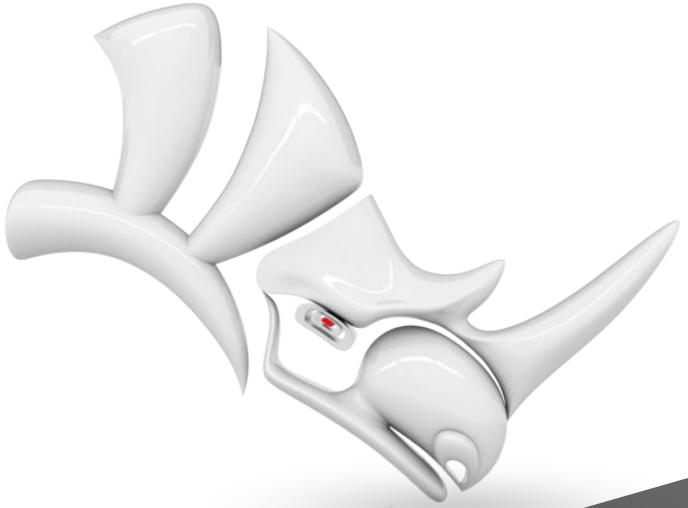
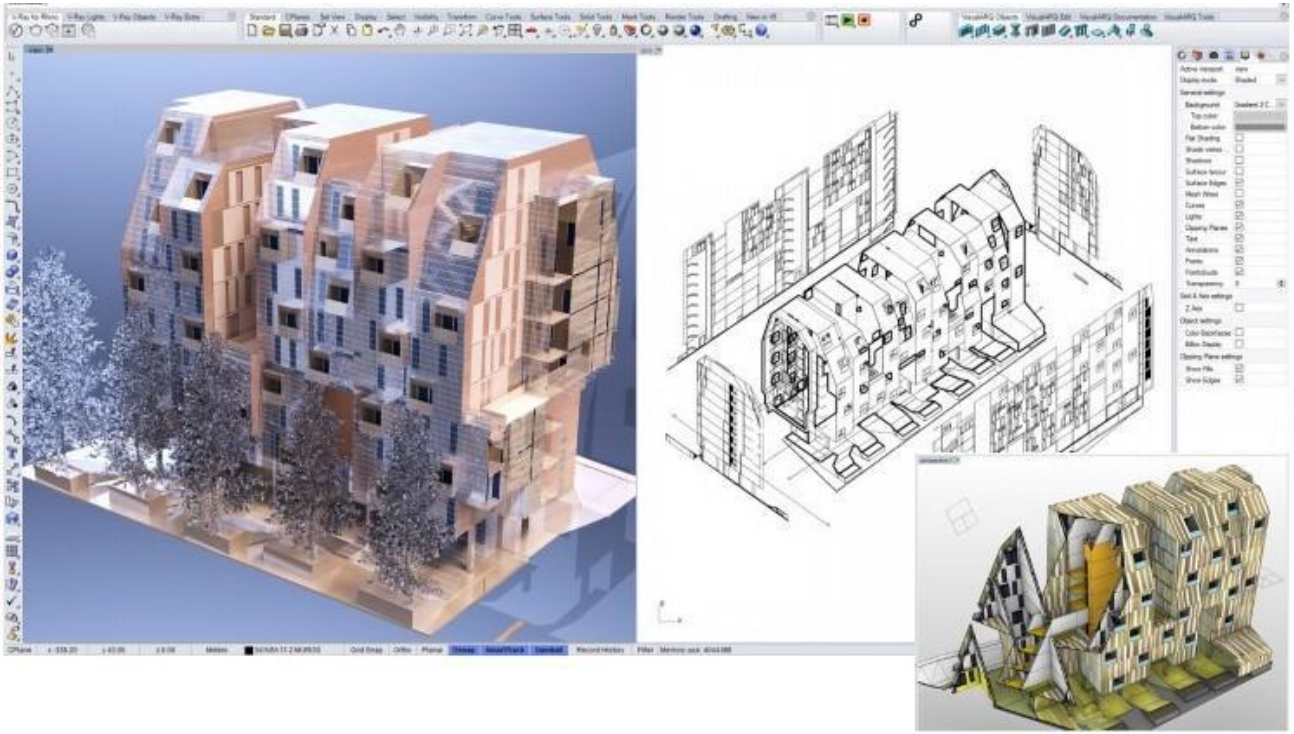


Rhinoceros® 6

Beginner & Advanced Tutorials

By Richard Yi for the Digital Research Hub

What is Rhinoceros 6?



