

**ANNEX B**

***Canal Lining Plan***

**THE STUDY  
ON  
THE LINING OF DISTRIBUTARIES AND MINORS  
IN  
PUNJAB  
IN  
THE ISLAMIC REPUBLIC OF PAKISTAN  
VOLUME II  
ANNEX B CANAL LINING PLAN**

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## **Annex B Canal Lining Plan**

### **B.1 Authorized Discharge and Design Discharge**

#### **B.1.1 Authorized Discharge**

The authorized discharge in the Study area is based on the so-called Irrigation Branch Method which was derived from the experience gained by the Department during the last hundred years. The Full Supply Factor which should be derived from the statistical records for other projects in operation, is the duty, i.e. the area successfully irrigated during a base period, per cusecs of mean supply at channel head, was determined without considering crop water requirements, since the canal system in the Study area was designed with the objective of extensive irrigation to bring more areas under irrigation in order to settle more people.

After determining the full supply factor, the Intensity of Irrigation, which is the percentage of the cultivable area irrigated annually, was determined to be 75% in the area. By studying different factors such as the type of soil, cultivation, habits of the people, marketability, climate, etc. the quantity of area to be irrigated in Kharif as well as Rabi was fixed. The ratio of area to be irrigated in Kharif and Rabi is known as Kharif-Rabi Ratio, which was originally determined to be 35% -40% per annum. After taking all the above factors into consideration, the number of cusecs required at the outlet to irrigate one thousand acres of area fit for irrigation, known as Water Allowance, was fixed to be 2.84 cusecs/1,000 acres.

The authorized discharge of each outlet has been updated from time to time in the Outlet Register of the respective branch offices on the basis of area to be supplied with irrigation water inclusive of the other allowances such as gardens or paddocks which are entitled to an extra supply. The latest authorized discharge at each outlet which was provided by the respective branch offices was adopted as the basis of the design discharge for preliminary design as will be discussed in the subsequent paragraphs.

#### **B.1.2 Design Discharge**

A series of discussions was made between the Chief Engineers/Superintending Engineers/Executive Engineers of the respective Irrigation Zones and the JICA Study Team for the determination of the design discharge. It is a common practice to adopt Consumptive Use Method to estimate irrigation water requirement. The study made in the Inception Report indicates that the water requirement thus estimated is as high as four times of the

actual surface water supply during the peak demand period with increase of crop intensity almost to 150% under the pressure of growing population in the recent years. According to the request of PID, adjustment of design discharge was made based on the above water requirement on the original condition that the crop intensity is 75% consisting of 35% in Kharif and 40% in Rabi. As a result, it is understood that the design discharge in the peak month is also as high as two times of the present surface water supply.

As discussed in the preceding paragraphs, design discharge estimated rationally based on the consumptive use cannot be justified in view of the limited amount of total water resources for Punjab. It is also noted that there is no master plan for the increase of application of water despite the fact that the area is suffering from shortage of water. Nonetheless it is proposed that the design discharge be increased by 10% of present authorized discharge at outlet considering the future development of water resources including diversion of water from the Indus and creation of reservoirs by constructing dams in the near future. The procedure for the calculation of the proposed design discharge for the priority canals for lining is as follows and calculation sheets are attached as Table B-1. It is understood that after lining of the channel, saved water will be the advantage for the beneficiaries in terms of quantity and equity.

- (1) The last updated authorized discharge at each outlet and CCA stated in the Outlet Register in the respective branch offices has been adopted as the basic figure.
- (2) The authorized discharge stated above has been increased by 10% and accumulated from the tail to the head of the distributaries and the minors.
- (3) The channel discharge has been designed by adding the standard absorption loss (Oab) stated in the guidelines<sup>1</sup> for unlined channels;

$$Q_{ab} = 0.0133 \times L \times Q^{0.5625}, \text{ where } L: \text{ length of section (1,000 feet)}$$

and Q: discharge of the section in cusec.

## **B. 2 Design Criteria**

### **B.2.1 General**

The design criteria was prepared based on the design concept to attain 1) silt transportation throughout the canals from the head to the tail with constant velocity by way

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<sup>1</sup>Source: Design Guidelines for Irrigation Channels, Design Directorate Publication No.

of steeper gradient and narrower/deeper section, 2) maximum depth limited up to 5 feet and 3) proportional distribution of water and silt through each outlet against discharge fluctuation in the parent canal. Most of the specifications stated below are described on water depth basis according to the suggestions made by Design Directorate. 3 inch thick in-situ concrete lining is generally proposed as lining method with proper earthwork by way of by-pass(diversion) construction. Precast concrete method and/or membrane are also recommended for further study to be applied where discharge is small or construction work is limited within the canal closure period.

Discussion meeting on the design criteria was held on 19th November, 1996. The following items are discussed for subject of design criteria for lined channels. Design Directorate sent comments and requested its review and confirmation among engineers concerned. Summary of the comments and conclusion by the study team are the followings.

- Design Directorate suggested 1:1.5 side slope where canal depth is deeper than 4 feet. The study team concluded that 1:1.25 slope can make slope stable enough.
- Freeboard of 1 to 1.5 feet were claimed by the Design Directorate and it was concluded that 1 foot freeboard can convey increased discharge in future up to 50 % (10% is already counted into designed full supply level ) and large enough. 0.5 feet freeboard was proposed by the study team for water depth is not more than 2 feet.
- Transition to and from the existing lining portions is to be taken part into design.
- Smoothing of corners in the canal prism is to be taken into consideration in the design.
- Proportionality of water and silt distribution were proved as stated below.

Contract agreement concluded on 26th day of October, 1996 between the JICA Study Team and the Khyber Consulting Engineers. Field works were completed on 20th of December, 1996 and survey results were checked and approved by the Study Team. The final report on the survey will be prepared in December. Actual work progress are given in Figure B-1 and Table B-2~4 show the summary of canal route survey. The total length of distributaries and minors to be surveyed was 553.2 km. Survey interval along center or control line is to be 600m (approx. 2 RD) and all points where any discontinuities are observed in the cross area, shape, slope, section lined/un-lined, drop, regulator or so. Elevations of canal bottom center and both banks are surveyed. Beginning and end points of existing lining portion, all points where any discontinuities such as the above were observed, and canals section by above stated interval covering the right-of-way of each canal. Vegetation, water-logging and surface condition within the right-of-way are observed. Kind,

condition and location of each and every structure are observed and checked. Bottom elevations of watercourses at the head connecting to each outlet are listed.

The table given below shows the comparison of length of canals of the contract of quantities and actual survey quantities.

No.	Name of Canal System	Contract	Surveyed	(Unit : Km)
				Balance
1.	Lower Jhelum Canal	198.48	185.48	-13.00
2.	Lower Chenab Canal	303.69	289.14	-14.55
3.	Central Bari Doab Canal	51.06	66.65	+15.59
Total		553.23	541.27	-11.96

According to the data<sup>2</sup> by ISRIP and their analysis, diameters of soil particles of suspended load at 90% pass and 50% pass are 0.066 mm and 0.027 mm for LJC area and 0.185 mm and 0.112 mm in LCC area. Concentrations of suspended load above 0.062 mm are 7.7 PPM only in LJC and 245.0 PPM in LCC area. The data above show that water flowing in LJC area are of less silt suspension and most of the suspended load can be washed throughout to farm land by normal flow velocity (1-1.5 ft/sec). Condition in LCC on the other hand requests special treatment since most suspended load precipitates within distributaries and minors canal reaches and concentrations are high. Table B-5&6 show the data from ISRIP.

### B.2.2 Basic Design Concept

(1) Soil mechanics survey was conducted on 10 points within the study area and its results show dominance of sandy silt in LCC area and more clayey silt in the other areas. Permeability are relatively low in all area. Inside friction angles and cohesion show that earth material acquired near by canals are suitable for embankment and that canal inside slope could be designed as sharp as 1: 1. Table B-7 shows the summary data of the survey.

(2) Water tightness of concrete is a important property as lining material. Methods to increase the water tightness are 1) application of admixtures AE or so, 2) improvement of water cement ration and size of aggregate and 3) careful construction supervision. According to evaluation of the methods above, approaches recommended to be applied to the project are 1) application of AE admixture to decrease entrapped air and water cement ratio, 2) application of rich mixed concrete (1:2:4) to decrease permeability of concrete, 3) application of steel slip form and rather small aggregate size to reduce required volume of water and 4)

<sup>2</sup> Siltation Data taken by ISRIP for 1982-1984 for branches and distributaries in LCC and main canal in LJC.

execution of careful supervision on even and less air content concrete as well as careful curling to avoid surface crack.

