User Manual

of

CSAY OBSTACLE HEIGHT CALCULATION

(Version 2023.1)
(A free and open-source software)

Based
on
ICAO ANNEX-14, VOL-I, OLS

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CHAPTER 1 DEFINITION

1.1 Definitions as per ICAO Annex 14

1.1.1 Aerodrome

A defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

1.1.2 Balked Landing

A landing manoeuvre that is unexpectedly discontinued at any point below the obstacle clearance altitude/height (OCA/H).

1.1.3 Aerodrome Reference point

The designated geographical location of an aerodrome

1.1.4 Clearway

A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.

1.1.5 Displaced Threshold

A threshold not located at the extremity of a runway

1.1.6 Obstacle

All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

a) are located on an area intended for the surface movement of aircraft; or

b) extend above a defined surface intended to protect aircraft in flight; or

c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

1.1.7 Obstacle Free Zone (OFZ)

The airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.

1.1.8 Obstacle Limitation Surface (OLS)

It defines the limit to which objects may project into the airspace

1.1.9 Runway

A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

1.1.10 Runway strips

A defined area including the runway and stopway, if provided, intended:

a) to reduce the risk of damage to aircraft running off a runway; and

b) to protect aircraft flying over it during take-off or landing operations.

1.1.11 Threshold

The beginning of that portion of the runway usable for landing.

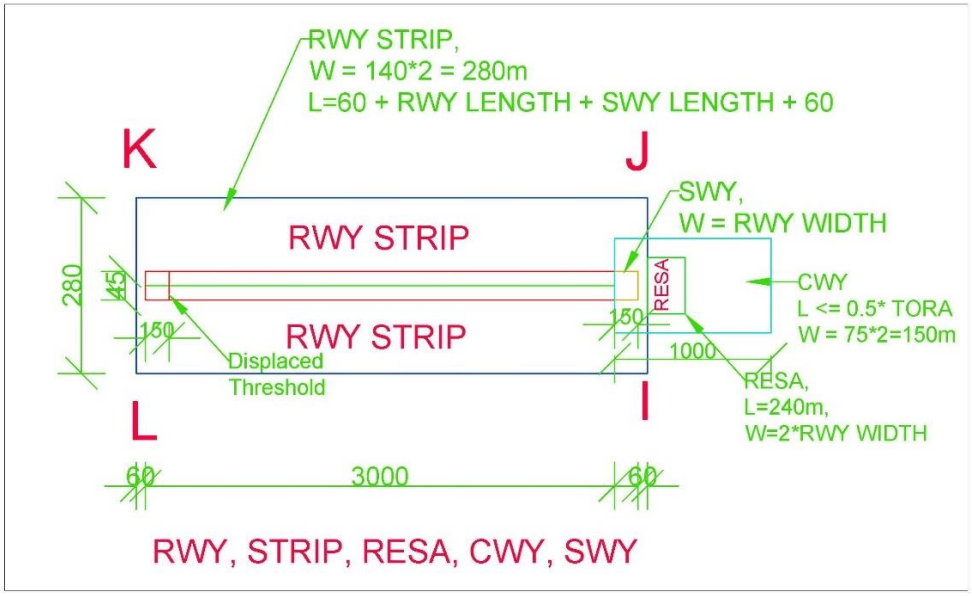


Figure 1. Rwy, Strip and other detail

CHAPTER 2 OBSTACLE LIMITATION SURFACE

2.1 Types of Obstacle Limitation Surfaces

1. CONICAL SURFACE
2. INNER HORIZONTAL SURFACE
3. INNER APPROACH SURFACE
4. APPROACH SURFACE
5. TRANSITIONAL SURFACE
6. INNER TRANSITIONAL SURFACE
7. BALKED LANDING SURFACE
8. TAKEOFF CLIMB SURFACE
9. OUTER HORIZONTAL SURFACE

2.2 OLS requirement

Runway Category	Runway Sub-Category	Obstacle Limitation surface
Non-Instrument Runway		1. Conical surface 2. Inner Horizontal 3. Approach surface 4. Transitional surface
Instrument Runway	Non-Precision Approach Runway	1. Conical surface 2. Inner Horizontal 3. Approach surface 4. Transitional surface
	Precision Approach Runway Category I	Mandatory Surfaces (Shall be) 1. Conical surface 2. Inner Horizontal 3. Approach surface 4. Transitional surface *Optional Surfaces (Should be)* *1. Inner Approach surface* *2. Inner Transitional surface* *3. Balked landing surface*
	Precision Approach Runway Category II or III	1. Conical surface 2. Inner Horizontal 3. Approach surface 4. Transitional surface 5. Inner Approach surface 6. Inner Transitional surface 7. Balked landing surface

- Note – 1: Take off climb surface shall be established for all runways meant of Take off climb.

2.3 Details of each OLS

In this document, calculations and drawings shall be based on "**PRECISION APPROACH RUNWAY CAT II OR III**" based on Table 4-1 Dimensions and slopes of obstacle limitation surfaces — Approach runways of ICAO ANNEX – 14, Vol – I, 9th Edition.

2.3.1 Conical Surface

Surfaces	Dimension
CONICAL	
Slope_%	5
Height_m	100

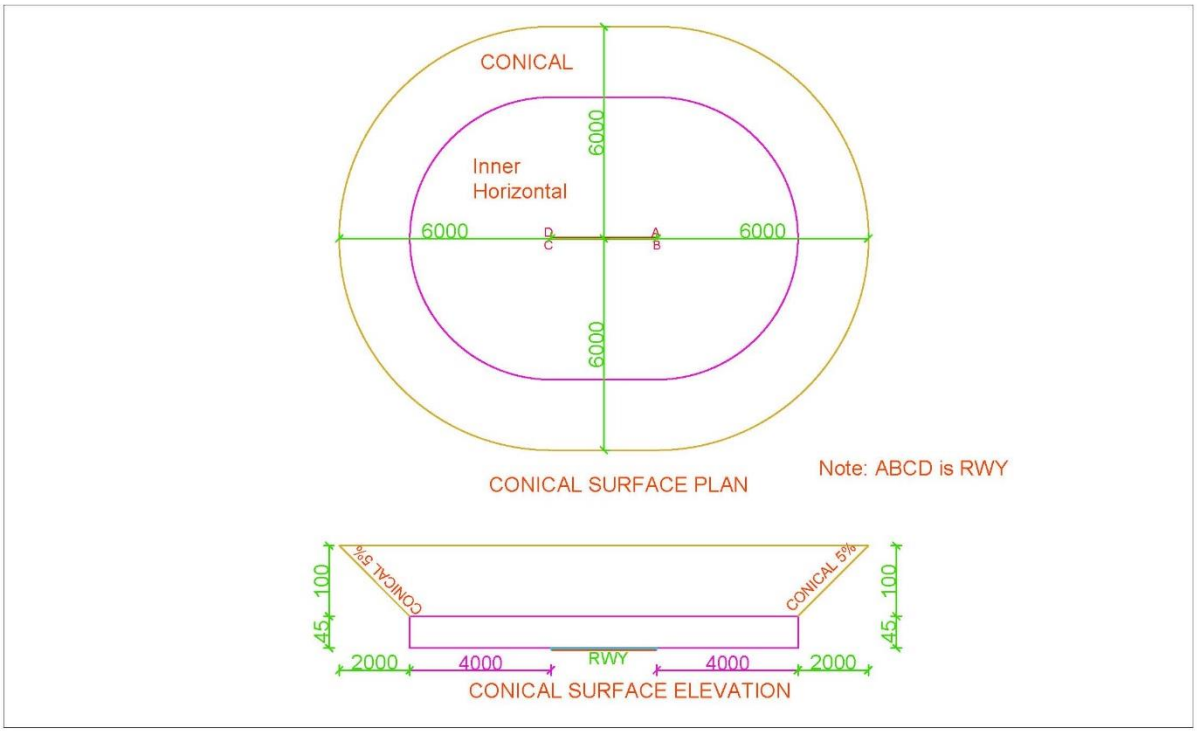


Figure 2. Conical Surface

2.3.2 Inner Horizontal Surface

Surfaces	Dimension
INNER_HORIZONTAL	
Height_m	45
Radius_m	4000

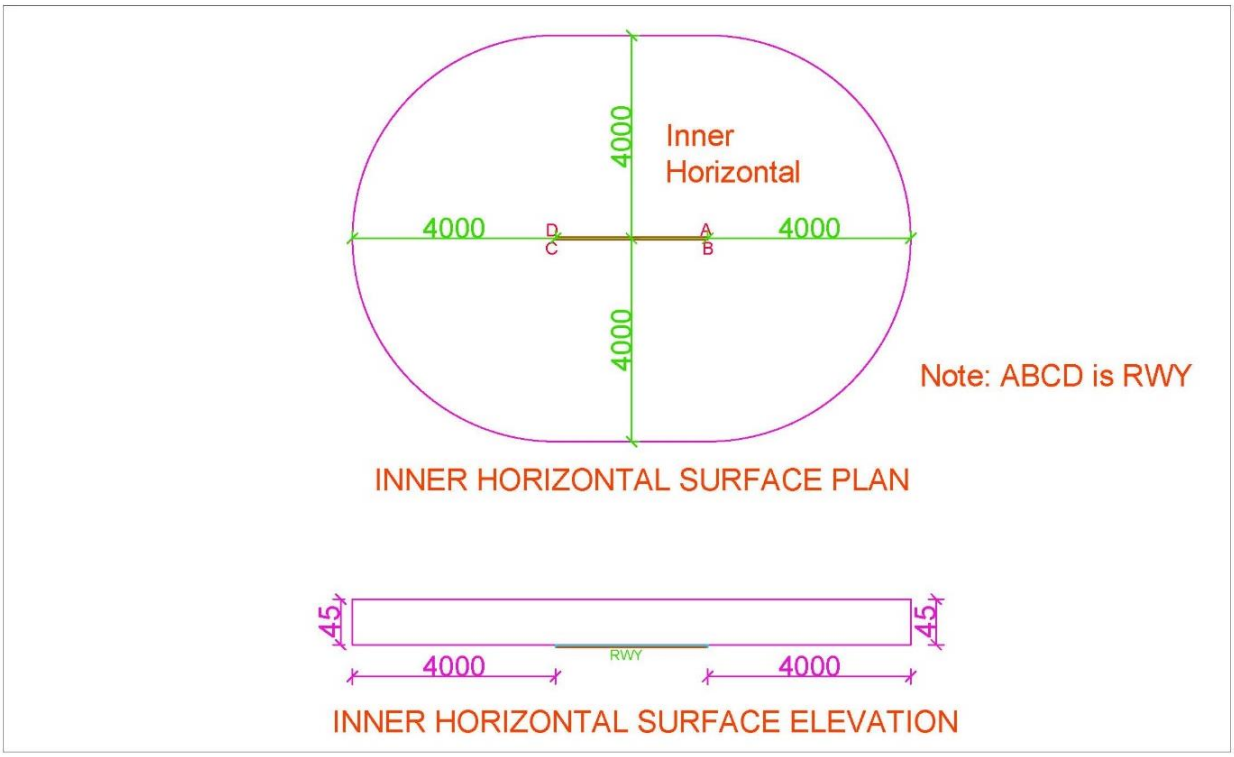


Figure 3. Inner Horizontal Surface

2.3.3 Inner Approach Surface

Surfaces	Dimension
INNER_APPROACH	
Width_m	120
Distance_from_threshold_m	60
Length_m	900
Slope_%	2

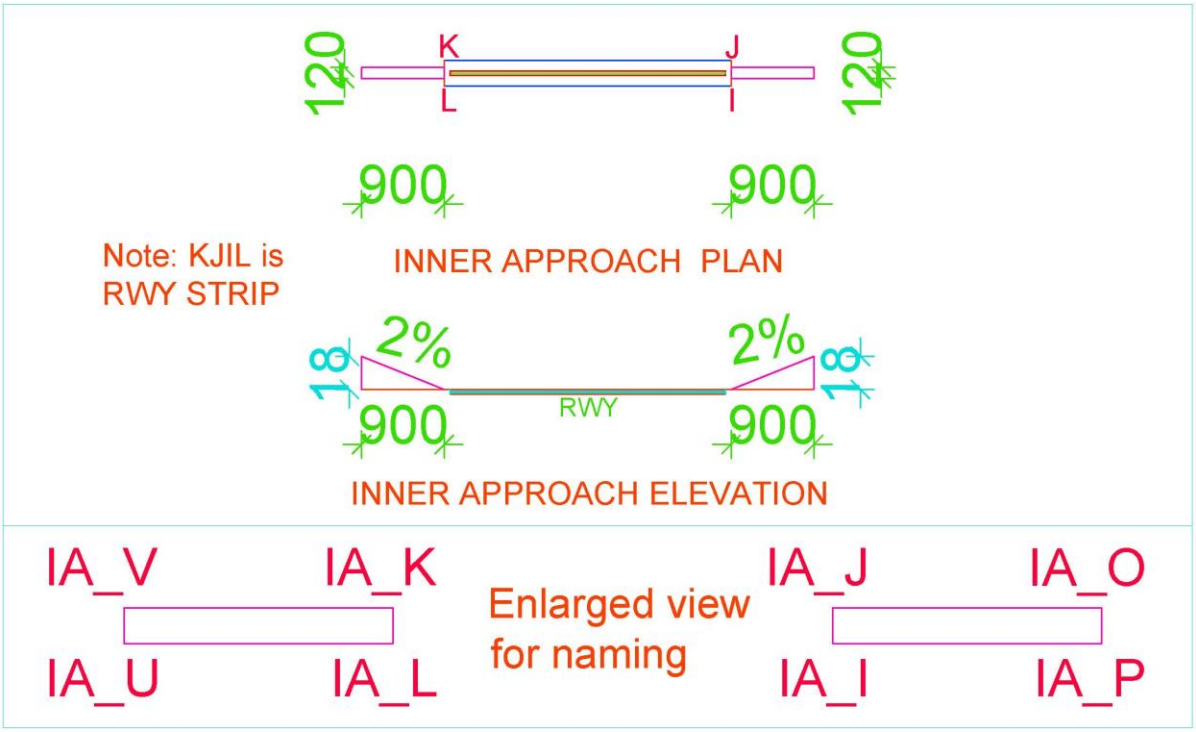


Figure 4. Inner Approach Surface

2.3.4 Approach Surface

Surfaces	Dimension	Surfaces	Dimension
Length_of_inner_edge_m	280	Second_Section	
Distance_from_threshold_m	60	Length_m	3600
Divergence_%	15	Slope_%	2.5
First_Section		Horizontal_Section	
Length_m	3000	Length_m	8400
Slope_%	2		

