

# **LIVING IN SUSTAINABILITY A CASE STUDY OF HONG KONG PUBLIC RENTAL HOUSING ESTATES**

**HONG KONG HOUSING AUTHORITY**

**Sustainable Building 2013 Hong Kong Regional Conference**

**Urban Density & Sustainability 12-13 September 2013**



# **LIVING IN SUSTAINABILITY**

- **Sustainability is one of the key maintenance strategies for public rental housing (PRH) estates**
- **Estate Improvement Programme (EIP) have been implemented for estates about 40 years old after Comprehensive Structural Investigation Programme (CSIP) and confirmed as structurally sound and economically viable for maintenance.**

# KWAI SHING WEST ESTATE

- PRH: 205 estates
- >30 years estates: 58 estates
- Kwai Shing West Estate is one of them



# BACKGROUND OF KWAI SHING WEST ESTATE

District :	Kwai Tsing
Completion Year :	1975 - 1977
Estate Area :	85,000 m <sup>2</sup>
Domestic Flats :	5,260
Population :	<p>14,800</p> <p>Elderly : 4,430 (30%)</p> <p>60% Households have elderly members aged 60 or above</p> <p>60 Flats are occupied with members of physically disabilities</p>
Ancillary Facilities :	<p>-Shopping Centre &amp; Market (1)</p> <p>-Multi-storey Car Parks (2)</p> <p>-Public Transport Terminal (1)</p> <p>-Community Hall (1)</p> <p>-Primary Schools (3) &amp; Kindergarten (1)</p>
Type of Domestic Blocks :	10 Old Slab Blocks (7 to 25 storeys)

# ESTATE IMPROVEMENT PROGRAMME OF KSWE

## THEME AND OBJECTIVES

### LIVING IN SUSTAINABILITY ‘便捷、環保、安居’

- a) Give the entire estate a **face-lift** and an identity alongside functional enhancement of the estate facilities;
- b) Improve **connectivity** and **Barrier Free Access**;
- c) Convert public areas to **quality communal open space** to enhance the interaction between tenants;
- d) Enhance the estate amenities and **greening** to improve the amenity and aesthetic of the estate;
- e) Improve common areas at **domestic blocks**;
- f) Enhance **home safety** especially to tenants who need special attention such as the Elderly and the Physically Impaired.

# **ESTATE IMPROVEMENT PROGRAMME OF KSWE**

## **THEME AND OBJECTIVES**

**IMPROVING THE BUILDING PERFORMANCE IN TERMS OF:**

**a) ENVIRONMENTAL**

**b) SOCIAL**

**c) ECONOMIC**

# ENVIRONMENTAL

- CERTIFICATION OF BEAM PLUS FOR EXISTING BUILDINGS
- IMPLEMENTATION OF ISO 50001 ENERGY MANAGEMENT SYSTEM (EnMS)
- ENVIRONMENTAL PROTECTION WINDOW (EPW)
- GREEN ROOF & VERTICAL GREENING





# **CERTIFICATION OF BEAM PLUS FOR EXISTING BUILDINGS**

- **THE PILOT ESTATES FOR CERTIFICATION TO THE BUILDING ENVIRONMENTAL ASSESSMENT METHOD (BEAM) PLUS FOR EXISTING BUILDINGS**
- **UNDER THIS ASSESSMENT, A WEIGHTING OVER DIFFERENT ENVIRONMENTAL PERFORMANCE:**
  - **SITE ASPECTS**
  - **MATERIAL ASPECTS**
  - **ENERGY USE**
  - **WATER USE**
  - **INDOOR ENVIRONMENTAL QUALITY**



# **CERTIFICATION OF BEAM PLUS FOR EXISTING BUILDINGS**

- **IMPROVEMENT MEASURES ARE GROUPED INTO 5 CATEGORIES:**
  - **DATA AND RECORDS GATHERING**
    - ENVIRONMENTAL PURCHASING RECORDS, WASTE RECORDS, ETC.
  - **PROCEDURES / MANUALS / GUIDELINES DEVELOPMENT**
    - TENANT GUIDELINES / HANDBOOKS
  - **SITE MEASUREMENTS**
    - WATER QUALITY SURVEY
  - **TECHNICAL STUDIES**
    - WASTE AUDIT, ENERGY AUDIT, CARBON AUDIT, WATER AUDIT
  - **BUILDING IMPROVEMENT WORKS**

# CERTIFICATION OF BEAM PLUS FOR EXISTING BUILDINGS

- **BUILDING IMPROVEMENT WORKS**
  - ADDITION OF INDEPENDENT MECHANICAL AIR FILTRATION SYSTEM FOR EXISTING REFUSE STORAGE AREAS



# CERTIFICATION OF BEAM PLUS FOR EXISTING BUILDINGS

- **BUILDING IMPROVEMENT WORKS**
  - REPLACEMENT OF WATER CISTERNS AND URINAL FLUSH VALVE FROM SINGLE FLUSH TO DUAL FLUSH SYSTEM
  - AUTO-SENSORY WATER TAPS FOR PUBLIC TOILETS



**DUAL FLUSH URINALS**



**DUAL FLUSH W.C.**



**AUTO-SENSORY WATER TAPS**

# CERTIFICATION OF BEAM PLUS FOR EXISTING BUILDINGS

- **BUILDING IMPROVEMENT WORKS**
  - INSTALLATION OF ELECTRICITY CHECK METER SYSTEM TO MONITOR ELECTRICAL ENERGY USAGE OF MAJOR ELECTRICAL LOADING



**CHECK METER SYSTEM**



# IMPLEMENTATION OF ISO 50001 ENERGY MANAGEMENT SYSTEM (EnMS)

- **BUILDING IMPROVEMENT WORKS**
- **OBTAINED THE ISO 50001 (EnMS) CERTIFICATION IN JUNE 2013 WHICH COVERS TEN DOMESTIC BLOCKS:**
  - **PUBLIC LIGHTING REPLACEMENT USING ENERGY EFFICIENT PRODUCT – ELECTRONIC BALLAST WITH REGISTRATION UNDER EMSD'S ENERGY EFFICIENCY LABELING SCHEME**