(3) Comparative study result on proportionality of outlet performances by types of outlets is shown in Figure B-2, where Type A ( $H_s = 0.3 \times D$ ,  $Y = H_s$ ), Type B ( $H_s = 0.46 \times D$ ,  $Y = 0.23 \times D$ ), Type C ( $H_s = 0.375 \times D$ ,  $Y = H_s$ ) and Type D ( $H_s = 0.5 \times D$ ,  $Y = 0.3 \times D$ ). Considering discharge fluctuation of current condition as well as future increase of discharge,  $H_s$  and  $Y$  are proposed to be  $0.375 \times D$  for AOSM (Type C). Proportionality of outlet discharge by location of outlet for different designed water depth of parent canal are also studied and ensured for the Type C outlet selected above. According to the working paper 37 of SWABI SCARP, AOSM outlet shows higher capacity of silt absorption through the outlet than the conventional APM outlet. Outlet discharges ( $Q_{out}$ ) are calculated;

$$Q_{out}(AOSM) = k \times Bt \times Y \times H_s^{0.5} \text{ and } Q_{out}(\text{Open Flume}) = k \times Bt \times G^{1.5}$$

#### (4) Depth & Velocity Oriented Design

The Manning's formula is to be employed for hydraulic design. Designed full supply level at each outlet is to be set not lower than the last design full supply level to ensure the better condition. Section is to be changed at the points of outlets where discharge changes more than 10% of the head discharge or at drops only. No design modification will be given for the existing lined portion. Proper transition or some countermeasures will be given in case that hydraulic regime in the new-lined section is extremely different from that in the existing lined portion.

Head reaches where discharge is relatively large are to be designed with the design B/D given to the specific discharge and with slope which is same as or milder than the existing design not to exceed maximum depth and maximum velocity and subsequently same procedure is to be applied to keep the standard velocity by changing gradient for relevant discharge for the upstream portion. Downstream portions are to be designed with steeper slope so as to keep the standard velocity. B/D ratio proposed is shown in Figure B-3. Velocity and depth of water at the tail is to be carefully designed so as to clear at least the minimum allowable velocity and depth. Design flow chart are shown in Figure B-4.

#### (5) Canal related Structure

1) AOSM or open flume outlets are proposed. AOSM is suitable for upstream of the channel where operation head is enough, 2) New VR(village road) bridge is proposed at



such points to minimize crossing of canal by heavy machinery or cattle/buffalo. Footpath rank bridges are proposed to be replaced with VR bridge, 3) New steps are proposed to be installed at one side of channel in turn. Buffalo wallow is proposed to be located at the head of the watercourses nearest to each bridges both from upstream and downstream and 4) Discharge control gates are proposed at the diversion facilities where no gates are installed presently. Meter Flume is to be replaced with a couple of staff gauges.

### **B.2.3 Design Criteria**

#### **(1) Lining Material and its Characteristics**

As practical lining material, concrete lining of 3 inch thick over 1 inch mortar plaster on the smoothen/trimmed surface in trapezoidal section are proposed. Smoothening at slope toe corner is proposed to avoid silt precipitation. Roughness coefficient is assumed to be 0.016. Side slope = 1: 1 for the sections where the water depth is less than 3 feet(0.91 m) and 1:1.25 for the case of deeper water depth than 3 feet are proposed.

#### **(2) B/D Ratio, Depth of Water, Velocity and Freeboard**

The designing discharge range is approximately from 4 cusec(0.12m<sup>3</sup>/s) to 500 cusec(14m<sup>3</sup>/s) and proposed B/D ration are from 0.8(identical for 1:1 section) to 4.5 respectively as shown in Figure B-3. Minimum bottom width (B min) is set at 1.5 feet (0.46m) to keep workability. Velocity is proposed to be kept higher than 2 ft/s(0.61 m/s), design standard velocity, throughout but minimum allowable velocity of 1.5 ft/s(0.46 m/s) is also given for the case where the relevant gradient could not allow the standard velocity inevitably. Maximum velocity is allowed up to 4 ft/s (1.22 m/s) considering allowable velocity of 3 inch lining and safety of children and baby cattle.

Maximum depth is proposed to be no deeper than 5 feet(1.52 m) considering up-lift pressure at the canal bottom and sides during small discharge/empty periods and easiness of construction. Standard depth range for design are from 4 to 2 feet and minimum depth is no shallower than 1.5 feet(0.46m) according to a standard depth of 1 foot over crest at tail cluster. Freeboard within lining is proposed as 1.0 foot (0.30 m) where water depth is deeper than 2 feet (0.61 m) and as 0.5 feet (0.15 m) where water depth is equal to or shallower than 2 feet (0.61 m). In accordance with USBR criteria 0.5 feet (0.15 m) earthen freeboard is also proposed throughout for all the channels.

#### **(3) Earthwork and Dimension of Canal Section**

Specifications of earthwork and dimension of improved canal cross section are proposed as follows. Stripping thickness of 0.2 m or 0.3 m are proposed respectively for outside and inside of canal prism. Bank cutting thickness within canal prism of 1.0 m or 2.0 m and over-embankment exceeding designed lining surface is proposed by 0.5 m or 1.0 m respectively for the cases that water depth is shallower than or equal to/deeper than 3.5 feet. Compaction is to be done up to designed lining height and earthen freeboard is formed by spoil banking.

Width and minimum embankment from field level for operation and maintenance road are 4.0 m and 0.3 m (1 foot) respectively. Bank width for filling section are proposed to be 1.0 m ( $Q < 50$  cusec), 1.5 m ( $50 < Q < 150$  cusec), 2.0 m ( $150 < Q < 300$  cusec) and 2.5 m ( $Q > 300$  cusec). Half width are respectively proposed for cutting section.

#### (4) Outlet

All outlets are to be renewed at the construction of lining. Pipe cum APM/AOSM with a outlet chamber is proposed generally. Operation head ( $H_m$ ) =  $0.82 \times H_s - 0.5 \times B_t$  are to be retained for the purpose of proportional operation of outlets as a semi-modular against discharge fluctuation. Open flume outlet remains as tail cluster at the tail or where  $H_m$  could not be ensured. Steel guide block for the adjusting part and covering (not air-tight) over the chamber are proposed. Outlet discharge measuring gauge is proposed to be installed at the outlet mouth.  $H_s$  and  $Y$  are proposed to be  $0.375 \times D$  for AOSM. Open flume is proposed to set at  $0.9 \times D$  depth. Width of orifice ( $B_t$ ) are proposed to employ standard sizes such as 0.2, 0.25, 0.32, 0.4, 0.5 & 0.63 feet.

#### (5) Other Related Structures

**Bridge:** New VR (village road) bridge (PC slab with effective width of 3.7m by standard of highway department) is proposed at such points to minimize crossing of canal by heavy machinery or cattle/buffalo where cattle are obviously crossing canals, bank are damaged by buffalo watering or where congested houses and shops nearby. Installation interval is to be not shorter than 5 RD considering that all the existing bridges are to be used with necessary repair work or replaced by same rank bridge and footpath rank bridges are to be replaced with VR bridge.

**Drops:** Drops are proposed to be re-designed according to the new canal design or removed. Vertical drop (water cushion type) are proposed for all.

Steps & Buffalo Wallow; All the existing steps are to be removed at construction and new steps are proposed at one side of channel in turn so as to keep habitats and cattle from cross-passing there. To minimize bank damage by cattle and buffalo, buffalo wallow is proposed at the head of the watercourses nearest to each bridge both from upstream and downstream.

Diversion Facilities from Branch Canals & Meter Flume; Discharge control gates are proposed at the diversion facilities where no gates are installed presently. Cost incurred for earthworks and civil works required for gate installation shall be borne by PID. Meter Flume is to be removed at construction and replaced with a couple of staff gauges installed within head reaches of each channels since existing meter flumes are observed out of use/function. For monitoring purpose, H/Q (water depth - discharge) curve shall be prepared by PID using the staff gauges right after construction.

### B.3 Cost Comparison

#### B.3.1 Comparison by Material

Unit construction cost and major repair cost for 10 years are estimated roughly for cost-benefit comparison study below for average canal assumed (30 cusec). Total cost for concrete and brick lining are close each other but periodical major repair would be required for brick lining to keep long-term water tightness and hence repair cost is higher and much conditional. Accordingly, concrete and brick lining could be economically viable. Application of membrane as a whole is denied but partial application for the particular area are to be left as alternative method considering its high water tightness and durability against alkali/salt. In accordance with all study results of literature review, field inspection, technical discussions, pre-qualification study and rough cost-benefit evaluation above, concrete lining is basically proposed for the project. Sections compared are shown in Figure B-5.

