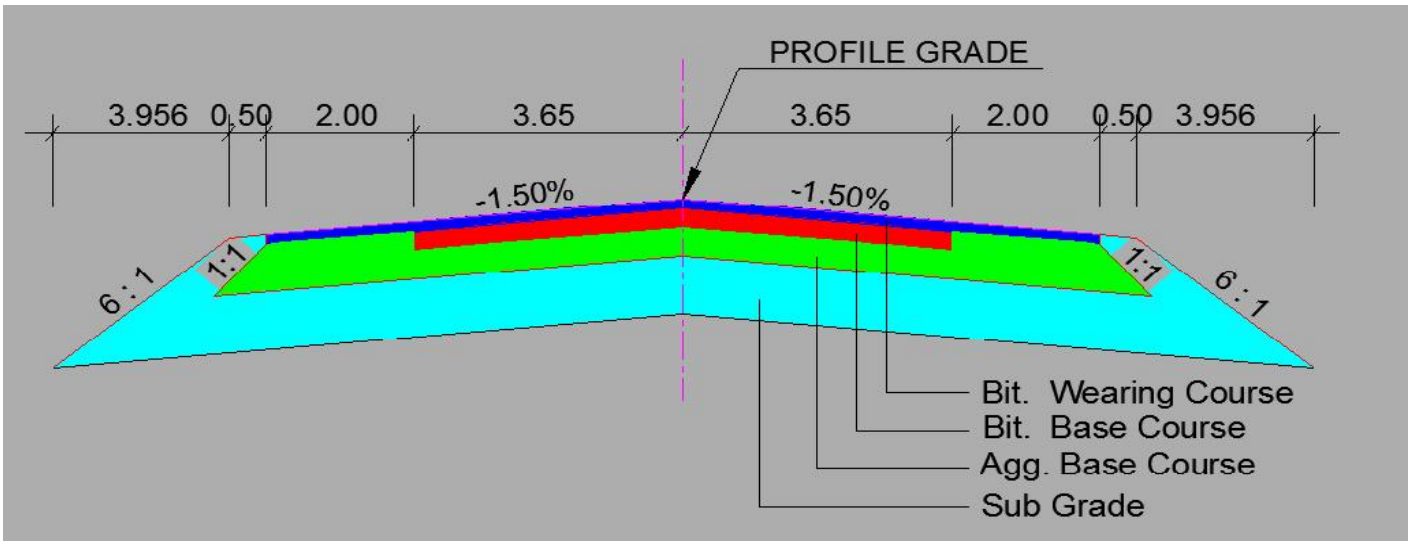


Also select the station from pulldown button to choose the particular station that station record will appear in the ground data box.

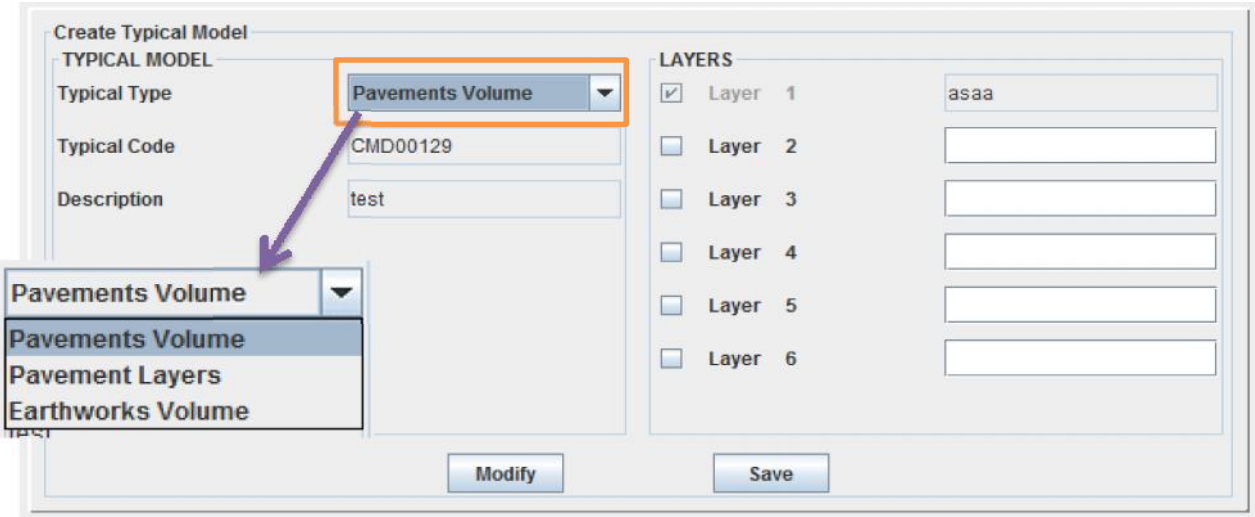
5.2 Pavement Levels

5.2.1 Pavement Levels - Overview

In Road Section the major structure of body is contains the pave--ment structure . In this structure contains too many layers like BWC , BBC, Agg BC , Sub Base and Sub Grade. The following figure represents the sample diagram of pavement structure in single road pavements.



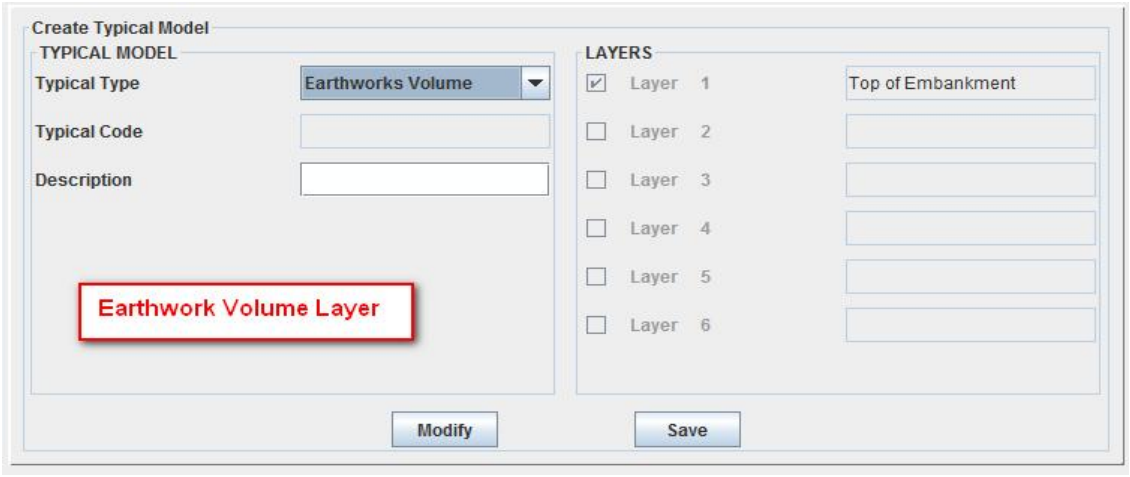
Pavement Levels database contains Earthwork Volume Layer - Top of Embankment , Pavement Volume Layers - 6 Nos. Before create the levels in Pave-ment in Typical Section model should create the Pavement Layers name and save .. After saving the layers only the pavement layer should appear in the table.



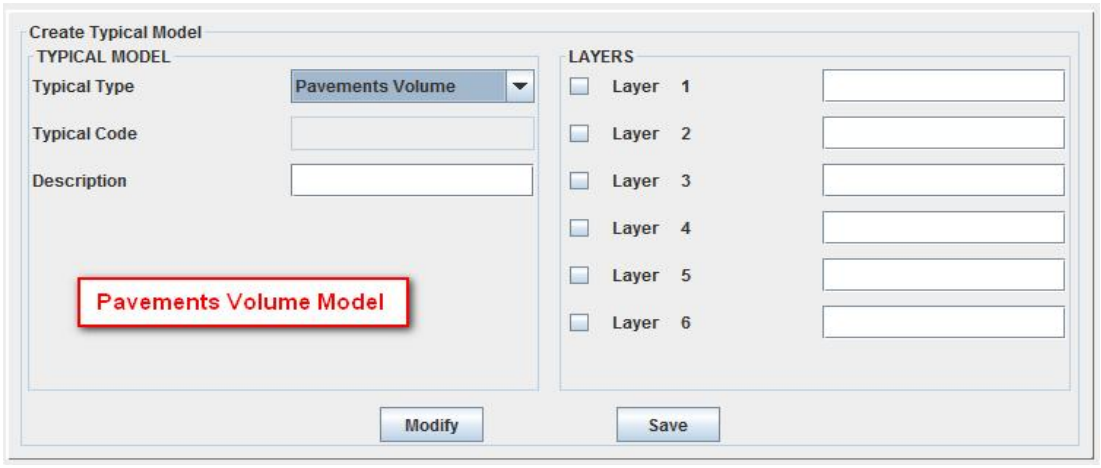
5.2.2 Create Pavement Layers

Before insert the pavement layers first to create the Typical Model from Typical Calculation menu to make the pavement layers and save that details.

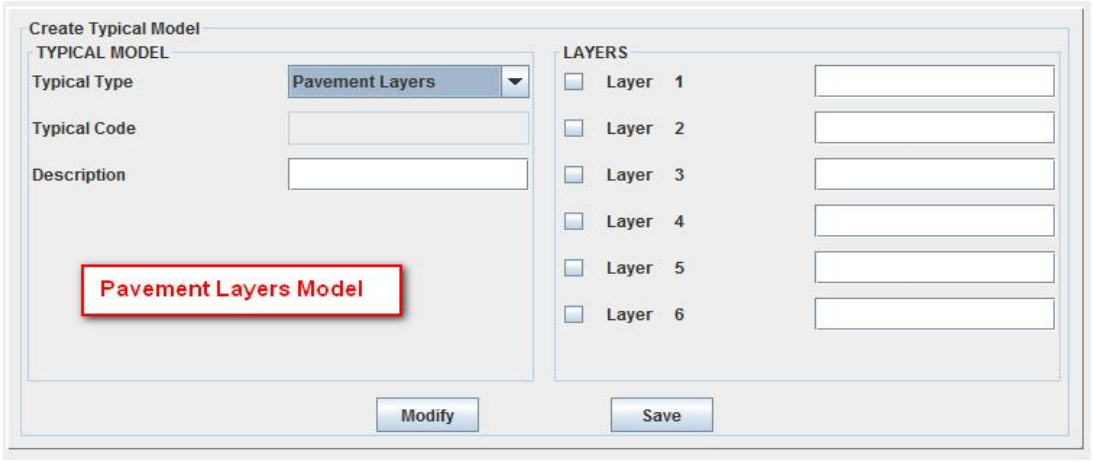
1. Earthwork Volume- contains 1 Layer



2. Pavement Volume - contains 6 Layers

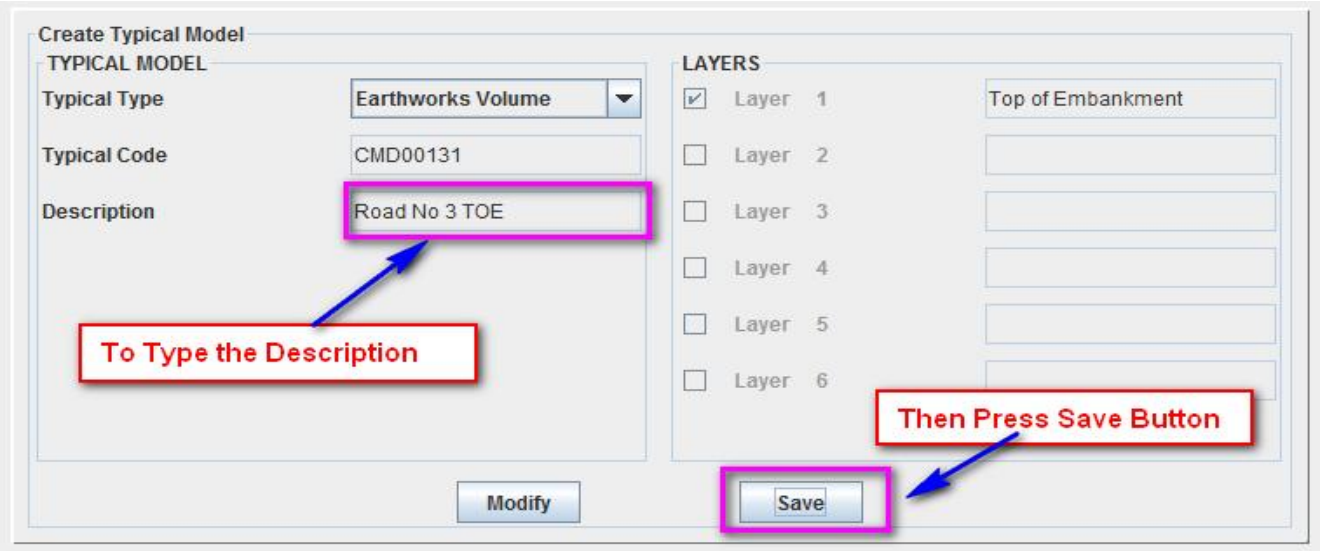


3. Pavement Layers - contains 6 Layers



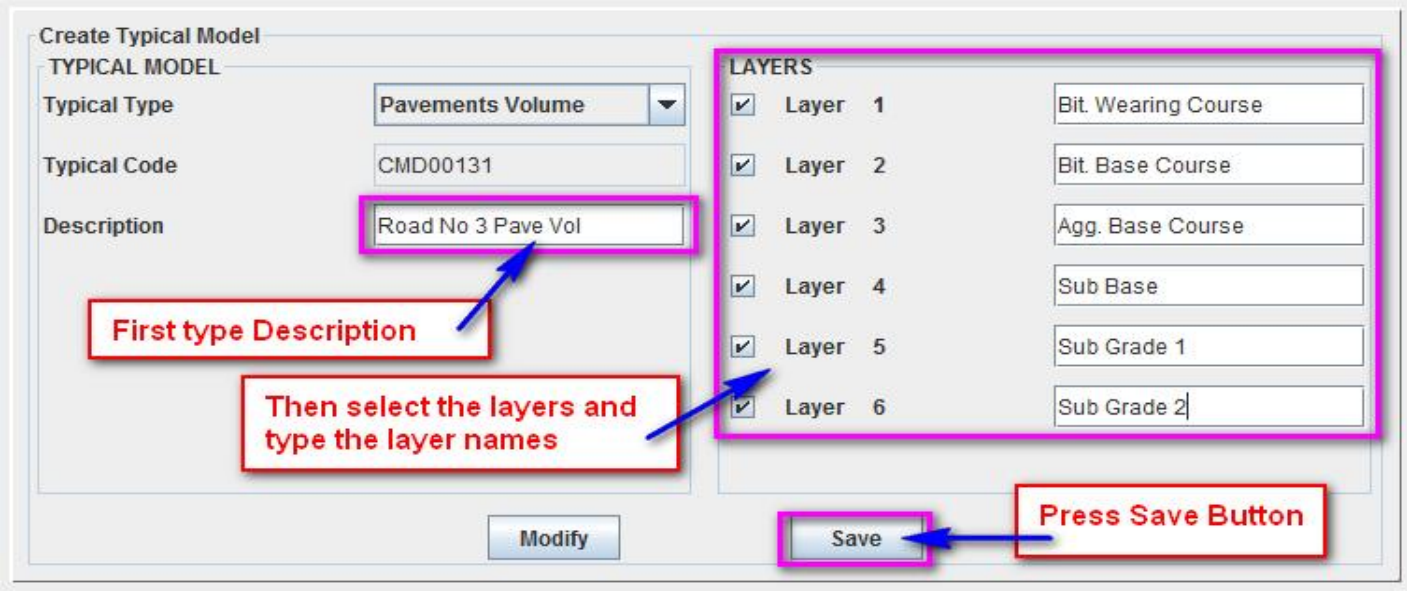
This Layers to calculated the Pavement levels calculation purpose.

Earthwork Volume- Top of Embankment creation



Now the Top of Embankment layer created in Pavement Levels table.

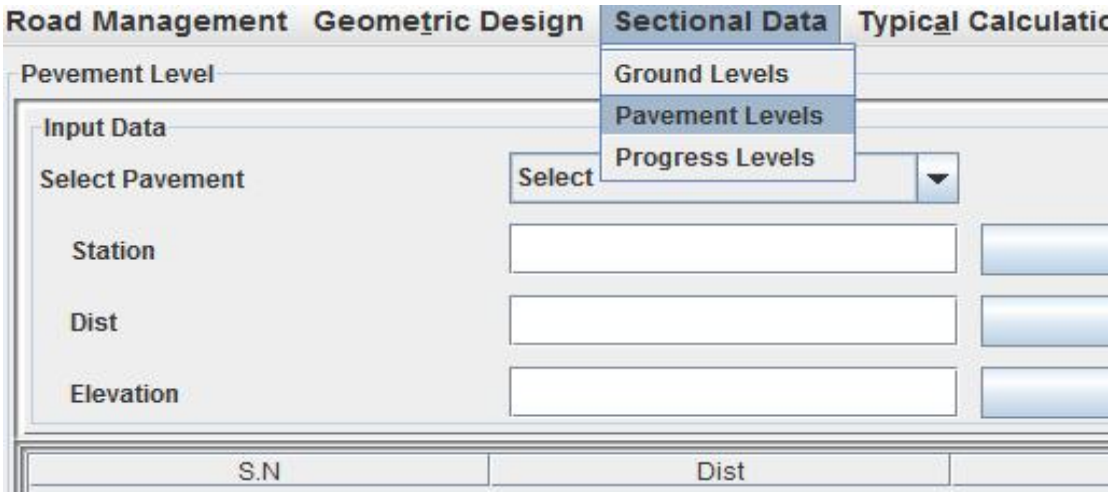
2. Pavement Volume - contains 6 Layers



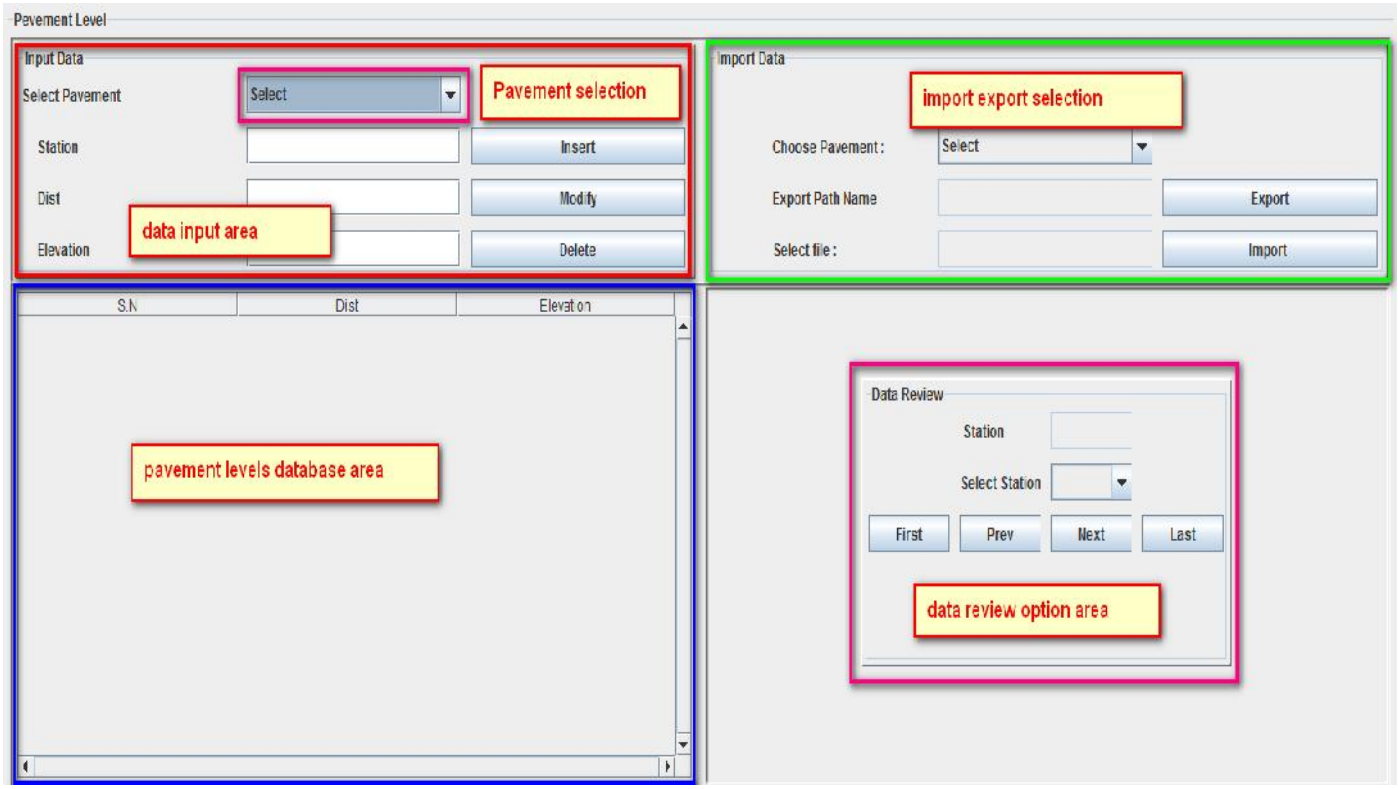
Now Bit. Wearing Course , Bit. Base Course , Agg. Base Course , Sub Base Sub Grade 1 , Sub Grade 2 Layers created in Pavement Table.

5.2.3 Selection of Pavement

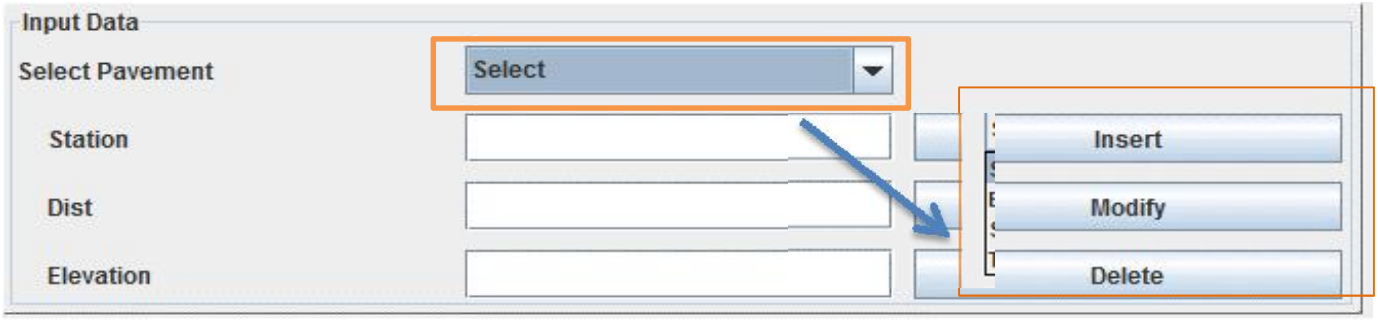
Successfully created the Typical Model .., to open sectional datas the pave--ment levels.



Now the Pavement Level Window will appear..,

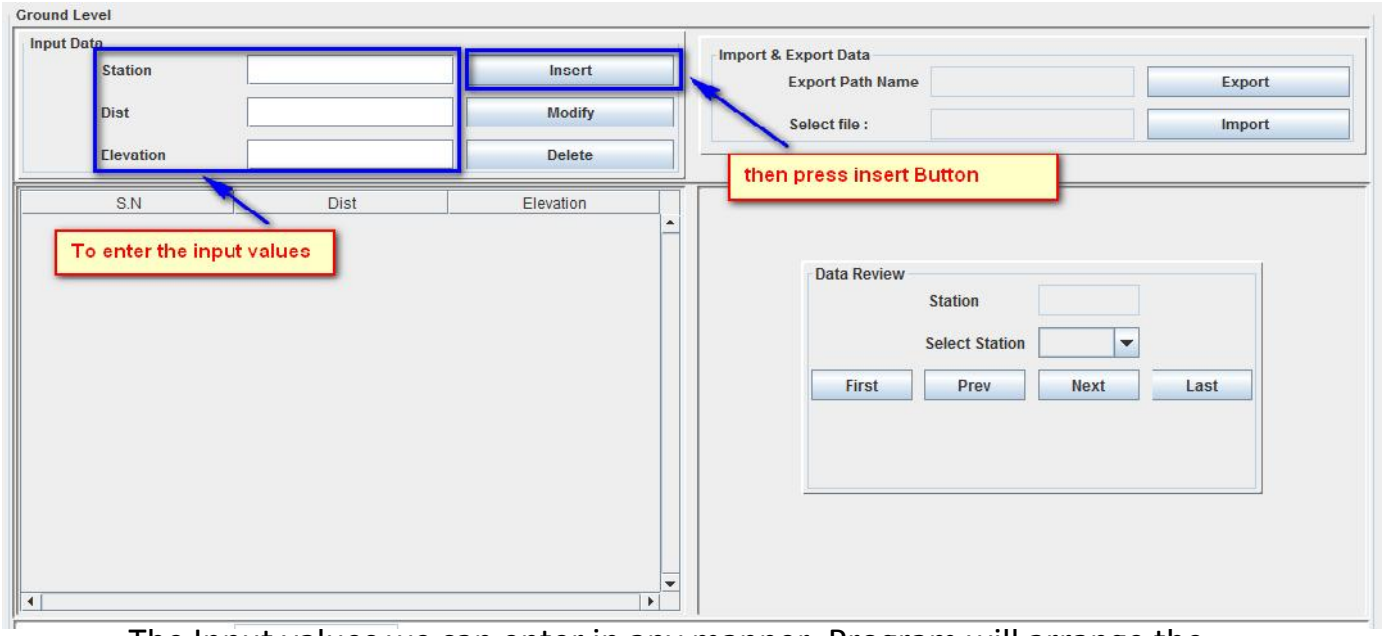


From the input data area select the pavement type then enter the input values.

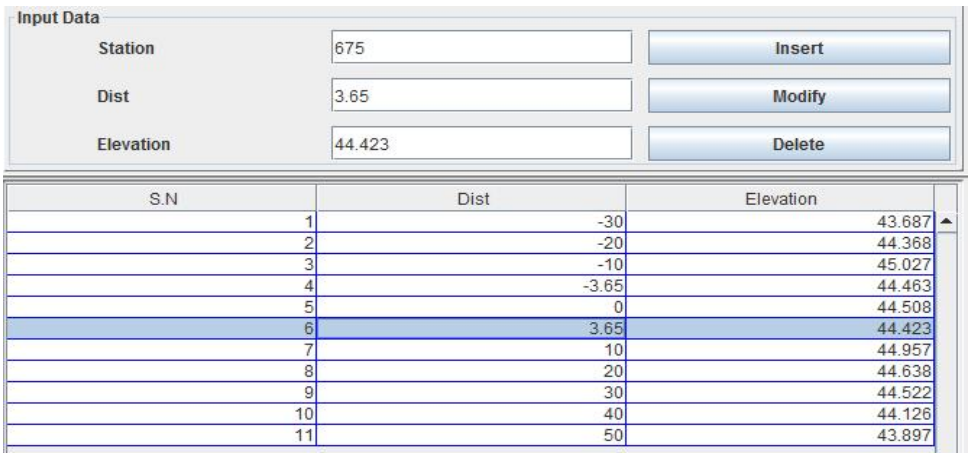


5.2.4 Insert Pavement Levels

To enter the values of station , Distance and Elevation in the input boxes then press " Insert " Button.



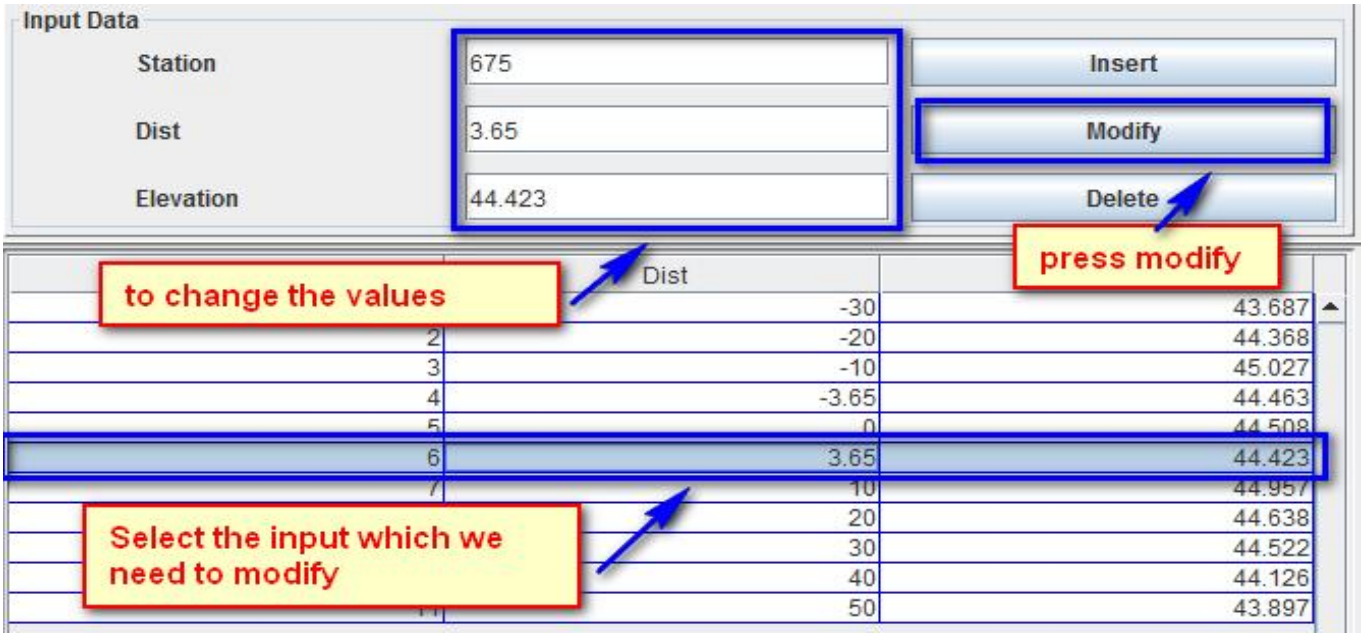
The Input values we can enter in any manner. Program will arrange the input data's arranged by ascending order based on Distance value. Whenever the input values inserted in the table the values are automatically saved in data base.



S.N	Dist	Elevation
1	-30	43.687
2	-20	44.368
3	-10	45.027
4	-3.65	44.463
5	0	44.508
6	3.65	44.423
7	10	44.957
8	20	44.638
9	30	44.522
10	40	44.126
11	50	43.897

5.2.5 Modify Pavement Levels

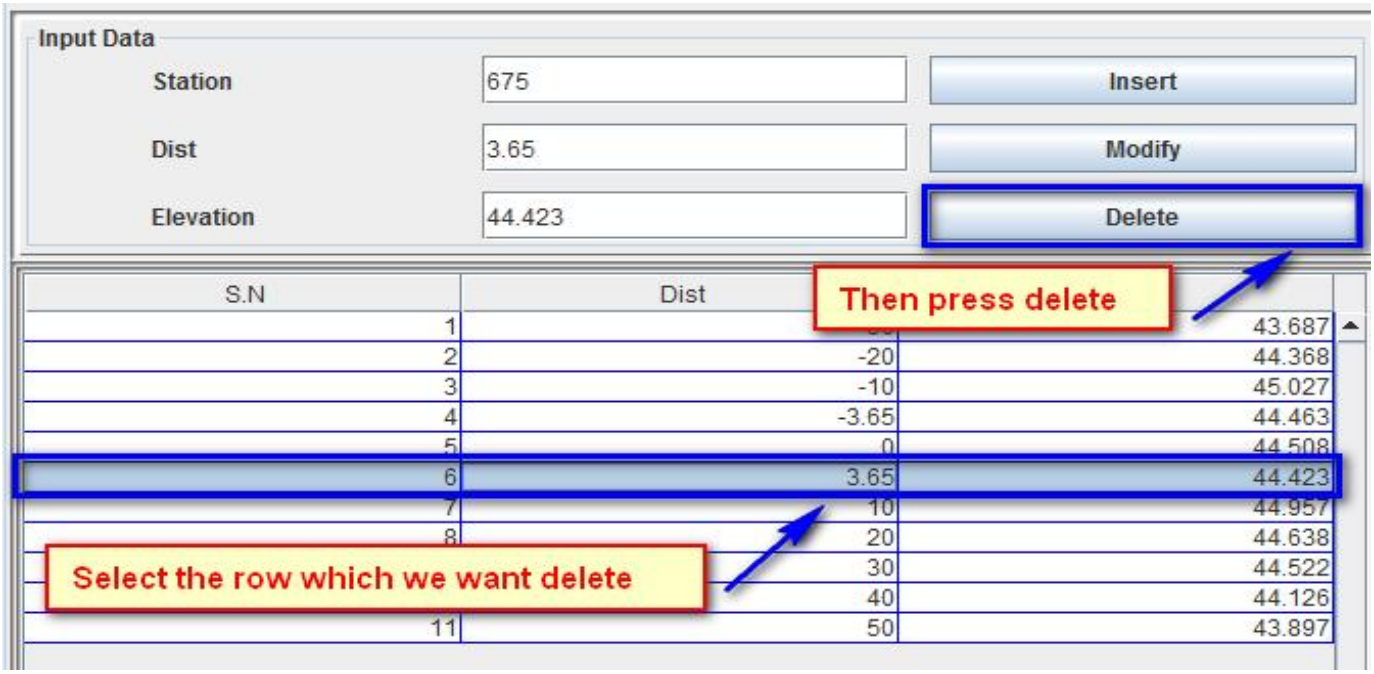
To Modify the Pavement Levels by selecting the values in the table to change the values from input boxes then press " Modify ".



After pressing the modify button the values are restored in the databases.

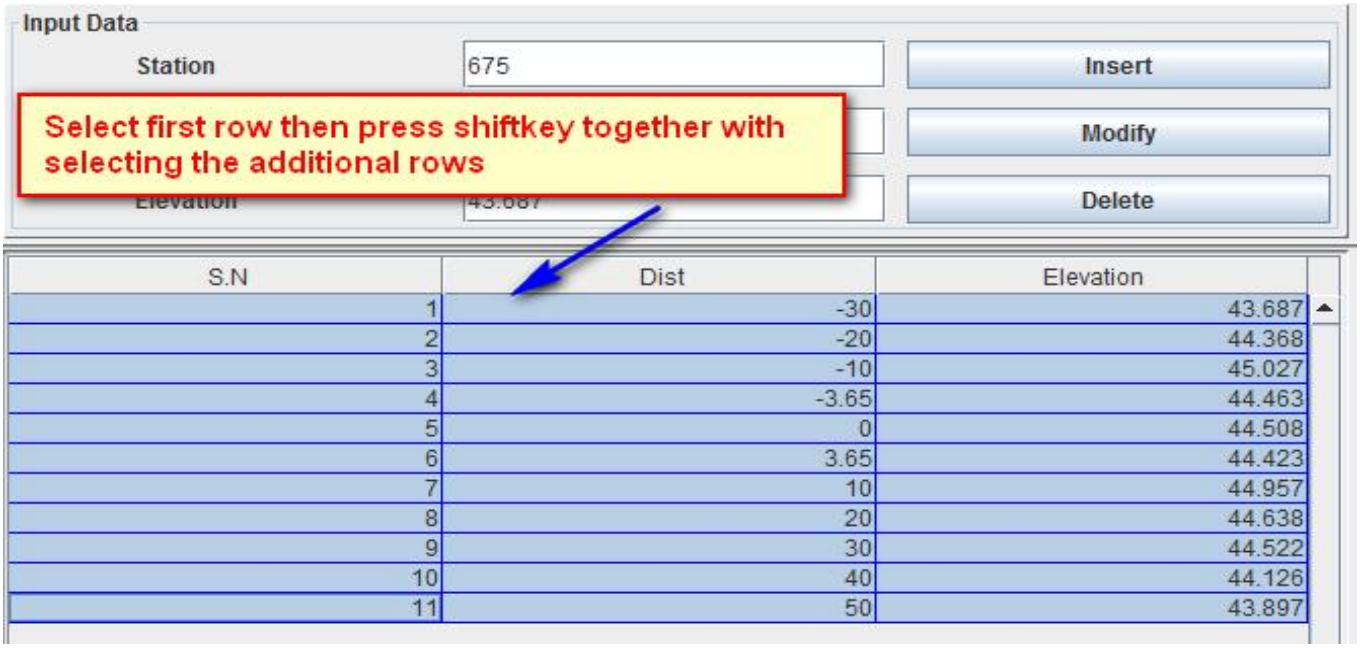
5.2.6 Delete Pavement Levels

To delete the any record in data base to select the row then press the delete button.



S.N	Dist	Elevation
1		43.687
2	-20	44.368
3	-10	45.027
4	-3.65	44.463
5	0	44.508
6	3.65	44.423
7	10	44.957
8	20	44.638
	30	44.522
	40	44.126
11	50	43.897

To delete the multiple selection select one row and press " Shift Key + to select the additional rows " and press delete.. If we delete the all the records in one station , the station will remove automatically from the data bases.

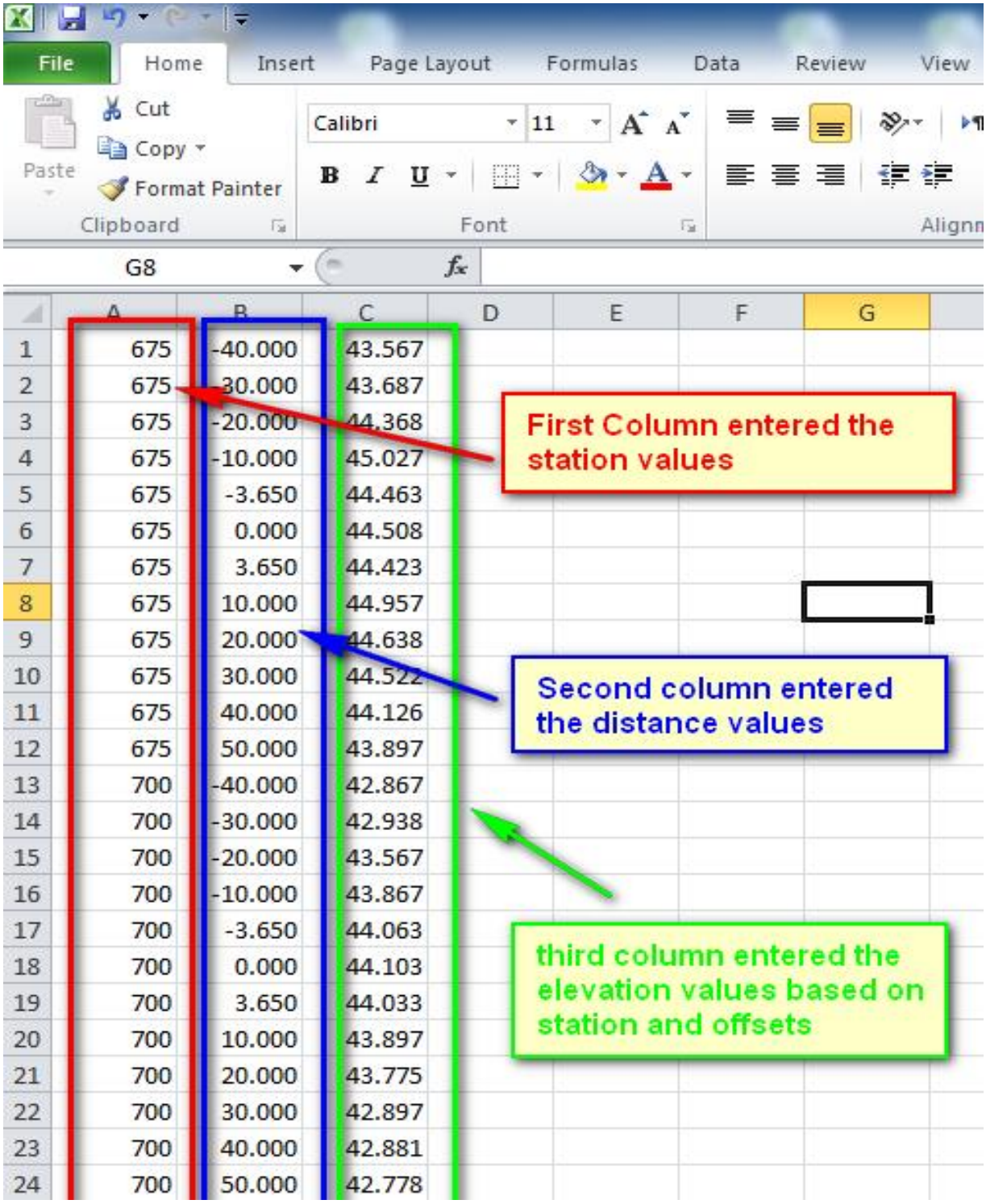


S.N	Dist	Elevation
1	-30	43.687
2	-20	44.368
3	-10	45.027
4	-3.65	44.463
5	0	44.508
6	3.65	44.423
7	10	44.957
8	20	44.638
9	30	44.522
10	40	44.126
11	50	43.897

5.2.7 Import Pavement Levels

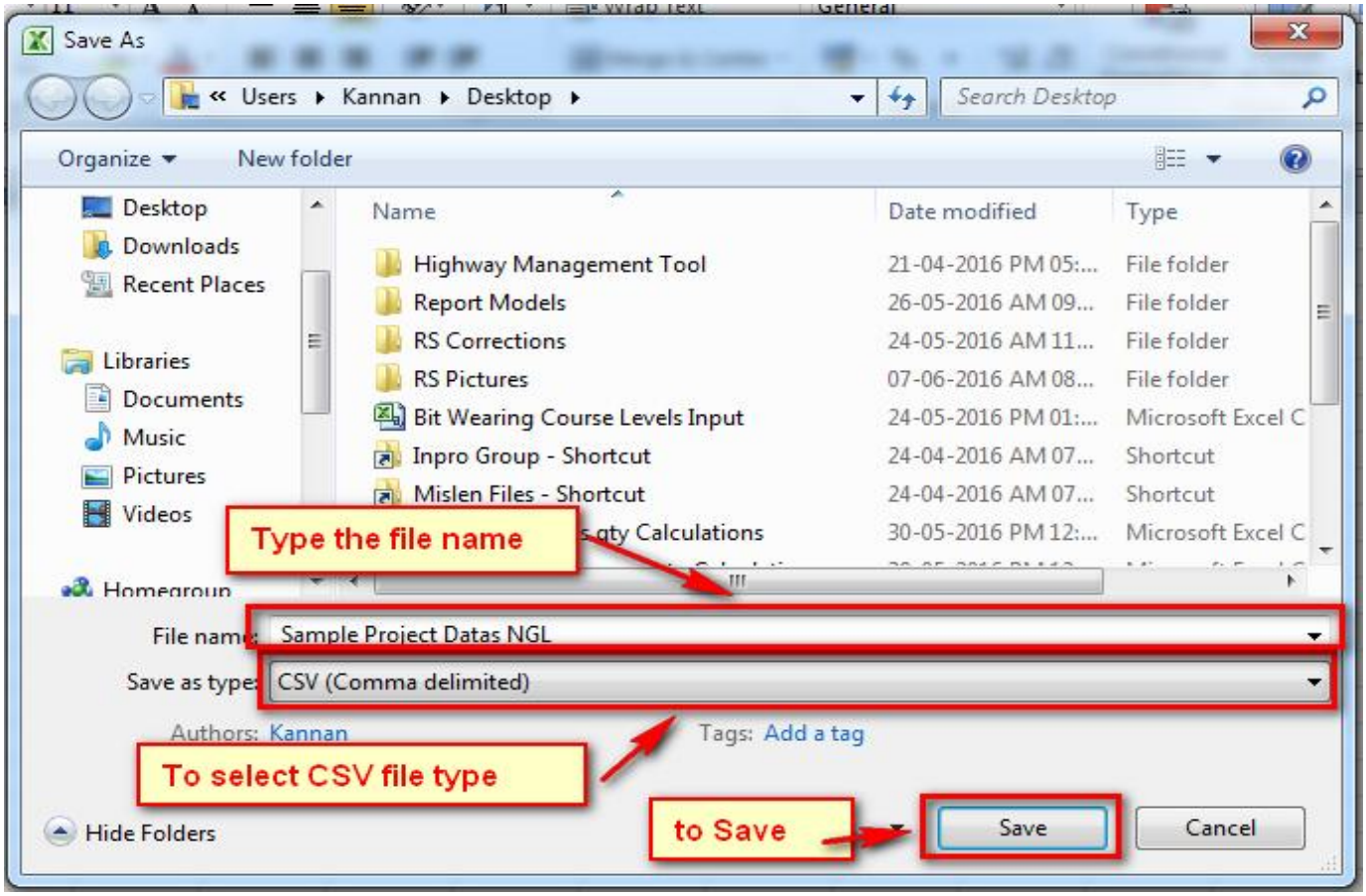
By the method of Import we can insert the pavement levels from the CSV file format.

First we create the pavement data values in " Excel program" based on the following figure…

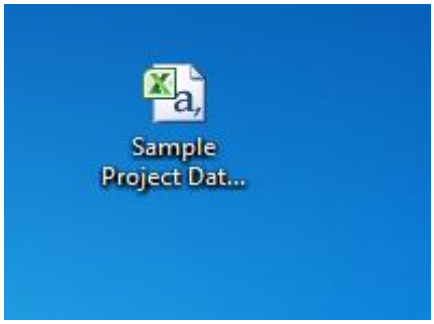


	A	B	C
1	675	-40.000	43.567
2	675	-30.000	43.687
3	675	-20.000	44.368
4	675	-10.000	45.027
5	675	-3.650	44.463
6	675	0.000	44.508
7	675	3.650	44.423
8	675	10.000	44.957
9	675	20.000	44.638
10	675	30.000	44.522
11	675	40.000	44.126
12	675	50.000	43.897
13	700	-40.000	42.867
14	700	-30.000	42.938
15	700	-20.000	43.567
16	700	-10.000	43.867
17	700	-3.650	44.063
18	700	0.000	44.103
19	700	3.650	44.033
20	700	10.000	43.897
21	700	20.000	43.775
22	700	30.000	42.897
23	700	40.000	42.881
24	700	50.000	42.778

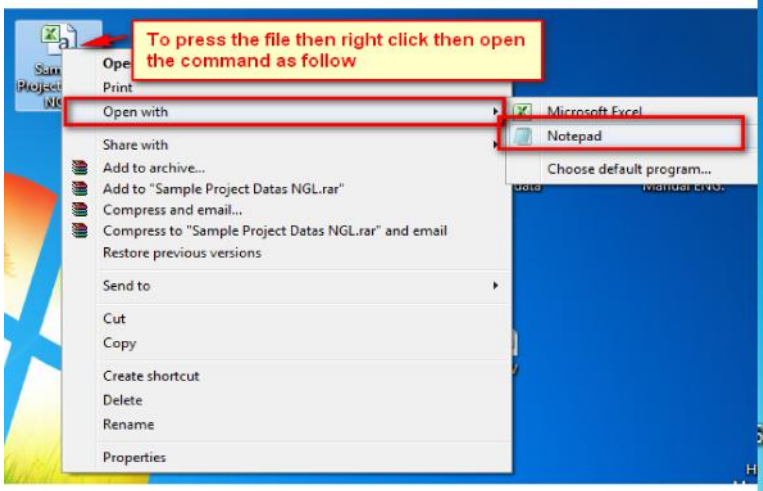
After successful completion of ground levels inputs in excel then save the excel file to CSV file format…

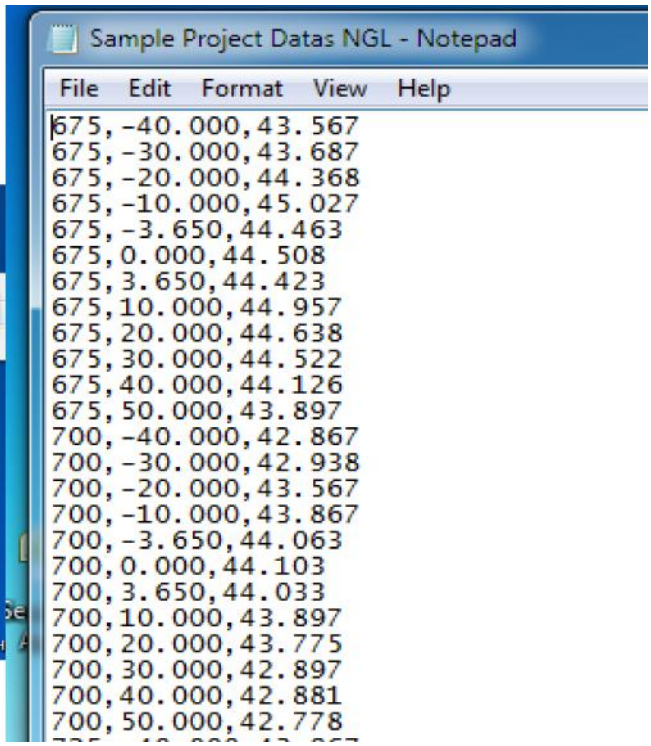


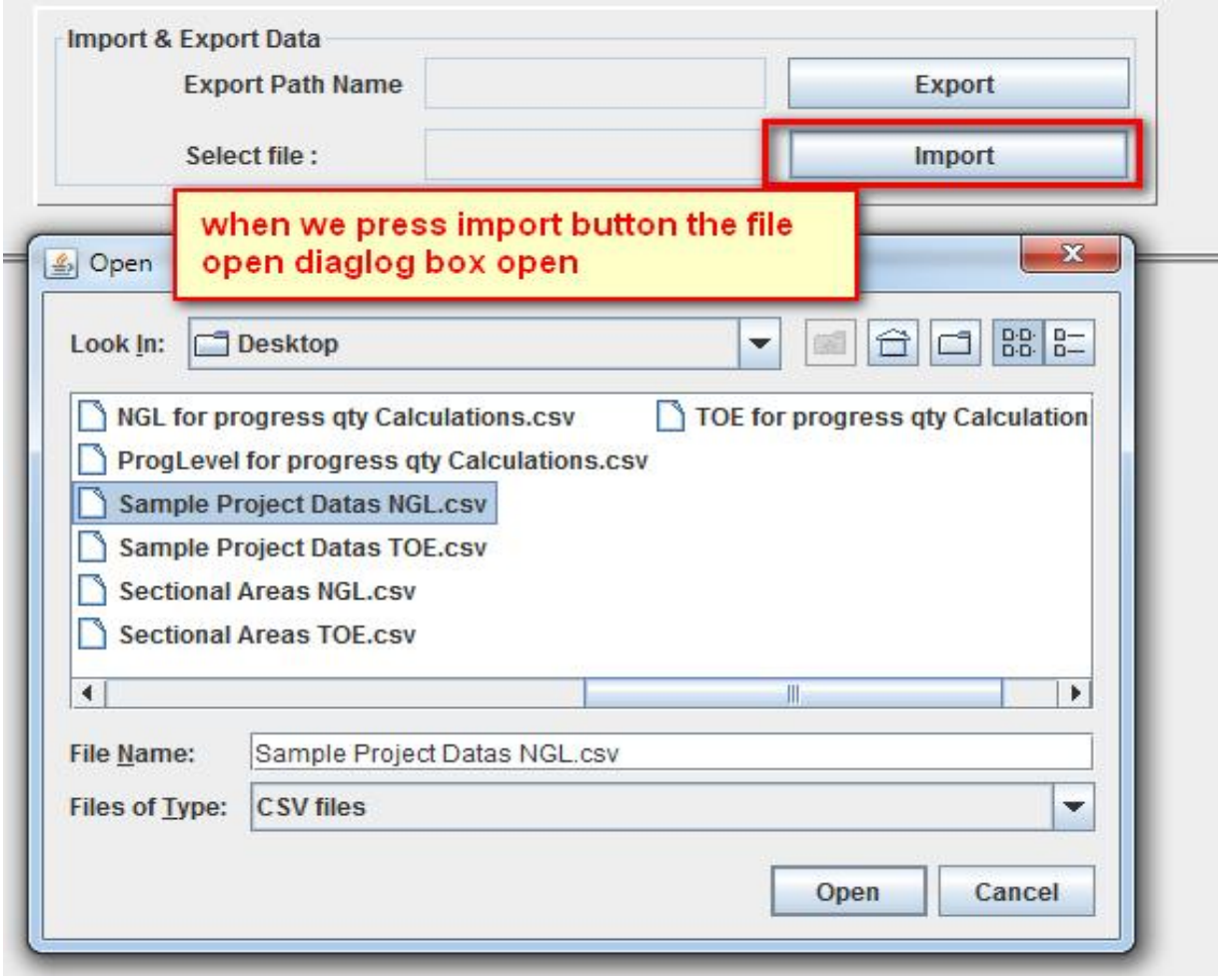
Now to see the file in desktop for your computer as same as following figure..



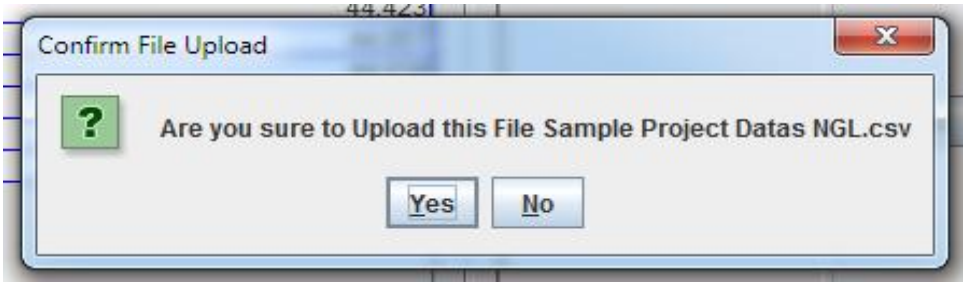
To view the file by opening the the csv file in notepad , the see the data like this .



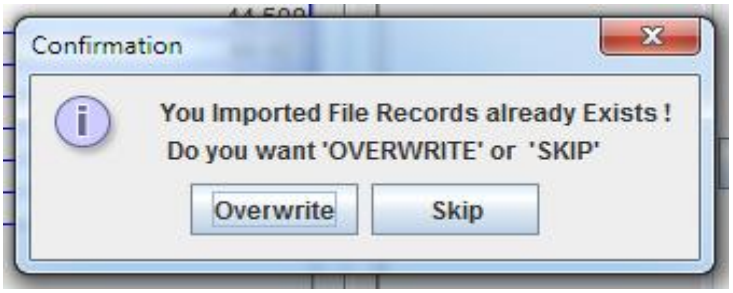




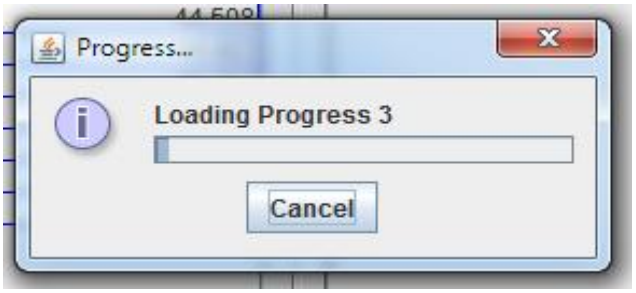
To open the file to confirm the file upload..,



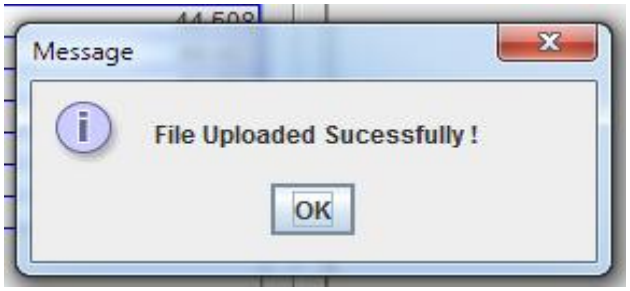
After confirmation if any data in data base to confirm the " overwrite or skip"



When the loading the data the progress bar updating the datas input…

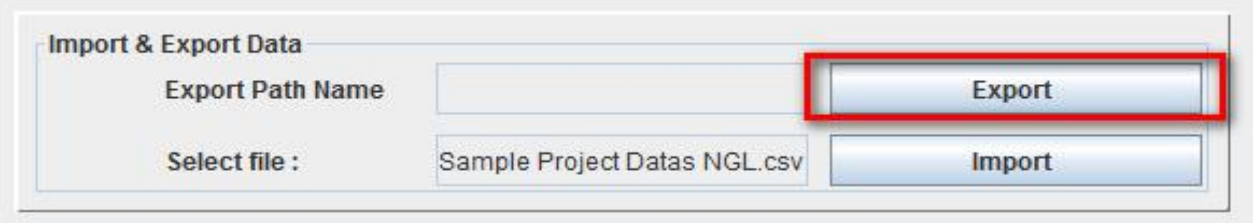


When the data's are successfully loaded the message box will confirm the loading..

