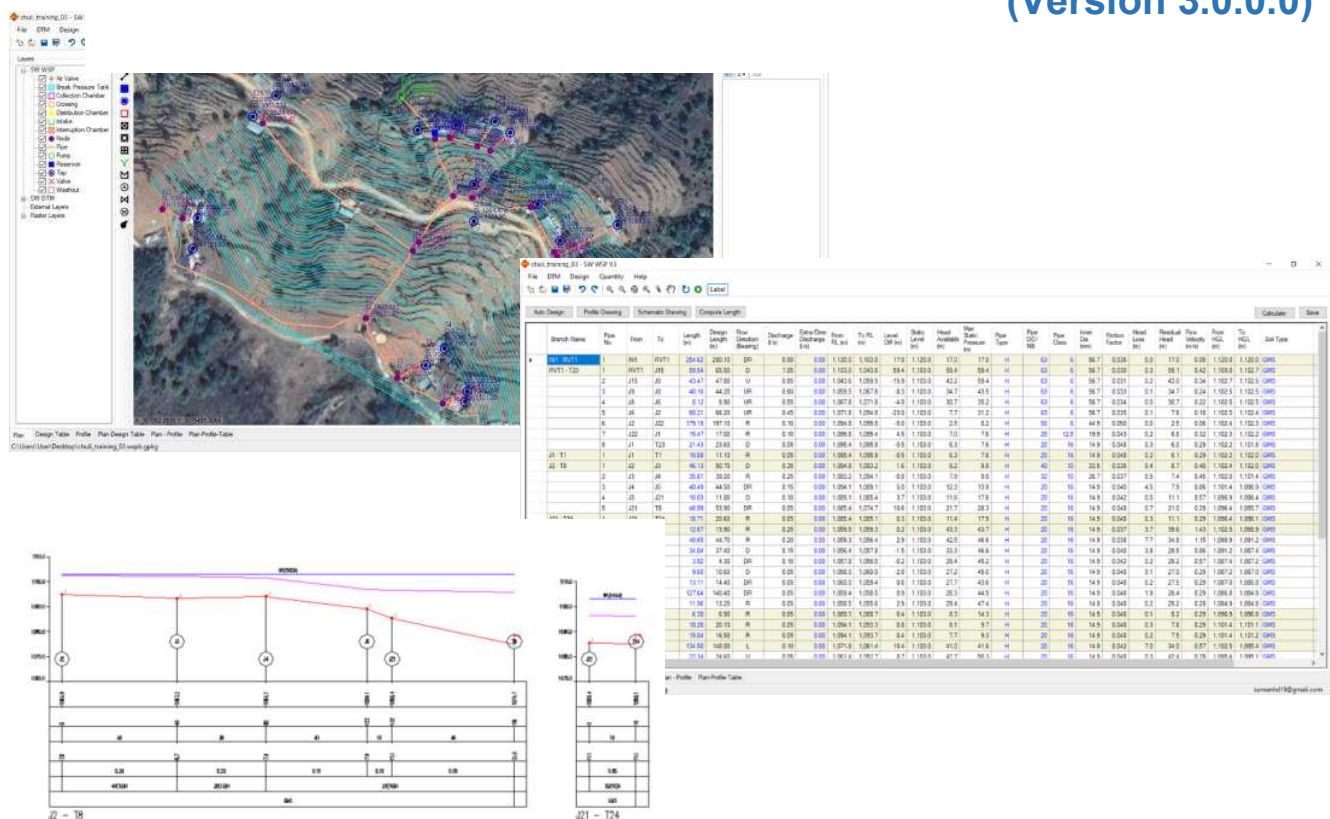


Software for Hydraulic Design and Cost Estimation for Rural Water Supply Projects in Nepal

Operation Manual

(Version 3.0.0.0)



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About SW WSP

The SW WSP was developed during 1996 by WELINK Consultants. Later it was adopted by SOFTWEL (A sister concern of WELINK) and has been upgrading and supporting it since 2000. A comprehensive update was done during 2005 for the ADB Funded CBWSSP. It was extensively applied in design and drawings of many rural water supply projects in Nepal.

Present SW WSP V3 is a significant upgrade to the previous version of SW WSP/SW CBWSSP. It includes facilities for integration with GIS, mobile application based survey with Professional GPS integration, Digital Terriam Modeling and cost estimation. The version is self-updating such that user gets automated update notice.

In order to support the community water supply in Nepal, the SW WSP V3 is released as a free software without any license fees.

Development Credits

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Specification

- Built-in tool, DTM for topomap preparation.
- Plan/Profile/ Design Table can be viewed in same window.
- Support online tile imagery and offline images for background reference.
- Support Digital elevation Model for design.
- Export drawing in print-ready format.
- Export detail quantities and cost instantly for reporting.
- Prepare BoQ of the project.

System Requirement

Operating System: Windows based OS (Windows 10 Recommended)

Supported OS: Windows 7 with SP1, Windows 8.1, Windows 10

Microsoft .NET Framework 4.8

Processor: 2.5 GHz (3+ GHz recommended)

Memory: 4 GB (8GB recommended)

Disk space: 2.0 GB.

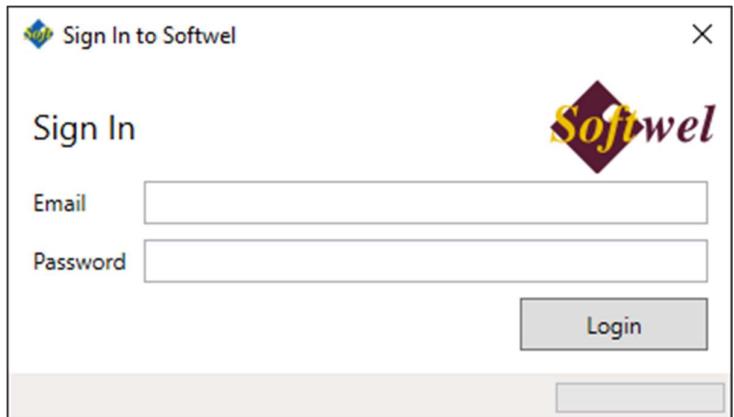
DirectX 10

Installation Note

1) Setup Instructions for SW WSP 3B

Note: Microsoft .NET Framework 4.8 is required to run the Software. You can download it from Microsoft official page.

- Register an account with Softwel. You can register an account from Softwel official page.
- Once you register, an e-mail will be sent to you containing the activation link. Click on the link to sign in and activate your Softwel account.
- Go to the [Downloads](#) page of Softwel.
- Download the SW WSP 3B Setup Download Utility.
- Run the Setup Download Utility.
- Enter your Softwel account email and password to sign in.



Sign In to Softwel

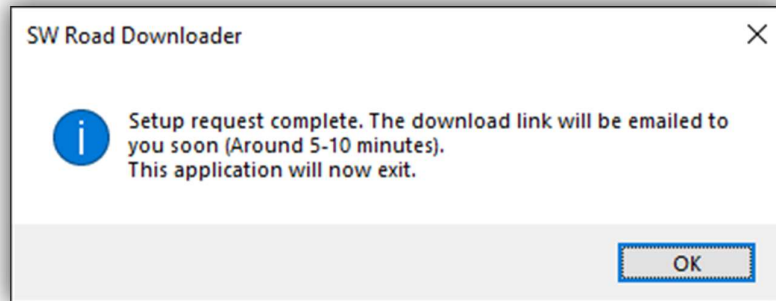
Sign In

Email

Password

Login

- Softwel will now prepare your installer and you will receive the download link and your product key in your email. This may take up to 10 minutes. The download link will only be valid for 24 hours.



- Download the setup from the link e-mailed to you and run it.
- The setup will ask for a product key. The product key has the format XXXXX-XXXXX-XXXXX-XXXXX-XXXXX. Enter the complete product key, including dashes.
- Once installed, you can start SW WSP V3 from your desktop or the Start menu.

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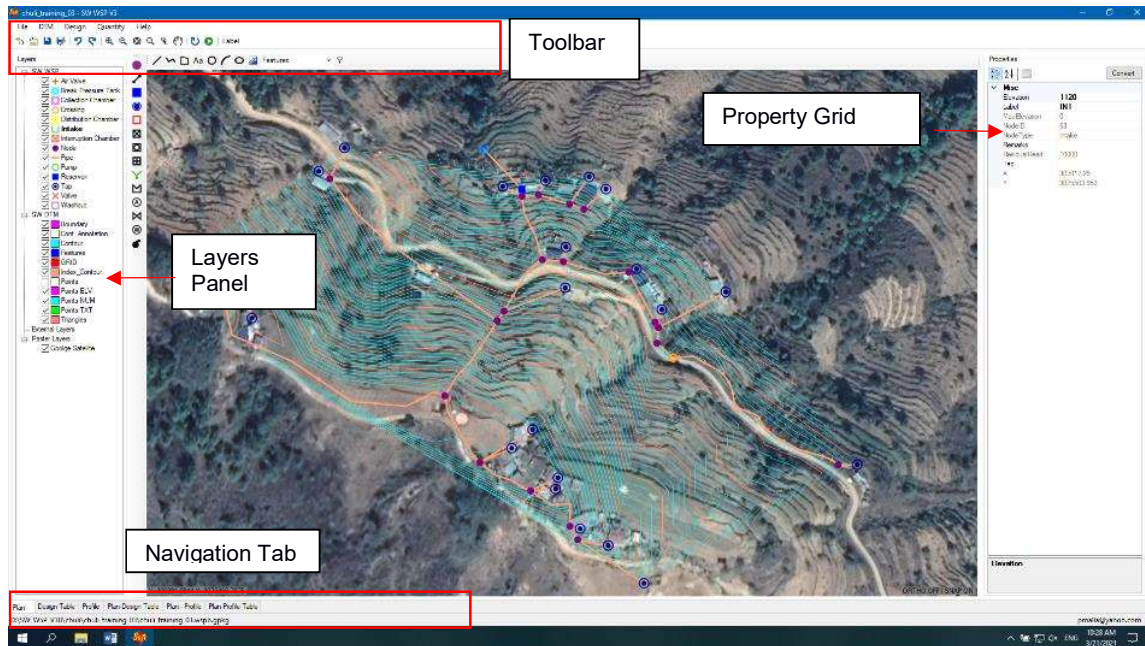
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Appendix A: Using SW MAPS for Survey Works

1 INTRODUCTION

1.1 Main Window (Plan Window)



1.2 MAIN MENU

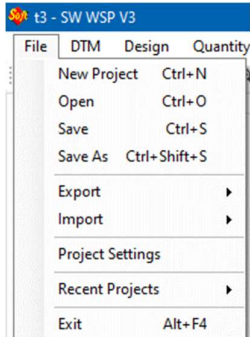
The entire system is grouped into menus based on their similarity of functions. The following table provides the summary of the menus and the sub-subsequent section provides details of each of the menus and the sub-menus

Menu	Description
File	Allows users to create new project, open existing project, create backup copy of project, save project, export the project into different file format, import project from (*.swmz) file format, setup project settings, browse recent projects and exit.
DTM	Surveyed points are processed, contours and terrain surfaces are generated. The source of terrain file required for the design is selected whether the source is internal DTM, external DTM or Grid. The elevation data is then extracted from the terrain file for the nodes added during the design process.
Design	Provides interface for design, design tables, water demand and reservoir sizing.
Quantity	Provides interface for Pipe Quantity and details cost estimation
Help	About the system.

2 SYSTEM MENU

2.1 File Menu

File menu has been divided into following sub-division.



2.1.1 New Project

Create new project with default settings. Projects will always be created inside a directory of the project name. New projects will have extension of *.wspb.gpkg.

2.1.2 Open

Open existing project with extension of *.wspb.gpkg,

2.1.3 Save

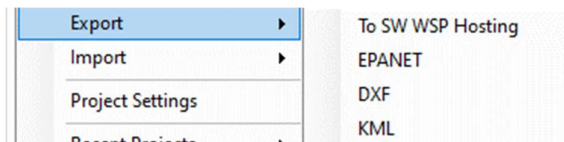
Save the Project.

2.1.4 Save As

Save the Project to different name.

2.1.5 Export Project

Export Project in different file format like EPANET INP File (*.inp), DXF (*.dxf), KML (*.kml). Also exports the project into SW WSP Hosting.



2.1.6 Import Project

Import Project file that has been created by SW Maps (*.swmz). A single or multiple project files can be imported.

2.1.7 Project Setting

Set parameters for Project Property, Project Information, Pipe Size, Pressure Criteria and Projection Options.

WSP Project Details

Project Property
Project Name : chuli_training_03
Project Path : C:\Users\User\Desktop\chuli_training_03.wspb.gpk

Project Info
Surveyed By : x
Designed By : x
Created Date : 3/7/2021 1:26:28 PM

Pipe Size
Minimum Pipe Size for HDPE : 16
Minimum HDPE Pipe Pressure Rating (kg/sqcm) : 4
Minimum Pipe Size for GI : 15

Pressure Criteria
Minimum Residual Pressure at Taps/Demand Points : 6 m
Minimum Residual Pressure at Other Locations : 0 m

Project Option
Projection System : UTM Zone : 45N

OK

2.1.8 Recent Projects

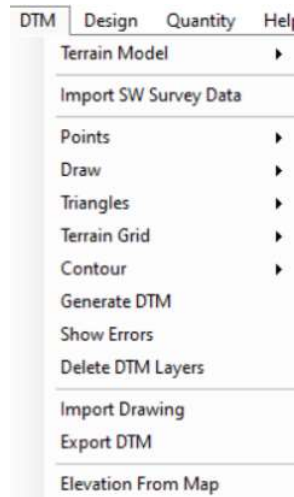
Display the list of recently opened project for quick opening of project file.

2.1.9 Exit

Exit the project file.

3 DTM

It is the built-in tools for the generation of a topographic map and terrain model. The available tools in the Terrain menu are as shown in the figure.



3.1 Terrain Model

Specify the terrain file to be used for design. The terrain file may be internal DTM or external DTM/Grid file. If the data is processed and dtm is created within the SW WSP, the "Internal Dtm" can be used. Otherwise, external dtm (*.dtm, *.dtmb) or Grid (*.tif) can be imported for the terrain data.

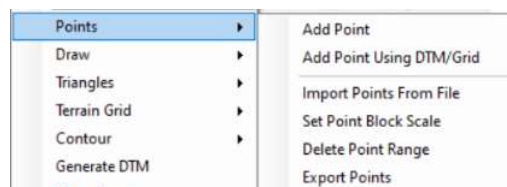


3.2 Import SW Survey Data

It imports the data from "SW Survey" Mobile App.

3.3 Points

Deal with the points data. It may be the surveyed data or generated data. Set Scale of Point Block, Delete Point using Range and Export Points into CSV file format.



