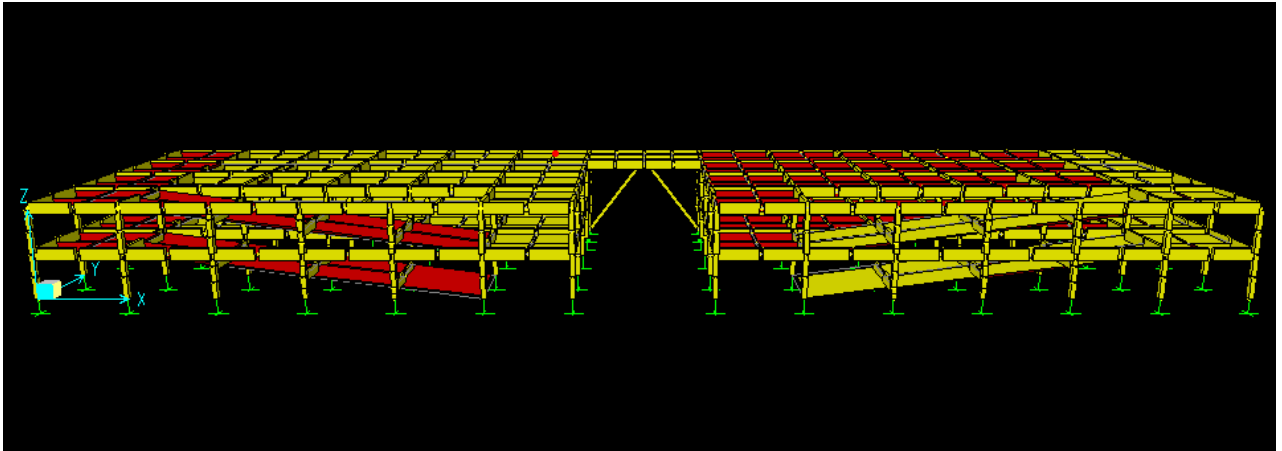


## Three Story Parking Structure



Symmetrical Parking Structure with access to a shopping center.

### Dimensions

*Half Structure*

Width: 100 ft

Length: 150 ft

Height: 26 ft

*Bridge*

Width: 25 ft

Length: 50 ft

Elevation: 26 ft

### Frame Sections Used

Columns: 18 in. by 18 in. (8 reinforcing bars)

