HDB Orientation Seminar for Consultants

17 Apr 09

HDB Orientation Seminar for Consultants

Date: 17 Apr 09 (Friday)
Time: 8.45 am to 1.00 pm
Venue: Punggol Room, Basement 1, HDB Hub

Programme

8.45 am	-	Registration
9.15 am	-	Guests to be seated
9.20 am	-	Arrival of Mr Lau Joo Ming, Deputy Chief Executive Officer (Building)
9.25 am	-	Deputy Chief Executive Officer's opening address
9.30 am	-	***Session 1 : Products***
		Topic 1: HDB's new development - good design, good practices and technical requirements
10.10am	-	Topic 2: Upgrading programmes – LUP / HIP / NRP
10.30 am	-	Tea Break
11.00 am	-	***Session 2 : Procurement***
		Topic 3: HDB's mode of procurement for engagement of private consultants
11.20 am	-	***Session 3 : Processes***
		Topic 4: Timeline / Key milestones for HDB projects
11.30 am	-	Topic 5: Contracts management
11.50 am	-	Topic 6: Project management
12.20 p m	-	Topic 7: Engineering (C&S, M&E) / Construction Safety
1.00 pm	-	End of Seminar

Consultants' Orientation Seminar

Design Practice

Jeremiah Lim

Senior Executive Architect

Agenda:

1) Principles and Elements of Good Design

2) Examples

3) Considerations at the larger parcel level.

What is Good Design?

Elements

1) Functional Requirements
2) Environmental Considerations
3) Aesthetics

+ Guiding Principles

Desired Outcomes

1. Affordable Housing that meets the needs and aspirations of home owners
2. Promotes Cohesive Communities, Convenience and Accessibility
3. Enhances the Image of Public housing

Principles of Good Design:

1) Efficiency
2) Buildability
3) Sustainability
4) Ease of Maintenance
5) Value for Money

Elements of Good Design:

1) Functional Requirements
2) Environmental Considerations
3) Aesthetics

Definition of "Good Design"

Functional requirements:

a) Flat:

- Size and layout of rooms
- Views, natural lighting and ventilation



b) Block:

- Design Efficiency
- Optimum layout of common services
- Privacy, security, safety



c) Precinct and landscape:

- Precinct layout and block spacing
- Pedestrian considerations
- Provision and optimum location of facilities
- Sufficient tree planting and greenery



Definition of "Good Design"

Environmental Considerations:

a) Sustainability

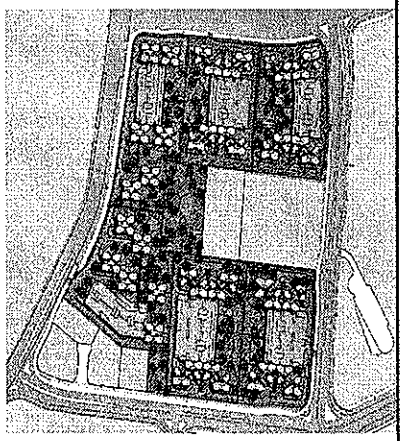
Estate Greenery, Orientation of blocks

b) Connectivity

- Seamless Pedestrian Connectivity to transport nodes, facilities and amenities/
- meet Universal Design requirements

c) Community Space

Good distribution and planning of spaces for Community Interaction



Definition of "Good Design"

Aesthetics:

a) Identity

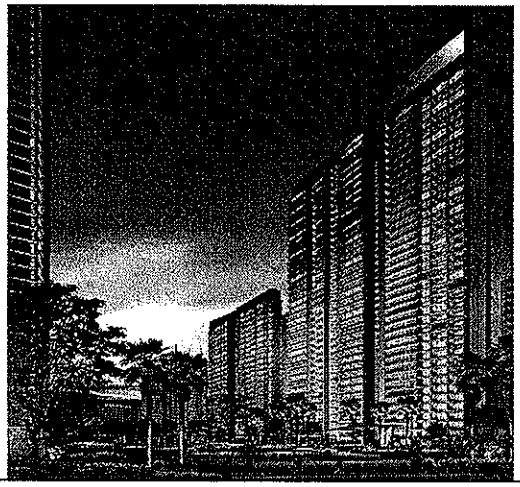


Definition of "Good Design"

Aesthetics:

b) Building design:

- Simple and elegant facade, colour scheme
- Where opportunity arises to have iconic designs



Definition of "Good Design"

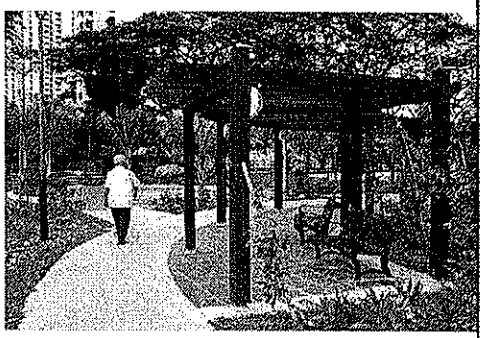
Aesthetics:

Visually appealing:

c) Landscape design:

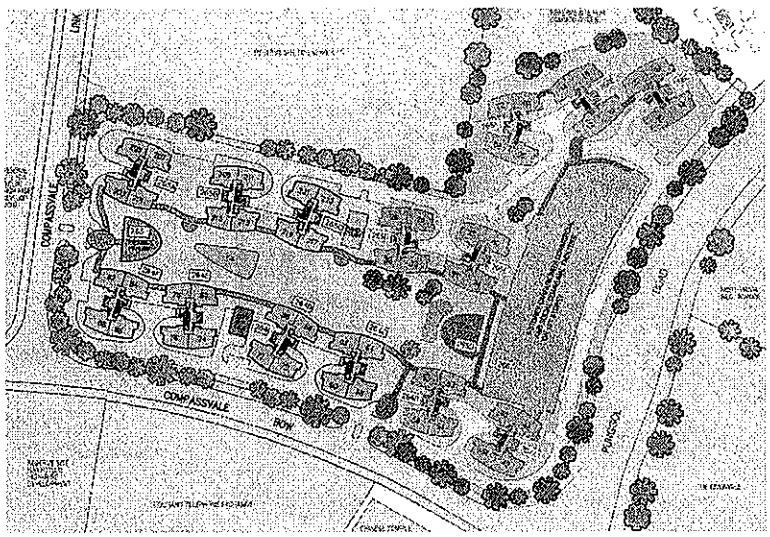
Enhances the built and public environment, interesting spaces that people will use and enjoy





EXAMPLES

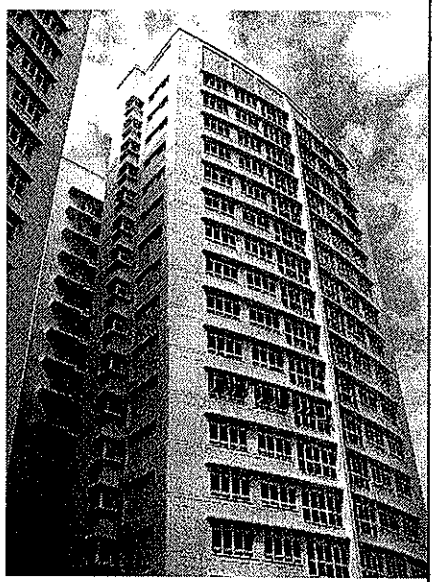
Precinct Layout – SK N2 C31 & 32



Block and MSCP Placement . Block Spacing . Block Orientation . Community Mall. Linkway system .

Sengkang N2 C31 & 32

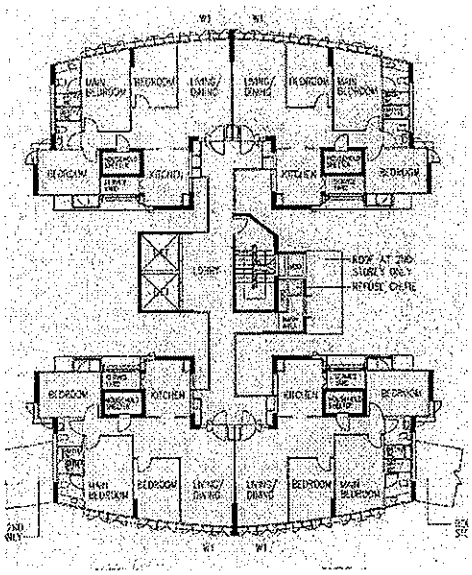




Sengkang N2 C31 & 32

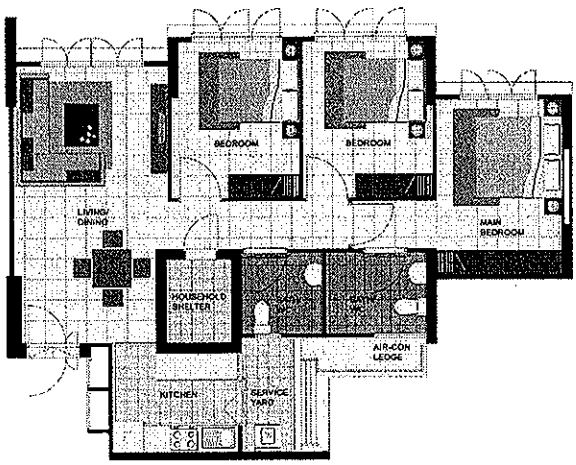


Block Design – SK N2 C31 & 32



- Privacy
- Security
- Maintenance
- Service Core/ CRC

Unit Design – Punggol East 24A

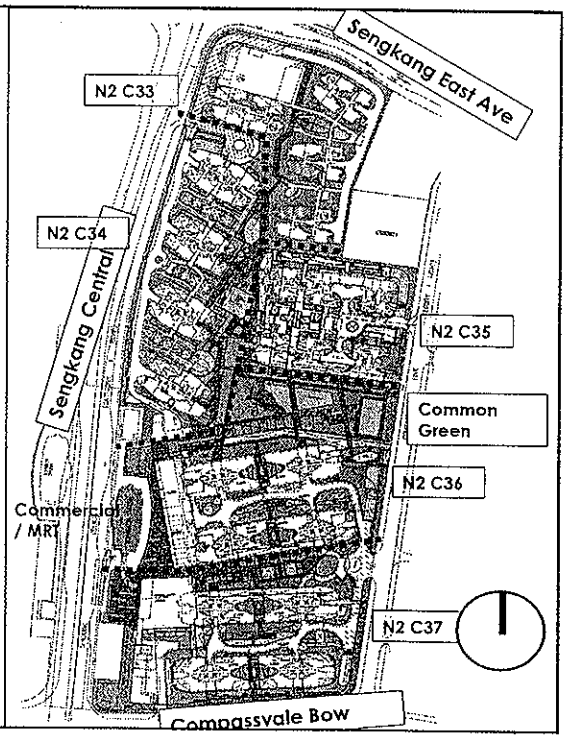


Considerations at the Larger Parcel

Sengkang N2C33 – 37

Key points:

1) Connectivity
2) Seamlessness
3) Identity
4) Provision and Distribution of Community Spaces



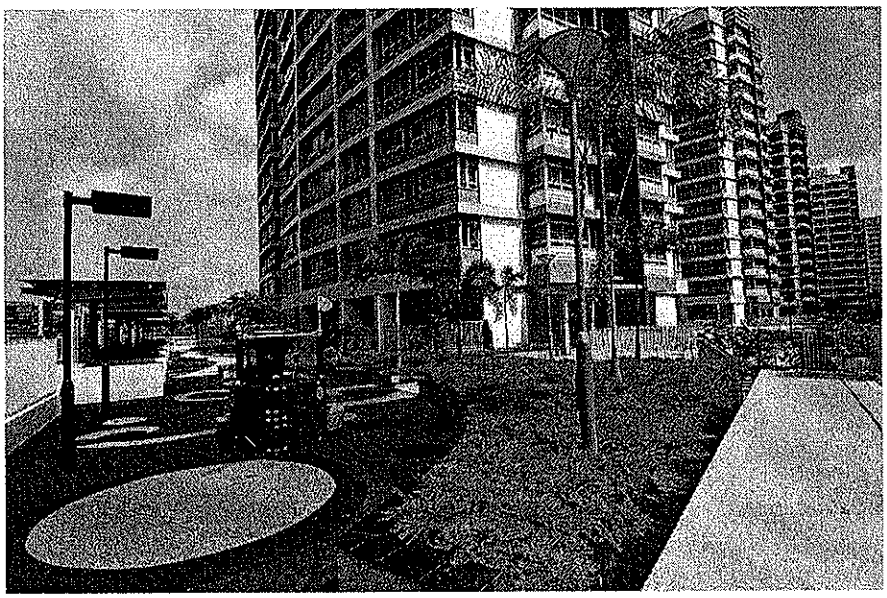
Sengkang N2C33 - 37



Sengkang N2C33 - 37



Sengkang N2C33 - 37



Sengkang N2C33 - 37



Thank You

TECHNICAL REQUIREMENTS

SAFETY DURABILITY EASE OF MAINTENANCE
COST CONSTRUCTABILITY ACCESSIBILITYSECURITY

BUILDING QUALITY DEPT
SA Tan Lily
17 April 2009



OUTLINE

1. Key Considerations
2. Technical requirements
3. Regulatory Compliance
4. References

1 Key Considerations in Public Housing Technical Requirements



2 Technical requirements

A. Safety

1. Measure against killer litter
2. Safety barrier at common areas
3. Safety barrier at roof

B. Designing for maintainability

1. Choice of materials
2. Fabrication method
3. Treatment on external facade
4. Access for maintenance at roof
5. Gondola Installation

C. Security

1. Unauthorised access

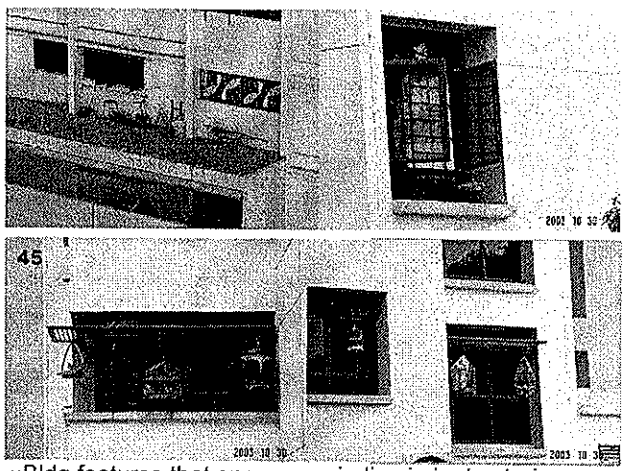
A1 SAFETY
Killer litter



*"**A girl was killed here by flower pot 5 years ago**... Recently, within a period of 14 days, there are 2 separate incidents where flower pots dropped to the ground floor..."*

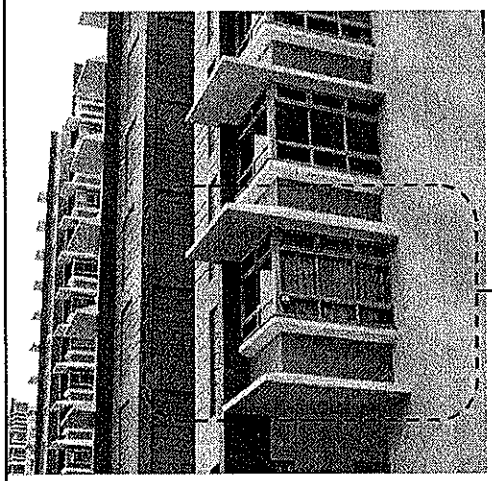
A1 SAFETY
Killer litter

- Potential killer



- Bldg features that encourage indiscriminate storing on external in the past

A1 SAFETY
Measures against killer litter

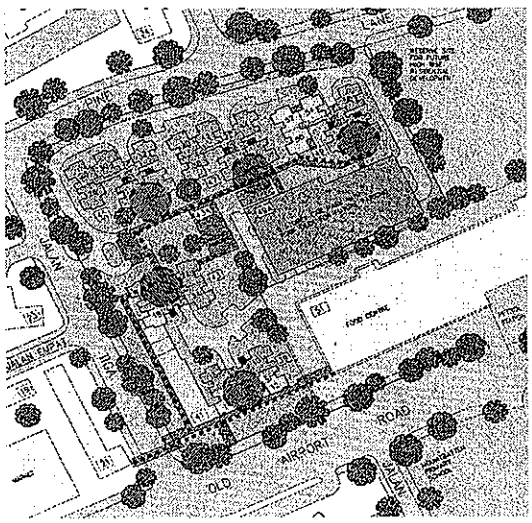


- Eliminate any opportunities for storing or hanging of objects on external facade

•Ledges are kept to minimum width and sloped

•North –south orientation eliminate the need for sunbreakers

A1 SAFETY
Measures against killer litter



- Provide safe route for residents

a. Designate block entrances and provide protective canopies.

b. Direct residents towards a safe route.

c. Covered walkways provides protection against

d. Locate footpaths and outdoor communal areas away from openings.

A1 SAFETY
Measures against litter

- Designate block entrance and provide protective canopies



✔ *Designated block entrance with overhead protective cover*



✘ *Designated block entrance without overhead protective cover*

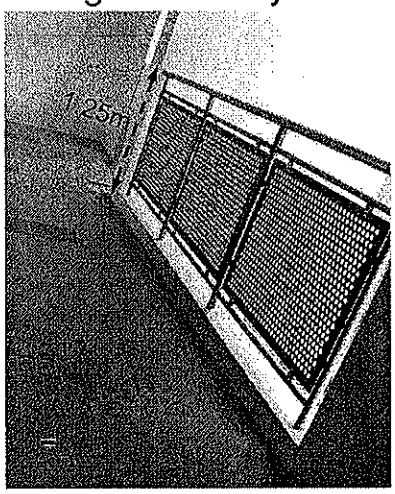
A1 SAFETY
Measures against litter



- *Using landscaping as barrier to discourage residents form walking below openings*
- *Dispensing with provision of apron*

A2 SAFETY
Safety Barrier at common areas

- Height of safety barrier



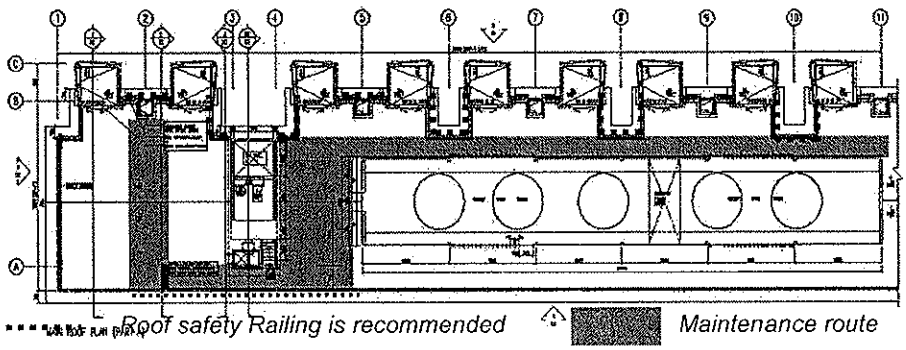
HDB's requirement

Height of safety barrier to common areas* is 1.25m for added child safety.

