

Legislative Council Panel on Housing

Technical Studies for Potential Public Housing Sites in the Planning Process

PURPOSE

This paper is to brief Members on the range of technical studies required during the planning process to assess the suitability and feasibility of developing potential sites for public housing use.

BACKGROUND

2. The objective of the Government and the Housing Authority (HA) is to provide public rental housing (PRH) to low-income families who cannot afford private rental accommodation, and provide subsidized sale flats under the Home Ownership Scheme (HOS) to meet the aspirations of low and middle-income families for home ownership. All sites identified for PRH and HOS developments intrinsically involve site constraints and issues to overcome before development can proceed. To meet the production target for PRH and HOS, a wide range of technical studies have to be undertaken to ascertain the suitability and feasibility of each site for public housing development. These are an essential part of the integrated planning and design process for public housing developments. The resulting draft planning briefs are used to seek agreement from Government Bureaux and Departments, and in the consultation with local communities and District Councils, before the planning briefs are finalized for approval by the Planning Department's District Planning Conference in the respective districts.

TECHNICAL STUDIES REQUIRED FOR POTENTIAL PUBLIC HOUSING SITES

3. To examine the development potential of a site and work out the optimal development intensity, development parameters and schematic layouts will be prepared taking into account the planning, traffic and environmental requirements and infrastructural assessments, geotechnical appraisals and investigations. Generally some 15 studies are required for potential public housing sites, namely–

- Site Potential Study
- Architectural Feasibility Study
- Traffic and Transport Impact Assessment
- Drainage Impact Assessment
- Sewerage Impact Assessment
- Noise Impact Assessment
- Air Quality Assessment
- Water Supply and Utilities Impact Assessment
- Geological and Geotechnical Appraisal
- Ground Investigation
- Microclimate Studies
- Air Ventilation Assessment
- Tree Survey and Impact Assessment
- Visual Appraisal
- Land Surveying

4. Additional specific studies may also be undertaken depending on the specific characteristics and constraints of individual sites. These studies may include but are not limited to the following –

- Planning and Engineering Studies
- Land Use Assessment
- Land Contamination Assessment
- Quantitative Risk and Potentially Hazardous Installations Assessment
- Site Formation Assessment
- Natural Terrain Hazard Study
- Existing Slope Features Assessment
- Ecological Assessment
- Heritage Impact Assessment
- Retail Viability Study

5. Brief descriptions of the key 25 technical studies are given in the **Annex**. Except for sites which are small with no major technical problems, broad technical assessments would generally be conducted either before or after the rezoning process, subject to concerned departments' advice on whether significant problems are envisaged.

6. To address specific technical concerns or requirements from relevant departments, further detailed assessments will be carried out after rezoning, during the planning brief, planning application or detailed design stage. Based on the outcome, we may have to seek endorsement from concerned government departments and authorities on the findings and proposed mitigation measures as

recommended by the technical studies. Recommendations arising from these studies will help formulate the planning and development parameters for scheme designs and subsequent detailed designs of the PRH and HOS projects. They will also be used to identify any necessary site formation and infrastructure works for the potential public housing sites.

7. Highlights of some specific studies are illustrated as follows –

- (a) **Land use assessment** is undertaken to examine the development potential of not only the site itself but also the adjacent land areas for more comprehensive and better planning for the area concerned, sometimes enabling acquisition of more land for public housing and pedestrian connectivity in the district if deemed appropriate e.g. the PRH site in Shatin Area 52.
- (b) **Land contamination assessment** is required for sites which have previously been used for industrial or related purposes like car repair workshops, factories, bus depots etc., e.g. the PRH development on the Ex-San Po Kong Flatted Factory site and the HOS development on Wang Yip Street West. The assessment is to verify the presence of contamination, the type and extent of such contamination and the treatment, if necessary.
- (c) **Potentially Hazardous Installations (PHI) Assessment** has to be conducted for sites within consultation zones of PHI facilities like gas plants and water treatment works e.g. the Hin Tin Street HOS site falls within the consultation zone of the Shatin Water Treatment Works.
- (d) **Natural Terrain Hazard Study** has to be conducted in the early planning stage for sites close to large steep natural slopes to identify the potential hazards, and mitigation measures required which may affect building disposition and net site area e.g. the PRH sites in Lin Shing Road, the Ex-Au Tau Departmental Quarters and the HOS sites at Pik Tin Street and Mui Wo.
- (e) To meet the requirement of the Town Planning Board, **Visual Impact Assessment** has to be conducted for sites requiring rezoning and planning application e.g. Sha Tsui Road HOS in Tai Wo Hau which is zoned “Comprehensive Development Area”.
- (f) An **Ecological Assessment** has been conducted for the PRH site at Fanling Area 49 to ascertain the ecological implication of developing the site where rich flora and fauna are identified along the stream traversing it.

