

Energy Efficient Lighting Design and other Technologies

IPRO 337 Team
Illinois Institute of Technology

The space



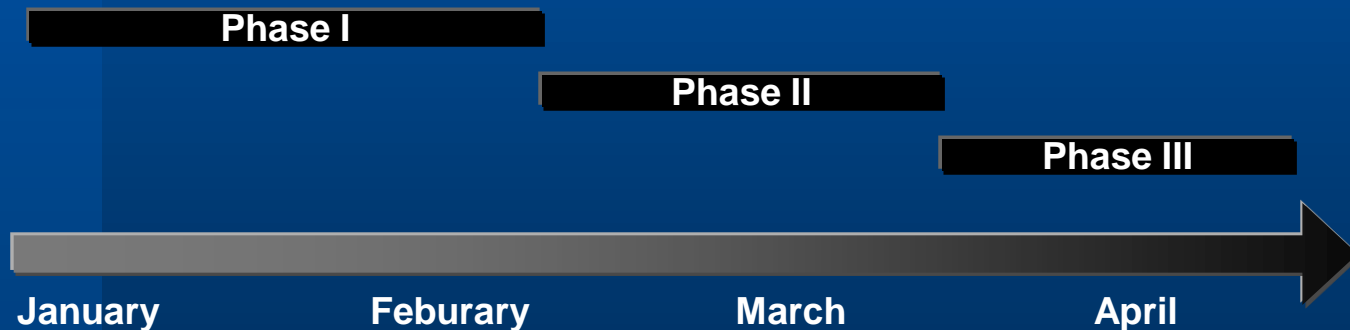
EXISTING SPACE



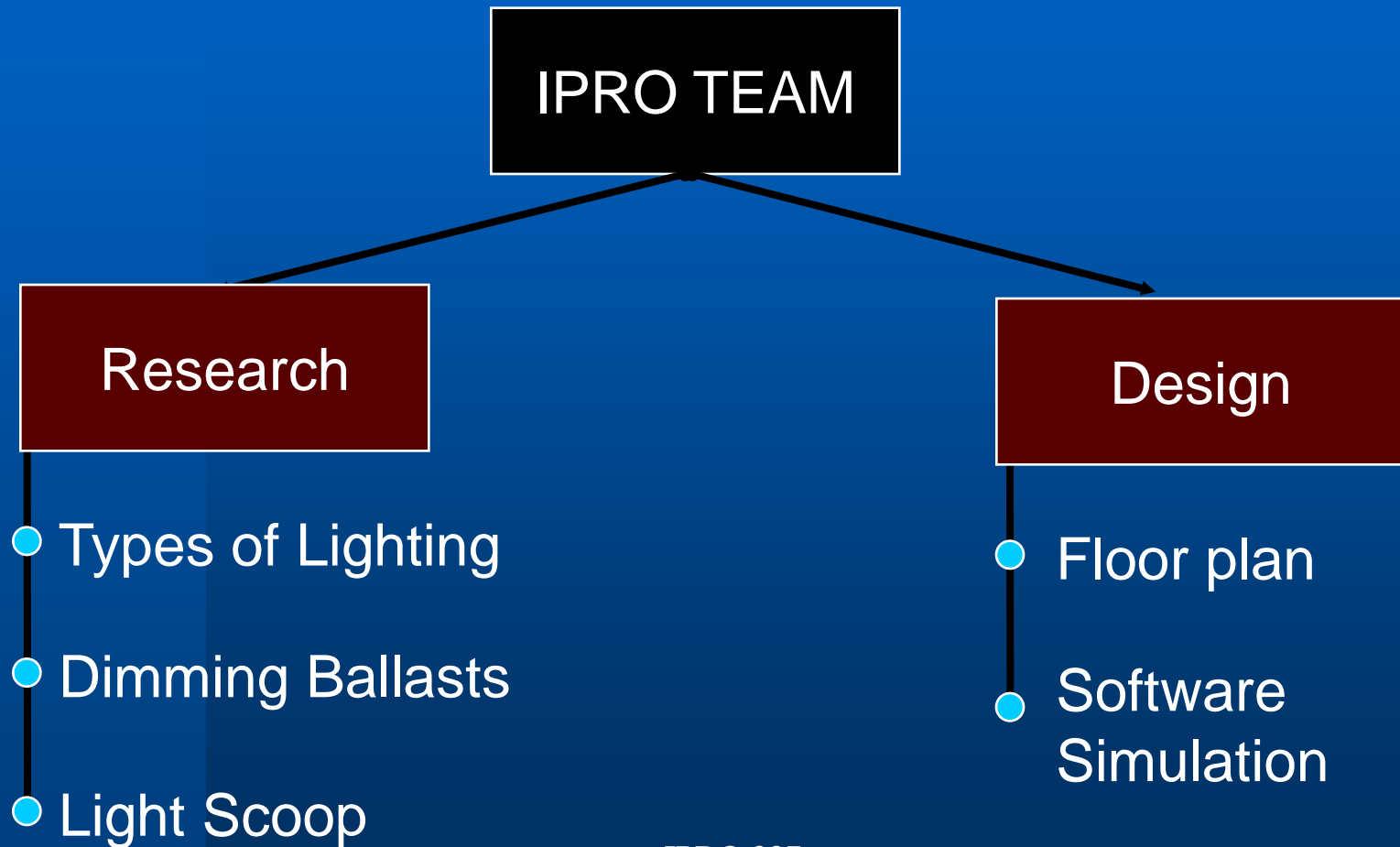
SOFTWARE RENDERED

Approach towards objectives

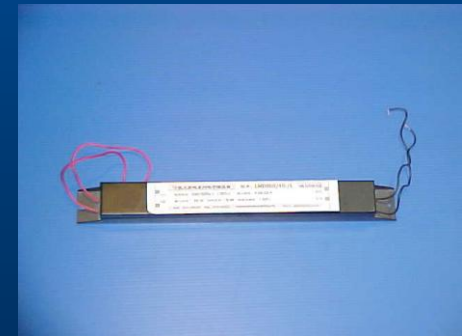
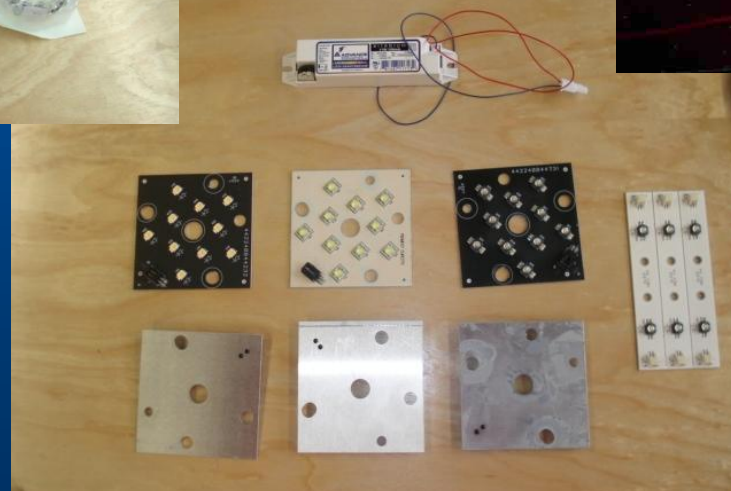
- Phase I: Product Research & Design of Space.
- Phase II: Lighting Design through Conventional Products.
- Phase III: Design and development of custom fixtures in an attempt to improve efficiency.



Phase I : Design of Space & Product Research



Lighting Product Research



Lighting Research

- Incandescent Light bulbs
- Compact Fluorescent Light bulbs (CFL)
- Fluorescent Tube (T8, T5)
- LEDs

Incandescent Light Bulb

- Efficacy (lm/ W) : 17
- Rated Life : 1000 hrs
- Cost (\$) : 0.2 - 2



100 W bulb gives out
1700 lumens

Compact Fluorescent Light Bulb

- Efficacy (lm/ W) : 50-70
- Rated Life : 6000–10,000 hrs
- Cost (\$): 3-8



26 W bulb gives out
1700 lumens

Fluorescent Tube: T5, T8 (4ft.)