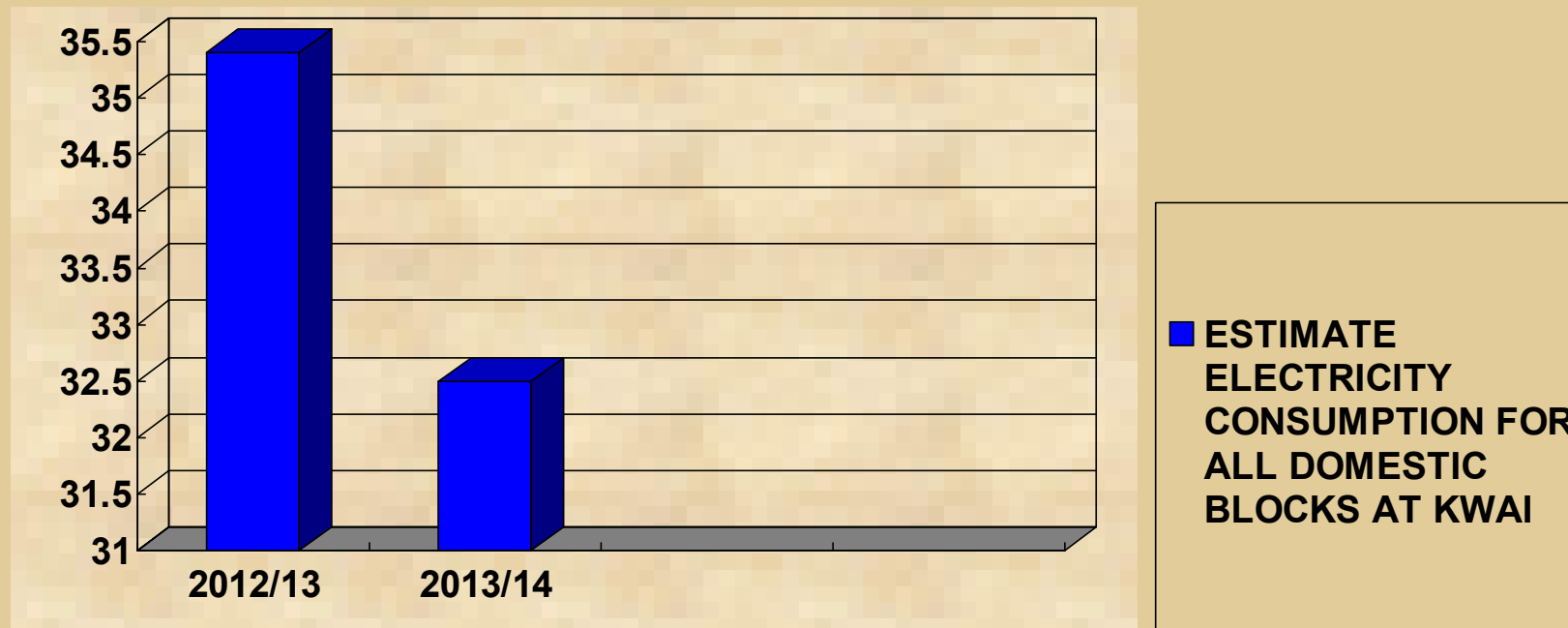
**BULKHEAD LIGHT FITTINGS C/W ELECTRONIC BALLAST**



# IMPLEMENTATION OF ISO 50001 ENERGY MANAGEMENT SYSTEM (EnMS)

- SIGNIFICANT REDUCTION OF ENERGY USE OF AT LEAST 10% OF ELECTRICITY CONSUMPTION FOR ALL DOMESTIC BLOCKS:

FROM 35.4kWh/m<sup>2</sup> DROPPED TO 32.5kWh/m<sup>2</sup>.



# ENVIRONMENTAL PROTECTION WINDOW (EPW)

- TO AROUSE TENANTS' AWARENESS OF ENERGY CONSERVATION AND ENVIRONMENTAL SUSTAINABILITY
- INSTALLATION OF A USED LCD PANEL AT GROUND FLOOR LIFT LOBBY OF ALL DOMESTIC BLOCKS TO SHOW THE PERIODIC CONSUMPTION OF:
  - ELECTRICITY (BOTH TENANTS & COMMUNAL)
  - GAS (TENANTS ONLY)
  - WATER (COMMUNAL ONLY)





# ENVIRONMENTAL PROTECTION WINDOW (EPW)

- PERIODIC COMPARISONS ON VARIOUS CONSUMPTION PERFORMANCES OF THE BLOCKS WITHIN THE SAME PERIOD IN PREVIOUS YEAR, AND PERIODIC COMPARISONS OF VARIOUS ENERGY USE INDEXES OF INDIVIDUAL BLOCK WITH THE AVERAGE FIGURES OF ALL PRH BLOCKS IN HONG KONG



4-MONTH AVE. WATER CONSUMPTION OF LANDLORD AT PUBLIC AREA (CUBE METER/FLAT/4-MONTH)



BI-MONTHLY ELECTRICITY SAVING PERFORMANCE OF TENANTS



MONTHLY GAS CONSUMPTION OF TENANT (UNIT/FLAT/MONTH)



AVE. MONTHLY ELECTRICITY CONSUMPTION OF LANDLORD AT PUBLIC AREA (IN kWh/FLAT/MONTH)

# GREEN ROOF & VERTICAL GREENING

- INCREASE THE GREEN RATIO TO 27% OF THE TOTAL CONSTRUCTION FLOOR AREA OF THE ESTATE
- TO PROVIDE VERTICAL GREENING AT LOW RISE STRUCTURES IN THE ESTATE SUCH AS THE PUMP HOUSES



# **SOCIAL**

- **TWIN TANK SYSTEM**
- **BARRIER-FREE ACCESS & CONNECTIVITY**
- **COMMUNITY ENGAGEMENT WORKSHOP**

# TWIN TANK SYSTEM

- TO PROVIDE TWIN TANK SYSTEM BY CONNECTING THE EXISTING WATER TANKS LOCATED ON THE SAME ROOF WITH MODIFICATION OF THE PIPE-WORKS
- MORE COST-EFFECTIVE AS IT RETAINS THE EXISTING STRUCTURE TO AVOID DEMOLITION AND CONSTRUCTION WASTE
- IMPROVE THE QUALITY OF LIVING AND SUSTAINABILITY OF THE ESTATE





# TWIN TANK SYSTEM

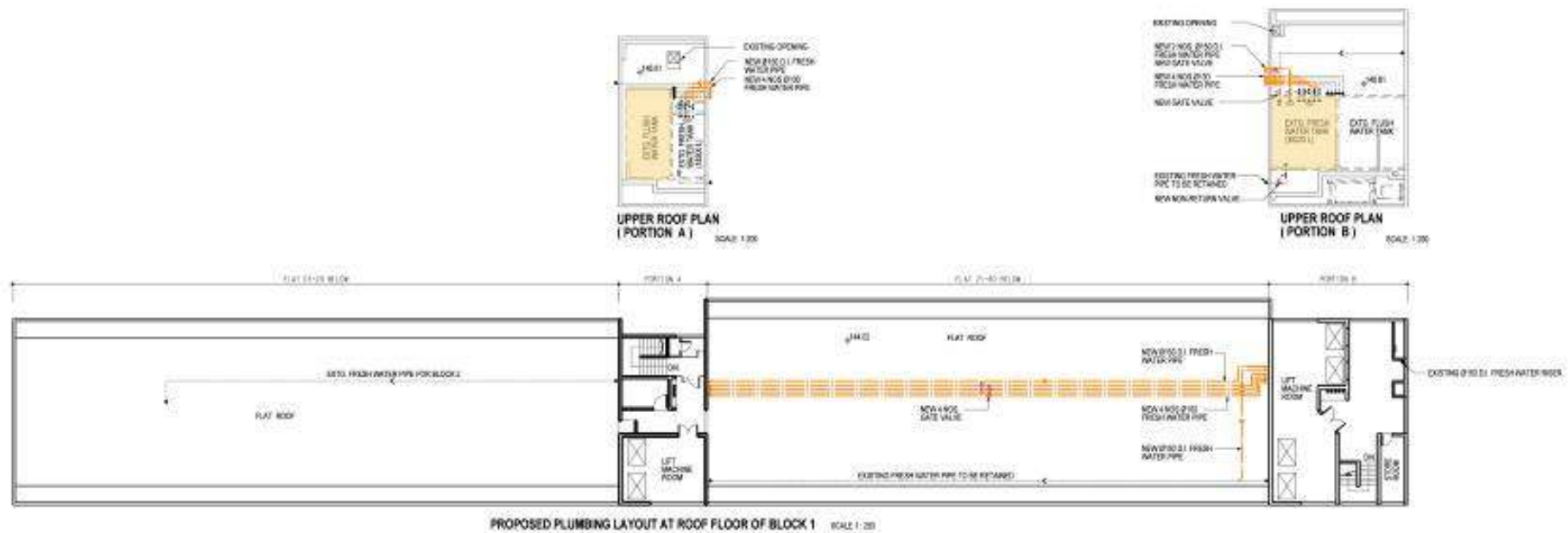
- **MODIFY TO TWIN TANK SYSTEM TO EXISTING WATER TANKS AT BLOCKS 1, 3, 5, 6, 8**
- **GLAZED TILE FINISH IN WATER TANKS**



