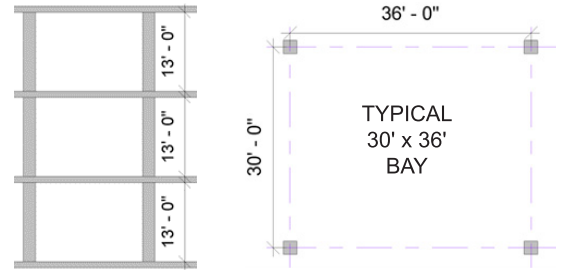


Pan Tips: Span Lengths

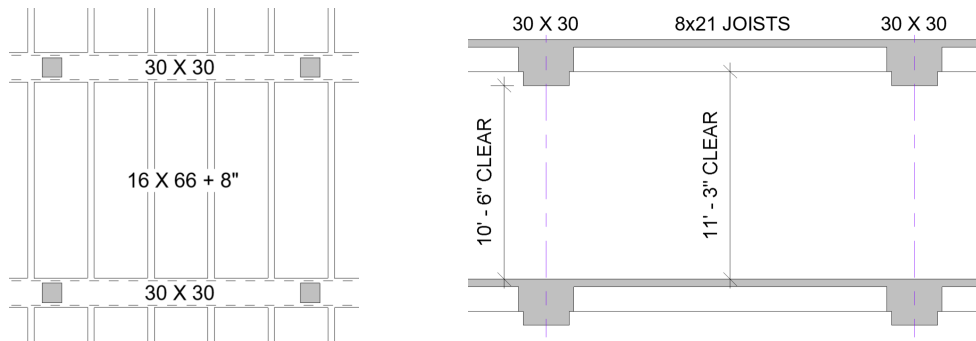
What direction should I run the joists?

The wide open concept is nothing new to commercial construction. Owners desire long clear spans. The building layout and end use often dictates framing decisions. The direction you run the pan voids impacts the efficiency of the structure as measured by reinforcing materials and concrete equivalent depth, however the biggest impact of span direction is typically formwork.

"Typical Bays" are often used to evaluate structural solutions. With pan construction, the design starts with a simple question: which way should I run the voids? The answer to that is driven by many factors including loads, continuity of spans, contributing area and clear story height limitations. You may run joist in short or long direction. The contributing area of the joists drives depth and pan capability. Let's look at a project with 30' x 36' bays and a target floor height of 13'-0".

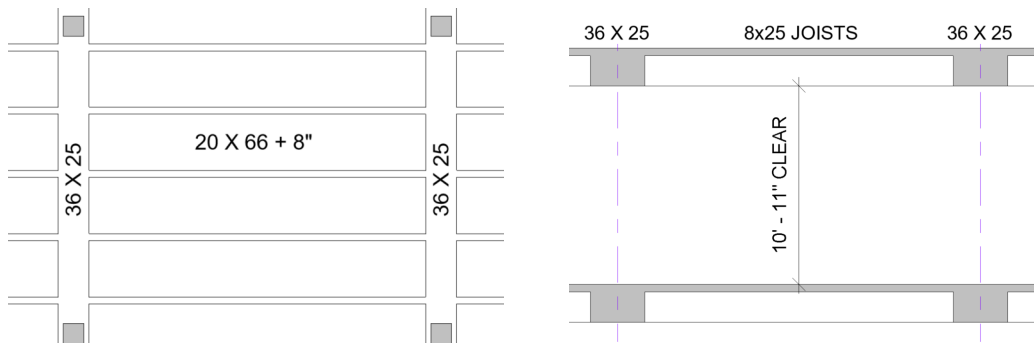


For our typical bay, an 8" joist between two 66" voids will have a contributing area of 6.16 SF per LF of joist. When run in the short direction, the calculations may support a 16" pan depth with 5" topping framing into 30" deep beams. This may produce savings in concrete with added cost for beam formwork and reduced clear story height. Other trades like electrical, mechanical and HVAC equipment will need to accommodate the deeper support beams so there may be little gain in added clearance in the pan areas from using a shallower pan system when framed into drop beams.



For the same job, when run in the long direction, calculations may support a 20" pan depth framing into steelform depth beams (flat soffits) with 5" topping. The system depth for beams and pan joists are both 25". For maximum efficiency, contractors prefer jobs where the joists frame into beams with the same system depth; commonly referred to as steelform depth beams. Flab beam soffits are a key design principle for constructability. When this approach is followed, the formwork that supports the pan decks is all at the same elevation, which saves on labor and time. We all know, time is money!

In our typical 30' x 36' bay, the designer can use 16" pans in the short direction with drop beams, or 20" pans in the long direction that frame into steelform depth beams. Concrete equivalent depth may be slightly higher in the 20" pan layout, but the savings in formwork will tilt the scale to running the pans in the long direction for overall system efficiency.



The beauty of cast-in-place construction is its flexibility. Designers have many options in determining the best layout that addresses the owner's end use needs.