Final Problem

**Documentation**

### **Overview**

The aim of the problem was to test and familiarise us with the designing and analyzing of basic structures using software, SAP2000.

The task was to build two residential buildings which are 100 apart and to build a bridge between them as with a growing number of building in the cities, a lot of bridges are built over buildings.

### **Dimensions**

The two-building have similar dimensions.(3 storey)

**Buildings** →

length: 30 ft

Width : 30 ft

Height : 50 ft

**Bridge** →

Length : 100 ft

Width : 30 ft

### **Materials Used**

* Concrete Columns ( 0.4m x 0.4m) Material : M20 concrete
* Concrete Beams ( 0.35m x 0.24m) Material : M20 concrete
* Truss Material : A992Fy50
* Slab (0.4265 ft x 0.4265 ft)(shell thin) Material : M20
* Bridge base ( 1 ft x 1 ft )(shell thin) Material : 4000psi

Rectangular members are used for the bridge along with steel slabs at the base.

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### **Loads**

1. Floors →

Beam → Dead load, wall load

Slab → Floor finish, partition, live load

2. Roof →

Beam → parapet wall load

Slab → floor finish, roof live

3.Bridge → dead load, gravity load

### **Steps Used for Building structure**

* Defining frame and area sections
* Drawing all frame sections and area sections using the tool.
* Defining loads
* Applying different loads
* Defining mass source, diaphragms, load combinations
* Meshing the slabs
* Lastly, verify if the structure passes the stress/capacity check also ensuring the beam/column ratio is less than 1. (N/m/C)

### **3D View of the structure**