Rhinoceros 6 is a versatile 3D modeller used in numerous design related industries.

You will primarily be using Rhinoceros 6 to create detailed renders and other architectural drawings such as plans, sections, elevations and technical drawings.

Beginner Tutorial

Rhinoceros 6 Plugins

Navigating The Interface

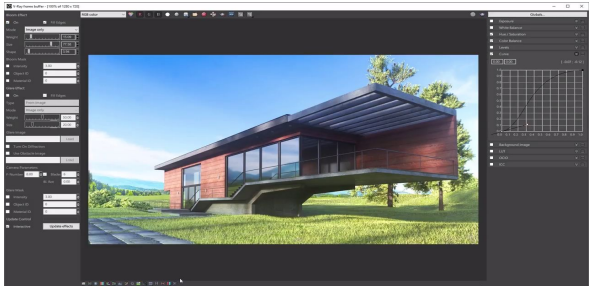
Basic Commands

Creating a Dom-Ino House

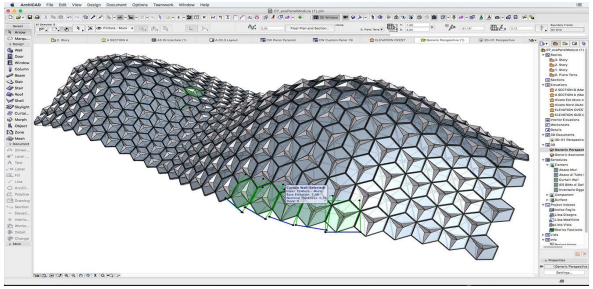
How to Export

Rhinoceros 6 Plugins