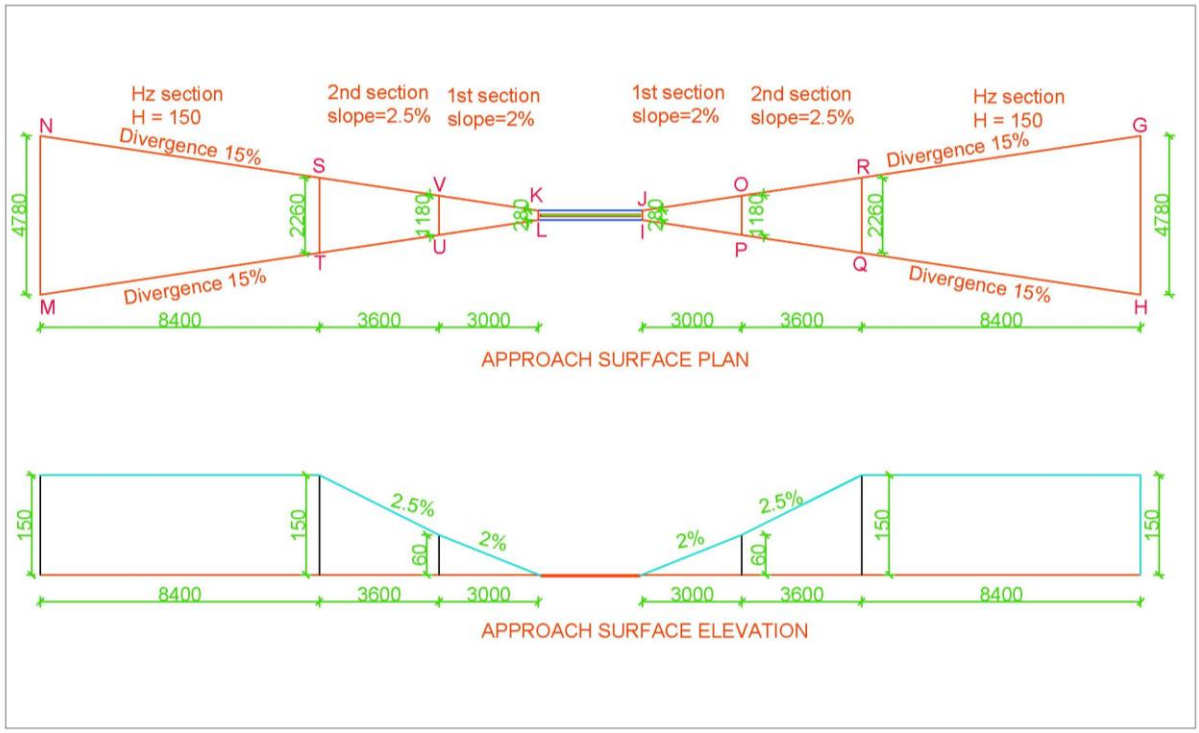


Figure 5. Approach Surface

2.3.5 Transitional Surface

Surfaces	Dimension
INNER_TRANSITIONAL	
Slope_%	14.3

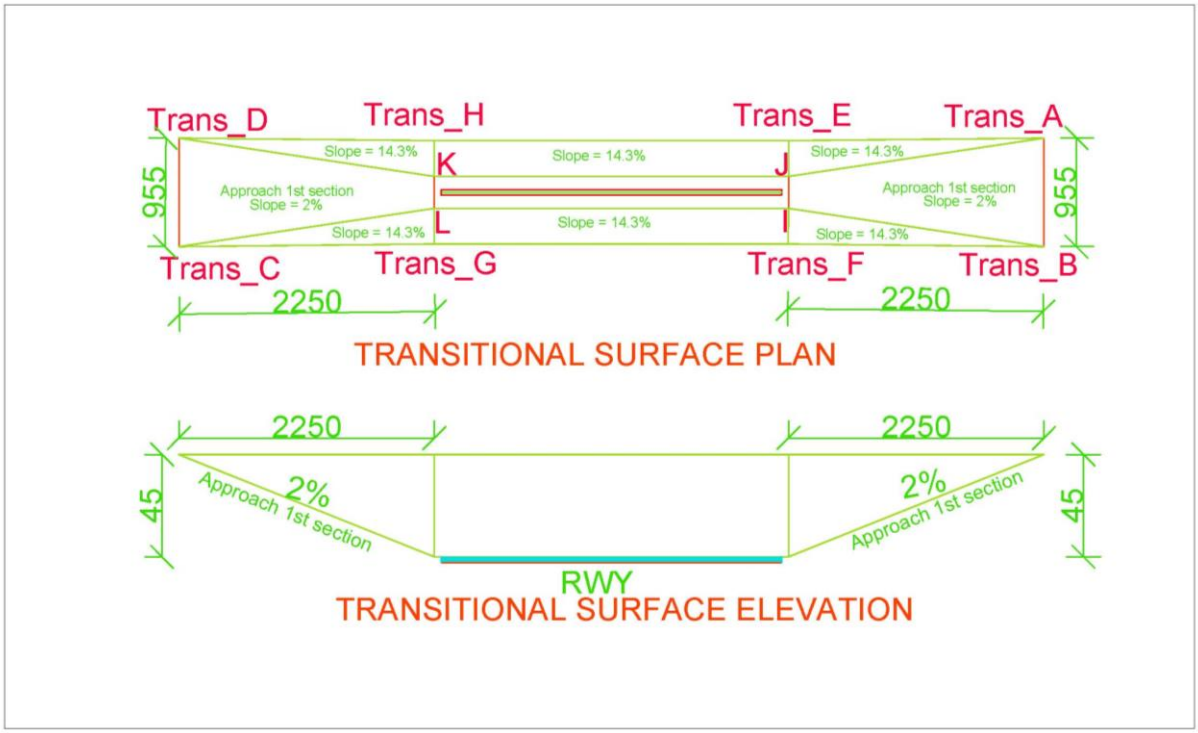


Figure 6. Transitional Surface

2.3.6 Inner Transitional Surface

Surfaces	Dimension
TRANSITIONAL	
Slope_%	33.3

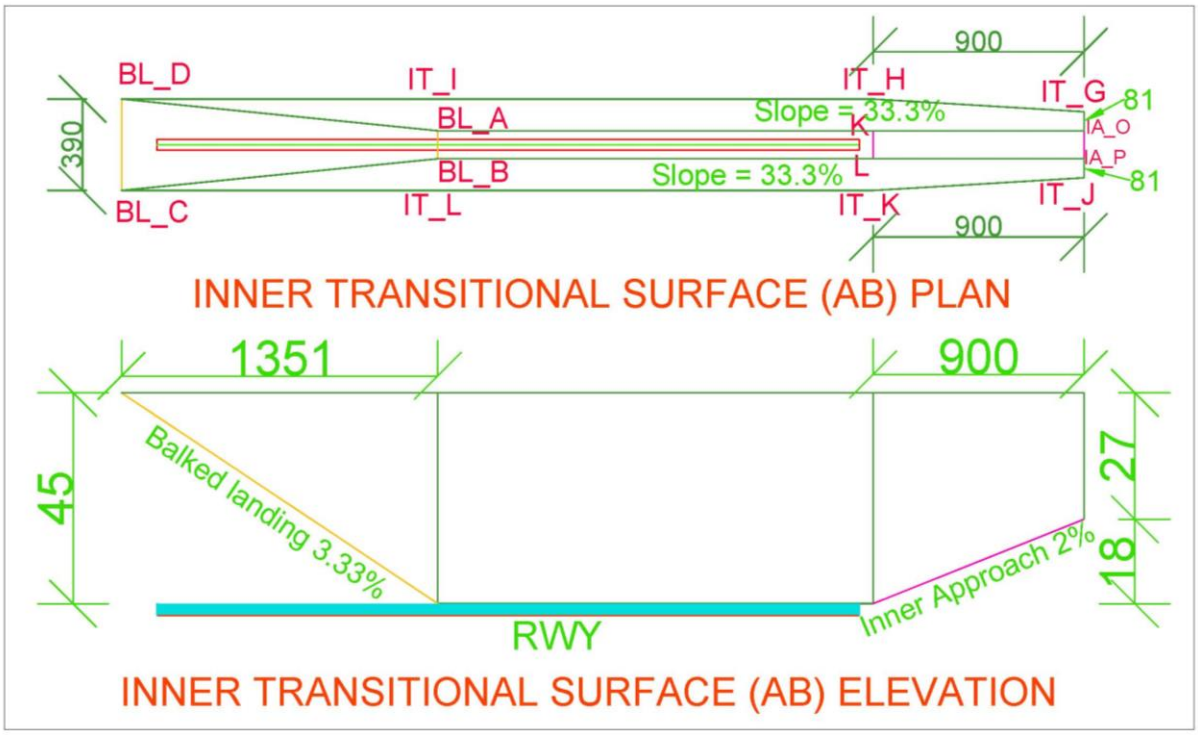


Figure 7. Inner Transitional Surface (AB Side)

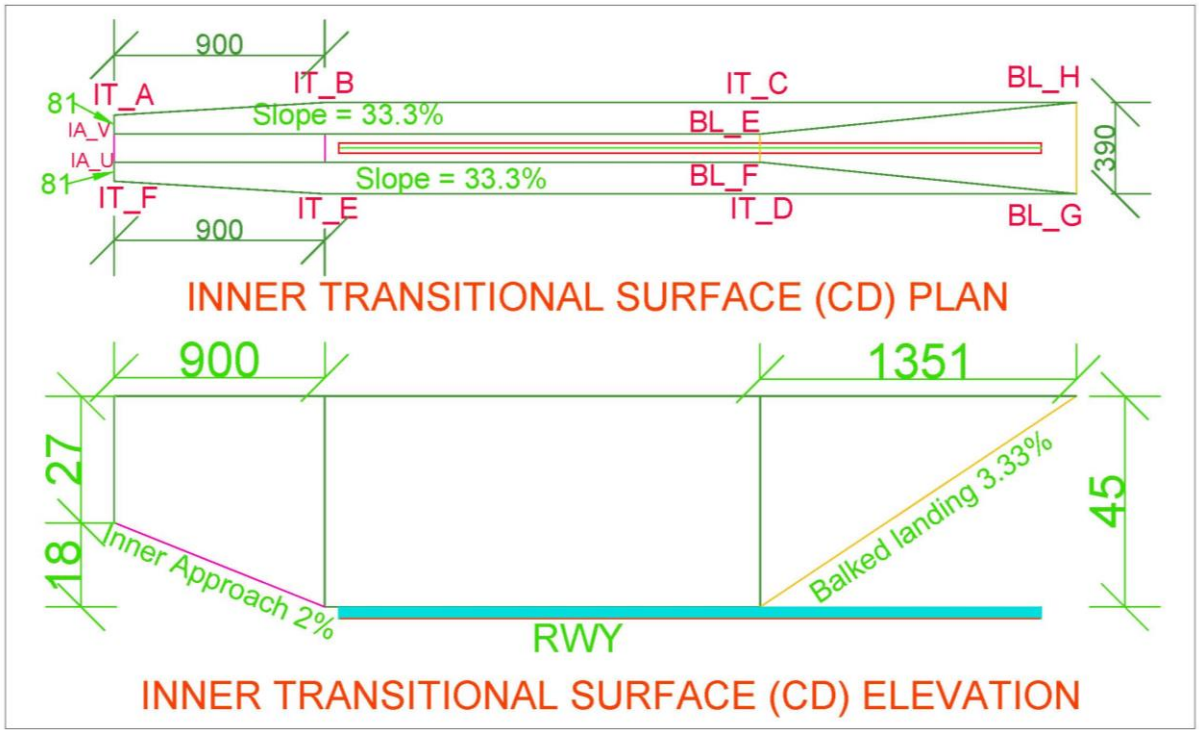


Figure 8. Inner Transitional Surface (CD Side)

2.3.7 Balked Landing Surface

Surfaces	Dimension
BALKED_LANDING	
Length_of_inner_edge_m	120
Distance_from_threshold_m	1800
Divergence_%	10
Slope_%	3.33