Girders / Floor Beams: 40 in. by 13 in. reinforced concrete

### Slab Sections Used

Slab: 7 in. concrete

### Load Applied

DL = Self Weight

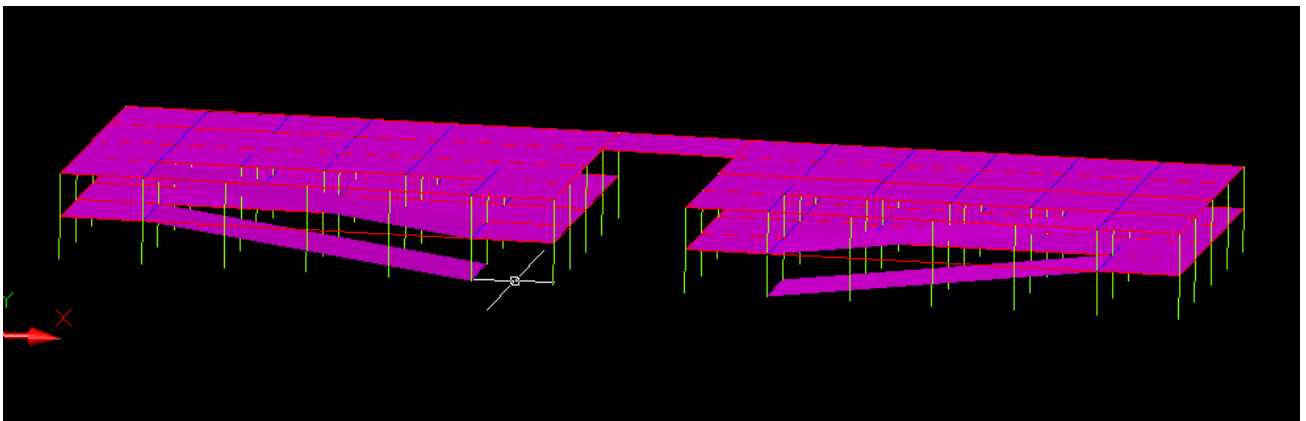
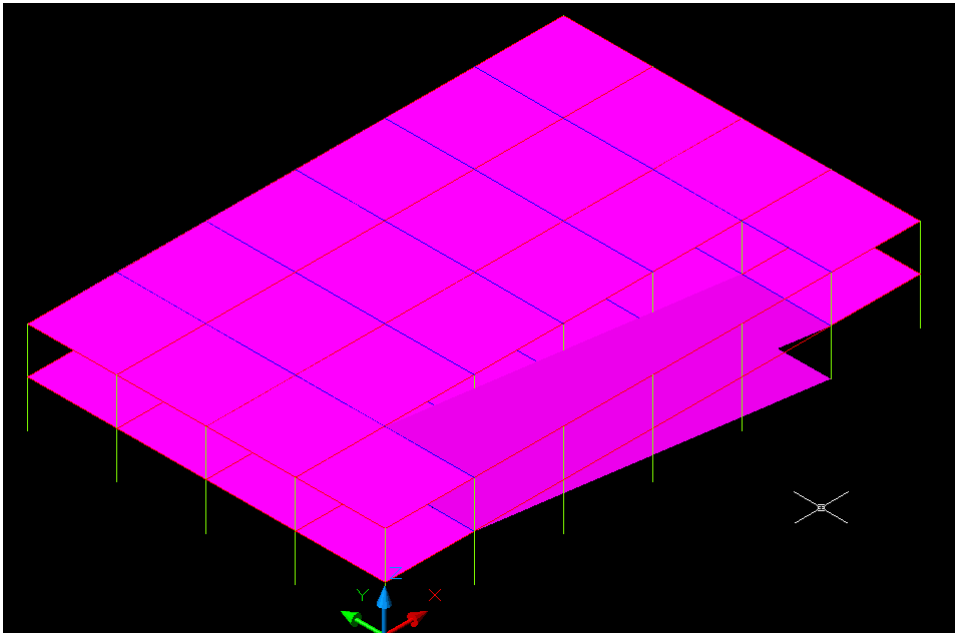
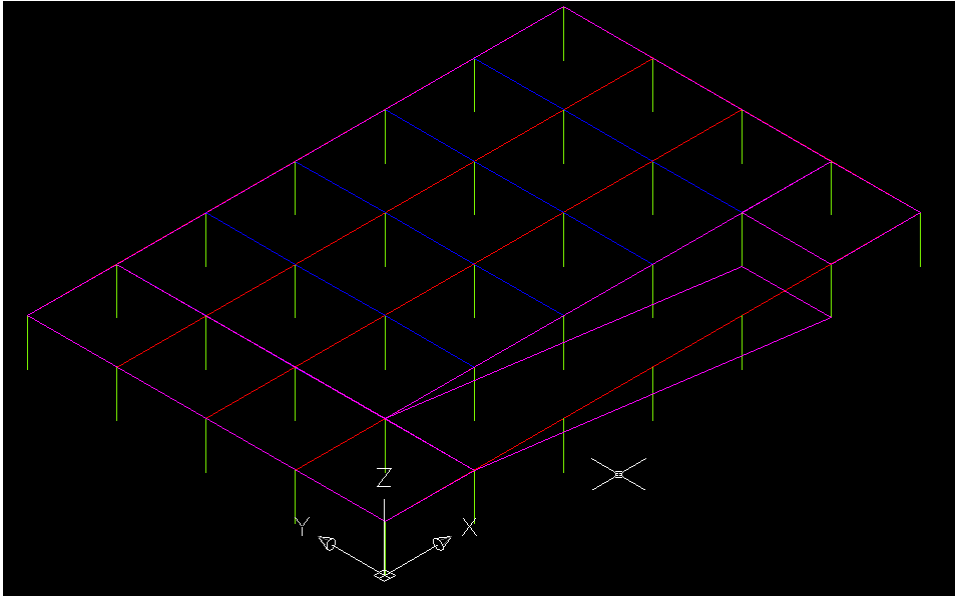
Floor Live Load = 50 psf (parking garage)

