PLANT LAYOUT
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Plant layout:

1. Site Layout
   Relevant to neighborhood (sewage, nearby roads, populated areas etc.)

2. Plot Layout
   Actual layout of the plot, fences, general area allocation.

3. Equipment Layout
Regulations for fences and distance to equipment.
Auxiliary processes: Power generation, cooling water, pumps, cooling towers, compressors, boilers, control equipment, air.
Personnel space should be upwind. Wind conditions should aid removal and dispersion of pollutants.
PLANT LAYOUT

Plot layout Models
PLANT LAYOUT

- Storage tanks: Need to be far when they contain gases under pressure, liquids with high vapor pressure or explosive fluids. Acids do not require long distances.
- Flare: Safety and control systems might vent some compounds to avoid explosions. Should be away from other flammable materials.

Two types of layout:

- Grouped layout
- Flow-time layout
PLANT LAYOUT

Main Process:

Grouped layout.
Similar type of equipment at the same place. Usually pumps, compressors, exchangers (not the auxiliary equipment). They are together for easier maintenance, supervision.

Flow-time layout.
The layout follows the PFD.
Main Process:

- Roads need to be straight.
- Control room should have visual contact with the main unit, however be at a safe distance.
## PLANT LAYOUT

### Typical distances (ft)

<table>
<thead>
<tr>
<th></th>
<th>Side</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main roads</strong> (width)</td>
<td>30</td>
<td>18</td>
</tr>
<tr>
<td><strong>Secondary roads</strong> (width)</td>
<td>25</td>
<td>16</td>
</tr>
<tr>
<td><strong>Pipe support</strong></td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td><strong>Pipe support, secondary</strong></td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td><strong>Pump base &lt;25 hp</strong></td>
<td>2 1/2</td>
<td>12</td>
</tr>
<tr>
<td><strong>Pump base &gt;25 hp</strong></td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td><strong>Compressors</strong></td>
<td>10</td>
<td>free</td>
</tr>
<tr>
<td><strong>Vertical vessels</strong></td>
<td>10</td>
<td>free</td>
</tr>
<tr>
<td><strong>Horizontal vessels, D&lt;10ft</strong></td>
<td>4</td>
<td>4 Heat exchangers</td>
</tr>
<tr>
<td><strong>Horizontal vessels, D&gt;10ft</strong></td>
<td>8</td>
<td>free</td>
</tr>
<tr>
<td><strong>Main equipment</strong></td>
<td>30</td>
<td>free</td>
</tr>
<tr>
<td><strong>Reactors</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Different Types of Plant Layout:
(a) Grade-Mounted, Horizontal, In-line Arrangement, and
(b) Structure-Mounted Vertical Arrangement