landscapingSMART - GeoSiteDesign&Built

GeoDesing meets Diggers and Dozers – who's afraid of triangles?

HSR
HOCHSCHULE FÜR TECHNIK
RAPPERSWIL
FHO Fachhochschule Ostschweiz

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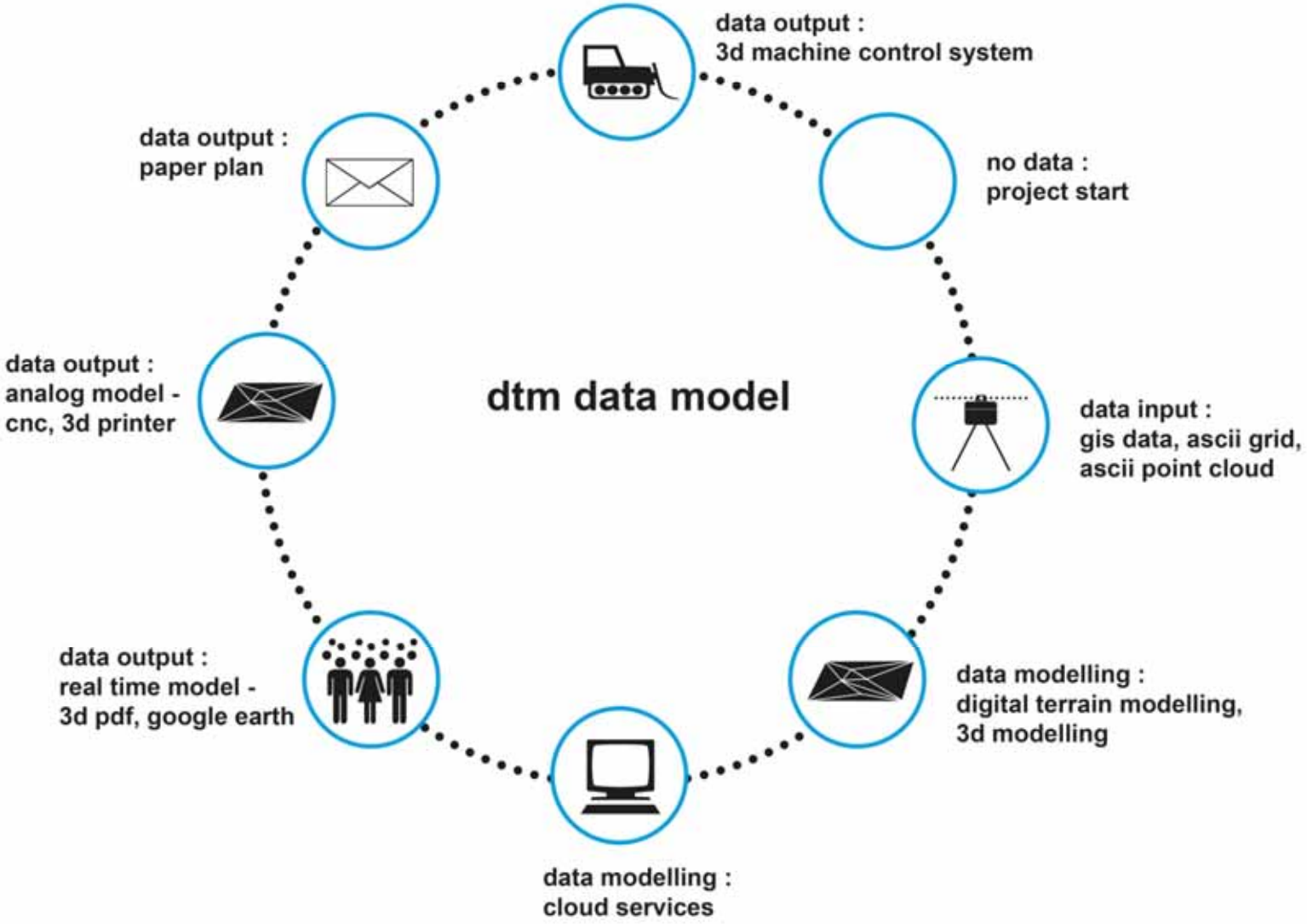

