

## Executive Summary

A New Medical Office Building for The Primary Health Network in Sharon, Pa will serve to help revitalize a community that hasn't seen new construction in 46 years. The 78,000 sq. ft. building will be located between Pitt and E Silver streets near the Shenango River. Construction began in November 2014 and is expected to be completed by January of 2016.

The following report contains an overview of the building site, size, architecture and structure in the first portion. An alternate solution to the structural framing of the building is offered and then explored in detail. A two way flat slab with drop panels and edge beams was designed for strength and serviceability requirements using spSlab and verified with hand calculations. These slabs are supported by concrete columns modeled in spColumn and verified with hand calculations.

The existing lateral system consists of Ivany Block masonry shear walls which were redesigned as concrete shear walls. The lateral system was modeled using ETABS 2013. The redesign focused heavily on keeping the original column layout with marked exceptions. The change to a concrete system resulted in drastically increased lateral loads due to seismic forces, these loads were calculated by ETABS and verified by hand.

Sharon, Pa hasn't had a commercial construction project since 1969. This gap in construction results in an even more pronounced gap in architecture. The new medical office building has to be modern enough to breathe new life into the city while acknowledging the surrounding buildings in order to mesh well with the community. The building's façade was redesigned in order to better accomplish these goals. The building and site were modeled using Revit 2015.

The Primary Health Network had a very tight budget for this project; efficiency played a leading role in all aspects of design. The change in building structure as well as the change in building façade result in an equivalent change in building cost which must be accounted for to determine the feasibility of the redesign. A cost comparison of the existing structural system to the structural redesign was completed using RS Means Facility Cost Data 2015. A Similar cost comparison was made between the existing and redesigned building facades.

The change in building material will also affect the building construction period. A building construction schedule was created for the redesigned structural system only using Microsoft Project by referencing the information found in RS Means Facility Cost Data 2015.

The redesign was found to reduce the overall structural depth while meeting all strength and serviceability requirements. The redesign increased the overall building cost primarily due to the redesign of the building façade.