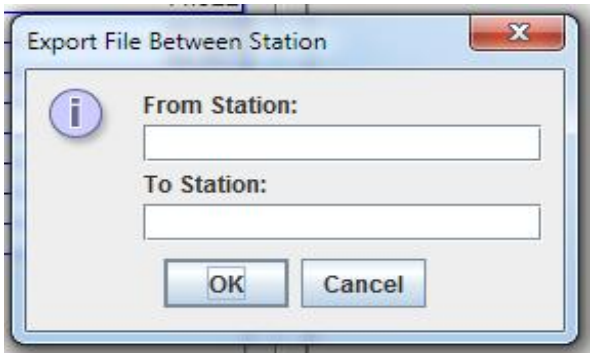


5.2.8 Export Pavement Levels

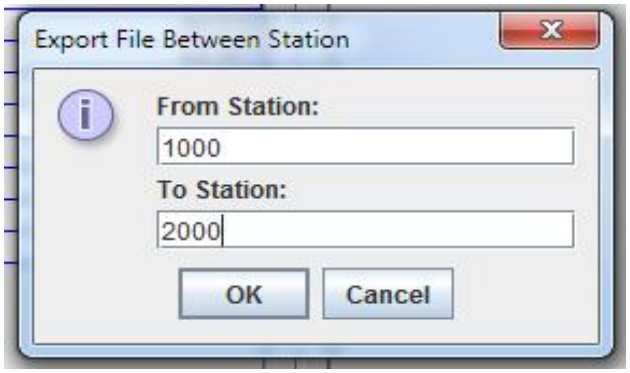
The ground data's need to export to select the export button..,



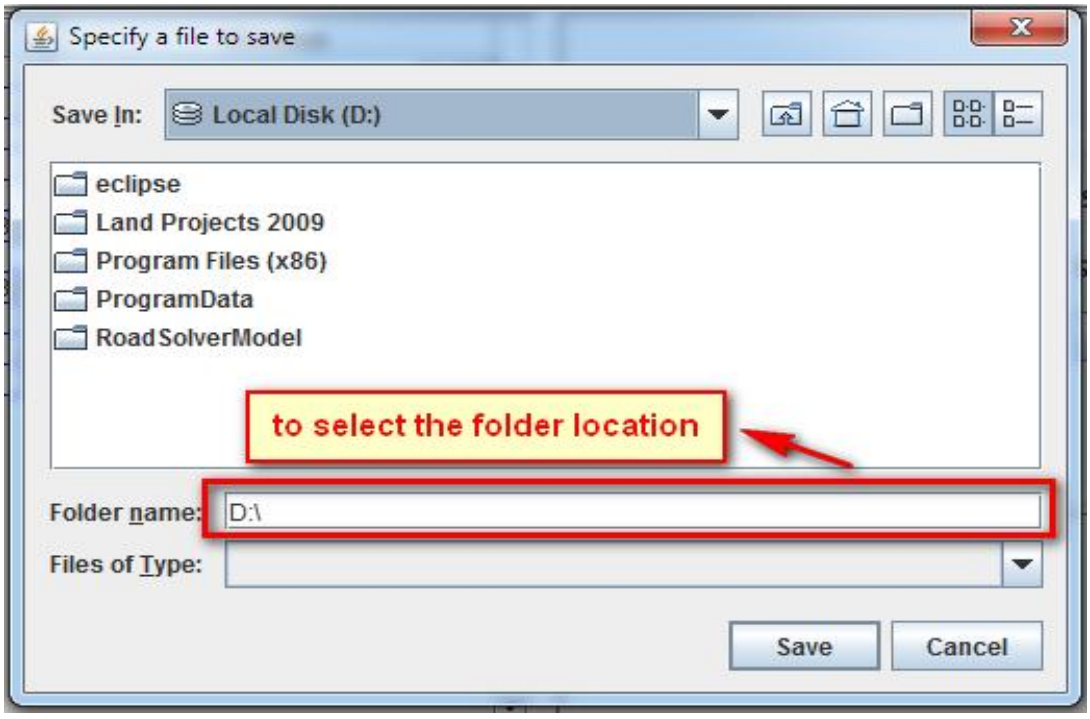
After selection the station reference window will appear



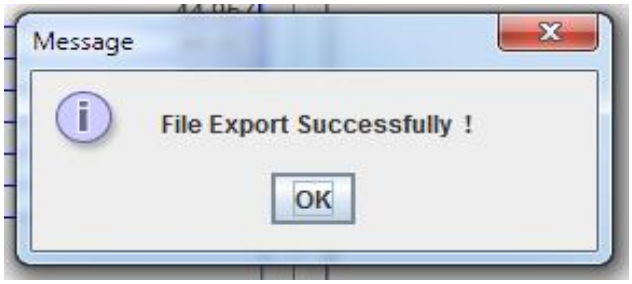
To enter the required station intervals which we want to export..,



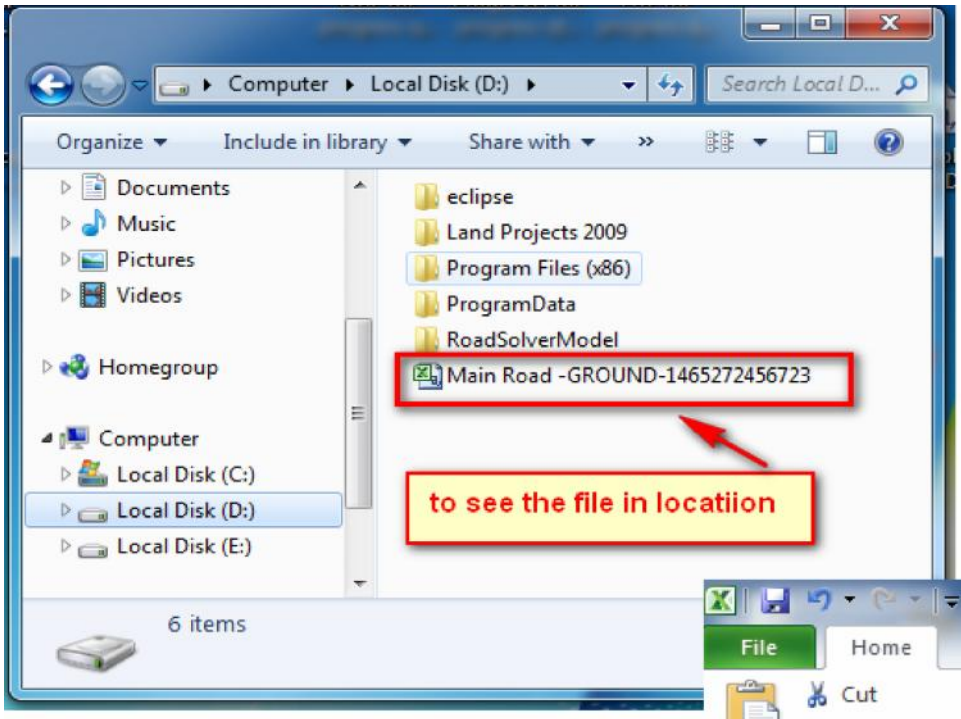
Then select the location which we want to store the file…



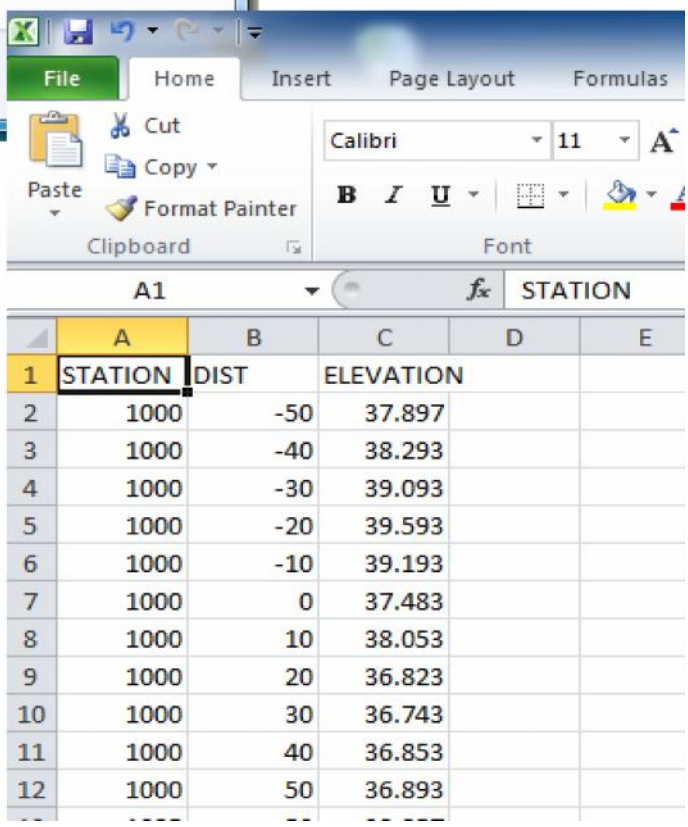
After successful completion of export the message box will appear..



to check the file which we stored that location…,



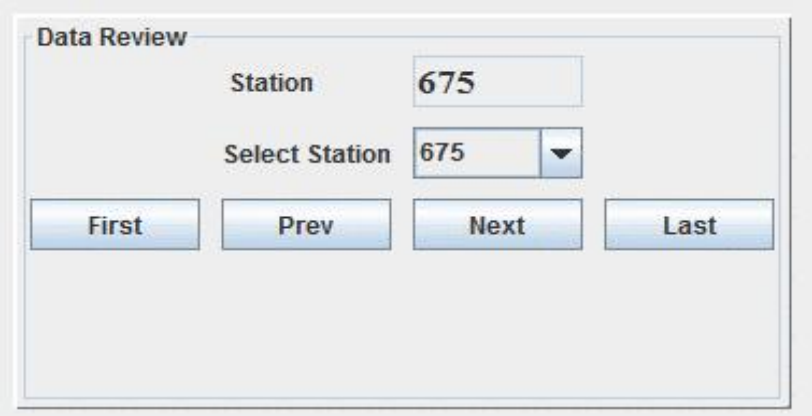
to open that file in excel the datas will appear same as figure.



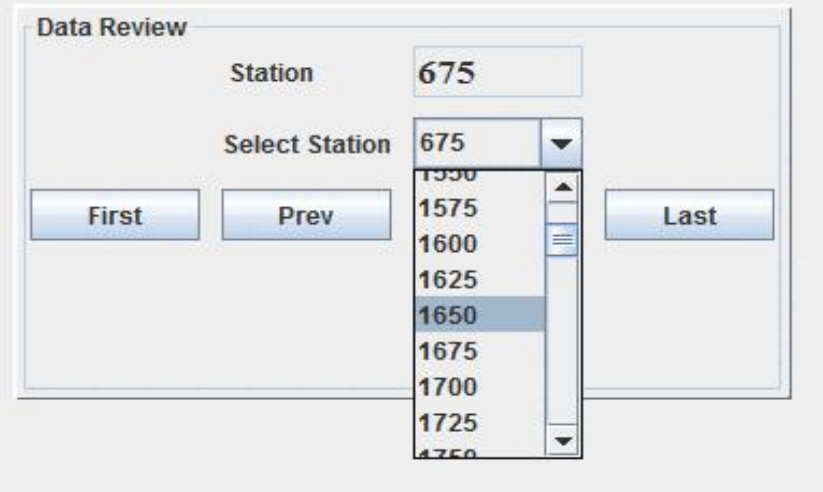
	A	B	C	D	E
1	STATION	DIST	ELEVATION		
2	1000	-50	37.897		
3	1000	-40	38.293		
4	1000	-30	39.093		
5	1000	-20	39.593		
6	1000	-10	39.193		
7	1000	0	37.483		
8	1000	10	38.053		
9	1000	20	36.823		
10	1000	30	36.743		
11	1000	40	36.853		
12	1000	50	36.893		

5.2.9 Review Pavement Levels

Data review option to review the data's which is in the database file…



If we press " First Button " the first station record will appear
If we press " Last Button " the Last station record will appear
To Press " Prev " or " Next " buttons to review the records in front or back.

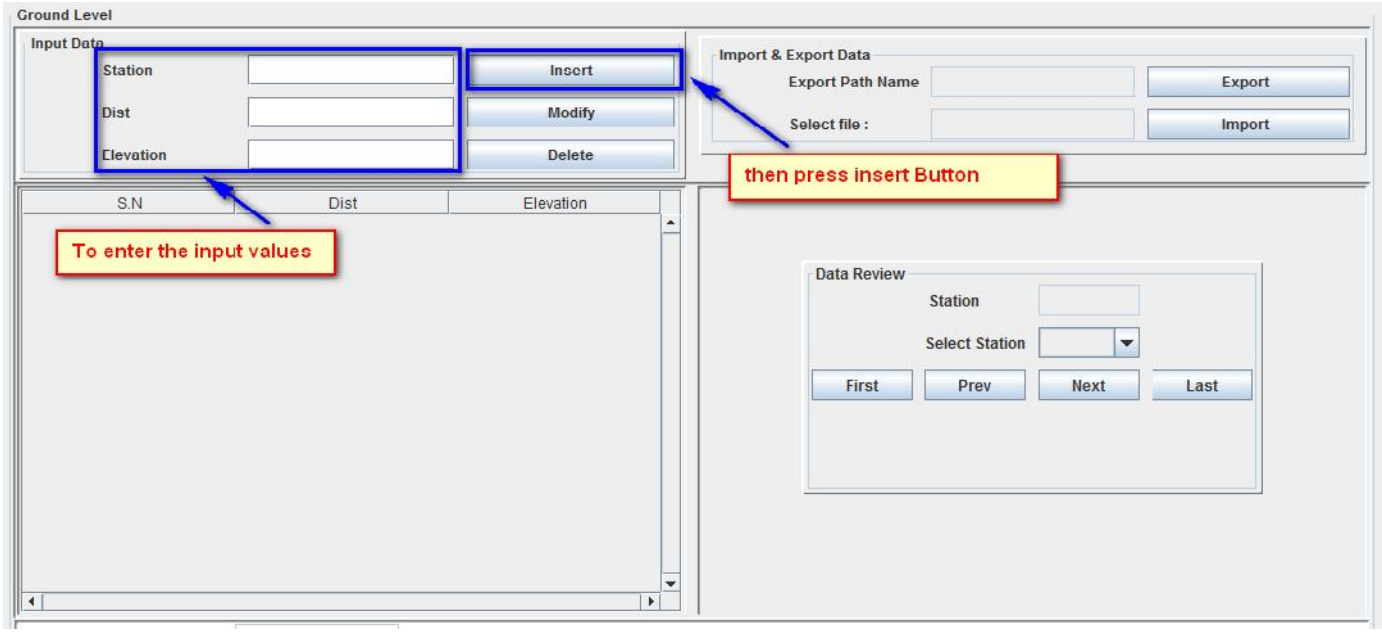


Also select the station from pulldown button to choose the particular station that station record will appear in the ground data box.

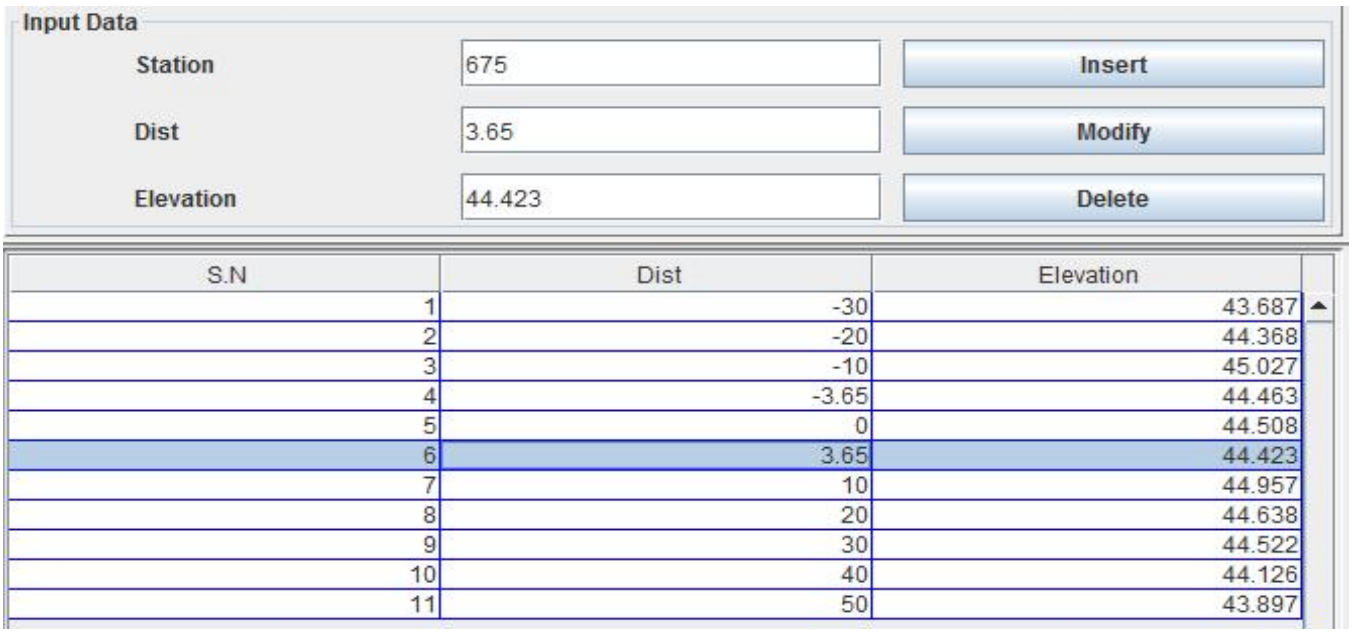
5.3 Progress Levels

5.3.1 Insert Progress Levels

To enter the values of station , Distance and Elevation in the input boxes then press " Insert " Button.



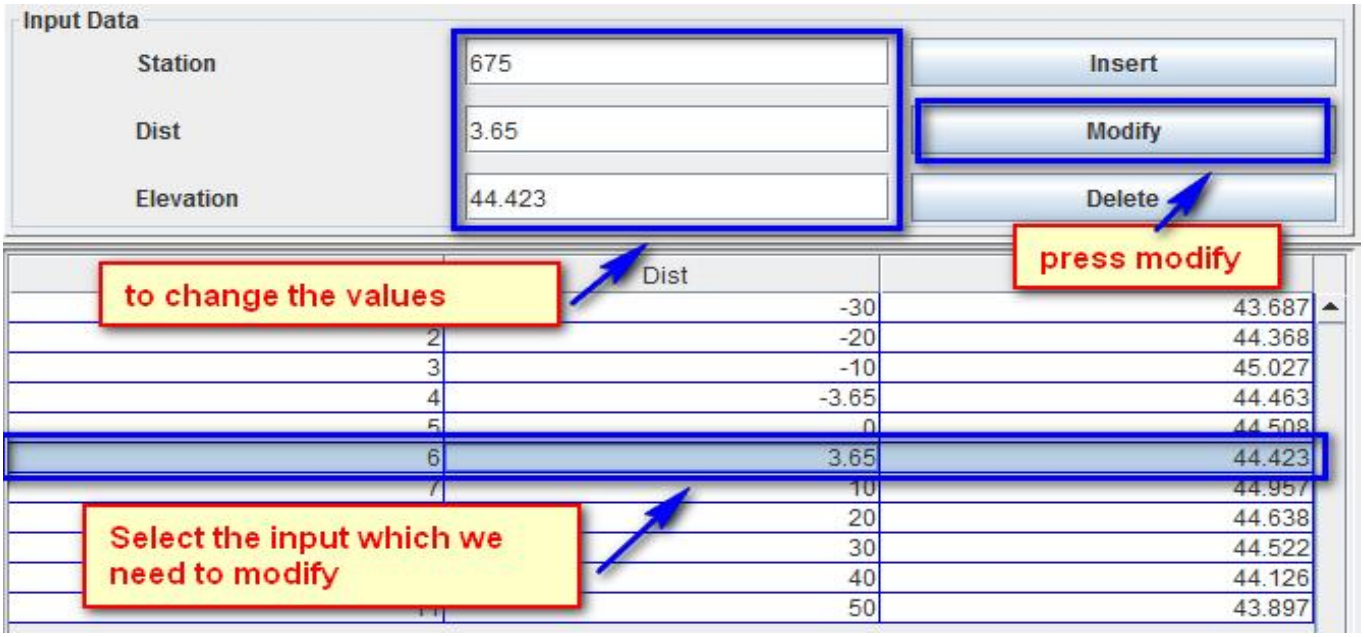
The Input values we can enter in any manner. Program will arrange the input data's arranged by ascending order based on Distance value. Whenever the input values inserted in the table the values are automatically saved in data base.



S.N	Dist	Elevation
1	-30	43.687
2	-20	44.368
3	-10	45.027
4	-3.65	44.463
5	0	44.508
6	3.65	44.423
7	10	44.957
8	20	44.638
9	30	44.522
10	40	44.126
11	50	43.897

5.3.2 Modify Progress Levels

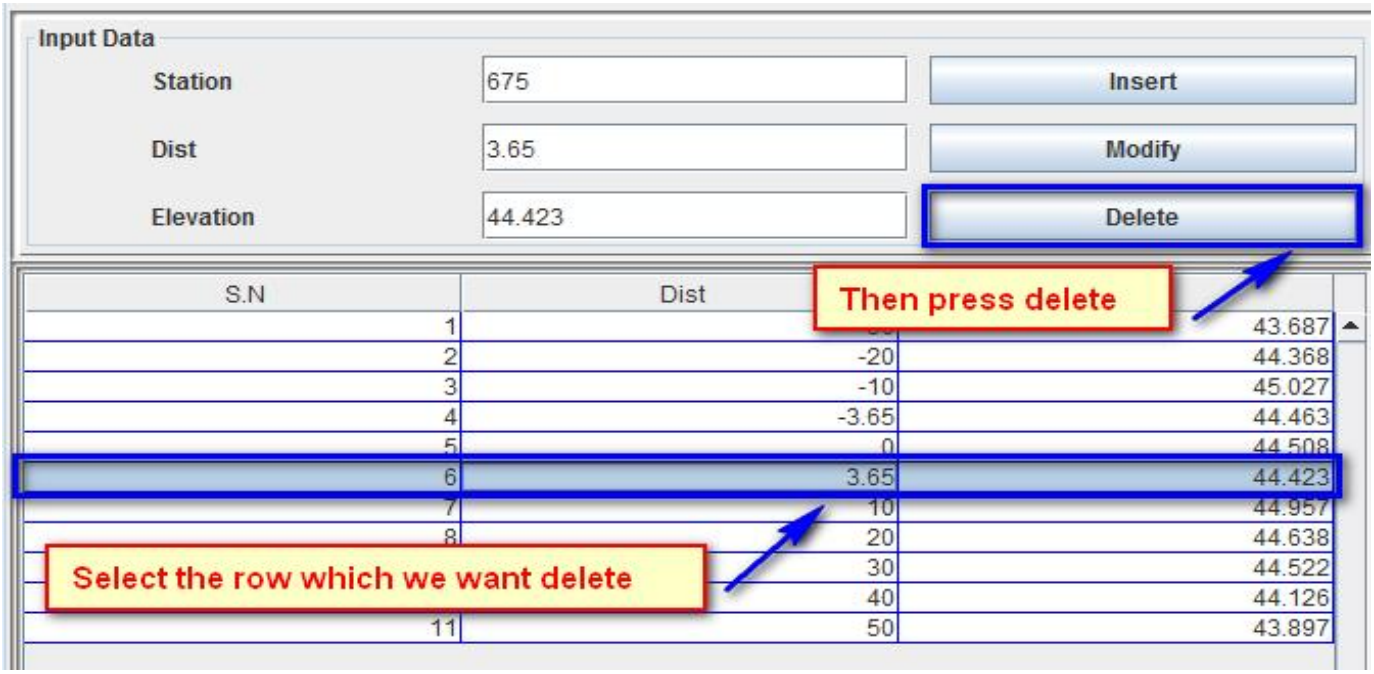
To Modify the Ground Levels by selecting the values in the table to change the values from input boxes then press " Modify ".



After pressing the modify button the values are restored in the databases.

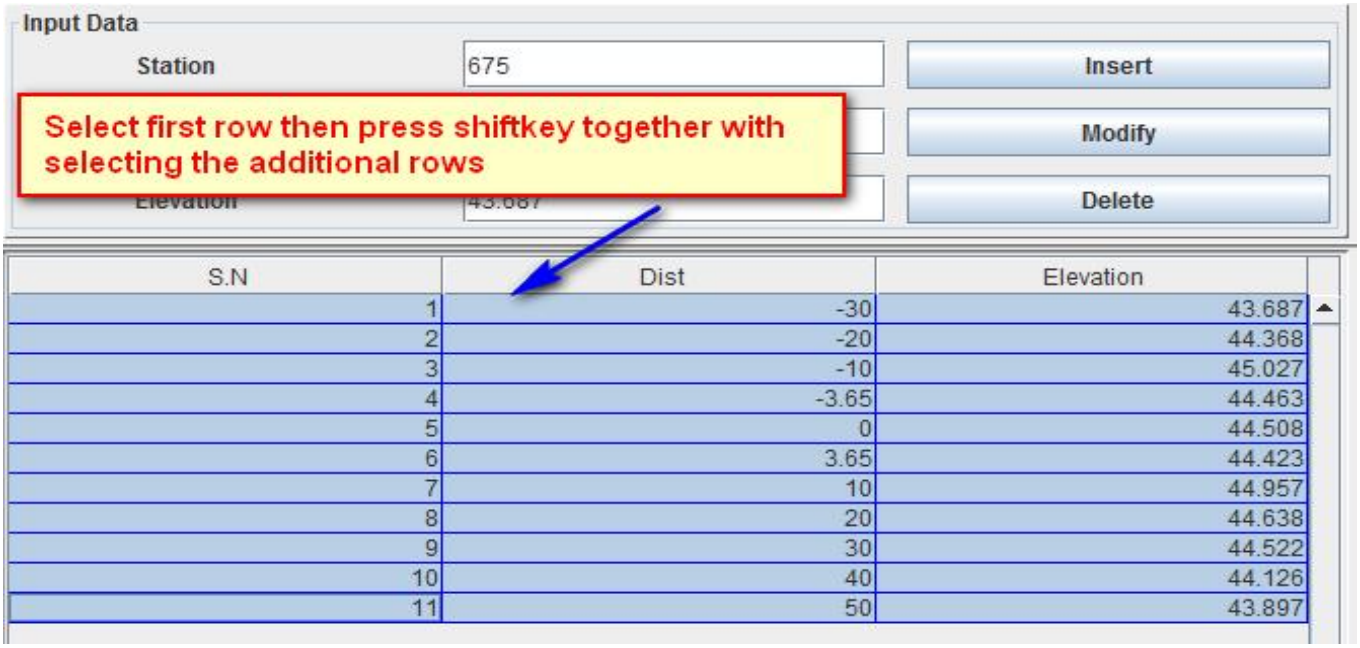
5.3.3 Delete Progress Levels

To delete the any record in data base to select the row then press the delete button.



S.N	Dist	Elevation
1		43.687
2	-20	44.368
3	-10	45.027
4	-3.65	44.463
5	0	44.508
6	3.65	44.423
7	10	44.957
8	20	44.638
	30	44.522
	40	44.126
11	50	43.897

To delete the multiple selection select one row and press " Shift Key + to select the additional rows " and press delete.. If we delete the all the records in one station , the station will remove automatically from the data bases.

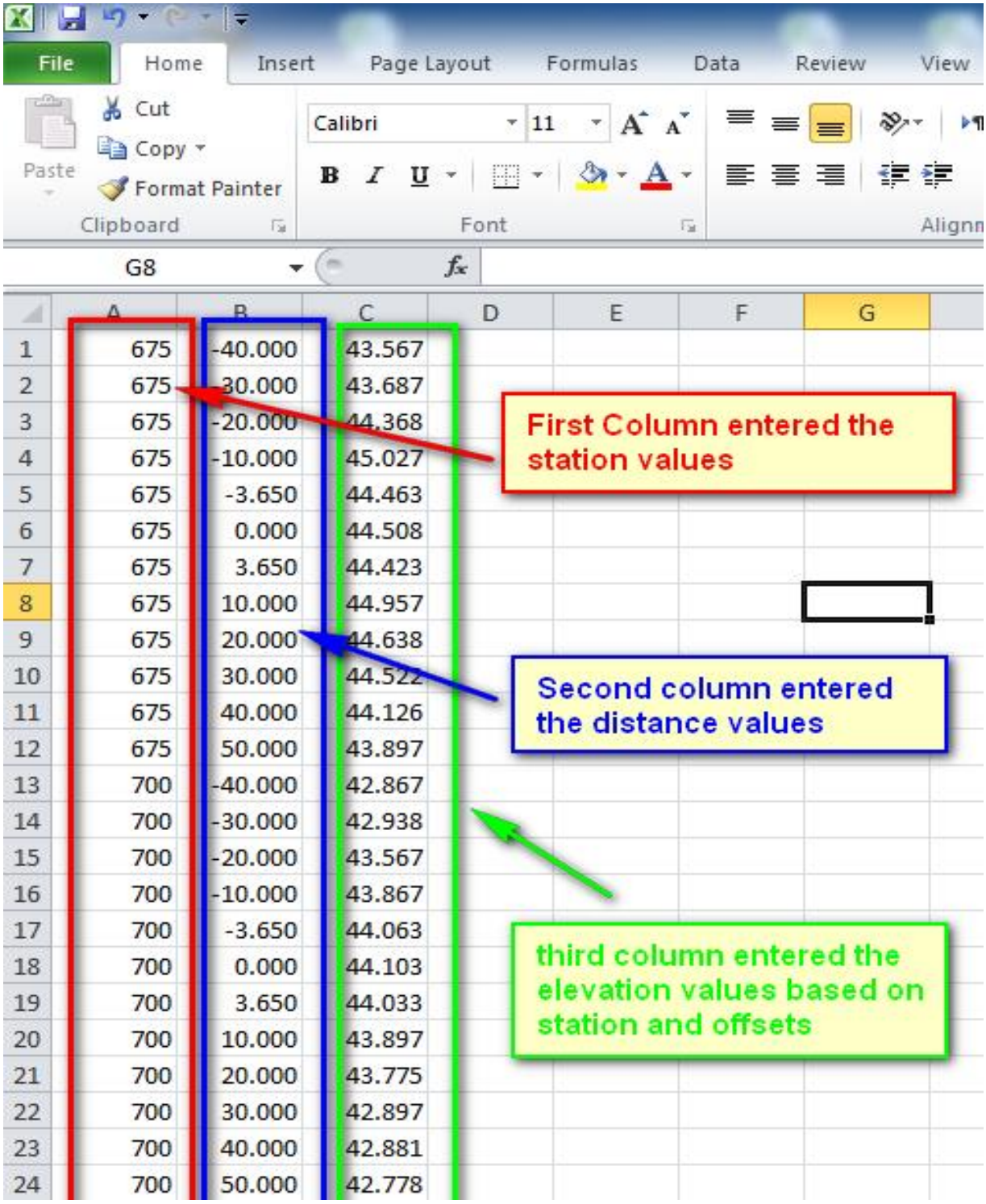


S.N	Dist	Elevation
1	-30	43.687
2	-20	44.368
3	-10	45.027
4	-3.65	44.463
5	0	44.508
6	3.65	44.423
7	10	44.957
8	20	44.638
9	30	44.522
10	40	44.126
11	50	43.897

5.3.4 Import the Progress Levels

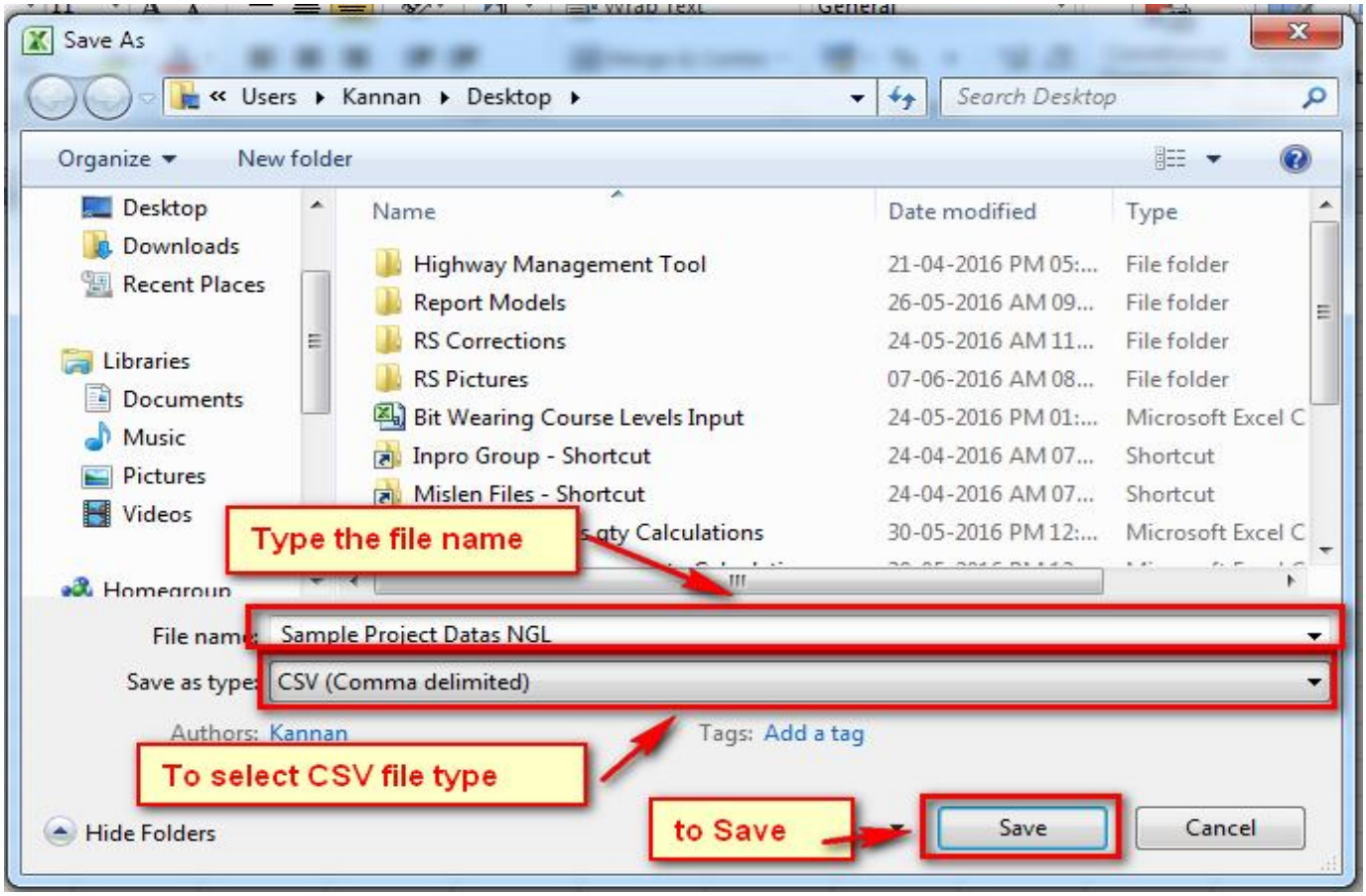
By the method of Import we can insert the pavement levels from the CSV file format.

First we create the pavement data values in " Excel program" based on the following figure…

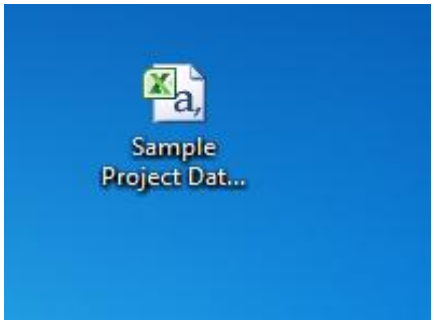


	A	B	C
1	675	-40.000	43.567
2	675	-30.000	43.687
3	675	-20.000	44.368
4	675	-10.000	45.027
5	675	-3.650	44.463
6	675	0.000	44.508
7	675	3.650	44.423
8	675	10.000	44.957
9	675	20.000	44.638
10	675	30.000	44.522
11	675	40.000	44.126
12	675	50.000	43.897
13	700	-40.000	42.867
14	700	-30.000	42.938
15	700	-20.000	43.567
16	700	-10.000	43.867
17	700	-3.650	44.063
18	700	0.000	44.103
19	700	3.650	44.033
20	700	10.000	43.897
21	700	20.000	43.775
22	700	30.000	42.897
23	700	40.000	42.881
24	700	50.000	42.778

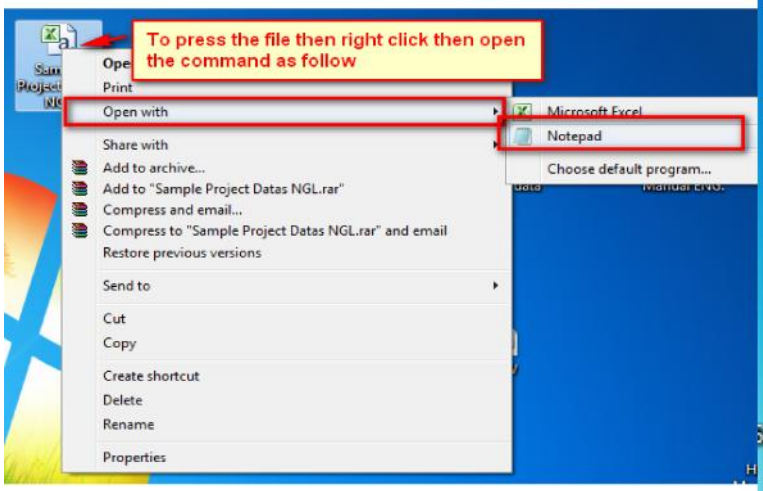
After successful completion of ground levels inputs in excel then save the excel file to CSV file format…

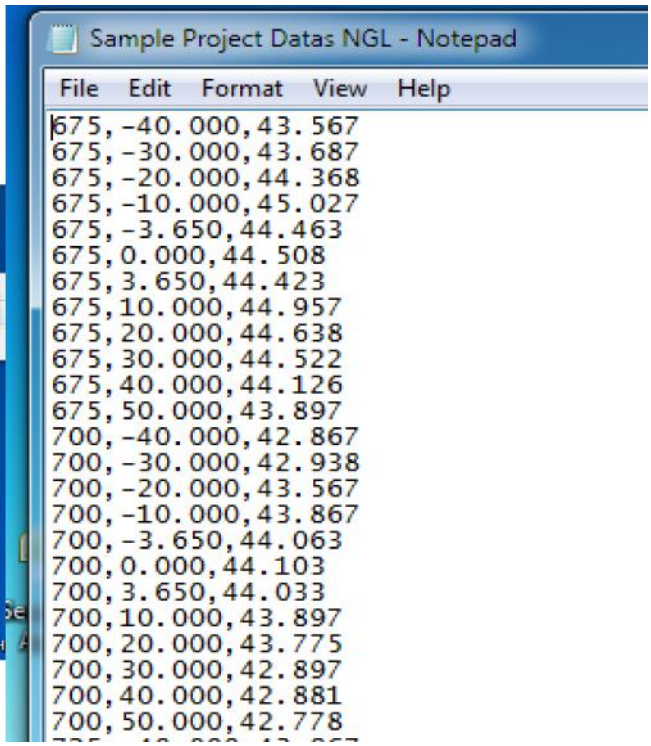


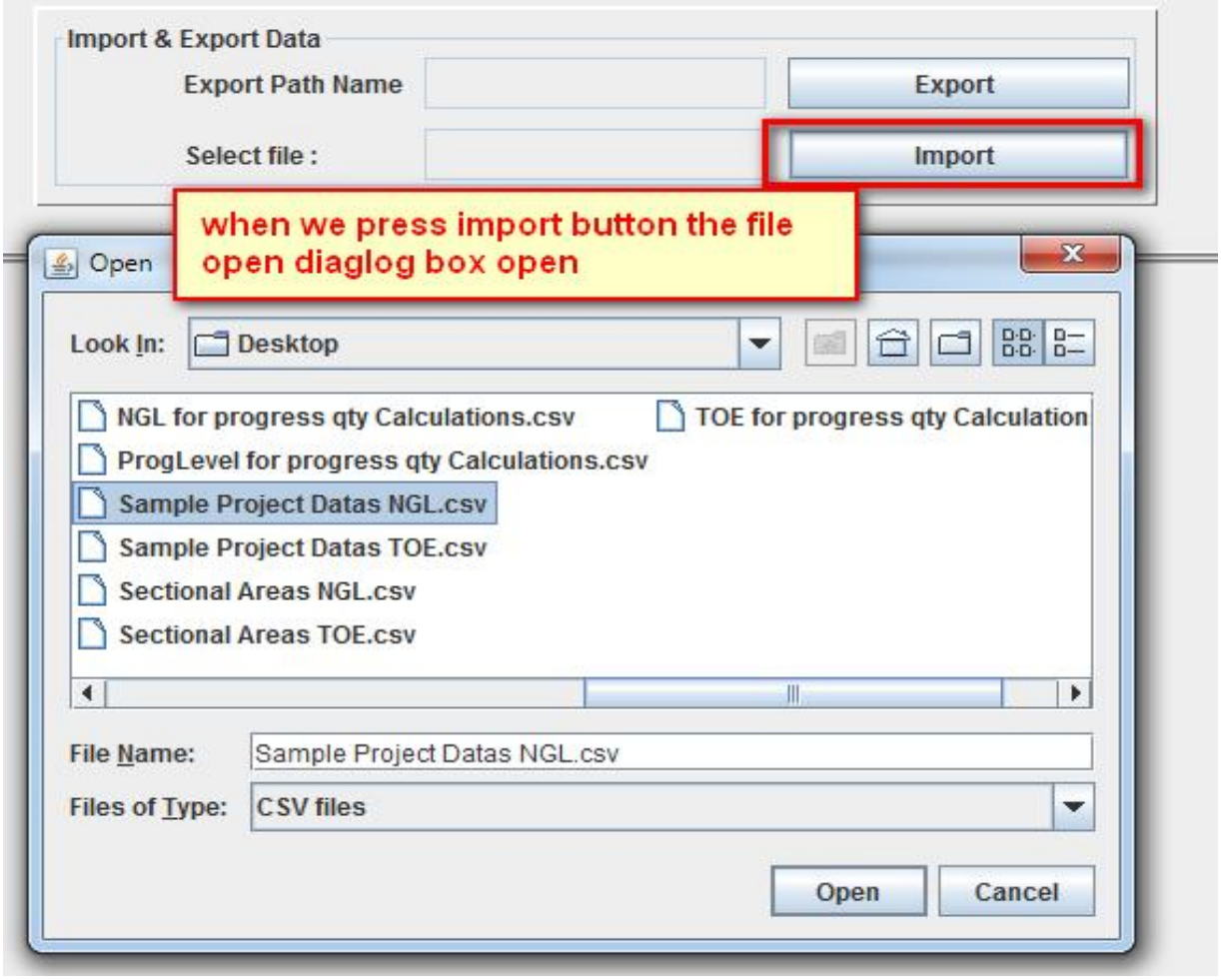
Now to see the file in desktop for your computer as same as following figure..



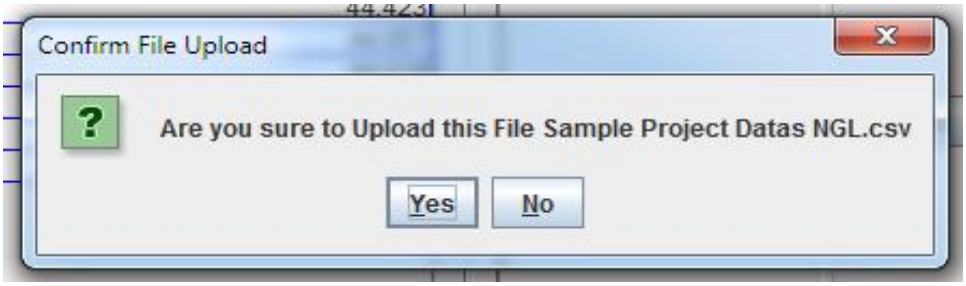
To view the file by opening the the csv file in notepad , the see the data like this .



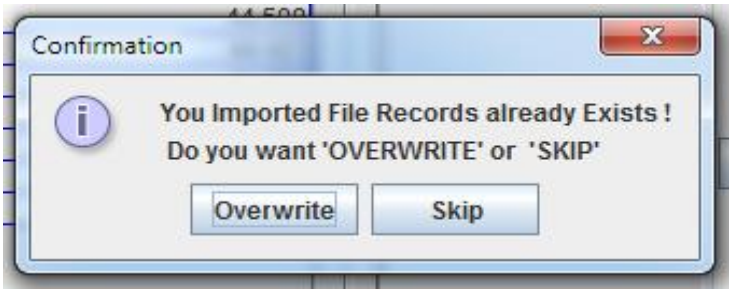




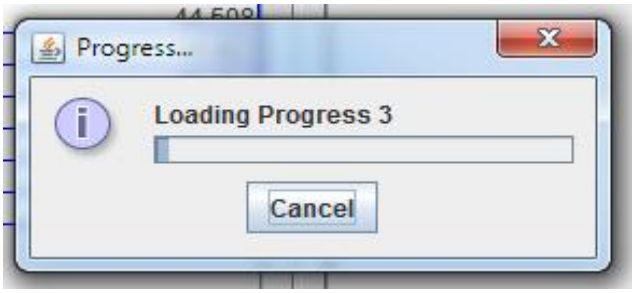
To open the file to confirm the file upload..,



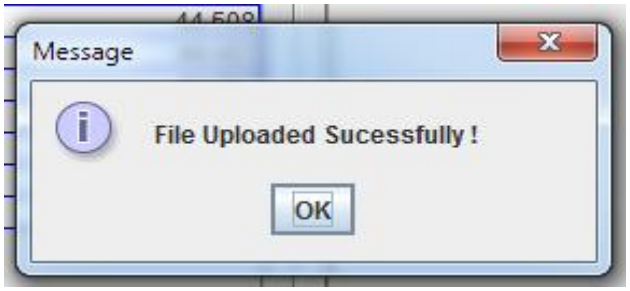
After confirmation if any data in data base to confirm the " overwrite or skip"



When the loading the data the progress bar updating the datas input…

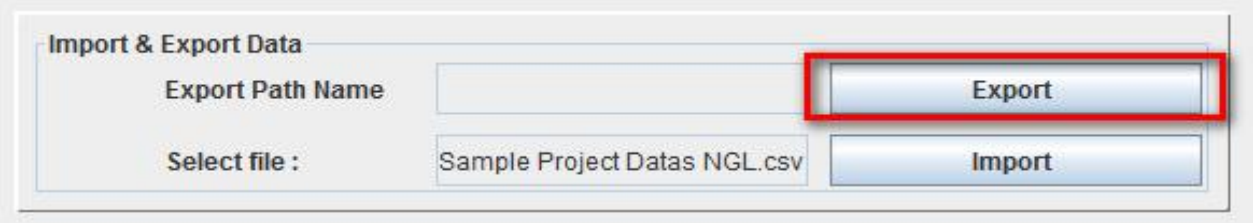


When the data's are successfully loaded the message box will confirm the loading..

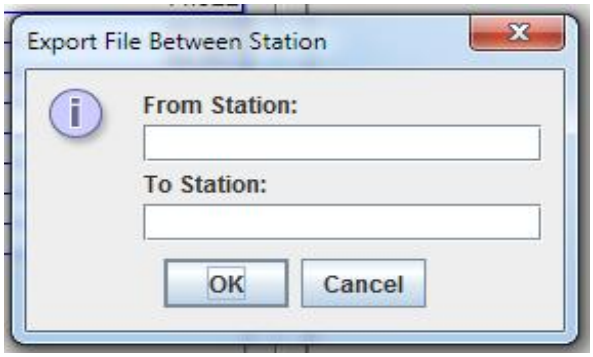


5.3.5 Export the Progress Levels

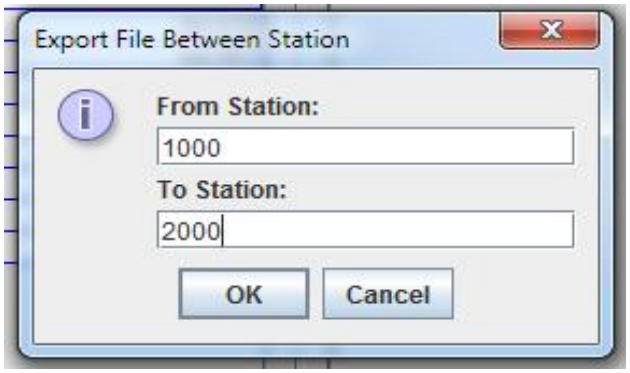
The ground data's need to export to select the export button..,



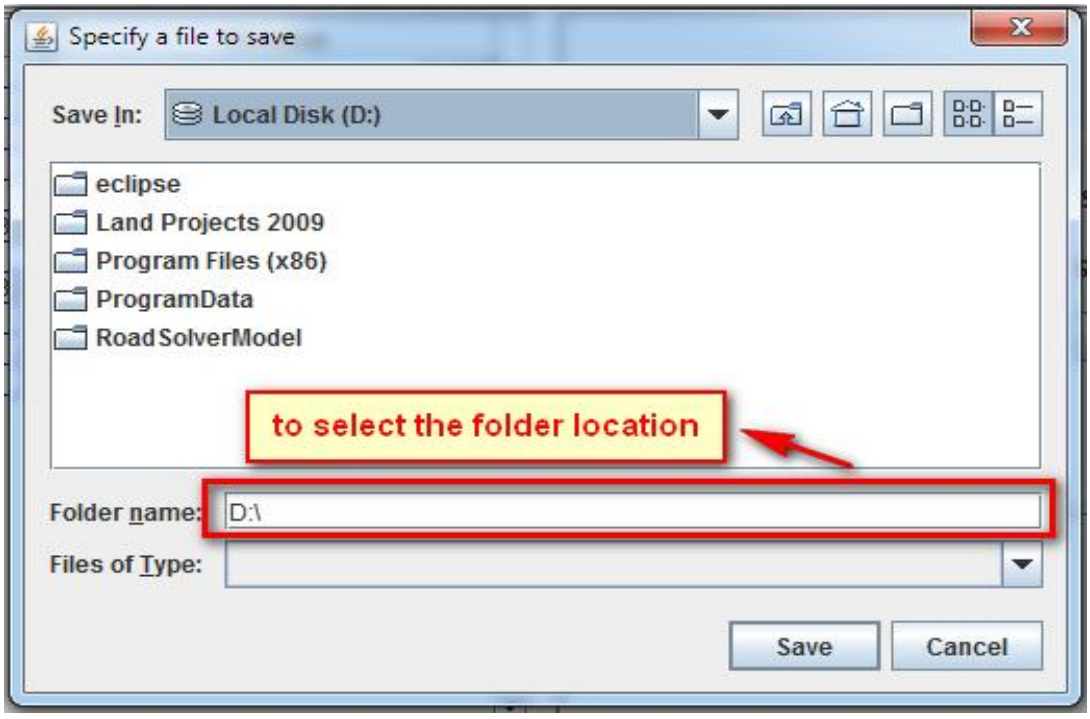
After selection the station reference window will appear



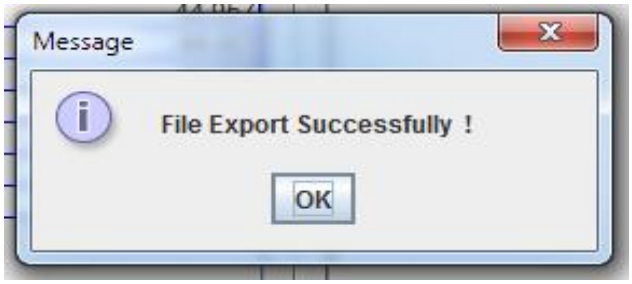
To enter the required station intervals which we want to export..,



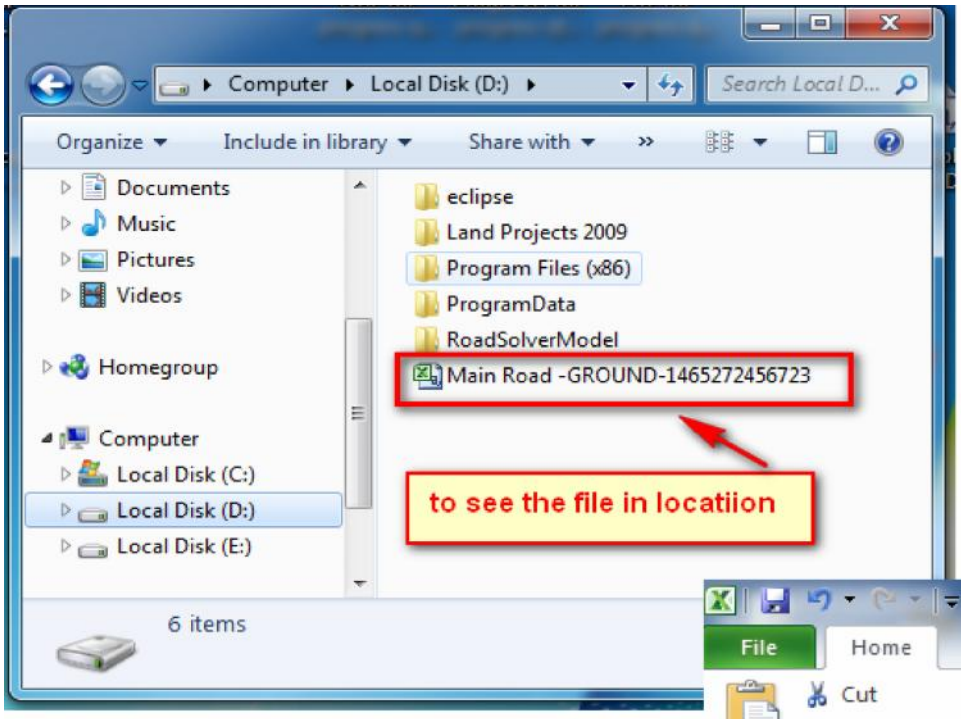
Then select the location which we want to store the file…



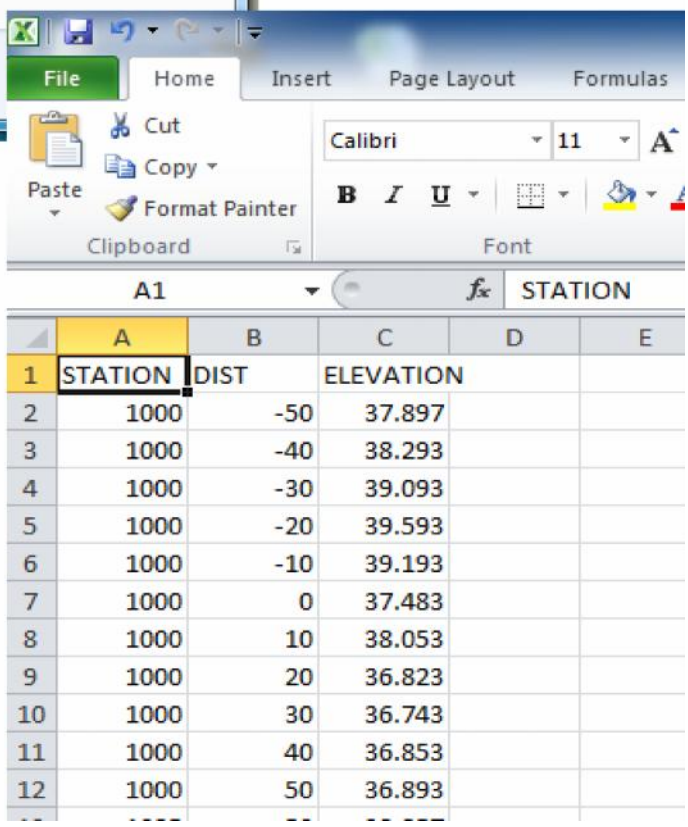
After successful completion of export the message box will appear..



to check the file which we stored that location…,



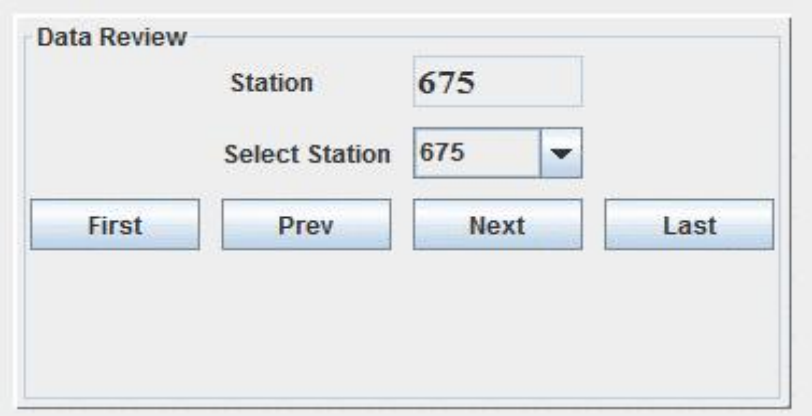
to open that file in excel the datas will appear same as figure.



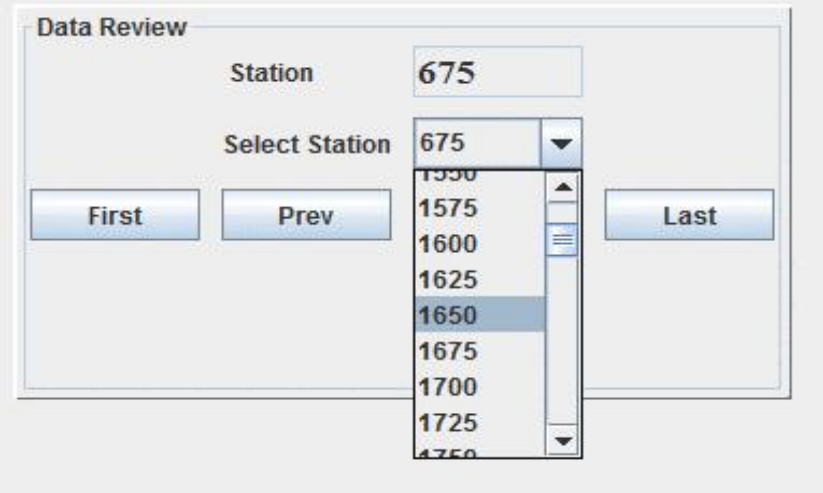
	A	B	C	D	E
1	STATION	DIST	ELEVATION		
2	1000	-50	37.897		
3	1000	-40	38.293		
4	1000	-30	39.093		
5	1000	-20	39.593		
6	1000	-10	39.193		
7	1000	0	37.483		
8	1000	10	38.053		
9	1000	20	36.823		
10	1000	30	36.743		
11	1000	40	36.853		
12	1000	50	36.893		

5.2.9 Review Progress Levels

Data review option to review the data's which is in the database file…



If we press " First Button " the first station record will appear
If we press " Last Button " the Last station record will appear
To Press " Prev " or " Next " buttons to review the records in front or back.



