

Structures On Grade on Newly Reclaimed Land

Structures on grade such as floor slabs, partitions, fence walls, ancillary structures, underground utilities and drainage laid on newly reclaimed land are liable to significant subsidence due to long-term consolidation of underlying compressible material. For the purpose of this practice note, any land of which the reclamation is completed within 7 years counting back from the first day of submission of the foundation plan is considered as newly reclaimed land.

Plans Submission

2. The following design rules are recommended for the design of different types of structures on grade on newly reclaimed land:-

- (a) The lowest floor slabs within the building envelope, except for the circumstances stated below, should be designed as suspended slabs so as to eliminate the need for costly repair due to settlement. The problem with partitions could also be resolved once they are rested on suspended slabs. Under the following circumstances, floor slabs may be designed as on-grade:
 - (i) The floor slab is used for car parking, loading and unloading, vehicular ramp or pedestrian pavement; or
 - (ii) The floor slab is directly above a raft pile cap.
- (b) Owing to the relative ease of reconstructing fence walls, landscaping structures, lightweight covered walkway that have been damaged by the effects of settlements, they may be designed as on-grade structures instead of being supported on structural members provided the effect of settlement will not cause the said structures to pose a hazard to life or property.
- (c) The foundations of the ancillary structures detached from main building such as transformer rooms, pump house etc. should be carried down through the reclaimed materials to firm stratum and the lowest floor slabs should be designed as suspended.
- (d) Underground utilities and drainage underneath a building should be designed to be either supported from the suspended floors or directly supported on pile caps. The pipe connection at the interface between the structurally supported portion and on-grade portion of pipes should be designed to accommodate differential settlement due to the subsidence of the latter.

/(e) Where

- (e) Where open-cut method of excavation is proposed for raft pile cap construction and where space allows, a rockfill plug around the pile cap shall be provided to mitigate the migration of soil into the void that may be formed underneath the cap due to long term ground consolidation. The suggested details for the rockfill plug are enclosed in Appendix A. Where unusually excessive settlement is anticipated, appropriate measures to minimize the migration of soil into the void should be duly considered and provided for.

3. Where it is intended not to follow the above design recommendations, the problem of differential and total settlement affecting structures on grade should be fully taken into consideration in their designs. In this connection, a detailed assessment of the time-related total and differential settlement (including predicted time-settlement curves) and a proposal for necessary measures to overcome or accommodate the problem are required to be included in your site formation, superstructure and drainage plans as necessary where structures on grade are proposed on newly reclaimed land.

Settlement Records and Previous Settlement Assessments

4. If a detailed assessment of settlements of site on newly reclaimed land is to be conducted, reference could be made to settlement measurements collected during the reclamation period. Such data should only serve as reference to the historical settlement characteristics of the site and building professionals should make their site-specific ground investigation, assessment and design works to overcome their anticipated settlement problems. The settlement assessment by the consultant engaged for the reclamation project could also be made available to building professionals. They should be regarded as supplementary information for site specific assessment and design works. The historical settlement record and settlement assessment for government reclamation, if available, can be obtained from the Territory Development Department (TDD) or the Civil Engineering Department (CED) or other departments, depending on which department undertook the reclamation projects for the site.

5. The provision of the historical settlement records and settlement assessment by TDD, CED or other departments does not and cannot absolve an authorized person and his appointed consultant from the responsibilities which they must assume for their site investigation, monitoring, assessment and design works. The user of the reference material should accept and understand that no warranty is expressed or implied by the parties who supplied or prepared such information on the accuracy or the reliability of the historical data and assessments by the government departments and consultants.

Settlement Monitoring

6. When the alternative approach outlined in paragraph 3 above is adopted, the Building Authority may invoke Section 17(1)(6)(ca) of the Buildings Ordinance requiring continuous settlement monitoring (through instrumentation) throughout the construction period and the submission of a report reviewing the assessment of settlement. This is to ensure the reliability of the time-settlement relationship estimated at the design stage.

/Maintenance

Maintenance Implication

7. Where long-term settlement is allowed for in the design of structures on grade, i.e. for structures in paragraphs 2(a)(i), 2(b), 2(d) and 3 above, the authorized person should alert the developer of the long-term consequential maintenance implications resulting from such a design and advise him to inform any prospective buyers who may have to bear such maintenance costs for their properties in the long-term future.

Application

8. For the purpose of plan submissions, this practice note will take immediate effect except for those building developments for which the application of consent for the foundation works has been submitted on or before 15 May 1999. However, the requirement in paragraph 7 regarding alerting the developer of the long-term consequential maintenance implications and advising him to inform prospective buyers will apply to all building developments for which occupation permit has not been issued.

9. For the avoidance of doubt, the main structure of a building and its foundations should be properly designed and constructed to take care of the effects of long-term consolidation of any underlying compressible material. In general, all such foundations should comply with the requirements of Part VI of the Building (Construction) Regulations on foundations.

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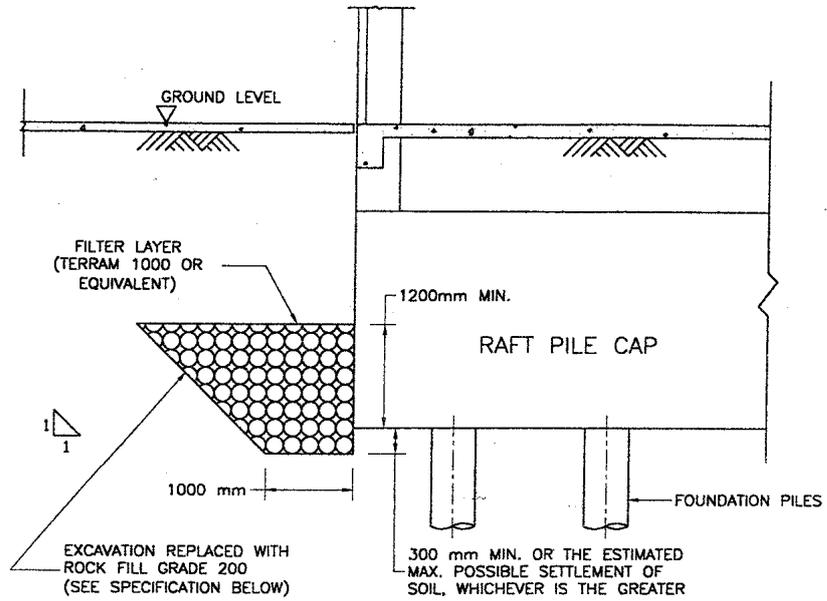
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Guidelines for Processing Submission Involving Structures on grade
Settlement of Newly Reclaimed Land

**Details of Preventive Measure against Migration of Soil
due to Potential Soil Settlement under Raft Pile Cap**



Notes :

1. Rock fill material shall consist of pieces of hard, durable rock of which not more than 30% by mass is discoloured or shows other evidence of decomposition. Concrete, masonry, brick and similar materials shall not be used instead of rock.
2. Particle size distributions of rock fill material (grade 200) :

Percentage by mass passing				
Size	BS test sieve			
200 mm	75 mm	20 mm	600 μm	63 μm
100%	20-75%	0-50%	-	-

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