3.3.1 Add Point

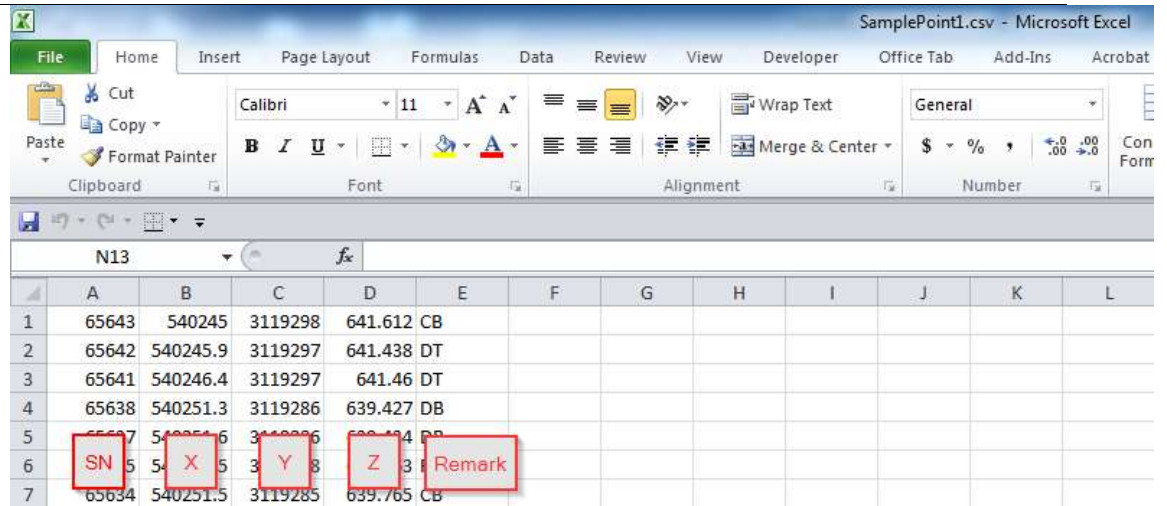
Add point with user-defined elevation.

3.3.2 Add Point Using DTM/Grid

Add point with elevation data extracted from DTM/Grid file.

3.3.3 Import Points from File

Import the surveyed points from *.csv format. The data must be stored in the order "Serial Number, X, Y, Z, Remark". The data must be without table heading.



	A	B	C	D	E	F	G	H	I	J	K	L
1	65643	540245	3119298	641.612	CB							
2	65642	540245.9	3119297	641.438	DT							
3	65641	540246.4	3119297	641.46	DT							
4	65638	540251.3	3119286	639.427	DB							
5	65637	540251.6	3119286	639.434	DB							
6	SN	X	Y	Z	Remark							
7	65634	540251.5	3119285	639.765	CB							

3.3.4 Set Point Block Scale

Change the display scale of the point in Plan view.

3.3.5 Delete Point Range

Delete the points based on user-defined point number range.

3.3.6 Export Points

Export the points to *.csv format.

3.4 Draw

3.4.1 Insert Block

This tool is used to insert the survey stations and benchmark block in the plan. The coordinates of benchmark and stations must be saved in *.CSV format. The order of data must be in the order "Serial Number, X, Y, Z, Station Name".

3.4.2 Grid

This tool is used to draw the grids and coordinates in the plan.

3.4.3 Add Boundary

It creates a boundary line around the survey data for triangulation of points.

3.4.4 Auto Boundary

It detects the data and creates boundary lines around the survey data automatically.

3.5 Triangles

3.5.1 Draw Triangles

It draws the triangles obtained after triangulation.

3.5.2 Erase Triangles

It erases the drawn triangulation.

3.6 Grid

3.6.1 Show Grid Extents

It displays extents of the grid terrain in Plan.

3.6.2 Erase Grid Extents

It erases the extents of the grid terrain from Plan.

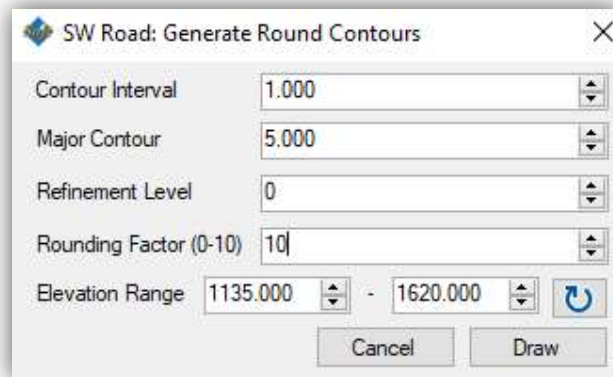
3.7 Contours

3.7.1 Draw Quick Contour

It allows the user to draw contours with the specified interval.

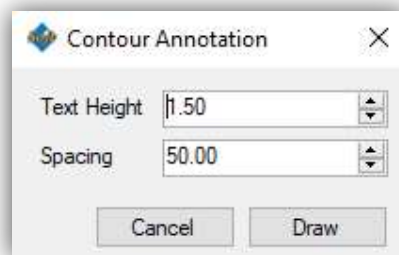
3.7.2 Draw Round Contour

It allows the user to draw smooth and round contours with the specified interval. Option for refinement level and rounding factors are provided in the form. User can modify as per requirement. Higher the refinement level and rounding factor, smoother will be the contour with longer processing time.



3.7.3 Contour Annotation

It allows the user to annotate the elevation of contour at a specified distance.



3.7.4 Erase Contour

It erases all the contours in DTM layers (not from imported external layers).

3.8 Generate DTM

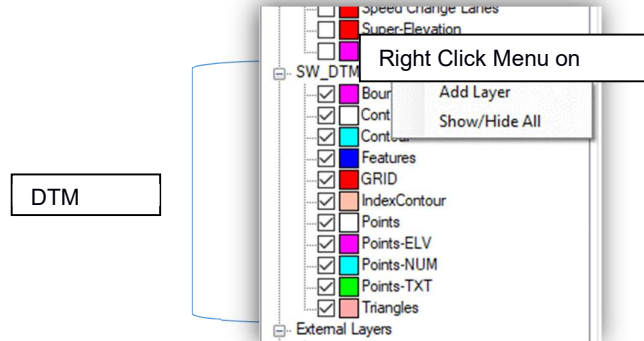
It processes all the points and features and generates dtm file which will be used as internal dtm while updating terrain. This function is equivalent to "Points>Process Points" and "Triangle>Triangulation" in SW DTM.

3.9 Show Errors

While generating dtm, the system may encounter errors due to features intersections. These errors can be viewed from this sub-menu.

3.10 Delete DTM Layers

It deletes the layers under SW_DTM. If the layers are default layers in SW_DTM, only objects in these layers are deleted.



3.11 Import Drawing

When surveyed data is processed outside the SW WSP, all the features need to be imported in SW WSP. This sub-menu imports such drawings including points, features, etc. These drawings can be further processed and modified within SW WSP unlike the "Import dxf" in layer panel which cannot be edited.

3.12 Export DTM

It exports the generated dtm file in the format *.dtmb so that the same terrain file can be used in another project.

3.13 Elevation from Map

Imports the elevation for the nodes used in the design file from the selected terrain file. User can enter the elevation in the "Elevation" column with reference to the extracted map elevation. Elevation value is used from "Elevation" if consists of data.

Apply DEM Elevation to Points

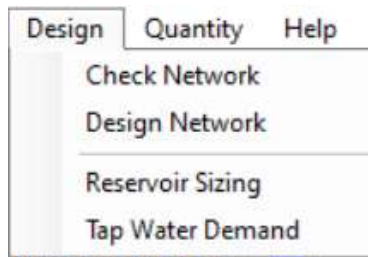
Elevation Source: INTERNAL Get Points

	FID	Label	Type	Vertex	Elevation	Map Elevation
	3	J3	J	0	1093.231	1093.231
	4	J4	J	0	1094.065	1094.065
	5	J5	J	0	1089.075	1089.074
	6	J6	J	0	1071.783	1071.784
	7	J7	J	0	1061.416	1061.420
	8	J8	J	0	1067.803	1067.805
	9	J9	J	0	1059.505	1059.505
	1	J1	J	0	1095.355	1095.371
	59	J22	J	0	0.000	1099.846
	20	J20	J	0	1058.500	1058.500
	2	J2	J	0	1094.802	1094.802
	57	J21	J	0	0.000	1085.355
	61	J23	J	0	0.000	1059.999
	19	J19	J	0	1045.087	1045.087
	10	J10	J	0	1059.292	1059.249
	11	J11	J	0	1056.359	1056.359
	13	J13	J	0	1057.844	1057.844
	14	J14	J	0	1058.006	1058.006

Apply

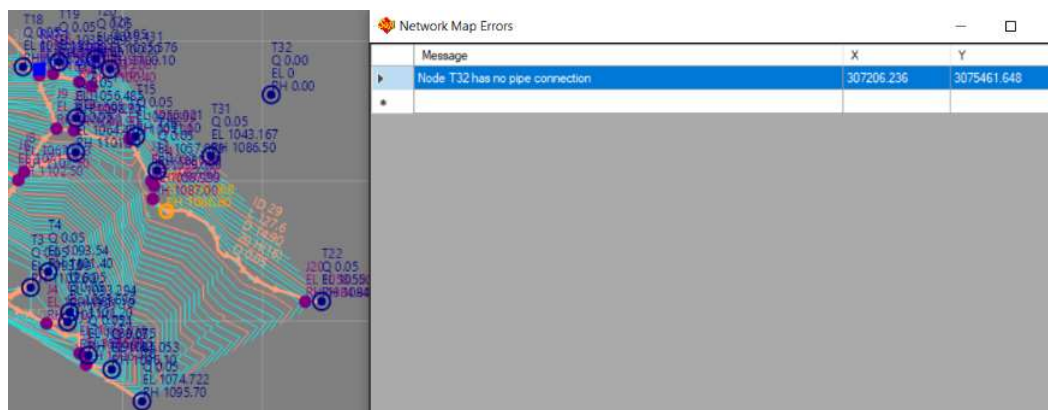
4 DESIGN

Design Menu has been divided into following sub-menu.



4.1 Check Network

Check if any Network Map Errors exists. Map errors are displayed in tabulated form. Double click the row to view the error in Plan.



4.2 Design Network

Generate the design table after Network Map errors have been rectified. User is required to use the tool after making change to Network.



4.3 Reservoir Sizing

Used for sizing of reservoir.

It lists all reservoirs in the Network along with the taps connected to it. It displays Total Daily Demand (lpd), Required Minimum Inflow (l/s) and Capacity Based on Minimum Inflow (cum).

User is required to provide adequate Inflow (l/s) and Reservoir Size (cum) for each reservoir. Reservoir Size with Adopted Inflow without Overflow (cum), Reservoir Size with Adopted Inflow with Overflow (cum), Overflow (cum) and Night Time Collection Volume (cum) are calculated based on above mentioned inputs.

S.No	Reservoir No	No of Taps Connected	Total Daily Demand (lpcd)	Required Minimum Inflow (l/s)	Reservoir Capacity Based on Minimum Inflow (cum)	Adopted inflow (l/s)	Reservoir Size with Adopted Inflow without Overflow (cum)	Reservoir Size with Adopted Inflow with Overflow (cum)	Overflow (cum)	Adopt Rese Size (l)
1	RVT1	21	9,230	0.107	3.85	0.000	0.00	0.00	0.00	

4.4 Tap Water Demand

Calculate the water demand.

Water demand is calculated on the basis of parameters listed below:

- Population Growth Rate (%).
- Survey/Design/Construction Period (Years).
- Design Period (Years).
- Yard Tap Demand (lpcd).
- Community Tap Demand (lpcd).
- Institutional Demand (lpcd).
- Health Institution Bed Demand (lpcd).
- Health Outdoor Patient Demand (lpcd).
- Minimum Design Flow for Community Tap (l/s).
- Minimum Design Flow for Yard Tap (l/s).

All taps in the Network are listed. Data like Owner Name, Tap Type, No of Household, Present Population, No of Students/ Institutional Population. Livestock Demand, No of Hospital Beds, No of Outdoor Patients and Other Demand are obtained from survey. Based on above mentioned parameters and survey data, water demand is calculated.

The calculated demand is reflected for each reservoir as Total Demand on the basis of no of taps connected to it.

Water Demand

Population Growth Rate: 1.5 % Yard Tap Demand: 65 lpcd Health Ins Bed Demand: 500 lpcd Minimum Design Flow for Community Tap: 0.1 l/s
 Survey/Design/Construction Period: 1 Yrs Community Tap Demand: 45 lpcd Health Out Patient Demand: 25 lpcd Minimum Design Flow for Yard Tap: 0.05 l/s
 Design Period: 20 Yrs Institutional Demand: 10 lpcd

S.No	Tap No	Owner Name	Tap Type	No of HH	Present Population	Base Population	Design Population	Domestic Demand (lpcd)	No of Student/ Inst Pop	Total Institutional Demand (lpcd)	Livestock Demand (lpcd)	No of Hospital Beds	No of Outdoor Patients	Total Health Inst Demand (lpcd)	Other Demand (lpcd)
1	T1	sete tamang	Household	1	6	6	8	520	0	0	0	0	0	0	0
2	T12		Household	0	5	5	7	455	0	0	0	0	0	0	0
3	T13		Household	0	5	5	7	455	0	0	0	0	0	0	0
4	T14	man bdr. roka	Household	1	4	4	5	325	0	0	0	0	0	0	0
5	T15		Household	0	5	5	7	455	0	0	0	0	0	0	0
6	T16		Household	0	5	5	7	455	0	0	0	0	0	0	0
7	T18	mangale roka	Household	1	7	7	9	585	0	0	0	0	0	0	0
8	T19	hasta bdr. roka	Household	1	5	5	7	455	0	0	0	0	0	0	0
9	T20	jt bdr. roka	Household	1	7	7	9	585	0	0	0	0	0	0	0
10	T21	Aate bdr. roka	Household	1	5	5	7	455	0	0	0	0	0	0	0

Calculate Save

4.5 Pump Design

A pump design facility is included in the system. Initially a pump has to be inserted in the map usually between Intake and reservoir. The outlet of the pump should always be to a reservoir.

Pump Design

Pump No: P1 Calculate Close

Discharge

Daily Demand (lpcd): 45000

Max Day Demand Factor: 1.3

System Leakage/Wastage (%): 15

Total Demand (lpcd): 110250

Pumping Hours (hr): 8.0

Pump Flow Rate (lps): 3.83

Pipe Size

Min Velocity (m/s): 1.50

Max Velocity (m/s): 3.00

Max Diameter (mm): 57

Min Diameter (mm): 40

Pipe Type: H

Outer/Nominal Dia (mm): 63

Pipe Pressure Class: 16

Inner Diameter (mm): 47.80

Pipe Roughness (mm): 0.0001

Pumping Head

Inlet: IN1 Elevation (m): 960.000

Outlet: RVT1 Elevation (m): 1000.000

Static Head (m): 40.000

Residual Head at Outlet (m): 6.0

Pipe Length (m): 200.00

Friction Factor: 0.026

Flow Velocity (m/s): 2.13

Frictional Head Loss (m): 25.02

Minor Head Loss (m): 0.92

Total Dynamic Head (m): 71.94

Pump Power

Pump Efficiency (%): 75.00

Safety Factor: 1.15

Required Power (KW): 4.1

Minor Headloss

£ factor	Count
Tee	2.0 2
Union	0.08 0
Elbow Regular 90	1.5 0
Elbow Regular 45	0.4 0
Return Bend	1.5 0
Globe Valve	10.0 0
Angle Valve	2.0 0
Gate Valve Open	0.15 0
Swing Check Valve	2.0 0
Ball Valve Open	0.05 0
Diaphragm Valve Open	2.3 0
Flow Meter	7.0 0

In the design stage, the daily demand for a pump need to be provided along with the demand factor and leakage %. Operating hours are to be provided for pump flow. The inlet and outlet should be chosen and the pipe diameter should be provided. The required TDH as well as power of the pump will be computed. Based on the discharge and head, pump' manufacture catalogue should be used to select proper pump for the project.