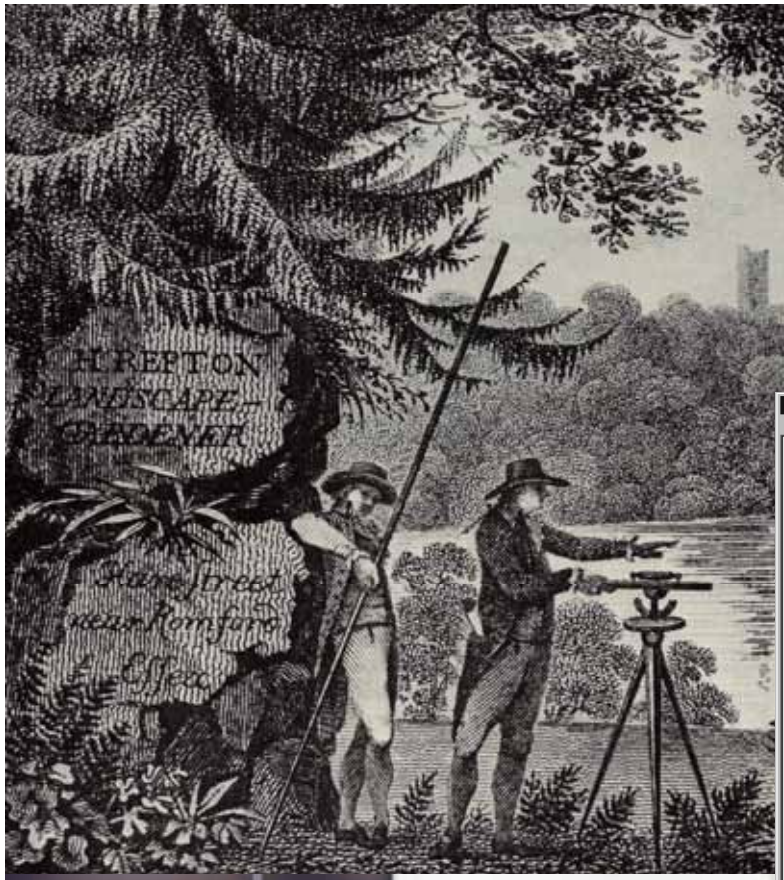

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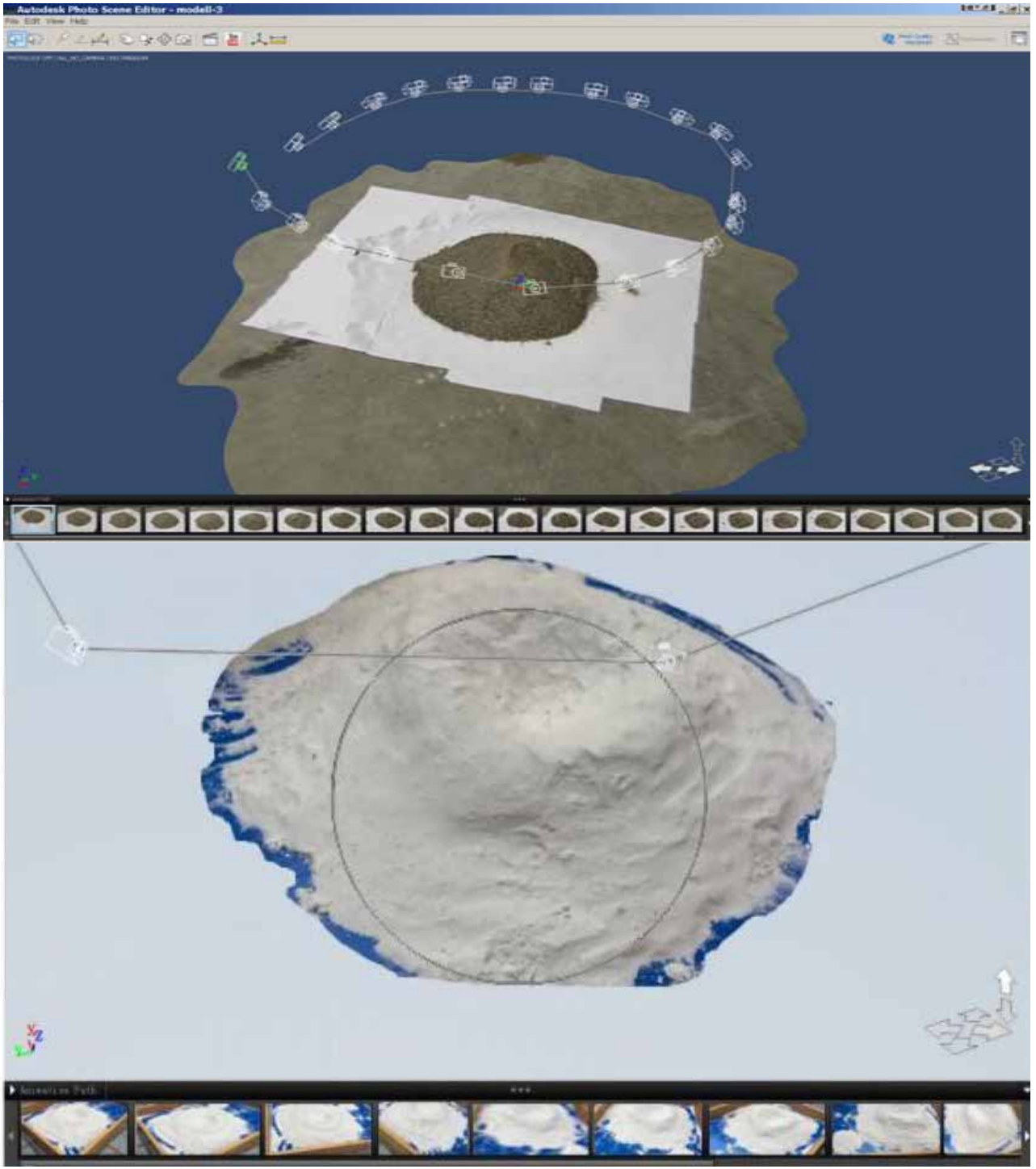
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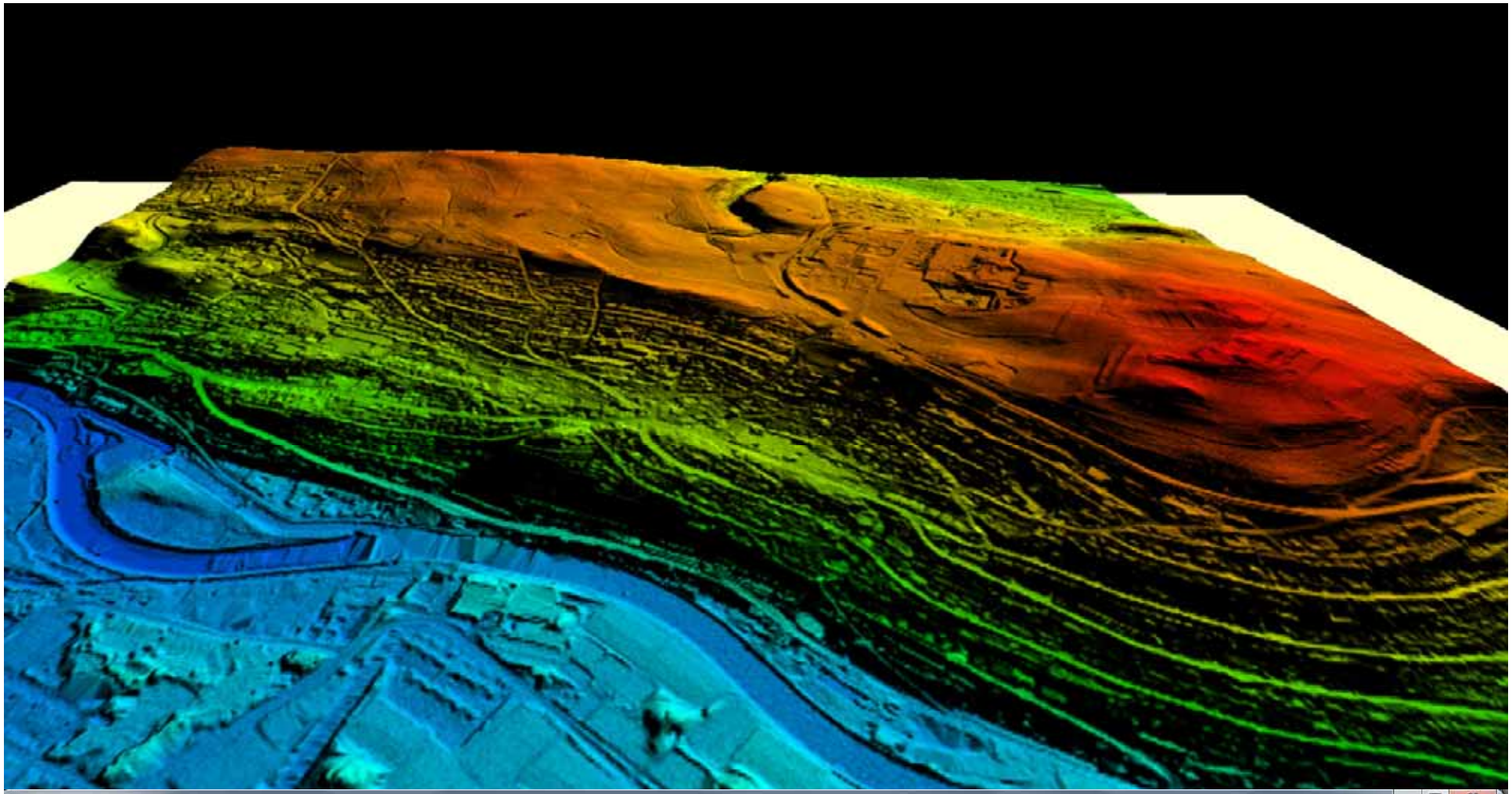

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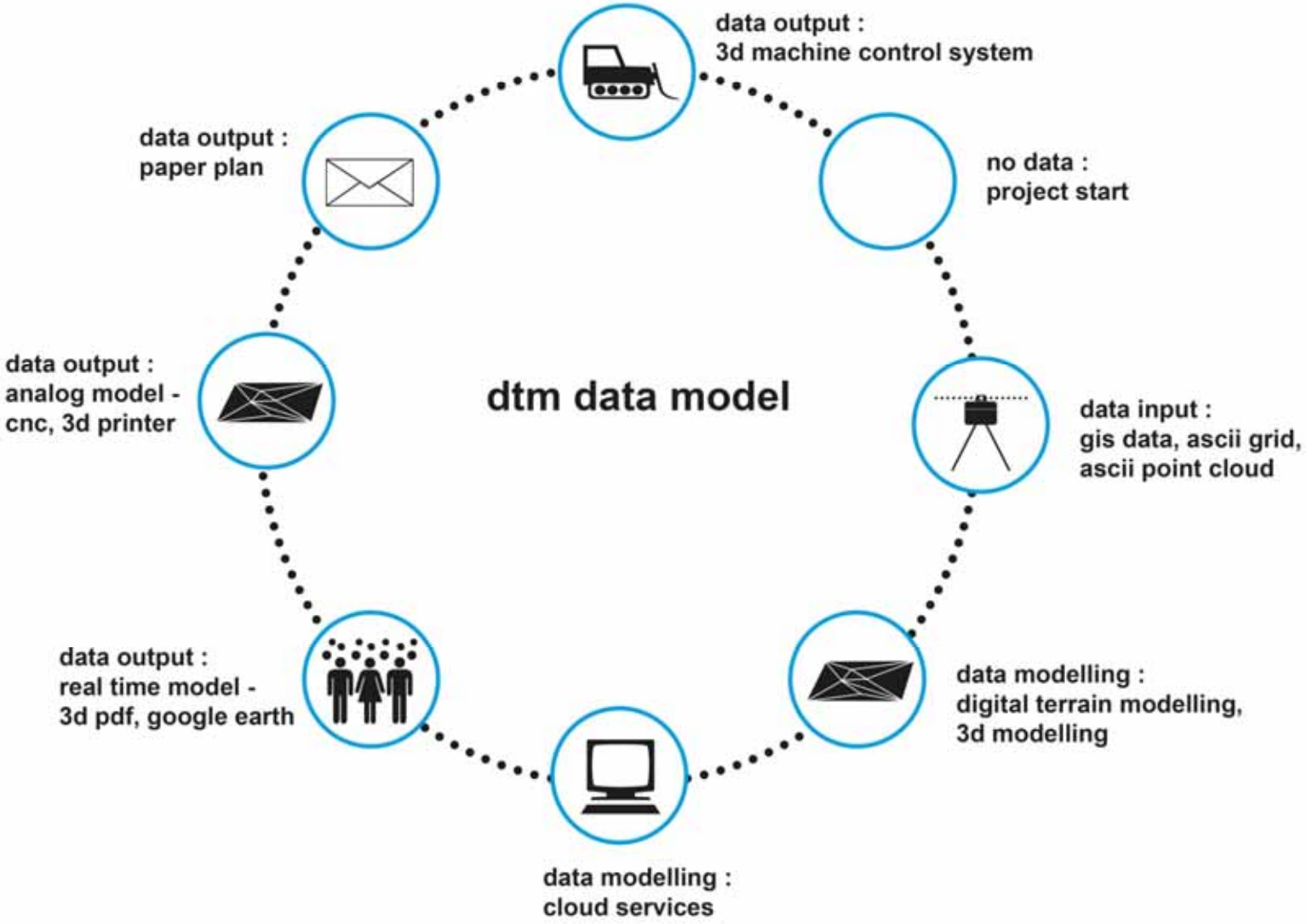
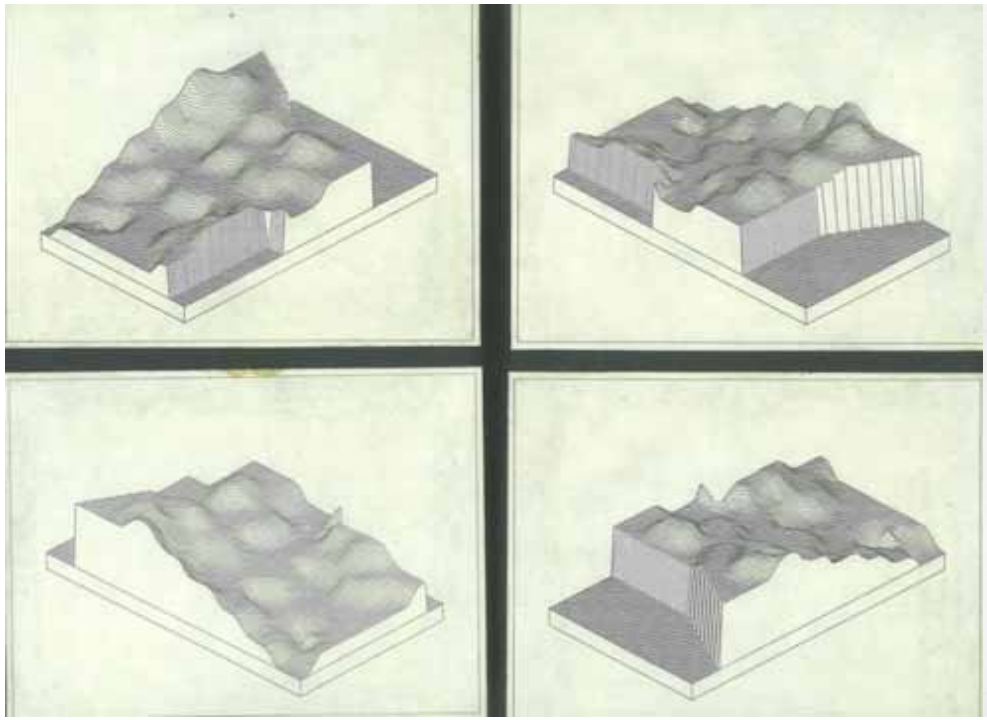
landscapingSMART