## EXISTING FAIR-FACE FINISH INSIDE THE WATER TANK



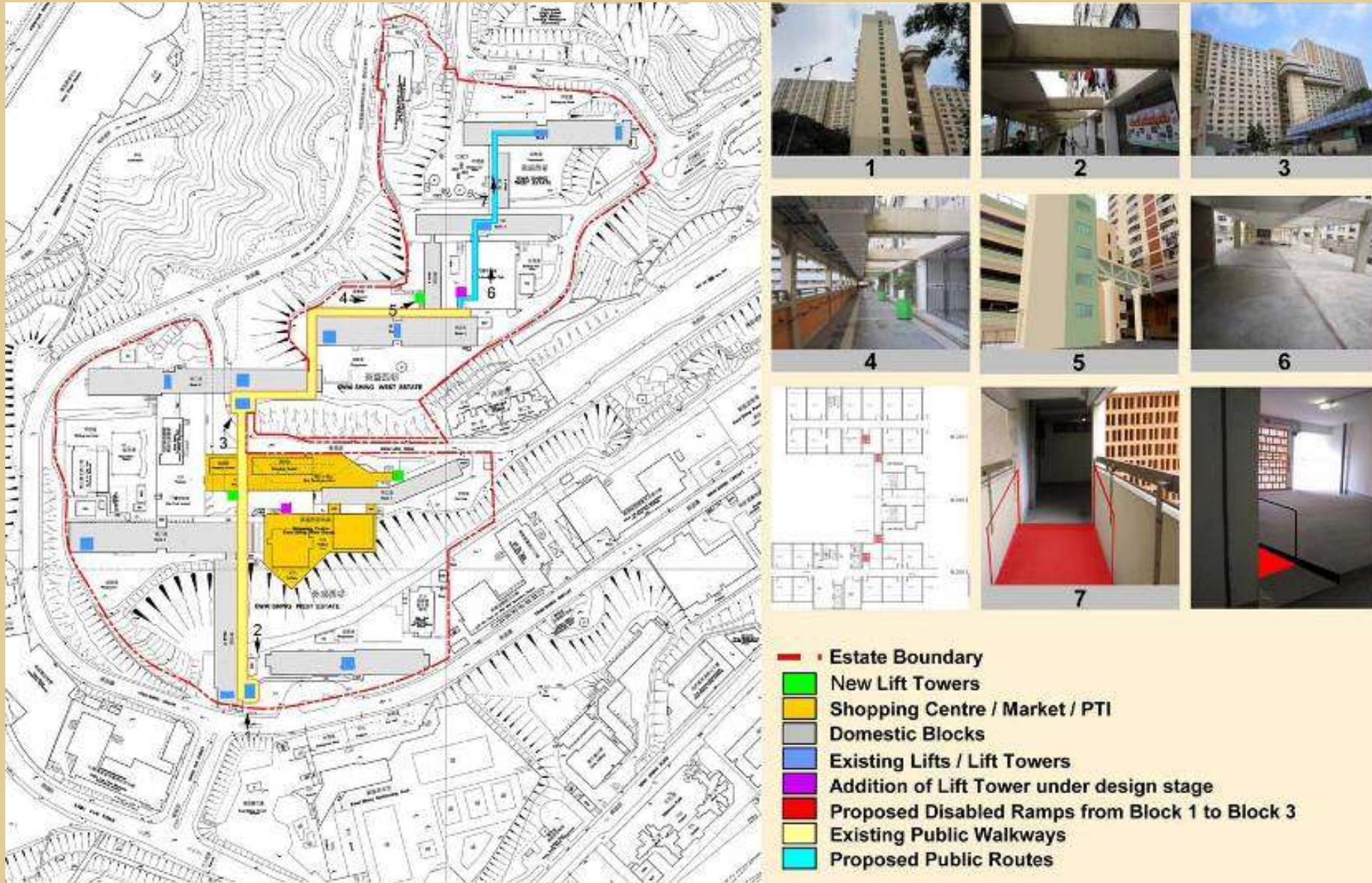
## PROVISION OF NEW GLAZED TILES FINISH



### SCHEMATIC DIAGRAM SHOWING THE PIPE CONNECTION OF EXISTING WATER TANKS

# BARRIER-FREE ACCESS & CONNECTIVITY

- AROUND 30% OF THE POPULATION AGED 60 OR ABOVE LIVING IN THIS 38 YEARS ESTATE
- IMPROVING BARRIER-FREE ACCESS (BFA) AND CONNECTIVITY WITHIN THE ESTATE IS INEVITABLE



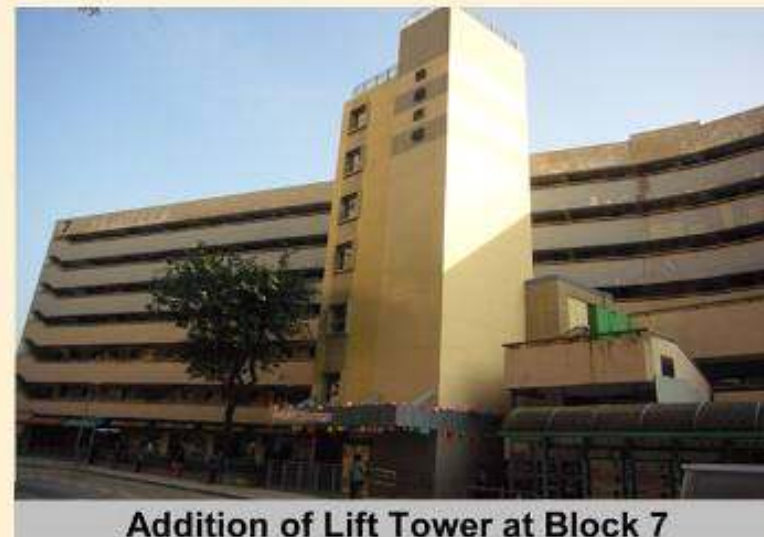
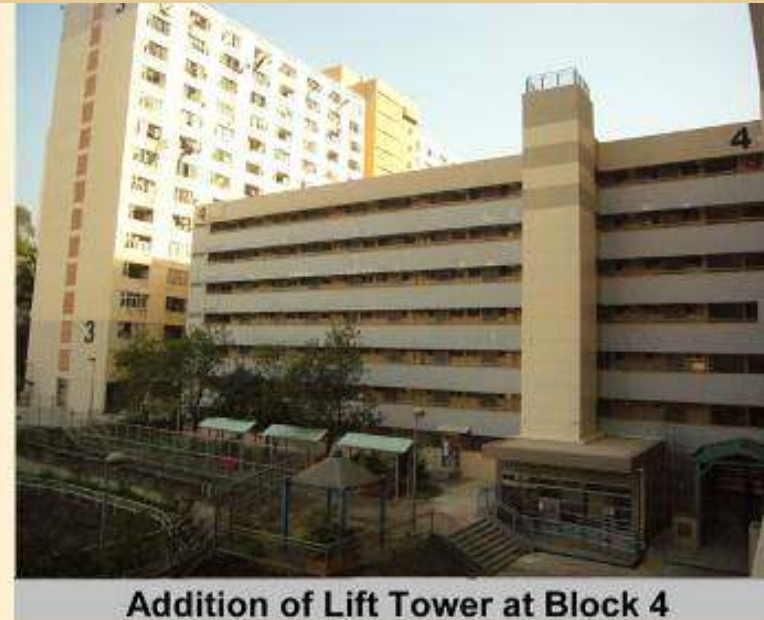
# BARRIER-FREE ACCESS & CONNECTIVITY

