Saturated Hydraulic Conductivity in Deep Solumed Clayey Ultisols

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Intensive Soil Surveys are used for Onsite Waste Disposal

Soil Scientist Reports:

- Soil Series
- Soil Limitations
- Estimated Percolations Rates (min./in.)
- Estimated Optimum Installation Depths

Estimated Percolation Rates

Based Upon:

- Soil survey data
- Field observations

Given general rates for each series
Loyd-45 min/inch

Field Tests

Selected 2 sites in Ultisols

- Lloyd-Cataula
- Lloyd

Looking for:

- Solum greater than 1.5 meter
- Thick argillic horizons upper 1 meter
- Homogenous horizon upper 1 meter
- Impacting horizon at 1 meter

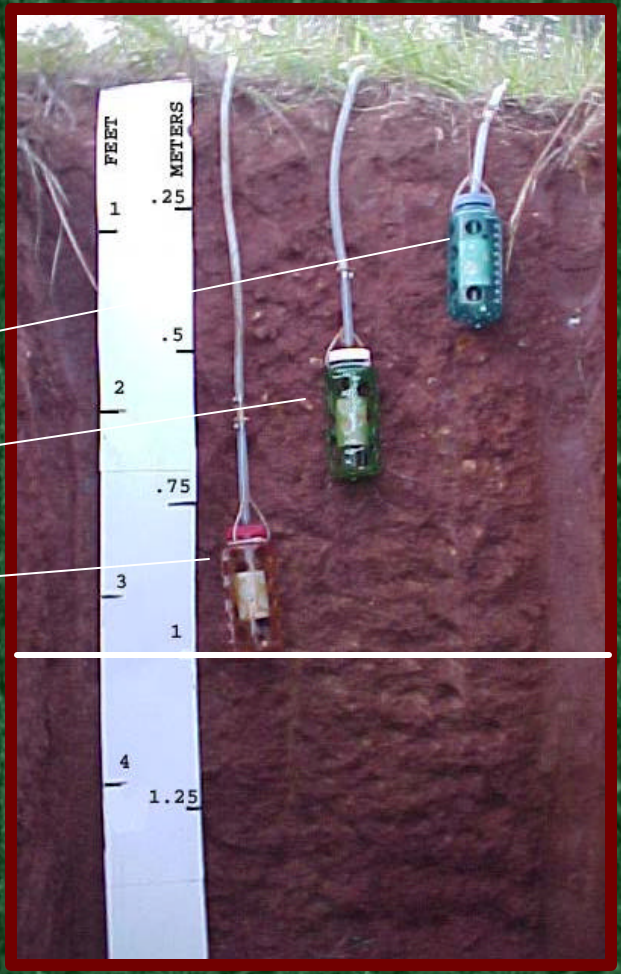
Saturation Tests

- Borehole Tests (0.10m dia.)
- Narrow Trench Tests (0.35m wide)
- Wide Trench Tests (1.00m wide)

Borehole Tests

Constant Head Tests At:

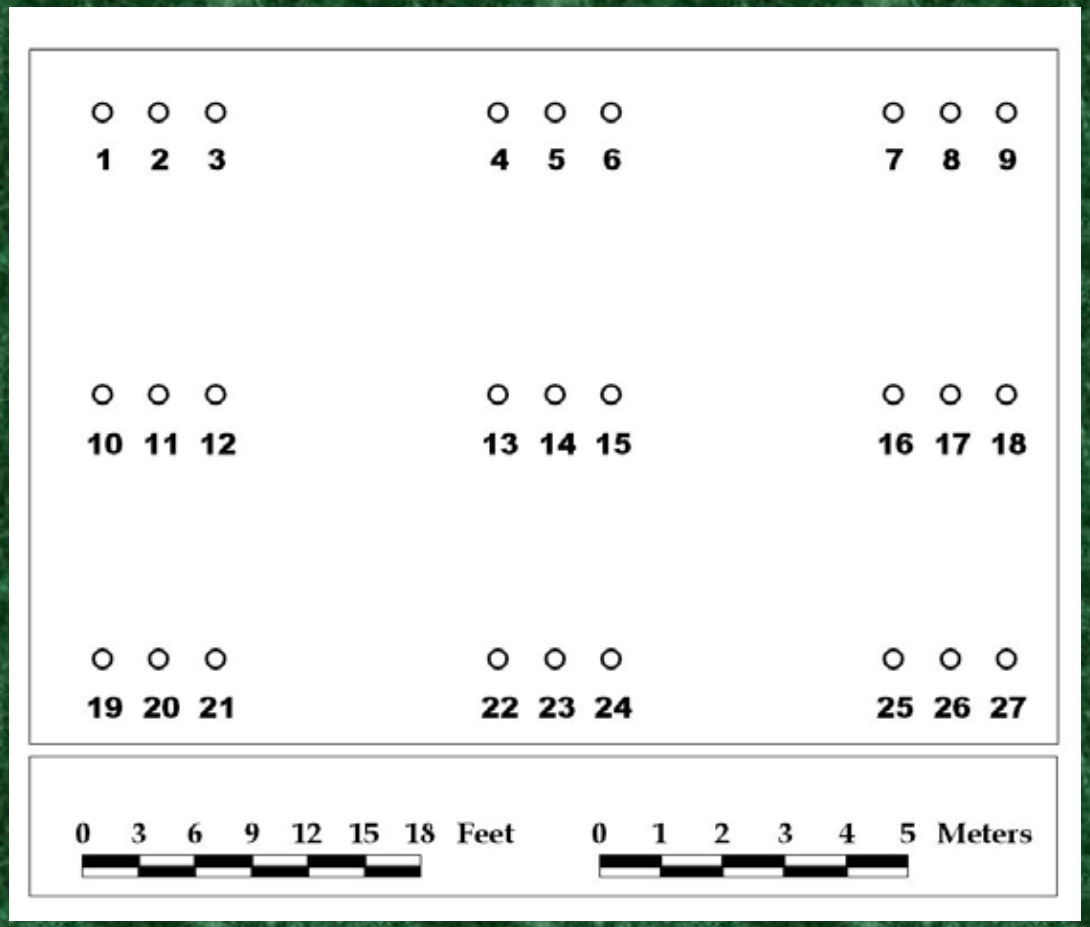
- 0.75m (30”) head
- 0.45m (18”) head
- 0.15m (6”) head