***lift lobbies, common corridors, roof gardens and other areas accessible be general public**

A3 SAFETY / EASE OF MAINTENANCE
Safety barrier at main roof

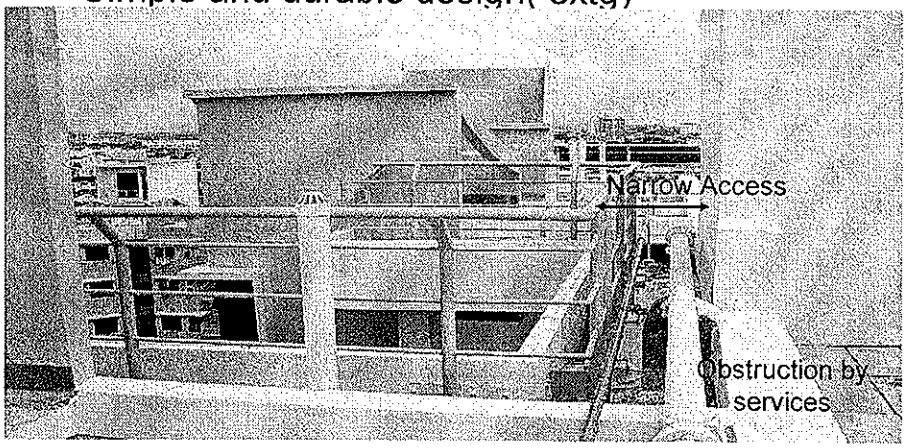
- Provide 1m high safety barrier
  - Along perimeter of main roof (new)
  - Along maintenance route where there's no roof fascia(for existing)



Roof safety Railing is recommended *Maintenance route*

A3 EASE OF MAINTENANCE/ SAFETY
Safety barrier at main roof

- Simple and durable design(extg)



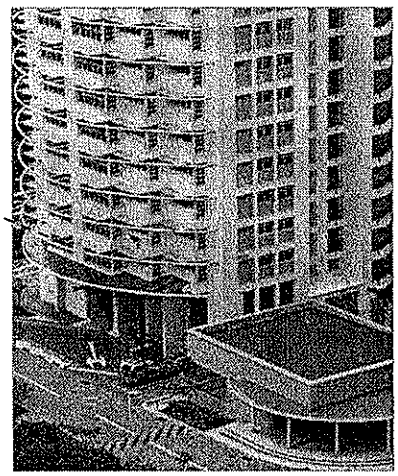
B1 Designing for Maintainability

- Considerations
  - Durable
    - In material and construction
    - long life expectancy
    - able to withstand rough usage
  - Ease of construction
  - Ease of maintenance
    - Minimum maintenance
    - Easy to inspect and maintain
  - Access for maintenance
  - Low operating, repair, replacement & maintenance cost
  - Easily available

B1 DURABILITY
Choice of material

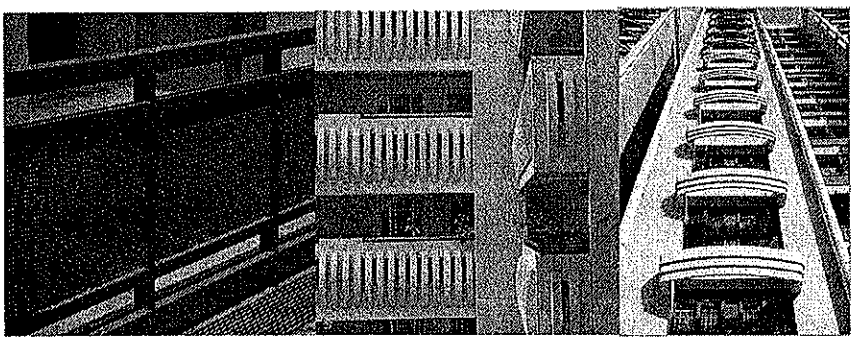
- Glass – shall not be used as roofing material or safety barrier





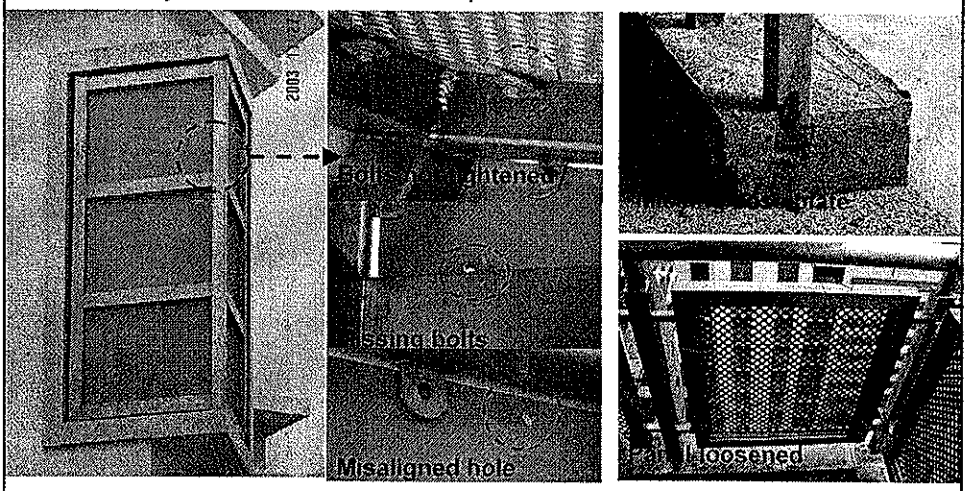
B2 DURABILITY
Fabrication of components

- Use precast elements and factory prefabrication. Rely less on workmanship on site



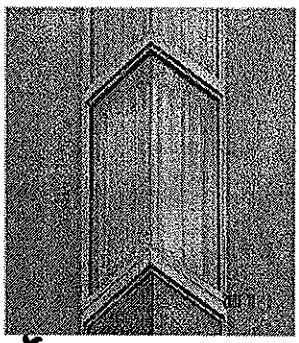
B2 DURABILITY
Fabrication of components

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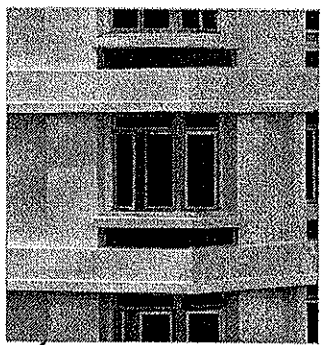


B2 DURABILITY
Fabrication of components

- Corner windows



✘ ***Avoid use of sealant joint for corner windows.*** *Sealant deteriorates over time and is likely to cause maintenance problem and create undue inconveniences to lessees.*



✓ ***Use corner mullion for a more robust joint.***

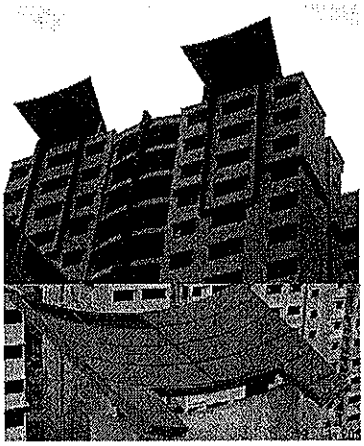
B3 SAFETY / EASE OF MAINTENANCE/ COST/ External facade

- Avoid
  - External plastering
  - Brick-cladding
  - In-situ tiling to façade walls
  - Other form of cladding or attachments at heights
- Safety risk due to falling panel
- Costly repair
- Difficult to inspect and maintain

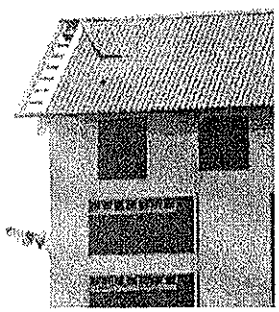


B3 SAFETY / EASE OF MAINTENANCE/ COST Roof

- Metal or clay roof shall NOT be used above 2nd storey of any HDB residential buildings.

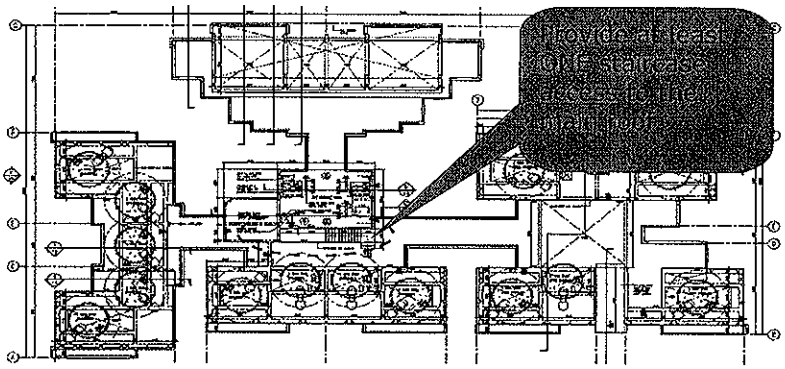


Part of roof panel dislodged



'Blown' away roof

B4 EASE OF MAINTENANCE
Access for maintenance - roof

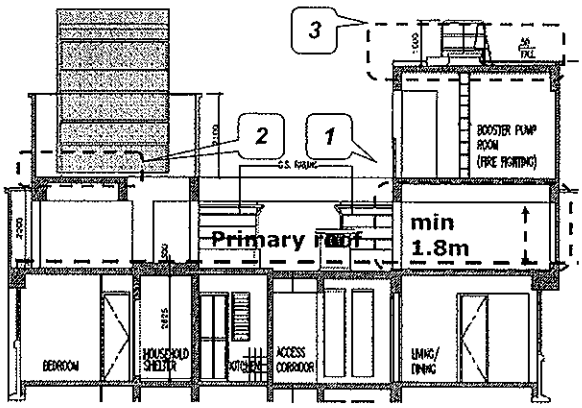


POINTS TO NOTE:

Provision of access for maintenance purpose

a. at least one staircase access to the main roof
b. staircase access from main roof to the lift machine room

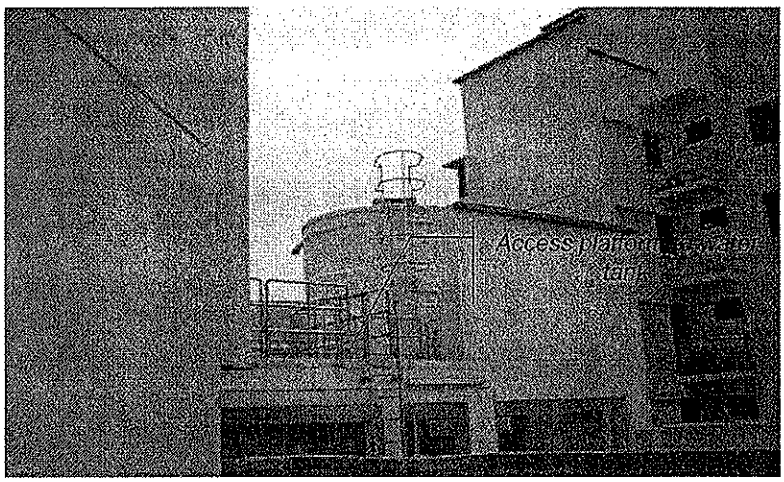
B4 EASE OF MAINTENANCE/ SAFETY
Access for maintenance - roof



POINTS TO NOTE:

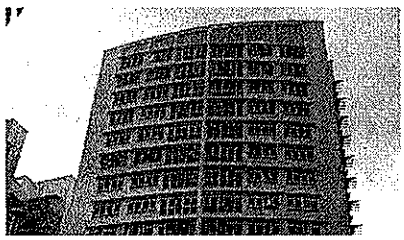
1. **Provide min 1.8m headroom below water tank for maintenance of pipes.**
2. **Provide access platform to water tanks.**
3. **Provide roof over booster pump room.**

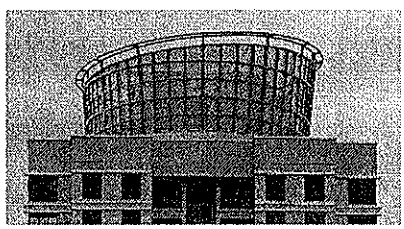
B4 EASE OF MAINTENANCE/ SAFETY
Access for maintenance - roof



B5 EASE OF MAINTENANCE
Installation of gondola

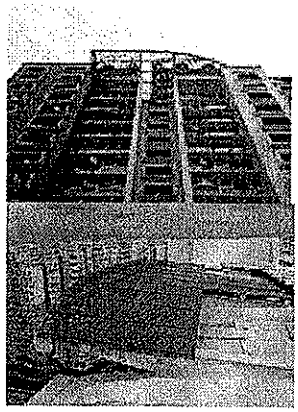
- Ensure all roofs, water tanks, features and every part of external façade is accessible for maintenance.
- Gondola is the MAIN means of access for maintenance of external façade.
  - Design for installation of gondola
  - Ensure no obstructions
  - Adequate space



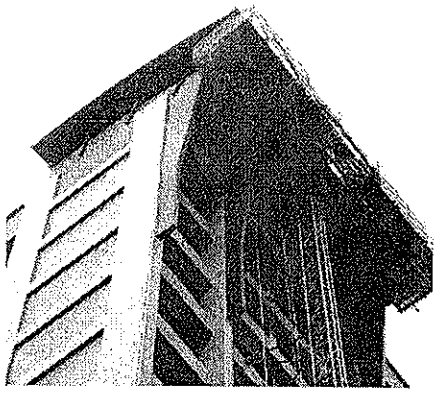


B5 EASE OF MAINTENANCE
Installation of gondola

- Obstruction to installation of gondola



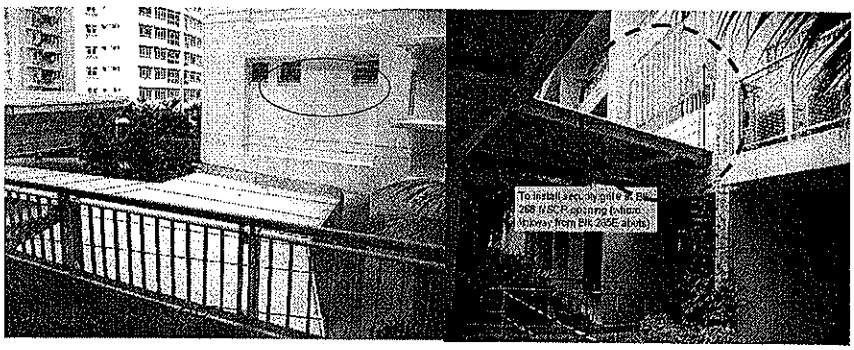
Cantilevered roof obstructs the hanging of maintenance gondola



Metal roof projects 3 m from building edge, not accessible from roof or by gondola for maintenance and repair

C1 SECURITY
Linkway connection

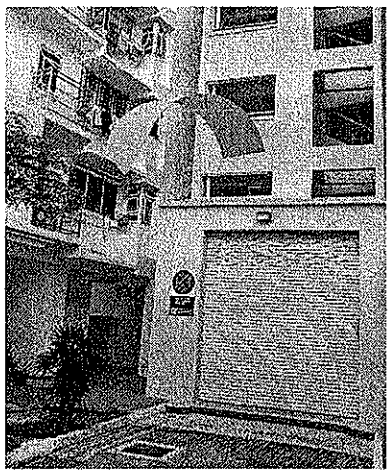
- Ensure linkway do not connect below opening of residential units



Roof of covered walkway provided possible 'unauthorised' access to residential unit. Although window are at high level, resident felt insecure. Grilles had to be installed at MSCP opening.

C1 SECURITY
External ledge

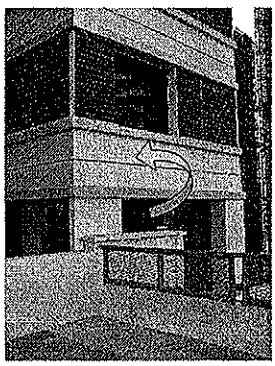
- Take care possible unauthorised access from lift lobby

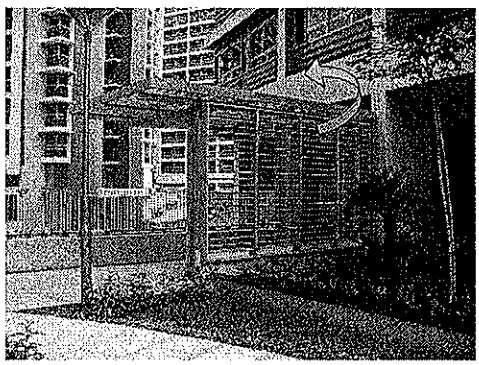


▪Provide grille with lock at lift lobby to prevent unauthorised access to CRC roof (maintenance access is still required).

C1 SECURITY
Features

- Ensure external features does not facilitate unauthorised access to units above





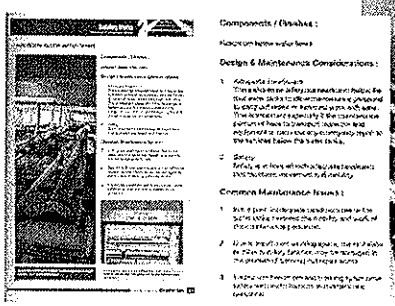
3 Regulatory Compliance

- Submission to authorities as as per private projects.
- Need to submit to HDB thru CORENET.
- Resolve regulatory compliance issues early prior to launch or exhibition
- Avoid mechanical system as means of compliance
  - MSCP should be designed without need for sprinkler or mechanical ventilation system
  - All escape staircases & lobbies should be naturally ventilated
  - Optimum compliance

4 References

1. **HDB standard specifications**
2. **HDB Guide Drawings**
3. **Town Council's publication -**
   " Design for Maintainability"





THANK YOU

A1 SAFETY

Measures against litter



RemakingOurHeartland
Realise • Rejuvenate • Regenerate



HDB'S UPGRADING PROGRAMMES

BRIEFING BY SA ONG LIN

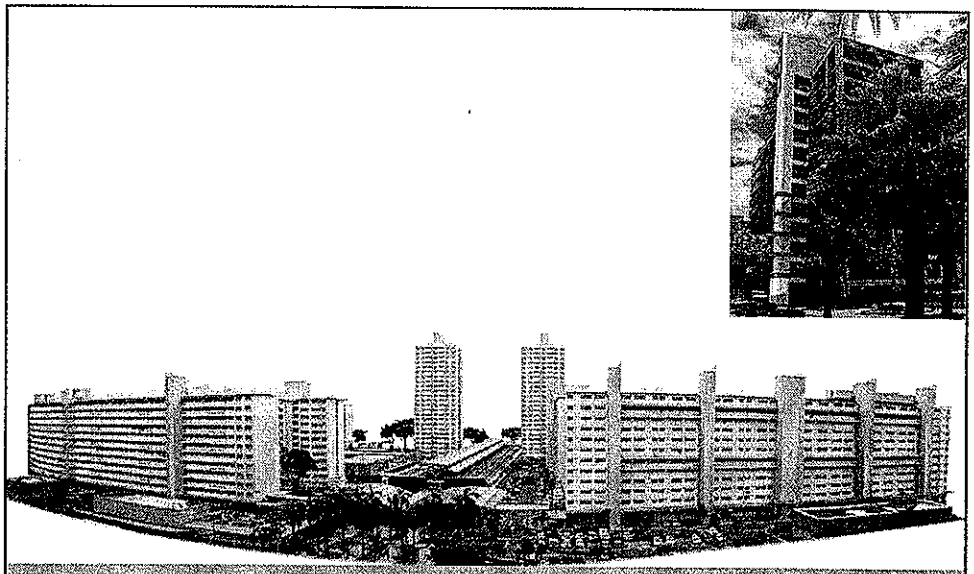
- Objectives of Upgrading Programmes
- Types of Upgrading Programmes

Objectives of Programmes

- Rejuvenate older towns & estates
- Transforms physical environment
- Enhance value of residents' assets

Types of Programmes

- Lift Upgrading Programme (LUP)
  - By HDB
- Home Improvement Programme (HIP)
  - By HDB
- Neighbourhood Renewal Programme (NRP)
  - By Town Councils



Lift Upgrading Programme (LUP)

- Overview
- Cost sharing principle
- Design Consideration/Configuration

Lift Upgrading Programme (LUP)

OVERVIEW

Under this programme, the lift services in the old apartment blocks will be upgraded to achieve:

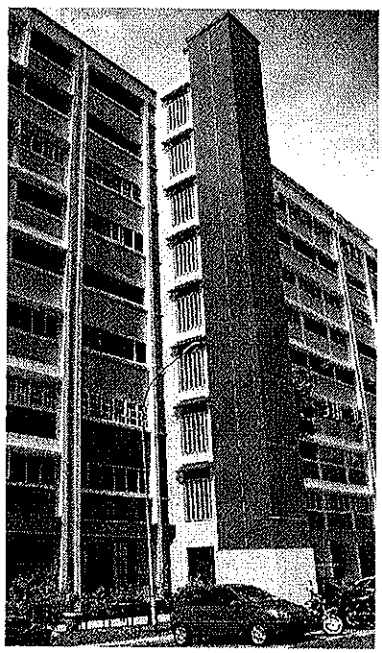
- **Direct lift access for all flats, where feasible**
- **More convenience**
- **Improved lifestyle**