4.6 Design Table

Lists all branches of Network.

Auto Design		Profile Drawing		Schematic Drawing		Compute Length		Calculate																Save					
Branch Name	Pipe No	From	To	Length (m)	Design Length (m)	Flow Direction (Flowing)	Discharge (l/s)	Extra/Direct Discharge (l/s)	From RL (m)	To RL (m)	Level Diff (m)	Static Level (m)	Head Available (m)	Max Static Pressure (m)	Pipe Type	Pipe OD/IN	Pipe Class	Inner Dia (mm)	Friction Factor	Head Loss (m)	Residual Head (m)	Flow Velocity (m/s)	From HGL (m)	To HGL (m)	Soil Type				
W1-RV1 RV1-T23	1	W1	RV1	254.62	280.10	DIR	0.00	0.00	1,120.0	1,120.0	17.0	1,120.0	17.0	17.0	H	63	6	56.7	0.035	0.0	17.0	0.00	1,120.0	1,120.0	GMS				
	1	RV1	J15	59.54	65.50	D	1.05	0.00	1,103.0	1,043.6	59.4	1,103.0	59.4	59.4	H	63	6	56.7	0.030	0.3	59.1	0.42	1,103.0	1,102.7	GMS				
	2	J15	J9	43.47	47.90	U	0.85	0.00	1,043.6	1,059.5	-15.9	1,103.0	43.2	59.4	H	63	6	56.7	0.031	0.2	43.0	0.34	1,102.7	1,102.5	GMS				
	3	J9	J8	40.16	44.20	UR	0.60	0.00	1,059.5	1,067.8	-8.3	1,103.0	34.7	43.5	H	63	6	56.7	0.033	0.1	34.7	0.24	1,102.5	1,102.5	GMS				
	4	J8	J6	8.12	8.90	UR	0.55	0.00	1,067.8	1,071.8	-4.0	1,103.0	30.7	35.2	H	63	6	56.7	0.034	0.0	30.7	0.22	1,102.5	1,102.5	GMS				
	5	J6	J2	60.21	66.20	UR	0.45	0.00	1,071.8	1,094.8	-23.0	1,103.0	7.7	31.2	H	63	6	56.7	0.035	0.1	7.6	0.18	1,102.5	1,102.4	GMS				
J1-T1 T2-T8	6	J2	J22	179.19	197.10	R	0.10	0.00	1,094.8	1,099.8	-5.0	1,103.0	2.5	8.2	H	50	6	44.9	0.050	0.0	2.5	0.06	1,102.4	1,102.3	GMS				
	7	J22	J1	15.47	17.00	R	0.10	0.00	1,099.8	1,095.4	4.5	1,103.0	7.0	7.6	H	25	12.5	19.9	0.043	0.2	6.8	0.32	1,102.3	1,102.2	GMS				
	8	J1	T23	21.43	23.60	D	0.05	0.00	1,095.4	1,095.8	-0.5	1,103.0	6.3	7.6	H	20	16	14.9	0.048	0.3	6.0	0.29	1,102.2	1,101.8	GMS				
	1	J1	T1	10.08	11.10	R	0.05	0.00	1,095.4	1,095.9	-0.5	1,103.0	6.3	7.6	H	20	16	14.9	0.048	0.2	6.1	0.29	1,102.2	1,102.0	GMS				
	1	J2	J3	46.13	50.70	D	0.35	0.00	1,094.0	1,093.2	1.6	1,103.0	9.2	9.8	H	40	10	33.5	0.035	0.4	9.7	0.40	1,102.4	1,102.0	GMS				
	2	J3	J4	35.81	39.20	R	0.25	0.00	1,093.2	1,094.1	-0.9	1,103.0	7.9	9.8	H	32	10	26.7	0.037	0.5	7.4	0.45	1,102.0	1,101.4	GMS				
J21-T24 J9-T22	3	J4	J5	40.49	44.50	DIR	0.15	0.00	1,094.1	1,089.1	5.0	1,103.0	12.3	13.9	H	20	16	14.9	0.040	4.5	7.9	0.86	1,101.4	1,096.9	GMS				
	4	J5	J21	10.03	11.00	D	0.10	0.00	1,089.1	1,085.4	3.7	1,103.0	11.6	17.6	H	20	16	14.9	0.042	0.5	11.1	0.57	1,096.9	1,096.4	GMS				
	5	J21	T8	48.99	53.90	DIR	0.05	0.00	1,085.4	1,074.7	10.6	1,103.0	21.7	28.3	H	20	16	14.9	0.040	0.7	21.0	0.29	1,096.4	1,095.7	GMS				
	1	J21	T24	18.71	20.60	R	0.05	0.00	1,085.4	1,085.1	0.3	1,103.0	11.4	17.9	H	20	16	14.9	0.041	0.3	11.1	0.29	1,096.4	1,096.1	GMS				
	1	J9	J10	12.57	13.90	R	0.25	0.00	1,059.5	1,059.3	0.2	1,103.0	43.3	43.7	H	20	16	14.9	0.037	3.7	39.6	1.43	1,102.5	1,098.9	GMS				
	2	J10	J11	40.55	44.70	R	0.20	0.00	1,059.3	1,056.4	2.9	1,103.0	42.5	46.6	H	20	16	14.9	0.038	7.7	34.8	1.15	1,098.9	1,091.2	GMS				
J5-T7 J4-T5	3	J11	J13	34.04	37.40	D	0.15	0.00	1,056.4	1,057.8	-1.5	1,103.0	33.3	46.6	H	20	16	14.9	0.040	3.8	29.5	0.86	1,091.2	1,087.4	GMS				
	4	J13	J14	7.92	4.30	DIR	0.10	0.00	1,057.8	1,058.0	-0.2	1,103.0	29.4	45.2	H	20	16	14.9	0.042	0.2	29.2	0.57	1,087.4	1,087.2	GMS				
	5	J14	J23	9.60	10.60	D	0.05	0.00	1,058.0	1,060.0	-2.0	1,103.0	27.2	45.0	H	20	16	14.9	0.048	0.1	27.0	0.29	1,087.2	1,087.0	GMS				
	6	J23	C3	13.11	14.40	DIR	0.05	0.00	1,060.0	1,059.4	0.6	1,103.0	27.7	43.6	H	20	16	14.9	0.048	0.2	27.5	0.29	1,087.0	1,086.8	GMS				
	7	C3	J20	127.64	140.40	DIR	0.05	0.00	1,059.4	1,058.5	0.9	1,103.0	28.3	44.5	H	20	16	14.9	0.048	1.9	26.4	0.29	1,086.8	1,084.9	GMS				
	8	J20	T22	11.96	13.20	R	0.05	0.00	1,058.5	1,055.6	2.9	1,103.0	29.4	47.4	H	20	16	14.9	0.048	0.2	29.2	0.29	1,084.9	1,084.8	GMS				
J6-T12	1	J5	T7	5.30	6.90	R	0.05	0.00	1,089.1	1,088.7	0.4	1,103.0	8.3	14.3	H	20	16	14.9	0.040	0.1	8.2	0.29	1,096.9	1,096.8	GMS				
	1	J4	T5	10.26	20.10	R	0.05	0.00	1,084.1	1,082.5	0.8	1,103.0	8.1	9.7	H	20	16	14.9	0.040	0.3	7.8	0.29	1,101.4	1,101.1	GMS				
	1	J4	T5	15.94	16.50	R	0.05	0.00	1,084.1	1,083.7	0.4	1,103.0	7.7	9.3	H	20	16	14.9	0.040	0.2	7.5	0.29	1,101.4	1,101.2	GMS				
	1	J6	T7	134.50	148.00	L	0.10	0.00	1,071.8	1,061.4	10.4	1,103.0	41.0	41.6	H	20	16	14.9	0.042	7.0	34.0	0.57	1,102.5	1,095.4	GMS				
2	J7	T12	22.34	24.60	H	0.05	0.00	1,061.4	1,052.7	8.7	1,103.0	42.7	50.1	H	20	16	14.9	0.041	0.1	42.4	0.29	1,095.4	1,095.1	GMS					
C:\Users\Use\Desktop\chul_training\02_wspib.gspig																												sumanhd19@gmail.com	

Plan: Design Table Profile Plan-Design Table Plan-Profile Plan-Profile-Table
C:\Users\User\Desktop\chul_training_03\wsp\gpgip

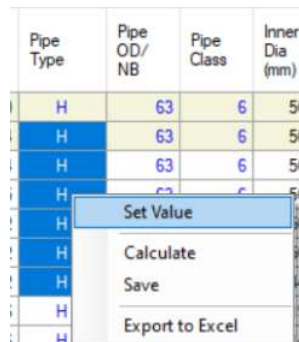
sumanhd19@gmail.com

The design steps to be followed are:


- Extract the elevation of nodes using DTM→ Elevation from map tool.
- Compute length for each pipe segment using “Compute Length”.
- Provide the discharge for branches that corresponds to Transmission Line in “Extra/Direct Discharge” column. The provided discharge is based on the “Adopted Inflow” for each reservoir.
- Click “Auto Design”. The software computes most economic pipe diameter and pipe class on the basis of criteria like Maximum Static Pressure, Residual Head and Flow velocity.

If required, User can manually change the Pipe Type, Pipe Diameter and Pipe Class, verify the Maximum Static Pressure, Residual Head and Flow Velocity criteria. Steps to be followed are:

- Select number of pipe segments where pipe parameter is to be changed and press right mouse click. Following tool pops out.



- Click “Set Value”. It will generate following window.

 Set Pipe Type and Diameter

Type H OD/NB (mm) 63 Pressure Class (kg/sqcm) 6

Apply

- Select appropriate Type, Diameter and Class and click Apply. Changes to other parameters can be seen in the design table.
- User can save, export the finalized design table using “Save” and “Export to Excel” tool respectively.

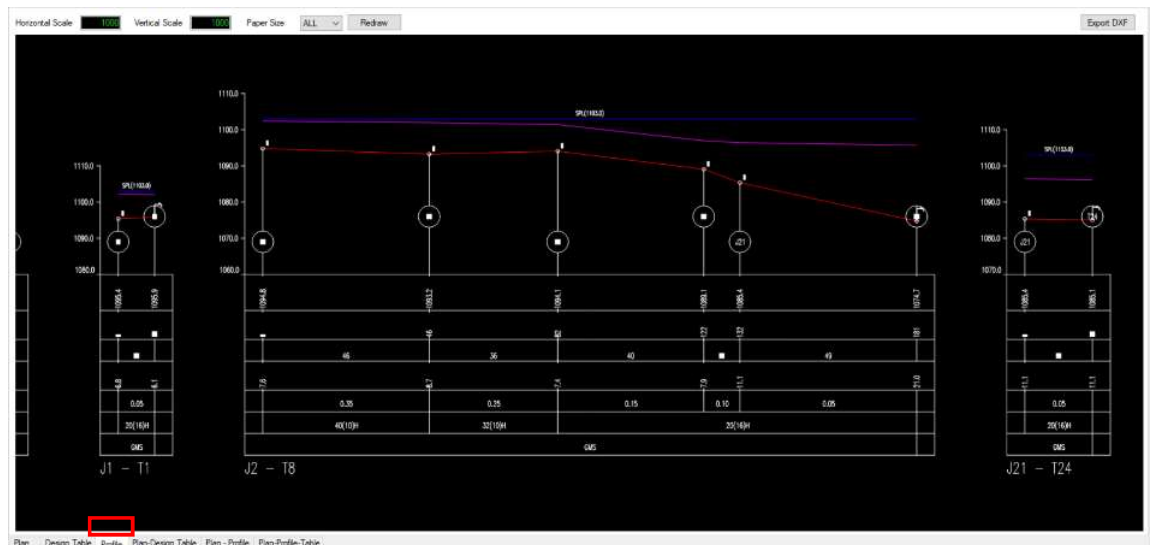
Note:

- Parameters in blue colour are editable.
- If the design criteria are not met, those parameters are displayed in red colour.

Pipe Type	Pipe OD/NB	Pipe Class	Inner Dia (mm)	Friction Factor	Head Loss (m)	Residual Head (m)	Flow Velocity (m/s)	From HGL (m)	To HGL (m)	Soil Type
H	63	6	56.7	0.035	0.0	17.0	0.00	1,120.0	1,120.0	GMS
H	32	10	26.7	0.031	13.5	45.9	1.88	1,103.0	1,089.5	GMS
H	32	10	26.7	0.031	6.6	23.5	1.52	1,089.5	1,083.0	GMS
H	32	10	26.7	0.032	3.1	12.1	1.07	1,083.0	1,079.9	GMS
H	32	10	26.7	0.033	0.5	7.5	0.98	1,079.9	1,079.3	GMS
H	32	10	26.7	0.033	2.7	-18.2	0.80	1,079.3	1,076.6	GMS
H	50	6	44.9	0.050	0.0	-23.3	0.06	1,076.6	1,076.5	GMS
H	25	12.5	19.9	0.043	0.2	-19.0	0.32	1,076.5	1,076.3	GMS
H	20	16	14.9	0.048	0.3	-19.8	0.29	1,076.3	1,076.0	GMS

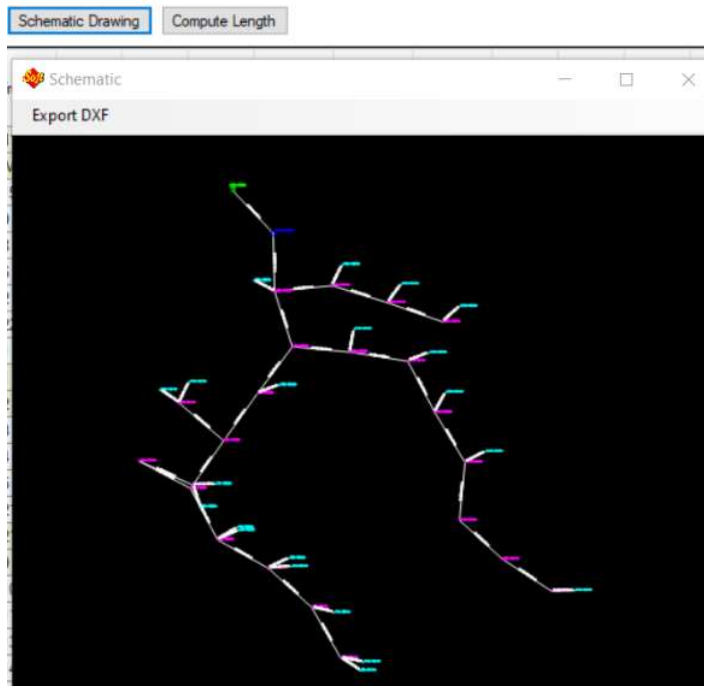
4.7 Profile

Display the ground (red), hydraulic (pink) and static pressure (blue) profile for each pipeline branch. User can set the horizontal and vertical scale and paper size to Export the profile in DXF (*.dxf) file format.