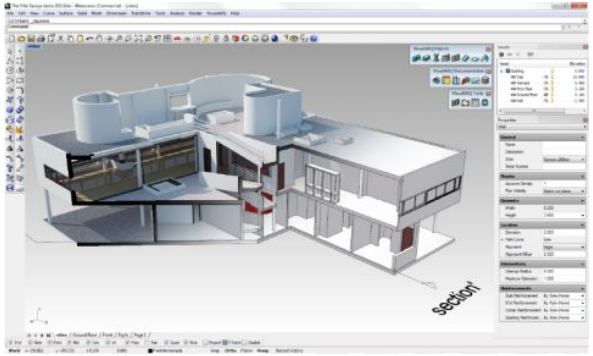
Vray



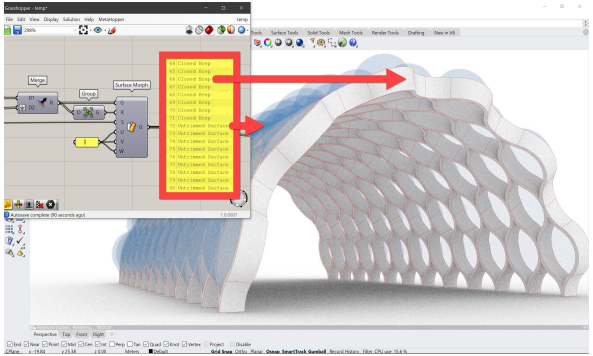
Grasshopper



VisualARQ



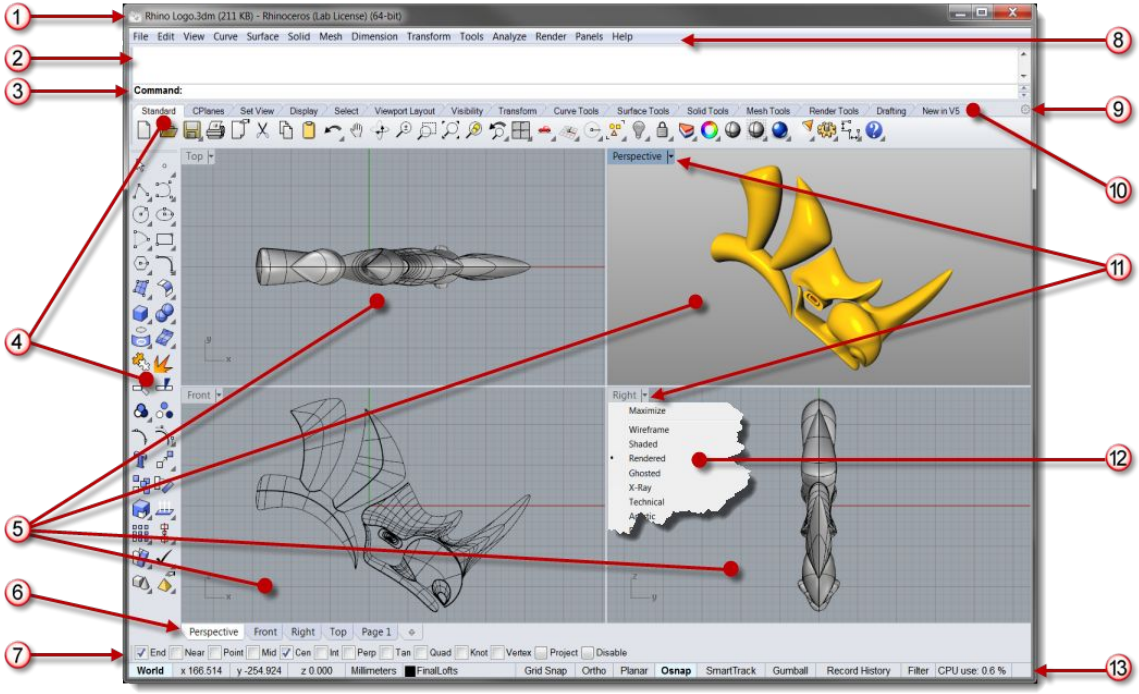
Grasshopper



One major benefit of using rhino is the plugins that you can use while designing.

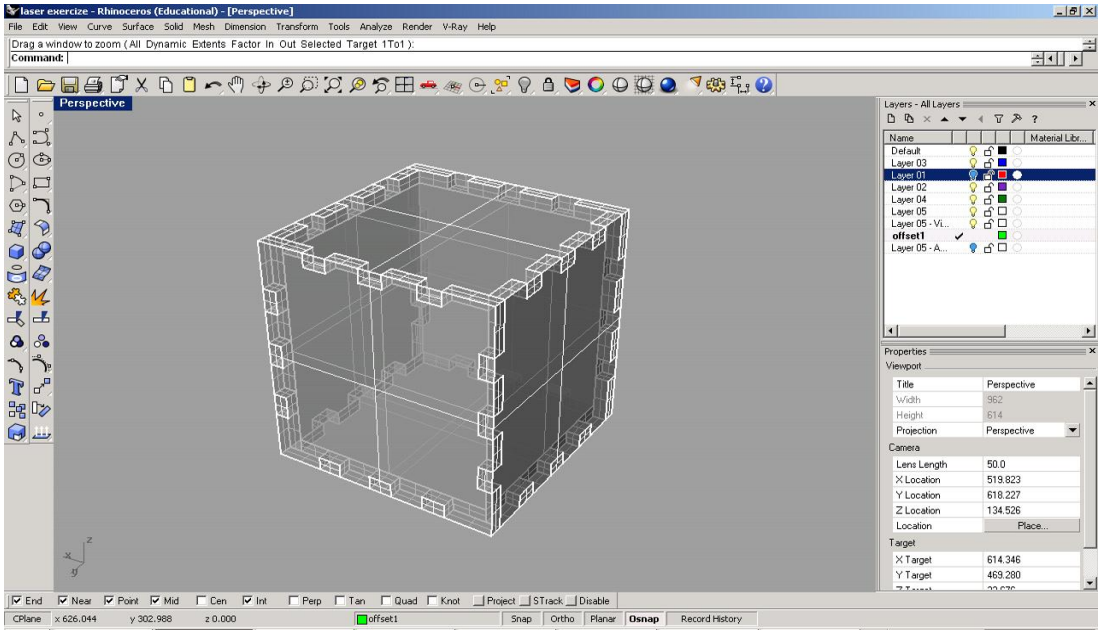
- You can use v-ray to make photorealistic renders
- Grasshopper to create complex parametric design
- VisualARQ to make an accurate BIM of your building, just to name a few.

