# PLANNING AND DEVELOPMENT OF SUSTAINABLE PUBLIC HOUSING PROJECTS IN INDUSTRIAL AREAS OF HONG KONG

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***ABSTRACT***

*Finding sufficient land supply to meet the public housing flat production target always poses a major challenge to the Administration. To optimize the use of scarce land resources in Hong Kong, the Hong Kong Housing Authority (HA) works with Government to increase the housing land supply by developing public housing in industrial areas.*

*Although we are striving hard to meet the quantitative flat production target under severe land, community and environmental constraints, we have never set aside our established qualitative goals for sustainability, which include providing homes for safe, green and healthy living in harmonious communities, developing properties that are functional and cost-effective, environmentally-friendly and people-oriented.*

*This Paper aims to share HA's experiences on planning of public housing development in industrial areas and how HA makes uses of its sustainable planning and design approaches to optimize the flat production by overcoming various site constraints. Key Considerations include competing land uses and provision of supporting facilities and open space, measures to address industrial/residential interfaces, reprovision of existing uses, optimization of the development intensity and building height, preservation and adaptive re-use of the historic buildings, managing local aspiration and community engagement, etc.*

*Two case studies are presented, including public housing developments in Fo Tan and transformation of Chai Wan Factory Estates by adaptive re-use, to illustrate different approaches, planning process, problems encountered, engagement with stakeholders, and creative solutions thus generated.*

*Steady and timely provision of land is critical in meeting the challenge of increasing demand for public housing in Hong Kong. The HA's experience on the use of industrial land for public housing developments demonstrated the importance of flexible, proactive and sustainable approaches in meeting the above challenges for the short and medium term.*

***Keywords:*** *ADAPTIVE RE-USE; FACTORY ESTATE; INDUSTRIAL AREA; INDUSTRIAL/RESIDENTIAL (I/R) INTERFACE; PRESERVATION; SUSTAINABLE PLANNING/ DEVELOPMENT.*

## 1. INTRODUCTION

One of the objectives of the Government and the Hong Kong Housing Authority (HA) is to provide public rental housing (PRH) to low income families who could not afford private rental accommodation with a target to maintain the average waiting time for general applicants at around three years. To meet this objective, the HA will build 79,000 new PRH flats for five years from 2012/13 to 2016/17, and in January 2013 the Chief Executive announced in his Policy Address that we need to build 100,000 flats for the five year period starting from 2018. Despite the large existing stock and the flat production each year, the demand for public rental flats continues to rise.

As for the subsidized sales flats, the Government announced in 2011 the resumption of the Home Ownership Scheme (HOS) to meet the aspirations of middle-income families to buy their own homes. The HA will provide about 17,000 flats over four years from 2016/17 to 2019/20, and thereafter achieve a target of 5,000 new HOS flats per year.

With the scarcity of land, finding timely available and suitable land to meet the flat production target presents a major challenge to the Government as well as the HA. With the decline of industrial activities in Hong Kong, there is scope to utilize the industrial land stock for residential use to boost public housing production and to speed up the restructuring of some of the obsolete industrial areas.

Against the above background, this paper aims to share the HA's experiences and proactive approaches on the planning of sustainable public housing development in industrial areas of Hong Kong.

## 2. BUILDING A SUSTAINABLE COMMUNITY

The concept of "sustainability" is now one of the major concerns to Hong Kong. We have been proactive in rising to this particular challenge and build sustainable and harmonious communities that are functional, cost effective and environmentally friendly.

Sustainable development requires the full integration of the need for economic and social development with those of conserving the environment. We have to find ways to increase prosperity and improve the quality of life, while reducing overall pollution and wastes, reducing the environmental impact of our activities and helping to preserve common resources and in doing so, create a sound basis for a sustainable public housing programme.