### Max Displacement

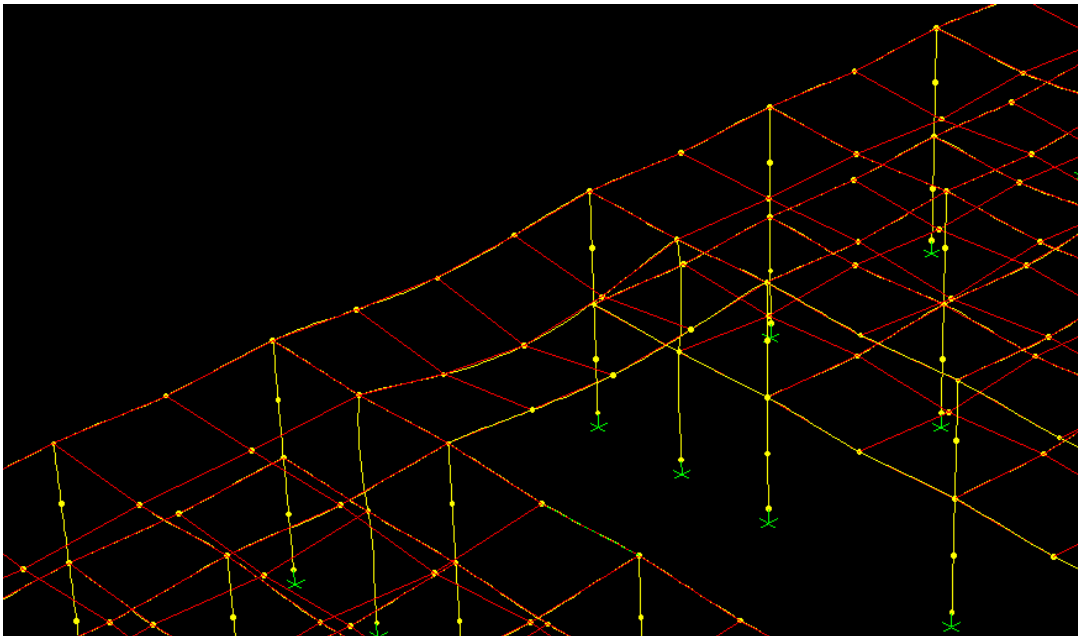
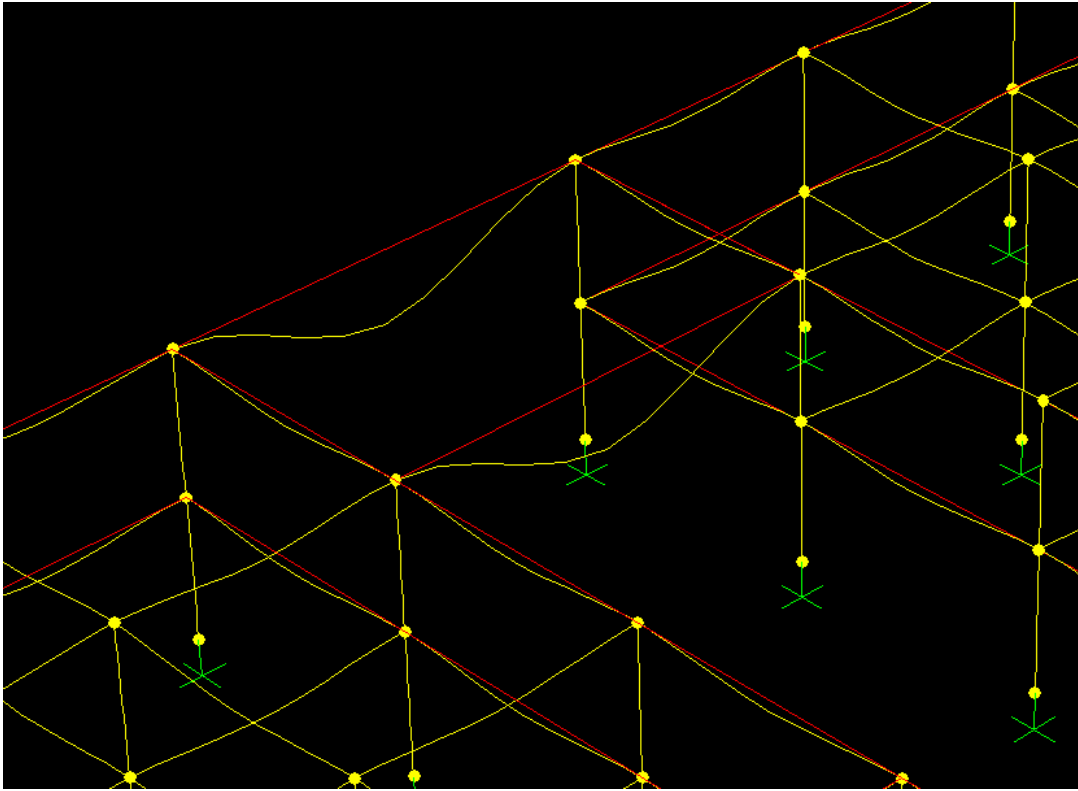
Max Joint Displacement = 2.916 in.