Navigating The Interface



1. **Window Title**: Displays the current model's file name and file size.
2. **Command history window**: Displays the previous commands and prompts.
3. **Command prompt**: Displays prompts for command actions, allows typing command names and options.
4. **Toolbars**: Contain graphical icons for initiating commands.
5. **Viewports**: Displays the Rhino working environment including object display, viewport title, background, construction plane grid, world axis icon.
6. **Viewport tabs**: Manages multiple-page layout style viewports along with standard modeling viewports.
7. **Osnap control**: Contains persistent object snap toggles.
8. **Menu**: Groups Rhino commands by function.
9. **Toolbar menu icon**: Opens the toolbar menu.
10. **Toolbar group**: A collection of tabbed toolbars.
11. Viewport title: Left click to activate the viewport without losing selected objects.
12. **Viewport title menu**: Each viewport has a title. Right-click the title or click down arrow to display the viewport title menu.
13. **Status bar**: Displays the current coordinate system, the current location and delta of the cursor, and the status bar panes.

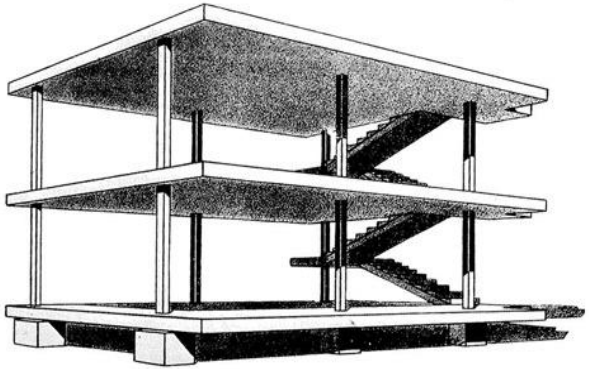
Basic Commands



Commands

_Polyline: *Draw a multi-segment curve*
_Box: *Draw a height for the box*
_ExtrudeCrv: *Creates a surface by tracing the path of a curve*
_ExtrudeSrf: *Creates a surface by tracing the path of a surface*
_BooleanDifference: *Trims polysurfaces with another polysurface*
_BooleanUnion: *The objects combine into one polysurface.*
_BooleanSplit: Cuts *polysurfaces with another polysurface*
_Explode: *Breaks objects down into separate components*
_Join: *Connects objects together to form a single object*
_Cap: *Fills openings in surfaces or polysurfaces*
_Group: *Creates a single named unit from selected objects*
_Mirror: *Creates a mirror-image copy of objects*
_NetworkSrf: *Creates a surface from a network of crossing curves*

Creating a Dom-Ino House

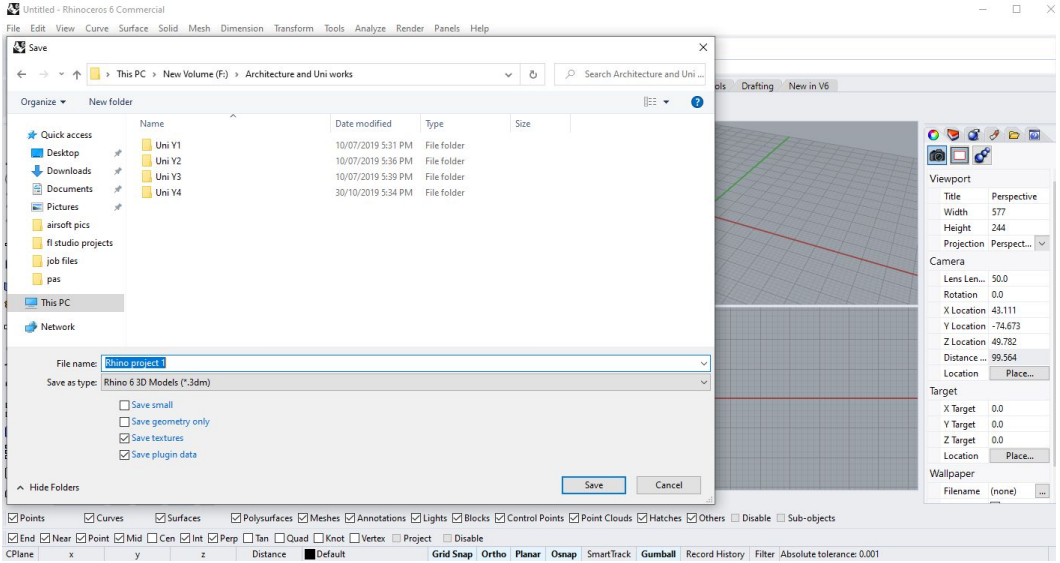


1. **Floors**
   - _Box: 6000x8000x200mm
   - Copy and paste the box: move copies up vertically 3000mm
   - _Booleandifference: for stair platforms

