Health Facility Planning Seminar for Hospital and Health Managers
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MALAYSIA

DESIGN DEVELOPMENT PROCESS AND USER INVOLVEMENT in Healthcare Projects

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- Introduction
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- Understanding the Role of Users in DESIGN DEVELOPMENT, CONSTRUCTION and COMMISSIONING stages
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Introduction

- Provision of a hospital or any healthcare buildings as a facility is a concerted team effort from initiation till its successful operation.
- The hospital building project, as a facility project, has a multi-faceted clientele as the customer or user-client; the design team as the professional technical adviser and consultant; as well as the contracting team as the builder and supplier.

Introduction

- The goal is to achieve a well balance facility that address the needs of the community it serves, provide the service appropriate to the level of care envisaged, sustainable in its operation and maintenance; as well as having aesthetically pleasing /healing/caring environment for users or user-client.

Essence of Hospital Project

- The Client/ Users
- Complexity
- Change
- Cost
- VE

The Client/User-Client

- The '**client**' for whom the hospital projects are planned and designed for are made up of many users of various discipline and hierarchy.

The MoH

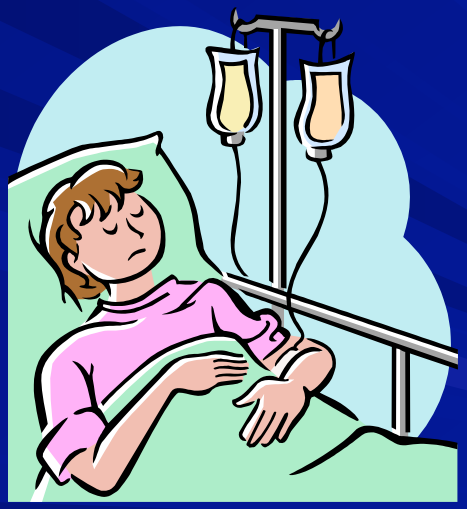
The State Health Office

Visitors, Relatives, Maintenance

The Client/User

- In hospital or any medical or healthcare facilities , the ultimate client or end-user of the facility as the customer, ……is the PATIENT.

Age
Gender
Ethnic
Background
Disease/ailments
Needs
Fears



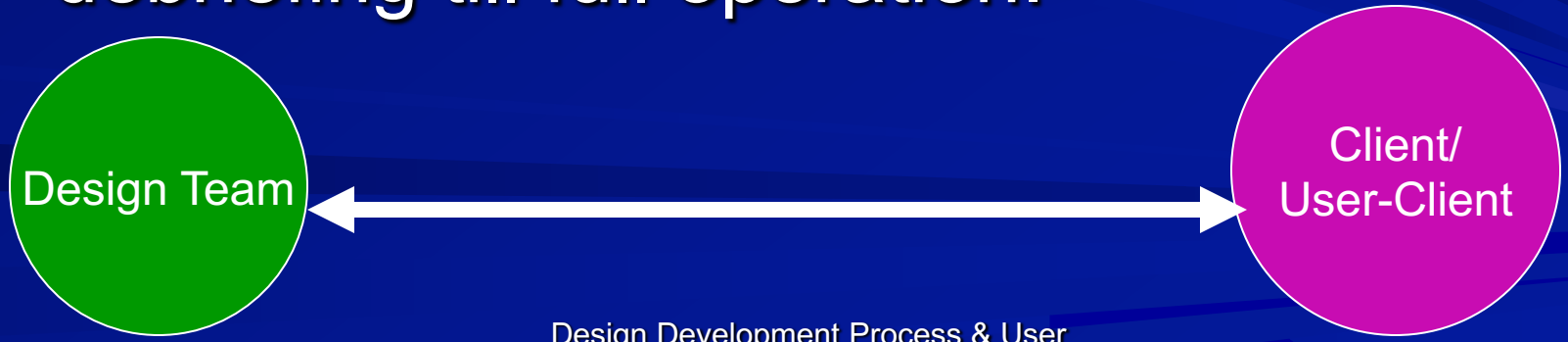
The Client/User

- Other client include the caregivers i.e. the clinical and non-clinical staff of the hospital; the relatives , the visitors, the maintenance team and some time the medical and nursing students.

- The better the facility is planned and designed for these clients the better their performances and well being will be in their health outcome.

The Client/User

- In order to meet the needs of the User-Client, the Design Team, who are made up of architects, health facility planners, equipment planner and engineers, must be able to communicate and work well with the User-Client from the process of debriefing till full operation.



The Client/User

- Every decision made in the interaction is important for the progress and outcome of the project. Thus everyone must be present with readiness!
- MoH, identifies ‘Client’ or Users as
  - ‘User-Client’ for ultimate users and
  - ‘Corporate Client’ for the provider based on hierarchy, authority, discipline and expertise.

The Client/User

- MoH had assigned appropriate ‘User-Client’ for the different stages of the interaction with the Design Team.
- These “User-Clients” are given a term of reference (TOR) and entrusted authority in the decision making for the progress of the project.

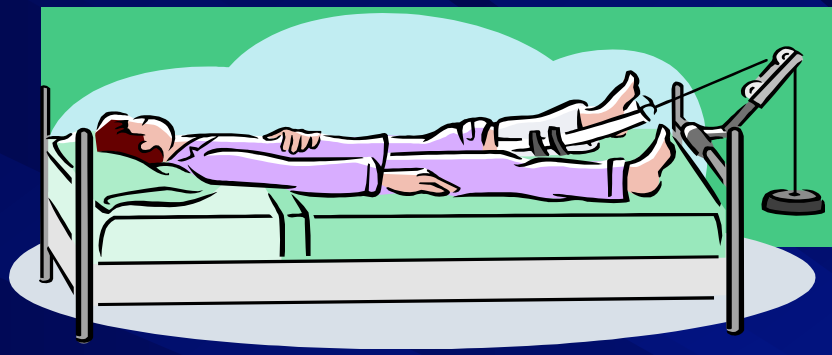
MoH 'User-Client' tasks

- as Corporate Client provides the parameters of the scope of work within the level of care and services approved by central agencies including MoH policies and guidelines.
- on staffing, logistics, referrals, etc
- i.e. the chosen personnel for the designated hospital (for new or redevelopment project) to interact at overall and departmental level within identified scope of work)

- While the Design Team need to understand the Users of the hospital in their interpretation of the Brief to Design;

  the 'User-Client' also need

  - to understand the language or medium used by the Design Team in their presentation through ability to read drawings, and documents;
  - understand project and technical terminologies used; apart from
  - orientating themselves to alternative concepts presented prior acceptance.

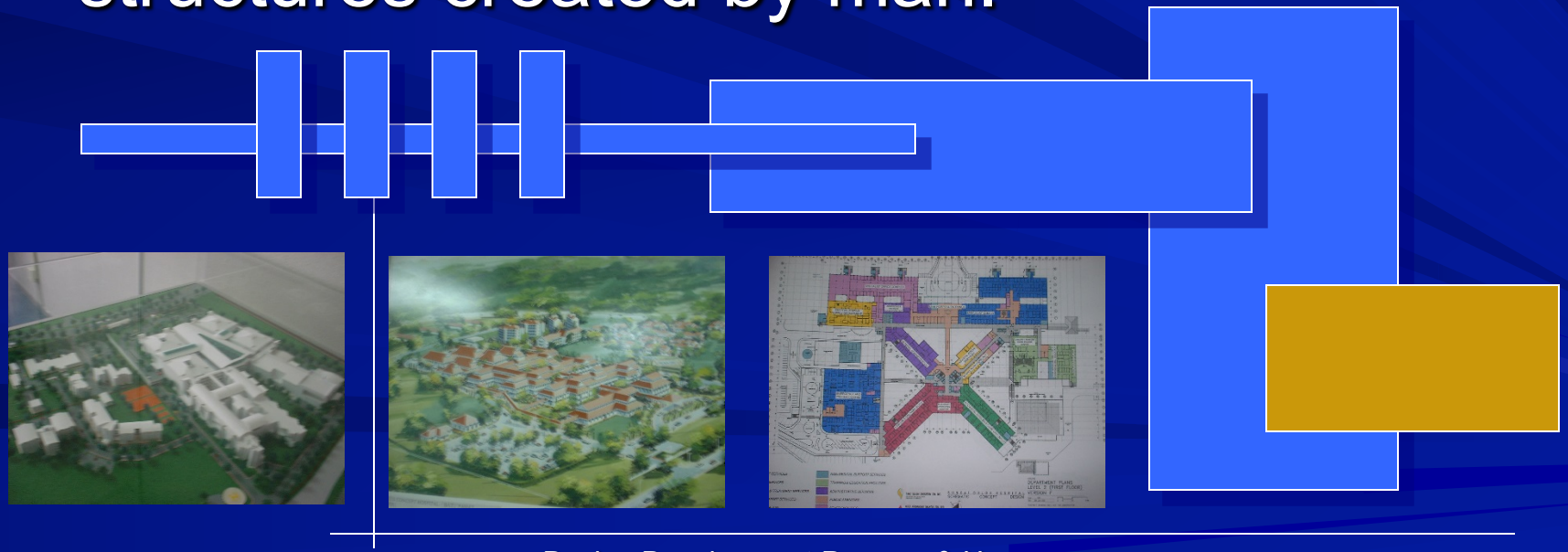


The User-Patient

- The Patient, at this point, is not directly involved in the user team.
- Patients are referred to as the catchment population with identified demography and disease trend captured through or from existing and the region hospital and national statistics.
- Needs of individual patients are priorities by clinical and functional needs before emotional and psychological needs.
- Update feedback are gathered from the Hospital Team from whence the project were initiated.
- The MoH will guide through as per overall policy.