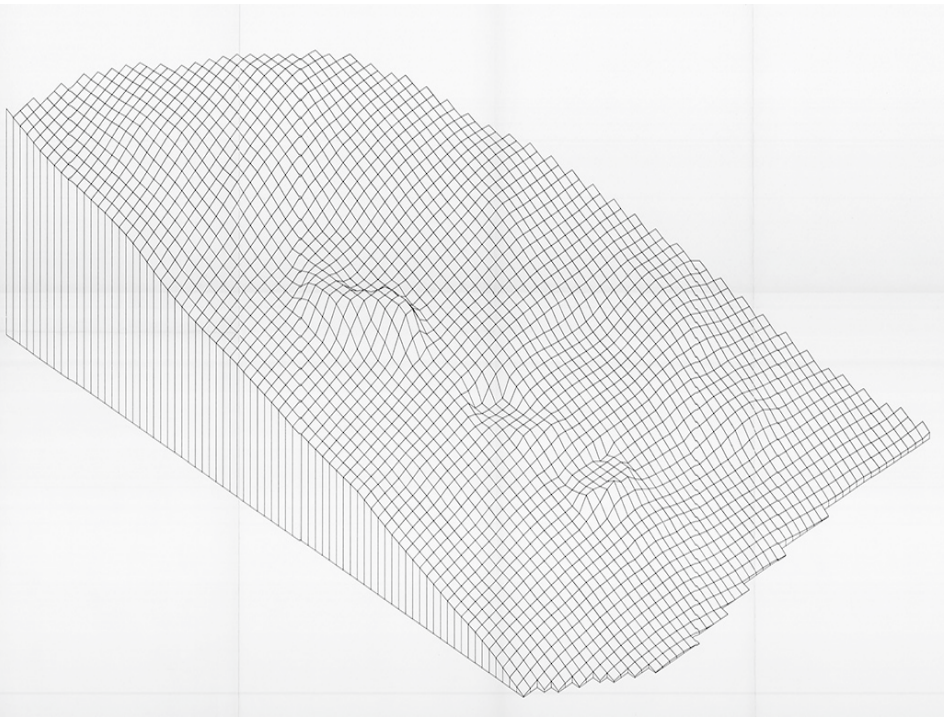


DTM basics

- Triangulated Irregular Network (TIN)
- Raster
- Delaunay-Triangulation

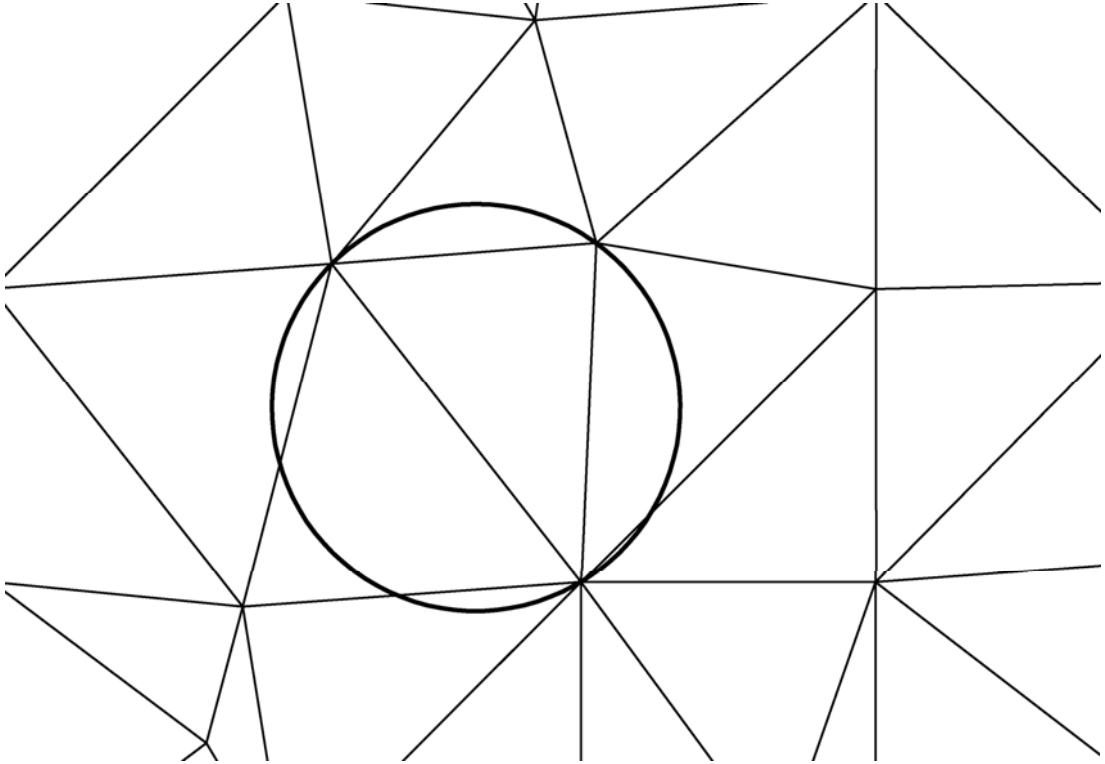
Raster

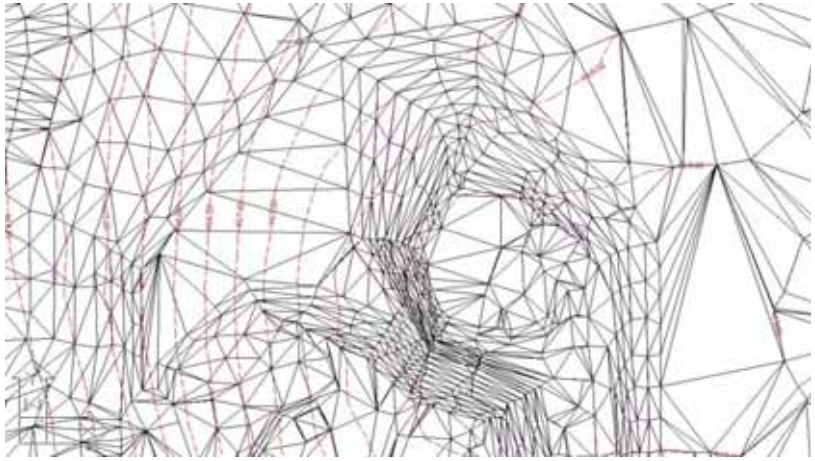


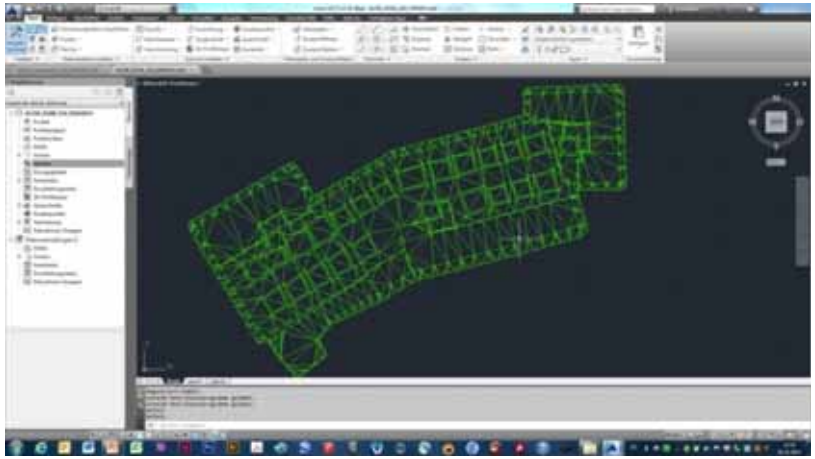


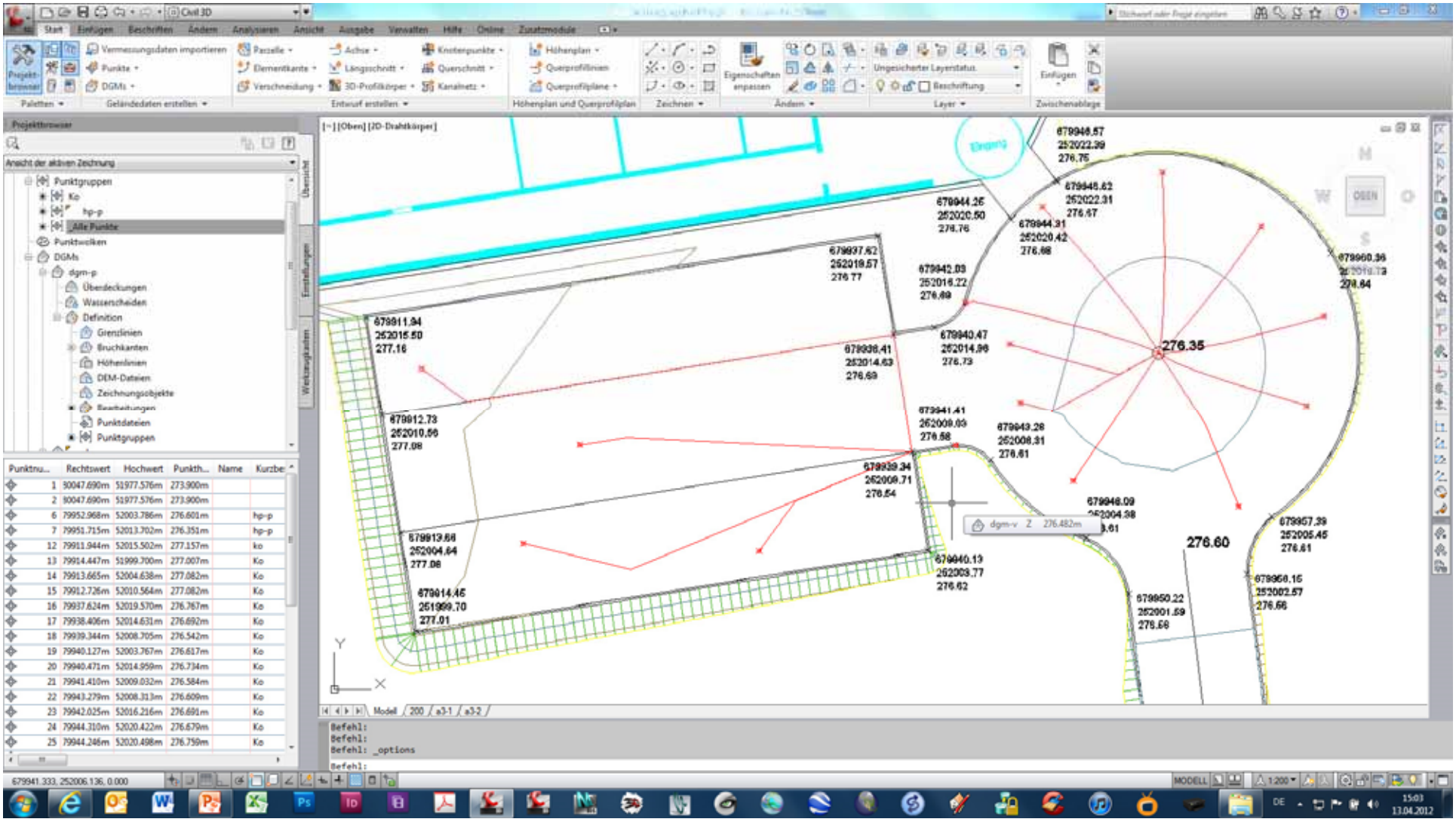
Delaunay-Triangulation

“In mathematics and computational geometry, a Delaunay triangulation for a set P of points in a plane is a triangulation DT(P) such that no point in P is inside the circumcircle of any triangle in DT(P). Delaunay triangulations maximize the minimum angle of all the angles of the