Also select the station from pulldown button to choose the particular station that station record will appear in the ground data box.

6. Typical Calculation

6.1 Create Typical Model

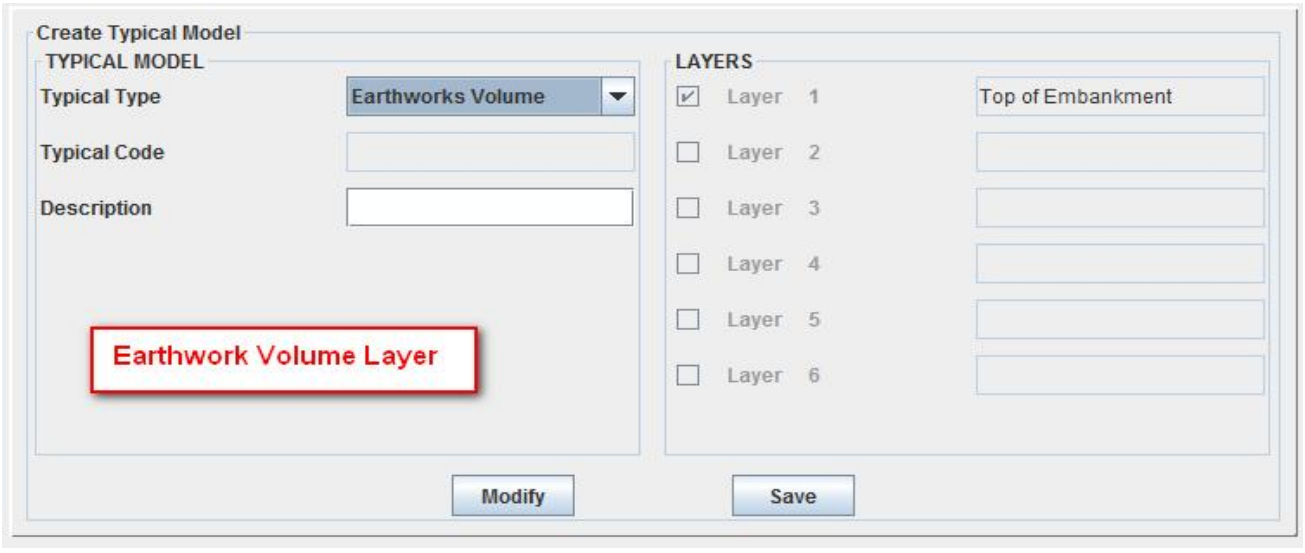
The purpose of Typical Model to create Template and to calculate the Pavement Levels for Volume and Setting out Levels Calculation. In Typical Model Calculation Module has three type of Sub module including with different layers for different purpose.

1. Earthwork Volume - Layer " Top of Embankment "
   for Earthwork Volume Calculation of Cut/Fill
2. Pavements Volume - Layers "6 Nos different Pavements "
   For Calculating Pavement Volumes like BWC , BBC , ABC and SG
3. Pavements Layers - Layers "6 Nos different Pavement Layers "
   For Calculating Pavement Layer Setting out Levels

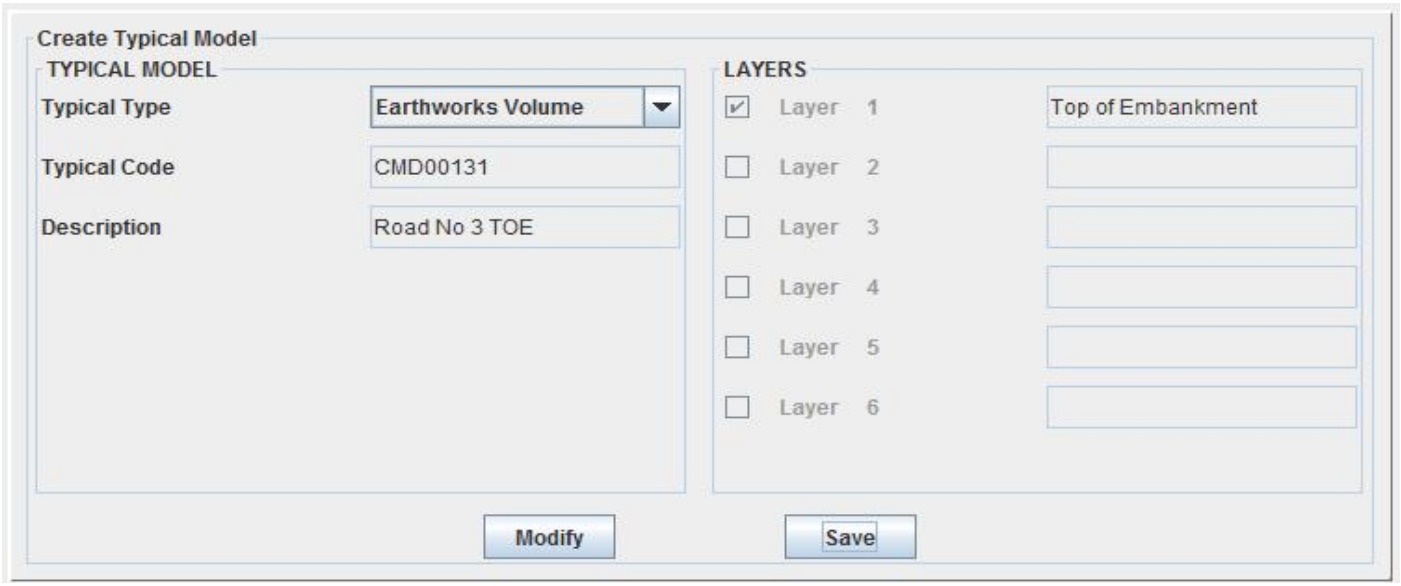
6.1.1 Earthwork Volume Model

In Typical Model Module the Earthwork Volume model is used to create template for Earthwork Calculation. In this module the Top of Embankment layer is already in default . To type the Layer Description and Save the layer the top of Embankment is created in Pavement Levels database table.

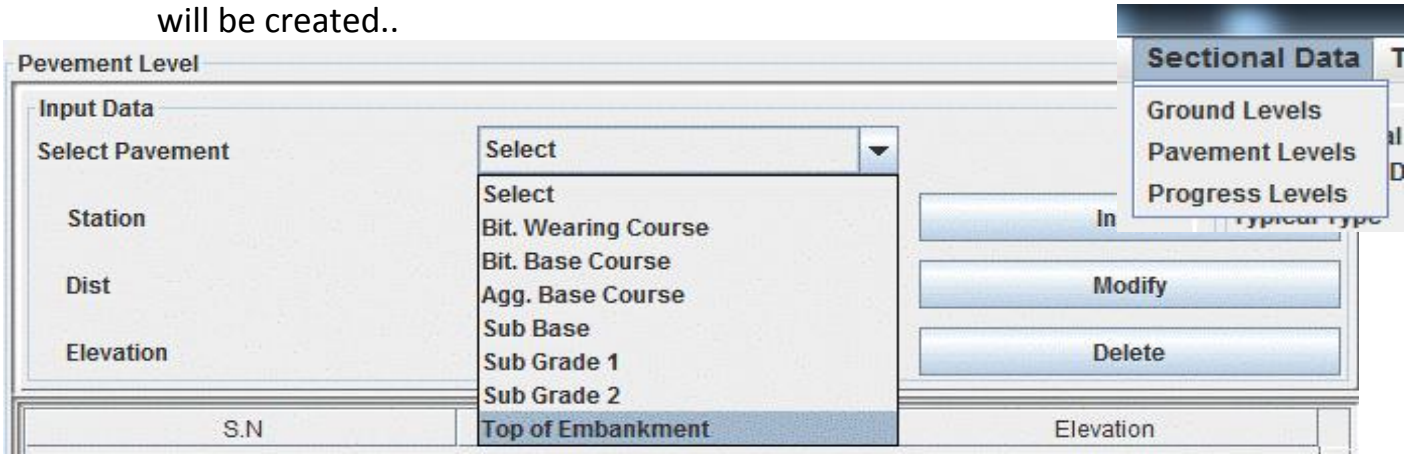
First to opent the Earthwork volume window the Layer will already selected. The Typical Code and Description only empty. To Fill the text in Description column Then press Save.



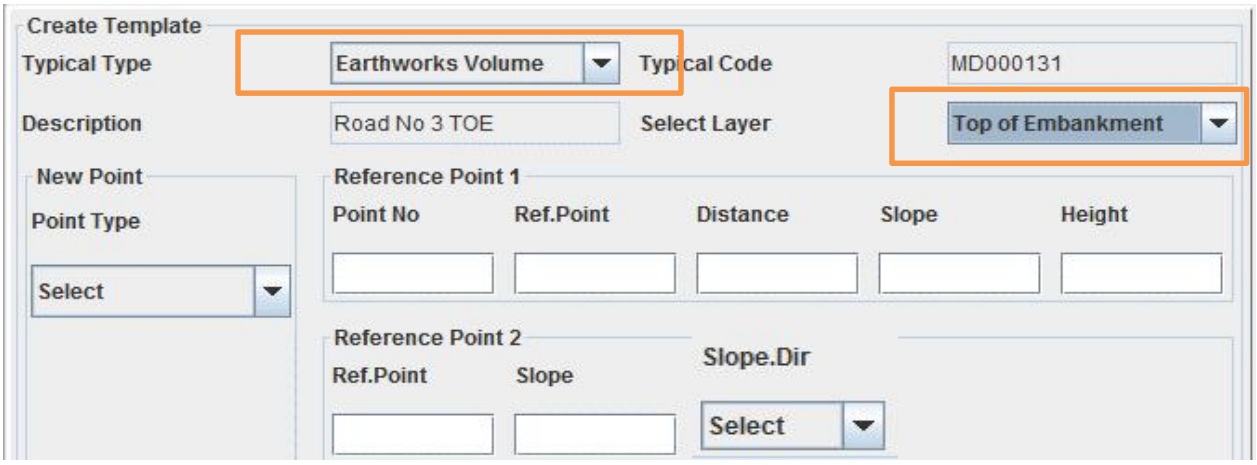
After fill Description data the window will like as follows..,



Now to check the Pavement database table the Top of Embankment layer will be created..



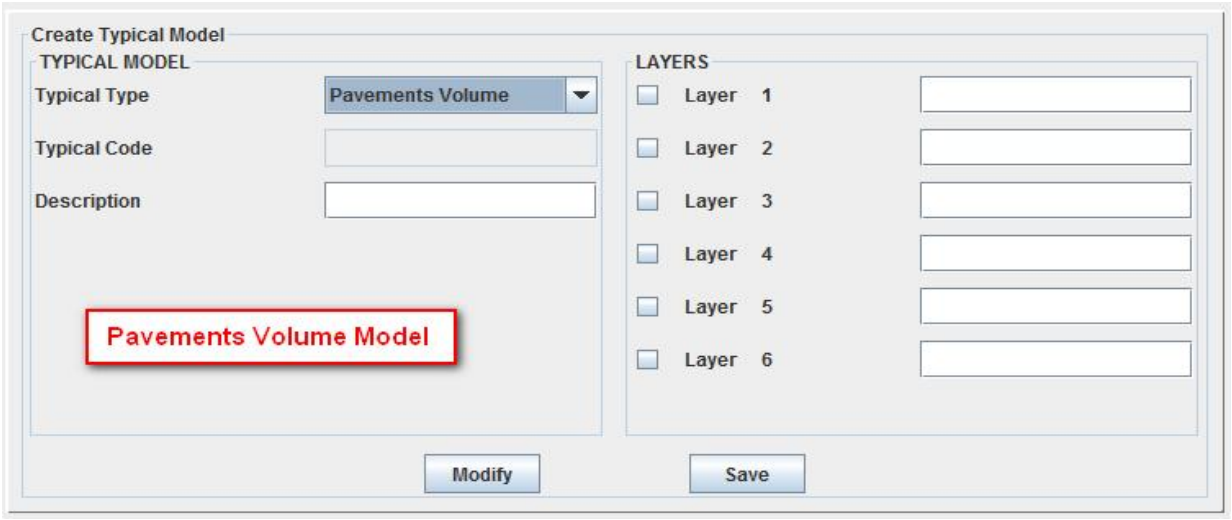
Also Layers created in Template Creation Form..



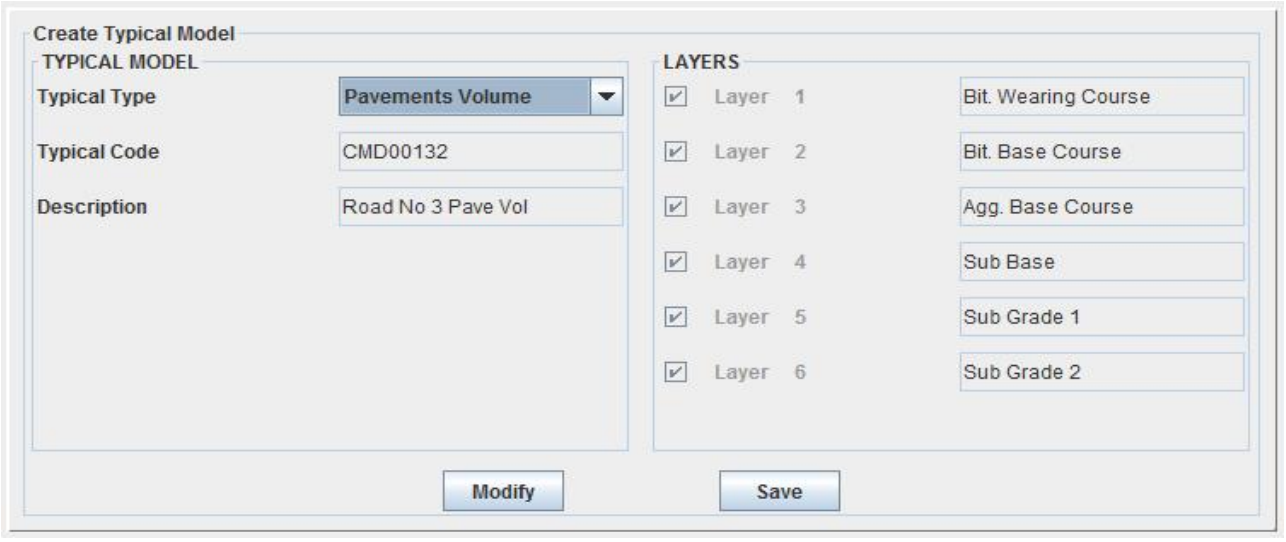
Top of Embankment Levels We can create Manual Input , import data and Calculate from Template ..

6.1.2 Pavement Volume Model

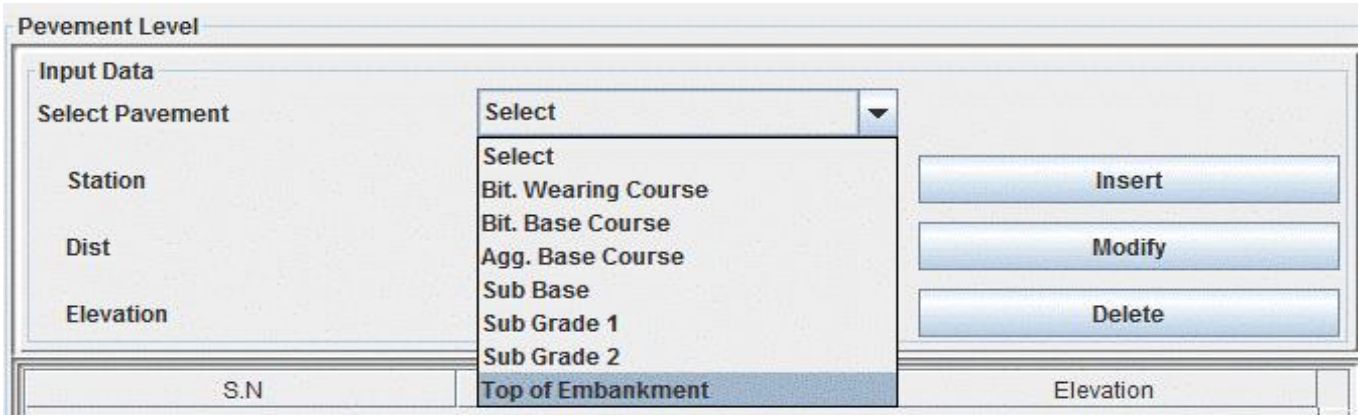
The Pavement Volume Model is created to used Pavement Volume Calculation. In this module has max 6 Pavements we can create for one Road. For New opening of Pavement Volume module all Layers are in empty also with description.



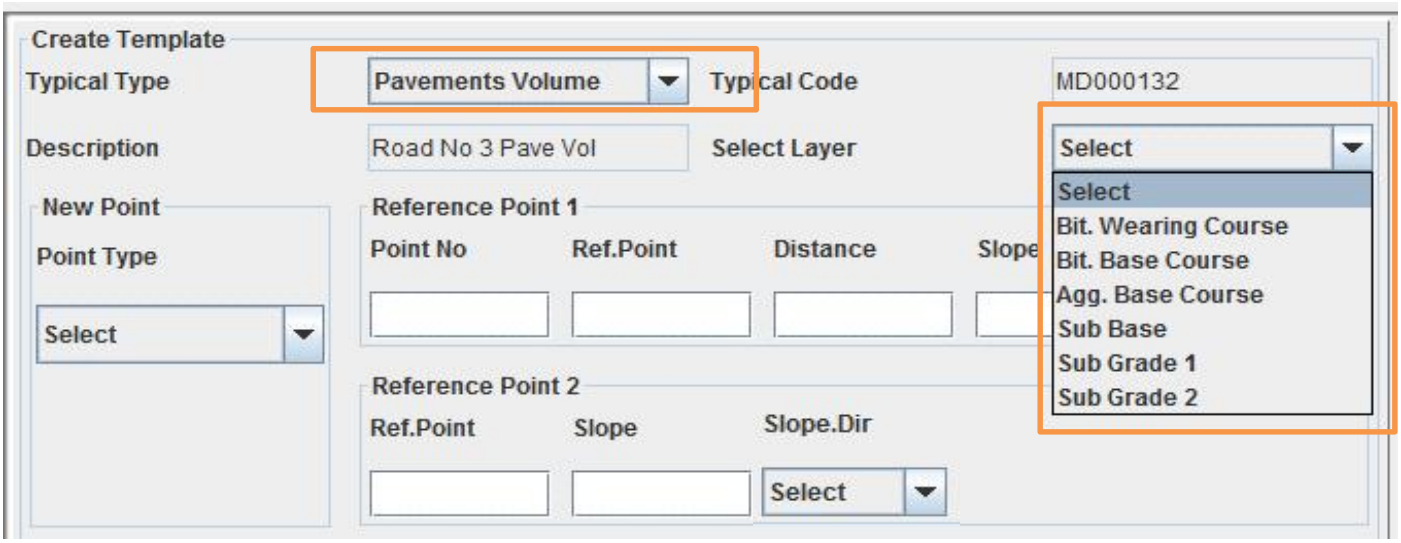
To Fill the Pavement layers and Press Save Button .. Now your window like as follow..



Now the Pavement Layers are created in Pavement Levels Database Table..

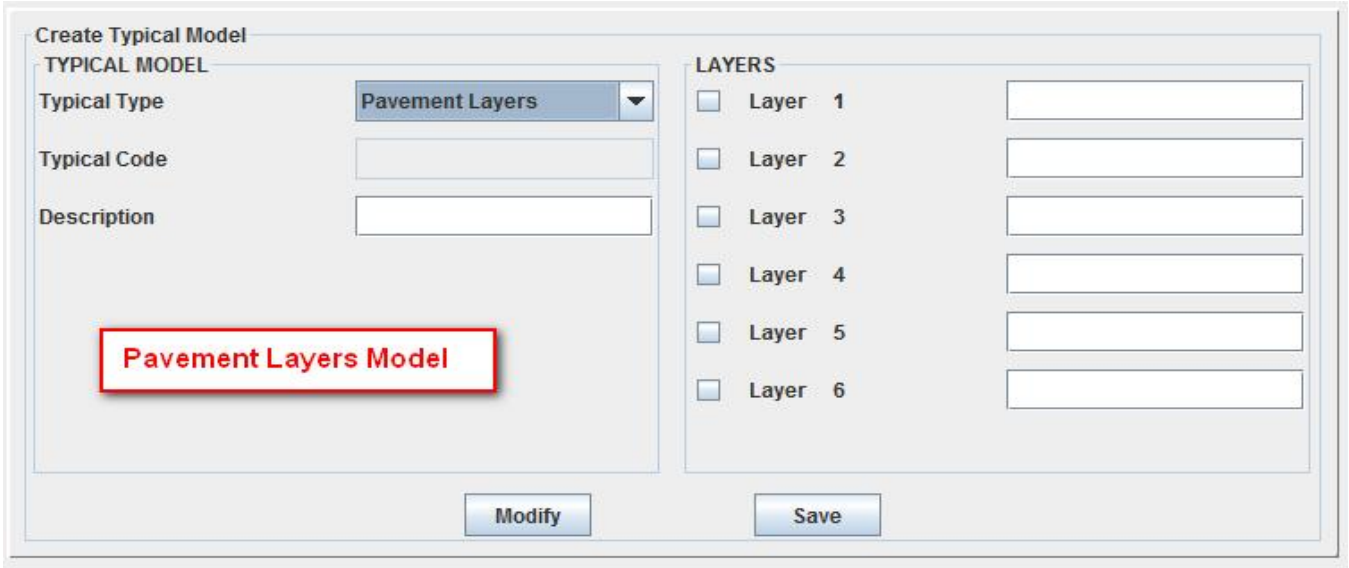


In Template Create Table also that layers will appear ..

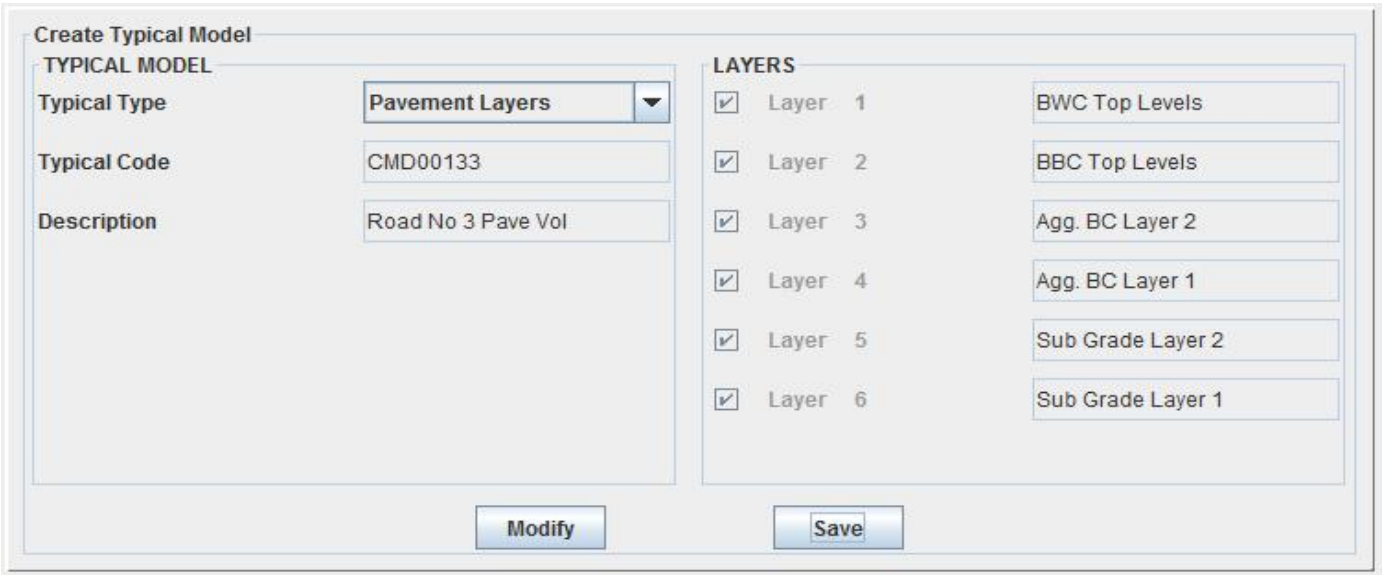


6.1.3. Pavement Layers Model

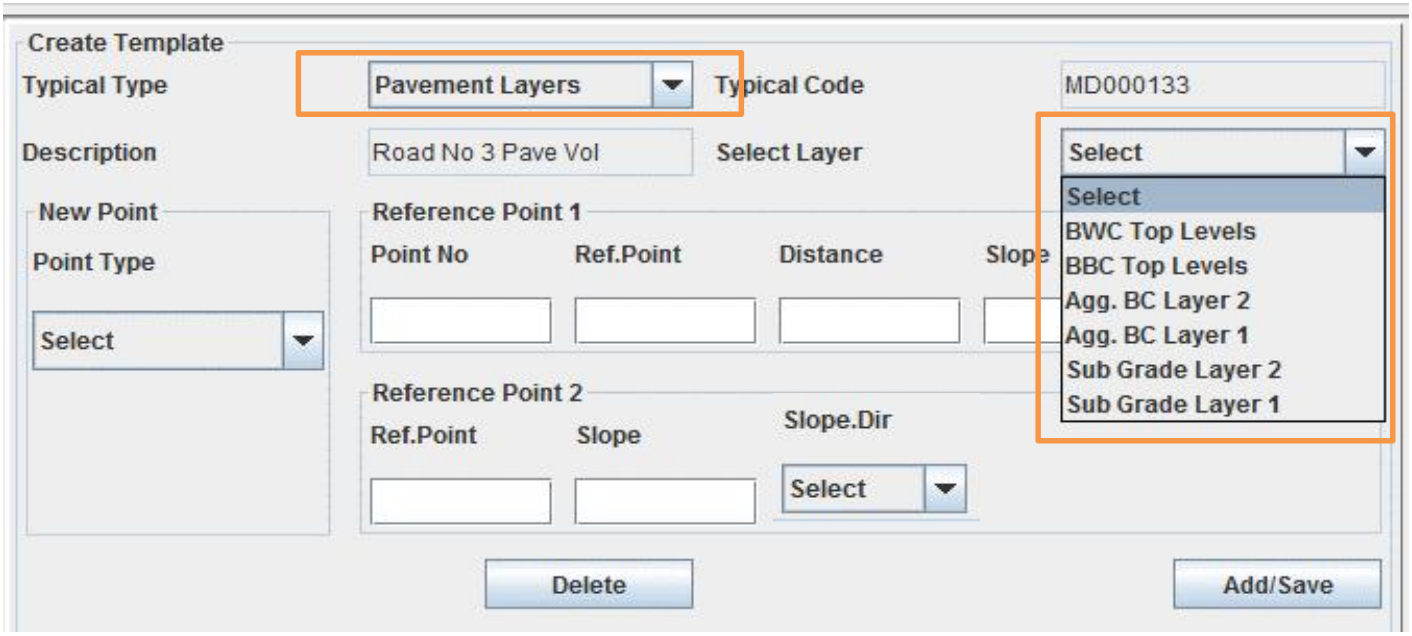
The Pavement Layers Model is created to used Pavement Levels Calculation. In this module has max 6 Pavement Layers we can create for one Road. For New opening of Pavement Layers module all Layers are in empty also with description.



After Fill the Layers window will look like as follow..,



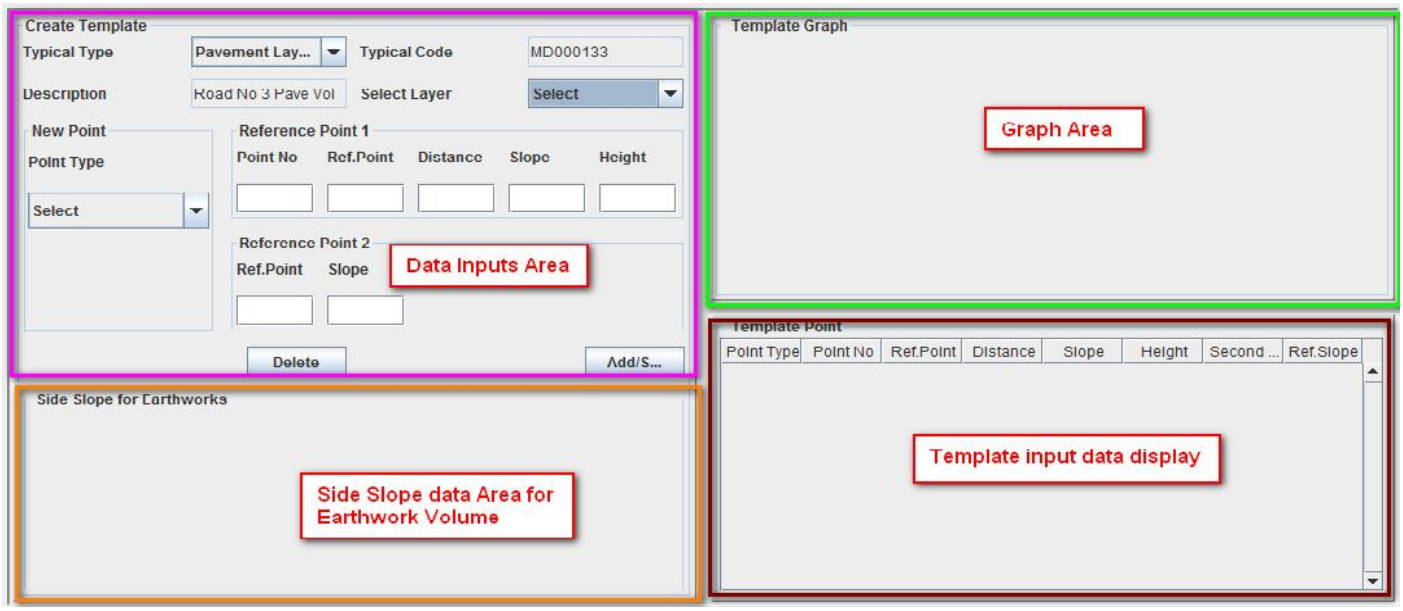
The Pavement Layers for Level Calculation now will appear in Create Template Form



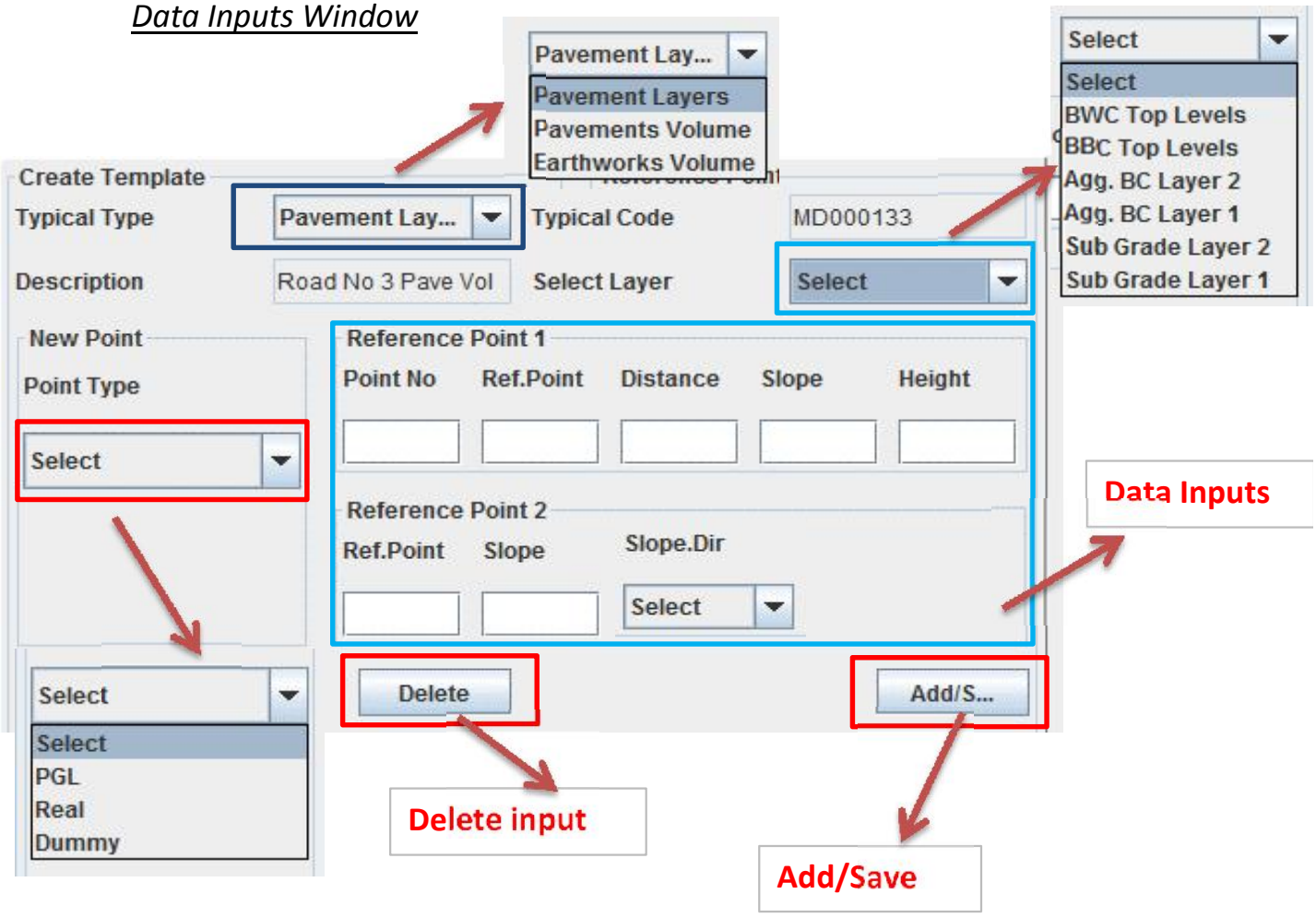
6.2 Create Template

6.2.1 Template - Basics and Functions

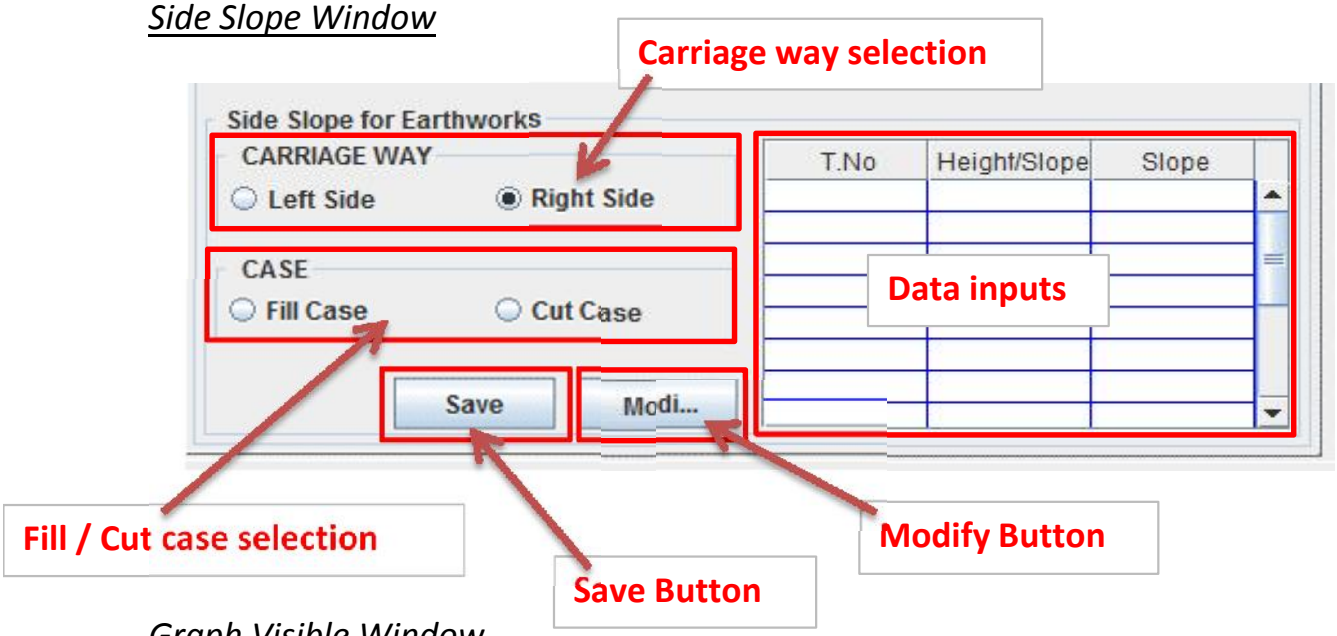
The Basic window of Template as Shown below ,,



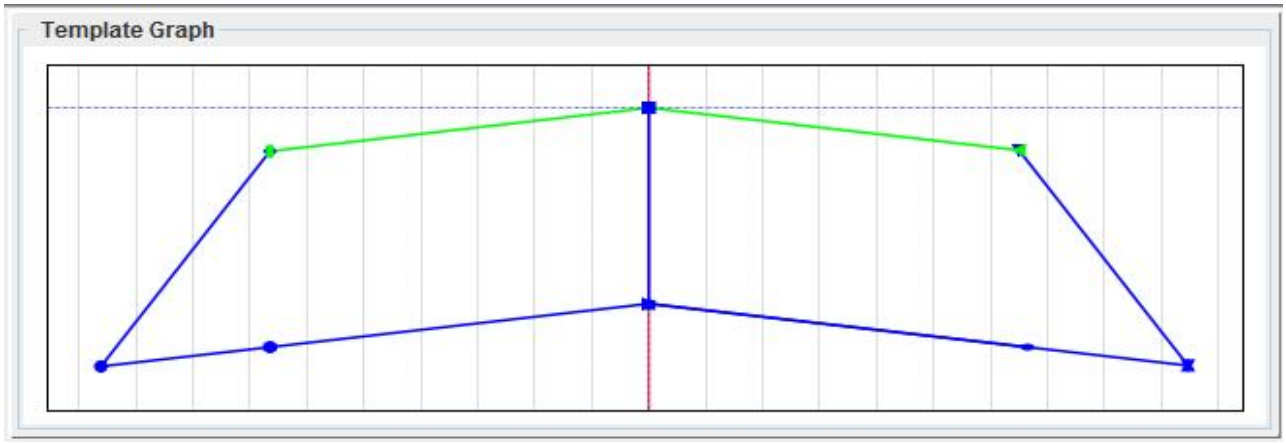
Data Inputs Window



Side Slope Window



Graph Visible Window



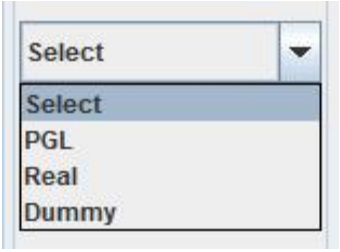
Template points Saving Window

Template Point

Point Type	Point No	Ref.Point	Distance	Slope	Height	Second R...	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			NO
Dummy	-1	0	6.50	-0.015				NO
Dummy	-2	0	-6.65	-0.015				NO
Real	3	0	0		-0.45			NO
Real	4	3	6.65	-0.015				NO
Real	5	-1	0	-0.166667		3	-0.015	Right
Real	2	3	-6.65	-0.015				NO
Real	1	-2	0	-0.166667		2	-0.015	Left

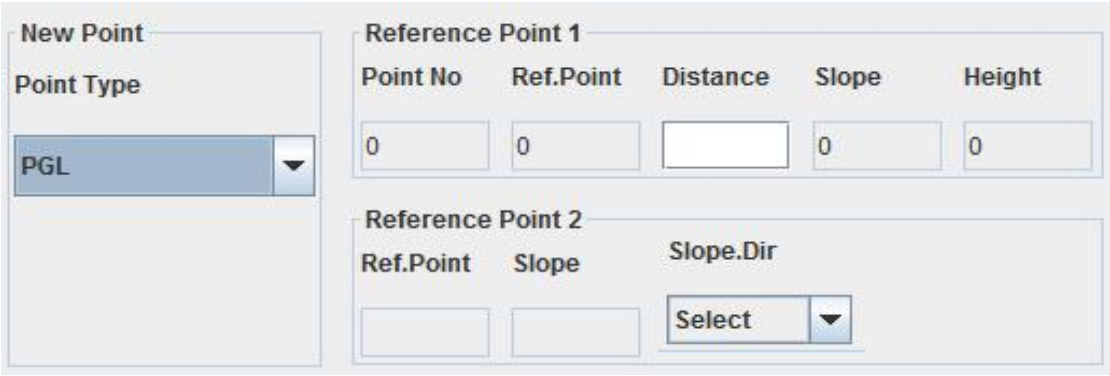
How to Create Template

In Template there was 3 type of Points



1. PGL Point - only one time with offset distance
2. Dummy Point - for Calculation Purpose . This Point will not store in database. The notation of Dummy points always with " - " Nos. It will use max time not any limits
3. Real Point - for the original point calculation . It will calculated from PGL Point or Dummy point or with real points .

PGL Point Creation

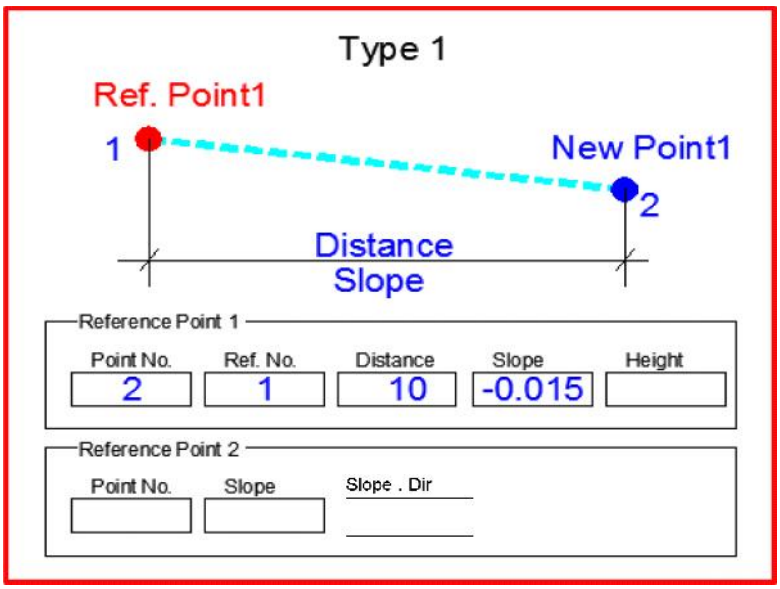


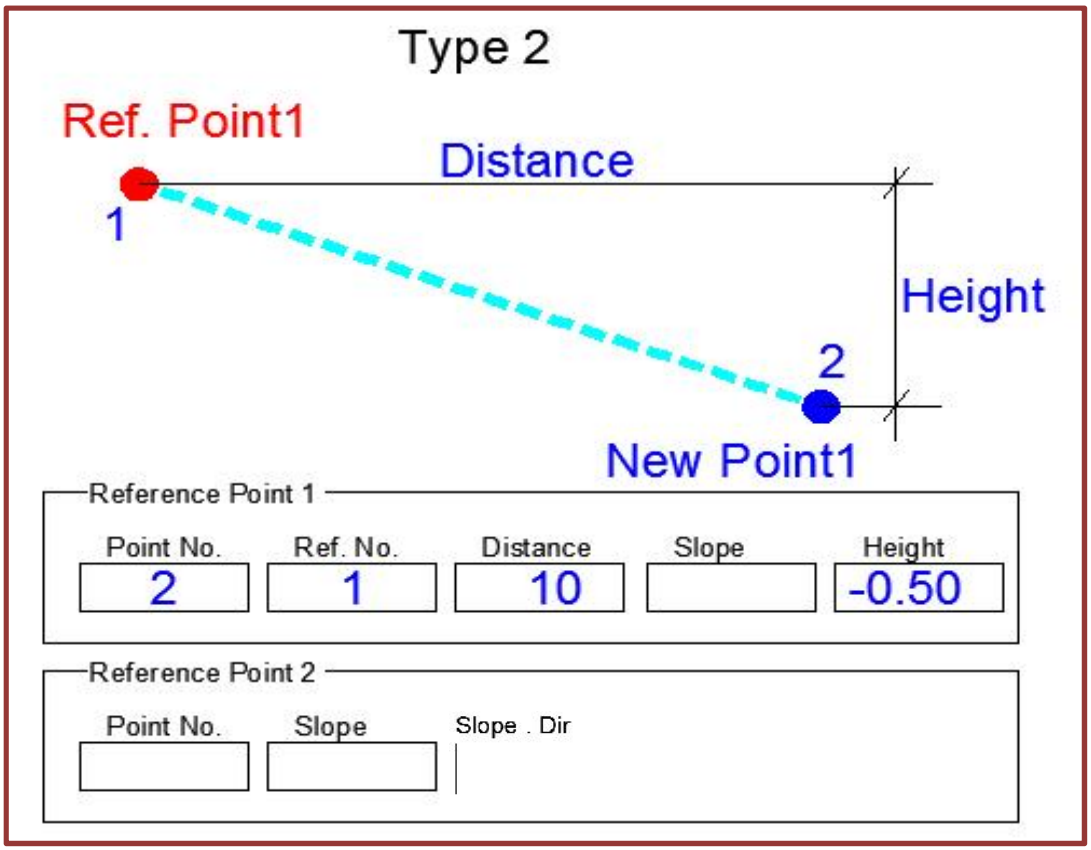
For PGL to enter the value of Distance

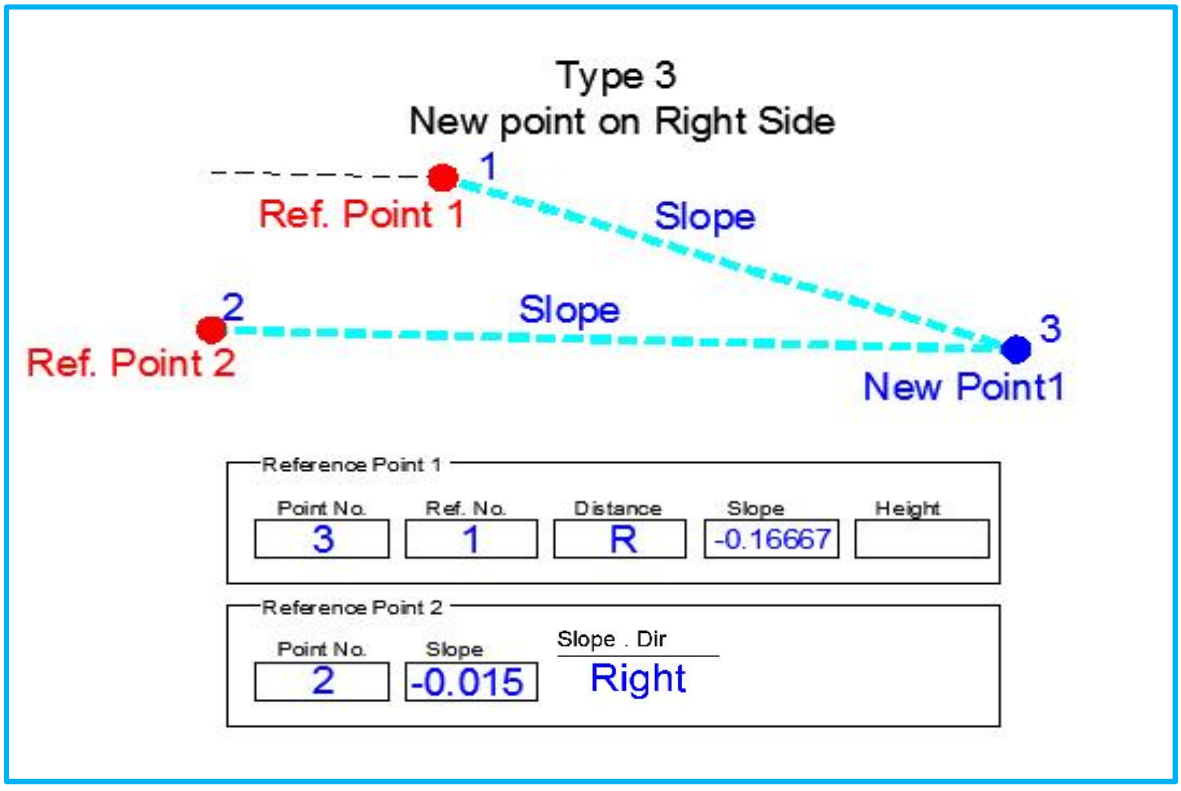
if PGL in Road Centre Distance = 0

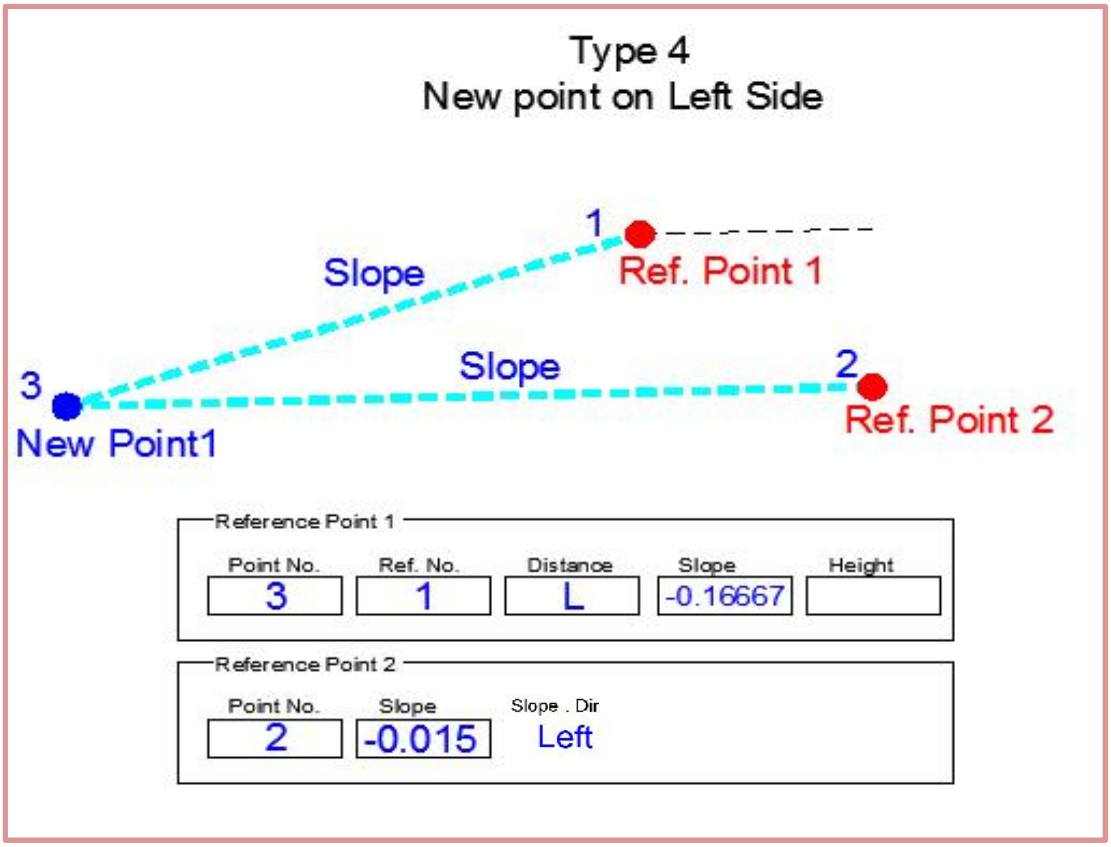
if PGL in Road Right Side Distance = " + " Value

if PGL in Road Left Side Distance = " - " Value




Type 2
Ref. Point1
Distance
1
Height
2
New Point1
Reference Point 1
Point No.
2
Ref. No.
1
Distance
10
Slope
Height
-0.50
Reference Point 2
Point No.
Slope
Slope . Dir

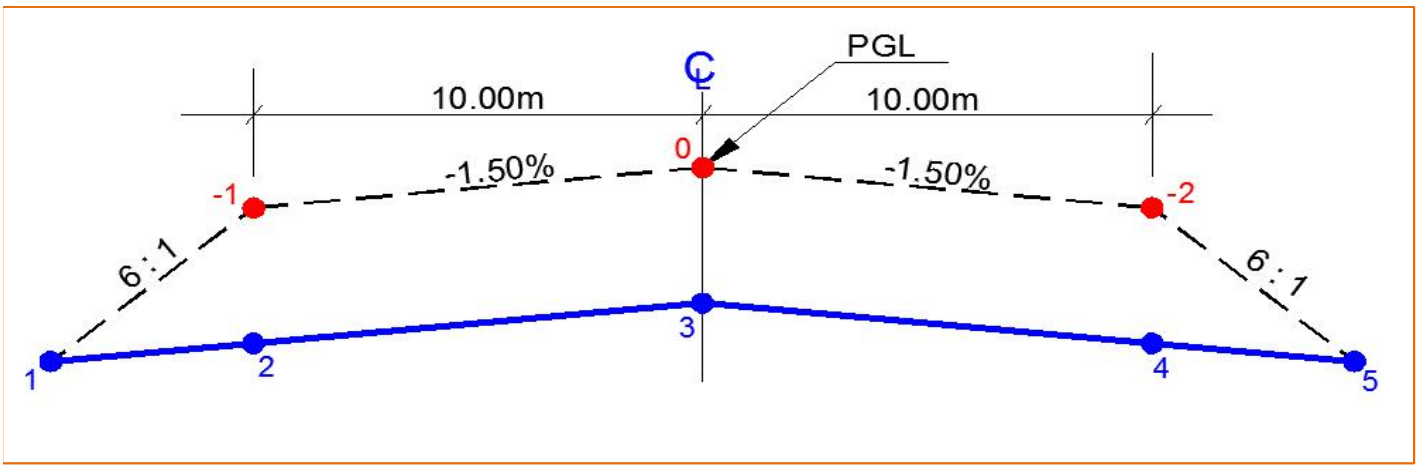

Type 3
New point on Right Side
1
Ref. Point 1
Slope
2
Slope
3
Ref. Point 2
New Point1
Reference Point 1
Point No.
3
Ref. No.
1
Distance
R
Slope
-0.16667
Height
Reference Point 2
Point No.
2
Slope
-0.015
Slope . Dir
Right



6.2.2 Template Creation for Earthwork Volume

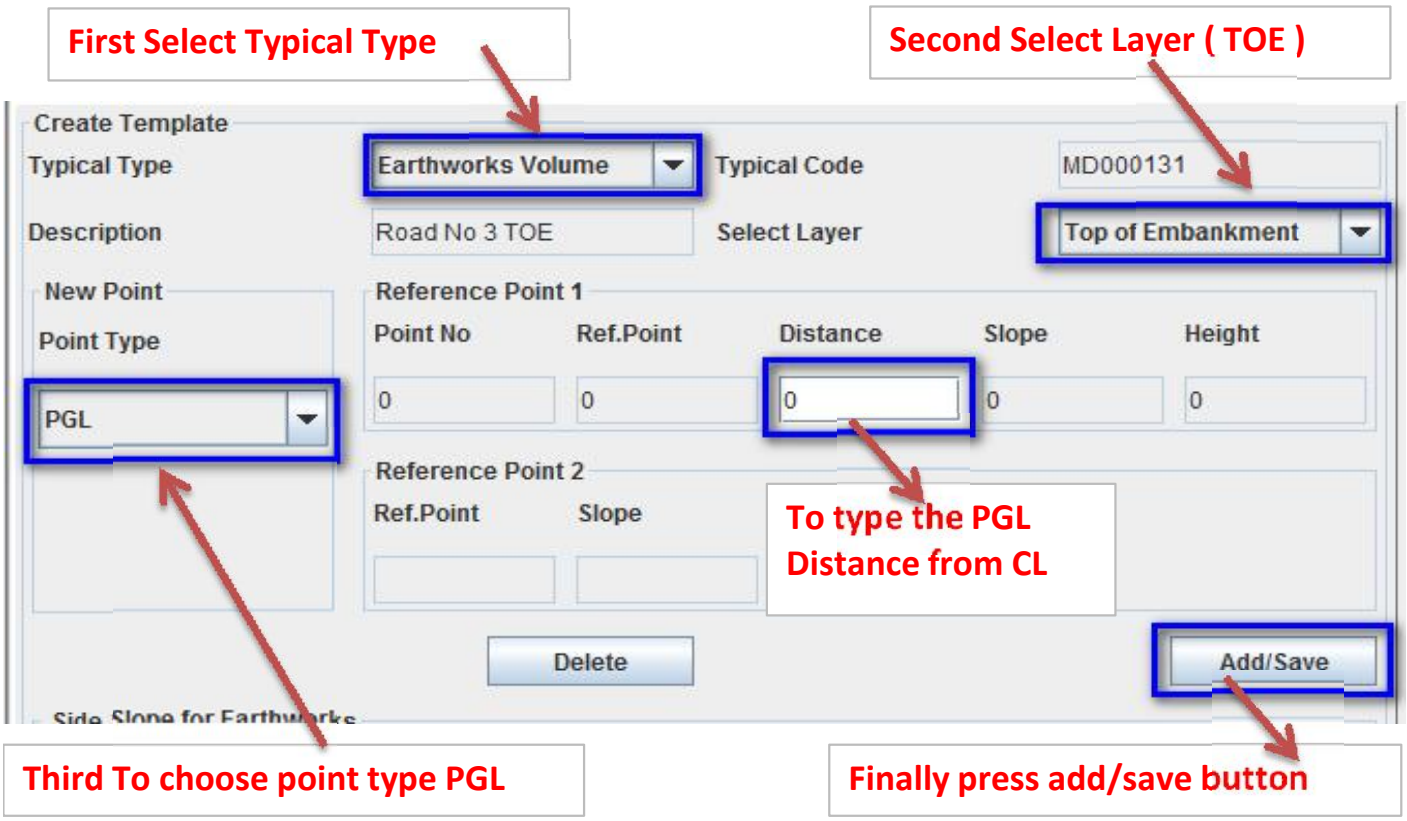
Template Creation

Now to Create the Template for Earthwork Volume Calculation - Top of Embankment. To go through the Typical Section ...