Complexity

- The degree of **complexity** of the hospital design problem is already manifested universally as among the most complex structures created by man.



Complexity

- All design involves compromises;

- it always involves finding the best possible balance of many factors, many of which in conflict or in competition with each other.

Complexity

- Clinical facilities present itself in a most extreme balancing trick. Other than **quality, cost** and simply **scope** to comply with, there are other more difficult and subtle planning factors to be resolved - i.e, functional, operational, technical, demands of modern medical and nursing care ,etc…. including the non negotiable requirements of fire safety, sterility, and culture.

Change

- Rate of **change** in health care is a common phenomena. Hence the Design Team need to ensure that the hospital can accommodate growth, change and some time encourage evolution in itself.
- The design ,hence, must be expandable , robust, versatile, indeterminacy and over-capacity (justified projection).

Change

- The MoH, as Corporate Client should based facility projects on a broad vision with wider value and projections. The national health services plan for 5 year-20 years span should augur well in the projected planning of any facility to take care of changes.
- User-Client should be informed of these projections and reflected in the decision making if there is a need to accommodate change.

Cost

- Hospitals are among the most expensive buildings that community needs to fund.
- Technical complexity, high level of engineering services, and necessary expensive equipment made up the capital cost whereby the required staff and maintenance required of that facility will determine the recurring operational cost.

Cost

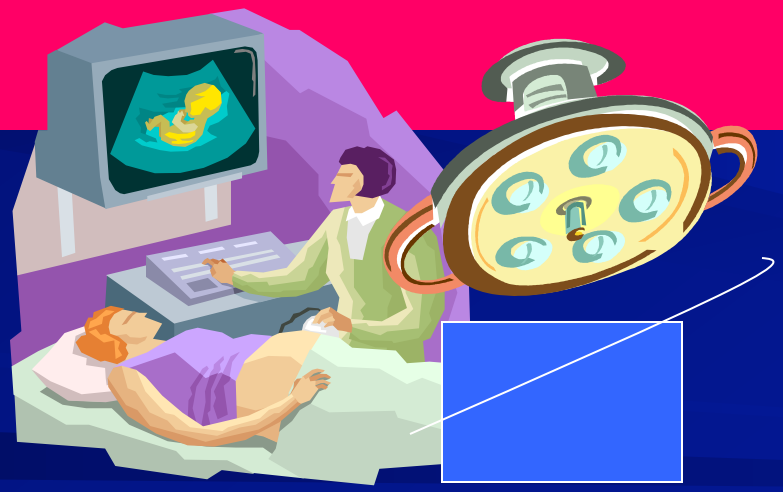
- As a cautionary remark..due to set COSTING…..there are tendencies for the Design Team to minimise cost by reducing areas, simplifying details, sharing areas at the expense of functions and needs !!!!!!

Value Management (VM) in public projects

- EPU has mandated VM in public projects valued at RM50 million and above (EPU Circular 2009)
- VM intervention in projects are as follows:
  - Value Assessment (VA)at strategic planning stage
  - Value Engineering (VE) at Design Stage
  - Value Review (VR) at Use Stage.

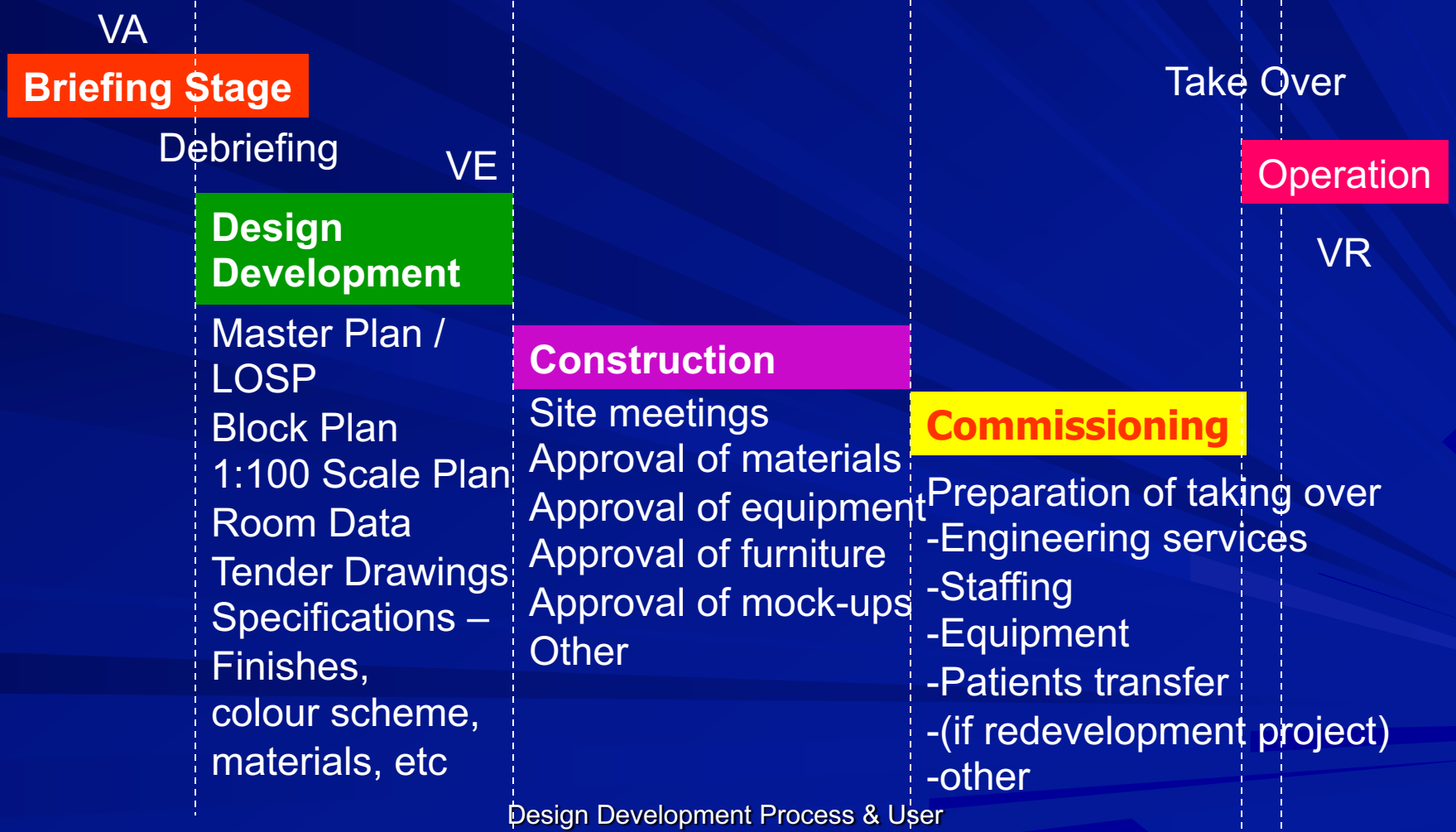
Source: JKR (2013) Value Engineering Application Guidelines for Public Project. Prokom

Understanding the Role of Users in DESIGN DEVELOPMENT PROCESS, CONSTRUCTION and COMMISSIONING stages