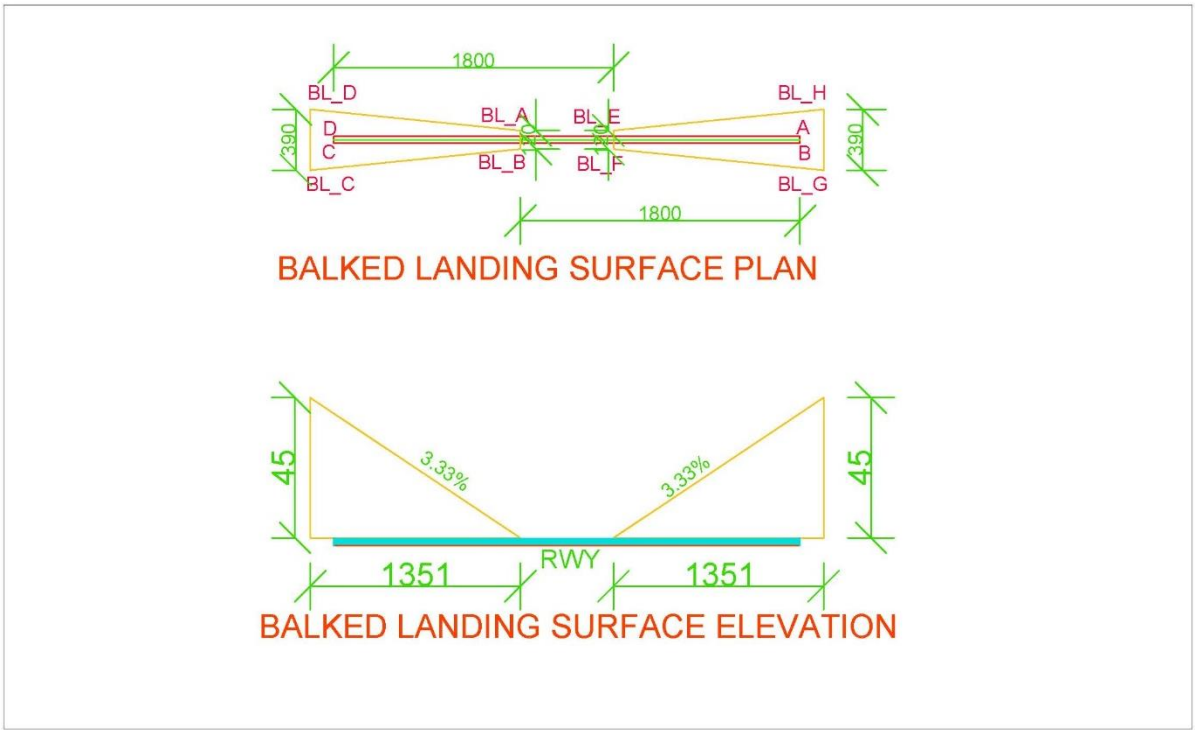


Figure 9. Balked Landing Surface

- *Note:*
  - *If threshold is displaced by distance 'd', Balked landing surface will also be displaced by distance 'd' in the direction of displaced threshold.*
  - *In* Figure 14 *"VNBW.txt", AB_Threshold_displaced_By and CD_Threshold_displaced_By shall be given value d1 and d2 respectively if Threshold AB is displaced by d1 and CD is displaced by d2.*
  - *If thresholds aren't displaced, value will be zero*

2.3.8 Take Off Climb Surface

Surfaces	Dimension
TAKE_OF_CLIMB_SURFACE	
Length_of_inner_edge_m	180
Distance_from_RWY_End_m	60
Divergence_%	12.5
Final_Width_m	1800
Length_m	15000
Slope_%	2

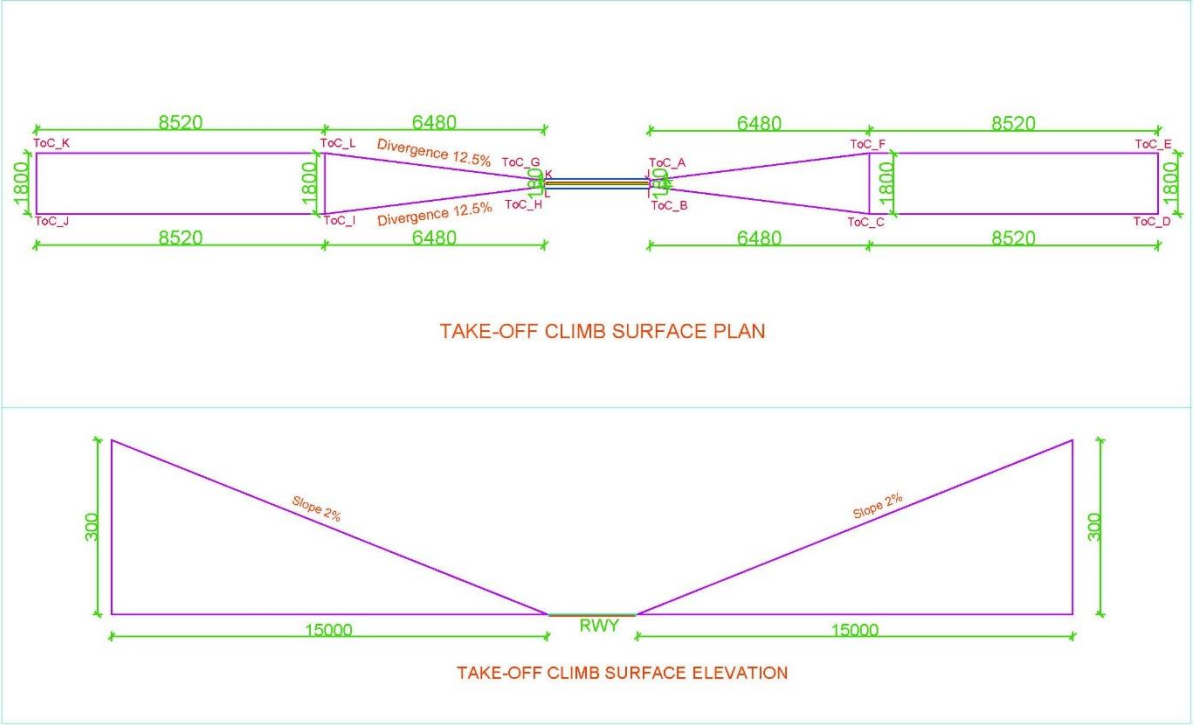


Figure 10. Take off Climb Surface

- ***Note:***
  - *Take-Off Climb Surface starts from 60m end of runway (i.e. RWY strip) or end of clearway, whichever is greater.*
  - *For example, as in* Figure 1*,*
    - *Distance of strip from RWY end (d1) = SWY + strip end = 150+60=210m*
    - *Distance of CWY from RWY end (d2) = 1000 m*
    - *Distance beyond strip end of CWY = 1000-210=790 m = d*
    - *This value i.e., 'd' is to be placed for respective end of runway in AB_CLWY_beyond_strip and CD_CLWY_beyond_strip as in* ***Error! Reference source not found.***Figure 14*.*

2.3.9 Outer Horizontal Surface

Surfaces	Dimension
Center at	ARP
Radius_m	15000

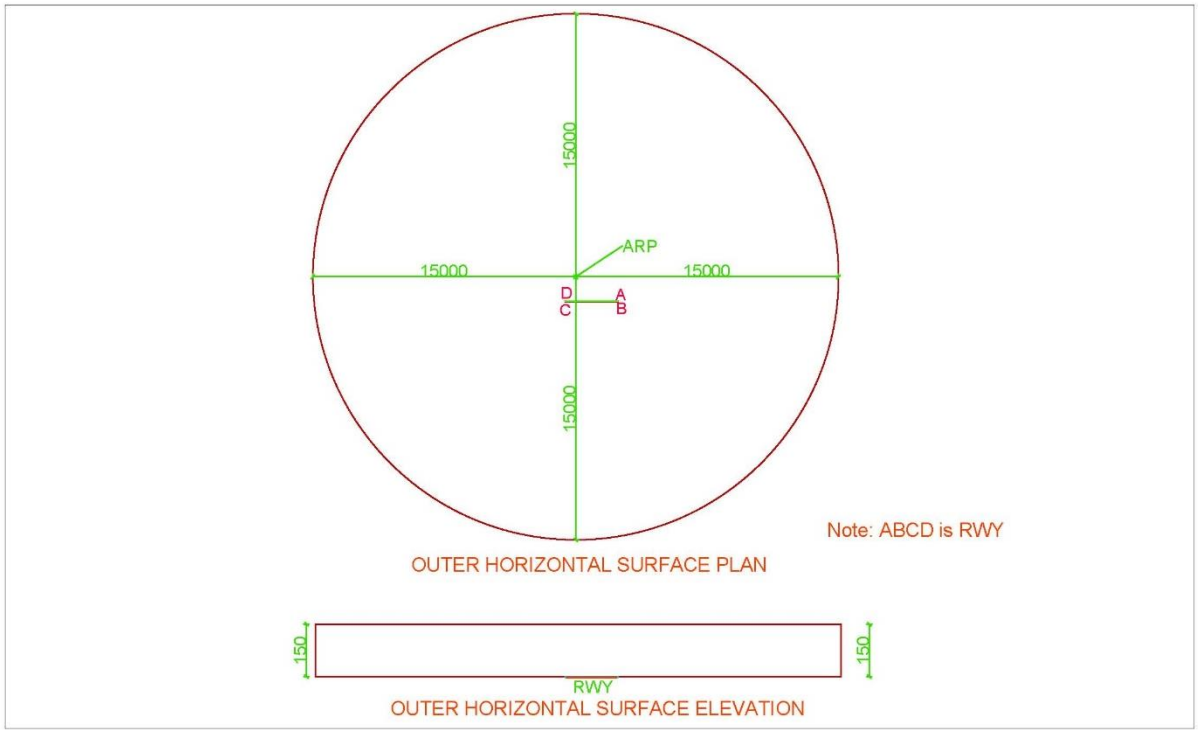


Figure 11. Outer Horizontal Surface

CHAPTER 3 INTRODUCTION TO SOFTWARE

3.1 Overview of Software

Name of the Software	**CSAY Obstacle Height Calculation**
Version	2023.1
Type	Free and Open source
Operating System	Windows 10 (preferable) or higher
Display resolution of Monitor screen (Recommended)	1366 x 768
Setup	No installation required
Link to download	https://github.com/ajayyadavay/CSAYObstacleHeightCalculation
Created/Developed/Programmed by	Er. Ajay Yadav
E-mail:	Civil.ajayyadav@gmail.com

3.2 Functions of Software

1) Finds the height of the obstacle
2) Generates OLS for any runway orientation of any country with correct input of Ellipsoid/Projection system of coordinate
3) Creates pdf of the report
4) Draws map of Obstacle Limitation surface and plotted point showing distance between runway and obstacle location
5) Creates tippani in Nepali and Letter in Nepali as well as English
6) Exports the route between runway and obstacle and their points to KML file
7) Allows user to Perform database operations: ADD, MODIFY, DELETE, DISPLAY, FILTER
8) Exports the saved/added data to excel
9) Allows user to Auto process which will generate report, tippani, letter, KML and Map saved in a folder
10) Allows user to enter decimal degrees (DD) of location of obstacle and also assists in converting from Degree, Minute and Second (DMS) format to DD.
11) Allows user to draw all the obstacle limitation surfaces or only selected surfaces and calculate accordingly
12) Allows user to extract coordinate (latitude and longitude) from map on mouse click
13) Allows user to input multiple obstacle coordinates in ".txt" format and output Obstacle table of all the input in excel format used during OLS Survey.

3.3 Limitation of Software

1) This software can be used for airport having only one Runway and not for airport having the parallel or intersecting runways or more than one Runways.

3.4 Layout of Software

1) There are Ten Tabs
2) All the Text boxes labelled with black foreground is input and others are either calculated textboxes or loaded from the '*.txt' files
3) For Auto process, input all required value and click on menu Processing>Auto Process button
4) Textboxes with orange colored label in "General" tab are compulsory input fields
5) All the Combo Boxes have their values loaded from "*.txt" files

6) Map is drawn in “RWY to obstacle distance calculation” tab
7) At top, there is Menu (File, Database and Processing)

3.5 Input Text files (“*.txt”) and folder

All the text files contain data as per the name of the text files.

Note: The user is allowed to only edit the content of text files strictly adhering to the format and user cannot rename or delete the text files or change the location of the text files.

Figure 12 shows folders and its content. The user can edit content as per their requirement.