- NEW LIFT TOWERS AT BLOCK 4,7 AND SHOPPING CENTRE WHERE NO LIFT PROVISION HAVE BEEN COMPLETED IN JAN 2013
- ACCESSIBLE UNISEX TOILETS AT SHOPPING CENTRE
- TACTILE GUIDE-PATHS, RAILINGS, RAMPS AND ACCESSIBLE PARKING SPACE
- WEATHER-PROTECTED PEDESTRIAN WALKWAYS TO ENHANCE THE CONNECTIVITY AMONGST BUILDING BLOCKS:
  - BY EXTENSION OF EXISTING COVERS ALONG ELEVATED WALKWAYS AT BLOCKS 6 & 9
  - COVERED WALKWAY AT PEDESTRIAN FOOTPATH FROM BLOCKS 1 TO 5



# BARRIER-FREE ACCESS & CONNECTIVITY

- NEW LIFT TOWERS AT BLOCK 4,7 AND SHOPPING CENTRE WHERE NO LIFT PROVISION HAVE BEEN COMPLETED IN JAN 2013



# BARRIER-FREE ACCESS & CONNECTIVITY

- NEW LIFT TOWERS AT CARPARK NEXT TO BLOCK 5 AND SHOPPING CENTRE / MARKET UNDER PLANNING STAGE



NEW LIFT TOWER AT CARPARK NEXT TO BLOCK 5

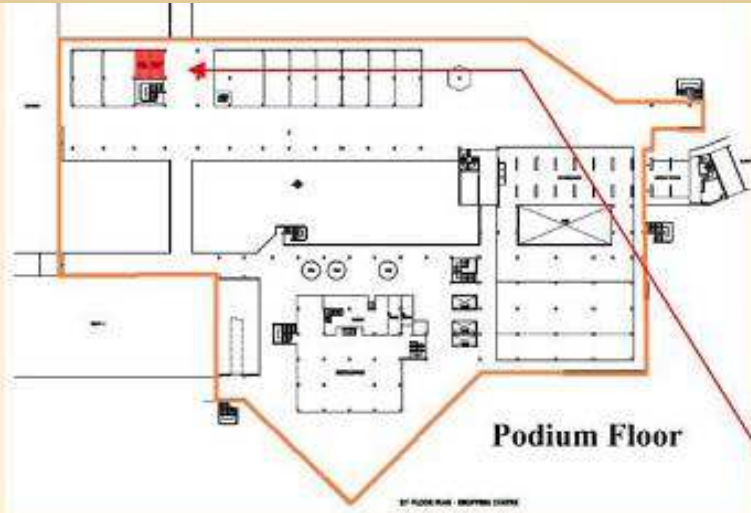


NEW LIFT TOWER AT SHOPPING CENTRE

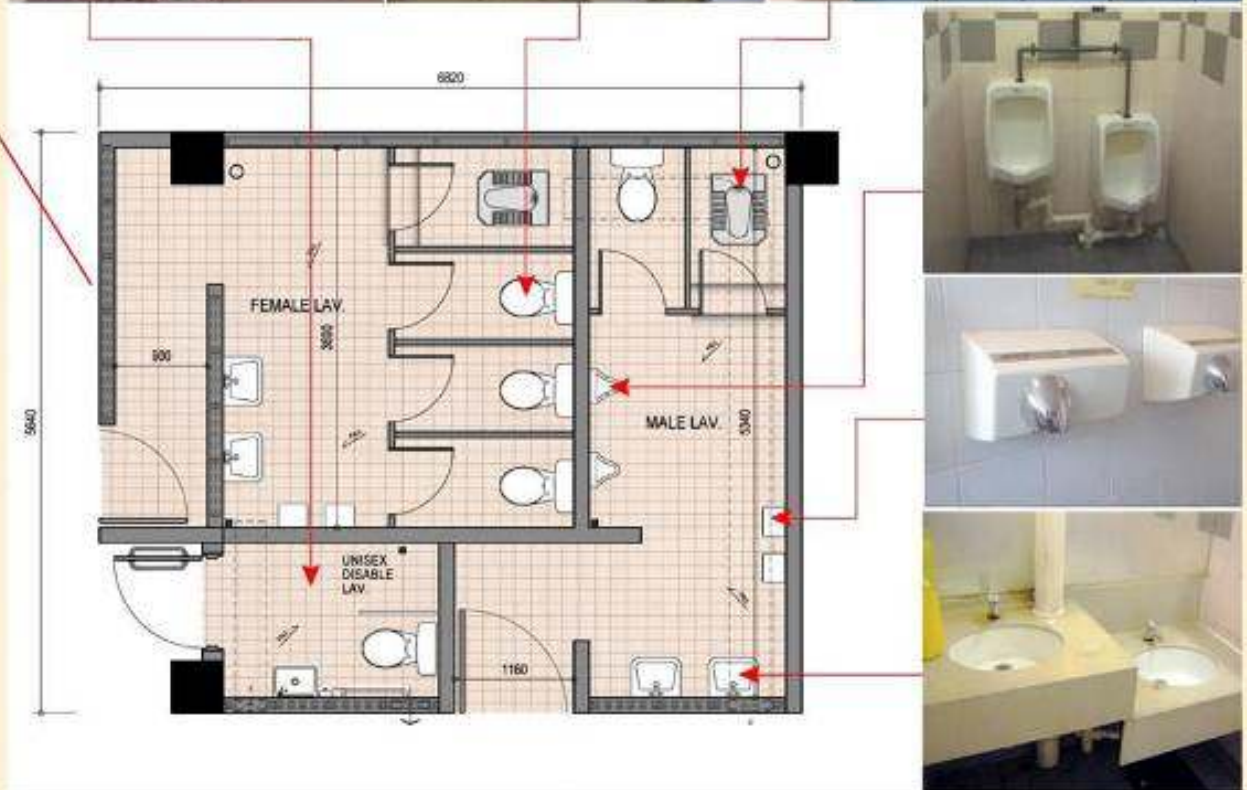


# BARRIER-FREE ACCESS & CONNECTIVITY

- ACCESSIBLE UNISEX TOILETS AT THE SHOPPING CENTRE



Renovation of Existing Toilets and Provision of New Disabled Toilet



Toilet Layout





# BARRIER-FREE ACCESS & CONNECTIVITY

- BARRIER-FREE IMPROVEMENT WORKS IN KWAI SHING WEST ESTATE

## SIGNAGE / DISABLE PARKING



Multi-sensory map



International symbol of accessibility



Disabled parking indication signage



Disabled parking

## TACTILE GUIDE PATH / DISABLE RAMPS / RAILING



Tactile guide path



Disabled ramp



Handrails



Surface channel covers

## LIFT INDICATOR / LIFT CONTROL BUTTONS / GRAB BARS IN TOILETS



Dot matrix lift indicator



Tactile lift control buttons



Tactile floor signage on lift landing

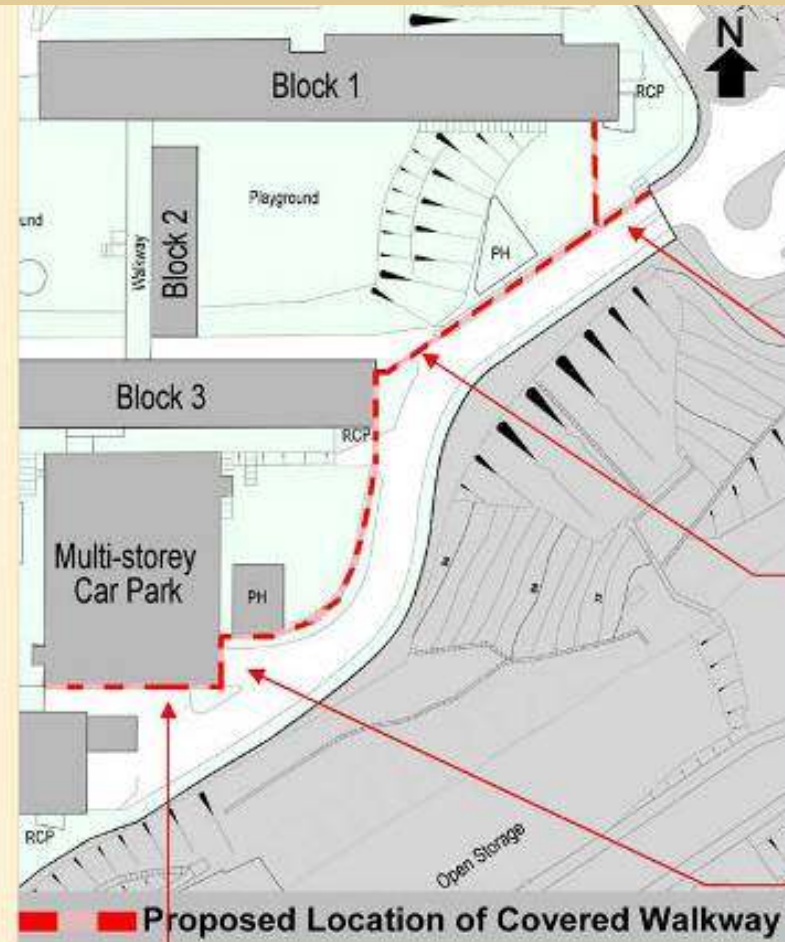
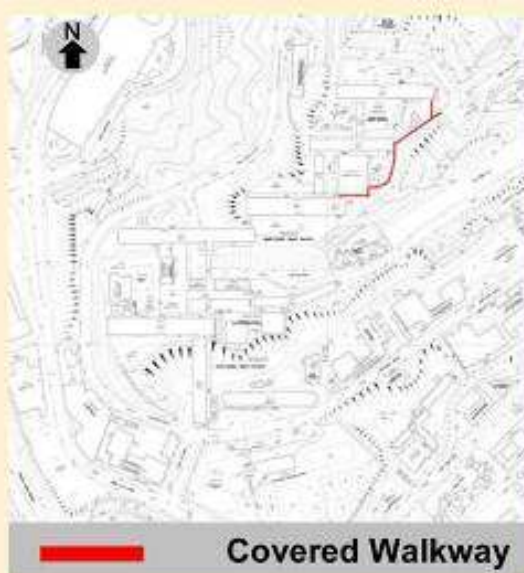


Additional grab bar in toilet



# BARRIER-FREE ACCESS & CONNECTIVITY

- WEATHER-PROTECTED PEDESTRIAN WALKWAYS TO ENHANCE THE CONNECTIVITY AMONGST BUILDING BLOCKS
  - COVERED WALKWAY AT PEDESTRIAN FOOTPATH FROM BLOCKS 1 - 5



# BARRIER-FREE ACCESS & CONNECTIVITY

- WEATHER-PROTECTED PEDESTRIAN WALKWAYS TO ENHANCE THE CONNECTIVITY AMONGST BUILDING BLOCKS
  - EXTENSION OF EXISTING COVERS ALONG ELEVATED WALKWAYS



Existing Condition



Improvement of Elevated Walkway



Existing Condition



Proposed New Glazed Cover

# COMMUNITY ENGAGEMENT WORKSHOP

- TO RAISE THEIR ENVIRONMENTAL AWARENESS, INSTILL A CULTURE OF ENVIRONMENTAL PROTECTION AND SENSE OF BELONGINGS TO THE ESTATE
- CONSULTATION TO COLLECT VIEWS FROM STAKEHOLDERS DURING THE PLANNING STAGE OF THE ESTATE IMPROVEMENT PROGRAMME (EIP) INCLUDING:
  - ESTATE MANAGEMENT ADVISORY COMMITTEE (EMAC) MEMBERS,
  - NON-GOVERNMENT ORGANISATIONS (NGOs),
  - LOCAL DISTRICT COUNCIL MEMBERS (DC),
  - NEIGHBOURHOOD SCHOOLS,
  - ESTATE TREE AMBASSADORS



# COMMUNITY ENGAGEMENT WORKSHOP

- COMMUNITY WORKSHOP TO GAUGE THE VIEWS AND EXPECTATIONS OF THE TENANTS OF LOCAL COMMUNITY
- SOCIAL ACTIVITIES, FOCUS GROUP MEETINGS AND WORKSHOP TO REACH THE CONSENSUS AS WE DEVELOP THE DETAILED DESIGN