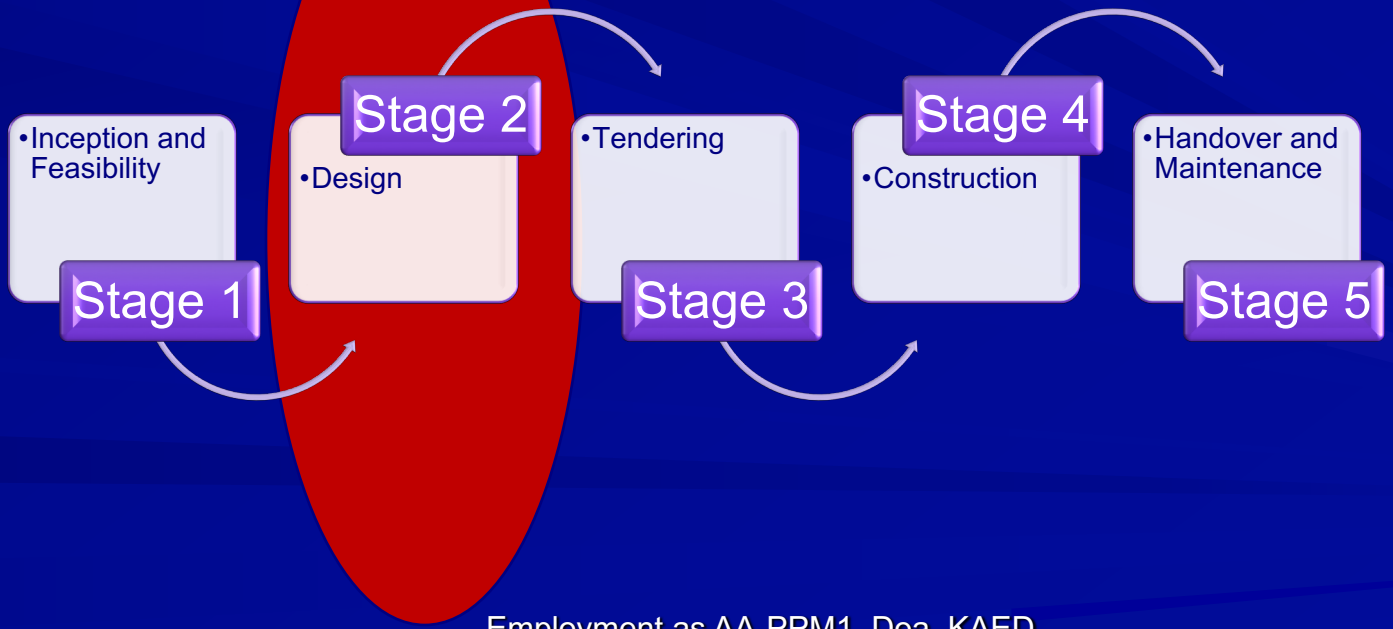
In Hospital Project

Stages of Hospital Projects (conventional)



DESIGN DEVELOPMENT STAGE

- Design Development is the stage after Inception and feasibility, before tendering, for TRADITIONAL process.

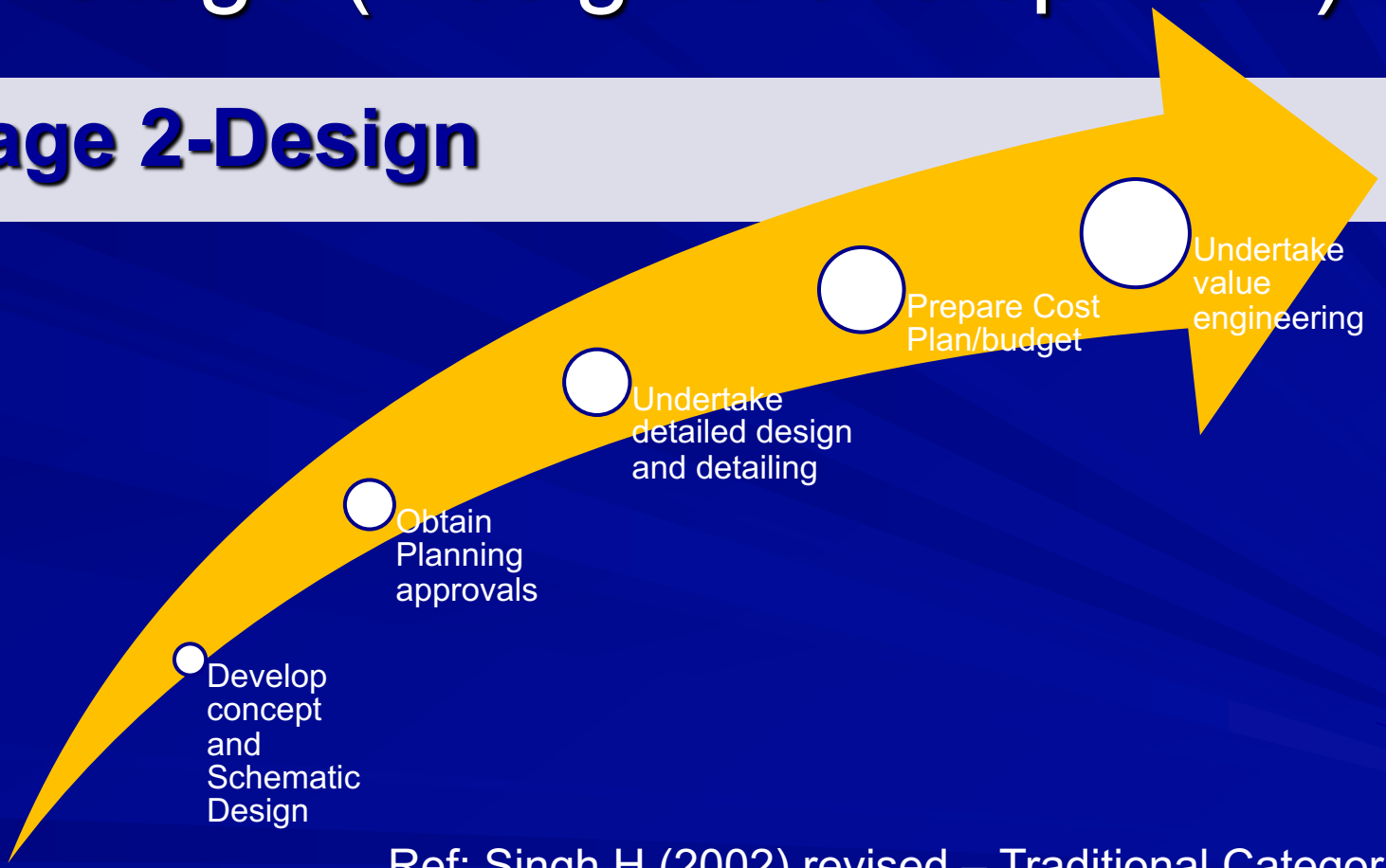


DESIGN DEVELOPMENT STAGE

- In PACKAGE DEAL or MANAGEMENT CONTRACT, Design Development is carried out after the initial agreement of the concept and cost .

Outline and Detailed Proposal Stage (Design Development)

Stage 2-Design



Ref: Singh.H (2002) revised – Traditional Categorization

Users' Role in DESIGN DEVELOPMENT PROCESS stages

In Hospital Projects

Sub-STAGES IN DESIGN DEVELOPMENT

Concept Plan

Master Plan / LOSP (LayOut Site Plan)
Block Plan

Sketch / Schematic Plan

Departmental layout plan
Adjacencies

Detail Drawing / Working Drawing

1:100 Scale Plan
Room Data
Tender Drawings
Specifications - Finishes, colour scheme, materials, etc

Design Development

- **Design Development** is a stage prior to tender documentation and construction.
- It is a stage **after** the formulation of the Design Brief by the Briefing Team (i.e. End Users, Planners and Architects) and starts during the debriefing stage .
- Design development is carried out **by the Design Team** of Architects , Engineers and Cost Consultants /Quantity Surveyors **with input from Users** in a formal interaction.

People involved in design development stages

- Developer/Owner
- Project Manager
- Architect
- Engineers
- Quantity Surveyor
- Town Planner
- Other Specialists
- Regulatory bodies
- Contractor for Turnkey/Management /Construction (where relevant)

People involved in design development stages

- Developer/Owner – provide BRIEF or statement of needs
- Project Manager – manage the project (in non traditional contract)
- Architect – planning, design and lead in the project development
- Engineers (C &S- civil (infrastructural works-roads, drains, hillslope, etc) and structure – substructure and superstructure
- Quantity Surveyor – cost planning
- Town Planner – advise on land use, merger, convert, plot ratio
- Other Specialists – Urban design, landscape, acoustic specialist, stage designers, …..
- Regulatory bodies – fire department, aviation department, radiation dept, waterworks, power supply, environment,,etc
- Contractor for Turnkey/Management /Construction (where relevant)

- In physical planning and design development, User-Client are involved from
  - the Site Zoning and eventual master-plan;
  - Building Massing /building types i.e. high rise or low rise;
  - Departmental adjacencies (location);
  - Whole Hospital policies that governed the overall site and dictates traffic flow i.e. porterage, supplies & disposal.
  - Detail layout, Room Data and Equipping!!

Design Development

- Stages in design development involve **many influencing factors of experience, culture, technology, common sense and other** on the part of the Design Team and User-Client.

