URBANSCAPE ProPET

The online Green Roofs stormwater detention modelling calculation application is provided free of charge to support the user in planning Urbanscape Green Roofs, with a special focus on stormwater management.

INSTRUCTIONS FOR USE (for general public)

The 'Project data' input field (Label 1, Figure 1) is intended for entering project specific data.

The 'Location of green roof' (Label 2, Figure 1) is informative and is important for potential additional communication in the event of specific or regulatory requirements in a locality or country.
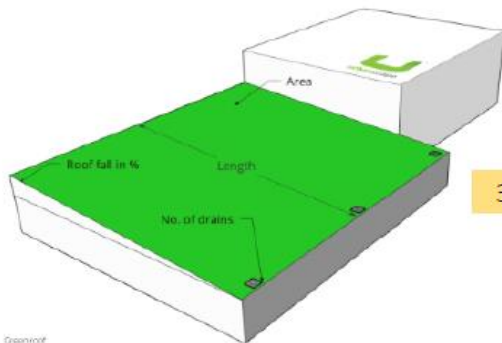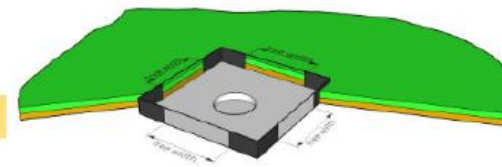
The images of the green roof and the drainage element (Label 3, Figure 1) are intended to explain the roof parameters that the web application user must define to calculate the drainage dynamics. These parameters are (Label 4, Figure 1):

• Roof surface area in m^2;

• Roof length in m;

• Roof slope in %;

• Number of drainage elements;

• Free width for rainfall runoff in m.

The parameters should be entered only for Area 1 (Label 4, Figure 1).

Figure 1: Project data and Green Roof data sections of the Urbanscape ProPET application.

The type of Urbanscape® Green Roof is selected from the drop-down list (Label 1, Figure 2).

Below it (Label 2, Figure 2) the composition of the Urbanscape® Green Roof, the individual layers from the top to the bottom layer, as also shown in the image in the right column (Label 3, Figure 2), is shown. The thickness in cm is also indicated for each layer and cannot be changed.

In the section displaying data on the load on the basic roof structure due to the installation of the green roof ('Load data'), the following data is displayed (Label 4 and Label 5, Figure 2) and cannot be changed:

• Height of the final Al profile in cm (Label 4, Figure 2);

• Specific mass of the Green Roof without water in kg/m^2; 'dry weight' (Label 5, Figure 2).

• Specific mass of the fully moistened Green Roof in kg/m^2 (water from the temporary water reservoir is drained away); 'fully saturated' (Label 5, Figure 2).