2. **Stairs**
   - _Box: Eight 250x1000x200 boxes
   - _Rectanglecrv and _Extrudecrv: for the Stair Base. And Group all together for Staircase.
   - Copy Paste Staircase and Flip with Gumball.
   - _Extrudesrf: to make platform

3. **Support beams:**
   - _Box: for both base and beam
   - _Box: 300x300x3000 for post, 600x600x400 base, boolean union, copy paste four times

How to Export



1. **'Save' or 'Save As'**

OR

2. **_Export** on Command Prompt
3. **Assign a location**
4. **Set type of file to 'Rhinoceros 6'**
5. **Save**

Advanced Tutorial

You Choose!

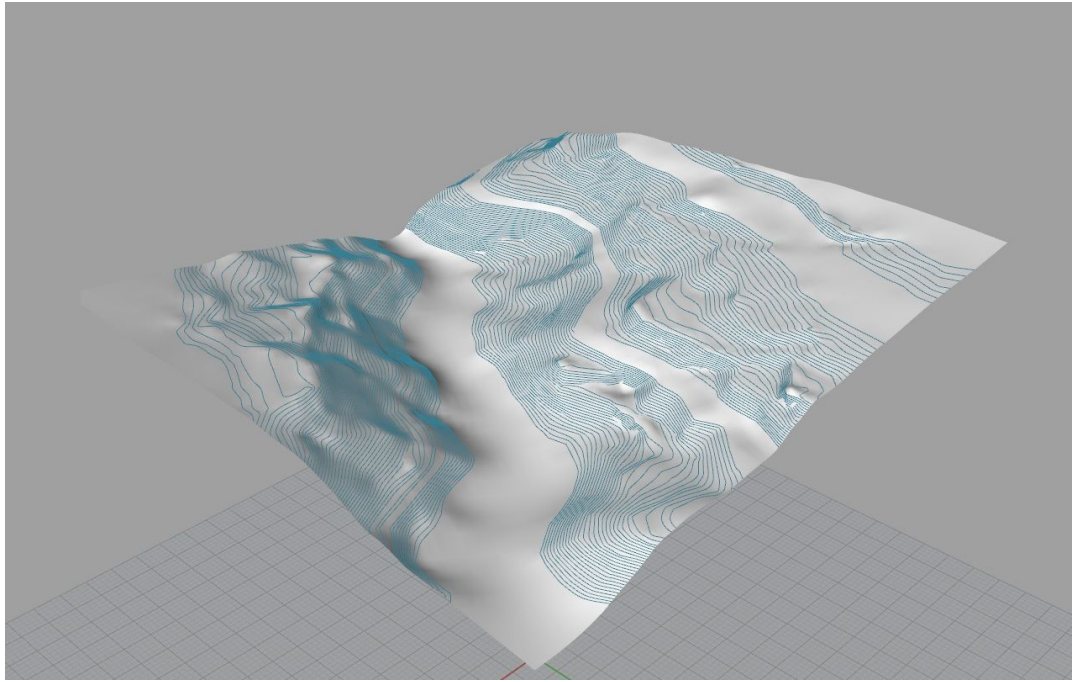
Two out of the Four

GIS to **Site Contours** Tutorial

Sections, Plans, Axonometric Tutorial

More Rhino **Commands** and **Tricks** Tutorial

