The Secret to Landscape Modeling with Revit

Raquel Bascones Recio
Landscape Architect, Populous.
Class summary

- Learn the basics of modeling Landscape designs with Revit. Discover how to build the most common hard and soft landscape elements and topography.
Key learning objectives

At the end of this class, you will be able to:

- Identify the difficulties of modelling landscape designs with Revit and how to remedy them
- Use Revit to build hard landscape elements
- Discover ways to model soft landscape elements
- Learn the basics of how to work with topography in Revit
1. INTRODUCTION
2. BIM FOR LANDSCAPE? REALLY?
3. SETTING OUT A LANDSCAPE REVIT MODEL
4. HARD LANDSCAPE ELEMENTS
5. SOFT LANDSCAPE ELEMENTS
6. URBAN FURNITURE
7. SCHEDULES
8. TOPOGRAPHY
9. ADD-INS
10. RENDER AND VISUALIZATION
Introduction
$30 BILLION
Total construction value of Populous projects

2000
Number of Populous projects completed globally

520 MILLION
Number of people who have attended a Populous facility in the last 10 years

34 countries where Populous has worked

18 MILLION
Number of seats in Populous-designed stadia

351,000
Number of club seats Populous has designed

3 main Olympic stadia designed

500
Number of Populous employees globally

Over 50 soccer and rugby team clients
Involvement in 6 FIFA World Cups

31 Super Bowls
8 national stadium clients
29 equestrian facilities designed
85 professional and civic arena clients

15,500
Number of suites Populous has designed
26 Major League Baseball franchise clients
40 convention centre clients
BIM for Landscape? Really?
1. Architects and Engineers working in BIM environments

2. Clients requesting BIM

3....
3. Mandatory in the United Kingdom

Betting on BIM: Inside the UK’s new construction technology mandate

It’s been nearly five years since Paul Messerschmidt, then the United Kingdom’s chief construction advisor, announced the plan to require all government contracts to be compliant with Level 2 Building Information Modelling (BIM), and the April 2016 deadline entered the national consciousness.

BIM has made steady progress and a growing number of projects across the globe are adopting BIM to achieve the potential benefits of the new requirement. Now, many construction projects in the UK are taking this to the next level: Level 3 BIM.

BIM Level 2: Final Countdown for the UK Government Mandate

21-03-2016

The April 2016 deadline set by the UK government for all centrally procured public sector projects in the UK to be constructed using BIM level 2 is fast approaching, with BIM Level 2 closely following on the horizon. It is widely regarded as the new era for the construction industry providing for a fully collaborative forum throughout the building life cycle, from initial design to operation and even deconstruction.

The benefits of BIM are well documented and include improved cost efficiencies, client outcomes, co-ordination and improved delivery times. This adoption in the UK has acted as a catalyst for improved change throughout the industry and a number of building projects are underway. It is clear that the benefits of adopting BIM are also felt in the wider industry with no less than 25% of organisations in the UK expecting to be using BIM within three years’ time according to the 2015 PBS National BIM Survey published in April 2015.

Budget 2016: Government to push ahead on Level 3 BIM

March 2016

While the Chancellor’s plans for a tax on sugary drinks may have grabbed most headlines, there was much for the construction industry to digest in the 2016 Budget - not least an explicit statement of intent when it comes to developing Level 3 BIM.

The government will develop the next digital standard for the construction sector - Building Information Modelling 3 - to save owners of built assets billions of pounds a year in unnecessary costs, and maintain the UK’s global leadership in digital construction.”
BUILDING

INFORMATION

MODELING

COLLABORATION
BENEFITS

- Company experience working with Revit
- Team background based on Autocad software
- Used by most Architects and Engineers
- Parametric design
- Unified software that allows to have views, sheets, 3D model and schedules in the same file
- Render and visualization capabilities

CHALLENGES

- No Landscape-specific build-in tools or workflows
- No interoperability with Autocad Civil 3D
- Difficulties working with Topography
- Many sub consultants still working on 2D information (i.e. Irrigation, Water Features)
Setting out a Landscape Revit Model
NEW PROJECT
VIEWS

Floorplans (per level):
- General Arrangement
- Grading and Levels
- Hard Landscape and Furniture
- Soft Landscape

Sections:
- Site wide sections
- Detail sections
WORKSETS

Site
- S-01 Components
- S-02 Existing Topography
- S-03 Proposed Topography
- S-04 Existing Planting
- S-05 Entourage
- S-06 Masses

Hard Landscape
- HL-01 Paving
- HL-02 Stairs, Ramps and Railings
- HL-03 Walls and Fences
- HL-04 Furniture

Soft Landscape
- SL-01 Trees
- SL-02 Planting
Hard Landscape Elements
PAVING
PAVING

Floor vs Roof

- Level alignment
Floor vs Roof

- Family hosting
PAVING

Floor vs Roof

- Editing shape
PAVING

Floor vs Roof

- Coordination

EXTERNAL  INTERNAL
Paving Floor Type
PAVING

Paving Floor Type

Natural Stone Bound Paving

Self Binding Gravel
PAVING

Warning, Hazard or Tactile Paving
PAVING

Warning, Hazard or Tactile Paving
PAVING

Representing paving
PAVING

Representing paving

- Material Surface Pattern
- Filled Region
GRADING & LEVELS
GRADING & LEVELS
GRADING & LEVELS
GRADING & LEVELS
GRADING & LEVELS
GRADING & LEVELS
KERBS (CURBS)
KERBS (CURBS)

