Station 9:32 Eff. rain method USDA S.C. Method

	Rain	Eff rain
	mm	mm
January	71.7	63.5
February	48.0	44.3
March	35.8	33.7
April	50.1	46.1
May	112.2	92.1
June	253.8	150.4
July	263.8	151.4
August	233.5	146.3
September	184.8	130.2
October	165.7	121.8
November	213.5	140.6
December	150.0	114.0
Total	1782.9	1234.2

Figure 3 - Rainfall data table

Crop Data

Lettuce was selected from the list of crops in CROPWAT Food and Agriculture Organization of the United Nations (FAO) database. All of the different values for the crop in the different stages of growth were automatically entered.

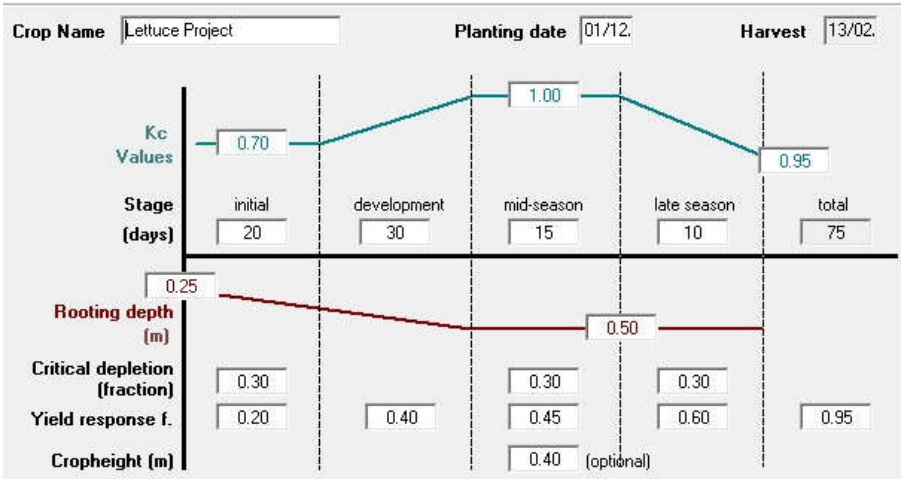

Figure 4 - Crop data

Soil

Sandy loam was selected in CROPWAT since that is the major soil type in the Piarco area. It has a field capacity of 25% and a permanent wilting point of 15%. The bulk density is 1.6 g/cm^3 the soil infiltration rate is 20 mm/hr.

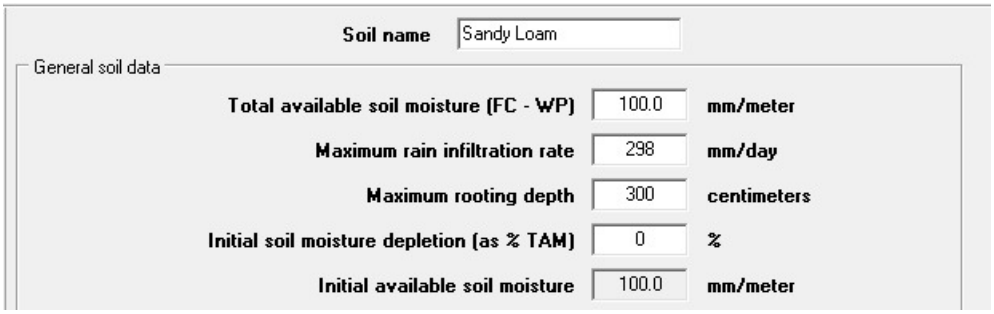

Figure 5 - Soil data

Net Irrigation Required

The data entered into CROPWAT was used to generate the crop water requirement table and chart seen below.

ETo station 9:32

Rain station 9:32

Month	Decade	Stage	Kc	ETc	ETc	Eff rain	Irr. Req.
			coeff	mm/day	mm/dec	mm/dec	mm/dec
Dec	1	Init	0.70	2.64	26.4	41.7	0.0
Dec	2	Init	0.70	2.61	26.1	39.1	0.0
Dec	3	Deve	0.76	2.94	32.3	33.1	0.0
Jan	1	Deve	0.86	3.46	34.6	25.8	8.8
Jan	2	Mid	0.96	4.00	40.0	19.7	20.2
Jan	3	Mid	0.99	4.27	47.0	18.1	28.9
Feb	1	Late	0.98	4.35	43.5	16.7	26.8
Feb	2	Late	0.95	4.36	13.1	4.3	5.9
					262.9	**198.5**	**90.7**