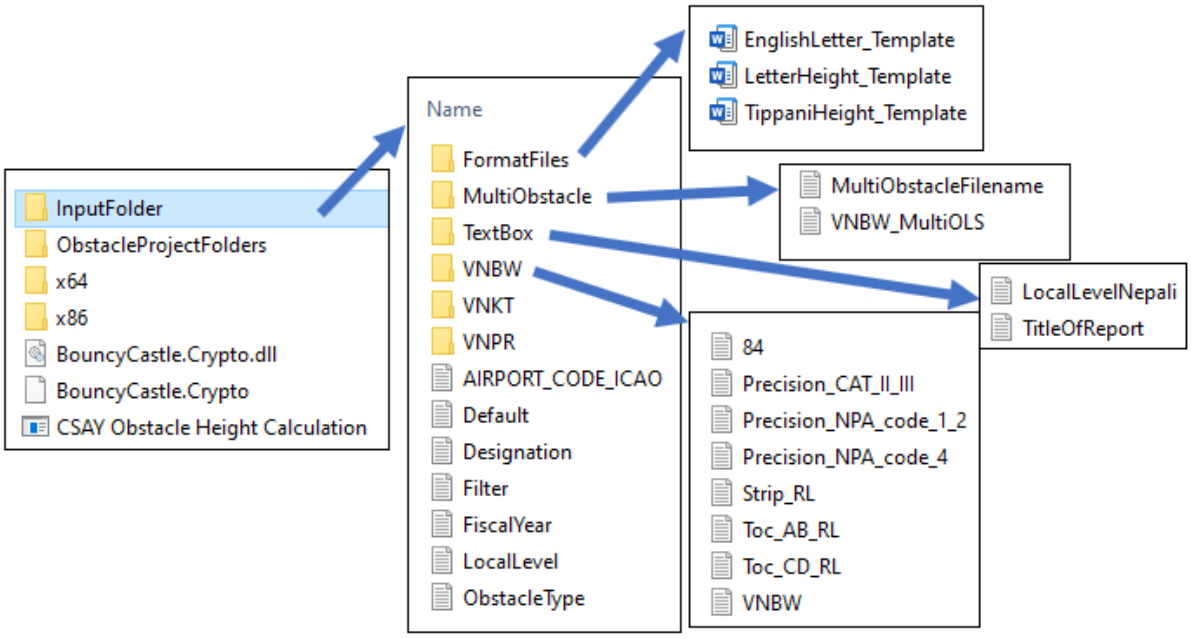


Figure 12. Input folder and its content

3.5.1 Content of TextBox Folder

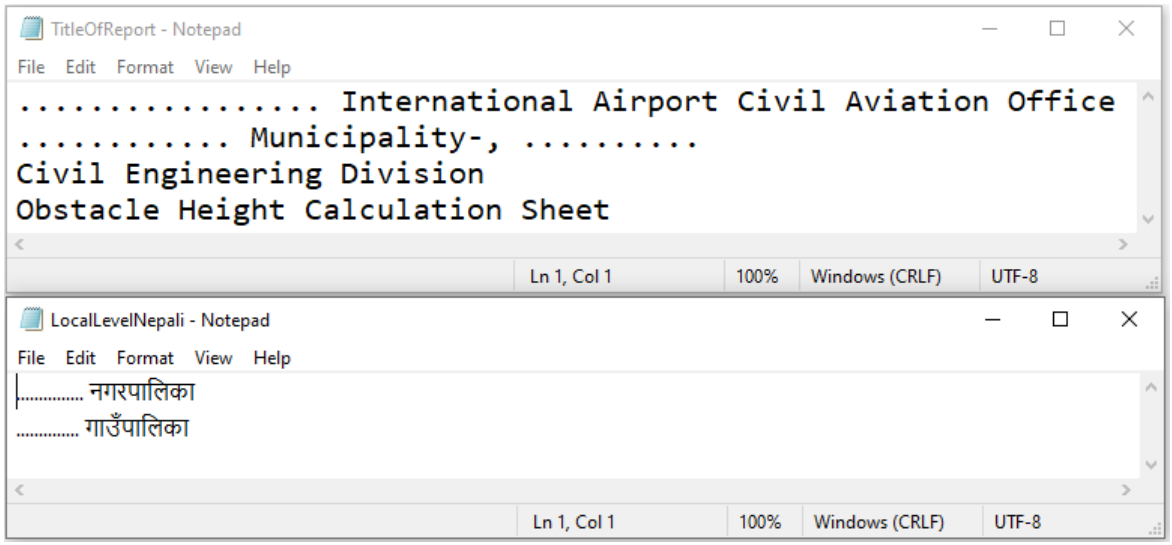


Figure 13. TextBox Folder Content

1) LocalLevelNepali.txt → contains local level name in Nepali/Devanagari and it should be in the same order as that of English local level name as shown in Figure 16.
2) TitleOfReport.txt → contains title of the report generated

3.5.2 Airport code folder content

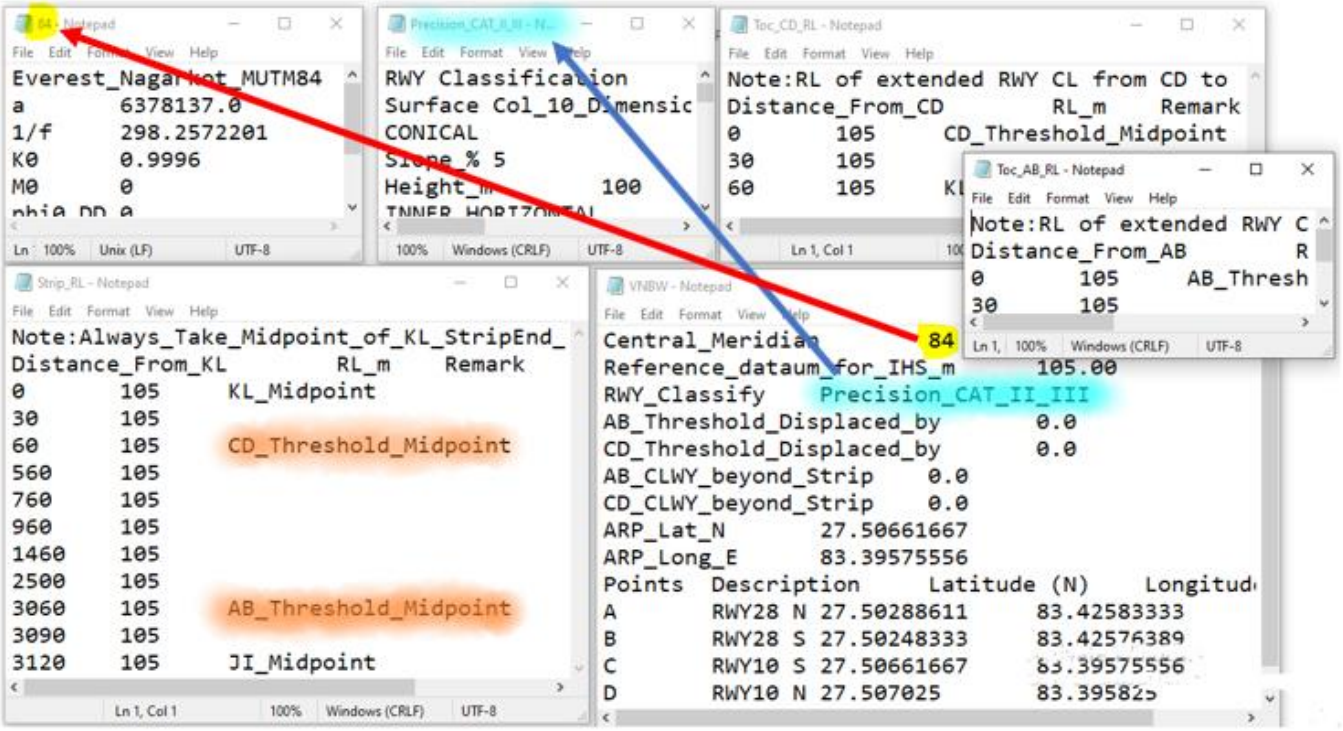


Figure 14. Airport Code (e.g., VNBW) Folder Content

1) "84.txt"
    a. contains parameter of ellipsoid used in 2D projection i.e., to convert latitude and longitude to Easting and Northing and vice-versa.
    b. Instead of "84.txt", you can rename or create a new file with different longitude, e.g., "87.txt" but "87" should be specified in "VNBW.txt" as value of Central_Meridian.
2) "Precision_CAT_II_III.txt"
    a. contains data of any one column of OLS table of ICAO ANNEX-14, VOL I, chapter 4, which specified dimension of OLS.
    b. Also "Precision_CAT_II_III" should be specified in "VNBW.txt" as value of "RWY_Classify".
    c. Different filename can be used but should be specified in "VMBW.txt"
3) ToC_CD_RL.txt
    a. This text file contains data of chainage-wise Reduced Level (RL) of extended centerline of Runway staring from the CD side Threshold and continuing along the centerline of clearway or end of Runway strip whichever is greater.
    b. *This filename cannot be changed.*
    c. The maximum RL of contained in this file is used as ground RL for Take-Off Climb Surface at CD Threshold.
4) ToC_AB_RL.txt

a. This text file contains data of chainage-wise Reduced Level (RL) of extended centerline of Runway staring from the AB side Threshold and continuing along the centerline of clearway or end of Runway strip whichever is greater.
b. *This filename cannot be changed.*
c. The maximum RL of contained in this file is used as ground RL for Take-Off Climb Surface at AB Threshold.

5) Strip_RL.txt
   a. Contains data of chainage-wise RL of centerline of strip i.e., centerline of Runway and its extension on both ends beyond thresholds and up to strip end.
   b. *This filename cannot be changed.*
   c. This data is used as ground RL for Transitional surface, Inner transitional surface, Approach and Inner Approach Surface.
   d. Transitional and Inner transitional surfaces use the nearest RL data and these surfaces will be drawn in the chainage specified in this file
   e. For Approach and Inner Approach, the midpoint RL of respective threshold is used and these RL's are identified by keyword *CD_Threshold_Midpoint* and *AB_Threshold_Midpoint* contained in this file.
   f. The chainage can be any regular interval (e.g., 0, 10, 20, 30, etc.) or irregular interval (e.g., 0, 10, 15, 23, 28, 30, etc.) but staring chainage i.e., zero should always begin at midpoint RL of "KL" near "CD threshold".
   g. For nomenclature, refer Figure 5 and Figure 31.
6) Airportcode.txt e.g., VNBW.txt
   a. This file can have any ICAO airport code name like "VNBW.txt", "VNKT.txt", "VNPR.txt", etc. Here "VNBW.txt" is used throughout the document as example.
   b. In text file VNBW.txt, Central meridian should be a number e.g., 84 and a filename "84.txt" should be in the same folder containing parameters of ellipsoid in format as shown in Figure 14.
   c. "Reference_dataum_for_IHS_m" contains RL for Inner Horizontal Surface
   d. RWY Classify should contains the filename e.g. "Precision_CAT_II_III.txt" of the file which contains information of OLS dimensions as shown in Figure 14.
   e. AB_Threshold_Displaced_by and CD_Threshold_Displaced_by contains length by which these thresholds have been displaced
   f. AB_CLWY_beyond_Strip contains length of clearway which extends beyond the strip at AB threshold as in Figure 1, this value will be (1000 – 150 – 60) = 790.
   g. CD_CLWY_beyond_Strip contains length of clearway which extends beyond the strip at CD threshold as in Figure 1, this value will be 0 as there is no clearway. Also, these values will be zero when clearway doesn't extend beyond the Runway strip.
   h. AB_CLWY_beyond_Strip and CD_CLWY_beyond_Strip specifies how far will the Take Off climb surface begins beyond the strip
   i. ARP_Lat_N and ARP_Long_E contains latitude and longitude of ARP published in Aerodrome manual
   j. A,B,C,D are points of the runway corners and contains their respective latitude and longitude. Refer Figure 31, for nomenclature.

3.5.3 MultiObstacle input format

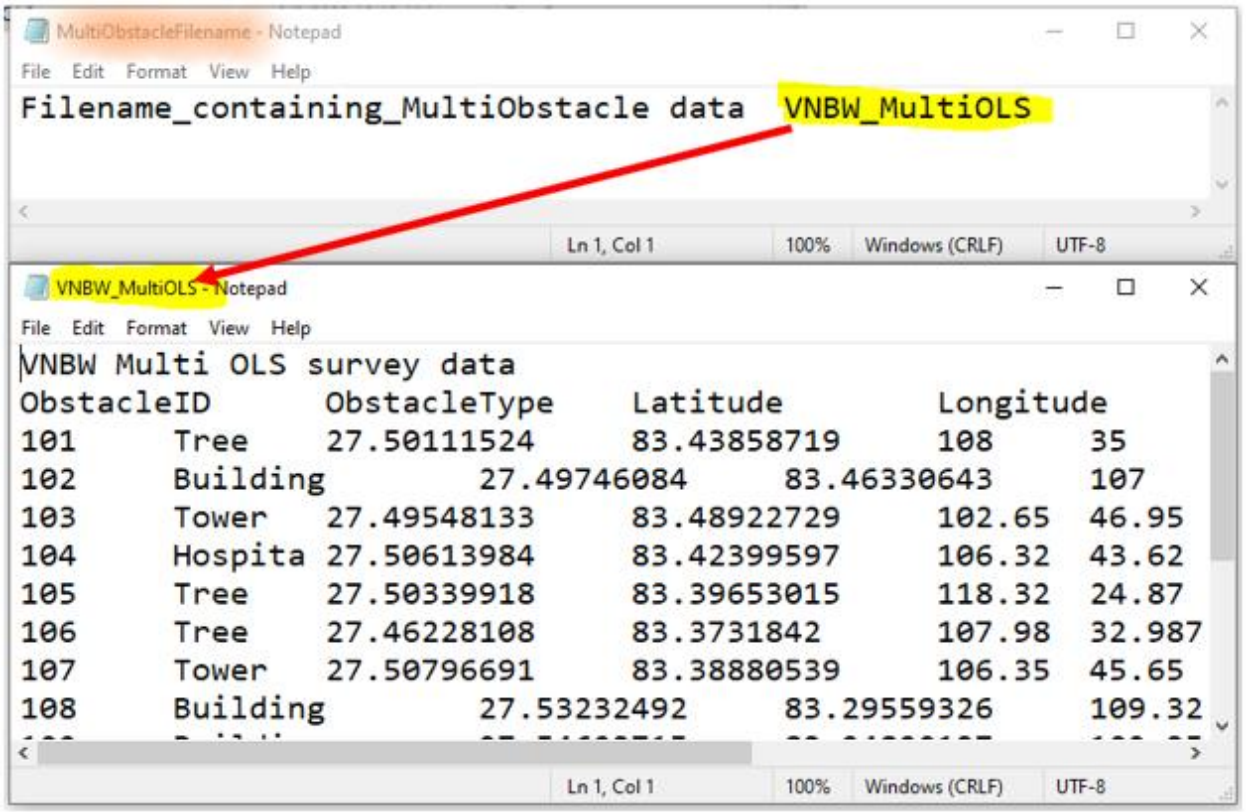


Figure 15. MultiObstacle folder content

1) "MultiObstacleFilename.txt" contains the filename which contains data related to different obstacle obtained after OLS survey and it loaded in the first table of Figure 27.