Lining Method	Const. Cost (relative cost to concrete)	Repair Cost (% of initial const. cost)	Long- term water- Tightness	Availability of Const. Material
A: Concrete Lining	1.0	3-5	△	⊙
B: Brick Lining	0.8	8-12	○	○
C: Membrane Lining	2.0	1-3	⊙	△

### **B.3.2 Comparison on Canal Section**

Cost comparison of concrete lining sections by different B/D ratio were done using present canal prism situation and design B/D ration according to relevant discharges. Results of the comparison state that 1) work volumes for concrete and mortar as well as lining surface preparation increase relatively to B/D ration and hence narrowest section shows the smallest cost, 2) earthwork volumes show fluctuation and more corresponding to current canal prism than B/D ratio, and therefore 3) since unit price of concrete work is quite higher than that of earthwork, the comparison is concluded that the narrowest section come to be the most economical section in general. On the other hand side, canal depth of the narrowest section (B/D = 0.8) comes very deep. It is accordingly decided that the narrowest section will be applied to the project in general with a depth regulation of about 1.5 m (5 feet) considering easiness of construction work and safeties of habitats and households. Results of cost comparison by sections are shown in Table B-8.

### **B.4 Lining Plan**

According to the references, study results of similar projects and field investigation results, construction methods applicable for distributaries and minors are a)temporary diversion method, b)construction of new canal by the original canal trace and c)construction on original trace while canal closure period. Compaction and trimming of canal slope are difficult and critical path for the construction within the canal closure period.

Proper supervision on earthwork quality control is one of the most important factor to affect life expectancy of canal lining. According to the advantage of temporary diversion method which would make continuous construction through an year round and easy quality control possible, temporary diversion method is proposed to be applied for the project in general and meteorological data stands for negligible breaks of continuous construction. Quality control strictly on water contents of earth material for embankment, cement mix as well as curing stage are recommended to ensure long term durability of canal bank and lining. Steel slip form, severe control on cement mix and long enough curing under wet condition are also proposed to be emphasized to make seepage minimum through canal prism. Lining sections at construction and at completion are shown in Figure B-6.

## ***TABLES***

Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No.	No. of (original) Watercourse	RD		Section Distance (feet)	Village	Check No.	Outlet Discharge		Section		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Improved under CCA (ha)	Remarks	
		(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)						
<b>Pindi Distributary</b>																
1	1245 390/L	390	119	390	119	85/NB	1.34	0.038	1.47	16.34	0.46	19.12	0.541	183	2,285	
2	1246 4302/L	4302	1311	3912	1192	85/NB	2.41	0.068	2.65	15.00	0.42	17.62	0.499	787	318	2,102
3	1247 10200/L	10200	3109	5898	1798	91/NB	1.76	0.050	1.94	12.59	0.36	14.71	0.417	636	257	1,784
4	1248 11300/L	11300	3444	1100	335	91/NB	2.27	0.064	2.50	10.83	0.31	12.42	0.352	791	320	1,527
5	1249 14700/R	14700	4481	3400	1036	R.Depot	1.22	0.035	1.34	8.56	0.24	9.86	0.279	431	174	1,206
6	1250 16031/L	16031	4886	1331	406	84/NB	1.11	0.031	1.22	7.34	0.21	8.36	0.237	390	158	1,032
7	1251 16035/L	16035	4887	4	1	84/NB	1.14	0.032	1.25	6.23	0.18	7.08	0.200	383	155	874
8	1252 22500/TL	22500	6858	6465	1971	84/NB	1.50	0.042	1.65	5.09	0.14	5.83	0.165	513	208	719
9	1253 22500/TF	22500	6858	0	0	81/NB	2.06	0.058	2.27	3.59	0.10	3.95	0.112	724	293	512
10	1254 22500/TR	22500	6858	0	0	R.Depot	1.53	0.043	1.68	1.53	0.04	1.68	0.048	540	219	219
							16.34	0.463		16.34	0.46			5,646	2,285	

<b>Hujjan Distributary</b>																
No.	No. of (original) Watercourse	RD		Section Distance (feet)	Village	Check No.	Outlet Discharge		Section		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Improved under CCA (ha)	Remarks	
		(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)						
1	354 5698/R	5698	1737	5698	1737	Hujjan	1.39	0.039	1.53	182.23	5.16	228.02	6.458	489	198	25,236
2	355 8250/R	8250	2515	2552	778	Hujjan	2.54	0.072	2.79	180.84	5.12	224.89	6.369	893	361	25,039
3	356 9000/L	9000	2743	750	229	Hujjan	1.21	0.034	1.33	178.30	5.05	221.39	6.270	427	173	24,677
4	357 9400/R	9400	2865	400	122	Chowal	2.34	0.066	2.57	177.09	5.02	219.85	6.226	823	333	24,504
5	358 10150/L	10150	3094	750	229	Hujjan	1.49	0.042	1.64	174.75	4.95	217.16	6.150	524	212	24,171
6	359 15648/L	15648	4770	5498	1676	Rawana	0.89	0.025	0.98	173.26	4.91	215.32	6.098	312	126	23,959
7	360 16508/R	16508	5032	860	262	Chowal	2.24	0.063	2.46	172.37	4.88	212.84	6.028	791	320	23,833
8	361 16730/L	16730	5099	222	68	Rawana	1.51	0.043	1.66	170.13	4.82	210.15	5.951	532	215	23,513
9	362 17774/L	17774	5418	1044	318	Uppi	1.65	0.047	1.82	168.62	4.78	208.43	5.903	579	234	23,298
10	363 17904/R	17904	5457	130	40	Uppi	0.84	0.024	0.92	166.97	4.73	206.33	5.843	294	119	23,063
11	364 18000/L	18000	5486	96	29	Uppi	2.23	0.063	2.45	166.13	4.70	205.37	5.816	786	318	22,944
12	365 23500/R	23500	7163	5500	1676	K.Raja	0.98	0.028	1.08	163.90	4.64	202.90	5.746	345	140	22,626
13	366 25577/L	25577	7796	2077	633		1.60	0.045	1.76	162.92	4.61	200.37	5.674	565	229	22,487
14	366 25593/R	25593	7801	16	5	K.Raja	2.55	0.072	2.81	161.32	4.57	198.07	5.609	898	363	22,258
15	367 28966/L	28966	8829	3373	1028		9.87	0.280	11.62	158.77	4.50	195.26	5.530	3439	1392	21,894
16	368 29088/R	29088	8866	122	37	Uppi	1.77	0.050	1.95	148.90	4.22	182.77	5.176	644	261	20,503
17	369 34634/L	34634	10556	5545	1690	K.Momin	0.83	0.024	0.91	147.13	4.17	180.79	5.120	294	119	20,242
18	370 36863/L	36863	11113	1827	557		2.50	0.071	2.75	146.30	4.14	179.88	5.094	879	356	20,123
19	371 39280/R	39280	11973	2417	737	K.Raja	19.06	0.540	22.35	143.80	4.07	175.77	4.978	5748	2326	19,767
20	372 43020/R	43020	13112	1452	443		1.02	0.029	1.12	124.74	3.53	152.97	4.332	357.5	145	17,441
21	373 43203/L	43203	13168	183	56	K.Raja	0.99	0.028	1.09	123.72	3.50	151.76	4.298	350	142	17,296
22	374 43210/R	43210	13170	7	2	K.Raja	6.07	0.172	6.99	122.73	3.48	150.13	4.252	2140	866	17,155
23	43310/R	43310	13201	100	30		2.14	0.061	2.35	116.66	3.30	142.63	4.039	652	264	16,289
	49050/R	49050	14950	5740	1750		1.22	0.035	1.34	114.52	3.24	139.96	3.964	418	169	16,025
							0.69	0.020	0.76	113.30	3.21	138.58	3.925	244	99	15,856
							13.85	0.392	16.27	112.61	3.19	137.82	3.903	4655	1884	15,757
							0.00	0.000	0.00	98.76	2.80	121.53	3.442	0	0	13,873

Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No. (original)	No. of Watercourse	KD (feet)	Section Distance (feet)	Village	Check No.	Outlet Discharge		Section Discharge		Design Discharge		Outlet CCA (acre)	Section CCA (ha)	Improved under	Remarks
						Authorized (cusec)	Design (cusec)	Authorized (m <sup>3</sup> /s)	Design (m <sup>3</sup> /s)	Authorized (m <sup>3</sup> /s)	Design (m <sup>3</sup> /s)				
24	375 49157/L	49157 14983	107	33 K.Raja		1.50	0.042	1.65	98.76	2.80	120.40	530	214	13,873	
25	376 49178/R	49178 14989	21	6		11.11	0.315	13.11	97.26	2.75	118.73	3728	1509	13,659	Sahawal Minor(13.11)
26	378 54700/L	54700 16673	4790	1460	65/SB	0.86	0.024	0.95	86.15	2.44	105.61	302	122	12,150	OFWM
27	379 54790/R	54790 16700	90	27	91/SB	1.10	0.031	1.21	85.29	2.42	104.53	389	157	12,028	
28	380 60272/R	60272 18371	5482	1671	65/SB	0.83	0.024	0.91	84.19	2.38	102.46	294	119	11,870	OFWM
29	381 61361/R	61361 18703	1089	332	65/SB	1.68	0.048	1.85	83.36	2.36	101.53	591	239	11,751	OFWM
30	61700/L	61700 18806	339	103	91/SB	0.55	0.016	0.61	81.68	2.31	98.70	194	79	11,512	OFWM
31	62472/L	62472 19041	772	235		1.95	0.055	2.15	81.13	2.30	97.91	689	279	11,434	
32	62573/R	62573 19072	101	31		2.24	0.063	2.46	79.18	2.24	95.70	786	318	11,155	
33	382 71738/L	71738 21866	9165	2793 Laliyani		2.03	0.057	2.23	76.94	2.18	93.11	668	270	10,547	
34	383 71852/R	71852 21900	114	35 Laliyani		1.90	0.054	2.09	74.91	2.12	90.86	563	228	10,277	OFWM
35	384 73000/R	73000 22250	1148	350 Laliyani		1.60	0.045	1.76	73.01	2.07	87.24	563	228	10,277	OFWM
36	385 73400/R	73400 22372	400	122 Laliyani		2.10	0.059	2.31	71.41	2.02	85.46	740	299	10,049	OFWM
37	386 75000/L	75000 22860	1600	488 Laliyani		1.02	0.029	1.12	69.31	1.96	82.96	358	145	9,749	OFWM
38	387 76485/R	76485 23313	1485	453 Laliyani		0.99	0.028	1.09	68.29	1.93	81.78	349	141	9,604	OFWM
39	388 78516/L	78516 23932	2031	619 Laliyani		2.15	0.061	2.37	67.30	1.91	80.44	757	306	9,463	OFWM
40	389 78516/R	78516 23932	0	0 Laliyani		0.98	0.028	1.08	65.15	1.85	77.84	344	139	9,157	
41	390 79968/R	79968 24374	1452	443 12/SB		0.91	0.026	1.00	64.17	1.82	76.45	319	129	9,018	OFWM
42	391 80994/L	80994 24687	1026	313 12/SB		2.69	0.076	2.96	63.26	1.79	75.45	947	383	8,888	OFWM
43	392 83350/L	83350 25405	65	20 M.wala		1.68	0.048	1.85	60.57	1.72	72.27	583	236	8,505	OFWM
44	393 87430/R	87430 26649	4080	1244 M.wala		9.23	0.261	10.91	58.89	1.67	70.27	3239	1311	8,269	M. Wala Minor(10.91)
45	394 88477/L	88477 26968	1047	319 M.wala		1.12	0.032	1.23	49.66	1.41	59.03	394	159	6,958	
46	395 89500/R	89500 27280	1023	312 M.WALA	65-SB	0.23	0.007	0.25	48.54	1.37	57.79	72	29	6,799	
47	396 91868/L	91868 28001	2368	722 M.WALA	65-SB	1.75	0.050	1.93	48.31	1.37	57.01	611	247	6,770	OFWM
48	397 92275/L	92275 28125	155	47		1.22	0.035	1.34	46.56	1.32	54.95	417	169	6,523	OFWM
49	398 95500/L	95500 29108	3225	983 Jaspal	15/SB	1.25	0.035	1.38	45.34	1.28	53.47	423	171	6,354	
50	401 98445/R	98445 30006	1845	562		10.39	0.294	12.13	44.09	1.25	51.80	3633	1470	6,183	Tangu Minor(12.13)
51	403 100000/L	100000 30480	1555	474		2.23	0.063	2.45	33.70	0.95	39.64	787	318	4,712	WAPDA/OFWM
52	404 100030/L	100030 30489	30	9 Laliyani	15/SB	18.96	0.537	22.36	31.47	0.89	37.17	6551	2651	4,394	Jaspal Minor(22.36)
53	405 100050/R	100050 30495	20	6 Laliyani	15/SB	0.91	0.026	1.00	12.51	0.35	14.49	320	130	1,743	OFWM
54	406 107500/L	107500 32766	7450	2271 Laliyani	15/SB	0.80	0.023	0.88	11.60	0.33	13.42	280	113	1,613	OFWM
55	413 107500/R	107500 32766	0	0 Laliyani		0.78	0.022	0.86	10.80	0.31	12.44	274	111	1,500	
56	414 111473/TR	111473 33977	3973	1211		1.06	0.030	1.17	10.02	0.28	11.49	342	138	1,389	OFWM
57	415 111473/TCR	111473 33977	0	0	13/SB	1.91	0.054	2.10	8.96	0.25	10.33	675	273	1,251	WAPDA/OFWM
58	416 111473/TLA	111473 33977	0	0	13/SB	0.98	0.028	1.08	7.05	0.20	8.22	347	140	977	OFWM
59	417 111473/TLL	111473 33977	0	0	13/SB	0.14	0.004	0.15	6.07	0.17	6.83	51	21	837	
						1.78	0.050	1.96	5.93	0.17	6.67	589	238	816	OFWM
						1.73	0.049	1.90	4.15	0.12	4.57	577	234	578	
						1.36	0.039	1.50	2.42	0.07	2.66	478	193	344	OFWM
						1.06	0.030	1.17	1.06	0.03	1.17	373	151	151	
						182.23	5.16					62,359	25,236		

Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No.	No. of Watercourse (original)	RD (feet)	RD (m)	Section Distance (feet)	Section Distance (m)	Village	Check No.	Outlet Discharge		Section Discharge		Design Discharge (cusec)	Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Improved under CCA (ha)	Remarks
								Authorized (cusec)	Design (cusec)	Authorized (m <sup>3</sup> /s)	Design (cusec)						
<b>Arian Minor (RD 28966/L, Hujjan Distributary)</b>																	
1	462 4494/L	4494	1370	4494	1370	19/SB		1.36	0.039	1.50	9.87	0.28	11.62	0.33	195	1,392	1,392 OFWM
2	463 9000/R	9000	2743	4506	1373	Kot Moman		1.40	0.040	1.54	8.51	0.24	9.89	0.280	201	1,197	OFWM
3	464 9450/L	9450	2880	450	137	Kot Moman		1.42	0.040	1.56	7.11	0.20	8.14	0.230	185	996	
4	465 13410/L	13410	4087	3960	1207	Kot Moman		1.04	0.029	1.14	5.69	0.16	6.55	0.186	367	149	811
5	466 17800/TR	17800	5425	4390	1338	Kot Moman		2.40	0.068	2.64	4.65	0.13	5.26	0.149	846	342	662 OFWM
6	467 17800/TL	17800	5425	0	0	Kot Moman		2.25	0.064	2.48	2.25	0.06	2.48	0.070	791	320	320 OFWM
								9.87	0.28		9.87	0.28			3,439	1,392	
<b>Kot Momin Minor (RD 36461/R, Hujjan Distributary)</b>																	
1	423 4214/R	4214	1284	4214	1284	Kot Raja		1.74	0.049	1.91	19.06	0.54	22.35	0.633	226	2,668	2,668 OFWM
2	424 7215/L	7215	2199	3001	915	Kot Momin		1.23	0.035	1.35	17.32	0.49	20.12	0.570	175	2,442	OFWM
3	425 7225/L	7225	2202	10	3	Kot Momin		1.07	0.030	1.18	16.09	0.46	18.55	0.525	376	152	2,267 OFWM
4	427 11566/R	11566	3525	4341	1323	Kot Raja		1.02	0.029	1.12	15.02	0.43	17.37	0.492	355	144	2,115 OFWM
5	428 11785/L	11785	3592	219	67	Kot Momin	9SB	1.43	0.040	1.57	14.00	0.40	15.97	0.452	503	204	1,971 OFWM
6	429 15394/R	15394	4692	3609	1100			1.12	0.032	1.23	12.57	0.36	14.38	0.407	398	161	1,767 OFWM
7	430 17695/R	17695	5393	2301	701	Kot Momin		1.55	0.044	1.71	11.45	0.32	12.94	0.366	550	223	1,606
8	431 17887/L	17887	5452	192	59		10/SB	1.51	0.043	1.66	9.90	0.28	11.10	0.314	532	215	1,384
9	432 22250/TR	22250	6782	4363	1330		10/SB	1.81	0.051	1.99	8.39	0.24	9.43	0.267	621	251	1,168 OFWM
10	433 22250/TL	22250	6782	0	0		11/SB	2.32	0.066	2.55	6.58	0.19	7.24	0.205	804	325	917 OFWM
11	434 22250/TCR	22250	6782	0	0		10/SB	2.11	0.060	2.32	4.26	0.12	4.69	0.133	713	289	592
12	434 22250/TCL	22250	6782	0	0		11/SB	2.15	0.061	2.37	2.15	0.06	2.37	0.067	749	303	303 OFWM
								19.06	0.54		19.06	0.54			6,594	2,668	
<b>Kot Raja Minor (RD 41568/R, Hujjan Distributary)</b>																	
1	418 2200/L	2200	671	2200	671	Kot Raja		1.24	0.035	1.36	6.07	0.17	6.99	0.198	437	177	866 OFWM
2	419 5800/R	5800	1768	3600	1097	Kot Raja		1.20	0.034	1.32	4.83	0.14	5.54	0.157	425	172	689 OFWM
3	420 9215/TR	9215	2809	3415	1041	Kot Raja		1.39	0.039	1.53	3.63	0.10	4.09	0.116	488	197	517
4	421 9215/TC	9215	2809	0	0			1.09	0.031	1.20	2.24	0.06	2.46	0.070	384	155	320
5	422 9215/TL	9215	2809	0	0		8/ASB	1.15	0.033	1.27	1.15	0.03	1.27	0.036	406	164	164
								6.07	0.17		6.07	0.17			2,140	866	



Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No. (original)	No. of Watercourse	RD (feet)	Section Distance (feet)	Village	Check No.	Outlet Discharge		Section		Design Discharge (cusec)	Outlet CCA (acre)	Section CCA (ha)	Improved under	Remarks
						Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (cusec)					
<b>Bhiki Minor(RD 43310/R, Hujjan Distributary)</b>														
1	436 4147/L	4147	1264	4147	1264	8/SB	0.80	0.023	0.88	13.85	0.39	13.85	0.39	1.974
2	437 9775/L	9775	2979	5628	1715 B.KHURD		1.14	0.032	1.25	13.05	0.37	15.12	0.428	281 114 1.974 OPWM
3	438 10496/R	10496	3199	721	220 Deowal		1.35	0.038	1.49	11.91	0.34	13.53	0.383	403 163 1.860
4	439 13242/R	13242	4036	2746	837 Deowal		2.47	0.070	2.72	10.56	0.30	12.00	0.340	474 192 1.697
6	441 13531/L	13531	4124	289	88 Deowal		1.68	0.048	1.85	8.09	0.23	9.14	0.259	868 351 1.505
5	440 13581/R	13581	4139	50	15 Deowal		0.89	0.025	0.98	6.41	0.18	7.28	0.206	591 239 1.154
7	442 13861/R	13861	4225	280	85 Deowal		1.45	0.041	1.60	5.52	0.16	6.30	0.178	315 127 915 OPWM
8	20785/TF	20785	6335	6924	2110		2.47	0.070	2.72	4.07	0.12	4.69	0.133	511 207 788
9	443 20785/TR	20785	6335	0	0 Deowal		1.60	0.045	1.76	1.60	0.05	1.76	0.050	870 352 581
							13.85	0.39		13.85	0.39	4.878	1.974	229 229 OPWM
<b>Sahawal Minor(RD49178/R, Hujjan Distributary)</b>														
1	445 6334/L	6334	1931	6334	1931	65/SB	0.09	0.003	0.10	11.11	0.31	13.11	0.371	31 13 1.575
2	446 7330/L	7330	2234	996	304 Laliani		1.61	0.046	1.77	11.02	0.31	12.66	0.359	546 221 1.563 OPWM
3	447 7800/R	7800	2377	470	143 Laliani		1.47	0.042	1.62	9.41	0.27	10.84	0.307	518 210 1.342 OPWM
4	448 14850/L	14850	4526	7050	2149 Laliani		2.09	0.059	2.30	7.94	0.22	9.20	0.260	736 298 1.132 OPWM
5	449 15236/R	15236	4644	386	118 Laliani		0.89	0.025	0.98	5.85	0.17	6.58	0.186	314 127 834 OPWM
6	450 18904/TL	18904	5762	3668	1118 Laliani		2.10	0.059	2.31	4.96	0.14	5.58	0.158	739 299 707 OPWM
7	450 18904/TR	18904	5762	0	0 Laliani		2.86	0.081	3.15	2.86	0.08	3.15	0.089	1009 408 408 OPWM
							11.11	0.31		11.11	0.31	3.893	1.575	
<b>Marulianwala Minor(RD 83285/L, Hujjan Distributary)</b>														
1	452 4042/R	4042	1232	4042	1232		1.77	0.050	1.95	9.23	0.26	10.91	0.309	625 253 1.311 WAPDA
2	453 7644/L	7644	2330	3602	1098 M.Wala		1.56	0.044	1.72	7.46	0.21	8.76	0.248	538 218 1.058 WAPDA
3	454 12488/R	12488	3806	4844	1476		2.06	0.058	2.27	5.90	0.17	6.88	0.195	724 293 840 WAPDA/OPWM
4	455 19250/TR	19250	5867	6762	2061		1.64	0.046	1.80	3.84	0.11	4.43	0.125	577 234 547
5	19250/TL	19250	5867	0	0		2.20	0.062	2.42	2.20	0.06	2.42	0.069	775 314 314
							9.23	0.26		9.23	0.26	3.239	1.311	

Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No.	No. of (original)	Watercourse	RD (feet)	RD (m)	Section Distance (feet)	Section Distance (m)	Village	Check No.	Outlet Discharge		Section		Design Discharge (cusec)	Outlet CCA (sec)	Section CCA (ha)	Improved under	Remarks	
									Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)						
<b>Tangu Minor (RD 92120/L, Hujjan Distributary)</b>																		
1	457	6242/L	6242	1903	6242	1903	M.Wala		10.39	0.29	10.39	0.29	12.13	0.344	718	291	1,470	
2	458	9990/R	9990	3045	3748	1142	M.Wala		2.04	0.058	2.24	0.39	9.55	0.271	550	223	1,180	
3	459	10022/L	10022	3055	32	10	M.Wala		1.59	0.045	1.75	0.24	7.63	0.216	657	266	957	
4	460	15873/TL	14873	4533	4851	1479	M.Wala		1.86	0.053	2.05	0.19	5.58	0.158	684	277	691	WAPDA/OFWM
5	461	15873/TR	15873	4838	1000	305		17/SB	2.96	0.084	3.26	0.08	3.28	0.093	1024	414	414	414 WAPDA/OFWM
									10.39	0.29					3,633	1,470		
<b>Jaspal Minor (RD 95500/L, Hujjan Distributary)</b>																		
1	468	4498/R	4498	1371	4498	1371	Lahani		18.96	0.54	1.77	0.54	22.36	0.633	563	228	2,651	OFWM
2	469	7916/L	7916	2413	3418	1042		16/SB	2.53	0.072	2.78	0.49	20.25	0.573	796	322	2,423	OFWM
3	470	8900/R	8900	2713	984	300		14/SB	1.15	0.033	1.27	0.42	17.22	0.488	405	164	2,101	OFWM
4	471	9755/L	9755	2973	855	261		16/SB	1.34	0.038	1.47	0.39	15.89	0.450	457	185	1,937	OFWM
5	472	9950/R	9950	3033	195	59		14/SB	0.79	0.022	0.87	0.35	14.36	0.407	279	113	1,752	OFWM
6	473	15217/R	15217	4638	5267	1605		14/SB	0.99	0.028	1.09	0.33	13.48	0.382	349	141	1,639	
7	474	17413/L	17413	5307	2196	669		16/SB	1.30	0.037	1.43	0.30	12.10	0.343	457	185	1,498	OFWM
8	475	18542/R	18542	5652	1129	344		14/SB	0.97	0.027	1.07	0.26	10.55	0.299	342	138	1,313	OFWM
9	476	20833/L	20833	6350	2291	698		17/SB	1.64	0.046	1.80	0.23	9.42	0.267	579	234	1,175	
10	477	21253/R	21253	6478	420	128		14/SB	1.04	0.029	1.14	0.19	7.51	0.213	354	143	941	
11	478	24083/L	24083	7340	2830	863		17/SB	1.10	0.031	1.21	0.16	6.35	0.180	385	156	797	
12	479	24083/R	24083	7340	0	0		14/SB	1.29	0.037	1.42	0.50	5.04	0.143	453	183	641	
13	480	27300/TR	27300	8321	3217	981		17/SB	1.14	0.032	1.25	0.09	3.62	0.102	403	163	458	
14	481	27300/TL	27300	8321	0	0		17/SB	2.07	0.059	2.28	0.06	2.28	0.064	729	295	295	
									18.96	0.54					6,551	2,651		
<b>Kirana Distributary</b>																		
1	1	300/L	300	91	300	91	Ghullapur		371.58	10.52	0.81	10.52	453.92	12.855	258	104	36,323	
2	2	2950/R	2950	899	2650	808	Ghullapur		1.46	0.041	1.61	0.50	452.98	12.828	513	208	36,219	
3	3	8900/R	8900	2713	5950	1814		66/20/21/SB	2.01	0.057	2.21	0.46	450.27	12.752	700	283	36,011	OFWM
4	4	9200/R	9200	2804	300	91			108.19	3.064	108.19	367.37	10.40	445.61	12.620		35,728	
5	5	9300/R	9300	2835	100	30	G.Pur Metla		1.74	0.049	1.91	0.25	7.34	337.30	9.552	612	248	35,728
6	6	18150/R	18150	5532	8850	2697	Metla	66/SE	1.49	0.042	1.64	0.25	7.29	335.35	9.497	524	212	35,480
7	7	18150/L	18150	5532	0	0	Metla		1.03	0.029	1.13	0.25	7.25	333.71	9.451	364	147	35,268
8	8	19235/L	19235	5863	1085	331	Metla		1.63	0.046	1.79	0.25	7.22	329.50	9.331	572	231	35,121
9	9	26220/R	26220	7992	6985	2129	Metla		1.28	0.036	1.41	0.25	7.17	327.71	9.281	449	182	34,890
10	10	26220/L	26220	7992	0	0	Metla		1.51	0.043	1.66	0.25	7.14	325.92	9.230	532	215	34,708
11	11	26900/R	26900	8199	680	207	Metla		1.56	0.044	1.72	0.25	7.09	321.87	9.115	551	223	34,493
									1.43	0.040	1.57	0.25	7.05	320.15	9.067	505	204	34,270