	T5	T8
Efficacy (lm/W)	104	93
Rated Life (hrs)	16,000- 20,000	20,000- 30,000
Cost (\$)	9-12	2-5



32 W T8 gives out
2900 lumens

LEDs

- Efficacy (lm/ W) : 30-(60) [150-200]
- Rated Life (hrs): 50,000–100,000
- Cost (\$): 1-4



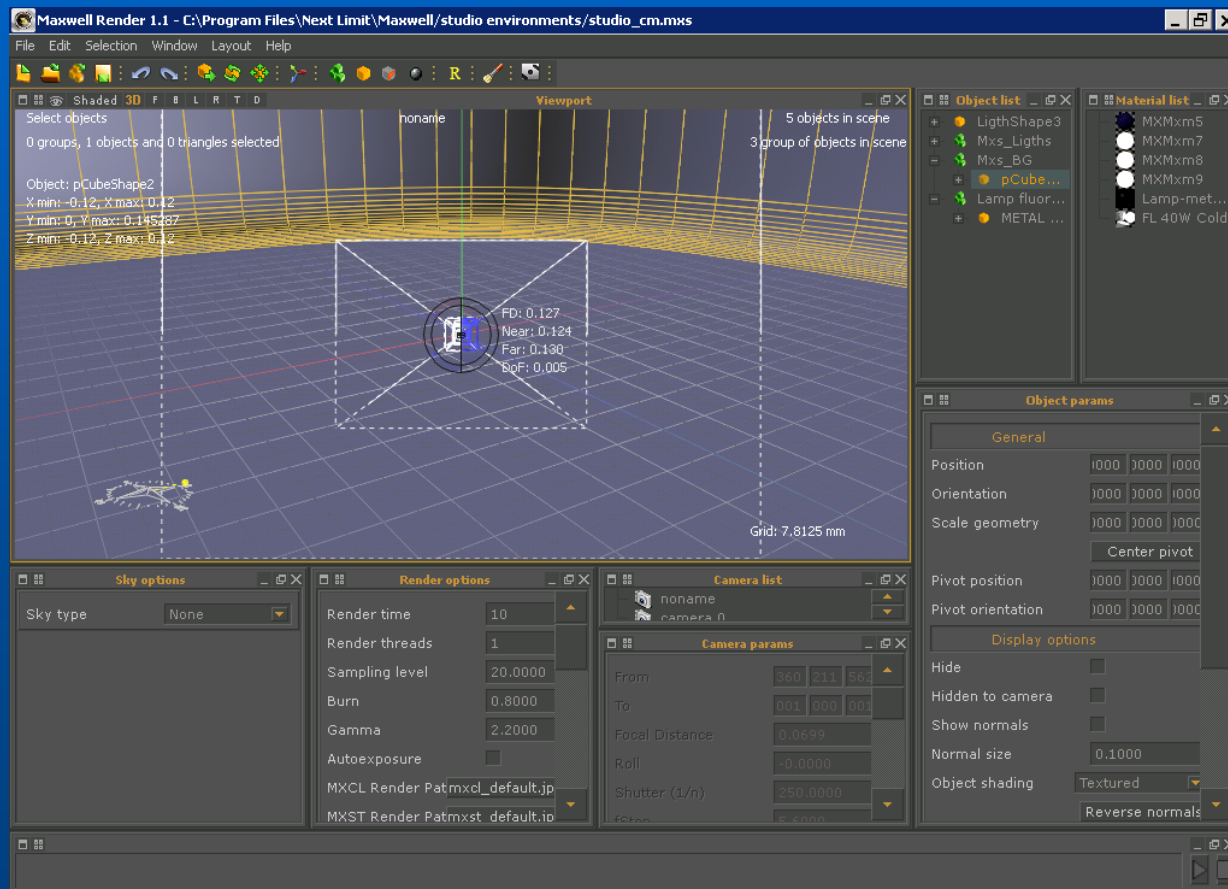
1.4 W LED gives out
42 lumens

Dimming Ballast

- Dim: 100% to 5%
- Cost (\$): 40
- Does not work next to windows
- More Research!