This Structure was designed to serve as a parking structure to a large shopping center with high volumes of cars and a smooth flow of traffic. The 40 ft. bridge connects two independent structures allowing for cars to more easily get around the parking structure. The Diagonal Bracing was absolutely necessary to prevent large deflections of 6 in at the center of the bridge slab.

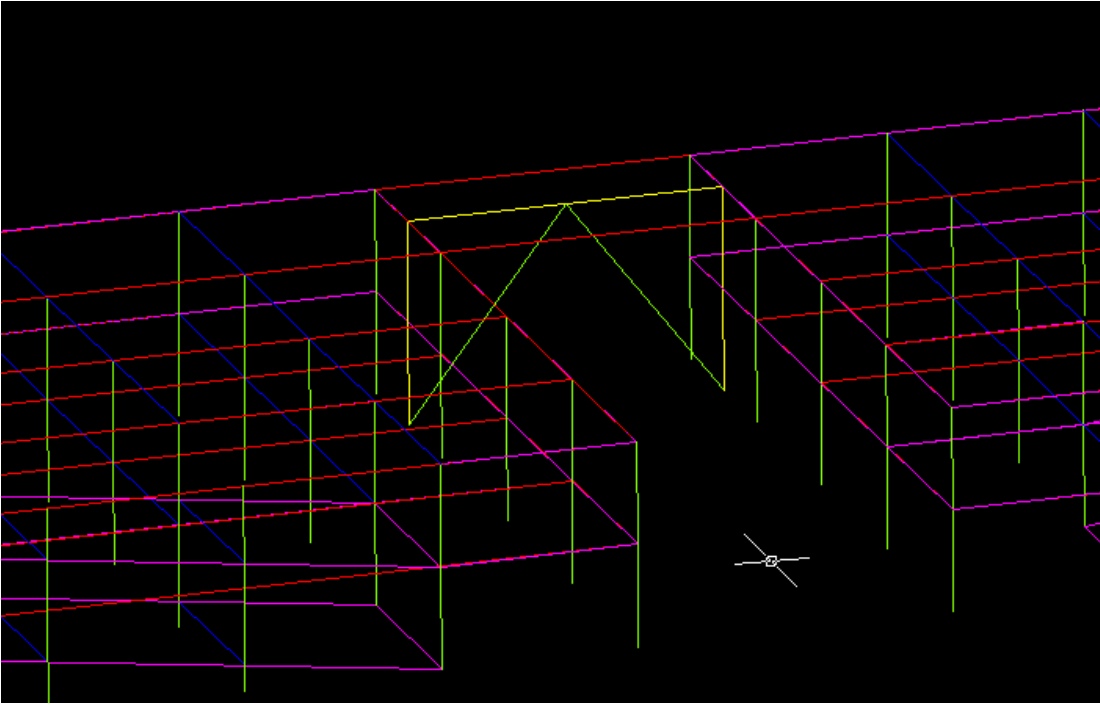
# Preliminary AutoCAD Drawings



After initial analysis the bridge could not be left with two deep columns only because of excessive deflections.

