EMERGENCY SANITATION WORKSHOP
DELFT – 13-15
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# CHALLENGES OF WASTE WATER DISPOSAL

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# BANGLADESH

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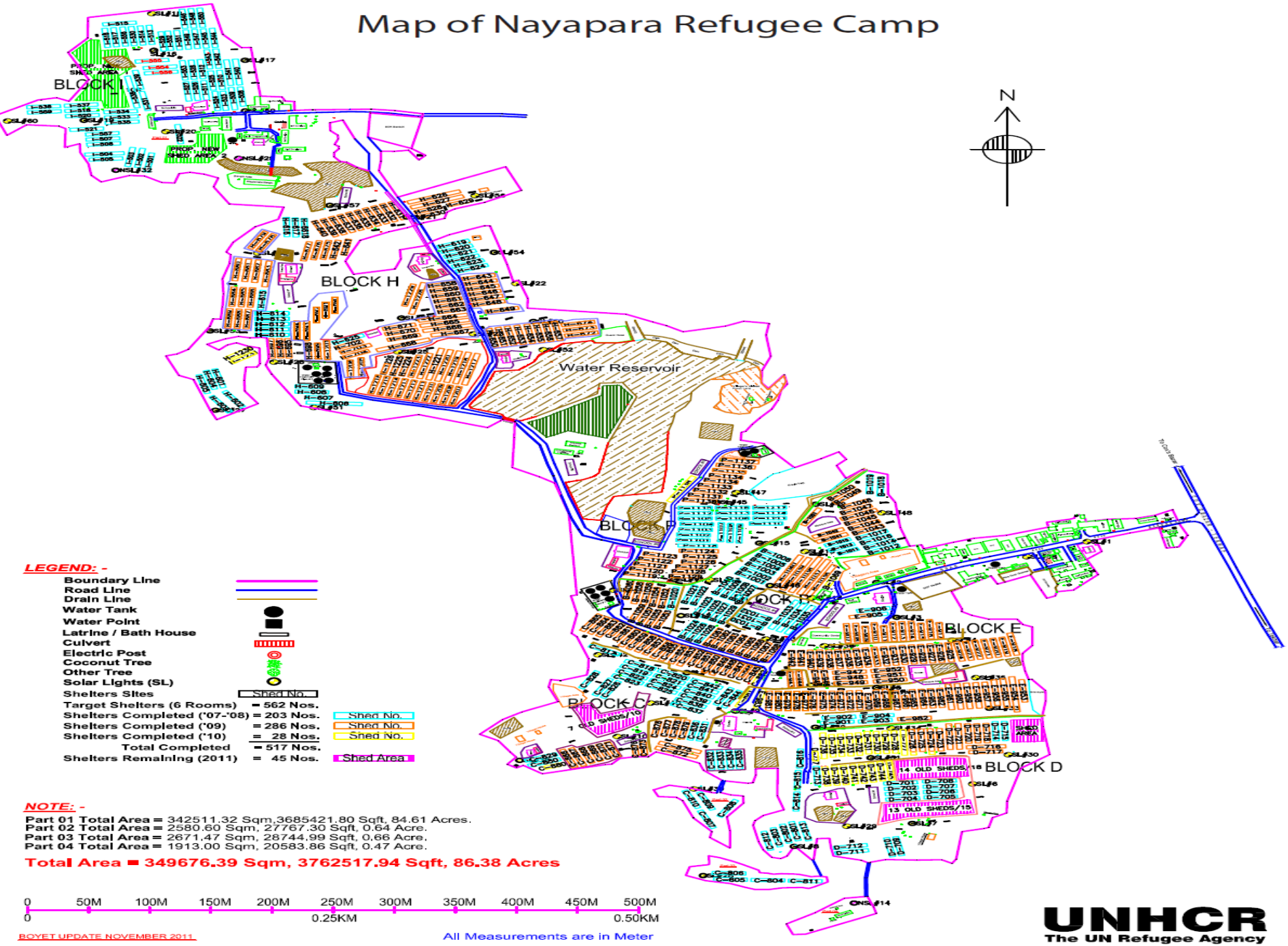
- 29,000 refugees from Myanmar (Rohingya) divided in 2 of camps since mid-1990's
- 635 stands (Kutapalong) + 842 stands (Nyapara)
- Daily production of faecal sludge around 29 m3/day
- Average density is 490 person / hectare
- Terrain is hilly with heavy precipitation during the rainy season
- No possibilities to expand/extend the camps (mosoon)