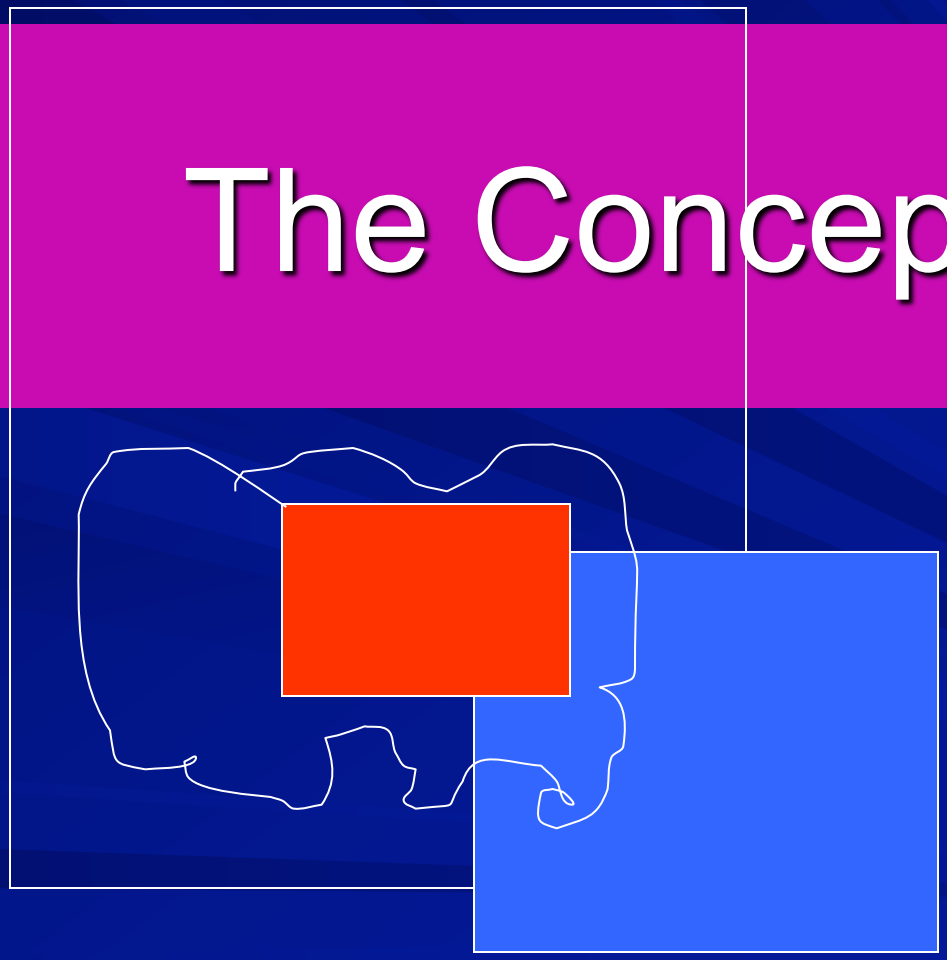
- Users at this stage are **End-Users of the facility being developed i.e. the Hospital Team together with the Corporate Client i.e. MoH and The State Health Office. Expert individuals will be called upon as required to assist in the decision making.**

Design Development

- Design Development is a process of formulating design for the purpose of construction of a **functional** facility. Aesthetic is essential after function is fulfilled.
- The focus of Design in hospitals or any health facility is for Patient Care. Hence the ultimate client are patients and those that supports patient care i.e. the staff , the procedures, the maintenance ,other.

Understanding the language of the Design Team

The Concept Plan



The Concept Plan

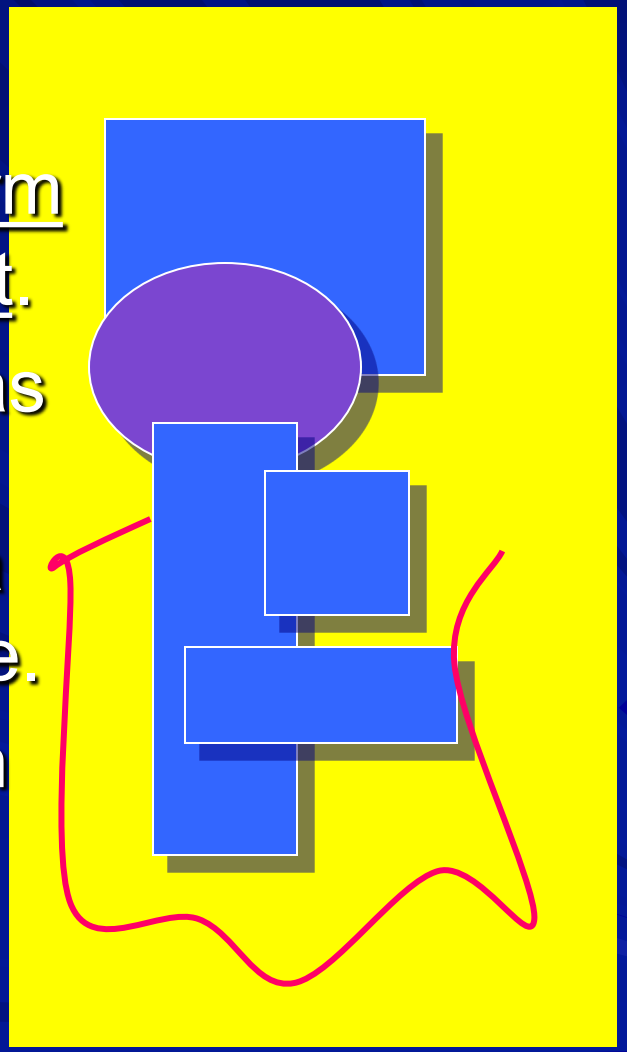
- The conceptual realisation of the project involves assimilation of the **design brief** by the Design Team from different levels as stated below :

- the Site
- the Building Complex
- the Department
- the Suite
- the Room
- the Individual Space

In a sense , there is a progression from a broad perspective to micro level , layer by layer, parallel to designers progression of work from master site planning all the way to the design of individual space.

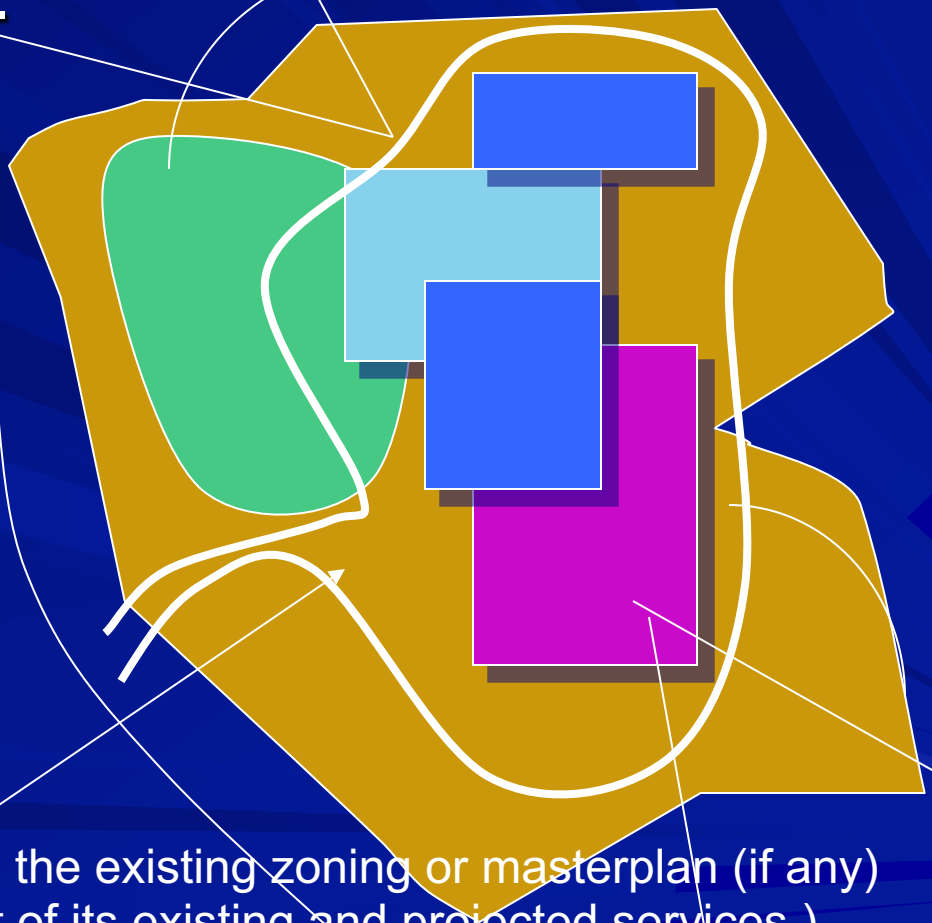
(the stages applies for both new hospital or redevelopment projects)

- **Concept plan** is actually drawings shown on the initial approach taken by designers to portray client/user needs in principle form in new or redevelopment project.
- No firm lines or build up form has been decided. The design is therefore considered as still in a fluid state and subject to change.
- Normally these are presented in **colourful mode** in the form of perspectives drawings, zoning plans and tentative elevations including design concept write up.



Zoning Plan - **for the site plan**

- Analysis of the site- its constraints and advantages, buildable area available ; external traffic flow; etc - as required by the **Master-plan** Brief.

