Identification of Government Facilities for Relocation

The identification of Government facilities for relocation in the Study adopted a three-stage systematic approach of stocktaking, prioritisation, screening, ranking, and appraisal. Thirty (30) facilities with higher relocation potential were selected from over 500 facilities located throughout the territory, based on their respective merits and conditions under the relevant criteria of site conditions, potential land uses, development constraints, relocation criteria of site conditions, potential land merits and limitations under the selection process.

The Study has prepared the CMP to provide a strategic planning framework to guide the development and relocation of suitable facilities, taking into account various factors including resource implications, relocation programme and project timeline. The Study has selected and prioritised a list of suitable Government facilities with potential for relocation to caverns. The Government should further formulate a priority list for developing适合 cavern development, increasing long-term land supply and meet specific needs.

Measures to Facilitate Cavern Development

The measures proposed to facilitate cavern development are summarised as follows:

(i) Promulgating cavern development guidelines through the promulgation of the CMP and other relevant Government guidelines and circulars;

(ii) Proactively considering cavern option assessment, where proposed new surface developments and areas require an underground option, assessing cavern areas with potential benefits to the public and communities;

(iii) Rezoning land for cavern development when proposing new refuse transfer stations, sewage treatment works and service reservoir, and continuing our cavern option assessment;

(iv) Developing caverns by means of underground quarrying to bring about benefit in enhancing the long-term land supply of Hong Kong.

Technical Matters

Various technical matters for cavern development have been investigated under the Study, which include:

(i) Updating Geodatabase, Guidelines and Engineering Documents;

(ii) Assessing the list of land uses with the potential for development in rock caverns in the Hong Kong Planning Standards & Guidelines;

(iii) Conducting Strategic Environmental Assessment and other development assessment;

(iv) Developing conceptual site safety schemes for cavern developments.

Recommendation and Way Forward

The identification and prioritisation of suitable facilities will provide a strategic planning framework to guide and prioritise suitable facilities for cavern development. The CMP should reference to identifies the Hong Kong Planning Standards & Guidelines in the course of planning and engineering studies, preparation/revision of town plans and development control for surface, underground and cavern developments in the territory.

The Study has identified a list of suitable Government facilities with potential for relocation to caverns. The Government should follow up and develop guidelines to implement the measures and promote the innovative development through relevant technical guidelines.

The Study has identified the Government facilities for relocation to caverns. The Government should continue to take action to facilitate the use of cavern development as an innovative option to increase the long-term land supply of Hong Kong.

Related Information

Introduction

Land is a scarce resource in Hong Kong and there is a pressing need to increase land supply in sustaining our social and economic development. Cavern development is a viable source of long-term land supply, which can provide valuable space for a broad variety of land uses and help address problems encountered in the congested urban environment. The fully-return with strong roots, Hong Kong is highly suitable for developing rock caverns, particularly on the urban fringe (Figure 1).

Co-Engineering and Development Department (CEDD) had carried out studies to explore the opportunities of enhancing rock cavern development in Hong Kong for a recent period. Subsequent to these studies, a few pilot projects on intercalation of existing Government buildings to caverns have been initiated and are being pursued by respective departments (Figure 2). To follow up the findings of the previous studies, CEDD commenced the “Long-term Strategy for Cavern Development” (October 2012).

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The benefits of cavern development are as follows. Developing rock caverns strategically can bring about planning and development gains, including but not limited to the following:

1. Ensure surface plans for other benefits such as relocating existing Government facilities to new caverns and
2. Remove inoperable land uses by removing unproductive facilities in caverns to minimize their nuisance to the community whilst reusing the caverns for beneficial uses by allocating suitable new facilities in caverns.

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Benefits and Limitations of Cavern Development

Cavern development would however face issues in its limitations. Cavern development, in fact, has a number of technical issues encountered could be more complicated. Cost-effectiveness may be a limiting factor, and in some cases, the use of cavern development alone may not address the overall problem particularly shortage of developable land.

Some notable overseas examples on various uses of caverns are shown in Figure 3.

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Some notable overseas examples on various uses of caverns are shown in Figure 3.
The benefits of cavern development are multifaceted. Developing rock caverns strategically can bring about planning and development gains, including but not limited to the following:

(i) Increase surface land for other beneficial uses by relocating existing government facilities to rock caverns;

(ii) Remove intractable land uses by removing underground facilities within a cavern to maximize their usage to the community while retaining the value of the land above and around the cavern, and in its surroundings;

(iii) Reduce surface land take by utilizing new build space within a cavern, including usable new public and private sector facilities within a cavern;

(iv) Reduce excavated rock arising from cavern construction, to be used as aggregate to support the local construction industry.

