Parameters for choosing location of Chowky

The Chowky is where the policemen will rest & carry out basic administrative work. Therefore it need not be exactly at the traffic point. Should be near the junction but at the same time away from the busy traffic. Should be easily accessible to the public.

Site Selection

Option 1
- DP plan shows reservation for RG with no demarcation of a shop line
- A single shop line exists in reality
- The shops can be demolished if illegal & the chowky can be placed there
- The chowky will be exactly in front of the junction & at the same time act as a protection against future misuse of land
- Option may not be practically viable as demolition of shops may not be possible.

Option 2
- The pavement beyond the Lalbaugh Junction continues to be 10m wide
- This area presently has temporary stalls selling goods
- The chowky can be placed here as the stalls can be dismantled easily and the pavement is 10m wide with a small amount of pedestrian traffic
- Option more feasible than option 1

Requirements of the traffic chowky

- Administration Area
- Storage for personal belongings
- Washroom
- Changing Room
- Dining Area & Pantry
- Rest / Sleeping Space
- Future Provision for CCTV Surveillance System
- Provision for Oxygen Masks & Leg Massagers
- Provision of a soothing environment & relief from pollution

Design Goals

- Small / compact
- Easy to construct
- Easily replicable
- Economical
- Natural light & ventilation
- Use of sustainable systems
- Minimal energy consumption
- Recycled / eco-friendly materials
Design of Eco - Traffic Police Chowky at Lalbaug-Byculla Flyover Junction, Sem1 2010 - 2012

Built Up Area: 191.8 Sq.ft.
Built Up Area for Smaller Chowky: 152.7 Sq.ft.

Legend
- Louvers open during the day & closed at night
- Louvers open at night & closed during the day
- Flow of hot air
- Flow of oxygenated air

Ideal positioning of fan for optimal circulation of air:
ECBC Code: The height of fan blades above the floor should be (H+W)/4, where H is the height of the room and W is the height of the work plane.
Design of Eco - Traffic Police Chowky at Lalbaug-Byculla Flyover Junction, Sem1 2010 - 2012

MATERIALS

Structural Supports: Precast concrete columns

Walls: Half cut plastic bottles filled with wood shavings and coconut husk. Wall plastered from inside. Walls cladded with poison ivy and creepers.

Plastic bottles to be used in place of hollow concrete blocks.

Roof: Clay tiles with bamboo structural framework. Insulation of roof with layers of bamboo board, felt and bamboo mat.

Floor: Half cut bamboo support with green oxide IPS

Windows: Glass louvered windows with bamboo wood framing

Seating: Refurbished tyres

Design Details
**Design of Eco - Traffic Police Chowky at Lalbaug-Byculla Flyover Junction, Sem1 2010 - 2012**

### Water & Waste Water Management System

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Qty of Water (litres)</th>
<th>No. of ppl</th>
<th>Total Qty (litres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flushing (WC)</td>
<td>6</td>
<td>6</td>
<td>36</td>
</tr>
<tr>
<td>Flushing (Urinal)</td>
<td>30</td>
<td>6</td>
<td>180</td>
</tr>
<tr>
<td>Shower</td>
<td>15</td>
<td>6</td>
<td>90</td>
</tr>
<tr>
<td>Pantry</td>
<td>5</td>
<td>6</td>
<td>30</td>
</tr>
</tbody>
</table>

**Calculations for Tank Capacities**

- Qty of grey water: 300 litres
- Qty of grey water in cum: 0.3 Cum
- Area required (10 sqm for 1 cum): 3 sq.m
- Fresh water requirement per day: 120 litres
- Qty of water required for flushing daily: 216 litres
- Qty of water required for plants: 32.4 litres
- Rainfall for 4 months: 1.966 m
- Area of roof: 92 sq.m
- Considering 80% is harvested: 50.33 cum
- Capacity of holding tank for urine: 340 litres
- Capacity of flushing water tank: 220 litres
- Capacity of fresh water tank: 150 litres
- Capacity of RWTH tank: 3150 litres

**Rootzone Treatment**

Rootzone treatment systems (RTS) are important for decentralisation of wastewater treatment and recycling. RTS consists of sealed filter beds made up of sand/gravel/sol, planted with vegetation which can grow in welland systems. After removal of coarse and floating material, the wastewater passes through the filter bed, where its biodegradation takes place.

**Calculations for Rootzone Treatment**

- Qty of flow per day: 0.3 cum
- BOD at inlet: 80 mg/l
- BOD at outlet: 10 mg/l
- log BOD: 1.90
- log 15: 1.15
- Area of planted filter: 2.18 sqm
- BOD load: 0.3 cu.m x 0.08 kg
- Organic load per sqm = BOD load/Area = 11 g BOD/sqm per day
- Cross sectional area: 0.35 sqm
- Assuming depth to be 0.5, width of the bed = 0.7 m
- Length of bed = 3.1 m

**Flow Chart for Waste Water Management System**

- Water Closet
- Washbasin / Shower
- Urine Collection Tank
- Rootzone Treatment Bed
- Flushing Tank

**Schematic Representation of Water and Waste Water Management System**

**Electrical Load Calculations**

<table>
<thead>
<tr>
<th>Equipments</th>
<th>No.</th>
<th>No. of hrs used</th>
<th>Load (Watts)</th>
<th>Total Load (Watt hour)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED Lights (Workspace)</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td>LED Lights (Outdoor)</td>
<td>2</td>
<td>7</td>
<td>5</td>
<td>70</td>
</tr>
<tr>
<td>LED Light (Pantry Toilet)</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Exhaust fan</td>
<td>1</td>
<td>16</td>
<td>40</td>
<td>768</td>
</tr>
<tr>
<td>Fan (Workspace)</td>
<td>1</td>
<td>6</td>
<td>48</td>
<td>288</td>
</tr>
<tr>
<td>Fan (Rest Area)</td>
<td>2</td>
<td>120</td>
<td>120</td>
<td>240</td>
</tr>
<tr>
<td>Computers</td>
<td>1</td>
<td>1</td>
<td>120</td>
<td>120</td>
</tr>
<tr>
<td>Leg Massager</td>
<td>1</td>
<td>1</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Water Pump (0.5 HP)</td>
<td>1</td>
<td>1</td>
<td>375</td>
<td>375</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>1951</td>
</tr>
</tbody>
</table>

**kWh**

- Total Load (kWh) = 1.951

**Energy to be generated by solar panel**

- Considering four solar hours per day for Mumbai.
- Energy required to be generated = 585 kWh
- Therefore, 3 panels of 200 kWh can be used.
- Area required = 5 sq.m approx

**Sustainable Technologies**

**RACHANA SANSAD'S INSTITUTE OF ENVIRONMENTAL ARCHITECTURE**