## 3. PLANNING BACKGROUND

### *3.1. PLANNING DEPARTMENT'S AREA ASSESSMENTS OF INDUSTRIAL LAND IN THE TERRITORY*

In view of the declining demand for industrial floorspace in Hong Kong, the Government has been exploring the feasibilities to rezone obsolete industrial land for other uses since late 1990s. In this connection, the Planning Department (PlanD) has carried out the "Study to Review the Planning Framework for Reservation and Provision of Industrial Land".

The latest "Area Assessment 2009 for Industrial Land in the Territory" completed in September 2010 identified a number of sites in Tsuen Wan West, Fo Tan, Fanling, Siu Lek Yuen and Tuen Mun for residential and other uses. Based on the Government's Assessments, we carried out site potential studies to ensure the identified sites are suitable for sustainable public housing development.

### *3.2. REDEVELOPMENT OF HA'S FACTORY ESTATES FOR PUBLIC HOUSING DEVELOPMENT*

The HA has a number of factory estates. They were originally built by the then Resettlement Department and the HA between the 1950s and 1980s as part of the government's resettlement programme for rehousing squatter factories and cottage workshops displaced by natural disasters or land resumption. At its peak, the HA has a total of 17 factory estates. With the decline on demand for industrial floorspace in Hong Kong, we have ceased building new factory estates since 1984. As some of the factory

estates were obsolete and unable to meet the needs of modern industrial buildings, we had decided in 2000 to progressively clear some of the older factory estates.

At present, only six remaining factory estates are still in operation. They have not been considered for redevelopment as their occupancies rates are steadily high, the industrial/residential interface problems are too serious or the sites are too small. Other factory estates have been redeveloped for public housing, open space, schools, or transformed to the Jockey Club Creative Arts Centre by adaptive re-use, etc. To meet the shortage of land supply for public housing, the HA is now redeveloping three factory sites for public housing developments. They are the redevelopment of Tai Wo Hau Factory Estate, San Po Kong Factory Estate and transformation of Chai Wan Factory Estate by adaptive re-use.

## 4. KEY CONSIDERATIONS FOR PLANNING OF SUSTAINABLE PUBLIC HOUSING DEVELOPMENT IN INDUSTRIAL AREAS

### *4.1 POLICY FRAMEWORK*

The Government's policy to transform industrial areas to non-industrial uses provides an overall policy framework for the proposed public housing developments. The PlanD's Area Assessment provides the planning support to facilitate the 'up-zoning' of industrial areas identified for other uses. Our proposed developments in areas such as Fo Tan and San Po Kong are in line with the overall comprehensive land use planning of the districts, giving the impetus to upgrade and revitalize the area.

### *4.2 ENVIRONMENTAL SUSTAINABILITY*

***PLANNING TO TACKLE INDUSTRIAL/RESIDENTIAL (I/R) INTERFACE PROBLEMS -*** Even though a site has been 'up-zoned', the process of actual land use transformation in an industrial area is a lengthy process. New residential developments near existing industrial uses might still be affected by industrial/residential (I/R) interface problems for an indefinite period of time. We have to take proactive and innovative steps to resolve the problems at early planning stage and apply design and technical solutions to mitigate adverse impacts to ensure that the I/R interface issues are fully addressed.

***REPROVISION OF EXISTING USES AND REMEDIATION OF CONTAMINATION OF SITES -*** Some of the industrial sites are occupied by temporary uses such as bus depot, abandoned vehicle surrender centre, car storage or repairing workshop. Timely evacuation or relocation of existing uses is critical to the development programme. We need to work closely with the relevant departments to relocate the existing uses. Since such land is usually contaminated, we need to allow time to carry out land decontamination works, and it will affect housing production programme.

### *4.3 SOCIAL AND ECONOMIC SUSTAINABILITY*

***OPTIMIZING DEVELOPMENT POTENTIAL AND PROVISION OF SUPPORTING FACILITIES AND OPEN SPACE -*** While we are striving hard to optimize the development intensity and building height when developing public housing in industrial areas, we need to strike a balance among the development intensity, flat production and the provision of community facilities and open space. Considering that the existing facilities within the industrial areas are intended for the workers and not for the local residents and open space are limited, it is important to provide supporting facilities and open space to serve the new residents as well as the existing district needs.