triangles in the triangulation; they tend to avoid skinny triangles. The triangulation is named after Boris Delaunay for his work on this topic from 1934” (Wikipedia, 4/2012).








Civil 3D
Projektbrowser
Ansicht der aktiven Zeichnung
Punktgruppen
Ko
hp-p
Alle Punkte
Punktwolken
DGMs
dgm-p
Überdeckungen
Wasserscheiden
Definition
Grenzlinien
Bruchkanten
Höhenlinien
DEM-Dateien
Zeichnungsobjekte
Punktdateien
Punktgruppen
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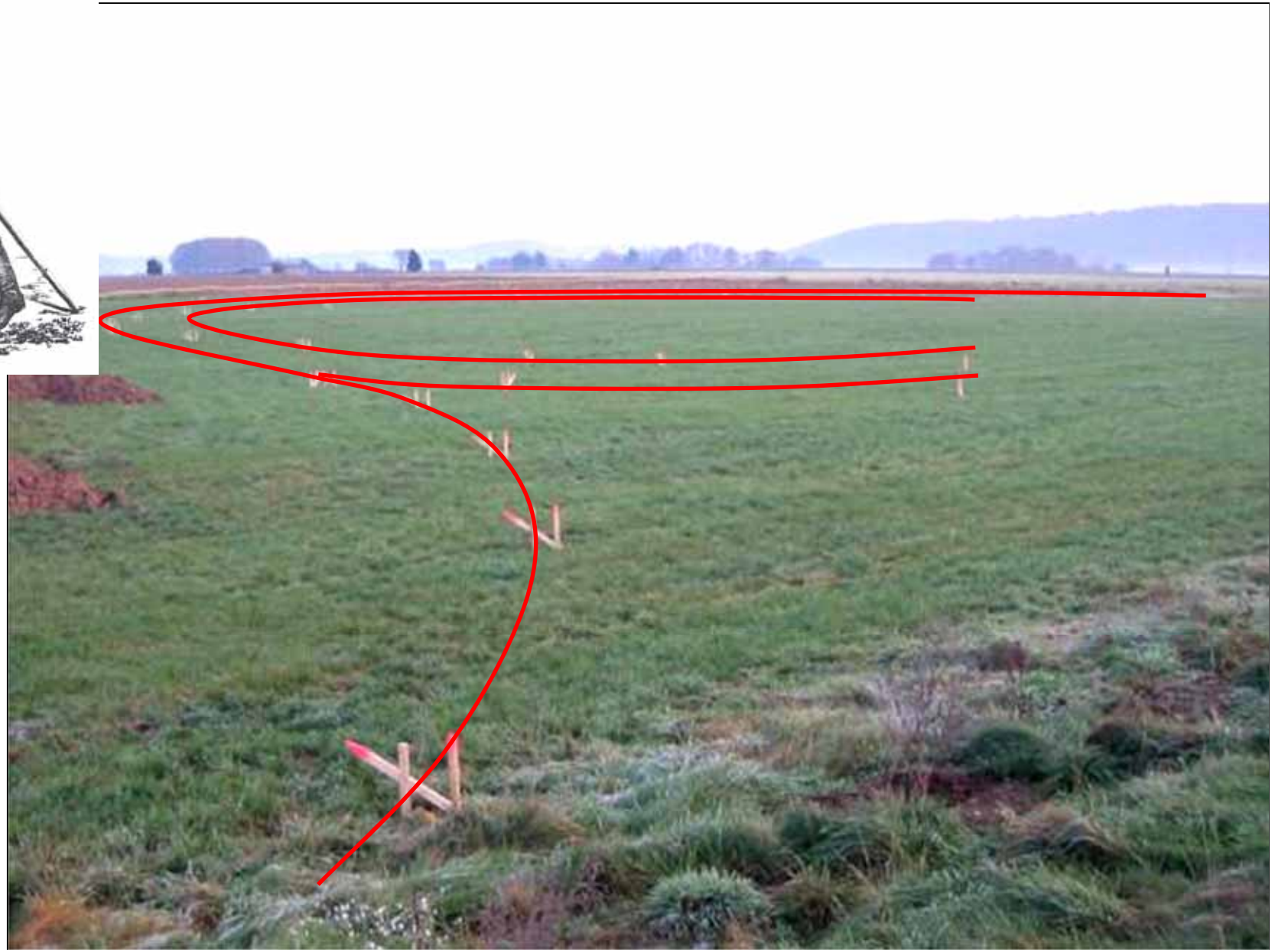
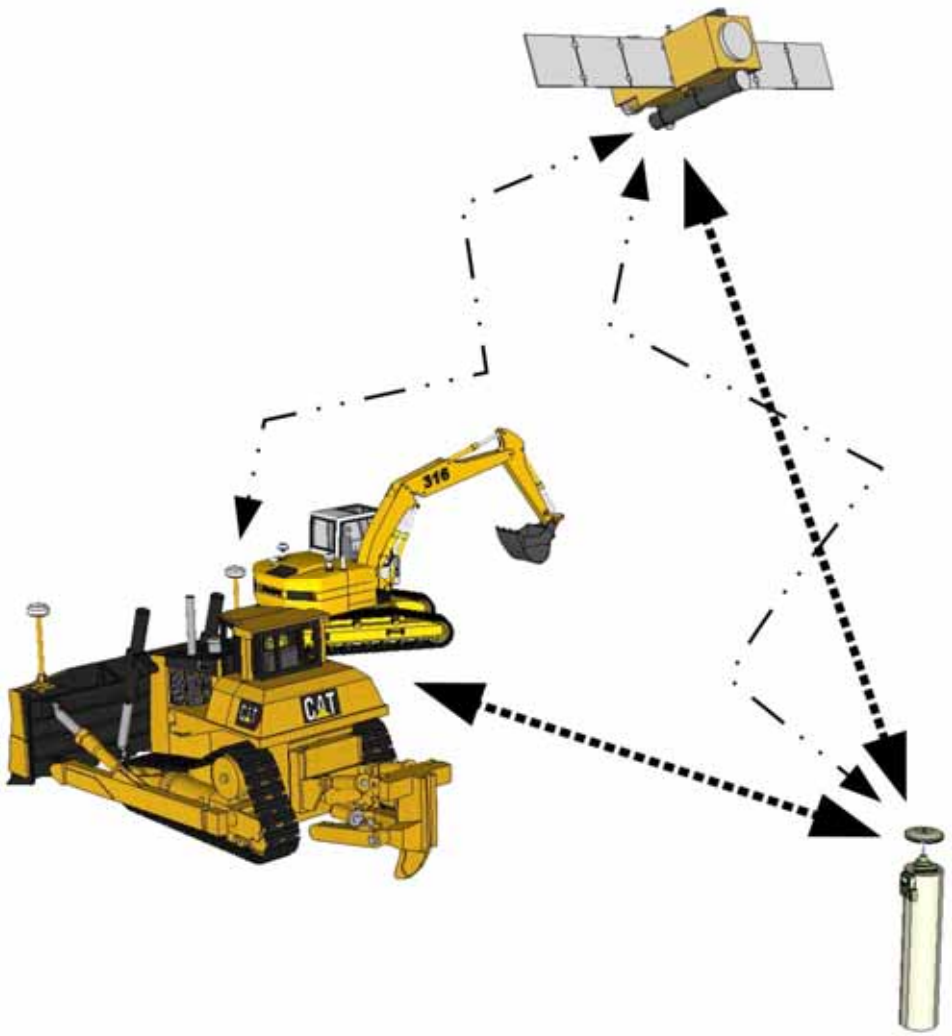
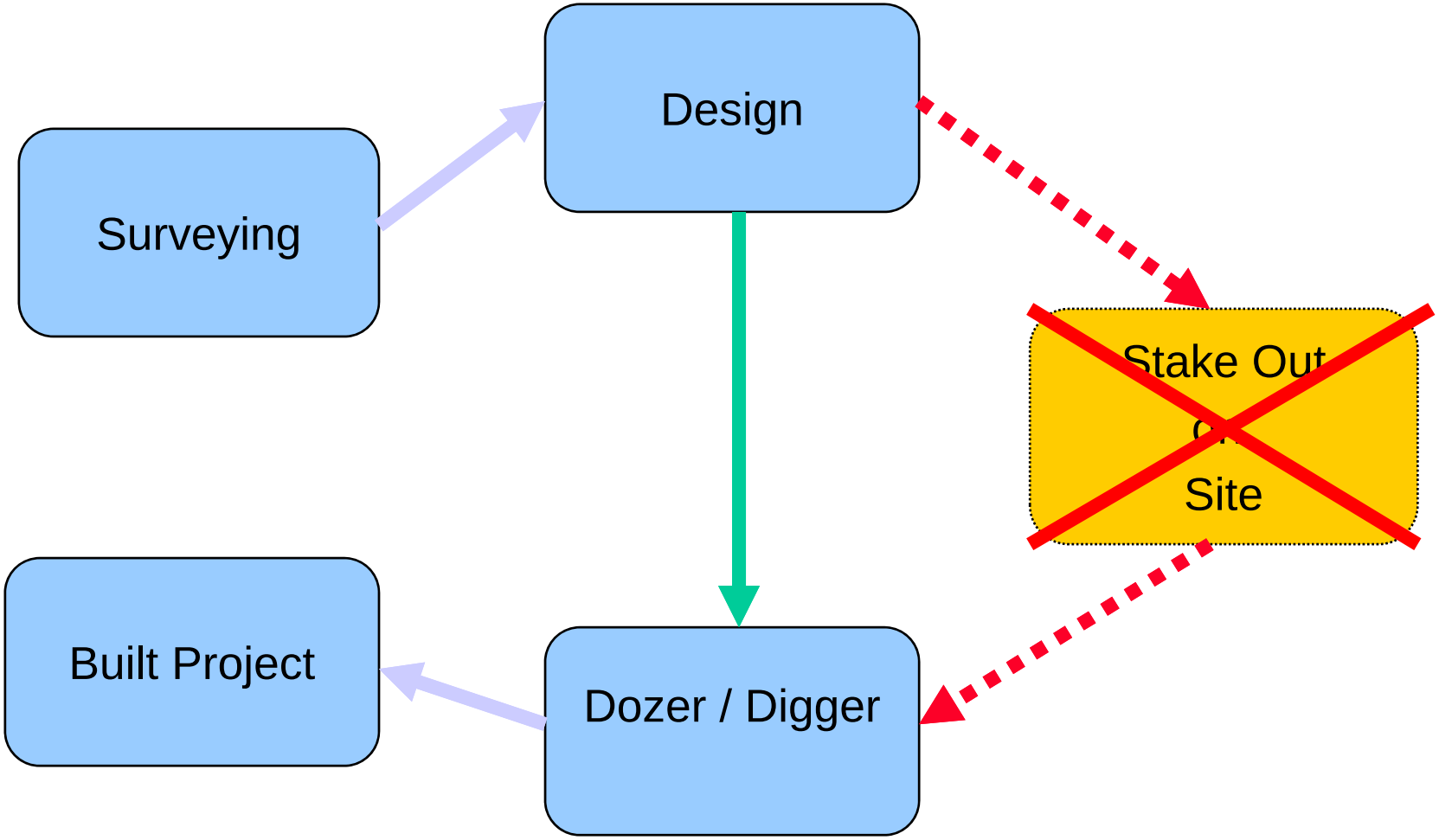