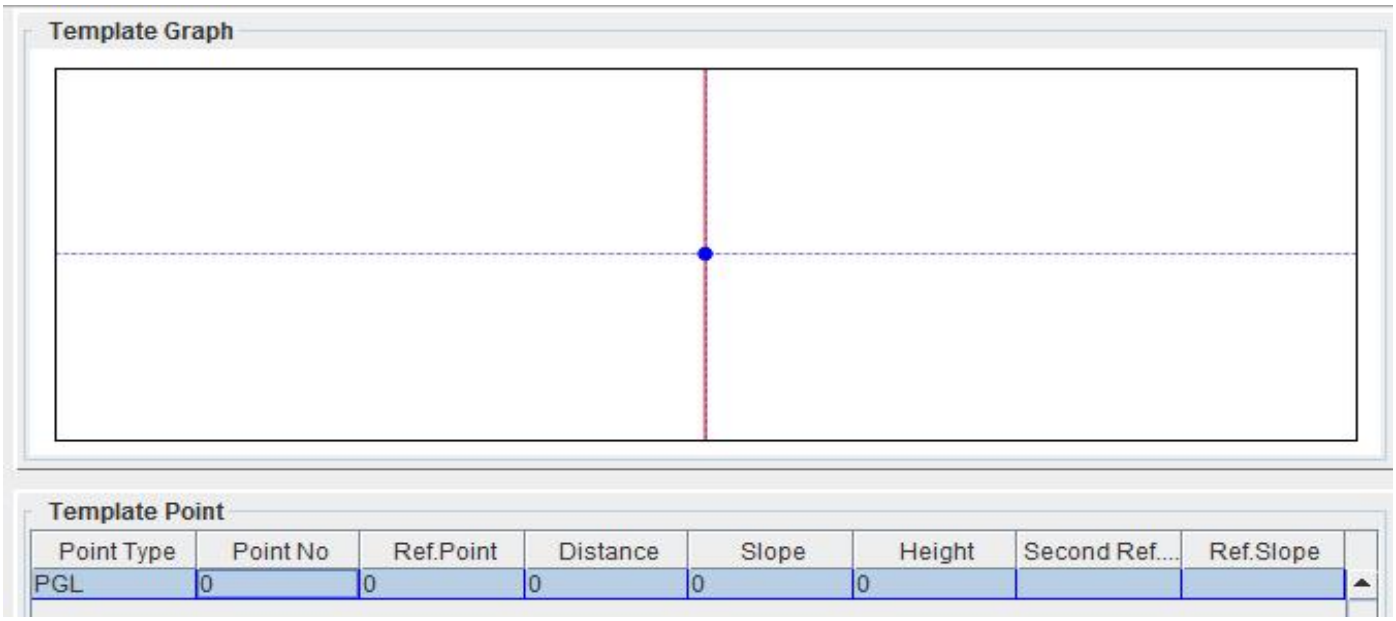


First Selection TOE line then choose the points which we required. The points Should created from left to right with integer numbers.

Then fix the Dummy points in any manner .. But the notation should be in negative numbers

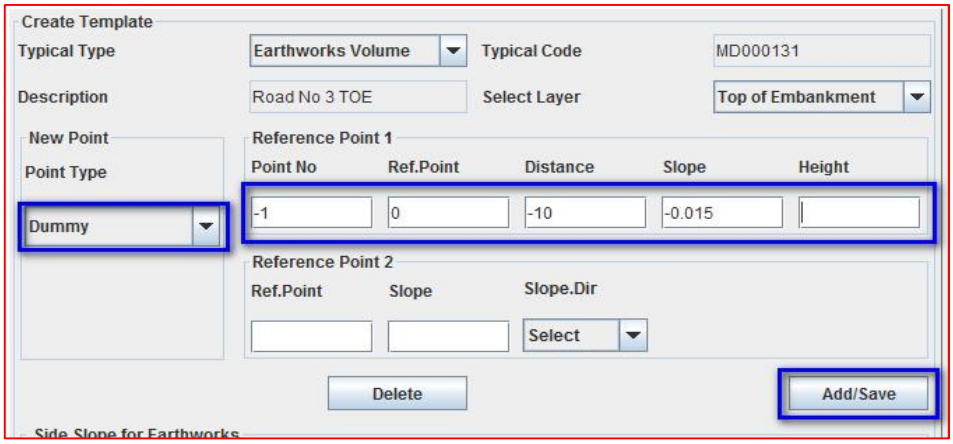


Now the Graph and Template point window will look as follow..,



To Create Dummy point -1

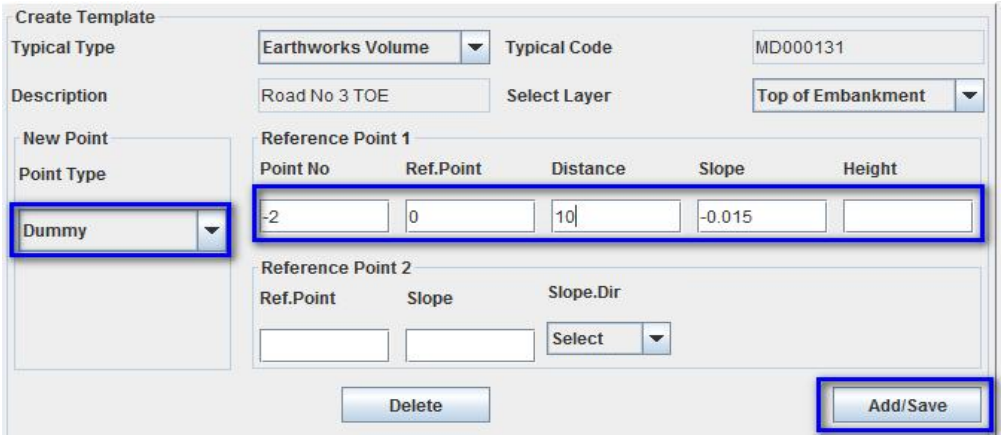
To Choose Dummy in point type , then type the input values as per table.. then press add/save button



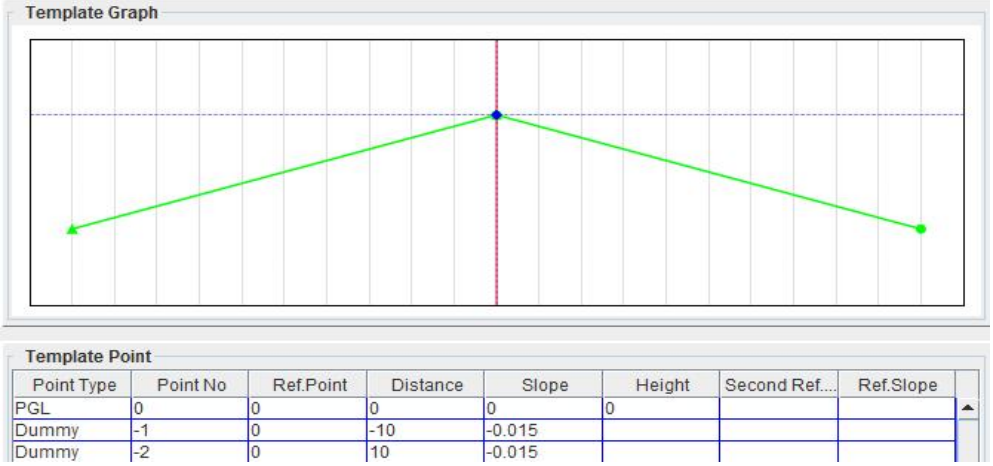
Now the Graph and Template Point will look as follow..,

To Create Dummy point -2

to Select Dummy type then point no "-2" ref, point with 0 dist "10" and slope " -0.015 " then add button

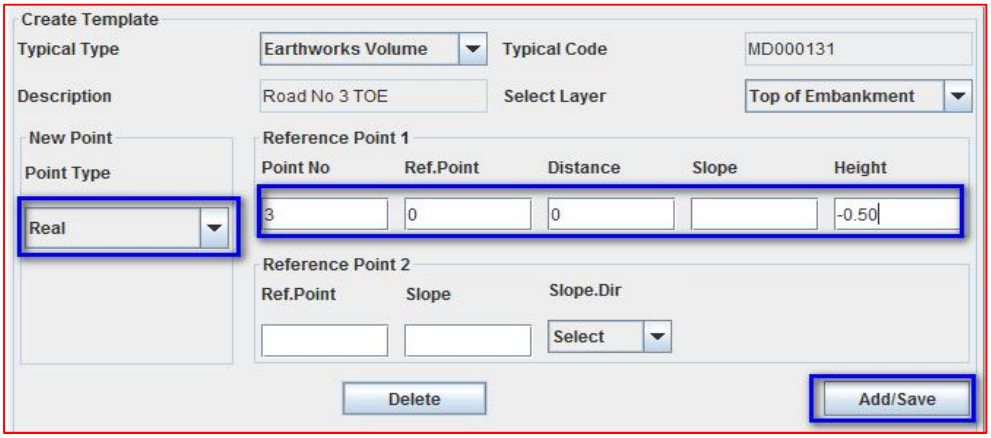


Now Graph will look like figure..

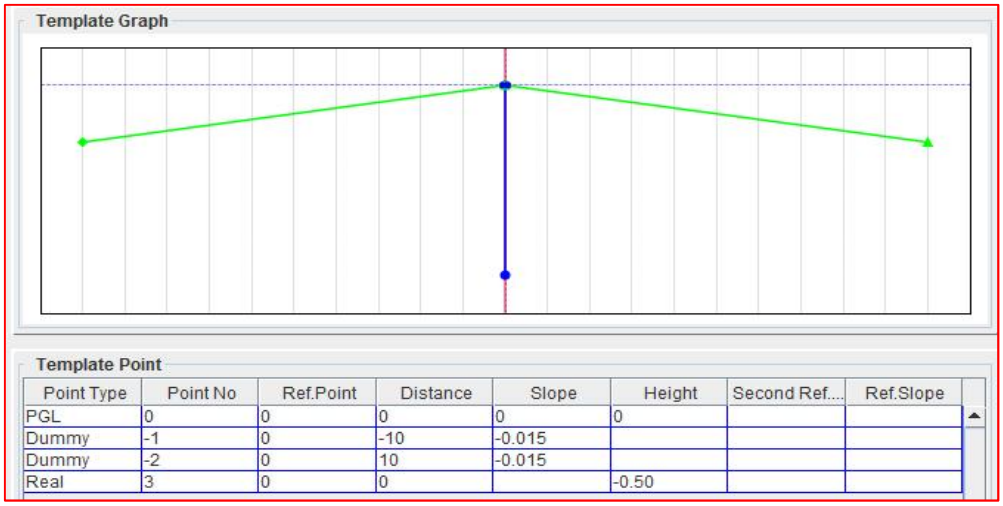


To Create Real point " 3 "

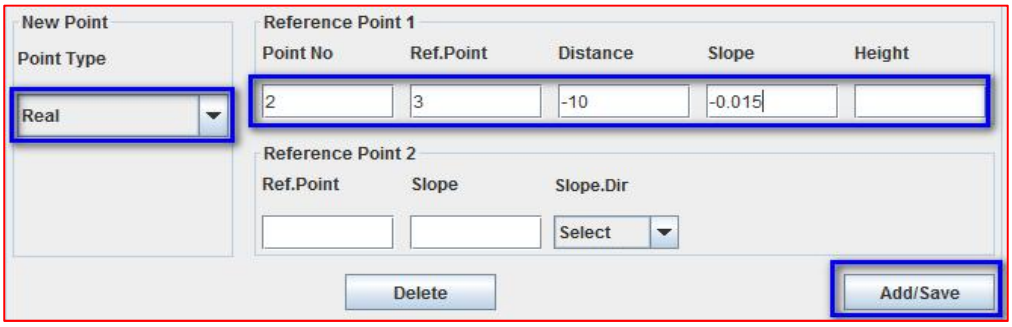
to Select Real type then point no "3" ref, point with 0 dist "0" and Height " -0.50 " then add button



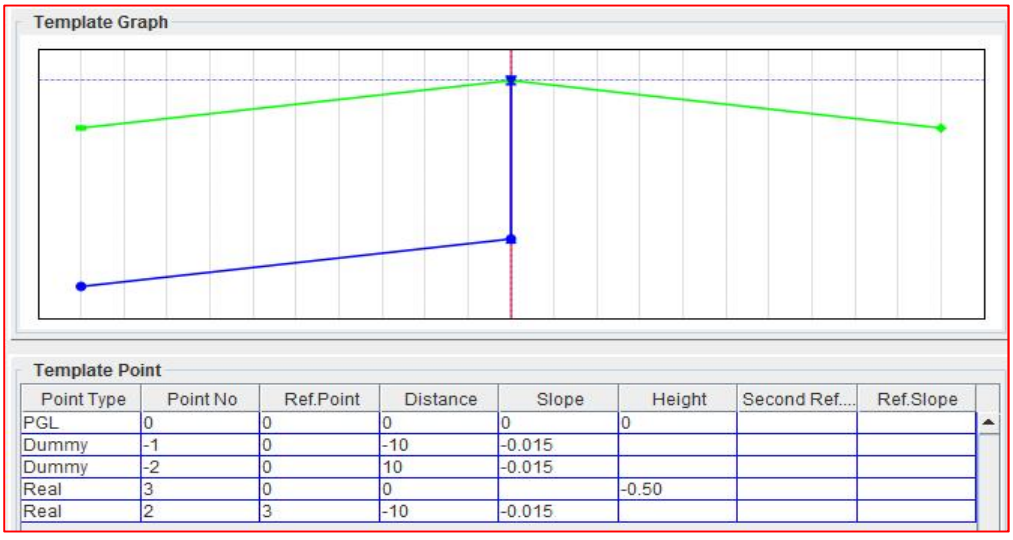
Now Graph will look like figure..



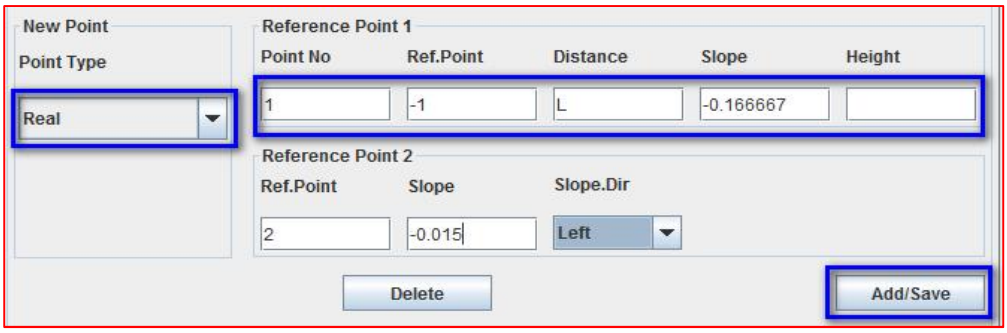
to Select Real type then point no "2" ref, point with "3" dist "-10" and Slope " -0.015 " then add button



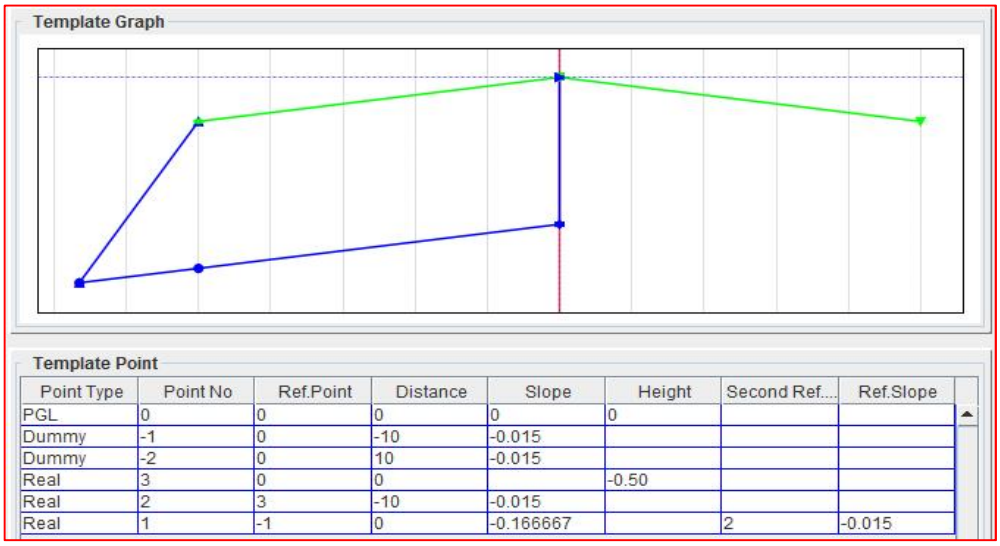
Now Graph will look like figure..



Now the point no 1 is based on two ref.points with slopes. point no "1" ref pt -1 slope -0.16667 and ref. pt 2 with slope of -0.015 - this point is came on left side so in Distance column type " L "

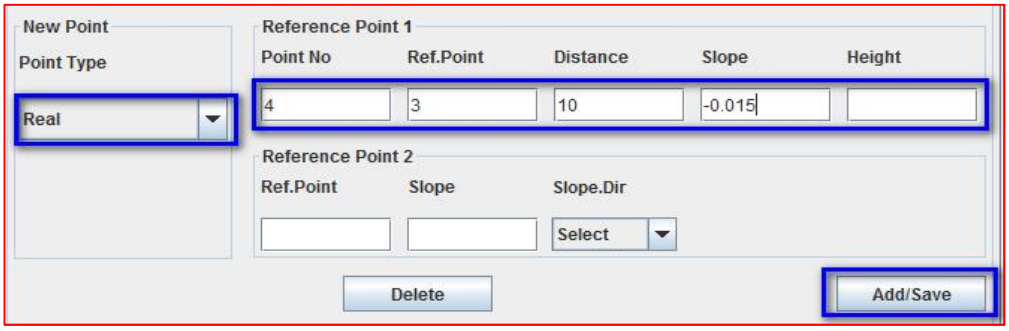


Now Graph will look like figure..

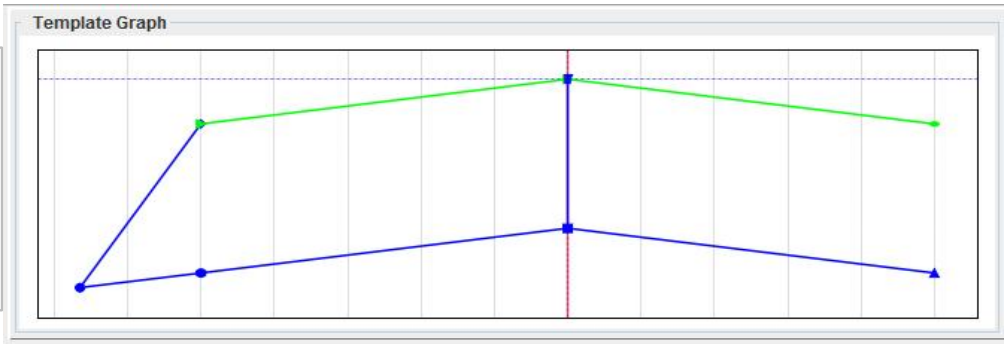


Point Type	Point No	Ref.Point	Distance	Slope	Height	Second Ref....	Ref.Slope
PGL	0	0	0	0	0		
Dummy	-1	0	-10	-0.015			
Dummy	-2	0	10	-0.015			
Real	3	0	0		-0.50		
Real	2	3	-10	-0.015			
Real	1	-1	0	-0.166667		2	-0.015

to Select Real type then point no "4" ref, point with "3" dist "10" and Slope " -0.015 " then add button



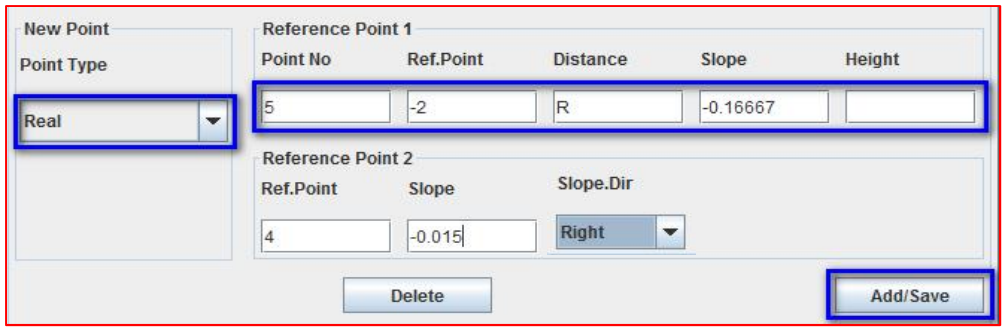
Now Graph will look like figure..



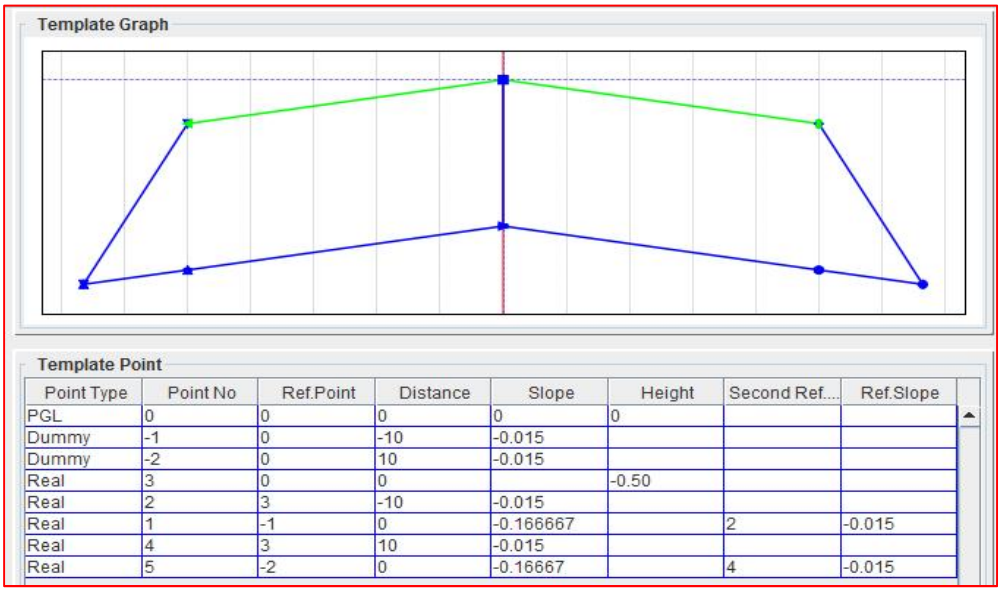
Template Point

Point Type	Point No	Ref.Point	Distance	Slope	Height	Second Ref....	Ref.Slope
PGL	0	0	0	0	0		
Dummy	-1	0	-10	-0.015			
Dummy	-2	0	10	-0.015			
Real	3	0	0		-0.50		
Real	2	3	-10	-0.015			
Real	1	-1	0	-0.166667		2	-0.015
Real	4	3	10	-0.015			

Now the point no 5 is based on two ref.points with slopes. point no "5" ref pt -2 slope -0.16667 and ref. pt 4 with slope of -0.015 - this point is came on left side so in Distance column type " R "



Now Graph will look like figure..

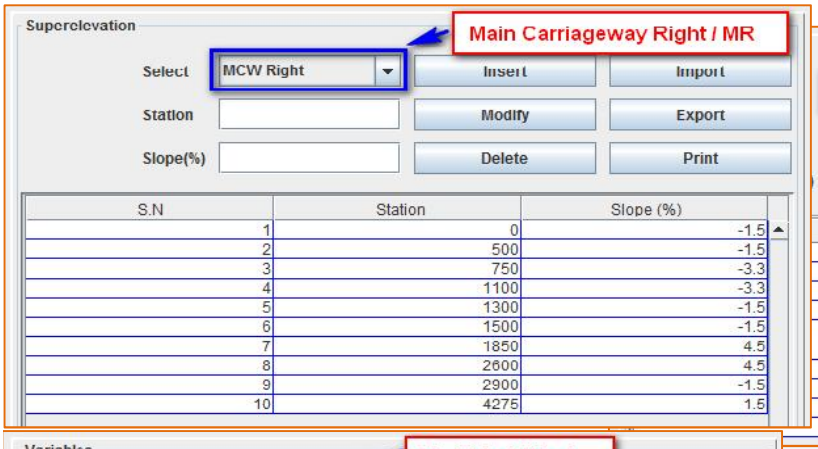


Template Point

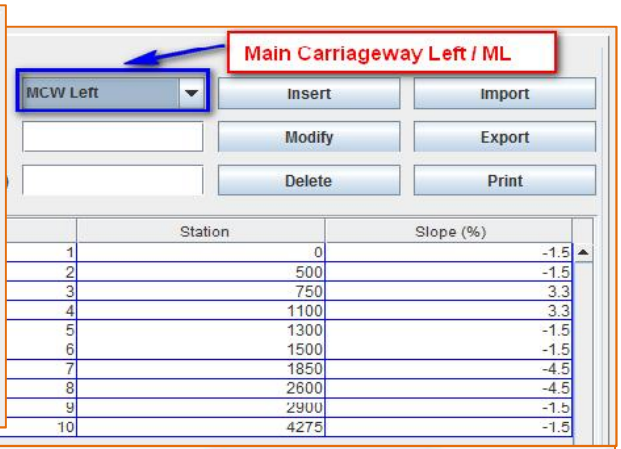
Point Type	Point No	Ref.Point	Distance	Slope	Height	Second Ref....	Ref.Slope
PGL	0	0	0	0	0		
Dummy	-1	0	-10	-0.015			
Dummy	-2	0	10	-0.015			
Real	3	0	0		-0.50		
Real	2	3	-10	-0.015			
Real	1	-1	0	-0.166667		2	-0.015
Real	4	3	10	-0.015			
Real	5	-2	0	-0.16667		4	-0.015

The above template now to see how to insert the Superelevation data's and Variables..

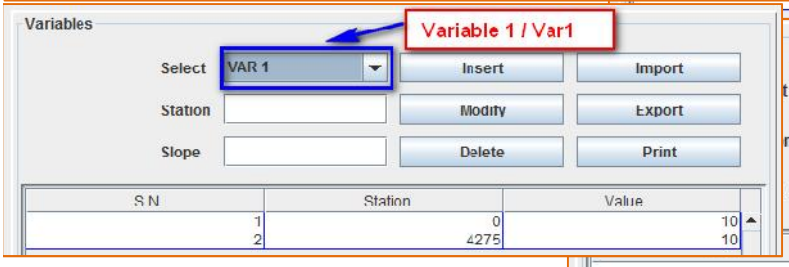
First to confirm the Superelevation data's and variables input are in data base



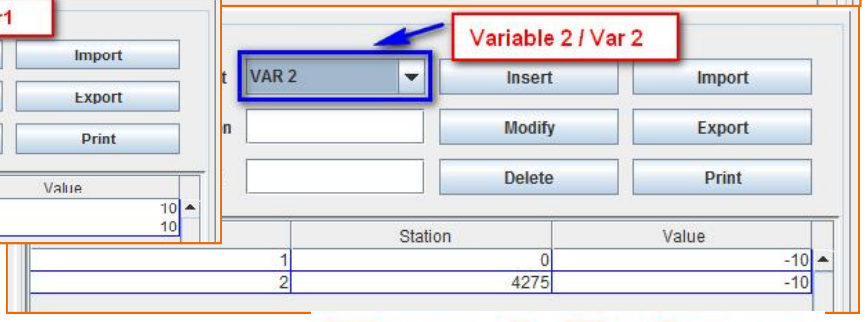
S.N	Station	Slope (%)
1	0	-1.5
2	500	-1.5
3	750	-3.3
4	1100	-3.3
5	1300	-1.5
6	1500	-1.5
7	1850	4.5
8	2600	4.5
9	2900	-1.5
10	4275	1.5



	Station	Slope (%)
1	0	-1.5
2	500	-1.5
3	750	3.3
4	1100	3.3
5	1300	-1.5
6	1500	-1.5
7	1850	-4.5
8	2600	-4.5
9	2900	-1.5
10	4275	-1.5

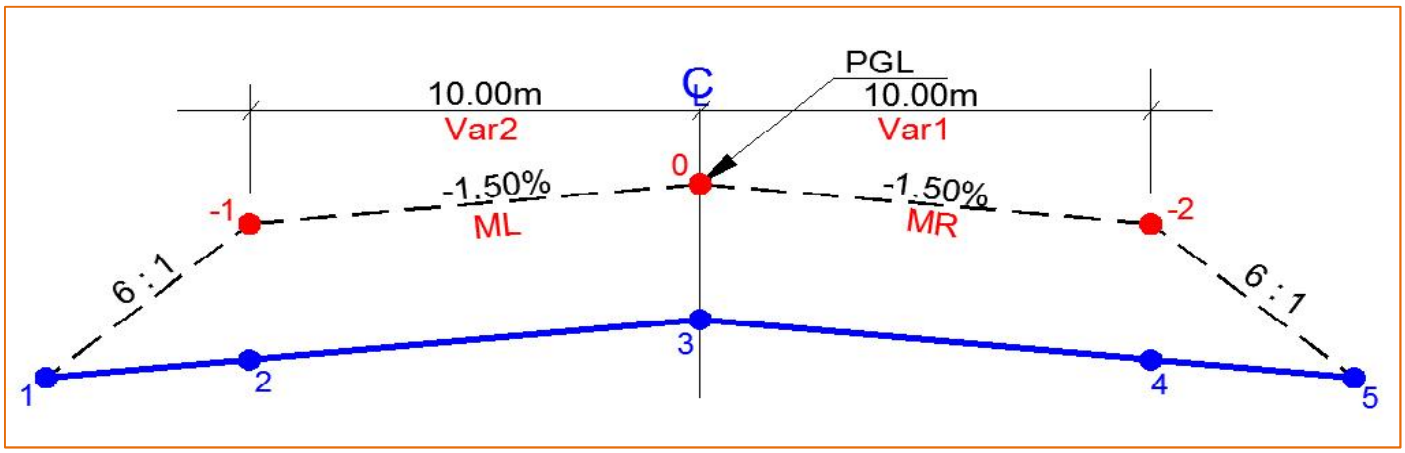


S.N	Station	Value
1	0	10
2	4275	10



	Station	Value
1	0	-10
2	4275	-10

After insert the Superelevation and Variable data the template will appear as follow..



Template Point

Point Type	Point No	Ref.Point	Distance	Slope	Height	Second Ref....	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			NO
Dummy	-1	0	10/Var1	-0.015/MR				NO
Dummy	-2	0	-10/Var2	-0.015/ML				NO
Real	3	0	0		-0.50			NO
Real	4	3	10/Var1	-0.015/MR				NO
Real	5	-1	0	-0.166667		4	-0.015/MR	Right
Real	2	3	-10/Var2	-0.015/ML				NO
Real	1	-2	0	-0.16667		2	-0.015/ML	Left

Important notes for TOE Template

- PGL values are taken from Vertical alignment datas
- The slope values are using Left & Right ' minus' will 'minus'and ' plus' will be 'plus' .
- The PGL we can use in template only one time .. If need more use Dummy point to create the same value.
- Using of Dummy points in template is unlimited . Also not in any order.
- The Real Points should be linear from Left to Right. At the time of
- Template creation based on calculation order we can use the point nos in any order.. At the time of calculation the order will be stored in data base.
- The Superelevation data to be used in template the value of slope will type in the format of " -0.015 / MR "
- The Superelevation variable used in template as following notations

Main Carriageway Right	MR
Main Carriageway Left	ML
Inner Shoulder Right	IR
Inner Shoulder Left	IL
Outer Shoulder Right	OR
Outer Shoulder Left	OL

- In Road Solver accepted the 20 nos variables to be used in Distance , Slope or Height. The values of Variables is taken from Variable Table. The variables are using in Template as " 10/var1"

Side Slope Creation

For Side Slope data the Fill Height always mentioned as positive nos and Cut Height will be negative no.

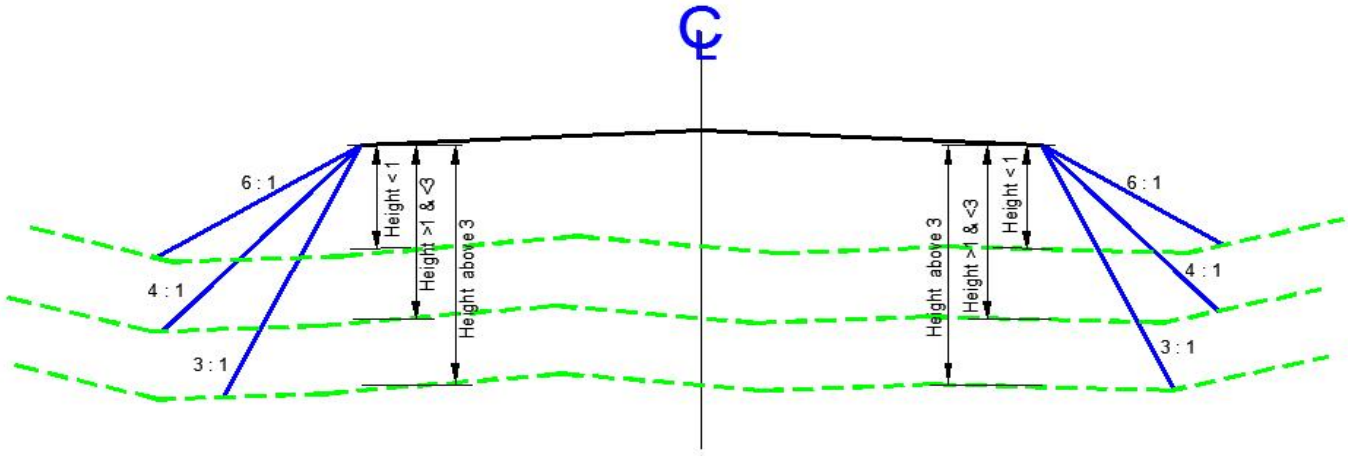
Now to check the data's from Typical Section for Fill & Cut Conditions

FOR FILL CONDITION

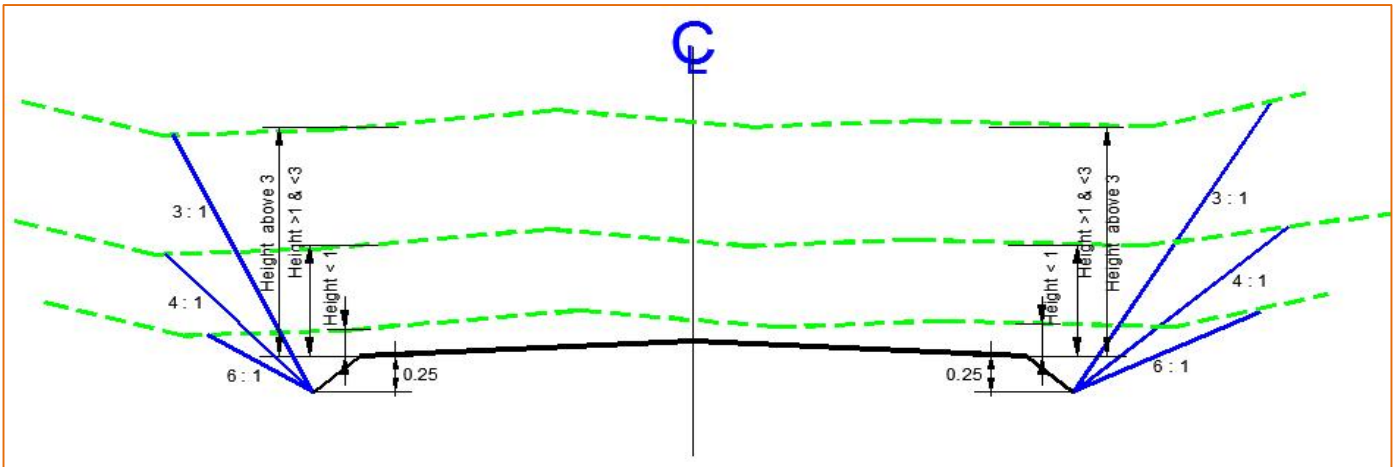
Height	Slope
0.00 to 1.00	6 : 1
1.01 to 3.00	4 : 1
above 3.00	3 : 1

FOR CUT CONDITION

Height	Slope
0.00 to 1.00	6 : 1
1.01 to 3.00	4 : 1
above 3.00	3 : 1

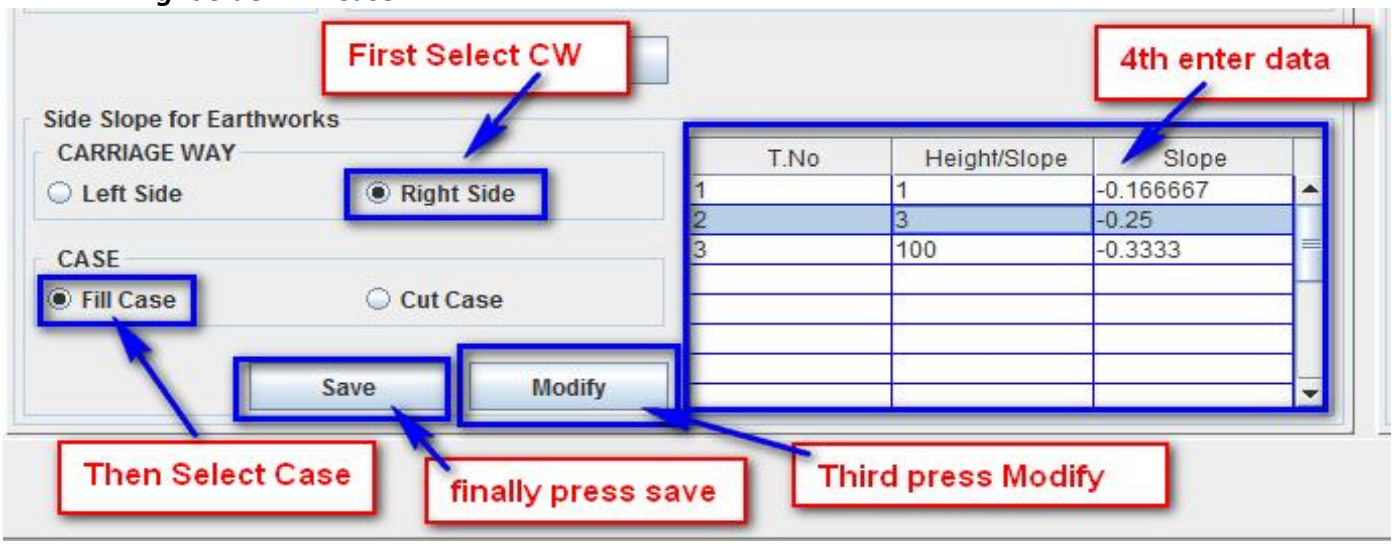


FOR FILL CONDITION - TYPE 1



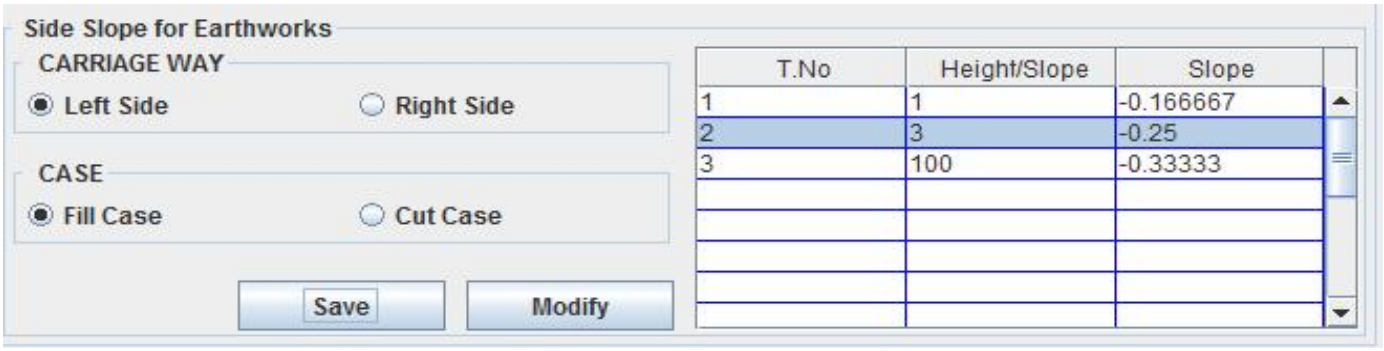
FOR CUT CONDITION - TYPE 1

Right Side - Fill Case

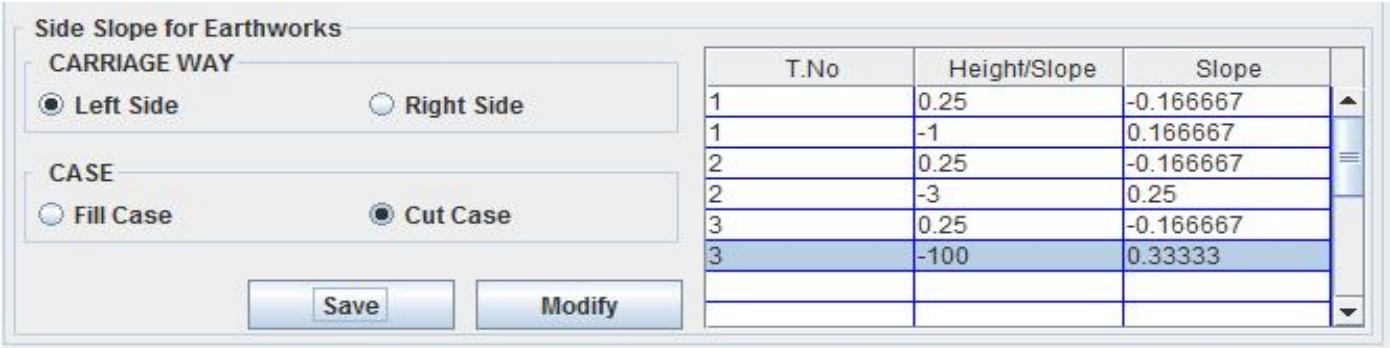


Right Side - Cut Case

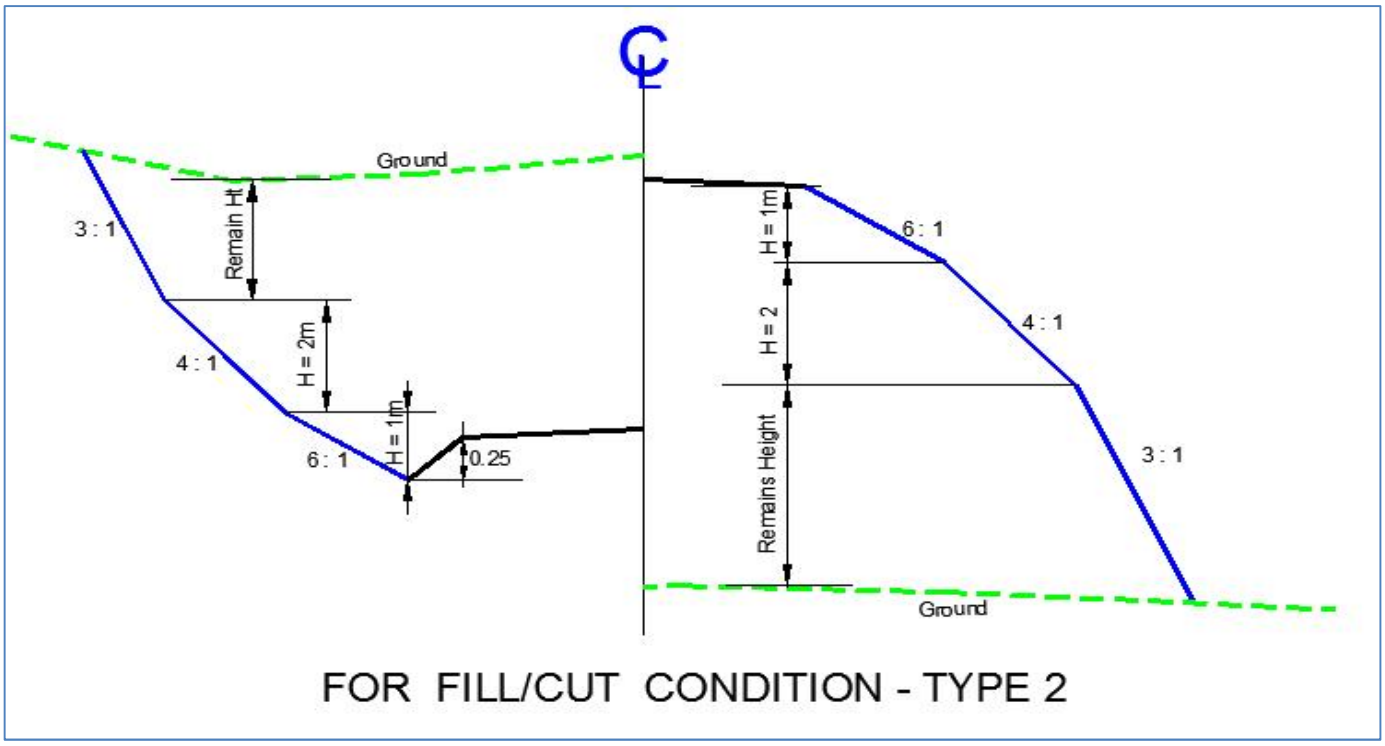
Left Side - Fill Case



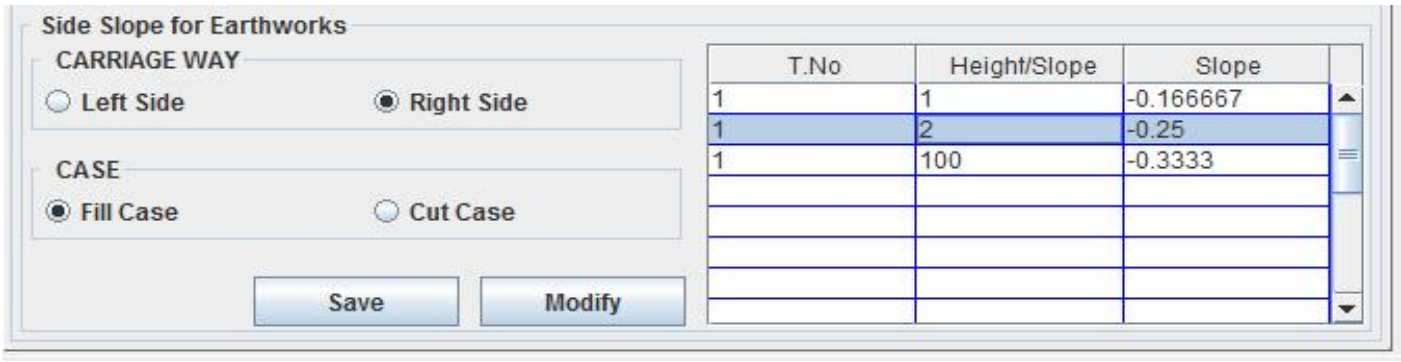
Left Side - Cut Case



Type 2 - Fill / Cut Condition

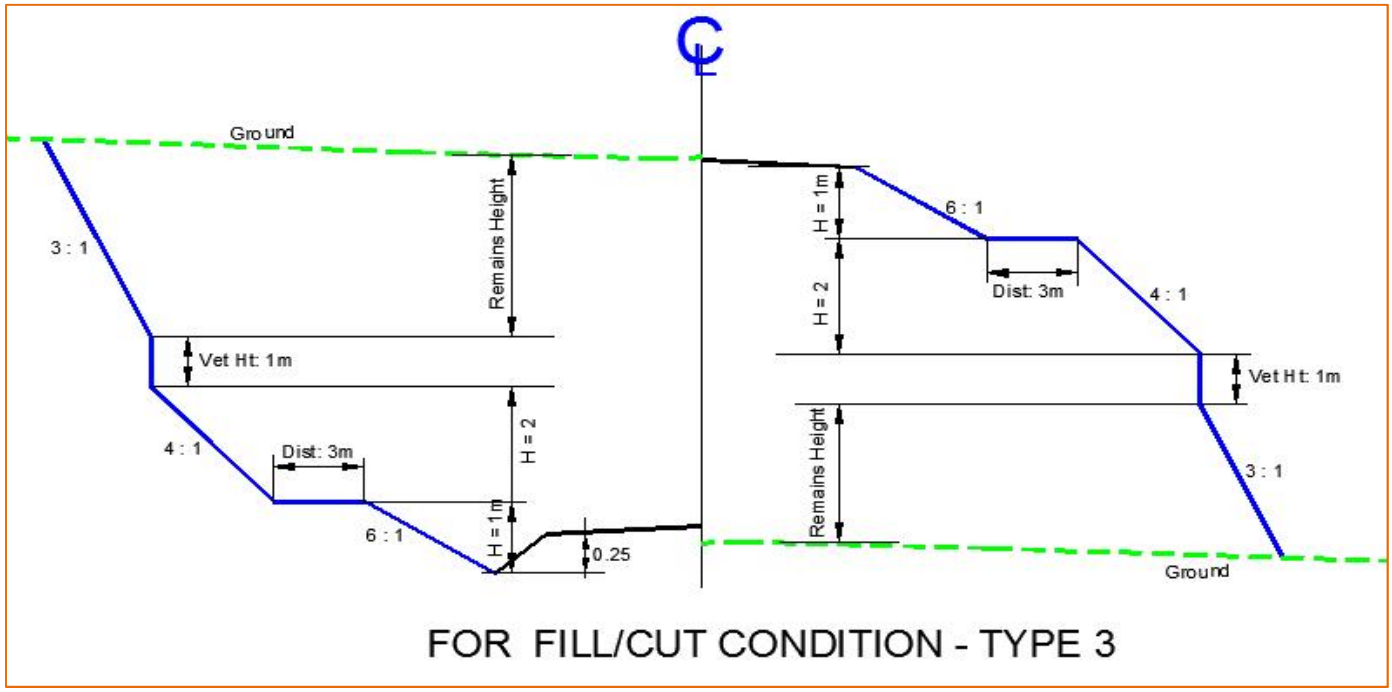


Right Side Fill Case - Side slope data as follow..,



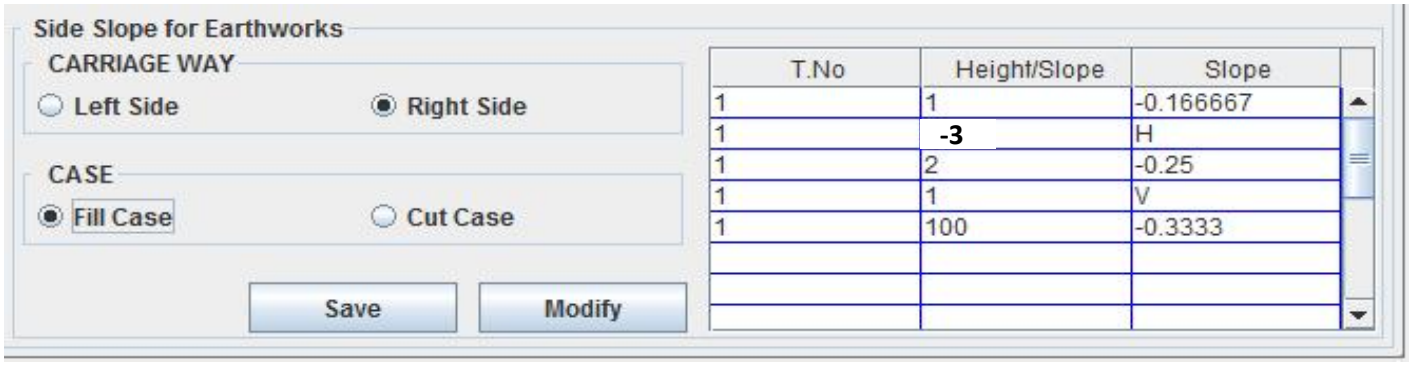
Left Side Cut Case - Side slope data as follow..,

Type 3 - Fill / Cut Condition



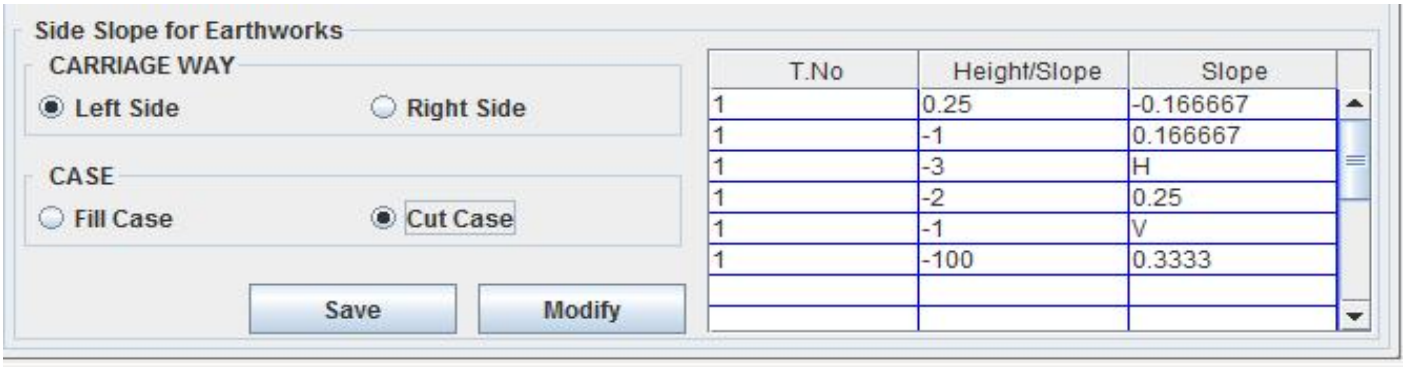
FOR FILL/CUT CONDITION - TYPE 3

Right Side Fill Case - Side slope data as follow..,



T.No	Height/Slope	Slope
1	1	-0.166667
1	-3	H
1	2	-0.25
1	1	V
1	100	-0.3333

Left Side Cut Case - Side slope data as follow..,



T.No	Height/Slope	Slope
1	0.25	-0.166667
1	-1	0.166667
1	-3	H
1	-2	0.25
1	-1	V
1	-100	0.3333

Important notes for TOE Template - Side Slope

- **Right & Left Side Fill Slope**
  - Height of Fill always positive numbers (Right & Left)
  - Fill Slope always negative numbers (Right & Left)
  - For Single Slope T.No is different (like 1,2,3,⋯)
  - For Continuous Slope T.No will same for each condition (like 1,1,1,.. 2,2,2,2⋯, 3,3,3,3..,)
  - For Horizontal distance with positive no for Right side Negative no for Left side and in slope should be write " H "
  - For Vertical Height with positive no for Right side Negative no for Left side and in slope should be write " V "

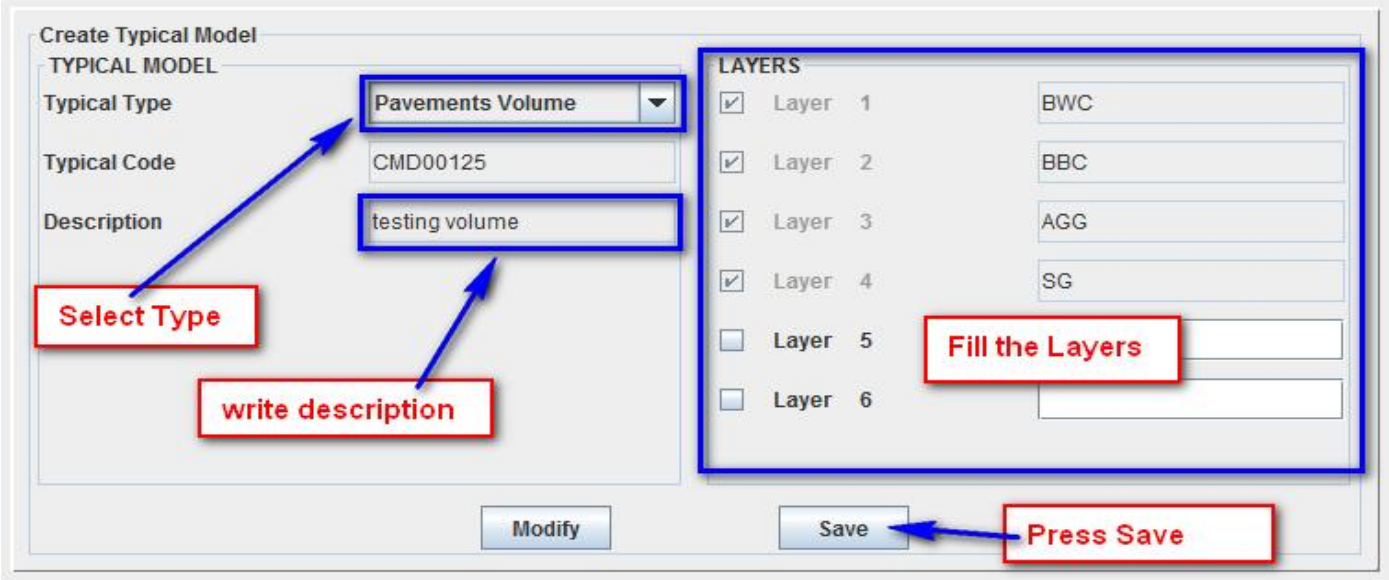
- **Right & Left Side Cut Slope**
  - Height of Cut always negative numbers (Right & Left)
  - Cut Slope always positive numbers (Right & Left)
  - For Single Slope T.No is different (like 1,2,3,⋯)
  - For Continuous Slope T.No will same for each condition (like 1,1,1,.. 2,2,2,2⋯, 3,3,3,3..,)
  - For Horizontal distance with positive no for Right side Negative no for Left side and in slope should be write " H "
  - For Vertical Height with positive no for Right side , Negative no for Left side and in slope should be write " V "

6.2.3 Template Creation for Pavement Volume

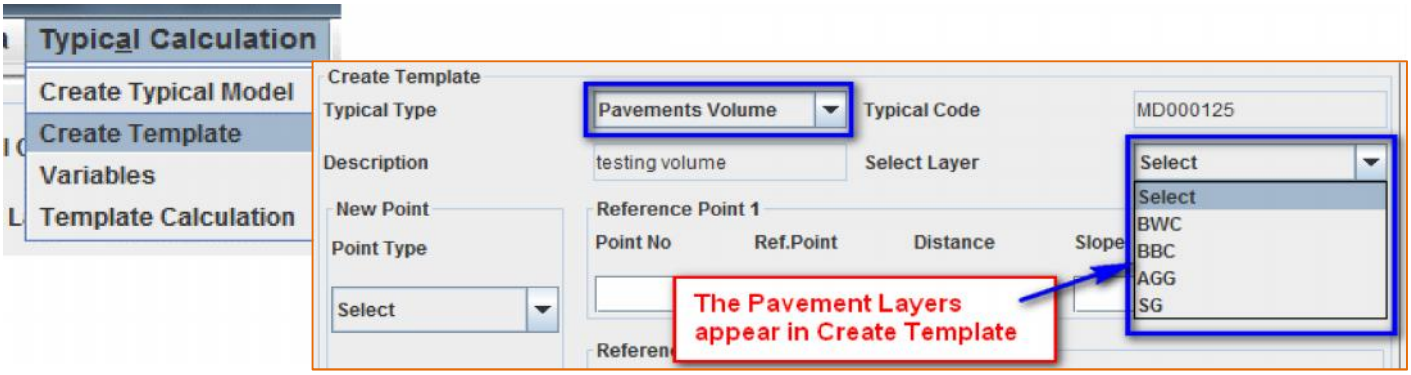
The purpose to create pavement volume template to calculate the Area and Volume of Pavement Structures like Bit. Wearing Course, Bit. Base Course , Agg. Base Course , Sub Base and Sub Grade .

