**IPRO 315—Design of a Large Scale Structure**

### Structural Design

#### Materials and Limitations
- For sustainability, use precast concrete wherever possible.
- Building design determined by architects of IPRO 335.

#### Features
- **Gravity Load Bearing System**
  - Precast concrete beams, hollow-core floor slabs
  - Cast-in-place concrete cantilever beams, columns, balconies
- **Lateral Load Resisting System**
  - Cast-in-place concrete shearwalls

#### Choosing Structural System
- Fit within the architectural plans provided by IPRO 335.
- Considering material and labor efficiency.
- Structural soundness

### Building Features
- Staggered towers at 13, 14, 17 floors.
- Large atriums.
- Green roof.
- Heavy mech. equipment.

### Gravity Load Bearing System

#### Floor Slabs
- Hollowcore Precast Slabs
  - Used throughout interior except at atriums.
  - Selected prefabricated Spancrete slab.
- Cast-in-Place Cantilever Slabs
  - Used in atrium and balcony cantilevers.
  - Poured simultaneously with columns.

#### Beams
- Precast Beams
  - Used for all simple-span beams.
  - To be prefabricated by outside manufacturer.
- Cast-in-Place Beams
  - Used to account for moment connections at atrium connection.
  - Poured simultaneously with columns.

#### Columns
- Double circular center column at lobby.
- Square columns elsewhere.

#### Connection Details

**CONCLUSIONS**
- Successfully created a structural system to fit the IPRO 335 building.
- Learned about coordination and communication among disciplines.