Chokera Distributary

Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No.	No. (original)	Number of Watercourse	RD (feet)	Section Distance (m)	Village	Check No.	Outlet Discharge		Section Discharge		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Improved under CCA (ha)	Remarks			
							Authorized (cusec)	Design (cusec)	Authorized (cusec)	Design (cusec)								
12	12	30205/L	30205	9206	3305	1007	22/SB	0.64	0.018	0.70	247.51	7.01	318.34	9.016	227	92	34,065	
13	13	30210/R	30210	9208	5	2	Mantia	1.28	0.036	1.41	246.87	6.99	316.52	8.964	450	182	33,973	
14	14	31328/L	31328	9549	1118	341	22/SB	1.89	0.054	2.08	245.59	6.96	315.11	8.924	665	269	33,791	
15	15	34725/L	34725	10584	3397	1035	Mantia	1.31	0.037	1.44	243.70	6.90	312.65	8.854	461	187	33,522	
16	16	34800/L	34800	10607	75	23	22/SB	1.92	0.054	2.11	242.39	6.86	310.07	8.781	677	274	33,336	OFWM
17	17	40785/L	40735	12416	5935	1809	25/SB	1.92	0.054	2.11	240.47	6.81	307.93	8.721	676	274	33,062	
18	18	40930/R	40930	12475	195	59	69/SB	2.02	0.057	2.22	238.55	6.76	303.85	8.605	713	289	32,788	
19	19	43800/R	45800	13960	4870	1484	69/SB	1.36	0.039	1.50	236.53	6.70	301.56	8.540	463	187	32,499	
20	20	47470/L	47470	14469	1670	509	23/SB	1.03	0.029	1.13	235.17	6.66	298.46	8.452	347	140	32,312	
21	21	48515/R	48515	14787	1045	319	67/SB	1.22	0.035	1.34	234.14	6.63	296.78	8.405	390	158	32,172	
22	22	49700/L	49700	15149	1185	361	23/SB	1.99	0.056	2.19	232.92	6.60	295.10	8.357	489	198	32,014	
23	23	49885/R	49885	15205	185	56	73/SB	4.25	0.120	4.84	230.93	6.54	292.52	8.284	1497	606	31,816	
24	24	50000/R	50000	15240	115	35	73/SB	1.31	0.037	1.44	226.68	6.42	287.62	8.145	458	185	31,210	
25	25	50790/L	50790	15481	790	241	23/SB	1.23	0.035	1.35	225.37	6.38	286.14	8.104	434	176	31,025	
26	26	54100/R	54100	16490	3310	1009	73/SB	1.40	0.040	1.54	224.14	6.35	284.54	8.058	492	199	30,849	
27	27	55200/R	55200	16825	1100	335	73/SB	0.98	0.028	1.08	222.74	6.31	281.94	7.985	343	139	30,650	
28	28	58410/R	58410	17803	3210	978	73/SB	1.18	0.033	1.30	221.76	6.28	280.52	7.944	415	168	30,511	OFWM
29	29	61135/R	61135	18634	2635	803	80/SB	0.99	0.028	1.09	220.58	6.25	278.20	7.879	347	140	30,343	OFWM
30	30	61800/L1	61800	18837	665	203	77/SB	1.72	0.049	1.89	219.59	6.22	277.09	7.847	602	244	30,203	OFWM
31	31	61800/R1	61800	18837	0	0	80/SB	1.23	0.035	1.35	217.87	6.17	274.37	7.770	432	175	29,959	OFWM
32	32	61800/L2	61800	18837	0	0	81/SB	0.99	0.028	1.09	216.64	6.14	272.81	7.726	349	141	29,784	
33	33	61800/R2	61800	18837	0	0	80/SB	2.11	0.060	2.32	215.65	6.11	271.72	7.695	715	289	29,643	OFWM
34	34	69700/L	69700	21245	7900	2408	86/SB	12.57	0.356	14.46	213.54	6.05	269.40	7.629	4051	1639	29,354	Hadda Minor(14.46)
35	35	69700/R	69700	21245	0	0	81/SB	1.85	0.052	2.04	200.97	5.69	254.94	7.220	636	257	27,714	OFWM
36	36	72827/R	72827	22198	3127	953	Hadda	1.05	0.030	1.16	199.12	5.64	250.54	7.095	370	150	27,457	OFWM
37	37	76225/L	76225	23233	3398	1036	86/SB	1.40	0.040	1.54	198.07	5.61	249.39	7.063	493	200	27,307	
38	38	77215/R	77215	23535	990	302	Hadda	1.55	0.046	1.77	195.26	5.57	246.92	6.993	496	201	27,108	OFWM
39	39	81020/R	81020	24695	3805	1160	89/SB	1.61	0.046	1.77	195.26	5.53	244.37	6.921	567	229	26,907	
40	40	84000/R	84000	25603	577	176	86/SB	1.60	0.045	1.76	193.65	5.48	242.31	6.862	493	200	26,677	OFWM
41	41	84205/R	84205	25666	205	62	89/SB	1.57	0.044	1.73	192.05	5.44	239.44	6.781	499	202	26,478	OFWM
42	42	84465/L	84465	25745	260	79	90/SB	1.94	0.055	2.13	190.48	5.39	237.02	6.712	622	252	26,276	OFWM
43	43	87200/R	87200	26579	2735	834	89/SB	1.19	0.034	1.31	188.54	5.34	234.72	6.647	418	169	26,024	OFWM
44	44	89285/R	89285	27214	2085	636	94/SB	1.44	0.041	1.58	187.35	5.31	233.35	6.608	439	178	25,855	OFWM
45	45	89527/L	89527	27288	242	74	90/SB	1.25	0.035	1.38	185.91	5.26	231.69	6.562	431	174	25,677	OFWM
46	46	94772/L	94772	28887	5245	1599	94/SB	1.51	0.043	1.66	184.66	5.23	229.54	6.501	531	215	25,503	
47	47	94800/R	94800	28895	28	9	90/SB	1.52	0.043	1.67	183.15	5.19	227.29	6.437	425	172	25,288	
48	48	96485/L	96485	29409	1685	514	90/SB	1.39	0.039	1.53	181.63	5.14	225.55	6.388	408	165	25,116	
49	49	97015/R	97015	29570	530	162	95/SB	1.37	0.039	1.51	180.24	5.10	222.56	6.303	477	193	24,951	
50	50	98145/R	98145	29915	1130	344	94/SB	1.37	0.039	1.51	178.87	5.07	221.04	6.260	459	186	24,758	OFWM
51	51	101620/L	101620	30974	3475	1059	98/SB	1.61	0.046	1.77	177.50	5.03	219.07	6.204	563	228	24,572	OFWM
52	52	102646/L	102646	31287	1026	313	98/SB	1.23	0.035	1.35	175.89	4.98	217.15	6.150	433	175	24,344	
53	53	103840/R	103840	31650	1194	364	100/SB	0.65	0.018	0.72	174.66	4.95	215.49	6.103	230	93	24,169	
								1.84	0.052	2.02	174.01	4.93	213.83	6.056	648	262	24,076	WAPDA
								1.42	0.040	1.56	172.17	4.88	211.52	5.990	502	203	23,814	WAPDA