Simulation Software: Maxwell Render

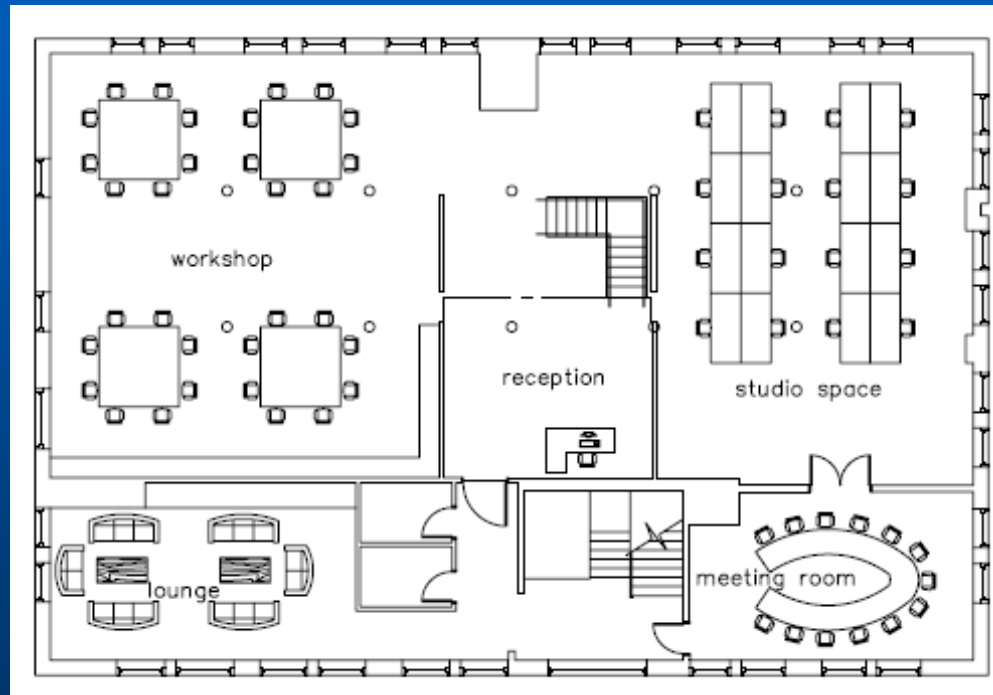


Rendering with daylight only



I PRO 337

Suggested Floor plan



Phase II :