4.8 Schematic Diagram

Display the schematic diagram of Design Network. All the components with corresponding reduced level and pipe segment with respective diameter, type, class, length and flow are displayed. User can export the profile to DXF (*.dxf) file format.



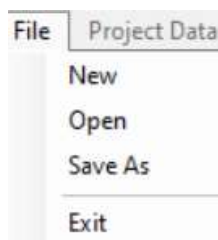
5 SW WSP ESTIMATOR

5.1 Main Menu

SW-Water Supply Estimator Current Version:1.0.0.4	
File Project Data Quantity Estimation Cost Estimation Rates Rate Analysis Reports District Rates Help	
Menus	Description
File	Allows users to create new SW WSP Estimate project, open existing project, create backup copy of project and exit.
Project Data	Allows users to update project information, editing norms, adding and updating work types, materials, labor and preferences.
Quantity Estimation	Allows users to add structure details used in project as well as import water supply design file for pipeline works.
Cost Estimation	View BoQ, Material Breakdown summary, Structure Material Breakdown, Summary of Cost, Fitting for each structure
Rate	Allows user to input transportation distance and rate, rate for each material used.
Rate Analysis	Allows users to view detail rate analysis and summary.
District Rate	Allow user to create palika specific district rate file. The file can be imported in project using Retrieve Rate.
Help	About the software.

5.2 File

Create new project, open existing file, save current project with different name and exit the SW WSP Estimator.



5.2.1 New

Create new SW WSP Estimate file (*.db). Data required to create a new project are listed below:

- Province
- District
- Municipality
- Project Code
- Fiscal Year

- Project Name
- Project Name in Nepali
- Created From: Template or Existing File.
- File Path: Path to save the created file
- Created Date

5.3 Project Data

Project Data Menu has been divided into following sub-menu.

5.3.1 Project Information

Add and update project information such that scheme information, demographic information, transportation of non-local materials and source info.

Project Details

Basic information about project filled during project creation is automatically imported in the form whereas scheme types, year of implementation and community names can be input in this tab.

Project Information

Project Details Demographic Info Transportation of Non Local Material Source Info

PROJECT DETAILS

Scheme Information

District: Province 1

Municipality: Shadananda Municipality

Ward No: 2

Scheme Code: 001

Scheme Name: Gajuri Water Supply Project

Scheme Name [In Nepali]:

Scheme Type: Gravity

Year of Implementation: 2021

Community Name: Gajuri

Community Name [In Nepali]:

Save

Demographic Information

Enter the Demographic Information like number of Household, Beneficiary Population, number and type of Institutional Toilets, Name of School and number of Students.

Project Information

Project Details Demographic Info Transportation of Non Local Material Source Info

DEMOGRAPHIC INFORMATION

Demographic Information

No of Household: 100

Beneficiary Population: 500

No of Institutional Toilet Constructed: 5

Institutional Toilet type:

Name of School: Shree Saraswati Ma.Vi

No of Students: 200

Save

Transportation of Non-Local Material

Enter the data regarding location and distance of Non-Local material like Name of Market, Road Head, Type of road and respective distances.

Project Information

Project Details Demographic Info **Transportation of Non Local Material** Source Info

LOCATION & DISTANCE FOR NON-LOCAL MATERIAL

Transportation

Name of Market : Banepa

Road Head Near to Scheme : Banepa

Total Distance from Market to Roadhead in km : 10

Type of Road

	From	To
Black Top :	Location Name Dhulikhel	Banepa
	Km 3	
Gravel :	Location Name Road Head	Road Head
	Km 10	
Earthen :	Location Name Banepa	Road Head
	Km 10	

Save

[Source Information](#)

Enter the information regarding source like Source Type, Name, Yield, Discharge measurement date, Safe Yield and Source Use condition (existing or new)

Project Information

Project Details Demographic Info Transportation of Non Local Material **Source Info**

SOURCE INFORMATION

	Source - 1	Source - 2
Type of Source	Spring	Spring
Name of Source	Tandi	Tandi
Yield of source (lps)	0	0
Measured Date	NA	NA
Safe Yield of Source (lps)	0	0
Whether Source is :	<input type="text"/>	

Save

5.3.2 Edit Norms

This menu allows the user to add norm group at left side of the form, norm description at the right side of the form. Norm's details can be entered by selecting the norm on the right side and right clicking and selecting View/Edit Details or simple double clicking the any of the norm.

Current Norms: N-202

Activity Group

Group Code	Activity Group
01	Site Clearance
02	Earthwork
03	Collection and Supply of Material
05	Brick Works
06	Stone Works
07	Plain/RCC
08	Form/Work
09	Roof Work
10	Wood Work
11	Flooring
12	Plastering
13	Painting
14	Cement Pointing
16	River Training and Gabion Works
17	Laying of Pipes and Sewer
18	Water Proofing Works
19	Demolition and Repair Works

Group Code : 02

Activity Group : Earthwork

Remove Group Add New Group Reload Save

Norms Items

Activity No.	Description	Units	Analysis Quantity
02.01	Earthwork in excavation in soft soil for all purposes	m3	1
02.02	Earthwork in excavation in hard soil for all purposes	m3	1
02.09	Earthwork in excavation in ordinary soil for drain & pipeline trench	m3	1
02.12	Earthwork in excavation in hard soil for drain & pipeline trench, ditch cutting	m3	1
02.14	Earthwork in excavation in boulder & gravel mixed soil for drain & pipeline trench	m3	1
02.15A	Earthwork in excavation in soft moorum rock for drain & pipeline trench	m3	1
02.15B	Earthwork in excavation for foundation in soft medium rock for drain trench	m3	1
02.16B	Earthwork in excavation for foundation in hard rock rock for drain, tunnel etc.	m3	1
02.25 KA	Earth filling with watering in ordinary soil	m3	1
02.25 KHA	Earth filling without watering	m3	1

Activity No. : 02.15A

Short Description : Earthwork in excavation in soft moorum rock for drain & pipeline trench

Full Description : Earthwork in excavation for drain & pipeline trench, soft moorum rock including a lead of 10 m and a lift of 1.5 m, for 1 m³

Specification : Quantity of Analysis: 1 Unit: m3

Save

Adding Norm Group

- Right Click on Activity Group section and click Add Group, new group code will be created automatically, give appropriate group name and click Add New Group.
- For deleting the group, select the row in activity group and click Remove Group.

Adding Norm Items

- Select the Activity Group.
- Right Click on Norms Items grid and select Add New, enter the activity no followed with Activity group code. The group code must and id must be separated with dot. i.e., 21.01 (21 is the group code and 01 is id)
- Duplicating the same norm item in current group is easy task. This makes us easy to create multiple norms with similar norms details. Clicking duplicate norms and giving new activity id will create duplicated norm within same group.
- User can delete the selected norm item by right clicking and clicking delete sub menu.

Adding Norm Details

- Double clicking in the norm detail row will pop up the norm detail entry form show below.
- Buttons in the right are placed to add labor, material, equipment, fitting and miscellaneous item. Clicking Add Labor will load all items in the dropdown, choose the item, enter quantity and click save. Similarly, material, equipment, pipe & fittings, miscellaneous and tools can be added.

Norms Details Entry

Current Norms: N-202 Activity No.: 07.04KHA Short Description: Plain cement concrete (1:1.5:3) for RCC works

Analysis Quantity: 1 Unit: m3

Item Type	Item Code	Item Name	Unit	Quantity	Applied To
Labour	L001	Skilled labour (for all works)	md	0.8	None
	L002	Unskilled labour (for all works)	md	7	None
Material	M004	Aggregate - 10 mm size	m³	0.29	None
	M005	Aggregate - 20 mm size	m³	0.57	None
	M007	Coarse Sand	m³	0.43	None
	M014	Cement	MT	0.4	None
Norms Item					

Add/Edit

+ Add Labour + Add Material + Add Equipment

+ Pipe/Fittings + Add Miscellaneous + Add Norms Item

+ Add Tools

Item Code: M005 Unit: m³

Item: Aggregate - 20 mm size

Quantity: 0.57

Applied to: None

Delete + Add/Edit Labour,Material Save

5.3.3 Add / Edit Work Types

Work Types

SN	Work Type Description	Unit	Recommended Fitting Set	DWSS-Reference Drawing
1	Access road Construction upto Treatment Plant Site	no	"	"
2	Air Valve Chamber	no	AVC-0	G-24
3	BPT(Pipe Type)	no	"	G-24B
4	Barbed Wire Fencing(Type B)- for 30 m	no	"	G-16,G-17
5	Break Pressure Chamber	no	BpT-0	G-18
6	Break Pressure Chamber Ferrocement	no	FBpT-0	G-18
7	Catch Drain at Treatment Plant Site	no		
8	Chaukidar Quarter	no		
9	Collection Chamber	no	CoC-0	G-16,G-17
10	Disinfection Chamber	no		
11	Distribution Chamber	no	DiC-0	G-16,G-17
12	Entrance Gate Type B	no	"	G-24
13	Entrance Gate(For BWF-B)	no		
14	Entrance Gate(For WF-A)	no	"	G-24A
15	Ferro Cement Sedimentation Tank(Type I)	no		
16	Ferro Cement Sedimentation Tank(Type II)	no		

Add/Edit Details

Work Type: Break Pressure Chamber Ferrocement

Unit: no

Recommended Fitting Set: FBpT-0 DWSS-Reference Drawing: G-18 Save

User can add new work types other than listed here. All the work types that are listed are shown in master quantity work type dropdown.

Standard structure can be made in this section by entering quantity estimation for the work types. This will make easier during quantity estimation.

The 'Work Types' window displays a table with the following data:

SN	Work Type Description	Unit	Recommended Fitting Set	DWSS-Reference Drawing
1	Access road Construction upto Treatment Plant Site	no	"	"
2	Air Valve Chamber	no	AVC-0	G-24
3	BPT(Pipe Type)	no		
4	Barbed Wire Fencing(Type B)- for 30 m	no	"	G-24B
5	Break Pressure Chamber	no	BpT-0	G-16,G-17
6	Break Pressure Chamber Ferrocement	no	FBpT-0	G-18
7	Catch Drain at Treatment Plant Site			
8	Chaukidar Quarter			
9	Collection Chamber		CoC-0	G-16,G-17
10	Disinfection Chamber			
11	Distribution Chamber		DiC-0	G-16,G-17
12	Entrance Gate Type B			G-24
13	Entrance Gate(For BWF-B)	no		
14	Entrance Gate(For WF-A)	no	"	G-24A
15	Ferro Cement Sedimentation Tank(Type I)	no		
16	Ferro Cement Sedimentation Tank(Type II)	no		

Below the table is the 'Add/Edit Details' form:

Work Type : Break Pressure Chamber Ferrocement

Unit : no

Recommended Fitting Set : FBpT-0 DWSS-Reference Drawing : G-18

Buttons: Save

5.3.4 Add/Edit Labor, Materials

Allows users to enter labor, material, fittings etc. Users can search for different items on the top right corner of the form.

User can add new items by right clicking in the grid and click **Add New**, this will generate new item code, data can be entered in the fields and click Save. For editing the data, user can select the item and right click and click **Edit Data**.

Labor Tab

The 'Project Items' window displays a table with the following data:

S.No	Item Code	Item Description	Unit
1	L001	Skilled labour (for all works)	md
2	L002	Unskilled labour (for all works)	md
3	L003	Helper	md
4	L004	Plumber	md
5	L005	Driver	md
6	L006	Asistant to driver	md
7	L007	Carpenter	md
8	L008	Painter	md

On the right side is the 'Add/Edit Details' form:

Item Type : Labour

Search: Item Code

Item Code : L002

Item Desc : Unskilled labour (for all works)

Item Unit : md

Weight/Unit : Kg/Unit

Trans. Ease :

Trans. Category :

Buttons: Save

Users can enter different types of labor.

Material Tab

Project Items

Item Type: **Material** Search: Item Code

S.No	Item Code	Item Description	Unit	Unit Weight (Kg)	Ease of Transport
1	M001	Block Stone	m³	2000	easy
2	M002	Bond Stone	m³	2000	easy
3	M003	1st class brick	no	2.4	easy
4	M004	Aggregate - 10 mm size	m³	1600	easy
5	M005	Aggregate - 20 mm size	m³	1600	easy
6	M006	Aggregate - 40 mm size	m³	1600	easy
7	M007	Coarse Sand	m³	1450	easy
8	M008	Mud (1.5 md of coolie)	m³	2000	easy
9	M009	Sal Wood	m³	1900	easy
10	M010	Local wood - Salla	m³	800	easy
11	M011	Local wood - others	m³	800	easy
12	M013	Bamboo	no	25	easy
13	M014	Cement	MT	1000	easy
14	M015	Tor-steel bar - 6 mmØ	kg	1	easy
15	M016	Tor-steel bar - 7 mmØ	kg	1	easy
16	M017	Tor-steel bar - 8 mmØ	kg	1	easy
17	M018	Tor-steel bar - 10 mmØ	kg	1	easy

Item Code: L002
 Item Desc: Unskilled labour (for all works)
 Item Unit: md
 Weight/Unit: Kg/Unit
 Trans. Ease:
 Trans. Category:
 Save

Users can enter different materials with in this tab. User can choose transportation ease as well as categorize as per local and non-local materials.

Fittings Tab

Project Items

Item Type: **Fittings** Search: Item Code

S.No	Item Code	Item Description	Unit	Unit Weight (Kg)	Ease of Transport
1	FBF-15	Brass Ferrule (15 mmØ)	no	1	easy
2	FBFS-100	Brass Flange Set 100 mm dia	no	1	easy
3	FBFS-125	Brass Flange Set 125 mm dia	no	1	easy
4	FBFS-140	Brass Flange Set 140 mm dia	no	1	easy
5	FBFS-16	Brass Flange Set 16 mm dia	no	1	easy
6	FBFS-160	Brass Flange Set 160 mm dia	no	1	easy
7	FBFS-180	Brass Flange Set 180 mm dia	no	1	easy
8	FBFS-20	Brass Flange Set 20 mm dia	no	1	easy
9	FBFS-200	Brass Flange Set 200 mm dia	no	1	easy
10	FBFS-225	Brass Flange Set 225 mm dia	no	1	easy
11	FBFS-25	Brass Flange Set 25 mm dia	no	1	easy
12	FBFS-32	Brass Flange Set 32 mm dia	no	1	easy
13	FBFS-40	Brass Flange Set 40 mm dia	no	1	easy
14	FBFS-50	Brass Flange Set 50 mm dia	no	1	easy
15	FBFS-63	Brass Flange Set 63 mm dia	no	1	easy
16	FBFS-75	Brass Flange Set 75 mm dia	no	1	easy
17	FBFS-80	Brass Flange Set 80 mm dia	no	1	easy
18	FBRC-15	Brass Bib Cock-15 mm dia.	no	0.28	easy

Item Code: FBFS-200
 Item Desc: Brass Flange Set 200 mm dia
 Item Unit: no
 Weight/Unit: 1 Kg/Unit
 Trans. Ease: easy
 Trans. Category:
 Save

Users can enter different fittings with its unit weight and ease of transportation in this tab.