3.5.4 Others Texfile input format

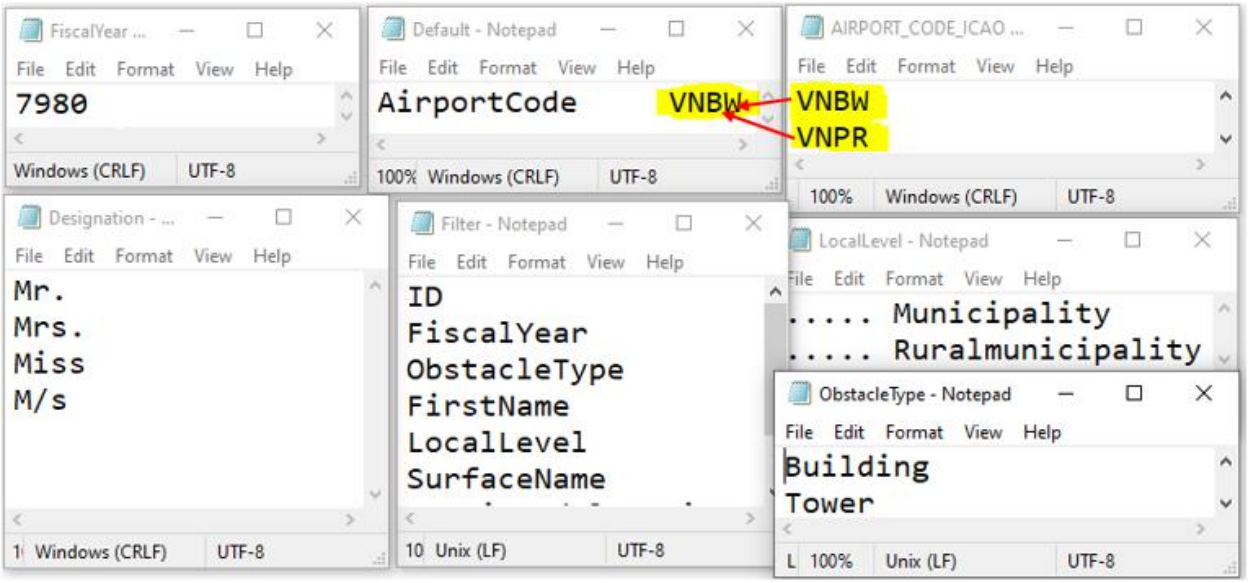


Figure 16. Other textfile content format

1) FiscalYear.txt

a. Contains fiscal year data in column-wise list format

2) Default.txt
   a. Contains only one airport code among the codes specified in "AIRPORT_CODE_ICAO.txt", which will be automatically loaded when the software opens by default. This can be changed to VNPR or VNKT or any other name among the list contained in "AIRPORT_CODE_ICAO.txt"
3) "AIRPORT_CODE_ICAO.txt"
   a. contains column-wise list of ICAO airport codes.
   b. However, IATA codes can also be used but all the files and folders should be renamed accordingly
4) Designation.txt
   a. Contains designation that will be put before name of the person/building/tower, etc. whose data is entered
5) Filter.txt
   a. Contains the column name of table shown in Figure 17, which can be used to filter the record in the table
6) LocalLevel.txt
   a. Contains local level name in English and must match the order contained in LocalLevelNepali.txt
   b. These texts are loaded in the combo box as shown in Figure 21 (for English) and Figure 22 (For Nepali/Devanagari)
   c. Selecting any name from "LocalLevel.txt" will automatically load corresponding name from "LocalLevelNepali.txt".
7) ObstacleType.txt
   a. Contains the type of obstacle name in column-wise list format

3.6 Content of Tab

3.6.1 Load All Record

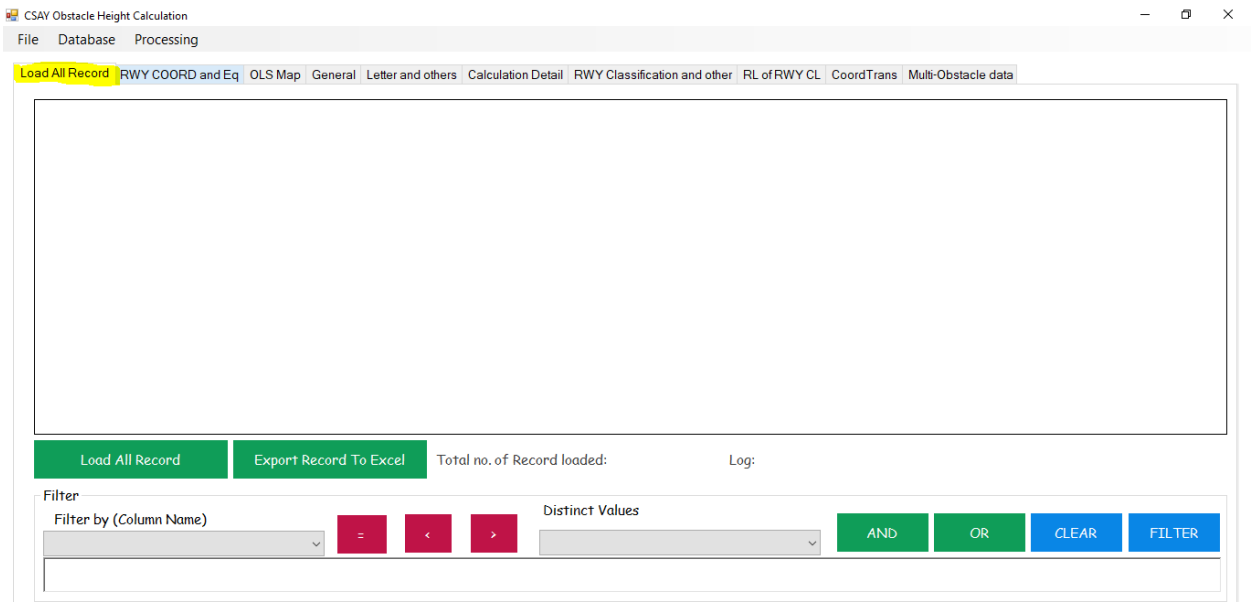


Figure 17. Load all Records Tab

3.6.2 RWY COORD and Eq

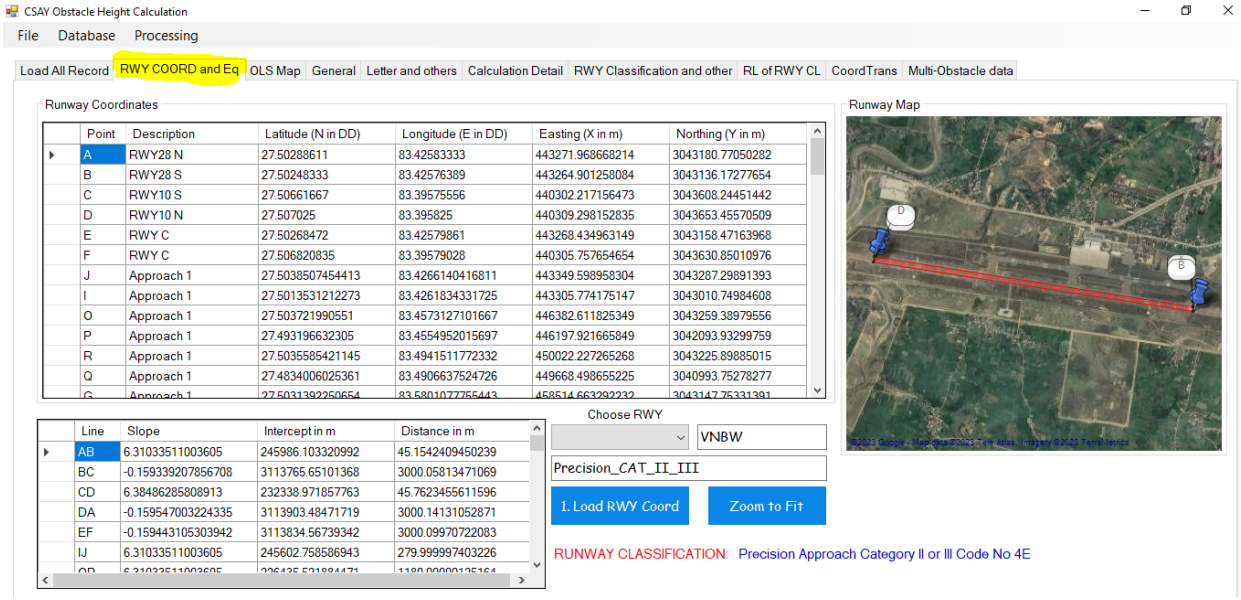


Figure 18. RWY COORD and Eq Tab

1) As in Figure 18, First enter the required data in specified format in text files as in Figure 12
2) Choose RWY
3) A Folder of the same name (Here, it is VNBW) should be present in folder and a file named “VNBW.txt” will be in the folder VNBW as shown in Figure 12 and Figure 14
4) Click button “1. Load RWY Coord” to load and “Zoom to Fit” to fit.
5) As in Figure 12, the “default.txt” contains name of the Airport code which will be automatically loaded, if file exists, when the software opens.
6) Runway Classification name will be loaded from “Precision_CAT_II_III.txt” as shown in Figure 12 and Figure 14.

3.6.3 OLS Map

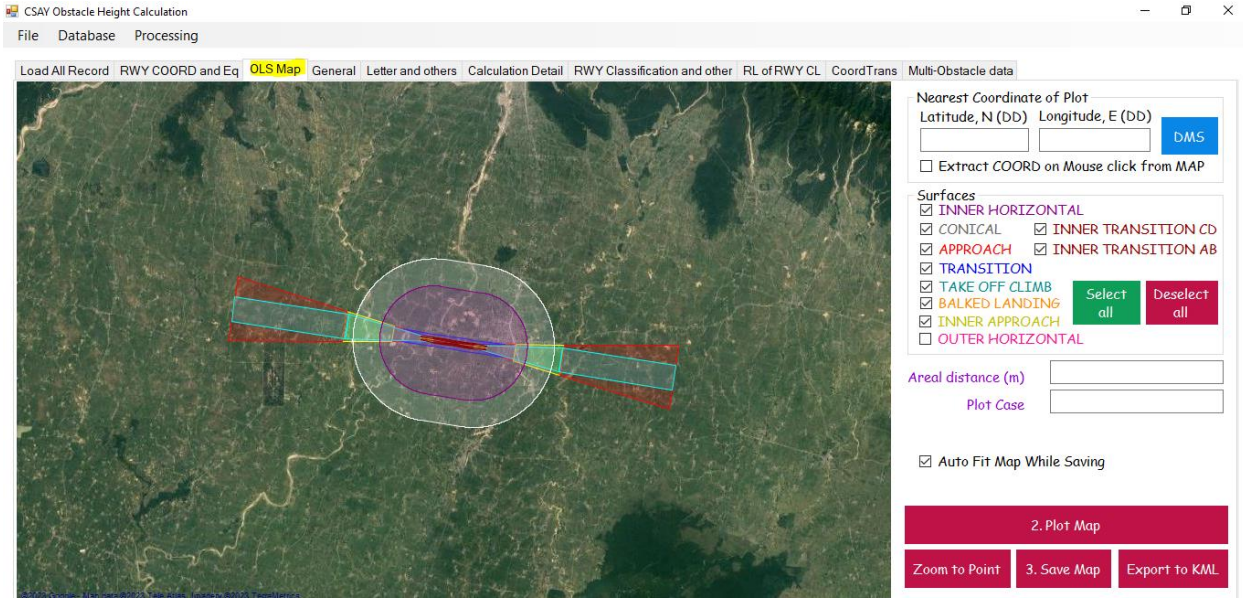


Figure 19. OLS Map Tab

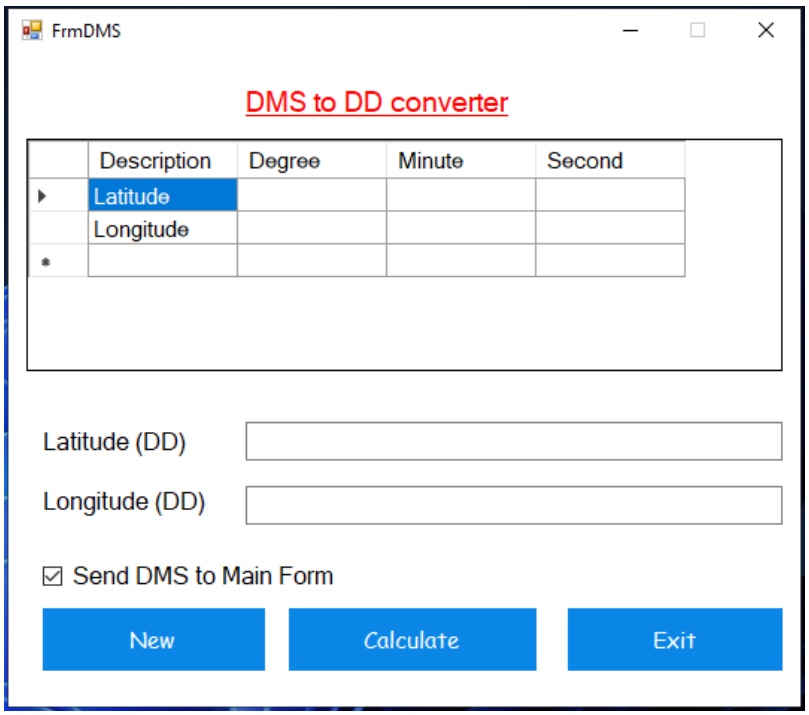


Figure 20. DMS to DD Converter

1) Input latitude and longitude in DD format.
2) Click DMS and enter latitude and longitude in DMS format as in Figure 20.
3) If “Extract COORD on mouse click from Map” is checked on, latitude and longitude text boxes will be filled the latitude and longitude of the map and if checked off, user has to input the coordinate themselves.
4) Under surfaces, select the required surfaces to **display and calculate**

5) Click button “2. Plot Map” to plot the obstacle and runway point and calculate areal distance
6) If “Auto Fit Map While Saving” is checked on, the map will be autofit to the points plotted and that map will be saved but if it is checked off, the user can adjust the map to desired zoom level by scrolling mouse wheel and then click “3. Save Map”
7) Click “Export to KML” to export the points of runway, obstacle and line joining them to KML file
8) “Zoom to Point” zooms map to the plotted point

