



2. EXECUTIVE SUMMARY

The final thesis report is intended to discuss findings of the three analyses performed on the new Office Building-G project. The project is a fourteen story office building with four levels of underground parking totaling 650,000 SF. Each analysis is intended to improve efficiency in the construction industry. The three analyses include: the use of a tieback system, implementation of photovoltaic glass in the curtain wall, and material delivery details during peak traffic hours.

Analysis #1: Use of Tieback System

The adjacent metro station calls for special considerations to be taken during the excavation phase on the new Office Building-G project. While the project team decided to use a raker system to account for the underground metro tunnel, it was suggested in the geotechnical report to use a tieback system. This analysis entailed a look at both tieback and raker excavation support systems, a cost analysis, and a schedule acceleration analysis. The findings show that if a tieback system is the only excavation support system used, the project can save \$177,450 and roughly 11 working days.

Analysis #2: Implementation of Photovoltaic Glass in Curtain Wall

After attending the PACE conference in October, I became interested in the use of photovoltaic glass that was mentioned in one of the sessions I attended. The new Office Building-G is projected to attain a LEED Silver rating and I thought this would be my best opportunity to focus more on this product and learn more about it. It was determined that implementing photovoltaic panels on the southern façade would be the most logical position on the building for the PV system. By using transparent PV panels, they will replace the current glass panels on the south side of the curtain wall. This change will have no effect on the structural support of the curtain wall. The electrical analysis provides a recommendation for connection to the existing building system. After taking rebates and incentives into account, the feasibility study shows that the system will make back its initial cost within 12 years of use.

Analysis #3: Material Delivery Details During Peak Traffic Hours

The new Office Building-G site is located between an adjacent metro station and the parking garage where the metro's users park daily. The pedestrians will walk past the site everyday during their commutes to and from work. During this time, pedestrian traffic will be high and material deliveries should be reduced to a minimum for safety of the pedestrians. This analysis shows a peak pedestrian volume between the hours of 9am and 11am, and also between 1pm and 4pm. Also discussed are strategies taken to determine the total time a truckload of a certain trade material takes to get delivered. The total estimated time it will take to deliver all the materials needed for the week of September 12, 2011 to September 16, 2011 is 27 hours and 10 minutes. With that information, a proposed material delivery schedule during the week of September 5, 2011 to September 9, 2011 was generated. Each day is scheduled to have 3 or 4 truckloads of material delivered.