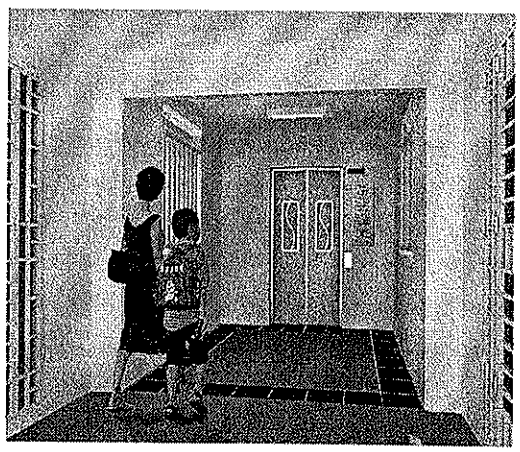


- **Lift upgrading**
  - **Heavily subsidised by Government**
  - **Town Council co-shares with residents**
  - **Households currently without direct lift access need to co-share**
  - **Singapore Citizens pay up to $3000/benefitting unit**



- Impact on residents' view
- Adequacy of weather protection
- Efficient design for cross ventilation and daylighting
- Minimal disruption to existing infrastructure and landscaping
- Design for privacy and security
- Minimise dust & noise during construction

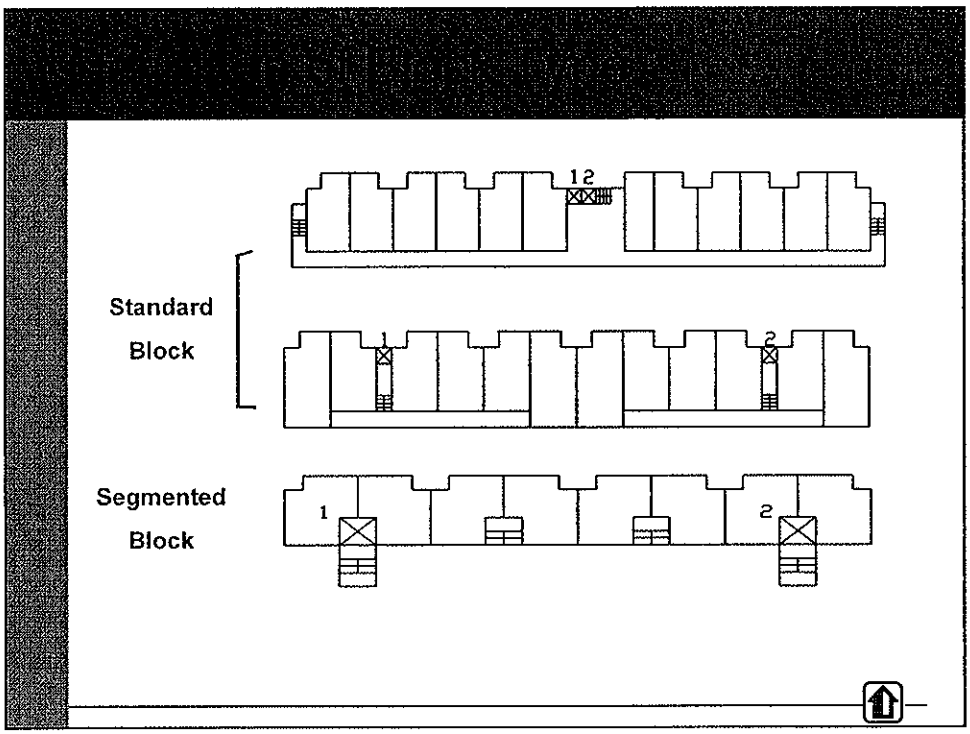


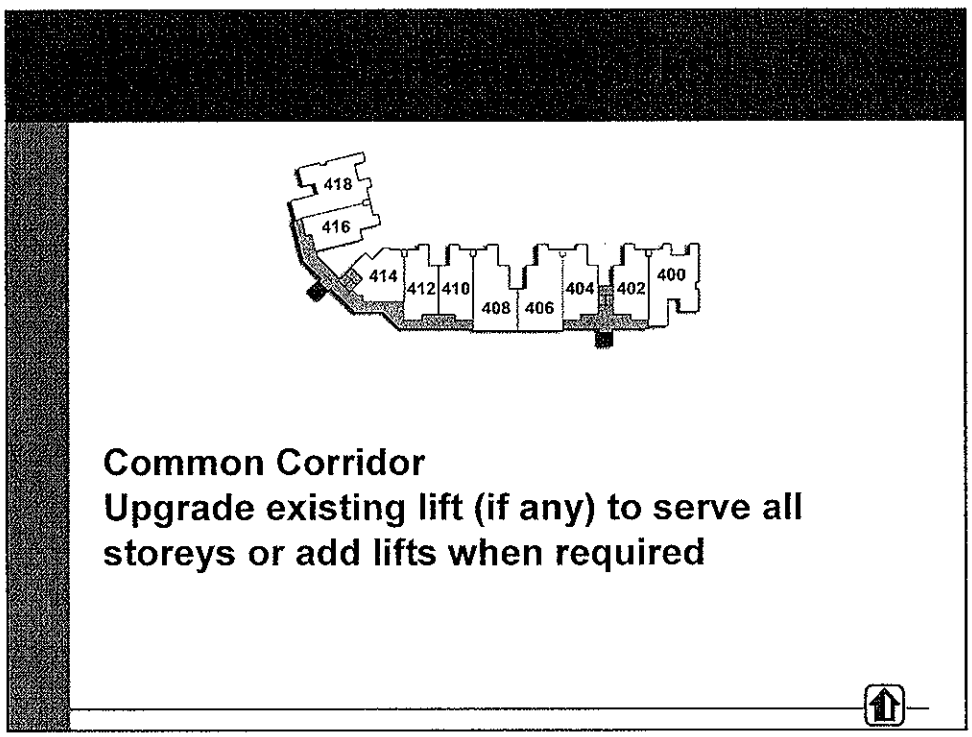


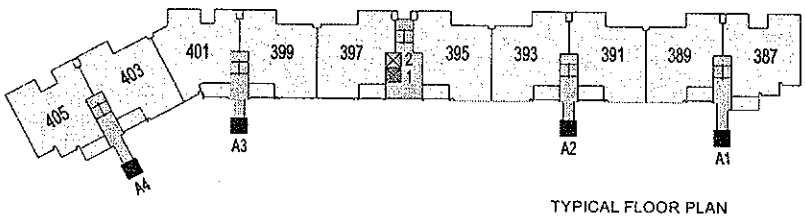
Privacy fins added at new lift lobbies

Weather protection

No obstruction of views

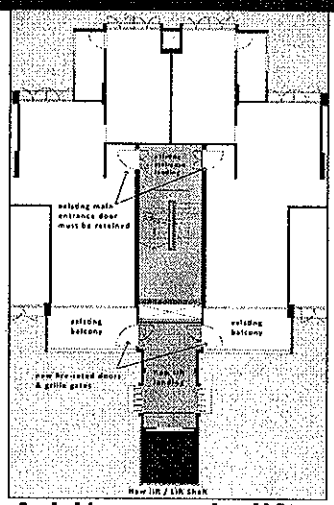

Standard
Block
Segmented
Block
1 2
1
2
1
2

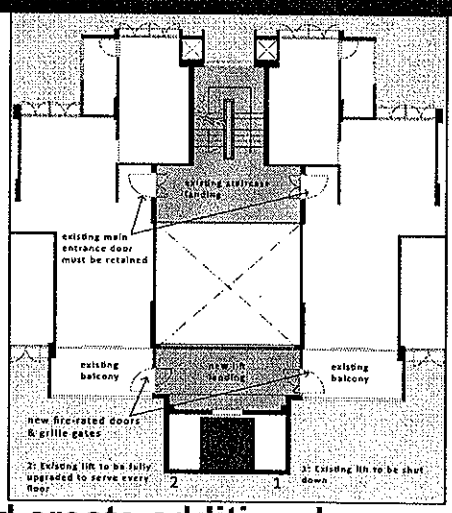

418
416
414
412
410
408
406
404
402
400
Common Corridor
Upgrade existing lift (if any) to serve all storeys or add lifts when required



TYPICAL FLOOR PLAN

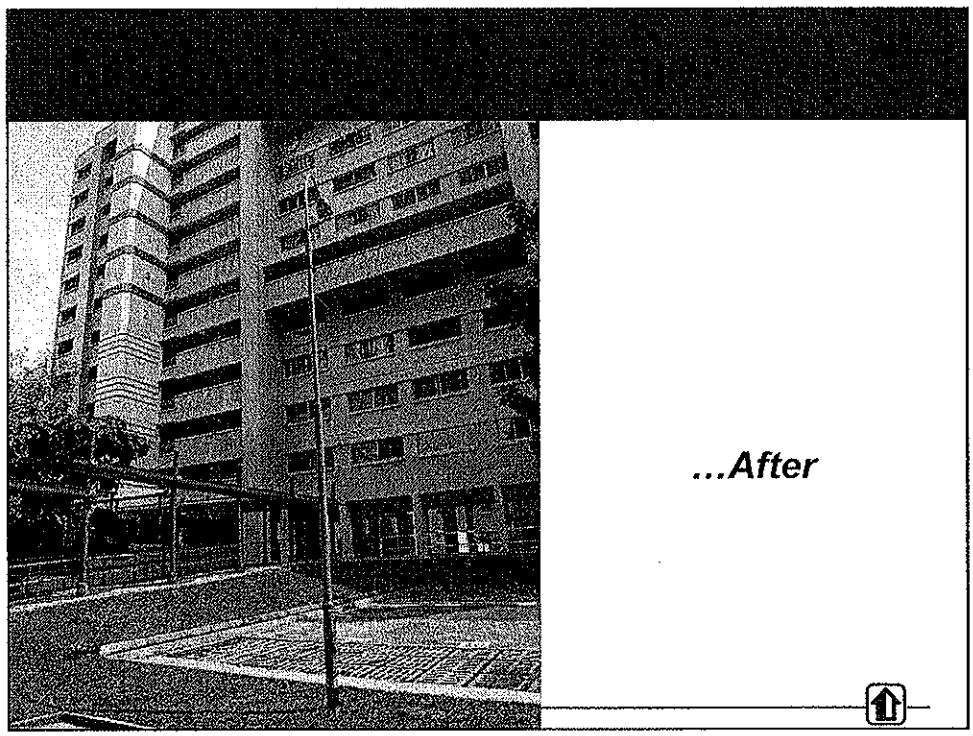
Segmented blocks
Upgrade existing lifts to serve all storeys
Add lifts to achieve 100% lift access



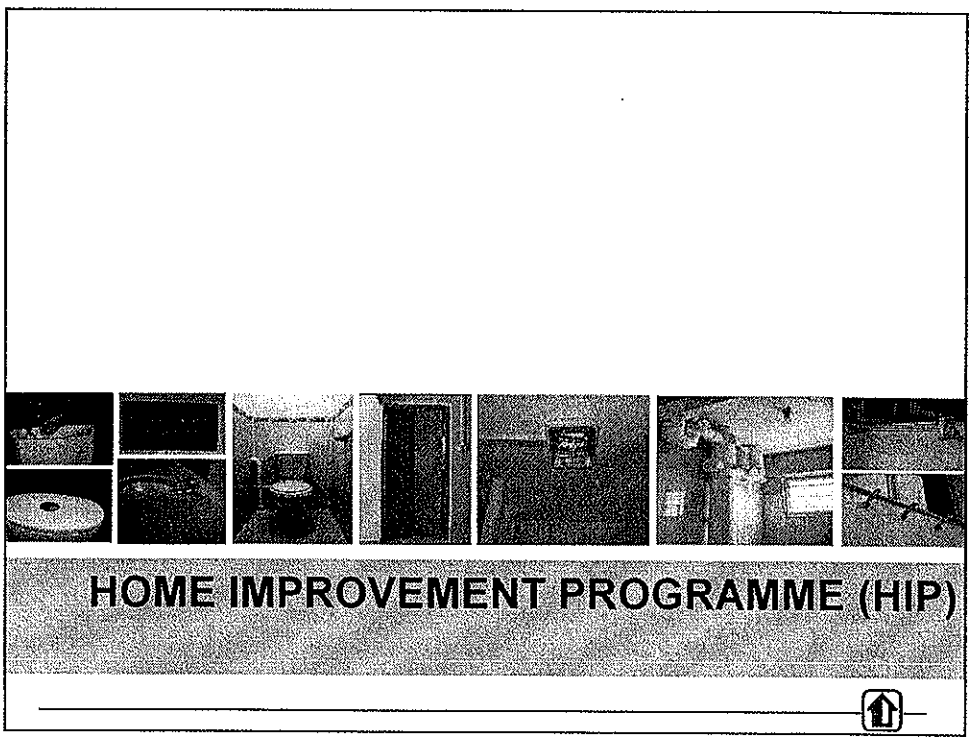


Add/upgrade lifts and create additional entrance to unit to achieve 100% lift access


Before...


...After

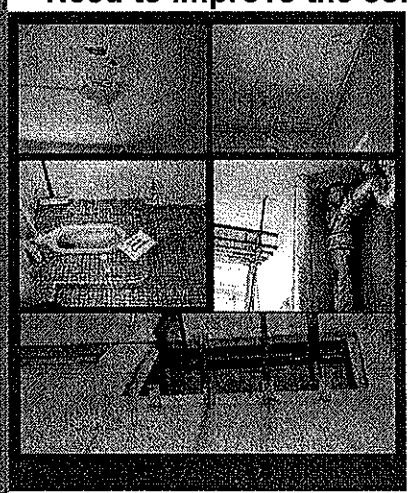

Programme
Added new lift shaft
Existing lift shaft
Completed Precinct


HOME IMPROVEMENT PROGRAMME (HIP)

- Background/Eligibility
- Scope of works
- Amount payable/Polling

HOME IMPROVEMENT PROGRAMME (HIP)

- Large stock of flats built before 1990
- Need to improve the conditions of ageing flats





- **Scope Of Works**

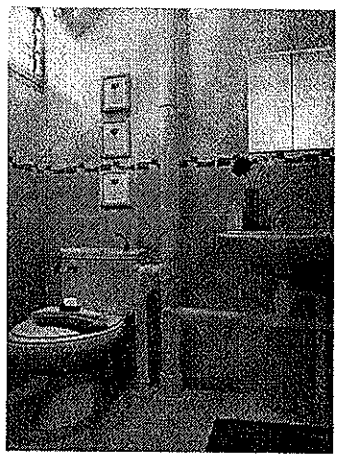
Optional Improvements		Essential Improvements
✓ Upgrade toilet/s ✓ Replace entrance door ✓ Replace entrance grille gate ✓ Replace refuse chute hopper	&	
– Offers greater flexibility – Pay only what they opted		– Address common maintenance problems – Enhance environmental & safety standards – Fully funded by Govt

- **Optional Improvements**

- Toilet Upgrading

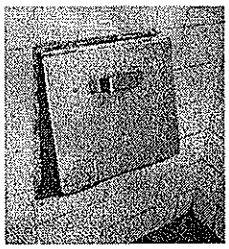


BEFORE

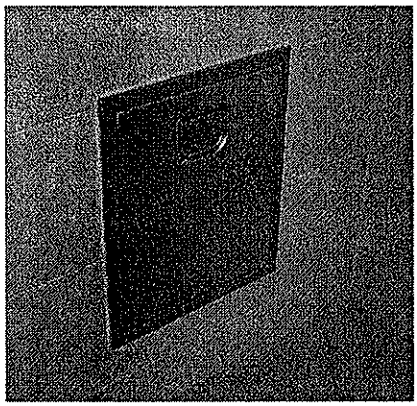


AFTER

- **Optional Improvements**
  - Replace refuse chute hopper

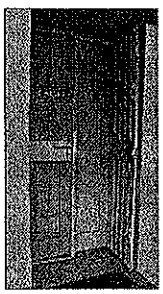


BEFORE

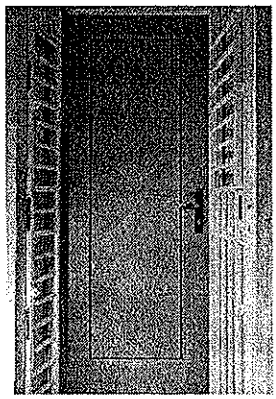


AFTER

- **Optional Improvements**
  - Replace Entrance Door & Grille Gate



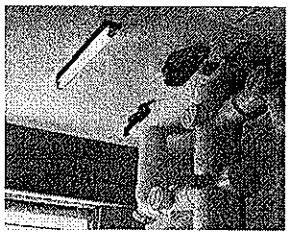
BEFORE



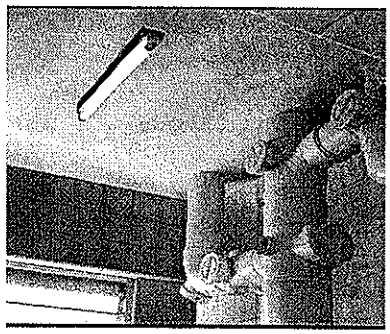
AFTER

• Essential Improvements

- Replace waste pipe
- Repair spalling concrete



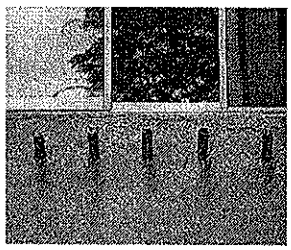
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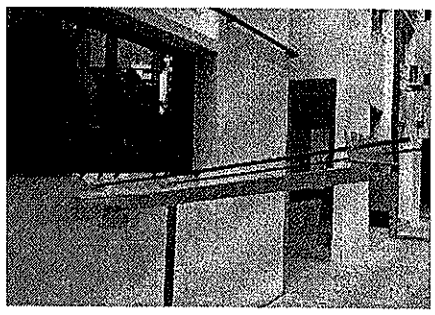
AFTER