3.6.4 General

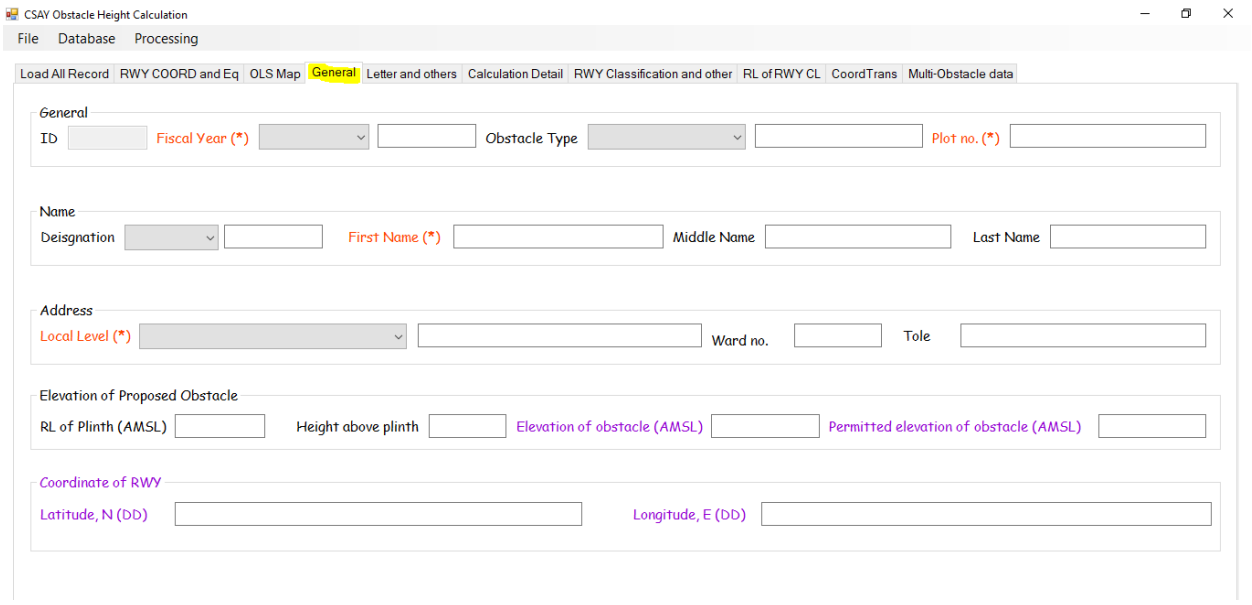


Figure 21. General Tab

1) All orange label marked with (*) are mandatory fields/textboxes
2) All black labelled fields are to be entered by user
3) Other are calculated or loaded from text files

3.6.5 Letters and others

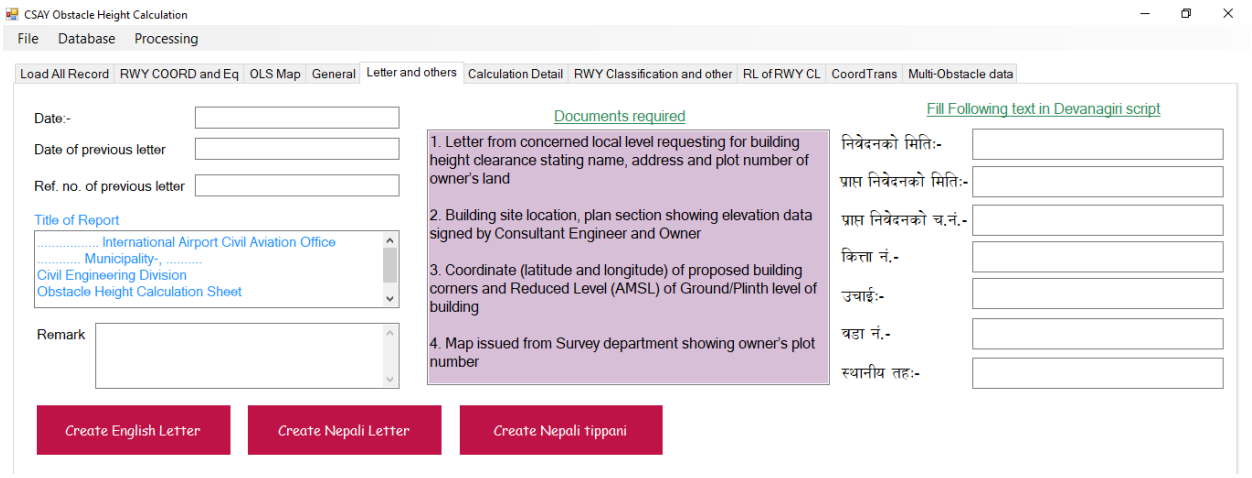


Figure 22. Letters and Others Tab

1) All black labeled are input
2) Blue colored fields are loaded form text files as shown in Figure 12.
3) No need to write in Devanagari i.e., Nepali because when you input in English, these Devanagari fields will be automatically filled
4) “Create English Letter”, “Create Nepali Letter” and “Create Nepali Tippani” button will create letter and Tippani in the format contained in “FormatFiles” folder as shown in Figure 12.

3.6.6 Calculation Detail

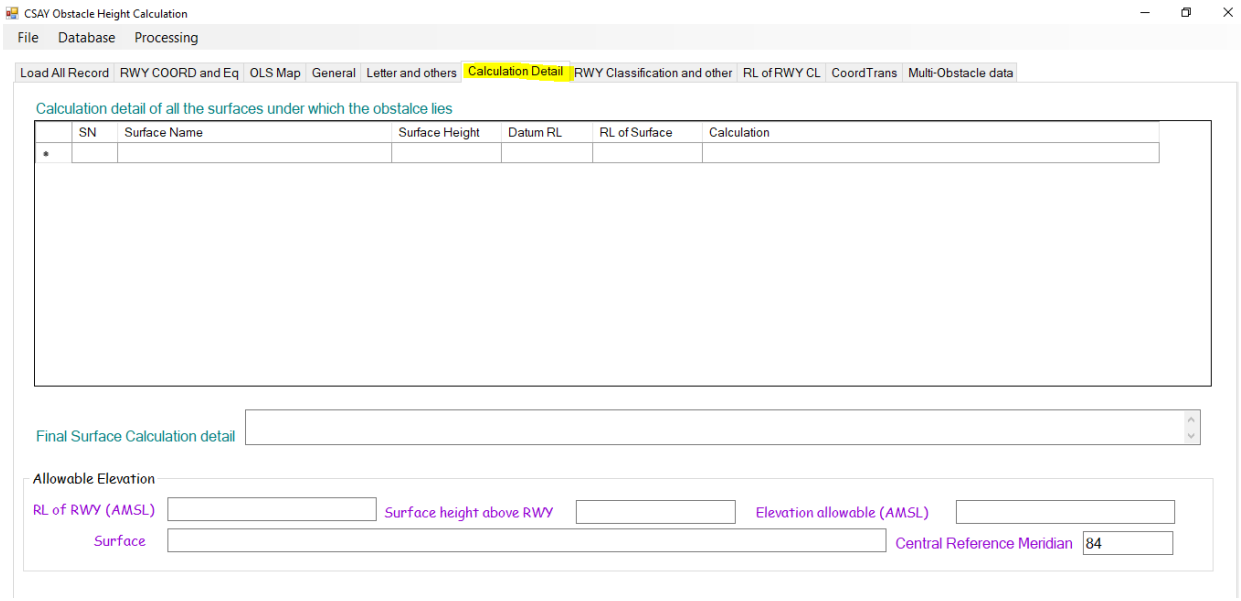


Figure 23. Calculation Detail

1) All the OLS below which the obstacle lies, will be listed with detailed calculation in the table as shown in Figure 23.
2) The minimum elevation data and corresponding surfaces will be shown in the text boxes and that shall be added to the table as shown in Figure 23.

3.6.7 RWY Classification and other

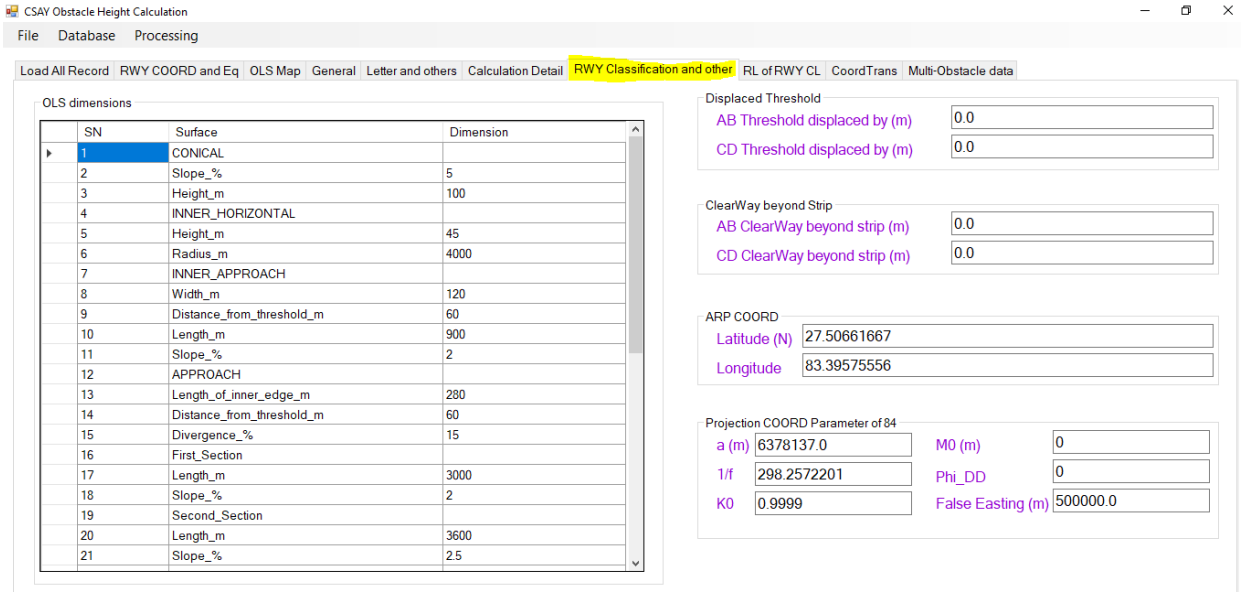


Figure 24. RWY Classification and other Tab

3.6.8 RL of RWY CL

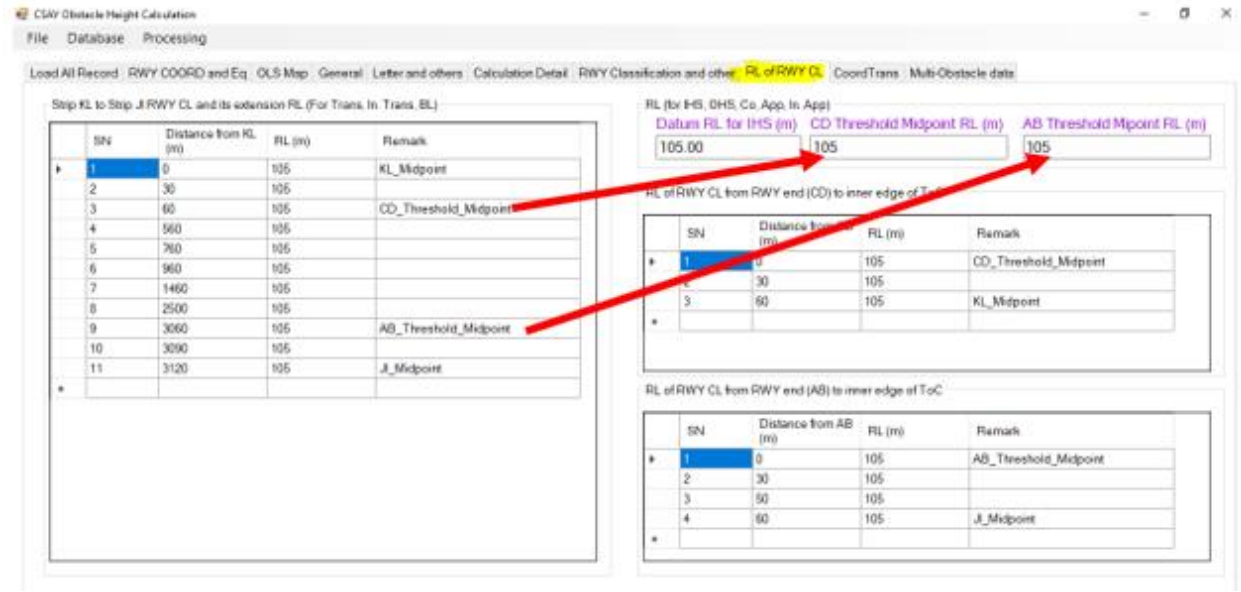


Figure 25. RL of RWY CL tab

1) After the user prepare input files as shown from 3.5 to 3.5.4, the tables and textboxes shown in Figure 25 will be automatically loaded.