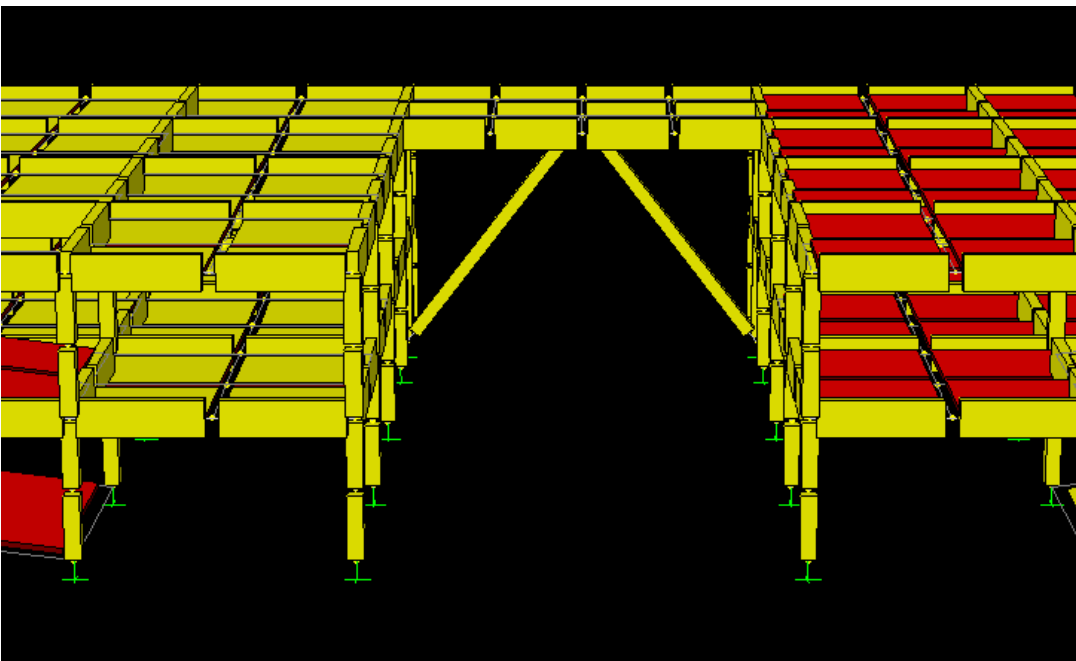


An Additional Beam across the center of the bridge with two additional supporting columns was tried and deflections were reduced, but not enough.

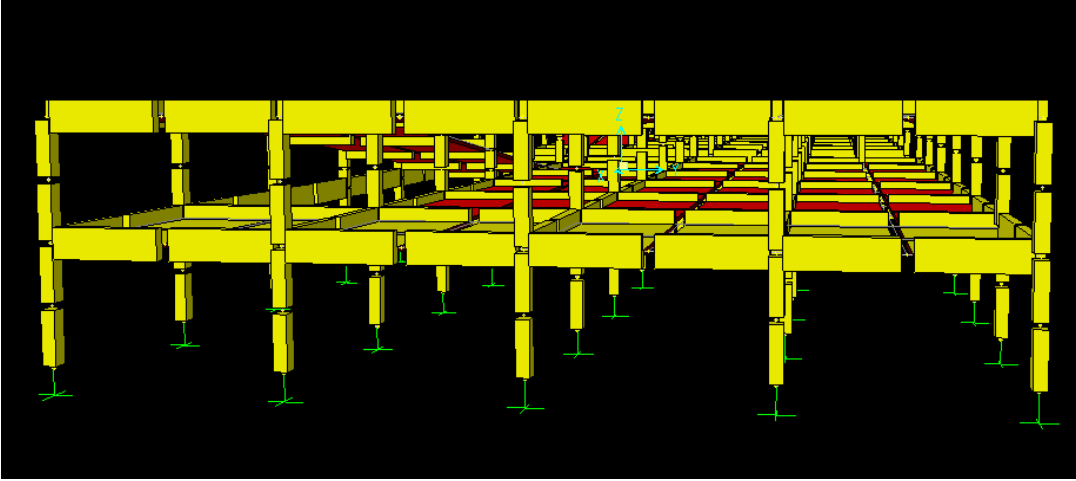


The solution to the bridge deflection problem was to add a diagonal brace which could support the bridge at its most critical point.