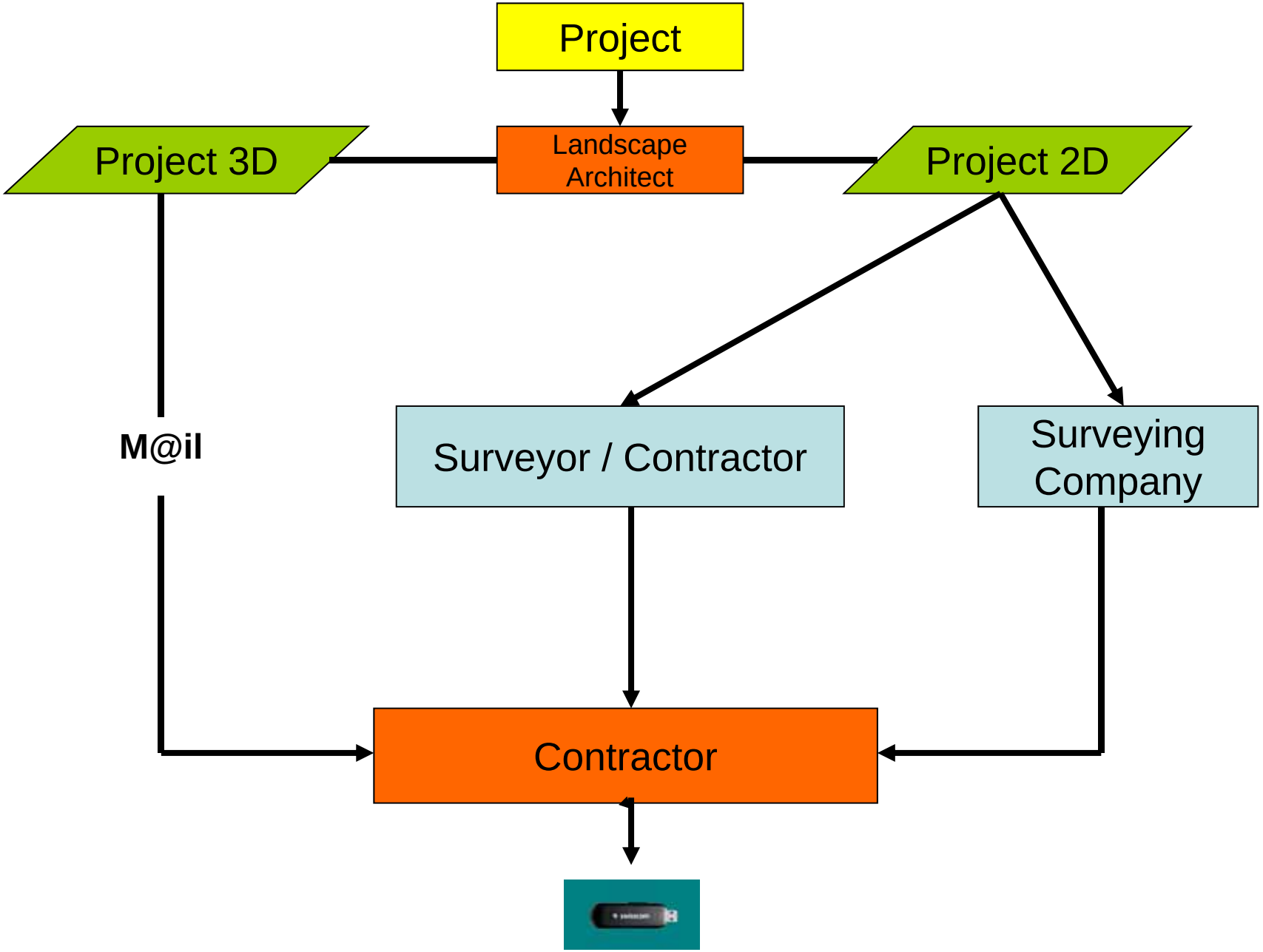
Differential Global Positioning System - DGPS
Global Navigation Satellite System - GNSS


Design
Surveying
Stake Out
Site
Built Project
Dozer / Digger

KÄPPELI
KÄPPELI
D
37EX
KOMATSU

TOPCON
ERNE
VOLVO
ERNE

SITECH


Project
Project 3D
Landscape Architect
Project 2D
M@il
Surveyor / Contractor
Surveying Company
Contractor