***COMPETING LAND USES AND PRESERVATION & ADAPTIVE RE-USE OF HISTORIC BUILDINGS -*** Although the industrial areas could release land for other uses, public housing might not be the only option. There are many competing land uses such as welfare, community, open space or private housing. We need to assess carefully the local community's aspirations against the needs from wider community. To create a sustainable plan, we seize every opportunity to integrate public's aspiration with the need for housing where possible. For example, we adapted the Cha Wan Factory Estate the last H-shape factory building in Hong Kong, for domestic use through which we were able to retain the heritage value of the building.

***MANAGING LOCAL ASPIRATION AND COMMUNITY ENGAGEMENT -*** There is a need to address both the housing need and the local aspiration so as to achieve a win-win situation. The proposed residential developments in industrial areas require rezoning of the sites. We need to gauge the views of District Council, stakeholders and local community and aspirations at early planning stage, and obtain their supports so as to minimize the possible delay on the development programme. We will proactively address their concerns into the proposal as far as possible, so as to help reduce the number of objections during the rezoning stage. This is an iterative process involving district planning, urban design, scheme design, plus multi-stakeholder engagement and negotiation process. We have achieved social sustainability through such planning approach.

## 5. CASE STUDIES OF SUSTAINABLE PUBLIC HOUSING DEVELOPMENTS IN INDUSTRIAL AREAS

The cases of the proposed PRH development at Fo Tan and the proposed transformation of Chai Wan Factory Estate by adaptive re-use highlighted the key planning processes of sustainable public housing developments in industrial areas and how we overcome various constraints to achieve successful outcomes.

### *5.1. CASE STUDY 1 – PROPOSED NEW PRH DEVELOPMENT IN FO TAN INDUSTRIAL AREA*

This brownfield site, mainly zoned "Industrial" ("I") in Fo Tan Industrial Area, was identified in the Area Assessment 2009 for residential use. It is currently occupied by the temporary bus depots, temporary car park, car repairing workshops, abandoned vehicle surrender centre and 10 private lots.

#### *5.1.1. MAJOR CHALLENGES AND OUR PROACTIVE PLANNING APPROACH*

***OPTIMIZING DEVELOPMENT POTENTIAL AND PROVISION OF SUPPORTING FACILITIES -*** At the outset of the site potential study stage in 2007, we were only studying a small piece of land of about 1.8 ha with plot ratio restriction of about 2.5 and building height limit of 20 storeys producing 740 flats. Through our continuous discussion with PlanD for about 2 years and after a series of technical studies, the site area was enlarged to 4.1 ha by amalgamation of adjoining lots, and plot ratio was increased to 5 with permissible building height raised to 37 storeys. As a result, the flat production was significantly increased from 740 to about 4,200 flats, thereby providing more comprehensive facilities and creating a more vibrant neighbourhood.

***RESOLVING I/R INTERFACE ISSUES TO ENSURE ENVIRONMENTALLY SUSTAINABILITY -*** Despite the site is located slightly away from the active industrial node, it is still partly within the 100m industrial buffer zones and is subject to I/R interface problems in particular the fixed noise source from the cooling towers at the adjacent Data Centre (Figure 1).

