

INTRODUCTION

The commercial office building discussed in this article was once a three-story sorority house. In order for developers to upgrade the building for commercial use, structural reinforcement was necessary on existing steel support beams. Additionally, developers intended on installing an additional commercial HVAC system on the roof of the building, which would add considerable loads.

PROBLEM

To strengthen the existing support beams, several solutions were considered by the project engineers including: (1) welded 1/2" steel plates and (2) applying 2 layers of HJ3's Carbon Laminate System to the tension face of the existing steel beams. The main criteria used to chose a solution were cost, installation time, and fire hazards. Based on these criteria, the engineers specified HJ3's Carbon Laminate System because it eliminated the use of welding (a potential fire hazard), could be installed in 10 hours, and created cost savings of 50% over the welded steel alternative.

INSTALLATION

Initially, the crews prepared the surface of the steel beam using wire wheels and sanding disks on grinders to remove surface rust. After surface preparation, HJ3's TC-300 Tack Coat was applied to the surface of the steel. Next, the first layer of HJ3's Carbon Laminate was placed against the coated surface of the beam and clamped. An additional coat of TC-300 was then applied to the surface of the installed Laminate and a second layer of laminate was immediately installed and clamped into place. This method was repeated on over 400 linear feet of steel support beams and took a total of 10 hours to complete the installation.

CONCLUSION

Just two layers of HJ3's Composite Laminate System provided the equivalent of 1/2" steel reinforcement to the existing steel support beams. This method of repair took less than one day to install, eliminated the use of welding equipment, and provided a high strength corrosion proof system to upgrade the building to commercial code. Total project savings were estimated to be over 50% of the alternative welded steel solution. The lack of odor from the epoxies allowed the installation to occur during normal working hours eliminating overtime costs. Additional advantages of the HJ3 system include:

- 10 x Tensile Strength of Steel
- Light Weight
- No Welding Required
 - Installation completed in less than one day
 - Speed of installation
 - 50% Cost Savings over alternative