## Kwai Shing West Estate 葵盛西邨

Community Workshop – Focus Group Meetings

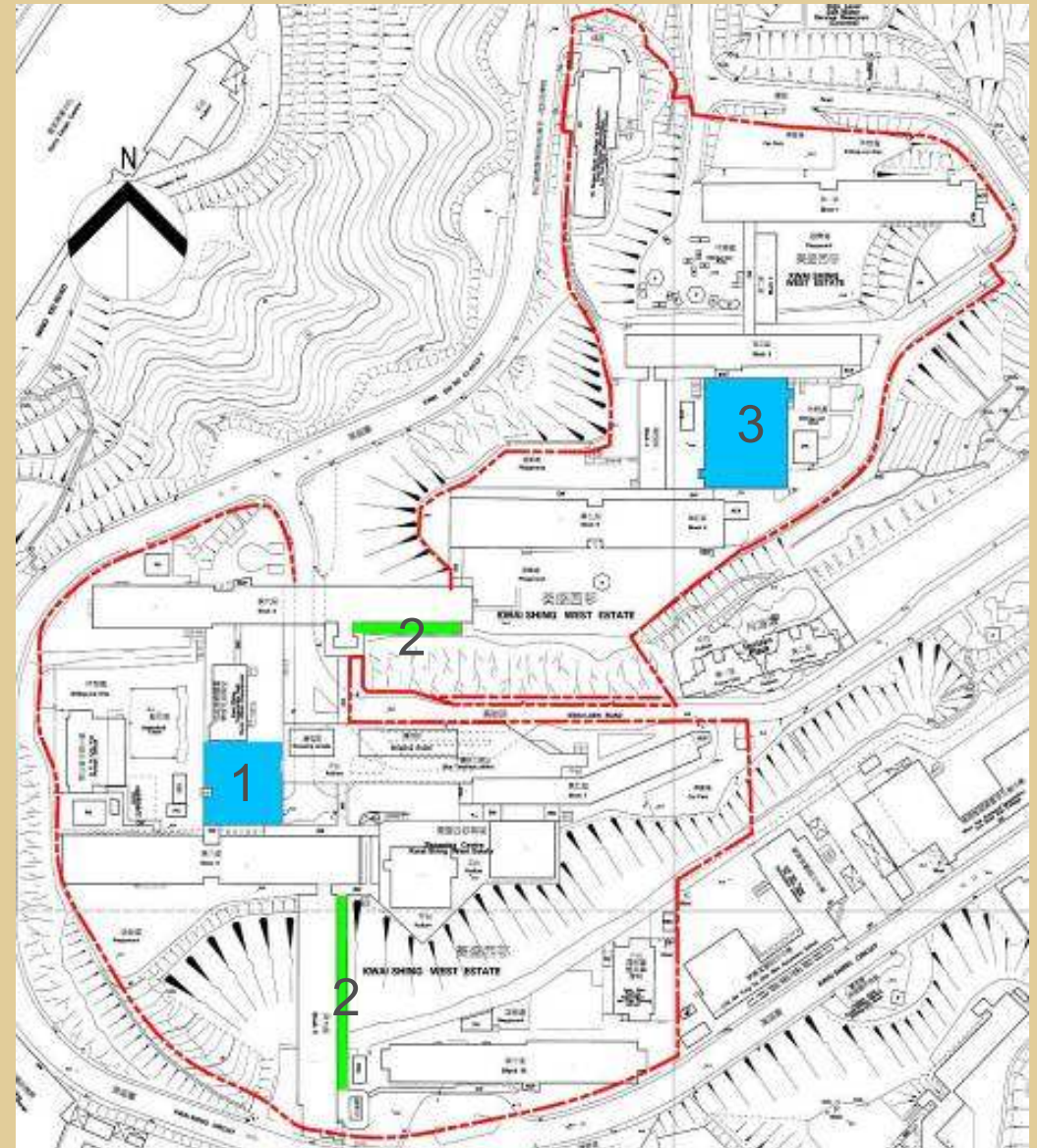
「社區工作坊」籌備小組會議



# PROPOSED AREAS FOR COMMUNITY ENGAGEMENT

## IDENTIFY AREAS CHARACTERISTICS

1. OPEN SPACE AT ROOF OF MULTI-STOREY CARPARK NO. 2 NEXT TO COMMUNITY CENTRE UNDER THE EIP
2. ART GALLERIES AT ELEVATED WALKWAYS OF BLOCKS 6 & 9 UNDER EIP
3. OPEN SPACE AT ROOF OF MULTI-STOREY CARPARK NO. 1 BETWEEN BLOCKS 3 & 5