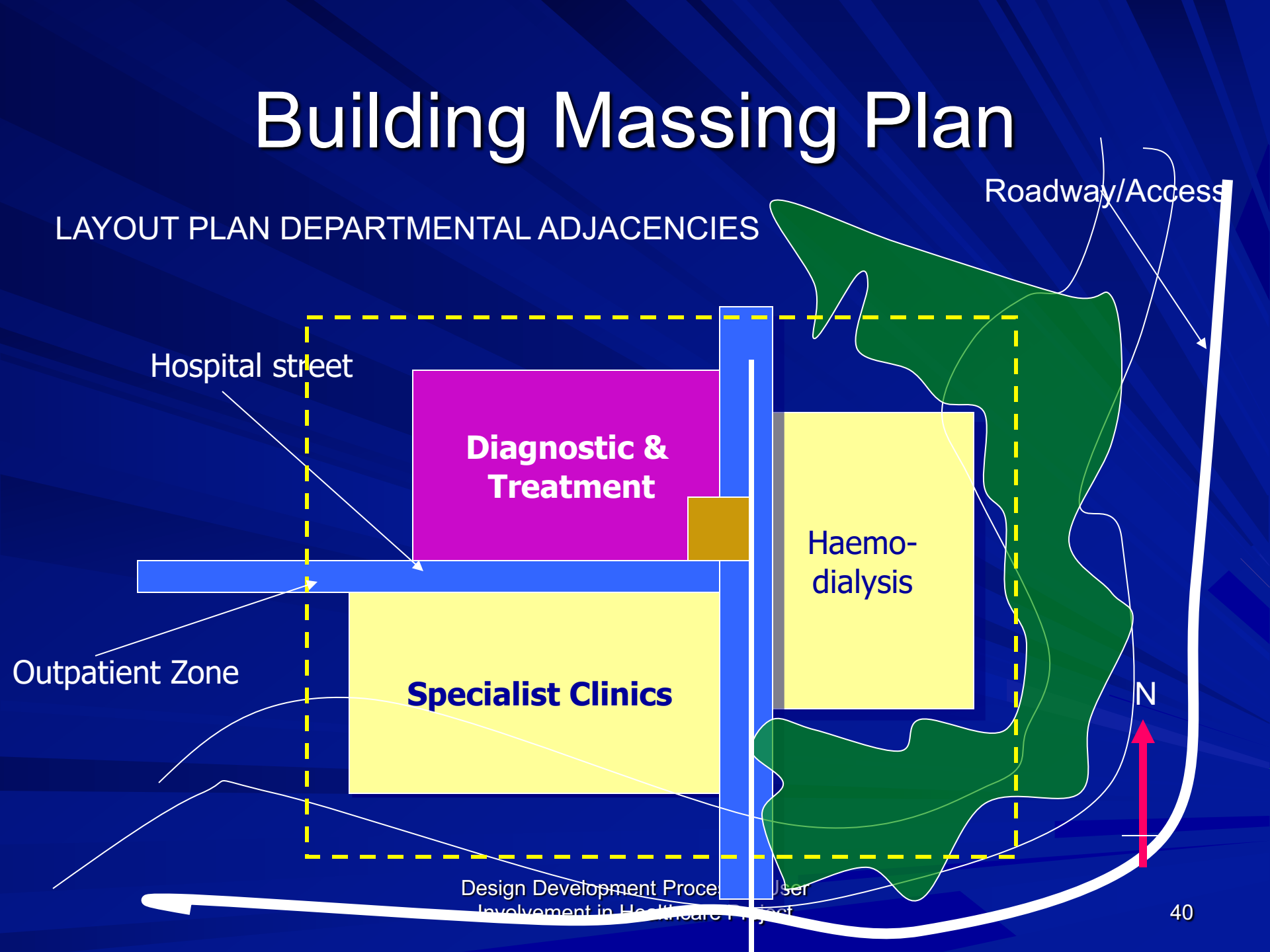


(In upgrading or redevelopment project, the existing zoning or masterplan (if any) should be reviewed physically in respect of its existing and projected services.)

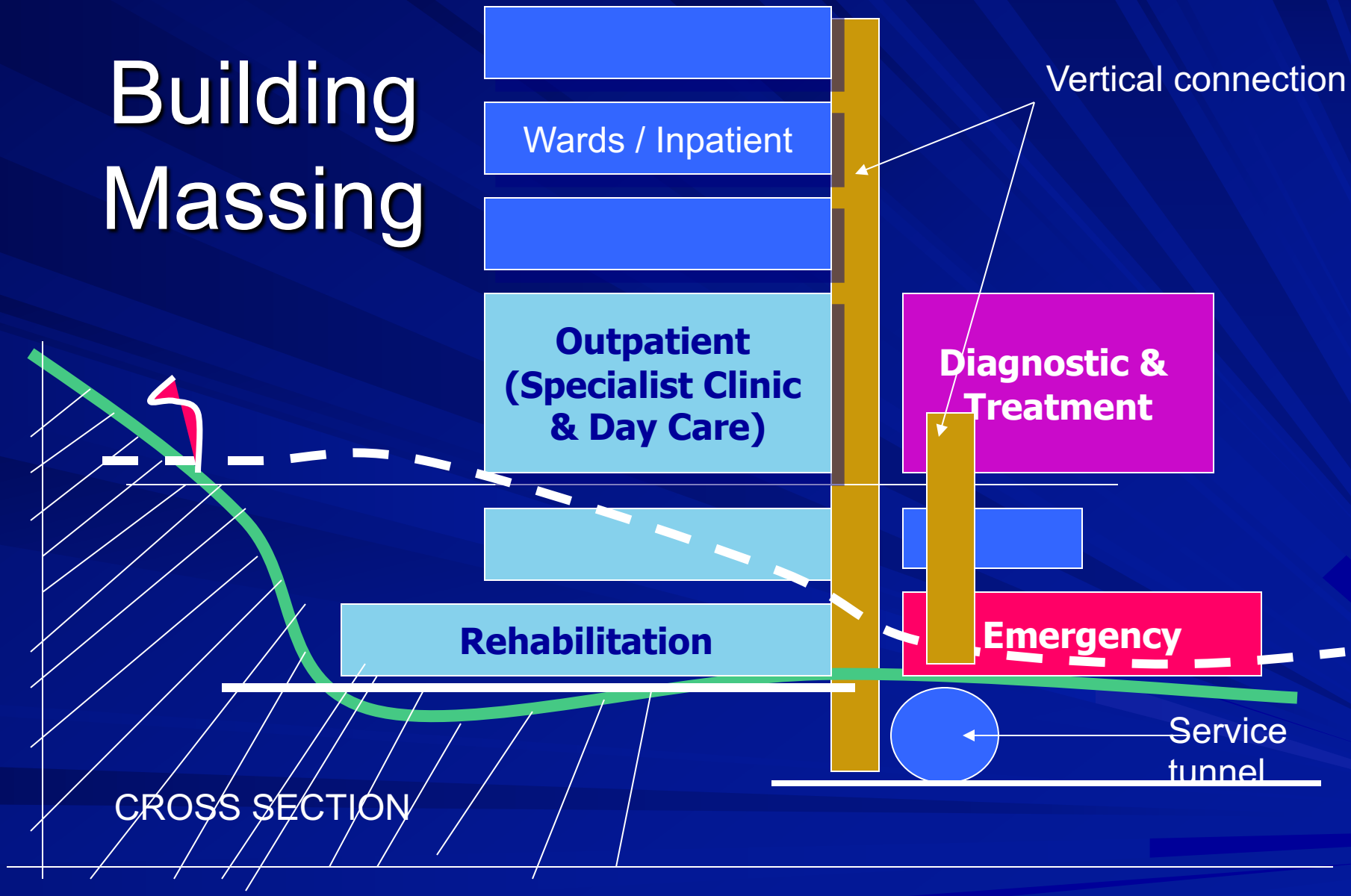
Building Massing Plan

- Building Massing plan includes ‘bubble diagrams’
  - in locating respective departments on the site plan,
  - its vertical and horizontal relationship, low rise and high-rise concept,
  - the engineering spatial requirements - concept or system;
  - inter departmental traffic flow, security and fire safety i.e. as a the **building complex requirements;**