• Essential Improvements

- Replace pipe sockets with external laundry racks

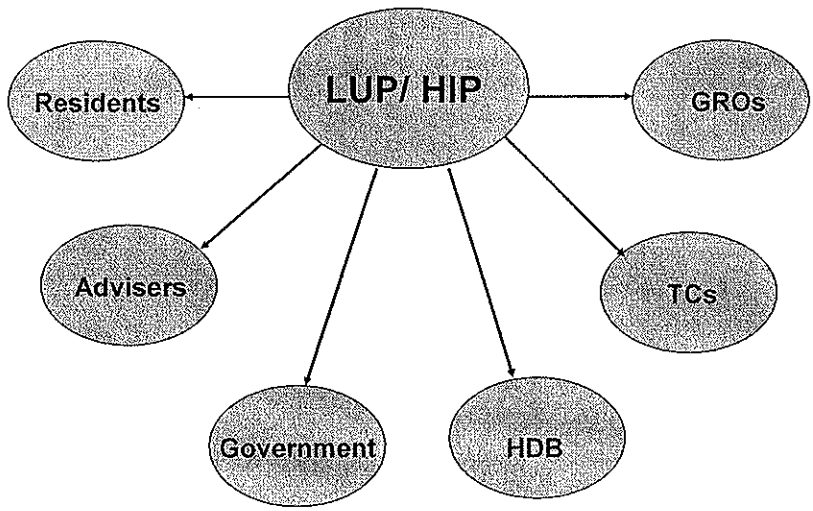


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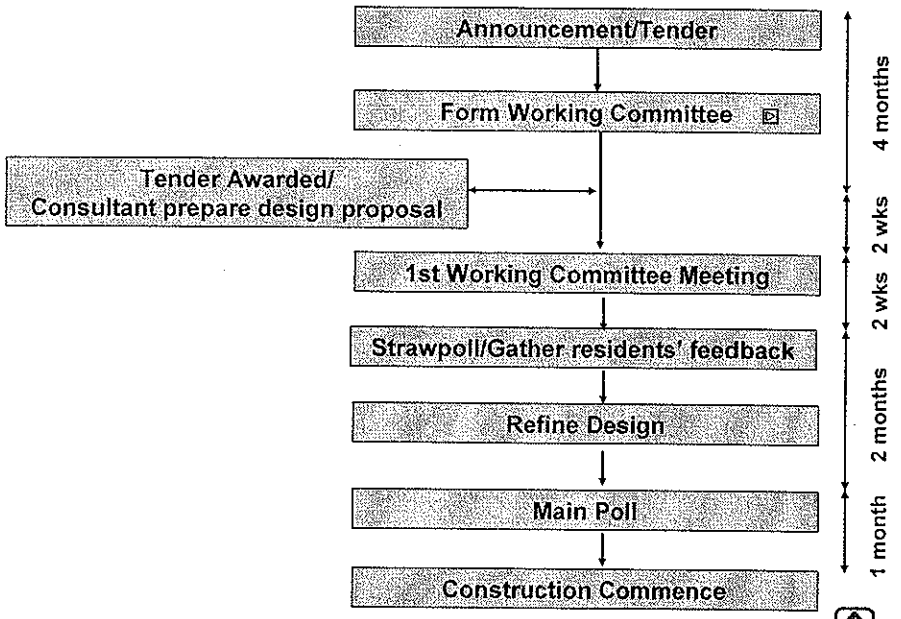


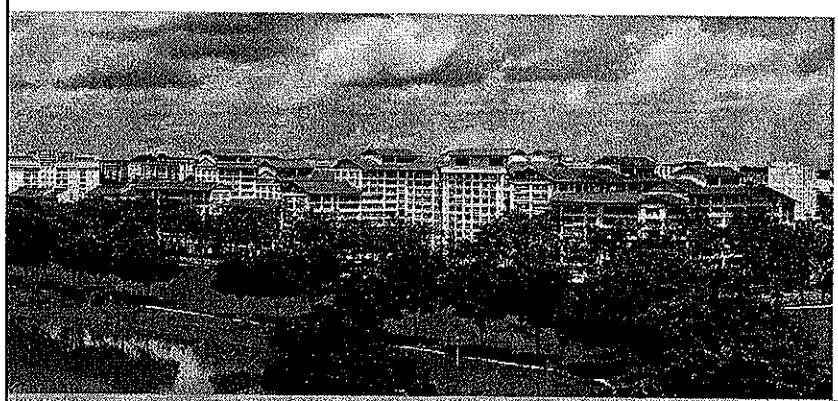
AFTER

- **Polling**
  - On block basis
  - 75% 'Yes' vote required before implementation
- **Pace**
  - LUP : 60 precincts for FY 08
  - HIP : 7 precincts for FY 08



Processes of LUP/HIP





NEIGHBOURHOOD RENEWAL PROGRAMME (NRP)

- Objectives
- Eligibility
- Scope of Works
- Implementation/Budget
- Working Committee/Roles & Responsibilty
- Public Consultation Process

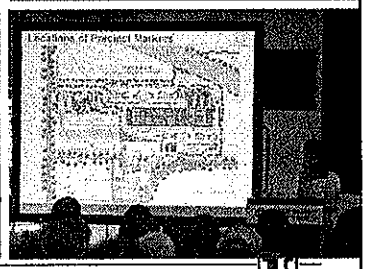
NEIGHBOURHOOD RENEWAL PROGRAMME (NRP)

- Greater Residents' involvement
  - Actively engages residents in shaping their environment

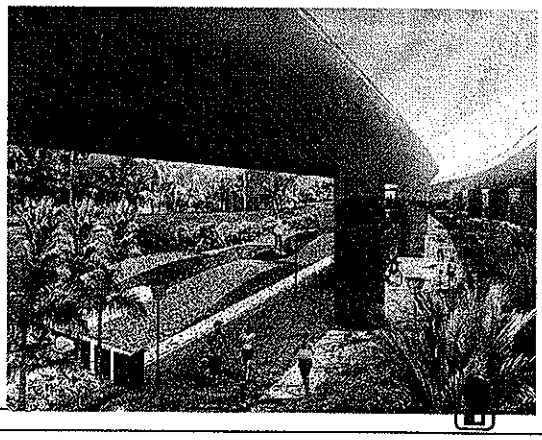
"Use this opportunity to get residents to be more actively involved. It may mean a slower process, but worth it in the longer term." - **Minister (ND)**







- **Involving 2 or more precincts**
  - Better utilisation of resources
  - Complementing facilities



Approved List Of Improvement Items Under NRP

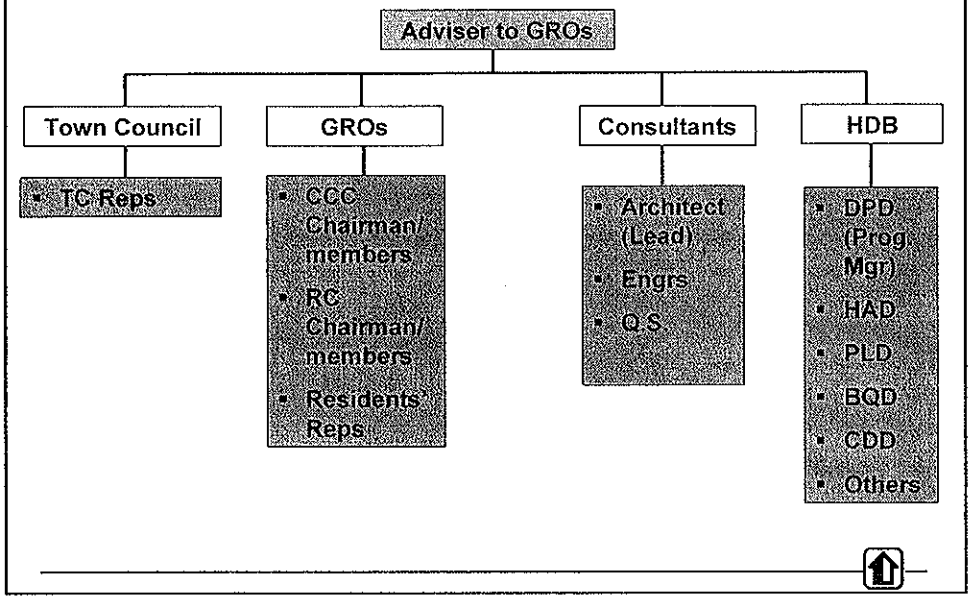
	Block Level
1	Residents' Corner
2	Lift lobby tiling & rescreeding
3	Lift lobby lighting
4	Lighting
5	Study Corner
6	New letterboxes
7	Block signage
8	Corridor tiling & rescreeding
9	Corridor lighting
10	Lift Surveillance systerm
11	Seating area at void decks
12	Bicycle station

	Precinct Level
1	Cover linkway
2	Canopy to blocks
3	Recreational mall
4	Hardcourt/ Badminton Court
5	Playground
6	Outdoor seating area
7	Pavilion/ Pergola
8	Pergola
9	Pebble Walk/ Foot Reflexology path
10	Landscaping
11	Drop-off point/ porch
12	Fitness Corner/ Station
13	Bird-Hanging/Singing Area
14	Perimeter Enhancement/ Precinct Markers
15	Landmark Structure
16	Shelter/ Trellis/ Pergola
17	Driveway
18	Multi-Purpose Court/ Basketball Court
19	Footpath/ Pavement/ Jogging Track
20	Amphitheatre
21	Paved Area/ Activity Plaza
22	Street Soccer Pitch
23	Community gardening area

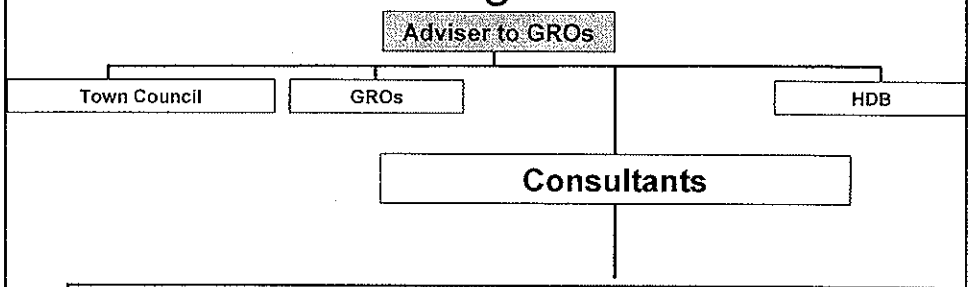
- **Implemented by Town Council**
- **Fully funded by Government**
- **Allocation : $3,400/DU**
- **Consensus Gathering**

  - On neighbourhood basis
    (through Town Hall Meeting & Exhibition)
  - 75% support required

- **Pace : FY08 – 7 precincts**

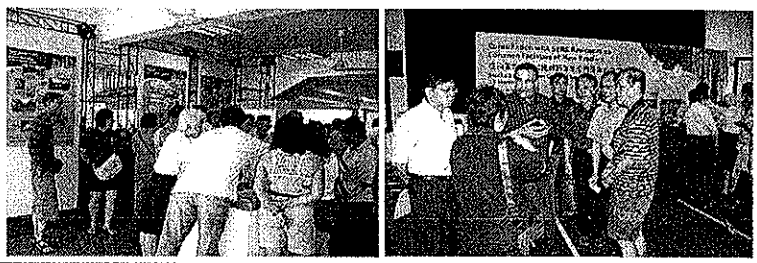


NRP Working Committee

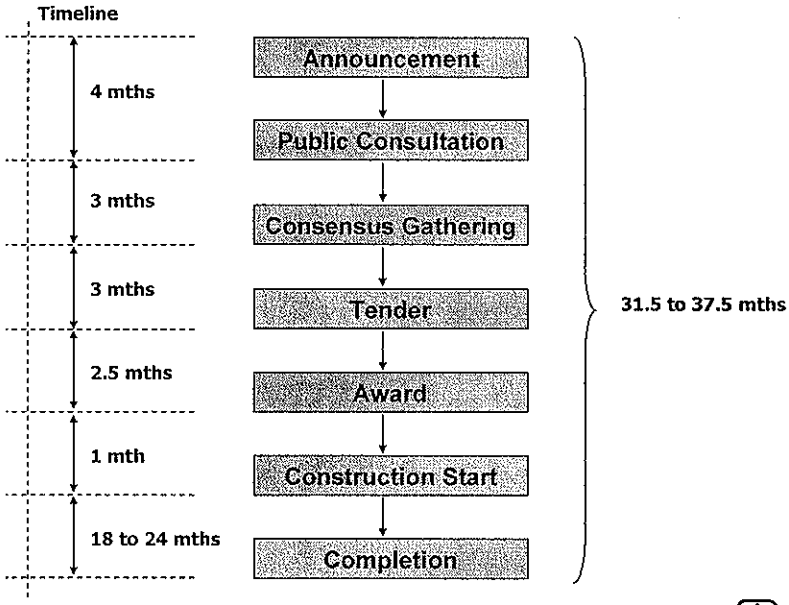


- **Design & implement NRP proposals (within budget)**
- **Provide professional inputs & explanation at public consultation forum**
- **Prepare publicity materials for public consultation & consensus gathering**
- **Ensure compliance with rules & regulations**
- **Submit plans to authorities**

- ***Visible & Active* process is <u>compulsory</u>**
  - Briefing on design
  - Solicit feedback related to design
  - Mini-exhibition (with model if necessary)
- **Forum to Adviser's decision**
  - Block parties
  - Public dialogue/s (i.e. project consultation mtg)
  - Survey (electronic/ hardcopy) (supporting)



Processes of NRP



Thank You

Mode of Procurement for Engagement of Private Consultants

17 Apr 2009

Briefing Officer: Mr Yeo Chee Shiang
Senior Contracts Manager
DPD, HDB

Briefing Outline

- Government Procurement
- Quality Fee Selection Method
- Design & Build Method

Government Procurement

- Government Instruction Manual 3B
  - Contracts and Purchasing Procedures
- Principles
  - Transparency
  - Value for Money
  - Open & Fair Competition

Government Procurement

- Tender Notice published in GeBIZ
- Website: **www.gebiz.gov.sg**
- Registered as GeBIZ Trading Partner to participate in HDB's projects

Procurement Modes

- Quality Fee Selection Method
- Design & Build Method

Quality Fee Selection Method (QFM)

- Quality Proposal and Fee Proposal
- Weighting for QFM
  - Quality / Fee Weighting : 80 / 20
- Procurement Steps
  - Expression of Interest (EOI) Stage
  - Tender Stage

QFM - EOI

- Multi-Disciplinary Team for Building Projects
  - Architectural Firm (Lead Consultant)
  - Civil & Structural Engineering Firm
  - Mechanical & Electrical Engineering Firm
  - Quantity Surveying Firm

QFM - EOI

- Critical Criteria
  - Listed on Public Sector Panels of Consultants (PSPC) administered by BCA
  - Not a sole proprietorship
  - Not restricted by HDB
  - Not debarred by SCOD
  - Not under petition for Judicial Management or Scheme of Arrangement or winding up

QFM - EOI

- Critical Criteria
  - Completed at least one high-rise project in last 5 years
  - Completed a project above $15M in the past 5 years
  - Has professional indemnity insurance (PII) at least $0.5M
  - Has ISO 9001: 2000 certification
  - Has minimum of 2 QPs / 2 QS* (degree holders)
  - Project QP/QS - at least 5 years' experience as practising QP/QS

* 1 of whom must have completed a project above $15 Mil as project QS

QFM - EOI

- Preliminary Design Concept
  - Project Design Brief
  - Submission
    - 2 pages of A4
    - Schematic layout plan, project data, brief write up and visuals etc
- Maximum of 5 MD Teams shortlisted

QFM - EOI

- Evaluation of Preliminary Design Concept

Areas of Evaluation		Quality Points
Architectural Design	Design Requirements	30
	Design Excellence	30
	Site Layout	20
	Block Design	15
	Others (e.g. new innovations)	5
Total		100

QFM - Tender

- Concept Design Proposal & Fee Proposal
- Weightage
  - Quality (80%) : Fee (20%)

QFM - Tender

- Evaluation of Concept Design Proposal

S/No.	Areas of Evaluation		Quality Points
1	Architectural Design	Design Excellence	20
		Site Layout	10
		Block Design	15
		Unit Design	15
2	Structural Design		25
3	Mechanical & Electrical Design		15
Total			100

QFM - Tender

- Fee Proposal
  - Weightage 20%
- Fee Caps
  - 50% higher or lower than the average fee of qualifying bids

QFM - Tender

- Combined Score
  - Weighted Quality Score + Weighted Fee Score
- MD Team with the highest Combined Score recommended for award of contract

QFM - Tender

- Contractual Arrangement
  - HDB enters into contracts with respective consultants

QFM - Tender

- Compensation to Unsuccessful MD Team
  - At EOI Stage
    - $250/- per MD Team
  - At Tender Stage
    - According to guidelines in QFM Framework

Design & Build Method (D&B)

- 2-Stage Open Tender Process
  - At Stage 1
    - Shortlisting of Contractors
    - Shortlisted Contractors submit their consultant team (Architect, C&S Engineer & M&E Engineer) to HDB for concurrence
    - Consultants' Eligibility
      - from specified panel of BCA PSPC
      - shall not be sole-proprietorship firm
      - shall have completed highrise projects

Design & Build Method (D&B)

- 2-Stage Open Tender Process
  - At Stage 2
    - Contractors and their consultants submit Design and Price Proposals

Design & Build Method (D&B)

- Evaluation of Design Proposal

Areas of Evaluation	Maximum Points
Design Excellence	20
Site Layout	10
Block Design	15
Unit Design	15
Quality of Finishes & Fittings	10
Engineering Design	10
Maintenance Consideration	20
TOTAL	100

Design & Build Method (D&B)

- Contractual Arrangement
  - HDB enters into Contract with
    - Contractor for design and construction
    - respective consultants for supervision

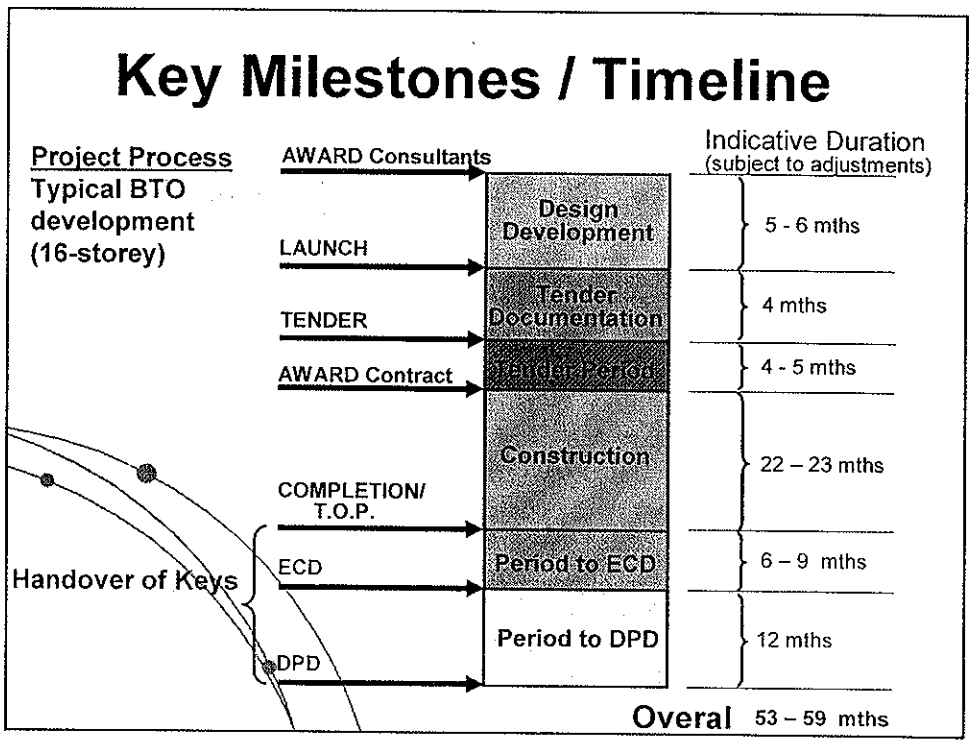
Thank You

Key Milestones / Timeline

for Typical New Housing Development

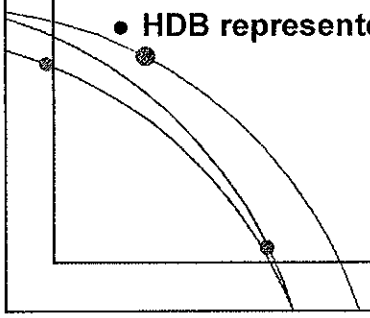
Ms Cheng Ya Ling
Senior Architect

Key Milestones / Timeline



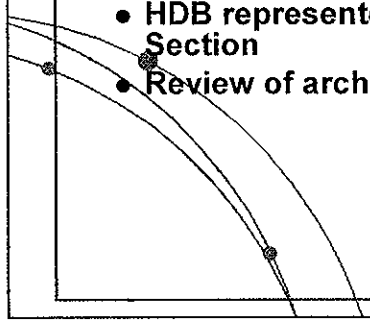
Key Milestones / Timeline

- Components:
  - Management Reviews
  - Progress Reviews
  - Working Sessions
- Management Review
  - Platform to deliberate on major issues
  - HDB represented by DCEO and Directors