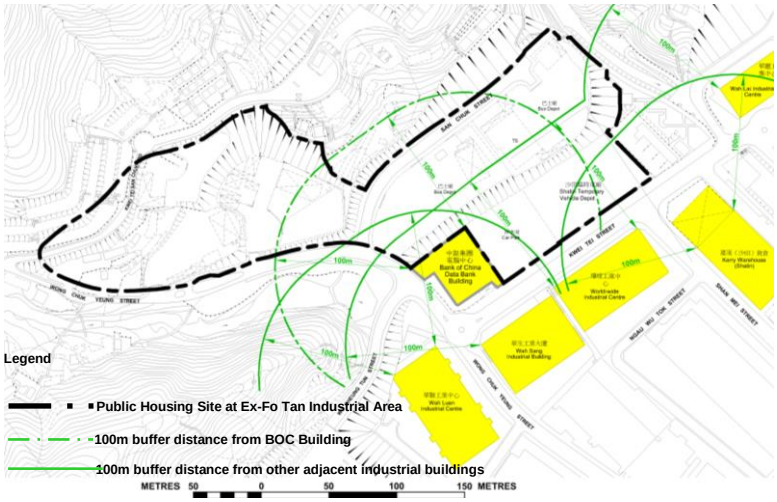


Figure 1: 100m Buffer Zones from Adjacent Industrial Buildings

To overcome the I/R interface problems, we took a proactive approach in achieving integration of the development with the immediate surroundings. We proposed a 3-storey retail and welfare block at the south-eastern part of the site to create a barrier between the residential development and the industrial buildings (Figure 2). This block with a landscaped roof would accommodate the planned supporting facilities such as wet market, retail shops, car park, bus bays, kindergarten, Day Care Centre for the Elderly, etc., serving not only the PRH development but also the local community.

For the adjacent Data Centre, we started the dialogue with the owner representatives and obtained their agreements to install at source acoustic treatments for the noisy cooling towers on the building roof. This could help us to address the noise problem from the cooling towers and allow us to design a better layout.

***REPROVISIONING THE EXISTING USES -*** There were an existing temporary bus depot, a temporary open carpark and a government abandoned vehicle surrender centre within our site. We took proactive approach and liaised with the government departments on identifying some possible reprovisioning sites in other districts. By doing so, we can resolve the reprovisioning issue and advance the availability dates of our site.

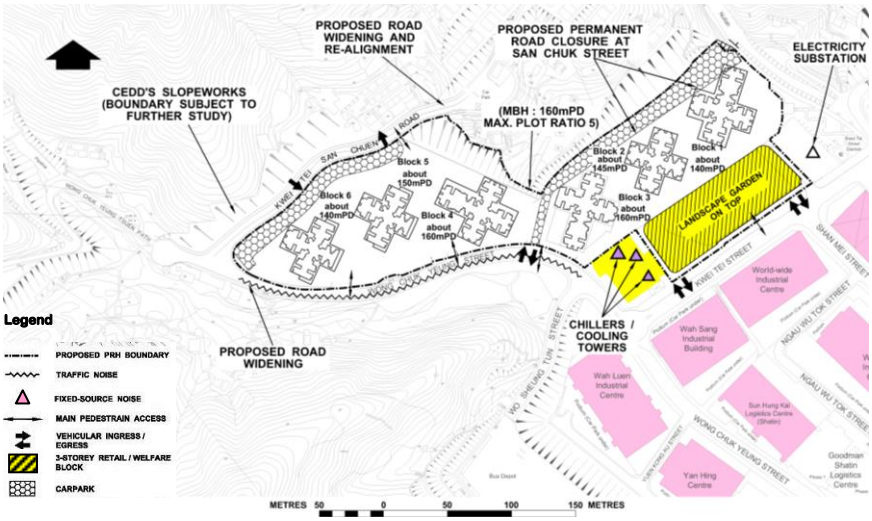


Figure 2: 3-storey Retail and Welfare Block

***ENGAGING LOCAL COMMUNITY TO ENHANCE MUTUAL UNDERSTANDING -*** Since the site required rezoning, we adopted a proactive approach to sound out the planning intention of the site to Sha Tin District Council (STDC) at early planning stage in 2010. Initially, STDC was concerned about the inadequate project information such as the transport and welfare provision. We explained to STDC that our intention was to seek their early comments so that their concerns can be incorporated. With STDC's initial support, we proceeded with the preparation for the rezoning. In 2011, we refined our scheme and obtained STDC's support.

