DTM (Digital Technical Map) in Marushka Design

CONTENTS

1 Aim of the Example

In this example we will demonstrate how is possible to create digital terrain model from digitally measured points, containing coordinates X, Y and Z. This example was created in version 4.2.5.0, so it does not have to be compatible with older versions.

2 Working with Example

o Unzip the **DTM_EN.zip** into **c:\MarushkaExamples** folder. The target folder must be respected due to interconnection of paths with the project. In the case of placing the files in the different folder, it would not be possible to work with an example.

o Open the **DTM_EN.xml** in MarushkaDesign environment.

o Select all form layers, in the context menu choose *Data – Load all*:
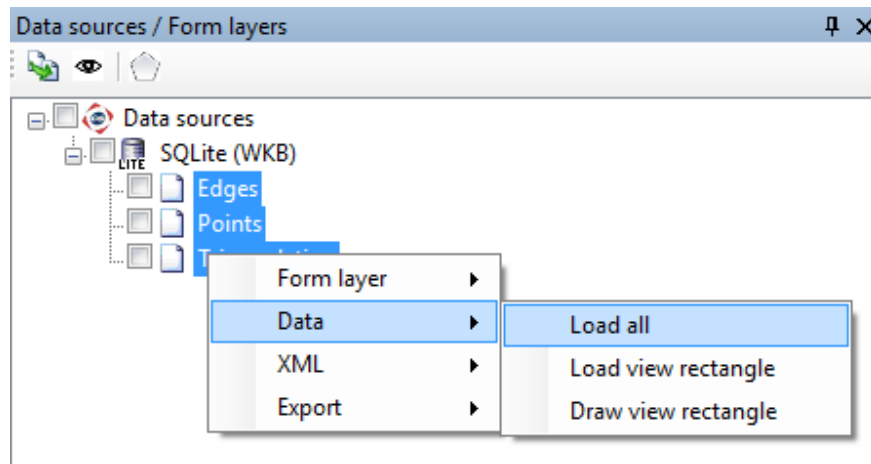
o In map window choose "Fit all":
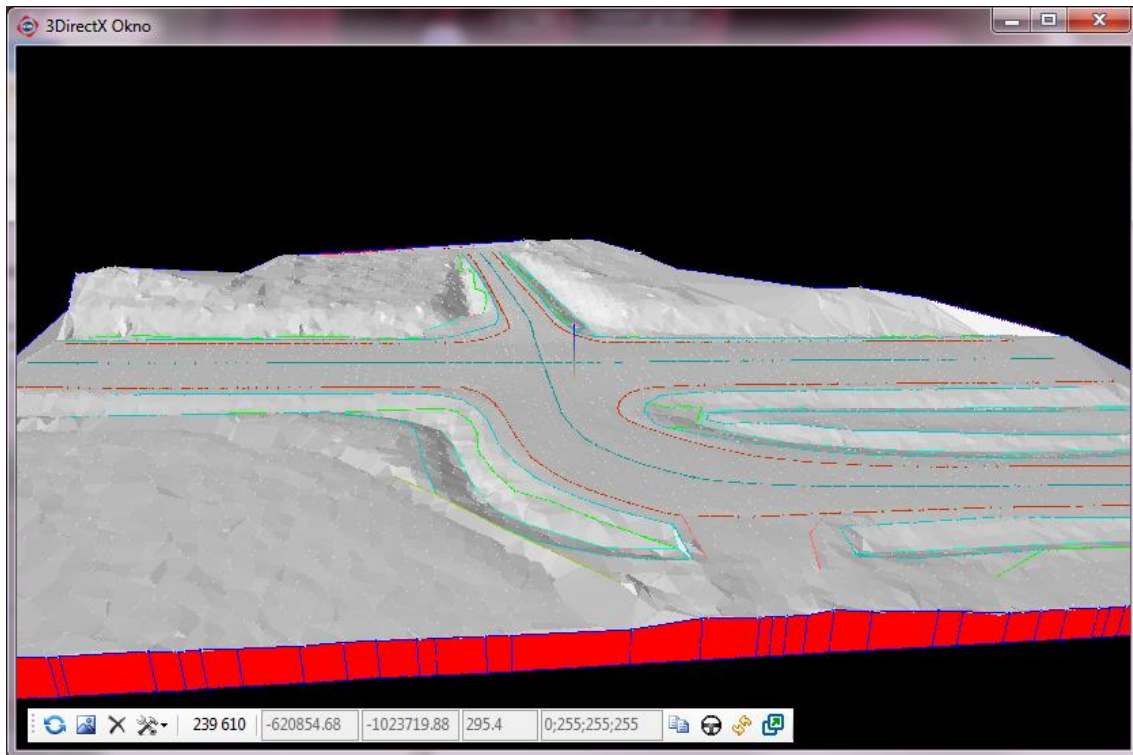

o Launch the local web server:

3 Dialog Box Sample

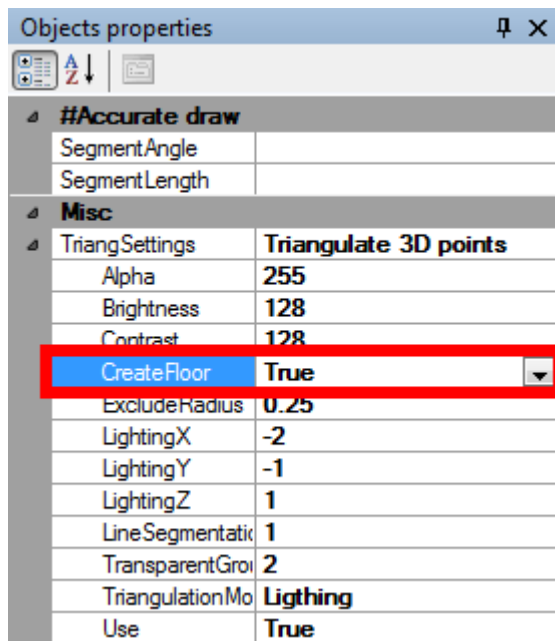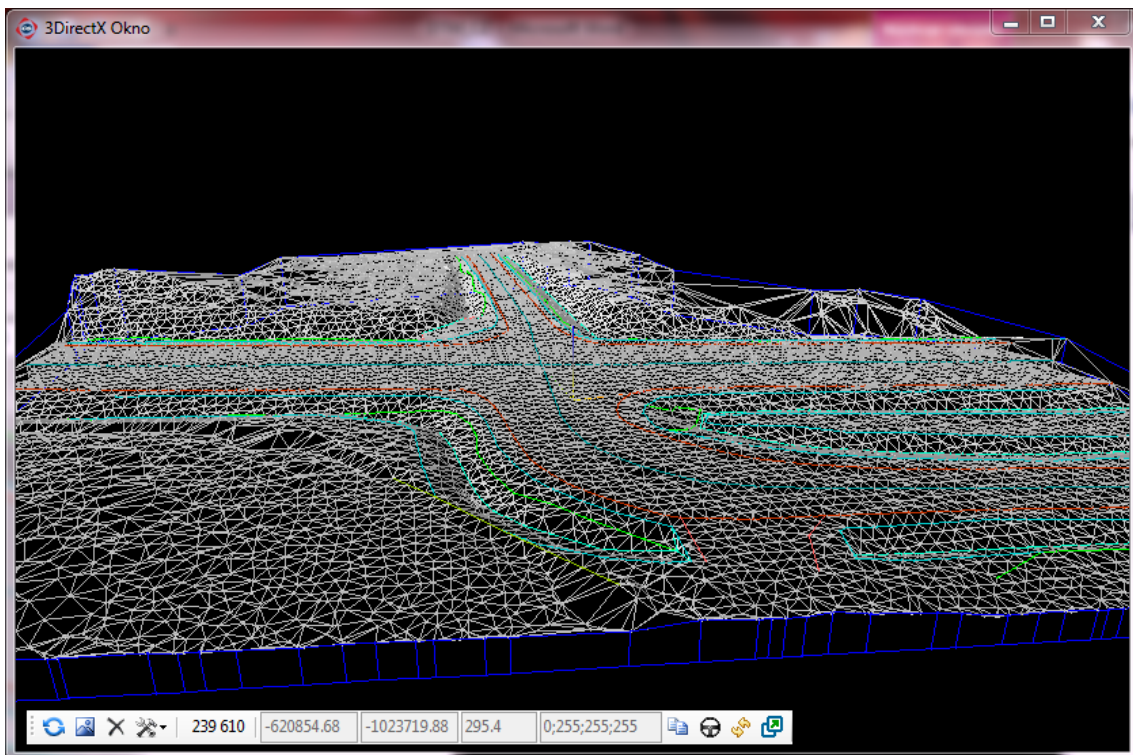Fig 1: Example of created digital terrain model in DirectX window

Fig 2: Example of wireframe model in DirectX window

Fig 3: Settings of window Object properties with active item *CreateFloor*

4   A Brief Description of the Example in Marushka Design

In this example, it is demonstrated, how it is possible to create Digital terrain model from point elements, which are containing coordinates X, Y and Z. Triangles are created using triangulation, this method uses various control mechanism, such as mandatory edges. Mandatory edges are drawn in the form layer *DtmExample*, these are drawn in color.

This example contains data store SQLite (WKB) with three form layers. Form layer Points contains geodetically measured points with coordinates X, Y, Z in *WKBPointZ* format. Form layer Edges contain mandatory edges in the *WKBLineStringZ* format. And layer *Triangulation* is empty and rectangles created during triangulation are saved into it.

By using triangulation, it is possible to create triangular surfaces form which the digital terrain model is created when the fill is displayed, see Fig 1.

Process how to create a triangular network is following:

1   Select: *Data – Load all* on all three form layers in data store *SQLite*.

2   In menu choose: *Draw ~ Area ~ Triangulate 3D points.*

3   In Physical layers window, select the layer *Triangulation* and select ok.

4   In *Object properties* window click on *Misc* and set attribute *CreateFloor* to value *True*, see Fig 3.

5   Next, click into the map window.

6   Down on the Marushka Design toolbar are displayed information about the triangulation process and after the triangulation ends, the information about number of created rectangles is displayed.

7   After the triangulation, open the *DirectX window* from the *menu ~ 3D Design ~ DirectX*, where you can see, if the digital terrain model looks as you expected, see Fig 2.

8   In the map window *DirectX* you can also have a look at how the points are triangulated by clicking on the hammer tools (Settings) and select *Shape Fill Color ~ WireFrame*. Usign this will dislay construction lines without fill, as in Fig 2.

9   In the *Physical layers* window, right click on the *Triangulace* layer and select *Export ~ STL*.

10 Next, you can open this file either directly in Windows or, for older Windows (7 and older) it is necessary to install some viewer of STL files, such as STL viewer, which is freeware.

11 Now it is possible to print the *STL* file on 3D printer.