SAND2011-1606 C
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Virtual Reality Content Development

Terrains and Models

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Simulation and Gaming Terrain Team

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

Acquiring Reference Resources

- Gather Up-to-date and High Quality Resources
  - Data types
    - GIS (Elevation, Imagery, Shapes, Points, etc.)
    - Pre-existing 3D models
    - CAD floor plans and designs
    - Photos
  - Acquire data from
    - Site\Customer
    - Internal SNL
    - Open source
    - Purchases from external Gov and non-Gov
  - Review for quality and usability
    - Resolution, file types, corrupt\empty data

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Data preparation

- Geo-rectify
- File type conversion
  - From resources to acceptable file types
- Photo manipulation
  - Make orthographic
  - Lens\color correction
  - Make transparent
  - Item removal

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Terrain Development

- Import resources into Terra Vista
- Create required shapes, lines, and points
- Apply code to shapes, lines, and points
- Create Gaming Area
  - Determine appropriate polygon density, tile size, image resolution.
- Export to .flt file
- Convert to appropriate format

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Model Development (Buildings)

- From scratch (with CAD resources)
  - Import references into 3D package
  - Prepare plans to be extruded to 3D
  - Model other parts not acquired from extrusion
    - Doors, Door over hangs, Fences, Windows, Ceiling Beam, Pipes
  - UV Mapping and Lightmap Baking
- Modify existing models
  - Reduce polygon count
    - Remove high detailed parts
    - Simplify geometry
  - Modify/Create Textures
- Export for particular game engine

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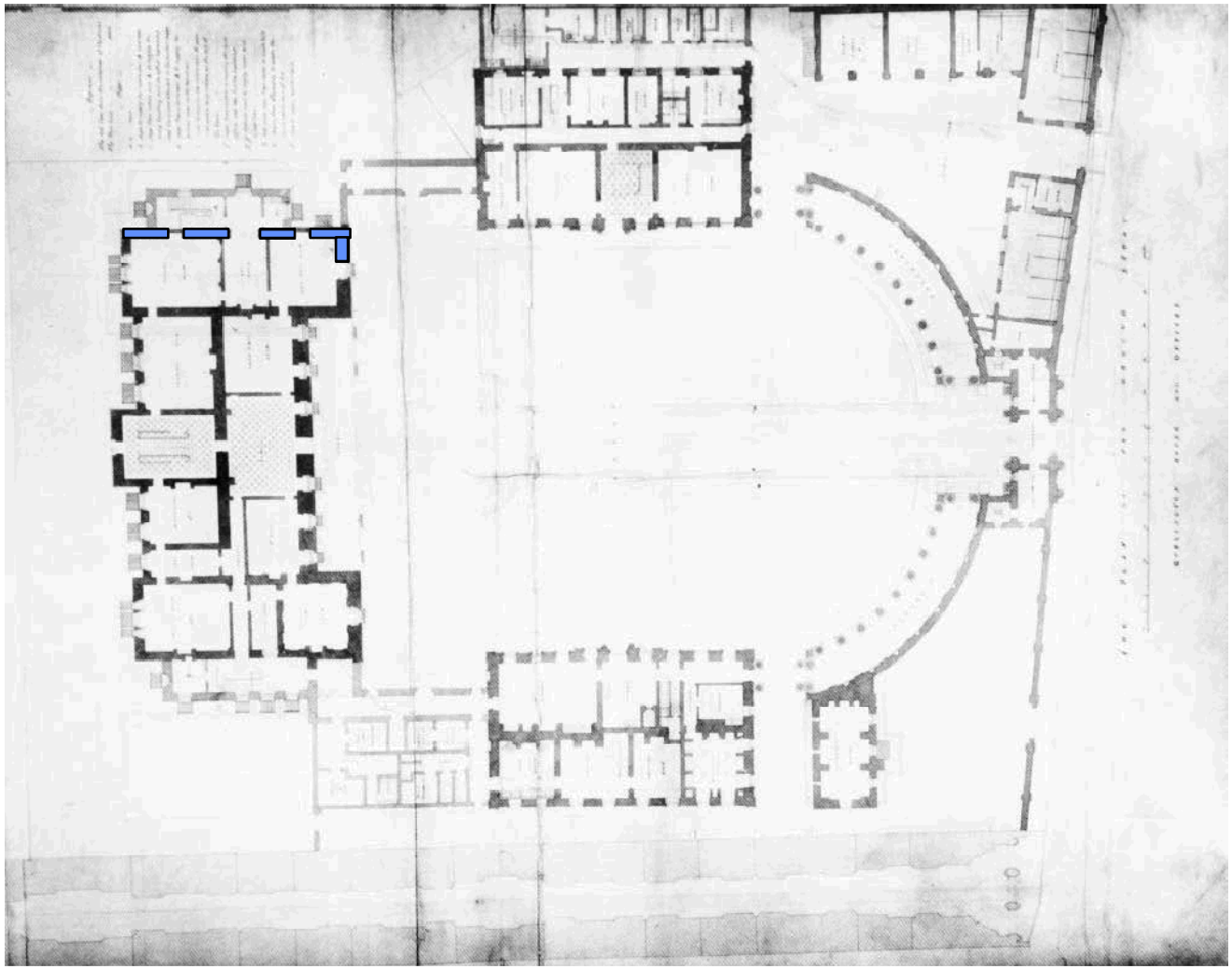
Modeling Notes
Working with Limited\Bad Resources