Some notable overseas examples on various uses of caverns are shown in Figure 3.

**Cavern Master Plan**

The Cavern Master Plan (CMP) (Figure 5) has been developed under the Study with the aim of providing a broad strategic planning framework in guide and shape territory-wide cavern development, and to promote governmental information for project proponents to identify suitable cavern sites for their development projects. The CMP delineates forty-eight (48) Planning Cavern Areas (PCAs) in the territory that are well-placed for developing for future needs of the adjoining districts. As SCVA is defined as an area that is easy to develop for features like buffer zones between individual facilities, intervening rock pillars to facilitate cavern development for both public and private sectors, and investigated a number of technical matters relating to rock cavern development.

The Study in September 2012 formulated a long-term strategy for cavern development. In brief, the Study has prepared a Caver Master Plan to outline Strategy, Cavern Areas for cavern development, drawn up a set of suitable government facilities for relocation to caverns, proposed measures to facilitate cavern development for both public and private sectors, and investigated a number of technical matters relating to rock cavern development.

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Introduction

Cavern development is an essential tool for Hong Kong and there is a pressing need to increase land supply in sustaining our social and economic development. Cavern development in Hong Kong will not only help to address the issue of limited land supply, which can provide a long-term source of land that can be developed for public and private sectors, but also help to facilitate cavern development for meeting the demands of both public and private sectors, and there is a pressing need to increase cavern development, particularly in the urban fringe.  

Civil Engineering and Development Department (CEDD) had carried out studies to explore the opportunities of enhancing rock cavern development in Hong Kong in recent years. Subsequent to these studies, a few pilot projects in relation to existing government facilities to caverns have been initiated and now being pursued by respective government departments (Figure 2). To follow up the findings of the previous studies, CEDD commenced the “Long-term Strategy relating to rock cavern development.” The Study had in September 2012 formulated a long-term strategy for cavern development. In brief, the Study had prepared Cavern Master Plan (CMP) for cavern development, drawn up a list of suitable government locations for relocation to caverns, proposed measures to facilitate cavern development for both public and private sectors, and investigated a number of technical matters relating to rock cavern development.

The Cavern Master Plan (CMP) (Figure 4) has been agreed to under the Study with the aim of providing a broad strategy for planning and development for caverns and to assist governmental authorities in identifying caverns for relocating government facilities. The CMP allocates forty-eight (48) Strategic Cavern Areas (SCVA) in the territory and uses a draft plan for development layout and future needs of the adjoining districts. As SCVA are defined as an area that is easy to access and can accommodate multiple facilities in rock caverns to meet the  

The benefits of cavern development are multifaceted. Developing rock caverns strategically can bring about planning and development gains, including but not limited to the following:

(i) Release surface land for other beneficial uses by relocating existing government facilities to caverns;
(ii) Remove incompressible land uses by removing underground facilities to caverns for minimizing their nuisance to the community whilst utilizing the cavern for accommodating new facilities;
(iii) Facilitate development of land in urban and suburban areas;
(iv) Reduce surface land taken by existing facilities;
(v) Improve the image of existing facilities;
(vi) Reduce environmental impacts; and
(vii) Reduce safety and environmental risks.

The benefits of cavern development include:

- New facilities (including suitable new public and private sector facilities) in caverns;
- Release developable lands for other priority uses (such as open spaces, community/residential uses by accommodating suitable new facilities in caverns); and
- Recycle excavated rocks arising from cavern construction, be used as aggregates to support the local construction industry.

Some notable overseas examples on various uses of caverns are shown in Figure 3.

Cavern development would however raise issue in terms of cavern that the development of rock caverns usually involves considerable capital investment and relatively long implementation time frames. The present and past cavern development approaches such as rezoning, reclamation and site formation. The technical issues encountered could be more complicated. Cost-effectiveness may not be comparable to traditional development approaches such as rezoning, reclamation and site formation. The technical issues encountered could be more complicated. Cost-effectiveness may not be comparable to traditional development approaches such as rezoning, reclamation and site formation. The technical issues encountered could be more complicated. Cost-effectiveness may not be comparable to traditional development approaches such as rezoning, reclamation and site formation. The technical issues encountered could be more complicated. Cost-effectiveness may not be comparable to traditional development approaches such as rezoning, reclamation and site formation.
Identification of Government Facilities for Relocation

The identification of Government facilities for relocation in the Study adopted a systematic approach of stocktaking, rationalisation, screening, ranking and appraisal. Thirty (30) facilities with higher relocation potential were selected from over 500 facilities located throughout the territory based on their respective needs and requirements under the various criteria of site conditions, potential land uses, and development constraints. These 30 facilities, covering a variety of facility types, such as sewage treatment works, refuse transfer stations, service reservoirs, and other services in terms of cavern use in Hong Kong including vehicle depots, archives, warehouse and material testing laboratories.