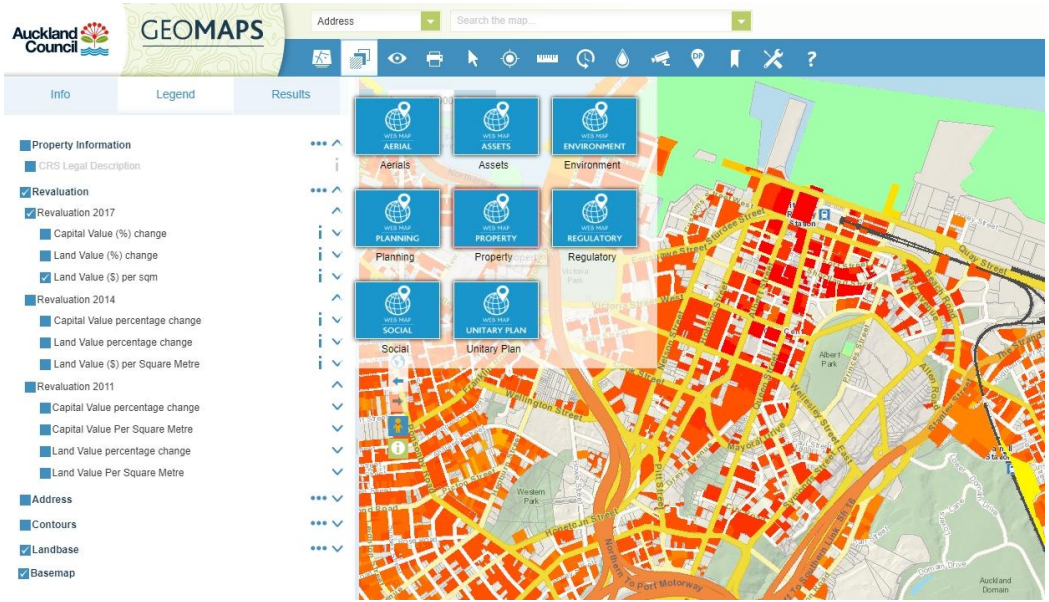
GIS to Site Contours



Order of Site Build on Rhinoceros:

1. Navigating Auckland GIS and Exporting Site Information
2. GIS Contour Lines to Contour Patch on Rhinoceros 6
3. GIS Building Footprint Lines to 3D Site Buildings on Patch and Site Correction and Footpath Build

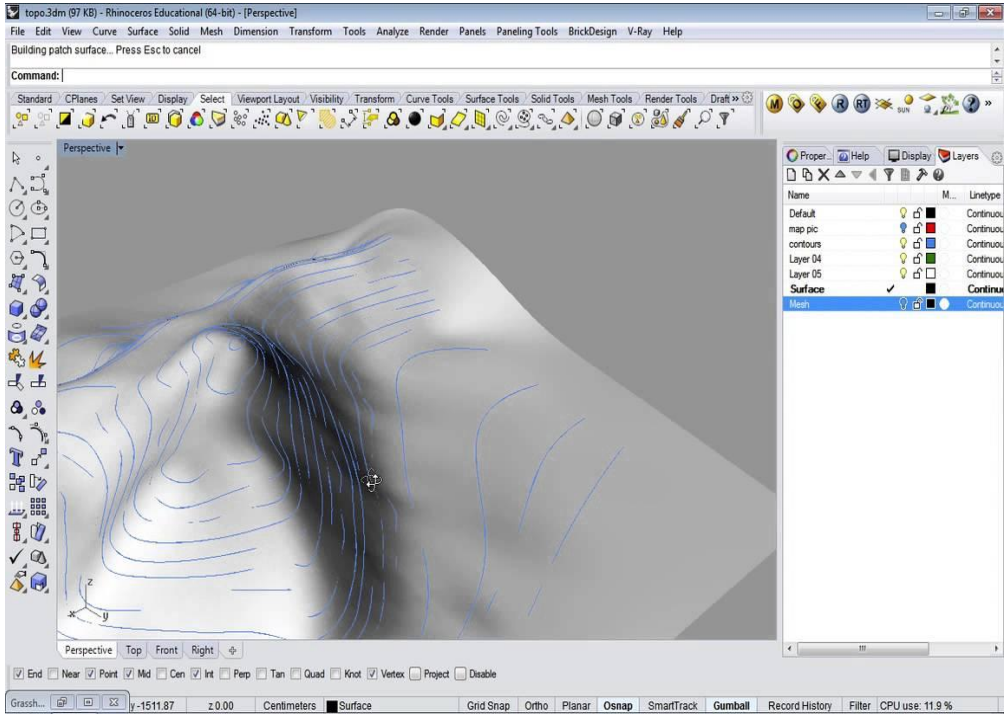
Navigating GIS



Navigating Auckland GIS and Exporting Site Information:

1. Go to google and search up Auckland Geomaps
2. Search the address to 291-297 Queen Street, Auckland CBD, Auckland 1010
3. Switch theme to aerials and describe each tick box options
4. Click on the tool button and select: aerials, contours, building footprints and kerblines.
5. Use the box tool and Export it as a DWG format it to the student's email.