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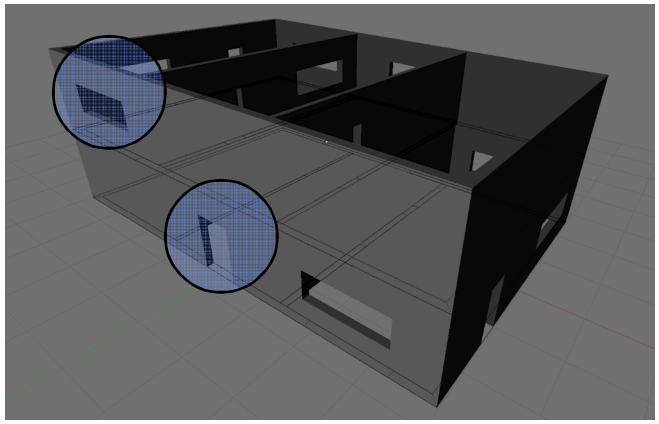
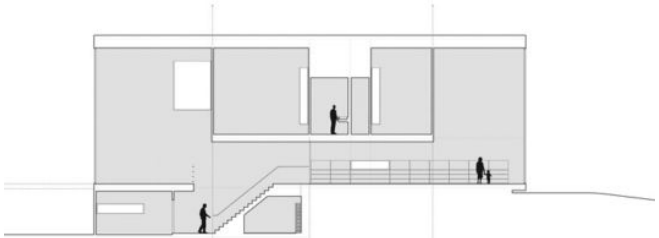
Modeling Notes



Not Just Floor Plan Extrusion



Complex Multi Levels

Adding Basic Reusable Details

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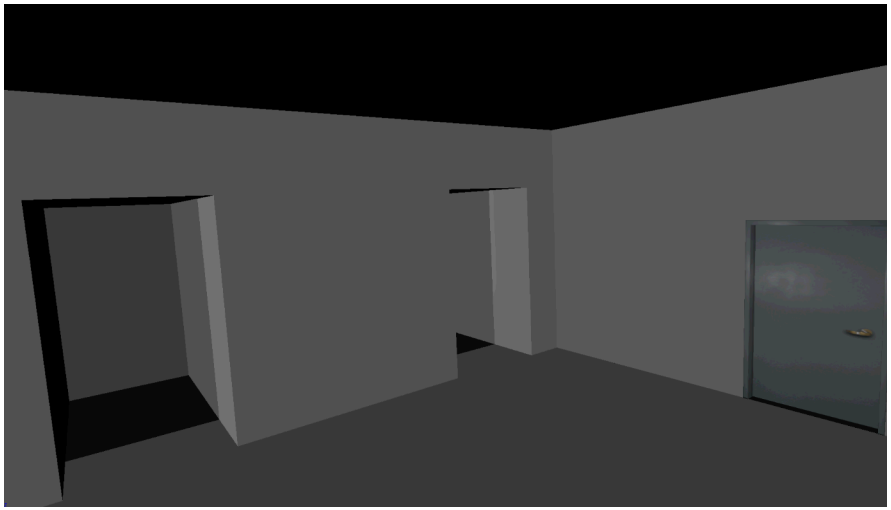
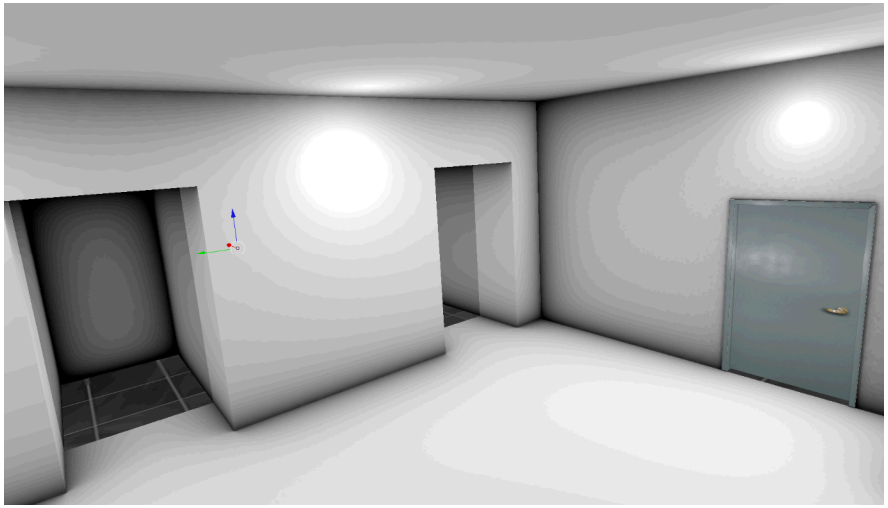
Modeling Notes
Light Mapping (Ambient Occlusion)



Without Ambient Occlusion



With Ambient Occlusion

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