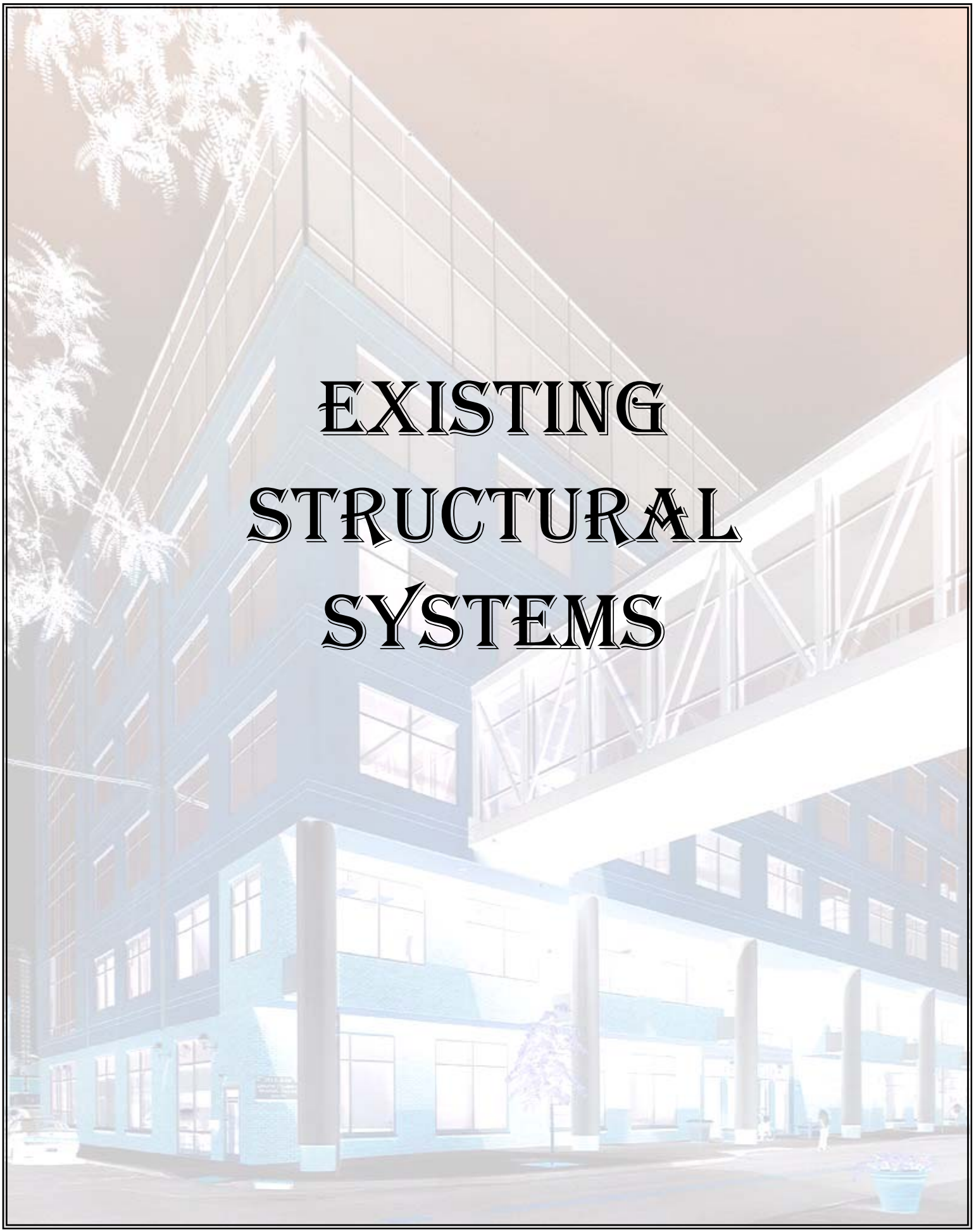

EXISTING STRUCTURAL SYSTEMS

Foundation:

The foundation for the William W. Wilkins Professional Building consists of reinforced concrete piers and grade beams supported on reinforced concrete caissons. See Figure 1 below. Caissons are drilled an average of 25′ to bear on sand/gravel with an allowable bearing stress of 16,000 psf. Concrete with a minimum 28 day strength of 3,000 psi was used for the caissons. Ranging in diameter from 48″ to 84″, these caissons are reinforced with #9, 10 or 11 bars with #3 or 4 ties at 12 or 18 inches. Piers and grade beams have a minimum 28 day strength of 3,500psi. On average, piers are 1′x1′ while grade beams vary from 12″×32″ to 24″ ×32″. Both are reinforced with #6, 7 or 8 bars with #3 stirrups at 12″.