Design through available products

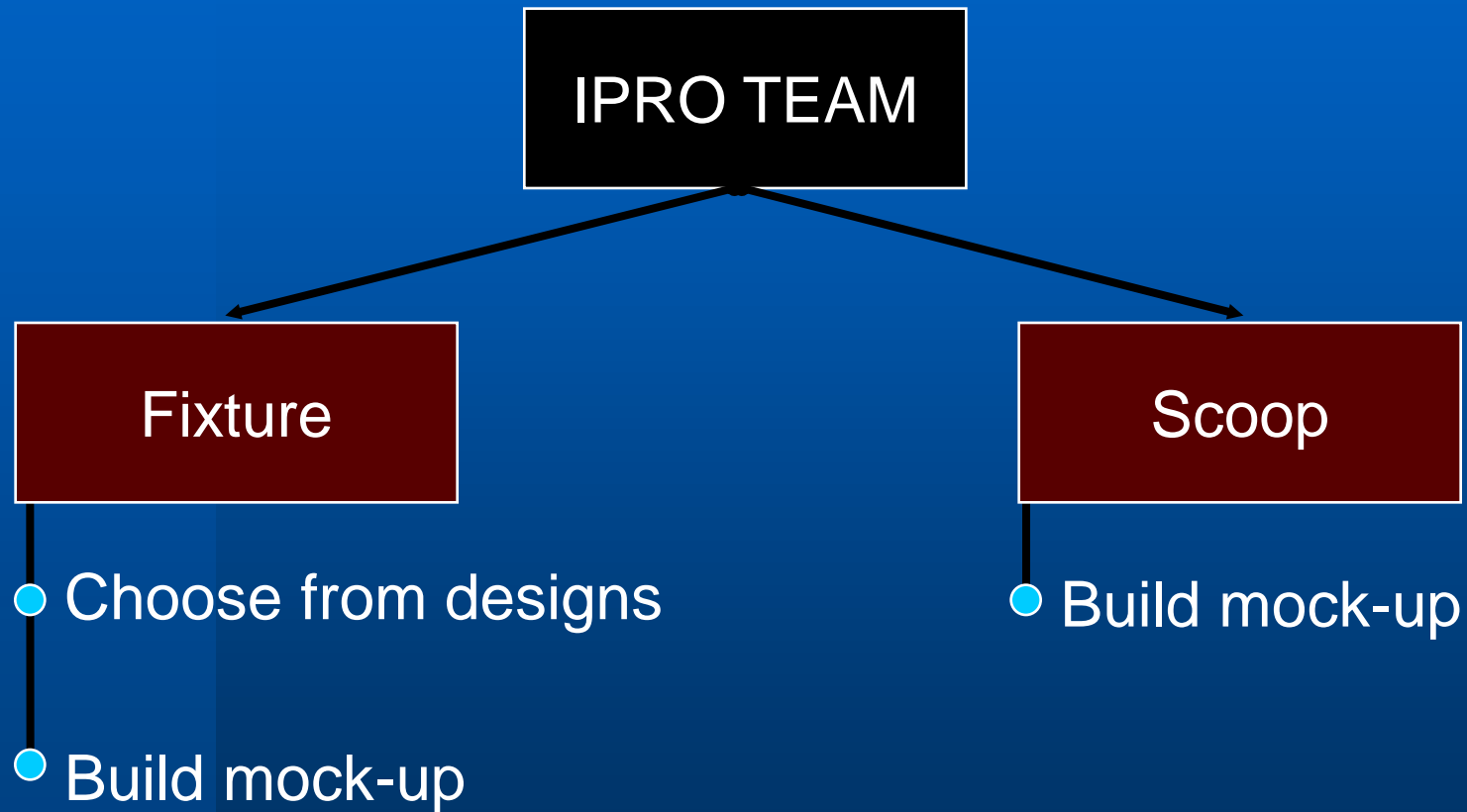


Further Enhancements

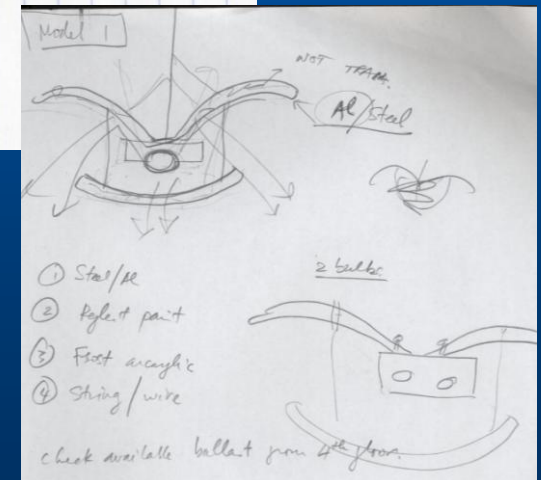
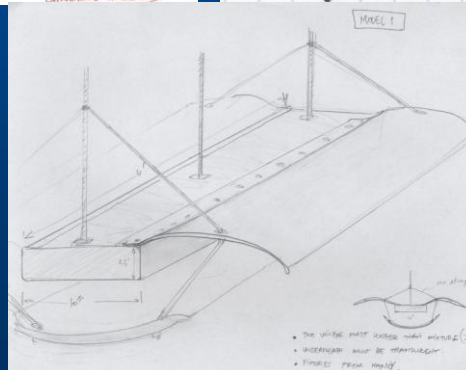
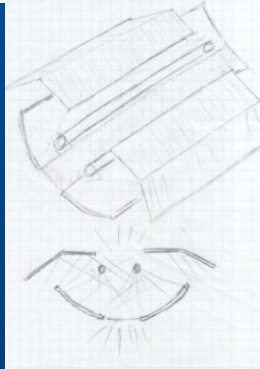
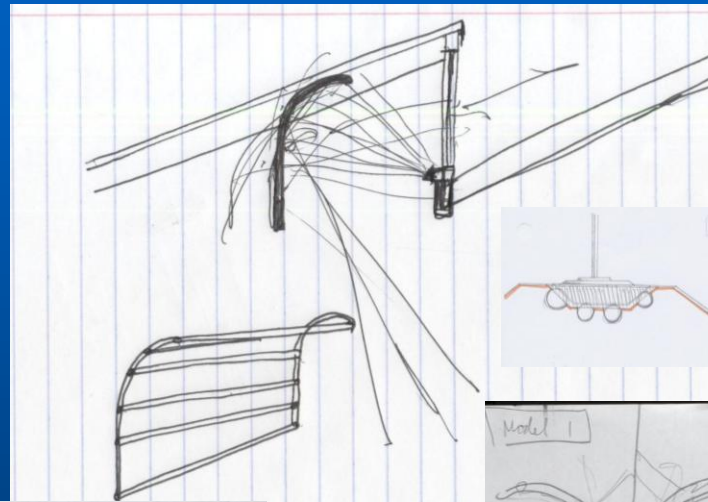
