

Behavior of convex corner in deep excavation for cut and cover tunneling

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ABSTRACT

The bored tunneling method is generally preferred for urban tunnel construction, However the cut & cover tunnel is still necessary for special conditions, such as metro station and access structures. In some case, deep excavation for cut & cover construction is planed of irregular and unusual shape, as a consequence, the convex and concave corner is often encountered during that excavation. In particular, discontinuity or imbalance of the support structure in the convex corner can lead to collapse, which may result in damages and casualties.

In this study, the behavior of the convex corner of retaining structure were investigated using 3-dimensional numerical models established to be able to simulate the split-shaped behavior of convex corners. To improve the stability in the vicinity of the convex corner, several stabilizing measures were proposed and estimated numerically. It is found that linking two discretized wales at the convex corner can effectively perform the control of deformation. Furthermore, it was also confirmed that the stabilizing measures can be enhanced when the tie-material linking two discretized wales is installed at the depth of the maximum wall deflection.

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