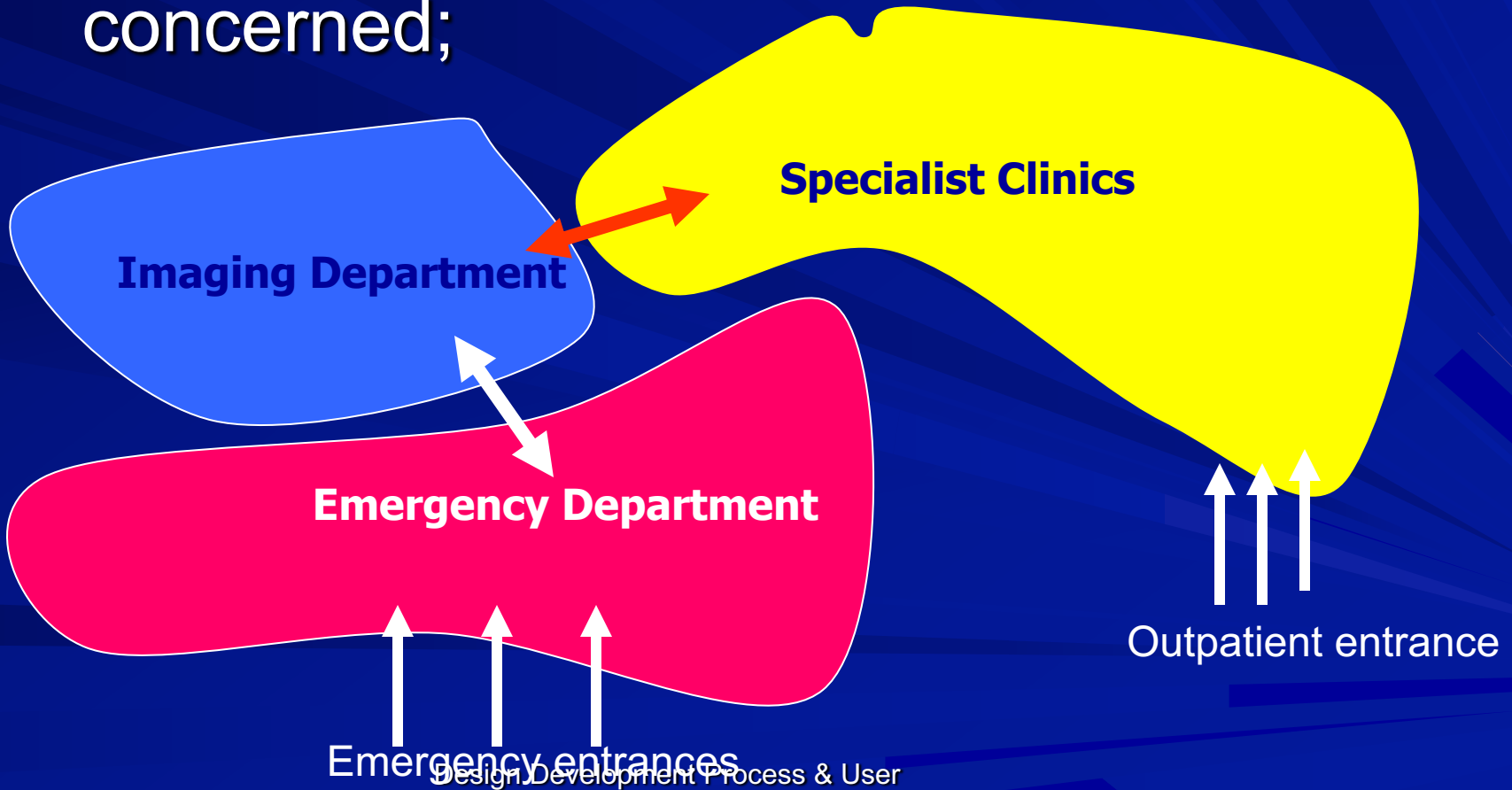
Building Massing Plan



Building Massing

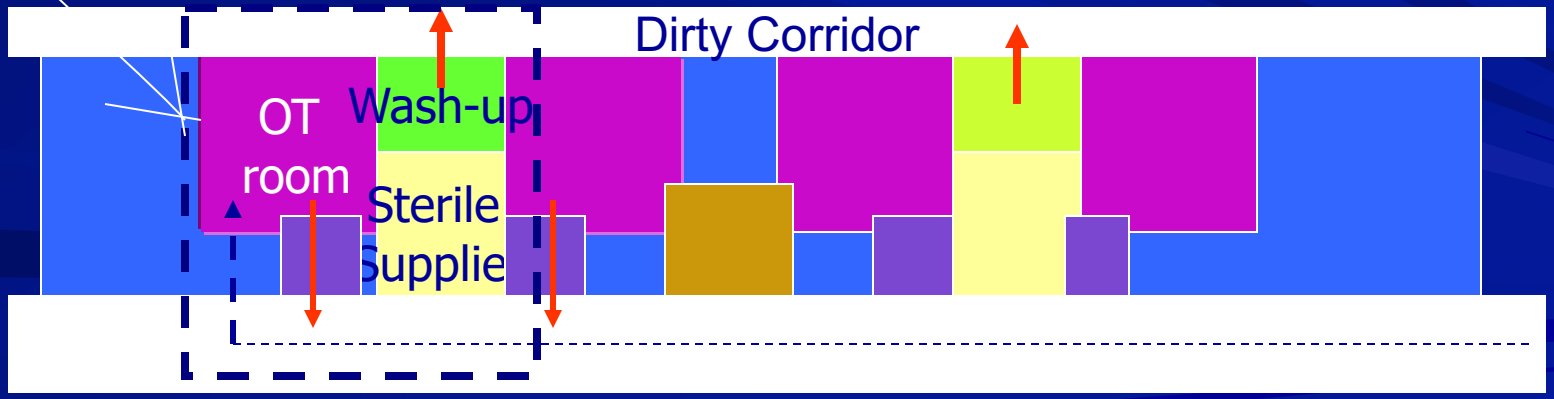


- **Departments** are still conceived as individual blocks per department or ‘bubbles’ as far as this stage is concerned;



Relationship of individual space to Department and Building Mass

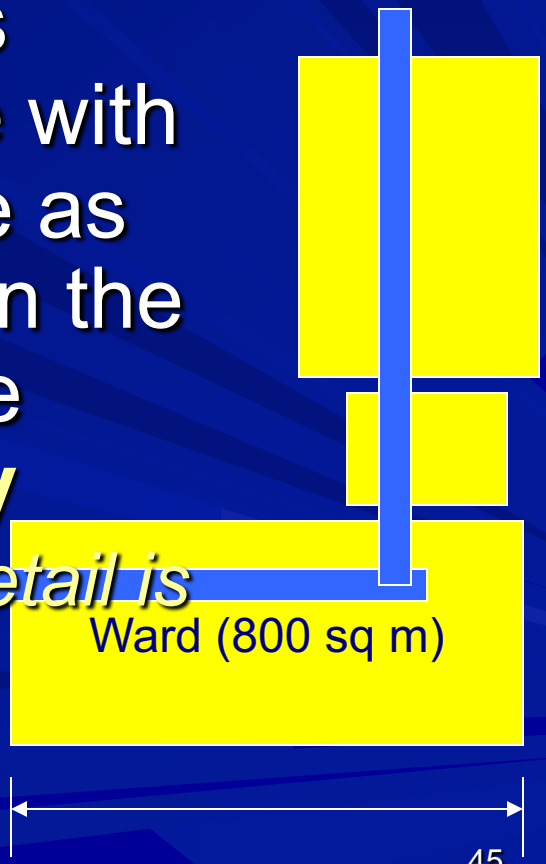
- **The OT Suite** is a complex of spaces within an OT Department.
- In Building Massing these spaces are considered as part of **a department** and therefore have no physical entity as yet to the whole. However it has to be considered in the mind as it has related activity as far as whole hospital policies is concerned;