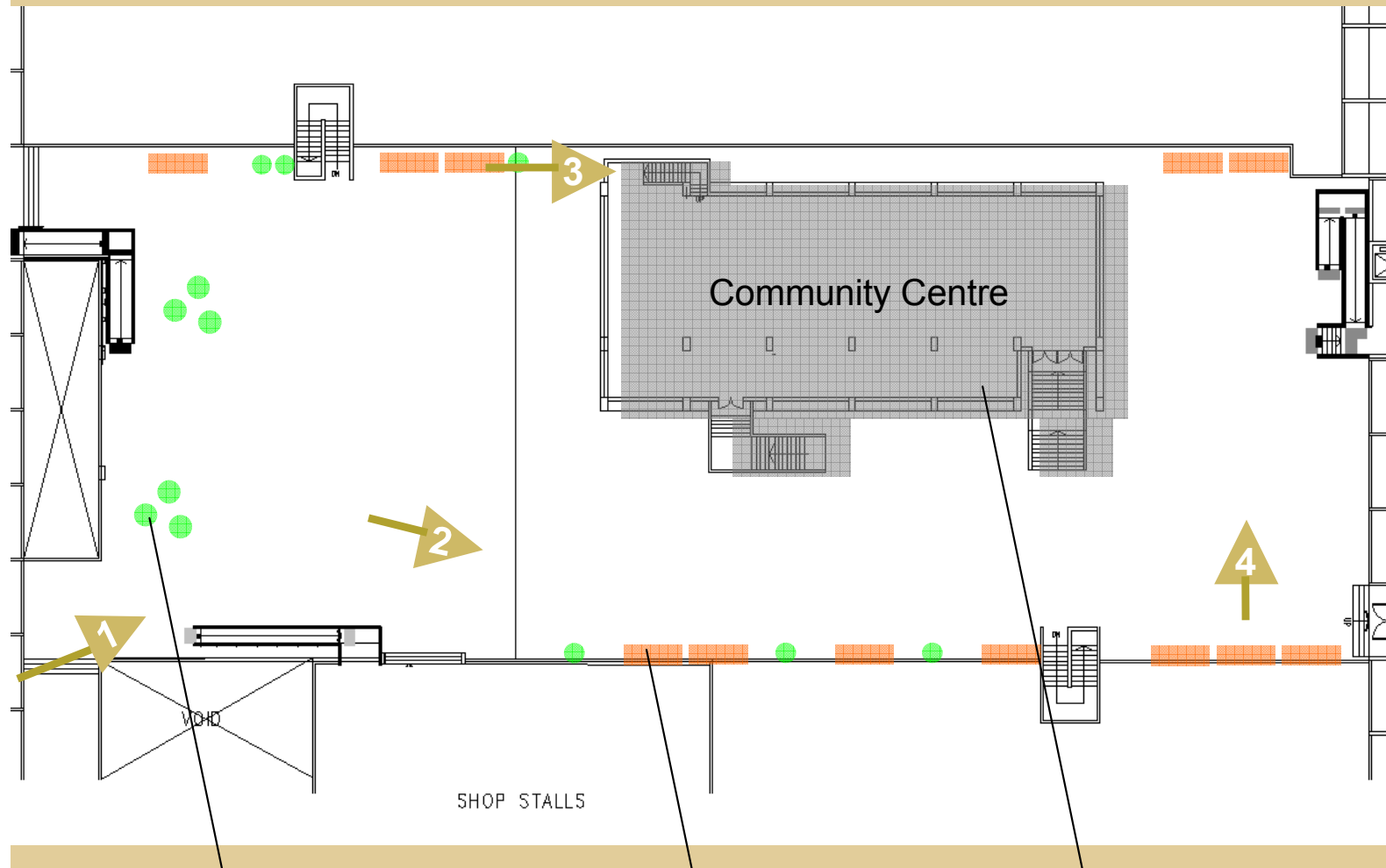
OPEN SPACE



ELEVATED WALKWAYS



# EXISTING ROOF OF CARPARK NO. 2



Existing Planter

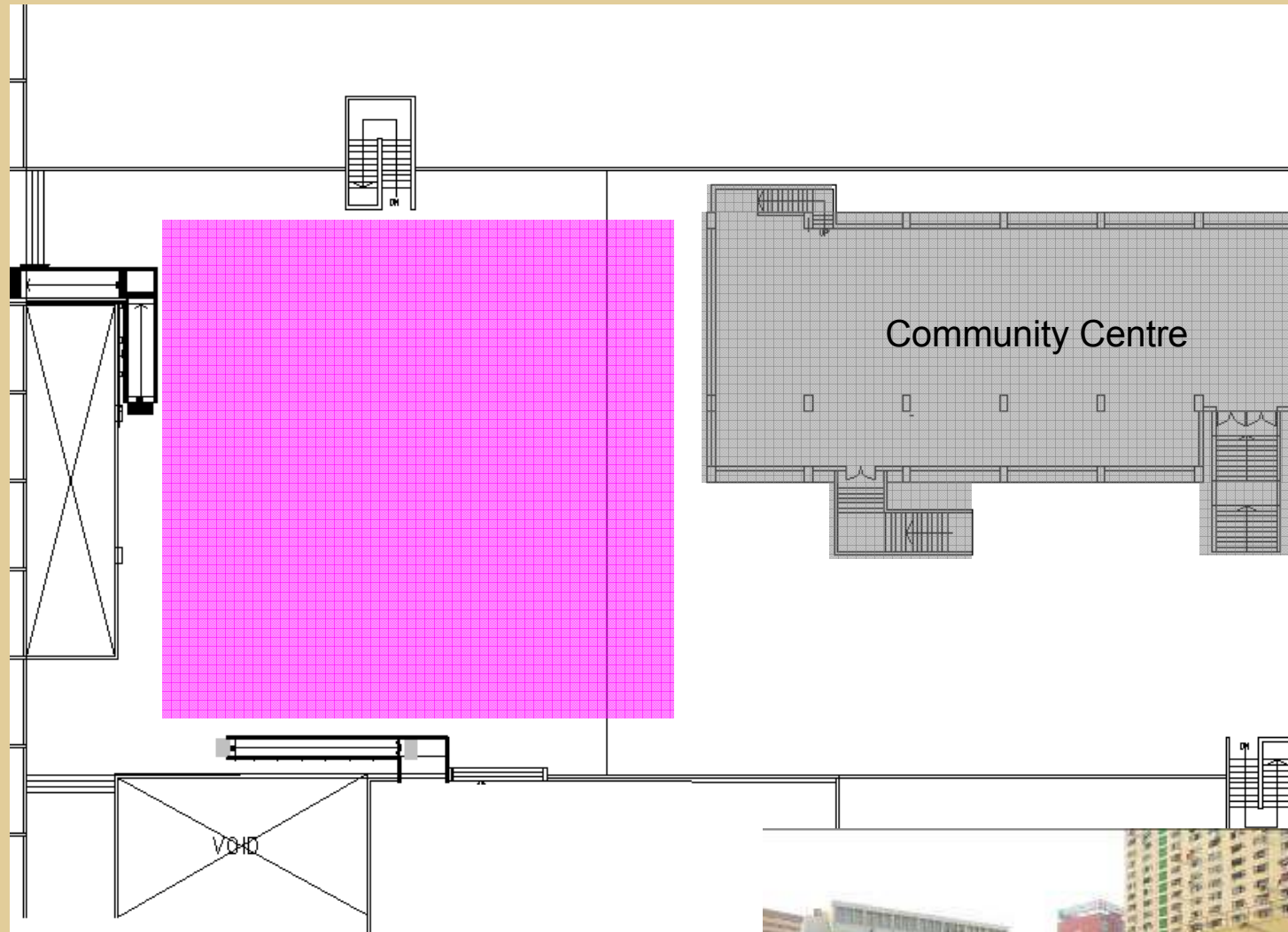


Existing Bench



Community Hall

# PROPOSED USES



SHOP STALLS

 Multipurpose Zone





# EXISTING ELEVATED WALKWAYS AT BLOCKS 6&9 AND PROPOSED ART GALLERIES



Existing Condition



Proposed Art Galleries



Art works by children from neighbourhood school – Lee Yak Ngok Memorial School

# ECONOMIC

- SHOPPING CENTRE IMPROVEMENT WORKS AT KWAI SHING WEST ESTATE
- EXISTING 3-STOREY SHOPPING CENTRE WITH RETAIL SHOPS ON G/F, A MARKET ON 1/F AND A SHOPPING LANE AT PODIUM
  - OCCUPANCY RATE FOR RETAIL SHOPS IS 96%, MARKET STALLS IS ONLY 26%
- COMMERCIAL FACILITIES WILL BE ENHANCED TO MEET UP-TO-DATE SHOPPING NEEDS THROUGH:
  - MAJOR RENOVATION TO THE INTERIORS, CONVERSION OF STOREROOMS