AMANO

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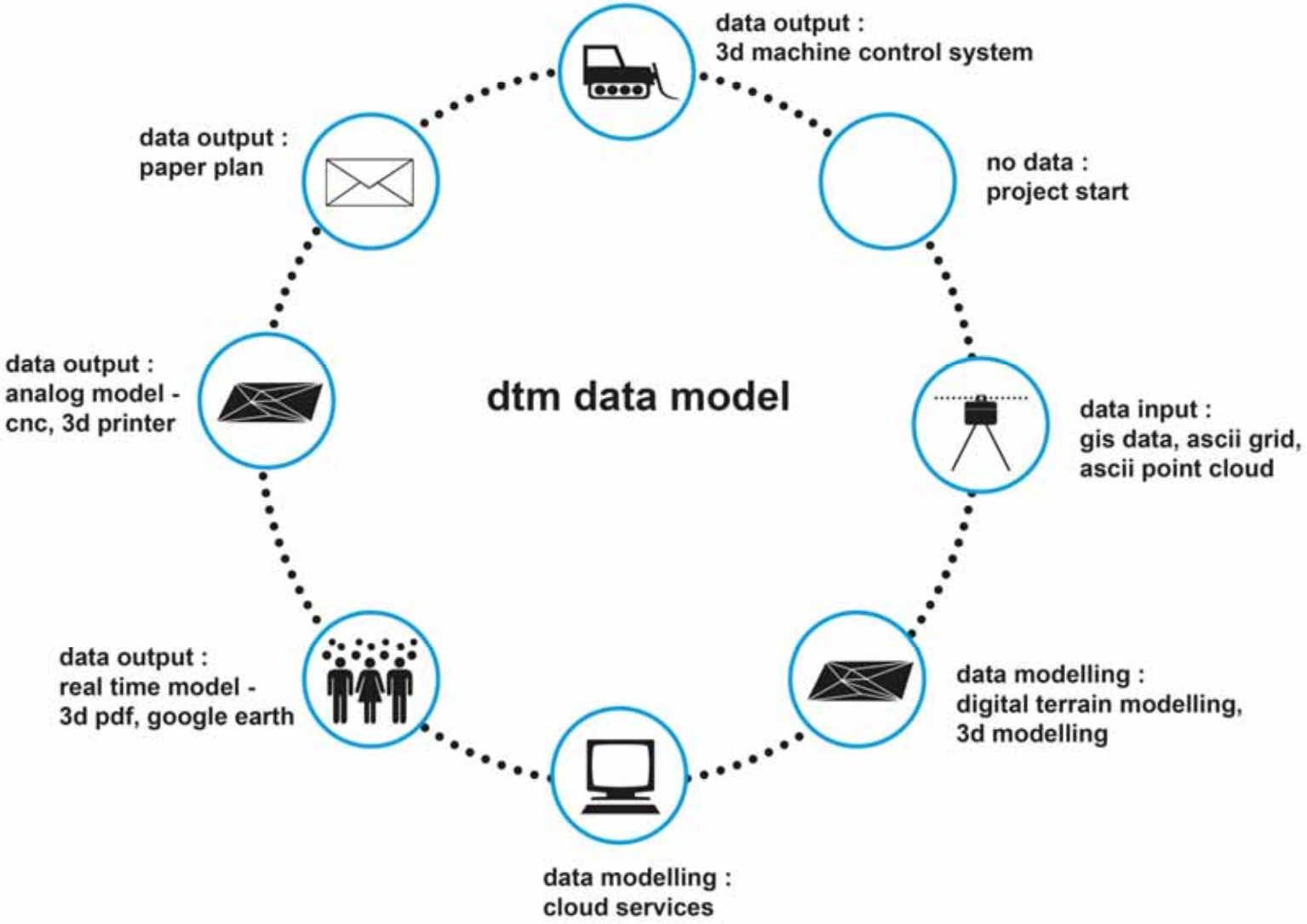
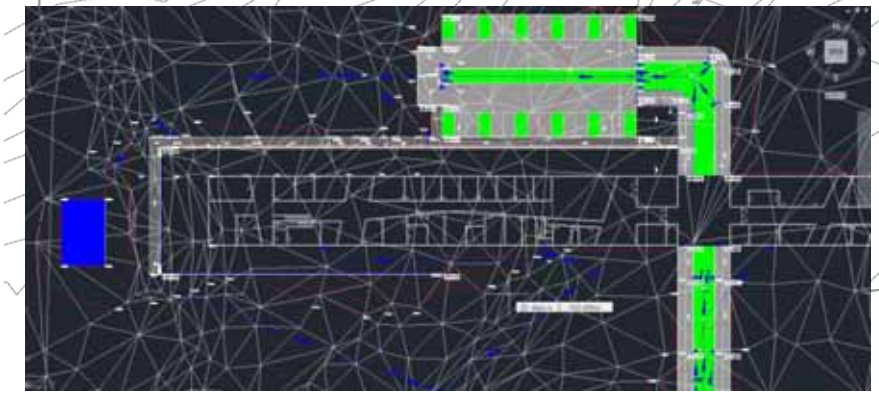
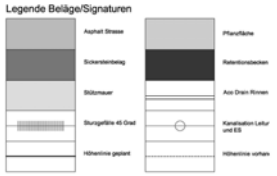


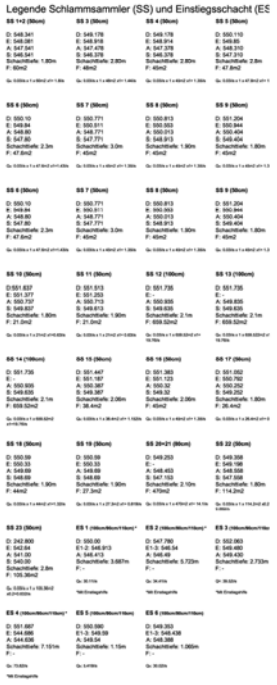
"Geodesign is a design and planning method which tightly couples the creation of design proposals with impact simulations informed by geographic contexts."[1]

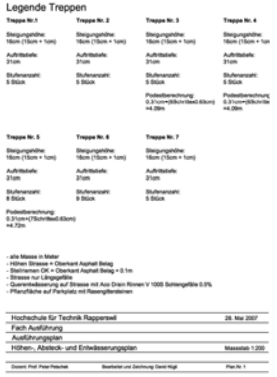
Flaxman, Michael. Geodesign: Fundamental Principles and Routes Forward. Talk at GeoDesign Summit 2010.

GeoSiteDesign&Built









Landscape Architects

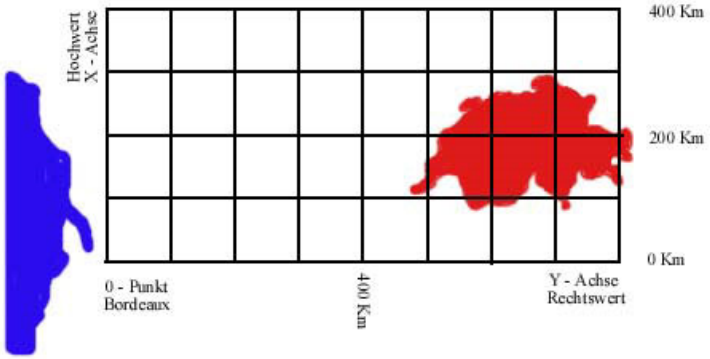
–

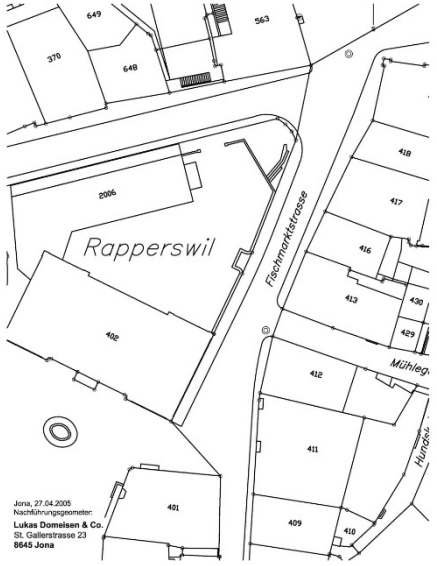
NO FEAR!!!

Recommendations (workshop / interviews):

Site Surveys / Basic Data:

- The DTM has to be in the national coordinate system.
- The basic data should not originate from scanned or traced contour lines.
- The data has to be precise, so hire a surveyor!



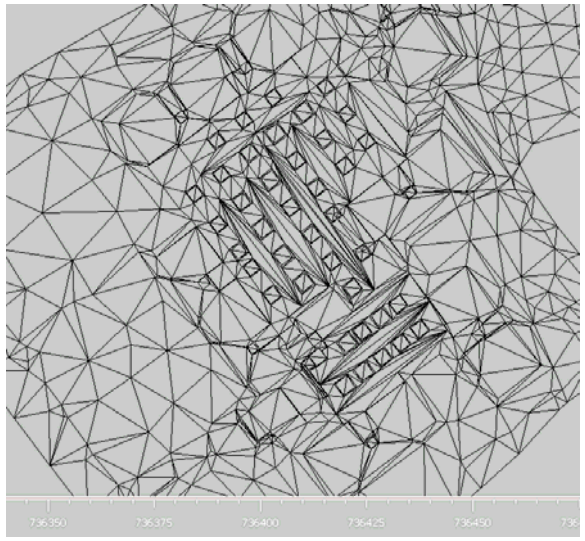


Interchange Format:

LandXML (‹landxml.org›), DXF or DWG.

Orientation

- If the breaklines are visible as lines, they serve for better navigation on the screen in the digger or bulldozer. Other basic data from the official cadastral survey, such as buildings or land boundaries, vegetation, and existing pipelines also help with navigation in the machine.
- Use Layers!!!