3.6.9 Coord Trans

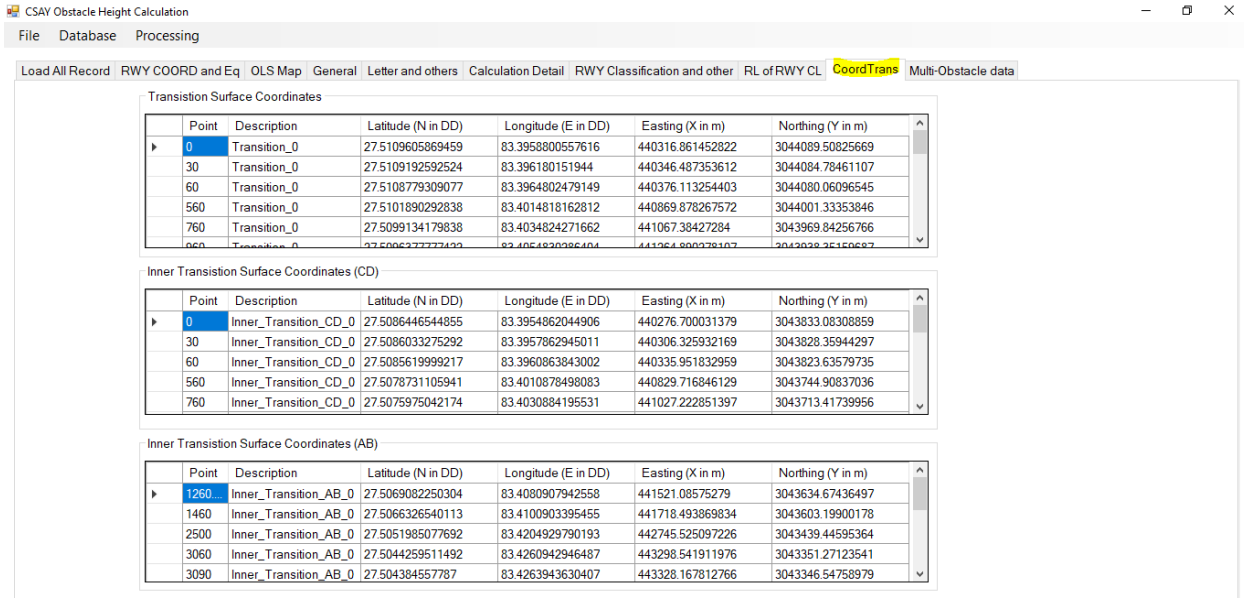


Figure 26. Coord Trans tab

1) The tables in this tab are automatically calculated after the user prepare input files as shown from 3.5 to 3.5.3

3.6.10 Multi-Obstacle data Tab

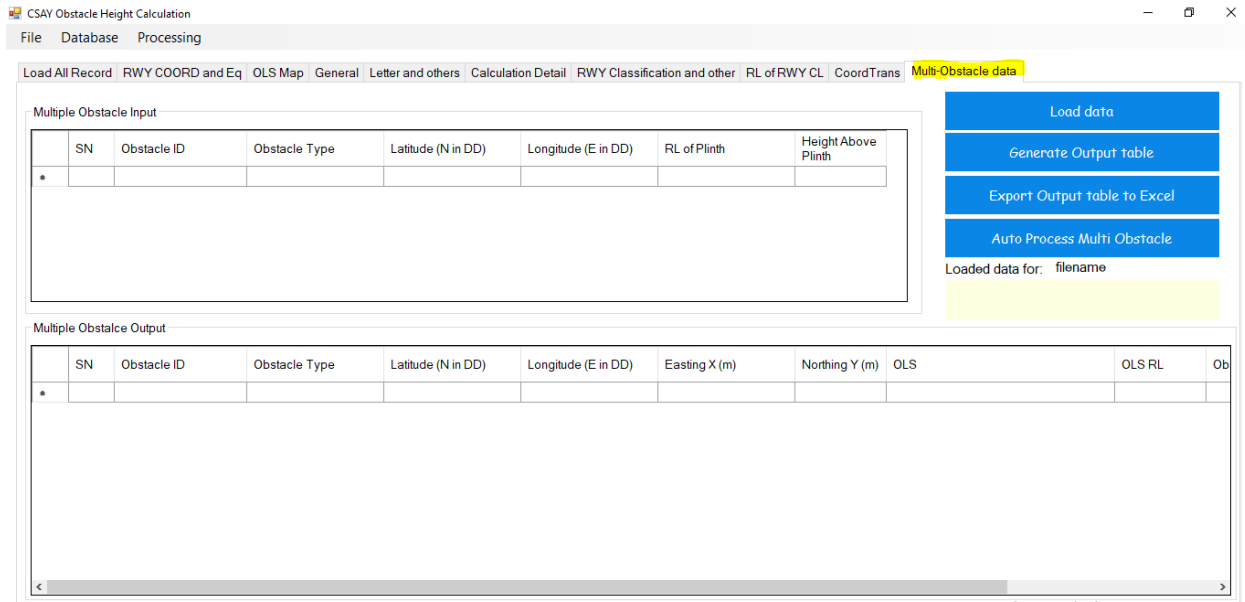


Figure 27. Multi-Obstacle data tab

1) The first table is input table which takes input on clicking button “Load data” from filename contained in “MultiObstacleFilename.txt”
2) Button “Generate Output table”, calculated the RL of obstacle and OLS and intrusion, if any
3) “Export Output to Excel” exports to excel
4) “Auto process Multi Obstacle” automatically performs action from (1) to (3), given that the input files are in format

5) It can be used in OLS Survey
6) These data are not added in the database of the software and user has to save excel files themselves
7) When calculating data, violet colored progress bar appears

3.6.11 Menu

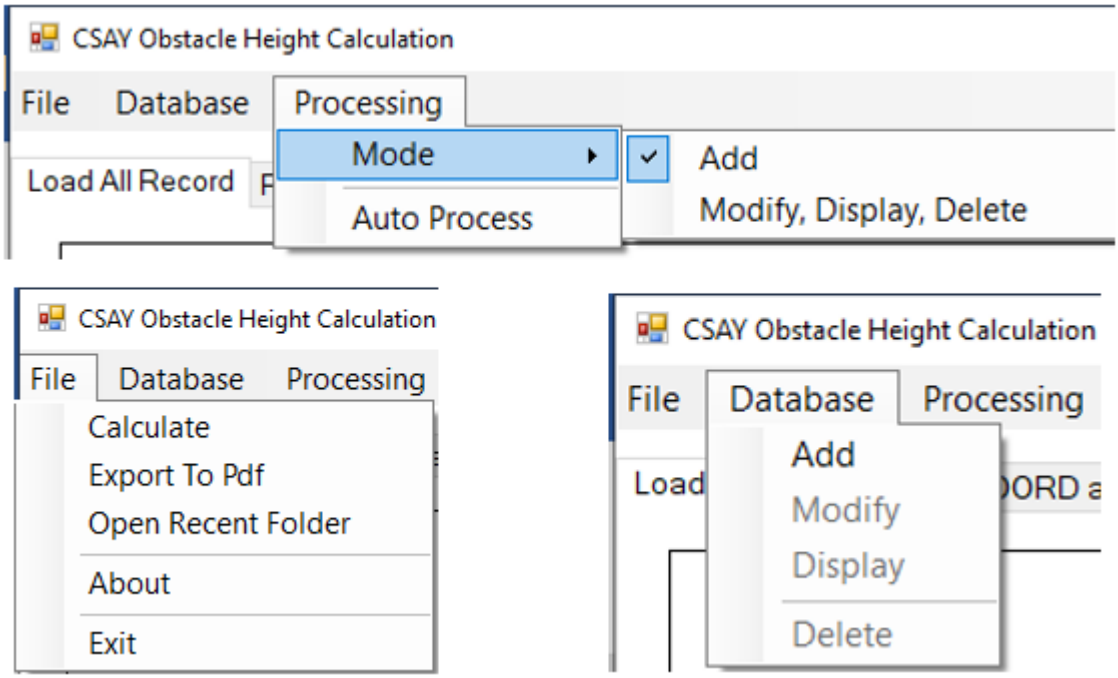


Figure 28. Menu

1) File menu
    a. Calculate
        i. After the user prepare input files as shown from 3.5 to 3.5.3, the use should click on “2. Plot map” of Figure 19
        ii. Then users need to input “RL of plinth (AMSL)” and “Height above plinth” as in Figure 21
        iii. Then user can click on File>Calculate and view calculation details as shown in Figure 23.
    b. After calculation and input of all black labelled fields, use can export report and English letter to pdf by clicking File>Export to Pdf
    c. “Open Recent Folder” Opens recently calculated and saved files
    d. “About” open about form as in Figure 29.
    e. “Exit” closes the software
2) Database menu
    a. “Add” to add data to database and ID auto-increases and All the projects are saved in Folder “ObstacleProjectFolders” as shown in Figure 12.
    b. “Modify” to modify the existing data
    c. “Display” to display the data after input of ID in General tab as in Figure 21
    d. “Delete” to delete the existing data
3) Processing
    a. Mode>Add

i. When this mode is checked, Database>Add will be enabled, Project ID text field will be disabled in General tab as shown in Figure 21 and user will be allowed to add data

b. Mode>Modify, Display, Delete
   i. When “Modify, Display, Delete” is checked on, “Delete”, “Modify” and “Display” of Database menu will be enabled and File>Add will be disabled and Project ID of General tab (Figure 21) will be enabled for user to input ID to display, delete or modify record.
   ii. The ID can be known by clicking on button “Load All Record” of Figure 16

c. Auto Process
   i. Firstly, prepare input files from 3.5 to 3.5.4
   ii. Choose required airport code and click on “1. Load RWY COORD” as shown in Figure 18.
   iii. Input coordinates in latitude and longitude format in respective fields as shown in Figure 19. OLS Map Tab.
   iv. Input all other required fields of General tab (Figure 21) and letter and others tab (Figure 22)
   v. Click on Processing>Auto Process and wait unit 100% processing is complete to generate reports, letters, Tippani, calculate obstacle elevation, export KML and save map.

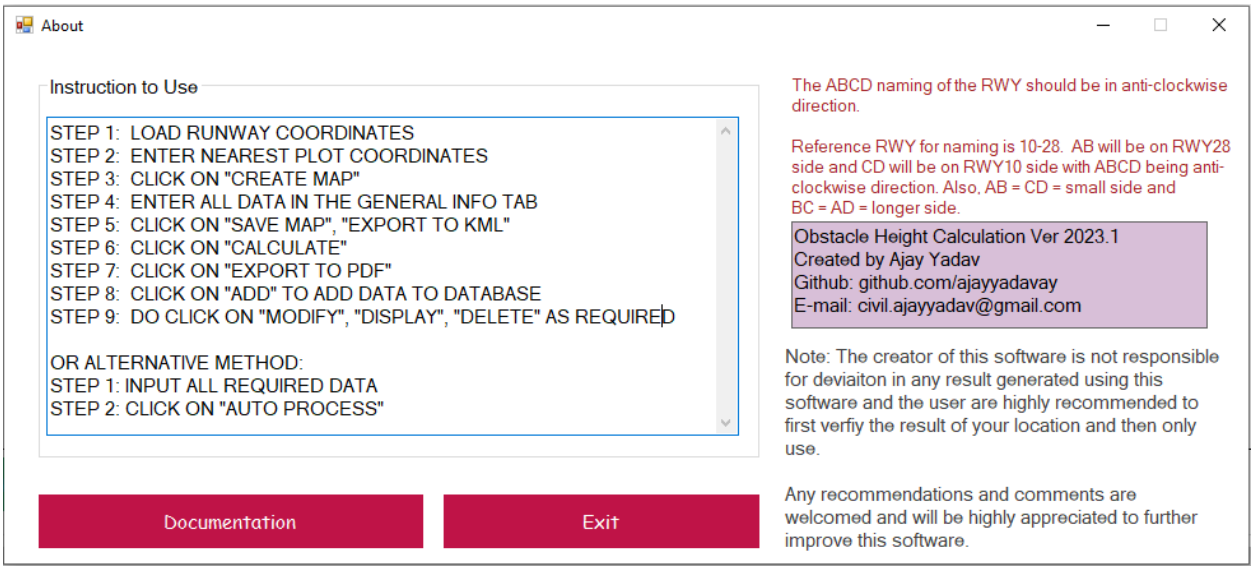


Figure 29. About

3.6.12 Filter

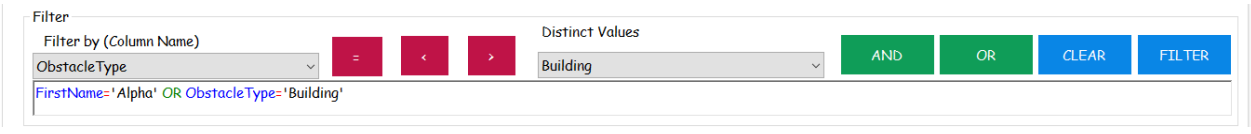


Figure 30. Filter

1) Format of Filter is –
   a. ‘FirstName’=’Alpha’ OR ‘ObstacleType’=’Building’
   b. Those records will be shown in the table of Figure 17 having First name as ‘Alpha’ or Obstacle type as ‘Building’

c. The user can use different such combination of filter
d. Button “Clear” will clear the filter text field
e. Button “=”, “<”, “>”, “AND”, “OR” have will input these texts in filter field
f. When the user selects the “Filter by (Column Name)” loaded from “Filter.txt” (Figure 16), combo box “Distinct Values” will be automatically loaded.
g. Distinct values of any column are the distinct values saved in the database under the same column of table Figure 17.

3.7 Nomenclature of Runway corners

1) The naming of corners of Runway corners shall be according to Figure 31.
2) Reference runway is RWY 10-28
3) Non-reference runway is any runway other than the reference runway i.e., RWY 10-28
4) To name any non-reference runway (i.e., runway other than RWY 10-28),
   a. Draw the centerline runway edge strip rectangular line of reference and the non-reference runway
   b. Rotate the reference runway i.e., RWY 10-28 about mid-point of centerline of RWY in such a that all the following conditions are satisfied-
      i. AB should always be below the EW line
      ii. CD should always be above the EW line
      iii. ABCD should be in anti-clockwise direction
      iv. AB and CD should be shorter sides i.e., along width of RWY
      v. AD and BC should be longer sides i.e., along the length of RWY
   c. Then get the latitude and longitude of corners A, B, C and D from google earth, GPS, etc. and write those coordinates Airport code text file (e.g., VNBW.txt, VNKT.txt, VNPK.txt, etc.) in the format specified as in **Error! Reference source not found.**.