• Specific mass of the Green Roof when full of water in kg/m^2 (the temporary water reservoir of the system is full and comes to overflow); 'max. weight' (Label 5, Figure 2).
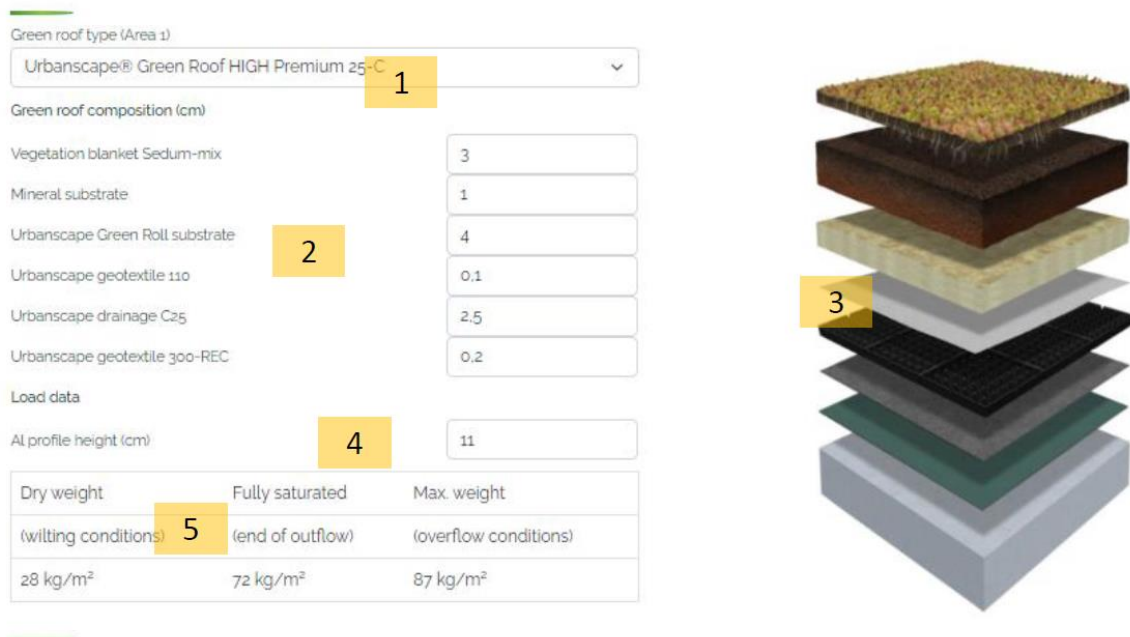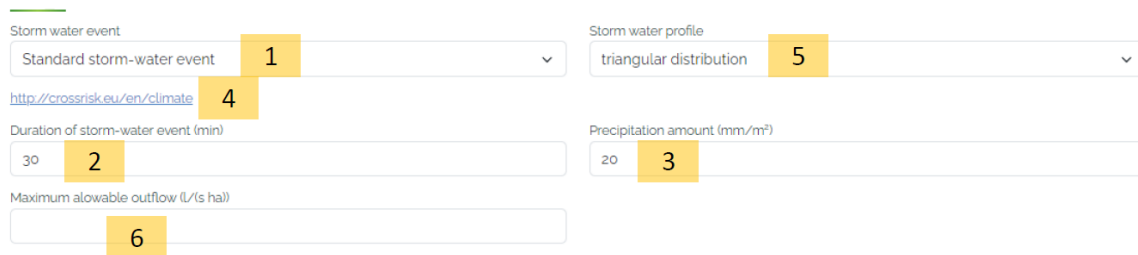

Figure 2: Green Roof type and Green Roof composition sections of the Urbanscape ProPET application.

Data regarding a stormwater event must be defined by the user:

• Duration of the precipitation event in minutes (Label 2, Figure 3);

• Total amount of precipitation per unit of roof area in mm/m^2 or l/m^2 (Label 3, Figure 3);

• The shape of the precipitation event profile to be chosen from drop-down list (Label 5, Figure 3);

• Maximum permitted runoff in l/(s ha), optional input (Label 6, Figure 3).

The version available to the general public does not allow users to enter their own precipitation event and cannot be changed (Label 1, Figure 3).

Storm water event
Standard storm-water event   1

http://crossrisk.eu/en/climate   4

Duration of storm-water event (min)
30   2

Maximum alowable outflow (l/(s ha))
        6

Storm water profile
triangular distribution   5

Precipitation amount (mm/m²)
20   3

Figure 3: Stormwater event section of the Urbanscape ProPET application.

RESULTS

After entering the necessary data, marked with *, the calculation of the outflow dynamics is performed automatically and the results of the calculation are displayed graphically and tabularly. (Figure 4).

In addition to the graphical presentation of the precipitation event (grey line on the graph) and the dynamics of precipitation runoff from Urbanscape Green Roof following specific project input data (green line on the graph), the results of the calculation are also shown in a table:

• Maximum intensity of precipitation in mm/m2min per m^2 of green roof, and in l/min for the entire roof. Time of highest precipitation intensity in minutes from the beginning of rainfall is presented on the right column in the same line (Label 1, Figure 4);

• Maximum intensity of precipitation runoff from the green roof in mm/m2min per m2 of green roof, and in l/min for the entire green roof. Minute in which precipitation runoff from the green roof is most intense is presented on the right column in the same line (Label 2, Figure 4);

• Time delay of the maximum precipitation runoff in minutes – this is the difference in minutes between the moment of maximum rainfall intensity and runoff from the green roof (Label 3, Figure 4);

• The end of the runoff of precipitation from the green roof in minutes (Label 4, Figure 4).