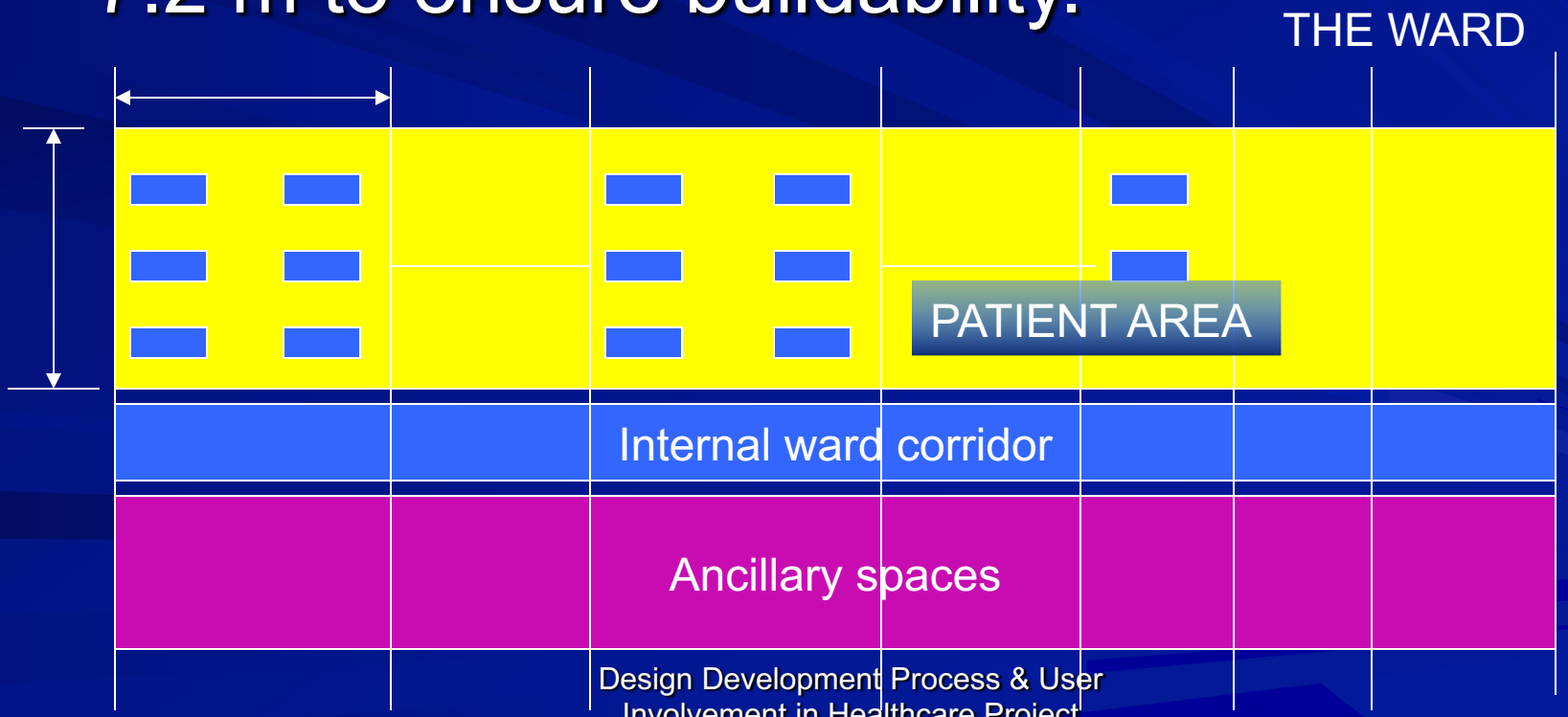
Schematic Plan or Sketch Plan

Schematic or Sketch Plan

- Schematic Plan or Sketch Plan is sometime known as Block Planning or departmental planning. It is actually drawings that is done with actual scale and size as close as possible to areas prescribed in the **design brief** as a result of the agreed concept plan.... but **by departments.** *Internal layout detail is still in its infancy*



- These drawings though sketchy in nature , hence the term Sketch Plan , are done following the acceptable structurally planning grid of 6.6 m x 6.6 m or 7.2m x 7.2 m to ensure buildability.



- The location of different departments as agreed in the concept plan is further illustrated with layout of individual rooms within the department considering both the inter relationship of the department and intra relationship of the individual room or space within the department.

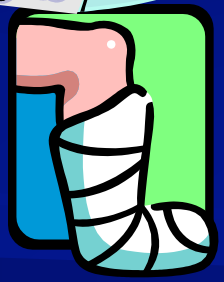
The designer in the process of producing these drawings is expected to have done some evaluation or research of contemporary similar facilities .

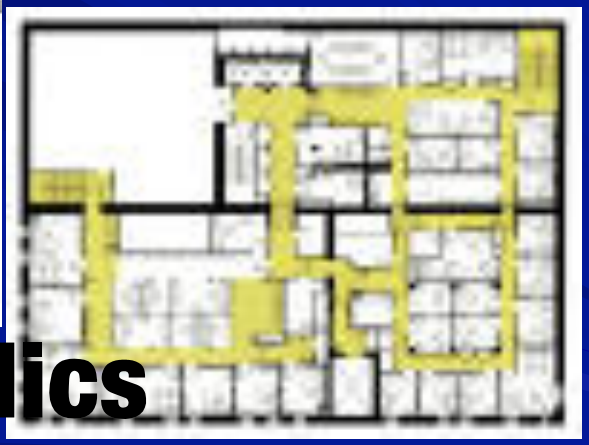
- Normally this planning proposal is submitted together with the revised Schedule of Accommodation (SOA) or room list with properties, as per proposed design against what has been prescribed in the **design brief**.
- The revised **Schedule of Accommodation** and total area accepted at this stage will be the basis of the total NEW project cost.
- The first PDA (Preliminary Detail Abstract) can be submitted to EPU at this stage.

The Brief Medical and / or Design Brief

The Reference

Detail Drawings





Orthopedics

Detail Drawings

- Detail Drawings is part of Working Drawings or Construction Drawings prior to tendering.
- It forms part of a tender document given to contractors considered to be binding.

Milestone of endorsement and approvals by users

In Design Development Stages

In summary

Stage

- the **Masterplan / Development Control Plan (DCP)** for submission to local authority for Development Order;

USERS INVOLVEMENT were to confirm what was initially agreed at the Concept Plan stage and endorsed it as part of Development Order submission to Local Authority

stage

- the **site plan** of the current proposed development / Layout Site Plan (LOSP) including location plan.

- Users input is to see that the component of services required are apparent.
- Corporate Client signature is required to endorse the plan for submission.

(The difference between the DCP and site plan is that the DCP remain a concept plan but the site plan is a constructive plan).

stage

- the translation of the approved sketch plan to **1:100 or 1:200 scale plan** for signing by the Client/User

- Depending on the scale of the project these can be very thick for signing by the Corporate Client/User.
- These drawings need to be checked against the sketch plan agreed with regards to workflow and inter and intra departmental.

….scale 1:100/ 1: 200 drawings

- At this stage, once the Client has agreed ,the schedule of accommodation prepared can now be given to users to prepare equipment list for the next stage – **The Room Data**
- It is also at this stage the the drawings are given to the supporting engineering professionals of the Design Team to proceed with their part of the job such as Structural Plans, Overall M & E services layout etc. (*Detail M & E can only be determine once the Room Data is finalised*).

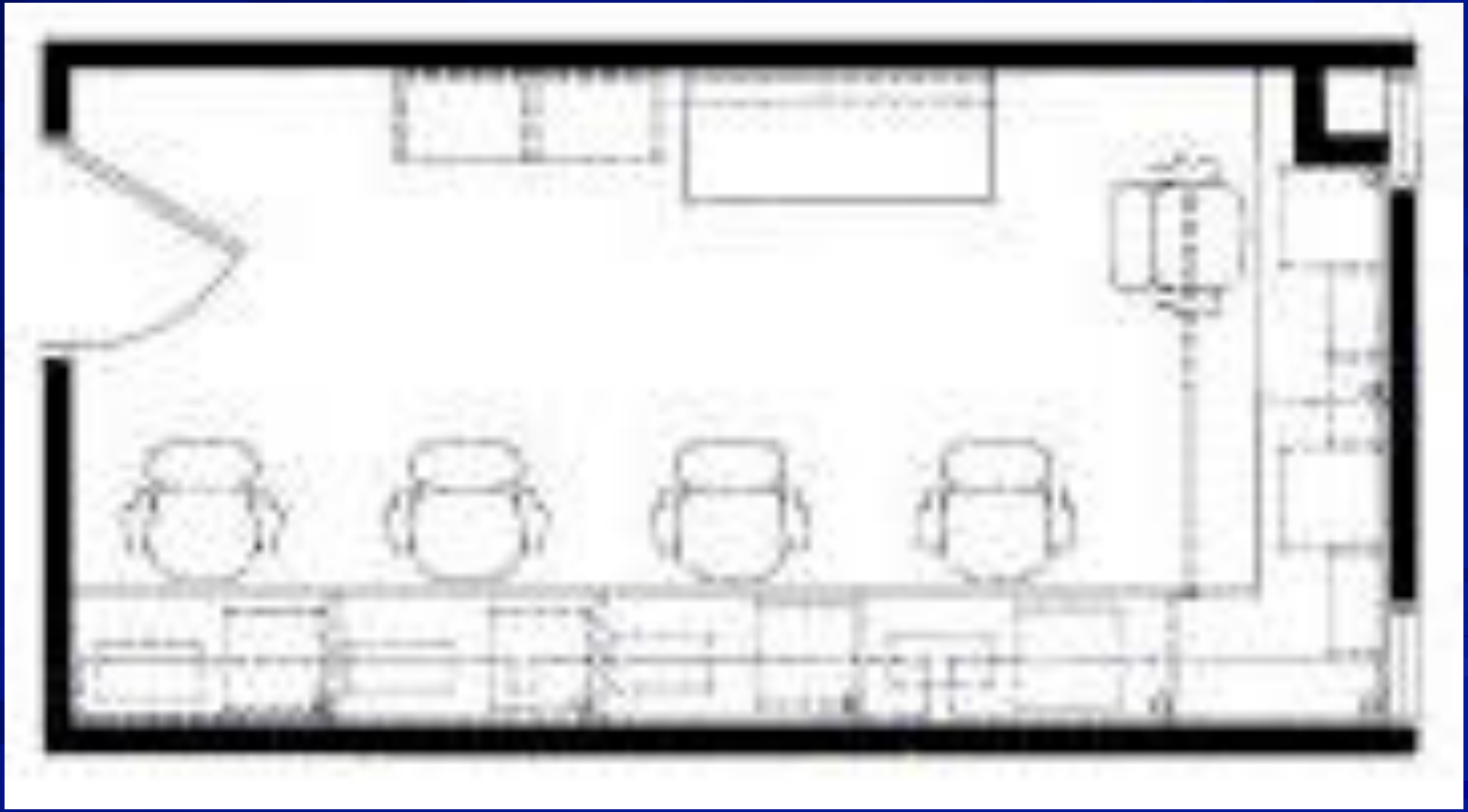
stage

- **the Room Data** ,that illustrate in drawing form (plan and elevation) in fou sided view of a space required in a department with written data on environment, finishes, performance, equipment of various groupings, activity ,etc.