Figure 6 - Irrigation requirements table

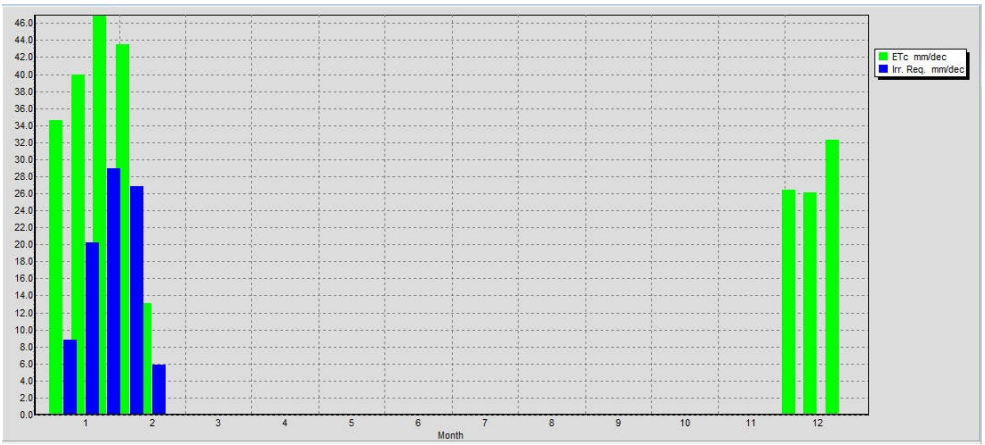

Figure 7 - Irrigation requirement graph

From the table and chart above it can be seen that the maximum irrigation water level was required on the 3rd decade in January with a value of 28.9 mm/dec.

Therefore,

$$net\ irrigation\ requirement, NIR = \frac{28.9\ mm/dec}{10} = 2.89\ mm/day$$

$$Velocity, V = \frac{Q}{A} = \frac{0.860119}{0.217618} = 3.9524ms^{-1}$$

It is advised that the velocity should be above $0.8ms^{-1}$ for an unlined sand channel. Therefore, this value is desired.

In designing a channel, a freeboard should be included as a safety design in cases of excess flooding or irrigation. It is chosen as a percentage of depth at 20%.

For this channel, the entire depth is 120% of 5.3cm. This gives 6.36cm.

The top width, T is then

$$T = b + 2Zd$$

$$T = 4 + 2 \times 2 \times 0.053 = 4.212m$$

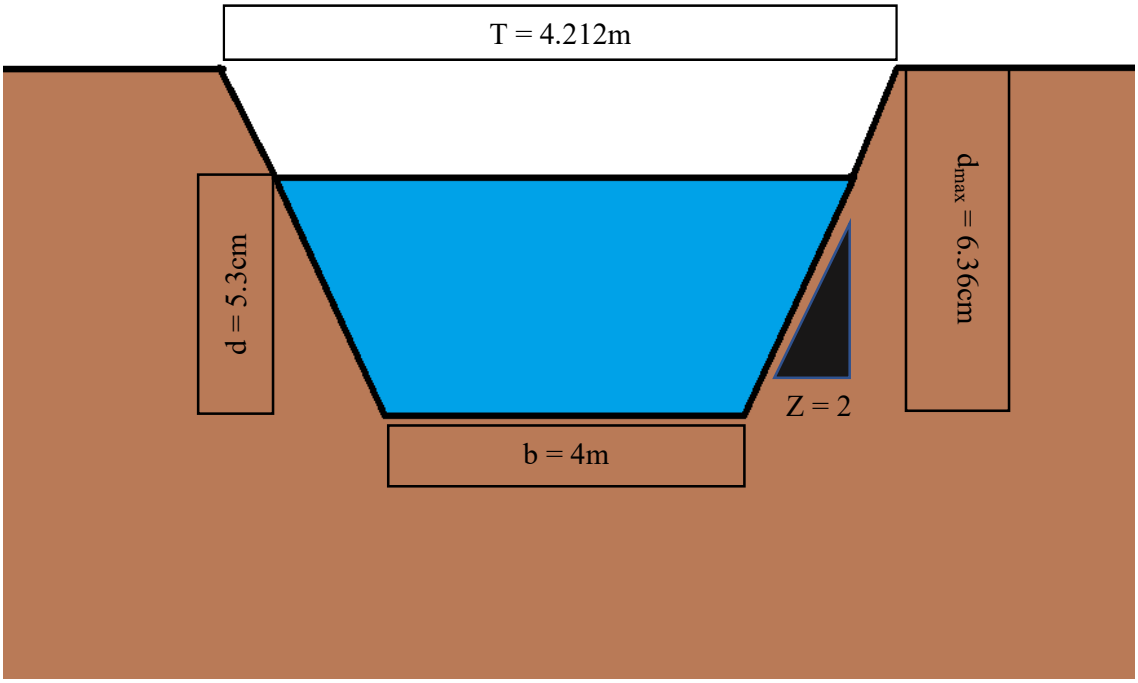

Figure 9 - Sketch of canal design