Graphical results are shown below in two separate graphs, representing runoff from the Urbanscape Green Roof in mm/m^{2}min and second graph representing runoff from Urbanscape Green Roof in l/min. Precipitation is marked in grey and runoff in green. Maximum available runoff is marked with a red line (not seen on Figure 4).

RESULTS

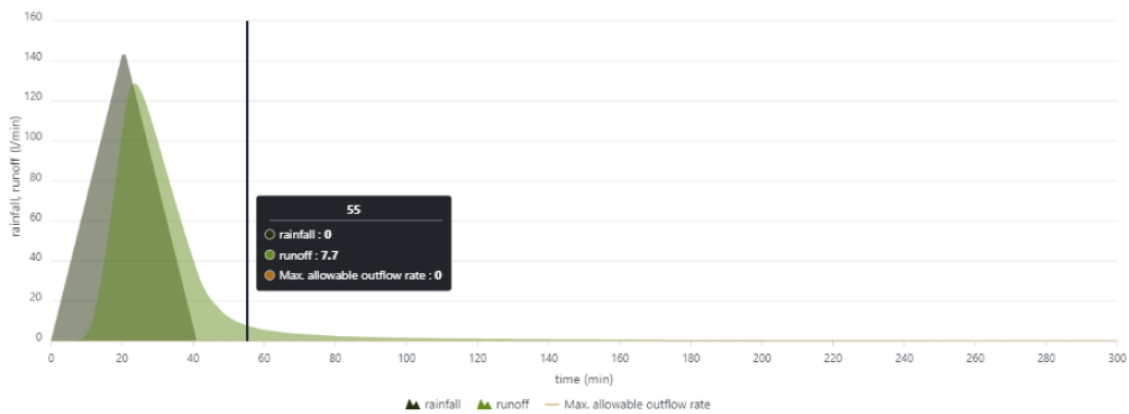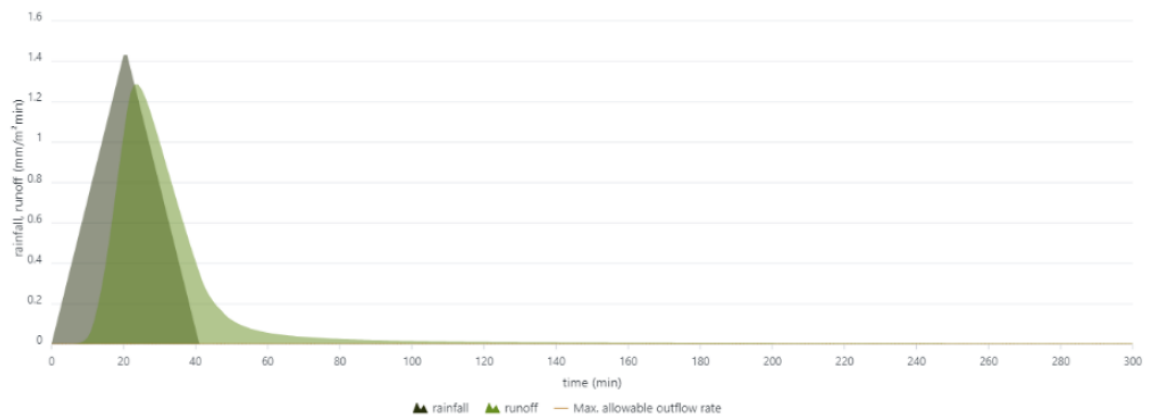|			
Max rainfal rate	1.42 mm/m²min	142.85 l/min	in 21 min
Max rainwater runoff rate	1.28 mm/m²min	128.38 l/min	in 24 min
Peek runoff delay	3 min		
End of runoff after	after 324 min		

Figure 4: Results of the Urbanscape ProPET application for a specific Urbanscape Green Roof project.