- Schedule of Finishes, iron- monggery, door and windows schedules, etc.

- The Users input at this stage is tremendous. Normally the Room Data Session for the whole hospital project between the Design Team and Client and actual users of the department or space takes 9-12 months.
- On average the session takes 1-2 days to complete one department the first time round.

ROOM LAYOUT SAMPLE



- The Room Data forms are prepared b the architects with initial information already filled up based on DESIGN BRIEF/Medical Brief, research, past experience and documented data on previous projects.
- These **forms** are given 2 weeks in advance to the USERs prior ROOM DATA discussion/interaction.
- **The discussion or Room Data Session is to add, confirmed or change the data including drawings.**
- It is here that the activity of each space and micro workflow of the space are being discuss at length.

- On completion of the Room Data, the Design Team will review the 1:100 Scale Drawings and the Site Plan, simultaneously preparing the detail drawings of cabinet design, door details, windows and door schedules, colour scheme etc

- Prior to tendering, these drawings are checked to ensure consistency by the health/medical planners. It is also at this stage that a FINAL COST of the project has been worked out for EPU's approval.

User Involvement in the

CONSTRUCTION stages

of Hospital Projects

Construction stages

Depends on the type of procurement and type of contract form used.

Earthwork and Infrastructure

Building Construction

Package 1

Package 2

Package 3

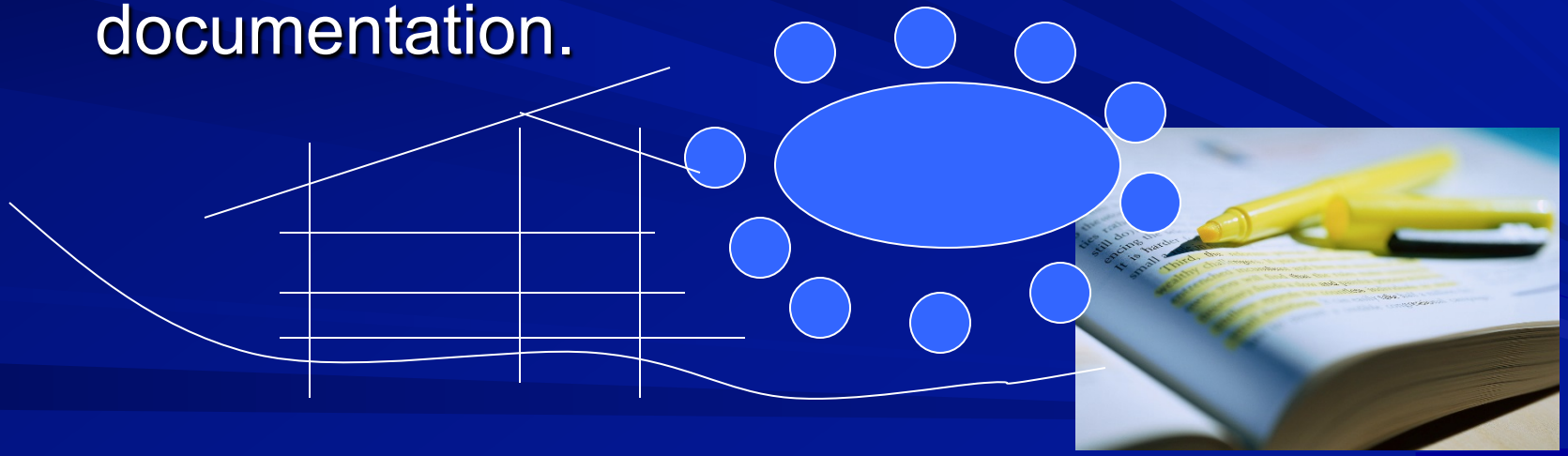
Through appropriate Channels of communication

Attend site meetings and participate
In decision making.
Need to be aware of the legal obligation of the
Contract such as allowing construction workers
stayed on site; noise; security; timeliness
(for redevelopment project);
Need to participate on approval of clinical and non clinical equipment,
any detail layout as required due to site circumstances;

Give trial to mock-ups
Assist in the preparation for handing over and taking over

Construction stages

- Users at this stage, monitor the hospital physical development through attending site meetings and perform site inspection with the design or consulting team. Feedback communicated in the meeting should be followed up with a written documentation.



Construction stages

- Users need to know
  - What needs to be communicated
  - How to communicate effectively
  - When to communicate
  - Where to communicate
  - Through Whom she/he should communicate

The overall objective of the project must be clear to all parties to avoid conflict. The User Client should have an assigned individual designated for the project for consistency and continuity

Construction stages

At this stage, at times, there will be request of change or further clarification made in clarifying detail specification earlier forgotten or overlooked…….functional requirement to scope of work as well as cost is referred. Design Brief or pre bid document is referred as basis of contract.

Any addition or changes made or variation approved at these sessions are recorded and documented in the 'As Built Drawings' for which the hospital and the maintenance team will be given as stipulated in the building contract for reference. (This Drawings is the responsibility of the Contractor and done after the completion of the project).

User Involvement in

COMMISSIONING Stages

of Hospital Projects

Commissioning Stages

- Commissioning is a process of taking over the project from the builder to user
- Commissioning starts a year prior to completion of the project to ensure continuity and smooth hand over of the project for operation
- Commissioning involves physical and service take over
- Different user-client will commission various items appropriate to their assignments i.e. engineering with the engineering requirements, clinical with their clinical provision requirements including equipment and the administrators on the staffing requirements

Commissioning Stages

- For new hospital projects , the process is quite straight forward. However for redevelopment projects, either on new or existing sites, the process has to be done at each phase of sectional completion,
- For redevelopment projects, the process of building temporary structures to decant occupiers to make way for renovation has to be planned by users with the Design Team at the onset. Decanting involve logistic, time, cost and a lot of planning especially if it involves moving of patients.

Commissioning Stages

- Users at commissioning stage should take note the following
  - the requirements of training;
  - handing over of operational manuals;
  - maintenance procedure;
  - location and provision of appropriate signages;
  - briefing on the use of each facility i.e. space, department, equipment, circulation flow as per planned and designed.

Commissioning Stages

- User-client leading at this stage should be the same team member involved in the earlier stages of the project.
- Responsibilities of the User-Client to prepare for take over should be clear with cost budgetted as well as human resource identified.
- The Contract Document are referred as basis of provision.

Commissioning Stages

- Commissioning of facilities where most user-client are involved include the ROOM by ROOM commissioning ..i.e. inspecting every aspect of provision from architecture, structural, layout, furniture, equipment, colour, fixtures, services-electrical, air-con, daylight,etc…as per ROOM DATA. The room is locked after each inspection with the list signed. Defects will be attended prior taking over.

Commissioning Stages

- Commissioning redevelopment projects can be stressful. Existing service must go on whilst new ones are in place. Integration of these services can be critical. Moving of patients to another hospital or putting them on emergency or temporary generator has been one of the actions made in decision making. Careful and precise planning to avoid mishap is a must.

C0NCLUSION

Conclusion

- Design Development in hospitals need a multitude of approach. It always needs to balance/compromise in order to achieve the best decision of the time since hospital architecture is always different, very complex, always changing and costly.
- Being design intensive, and in need of checkpoint at various stages to ensure functionality and the brief (as part of the contract) being translated accurately, commitment on the part of users and design team is crucial.

Conclusion

- Construction stage is the product of the Design Development stage. Users and the Design Team monitors the handiwork of the contractors translating needs from design to physical entity. Checkpoints at site visits and meetings are important. As a legal obligations observations and comments must be in written form through appropriate channel.

Conclusion

- Prior to completion and taking over, users are to prepare programmes for taking over various aspects of the hospitals from the physical entity, engineering services to human resources.
- For redevelopment and replacement projects, patient and equipment transfer will need to be etched into the programme.

Conclusion

- Overall perspective to the broad objectives and goals of the project is important for the Design Team, Users and Contractors.
- Understanding their translation to buildable detail provide common reference among the team for precision and decision making.
- Communication is the key. Documentation is the legacy.

Conclusion

- The Design Team and Users need to be constantly at pace to changing requirements of health care within the country and internationally if the design solution to be developed and implemented is to match the requirements of the 21st.Century. i.e. the BRIEF must be dynamic, encompassing broad perspective and yet detailed enough for decision makers to make the right decision for the project.

Thank You, Wassalam