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Structural Option
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S&T Bank
Corporate Headquarters
Indiana, PA

Executive Summary

S&T Bank, located in Indiana, PA is the corporate headquarters for the company. To be sure of an economical design, the existing design for the building is compared to a new design considering the structural system.

The original system consists of a structural steel frame. The floor system consists of a 3" normal weight concrete slab topping, reinforced with 6x6 W1.4 x W1.4 WWF placed on Bowman 28 Gage SF-1 galvanized deck. The concrete topping is rated at 3000psi. The decking is set on 24k4 joists that are spaced at 2' apart. The foundation includes a 12" masonry wall with concrete piers placed intermittently. The building is supported on spread footings which sit on soil that can support a maximum of 6000psf. The frame resists lateral forces with moment connections placed throughout many of the column-girder connections.

The proposed building incorporates a two-way flat slab system. The slab is 10" thick and has 5.5" drop panels at most of the columns. 20" x 20" and 24" x 24" concrete columns support the slab system. The columns rest on spread footings which are slightly larger than the spread footings for the original design. This is due to the added building weight. The monolithically poured concrete frame is determined to be sufficient to resist the lateral loads without the assistance of shear walls.

The proposed concrete system costs \$622,311 less than the existing steel system, but takes 95 more days to construct. The added duration is a result of setting and removing formwork as well as the additional time to allow the concrete to cure.

Existing lighting in the research room on the first floor of the bank uses (2) 32 watt T8 lamps in a direct lighting fixture to light the room. The room doesn't meet the recommended minimum 50fc light intensity for the use prescribed. The existing light levels are 32.7fc – 46.1fc. A new indirect system, which also uses (2) 32 watt T8 lamps, is proposed to replace the existing lighting scheme. The new lighting scheme produces light levels of 41.8fc – 59.3fc.

It is noted that even though the concrete system is \$622,311 less than the steel system, further investigation is required to specify which system is more economical. The proposed lighting scheme is recommended over the existing lighting system because the indirect meets recommended lighting levels and will reduce most of the glare on the workspace. These better working conditions will promote a more productive environment.