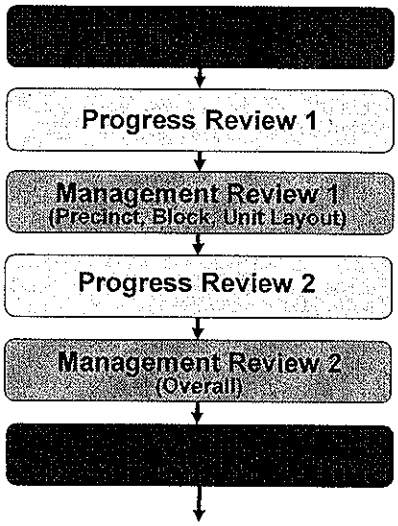
Key Milestones / Timeline

- Progress Review
  - HDB represented by various stakeholder departments
  - Review and resolution of technical & requirement issues with stakeholders before Management Review
- Working Sessions
  - HDB represented by Design & Development Section
  - Review of architectural design & requirements



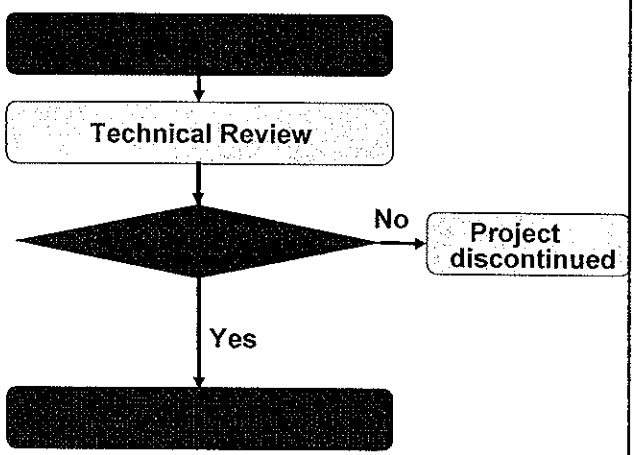
Key Milestones / Timeline

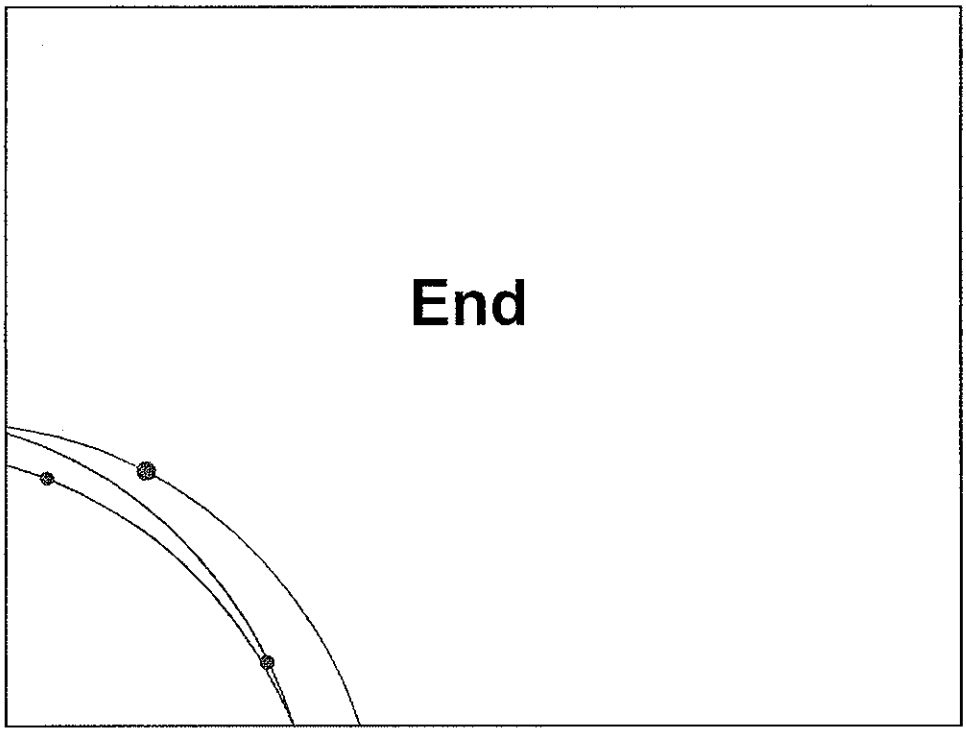
Design Stage Schedule



Key Milestones / Timeline

Design Stage Schedule (cont'd)




End

Contracts Management

Ms Catherine Lim
Senior Executive Contracts Manager

Outline

Outline

- **Design Stage**
  - Tender Documentation
  - Liquidated Damages
  - Warranties
  - Cost Management
- **Tender Stage**
  - Tender Evaluation
  - Tender Award
  - Tender Execution

Outline (Cont'd)

- **Construction Stage**
  - Cost Management
  - Variations & Payments & Contractual Advice
  - Ad-hoc/Additional Cost Advice
- **Completion Stage**
  - Preparation of Final Account
  - Other Important Documentation
- **Others**
  - VO Checking Scheme

Design Stage

Tender Documentation (Lump Sum)

- Invitation to Tender
- Form of Tender
- Instructions to Tenderer*
- Conditions of Contract (PSSCOC & PCOC*)
- Standard & Supplementary Specifications*
- Standard Schedule of Rates* & Drawings*

* *Provided by HDB*

Contracts Management

Tender Documentation (Lump Sum)

- Use of GeBIZ for procurement
- Consultant to work closely with HDB on the issuance of amendment letters and extension of tender closing date.

Design Stage

Contracts Management

Liquidated Damages

- **Objective**
  - To recover losses that HDB might incur as a result of a delay in completion, also to act as a deterrent to Contractors
- Base LD rates are spelt out in Standard Specifications
- Base LD rates are used to work out LD rate for each phase depending on no. of Dwelling Units and/or Area
- Base LD rates shall also be used for sub-phasing works

Design Stage

Contracts Management

Warranties

- To be incorporated in tender documents
- Shall follow prevailing "Approved List of Permitted Warranties"
- The type of work, format, eventualities and period of warranty for respective items shall be followed strictly
- **QFM Projects**
  - In the event Consultant wishes to include new warranty, Consultant has to obtain technical clearance from Progress Review (PR), followed by approval from Management Review (MR) chaired by DCEO(B)
- **D&B Projects**
  - Contractors must provide warranties in the "Approved List of Permitted Warranties" where the work item, material or design is used in the project

Design Stage

Contracts Management

Cost Management (Building/QFM)

- Construction Cost Budget (CCB) given by HDB
- Subjected to quarterly revision by HDB and additional design features
- Consultant required to work closely with HDB during the whole course of design to ensure cost of project is within CCB

Design Stage

Cost Management (LUP & HIP)

- **Lift Upgrading Programme (LUP)**
  - Manage cost within the stipulated cost caps for each Benefiting Unit (BU) in the different block types in accordance with the Costing Principles

- **Home Improvement Programme (HIP)**
  - Manage cost within the stipulated budget of the following 2 categories of work :
    - Optional Improvement
    - Essential Improvement

Design Stage

Tender Stage

Contracts Management

Tender Evaluation & Award

- Price-Quality Method (PQM)
  - For General Building (CW01) and Civil Engineering (CW02) tenders of $3M and above
  - Assessment by HDB
- Consultant assess any alternative bids & analyse the tender bid & makes recommendation
- Consultant prepares draft tender report
- Consultant will draft Letter of Acceptance
- HDB to issue Letter of Acceptance

Tender Stage

Contracts Management

Tender Execution

- Consultant QS to monitor and ensure that Insurance Policies and Performance Guarantee are submitted and in order
- Consultant QS to check through Articles of Agreement before execution of contract by successful Contractor and HDB

Tender Stage

Construction Stage

Cost Management

- Consultant QS to monitor and ensure project expenditure is within the approved overall estimated project expenditure budgeted in the tender report
- For Building Projects, 5% contingency is provided for in the overall estimated project expenditure
- Before the project expenditure is exceeded (say due to VOs), Consultant QS is to submit a report to request for a revision of the overall estimated project expenditure

Contracts Management

Cost Management (LUP & HIP)

- Submission By Consultant QS (Billing to Residents Stage)

Reporting Items	LUP	HIP
Prepare Estimated Cost For Billing (approximately 2 months after issuance of the Certificate of Substantial Completion for the last phase in each precinct)	Provide detailed cost breakdown, with apportionment done according to the Costing Principles.	

Construction Stage

Contracts Management

Variations, Payments & Contractual Advice

- RVO & AO
  - Consultant to seek HDB's approval for proposed variations
- Progress Payments
  - Consultant may be required to use web based e-payment system
  - To be done monthly or bi-monthly(if need be)
- Contractual Advice
  - Consultant QS to advise HDB and other consultants in MD team

Construction Stage

Ad-Hoc/Additional Cost Advice

- As and when required, when cost information relating to the project is requested, Consultant QS to provide updated cost information and necessary details with measurement and rates

Construction Stage

Completion Stage

Preparation of Final Account

- Prepare the Final Account within 7 months from completion. The Consultant QS shall submit a copy of the Final Account to HDB for retention
- Consultant QS to prepare the Interim Final Account with the contractor.
- Assist in the settlement of disputes or differences which may arise between HDB and the Contractors in relation to the Project

Other Important Documentation

- Preparation & Issuance of Certificate of Substantial Completion
- Issuance Final Certificate of Completion after DLP expires, or after all defects have been rectified (whichever is later)
- Preparation of As-Built Drawings for submission to HDB
- Ensure all Warranties submitted are in order
- Ensure Certificate of Statutory Completion is obtained

Others

VO Checking Scheme

8 COST RECOVERY FOR ERROR IN VALUATION OF VARIATION ORDER

- HDB may conduct random checks on the accuracy of the valuation of VO
- Evaluation Criteria :
  - The number of VOs with errors detected shall not be more than 5% of the total number of the VOs checked; and
  - The total value of VO errors detected shall not be more than 3% of the total value (absolute value) of the VOs checked

HDB will exercise cost recovery if the above error threshold is being exceeded

(Details could be found in the scope of services of consultancy contracts)

Others

End



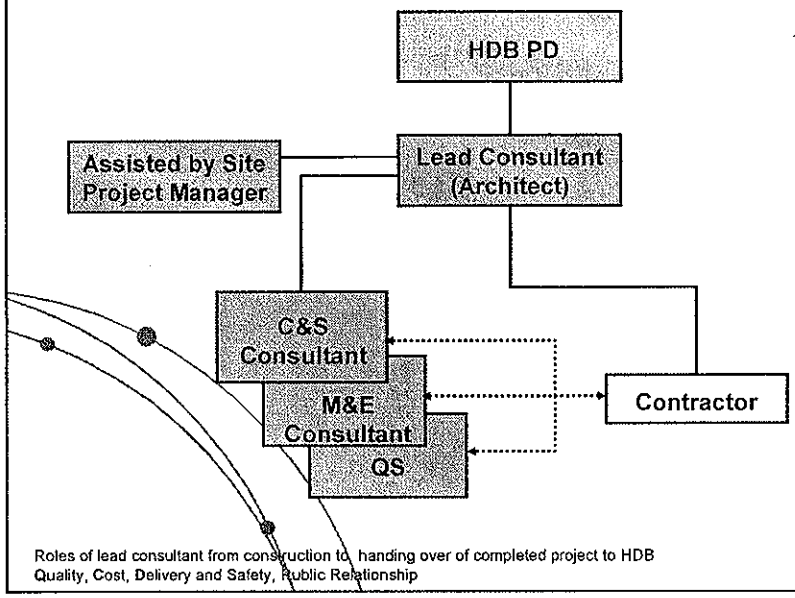
Project Management (Construction)

Mr Tan Eng Seng
Senior Project Manager

Outline

1. Project Organisation Structure
2. Quality
3. Delivery
4. Cost
5. Safety and Pollution Controls
6. Public Relation
7. Handover

1. Project Organisation Structure



Roles of lead consultant from construction to handing over of completed project to HDB
Quality, Cost, Delivery and Safety, Public Relationship

Site Project Manager (Full-time)

- **Assist the lead consultant in project administration, supervision and day-to-day operations on site**
- **Coordinate with other consultants, contractors, service providers etc. in resolving site issues**
- **Oversee and manage the performance of Site Supervisors**

Qualifications :

- A Degree in Arch, Civil / Structural / Electrical / Mechanical Engineering, Building Science or Quantity Surveying ;
- The degree shall be recognised either by the respective Professional Bodies, professional institutions or BCA ; and
- A minimum of 3 years of relevant experience in construction industry.

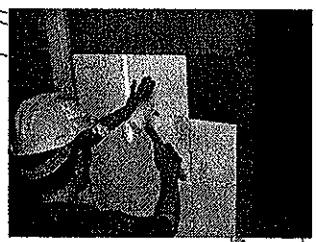
Site Project Manager (Full-time)

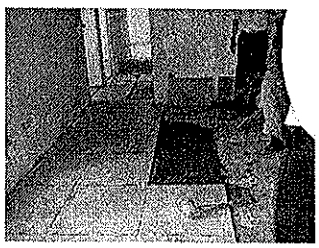
Roles of Site Project Manager from commencement to completion to ensure the following :

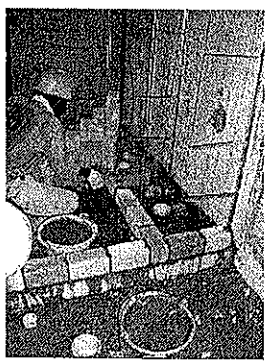
- Quality
- Cost
- Delivery
- Safety & Pollution Control
- Public Relation
- Handover of completed works

2. Quality

- Construction Quality Management System to ensure compliance with specifications and drawings
  - Materials control / testing
  - Conduct trade demonstrations



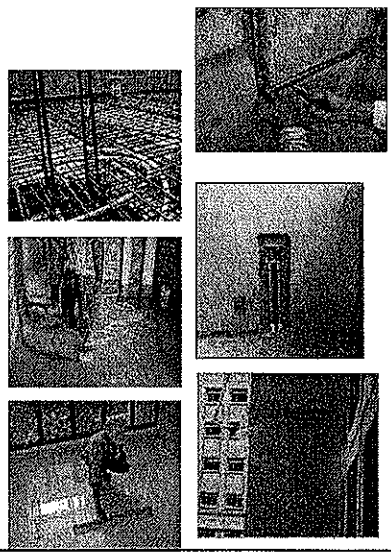




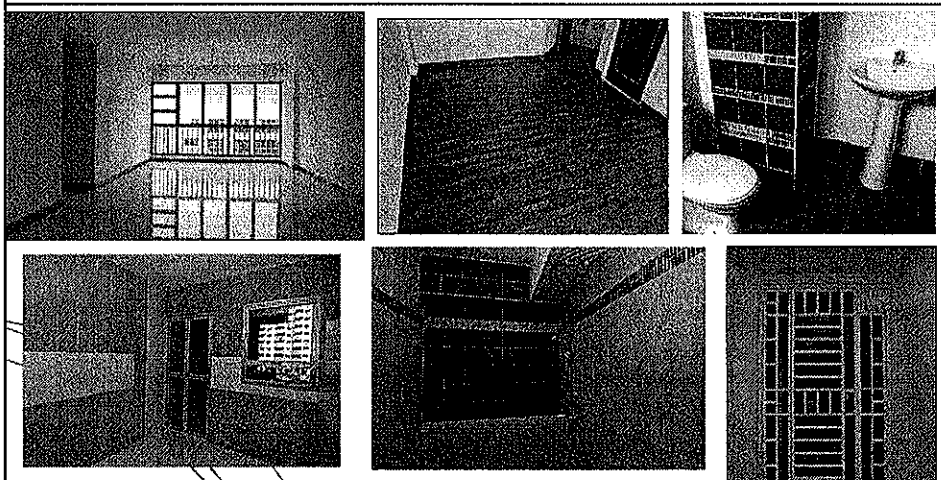
2. Quality

In-process Supervision

- Work with Consultants to come up with Quality Inspection Guides/Checklist/ Forms for in-process supervision
- Establish guidelines on frequency of checks
  Eg.
  - waterproofing for bathroom/kitchen
  - sanitary pipes
  - concealed services
  - tiling work
  - timber door installation
  - cement block laying
  - timber flooring
  - M&E installation
  - watertightness test
- Assure 3
- Review with contractor to identify shortcomings and discuss how to improve them



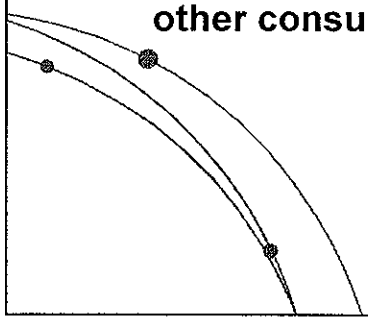
2. Quality



- Timely completion of the sample units
- Arrange QPs' inspection to ensure conformance with sales brochures, specifications and drawings
- Reference for workmanship standard for finishing works

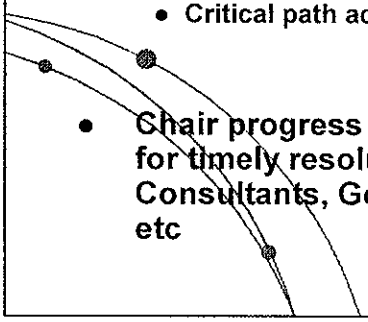
3. Cost

- Conduct checks on claims submitted by contractor
- Track and manage the Requests for Variations Order from contractor and other consultants



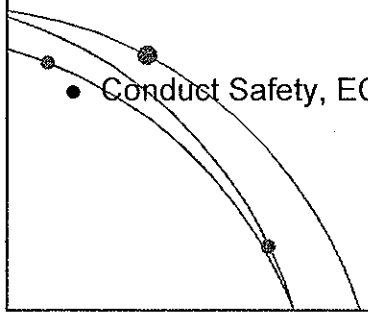
4. Delivery

- Review and approve Contractor's Master Construction Programme
- Manage the progress of work
  - Close monitoring of key miles stones (eg sample units, services laying & supply)
  - Critical path activities (eg RC cycle time)
- Chair progress meetings and technical meetings for timely resolution of site issues with Contractor, Consultants, Govt Authorities, Services Providers etc



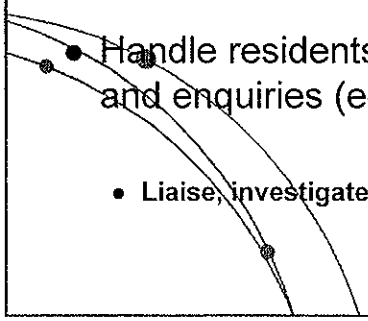
5. Safety & Pollution Controls

- Safety Management System
  - **Risk Assessment**
  - **Safe Work Procedures**
- ECM, Noise Controls and Housekeeping Practices
  - **Ensure compliance with PUB and NEA regulations**
- Conduct Safety, ECM and Housekeeping Checks



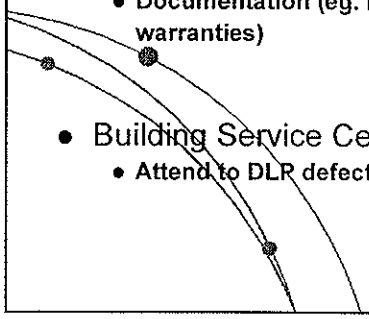
6. Public Relation

- Build rapport with other stakeholders
  - **RCs, residents, BO, TC**
  - **Give notices to nearby residents in advance**
- Handle residents and other authorities' feedback and enquiries (eg. noise, ECM, safety issues)
  - **Liaise, investigate and respond to the feedback**

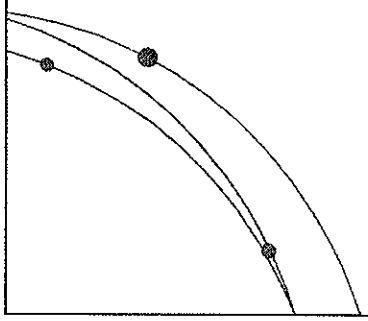


7. Handover

- RI Inspections / Clearances / TOP
  - **TOP application is on the block by block basis**
- Inspection by HDB
  - **Conduct checks and satisfied that building block is completed with good workmanship before arranging to hand over to HDB**
  - **Documentation (eg. maintenance manuals, test reports/certificates, warranties)**
- Building Service Centre
  - **Attend to DLR defects**