# Map of Nayapara Refugee Camp




**LEGEND: -**

- Boundary Line
- Road Line
- Drain Line
- Water Tank
- Water Point
- Latrine / Bath House
- Culvert
- Electric Post
- Coconut Tree
- Other Tree
- Solar Lights (SL)
- Shelters Sites — Shed No.

| | |
|---|---|
| Target Shelters (6 Rooms) | = 562 Nos. |
| Shelters Completed ('07-'08) | = 203 Nos. — Shed No. |
| Shelters Completed ('09) | = 286 Nos. — Shed No. |
| Shelters Completed ('10) | = 28 Nos. — Shed No. |
| Total Completed | = 517 Nos. |
| Shelters Remaining (2011) | = 45 Nos. — Shed Area |

**NOTE: -**

Part 01 Total Area = 342511.32 Sqm,3685421.80 Sqft, 84.61 Acres.
Part 02 Total Area = 2580.60 Sqm, 27767.30 Sqft, 0.64 Acre.
Part 03 Total Area = 2671.47 Sqm, 28744.99 Sqft, 0.66 Acre.
Part 04 Total Area = 1913.00 Sqm, 20583.86 Sqft, 0.47 Acre.

**Total Area = 349676.39 Sqm, 3762517.94 Sqft, 86.38 Acres**

0 50M 100M 150M 200M 250M 300M 350M 400M 450M 500M
0 0.25KM 0.50KM

BOYET UPDATE NOVEMBER 2011

All Measurements are in Meter

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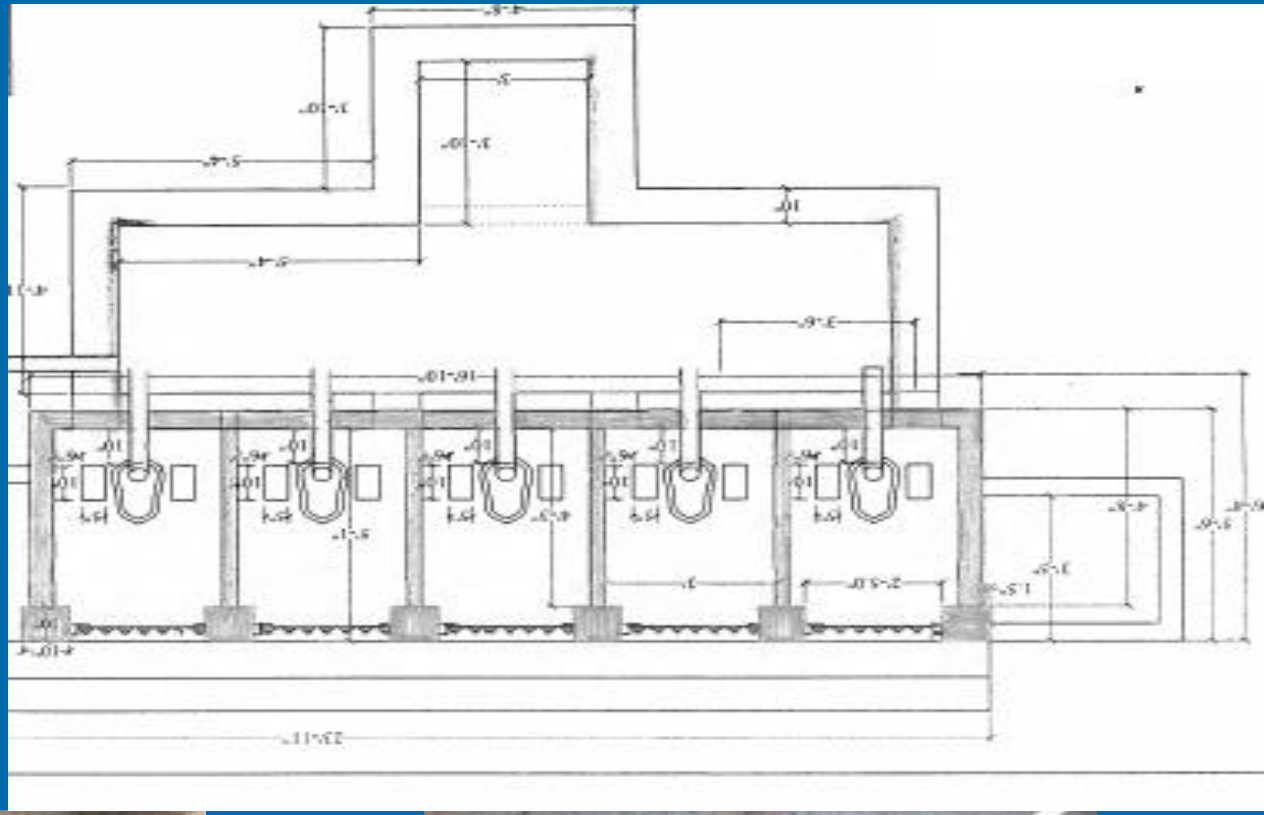
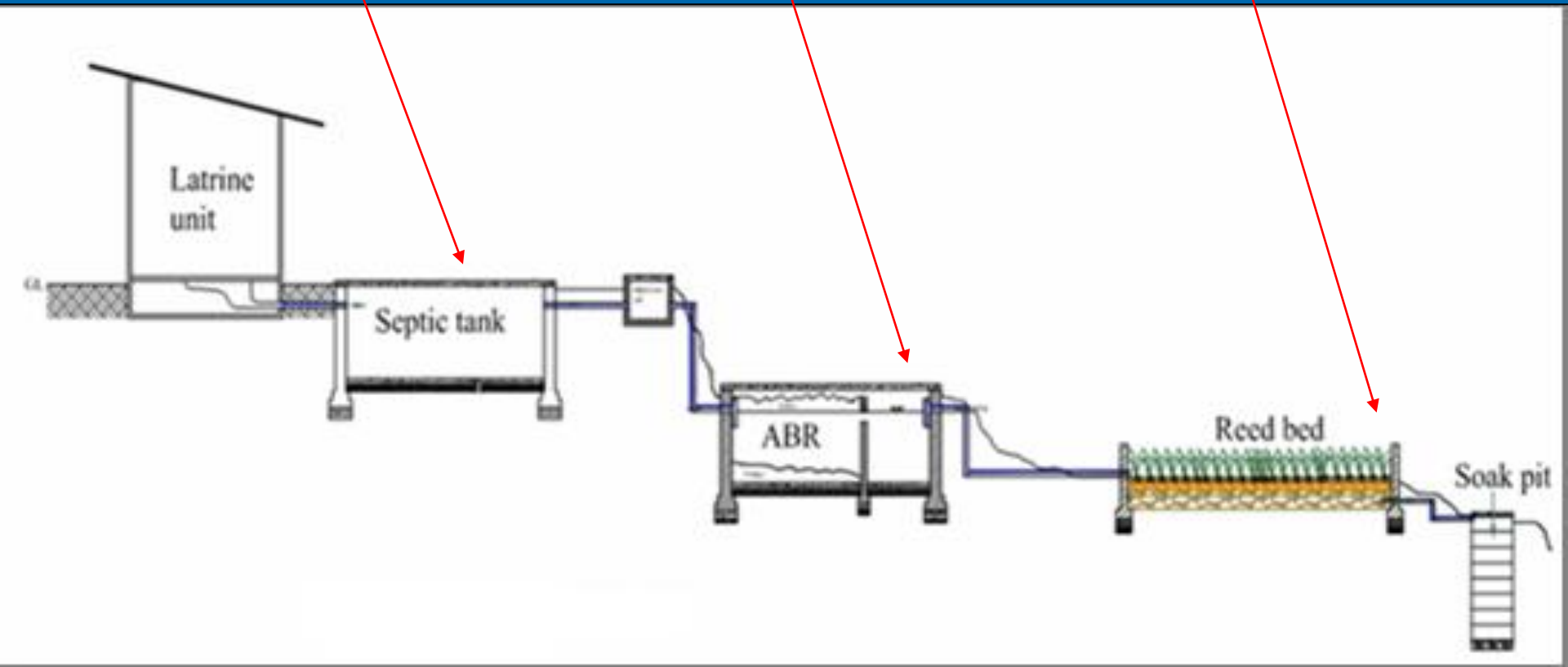


Primary treatment in the holding tank connected to each latrine block

Secondary treatment: The faecal sludge is then pumped to an Anaerobic Baffled Reactor (ABR).

Finally treatment: the effluent was fed to an adjoining Reed Bed



# DESIGN CRITERIA

- Low operation and maintenance cost
- Low tech (when possible no pump)
- In the example of Bangladesh low footprint
- Meeting standard of the country
- However wastwater treatment is in an exception!