Course Description (long) - 3D-Dig Execution and Dumping Course

This course covers the 3D-Dig **Execution and Dumping** tool. Before commencing this course, you should be familiar with the basics of 3D-Dig and the 3D-Dig **Automated Excavation and Dump Sequencing** software module. The **Execution and Dumping** tool performs the same function as **Automated Excavation and Dumping**. That is, it allows complex excavation sequences to be automatically excavated in a sequential manner according to a schedule. The **Automated Excavation** processes excavate the entire width of a bench or strip. This is suitable for medium to long-term simulation and for many short-term simulation requirements. However, it is often desirable to further subdivide the excavation of the bench in a more complex manner. Such detailed simulation is useful for situations, such as allocating multiple excavators to a confined area of a single patch, modelling important details such as digging down a ramp to a lower bench level and the removal of existing ramps etc. It can also be useful when excavating or/and developing suitable strategies for building stockpiles. In addition to these applications the Execution tool can also be used for performing very quick and approximate longer-term simulations.

Setup & First Lift Module

This module introduces basic concepts and settings for 3D-Dig Execution module. You will learn how to create, set up and edit **Execution Polygons**. And then, construct a **Supersequence**, based on the **Subsequences** associated with these **Execution Polygons**, for the First Lift. Also, you will see how to use **Preset Productivity**, and assign excavators of different types to **Execution Subsequences**.

Overview

The lesson covers the introductory explanation of initial concepts of **Execution** module compared to **Automated Excavation and Dumping**. The example Pit, which is used in this Course, is briefly described here. First introduction to the basic element of this module called an **Execution Polygon**.

Execution Polygons

The lesson covers the setting up of the **Execution Polygons** using **More Feature Types** concept, and the explanation of how to create the **Execution Polygon** both in “one at a time” manner and in multi creation way. This process automatically creates a set of **Subsequences** associated with each polygon.

Supersequence
In this lesson, you will create a **Supersequence** for one bench level and run the simulation.

Excavators
In this lesson, you will create three excavators - two large excavators for waste removal and one more excavator for ramp construction.

Excavation
In the concluding lesson of this module, you will set up **Preset Productivities** and then assign them and excavators, created in the previous lesson, to appropriate **Execution Subsequences**.

Second Lift **Module**
In this module, a Simulation for the Second Lift is implemented. The Simulation includes **Execution** templates for access ramp (down to the second lift) and for the waste for this lift, as well as a particular template to remove the access ramp after the waste is done. A new combo **Supersequence** for two lifts is assembled and simulated. Some further refinement of the Simulation is applied to fix some issues appeared while the two-lift simulation.

Ramp
In the first lesson of this module, you will create an **Execution** template for access ramp down to the second lift level.

Waste
In this lesson, you will create an **Execution** template for second lift waste.

Supersequence & Ramp
In this lesson, you will create and run a **Supersequence** for the second lift and add an **Execution Polygon** to remove a remnant of the access ramp remaining at the second lift.

Productivities
The lesson will demonstrate how to set up **Preset Productivities** and Excavators for the second lift and assign them to **Execution Subsequences**.

Assemble
In this lesson, you will assemble and run a new combo **Supersequence** for both lifts.

Refine Simulation

On completion of each **Subsequence**, the excavators have been left in their last dig position. Also, the **Simulation** shows that some **Execution Polygons** are too narrow. In the final lesson of this module, you will refine **Simulation** to fix these two issues.

Add Dumps Module

This module is focused on creating and assigning dumps for the simulation. Also, a concept of **Excavation Dependencies** is described. It allows you to avoid prematurely commencing dumping when an appropriate ramp access is not yet complete. Finally, setting up image capturing and reporting are shown.

Create Dumps

In the opening lesson of this module, you will create dumps for **Subsequences** using imported Surface Features as guidelines.

Assign & Run

In this lesson, you will assign dumps to **Subsequences** and then run the Simulation. Before assigning dumps, you should carefully watch the simulation of the excavation sequence to establish availability of access to various dumps throughout the simulation. During the set up in debugging phase, you need to speed up the simulation. In this lesson you increase the **Discrete Volume To Dump** and decrease the **Resolution** in **Dump Settings**.

Excavation Dependencies

When you ran the simulation in the previous lesson, you found that the material for some of the 557 execution **Subsequences** reported prematurely to the 557 dump. In this lesson you will correct the problem using a concept called **Excavation Dependency**. It allows you to assign a particular **Excavation Sequence** to a nominated dump. Once the **Excavation Dependency** is assigned, the dump will not be enabled until the nominated **Excavation Sequence** has been fully excavated.

Images & Reporting

In the concluding lesson of this module, you will set up for the image capture and reporting. Following this, you will run the simulation and capture the video.

In the option **Block Excavation Order** group of the **Simulation Settings** there is an option **Interleave Blocks With Times In Step**. Using this option, when there are two or more parallel branches in the **Supersequence**, 3D-Dig will simulate the first block of the first Branch, determine the excavation time and advance the calendar. It will repeat the process for all blocks in parallel

branches. In this matter each branch is kept in a time-based lockstep with the level of resolution being the excavation time for each block.

To create a text report file go to the **Simulation Settings**, check **Generate Report**, input a suitable report file name, click the **Browse** button and browse for the folder, where your files are saved. After simulation complete open Excel and open the generated report file (select **Text file** type). The Excel file contains key information on the simulation.