- (g) **Heritage Impact Assessment** has been conducted for sites with heritage value e.g. the proposed conversion of the Ex-Chai Wan Factory Estate, which is the only remaining H-shaped flatted factory block in Hong Kong.

CONCLUSION

8. In view of the complexity of the potential public housing sites and the increasing aspiration from the public for a better living environment, the HA will continue to conduct various technical assessments to ascertain the suitability and feasibility and to optimize the development potential of the sites identified for public housing use.

INFORMATION

9. Members are invited to note the content of this paper.

Transport and Housing Bureau
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Technical Studies for Potential Public Housing Sites

1. **Site Potential Study**

A site potential study is to explore the development potential of a site for public housing development, having regard to planning, environmental, heritage, ecology, urban design, traffic and transport, landscaping, infrastructure, air ventilation, provision of community, open space and recreation, retail facilities, rehousing etc. Optimal development intensity will be recommended.

2. **Architectural Feasibility Study**

Architectural feasibility study for potential public housing sites is required and conceptual layouts will be prepared as a basis for establishing development potential and conducting preliminary engineering assessments and micro-climate studies.

3. **Traffic and Transport Impact Assessment**

Traffic impact assessment is required to investigate the district traffic conditions and identify road improvement works required prior to population intake. Demand for public transport services and additional public transport facilities such as public transport terminus will also be examined. Pedestrian assessment will also be included, and grade separated pedestrian facilities may be recommended where appropriate.

4. **Drainage Impact Assessment**

Drainage impact assessment is required to assess the risk of flooding. The capacity of existing district storm water drainage systems will be examined and proper mitigation measures or upgrading works will be recommended if any inadequacy in the existing system is identified.

5. **Sewerage Impact Assessment**

A sewerage impact assessment is essential to confirm the adequacy of district sewerage disposal and treatment facilities in the early planning stage. If any inadequacy in the major sewerage infrastructure is identified, engineering solution may be recommended such as upgrading of trunk sewers and provision of temporary sewerage pumping stations etc.

6. **Noise Impact Assessment**

In developed or to-be-developed areas served by transport networks, many potential public housing sites are subject to existing road traffic noise, railway noise and other fixed noise sources, thereby imposing constraints

on the developments on sites. Assessment is required to identify the source of noise impact and to propose possible mitigation measures such as erection of noise barriers on the roads/railway tracks. Noise mitigation measures at source, at path of propagation, and/or at receiving end within the potential public housing sites will also be explored as appropriate.

7. Air Quality Assessment

Quantitative air quality assessment on vehicular emissions and/or chimney emissions will be required in the early planning stage to ascertain the suitability of a site for public housing use. HA will formulate the study methodology in consultation with the relevant government departments for sites close to major roads and/or buildings with chimneys. Mitigation measures, if require, will also be proposed to ensure that the Air Quality Objectives under the Air Pollution Control Ordinance will be met. Odour study may also be conducted for sites subject to odour impact from nearby pollution sources like sewerage treatment works.

8. Water Supply and Utilities Impact Assessment

The demand for fresh and flushing water supply generated by new developments in potential public housing sites has to be assessed to ensure that the existing water supply system including water mains, pumping stations and service reservoirs is able to cater for the need of the new development. HA also explores with other utilities undertakers to ensure that provision of the utilities will meet the demand arising from the new developments. For sites in close proximity to high voltage overhead transmission lines, an assessment on safety is required to confirm that housing development is feasible.

9. Geological and Geotechnical Appraisal

Geological and geotechnical appraisal is required to identify if there is any adverse geological and geotechnical features etc. as the underlying geological and geotechnical conditions of the potential sites may have huge impact on their suitability for public housing development. For example, sites with extensive underground marble cavities located within the Scheduled/Designated Areas may impose severe constraints for high-rise housing development. Sites with other adverse geological and geotechnical features such as faults, highly variable and deep weathering profiles, high groundwater table will also impose significant design and construction constraints to public housing developments.

10. Ground Investigation

Ground investigation is required in the potential stage to provide input for layout planning and foundation design. With the preliminary findings of the investigation, proposed high rise domestic buildings should as far as practicable be positioned in locations with the least geotechnical constraints.

11. Microclimate Studies

Micro-climate studies involve the application of modern scientific technologies, including computational fluid dynamics simulations, wind tunnel tests and daylight simulation tools, etc. The innovative application of these established technologies provides a scientific platform to compare different design options and help fine-tune the architectural layout, disposition of buildings and detailed design features based on quantitative and more objective analyses. The design aspects being studied include wind environment, natural ventilation, daylight and sun-shading and mitigation of solar heat gain for the entire development, covering both indoor and outdoor environment in individual residential apartments, common areas in domestic buildings, semi public and public domains in the neighbourhood.