In 2012, STDC set up a Working Group on Land Development to offer comments to the Government on major land development projects at the early planning stage. We took advantage of this opportunity and invited the Members for a site visit to present our PRH and HOS sites in Fo Tan and Sha Tin. Despite the additional workload, we see this as a golden opportunity to promote partnering between HD and STDC, in keeping with our caring culture to build harmonious community. After the STDC consultation, we continued to follow up their requests for improvements on traffic, public transport and cycle track issues that extend beyond our adjoining neighbourhood.

***REZONING "INDUSTRIAL" TO "RESIDENTIAL (GROUP A)" FOR TIMELY FLAT PRODUCTION -*** In the past, the Government only considered rezoning industrial sites from "I" to "Residential (Group E)" ("R(E)") for a better control on environmental issues. However, our site was successfully rezoned to "Residential (Group A)" ("R(A)") direct instead of "R(E)". This was mainly contributed by early completion of the technical assessments to well justify our residential proposal is environmentally acceptable. The layout design, no podium structure, building height profile, road widening and pedestrian linkage were agreed at the early site potential study stage. The "R(A)" zoning greatly streamlines the overall planning procedure and avoid the need for extra time and resource to submit planning application to the Town Planning Board (the Board).

### *5.1.2. SUCCESSFUL OUTCOMES*

Through continuous discussion with the concerned departments, we fully utilize the valuable land resource by increasing the site area and development intensity. Also, we took lead to early engage the STDC and sound out our planning intention of the site and provide prompt responses to their concerns. We took proactive actions to resolve the I/R interface issues to ensure environmental sustainability of the development. More important, without compromising the environmental considerations, this is almost the first successful case of rezoning "I" site directly to "R(A)" site so as to speed up the development programme and flat production.

### *5.2. CASE STUDY 2 – PROPOSED TRANSFORMATION OF THE CHAI WAN FACTORY ESTATE FOR PUBLIC RENTAL HOUSING CUM MUSEUM FOR HA'S FACTORY ESTATES*

The Chai Wan Factory Estate (CWFE) is located at the Chai Wan Business Area adjoining the Chai Wan MTR Station (Figure 3). It is a six-storey walk-up block built in 1959. The factory estate has been evacuated since end 2012.

The site of CWFE and the adjacent bus terminus was zoned as "CDA" which was intended for comprehensive development/redevelopment for residential and or commercial uses in 2001. The after use of the site had evolved with changing circumstances over the years. While the HA had been pursuing to redevelop the site for public housing, commercial development was not precluded in view of the prime location of the site.

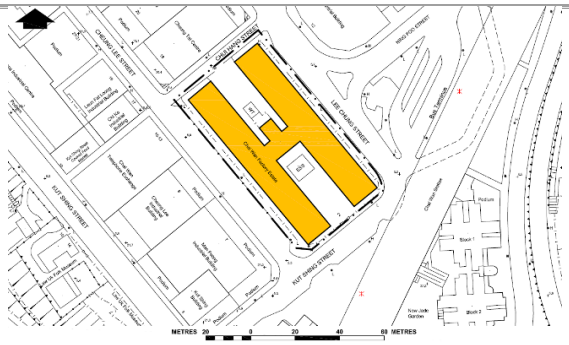

Figure 3: Chai Wan Factory Estate, the last Surviving H-shaped factory estate building in Hong Kong

### *5.2.1. Major Challenges and Our Proactive Planning Approach*

***Responding Positively to Public's Aspiration -*** HA's original plan was to provide some 400 flats through redevelopment. However, in the recent years, there has been increasingly strong demand to preserve the last H-type factory building in Hong Kong (Figure 3). The proposal was first initiated by the Eastern District Council and as the strong aspiration transpired, HA took the initiative to reassess the original redevelopment plan. Through active engagement with concerned LegCo Members, Eastern District Council members and local concern groups, a concept marrying the conservation need while meeting the short term demand for public rental housing was conceived. The proposed transformation by adaptive re-use of the building will provide some 190 flats for singletons and small families in 2015/16.