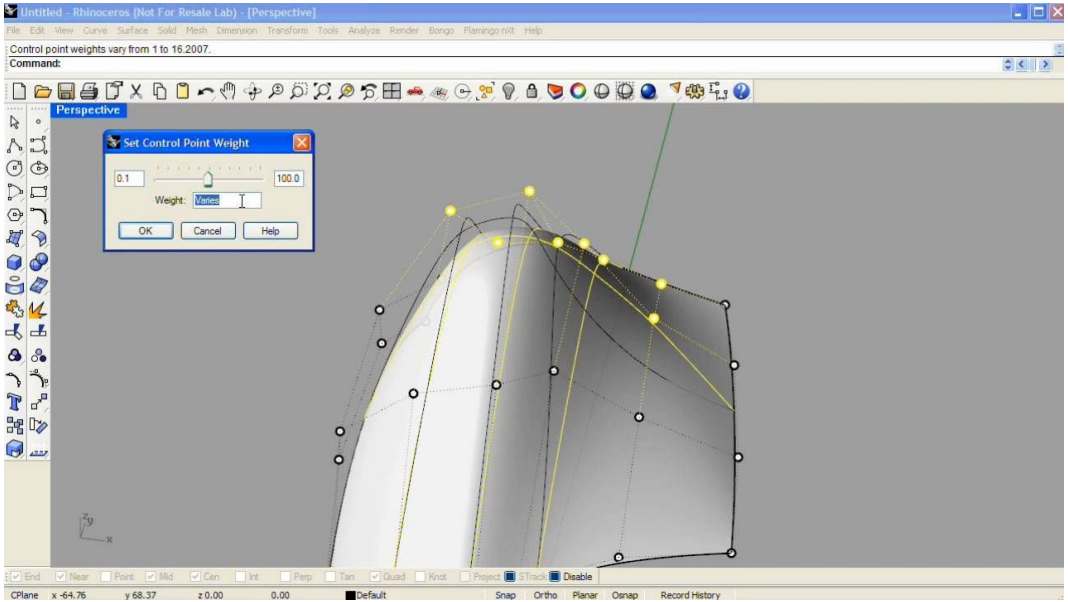
GIS Line to Patch Surface



GIS Contour Lines to Contour Patch on Rhinoceros 6:

1. Export files and explain layers and what to select.
2. Form Boundary curve around the site
3. Select contour lines and use _patch
4. Enter UV Span Values as 100, 100: A Greater UV Span Value means better the detail and accuracy
5. Make a border cut: _trim with an _Extrudecrv Boundary line

Building Footprint to Buildings



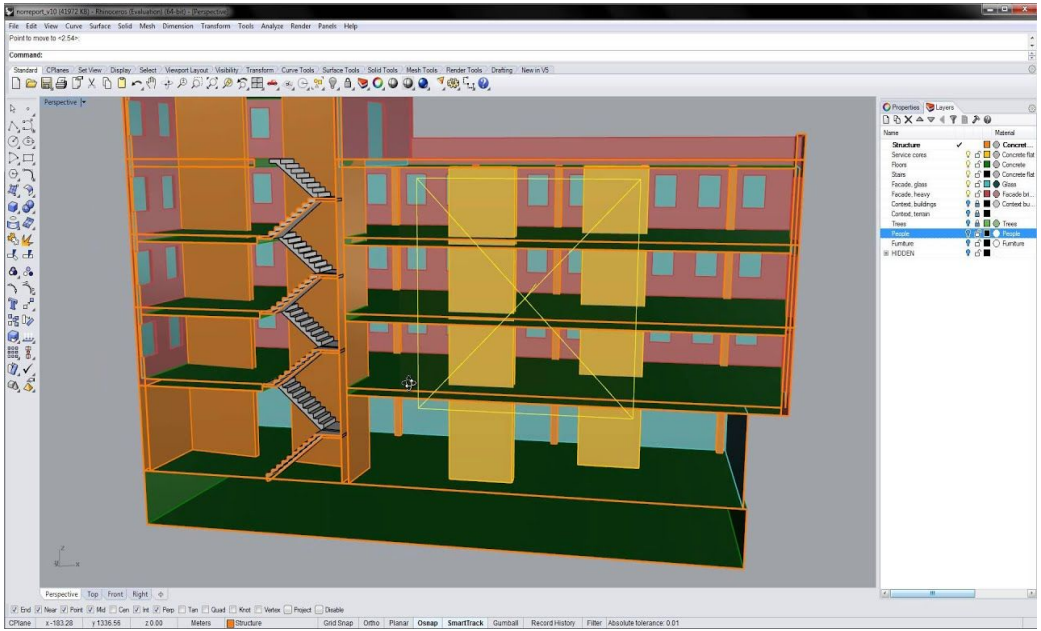
GIS Building Footprint Lines to 3D Site Buildings on Patch and Site Correction and Footpath Build:

1. Use Google Maps or Pictures as Reference.

2. Extrude building footprint and height should depend how many floors each building has.

3. Use _PointsOn for reshaping the contour

Sections, Plans & Axonometric Tutorial



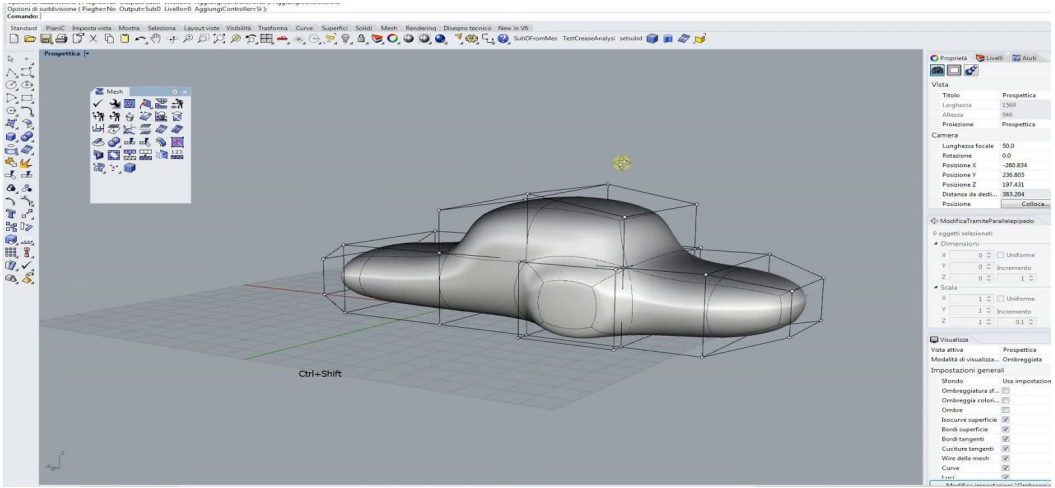
Sections & Plans:

1. Use _clippingplane for both section and plan
2. _Make2D and/or Render on the appropriate viewport
3. _Scale the make2d curves to the specific scale the student needs
4. Export as an illustrator (.ai) file

Axonometric

1. _Isometric and choose specific view angle on Command Prompt
2. Make2D and/or Render on the appropriate viewport
3. Export as an illustrator (.ai) file

More Rhino Commands and Tricks



Commands:

_BlendEdge = Soften the edges of polysurfaces
_Planarsrf = Make surfaces out of a network of curves
_ExtractWireframe = Copies the wireframe of a surface or polysurface
_SelectionFilter = Allows certain elements to be selected
_OffsetSrf = Applies a constant extrusion across an entire surface
_OffsetCrv = Applies a constant extrusion across a curve
_Helix = Make spiral curve from 2 points on same axis
_PointsOn = Allows the user to edit surfaces through points
_Intersect = Create surface on intersecting polysurfaces and points on intersecting curves
_Patch: Creates surfaces through joined and unjoined curves
_EdgeSrf: Creates surface from Unjoined curves
_Project: Paste Curves onto Surfaces or Polysurfaces
_Rebuild: Increases or Decreases Points for Surface
_Crvnetwork: Joins Curves with a Smooth Surface
_NetworkSrf: Creates Surfaces from a Network of Curves

Rhinoceros 6

Any Questions...?

Thanks for listening.

For further queries or tutorials feel free to visit the Digital Research Hub (DRH) on level 4 in the School of Architecture and Planning- Room 421-423.

drh.nz

drh.nz