Miscellaneous Tab

Project Items

Item Type: Miscellaneous Search: Item Code

S.No	Item Code	Item Description	Unit
1	I001	Hoisting and fixing of Cable(14 mm dia) and Suspender	Job
2	I002	Installation charges of 5 Ø pipe pieces and fittings in PST*	Job
3	I003	Installation charges of 5 Ø pipe pieces and fittings in RF*	Job
4	I004	Installation charges of 5 Ø pipe pieces and fittings in SSF*	Job
5	I005	Supply of 500 litres capacity HDPE tank with necessary fittings in...	Job
6	I006	Installation of pipe pieces and fittings for inlet, outlet, inlet, was...	Job
7	I007	Electrification and Sanitary work in chaukidar quarter	Job
8	I008	GI water stopper 150 mm wide, 20 SWG	m
9	I009	32 mmØ GI pipe ladder 45cm width -for tank inside	no
10	I010	6 mmØ bar mesh on MS angle(25×25×3) frame to cover lantern ...	m2
11	I011	Water Level Indicator	Job
12	I012	Installation of pipes & fittings for RCC tank	Job
13	I013	Supply and installation of Perforated HDPE Pipe of 160 mm dia ...	m
14	I014	Supply and installation of Perforated HDPE Pipe of 63 mm dia 1...	m
15	I015	Preparation and placing of 3 to 6 mm size gravel filter Media	m2
16	I016	Preparation and placing of 20 to 40 mm size gravel filter Media	m2
17	I017	Preparation and placing of 6 to 20 mm size gravel filter Media	m2
18	I018	Preparation and placing of 40-20 mm size gravel filter Media	m3
19	I019	Preparation and placing of 20-10 mm size gravel filter Media	m3

Item Code: I003
 Item Desc: Installation charges of 5 Ø pipe pieces and fittings in RF*
 Item Unit: Job
 Weight/Unit: Kg/Unit
 Trans. Ease:
 Trans. Category:
 Save

Users can enter different miscellaneous items with in this tab.

Preferences

Miscellaneous

Heading	Value
VAT (%)	13
Contractor OverHead(%)	15
Contigencies(%)	2.5

Save

Users can update VAT, Contractor Overhead.

5.4 Quantity Estimation

Users can input structure in the master quantity table with specified work types along with work location and structure count. The detail work can be inputted in the detail estimation sheet.

5.4.1 Master Quantity

For adding new work user must right click and Select **Add New**. This will enable the work type, description and structure count/length.

Structures that are usually used in water supply projects are listed in the work type dropdown. It is mandatory to give appropriate work description and total no/length. After clicking save button, if the work type has standard quantity available it will ask for importing it in current master quantity. Accept it to import the standard quantity if required.

User can select the row right click and Select **Edit Data** to update the information or delete the master quantity items.

The screenshot shows a window titled "Master Construction Items" with a table of construction items and a form below it.

S.No	Work Type	Work Location	Reference Drawings	Standard Type/Spec	Total No /Length	Unit Cost	Total Cost[Without OH]
1	Collection Chamber	0+250	G-16,G-17		1	174,731.03	174,731.03
2	Ferrocement Tank(20 cum)	0+600	G-10,G-11,G-12		1	365,166.32	365,166.32
3	Spring Intake (Type-I) (Type -A)	0+000	G-01,G-03		1	218,630.52	218,630.52
4	Pipeline works	TL & DL			1	841,918.22	841,918.22
5	Private Tap Stand	Tap Stands			50	26,946.80	1,347,340.16
6	Interruption Chamber	0+350	G-16,G-17		1	173,441.03	173,441.03
7	Washout Chamber	Diff Locations			3	13,551.64	40,654.91
	Total Cost						3,161,882.19

Below the table is a form with the following fields:

- Work Type: Collection Chamber (dropdown)
- Standard Type/Spec: (empty field)
- Recommended Fitting: CoC-0 (dropdown)
- Work Description: 0+250 (text field)
- Total No/Length: 1 (text field)
- Ref Dwg: G-16,G-17 (text field)
- Save button

User can add new work type items by clicking the button available beside work type dropdown.

Double click the selected row to open detail quantity form.

5.4.2 Detail Quantity

Select work type from the dropdown and corresponding structure location and click Load.

Select **Norm Group**, item and give location for the structure with its count and dimension and click **Add New**.

For updating the information edit the selected row and click **Update** button.

Detailed Quantity Estimation

Work Type: Collection Chamber Work Description: 0+250 No/Length: 1 Load

Details Fittings Bar Schedule Summary

S.No	Item Code	Items/Location/Desc	Unit	No	Diameter	Length/ Perimeter	Breadth/ Area	Height/ Volume	Quantity	Total Quantity	Remark
1	02.01	Earthwork in excavation in soft soil for all p...	m3	1	0.00	3.45	1.85	1.30	8.30	8.30	
2	02.25 KA	Earth filling with watering in ordinary soil	m3	1	0.00	10.20	0.10	1.30	1.33	1.33	
3	06.01.02	Stone (rubble) masonry work in 1:4 c-s mo...	m3	1	0.00	1.65	0.45	1.10	0.82	4.45	
				1	0.00	1.65	0.45	1.30	0.97		
				2	0.00	1.65	0.45	1.10	1.63		
				2	0.00	0.70	0.45	1.30	0.82		
				1	0.00	0.75	0.45	0.65	0.22		
4	06.05	Dry stone soling(stone filling in foundation)	m3	1	0.00	3.60	1.85	0.15	1.00	1.00	
5	07.02GHA	Plain cement concrete (1:2:4) work in foun...	m3							1.57	
		Pipe Embedment block		6	0.00	0.45	0.30	0.30	0.24		
		Pipe Support		1	0.00	0.60	0.45	0.10	0.03		

Norm Group: 02 Earthwork Item: 02.01:Earthwork in excavation in soft soil for all purposes No: 1 Quantity: 8.29725 Add New

Unit: m3 Location: Length/ Perimeter: 3.45 Diameter: 0 Update

Breadth/Area: 1.85 Use Dia for: Height/Volume: 1.3 Recalculate

Search Item Norms Recommended fitting CoC-0 Drawing Reference G-16, G-17

Detailed Quantity Estimation

Work Type: Collection Chamber Work Description: 0+250 No/Length: 1 Load

Details Fittings Bar Schedule Summary

Assign Fitting Inlet/Outlet

Fitting At	Size of GI Pipe
Inlet	32
Outlet	32
Washout	40

Fitting Assigned for Collection Chamber

Fitting Code	Fitting Name	Unit	Fitting Quantity	Total Quantity
Inlet 32				
FGEL-32	GI Elbow (32 mmØ)	no	3	3
FBU-32	Brass Union (32x40 mmØ)	no	2	2
FGPM-32	GI Pipe (32mm)-MC	m	4.25	4.25
Outlet 32				
FGNI-32	GI Nipple (32 mmØ)	no	3	3
FGST-40	GI Strainer (40 mmØ)	no	1	1
FGRS-40x32	GI Reducer Socket (40x32 mmØ)	no	1	1
FGUN-32	GI Union (32 mmØ)	no	1	1
FGEL-15	GI Elbow (15 mmØ)	no	2	2
FGUT-32x15	GI Unequal Tee (32x15 mmØ)	no	1	1
FGPM-15	GI Pipe (15mm)-MC	m	0.75	0.75
FGMGAV-32	GM Gate Valve (32 mmØ)	no	1	1
FGET-32	GI Equal Tee (32 mmØ)	no	1	1
Washout 40				
FGIP-40	GI Plug (40 mmØ)	no	1	1
FGPM-40	GI Pipe (40mm)-MC	m	1	1
FGS-40	GI Socket 40 mmØ	no	3	3
FHP6-63	PE-100, PN-6, DN-63	m	5	5

Add Fitting Default Fittings Save

For providing fitting for the structure first click Default Fittings button, this will list the inlet, outlet, washout & overflow rows. For the size of pipe user must give GI size which can be seen by hovering mouse over top of the Assign fitting grid.

After providing fitting size of inlet, outlet, washout and overflow click **save** button, which shows all fittings for that structure.

Detailed Quantity Estimation

Work Type: Collection Chamber Work Description: 0+250 NoLength: 1 Load

Details Fittings Bar Schedule Summary

S.No	Item Code	Description	Unit	No / Length	Unit Quantity	Total Quantity	Rate	Unit Amount	Total Amount(Without OH)
1	02.01	Earthwork in excavation in soft soil for all purposes	m3	1	8.30	8.30	576.80	4,785.85	4,785.85
2	02.25 KA	Earth filling with watering in ordinary soil	m3	1	1.33	1.33	1,562.00	2,071.21	2,071.21
3	06.01.02	Stone (rubble) masonry work in 1:4 c-s mortar	m3	1	4.45	4.45	22,314.65	99,386.66	99,386.66
4	06.05	Dry stone soling(stone filling in foundation)	m3	1	1.00	1.00	4,200.00	4,195.80	4,195.80
5	07.02GHA	Plain cement concrete (1:2:4) work in foundation	m3	1	1.57	1.57	23,333.05	36,516.22	36,516.22
6	07.05.03	Steel reinforcement(6mm)	kg	1	25.21	25.21	102.62	2,587.24	2,587.24
7	08.02KHA	Centering & shuttering for walls, vertical surface	m2	1	4.42	4.42	575.62	2,544.54	2,544.54
8	12.01KA	12.5 mm thick cement plaster in 1:2 c-s	m2	1	0.95	0.95	658.15	623.93	623.93
9	12.04KHA	20 mm (3/4") thick cement plaster in 1:4 c-s	m2	1	9.55	9.55	957.40	9,145.56	9,145.56
10	21.02	Reinforcement including wire and rod etc.	kg	1	0.24	0.24	1,212.01	287.25	287.25
11	25.09	Supply and Installation of standard man hole cover(600mmdl...	set	1	2.00	2.00	2,005.88	4,011.76	4,011.76
12		Structure Fitting Cost		1				8,575.00	8,575.00
		Total Cost						174,731.03	174,731.03

5.4.3 Pipeline Works

PipeLine Work

Pipeline work Input Pipeline Earthwork Summary Laying & Joining Summary

Pipe Code	Pipe Description	Purpose	Soil Type	Length	Breadth	Height
FHP12.5-110	PE-100, PN-12.5, DN-110	All	OS	100	0.6	0.9

+ Add New Prepare Pipeline Construction Data Import from Design File Save

Summary

Pipe Code	Pipe Description	Purpose	Soil Type	Length	E/W Volume
FHP12.5-110	PE-100, PN-12.5, DN-110	All	OS	100.00	54.00

For adding Pipes click Add New, selecting the pipe description will show the pipe code. User can select purpose of pipe and soil type along with the total length of designed pipe length.

User can directly import designed SWWSP File (*.wspb.gpkg) format file for pipe length. For preparing pipeline construction data user must add Pipeline works master quantity in mater quantity section. After that select the pipeline work from the drop down and click OK. This will create all the needed quantity required for pipeline works such as laying & joining works, pipeline length. It is mandatory to prepare pipeline construction data.

Summary of pipeline earthwork, laying and joining can be view in this form.

5.5 Cost Estimation

5.5.1 Bill of Quantity

Structure wise breakdown can be view grouped by work types.

Bill of Quantities						
Grouped By Norm Group.			Group By Norm Group		Group By Work Type	
Activity No.	Description of Work	Unit	Quantity	Rate Without Overhead	Amount Without Overhead (NRs)	
14	Cement Pointing					
14.05	3 mm thick cement punning in 1:1 cement sand mortar for 1 m2	m2	225.56	170.00	38,345.20	
02	Earthwork					
02.01	Earthwork in excavation for all purposes in soft soil, clay and silty soil including a lead of 10 m and a lift of 1.5 m, for 1 m³	m3	138.09	576.80	79,652.91	
02.12	Earthwork in excavation for drain & pipeline trench, ditch cutting in hard soil including a lead of 10 m and a lift of 1.5 m, for 1 m³	m3	4.55	1,030.00	4,686.50	
02.14	Earthwork in excavation for drain & pipeline trench, in boulder & gravel mixed soil including a lead of 10 m and a lift of 1.5 m, for 1 m³	m3	318.10	1,310.16	416,759.28	
02.15B	Earthwork in excavation for foundation, drain trench, medium rock including a lead of 10 m and a lift of 1.5 m, for 1 m³	m3	82.14	3,708.00	304,573.27	
02.25 KA	Earth filling with watering, including a lead of 10 m, with ordinary soil in 15 cm thick layers including spreading and manual compaction after each layer for 1 m3 :	m3	12.98	1,562.00	20,278.67	
02.39GHA	Refilling of pipe line trench with gravel and boulder mixed soil including watering and ramming every 20 cm layers for 1 m3 :	m3	283.50	494.40	140,162.40	
02.39KA	Refilling of pipe line trench with soft Soil including watering and ramming every 20 cm layers for 1 m3 :	m3	121.50	412.00	50,058.00	
11	Flooring					
11.20	3 mm thick cement punning in cement for 1 m2	m2	23.88	334.90	7,997.08	
08	FormWork					
08.02KA	Preparation of formwork for floors and slab including selection, collection of materials, cutting, nailing, fixing in position as per drawing, removal and disposal with a lead of 30 m for 1 m2.	m2	129.60	642.62	83,285.16	
08.02KHA	Preparation of formwork For walls, vertical surface (Height 4.0 m and width 0.5 m) including selection, collection of materials, cutting, nailing, fixing in position as per drawing, removal and disposal with a lead of 30 m for 1 m2.	m2	8.84	575.62	5,089.08	
17	Laying of Pipes and Sewer					

Bill of Quantities						
Grouped By Work Types.			Group By Norm Group		Group By Work Type	
Activity No.	Description of Work	Unit	Quantity	Rate Without Overhead	Amount Without Overhead (NRs)	
02.01	Earthwork in excavation for all purposes in soft soil, clay and silty soil including a lead of 10 m and a lift of 1.5 m, for 1 m³	m3	8.30	576.80	4,785.85	
02.25 KA	Earth filling with watering, including a lead of 10 m, with ordinary soil in 15 cm thick layers including spreading and manual compaction after each layer for 1 m3 :	m3	1.33	1,562.00	2,071.21	
06.01.02	Stone (rubble) masonry work upto 5 m height of wall including collection of hard block stones, preparation of cement mortar and a lead of cement 1m for 1 m3 in :Cement mortar (1:4)	m3	4.45	22,314.65	99,386.66	
06.05	Stone filling in foundation trench & levelling including a lead of 30 m for 1 m3	m3	1.00	4,200.00	4,195.80	
07.02GHA	Plain Cement concrete (1:2:4) work in foundation, wall including collection of materials and a lead of 30 m for 1m3 :	m3	1.57	23,333.05	36,516.22	
07.05.03	Cutting, bending, placing in position according to the drawing and binding of M.S. rod for R.C.C. works including a lead of 30 m for 1 M.T.	kg	25.21	102.62	2,587.24	
08.02KHA	Preparation of formwork For walls, vertical surface (Height 4.0 m and width 0.5 m) including selection, collection of materials, cutting, nailing, fixing in position as per drawing, removal and disposal with a lead of 30 m for 1 m2.	m2	4.42	575.62	2,544.54	
12.01KA	12.5 mm thick cement plaster in 1:2 c-sfor 1 m2	m2	0.95	658.15	623.93	
12.04KHA	20 mm (3/4") thick cement plaster in 1:4 c-s for 1 m2	m2	9.55	957.40	9,145.56	
21.02	Reinforcement including wire and rod etc.	kg	0.45	1,212.01	539.73	
25.09	Supply and installation of standard man hole cover(600mmdia) for 1 set	set	2.00	2,005.88	4,011.76	
21.02	Reinforcement including wire and rod etc.	kg	0.45	1,212.01	539.73	
2	Ferrocement Tank(20 cum)				NRs. 348185.32	
01.08	Excavating 15-20cm of the top soil including disposal outside of the construction site for 1m2	m2	27.74	128.00	3,550.08	
02.14	Earthwork in excavation for drain & pipeline trench, in boulder & gravel mixed soil including a lead of 10 m and a lift of 1.5 m, for 1 m³	m3	33.35	1,310.16	43,691.22	
02.25 KA	Earth filling with watering, including a lead of 10 m, with ordinary soil in 15 cm thick layers including spreading and manual compaction after each layer for 1 m3 :	m3	9.14	1,562.00	14,281.37	
06.02.02	Stone (rubble) masonry work in mud mortar including collection of hard block stones upto 5 m height of masonry wall and a lead of 30 m for 1 m3 :	m3	2.01	5,933.00	11,940.16	
	Stone filling in foundation trench & levelling including a lead of 30 m for					