Using Kring (patented) Saturated Float

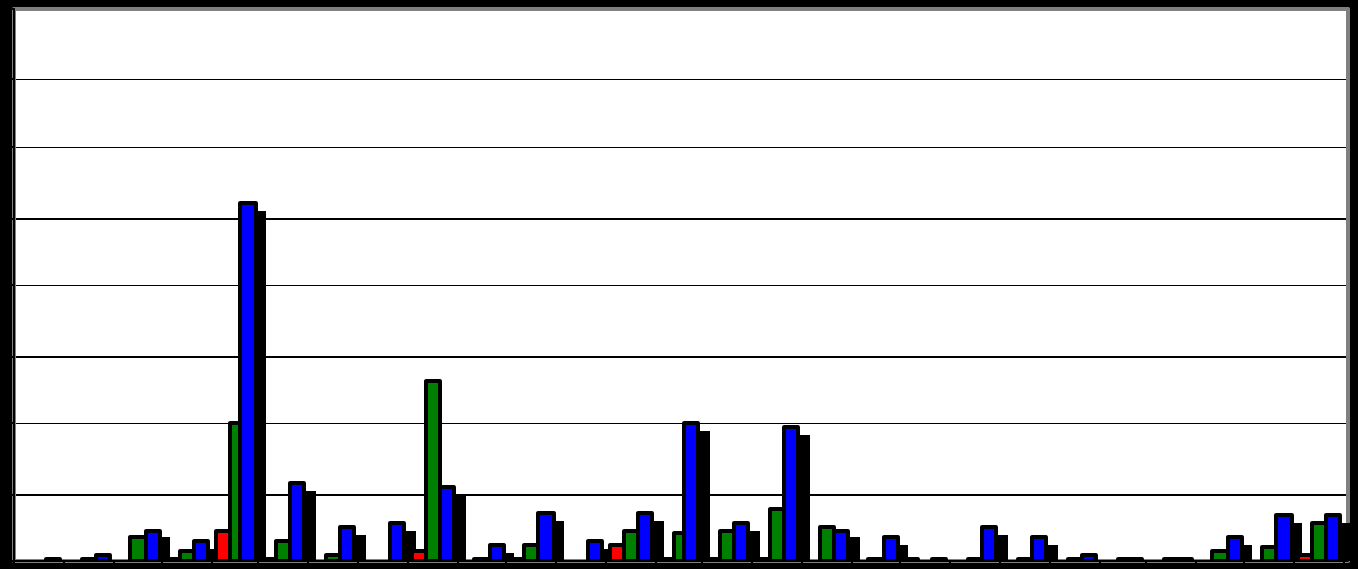
Borehole Tests

27 Units at Three Depths



Borehole Results

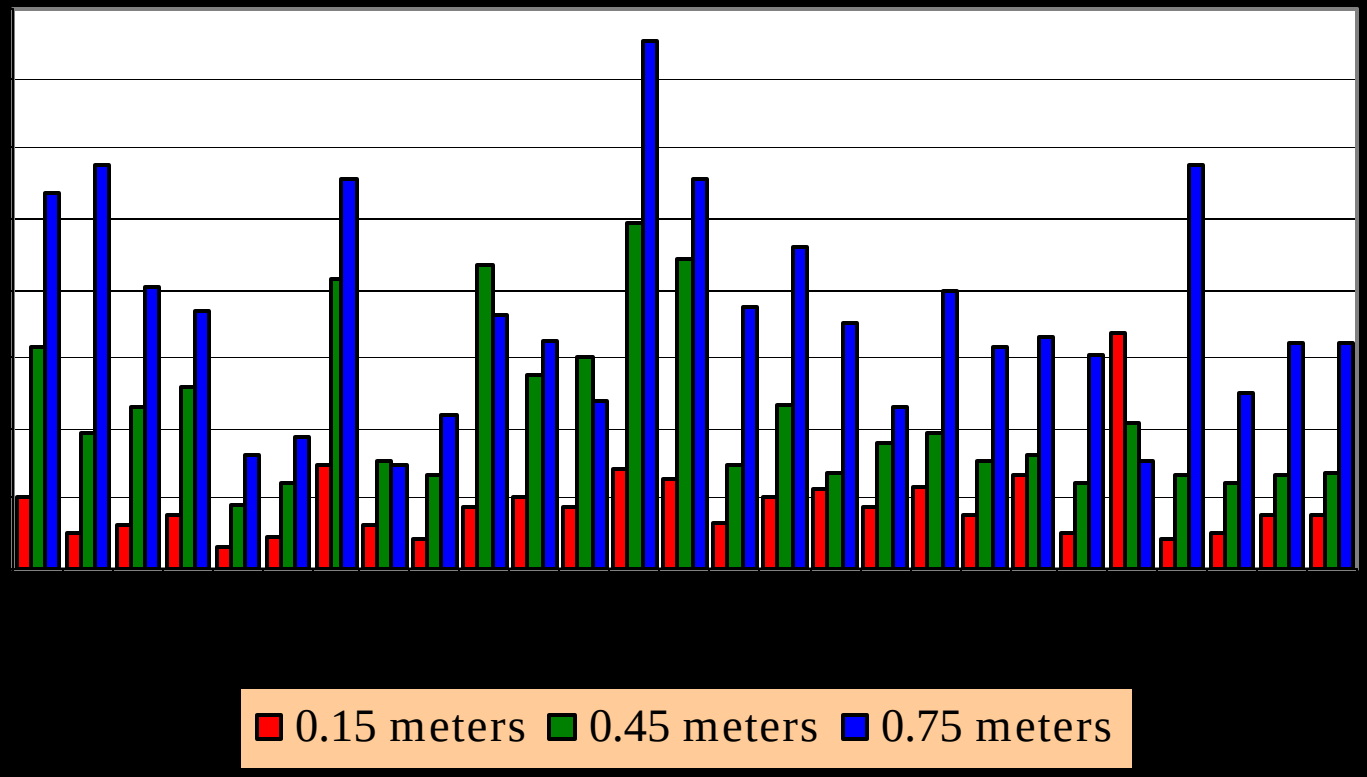
Site 1
Lloyd-Cataula



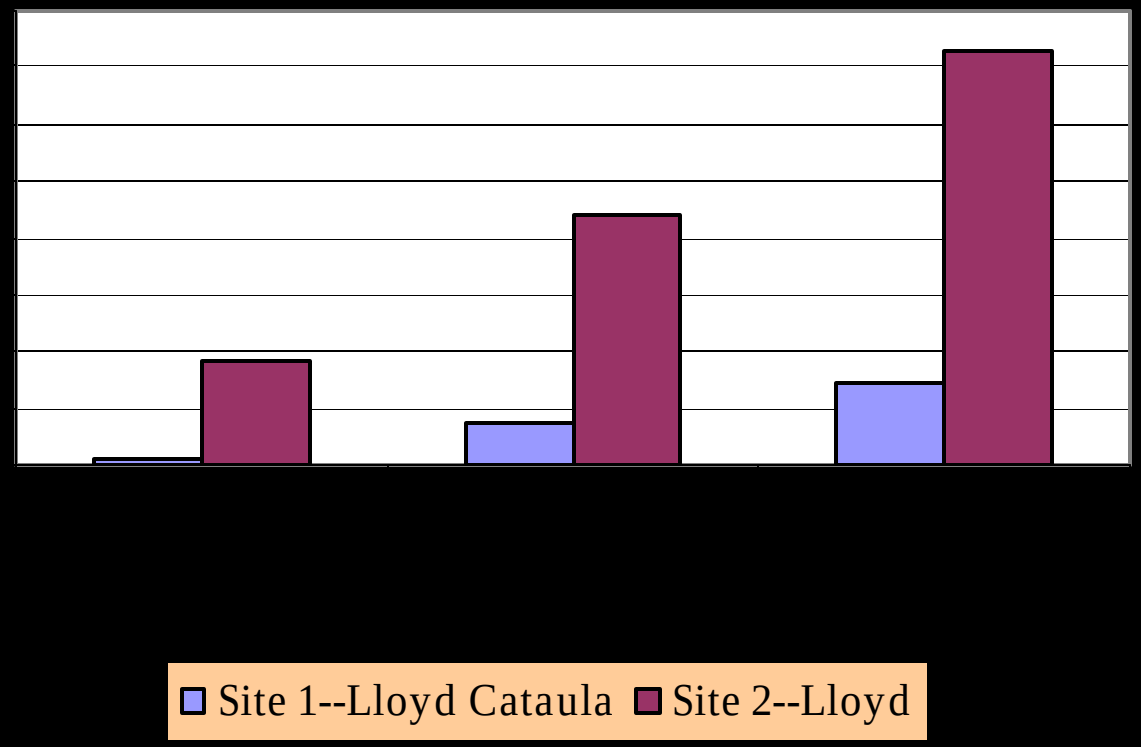
0.15 meters 0.45 meters 0.75 meters

Borehole Results

Site 2
Lloyd



Comparative Saturated Hydraulic Conductivity Rates



Narrow Trench Tests

Dimensions:

- 2.0 meters long
- 0.35 meters wide
- 1.00 meters deep

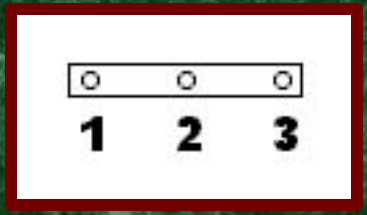
Constant Head At:

- 0.15 meters
- 0.45 meters
- 0.75 meters

Simulates narrow trench installation

Test A—Smeared walls

Test B—Cleaned walls



Narrow Trench

- Lloyd-Cataula
- Smeared Walls

Narrow Trench

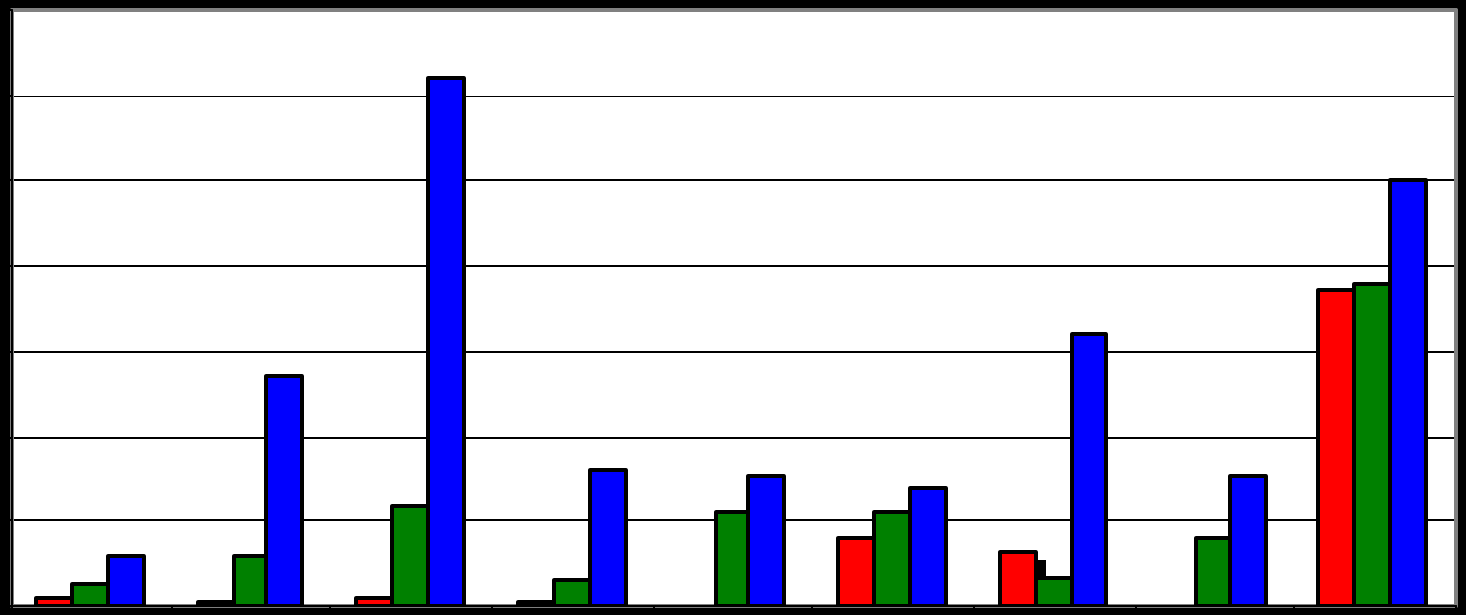
liters per hour

Trench	0.15m (6”)	0.45m (18”)	0.75m (30”)
NT1	0.4	1.25	3
NT2	0.25	3	13.5
NT3	0.5	6	31
NT4	0.2	1.5	8
NT5	0.1	5.5	7.5
NT6	4	5.5	7
NT7	3.2	1.6	16
NT8	0.1	4	7.5
NT9	18.5	19	25

Trench Conductivity Rates

Site 1

Lloyd-Cataula



0.15 meters 0.45 meters 0.75 meters

Conclusion

Infiltration rates are variable

- Different depths
- Different heads
- Within small areas

Site-specific tests are the best method to predict individual site potential