First to select Typical Calculation menu to choose Create typical Model

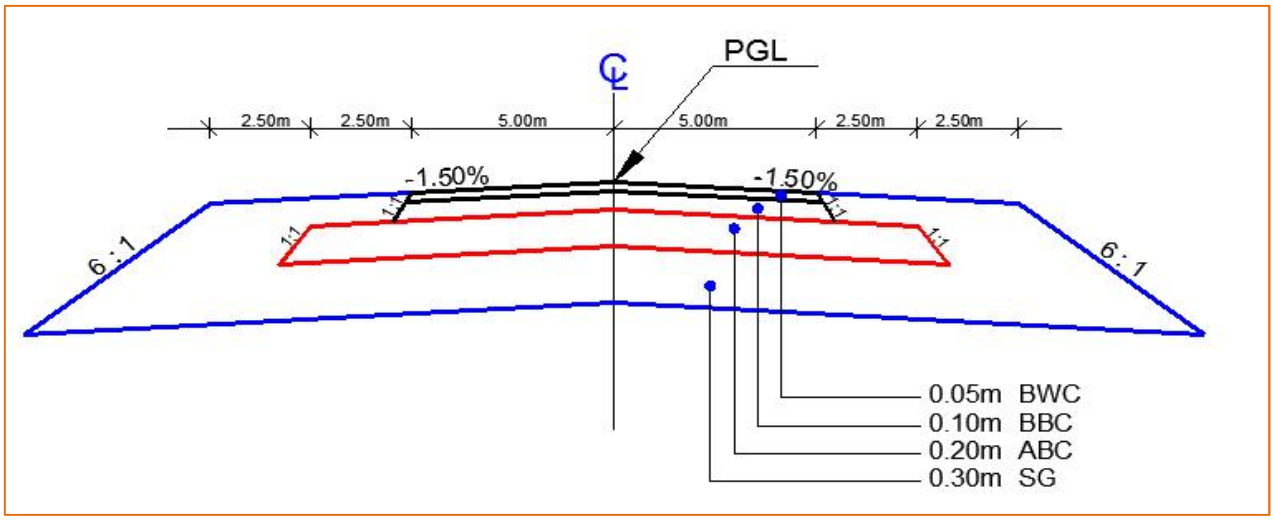
The Screen will appear like below … then Fill the layers as per requirement



Then goto in Typical Calculation Select Create Template



The Pavement Structure of Sample Road as following dimensions..

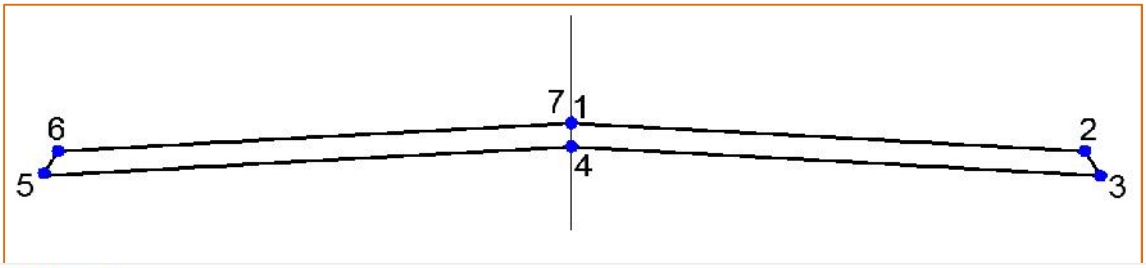


For BWC Calculation

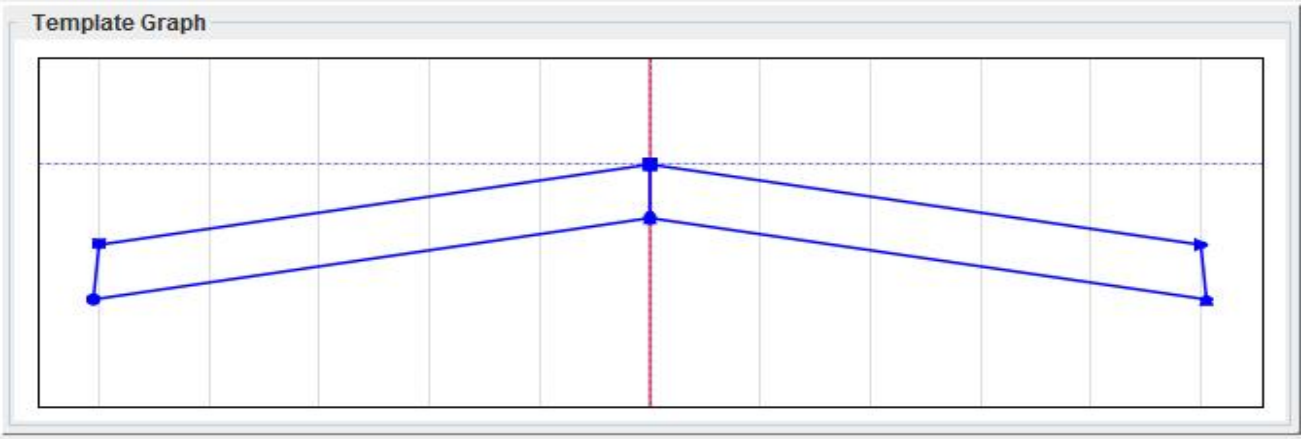
First to Create the Template for BWC.

First to fix the PGL point ., then create Dummy point if required..

Then create Real points from any location and close the point at the same as starting point.



Template Graph



Template Point

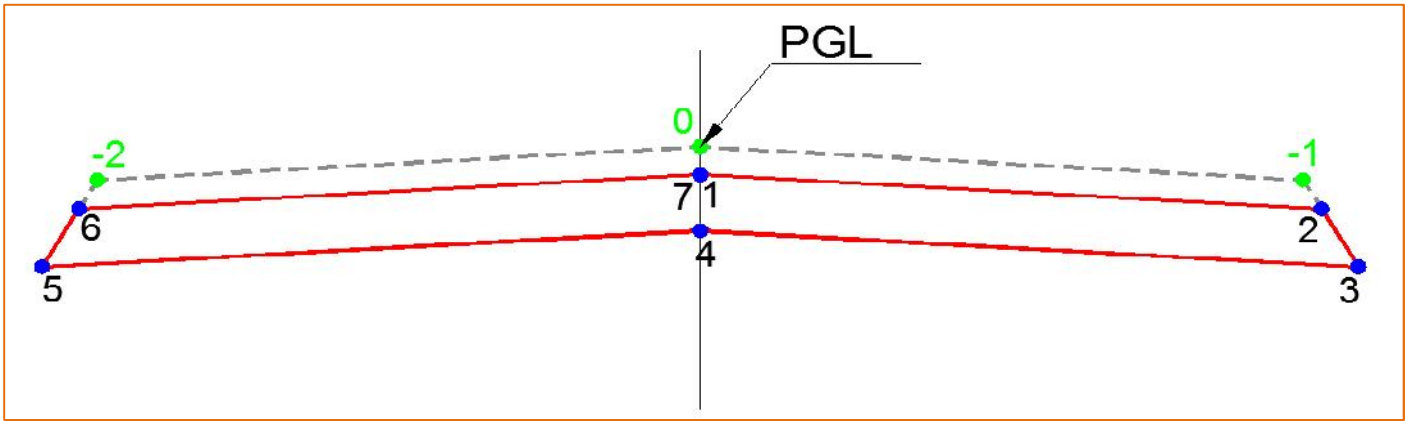
Point Type	Point No	Ref.Point	Distance	Slope	Height	Second R...	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			
Real	1	0	0		0			
Real	4	1	0		-0.05			
Real	2	1	5	-0.015				NO
Real	3	2	0	-1		4	-0.015	Right
Real	6	1	-5	-0.015				
Real	5	6	0	-1		4	-0.015	
Real	7	1	0		0			

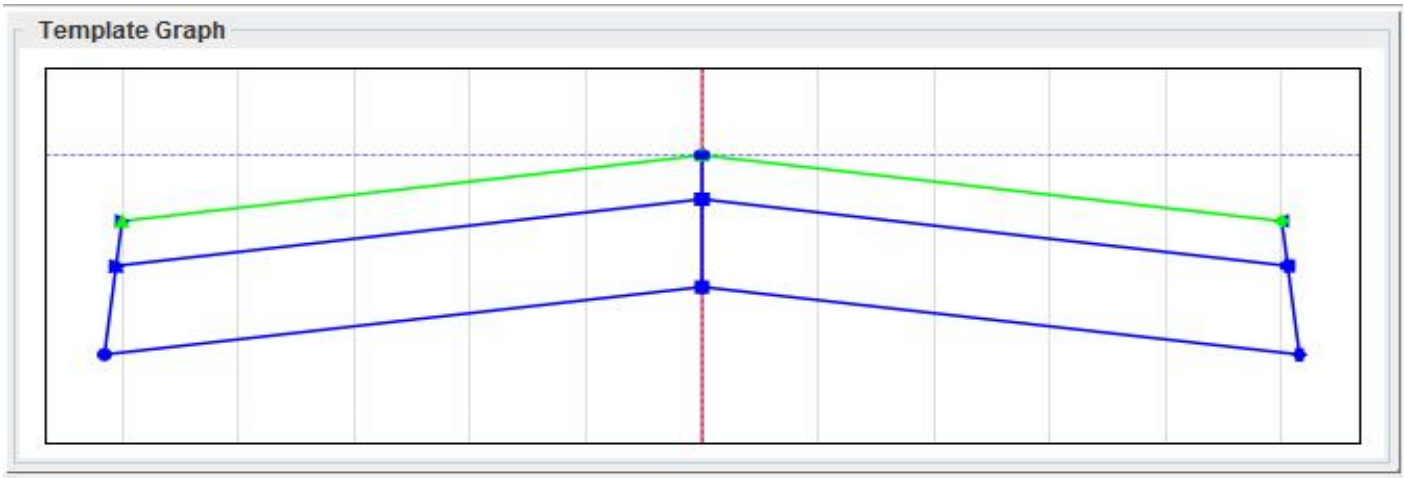
For BBC Calculation

Second to Create the Template for BBC.

First to fix the PGL point ., then create Dummy point if required..

Then create Real points from any location and close the point at the same as starting point.





Template Point

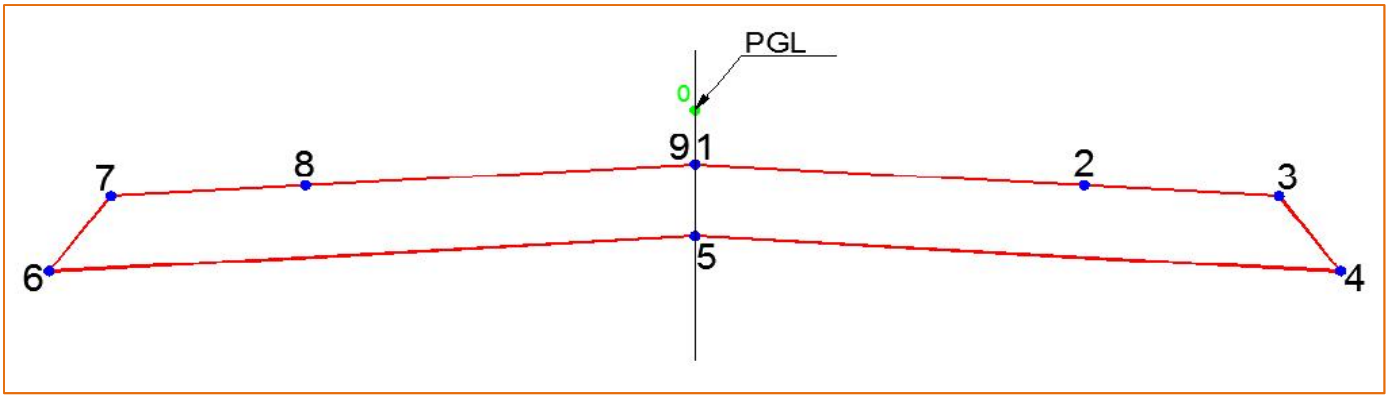
Point Type	Point No	Ref.Point	Distance	Slope	Height	Second R...	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			
Dummy	-1	0	5	-0.015				NO
Dummy	-2	0	-5	-0.015				NO
Real	1	0	0		-0.05			
Real	4	1	0		-0.10			
Real	2	-1	0	-1		1	-0.015	Right
Real	3	2	0	-1		4	-0.015	Right
Real	6	-2	0	-1		1	-0.015	
Real	5	6	0	-1		4	-0.015	
Real	7	1	0		0			

For ABC Calculation

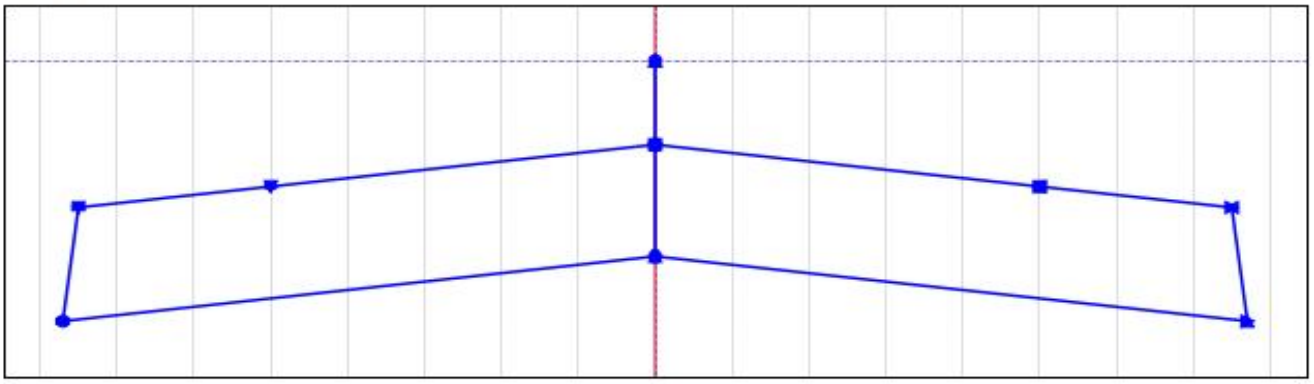
Third to Create the Template for ABC.

First to fix the PGL point ., then create Dummy point if required..

Then create Real points from any location and close the point at the same as starting point.



Template Graph



Template Point

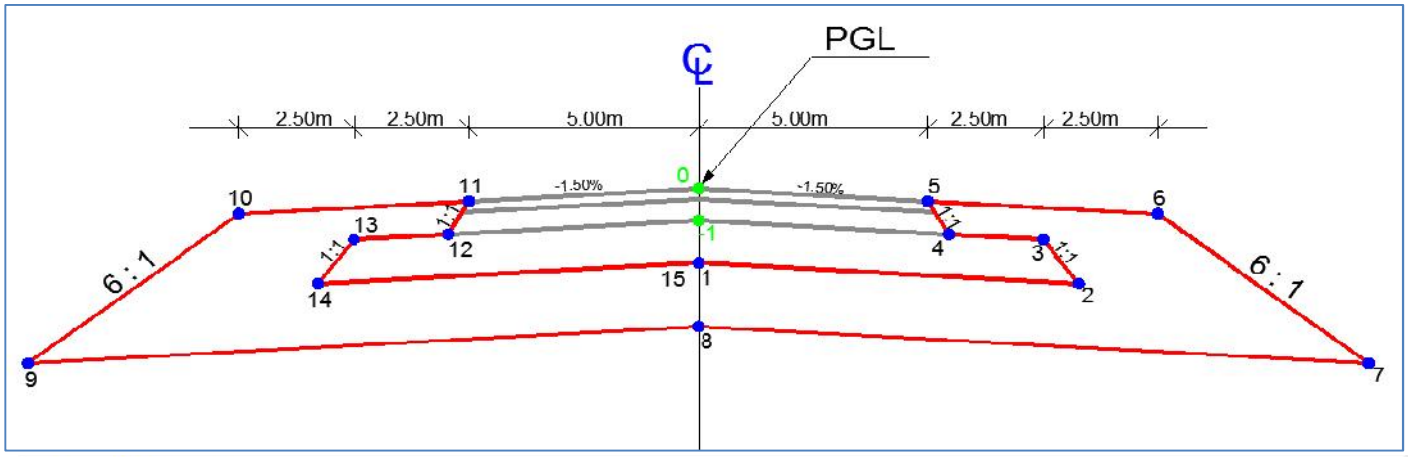
Point Type	Point No	Ref.Point	Distance	Slope	Height	Second R...	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			
Real	1	0	0		-0.15			
Real	2	1	5	-0.015				NO
Real	3	2	2.50	-0.015				NO
Real	5	1	0		-0.20			
Real	4	3	0	-1		5	-0.015	Right
Real	8	1	-5	-0.015				
Real	7	8	-2.50	-0.015				
Real	6	7	0	-1		5	-0.015	Left
Real	9	1	0		0			

For SG Calculation

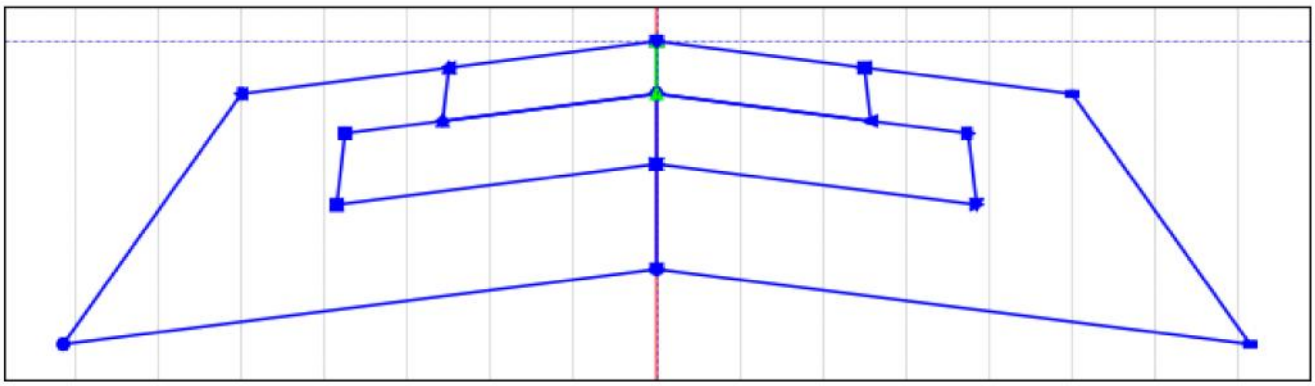
Fourth to Create the Template for SG.

First to fix the PGL point ., then create Dummy point if required..

Then create Real points from any location and close the point at the same as starting point.



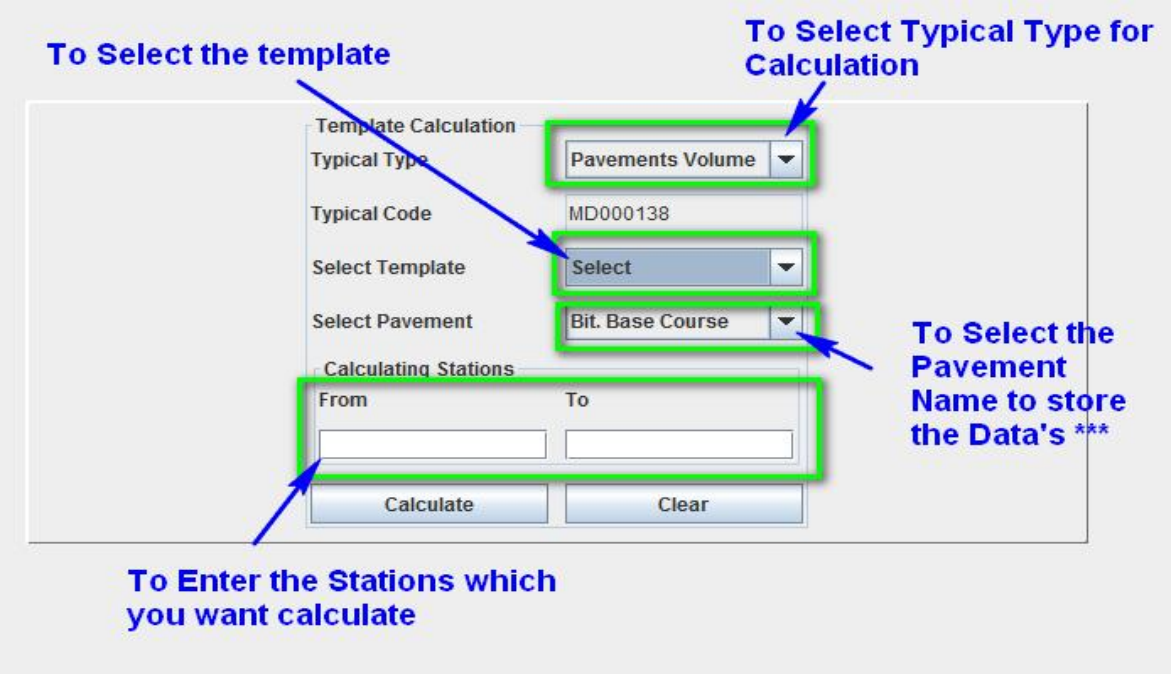
Template Graph



Template Point

Point Type	Point No	Ref.Point	Distance	Slope	Height	Second R...	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			NO
Dummy	-1	0	0		-0.15			NO
Real	1	0	0		-0.35			NO
Real	5	0	5	-0.015				NO
Real	4	5	0	-1		-1	-0.015	Right
Real	3	-1	7.50	-0.015				NO
Real	2	3	0	-1		1	-0.015	Right
Real	6	5	5	-0.015				NO
Real	8	1	0		-0.30			NO
Real	7	6	0	-0.16667		8	-0.015	Right
Real	11	0	-5	-0.015				NO
Real	12	11	0	-1		-1	-0.015	Left
Real	13	-1	-7.50	-0.015				NO
Real	14	13	0	-1		1	-0.015	Left
Real	10	11	-5	-0.015				NO
Real	9	10	0	-0.16667		8	-0.015	Left
Real	15	1	0		0			NO

After create the Templates for Pavement layers goto Template Calculation., The Following screen will appear.., enter the required data based on the related field.., then press the calculation..,

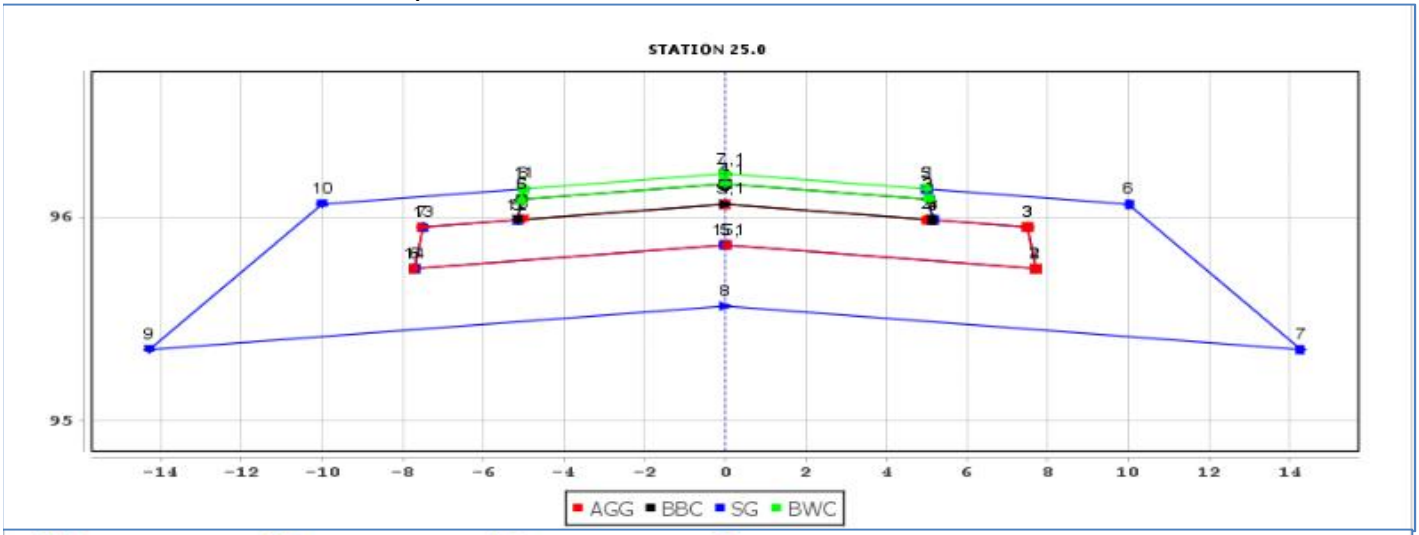


Each Layer will be calculated Separately to store the data in database..,

Note : *** this option to be used for if any road has many templates to s store in one location of data base. In Create Typical model to create the Original name of Pavement layer (Which will need to Report) other template name are as per your required names.. Always the data will be store in original name of Pavement layer location only..,

After Successful calculation goto Reports to print the reports..,

The Pavement Report will be as ..,



BWC

No	Dist	Eleva
1	0.000	96.215
2	5.000	96.140
3	5.051	96.089
4	0.000	96.165
5	-5.051	96.089
6	-5.000	96.140
7	0.000	96.215

BBC

No	Dist	Eleva
1	0.000	96.165
2	5.051	96.089
3	5.152	95.988
4	0.000	96.065
5	-5.152	95.988
6	-5.051	96.089
7	0.000	96.165

AGG

No	Dist	Eleva
1	0.000	96.065
2	5.000	95.990
3	7.500	95.953
4	7.703	95.749
5	0.000	95.865
6	-7.703	95.749
7	-7.500	95.953
8	-5.000	95.990
9	0.000	96.065

SG

No	Dist	Eleva
1	0.000	95.865
2	7.703	95.749
3	7.500	95.953
4	5.152	95.988
5	5.000	96.140
6	10.000	96.065
7	14.286	95.351
8	0.000	95.565
9	-14.286	95.351
10	-10.000	96.065
11	-5.000	96.140
12	-5.152	95.988
13	-7.500	95.953
14	-7.703	95.749
15	0.000	95.865

Pavement Volumes

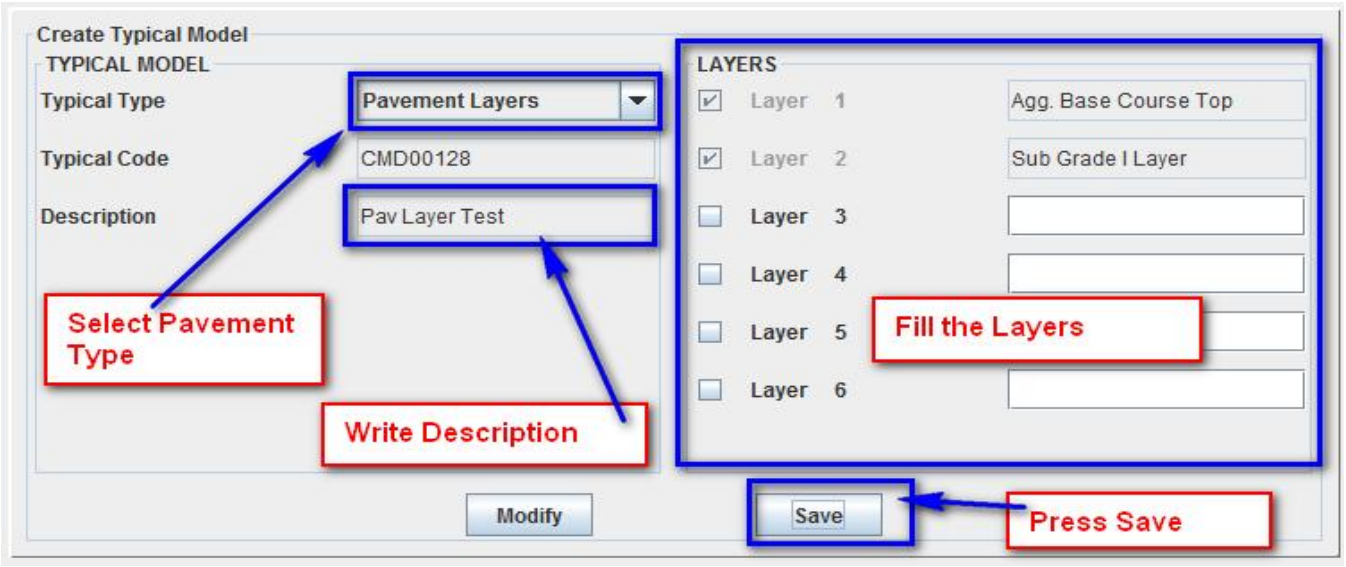
Pavements	Curr.Sec	Prev.Sec	Dist	Volume	Cummu.
BWC	0.50372	0.50373	25.00000	12.59313	12.59313
BBC	1.01768	1.01768	25.00000	25.44188	38.03500
AGG	3.04536	3.04266	25.00000	76.10031	114.13531
SG	11.21421	11.21676	25.00000	280.38719	394.52250

6.2.3 Template Creation for Pavements Layers

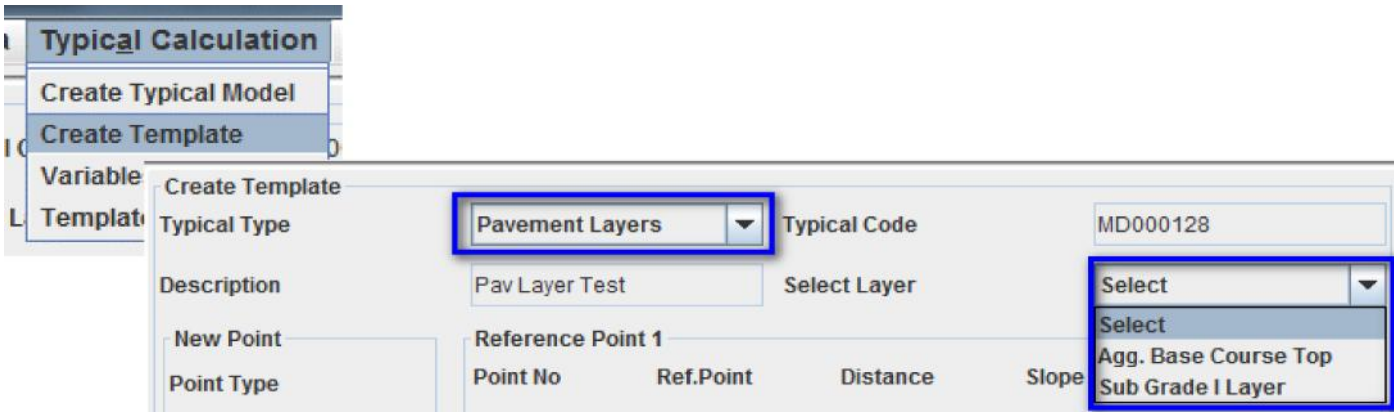
The purpose to create pavement Layers template to calculate the Setting out Levels of Pavement Structures like Bit. Wearing Course, Bit. Base Course , Agg. Base Course , Sub Base and Sub Grade .

First to select Typical Calculation menu to choose Create typical Model

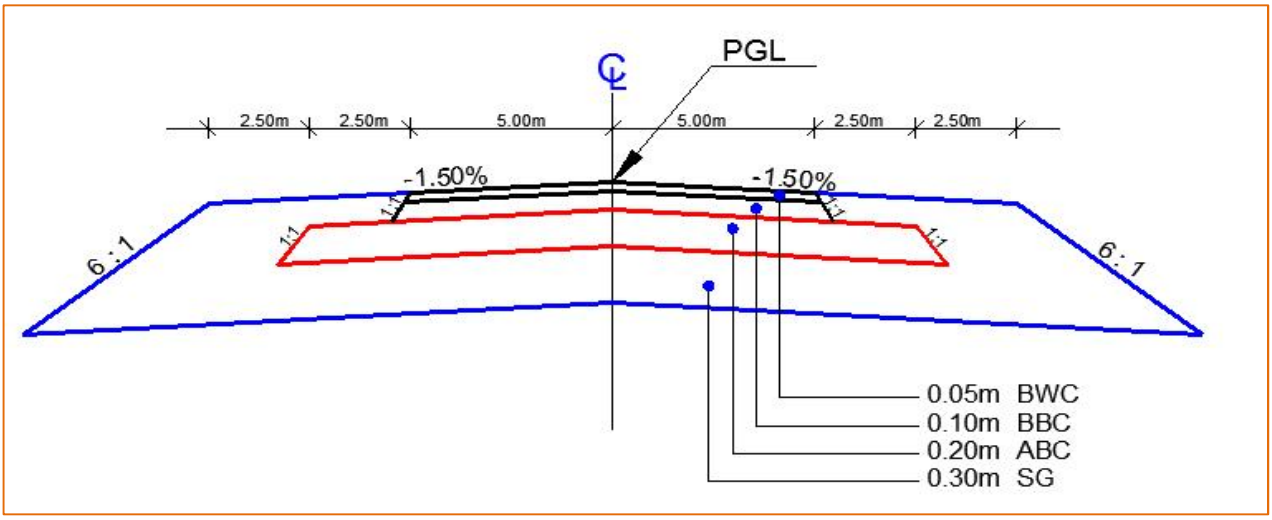
The Screen will appear like below … then Fill the layers as per requirement



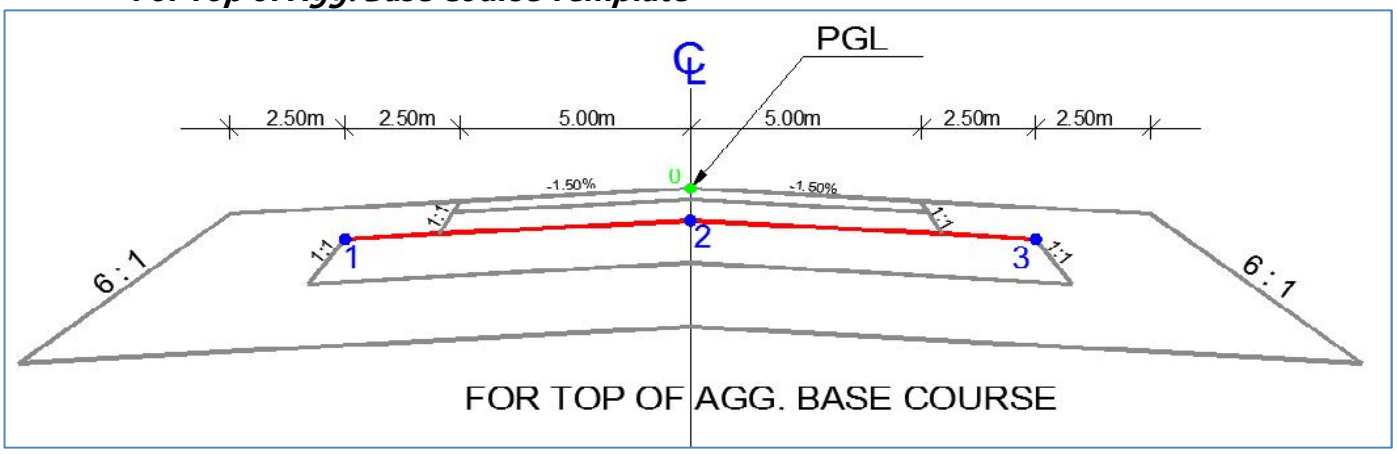
Then goto in Typical Calculation select Create Template



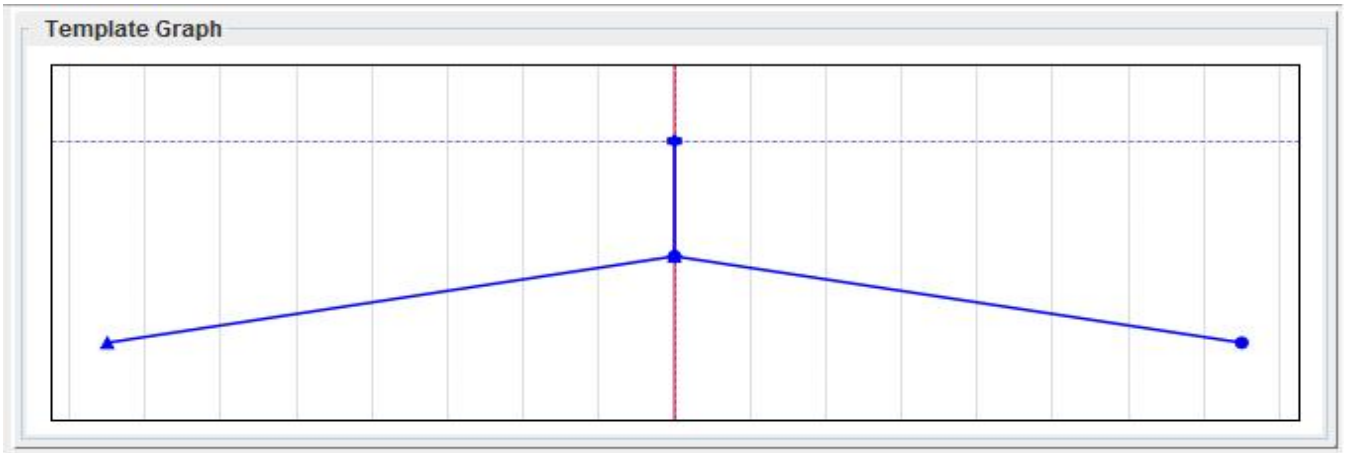
In this Typical Section to create the pavement layer template for Top of Agg. Base course and Sub Grade I layer setting out Levels



For Top of Agg. Base Course Template



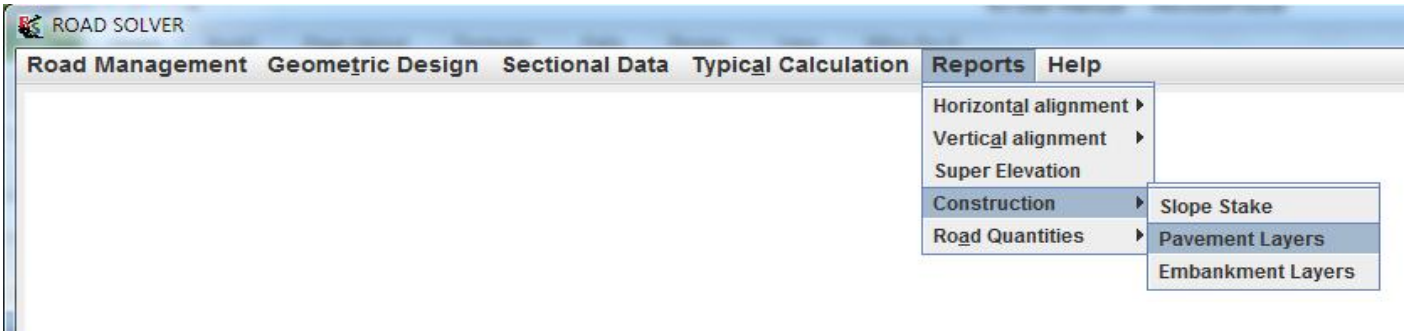
After entering the datas the template will be



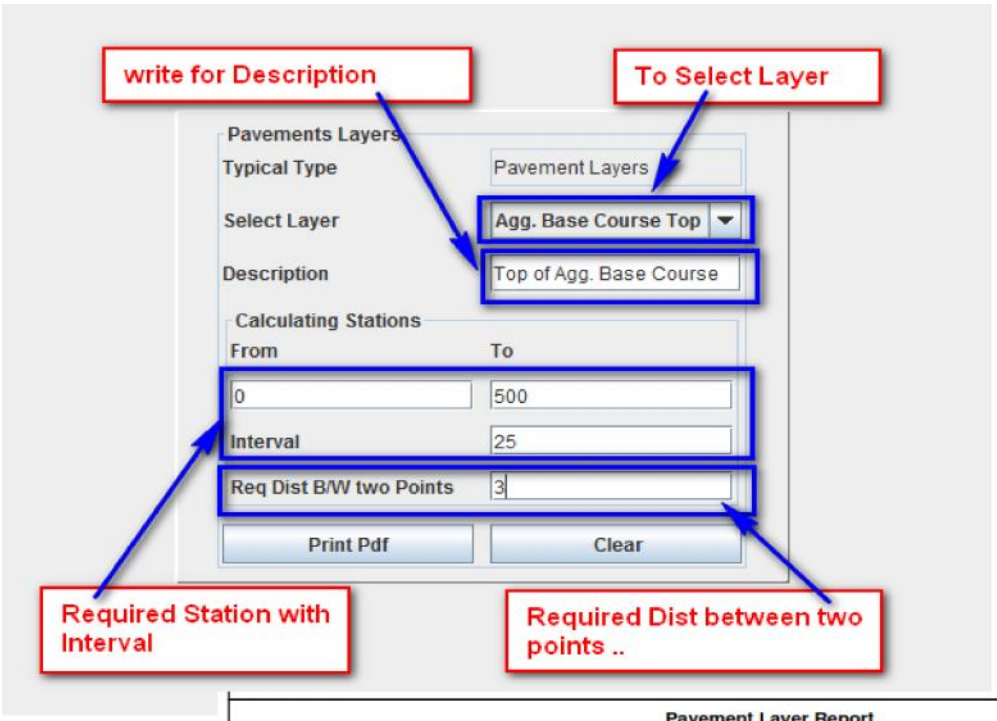
Template Point

Point Type	Point No	Ref.Point	Distance	Slope	Height	Second R...	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			NO
Real	2	0	0		-0.15			NO
Real	1	2	-7.50	-0.015				NO
Real	3	2	7.50	-0.015				NO

Now goto Reports menu select Construction and Choose Pavement layers



In Pavement Layer Calculation form fill the required fields and press print

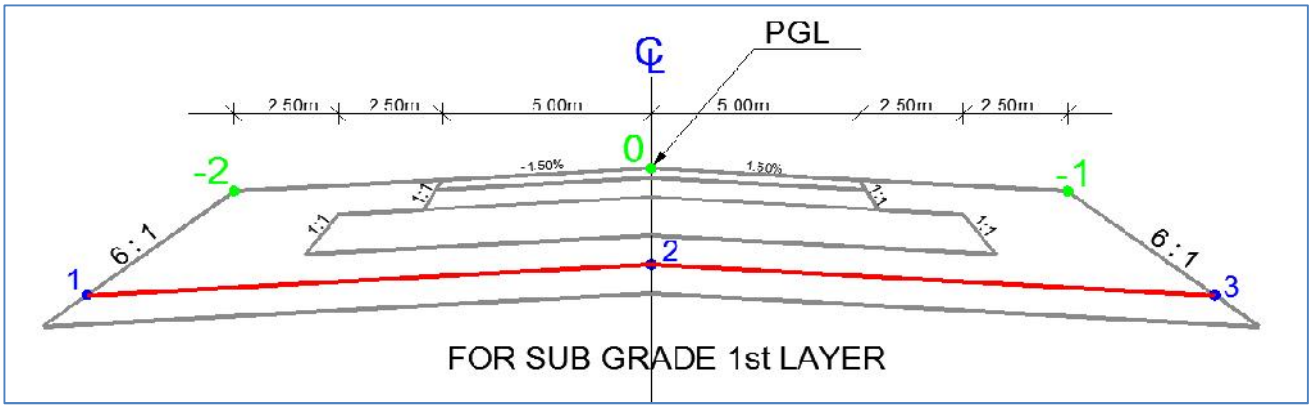


Pavement Layer Report
Top of Agg. Base Course

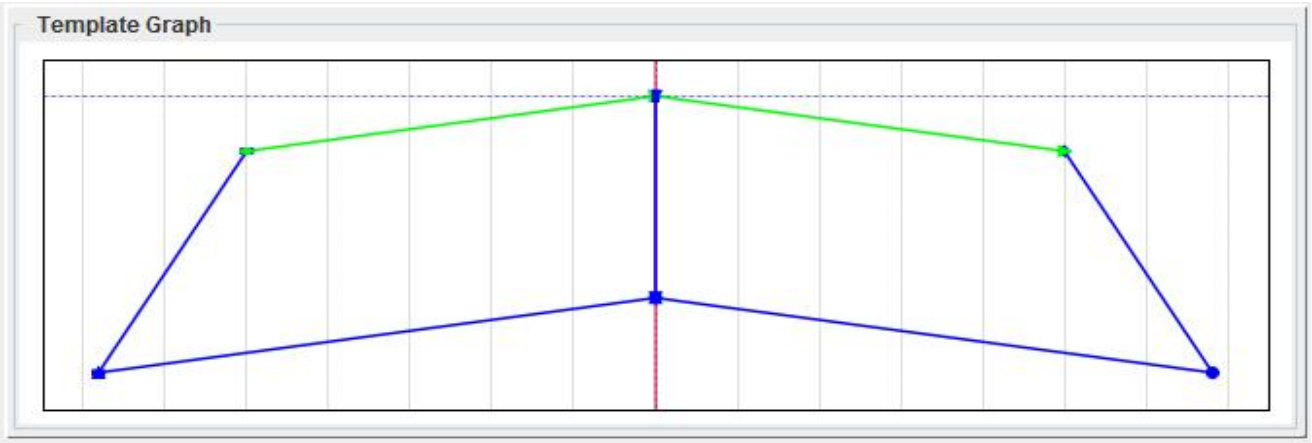
Station	No	1	2	3	4	5	6	7
0	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	96.028	96.051	96.096	96.141	96.096	96.051	96.028
Station	No	1	2	3	4	5	6	7
25	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.953	95.975	96.020	96.065	96.020	95.975	95.953
Station	No	1	2	3	4	5	6	7
50	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.877	95.900	95.945	95.990	95.945	95.900	95.877
Station	No	1	2	3	4	5	6	7
75	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.801	95.824	95.869	95.914	95.869	95.824	95.801
Station	No	1	2	3	4	5	6	7
100	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.726	95.748	95.793	95.838	95.793	95.748	95.726
Station	No	1	2	3	4	5	6	7
125	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.650	95.672	95.717	95.762	95.717	95.672	95.650
Station	No	1	2	3	4	5	6	7
150	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.574	95.597	95.642	95.687	95.642	95.597	95.574

For Sub Grade 1 Layer Template

To identify the location of Layer and create the points as per calculation requirement then enter in to template.



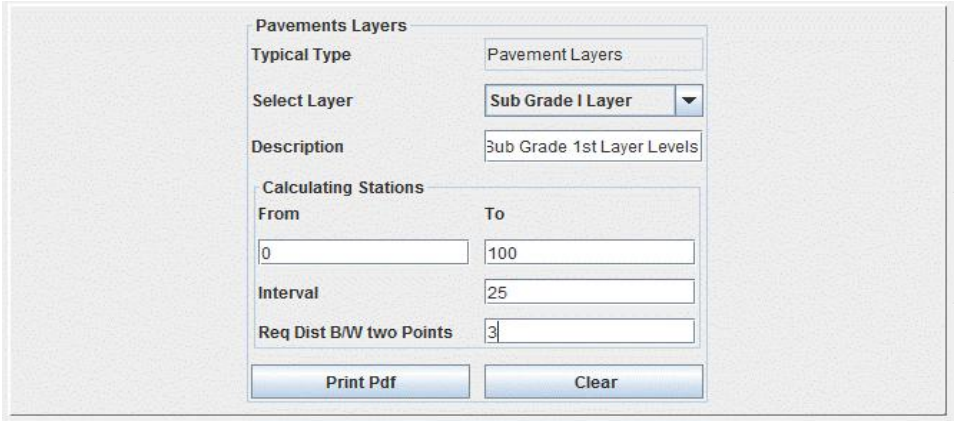
After entering the data's the template will be..



Template Point

Point Type	Point No	Ref.Point	Distance	Slope	Height	Second R...	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			NO
Dummy	-1	0	10	-0.015				NO
Dummy	-2	0	-10	-0.015				NO
Real	2	0	0		-0.55			NO
Real	1	-2	0	-0.16667		2	-0.015	Left
Real	3	-1	0	-0.166667		2	-0.015	Right

Then goto calculation form from reports to run the template..,



The Sub Grade 1st Layer Level will appear in Report..

Pavement Layer Report
Sub Grade 1st Layer Levels

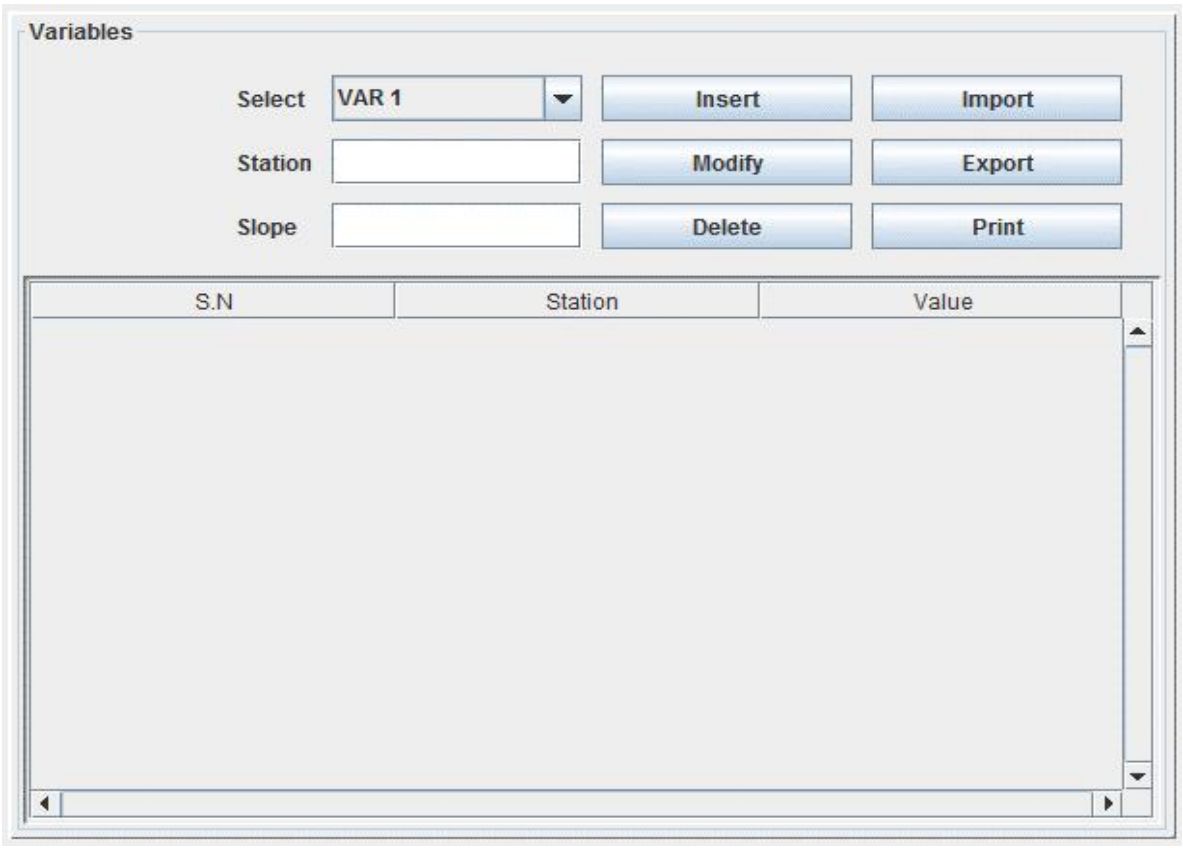
Station	No	1	2	3	4	5	6	7	8	9	10	11
0	Dist	-13.626	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	13.626
	Elev.	95.537	95.561	95.606	95.651	95.696	95.741	95.696	95.651	95.606	95.561	95.537
Station	No	1	2	3	4	5	6	7	8	9	10	11
25	Dist	-13.626	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	13.626
	Elev.	95.461	95.485	95.530	95.575	95.620	95.665	95.620	95.575	95.530	95.485	95.461
Station	No	1	2	3	4	5	6	7	8	9	10	11
50	Dist	-13.626	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	13.626
	Elev.	95.386	95.410	95.455	95.500	95.545	95.590	95.545	95.500	95.455	95.410	95.386
Station	No	1	2	3	4	5	6	7	8	9	10	11
75	Dist	-13.626	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	13.626
	Elev.	95.310	95.334	95.379	95.424	95.469	95.514	95.469	95.424	95.379	95.334	95.310
Station	No	1	2	3	4	5	6	7	8	9	10	11
100	Dist	-13.626	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	13.626
	Elev.	95.234	95.258	95.303	95.348	95.393	95.438	95.393	95.348	95.303	95.258	95.234

6.3 Variables

6.3.1 Variables - Introduction

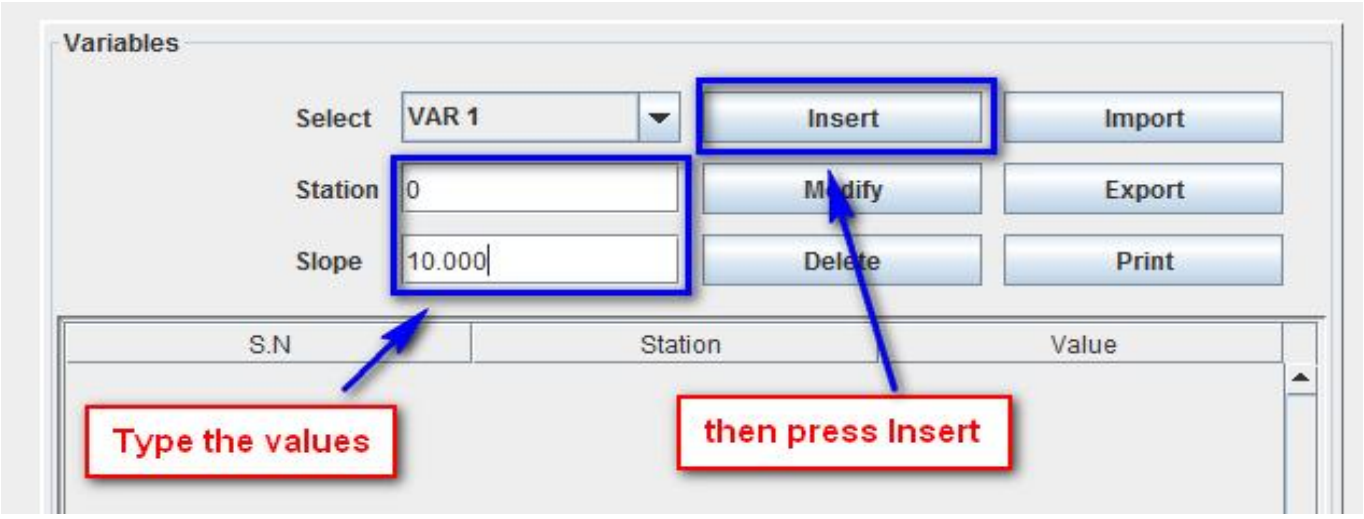
Road Solver Program using Variables 20 nos for Template Calculations. In Template the Distance , Slope and Height locations to use different nos for different Station calculations. Also Variable used for Elevations for each station to be consider in calculation. The Value will be calculated any interpolation and it will reflect the same. Variable names used in template as follow notation..,

1	Variable 1	Var1	11	Variable 11	Var11
2	Variable 2	Var2	12	Variable 12	Var12
3	Variable 3	Var3	13	Variable 13	Var13
4	Variable 4	Var4	14	Variable 14	Var14
5	Variable 5	Var5	15	Variable 15	Var15
6	Variable 6	Var6	16	Variable 16	Var16
7	Variable 7	Var7	17	Variable 17	Var17
8	Variable 8	Var8	18	Variable 18	Var18
9	Variable 9	Var9	19	Variable 19	Var19
10	Variable 10	Var10	20	Variable 20	Var20

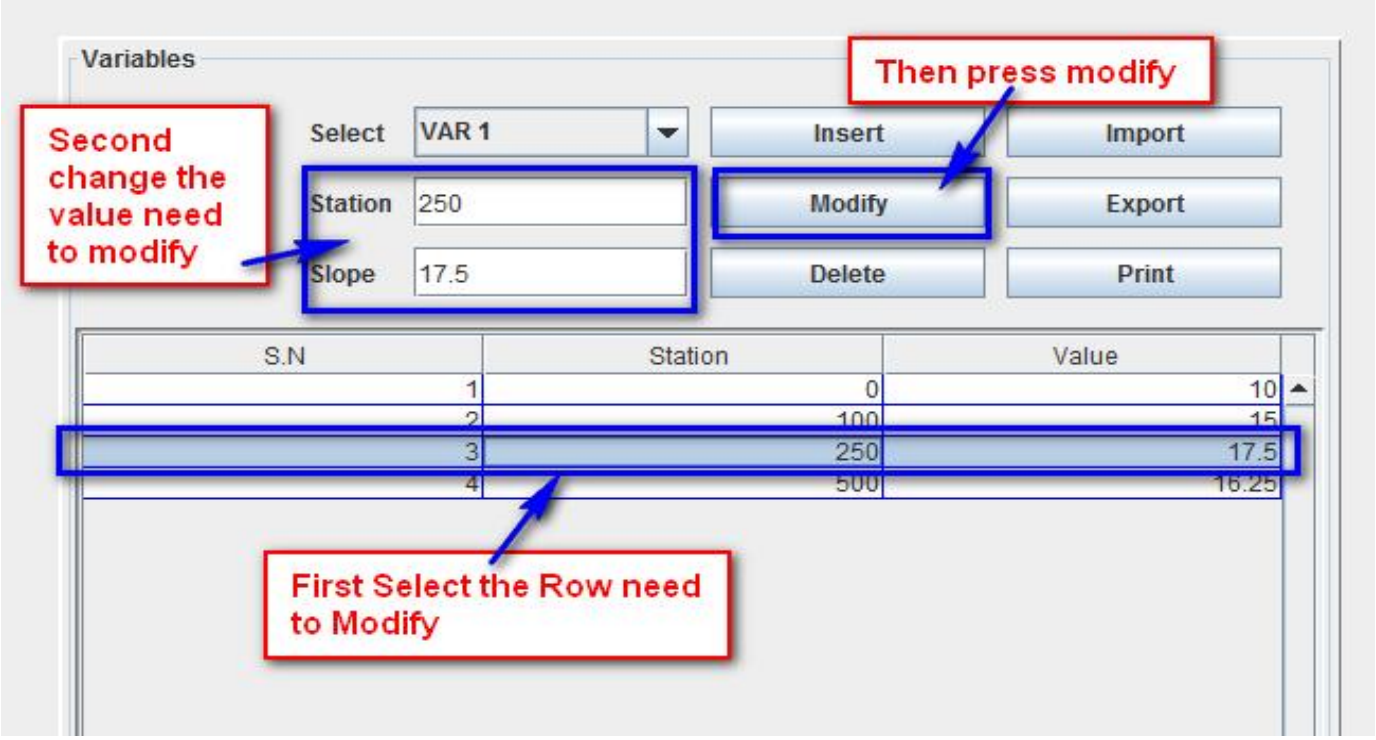


6.3.2 Variables - Insert data

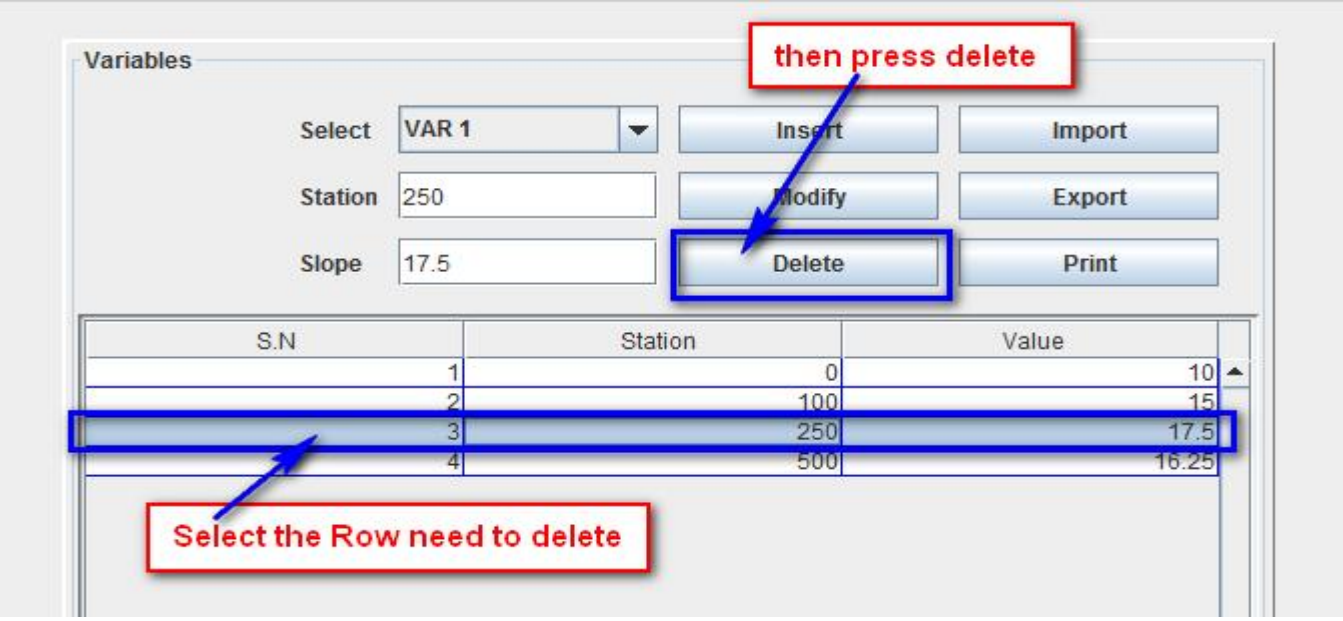
To Type the Station and Value in table then Press Insert Button. The Data's stored in table (Data base).