12. Air Ventilation Assessment

Air ventilation assessment is required for developments which may have impacts on macro wind environment, including public housing. The impact of a development on the pedestrian wind environment will also be assessed.

13. Tree Survey and Impact Assessment

A survey of existing trees and an impact assessment is required for all potential public housing sites. The impact of the housing development on the trees that may require preservation, transplanting, or removal is included in the assessment. A tree compensation plan will be proposed for all trees affected and required to be removed.

14. Visual Appraisal

In general, visual appraisal is necessary to demonstrate the visual change of the site from key public viewing points. A more detailed assessment in the form of a **Visual Impact Assessment** will be required for sites requiring rezoning and planning application to the Town Planning Board.

15. Land Surveying

Land Surveying is required for the study of the existing topography, utilities and trees of the subject site and surrounding environs to facilitate various works disciplines to conduct feasibility studies; including site formation, drainage, sewerage, and traffic systems, and tree assessment etc. A study of land boundary record is also required for identifying the land status of the potential site.

16. Planning and Engineering Studies

Planning and Engineering Studies are conducted for large and complex sites where district based technical investigation will be required to confirm the suitability of the sites for public housing developments and other land uses, where appropriate. Optimal development parameters will be formulated and engineering measures will be recommended for the subsequent site formation and infrastructure design.

17. Land Use Assessment

Review on the land uses in the vicinity of the potential housing sites will be undertaken. Liaison with the relevant government departments may be required for proposals that involve swapping with, relocation and reprovisioning of existing and/or planned facilities where appropriate.

18. Land Contamination Assessment

Land contamination assessment will be required for sites which have previously been used for industrial or related purposes, for example, car repair workshops and factories. The extent of contamination will be studied and remediation proposals will be formulated for approval by the relevant government departments. Ground investigation and laboratory test of soil samples will be included in the assessment. Pending the outcome of the assessment, land decontamination works might be required before formation of the sites.

19. Quantitative Risk and Potentially Hazardous Installations Assessment

Land uses and population increase are restricted within the consultation zone of potential hazardous installations such as chlorine storage and industrial gas facilities. Developments within the consultation zone have to be assessed to ensure that the risks to the public are confined to acceptable limit. Risk assessment is also required for potential housing sites falling within the consultation zone of landfill sites.

20. Site Formation Assessment

Site formation is required for sites located in hilly terrain. It involves earthworks excavation, filling and disposal operation. The extent of earthworks has to be identified in the early stage to determine the site formation period required. Earthworks disposal sites and source of import fill (in the case of filling) should also be identified in the early stage. Noise and traffic impact arising from the construction activities and safety of using explosives for rock excavation will be examined where appropriate.

21. Natural Terrain Hazard Study

Natural Terrain Hazard Study is required for potential public housing sites close to large steep natural slopes. Natural terrains, which are often huge and extensive and which possess only a small margin of safety under the prevailing weather conditions, are vulnerable to becoming unstable due to abnormal weather conditions such as exceptionally heavy rainfall or due to disturbances caused by human activities. It is therefore necessary to conduct a natural terrain hazard study in the early planning stage to identify potential hazards posed by the natural terrain and propose appropriate mitigation measures such as provision of non-building buffer zones, installation of soil nails, construction of debris-resisting barriers etc.

22. Existing Slope Features Assessment

All man-made slopes within or immediately adjacent to potential public housing sites have to be critically appraised during the early stages of a development. A detailed search and review on the available previous design and construction records have to be conducted. If modifications to the profiles of existing slopes are proposed for the public housing development, stability assessments are required. Even if the proposed development will not cause changes to the geometry of the existing slopes, stability assessments are still required to ascertain whether the existing slopes possess an adequate margin of safety under the current standards.

23. Ecological Assessment

Ecological assessment is required for potential public housing sites situated in the vicinity of areas with ecological and conservation importance. A review of ecological baseline information and comprehensive survey are required to ascertain the ecological value of the potential housing sites and its surroundings. Potential ecological impact will be assessed and necessary mitigation measures will be proposed.

24. Heritage Impact Assessment

Heritage impact assessment is required for potential public housing sites that fall within an archaeological zone or are located in close vicinity to sites of archaeological or historical interests/values. Archaeological survey may be required before site formation and construction works.

25. Retail Viability Study

In the planning and design of major public housing development, a retail viability study will be conducted on a need basis to determine the type and the size of the required retail facilities. The study will consider the population of the development, the existing retail facilities in the adjacent areas and the development constraints of the site. The proposed retail provision endeavours to meet the basic needs of the residents of the public housing developments.