

## Shape Management Method for Safety Evaluation of Bridge Based on Terrestrial Laser Scanning Using Least Squares

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**Abstract :** All the world are studying the construction technology of double deck tunnel in order to respond to the increasing urban traffic demands and environmental changes. Advanced countries have the construction technology of the double deck tunnel structure. but the domestic country began research on it. Construction technologies are important. But Safety evaluation of structure is necessary to prevent possible accidents during construction. Thus, the double deck tunnel was required the shape management of middle slabs. The domestic country is preparing the construction of double deck tunnel for an alternate route and a pleasant urban environment. Shape management of double deck tunnel has been no research because it is a new attempted technology. The present, a similar study is bridge structure for the shape management. Bridge is implemented shape model using terrestrial laser scanning(TLS). Therefore, we proceed research on the bridge slabs because there is a similar structure of double deck tunnel. In the study, we develop shape management method of bridge slabs using TLS. We select the Test-bed for measurement site. This site is bridge located on Sungkyunkwan University Natural Sciences Campus. This bridge has a total length of 34m, the vertical height of 8.7m from the ground. It connects Engineering Building #1 and Engineering Building #2. Point cloud data for shape management is acquired the TLS and We utilized the Leica ScanStation C10/C5 model. We will confirm the Maximum displacement area of middle slabs using Least-Squares Fitting. We expect to raise stability for double deck tunnel through shape management for middle slabs.

**Keywords :** bridge slabs, least squares, safety evaluation, shape management method, terrestrial laser scanning

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