5.5.2 Structure Wise Breakdown

Structure wise Breakdown summary of the project can be viewed from this menu

Structure Breakdown of Material

Material Breakdown

S.No	Item Code	Item Description	Unit	Rate	Collection Chamber [0-250]	Ferrocement Tank(20 cum) [0-600]	Spring Intake (Type-I) (Type -A) [0-000]	Pipeline works [TL & DL]	Private Tap Stand [Tap Stand]	Interruption Chamber [0-350]	Washout Chamber [Diff.Locations]	Total Quantity	Total Amount
1	L001	Skilled labour (for all works)	md	900.00	10.79	41.92	10.11		108.99	10.83	1.52	183.95	165,556.58
2	L002	Unskilled labour (for all works)	md	800.00	39.72	119.29	101.07	766.67	558.33	39.66	11.92	1,636.65	1,309,319.78
3	L003	Helper	md	700.00				0.00					
4	L004	Plumber	md	900.00									
5	L008	Painter	md	800.00		2.11						2.11	1,688.52
Material													
6	M001	Block Stone	m³	2,500.00	5.45	5.73	5.16		23.98	5.45	1.96	47.74	119,341.75
7	M002	Bond Stone	m³	2,500.00	0.65	0.94	0.60		4.23	0.65	0.32	7.38	18,451.94
8	M004	Aggregate - 10 mm size	m³	2,800.00	0.17	0.59	0.12		2.51	0.17	0.02	3.59	10,064.04
9	M005	Aggregate - 20 mm size	m³	2,800.00	0.34	1.16	0.96		5.02	0.34	0.05	7.91	22,136.91
10	M006	Aggregate - 40 mm size	m³	2,800.00	0.81	0.21	0.79		11.88	0.81	0.11	14.61	40,907.05
11	M007	Coarse Sand	m³	25,725.00	2.91	2.63	2.66		17.69	2.91	0.45	29.25	752,516.72
12	M008	Mud (1.5 md of coolie)	m³	1,150.00	1.33	9.99	1.19			1.33		13.83	15,901.91
13	M011	Local wood - others	m³	25,400.00	0.04	0.01	0.03		1.24	0.04	0.01	1.38	35,164.52
14	M013	Bamboo	no	162.50		11.55						11.55	1,877.46
15	M014	Cement	MT	16,490.00	1.32	2.71	1.16		10.31	1.32	0.15	16.97	279,872.63
16	M015	Tor-steel bar - 6 mmØ	kg	80.49	26.47	11.27	19.51			26.47		83.73	6,739.10
17	M017	Tor-steel bar - 8 mmØ	kg	80.49					125.00			125.00	10,141.74
18	M018	Tor-steel bar - 10 mmØ	kg	80.49	3.61	143.72				9.86		148.29	11,935.81
19	M020	Binding wire	kg	110.49	0.35	6.81	0.19		1.20	0.28		8.83	975.17
20	M025	Nails	kg	110.49	1.11	140.33	0.81		31.06	1.11	0.24	174.65	19,297.60
21	M043	Chicken wire mesh	m²	150.20	1.61	64.23				0.43		66.27	9,953.86

5.5.3 Structure Fittings

Summary of fittings used for each structure can be viewed from this menu.

Structure Fittings

Fitting Assigned to Structure

S.No	Fitting Code	Fitting Name	Unit	Quantity	Rate	Amount [without OH]
1		Spring Intake (Type-I) (Type -A)-0+000		Str. Count :1		
	Outlet	32				
1.01	FGPM-15	GI Pipe (15mm)-MC	m	0.90	100.00	90.00
1.02	FGPM-32	GI Pipe (32mm)-MC	m	1.95	200.00	390.00
1.03	FGNI-32	GI Nipple (32 mmØ)	no	2.00	400.00	800.00
1.04	FGMGAV-32	GM Gate Valve (32 mmØ)	no	1.00	500.00	500.00
1.05	FGUT-32x15	GI Unequal Tee (32x15 mmØ)	no	1.00	200.00	200.00
1.06	FGUN-32	GI Union (32 mmØ)	no	1.00	500.00	500.00
1.07	FGST-40	GI Strainer (40 mmØ)	no	1.00	300.00	300.00
1.08	FBU-32	Brass Union (32x40 mmØ)	no	1.00	200.00	200.00
1.09	FGRS-40x32	GI Reducer Socket (40x32 mmØ)	no	1.00	400.00	400.00
1.10	FGET-15	GI Equal Tee (15 mmØ)	no	1.00	400.00	400.00
	Overflow	40				
1.11	FGPM-40	GI Pipe (40mm)-MC	m	3.25	300.00	975.00
1.12	FGUN-40	GI Union (40 mmØ)	no	2.00	600.00	1,200.00
1.13	FGNI-40	GI Nipple (40 mmØ)	no	4.00	500.00	2,000.00
1.14	FGEL-40	GI Elbow (40 mmØ)	no	2.00	300.00	600.00
1.15	FGET-40	GI Equal Tee(40 mmØ)	no	1.00	200.00	200.00
1.16	FGRS-50x40	GI Reducer Socket (50x40 mmØ)	no	1.00	200.00	200.00
	Washout	40				
1.17	FGMGAV-40	GM Gate Valve (40 mmØ)	no	1.00	200.00	200.00
1.18	FHP6-63	PE-100, PN-6, DN-63	m	5.00	250.00	1,250.00
1.19	FBU-40	Brass Union (40x50 mmØ)	no	1.00	300.00	300.00
	Sub Total					10,705.00

5.5.4 Summary of Cost

Summary of Cost can be viewed from this menu.

Project Cost Summary[without contractor overhead]				
SN	Description of Work	Unit	Quantity	Amount(NRs)
A. Water Supply and Sanitation works				
A1. Civil works : Structure Cost Excluding Fittings				
1	Collection Chamber	no	1	166,948.25
2	Ferrocement Tank(20 cum)	no	1	348,185.32
3	Interruption Chamber	no	1	166,156.03
4	Pipeline works	m	1000	841,918.22
5	Private Tap Stand	no	50	1,347,340.16
6	Spring Intake (Type-I) (Type -A)	no	1	207,925.52
7	Washout Chamber	no	3	40,654.91
Sub Total				3,119,128.41
A2. Structure Fitting Cost				
1	Structure Fitting Cost			43,546.00
Sub Total				43,546.00
Total cost of civil works (A)				3,162,674.41

5.6 Rates

5.6.1 Transportation Rates

Transportation rates according to district rate are entered in the form below with mentioned unit. Transportation by truck, transportation by mule, loading/unloading and transportation by porter can be saved.

Transportation by Truck (NRs/Kg/Km)				Transportation by Mule	
District Rate				District Rate	
	Blacktop	Gravel	Earthen	Easy Load	0
Easy Load	0.03	0.03	0.03	Uneasy Load	0
Uneasy Load	0.04	0.04	0.04	Very Uneasy Load	0
Very Uneasy Load	0.05	0.05	0.05		
Load/Unload (Nrs/Kg)				Transportation by Porter (NRs/Kg/Km)	
District Rate				District Rate	
	Load	Unload		Easy Load	1
Easy Load	0.2	0.2		Uneasy Load	1
Uneasy Load	0.2	0.2		Very Uneasy Load	1
Very Uneasy Load	0.2	0.2			

Save

5.6.2 Transportation Distance

Transportation distance for material, fitting and tools are entered in the below form.

Transportation Distance Entry

Item Type: Material Refresh

	Item Code	Item Description	Unit	Material Source	Black Top Length(km)	Gravel Road Length(km)	Earthen Road Length(km)	Porterage Length(km)
▶	M001	Block Stone	m³	Banepa	0	0	0	0.5
	M002	Bond Stone	m³	Banepa	0	0	0	0.5
	M004	Aggregate - 10 mm size	m³	Banepa	0	0	0	0.5
	M005	Aggregate - 20 mm size	m³	Banepa	0	0	0	0.5
	M006	Aggregate - 40 mm size	m³	Banepa	0	0	0	0.5
	M007	Coarse Sand	m³	Banepa	0	0	0	0.5
	M008	Mud (1.5 md of coolie)	m³	Banepa	0	0	0	0.5
	M011	Local wood - others	m³	Banepa	0	0	0	0.5
	M013	Bamboo	no	Banepa	0	0	0	0.5
	M014	Cement	MT	Banepa	3	0	0	0
	M015	Tor-steel bar - 6 mmØ	kg	Banepa	3	0	0	0
	M017	Tor-steel bar - 8 mmØ	kg	Banepa	3	0	0	0
	M018	Tor-steel bar - 10 mmØ	kg	Banepa	3	0	0	0
	M020	Binding wire	kg	Banepa	3	0	0	0
	M025	Nails	kg	Banepa	3	0	0	0
	M043	Chicken wire mesh	m²	Banepa	3	0	0	0

Save

5.6.3 Rate Entry

District rates for different district and municipality are previously inputted by District Rates application. Labor, Materials and Fittings used in the project are automatically listed in the tabs.

For retrieving the rates for district rate file previously created, click Retrieve Rates and select appropriate file to import and click Ok. Which will import the existing item rate automatically from district rate file to current project file.

Labor Tab

Labour Material Equipment Fittings Tools Refresh

	ItemCode	Description	Unit	Rate	Remark
▶	L001	Skilled labour (for all works)	md	900.00	
	L002	Unskilled labour (for all works)	md	800.00	
	L003	Helper	md	700.00	
	L004	Plumber	md	900.00	
	L008	Painter	md	800.00	

Retrieve Rates Save

Material Tab

Labour Material Equipment Fittings Tools Refresh

	Item Code	Description	Unit	Rate (Without VAT)	Truck/Tractor Transport Rate	Potorage Transport Rate	Rate at Site	Is Collected?	Remarks
▶	M001	Block Stone	m³	1,500.00	0.00	1,000.00	2,500.00	<input type="checkbox"/>	
	M002	Bond Stone	m²	1,500.00	0.00	1,000.00	2,500.00	<input type="checkbox"/>	
	M004	Aggregate - 10 mm size	m³	2,000.00	0.00	800.00	2,800.00	<input type="checkbox"/>	
	M005	Aggregate - 20 mm size	m³	2,000.00	0.00	800.00	2,800.00	<input type="checkbox"/>	
	M006	Aggregate - 40 mm size	m³	2,000.00	0.00	800.00	2,800.00	<input type="checkbox"/>	
	M007	Coarse Sand	m³	25,000.00	0.00	725.00	25,725.00	<input type="checkbox"/>	
	M008	Mud (1.5 md of coolie)	m³	150.00	0.00	1,000.00	1,150.00	<input type="checkbox"/>	
	M011	Local wood - others	m³	25,000.00	0.00	400.00	25,400.00	<input type="checkbox"/>	
	M013	Bamboo	no	150.00	0.00	12.50	162.50	<input type="checkbox"/>	
	M014	Cement	MT	16,000.00	490.00	0.00	16,490.00	<input type="checkbox"/>	
	M015	Tor-steel bar - 6 mmØ	kg	80.00	0.49	0.00	80.49	<input type="checkbox"/>	

Retrieve Rates Collection Norm Save

Local materials are usually collected from nearby sources or brought from crushers. If they are collection appropriate norms must be assigned for collection.

Labour Material Equipment Fittings Tools Refresh

	Item Code	Description	Unit	Rate (Without VAT)	Truck/Tractor Transport Rate	Potorage Transport Rate	Rate at Site	Is Collected?	Remarks
	M001	Block Stone	m³	1,500.00	0.00	1,000.00	2,500.00	<input checked="" type="checkbox"/>	
	M002	Bond Stone	m²	1,500.00	0.00	1,000.00	2,500.00	<input checked="" type="checkbox"/>	
	M004	Aggregate - 10 mm size	m³	2,000.00	0.00	800.00	2,800.00	<input checked="" type="checkbox"/>	
	M005	Aggregate - 20 mm size	m³	2,000.00	0.00	800.00	2,800.00	<input checked="" type="checkbox"/>	
	M006	Aggregate - 40 mm size	m³	2,000.00	0.00	800.00	2,800.00	<input checked="" type="checkbox"/>	
	M007	Coarse Sand	m³	25,000.00	0.00	725.00	25,725.00	<input checked="" type="checkbox"/>	
	M008	Mud (1.5 md of coolie)	m³	150.00	0.00	1,000.00	1,150.00	<input type="checkbox"/>	
	M011	Local wood - others	m³	25,000.00	0.00	400.00	25,400.00	<input type="checkbox"/>	
	M013	Bamboo	no	150.00	0.00	12.50	162.50	<input type="checkbox"/>	
	M014	Cement	MT	16,000.00	490.00	0.00	16,490.00	<input type="checkbox"/>	
	M015	Tor-steel bar - 6 mmØ	kg	80.00	0.49	0.00	80.49	<input type="checkbox"/>	

Retrieve Rates Collection Norm Save

If the items are collected from quarry mark it as collected and save the data. Click Collection Norm button, which will show the Local materials in the list. Assign appropriate norms to each of the item and click save.

Material Collection

	SN	ItemCode	Description	Unit	Collection Norm
▶	1	M001	Block Stone	m³	03.15:Collection and Stacking of Stone (rubble) of required size
	2	M002	Bond Stone	m²	03.04:Collection and stacking of stone (rubble) of required size
	3	M004	Aggregate - 10 mm size	m³	03.02KA:Collection, screening, stacking and supply of gravel:5 - 70 mm siz...
	4	M005	Aggregate - 20 mm size	m³	03.02KA:Collection, screening, stacking and supply of gravel:5 - 70 mm siz...
	5	M006	Aggregate - 40 mm size	m³	03.02KA:Collection, screening, stacking and supply of gravel:5 - 70 mm siz...
	6	M007	Coarse Sand	m³	03.01NGA:Collection, screening and supply of sand:In hilly area (excavating...