6.3.3 Variables - Modify data

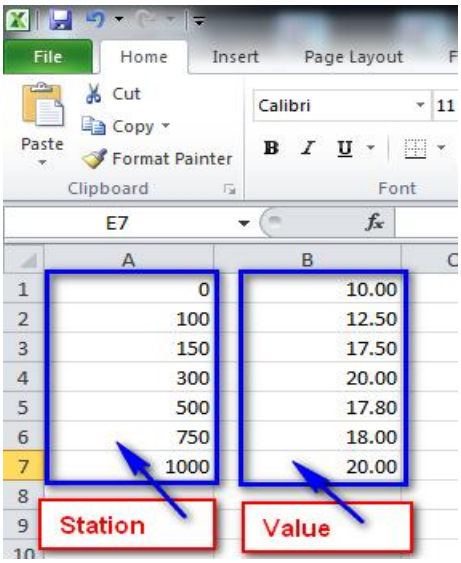


6.3.4 Variables - Delete data

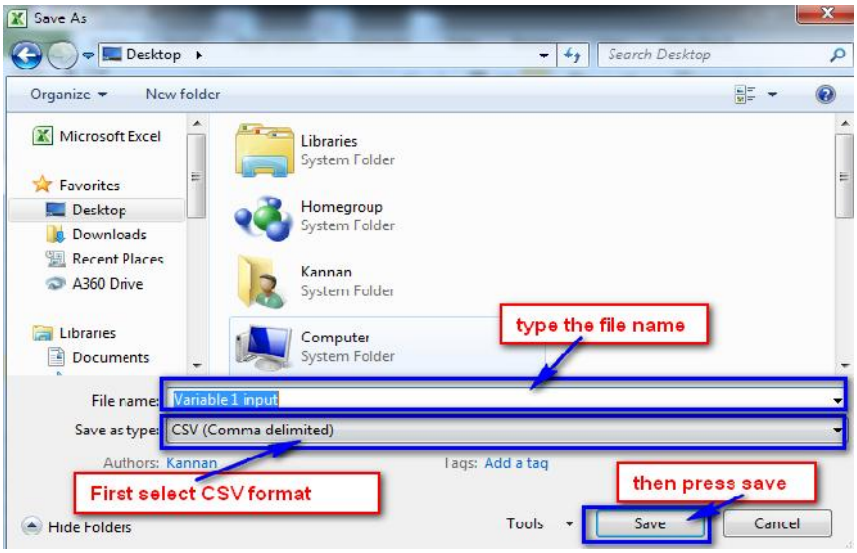


6.3.5 Variables - Import data

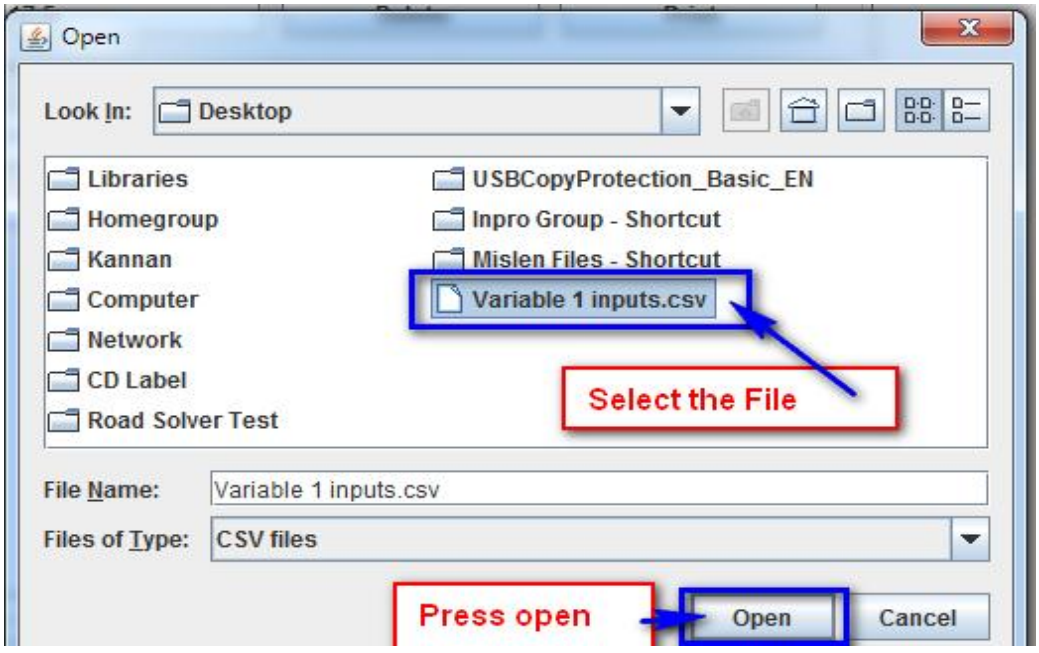
First type in Excel Program by Station and Value



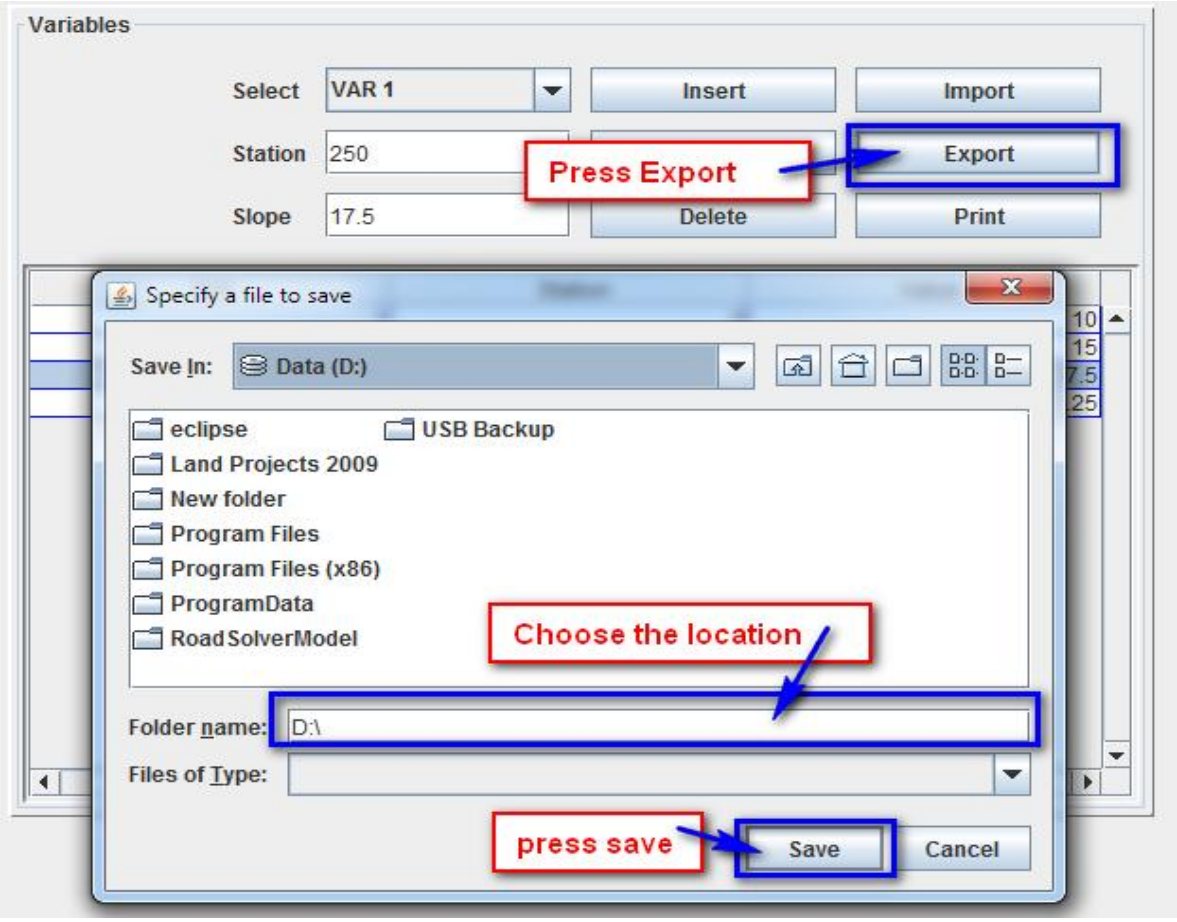
Then Save as file in CSV format …



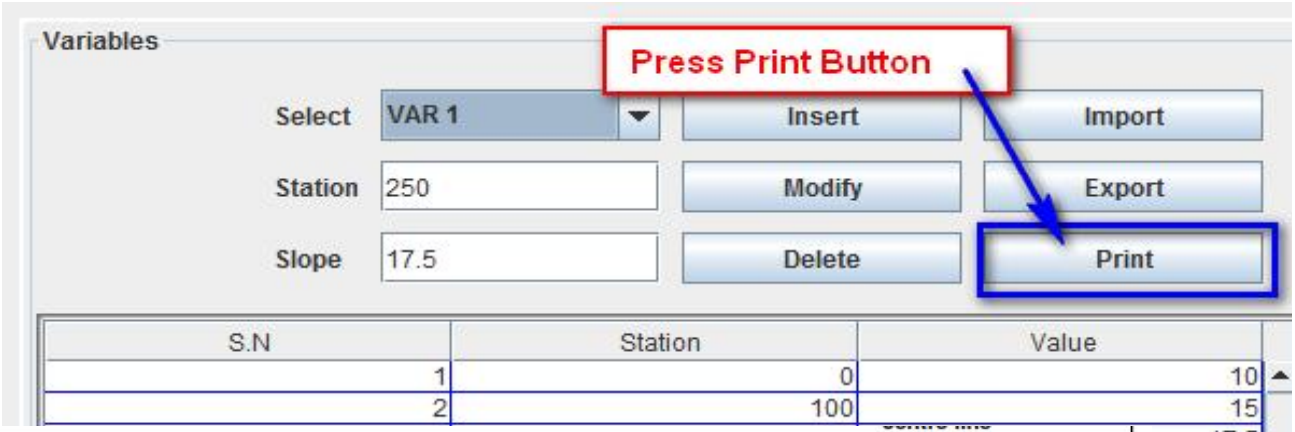
Now press import button select that CSV file will be imported..



6.3.5 Variables - Export data



6.3.7 Variables - Print data

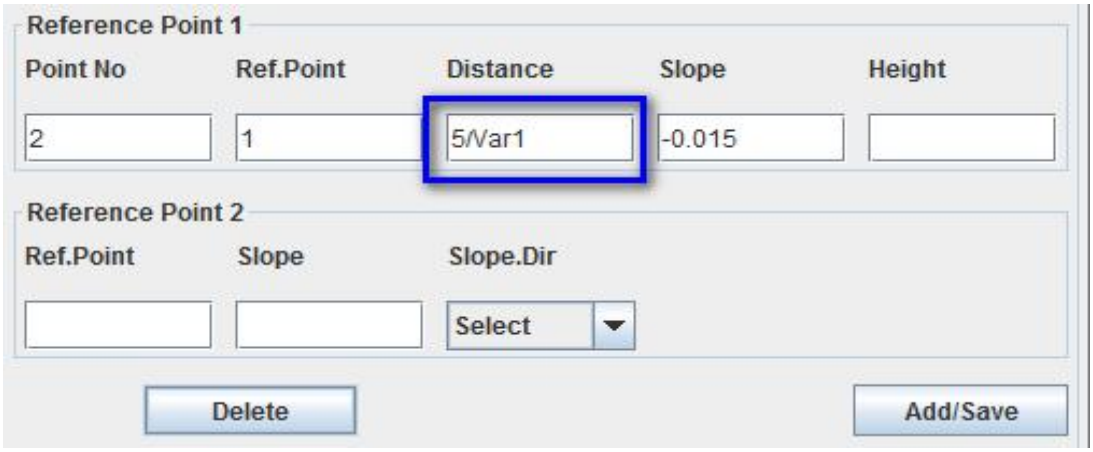


Variable
VAR 1

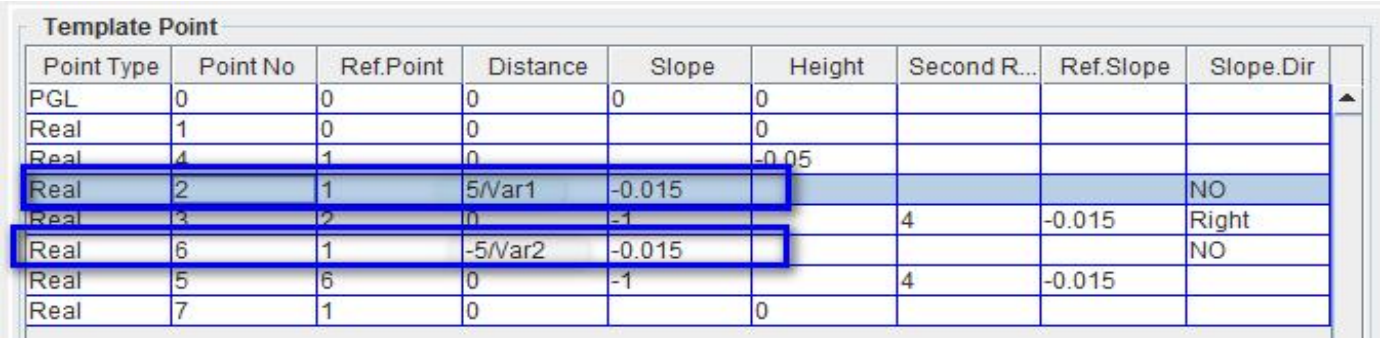
S.N	Station	Slope
1	0	10
2	100	15
3	250	17.5
4	500	16.25

6.3.8 How to use Variables in Template

At the time of Template Creation the Columns of Distance , Slope or Height location type the value then " / " and type the variable name " Var1 "



Now the template point table will be…



Point Type	Point No	Ref.Point	Distance	Slope	Height	Second R...	Ref.Slope	Slope.Dir
PGL	0	0	0	0	0			
Real	1	0	0		0			
Real	4	1	0		-0.05			
Real	2	1	5/Var1	-0.015				NO
Real	3	2	0	-1		4	-0.015	Right
Real	6	1	-5/Var2	-0.015				NO
Real	5	6	0	-1		4	-0.015	
Real	7	1	0		0			

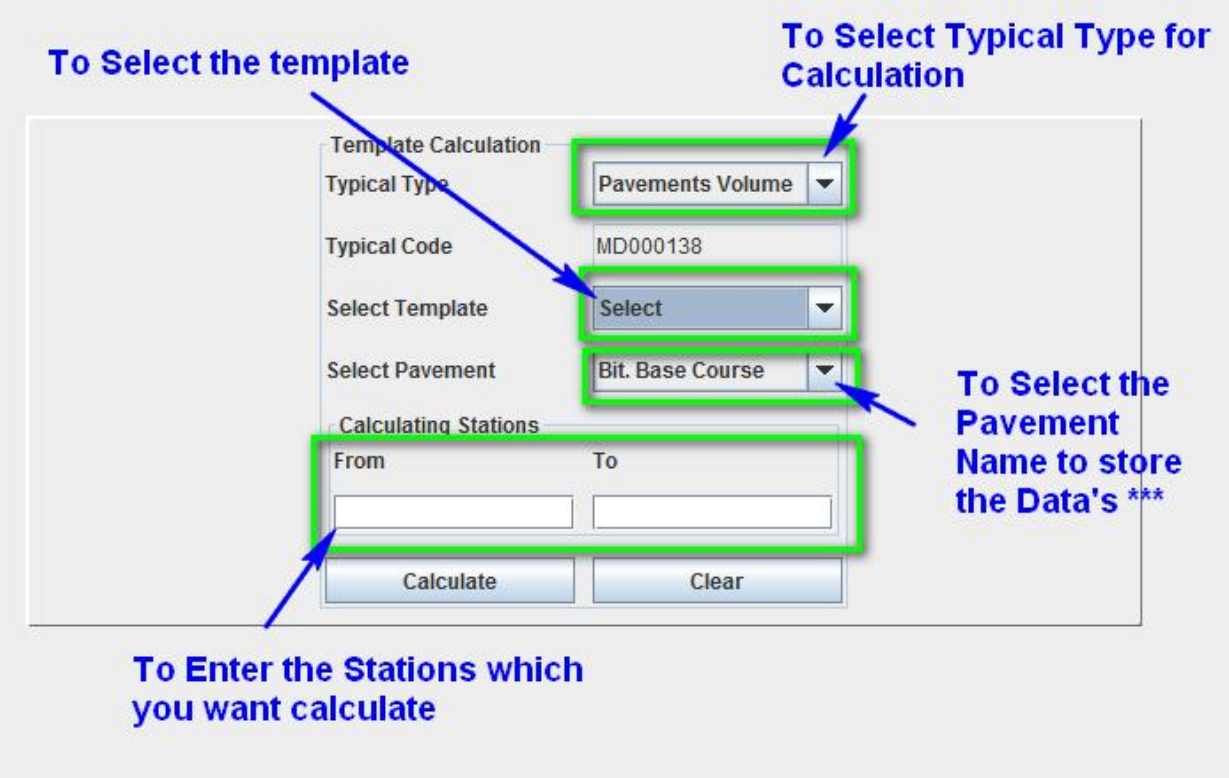
Important notes for Variable inputs

- **Variable only accepted Number whether positive or negative.**
- **Var1 to Var20 to be used any place with different values. Each variable calculated separately.**
- **The input values of Each Variable where there is a changes in value that control point value only enter. In between any station value will be calculated by the program.**
- **The variable should be entered after " / " symbol with " Var1".**
- **The value of Variable input will be taken the same in format. If its positive , negative or slope and any other format.**

6.4 Template Calculation

6.4.1 Template Calculation

Template Calculation window is used to calculate the Earthwork Volume and Pavement Volume Calculations.



Important notes for Template Calculation

- **Template Calculation to calculate the values and store in Table.**
- **The Station interval is taken from the Ground Inputs .., So Ground data Should be added before the Calculation.**

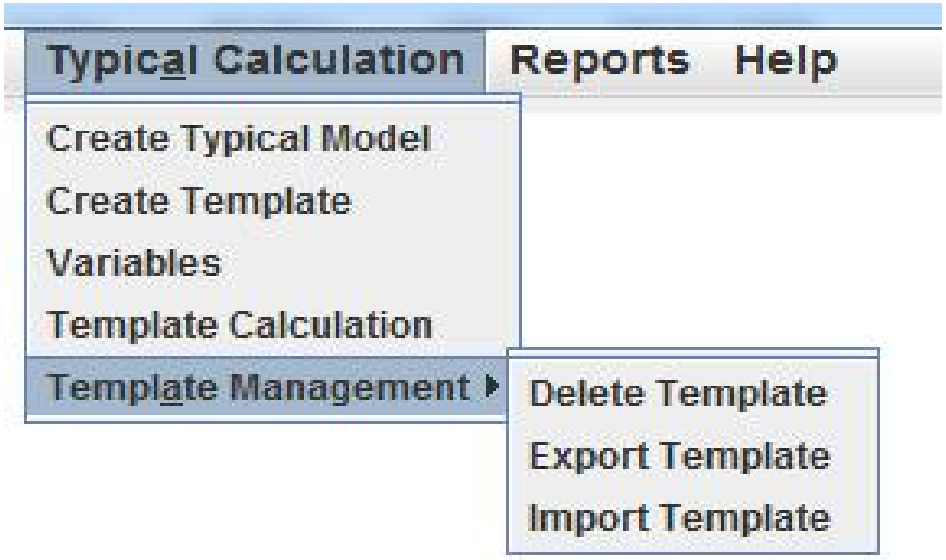
6.5 Template Management

6.5.1 Template Management Basic and Functions

In this section is used to manage the existing templates to another project or delete the not required templates from the Road Solver Data base.

From this option we can make the following actions..,

1. To Delete the Existing Template
2. Export the Existing Template
3. Import the exported template to assign the required pavement / Earthwork layers..,



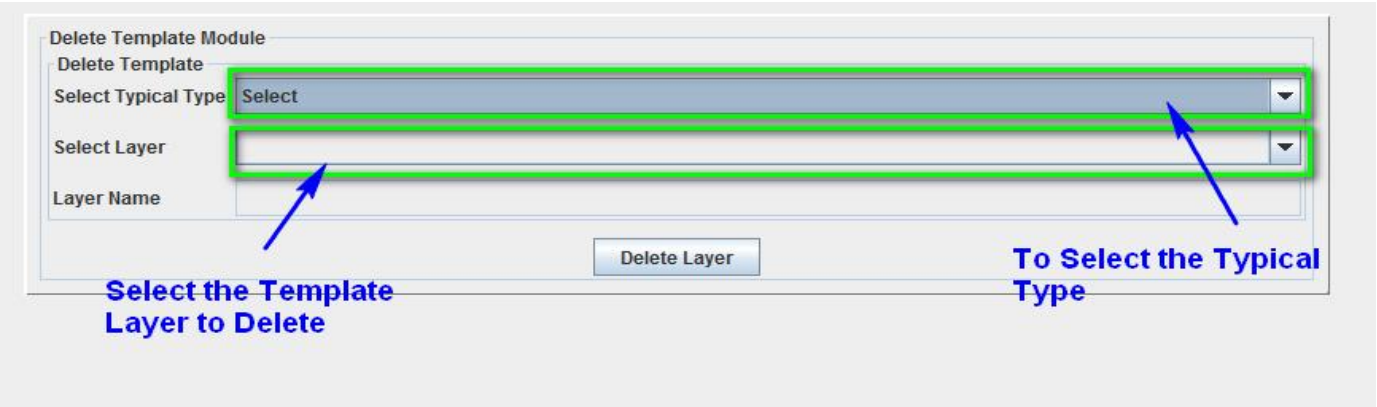
6.5.2 Delete Template

This option is used to unwanted template to Delete from Road Solver Database..,

First to select the Typical Type like Earthwork Volume , Pavement Volume and Pavement Layers..,

Then Select the Template layer which is already in Database

After Select the both then press delete layer button..,

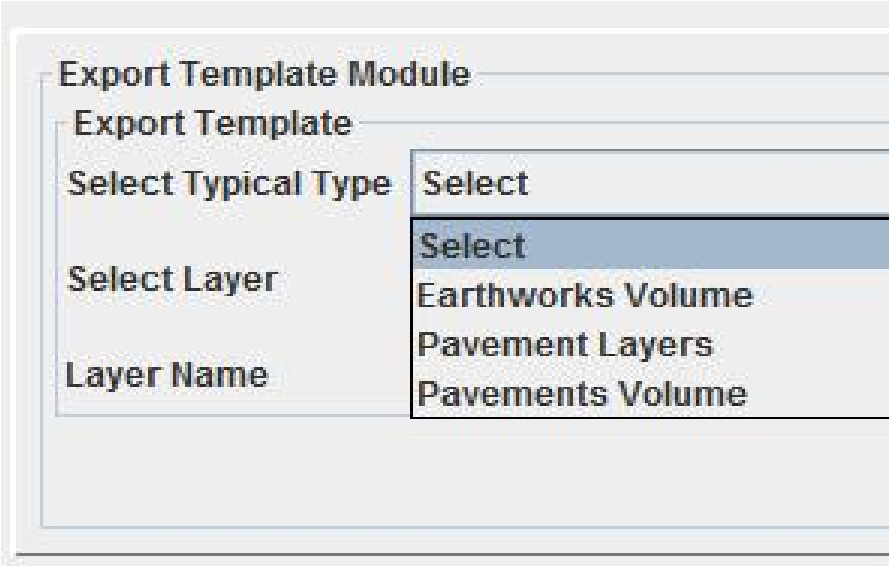


Before delete the template the confirmation window will appear., if press " Yes " the action will be complated otherwise abort from that action.

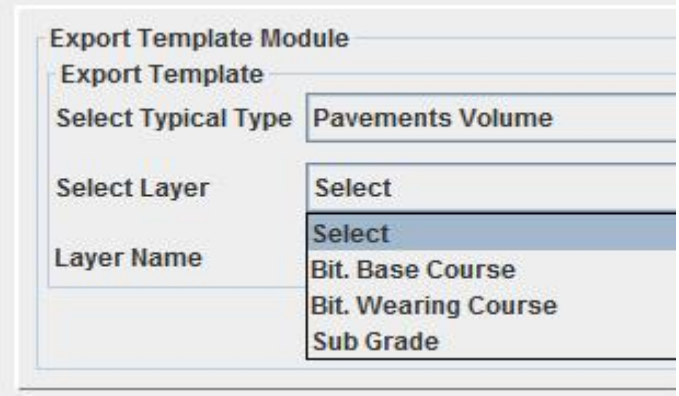
6.5.3 Export Template

In this option any existing template want use another project to export that template file.,

First to select the Typical Type like Earthwork Volume , Pavement Volume and Pavement Layers..,

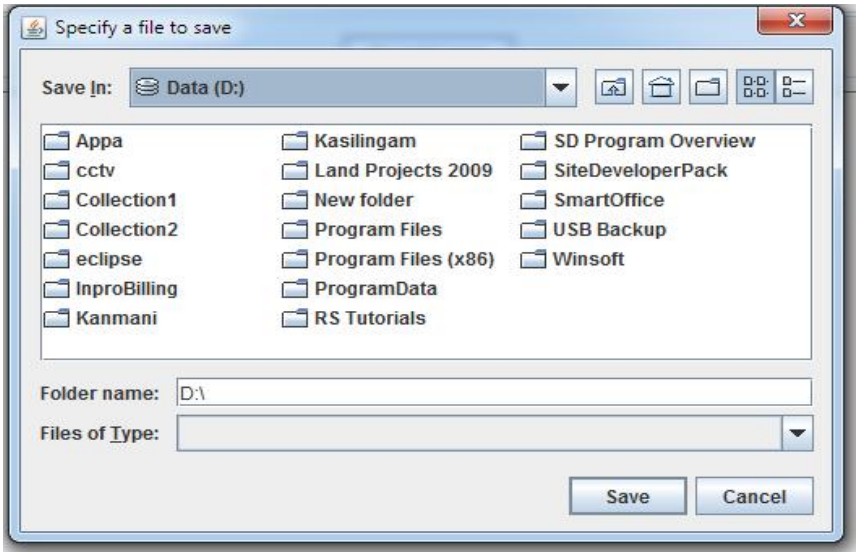


After Select the Typical Type from then to Select the Template layer which is need to be export..,

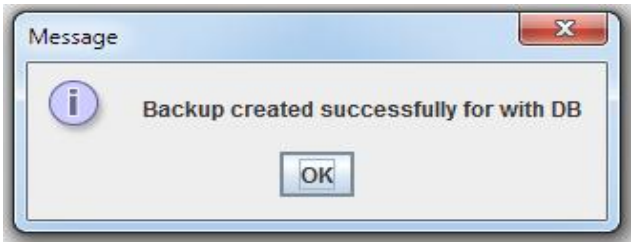


After Selection then Press " Export Layer "

Now is asking the file location choose the required place then save .



After Successful action the message box will appear as follows..,

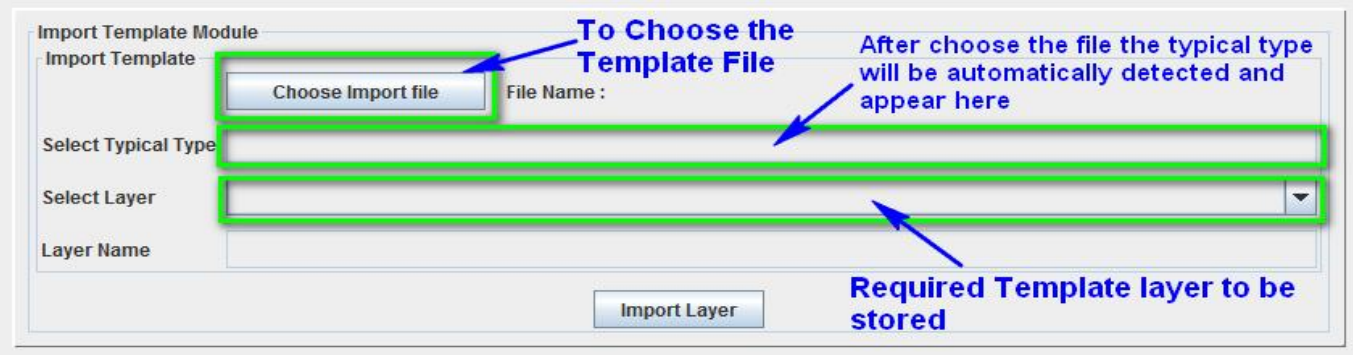


6.5.4 Import Template

This action will be made for import the any template file to current project..,

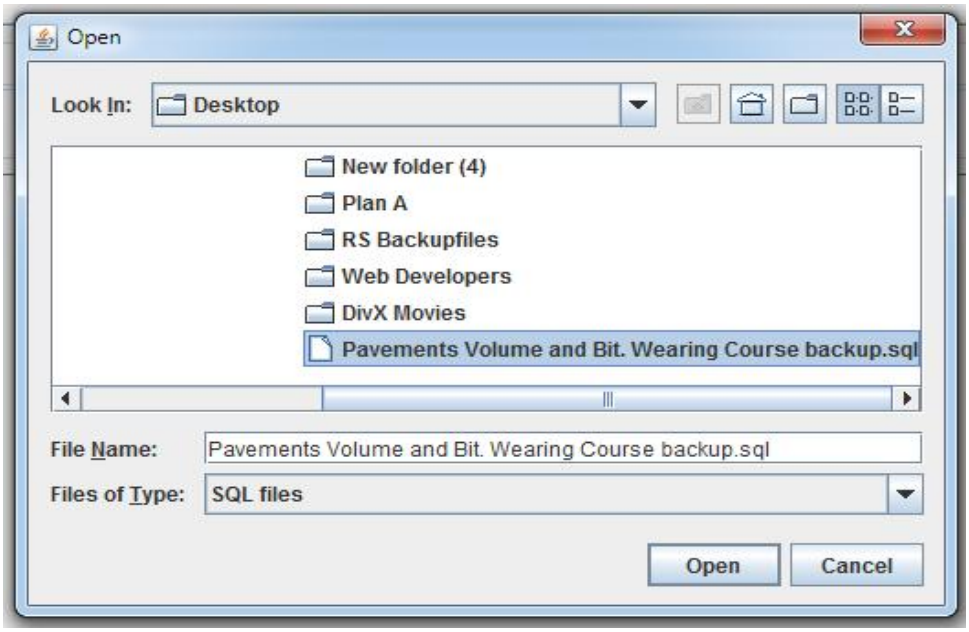
1. First to add the Template file by press the button of choose import file Button..

2. After choose the import file the file will be detected and the Typical Type will be appear in Typical Type Location
3. Then to select the Layer which is want to be stored..,



If the Select Layer contains empty we can not store the file to the project. So before make this action first to create the required layers in " Create Typical Model " Window.

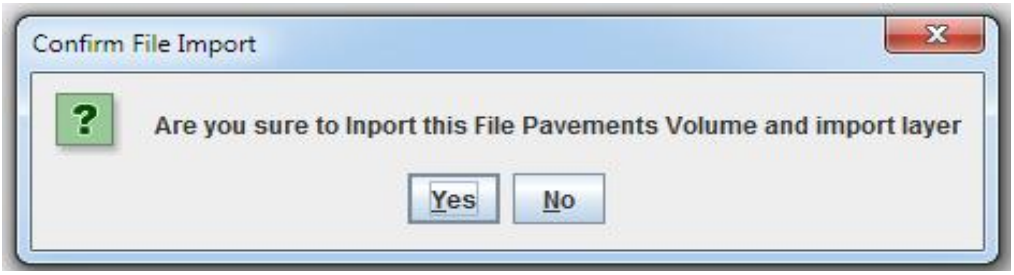
Now to choose the file window will appear as follows..,



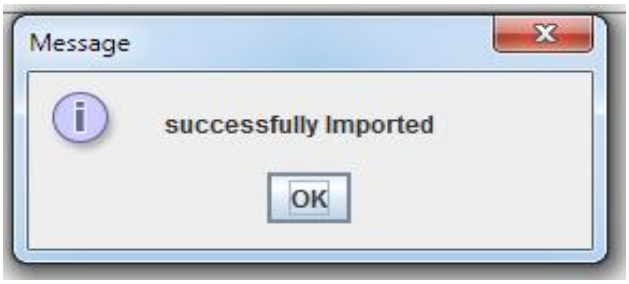
After choose the file the confirmation message box will appear..,

After processing the file the screen will be appear as follows..,

After choose the layer the confirmation screen will appear as follow..,



if the file will be stored the successful screen will appear as follows..,



If any layer will be existing the confirmation screen will be appear , if need to overwrite of no need to confirm the action

Note :

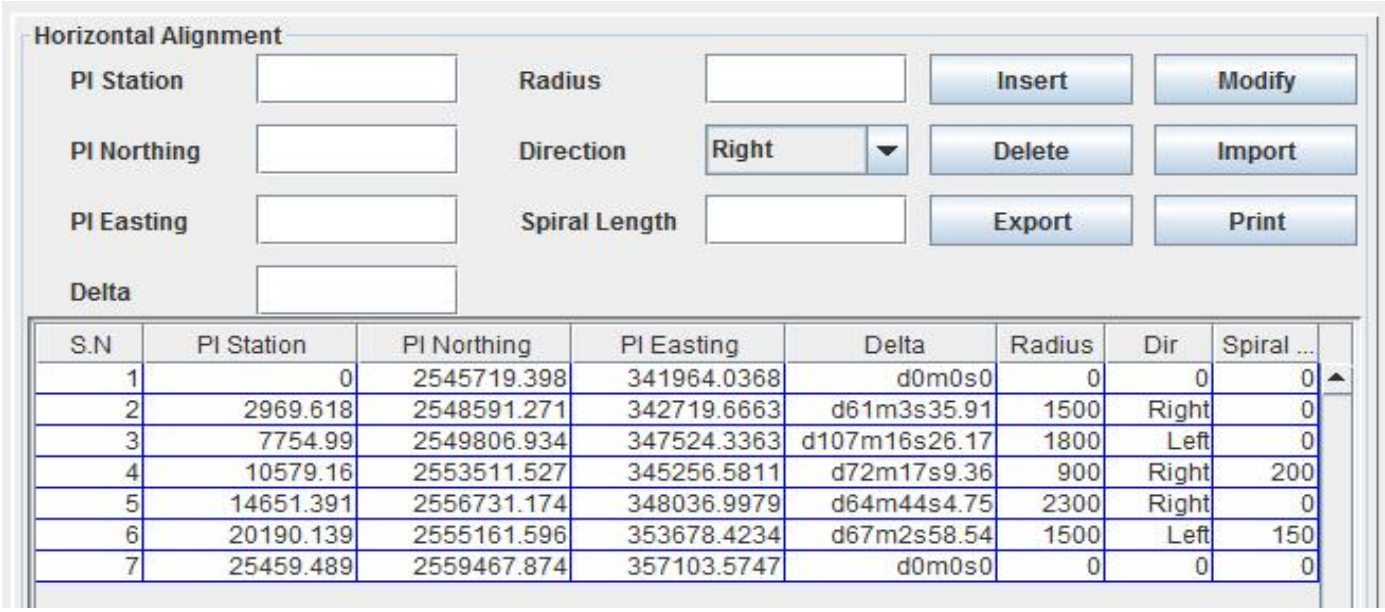
1. The typical layers will be stored in same layer only..,
2. Should be the layer already created in Typical Model then only data can be stored in same layer..,
3. Before start the import fix the required layers in Typical model then import..,

7. Reports

7.1 Horizontal Alignment

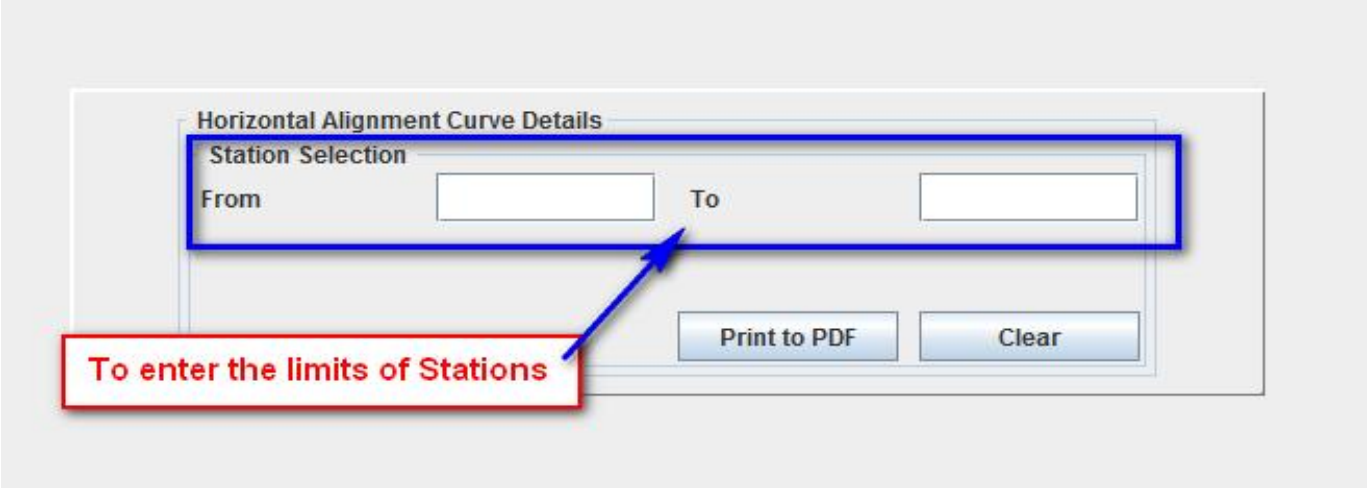
7.1.1 Horizontal Curve data's

The Data table of Horizontal Alignment of Road..



S.N	PI Station	PI Northing	PI Easting	Delta	Radius	Dir	Spiral ...
1	0	2545719.398	341964.0368	d0m0s0	0	0	0
2	2969.618	2548591.271	342719.6663	d61m3s35.91	1500	Right	0
3	7754.99	2549806.934	347524.3363	d107m16s26.17	1800	Left	0
4	10579.16	2553511.527	345256.5811	d72m17s9.36	900	Right	200
5	14651.391	2556731.174	348036.9979	d64m44s4.75	2300	Right	0
6	20190.139	2555161.596	353678.4234	d67m2s58.54	1500	Left	150
7	25459.489	2559467.874	357103.5747	d0m0s0	0	0	0

First to choose the Curve Report for Alignment



Project Name :Dualization of Highway Development project at Location

Description :Geometric and Quantities **Consultant :XYZ Supervision Consultant**

Client :Ministry of Tranportation **Contractor :ABC Golden Road Company**

Road ID : RD0001 **Road Name : Main Road**

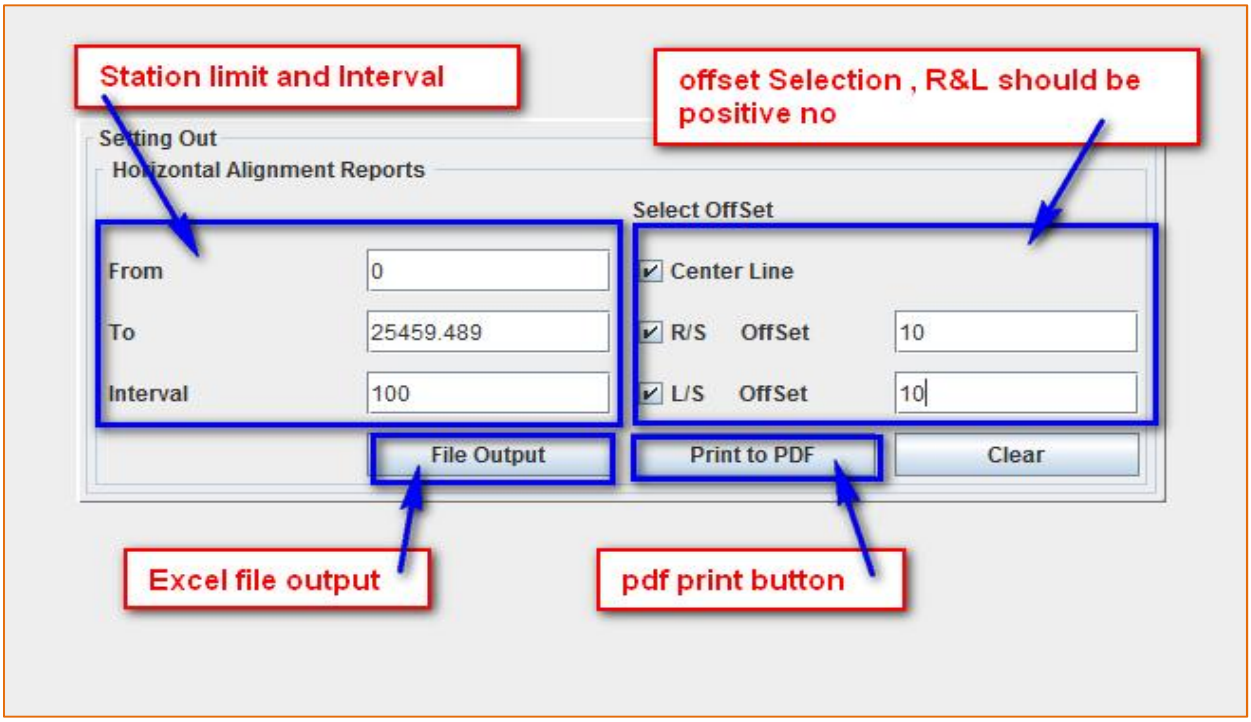
Horizontal Alignment Report
Station and Curves

Start Station:	Sta: 0	N: 2545719.398	E: 341964.0368
Curve No : 1 Type : Circular Curve	PI Sta: 2969.618 PC Sta: 2084.993 PT Sta: 3683.538 Delta: 61-3-36 Tangent: 884.625	N: 2548591.2710 N: 2547735.7632 N: 2548808.2584 Direction: Right Curve Length: 1598.545	E: 342719.6663 E: 342494.5704 E: 343577.2667 Radius: 1500.000 Exit.Dist: 241.425
Curve No : 2 Type : Circular Curve	PI Sta: 7754.990 PC Sta: 5310.228 PT Sta: 8680.336 Delta: 107-16-26 Tangent: 2444.762	N: 2549806.9340 N: 2549207.2652 N: 2551892.0430 Direction: Left Curve Length: 3370.107	E: 347524.3363 E: 345154.2627 E: 346247.9432 Radius: 1800.000 Exit.Dist: 1235.928
Curve No : 3 Type : Spiral Curve	PI Sta: 10579.160 BTC Sta: 9820.482 BCC Sta: 10020.482 ECC Sta: 10955.913 ETC Sta: 11155.913 Circular Curve Data Delta: 72-17-9 Tangent: 758.678 Spiral Curve Data Spiral Length: 200.000 Radius: 900.000 Theta: 6-21-59	N: 2553511.5270 N: 2552864.4591 N: 2553038.6900 N: 2553929.7095 N: 2554085.7286 Direction: Right Curve Lenght: 935.431 XM: 99.956 TK: 66.743 TL: 133.421	E: 345256.5811 E: 345652.6817 E: 345554.7042 E: 345627.4930 E: 345752.4491 Radius: 900.000 Exit.Dist: 214.926 X: 199.753 Y: 7.401 A: 424.264
Curve No : 4 Type : Circular Curve	PI Sta: 14651.391 PC Sta: 13193.606 PT Sta: 15792.219 Delta: 64-44-5 Tangent: 1457.785	N: 2556731.1740 N: 2555627.9457 N: 2556340.4254 Direction: Right Curve Length: 2598.613	E: 348036.9979 E: 347084.2741 E: 349441.4385 Radius: 2300.000 Exit.Dist: 423.075
Curve No : 5 Type : Spiral Curve	PI Sta: 20190.139 BTC Sta: 19120.963 BCC Sta: 19270.963 ECC Sta: 20876.265 ETC Sta: 21026.265 Circular Curve Data Delta: 67-2-59 Tangent: 1069.176 Spiral Curve Data Spiral Length: 150.000 Radius: 1500.000 Theta: 2-51-54	N: 2555161.5960 N: 2555448.1808 N: 2555410.3926 N: 2555882.5538 N: 2555998.3626 Direction: Left Curve Lenght: 1605.303 XM: 74.992 TK: 50.010 TL: 100.015	E: 353678.4234 E: 352648.3714 E: 352793.5164 E: 354248.6690 E: 354343.9754 Radius: 1500.000 Exit.Dist: 299.448 X: 149.962 Y: 2.500 A: 474.342
End Station:	Sta: 25459.489	N: 2559467.874	E: 357103.5747

Contractor **Page No 1** **Consultant**

7.1.2 Horizontal Setting out data's

the Setting out Window …



The Setting out Report (pdf) will be…

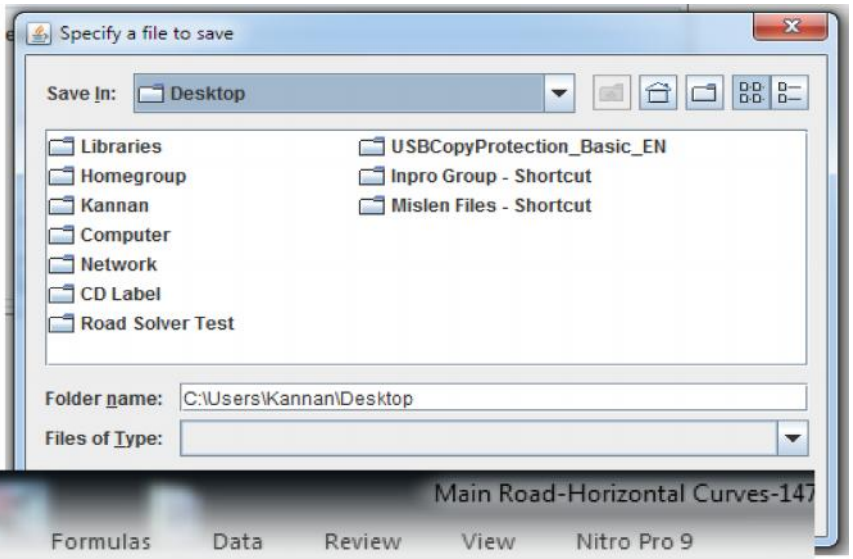
Project Name :Dualization of Highway Development project at Location
Description :Geometric and Quantities **Consultant :XYZ Supervision Consultant**
Client :Ministry of Tranportation **Contractor :ABC Golden Road Company**

Road ID : RD0001 **Road Name : Main Road**

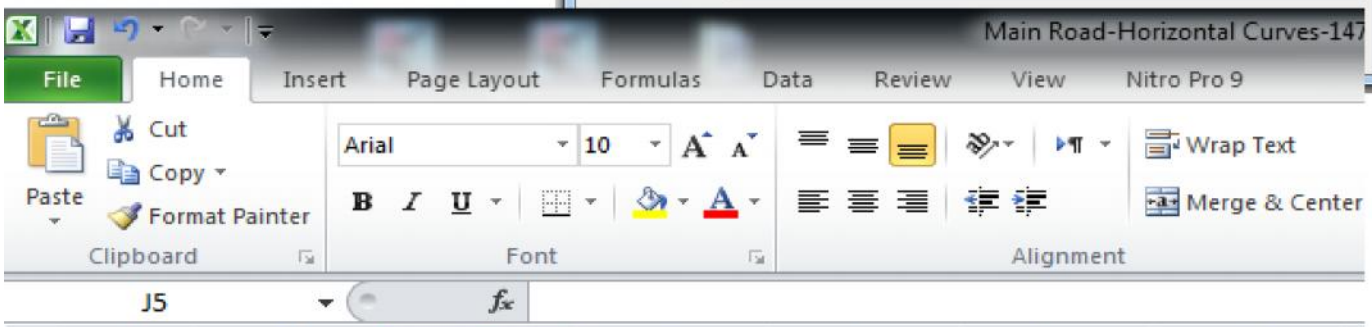
Horizontal Alignment Report
Setting Out Data's

Station	Right Side Offset :10m		Center Line		Left Side Offset :10m	
	Northing	Easting	Northing	Easting	Northing	Easting
0.000	2545716.8535	341973.7077	2545719.3980	341964.0368	2545721.9425	341954.3659
100.000	2545813.5620	341999.1530	2545816.1065	341989.4821	2545818.6510	341979.8113
200.000	2545910.2705	342024.5983	2545912.8150	342014.9275	2545915.3595	342005.2566
300.000	2546006.9790	342050.0437	2546009.5235	342040.3728	2546012.0680	342030.7020
400.000	2546103.6875	342075.4890	2546106.2320	342065.8182	2546108.7765	342056.1473
500.000	2546200.3960	342100.9344	2546202.9405	342091.2635	2546205.4850	342081.5927
600.000	2546297.1045	342126.3797	2546299.6490	342116.7089	2546302.1935	342107.0380
700.000	2546393.8130	342151.8251	2546396.3575	342142.1542	2546398.9021	342132.4834
800.000	2546490.5215	342177.2704	2546493.0660	342167.5996	2546495.6106	342157.9287
900.000	2546587.2300	342202.7157	2546589.7745	342193.0449	2546592.3191	342183.3740
1000.000	2546683.9385	342228.1611	2546686.4830	342218.4902	2546689.0276	342208.8194
1100.000	2546780.6470	342253.6064	2546783.1915	342243.9356	2546785.7361	342234.2647
1200.000	2546877.3555	342279.0518	2546879.9000	342269.3809	2546882.4446	342259.7101
1300.000	2546974.0640	342304.4971	2546976.6085	342294.8263	2546979.1531	342285.1554
1400.000	2547070.7725	342329.9425	2547073.3170	342320.2716	2547075.8616	342310.6008