Layer TIN

Layer breaklines

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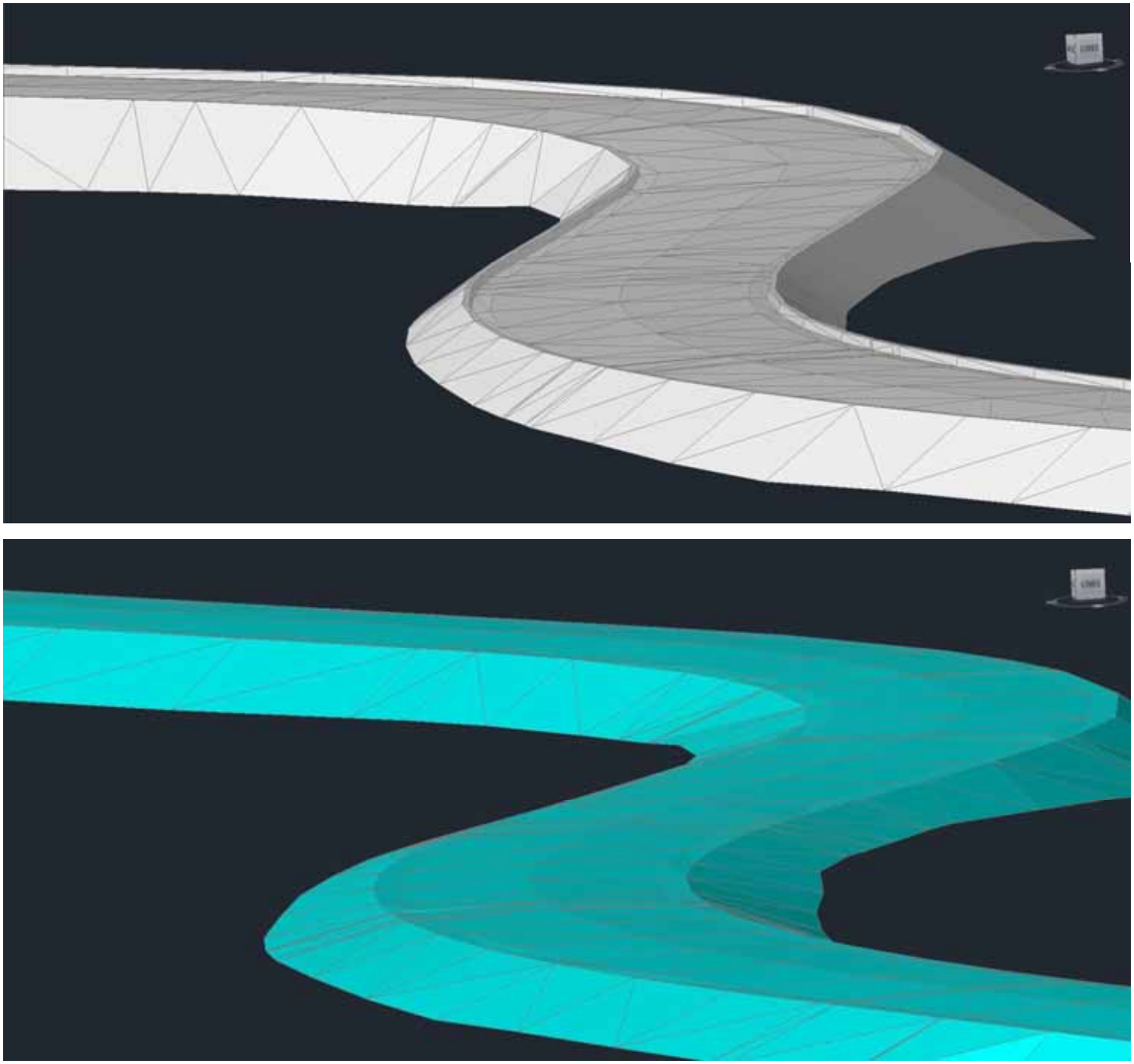
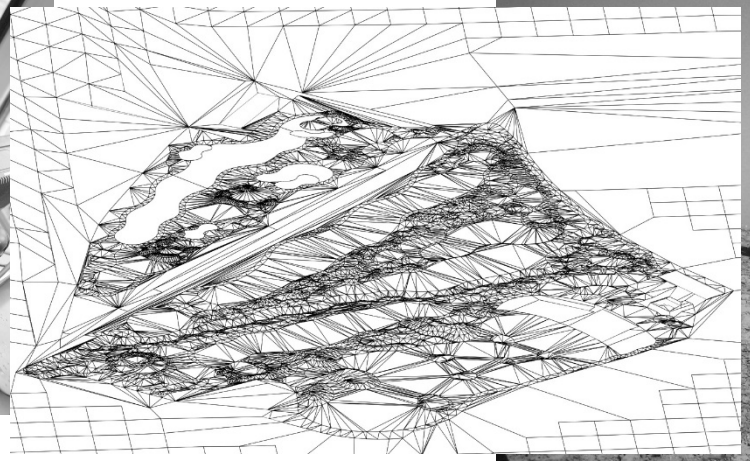
0.01m

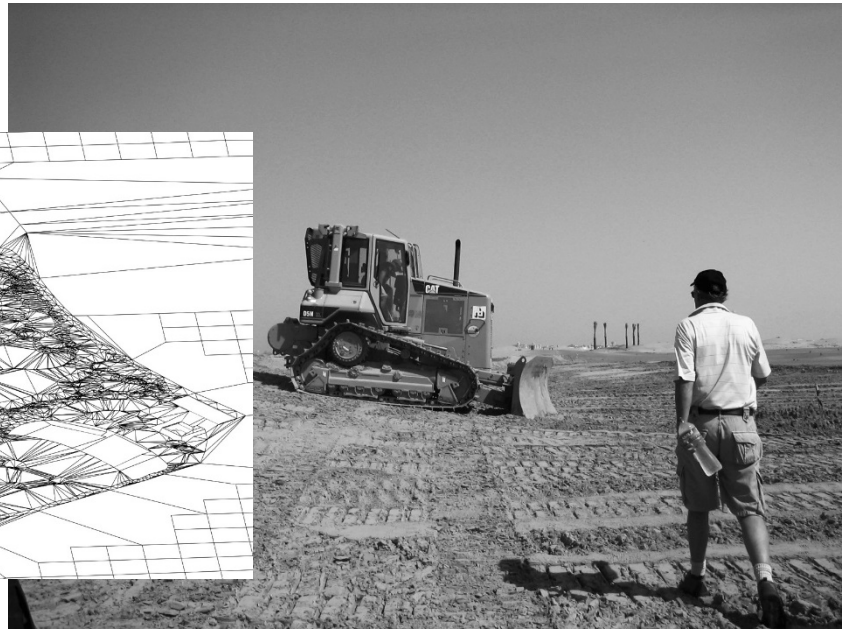


Pipelines

A 3D polyline (water run) is defined as a rule for trenches of sewer and utility pipelines. Standard machine control can excavate the pipeline according to the lines.

Design: use all available Geodata
Construction: hire a Surveyor
DTM: Landscape Architects





竖向工程 - erstes chinesisches Lehrbuch

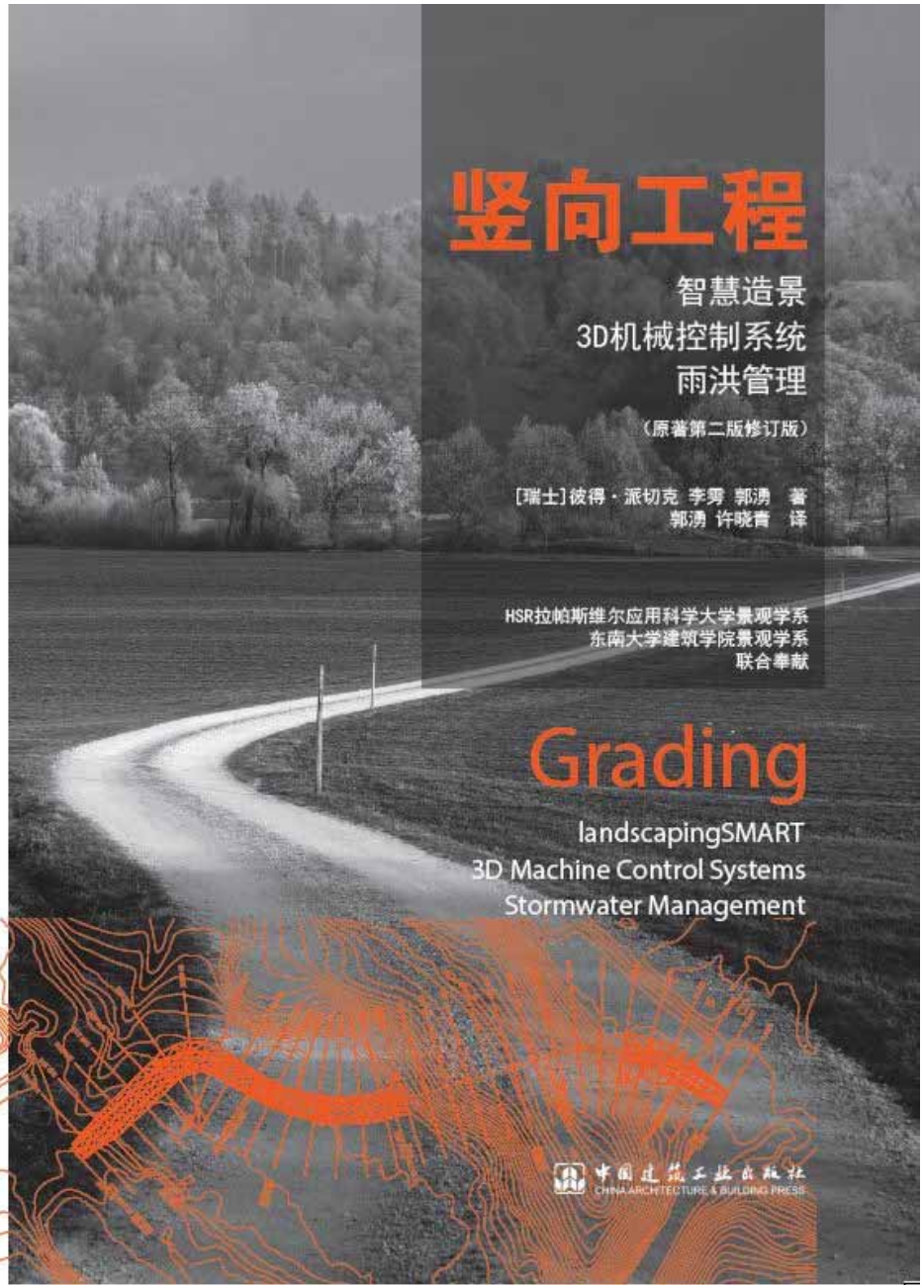
本书是瑞士HSR拉帕斯维尔应用科学大学景观学系与东南大学建筑学院景观学系的合作成果。