Note:

1. *If the naming order is wrong or not as per specified, OLS cannot be drawn correctly.*
2. *Since the software code was written with respect to RWY 10-28 and parameters were then set for other runways so, RWY 10-28 is regarded as reference runway.*

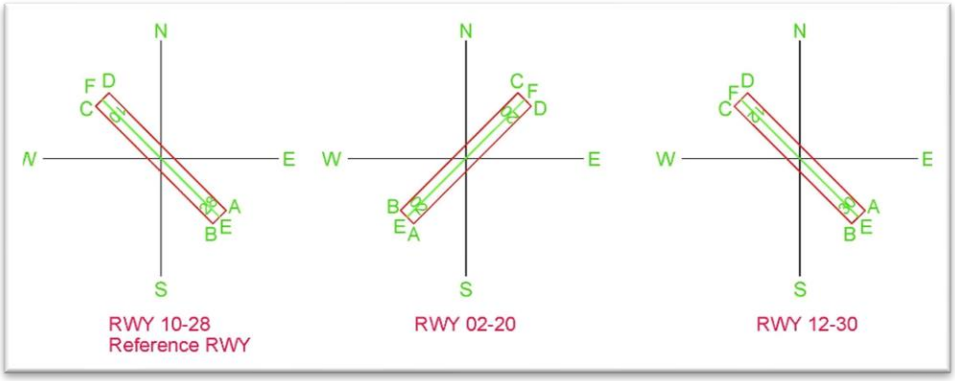


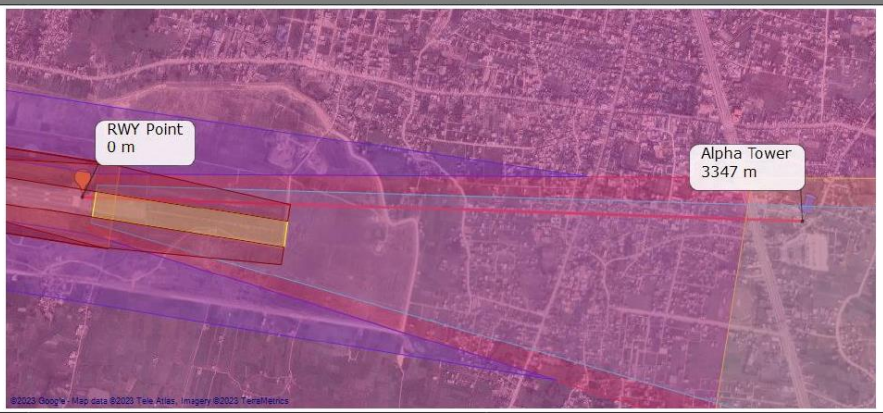
Figure 31. Runway corner nomenclature

3.8 Output

3.8.1 Report

..... International Airport Civil Aviation Office
..... Municipality-, ...
Civil Engineering Division
Obstacle Height Calculation Sheet

A. General Information		
1	Obstacle Calculation ID	1
2	Fiscal Year	7980
3	Obstacle Type	Tower
4	Owner's Name	Alpha Yankee
5	Address	Tango Municipality - 11, Bravo
6	Plot number	123
7	Nearest Plot Coordinate	27.5018765576825, 83.4597015380859
8	Runway Coordinate	27.50288611, 83.42583333
9	Distance from RWY to Obstacle	3347.17 m
B. Elevation of Proposed obstacle		
10	RL of Plinth (AMSL)	135 m
11	Height of obstacle above Plinth	25 m
12	Maximum Elevation of Obstacle (AMSL)	160.000 m
C. Allowable Elevation of Obstacle		
13	RL of RWY (AMSL)	105.000 m
14	Obstacle lying in surface	INNER HORIZONTAL
15	Surface height above RWY	45.000 m
16	Allowable Maximum Obstacle Elevation	105 + 45.000 = 150.000
17	Hence, Maximum Permitted height of obstacle	150.000 m
D. Reference		
18	Runway Classification	Precision Approach Category II or III Code No 4E
19	Airport	VNBW
20	Docs refered	OLS Chart of ICAO Annex-14 Volume I, Chapter 4 and CAR-14
E. Google Earth Image showing RWY to Obstacle position		



3.8.2 Letter in Nepali

मितिः २०..-००-००

श्री नगरपालिका
नगर कार्यपालिकाको कार्यालय
, नेपाल ।

विषयः भवन निर्माणका लागि सहमति सम्बन्धमा ।

उपरोक्त विषयमा त्यस कार्यालायको च.नं. ०००, मिति २०../००-०० को पत्रबाट माग भएको सिफारिस सम्बन्धमा, न.पा. वडा नं. ० ख, किता नं. ०,००,००० मा घर निर्माण गर्न भनी प्राप्त भएका भवन निर्माण सम्बन्धी नक्सा, अन्य संलग्न कागजात तथा सो स्थानको गुगल अर्थबाट लिइएको elevation समेतलाई अध्ययन गर्दा उक्त भवनको अधिक्तम उचाई ०००.०० मिटर (AMSL) रहेको पाइएको । यस प्राधिकरणको पूर्व स्वीकृती विना उक्त उचाईमा वृद्धि गर्ने कुनै पनि स्थायी संरचना निर्माण, पोल, टावर, एण्टेना तथा अन्य कुनै पनि उपकरण जडान समेत नगर्ने सर्तमा Country's adoption of ICAO ANNEX-14, अन्तर्गत Obstacle Limitation Surface (OLS) मा व्यवस्था भएको मापदण्ड वमोजिम निर्माण सहमति प्रदान गरिएको व्यहोरा निर्णयानुसार जानकारी गराइन्छ ।

ई. .....
प्रमुख, सिभिल ईन्जिनिरिङ्ग महाशाखा

वोधार्थः
१. श्रीमान् ..... ज्यू, ... ।

1) Note: In InputFolder>FormatFiles>LetterHeight_Template.dotx as shown above, the orange colored text is not be deleted or edited as they are bookmarked and software replaces these orange colored text with the calculated and user-input data.
2) However, the black texts can be edited as required and saved with same file name.
3) Bookmarks: Date_BM_Letter, Elevation_ Letter, OwnerLocation_BM_ Letter , PlotNo_BM_ Letter, PrevDate_BM_ Letter, RefNo_BM_ Letter

3.8.3 Tippani in Nepali

.....नागरिक उड्डयन .....

.....विमानस्थल नागरिक उड्डयन कार्यालय

....., ...

टिप्पणी र आदेश

विषयः भवनको उचाई सम्वन्धमा । मितिः २०००/००/००

श्रीमान् महाशाखा प्रमुख ज्यू,

प्रस्तुत विषयमा नगरपालिका कार्यालयको च. नं. ०००, मिति २०००/००/०० को पत्र र सो साथ प्राप्त जग्गाको नापी नक्सा, साईट प्लान, भवन निर्माण नक्सा तथा अन्य कागजपत्र पेश गरी भवन निर्माणको लागि सहमति माग गरेको व्यहोरा अनुरोध छ । Contry's adoption of ICAO ANNEX-14 अन्तर्गत Obstacle Limitation Surface (OLS) मा भएका मापदण्ड बमोजिम निर्माण सहमति दिन प्राप्त कागजपत्र तथा गुगल अर्थबाट site को elevation तथा रनवे देखि सो स्थान सम्मको दुरि लिई निर्माण हुने संरचनाको अधिक्तम उचाई निकालिएको Calculation Sheet यसै साथ संलग्न छ । सो अनुसार भवनको अधिकतम उचाई ०००.०० मिटर (AMSL) भएको पाइएको हुँदा न. पा. वडा नं. ००, कित्ता नं. ०, ००, ००० मा उक्त उचाईको भवन निर्माणले OLS मा बाधा नपर्ने हुँदा निर्माण सहमति दिन सकिने व्यहोरा निर्णयार्थ पेश गर्दछु ।

.....
ई....., व. स.
सिभिल इन्जिनियरिङ्ग महाशाखा

व. अ. ई. श्री .....जी,
चेक जाँच गरी राय ।

.....
ई. .....
प्रमुख, सिभिल इन्जिनियरिङ्ग महाशाखा

श्रीमान् महाशाखा प्रमुख ज्यू,
उक्त पेश भई आएका Calculation Sheet, नक्सा तथा अन्य कागजपत्रहरु चेक जाँच गर्दा Contry's adoption of ICAO ANNEX-14 अनुसार OLS penetrate नगरेकोले सहमति दिन सकिने व्यहोरा पेश गर्दछु ।

.....
ई. ....., व. अ.
सिभिल इन्जिनियरिङ्ग महाशाखा

श्रीमान् महाप्रबन्धक ज्यू,
माथि पेश भए बमोजिमको व्होरा स्वीकृतार्थ पेश गर्दछु ।

.....
ई. .....
प्रमुख, सिभिल इन्जिनियरिङ्ग महाशाखा

1) Note: In InputFolder>FormatFiles>LetterHeight_Template as shown above, the orange colored text is not be deleted or edited as they are bookmarked and software replaces these orange colored text with the calculated and user-input data.
2) However, the black texts can be edited as required and saved with same file name.

3) Bookmarks: Date_BM_Tippani, Elevation_BM_Tippani, LocalLevel_BM_Tippani, OwnerLocation_BM_Tippani, PlotNo_BM_Tippani, PrevDate_BM_Tippani, RefNo_BM_Tippani

3.8.4 Letter in English

Date: - 2080-02-18

To
..... Municipality
....., ... Province
Nepal

Subject: Regarding consent for building construction

In response to the letter received from that office dated 2080-01-05 with ref. no. 235 requesting consent for Building construction, this is to certify that maximum permitted elevation of the proposed Building located at Foxtrot Municipality-7, Tango having plot no. 123, 254 of Mr. Alpha Yankee determined after studying the received drawings, Google Earth Map other related papers is 128.030 m (AMSL). Furthermore, it is to notify that this permit has been granted in accordance with the standards stipulated in Obstacle Limitation Surface (OLS) under Civil Aviation Requirement-14 (CAR-14) on the condition that there shall be no further increment of Building height by permanent construction of structure or by installment of pole, tower, antenna or any other equipment without prior approval of this Authority.

.....
Er.
Cheif, CED

CC:
1. GM, ...Airport

1) Note: In InputFolder>FormatFiles>LetterHeight_Template.dotx as shown above, the orange colored text is not be deleted or edited as they are bookmarked and software replaces these orange colored text with the calculated and user-input data.
2) However, the black texts can be edited as required and saved with same file name.
3) Bookmarks: Date_El, Prev_Date_EL, Ref_no_EL, Address_EL, Plot_No_EL, Name_EL and RL_EL.

3.9 Steps to calculate Obstacle Height with Auot-Process

The following steps shall be followed to calculate Obstacle height

1) Prepare input in all the text files as in Figure 12
2) Open the application

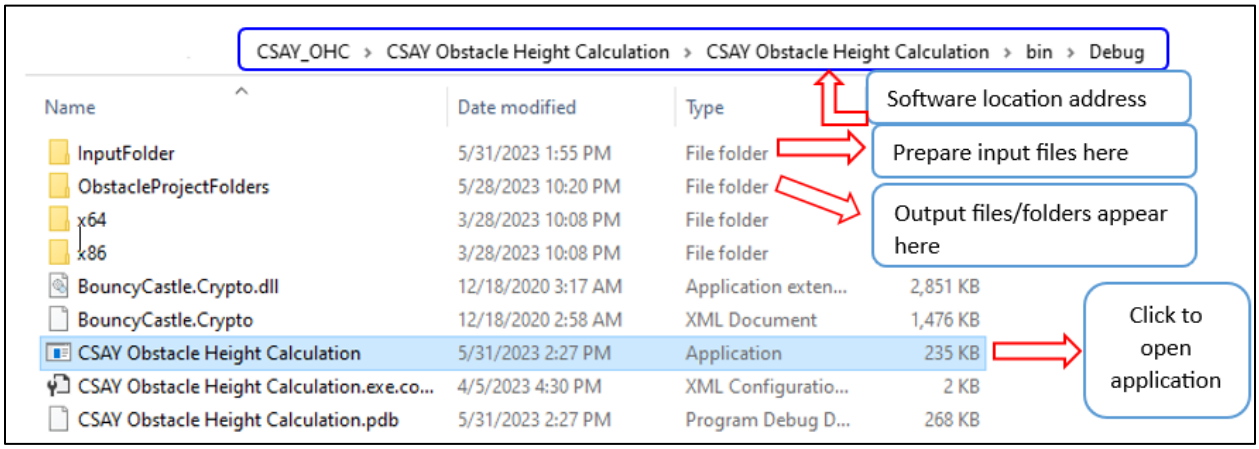


Figure 32. Software Executable file Location

3) The screen as in Figure 17 appears
4) Load RWY location data as in Figure 18
5) Navigate through different tabs and input all the fields labelled black in color as in Figure 19 to Figure 22.
6) Click “Auto process” from menu Processing>Auto Process Figure 28
7) The output will be saved in “ObstacleProjectFolders” as shown in Figure 32.
8) All records are stored in “ObstacleHeightRecord.sqlite3” located in the same as the application itself.

CSAY OBSTACLE HEIGHT CALCULAION

(A Free and Open-Source Software)

Version 2023.1

Functions/Features of the Software

- Finds the height of the obstacle, plots OLS, generates report, letters and Tippani, export plotted points to KML
- Generates OLS for any runway orientation of any country with correct input of Ellipsoid/Projection system of coordinate
- Allows user to Perform database operations: ADD, MODIFY, DELETE, DISPLAY, FILTER
- Allows user to draw all the obstacle limitation surfaces or only selected surfaces and calculate accordingly
- Allows user to extract coordinate (latitude and longitude) from map on mouse click
- Allows user to input multiple obstacle coordinates in ".txt" format and output Obstacle table of all the input in excel format used during OLS Survey.

Er. AJAY YADAV