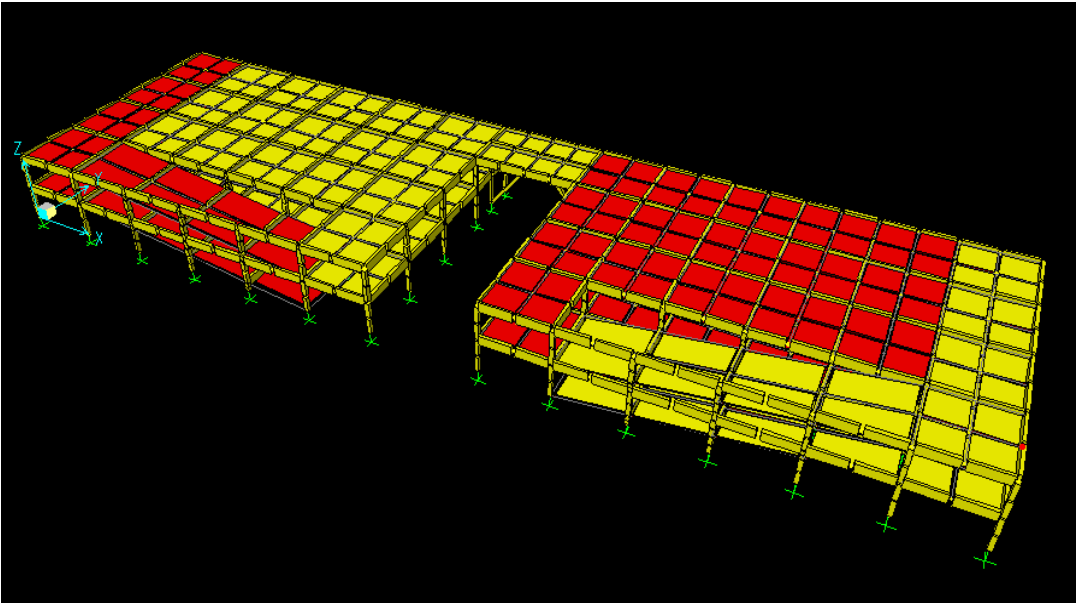
### SAP 2000 Models



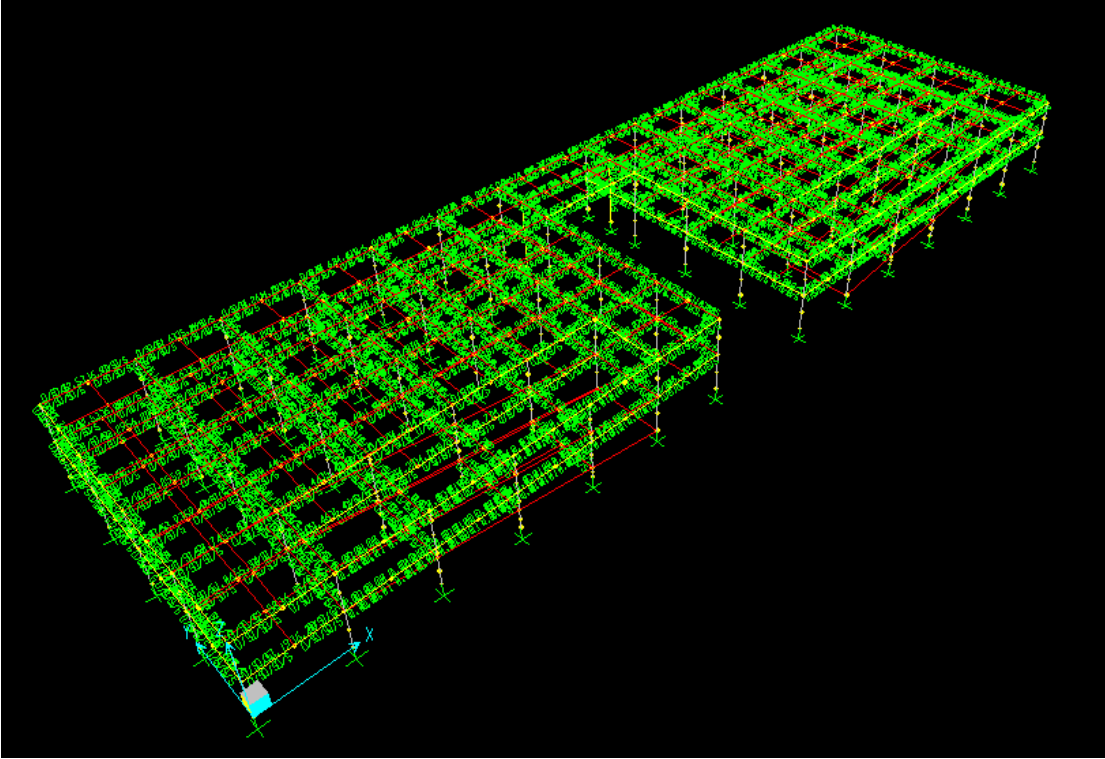
Here is a view of the 40 in deep columns and 18 in by 18 in bracing that supports the 40 foot bridge.



This SAP model provides a view of the parking bays within the structure and the limitations posed by the interior columns.



Here is an overall view of the entire structure. All of the Ramps in the Structure are located on one side of the Structure. The Bridge helps to mitigate traffic by preventing cars from becoming jammed at the top of a full structure.



The Stress Ratios Generated by SAP