***Meeting the Environmental Challenges and the need to Preserve the Building's Heritage Value -*** To convert a factory building for residential use is in itself a challenging proposition, let alone preserving its heritage value. Apart from the change of use, the project has to preserve the original shape, structure, building elements and appearance of the factory building as far as practicable. To this end, HA took proactive steps to engage experts to conduct Heritage Impact Assessment (HIA) to ensure that the conservation principles will be met. The HIA of this project was endorsed by the Antiquities Advisory Board in April 2013.

The conversion plan also needs to take into account the residential/industrial interface issues and the noise impact from the nearby bus terminus, railway and adjacent roads (Figure 4). To meet the above challenge while keep the block in its original shape as far as practicable, all air and noise sensitive receivers will be facing inward into the courtyard. The original H-shaped build form has two distinct 'courtyards' which will best serve the above purpose (Figure 5). With landscaping and beautification, the courtyards will become activity nodes and estate gathering place.

***Engaging District Council and Local Concern Groups -*** During initial engagement with some members of the Eastern District Council, we gathered the 'wish list' from local communities on the proposed uses to be incorporated into the project. In response, we have incorporated in our preliminary plan to display the history of Chai Wan Factory Estate in public area such as G/F courtyard, access routes, lobby and corridors. We will conduct further public engagement with the Eastern District Council and local interest groups to work on the details.

### *5.2.2. Successful Outcomes*

The proposed conversion plan of Chai Wan Factory Estate has well served the public's interest on preserving the local history while meeting the need for public housing. By

converting the last H-shaped factory estate in Hong Kong into residential cum community use, we have given the building a new life. Comparing to the original demolish and rebuild approach, the project will generate less construction waste and advance the delivery of new flat production by two and a half years.

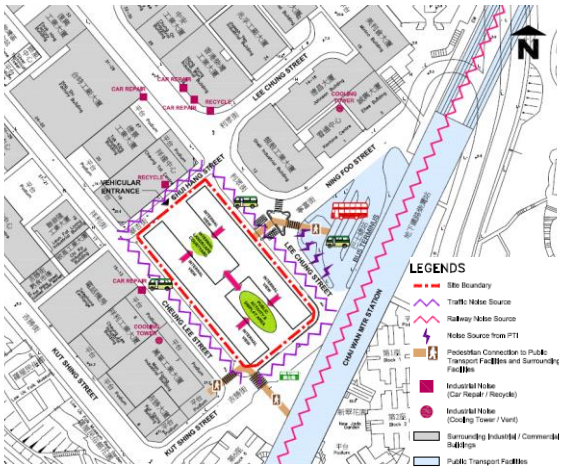


Figure 4: Site Constraints

Figure 5: The wrapped around corridor is a distinct feature of the factory building

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## 6. WAY FORWARD

Land is a precious resource in Hong Kong. With the rapid rising demand for residential land, we need to continue to identify suitable land for housing development. With the shortfall of readily available residential sites, we need to reconsider sites that were previously ruled out for residential use. While the Government continues to study the use of green field sites such as agriculture land, green belt land in the New Territories for residential developments as a long term measure, the use of brown field sites in industrial areas provides a medium measure to increase land supply for housing. Although the policy and planning framework established by the Government provides a direction and support for the future development, we still need to deploy very intensive resources and efforts to realize the projects.

The case studies demonstrated that how we overcame various constraints and successfully plan for the public housing developments in industrial areas. The length of time required to plan and resolve various constraints emphasizes the complexity of residential development in industrial area. We take great pride in meeting the housing need of the people and at the same time providing good quality, harmonious and environmentally-friendly homes that people are happy to live in. One of the keys to success lies in adopting proactive and integrated planning approaches to tackling town planning procedure, resolving I/R interface issues, addressing the community need and aspiration, engaging DC, carrying out consultation in an open manner, and working closely with government departments and stakeholders.

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