InfraWorks 360 for Architects

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

Gather & utilize various Data

Develop your design proposals

Analyze & Present your designs
Software summary

Data Gathering
- RECAP
- C3D

Design
- 3DS MAX
- R

Analysis & Presentation
- FLOW
- MAX

nearmap.com
01 Data Gathering
01 Data Gathering

- Coordinate systems Civil 3d
- Aerial imagery nearmap
- Shape files Bbbike
- Concept design Formit/sketchup
- Laser scan Recap
Coordinate systems | MGA 56

**MGA - Map Grid of Australia**

The official coordinate projection for use with the Geocentric Datum of Australia 1994 (GDA94)

<table>
<thead>
<tr>
<th>Description</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projection</td>
<td>Transverse Mercator</td>
</tr>
<tr>
<td>Zone Width</td>
<td>6 degrees</td>
</tr>
<tr>
<td>Longitude of Origin</td>
<td>Central Meridian of each zone</td>
</tr>
<tr>
<td>Latitude of Origin</td>
<td>Equator (zero degrees)</td>
</tr>
<tr>
<td>False Easting</td>
<td>500,000</td>
</tr>
<tr>
<td>False Northing</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Central Scale Factor</td>
<td>0.99996</td>
</tr>
<tr>
<td>Units</td>
<td>Metre</td>
</tr>
<tr>
<td>Ellipsoid</td>
<td>GRS80</td>
</tr>
<tr>
<td>More Information</td>
<td>Go to ICSM website.</td>
</tr>
</tbody>
</table>

**MGA Zones for NSW**

Coordinate systems | MGA 56

Autodesk Civil 3D

Autodesk InfraWorks 360
Civil 3d | right click settings to set MGA 56 (GDA 94)
Choosing the correct date
Compare the dates for best results

Aim for Summer midday short shadows

Avoid Winter morning/end of day long shadows
Saving out data
VIDEO 1 – NEARMAP IMPORT TO CIVIL 3D

*full workflow video on Autodesk ANZ - YouTube
MAPEXPORT | shp & shx files

Check the x & y values

Use polygon & select manually

Make sure polylines are closed
Shape files | http://extract.bbbike.org/
use the shp files
Data gathering | Recap measurements & mirror balls

Laser scan courtesy of Brett Casson
Attach point cloud scan (manually placed & rotated)
Creating a site surface from point cloud data
*full workflow video on Autodesk ANZ - YouTube

VIDEO 2 – CONVERT POINT CLOUD TO SURFACE
Civil 3D | Mapimport of road shp files from Bbbike

- Or just drag and drop!
Nearmap | Bbbike | ReCap – check in Civil 3d
Data gathering | Sketchup buildings

Deutsche Bank Place Sydney

The Deutsche Bank Place building at 126 Phillip St, Sydney is one of the most recognisable buildings in Sydney. Consisting of 39 floors, the building was completed in 2008. It is officially Sydney’s third tallest building excluding Sydney Tower at 240m to the top of the roof framework, but is only 168m to the roof. It is the second tallest building in the world with fewer than 40 stories. An atrium 150m tall is located between the main building and lift tower and is the tallest in Australia and one of the tallest in the world. Modeled by Peter Olsen, Brighton-le-Sands, Sydney, Australia.

3d preview with textures

Google earth location
Data gathering | Sketchup textures missing?
Data gathering | Run Sketchup through 3ds max

Note – can export DAE file direct from sketch up
Data gathering | Formit

Model on web browser or mobile with google maps for base

Download as rvt file and bring direct into InfraWorks
Data gathering | Formit

Bring rvt file to 3ds max to texture with site photos

Export as a DAE file to bring textures through to Infraworks
VIDEO 3 – FORMIT SITE MODELS

*full workflow video on Autodesk ANZ - YouTube
Building Heights | http://www.itoworld.com/
Building Heights | red = no height information!

http://www.itoworld.com/map/85
Use this formula to calculate the height of the building:

\[ \text{Height} = (\tan(\text{angle}) \times \text{distance}) + \text{eye height} \]

Example: Given a building distance of 25 meters, an angle of 37 degrees, and an eye height of 1.75 meters, the formula would be:

\[ \text{Height} = \tan(37) \times 25m + 1.75m \]
\[ = 0.75355 \times 25m + 1.75m \]
\[ = 20.6m \]

Building height | use trigonometry (or guestimate…)

With a few simple measurements, it's possible to estimate heights with some accuracy. Take a look at the figure below. All you need to know is:

- your distance from the building
- your eye height
- the angle between the ground and the top of the building

Existing site building needs a base

3d warehouse model placed in InfraWorks

Google earth panorama reference view
Create a custom façade for in product building

Façade style palette

Configure the façade layouts & blocks

Edit your custom textures in Autodesk Pixlr editor (free web app)

Define the new texture in materials palette
Create a custom façade – duplicate an existing one
Starting the InfraWorks 360 model from scratch

Name

Model extents
use nearmap

MGA-56

Left side of road...
Data Sources | Revit & Navisworks required

- 3D Model
- Autodesk AutoCAD Civil 3D DWG
- Autodesk IMX
- Autodesk Revit
- CityGML
- DGN 3D Model
- DWG 3D Model
- IFC
- LandXML
- Point Cloud
- Raster
- SDF
- SHP
- SQLite
- SketchUp
Now bring in the data!

- nearmap
- Bbbike
- Point cloud
- Formit
- Sketchup
note!

- Nearmap (MGA-56)
- Bbbike (use LL84)
- Point cloud – (XY-M with MGA-56 position and x,y,z & rotation)
- Formit & Sketchup (interactive place)
02 Design

- Design options **Formit**
- Tower design **Revit**
- Furniture **3ds max**
- People **3ds max Populate**
- Soft scape **Autodesk Seek**
Formit | Tower options

- Fast sketch design
- Web & mobile
- Use google earth

- Formit pro solar analysis
- Import/export Revit data
- Export obj
Formit | tower options
VIDEO 4 – FORMIT DESIGN OPTIONS

*full workflow video on Autodesk ANZ - YouTube
Tower design | import Revit direct with MGA-56
Setting up project base point (enter in meters)

Get your N/S (y) E/W (x) Elevation (z) and rotation (angle from true North) from the Civil 3d MGA 56 set up
Export dwg set up | Meters & shared coordinate
X-Ref into Civil 3d to check against nearmap setup
Data source | Revit data import - simplify
Data source | Revit curtain wall issues

Note – to get better textures link it to 3ds max and use standard textures
Data source | Export NWC from Revit
Export FBX from Navisworks
Furniture & sculpture | inspiration

Millennium park Chicago
3ds Max | Fast 3d design and texturing
3ds Max | Import as furniture to InfraWorks 360
3ds max | Add the DAE file to the INFW style palette

Note – can also simplify heavy models at import stage
InfraWorks 360 | in product design tools + add & edit

Streets

Buildings

Furniture
Populate people | use standard materials
Add butterfly's from Autodesk knowledge network

`\$Scenes\Crowd\MotionClips`

http://knowledge.autodesk.com/support/3ds-max/downloads/caas/downloads/content/3ds-max-2016-sample-files.html
*full workflow video on Autodesk ANZ - YouTube

- VIDEO 5 – 3DS MAX FURNITURE & SCULPTURE
Note – go to the existing tree group properties and delete the manual style name 1st!
Tree Randomize | Style rules
Seamless grass | new textures in Material/terrain
Soft scape design | Autodesk Seek trees from xfrog
03 Analysis & Presentation
Analysis & Presentation

- Animated text **3ds max**
- Cars **3ds max Civil view**
- Shadows **Autodesk Pixlr**
- Airflow **Flow Design**
- Animation **InfraWorks 360**
3ds Max | Animated text
VIDEO 7 – 3D ANIMATED TEXT

*full workflow video on Autodesk ANZ - YouTube
Civil view | use shape files for vehicles to follow
Civil view | Script to convert Arch & Design materials
*full workflow video on Autodesk ANZ - YouTube

- VIDEO 8 –CIVIL VIEW
InfraWorks 360 |Align with roads & turn on animation
Shadow overlays | Feature & terrain themes

Option 1
12pm – 3pm April

Option 2
12pm 3pm April

Option 3
12pm 3pm April
Shadow overlays | Feature & terrain themes
Overlay in Autodesk Pixlr editor to review shadows
Airflow | export the fbx for Autodesk Flow Design
Autodesk Flow Design | import fbx model (no trees!)
Flow line settings | Adjust seed box
Run velocity analysis for winds (flow line display)
Iso surfaces & surface pressures
Colour schemes and displays
*full workflow video on Autodesk ANZ - YouTube

- VIDEO 9 – AIRFLOW
Story board | Sun path study winter/summer
Story board | simple animation presets
*full workflow video on Autodesk ANZ - YouTube

- VIDEO 10 – STOREY BOARD
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