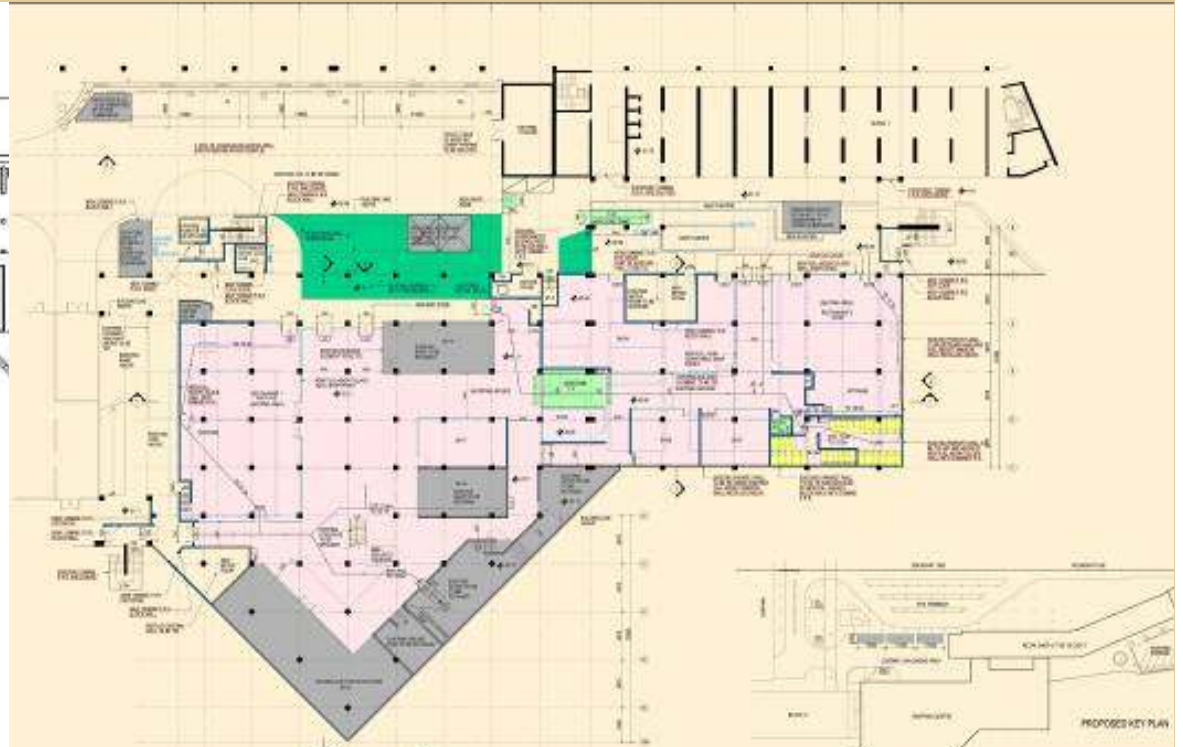


# ECONOMIC

- MAJOR RENOVATION TO THE INTERIORS, CONVERSION OF STOREROOMS



Existing Ground Floor Plan

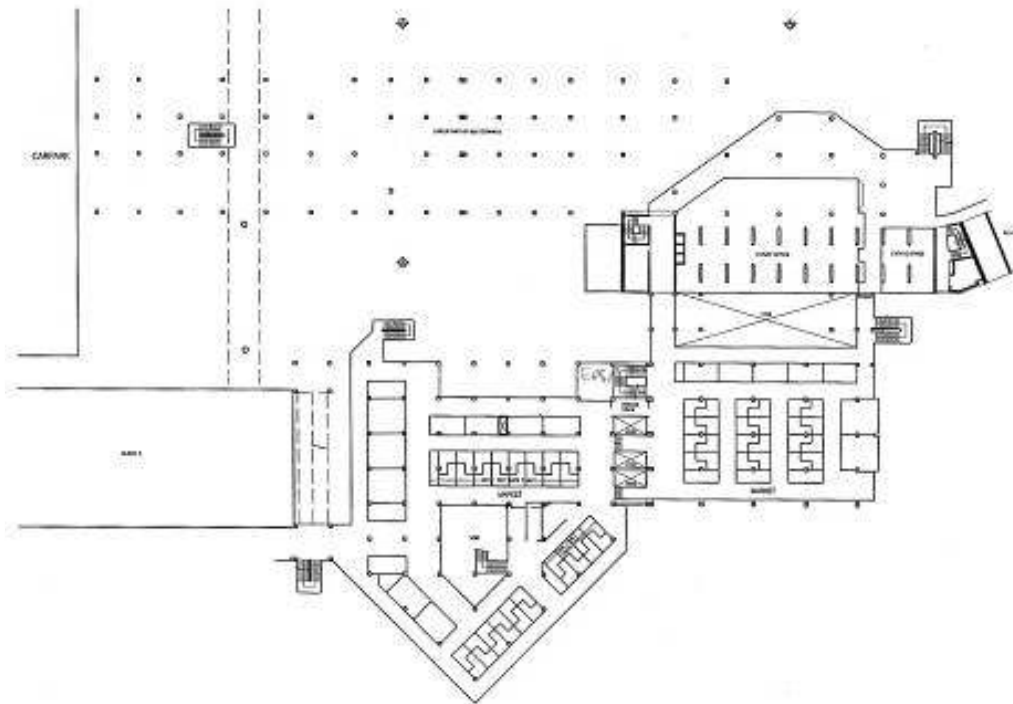


Proposed Ground Floor Plan of Shopping Centre

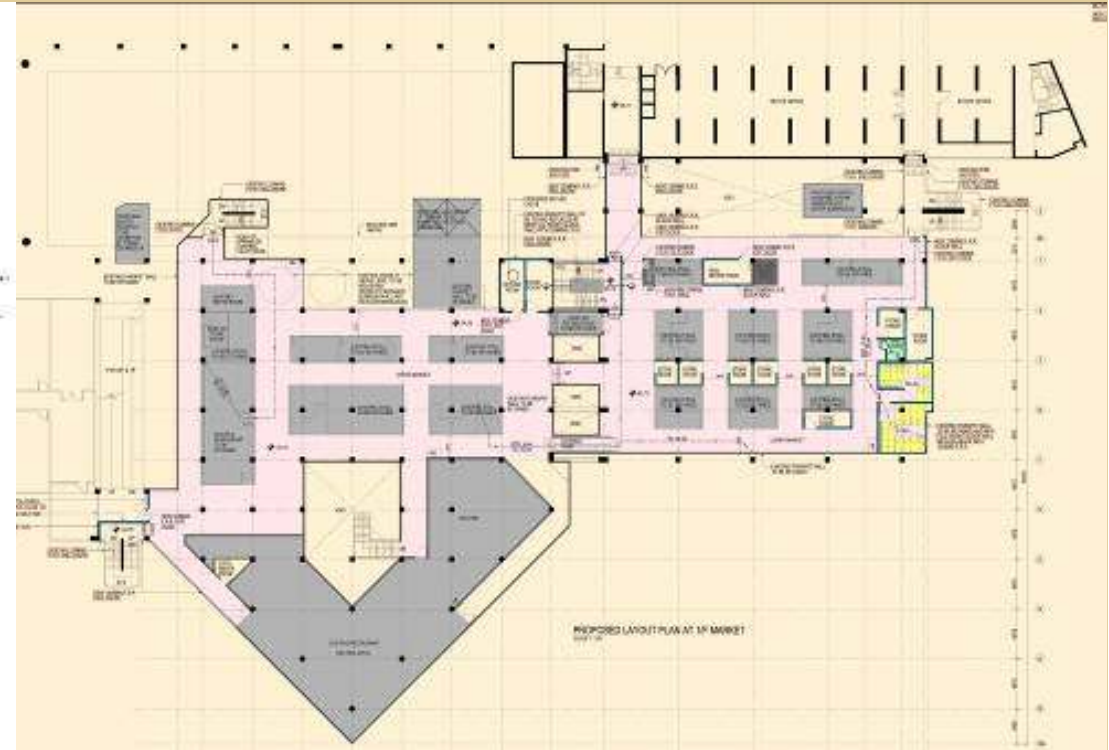


# ECONOMIC

- MAJOR RENOVATION TO THE INTERIORS, CONVERSION OF STOREROOMS