Refresh Save

Fittings Tab

Project Items

Item Type: **Fittings** Search: **Item Code**

S.No	Item Code	Item Description	Unit	Unit Weight (Kg)	Ease of Transport
1	FBF-15	Brass Ferrule (15 mmØ)	no	1	easy
2	FBFS-100	Brass Flange Set 100 mm dia	no	1	easy
3	FBFS-125	Brass Flange Set 125 mm dia	no	1	easy
4	FBFS-140	Brass Flange Set 140 mm dia	no	1	easy
5	FBFS-16	Brass Flange Set 16 mm dia	no	1	easy
6	FBFS-160	Brass Flange Set 160 mm dia	no	1	easy
7	FBFS-180	Brass Flange Set 180 mm dia	no	1	easy
8	FBFS-20	Brass Flange Set 20 mm dia	no	1	easy
9	FBFS-200	Brass Flange Set 200 mm dia	no	1	easy
10	FBFS-225	Brass Flange Set 225 mm dia	no	1	easy
11	FBFS-25	Brass Flange Set 25 mm dia	no	1	easy
12	FBFS-32	Brass Flange Set 32 mm dia	no	1	easy
13	FBFS-40	Brass Flange Set 40 mm dia	no	1	easy
14	FBFS-50	Brass Flange Set 50 mm dia	no	1	easy
15	FBFS-63	Brass Flange Set 63 mm dia	no	1	easy
16	FBFS-75	Brass Flange Set 75 mm dia	no	1	easy
17	FBFS-80	Brass Flange Set 80 mm dia	no	1	easy
18	FBRC-15	Brass Bib Cock-15 mm dia.	no	0.28	easy

Item Code: **FBFS-200**
 Item Desc: **Brass Flange Set 200 mm dia**
 Item Unit: **no**
 Weight/Unit: **1** Kg/Unit
 Trans. Ease: **easy**
 Trans. Category: **Save**

Tools

Project Items

Item Type: **Tools** Search: **Item Code**

S.No	Item Code	Item Description	Unit	Unit Weight (Kg)	Ease of Transport
1	T001	Shovel	no	2.4	easy
2	T002	Pick Axe	no	5	easy
3	T003	Hoe	no	2	easy
4	T004	Crowbar 1 × 5"	no	3.5	easy
5	T005	Sledge Hammer 10 lbs	no	4.55	easy
6	T006	Sledge Hammer 10 lbs	no	1	easy
7	T007	Stone Chisel 1 × 12"	no	2	easy
8	T008	Tools Box with locking set	no	10	easy
9	T009	Heating Plate (100 mm dia.)	no	2.5	easy
10	T010	Heating Plate (150 mm dia.)	no	3.5	easy
11	T011	Teflon cover	m²	0.5	easy
12	T012	Thermochrome Crayon	no	1	easy
13	T013	Blow Torch	no	1	easy
14	T014	Pipe Wrench 36"	no	3	easy
15	T015	Pipe Wrench 24"	no	2.5	easy
16	T016	Pipe Wrench 14"	no	1.5	easy
17	T017	Pipe Wrench 18"	no	2.4	easy
18	T018	Chain Wrench 36"	no	2.4	easy

Item Code: **T008**
 Item Desc: **Tools Box with locking set**
 Item Unit: **no**
 Weight/Unit: **10** Kg/Unit
 Trans. Ease: **easy**
 Trans. Category: **Save**

5.7 Rate analysis

5.7.1 Rate Analysis

Summary of Rate Analysis can be viewed from this menu.

SN	Item Code	Description of Work	Quantity	Unit	Kind	Description	Quantity	Unit	Rate	Amount	Total	Item Rate (Without On)
1	01.08	Site clearance	1	m2	Labour	Unskilled labour (for all works)	0.16	md	800.00	128.00	128.00	128.00
2	02.01	Earthwork in excavation in soft soil for all purposes	1	m3	Labour	Unskilled labour (for all works)	0.7	md	800.00	560.00	576.80	576.80
					Miscellan...	Add 3% of Labour for Tools and ...				16.80		
3	02.12	Earthwork in excavation in hard soil for drain & pipel...	1	m3	Labour	Unskilled labour (for all works)	1.25	md	800.00	1,000.00	1,030.00	1,030.00
					Miscellan...	Add 3% of Labour for Tools and ...				30.00		
4	02.14	Earthwork in excavation in boulder & gravel mixed s...	1	m3	Labour	Unskilled labour (for all works)	1.59	md	800.00	1,272.00	1,310.16	1,310.16
					Miscellan...	Add 3% of Labour for Tools and ...				38.16		
5	02.15B	Earthwork in excavation for foundation in soft mediu...	1	m3	Labour	Unskilled labour (for all works)	4.5	md	800.00	3,600.00	3,708.00	3,708.00
					Miscellan...	Add 3% of Labour for Tools and ...				108.00		
6	02.25 KA	Earth filling with watering in ordinary soil	1	m3	Labour	Unskilled labour (for all works)	0.5	md	800.00	400.00	1,562.00	1,562.00
					Material	Mud (1.5 md of coolla)	1	m³	1,150.00	1,150.00		
					Miscellan...	Add 3% of Labour for Tools and ...				12.00		
7	02.39GHA	Refilling of pipe line trench with gravel and boulder ...	1	m3	Labour	Unskilled labour (for all works)	0.6	md	800.00	480.00	494.40	494.40
					Miscellan...	Add 3% of Labour for Tools and ...				14.40		
8	02.39KA	Refilling of pipe line trench with soft Soil	1	m3	Labour	Unskilled labour (for all works)	0.5	md	800.00	400.00	412.00	412.00
					Miscellan...	Add 3% of Labour for Tools and ...				12.00		

5.7.2 Rate analysis Summary

Summary of financial proposal for implementation can be viewed from this menu.

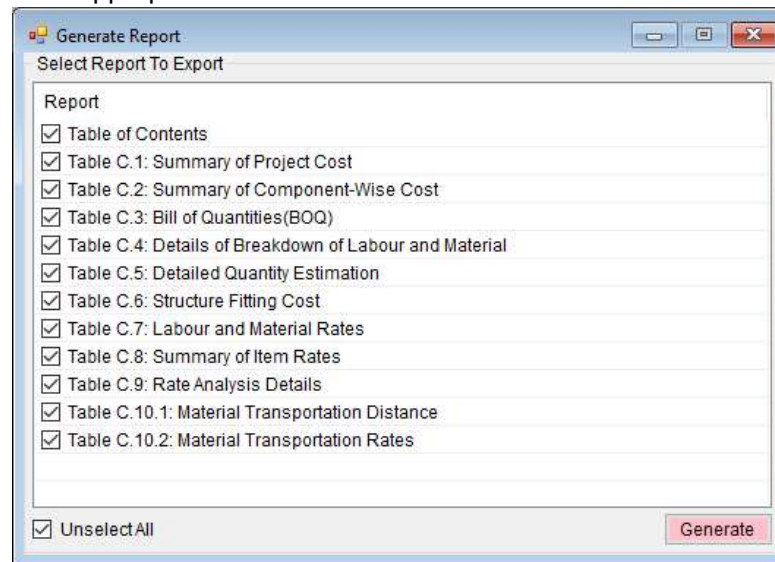
SN	Norms No.	Description of Work	Quantity	Unit	Total	ItemRate
1		Site Clearance				
1.01	01.08	Site clearance	1	m2	147.20	147.20
2		Earthwork				
2.01	02.01	Earthwork in excavation in soft soil for all purposes	1	m3	663.32	663.32
2.02	02.12	Earthwork in excavation in hard soil for drain & pipel...	1	m3	1,184.50	1,184.50
2.03	02.14	Earthwork in excavation in boulder & gravel mixed s...	1	m3	1,506.68	1,506.68
2.04	02.15B	Earthwork in excavation for foundation in soft mediu...	1	m3	4,264.20	4,264.20
2.05	02.25 KA	Earth filling with watering in ordinary soil	1	m3	1,796.30	1,796.30
2.06	02.39GHA	Refilling of pipe line trench with gravel and boulder ...	1	m3	568.56	568.56
2.07	02.39KA	Refilling of pipe line trench with soft Soil	1	m3	473.80	473.80
3		Collection and Supply of Material				
3.01	03.15	Collection and Stacking of Stone (rubble) of require...	1	m3	1,840.00	1,840.00
3.02	03.04	Collection and stacking of stone (rubble) of required...	1	m3	1,288.00	1,288.00
3.03	03.02KA	Collection, screening, stacking and supply of gravel...	1	m3	2,300.00	2,300.00
3.04	03.01NGA	Collection, screening and supply of sand:In hilly are...	1	m3	1,370.80	1,370.80
4		Stone Works				
4.01	06.01.02	Stone (rubble) masonry work in 1:4 c-s mortar	1	m3	25,661.85	25,661.85
4.02	06.01.03	Stone (rubble) masonry work in 1:6 c-s mortar	1	m3	25,305.35	25,305.35
4.03	06.02.01	Dry Stone (rubble) masonry work	1	m3	6,037.50	6,037.50
4.04	06.02.02	Stone (rubble) masonry work in mud mortar	1	m3	6,822.95	6,822.95
4.05	06.05	Dry stone soling(stone filling in foundation)	1	m3	4,830.00	4,830.00
4.06	06.05.01	Boulder packing	1	m3	4,830.00	4,830.00
4.07	06.05.02	Gravel Packing	1	m3	4,002.00	4,002.00
5		Plain/RCC				
5.01	07.02GA	Plain cement concrete (1:3:6) work in foundation	1	m3	25,657.13	25,657.13
5.02	07.02GHA	Plain cement concrete (1:2:4) work in foundation	1	m3	26,833.01	26,833.01

5.8 Reports

5.8.1 Export Estimate Report

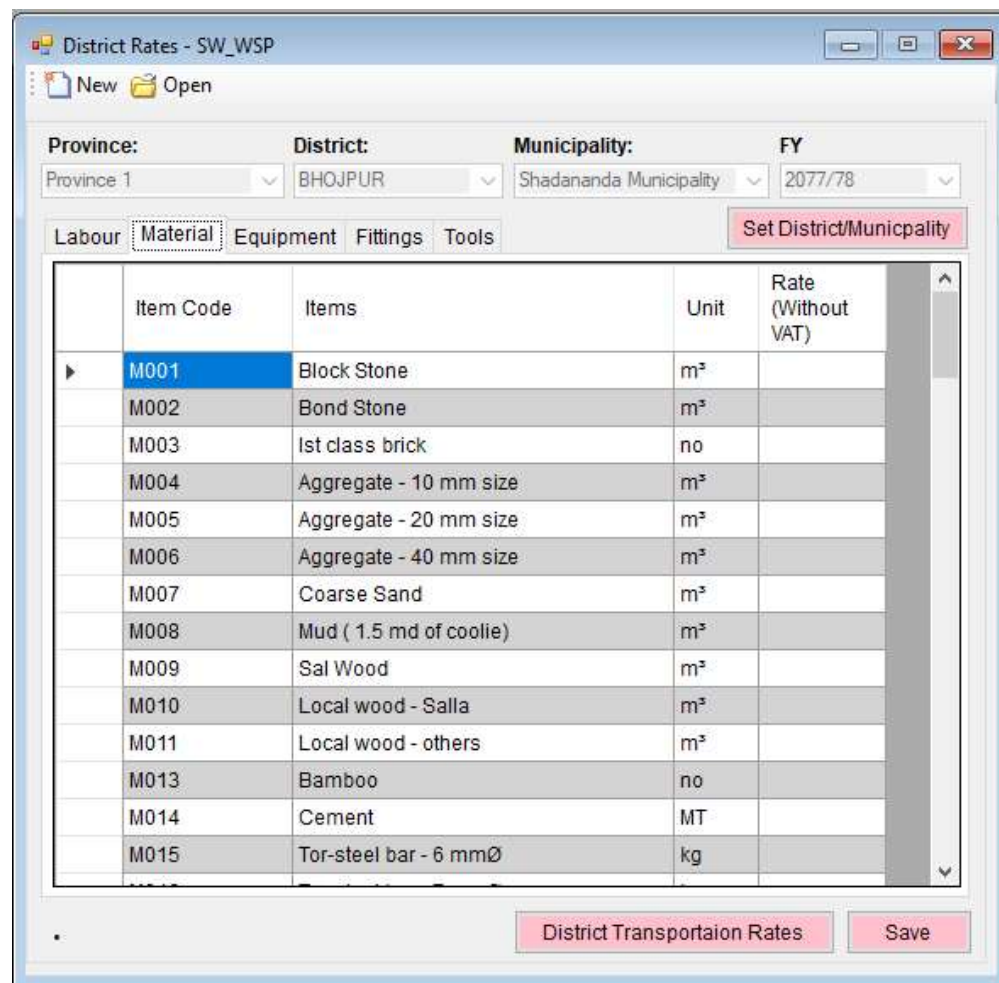
Check required report or select all from the list and click generate.

Give appropriate file name and click save.



5.9 District Rate

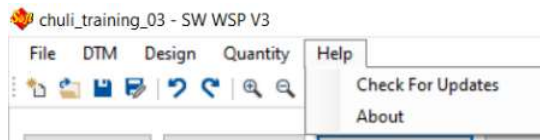
5.9.1 District Rate Module



For creating new district file for municipality, select **New** and select Province, District and Municipality along with Fiscal year. Click Set District/Municipality to set the items in the grid.

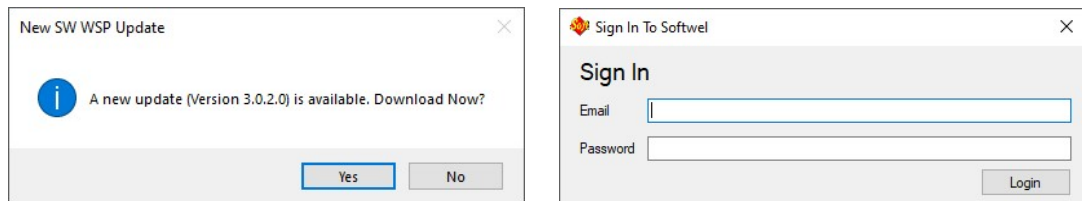
Beside district rate, you can add the district transportation rates as well, which makes us easy to retrieve rate in Rate Entry form.

6 HELP

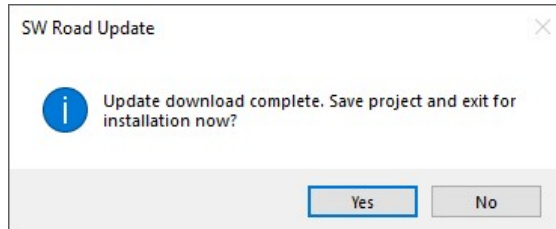


6.1 Check For Updates

Check if update is available. If update is available, following window pops out.



Click “Yes” and provide the Email and Password used for registered with Softwel to update the software. Once the software is downloaded, following window pops out.



Click “Yes” to complete the installation.

6.2 About

It displays information about the software.