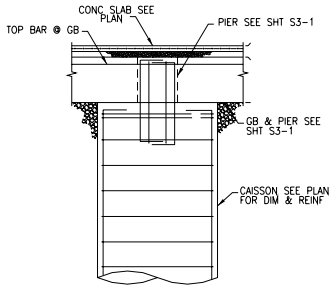

Figure 1: Typical Caisson Detail

Floor system:

The floor system in the Wilkins building is designed for composite steel-concrete behavior. Floor slabs consist of 3 ½″ normal weight concrete on 2″ 18 gage composite steel deck reinforced with W2.1xW2.1 welded wire fabric (WWF). Decking is welded to support steel. The slab on grade (SOG) varies slightly consisting of 4″ concrete on 6″ porous fill reinforced with W1.4xW1.4 WWF. Both the floor slabs and SOG are built with concrete having a minimum 28 day compressive strength of 3500 psi. A typical bay consists of W16x31 beams spanning 32′-4″ in the East-West direction framing into W24x55 girders spanning 30′-9″ in the North-South direction. ¾″ diameter by 4 ½″ long headed studs are spaced evenly along members to transfer loads. Roof framing of a typical bay uses the same size members designed as non-composite. On the East face there is a slight overhang supported by W12x14 beams framing into W16x26 girders. Moment connections are used where beams connect to columns and girders. A typical framing plan is shown below in Figure 2.

