Deformation detection is essential for ensuring steel structures' safety and reliability. Close Range Photogrammetry has been proven effective in capturing detailed 3D models of structures which will help us detect subtle changes in geometry. In this study, we investigate and provide a methodology for detecting possible deformations caused by the transportation of SteelBricks. The dataset consists of total of 16 specimens, which include 6 Missile Impacts, 3 Bi-Axial, 2 In-Plane Shear, 2 In-Plane + Out of Plane Shear, and 3 Out of Plane Shear specimens. However due to unforeseen circumstances, we will narrow our focus to 11 specimens, which include 3 Missile Impact, 3 Bi-Axial, 2 In-Plane Shear, 2 In-Plane + Out of Plane Shear, and 1 Out of Plane Shear. These specimens were initially fabricated at Cauton Engineering Ltd. in Nottingham, England, and later transported to Purdue University, West Lafayette, Indiana. We aim to identify and quantify any possible geometric deformations caused through transportation by comparing the point cloud data collected in Nottingham and West Lafayette. Using a traverse survey method, we established survey markers on the specimen to compute the accuracy of the generated 3D models. The accuracy found on the point clouds was approximately 1cm. Then, we implemented a registration technique to align the point clouds, obtained from Nottingham and West Lafayette, from two different coordinate systems into one coordinate frame. The registration technique was done in two different ways (1) manually selected the conjugate points on CloudCompare (2) using Iterative Closest Point algorithm. Additionally, the overall Root Mean Square Errors computed for both registration processes was 2mm and 1.675mm, respectively, indicating the registration process was done precisely. We calculated the distances between the point clouds from England to West Lafayette to detect the geometric deformations and visualized our results. The accuracy of a point cloud, which reflects the margin of error in the data, is estimated to be around 1cm. Therefore, any computed distance exceeding this threshold would signify a substantial distortion in the specimen. Based on our results, there were some changes to the geometry of the specimens after transportation. However, they were not significant enough to be considered deformation. Therefore, the transportation process did not cause any substantial damage to the specimens. Although our study found no significant deformation in the specimen, the proposed methodology provides a valuable method to detect and quantify changes in specimens during transportation.