If we choose file output .., the file save window will appear..,



If Double click that file that will open in Excel will appear as follows

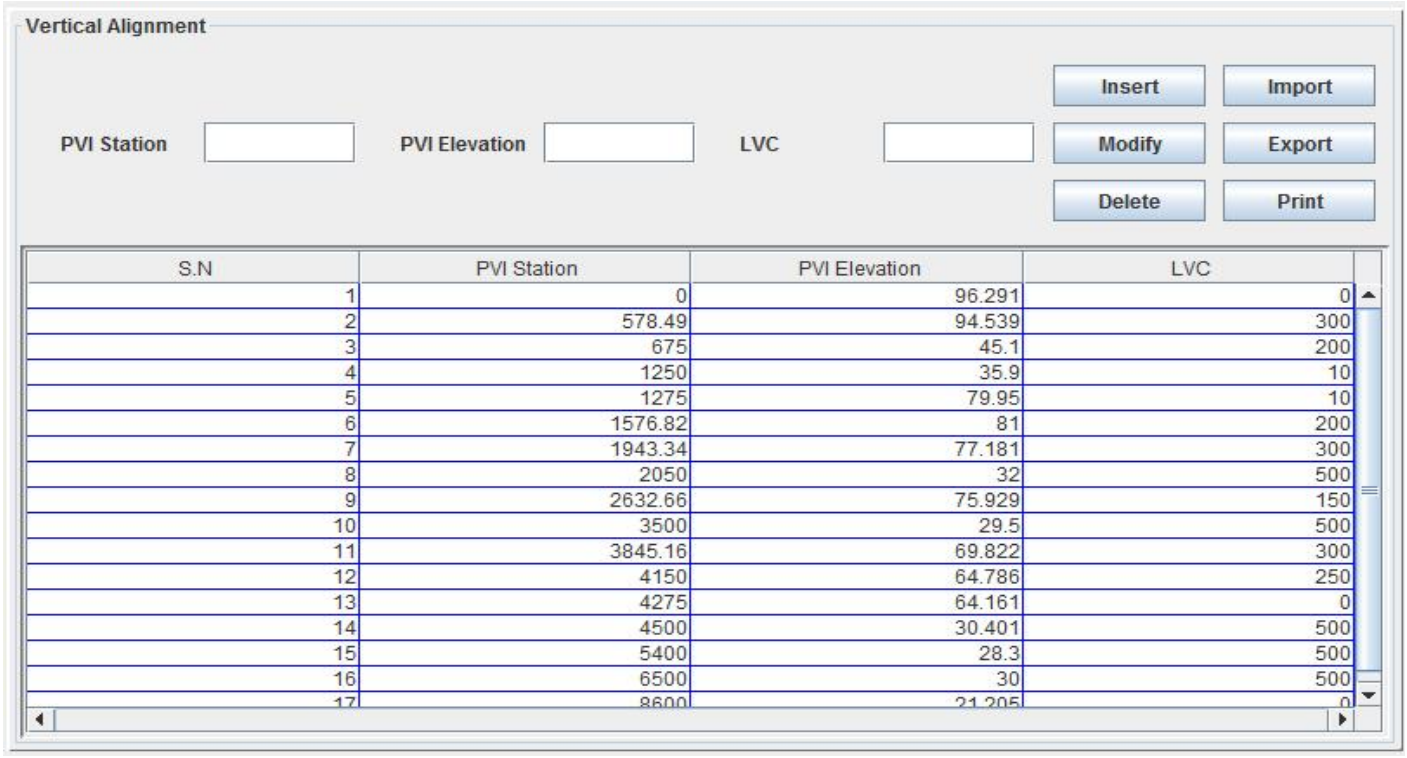


	A	B	C	D	E	F	G
1		HORIZOTAL STATION AND CURVES REPORT					
2	Project Na	Dualization of Highway Development project at Location					
3	Description	Geometric and Quantities			Consultant	: XYZ Supervision Consultant	
4	Client	Ministry of Tranportation			Contractor	: ABC Golden Road Company	
5	Road ID	RD0001			Road Name	Main Road	
6		Right Side Offset:10m		Center Line		Left Side Offset:10 m	
7	Station	Northing	Easting	Northing Line	Easting	Northing	Easting
8	0	2545716.8535	341973.7077	2545719.3980	341964.0368	2545721.9425	341954.3659
9	100	2545813.5620	341999.1530	2545816.1065	341989.4821	2545818.6510	341979.8113
10	200	2545910.2705	342024.5983	2545912.8150	342014.9275	2545915.3595	342005.2566
11	300	2546006.9790	342050.0437	2546009.5235	342040.3728	2546012.0680	342030.7020
12	400	2546103.6875	342075.4890	2546106.2320	342065.8182	2546108.7765	342056.1473
13	500	2546200.3960	342100.9344	2546202.9405	342091.2635	2546205.4850	342081.5927
14	600	2546297.1045	342126.3797	2546299.6490	342116.7089	2546302.1935	342107.0380
15	700	2546393.8130	342151.8251	2546396.3575	342142.1542	2546398.9021	342132.4834
16	800	2546490.5215	342177.2704	2546493.0660	342167.5996	2546495.6106	342157.9287
17	900	2546587.2300	342202.7157	2546589.7745	342193.0449	2546592.3191	342183.3740
18	1000	2546683.9385	342228.1611	2546686.4830	342218.4902	2546689.0276	342208.8194
19	1100	2546780.6470	342253.6064	2546783.1915	342243.9356	2546785.7361	342234.2647
20	1200	2546877.3555	342279.0518	2546879.9000	342269.3809	2546882.4446	342259.7101
21	1300	2546974.0640	342304.4971	2546976.6085	342294.8263	2546979.1531	342285.1554
22	1400	2547070.7725	342329.9425	2547073.3170	342320.2716	2547075.8616	342310.6008
23	1500	2547167.4810	342355.3878	2547170.0255	342345.7170	2547172.5701	342336.0461
24	1600	2547264.1895	342380.8332	2547266.7340	342371.1623	2547269.2786	342361.4915
25	1700	2547360.8980	342406.2785	2547363.4425	342396.6077	2547365.9871	342386.9368
26	1800	2547457.6065	342431.7238	2547460.1510	342422.0530	2547462.6956	342412.3821
27	1900	2547554.3150	342457.1692	2547556.8595	342447.4983	2547559.4041	342437.8275
28	2000	2547651.0235	342482.6145	2547653.5680	342472.9437	2547656.1126	342463.2728
29	2100	2547747.6160	342508.1065	2547750.2571	342498.4615	2547752.8983	342488.8166

7.2 Vertical Alignment

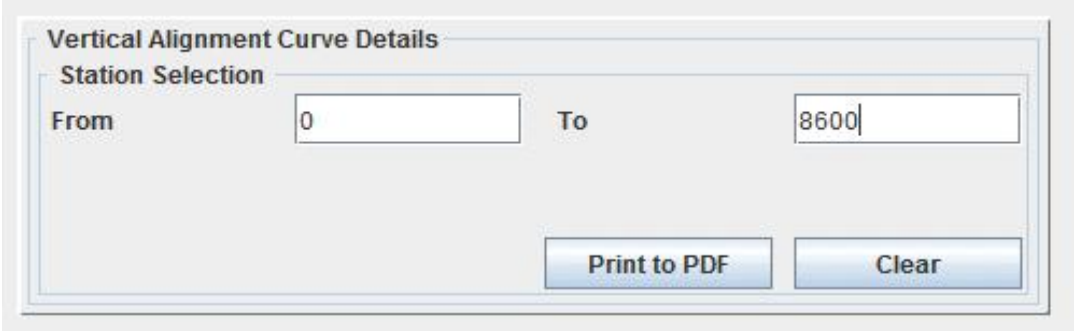
7.2.1 Vertical Curve data's

The Vertical Alignment Data Table …



S.N	PVI Station	PVI Elevation	LVC
1	0	96.291	0
2	578.49	94.539	300
3	675	45.1	200
4	1250	35.9	10
5	1275	79.95	10
6	1576.82	81	200
7	1943.34	77.181	300
8	2050	32	500
9	2632.66	75.929	150
10	3500	29.5	500
11	3845.16	69.822	300
12	4150	64.786	250
13	4275	64.161	0
14	4500	30.401	500
15	5400	28.3	500
16	6500	30	500
17	8600	21.205	0

The Vertical Alignment Curve Data Report Window …



Curve Report for Vertical Alignment

Project Name :Dualization of Highway Development project at Location

Description :Geometric and Quantities **Consultant :XYZ Supervision Consultant**

Client :Ministry of Tranportation **Contractor :ABC Golden Road Company**

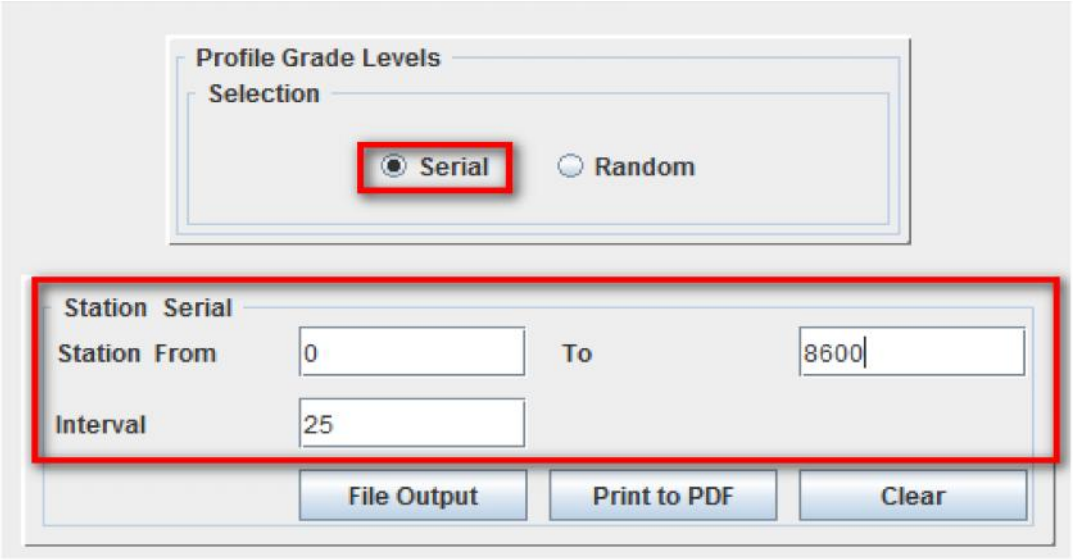
Road ID : RD0001 **Road Name : Main Road**

Vertical Alignment Report
Station and Curves

Start Station :0		Elevation :96.291		Lvc :0	
Curve No	1	PVC Station	428.490	PVC Elevation	94.993
Type	Crest Curve	PVT Station	728.490	PVT Elevation	17.699
PVI Station	578.490	Grade in (%)	-0.30286	Radius	589.114
PVI Elevation	94.539	Grade out(%)	-51.22682	K Value	5.891
LVC	300.000	Change (%)	-50.92396	Mid Ordinate	19.096
Curve No	2	PVC Station	575.000	PVC Elevation	96.327
Type	Sag Curve	PVT Station	775.000	PVT Elevation	43.500
PVI Station	675.000	Grade in (%)	-51.22682	Radius	403.008
PVI Elevation	45.100	Grade out(%)	-1.60000	K Value	4.030
LVC	200.000	Change (%)	49.62682	Mid Ordinate	-12.407
Curve No	3	PVC Station	1245.000	PVC Elevation	35.980
Type	Sag Curve	PVT Station	1255.000	PVT Elevation	44.710
PVI Station	1250.000	Grade in (%)	-1.60000	Radius	5.624
PVI Elevation	35.900	Grade out(%)	176.20000	K Value	0.056
LVC	10.000	Change (%)	177.80000	Mid Ordinate	-2.223
Curve No	4	PVC Station	1270.000	PVC Elevation	71.140
Type	Crest Curve	PVT Station	1280.000	PVT Elevation	79.967
PVI Station	1275.000	Grade in (%)	176.20000	Radius	5.687
PVI Elevation	79.950	Grade out(%)	0.34789	K Value	0.057
LVC	10.000	Change (%)	-175.85211	Mid Ordinate	2.198
Curve No	5	PVC Station	1476.820	PVC Elevation	80.652
Type	Crest Curve	PVT Station	1676.820	PVT Elevation	79.958
PVI Station	1576.820	Grade in (%)	0.34789	Radius	14390.024
PVI Elevation	81.000	Grade out(%)	-1.04196	K Value	143.900
LVC	200.000	Change (%)	-1.38985	Mid Ordinate	0.347
Curve No	6	PVC Station	1793.340	PVC Elevation	78.744
Type	Crest Curve	PVT Station	2093.340	PVT Elevation	13.641
PVI Station	1943.340	Grade in (%)	-1.04196	Radius	726.078
PVI Elevation	77.181	Grade out(%)	-42.35983	K Value	7.261
LVC	300.000	Change (%)	-41.31787	Mid Ordinate	15.494
Curve No	7	PVC Station	1800.000	PVC Elevation	137.900
Type	Sag Curve	PVT Station	2300.000	PVT Elevation	50.848
PVI Station	2050.000	Grade in (%)	-42.35983	Radius	1002.020
PVI Elevation	32.000	Grade out(%)	7.53939	K Value	10.020
LVC	500.000	Change (%)	49.89922	Mid Ordinate	-31.187
Curve No	8	PVC Station	2557.660	PVC Elevation	70.274
Type	Crest Curve	PVT Station	2707.660	PVT Elevation	71.914
PVI Station	2632.660	Grade in (%)	7.53939	Radius	1163.474
PVI Elevation	75.929	Grade out(%)	-5.35303	K Value	11.635
LVC	150.000	Change (%)	-12.89242	Mid Ordinate	2.417
Curve No	9	PVC Station	3250.000	PVC Elevation	42.883
Type	Sag Curve	PVT Station	3750.000	PVT Elevation	58.705
PVI Station	3500.000	Grade in (%)	-5.35303	Radius	2935.107
PVI Elevation	29.500	Grade out(%)	11.68212	K Value	29.351
LVC	500.000	Change (%)	17.03515	Mid Ordinate	-10.647
Curve No	10	PVC Station	3695.160	PVC Elevation	52.299
Type	Crest Curve	PVT Station	3995.160	PVT Elevation	67.344
PVI Station	3845.160	Grade in (%)	11.68212	Radius	2249.865
PVI Elevation	69.822	Grade out(%)	-1.65201	K Value	22.499
LVC	300.000	Change (%)	-13.33413	Mid Ordinate	5.000

Contractor **Page No 1** **Consultant**

7.2.2 Profile Grade data's



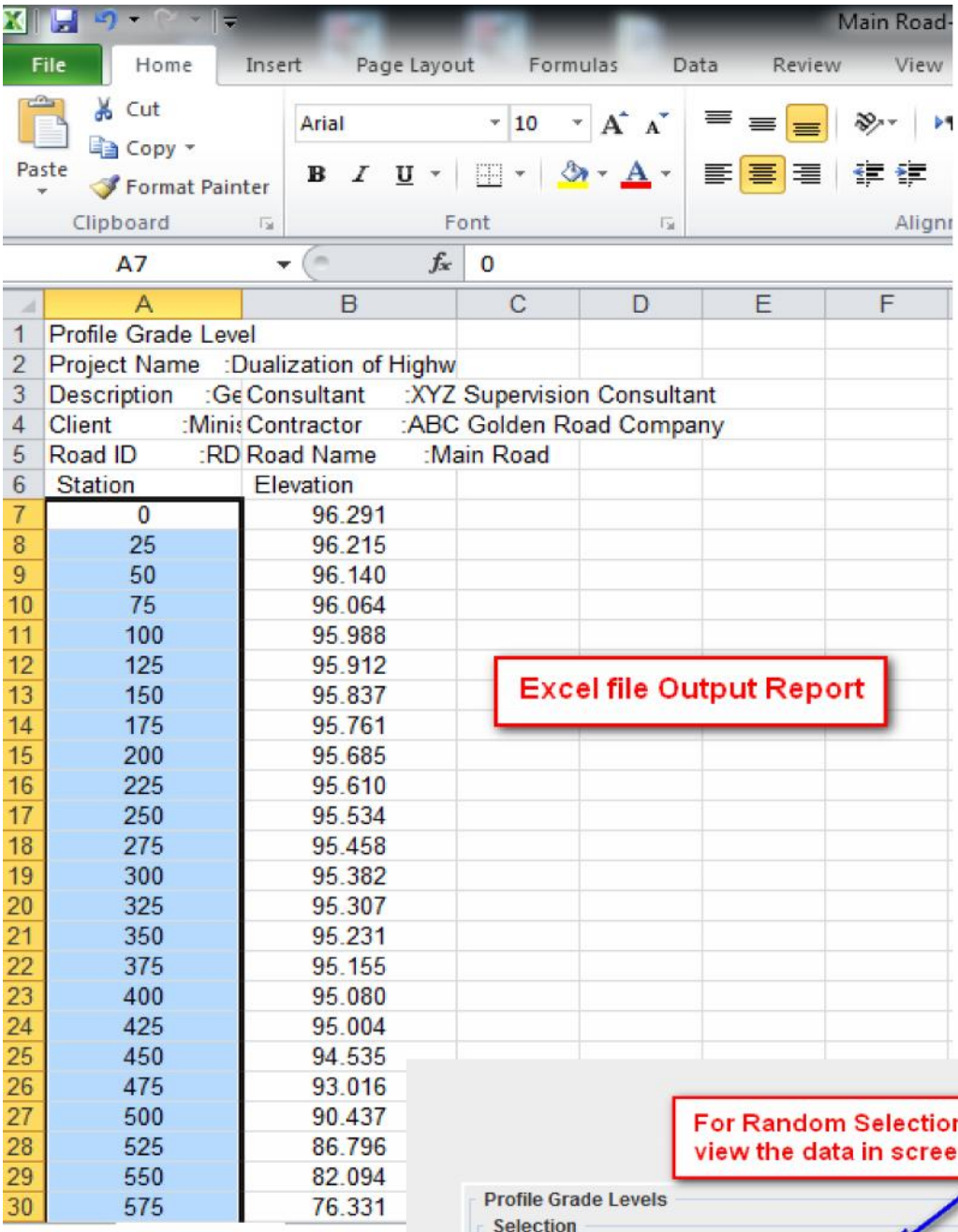
Project Name :Dualization of Highway Development project at Location
Description :Geometric and Quantities
Consultant :XYZ Supervision Consultant
Client :Ministry of Tranportation
Contractor :ABC Golden Road Company

Road ID : RD0001
Road Name : Main Road

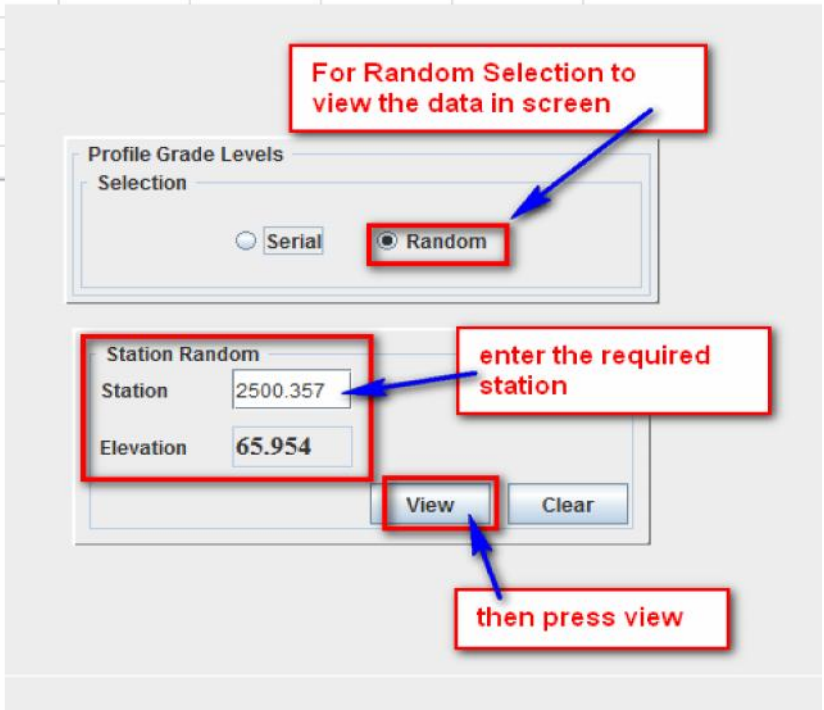
Vertical Alignment Report
Profile Grade Level

Station	Elevation
0.000	96.291
25.000	96.215
50.000	96.140
75.000	96.064
100.000	95.988
125.000	95.912
150.000	95.837
175.000	95.761
200.000	95.685
225.000	95.610
250.000	95.534
275.000	95.458
300.000	95.382
325.000	95.307
350.000	95.231
375.000	95.155
400.000	95.080
425.000	95.004
450.000	94.535
475.000	93.016
500.000	90.437

Pdf file Report



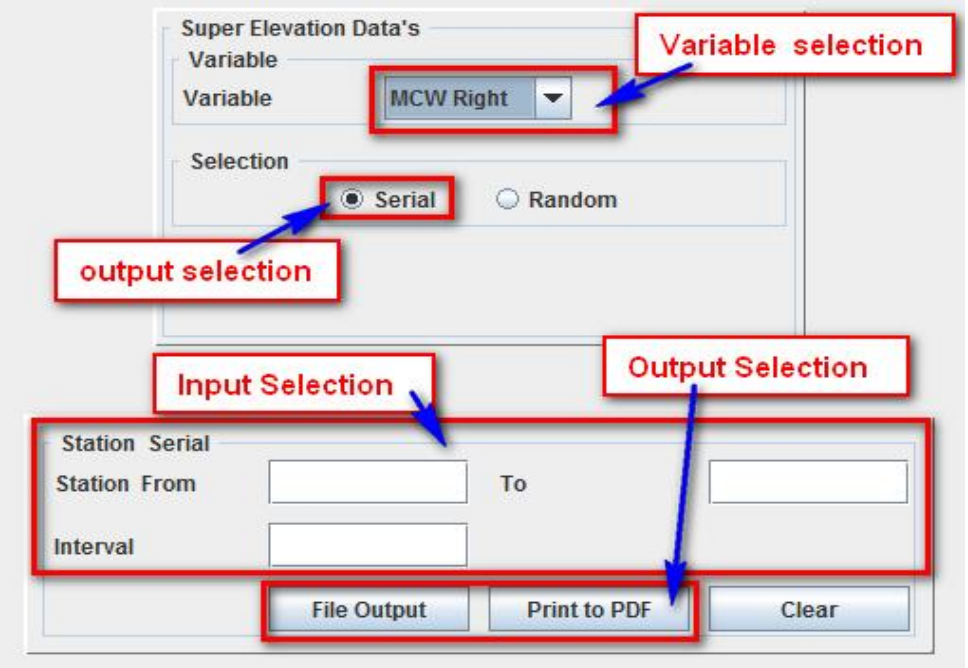
For Random Selection the output will appear in the screen.



7.3 Superelevation

7.3.1 Superelevation data's

In Superelevation data output based on variables selection for serial,Random output



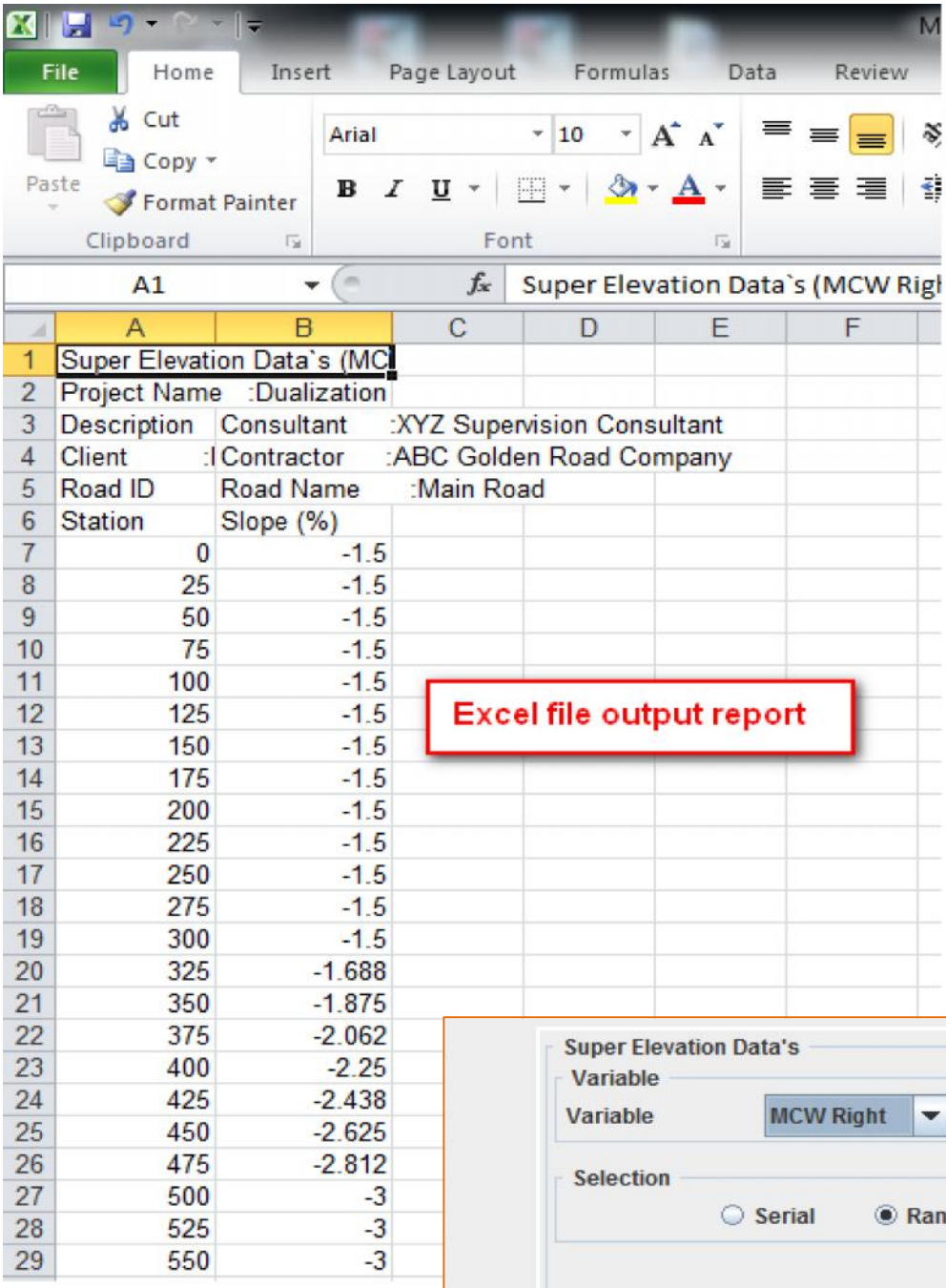
For Serial output Reports

Project Name :Dualization of Highway Development project at Location
Description :Geometric and Quantities
Client :Ministry of Tranportation
Consultant :XYZ Supervision Consultant
Contractor :ABC Golden Road Company

Road ID : RD0001
Road Name : Main Road

Super Elevation Data`s
MCW Right

Station	Slope (%)
0.000	-1.500
25.000	-1.500
50.000	-1.500
75.000	-1.500
100.000	-1.500
125.000	-1.500
150.000	-1.500
175.000	-1.500
200.000	-1.500
225.000	-1.500
250.000	-1.500
275.000	-1.500
300.000	-1.500
325.000	-1.688
350.000	-1.875
375.000	-2.062



	A	B	C	D	E	F
1	Super Elevation Data`s (MC					
2	Project Name	:Dualization				
3	Description	Consultant	:XYZ Supervision Consultant			
4	Client	:I Contractor	:ABC Golden Road Company			
5	Road ID	Road Name	:Main Road			
6	Station	Slope (%)				
7	0	-1.5				
8	25	-1.5				
9	50	-1.5				
10	75	-1.5				
11	100	-1.5				
12	125	-1.5				
13	150	-1.5				
14	175	-1.5				
15	200	-1.5				
16	225	-1.5				
17	250	-1.5				
18	275	-1.5				
19	300	-1.5				
20	325	-1.688				
21	350	-1.875				
22	375	-2.062				
23	400	-2.25				
24	425	-2.438				
25	450	-2.625				
26	475	-2.812				
27	500	-3				
28	525	-3				
29	550	-3				

Excel file output report

7.4 Construction

7.4.1 Slopestake points

The Slopestake points Report for Settingout work limits of Earthworks for Roads. Also it will represents the Fill or Cut Areas.

Project Name :Testing of Pavement calculations

Description :testing program **Consultant :xyz consultant**

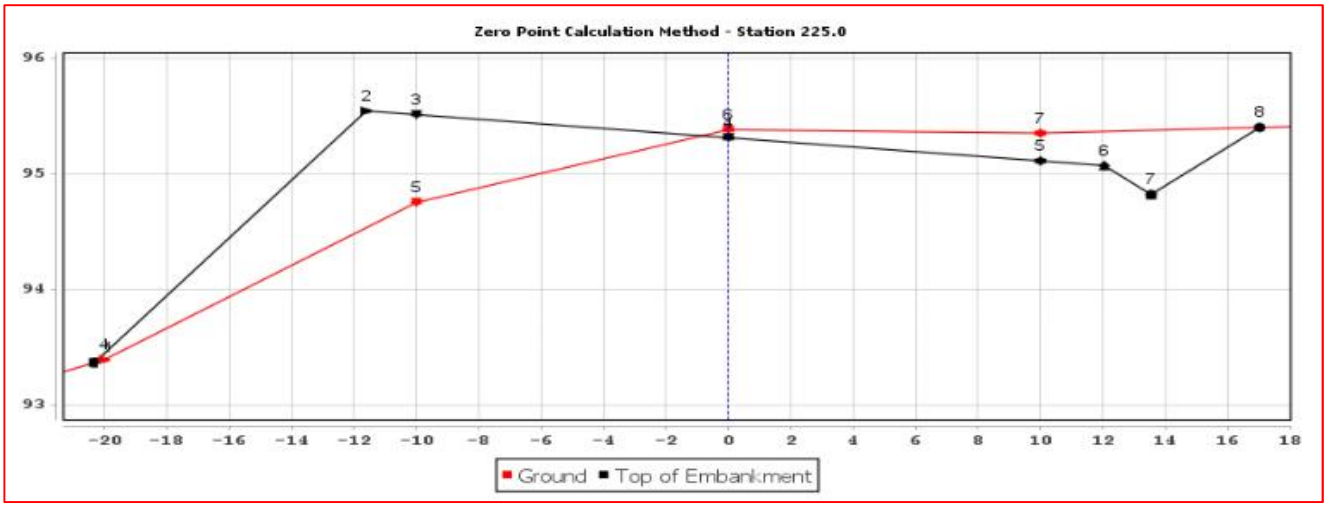
Client :ministry of Transport **Contractor :abc contractor**

Road ID : RD00093 **Road Name : Road Test based on centre line**

SLOPE STAKE REPORT

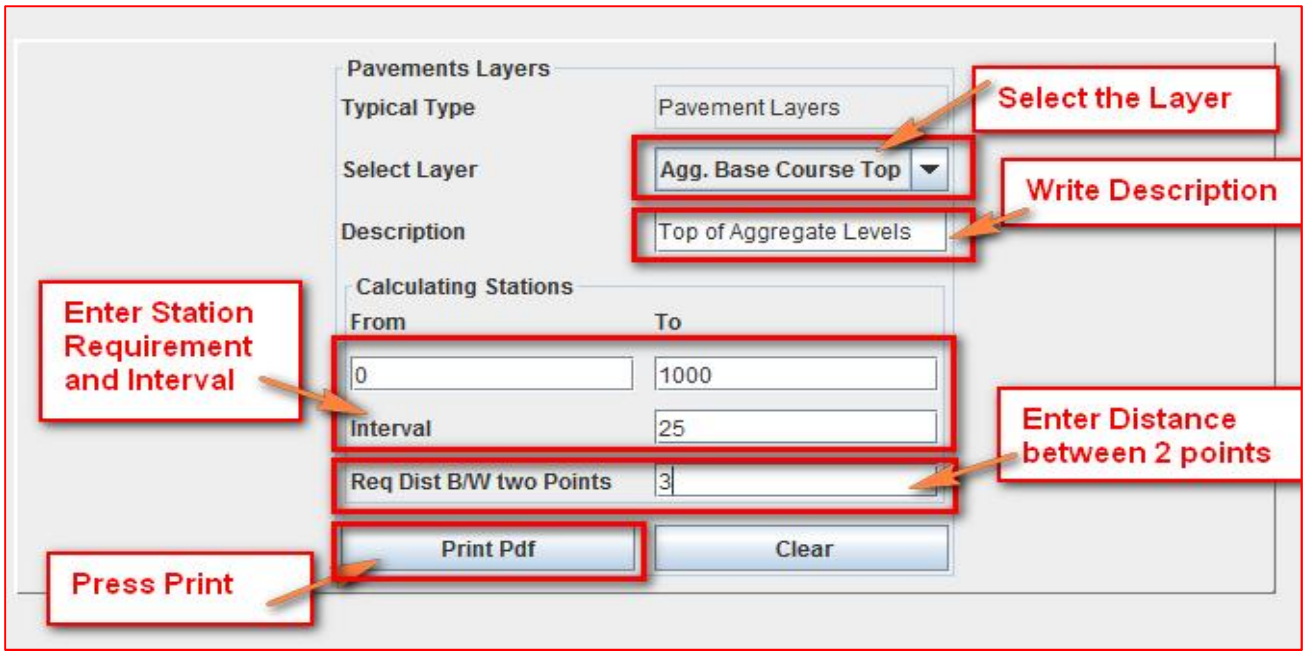
STATION	LEFT SIDE		RIGHT SIDE	
	DIST	CASE	DIST	CASE
0	-11.607	Cut	20.508	Cut
25	-11.607	Cut	21.187	Cut
50	-11.755	Fill	16.974	Cut
75	-12.203	Fill	18.421	Cut
100	-12.879	Fill	15.288	Cut
125	-11.958	Fill	19.097	Cut
150	-11.893	Fill	19.157	Cut
175	-12.386	Fill	17.853	Cut
200	-15.856	Fill	18.459	Cut
225	-20.316	Fill	17.026	Cut
250	-22.275	Fill	12.498	Fill
275	-24.549	Fill	15.999	Cut
300	-21.494	Fill	14.169	Fill
325	-23.759	Fill	14.761	Fill
350	-18.783	Fill	15.046	Fill
375	-19.78	Fill	15.046	Fill

Sample Section of Earthwork.. At Station 0+225



7.4.2 Pavement Layers

Refer chapter 6.2.4 Template Creation for Pavement Layers for Pavement Layer template Creation . After Successful Completion of Template Creation goto Reports and choose in Construction >> Pavement Layers the following Screen will appear



Project Name :Testing of Pavement calculations

Description :testing program **Consultant :xyz consultant**

Client :ministry of Transport **Contractor :abc contractor**

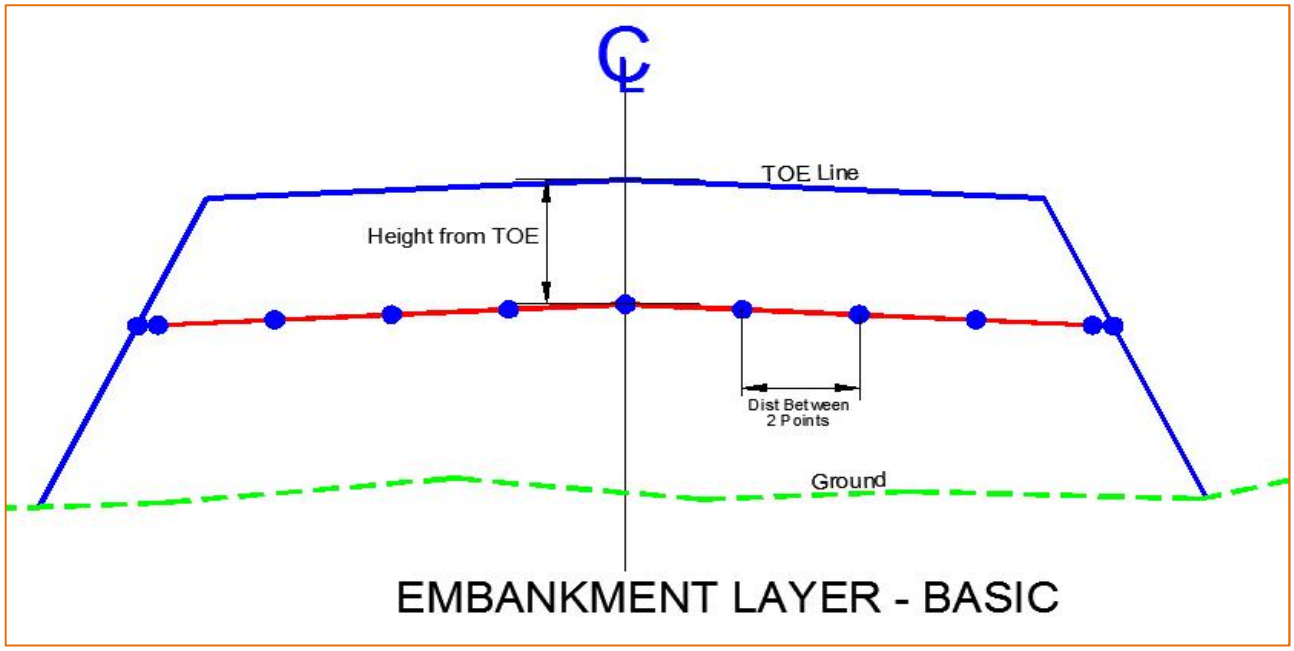
Road ID : RD00093 **Road Name : Road Test based on centre line**

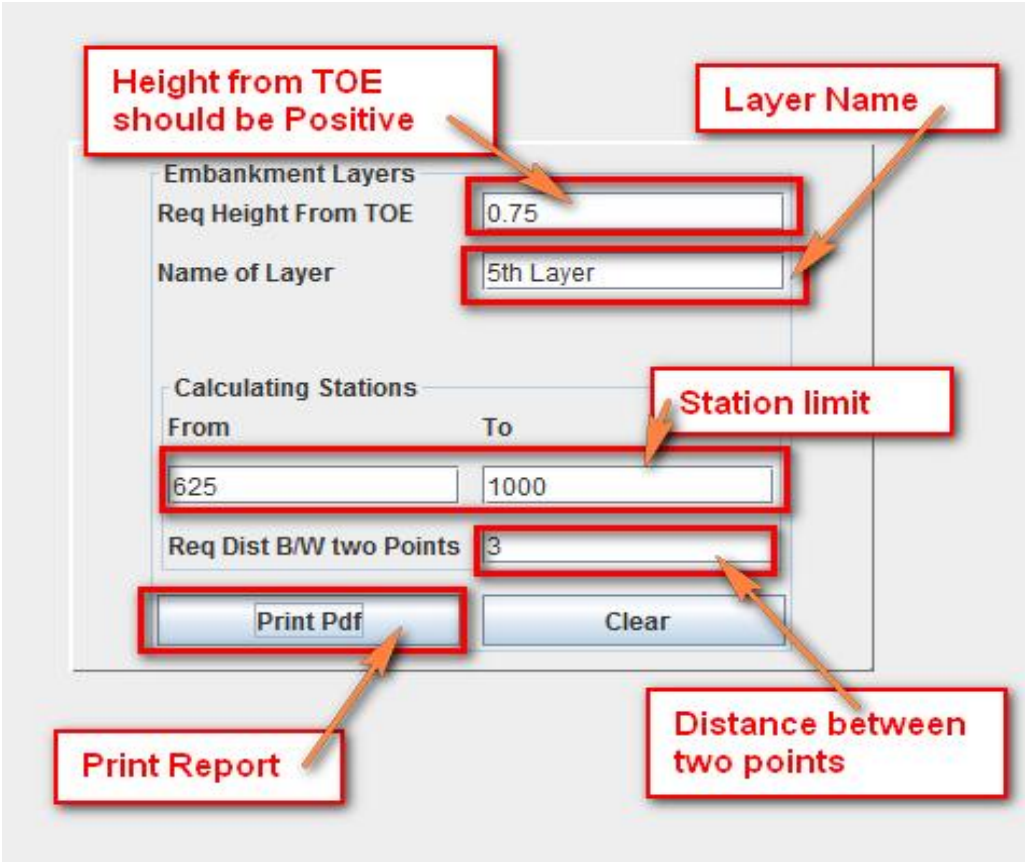
Pavement Layer Report
Top of Aggregate Levels

Station 0	No	1	2	3	4	5	6	7
	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	96.028	96.051	96.096	96.141	96.096	96.051	96.028
Station 25	No	1	2	3	4	5	6	7
	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.953	95.975	96.020	96.065	96.020	95.975	95.953
Station 50	No	1	2	3	4	5	6	7
	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.877	95.900	95.945	95.990	95.945	95.900	95.877
Station 75	No	1	2	3	4	5	6	7
	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.801	95.824	95.869	95.914	95.869	95.824	95.801
Station 100	No	1	2	3	4	5	6	7
	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.726	95.748	95.793	95.838	95.793	95.748	95.726
Station 125	No	1	2	3	4	5	6	7
	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.650	95.672	95.717	95.762	95.717	95.672	95.650
Station 150	No	1	2	3	4	5	6	7
	Dist	-7.500	-6.000	-3.000	0.000	3.000	6.000	7.500
	Elev.	95.574	95.597	95.642	95.687	95.642	95.597	95.574

7.4.3 Embankment Layers

Embankment Layer command to used to calculate the Layers in Filling Section . Those points are calculated from the Top of Embank= -ment Levels. The basic function of Embankment layer to see The diagram..





The Report Generated as below..,

Project Name :Testing of Pavement calculations

Description :testing program **Consultant :xyz consultant**

Client :ministry of Transport **Contractor :abc contractor**

Road ID : RD00093 **Road Name : Road Test based on centre line**

Embankment Layer Report

5th Layer

Height From TOE :0.75 Interval of :3

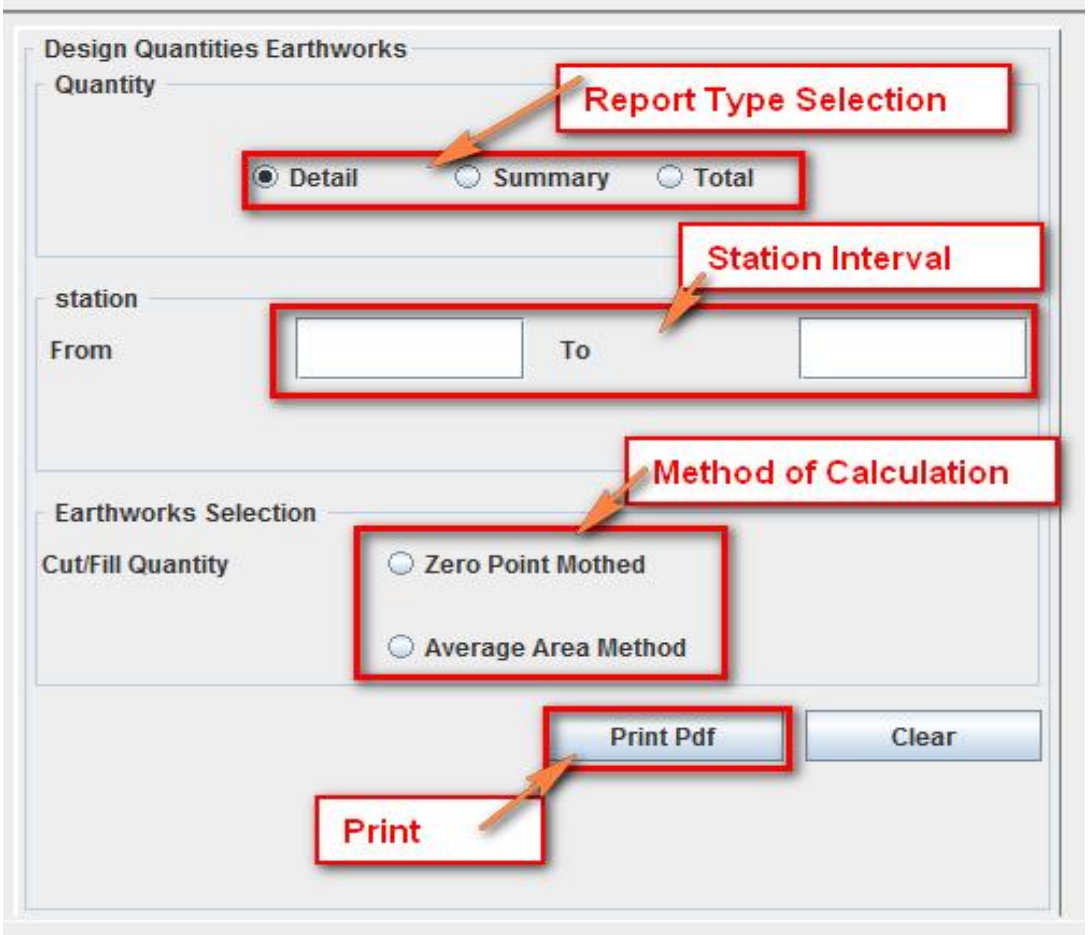
Station	No	1	2	3	4	5	6	7	8	9	10	11	
625	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	14.439	
	Elev.	92.482	92.435	92.375	92.315	92.255	92.195	92.135	92.075	92.015	91.955	91.906	
Station	No	1											
650	Dist	0.000											
	Elev.	-NOT in TOE Layer-											
Station	No	1	2	3	4	5	6	7	8	9	10	11	12
675	Dist	-14.385	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	15.000	15.306
	Elev.	91.669	91.622	91.562	91.502	91.442	91.382	91.322	91.262	91.202	91.142	91.082	91.076
Station	No	1	2	3	4	5	6	7	8	9	10	11	12
700	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	15.000	15.307
	Elev.	91.207	91.160	91.100	91.040	90.980	90.920	90.860	90.800	90.740	90.680	90.620	90.614
Station	No	1	2	3	4	5	6	7	8	9	10	11	
725	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	14.439	
	Elev.	90.707	90.660	90.600	90.540	90.480	90.420	90.360	90.300	90.240	90.180	90.131	
Station	No	1	2	3	4	5	6	7	8	9	10	11	
750	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	14.439	
	Elev.	90.184	90.137	90.077	90.017	89.957	89.897	89.837	89.777	89.717	89.657	89.608	
Station	No	1	2	3	4	5	6	7	8	9	10	11	
775	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	14.439	
	Elev.	89.660	89.613	89.553	89.493	89.433	89.373	89.313	89.253	89.193	89.133	89.084	
Station	No	1	2	3	4	5	6	7	8	9	10	11	
800	Dist	-14.385	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	14.439	
	Elev.	89.136	89.089	89.029	88.969	88.909	88.849	88.789	88.729	88.669	88.609	88.560	
Station	No	1	2	3	4	5	6	7	8	9	10	11	12
825	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	15.000	15.307
	Elev.	88.613	88.566	88.506	88.446	88.386	88.326	88.266	88.206	88.146	88.086	88.026	88.020
Station	No	1	2	3	4	5	6	7	8	9	10	11	
850	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	14.439	
	Elev.	88.089	88.042	87.982	87.922	87.862	87.802	87.742	87.682	87.622	87.562	87.513	
Station	No	1	2	3	4	5	6	7	8	9	10	11	
875	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	14.439	
	Elev.	87.565	87.518	87.458	87.398	87.338	87.278	87.218	87.158	87.098	87.038	86.989	
Station	No	1	2	3	4	5	6	7	8	9	10	11	12
900	Dist	-14.385	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	15.000	15.306
	Elev.	87.042	86.995	86.935	86.875	86.815	86.755	86.695	86.635	86.575	86.515	86.455	86.449
Station	No	1	2	3	4	5	6	7	8	9	10	11	12
925	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	15.000	15.306
	Elev.	86.518	86.471	86.411	86.351	86.291	86.231	86.171	86.111	86.051	85.991	85.931	85.925
Station	No	1	2	3	4	5	6	7	8	9	10	11	
950	Dist	-14.386	-12.000	-9.000	-6.000	-3.000	0.000	3.000	6.000	9.000	12.000	14.439	
	Elev.	85.994	85.947	85.887	85.827	85.767	85.707	85.647	85.587	85.527	85.467	85.418	

Contractor **Page No 1** **Consultant**

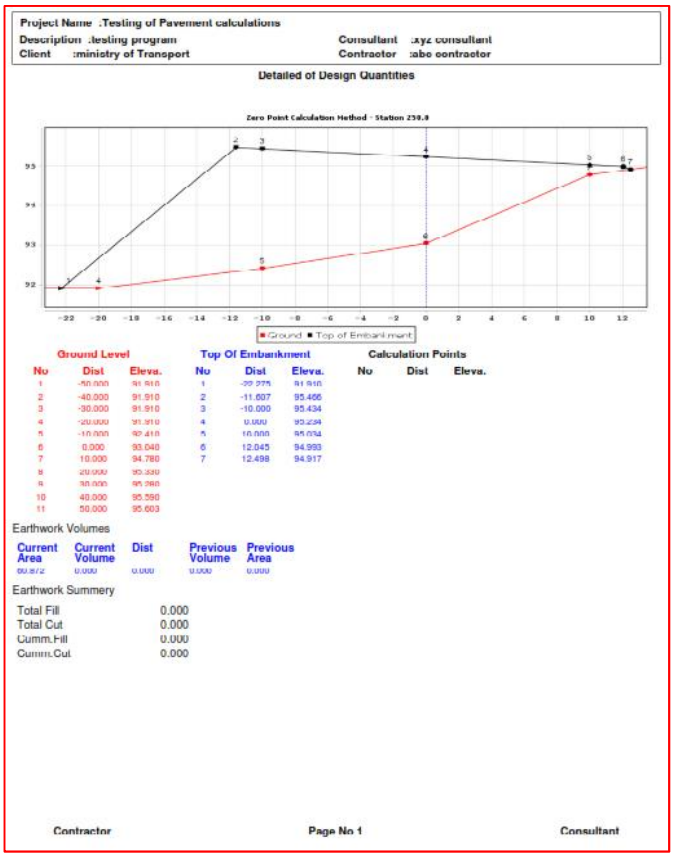
7.5 Road Quantities

7.5.1 Earthworks Quantities - Design

In Report of Earthworks Quantities - Design to Print out the Earthwork Calculation Report (Fill/Cut). This Reports contains Detailed , Summary and Total.



Detailed Reports..



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detailed of Design Quantities

Zero Point Calculation Method - Station 250.0

Ground Top of Embankment

Ground Level			Top Of Embankment			Calculation Points		
No	Dist	Eleva.	No	Dist	Eleva.	No	Dist	Eleva.
1	-50.000	91.910	1	-20.375	91.910			
2	-40.000	91.910	2	-11.607	95.466			
3	-30.000	91.910	3	-10.000	95.434			
4	-20.000	91.910	4	0.000	95.234			
5	-10.000	92.410	5	10.000	95.084			
6	0.000	93.040	6	12.045	94.993			
7	10.000	94.780	7	12.498	94.917			
8	20.000	95.330						
9	30.000	95.260						
10	40.000	95.550						
11	50.000	95.603						

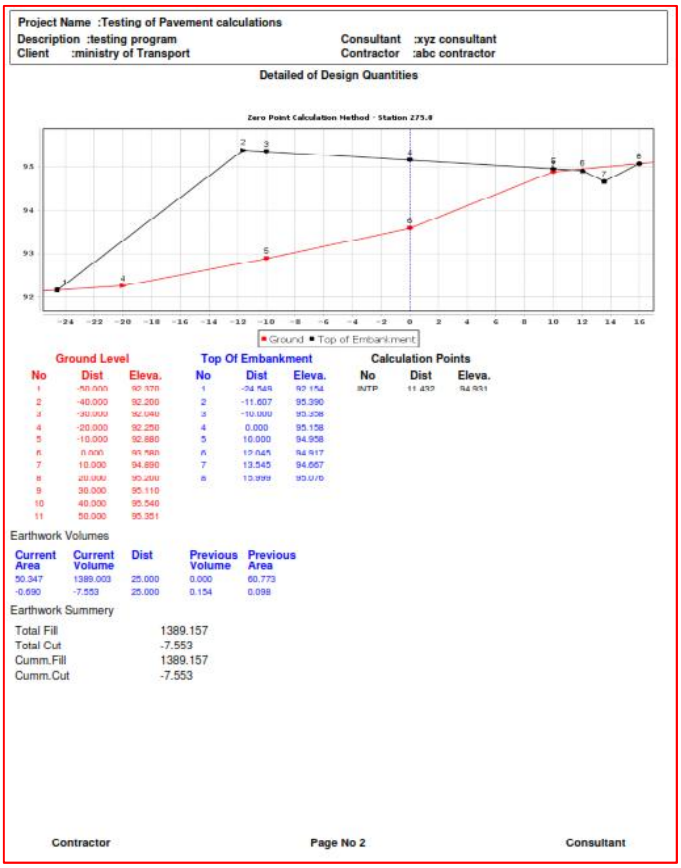
Earthwork Volumes

Current Area	Current Volume	Dist	Previous Volume	Previous Area
50.872	0.000	0.000	0.000	0.000

Earthwork Summery

Total Fill	0.000
Total Cut	0.000
Cumm.Fill	0.000
Cumm.Cut	0.000

Contractor Page No 1 Consultant



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detailed of Design Quantities

Zero Point Calculation Method - Station 275.0

Ground Top of Embankment

Ground Level			Top Of Embankment			Calculation Points		
No	Dist	Eleva.	No	Dist	Eleva.	No	Dist	Eleva.
1	-50.000	92.370	1	-24.548	92.154	INTP	11.493	94.931
2	-40.000	92.200	2	-11.607	95.390			
3	-30.000	92.040	3	-10.000	95.358			
4	-20.000	92.250	4	0.000	95.158			
5	-10.000	92.880	5	10.000	94.958			
6	0.000	93.580	6	12.045	94.917			
7	10.000	94.890	7	13.545	94.667			
8	20.000	95.200	8	19.999	95.076			
9	30.000	95.110						
10	40.000	95.540						
11	50.000	95.351						

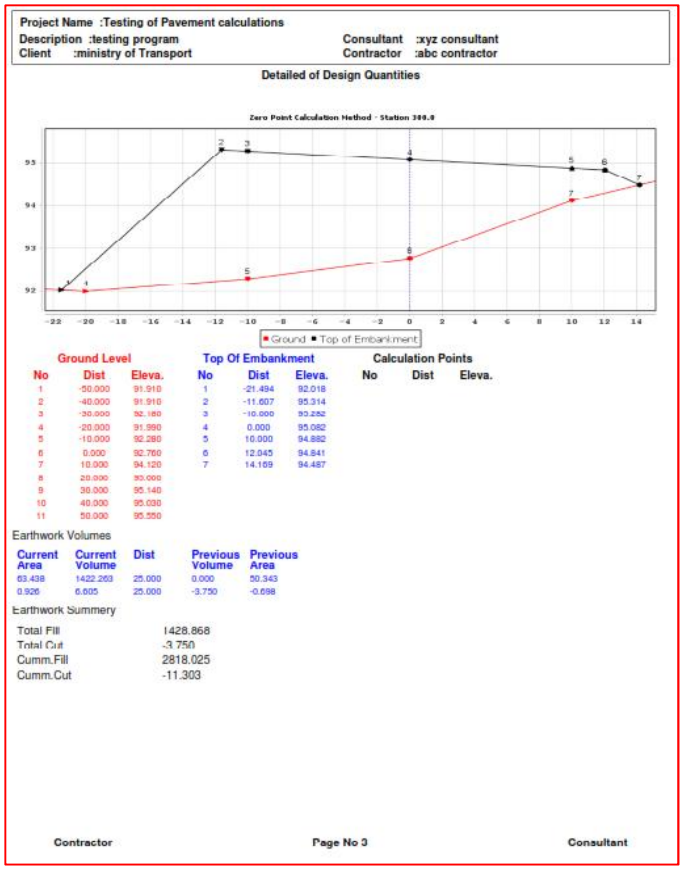
Earthwork Volumes

Current Area	Current Volume	Dist	Previous Volume	Previous Area
50.947	1389.003	25.000	0.000	60.773
-0.690	-7.553	25.000	0.154	0.098

Earthwork Summery

Total Fill	1389.157
Total Cut	-7.553
Cumm.Fill	1389.157
Cumm.Cut	-7.553

Contractor Page No 2 Consultant



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detailed of Design Quantities

Zero Point Calculation Method - Station 300.0

Ground Top of Embankment

Ground Level			Top Of Embankment			Calculation Points		
No	Dist	Eleva.	No	Dist	Eleva.	No	Dist	Eleva.
1	-50.000	91.910	1	-21.494	92.018			
2	-40.000	91.910	2	-11.607	95.314			
3	-30.000	92.160	3	-10.000	95.282			
4	-20.000	91.990	4	0.000	95.082			
5	-10.000	92.280	5	10.000	94.882			
6	0.000	92.760	6	12.045	94.841			
7	10.000	94.120	7	14.169	94.487			
8	20.000	95.000						
9	30.000	95.140						
10	40.000	95.030						
11	50.000	95.550						

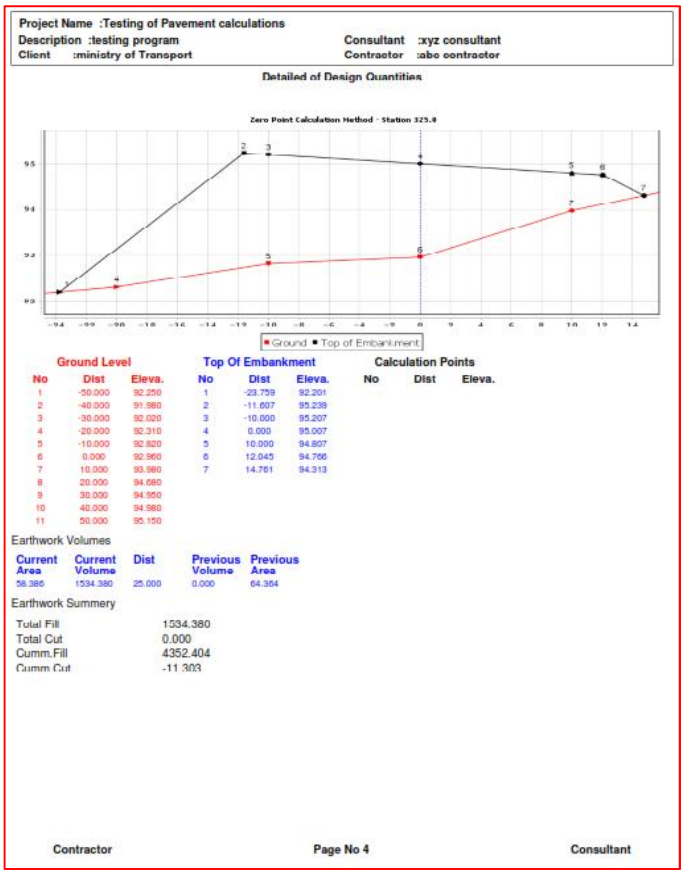
Earthwork Volumes

Current Area	Current Volume	Dist	Previous Volume	Previous Area
63.438	1422.263	25.000	0.000	50.343
0.926	6.605	25.000	-3.750	-0.698

Earthwork Summery

Total Fill	1428.868
Total Cut	-3.750
Cumm.Fill	2818.025
Cumm.Cut	-11.303

Contractor Page No 3 Consultant



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detailed of Design Quantities

Zero Point Calculation Method - Station 325.0

Ground Top of Embankment

Ground Level			Top Of Embankment			Calculation Points		
No	Dist	Eleva.	No	Dist	Eleva.	No	Dist	Eleva.
1	-50.000	92.250	1	-23.759	92.201			
2	-40.000	91.980	2	-11.607	95.239			
3	-30.000	92.020	3	-10.000	95.207			
4	-20.000	92.310	4	0.000	95.007			
5	-10.000	92.820	5	10.000	94.807			
6	0.000	92.960	6	12.045	94.766			
7	10.000	93.980	7	14.761	94.313			
8	20.000	94.680						
9	30.000	94.950						
10	40.000	94.980						
11	50.000	95.150						

Earthwork Volumes

Current Area	Current Volume	Dist	Previous Volume	Previous Area
58.386	1534.380	25.000	0.000	64.364

Earthwork Summery

Total Fill	1534.380
Total Cut	0.000
Cumm.Fill	4352.404
Cumm.Cut	-11.303

Contractor Page No 4 Consultant

Summary Reports ..,

Project Name :Testing of Pavement calculations
Description :testing program **Consultant :xyz consultant**
Client :ministry of Transport **Contractor :abc contractor**