Floors
- Floor: Architectural
- Floor: Structural
- Floor: By Face
  - Floor: Slab Edge

Roofs
- Roof: By Footprint
  - Roof: Extrusion
  - Roof: By Face
  - Roof: Soffit
  - Roof: Fascia
  - Roof: Gutters

Both
KERBS (CURBS)
STAIRS
Ramp cannot have two slopes
RAILINGS
RAILINGS
WALLS
FENCES

Using curtain walls as fences

- Horizontal and vertical mullions: Any profile
- Panels: Any wall type or Empty panel
FENCES

Using curtain walls as fences
Using curtain walls as fences

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FENCES

Using curtain walls as fences
GATES

Using curtain walls doors as gates
WATER FEATURES
WATER FEATURES
WATER FEATURES
Soft Landscape Elements
MODEL AND REPRESENTATION
TREE PLANTING

RPC

3D Trees

2D Trees
TREE PLANTING
UNDERSTORY PLANTING
PLANTING

Specimen Shrubs

Understory planting

Data
- Height
- Layers
- Soil depth
- Area
UNDERSTOREY PLANTING
UNDERSTOREY PLANTING
UNDERSTOREY PLANTING

30 No. Buxus sempervirens
10 m²

12 No. Juniperus horizontalis
6 m²

9 No. Rosmarinus officinalis
2 m²

30 No. Buxus sempervirens
10 m²

25 No. Echium candicans
8 m²

9 No. Lavandula officinalis
3 m²
PLANTING PLANS

Representing understory planting

- Material Surface Pattern
- Filled Region
Urban Furniture
URBAN FURNITURE
Schedules
SCHEDULES

Hard Landscape
Soft Landscape
Furniture
HARD LANDSCAPE SCHEDULE

Paving

Stairs

Ramps

Railings

Walls

Fences & Gates
HARD LANDSCAPE SCHEDULE
HARD LANDSCAPE SCHEDULE

Data
- Material
- Size
- Joints (if applicable)
- Colour
- Finish
- Quantities/Area
- Model
- Manufacturer

OPTIONS
- Create new parameter
- Rename existing parameter
## HARD LANDSCAPE SCHEDULE

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HARD LANDSCAPE SCHEDULE
# HARD LANDSCAPE & FURNITURE SCHEDULE

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SOFT LANDSCAPE SCHEDULE

Trees

Specimen Shrubs

Understorey planting
**SOFT LANDSCAPE SCHEDULE**

**Understorey planting**

- Area
- Spacing \( \rightarrow \text{NEW} \)
- Quantities

Triangular pattern: \( \frac{\text{Area}}{\text{Spacing}} \times \text{Spacing} \times 0.866 \)

Square pattern: \( \frac{\text{Area}}{\text{Spacing}} \times \text{Spacing} \)
Topography
TOPOGRAPHY

Challenges

- Toposurfaces are made with one single material that extends to infinite. There is no way to control layers, materials or depths. You can only change the colour at the top surface (material).

- Only few families (mostly entourage families) can be hosted by a Toposurface

- No voids can be opened

- No specific tools to model water bodies

- No interaction with hard landscape elements

- Revit creates Toposurface based on triangles not contours

- No interoperability between Revit and Civil 3D

- Toposurface can't be smoothed

- No grading tools
CREATING TOPOSURFACES
CREATING TOPOSURFACES

Contours

Triangles
SITE TOOLS

- Only one direction sloping
- No control on borders (vertical walls)
- Refine toposurfaces boundaries
- Create roads, kerbs and footpaths
SITE TOOLS  Split Surface: Refine Toposurfaces’ Boundaries
SITE TOOLS  Split Surface: Create roads, kerbs and footpaths
SITE TOOLS

- Toposurface remains unique
- Availability to change the surface material
MODIFYING TOPOSURFACES
MODIFYING TOPOSURFACES
MODIFYING TOPOSURFACES
CUT & FILL

Existing

New construction

Properties

- Topography (1)
- Materials and Finishes
  - Material: <By Category>
- Dimensions
  - Projected Area: 38341.636 m²
  - Surface Area: 38742.711 m²
- Identity Data
  - Image
  - Comments
  - Name
  - Mark
  - Phasing
    - Phase Created: New Construction
    - Phase Demolished: None
- Other
  - Net cut/fill: 18280.771 m³
  - Fill: 27368.331 m³
  - Cut: 9587.560 m³
Add-ins
TOPO ALIGN

- **Align to Element**: Adjust toposurface to edge or floor geometry
- **Points from Lines**: Add points on toposurface along model lines
DYNAMO BIM

- Hardscape (Floors) that follows topography
- Automatic creation of planting lines
- Parametric placement of families
- Topography from Rhino elements
- Fence follows toposurface
- Sheet and View management
Render & Visualization
VIRTUAL REALITY
VIRTUAL REALITY

Revit Model

3D Studio Max

Autodesk 360 Cloud Render

LINK
Q&A
How did I do?

- Your class feedback is critical. Fill out a class survey now.
- Use the AU mobile app or fill out a class survey online.
- Give feedback after each session.
- AU speakers will get feedback in real-time.
- Your feedback results in better classes and a better AU experience.
Thanks!

raquel.bascones@populous.com

POPULOUS™