



The hydrological response of the combination between LID and underground integrated pip corridors based on SUSTAIN

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With the global climate change and the rapid expansion of urban land use, urban storms and floods have occurred frequently. The state has gradually attached importance to the unified construction of low-impact development facilities (LID) and underground integrated pipe corridors (GL), which makes sponge city both beautiful and practical. In order to study the urban hydrological response of the combination between LID and underground integrated pip corridors (LID_GL), the Yangmei River Basin, a pilot area of Guangzhou's integrated pipe corridors, was taken as an example to evaluate and compare the hydrological response of traditional development, GL, LID, GL_LID scenarios. The results show that:

- (1) The traditional development scenario is verified by the measured rainfall of "2018.06.08". The simulation results are consistent with the areas where are liable to waterlogging under the actual circumstance, which proves that the SWMM model is suitable for the hydrological response evaluation of LID_GL scenario in the Yangmei River Basin.
- (2) The SUSTAIN model can realize the optimized layout of LID, but the simulation accuracy needs to be improved. On the contrary, the SWMM model cannot realize the LID optimized layout, but the simulation accuracy of urban hydrological response is high. To Combine their advantages, the LID optimized layout schemes calculated by SUSTAIN model are input into SWMM model for hydrological simulation. The results show that this method can avoid the situation that the evaluation results are irrational due to improper layout of LID.
- (3) The overflow reduction in the LID_GL scenario is best, which can exceed 60% under high-return-period rainfall conditions. Its peak outlet flow is lower than GL scenario and the peak appearance time is also delayed.

The above research results can provide reference and theoretical support for the unified construction of LID and underground integrated pip corridors (LID_GL) in the future.