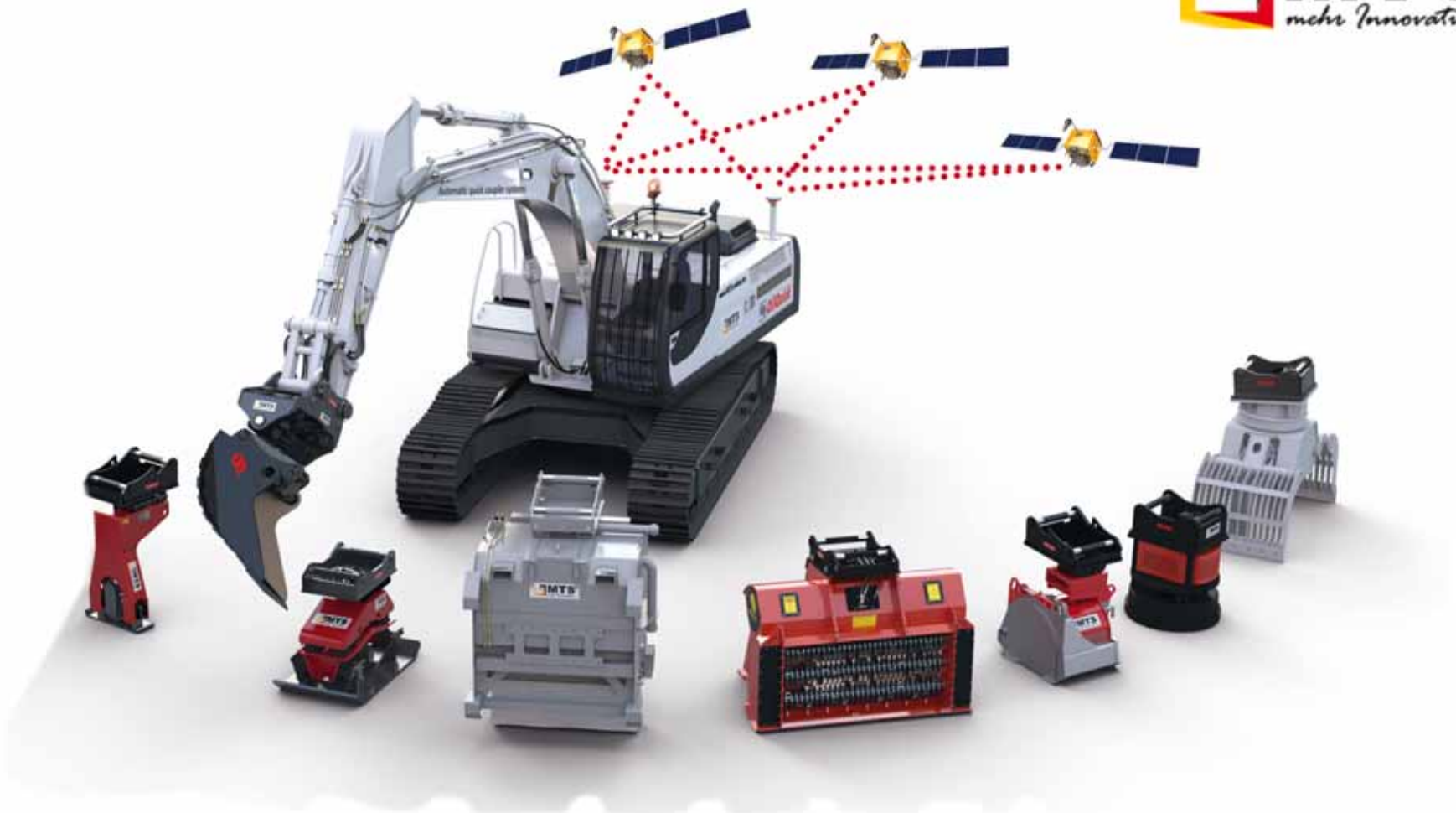
竖向与种植一样是风景园林师最为重要的设计手段之一。风景园林师必须掌握运用等高线表达设计构思和进行方案推敲的能力，能够运用等高线对设计、生态、经济和工程技术等多方面的因素进行检查和判断。这就需要地形塑造的知识。彼得·派切克的著作《竖向工程》不仅对台地、坡地、高程点、等高线和土方量计算等基础知识进行了讲解，还介绍了包括景观的稳定加固、道路和停车场的竖向设计、地形塑造的现场施工等专题，而且还给读者带来了利用数字地面模型（DTM）构建“智慧造景”工作流以及3D机械控制系统等新技术应用的全面见解。

雨洪管理的基本原理、工作流程和计算方法在书中有详细的论述。大量的国内外竖向工程案例被收录在书中。竖向设计练习题和术语表也是本书的特色内容，有助于读者熟练掌握所习得的竖向工程知识。

中文版新增了“中国古代竖向工程”和“中国当代竖向工程案例”两个章节，从中国传统文化、历史积淀，以及最新的竖向工程实践成果等方面丰富了理论基础，提升了参考价值。本书既是一本竖向工程的理论著作，也可以作为指导手册应用于工程实践。

竖向工程 智慧造景 3D机械控制系统 雨洪管理





MTS AG: Maschinentechnik Schrode AG
&
Schrode Tief-u. Straßenbau GmbH

Nationales Freiheits- und Einheitsdenkmal Berlin

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WIR SIND DAS VOLK. WIR SIND EIN VOLK.
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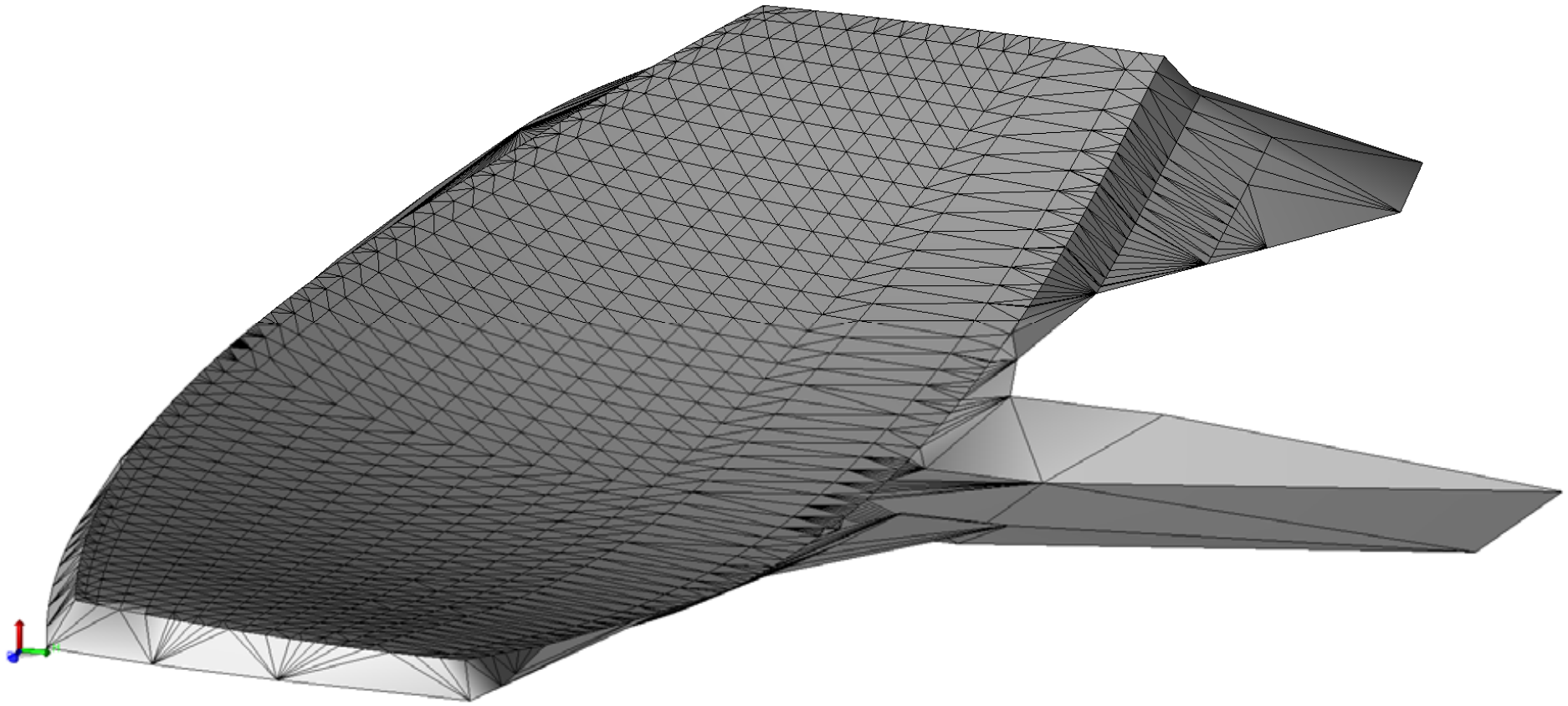

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