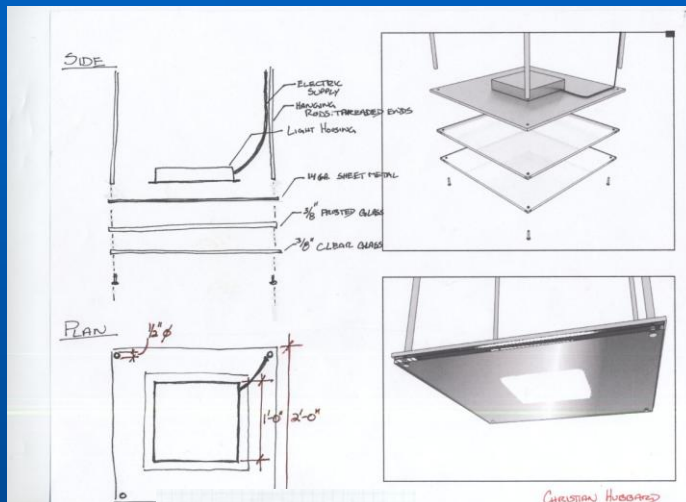
- Daylight sensors and auto dimming light controls.
- Occupancy Sensors.
- Addition of more storage capacity to existing battery backup.

Phase III :

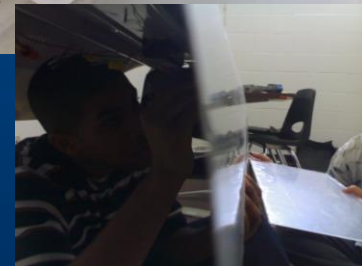
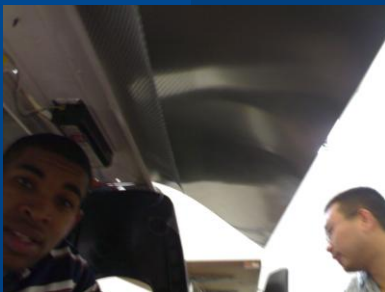
Creating new designs