Appendix A

Using SW MAPS for Survey Works

Using SW MAPS for Survey Works

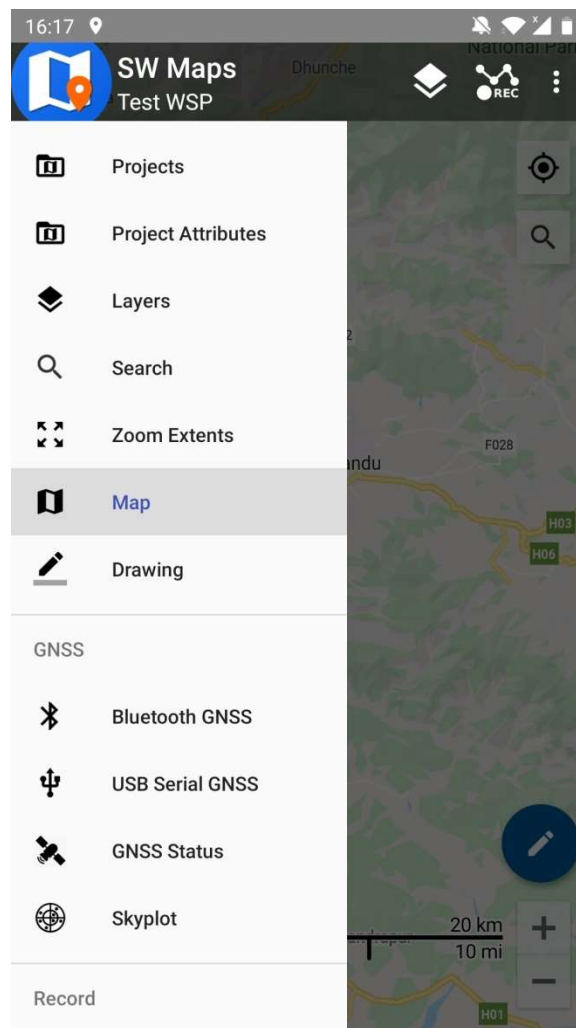
1. Starting with Project

SW Maps stores all recorded data and layer definitions in a project database. Projects can be created or opened using the “Projects” Sidebar, which can be opened using the menu or the navigation drawer.

SW Maps will prompt you to create a new project when opened for the first time and whenever no projects are available. The last used project is opened at each startup.

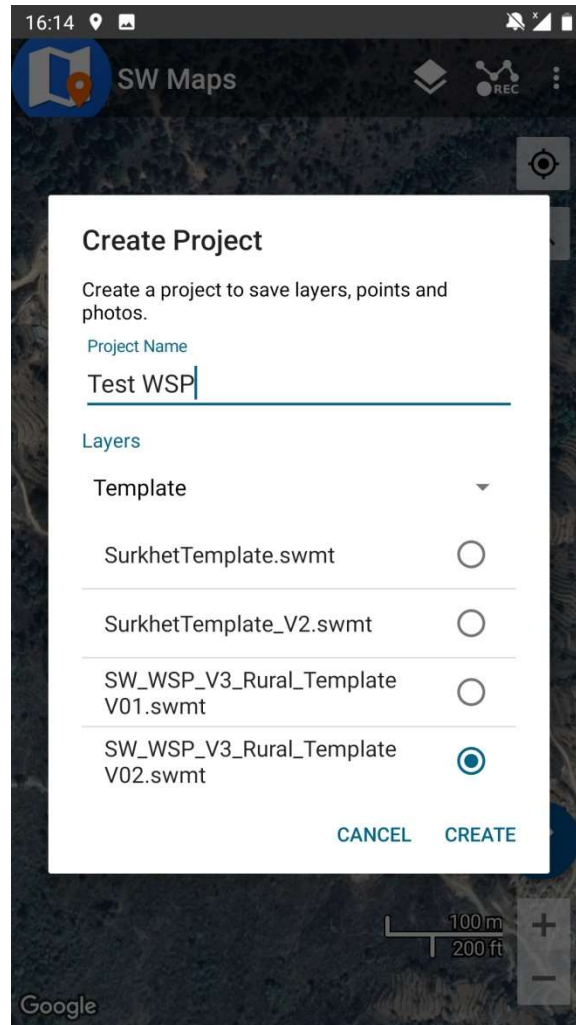
1.1. The Projects Sidebar

The Projects sidebar can be opened using the  Projects button on the navigation drawer.



1.2. Creating New Projects

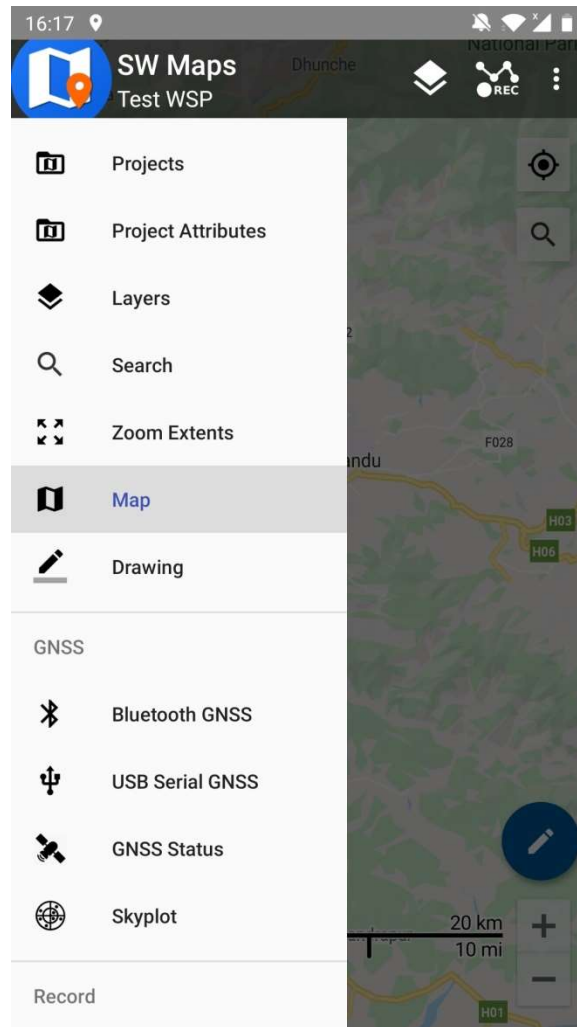
To create a new project, follow the steps below.



1. Press the **+** button to open the “Create Project” dialog.
2. Enter the name of the new project.
3. In Layers dropdown menu, select “Template” which will show all the templates installed in SW Maps Template directory.
4. Select the “SW_WSP_V3_Rural_Template.swmt”
5. Press “Create”.



2. Bluetooth GNSS

SW maps supports connecting to external GPS devices through Bluetooth, which allows the use of high accuracy GPS instruments for data collection.

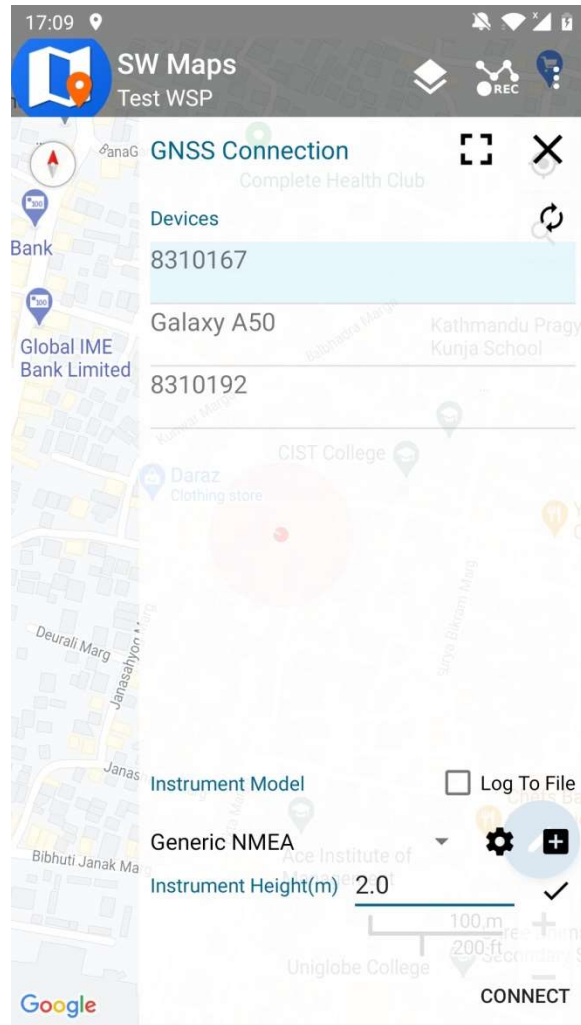


2.1. Connecting a Bluetooth GPS

To connect a Bluetooth GPS, follow the steps below:

1. Pair the GPS device with the phone.
2. Open the navigation drawer and press the  Bluetooth GNSS button to open the GNSS Connection sidebar. If Bluetooth is not enabled, a dialog will appear asking you to turn it on.
3. The GNSS Connection sidebar will show a list of all paired devices. Select your device (code of G6Ni) from the list. If the list is empty or needs to be refreshed, press the  button.
4. Select the instrument model (Generic NMEA) from the Instrument Model dropdown.

5. Enter the instrument height. The height can be changed at any time by entering the new height and pressing the ✓ button beside it.
 6. Press the “Connect” button.
- Once the instrument is connected a notification is displayed showing the current position as obtained from the external GPS (G6Ni).

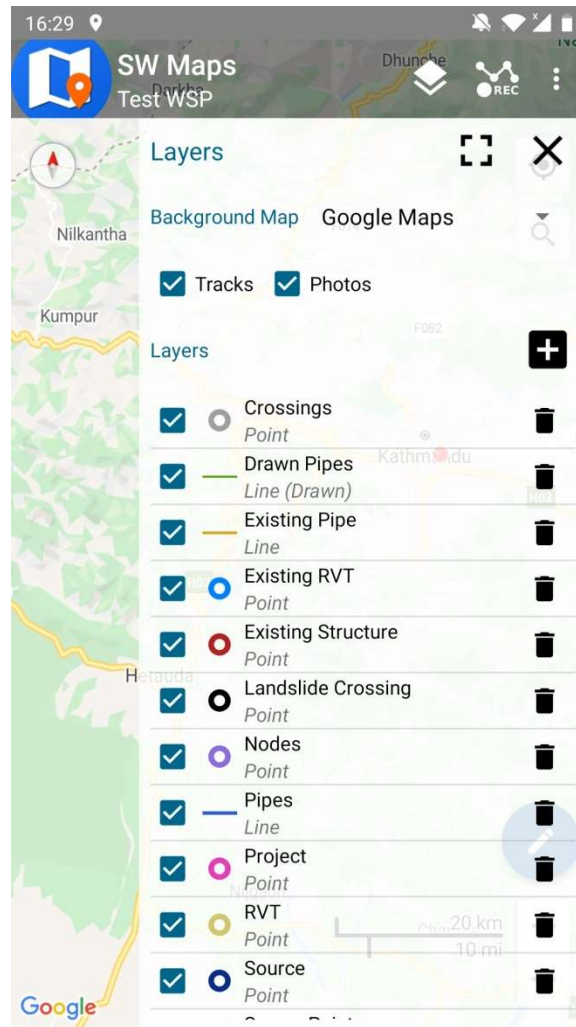


3. Layers

Layers are references to data sources which are symbolized over the map. Each layer needs to have a layer name. Shapefiles and recorded feature layers also require symbol information.

3.1. The Layer Sidebar

Layer Settings can be accessed using the Layers sidebar, which can be accessed from the menu or the navigation drawer.



The following items can be accessed from the layer sidebar, which includes Background Map, Show Tracks, Show Photos, and Layer List. The Layer List contains all the layers defined in the template selected while creating the project.

4. Features

Features are entities comprising of geometry (points, lines or polygons) and attributes associated with them. In SW Maps, recorded features must be associated with one layer, and are displayed on the map itself.


Features are displayed on the map with their own layer symbol, and a point id. Elevation of the point is also displayed alongside the marker. The appearance of elevation on the marker can be toggled via the application preferences.

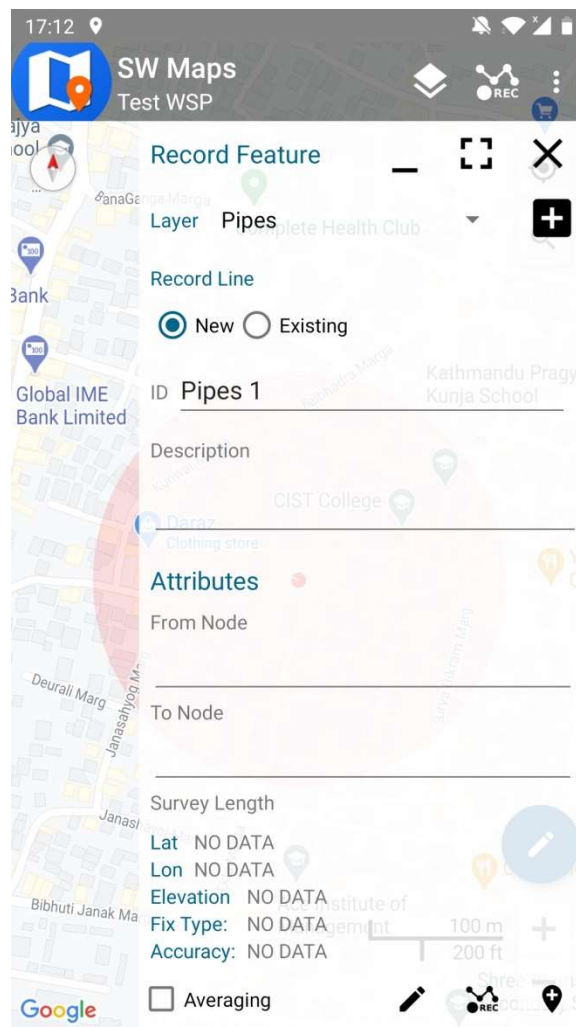
Features can be interacted with by tapping on their point markers.

4.1. Recording Features

The Record Feature sidebar allows you to record new features append points to existing features and assign values to feature attributes. To open the Record Feature sidebar, press the Record Feature entry in the Record menu. Alternatively, press the Feature item under the Record entry in the navigation drawer.

To record features, follow the steps below.

1. Select the feature layer from the dropdown.
2. For Line Features (Pipes or Existing Pipes Layers), check the “New” option and enter a unique ID. To append points to existing Pipes or Existing Pipes, check the “Existing” option and select the feature ID from the dropdown.
3. For Point Features (Crossing, RVT, Source, Survey Points, etc.), go to step 4.
4. Enter a description, and fill up attribute values. The description and attributed values may be changed later.
5. Press the “Record”  button.



17:12

SW Maps
Test WSP

Record Feature

Layer Pipes

Record Line

☒ New ☐ Existing

ID Pipes 1

Description

Daraz
Clothing store

Attributes

From Node

To Node

Survey Length

Lat NO DATA
Lon NO DATA
Elevation NO DATA
Fix Type: NO DATA
Accuracy: NO DATA

☐ Averaging

100 m
200 ft

REC

4.2. Viewing Feature Properties

To view the properties and attribute values of a previously recorded point feature, press the point marker on the map. For lines and polygons, press one of its vertices. This will show the feature properties in a sidebar, including co-ordinates of the marker, length of lines, area and perimeter of polygon features.


4.3. Editing and Deleting Feature

Features can also be edited or deleted using the feature properties sidebar.

To edit feature attributes, enter the new values in the attribute list and press the Save button.

To edit the item description, type in the new description in the descriptions box, then press the ✓ button beside it.

To delete the selected point from the line or polygon feature, press the Delete Point button.

To delete the whole feature, press the Delete  button.