Thank You



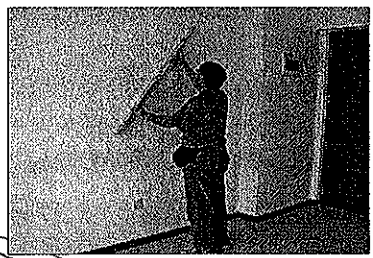
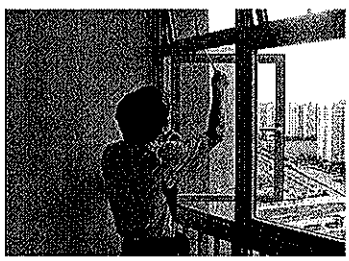
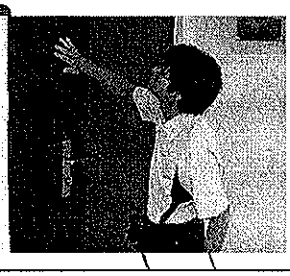
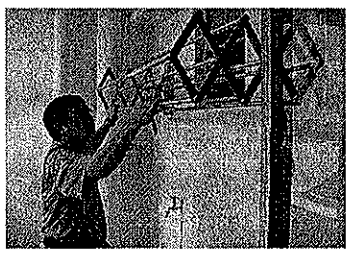
Assure 3

Defects	Warranty Period
Ceiling leakages at toilet/ kitchens	Five years
Water seepage from external walls	Five years
Spalling concrete	Ten years

- Cast-in sanitary pipe sleeves
- Cast-in window frames

BIT

Building Inspection Team (BIT) will audit check before taking over the completed works

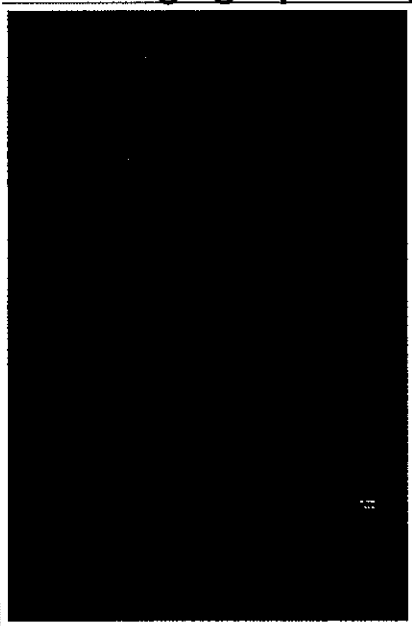
Project Management in **UPGRADING PROJECTS**

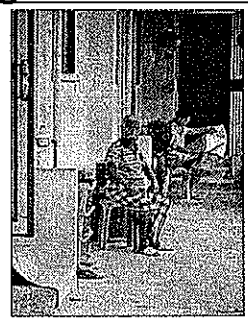
By **Albert Law**
Senior Project Manager
Upgrading Construction Management Section
BQD

Project Management in **UPGRADING** Projects

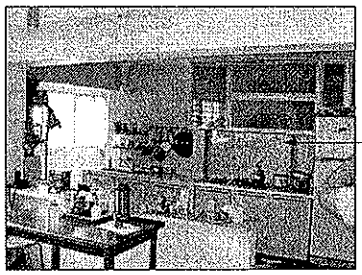
1. **Challenging Operating Environments**
2. **Communications** With **Residents** & Other **Stakeholders**
3. Meeting The ***5* Key Project Management Parameters**

1 Challenging Operating Environments









Existing flat conditions

1 Challenging Operating Environments

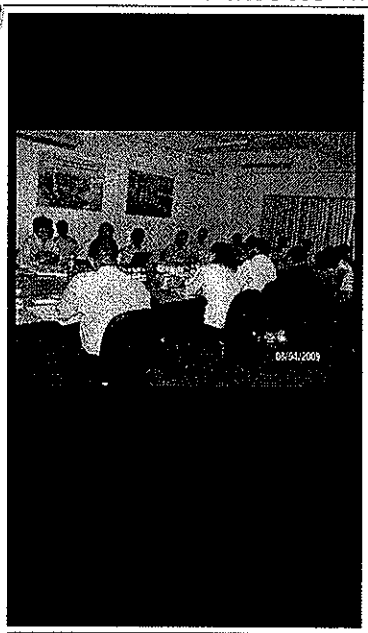
- To communicate effectively with flat owners on their decisions & the effects of upgrading works
- To address concerns of residents, Advisor, GRLs, etc
- To regularly update works status

Have A Good Communication Plan With Residents / GRLs / Advisor

- To ensure proper planning & adequate resources for all works
- To make no mistake in the execution of upgrading works
- To minimise inconvenience and nuisance caused to residents

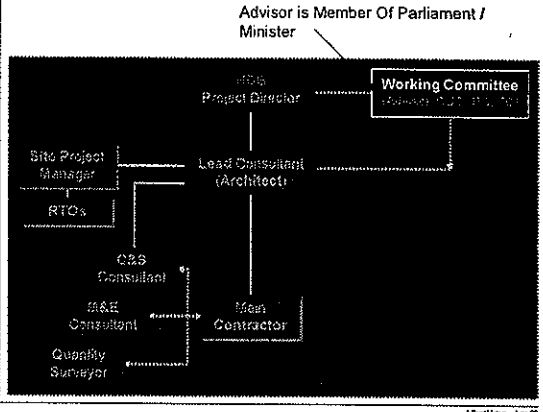
Execute '1st Time Right' Upgrading Design & Work At All Times

2 Communications With Residents & Other Stakeholders

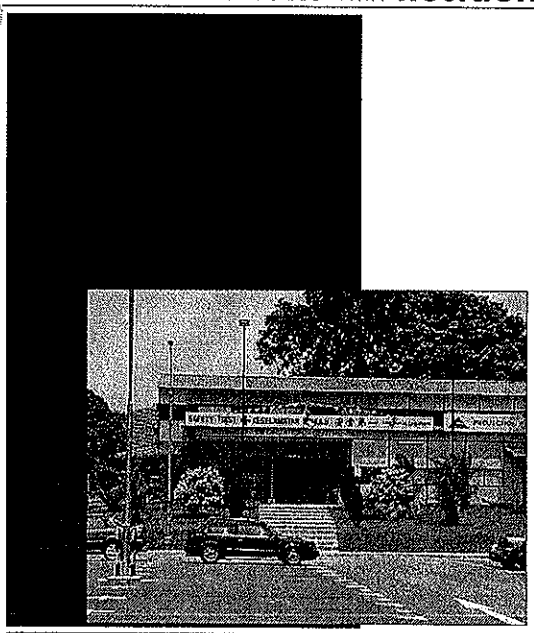


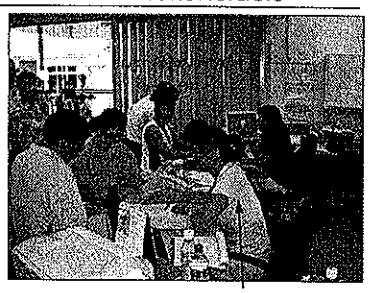
Roles & Responsibility Of Working Committee

- To assist in explaining inconveniences to residents
- To give residents' feedback on upgrading works
- To refer resident's concern to Project Team



2 Communications With Residents & Other Stakeholders



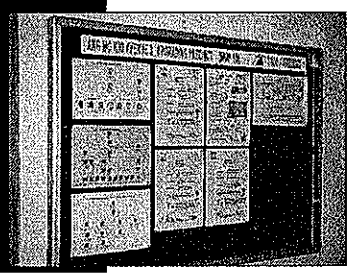


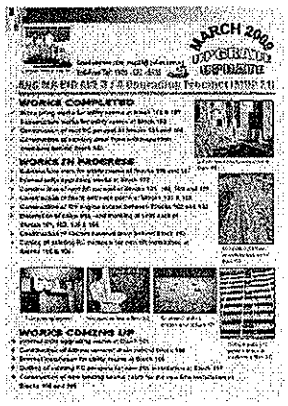
Full-time PROs attending to Residents' feedback at Information Centre



2 Communications With Residents & Other Stakeholders

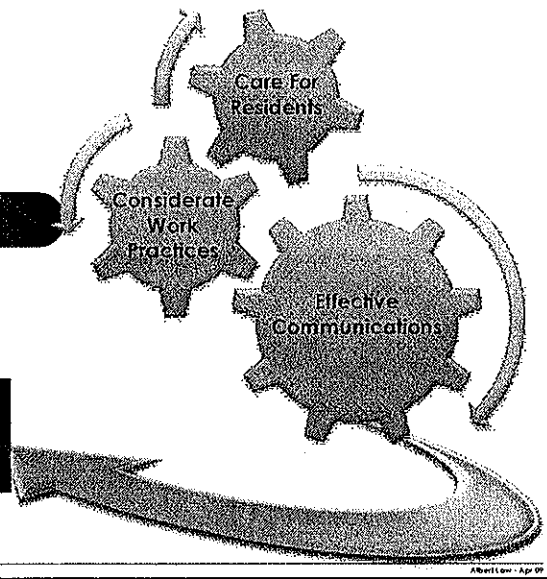
- Conditions Survey
- 2-Month + 2-Week Notices
- 3-Day Reminder
- Monthly "**Upgrade Update**" Newsletters
- Notice Boards At Void Decks





3 The 5 Key Project Management Parameters

1. Quality
2. Cost
3. Timely Delivery
4. Safety & Housekeeping
5. Public Relations

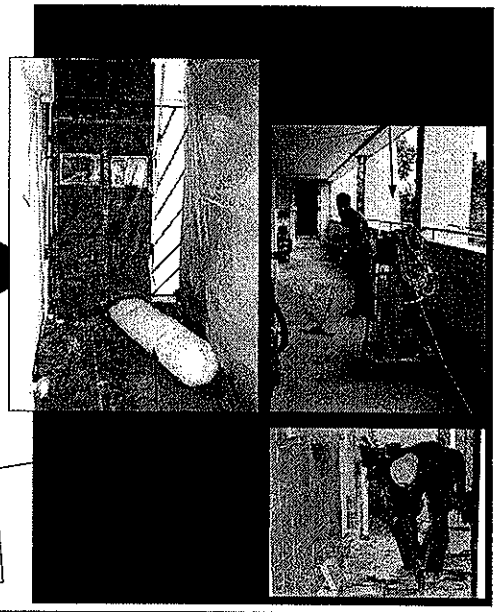


Public Relations Management Is One Important Dimension Of The 5 Key Project Management Parameters

3 Meeting The 5 Key Project Management Parameters
Provisions For A Considerate Project Management

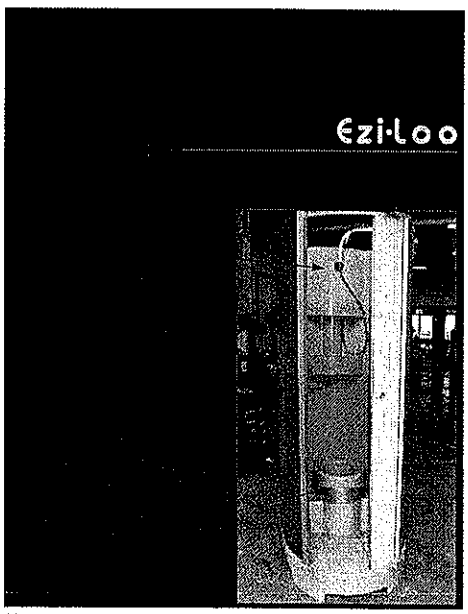
1. [redacted]
2. [redacted]
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4. Safety & House[redacted]
5. Public Relati[redacted]





3 Meeting The 5 Key Project Management Parameters
Provisions For A Considerate Project Management

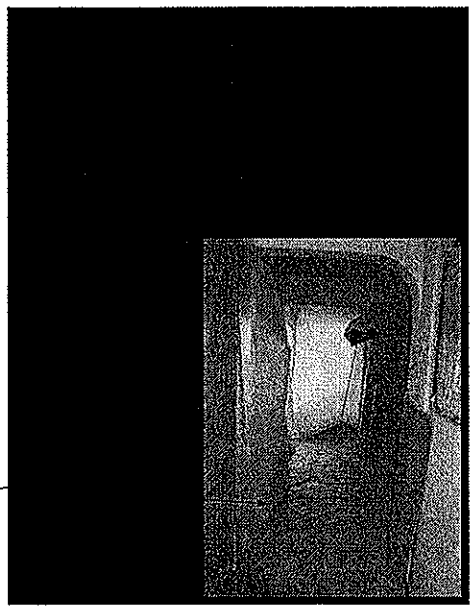
1. [redacted]
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4. [redacted]
5. Public Relati[redacted]



3 Meeting The 5 Key Project Management Parameters
Provisions For A Considerate Project Management

1.
2.
3.
4. Safety & House Keeping
5. Public Relations





3 Meeting The 5 Key Project Management Parameters
Provisions For A Considerate Project Management

1.
2.
3.
4.
5. Public Relations

Permitted Working Hours

Mondays - Saturdays
8:00 am - 6:00 pm (Precinct/Block Works)
9:00 am - 5:00 pm (Works Within Flat)

Sundays & Public Holidays
No Works

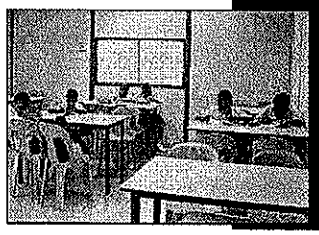


Max Allowable Noise Levels

Duration	Max Noise Level
8 hrs	80 dB(A)
4 hrs	85 dB(A)
2 hrs	90 dB(A)
1 hr	95 dB(A)
Noise Source	**Measurement Point**
Outside Flat	< 10 m From Source
Inside Flat	< 5 m From Source

3 Meeting The 5 Key Project Management Parameters
Provisions For A Considerate Project Management

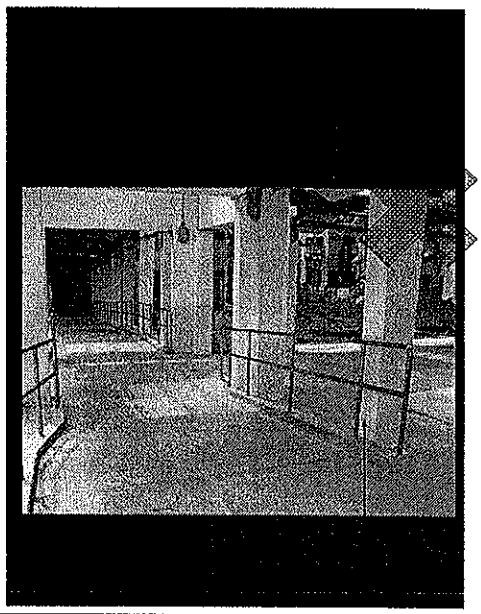
1. [redacted]
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4. [redacted]
5. Public Relati[redacted]





3 Meeting The 5 Key Project Management Parameters
Cost Management

1. [redacted]
2. Cost
3. [redacted]
4. [redacted]
5. [redacted]



3 Meeting The 5 Key Project Management Parameters
Control On Critical Work Items

1. Quality
2.
3. Timely Delivery
4. Safety & Housekeeping
5.





- Application Of Waterproofing Systems
- Installation Of Sanitary Piping System
- Lift Construction
- Execution Of Works Within The Flats
- Tiling Works
- Fastening Details Of Lift Cladding
- Clothes Drying Rack

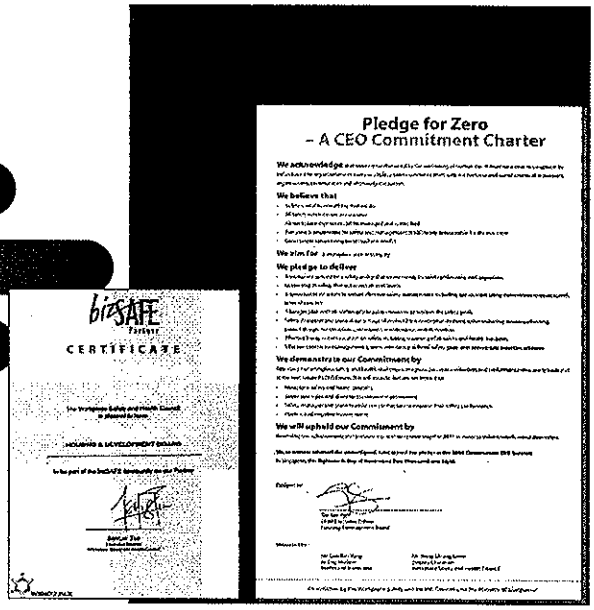
3 Meeting The 5 Key Project Management Parameters
Control On Critical Work Items

1. Quality
2.
3. Timely Delivery
4. Safety & Housekeeping
5.



3 Meeting The 5 Key Project Management Parameters Requirement For A Safe Working Environment

1.
2.
3.
4. Safety & Housekeeping
5.



Albert Low - Apr 09

3 Meeting The 5 Key Project Management Parameters Requirement For A Safe Working Environment

1.
2.
3.
4. Safety & Housekeeping
5.