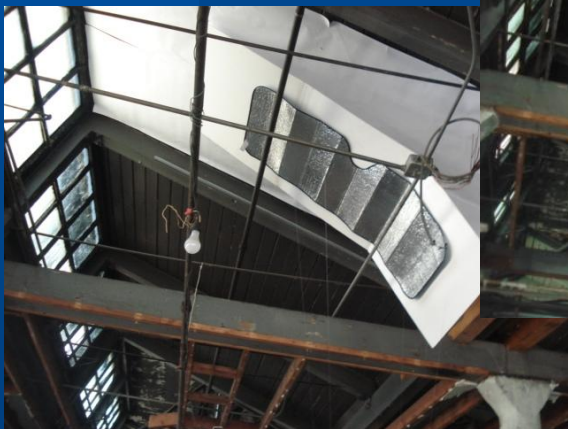
Fixture Designs



Fixture fabrication



Light Scoop Mock-Up



Workroom with only daylight

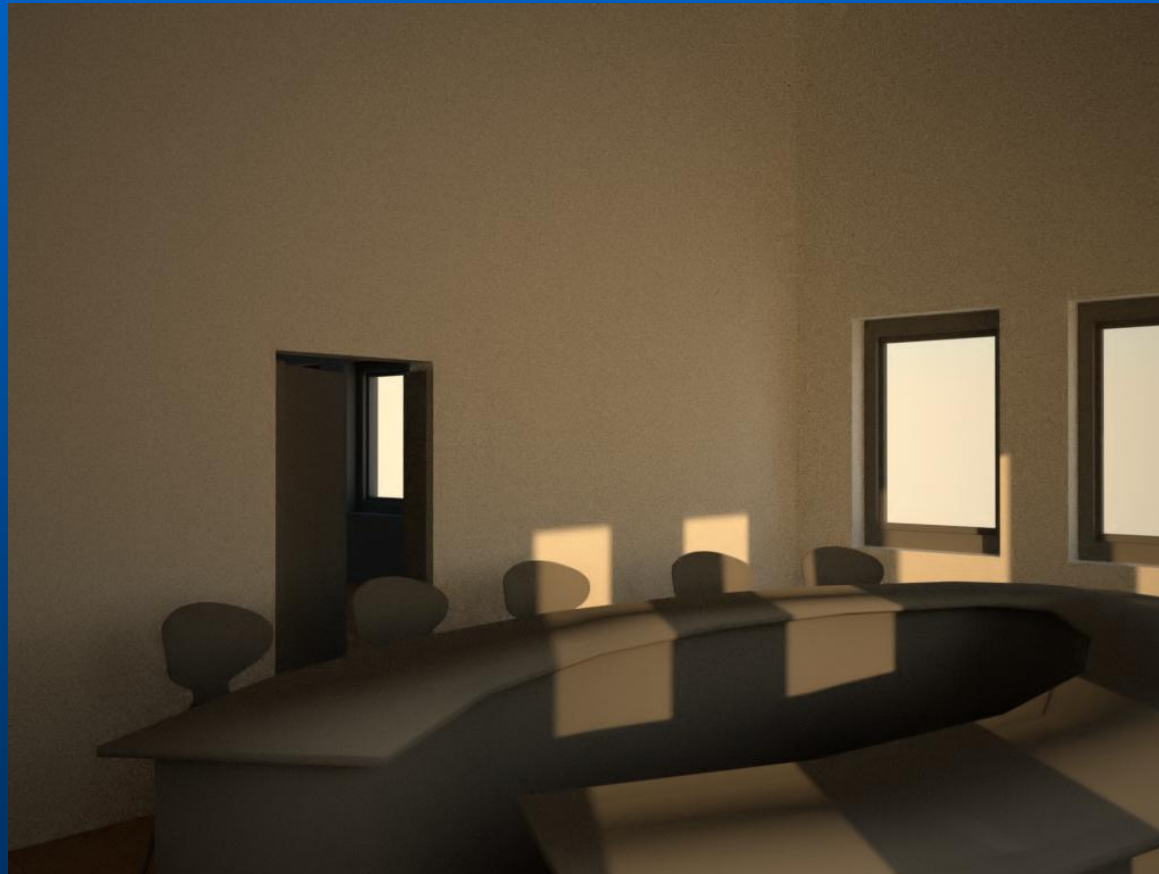


Workroom with light fixtures



I PRO 337