Summary of Design Quantities

Station	Area Fill	Fill Volume	Cumm.Fill	Area Cut	Cut Volume	Cumm.Cut
1275.000	75.419	1841.158	49950.214	0.000	0.000	-2261.206
1300.000	80.525	1949.289	51899.504	0.000	0.000	-2261.206
1325.000	70.729	1890.669	53790.173	0.000	0.000	-2261.206
1350.000	76.740	1843.366	55633.538	0.000	0.000	-2261.206
1375.000	78.569	1941.360	57574.899	0.000	0.000	-2261.206
1400.000	81.443	2000.149	59575.048	0.000	0.000	-2261.206
1425.000	89.146	2132.374	61707.422	0.000	0.000	-2261.206
1450.000	86.114	2190.759	63898.181	0.000	0.000	-2261.206
1475.000	68.334	1930.609	65828.790	0.000	0.000	-2261.206
1500.000	47.540	1448.431	67277.220	0.000	0.000	-2261.206
1525.000	29.686	965.331	68242.551	0.000	0.000	-2261.206
1550.000	13.044	534.130	68776.681	0.000	0.000	-2261.206
1575.000	6.589	245.543	69022.224	0.000	0.000	-2261.206
1600.000	1.707	103.777	69126.001	-0.004	-0.001	-2261.207
1625.000	0.963	33.288	69159.289	0.000	-0.003	-2261.211
1650.000	6.762	96.564	69255.853	0.000	0.000	-2261.211
1675.000	14.887	270.606	69526.458	0.000	0.000	-2261.211
1700.000	20.458	441.808	69968.266	0.000	0.000	-2261.211
1725.000	26.390	585.598	70553.865	0.000	0.000	-2261.211
1750.000	35.156	769.320	71323.185	0.000	0.000	-2261.211
1775.000	32.165	841.509	72164.695	0.000	0.000	-2261.211
1800.000	35.503	845.855	73010.549	0.000	0.000	-2261.211
1825.000	46.030	1019.173	74029.722	0.000	0.000	-2261.211
1850.000	50.792	1210.275	75239.996	0.000	0.000	-2261.211
1875.000	47.610	1230.020	76470.017	0.000	0.000	-2261.211
1900.000	58.971	1332.266	77802.283	0.000	0.000	-2261.211
1925.000	49.759	1359.131	79161.414	0.000	0.000	-2261.211
1950.000	25.118	935.968	80097.381	0.000	0.000	-2261.211
1975.000	27.826	661.798	80759.180	0.000	0.000	-2261.211
2000.000	25.420	665.566	81424.746	0.000	0.000	-2261.211
2025.000	16.512	524.140	81948.886	0.000	0.000	-2261.211
2050.000	23.652	502.044	82450.930	0.000	0.000	-2261.211
2075.000	14.187	472.986	82923.916	0.000	0.000	-2261.211
2100.000	2.897	210.086	83134.002	-0.389	-1.404	-2262.615
2125.000	0.000	2.215	83136.216	-60.320	-724.854	-2987.468
2150.000	0.000	0.000	83136.216	-57.603	-1649.014	-4636.482
2175.000	0.000	0.000	83136.216	-75.868	-1668.390	-6304.873
2200.000	0.000	0.000	83136.216	-30.852	-1334.009	-7638.881
2225.000	3.855	8.946	83145.163	-1.413	-364.074	-8002.955
2250.000	3.430	88.777	83233.940	-1.073	-28.789	-8031.744
2275.000	13.674	202.603	83436.543	0.000	-1.897	-8033.641
2300.000	21.632	441.315	83877.858	0.000	0.000	-8033.641
2325.000	34.473	701.311	84579.170	0.000	0.000	-8033.641
2350.000	24.691	739.552	85318.721	0.000	0.000	-8033.641
2375.000	9.829	431.505	85750.226	0.000	0.000	-8033.641
2400.000	6.582	194.741	85944.967	-1.492	-8.240	-8041.881
2425.000	10.810	208.103	86153.070	0.000	-9.576	-8051.458
2450.000	7.195	225.052	86378.122	0.000	0.000	-8051.458
2475.000	7.189	179.162	86557.284	-0.386	-4.188	-8055.646
2500.000	10.522	221.204	86778.488	-0.731	-13.781	-8069.427

Contractor **Page No 2** **Consultant**

Total Quantity to appear in Screen

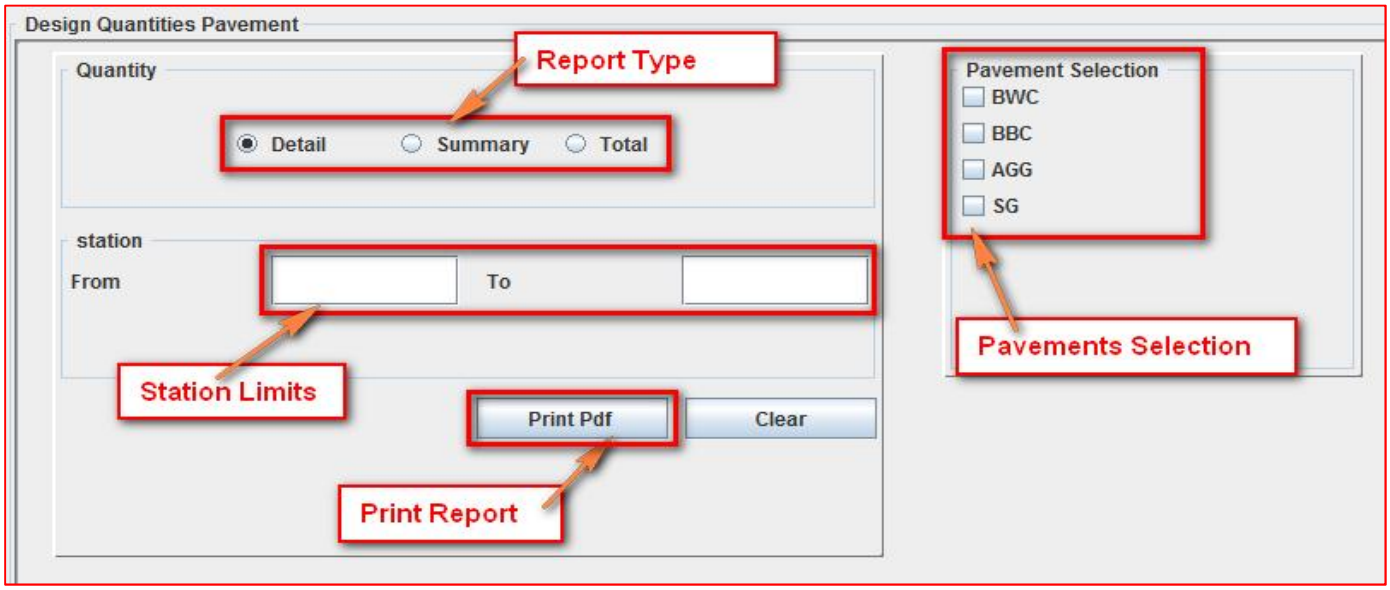
Project Name :Road Solver Sample Project - Using Variables Calculation
Description :Using Variables Calculation **Consultant :XYZ Consultant**
Client :Ministry of Transport **Contractor :ABC Contractor**

Road ID : RD000115 **Road Name : Road No 1 using Variables**

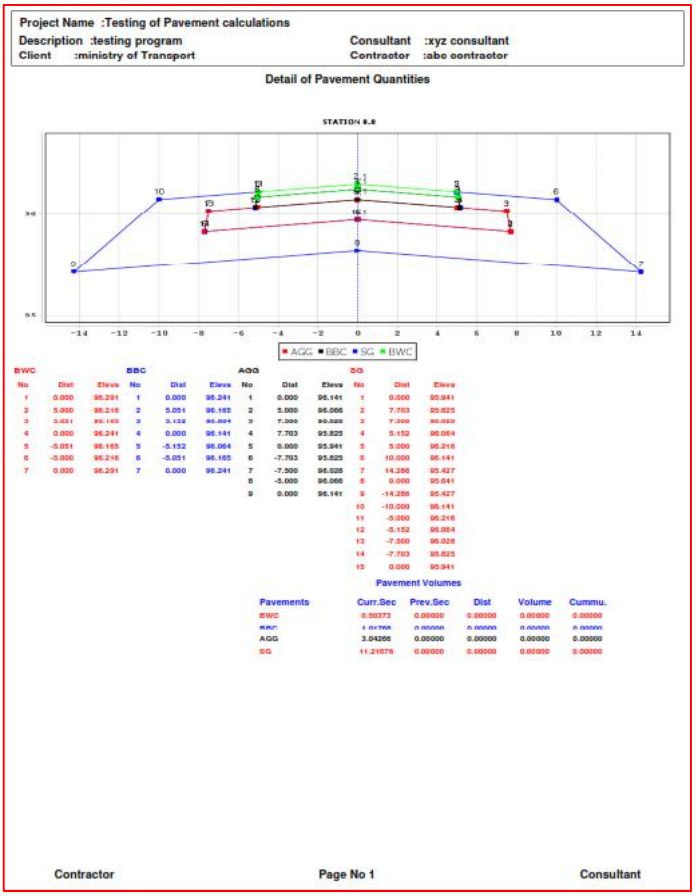
Total Earthwork Quantities -(Zero Point Method)
Total Fill 91050.790
Total Cut -5140.973

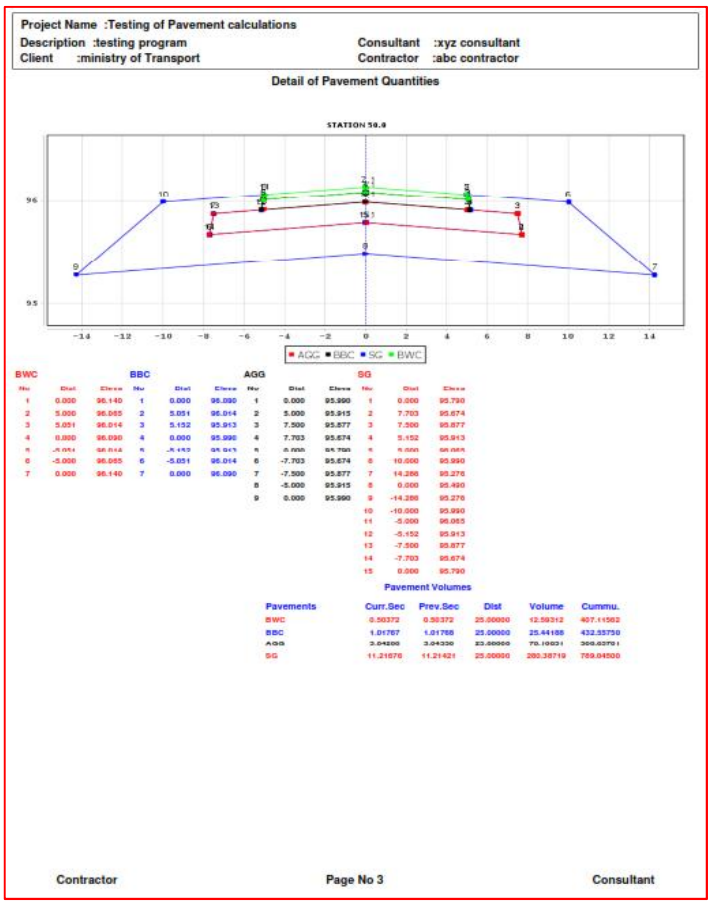
7.5.2 Pavements Quantities - Design

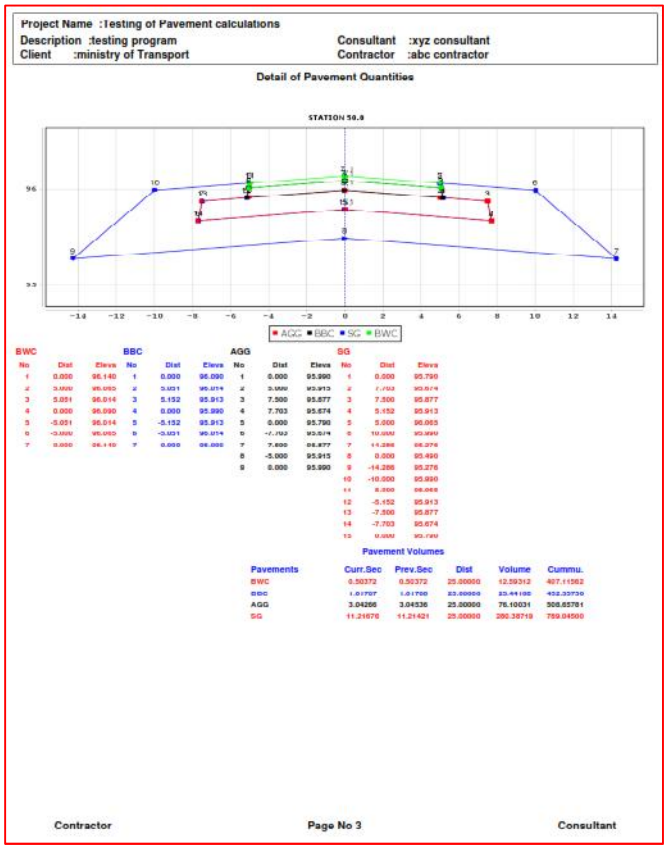
The Report for Pavement Quantities is generated from Pavement Levels . The Report type will be Detailed , Summary and Total. To click the Pavement Quantities Report the following screen will appear..,



Detailed Reports..







Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

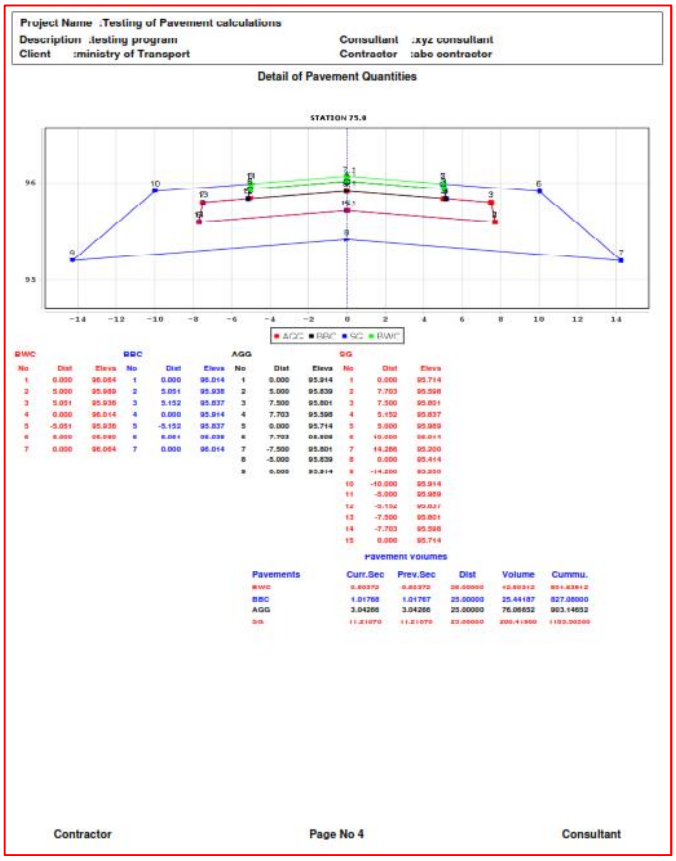
Detail of Pavement Quantities

STATION 50.0

Pavement Volumes

Pavements	Curr.Sec	Prev.Sec	Dist	Volume	Cummu.
BWC	0.50372	0.50372	25.00000	12.59312	407.11562
BBC	1.01767	1.01768	25.00000	25.44188	458.33730
AGG	3.04266	3.04536	25.00000	76.10031	508.65781
SG	11.21676	11.21421	25.00000	280.38719	759.04500

Contractor Page No 3 Consultant



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

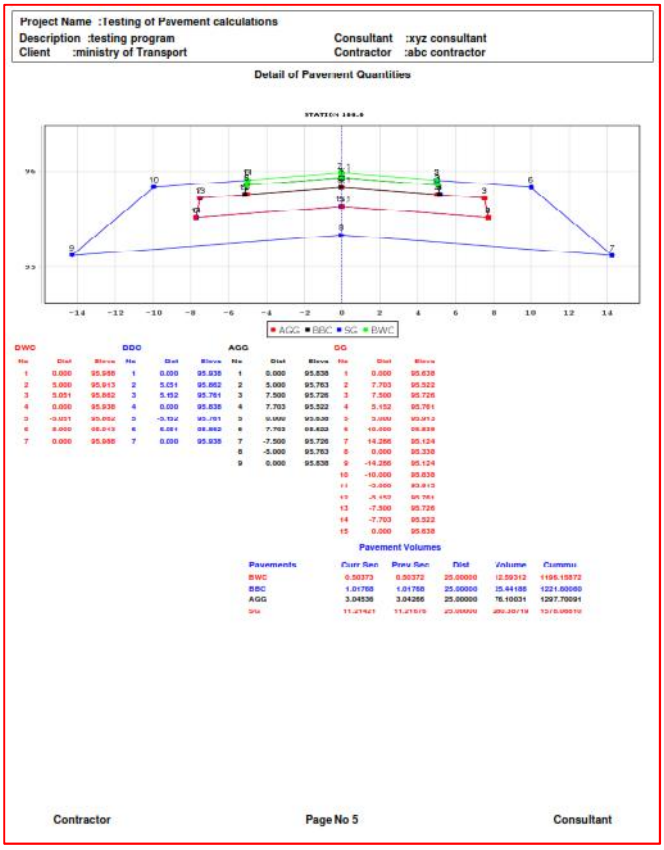
Detail of Pavement Quantities

STATION 75.0

Pavement Volumes

Pavements	Curr.Sec	Prev.Sec	Dist	Volume	Cummu.
BWC	0.50372	0.50372	25.00000	12.59312	881.63812
BBC	1.01768	1.01767	25.00000	25.44187	827.08000
AGG	3.04266	3.04266	25.00000	76.06652	903.14652
SG	11.21676	11.21676	25.00000	280.41900	1183.56200

Contractor Page No 4 Consultant



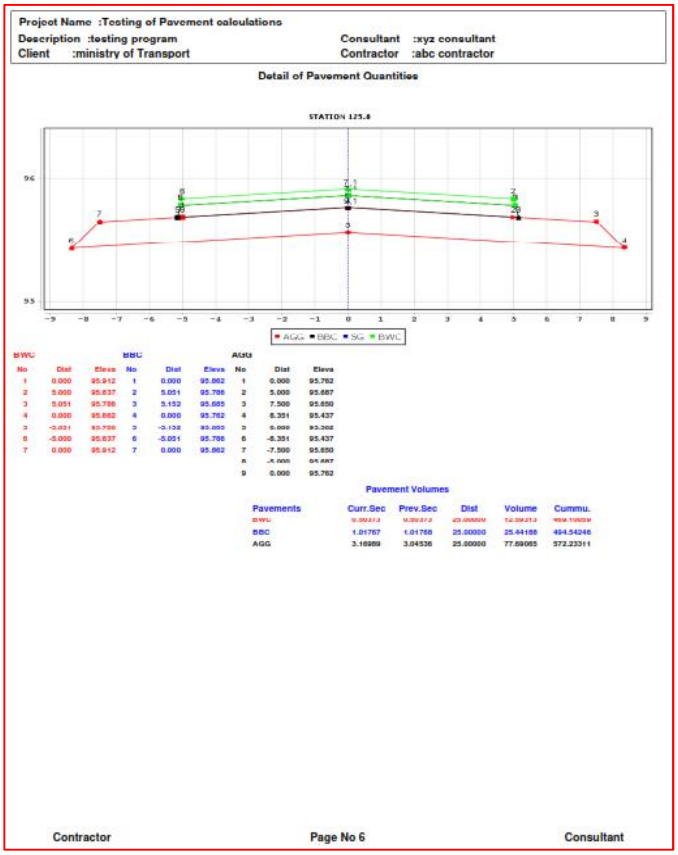
Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detail of Pavement Quantities

Pavement Volumes

Pavements	Curr.Sec	Prev.Sec	Dist	Volume	Cummu.
BWC	0.50373	0.50372	25.00000	12.59312	1196.15872
BBC	1.01768	1.01768	25.00000	25.44188	1221.60060
AGG	3.04536	3.04266	25.00000	76.10031	1297.70091
SG	11.21421	11.21676	25.00000	280.38719	1578.09810

Contractor Page No 5 Consultant



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detail of Pavement Quantities

STATION 125.0

Pavement Volumes

Pavements	Curr.Sec	Prev.Sec	Dist	Volume	Cummu.
BWC	0.50372	0.50372	25.00000	12.59312	959.10938
BBC	1.01767	1.01768	25.00000	25.44188	484.54248
AGG	3.16989	3.04536	25.00000	77.69065	572.23311

Contractor Page No 6 Consultant

Summary Report..,

Project Name :Road Solver Sample Projects - Earthwork Pavement Quantities
Description :Earthwork Pavement Qty
Client :Ministry of Transport
Consultant :XYZ Consultant
Contractor :ABC Contractor
Road ID : RD000115
Road Name : New Road Earthwork and Pavement Quantities

Summary of Pavement Quantities Design

Bit. Wearing Course				
Station	Dist	Area	Volume	Cumm.
675.000	0	0.619	0.000	0.00000
700.000	25	0.619	15.475	15.47520
725.000	25	0.619	15.475	30.95040
750.000	25	0.619	15.475	46.42560
775.000	25	0.619	15.475	61.90080
800.000	25	0.619	15.475	77.37600
825.000	25	0.619	15.475	92.85120
850.000	25	0.619	15.475	108.32640
875.000	25	0.619	15.475	123.80160
900.000	25	0.619	15.475	139.27680
925.000	25	0.619	15.475	154.75200
950.000	25	0.619	15.475	170.22720
975.000	25	0.619	15.475	185.70240
1000.000	25			
1025.000	25			
1050.000	25			
1075.000	25			
1100.000	25			
1125.000	25			
1150.000	25			
1175.000	25			
1200.000	25			
1225.000	25			
1250.000	25			
1275.000	25			
1300.000	25			
1325.000	25			
1350.000	25			
1375.000	25	0.619	15.475	432.99555
1400.000	25	0.619	15.475	448.47075
1425.000	25	0.619	15.475	463.94595

Project Name :Road Solver Sample Projects - Earthwork Pavement Quantities
Description :Earthwork Pavement Qty
Client :Ministry of Transport
Consultant :XYZ Consultant
Contractor :ABC Contractor
Road ID : RD000115
Road Name : New Road Earthwork and Pavement Quantities

Total of Pavement Quantities Design

Layer	Volume
Bit. Base Course	221.47200
Bit. Wearing Course	819.10042
Sub Grade	7898.95190

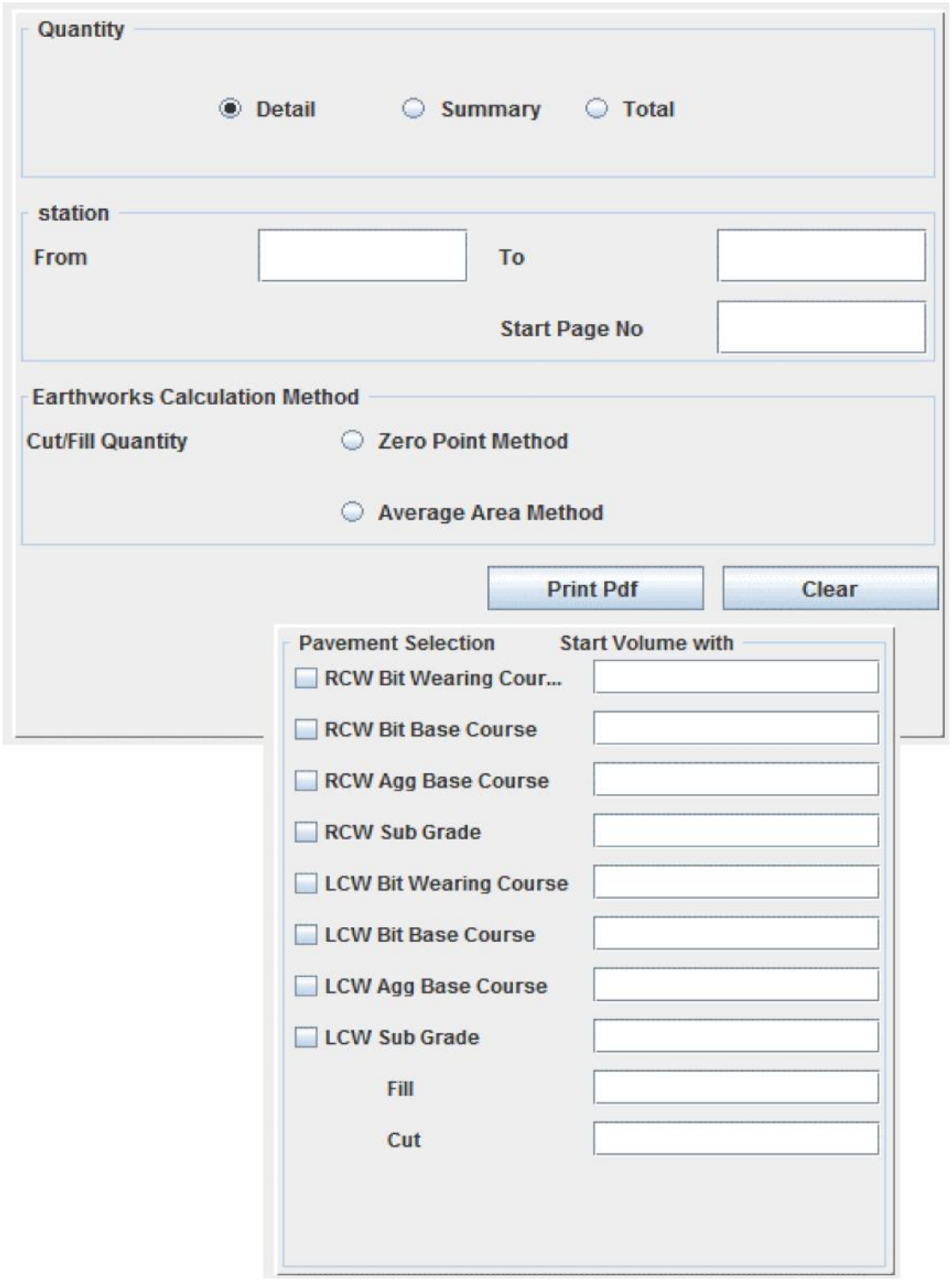
Contractor Page No 1 Consultant

The Summary report will generated for each pavement layer separately ..,

Also the Total Summay Report also created in PDF formats..

7.5.3 Earthwork & Pavements Quantities - Design

In this Report model we can generate the Both Earthwork and Pavement Quantities in one Report.



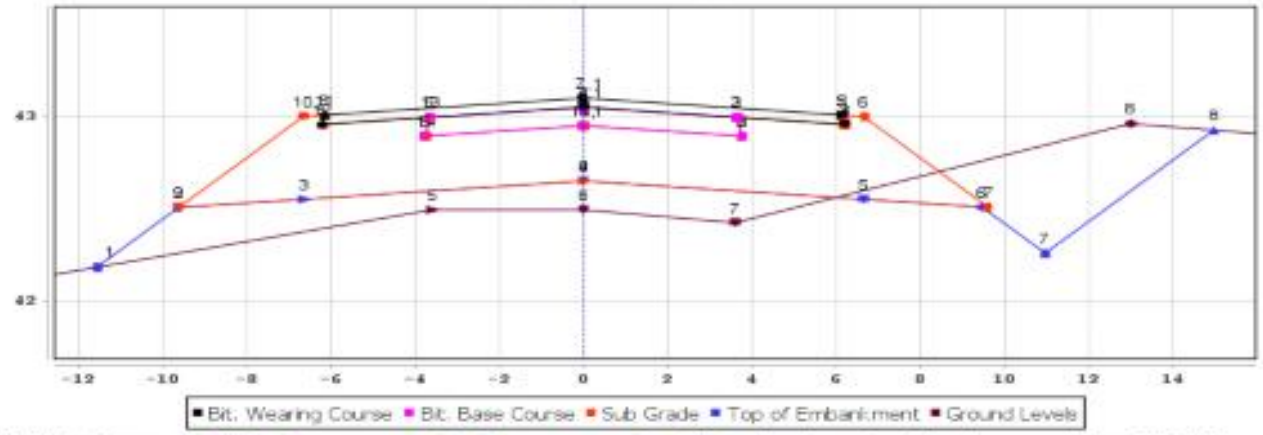
When we choose this option the above screen will appear..,

To fill the required data's then click the " Print Report " the report will be generated..,

Project Name	**:Road Solver Sample Projects - Earthwork Pavement Quantities**		
Description	**:Earthwork Pavement Qty**	**Consultant**	**:XYZ Consultant**
Client	**:Ministry of Transport**	**Contractor**	**:ABC Contractor**
Road ID	**: RD000115**	**Road Name**	**: New Road Earthwork and Pavement Quantities**

Detail Earthwork & Pavement Quantities Design

STATION 800.000 PGL 43.100 RCW - LCW -



Bit. Wearing Course

No	Dist	Elevs
1	0.000	43.100
2	6.150	43.008
3	6.201	42.957
4	0.000	43.050
5	-6.201	42.957
6	-6.150	43.008
7	0.000	43.100

Bit. Base Course

No	Dist	Elevs
1	0.000	43.050
2	3.650	42.995
3	3.752	42.894
4	0.000	42.950
5	-3.752	42.894
6	-3.650	42.995
7	0.000	43.050

Sub Grade

No	Dist	Elevs
1	0.000	42.950
2	3.752	42.894
3	3.650	42.995
4	6.201	42.957
5	6.150	43.008
6	8.650	43.000
7	9.617	42.506
8	0.000	42.650
9	-9.617	42.506
10	-8.650	43.000
11	-6.150	43.008
12	-6.201	42.957
13	-3.650	42.995
14	-3.752	42.894
15	0.000	42.950

Top of Embankment

No	Dist	Elevs
1	-11.569	42.151
2	-9.617	42.506
3	-8.650	42.550
4	0.000	42.650
5	8.650	42.550
6	9.467	42.508
7	10.967	42.258
8	14.972	42.926

Ground Levels

No	Dist	Elevs
1	-40.000	42.001
2	-33.600	42.201
3	-23.600	42.501
4	-13.600	42.101
5	-3.600	42.493
6	0.000	42.493
7	3.600	42.423
8	13.000	42.961
9	23.000	42.781
10	33.000	42.481
11	43.000	42.401
12	50.000	42.341

Intersection Point

No	Dist	Elevs
1	5.992	42.560

Earthwork Volumes

Current Area	Current Volume	Dist	Previous Volume	Previous Area
2.548	50.124	25.000	0.000	1.462
0.020	0.125	25.000	-0.134	-0.021
-2.390	-68.918	25.000	0.000	-3.124

Earthwork Summary

Total Fill	50.249
Total Cut	-69.052
Cumm.Fill	215.56083
Cumm.Cut	-308.52629

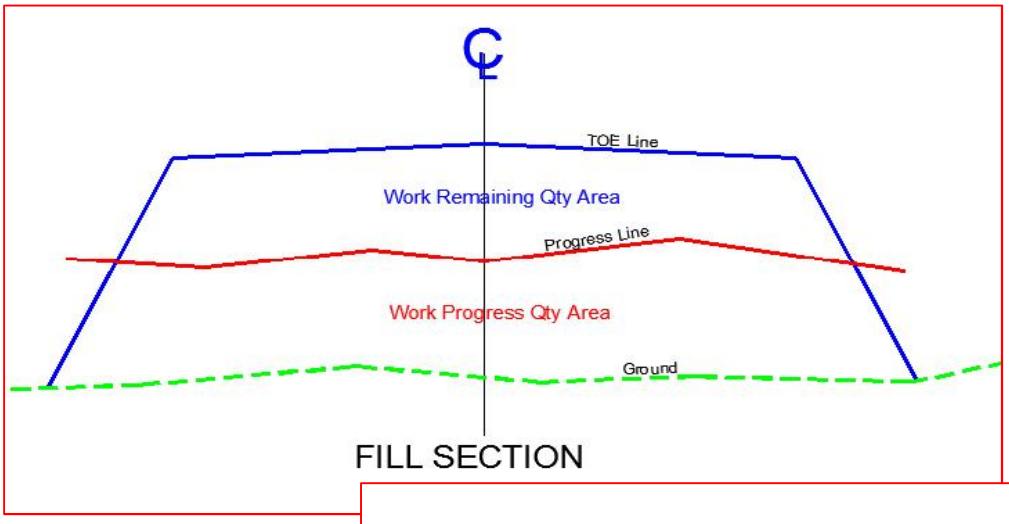
Pavement Volumes

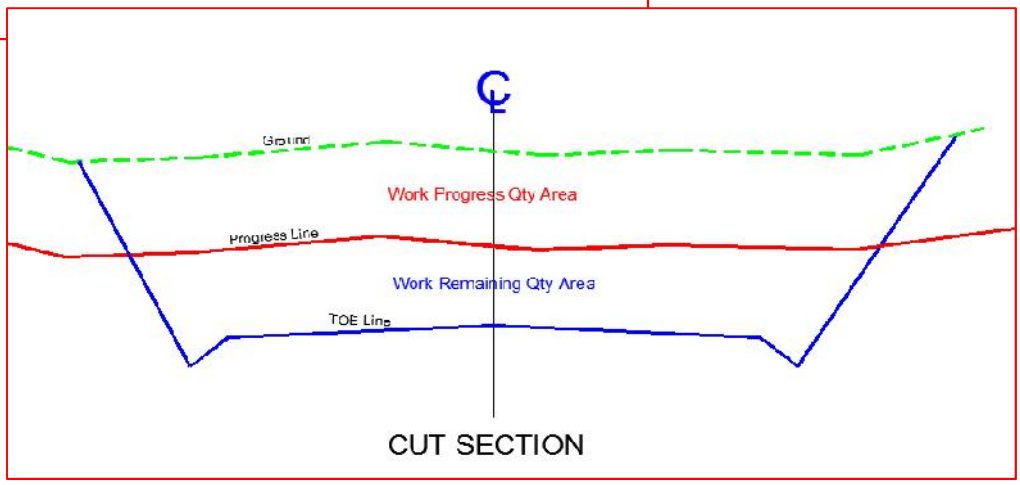
Pavements	Curr.Sec	Prev.Sec	Dist	Volume	Cummu.
Bit. Wearing Course	0.61901	0.61901	25.00000	15.47520	77.37600
Bit. Base Course	0.73824	0.73824	25.00000	18.45600	92.28000
Sub Grade	5.96040	5.96040	25.00000	149.00993	745.04963

The Summary reports also generated same like previous options..,

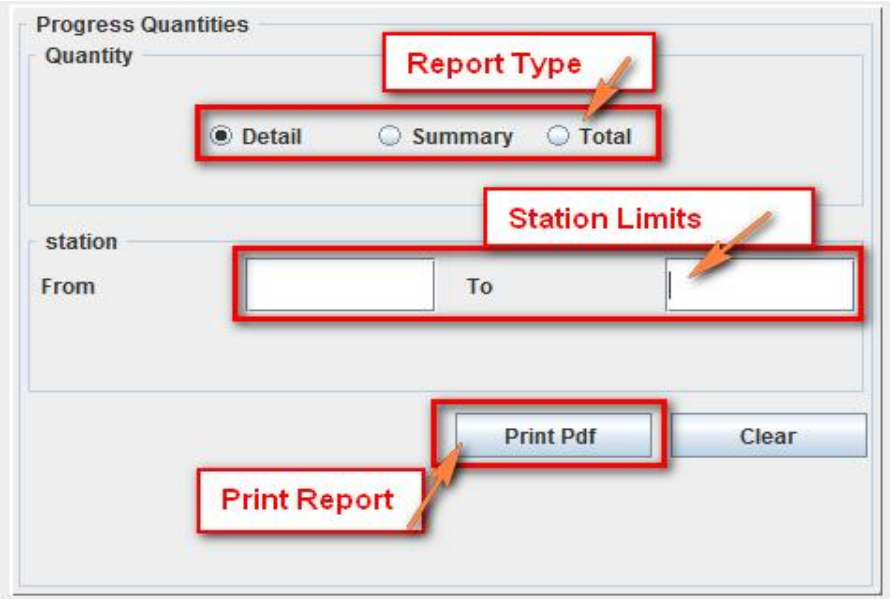
7.5.4 Earthworks Quantities - Progress

Earthwork Progress Quantities Calculated the Quantities of Work completion and Work Remaining from the Design Quantities. The Basic calculation method shown on the following diagram .

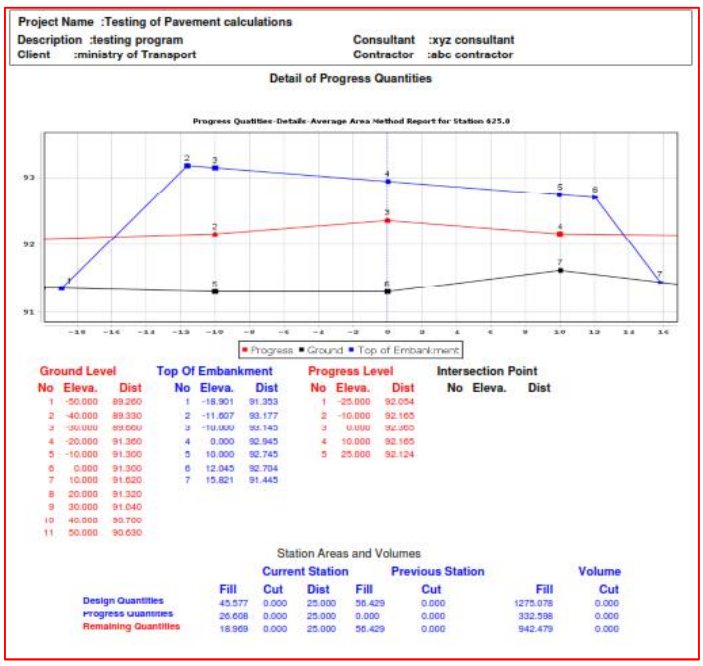




To Click the Progress Qty the following window will appear in screen..



Detailed Quantity Report..,



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detail of Progress Quantities

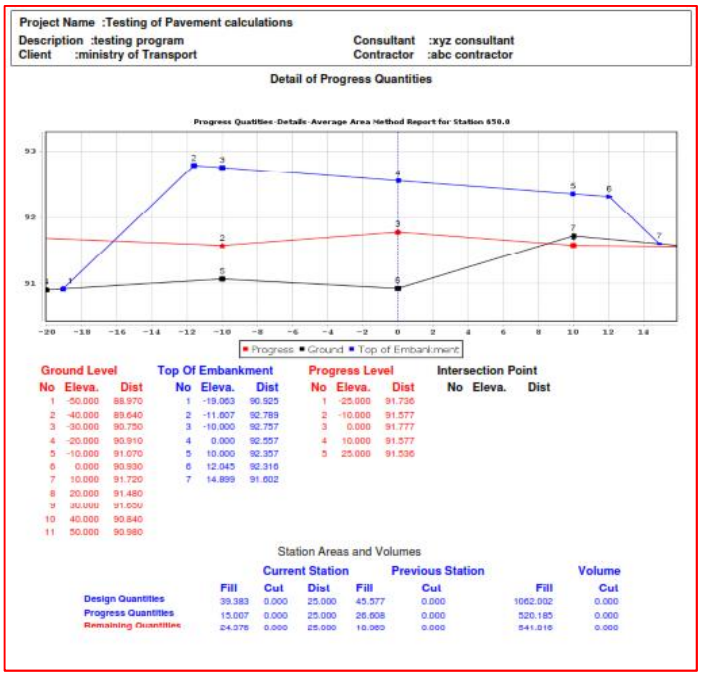
Progress Quantities-Details-Average Area Method Report for Station 625.0

Progress Ground Top of Embankment

Ground Level			Top Of Embankment			Progress Level			Intersection Point		
No	Eleva.	Dist	No	Eleva.	Dist	No	Eleva.	Dist	No	Eleva.	Dist
1	-50.000	89.260	1	-18.901	91.353	1	-25.000	92.054			
2	-40.000	89.330	2	-11.607	93.177	2	-10.000	92.165			
3	-30.000	89.660	3	-10.000	93.140	3	0.000	92.360			
4	-20.000	91.360	4	0.000	92.945	4	10.000	92.165			
5	-10.000	91.300	5	10.000	92.745	5	25.000	92.124			
6	0.000	91.300	6	12.045	92.704						
7	10.000	91.620	7	15.821	91.445						
8	20.000	91.320									
9	30.000	91.040									
10	40.000	90.700									
11	50.000	90.630									

Station Areas and Volumes

	Current Station			Previous Station		Volume	
	Fill	Cut	Dist	Fill	Cut	Fill	Cut
Design Quantities	45.577	0.000	25.000	56.429	0.000	1275.078	0.000
Progress Quantities	26.608	0.000	25.000	0.000	0.000	332.598	0.000
Remaining Quantities	18.969	0.000	25.000	56.429	0.000	942.479	0.000



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detail of Progress Quantities

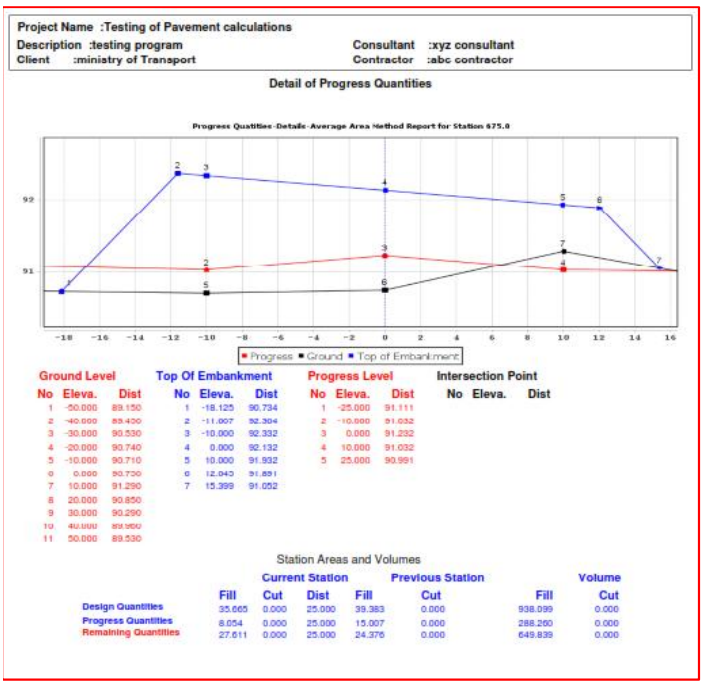
Progress Quantities-Details-Average Area Method Report for Station 650.0

Progress Ground Top of Embankment

Ground Level			Top Of Embankment			Progress Level			Intersection Point		
No	Eleva.	Dist	No	Eleva.	Dist	No	Eleva.	Dist	No	Eleva.	Dist
1	-50.000	88.970	1	-19.063	90.925	1	-25.000	91.736			
2	-40.000	89.640	2	-11.607	92.789	2	-10.000	91.577			
3	-30.000	90.750	3	-10.000	92.757	3	0.000	91.777			
4	-20.000	90.910	4	0.000	92.557	4	10.000	91.577			
5	-10.000	91.070	5	10.000	92.357	5	25.000	91.536			
6	0.000	90.930	6	12.045	92.316						
7	10.000	91.720	7	14.899	91.602						
8	20.000	91.480									
9	30.000	91.630									
10	40.000	90.840									
11	50.000	90.980									

Station Areas and Volumes

	Current Station			Previous Station		Volume	
	Fill	Cut	Dist	Fill	Cut	Fill	Cut
Design Quantities	39.383	0.000	25.000	45.577	0.000	1062.002	0.000
Progress Quantities	15.007	0.000	25.000	26.608	0.000	520.185	0.000
Remaining Quantities	24.376	0.000	25.000	18.969	0.000	841.816	0.000



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detail of Progress Quantities

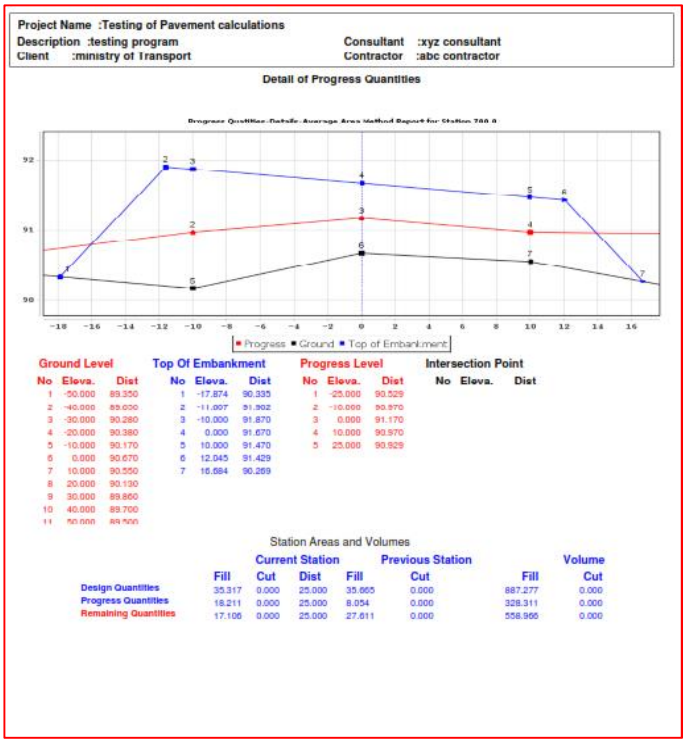
Progress Quantities-Details-Average Area Method Report for Station 675.0

Progress Ground Top of Embankment

Ground Level			Top Of Embankment			Progress Level			Intersection Point		
No	Eleva.	Dist	No	Eleva.	Dist	No	Eleva.	Dist	No	Eleva.	Dist
1	-50.000	89.150	1	-18.125	90.734	1	-25.000	91.111			
2	-40.000	89.400	2	-11.607	92.304	2	-10.000	91.032			
3	-30.000	90.530	3	-10.000	92.332	3	0.000	91.232			
4	-20.000	90.740	4	0.000	92.132	4	10.000	91.032			
5	-10.000	90.710	5	10.000	91.932	5	25.000	90.991			
6	0.000	90.730	6	12.045	91.891						
7	10.000	91.290	7	15.398	91.052						
8	20.000	90.850									
9	30.000	90.290									
10	40.000	89.960									
11	50.000	89.530									

Station Areas and Volumes

	Current Station			Previous Station		Volume	
	Fill	Cut	Dist	Fill	Cut	Fill	Cut
Design Quantities	35.665	0.000	25.000	39.383	0.000	938.099	0.000
Progress Quantities	8.054	0.000	25.000	15.007	0.000	288.260	0.000
Remaining Quantities	27.611	0.000	25.000	24.376	0.000	649.839	0.000



Project Name :Testing of Pavement calculations
Description :testing program
Client :ministry of Transport
Consultant :xyz consultant
Contractor :abc contractor

Detail of Progress Quantities

Progress Ground Top of Embankment

Ground Level			Top Of Embankment			Progress Level			Intersection Point		
No	Eleva.	Dist	No	Eleva.	Dist	No	Eleva.	Dist	No	Eleva.	Dist
1	-50.000	89.350	1	-17.874	90.335	1	-25.000	90.529			
2	-40.000	89.600	2	-11.607	91.902	2	-10.000	90.970			
3	-30.000	90.280	3	-10.000	91.870	3	0.000	91.170			
4	-20.000	90.380	4	0.000	91.670	4	10.000	90.970			
5	-10.000	90.170	5	10.000	91.470	5	25.000	90.929			
6	0.000	90.670	6	12.045	91.429						
7	10.000	90.550	7	16.684	90.269						
8	20.000	90.130									
9	30.000	89.860									
10	40.000	89.700									
11	50.000	89.500									

Station Areas and Volumes

	Current Station			Previous Station		Volume	
	Fill	Cut	Dist	Fill	Cut	Fill	Cut
Design Quantities	35.317	0.000	25.000	35.665	0.000	887.277	0.000
Progress Quantities	18.211	0.000	25.000	8.054	0.000	328.311	0.000
Remaining Quantities	17.106	0.000	25.000	27.611	0.000	558.966	0.000

Station Areas and Volumes

	Current Station			Previous Station		Volume		Cumulative	
	Fill	Cut	Dist	Fill	Cut	Fill	Cut	Fill	Cut
Design Quantities	64.362	0.000	25.000	50.342	-0.698	1433.801	-8.730	3900.492	-2395.354
Progress Quantities	43.395	0.000	25.000	40.838	-0.698	1052.912	-8.730	2952.543	-1133.761
Remaining Quantities	20.968	0.000	25.000	9.503	0.000	380.889	0.000	947.949	-1261.593

ct Name :Road Solver Sample Project - Progress Quantities
ription :Progress Quantities
t :Ministry of Transport

Consultant :XYZ Consultant
Contractor :ABC Contractor

Road ID : RD000117

Road Name : Road No 1 0+000 to 1+000 Progress Qty

Summary of Earthawork Progress Quantities

		Design Quantities				Progress Quantities				Remaining Quantities			
Station	Dist	Fill Area	Fill Vol	Cut Area	Cut Vol	Fill Area	Fill Vol	Cut Area	Cut Vol	Fill Area	Fill Vol	Cut Area	Cut Vol
0.000	0.000	0.000	0.000	-17.936	-0.000	0.000	0.000	-12.665	-0.000	0.000	0.000	-5.270	-0.000
25.000	25.000	0.000	0.000	-22.365	-503.755	0.000	0.000	-19.419	-401.060	0.000	0.000	-2.945	-102.695
50.000	25.000	0.004	0.048	-10.105	-405.870	0.000	0.000	-2.493	-273.908	0.004	0.048	-7.611	-131.962
75.000	25.000	0.083	1.083	-16.101	-327.578	0.083	1.035	-4.546	-87.988	0.000	0.048	-11.556	-239.590
100.000	25.000	1.154	15.460	-3.056	-239.472	0.147	2.879	-0.346	-61.150	1.007	12.581	-2.710	-178.322
125.000	25.000	0.138	16.146	-11.186	-178.033	0.000	1.843	-5.812	-76.981	0.138	14.303	-5.374	-101.051
150.000	25.000	0.093	2.884	-8.953	-251.735	0.000	0.000	-4.067	-123.490	0.093	2.884	-4.886	-128.245
175.000	25.000	0.223	3.944	-5.986	-186.734	0.002	0.024	-1.171	-65.473	0.221	3.920	-4.815	-121.261
200.000	25.000	1.553	22.191	-4.663	-133.117	1.172	14.669	-0.465	-20.443	0.381	7.522	-4.199	-112.675
225.000	25.000	9.378	136.635	-3.732	-104.943	3.675	60.584	0.000	-5.806	5.703	76.051	-3.732	-99.137
250.000	25.000	60.872	878.127	0.000	-46.654	50.487	677.028	0.000	0.000	10.385	201.099	0.000	-46.654
275.000	25.000	50.342	1390.172	-0.698	-8.730	40.838	1141.569	-0.698	-8.730	9.503	248.604	0.000	0.000
300.000	25.000	64.362	1433.801	0.000	-8.730	43.395	1052.912	0.000	-8.730	20.968	380.889	0.000	0.000
325.000	25.000	58.387	1534.363	0.000	0.000	38.209	1020.041	0.000	0.000	20.178	514.322	0.000	0.000
350.000	25.000	52.039	1380.314	0.000	0.000	40.241	980.620	0.000	0.000	11.798	399.694	0.000	0.000
375.000	25.000	50.585	1282.792	0.000	0.000	40.244	1006.065	0.000	0.000	10.341	276.727	0.000	0.000
400.000	25.000	94.529	1813.925	0.000	0.000	66.934	1339.728	0.000	0.000	27.595	474.197	0.000	0.000
425.000	25.000	93.267	2347.447	0.000	0.000	83.982	1886.450	0.000	0.000	9.285	460.997	0.000	0.000
450.000	25.000	82.508	2197.181	0.000	0.000	71.807	1947.365	0.000	0.000	10.701	249.816	0.000	0.000
475.000	25.000	72.779	1941.088	0.000	0.000	56.591	1604.975	0.000	0.000	16.188	336.113	0.000	0.000
500.000	25.000	65.038	1722.710	0.000	0.000	52.149	1359.243	0.000	0.000	12.889	363.468	0.000	0.000
TOTAL		Contractor 20.314			-2395.354	Page No 1 4097.029			-1133.761	Consultant 4023.285			-1261.593

The Total Summary report will be generated as like..,

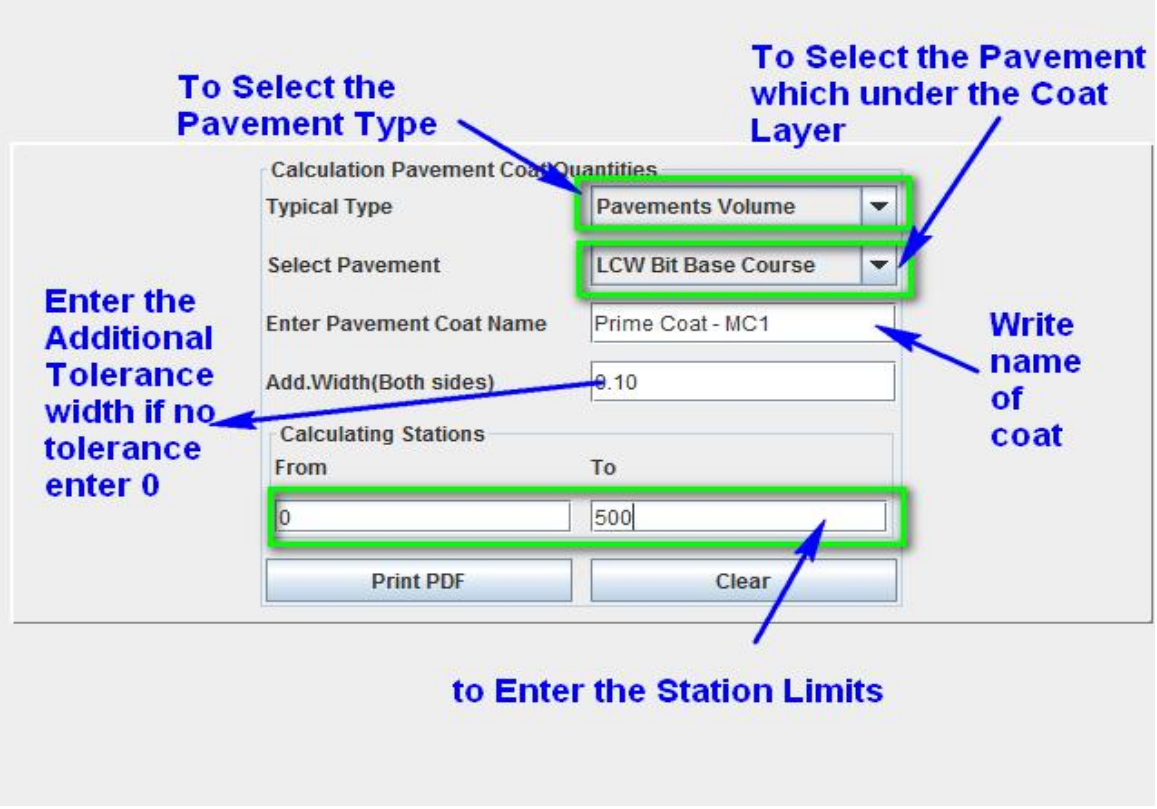
Project Name :Road Solver Sample Project - Progress Quantities			
Description :Progress Quantities		Consultant :XYZ Consultant	
Client :Ministry of Transport		Contractor :ABC Contractor	
Road ID :	RD000117	Road Name :	Road No 1 0+000 to 1+000 Progress Qty

Total of Earthawork Progress Quantities

	Fill Volume (Cu.m)	Cut Volume (Cu.m)
Total Design Quantities	37894.993	-2395.354
Total Progess Quantities	23159.534	-1133.761
Total Remaining Quantities	14735.459	-1261.593

7.5.5 Pavement Coat Quantities

In Road Solver the Pavement Coat Quantities also be calculated from the Pavement Volume Layers. To select this option the followin screen will be appear ..,



In that screen first to choose the Typical Type of Pavement Model . From that to select the Pavement which we want to calculate the Coat Quantitiy under that pavement. Road Solver calculate the min. and max width of the layer from that data base then calculate the width of coat layer. In addition if any tolerance will be added to that quantity also possible..

After successful enter the required data's the report will be generated as ..,

Project Name :Road Solver Sample Project - Using Variables Calculation

Description :Using Variables Calculation **Consultant :XYZ Consultant**

Client :Ministry of Transport **Contractor :ABC Contractor**

Road ID : RD000116 **Road Name : Road No 1 using Variables**

Pavement Coat Quantities-Bit. Base Course
Prime Coat - MC1

Station	Dist	Mini.L	Max.L	Add.Length	Total Length	Avg.Length	Total Area	Cumm Area
2000.000	0.00	-3.752	3.752	0.15	7.654	0.00	0.00	0.00
2050.000	50.000	-3.752	3.752	0.15	7.654	7.654	382.700	382.700
2075.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	574.050
2100.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	765.400
2125.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	956.750
2150.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	1148.100
2175.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	1339.450
2200.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	1530.800
2225.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	1722.150
2250.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	1913.500
2275.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	2104.850
2300.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	2296.200
2325.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	2487.550
2350.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	2678.900
2375.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	2870.250
2400.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	3061.600
2425.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	3252.950
2450.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	3444.300
2475.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	3635.650
2500.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	3827.000
2525.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	4018.350
2550.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	4209.700
2575.000	25.000	-3.752	3.752	0.15	7.654	7.654	191.350	4401.050
2600.000	25.000	-3.750	3.753	0.15	7.653	7.654	191.338	4592.387
2625.000	25.000	-3.748	3.754	0.15	7.652	7.653	191.313	4783.700

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