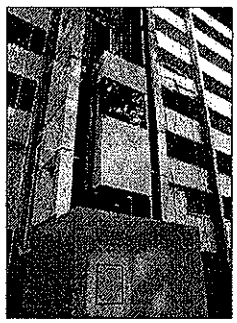
Albert Low - Apr 09

The **Achievements** Of **Partnership**



New Space-Adding-Items In An Upgraded MUP Project

New Shaft-less Lift





New / Upgraded Lifts

Q&A

Thank You

Upgrading Construction Management Section

BQD

Engineering
(Civil & Structural)

Mr Winston Toh
Senior Executive Engineer

APPROACH TO SITE INVESTIGATION & PILE DESIGN & CONSTRUCTION FOR HDB BUILDING PROJECTS

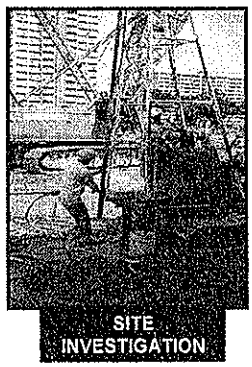
SITE INVESTIGATION & PILE DESIGN & CONSTRUCTION

Objective:

- To give an overview on:
  - optimisation of site investigations
  - optimisation of piling design
- To share HDB's practice on pile design & construction

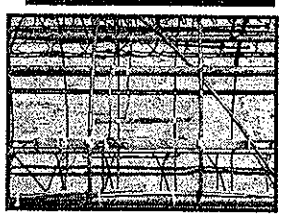
HDB'S GUIDELINES ON OPTIMISATION OF SITE INVESTIGATION (SI)

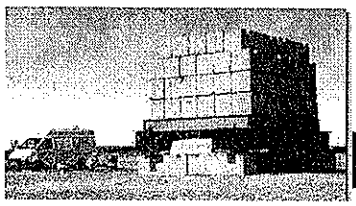
- SI for foundation of highrise buildings:
  - Use of existing borehole (BH) information
  - Preliminary assessment of ground conditions
  - Carry out BHs within blocks footprints
  - SI phased / carried out in stages
  - Assess sufficiency of BHs progressively



HDB'S GUIDELINES ON OPTIMISATION OF PILE DESIGN

- Instrumented Ultimate Load Test (ULT):
  - At least 1 before start of piling
  - Joint review with HDB
  - QP to seek BCA's approval if pile design can be further optimized

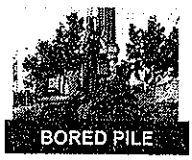

PILE INSTRUMENTATION


PILE LOAD TESTING

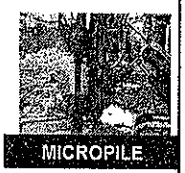
HDB'S PILE DESIGN & CONSTRUCTION PRACTICE

Pile Design:

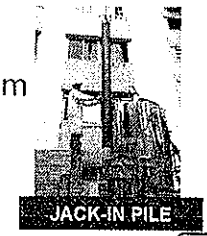
- Types of foundations used in HDB projects:
  - Bored pile
  - Steel H-pile
  - Micropile
  - Jack-in steel pipe & H-pile
  - Precast RC pile


BORED PILE


STEEL H-PILE


MICROPILE

- Piles designed with safety factor of minimum 2.5 times nominal working load (WL)

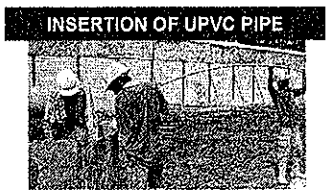

JACK-IN PILE

HDB'S PILE DESIGN & CONSTRUCTION PRACTICE

Pile Construction:

- For driven piles:
  - "Dolly" or follower disallowed during pile driving
- For bored piles:
  - Installation of 16mm nominal internal diameter UPVC pipe
  - Prelaid 3mm diameter wire inside pipe
  - For audit checking of pile penetrations


UPVC PIPE WITH COUNTER WEIGHT


INSERTION OF UPVC PIPE

HDB'S PILE DESIGN & CONSTRUCTION PRACTICE

Load Testing (Conducted in 1 cycle) :

Type of Test	Test Load
Instrumented Ultimate Load Test (ULT)	3 times WL
Non Instrumented ULT	2.5 times WL
Standard Load Test (SLT)	2 times WL

HDB'S PILE DESIGN & CONSTRUCTION PRACTICE

Failure Criteria of Load Tests:

Type of Test	Failure Criteria
Ultimate Load Test (ULT)	- settlement > 25mm @ 2 times WL - continues without further load increment before/at 2.5 times WL - does not meet requirements specified in SS CP4 for Foundations
Standard Load Test (SLT)	- settlement > 25mm @ 2 times WL



APPROACH TO DESIGN OF MINOR INFRASTRUCTURE WORKS FOR HDB BUILDING PROJECTS



MINOR INFRA WORKS

Objective

To give an overview in the design considerations of minor infrastructure works for HDB building projects

Scope of Minor Infrastructures works :

- Minor earthworks/Platforming
- Minor Sewer
- Service Roads / Driveways and Drains
- Others such as retaining structures etc



MINOR EARTHWORKS/PLATFORMING

- Design in accordance with prevailing PUB's requirements (Drainage & Sewerage)

<u>Design Considerations of Building Platform Levels</u>

- Existing/surrounding site conditions
- Minimum flood level
- Optimal platform levels for effective sewerage/ drainage system



MINOR SEWER

- Design in accordance with prevailing PUB's Code of Practice on Sewerage and Sanitary Works

<u>Design Considerations of Minor Sewer</u>

- Min size of sewer / Min depth of manhole
- Preferably 1 sewer manhole per block for connection from sanitary system
- Minor sewers are connected and discharged into nearby main/trunk sewers

SERVICE ROADS / DRIVEWAYS & DRAINS

- Design of drainage system in accordance with prevailing PUB's Code of Practice on Surface Water Drainage
- Design of fire engine access and hard-standing area in accordance with prevailing Fire Safety & Shelter Department's (FSSD) requirements, &
- Design of service road access to Centralised Refuse Chamber (CRC) in accordance with NEA's requirements.

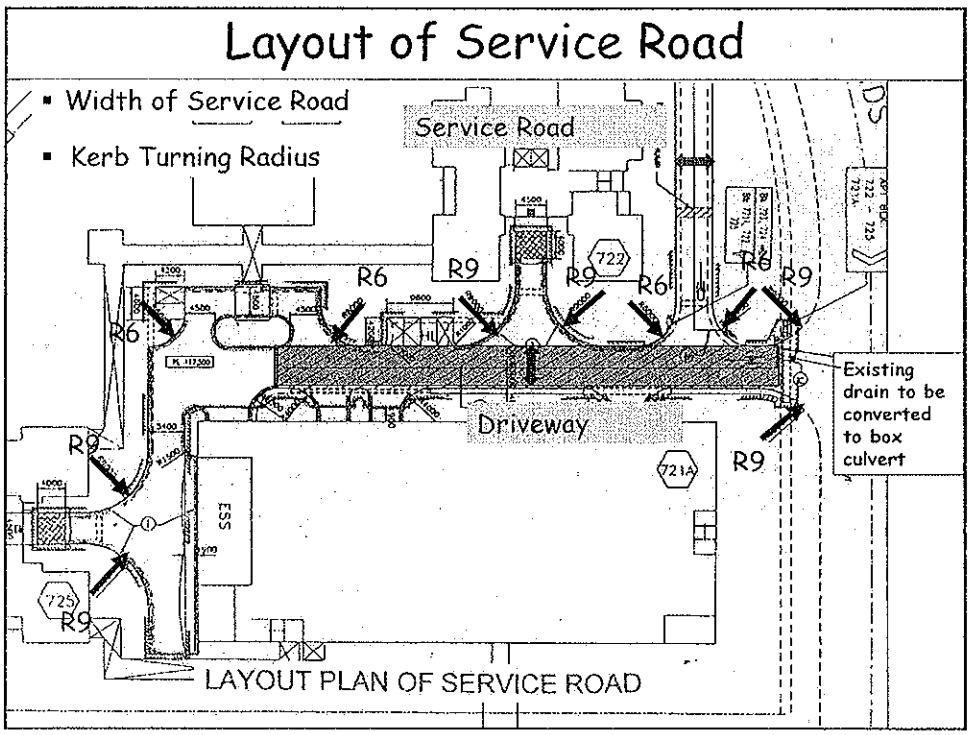
SERVICE ROADS / DRIVEWAYS & DRAINS

Design Considerations :

(a) For Service Road / Driveway

- Geometric Design
- Traffic loading & pavement designs
- Traffic Scheme (Traffic markings, signage, hump)
- Service bays, handicapped lots, temporary lorry lots
- Fire engine access & hard standing area

Layout of Service Road



SERVICE ROADS / DRIVEWAYS & DRAINS

(b) For Reinforced Concrete Drains

	Items	Preferred Value	Remarks
A	Min. Internal width	600 mm	For maintenance ease
B	Summit depth clearance	500mm	For economic consideration
c	Drain velocity	1 m/s < v < 3 m/s	For self cleansing & minimising drain invert scouring
D	Drain Cascades	150 mm (min) & 300mm (max)	Introduce where platforms change drastically over a short distance
E	Discharge Outlet	300 mm drop at connection point	To reduce backflow to service road from road side drain
F	Drain Opening Cover Slabs	Spaced at 9.6 m c/c	At openings of maintenance accesses and when there is a change in flow direction



SERVICE ROADS / DRIVEWAYS & DRAINS

(c) For Entrance Access Culvert

- **Existing roadside drain converted into entrance culvert**
- **Approvals from PUB, LTA & NParks are required**



HDB'S STRUCTURAL ENGINEERING PRACTICE & REQUIREMENTS



DESIGNING FOR PUBLIC HOUSING

HDB STRUCTURES ARE DESIGNED FOR :

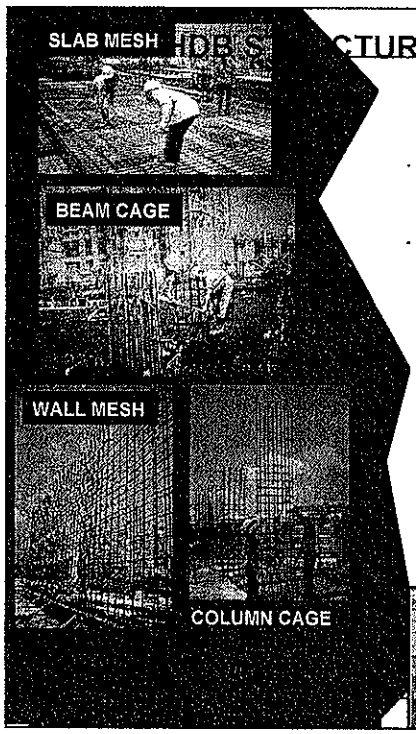
1) BUILDABILITY

ADOPT PREFABRICATION IN CONSTRUCTION
- - PREFABRICATED REINFORCEMENTS
- - HDB PRECAST BUILDING SYSTEM

2) SUSTAINABILTY

- CONCRETE USAGE INDEX (CUI)
- HDB CONCRETE REDUCTION MEASURES (CRM)

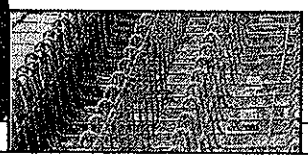


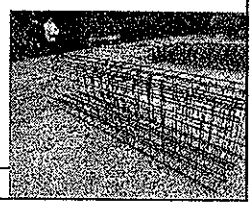


CTURES - DESIGN FOR BUILDABILITY

- Minimum Buildability Score of 80 to be achieved.
- Extensive use of Prefabrication to save labour and increase site productivity.

Prefabricated Reinforcements
- Beam Cages
- Column Cages
- Welded Mesh

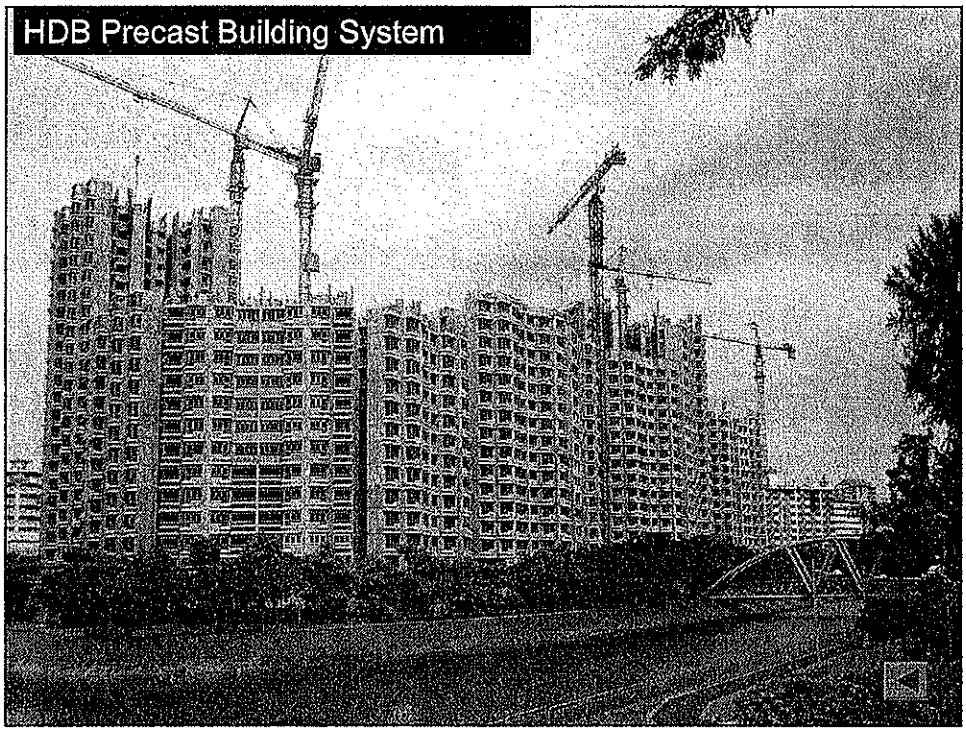


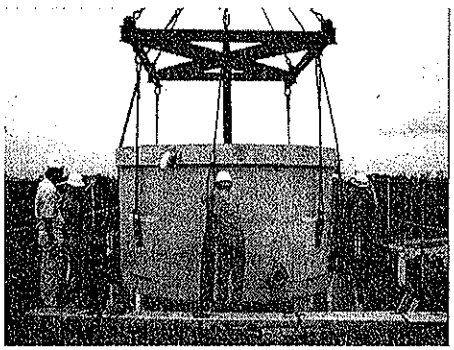


PREFABRICATION THRU' PRECAST

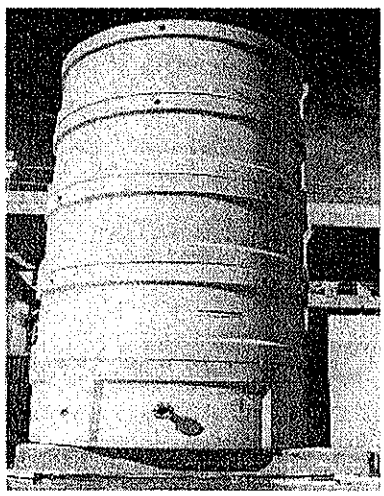
- Precast Column Beam Slab (PCBS) System
- PC Planks with CIS topping
- PC Envelope (Facades / Gable End Walls)
- Standard PC Elements (Refuse Chutes / Watertanks / Staircases)
  < 20 Sty – PC Watertanks
  ≥ 20 Sty – PC Segmental Ring Tanks
  (Cast In-Situ Watertanks not allowed)
- Multi-tier PC Columns
- PC Internal Elements (PC infilled walls / PC partition walls)
- PC Volumetric Household Shelters with hollow-core wall system
- PC Structural Walls (Lift walls / Staircase Walls / Hollow Core Walls)

HDB Precast Building System

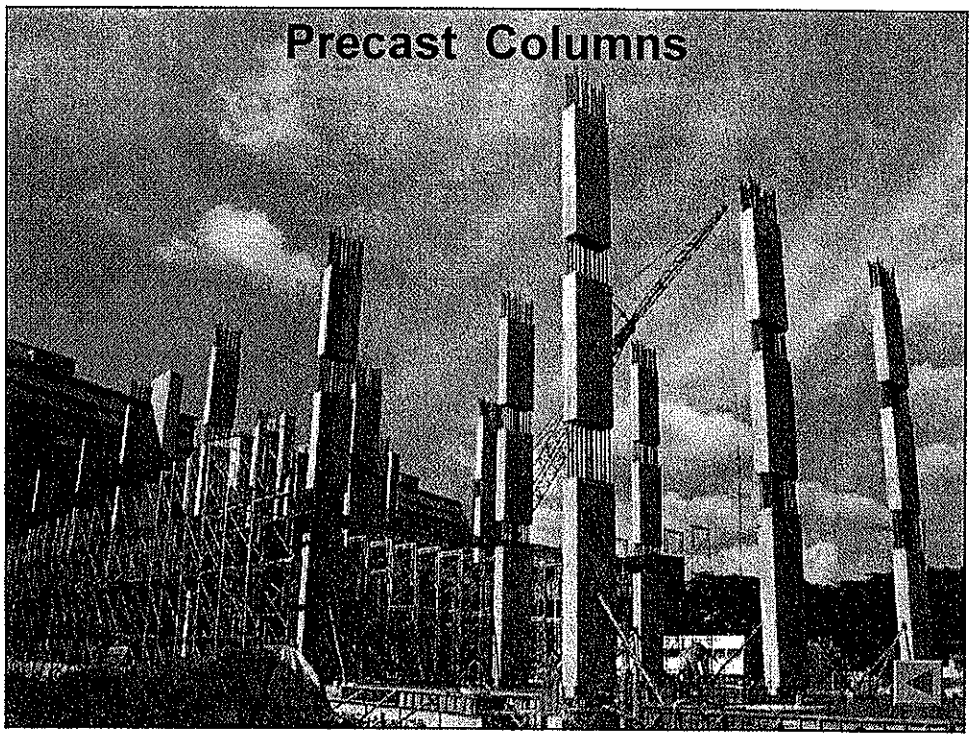




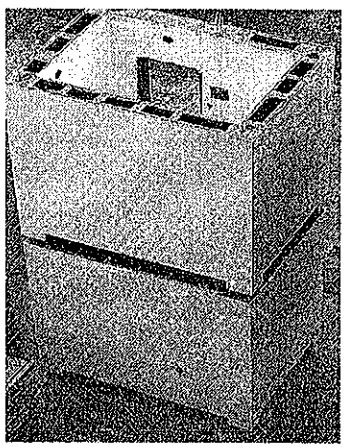
PC Watertank
< 20 Sty Blk



PC Segmental Ring Tanks
≥ 20 Sty Blk

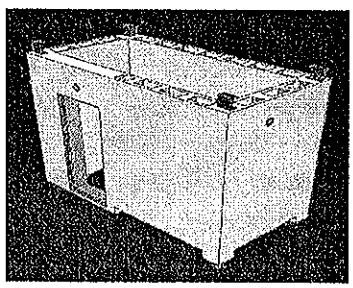


PRECAST HOLLOW-CORE ELEMENTS



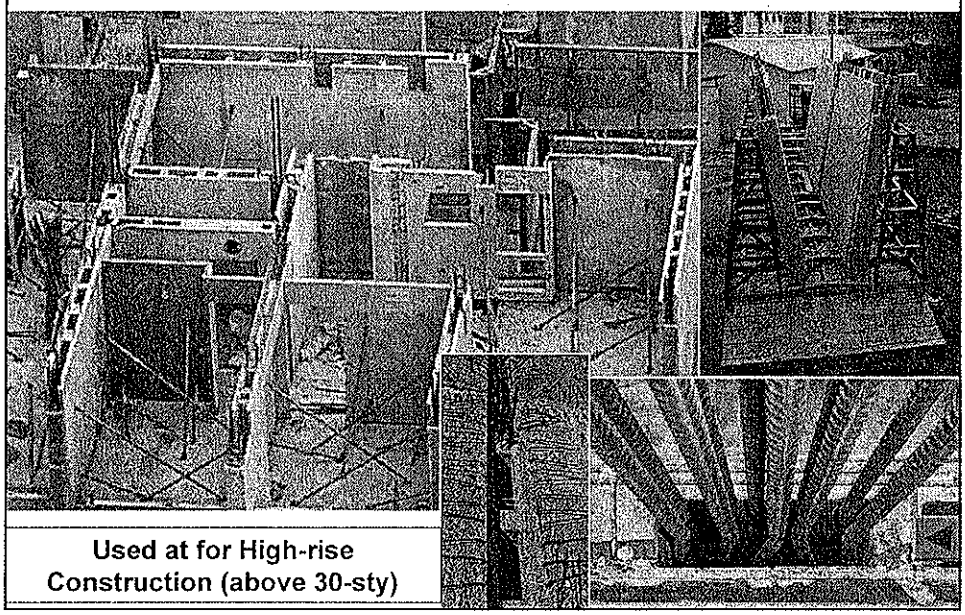
Reduce Component Weight

Increase Site Productivity



Precast Hollow Core Household Shelters

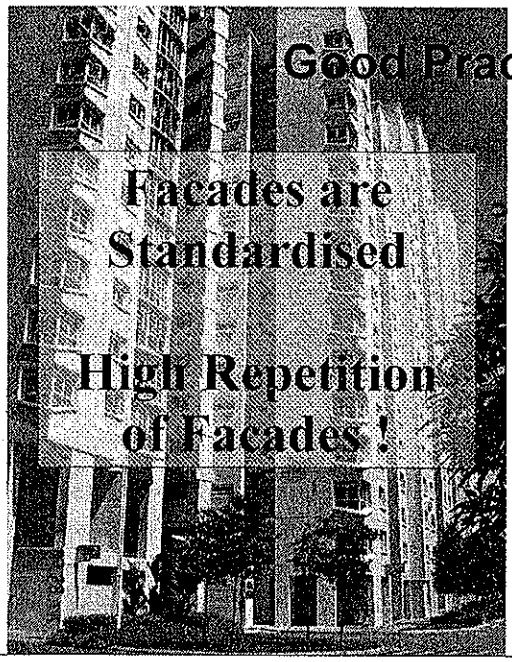
Precast Hollow Core Wall



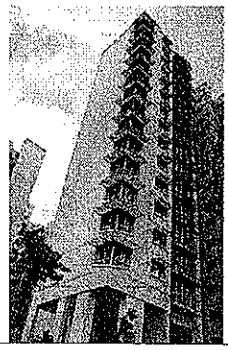
Used at for High-rise Construction (above 30-sty)

