

Change of Use Design for a Mall in Atlanta, GA.

Background

In this project, the roof structure at a mall in Atlanta, GA was to be subject to change of use. The roof level was to become the floor for an additional level of the facility. The name of the facility will remain undisclosed for this project profile. Within the change of use, selected areas of this level would be required to adequately support a 100 psf live load. To assist in determining the as-built allowable live load, TEC was asked to perform materials testing at two selected beams to determine the type of steel used in original construction.

Solution

TEC Services personnel performed a site visit to Phipps Plaza to observe the removal of steel coupons to be used for materials testing. Two coupons were cut from the selected beams using a low heat method so that the properties of the steel samples were not changed. TEC documented the locations of sampling and obtained the coupons for laboratory material testing. Small portions of each sample were used to conduct chemical composition testing per ASTM E 415 – 08, “*Standard Test Method for Atomic Emission Vacuum Spectrometric Analysis of Carbon and Low-Alloy Steel.*” The remainder of the samples were machined into mechanical testing test specimens and tested at our Materials Testing Laboratory for ultimate, yield and elongation tensile properties per ASTM A 370-02, “*Standard Test Methods and Definitions for Mechanical Testing of Steel Products.*” Property data from Chemical and Physical Properties testing were compared to selected ASTM specifications to determine the grade of steel used in the two selected beams.

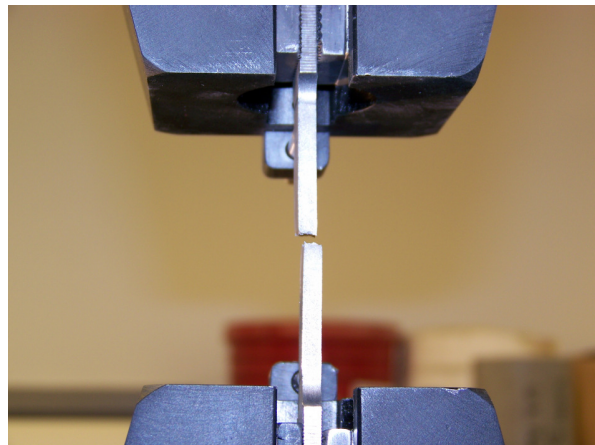
The results of chemical and tensile testing indicated sampled steel at both locations met the Chemical and Tensile Requirements of ASTM A36-08. The steel test specimens did not meet the requirements of ASTM A 572-07 (grade 50). The engineer of record used this information to determine the as built allowable loads for the subject level.



Steel Sample No. 1.



Machined Test Specimens obtained from steel samples No.s 1 and 2.



Tensile testing was conducted in our AASHTO accredited materials testing laboratory.