Broad planning and technical assessments were conducted on the facilities to further review various needs and requirements of Government to relocate these, as well as the overall benefits to the public and communities. The Study has identified 27 facilities suitable for relocation to caverns. The Government should further formulate a priority list for launching feasibility studies on relocation to caverns so as to outline the long-term land supply and meet specific needs.

Measures to Facilitate Cavern Development

The proposed measures to facilitate cavern development are summarised as follows:

1. Promoting cavern development information through the promotion of the CMP and other relevant Government guidelines and circulars;
2. Proactively considering cavern development when proposing new works, transfer station, sewage transfer works and service reservoir, and carrying out cavern option assessments;
3. Allocating land for cavern development by launching planning proposals and/or by rezoning land with identified needs and potential for integration into caverns.
4. Developing caverns by means of underground mining to bring about benefit in enhancing the long-term land supply by creating a cavern land bank.
5. Developing caverns by means of underground quarrying to bring about benefit in enhancing the long-term land supply by creating a cavern land bank.
6. Developing caverns by means of underground mining to bring about benefit in enhancing the long-term land supply by creating a cavern land bank.

Technical Matters

Various technical matters for cavern development have been investigated under the Study to facilitate the process of cavern developments that have been carried out:

1. Updating Geoguide 4: Guide to Cavern Engineering,
2. Revising the list of land uses with the potential for development in rock caverns in the Hong Kong Planning Standards & Guidelines;
3. Conducting Strategic Environmental Assessment (SEA) on cavern developments;
4. Developing conceptual fire safety schemes for cavern developments;
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The Study has prepared the CMP to provide a strategic planning framework to guide and the State territory-wide cavern development in Hong Kong. The CMP should be referred to alongside the Hong Kong Planning Guidelines & Standards in the course of planning and engineering studies, preparation/revision of town plans and development control for surface; underground and cavern developments in the territory. The Study has broadly reviewed a list of suitable Government facilities with potential relocation in caverns. The Government should further formulate a priority list for launching feasibility studies on relocation to caverns so as to outlet the long-term land supply and meet specific needs.

Recommendation and Way Forward

The CMP has gained international recognition and was awarded by the International Tunnelling and Underground Space Association (ITA) as the best of the Innovative Underground Space Concept of the Year in the ITA Tunnelling Awards ceremony on 15 November 2017. The details of this award are available in the CMP's website. The CMP was also awarded a Certificate of Merit by the Hong Kong Institute of Planner in 2018 for its merit in urban design and land use planning in Hong Kong. The details of this award are available in the CMP's website.
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The identification of Government facilities for relocation in the Study adopted a systematic approach of stocktaking, rationalisation, screening, ranking and appraisal. Thirty (30) facilities with higher relocation potential were selected from over 500 facilities located throughout the territory based on their respective merits and criteria under the following categories: potential land use, site conditions, and other relevant criteria.

Measures to Facilitate Cavern Development

The proposed measures to facilitate cavern development are summarised as follows:

1. Promulgating cavern development information through the publication of the CMP and other relevant Government guidelines and circulars.
2. Preparing technical guidelines for cavern development when proposing new surface transfer stations, warehouse and material testing laboratories, and carrying out cavern option assessment.
3. Revising the list of land uses for cavern development to facilitate the integration of cavern development with surface development to increase land use efficiency.
4. Developing cavern by means of underground quarrying to bring about benefits in enhancing the long-term land supply by creating a cavern land bank.
5. Developing cavern by means of underground quarrying to bring about benefits in enhancing the long-term land supply by creating a cavern land bank.

Technical Matters

Several technical matters for cavern development have been investigated under the Study to facilitate cavern development for both public and private sectors. These matters include:

- Developing cavern by means of underground quarrying to bring about benefits in enhancing the long-term land supply by creating a cavern land bank.
- Integrating cavern development in area-based P&E studies to capitalise strategic benefits and synergise with integrating cavern development with surface development when there are suitable SCIW areas, and
- Developing cavern by means of underground quarrying to bring about benefits in enhancing the long-term land supply by creating a cavern land bank.

Recommendation and Way Forward

The Study has prepared the CMP to provide a strategic framework to guide and coordinate territory-wide cavern development in Hong Kong. The CMP should refer to relevant Government guidelines and standards to coordinate with the course of planning and engineering studies, geographic/technical of cavern plans and development control for surface, underground, and cavern developments in the territory.

The Study has also reviewed a list of suitable Government facilities with potential for relocation to caverns. The Government should further formulate a priority list for relocation to caverns by considering suitability and potential land use and meet specific requirements.

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