

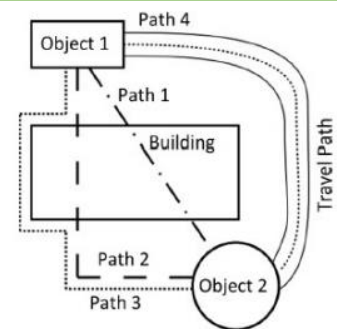
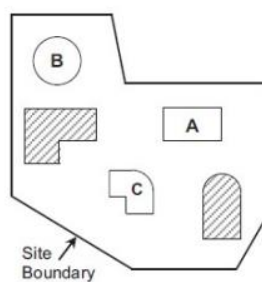
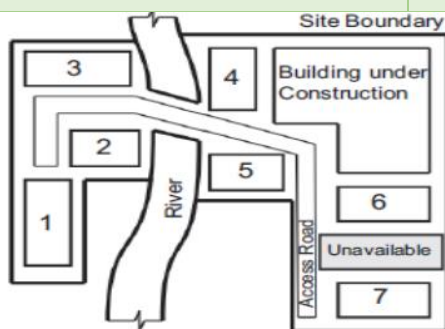
Site Establishment  
Study Notes  
**16138**

# LECTURE 1 – SITE LAYOUT PLANNING

## Importance of Site Layout Planning

- Definition: The efficient planning of site space throughout the course of a construction project.
- Site layout planning is a limited resource so much be used efficiently, and has an impact on:

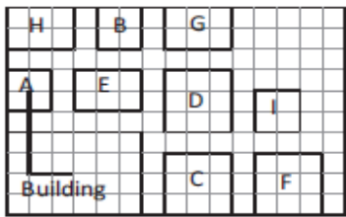
Productivity	Safety	Security
<ul style="list-style-type: none"> <li>▪ Reduce on-site travel distance to support activities (more time traveling = \$\$)</li> <li>▪ Should have all machinery/equipment closest to where they are required.</li> <li>▪ Gates should allow easy access for deliveries.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Aim for zero accidents/collisions.</li> <li>▪ Hoardings, access gates, fences, barriers should be in specific areas where the danger is highest for workers/pedestrians.</li> <li>▪ Heavy lifting/equipment entering should have specific procedures and protocols.</li> <li>▪ This may <b>change</b> as the construction project moves forward.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prohibit unauthorised access &gt;&gt; Safety and security reasons.</li> <li>▪ Security gates and signage should surround specific areas of the site to protect workers and the site from harm.</li> <li>▪ <b>E.G. Differentiating work spaces, lockable spaces, gates.</b></li> </ul>



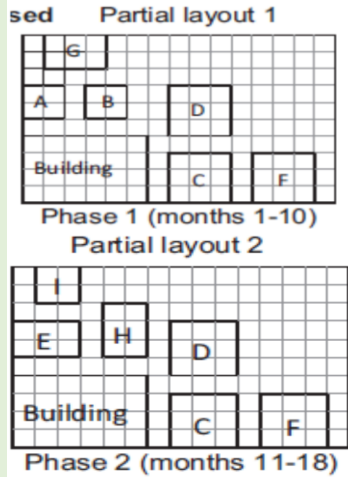
## Approaches to Site Layout Planning

Static (Use + Main Items)	Phase (Use + Main Items)	Dynamic (Use + Main Items)
<ul style="list-style-type: none"> <li>▪ For short term construction projects.</li> </ul>	<ul style="list-style-type: none"> <li>▪ For medium sized projects.</li> </ul>	<ul style="list-style-type: none"> <li>▪ For large scale mega projects.</li> </ul>

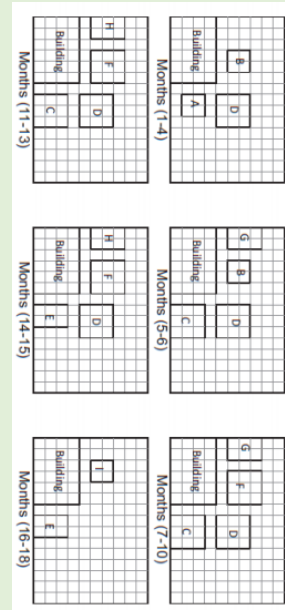
- Building/structure under construction.
- Main equipment.
- Stores/deposits.
- Water/electricity power supply.
- Stormwater drainage, dewatering.
- Auxiliary plants, yards and workshops
- Consists of **one** phase, inclusive of all elements.



- In-use stores, deposits, equipment, materials.
- Two phases of construction.

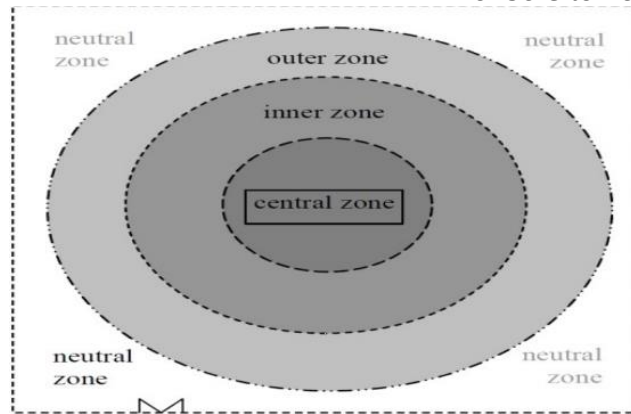


- Has many different stages.

