

# Development of Activity Diagram for Flooding During Construction of Utility Tunnels

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## (a) Purpose of study or research hypothesis

In this study, we purpose an Activity Diagram for flooding that can occur during the construction of the utility tunnels to reduce and eliminate the damage.

## (b) Key issue(s) or problem(s) addressed

Recently, as the importance of life-line has been increasing in downtown area, there is a lot of electric power facilities on the ground, which is harming the beauty of the city and as the water and cooling / heating piping are buried in the ground and frequent excavation occurs, it causes problems such as traffic confusion and sink hole. To overcome these disadvantages, the acceptance of utility tunnels that can accommodate underground life-lines is increasing. However, safety standards for flooding occurring during the construction of utility tunnels are insufficient.

## (c) Methodology or approach used

Activity Diagram, unlike existing thick manuals, allows workers who need to respond quickly in case of a flooding to transfer their response actions to the co-workers, and the co-worker then performs the following response actions to simplify the corresponding process systematically and efficiently.

## (d) Results or conclusions derived from the project

Therefore, this study utilizes Activity Diagram to systematically and efficiently check the follow-up response process by presenting conciliatory actions by stage and step by step in case of flooding.

## (e) Implications of the project relevant to congress themes

The activity diagram for the response of the flooding can be flexibly modified according to the characteristics of the site of the community and used for disaster response. It could also contribute to the mitigation of properties damage.

Since it is widely used in common areas and tunnel construction sites, it is expected to contribute to reducing and responding to damages from flooding disasters.

**Keywords** : Utility Tunnels, CCA(Cause-Consequence Analysis), Activity Diagram