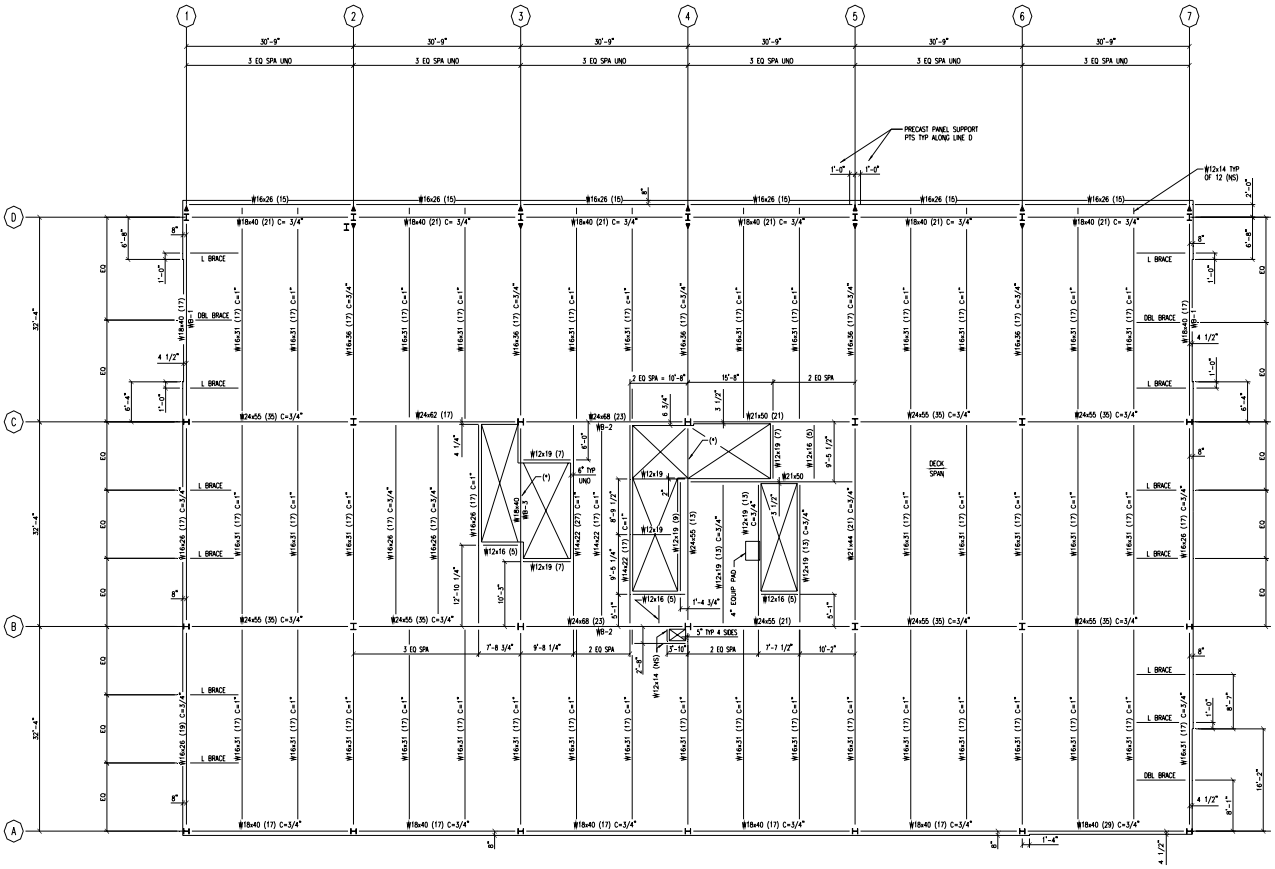

Figure 2: Typical Floor Plan

Columns:

Columns are ASTM 992 Grade 50 rolled W12 steel shapes with splices on the third and fifth floors. Splice connections use welds and ¾″ diameter A325 bolts. Web bolts are slip critical, to connect plates. (See Figure 3 below). The largest columns are W12x136 and are part of the lateral system. Gravity columns range from W12x40s at the roof level to a maximum size of W12x106 at ground level. Base plates are either 18x18 or 20x20 with thicknesses ranging from 1 ¾″ to 2 ½″. Connections consist of (4) anchor bolts of varying sizes.

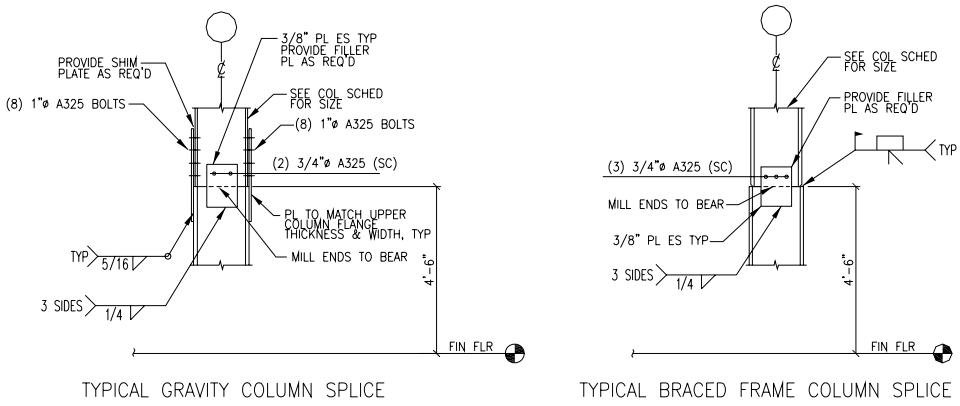

Figure 3: Typical Column Splice Details

Lateral System:

Lateral loads are resisted in the Wilkins building using concentric braced frames. Two frames spanning North-South are located near the elevator shafts. Frames spanning East-West are split with one by the elevator shafts, one on the exterior South-East bay and one on the exterior North-East bay. Lateral bracing in these frames are ASTM A500 Grade B tubes ranging in size from HSS5x5x.1875 to HSS8x8x.25. A typical braced frame is shown in Figure 4 below. The tube steel is welded to gusset plates that connect to main framing members.

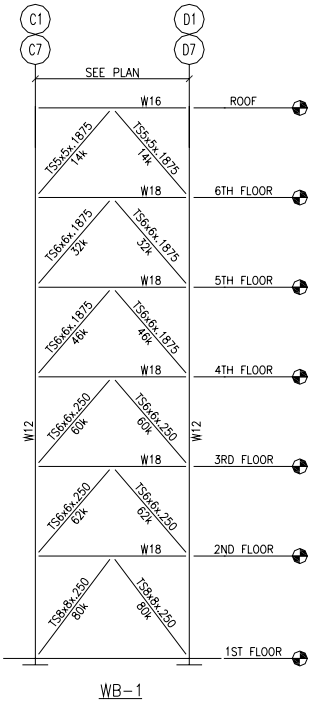

Figure 4: Typical Braced Frame