Meeting room with only daylight



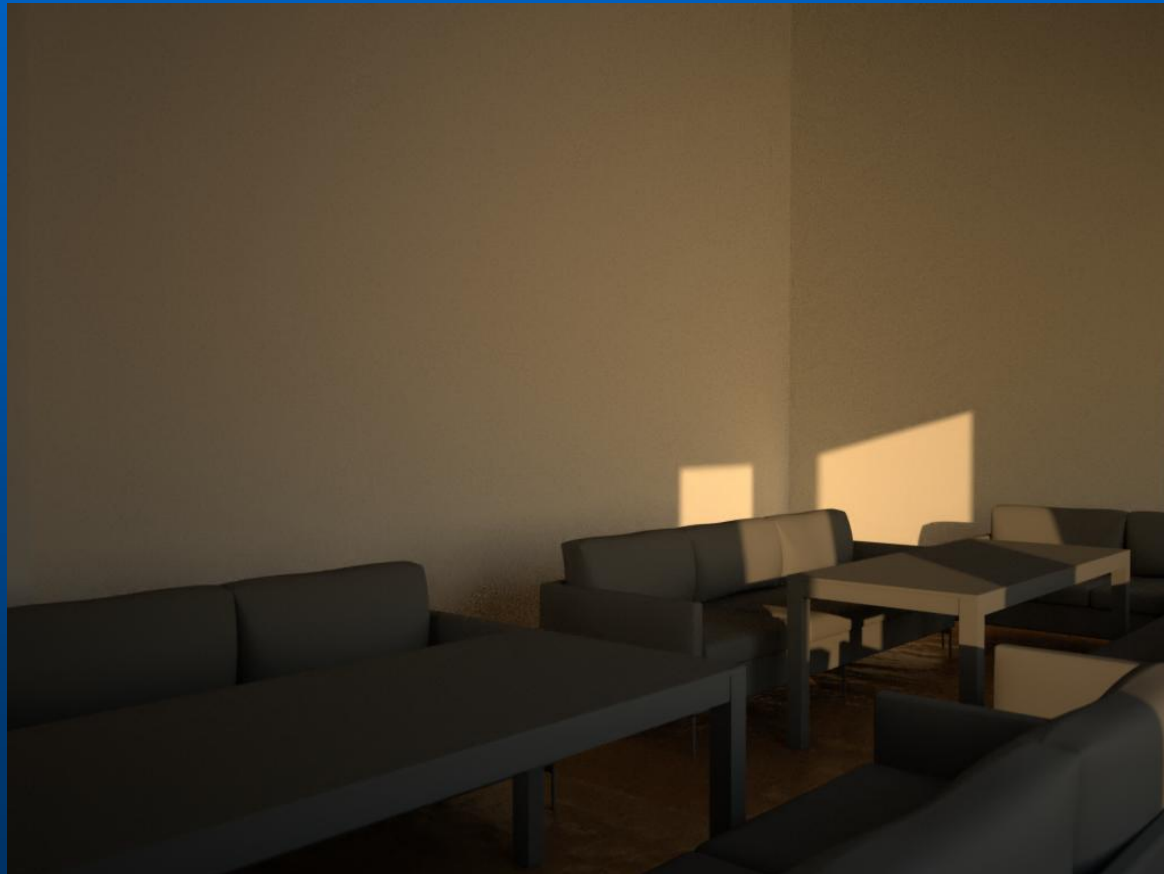
I PRO 337

Meeting room with light fixtures



I PRO 337

Lounge with only daylight



I PRO 337

Lounge with light fixtures



I PRO 337

Thank You.
Questions?