Existing First Floor Plan of Market

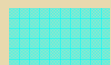
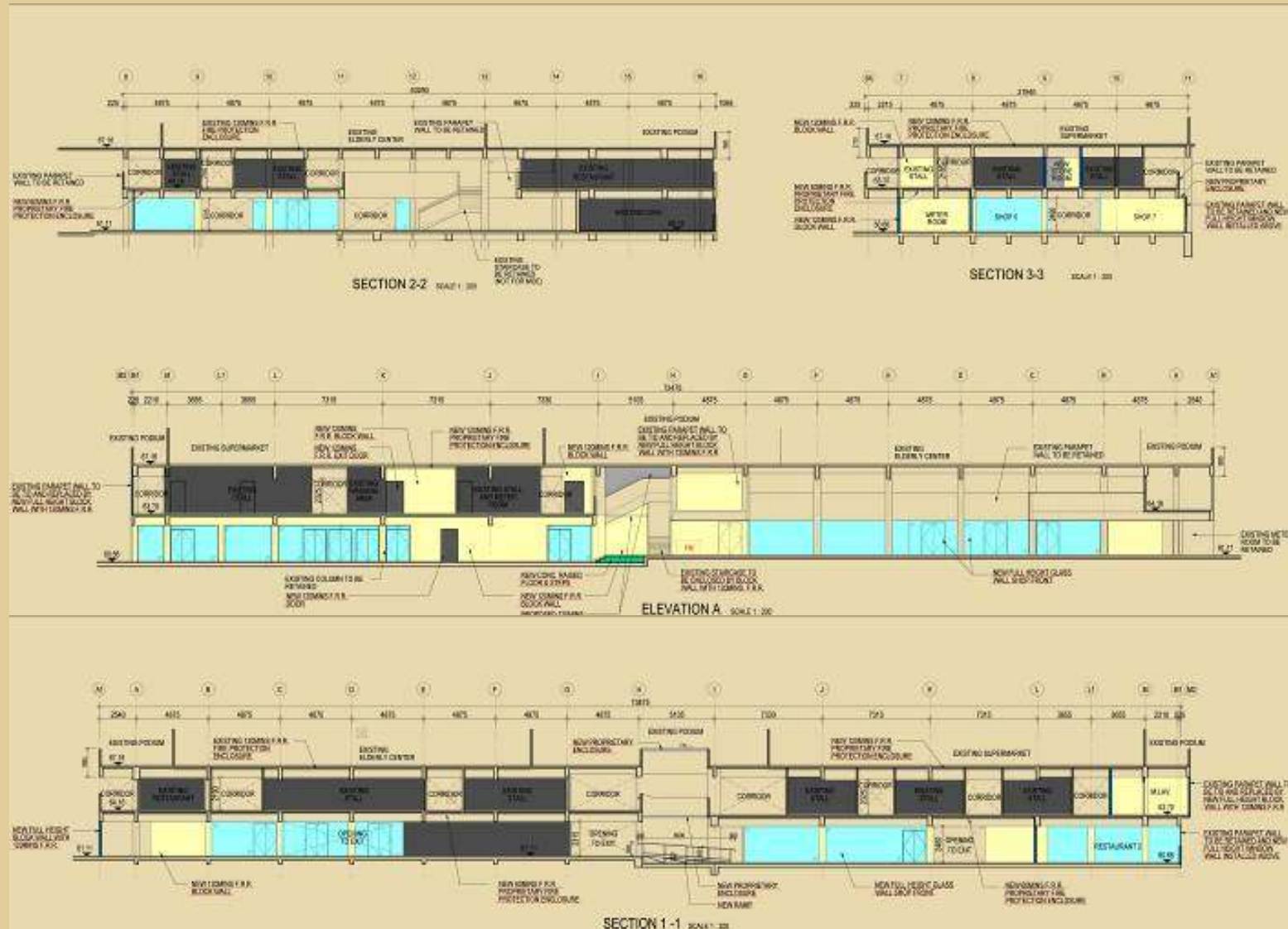


Proposed First Floor Plan of Shopping Centre & Market



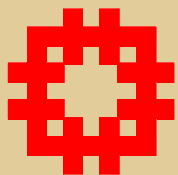
# ECONOMIC

## - MAJOR RENOVATION TO THE INTERIORS, CONVERSION OF STOREROOMS



New Shops

Sections of Shopping Centre & Market



# THANK YOU