PRECAST CONCRETE (DESIGN GUIDE)

- Minimum 70% Precast Implementation
- 10 days and less short construction cycle time
- Minimum 100 repetitions for each type of PC Facades to achieve cost efficiency of moulds
- PC Components simplified to achieve high repetition / standardisation
- Number of different types of PC components per floor to be optimised
- Integrate small panels into larger size components



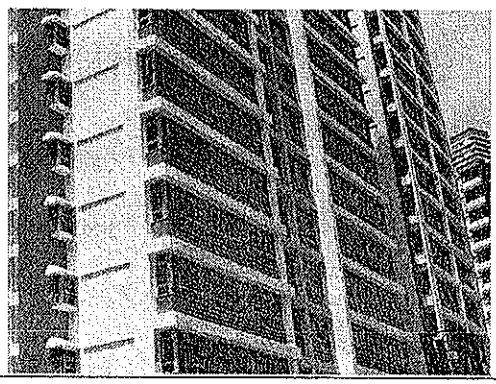


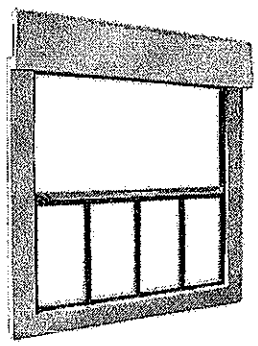


Max. Repetitions -Minimum 100 Repetition for each Façade Type

PRECAST FACADES (CIWs)

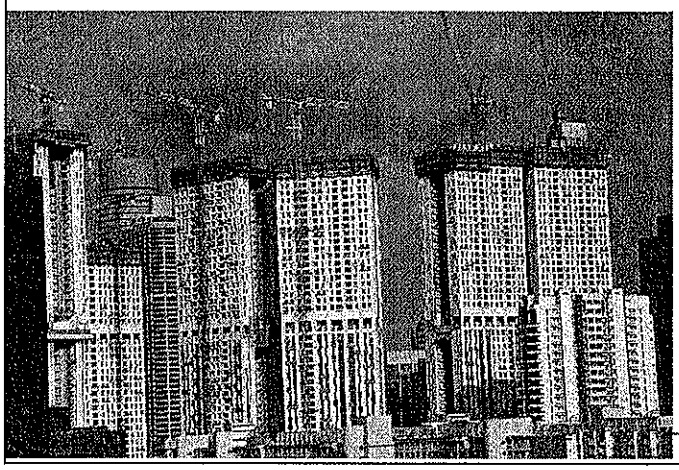
- PC Facades Designed for Cast in Aluminium Window Frames
- Linking Concrete Elements All Round Aluminium Window Frame
- PC Facade to provide the necessary rigidity and stiffness for handling and installation

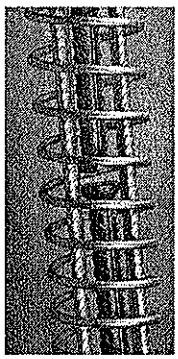




PRECAST COLUMNS / WALLS

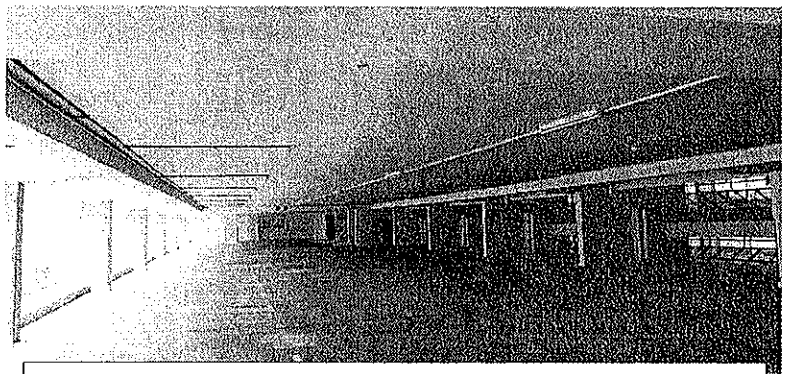
- Precast Columns (Grade 50) eliminate need for external scaffold
- Column connection uses HDB Spiral Connectors (with SS mortar grout Grade 70)





MSCP / CARPARK STRUCTURE

- Semi Precast Structural System
- Precast Prestressed Concrete Floor Plank System adopted for the design



- No Internal Columns - only Peripheral Columns to Create Wide Span MSCP Structure

DESIGN FOR SUSTAINABILITY

CONCRETE USAGE INDEX (CUI)

BCA Sustainable Construction Initiatives

- Concrete Usage Index (CUI) is the volume of concrete (m^3) used to construct the superstructure divided by its constructed floor area (m^2)
- CUI for projects tendered in 2009 shall not exceed 0.44 m^3/m^2



DESIGN FOR SUSTAINABILITY

HDB CONCRETE REDUCTION MEASURES (CRM)

STRUCTURE

Slabs
- Thinner Slabs
- Roof Slab - use folds at beam locations etc.

Beams
- 250mm x 500mm (B x D)

Column
- 250mm Column Width
- Column Size Reduction at Every 4 sty



THANK YOU



Engineering – Electrical & Mechanical Services

Mr Cheng Khay Ping
Senior Executive Engineer

Contents

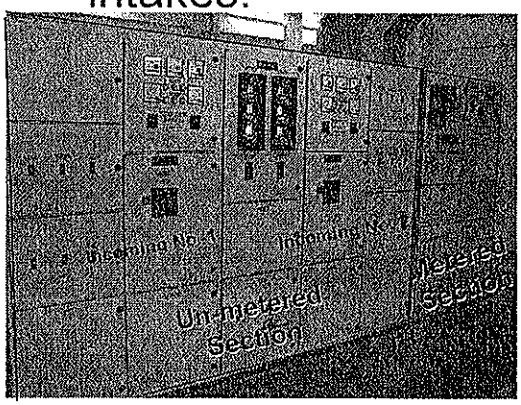
- Electrical Services
- Mechanical Services
- Lift Installations
- Lift Monitoring

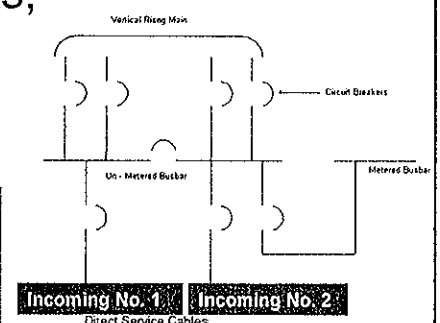
Electrical Services

- For rental blocks, wirings in surface trunking or conduits.
- For sold blocks, wirings in concealed PVC conduits.

Electrical Services

- For residential blocks, busbar coupler separating the two intakes.

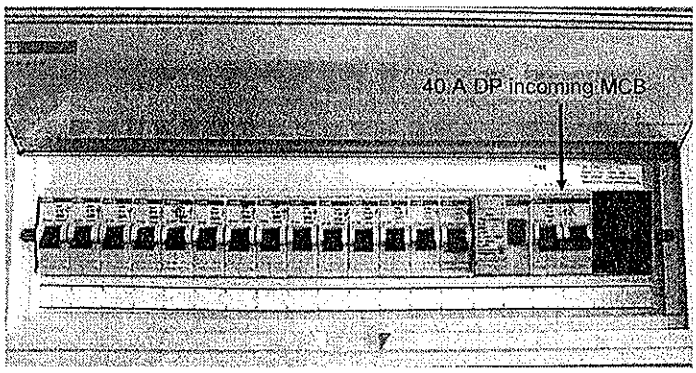




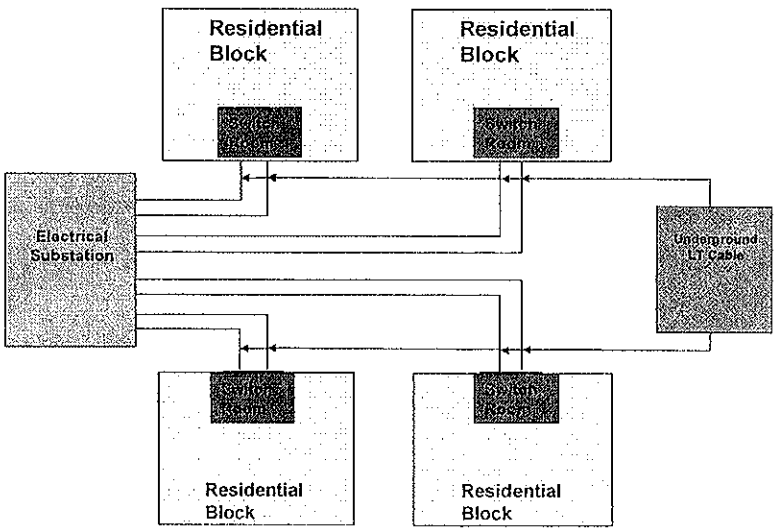
Applied Load	Main Incoming MCCB rating
Below 276 KVA	300A
Between 276 and 414 KVA	400A
Between 414 and 552 KVA	600A
Above 552 KVA	800A

Electrical Services

- Recommended load requirements for each type of flats differ and ranged from 3.5 KVA to 4.5 KVA per unit.
- For each flat, 40 A DP incoming MCB.



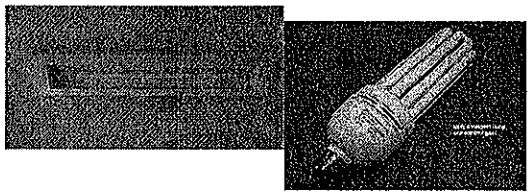
Electrical Services



Schematic Diagram of an HDB underground LT cable network

Electrical Services

- Use T5 fluorescent luminaires with electronic ballast in common areas, service rooms and multi-storey carparks.
- Use High Powered Compact Fluorescent (HPCF) lamps in outdoor areas where the lighting columns are 6 m and below.

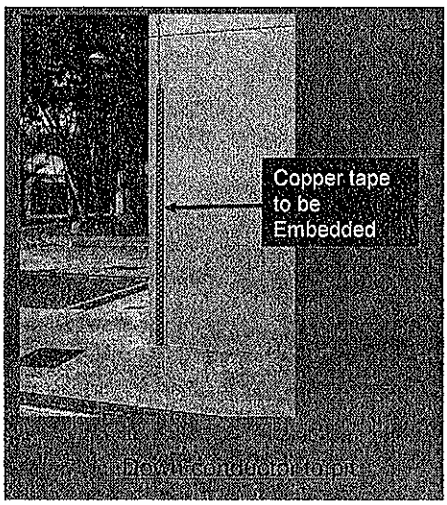


cp. 55 631

- HDB's lighting level requirements are in the Public Housing Design Guide (M & E).

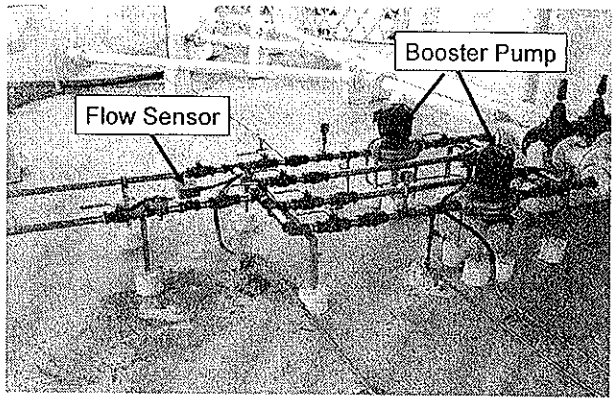
Electrical Services

- If automatic fire alarm system is required in MSCP, manual callpoints not required in carpark deck.
- Down conductors on the external wall and/or column, except the lower end.



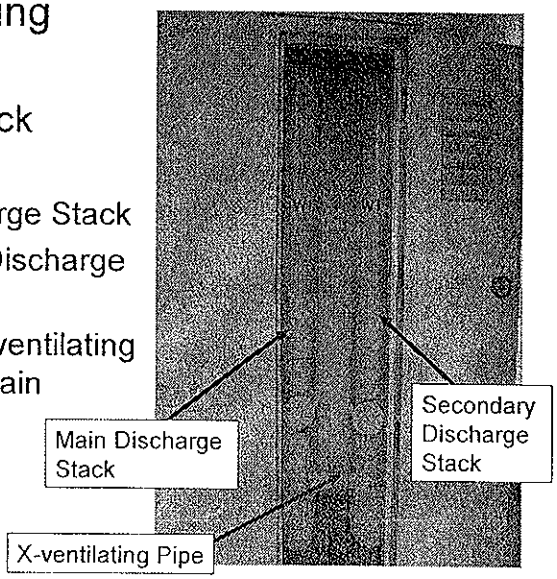
Mechanical Services

- Water Supply System
  - Booster Pumping System @ rooftop
    - To increase water supply pressure of top storeys dwelling units
    - Operation of booster pump is controlled by flow sensor when there is demand of water



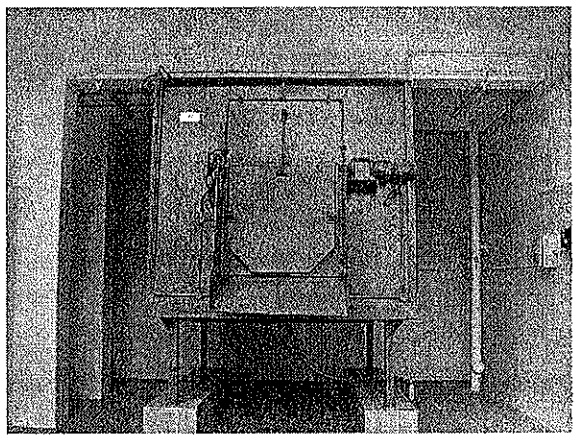
Mechanical Services

- Sanitary Plumbing System
  - Ventilated Stack System
    - Main Discharge Stack
    - Secondary Discharge Stack
    - Adequate x-ventilating pipes @ certain storeys



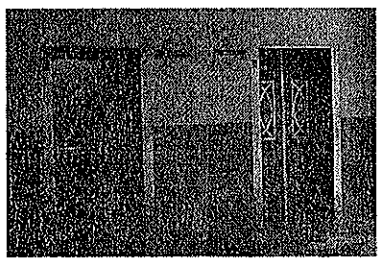
Mechanical Services

- Centralised Refuse Collection System
  - Refuse Handling Equipment @ 1st storey



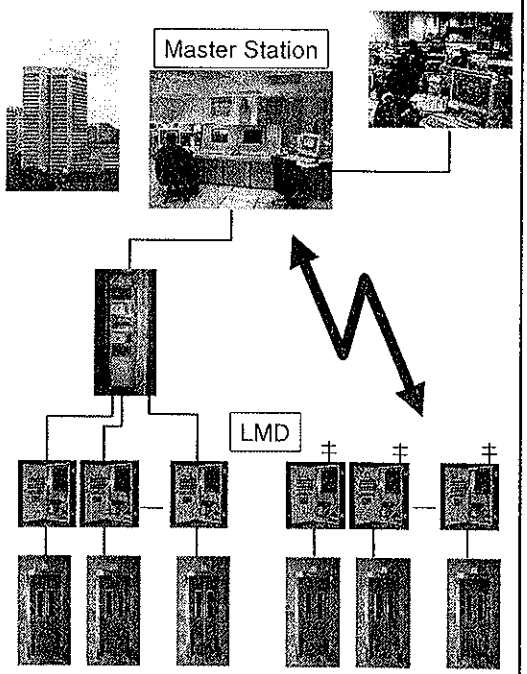
Lift Installations

- Supply and installations of lifts are outside scope of building contracts.
- Propose the location, type and number of lifts to be provided.
- Lift Traffic Analysis to be carried out.



Lift Monitoring

- Lift Monitoring Device (LMD), connected to the Master station via GPRS network or telephone leased line.
- Provide telephone point at the lift machine room/TMS closet and cables.





Construction Safety

Presented By : SE Ng Chun Tat
Building Technology Department

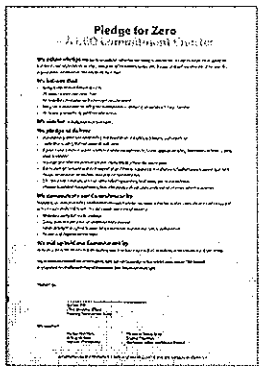


Contents

- HDB Commitment
- Consultant's Role
  - Design Stage
  - Construction Stage
- Performance Assessment

HDB Commitment

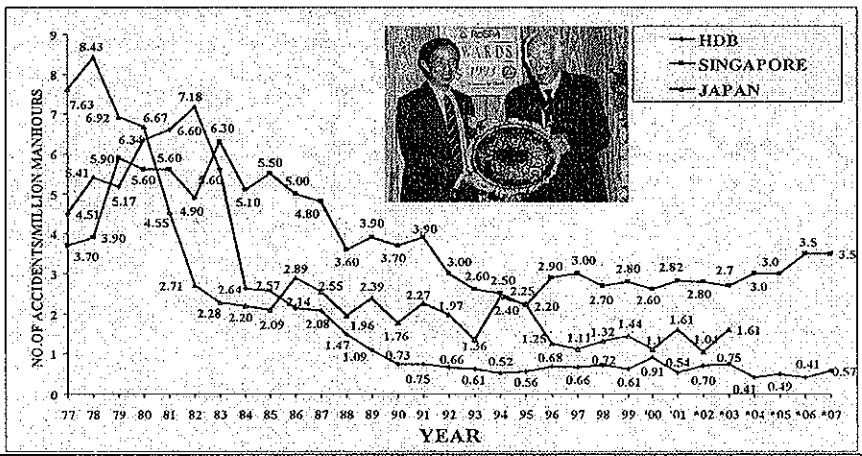




- **Pledge for Zero – A CEO Commitment Charter**
- **33 CEOs pledged their commitment to raise Singapore safety standards to world class levels.**

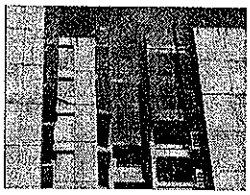
HDB Commitment

- Zero Fatality in HDB Projects
- AFR of 0.68 or better



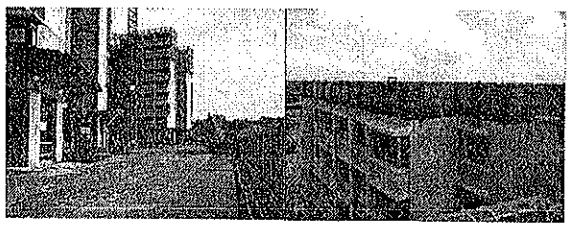
Consultant's Role

- Design Stage
  - Eliminate use of scaffold to do construction (No protrusion/cantilever design that required use of scaffold)
  - Risk Management to ensure design is easy to construct and maintain



Consultant's Role

- Construction Stage
  - Construction Safety Management Briefing (1month after LA)
  - Pre-hoisting Briefing (Prior to 1st lifting operation on site)
  - Safety & Housekeeping assessment on Contractor
  - Ensuring compliance to HDB specifications
  - Focus on 3 critical items
    - Fall From Height
    - Falling Objects
    - HouseKeeping



Consultant's Role

- Construction stage -HDB Specifications
  - Building Specifications
    - Clause 1.1.26 (Employment of Site Personnel)
    - Clause 1.1.65 (Schedule Of PE Submission)
    - Clause 1.4 (Construction Equipment)
    - Clause 1.5 (Safety Measures)
  - Upgrading Specifications
    - Clause 1.3.3 (Employment of Site Personnel)
    - Clause 1.5.12 (Use of Mobile Working Platform for External Works)
    - Clause 1.5.13 (Bell System for P/M Hoist)
    - Clause 1.8 (Construction Equipment)
    - Clause 1.9 (Safety Measures)

Performance Assessment

- Thru' HDB construction audit