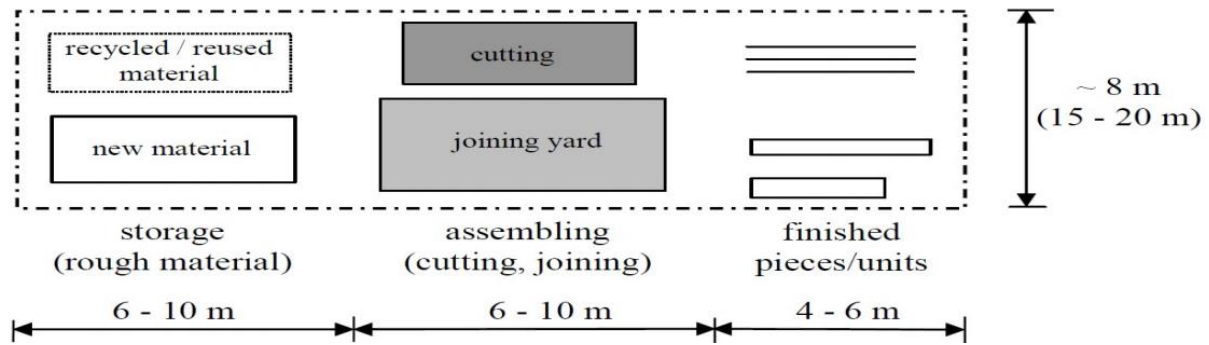


## Zoning

Central Zone	Inner Zone	Outer Zone	Neutral Zone
<ul style="list-style-type: none"> <li>▪ Based off crane.</li> <li>▪ Surrounds the building/structure.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Close to central zone.</li> <li>▪ Active/short term stores.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Secondary stores.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Out of reach of cranes.</li> </ul>
<ul style="list-style-type: none"> <li>▪ Cranes</li> <li>▪ Building</li> </ul>	<ul style="list-style-type: none"> <li>▪ Prefabricated elements</li> <li>▪ Material lay-down area.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Steel yard</li> <li>▪ Wood yard</li> <li>▪ Batching plant</li> <li>▪ Stores for on-roof HVAC devices</li> <li>▪ Diesel generator</li> </ul>	<ul style="list-style-type: none"> <li>▪ Site offices</li> <li>▪ Parking lots,</li> <li>▪ Temporary waste deposits,</li> <li>▪ Security,</li> <li>▪ Contaminated water tanks.</li> <li>▪ Tool shed</li> <li>▪ Material hoist.</li> </ul>



- Further Considerations at Zoning:
  - Type of project (residential v commercial)
  - Term of project (short term – simpler layout design, long term – more developed temporary infrastructure/on-site production, phases – preliminary works, structural works, finishes, installations).
- On-Site Main Equipment:
  - **Cranes (tower cranes):**
    - Height of beam.
    - Dimensions of effective lifting area.
    - Location of other main equipment is based upon where the cranes are located.
    - Assembly/counting characteristics (base frame, beam, assembly of crane by auto-crane).
  - **Elevators:**
    - Location of picking area to allow for easy delivery of materials.
  - **Other:**
    - Spatial relations of near-by equipment and processes (E.G. Pile driver, sheet-wall piling, excavation).
    - Room necessary for operation.
- Auxiliary Yards, Plants and Workshops:
  - E.G. Wood yard (formwork, shutter, timbering), steel yard (reinforcement processing plant), batching (concrete mixing) plant, on-site prefabrication, lime and mortar plant.
  - **Wood Yard:**
    - Use of formwork systems.
    - Irregular architecture may increase its use.
    - **Stored** on sleepers and laid on spaced.
    - **Cutting** via band-saw and circular-saw.
    - **Assembled** in joining yard.
    - **Infrastructure:** Electric power supply (buried cable), water supply (fire plug), road and surface (gravel-typed dry/hard surface).



- **Steel Yard:**

- Consist of straight rods and bars, rods and bars cut and bended, rolls of wires.
- Storage type and quality (E.G. 6mm, 304 vs. 12mm, 316).
- **Cutting and bending** can be conducted linearly or parallel.
- **Assembly** on a work bench.
- **Storing** on the ground or on spacers.
- **Infrastructure:** Electric power supply (buried cable), water supply (fire plug), road and surface (fencing/enclosing NOT needed).

- **Batching (Concrete Mixing) Plant:**

- On-site batching plants.
- At urban sites, less frequently applied (spacing concerns).
- **Infrastructure:** Electric power supply (high consumption), water supply (high/intensive consumption).
- **Road and surface:** Access, loading bay.

- **Stores and Deposits:**

- Must consider location of the site (urban v suburban), timing of use, frequency and timing of transportation (reliability, cost of storing).
- Consists of closed stores (containers/store houses), shelters (temporary structures), open deposits (hard surface) and special stores (special storage regulations?)

- **Calculating Storage Area (Below) (IN EXAM)**

$$F = (V/n) \times K$$

F= Area of storage needed (m<sup>2</sup>)

V= Volume (quantity) of material to be stored (unit)

N= Storage standard (unit/ m<sup>2</sup>)

K= Extension factor (k>1)