Table B - 1 (U/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No.	No. (original)	Number of Watercourse	RD		Section Distance (feet)	Village	Check No.	Outlet Discharge		Section		Design Discharge (cusec)	Outlet CCA (acre)	Section CCA (ha)	Improved under	Remarks		
			(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (cusec)							
54	54	104900/R	104900	31974	1060	323	98/SB	1.06	0.030	1.17	170.75	4.84	209.64	5.937	373	151	23,611	
55	55	104900/L	104900	31974	0	0	98/SB	1.15	0.033	1.27	169.69	4.81	208.19	5.896	404	163	23,460	
56	56	104900/R	104900	31974	0	0		25.95	0.735	30.77	168.54	4.77	206.92	5.860	8768	3548	23,296	Maikana Minor(30.77)
57	57	107157/L	107157	32661	2257	688	98/SB	1.18	0.033	1.30	142.59	4.04	176.15	4.989	416	168	19,748	WAPDA/OFWM
58	58	110250/L	110250	33604	3093	943	102/SB	1.23	0.035	1.35	141.41	4.00	174.31	4.936	432	175	19,579	WAPDA
59	59	111500/R	111500	33985	1250	381	100/SB	1.46	0.041	1.61	140.18	3.97	172.21	4.877	515	208	19,405	
60	60	113775/L	113775	34679	2275	693	102/SB	1.27	0.036	1.40	138.72	3.93	170.30	4.823	433	175	19,196	WAPDA/OFWM
61	61	114928/R	114928	35030	1153	351	105/SB	0.91	0.026	1.00	137.45	3.89	168.36	4.768	320	130	19,021	
62	62	116055/L	116055	35374	1127	344	102/SB	1.18	0.033	1.30	136.54	3.87	167.08	4.732	415	168	18,891	WAPDA
63	63	118000/R	118000	35966	1945	593	105/SB	1.25	0.035	1.38	135.36	3.83	165.52	4.687	410	166	18,723	OFWM
64	64	119327/L	119327	36371	1327	404	106/SB	1.09	0.031	1.20	134.11	3.80	163.69	4.636	384	155	18,558	WAPDA
65	65	119347/L	119347	36377	20	6	106/SB	2.01	0.057	2.21	133.02	3.77	162.18	4.593	690	279	18,402	WAPDA/OFWM
66	66	120100/L	120100	36606	753	230	106/SB	1.77	0.050	1.95	131.01	3.71	159.96	4.530	604	244	18,123	WAPDA/OFWM
67	67	121714/L	121714	37098	1614	492	106/SB	1.92	0.054	2.11	129.24	3.66	157.84	4.470	677	274	17,878	WAPDA/OFWM
68	68	121850/L	121850	37140	136	41	110/SB	1.15	0.033	1.27	127.32	3.61	155.36	4.400	403	163	17,604	WAPDA
69	69	121864/R	121864	37144	14	4	105/SB	1.27	0.036	1.40	126.17	3.57	154.06	4.363	428	173	17,441	
70	70	123475/L	123475	37635	1611	491	110/SB	2.35	0.067	2.59	124.90	3.54	152.66	4.323	817	331	17,268	WAPDA/OFWM
71	71	126331/L	126331	38506	2856	871	114/SB	1.99	0.056	2.19	122.55	3.47	149.72	4.240	699	283	16,938	WAPDA
72	72	126500/R	126500	38557	169	52	107/SB	2.89	0.082	3.18	120.56	3.41	146.89	4.160	945	382	16,655	WAPDA
73	73	126620/L	126620	38594	120	37	111/SB	1.60	0.045	1.76	117.67	3.33	143.68	4.069	562	227	16,272	
74	74	126620/L	126620	38594	0	0		12.15	0.344	14.34	116.07	3.29	141.89	4.018	4277	1731	16,045	Wasuana Minor(14.34)
75	75	131150/R	131150	39975	4530	1381	107/SB	2.05	0.058	2.26	103.92	2.94	127.55	3.612	722	292	14,314	OFWM
76	76	137100/L	137100	41788	5950	1814	113/SB	1.30	0.037	1.43	101.87	2.88	124.38	3.522	432	175	14,022	
77	77	140615/L	140615	42859	3515	1071	113/SB	0.70	0.020	0.77	100.57	2.85	121.76	3.448	247	100	13,847	
78	78	142000/L	142000	43282	1385	422	113/SB	0.95	0.027	1.05	99.87	2.83	120.30	3.407	335	136	13,747	
79	79	142200/L	142200	43343	200	61		9.75	0.276	11.32	98.92	2.80	118.98	3.370	3234	1309	13,611	Tandalian Minor(11.32)
80	80	142360/R	142360	43391	160	49	112/SB	2.35	0.067	2.59	89.17	2.53	107.62	3.048	827	335	12,302	WAPDA/OFWM
81	81	144900/R	144900	44166	2540	774	112/SB	0.96	0.027	1.06	86.82	2.46	105.01	2.974	337	136	11,968	OFWM
82	82	145048/L	145048	44211	148	45	116/SB	0.71	0.020	0.78	85.86	2.43	103.49	2.931	251	102	11,831	
83	83	147325/R	147325	44905	2277	694	115/SB	0.86	0.024	0.95	85.15	2.41	102.68	2.908	302	122	11,730	
84	84	149485/R	149485	45563	2160	658		0.27	0.008	0.30	84.29	2.39	101.33	2.870	95	38	11,608	
85	85	150600/L	150600	45903	1115	340	116/SB	0.58	0.016	0.64	84.02	2.38	100.64	2.850	205	83	11,569	
86	86	150660/R	150660	45921	60	18	142/SB	1.65	0.047	1.82	83.44	2.36	99.81	2.827	585	237	11,486	OFWM
87	87	150750/R	150750	45949	90	27	142/SB	1.71	0.048	1.88	81.79	2.32	97.98	2.775	587	238	11,249	OFWM
88	88	150910/R	150910	45997	160	49	142/SB	1.31	0.037	1.44	80.08	2.27	96.09	2.721	453	183	11,012	OFWM
89	89	151400/R	151400	46147	490	149		1.00	0.028	1.10	78.77	2.23	94.62	2.680	B.S.	10,829		Bulk Supply
90	90	151500/R	151500	46177	100	30		17.40	0.493	20.24	77.77	2.20	93.43	2.646	5866	2374	10,829	Rodian Minor(20.24)
91	91	155300/R	155300	47335	3800	1158	116/SB	12.95	0.367	15.01	60.37	1.71	73.18	2.072	4394	1778	8,455	Hunde Minor(15.01)
92	92	156800/L	156800	47793	1500	457		0.57	0.016	0.63	47.42	1.34	57.60	1.631	200	81	6,676	
93	93	159767/R	159767	48697	2967	904	123/SB	1.12	0.032	1.23	46.85	1.33	56.78	1.608	396	160	6,595	OFWM
94	94	164272/L	164272	50070	4505	1373	126/SB	0.58	0.016	0.64	45.73	1.30	55.17	1.562	204	83	6,435	
95	95	166344/R	166344	50702	2072	632	127/SB	1.59	0.045	1.75	45.15	1.28	53.96	1.528	559	226	6,353	
96	96	166450/L	166450	50734	106	32	128/SB	0.35	0.010	0.39	43.56	1.23	51.95	1.471	124	50	6,126	
97	97	166450/L	166450	50734	0	0		8.16	0.231	9.48	43.21	1.22	51.55	1.460	2833	1147	6,076	Kilia Minor(9.48)

Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No. No. (original)	Number of Watercourse	RD (feet)		Section Distance (feet)	Village	Check No.	Outlet Discharge (cusec)		Section Discharge (m <sup>3</sup> /s)		Design Discharge (m <sup>3</sup> /s)	Design Discharge (cusec)	Outlet CCA (acre)	Section CCA (ha)	Improved under CCA (ha)	Remarks
		(feet)	(m)				Authorized (cusec)	(m <sup>3</sup> /s)	(cusec)	(m <sup>3</sup> /s)						
92	171590/L	171590	52301	5140	1567	128/SB	1.41	0.040	1.55	35.05	0.99	42.07	497	201	4,930	
93	173800/R	173800	52974	2210	674	127/SB	1.49	0.042	1.64	33.64	0.95	39.97	526	213	4,729	OPWM
94	175980/R	175980	53639	2180	664	127/SB	1.64	0.046	1.80	32.15	0.91	38.10	577	234	4,516	OPWM
95	176100/R	176100	53675	120	37	131/SB	0.94	0.027	1.03	30.51	0.86	36.07	318	129	4,282	
96	176100/L	176100	53675	0	0	128/SB	1.12	0.032	1.23	29.57	0.84	35.02	393	159	4,153	
97	181352/R	181352	55276	5252	1601	131/SB	1.65	0.047	1.82	28.45	0.81	33.79	582	236	3,994	
98	182560/L	182560	55644	1208	368		0.34	0.010	0.37	26.80	0.76	31.47	119	48	3,759	
	183550/R	183550	55946	990	302		5.78	0.164	6.60	26.46	0.75	30.99	2032	822	3,711	
99	185762/L	185762	56620	2212	674	132/SB	1.84	0.052	2.02	20.68	0.59	24.30	642	260	2,888	
100	189042/R	189042	57620	3280	1000	133/SB	1.27	0.036	1.40	18.84	0.53	22.10	446	180	2,629	OPWM
101	190162/L	190162	57961	1120	341	132/SB	2.22	0.063	2.44	17.57	0.50	20.45	758	307	2,448	OPWM
102	191232/R	191232	58258	2190	668	133/SB	2.14	0.061	2.35	15.35	0.43	17.93	754	305	2,141	
103	192830/R	192830	58775	2668	813		0.05	0.001	0.06	13.21	0.37	15.43	481	195	1,836	
104	192882/L	192882	58790	1650	503	136/SB	1.37	0.039	1.51	13.16	0.37	15.21	481	195	1,836	
105	197387/L	197387	60164	4505	1373	113/SB	1.38	0.045	1.74	11.79	0.33	13.60	385	164	1,641	
106	200552/L	200552	61128	3165	965	136/SB	1.60	0.045	1.76	10.21	0.29	11.61	562	227	1,443	
107	200802/R	200802	61204	250	76	137/SB	1.33	0.038	1.46	8.61	0.24	9.68	468	189	1,216	OPWM
108	203170/R	203170	61926	2368	722	136/SB	1.38	0.039	1.52	7.28	0.21	8.20	482	195	1,026	OPWM
109	203977/L	203977	62172	307	246	139/SB	1.90	0.054	2.09	5.90	0.17	6.58	670	271	831	OPWM
110	204452/R	204452	62317	475	145	137/SB	1.26	0.036	1.39	4.00	0.11	4.46	444	180	560	OPWM
111	206322/L	206322	62887	1870	570	139/SB	1.67	0.047	1.84	2.74	0.08	3.06	564	228	380	
112	206482/R	206482	62936	160	49	139/SB	1.07	0.030	1.18	1.07	0.03	1.18	376	152	152	
	206542	62954		60	18											Proposed Tail
							371.58	10.52					59.754	36.323		
													36.322			
<b>Saruli Minor( RD 49885/R ,Kirana Distributary)</b>																
1	195 5200/TR	5200	1585	5200	1585	74/SB	1.49	0.042	1.64	4.25	0.12	4.84	524	212	606	
2	196 5200/TL	5200	1585	0	0	74/SB	2.76	0.078	3.04	2.76	0.08	3.04	973	394	394	
							4.25	0.12					1,497	606		
<b>Hadda Minor( RD 61800/R ,Kirana Distributary)</b>																
1	197 2530/R	2530	771	2530	771	77/SB	1.63	0.046	1.79	12.57	0.36	14.46	552	223	1,639	
2	198 5595/R	5595	1705	3065	934	77/SB	0.80	0.023	0.88	10.94	0.31	12.52	281	114	1,416	
3	199 6880/L	6880	2097	1285	392	81/SB	1.53	0.043	1.68	10.14	0.29	11.47	539	218	1,302	
4	200 6955/R	6955	2120	75	23	82/SB	1.79	0.051	1.97	8.61	0.24	9.72	552	223	1,084	OPWM
5	201 10500/R	10500	3200	3545	1081	82/SB	2.03	0.057	2.23	6.82	0.19	7.75	614	248	861	OPWM
6	202 13490/TR	13490	4112	2990	911	84/SB	1.81	0.051	1.99	4.79	0.14	5.37	580	235	612	OPWM
7	203 13490/TF	13490	4112	0	0	84/SB	1.40	0.040	1.54	2.98	0.08	3.28	406	164	378	
8	204 13490/TL	13490	4112	0	0	84/SB	1.58	0.045	1.74	1.58	0.04	1.74	527	213	213	OPWM
							12.57	0.36					4,051	1,639		

Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No.	No. (original)	Number of Watercourse	RD		Section Distance (feet)	Village	Check No.	Outlet Discharge		Section Discharge		Design Discharge (m <sup>3</sup> /s)	Improved under CCA (ha)	Remarks
			(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)			
<b>Malkana Minor (RD 104900/R, Kirana Distributary)</b>														
1	214	1610/L	1610	491	1610	491	101/SB	1.80	0.051	1.98	0.051	25.95	0.73	3,548
2	213	4405/L	4405	1343	2795	852	100/SB	1.50	0.042	1.65	0.042	25.95	0.73	253
3	215	7645/R	7645	2330	3240	988	97/SB	0.75	0.021	0.83	0.021	24.15	0.68	625
4	216	8820/L	8820	2688	1175	358	101/SB	1.27	0.036	1.40	0.036	22.65	0.64	528
5	217	10203/L	10203	3110	1383	422	101/SB	1.17	0.033	1.29	0.033	26.75	0.758	266
6	218	13134/R	13134	4003	2931	893	Assianwala	2.46	0.070	2.71	0.070	21.90	0.62	417
7	219	13495/R	13495	4113	361	110	Assianwala	0.60	0.017	0.66	0.017	20.63	0.58	405
8	220	16290/L	16290	4965	2795	852	103/SB	1.68	0.048	1.85	0.048	19.46	0.55	867
9	221	17460/L	17460	5322	1170	357	103/SB	1.56	0.044	1.72	0.044	17.00	0.48	211
10	222	20782/L	20782	6334	3322	1013	103/SB	2.34	0.066	2.57	0.066	16.40	0.46	590
11	223	22990/R	22990	7007	2208	673	99/ASB	1.46	0.041	1.61	0.041	14.72	0.42	549
12	224	24000/L	24000	7315	1010	308	P.A.F	0.07	0.002	0.08	0.002	13.16	0.37	823
13	225	33130/L	33130	10098	9130	2783	P.A.F	1.00	0.028	1.10	0.028	10.82	0.31	209
14	226	33330/TL	33330	10159	200	61		2.45	0.069	2.70	0.069	9.36	0.27	25
15	227	33330/TF	33330	10159	0	0		4.23	0.120	4.65	0.120	8.29	0.23	10
16	228	33330/TR	33330	10159	0	0		1.61	0.046	1.77	0.046	5.84	0.17	863
								25.95	0.73	1.77	0.050	1.77	0.05	564
								25.95	0.73	1.77	0.050	1.77	0.05	8768
														3548
<b>Wasuana Minor (RD 126400/L, Kirana Distributary)</b>														
1	205	7650/R	7650	2332	7650	2332	111/SB	1.57	0.044	1.73	0.044	12.15	0.34	1,731
2	206	10300/R	10300	3139	2650	808	113/SB	1.68	0.048	1.85	0.048	12.15	0.34	223
3	207	10320/R	10320	3146	20	6	114/SB	1.61	0.046	1.77	0.046	10.58	0.30	551
4	208	11680/R	11680	3560	1360	415	114/SB	1.70	0.048	1.87	0.048	8.90	0.25	593
5	209	16000/L	16000	4877	4320	1317	114/SB	1.75	0.050	1.93	0.050	7.29	0.21	566
6	210	16000/TF	16000	4877	0	0	115/SB	1.14	0.032	1.25	0.032	5.59	0.16	598
7	211	22600/TR	22600	6888	6600	2012	115/SB	1.48	0.042	1.63	0.042	3.84	0.11	618
8	212	22600/TL	22600	6888	0	0	115/SB	1.22	0.035	1.34	0.035	2.70	0.08	521
								12.15	0.34	1.34	0.03	1.22	0.03	429
								12.15	0.34	1.34	0.03	1.22	0.03	4,277
														1,731

Table B - 1 (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No.	No. (original)	Watercourse	RD		Section Distance (feet)	Village	Check No.	Outer Discharge		Section Discharge		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Improved under	Remarks		
			(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)							
<b>Tandallian Minor (RD 142200/L, Kirana Distributary)</b>																		
1	229	975/R	975	297	975	297	113/SB	0.40	0.011	0.44	9.75	0.28	1.40	57	1,304			
2	230	7020/L	7020	2140	6045	1843	116/SB	1.15	0.033	1.27	9.35	0.26	3.14	127	1,248			
3	231	8512/L	8512	2594	1492	435	P-R	0.50	0.014	0.55	8.20	0.23	R.H.	1,121			Rear House Supply	
4	232	8950/R	8950	2728	438	134	116/SB	0.77	0.022	0.85	7.70	0.22	2.70	109	1,121			
5	233	10106/R	10106	3080	1156	352	119/SB	1.10	0.031	1.21	6.93	0.20	3.88	157	1,011			
6	234	11240/R	11240	3426	1134	346	119/SB	0.86	0.024	0.95	5.83	0.17	2.85	115	854			
7	235	11390/L	11390	3472	150	46	Nishitabad	0.08	0.002	0.09	4.97	0.14	B.S.	739			Bulk Supply	
8	236	13000/TL	13000	3962	1610	491	120/SB	1.08	0.031	1.19	4.89	0.14	4.78	193	739		OFWM	
9	237	13000/TR	13000	3962	0	0	120/SB	2.51	0.071	2.76	3.81	0.11	8.85	358	546			
10	238	13000/TF	13000	3962	0	0	120/SB	1.30	0.037	1.43	1.30	0.04	4.63	187	187			
								9.75	0.28				3,223	1,304				
								9.75	0.28				1,304					
<b>Rodian Minor (RD 151500/R, Kirana Distributary)</b>																		
1	239	220/L	220	67	220	67	118/SB	1.03	0.029	1.13	17.40	0.49	3.63	147	2,374			
2	240	2651/L	2651	808	2431	741	118/SB	0.99	0.028	1.09	16.37	0.46	3.33	135	2,227			
3	241	5000/R	5000	1524	2349	716	117/SB	1.64	0.046	1.80	15.38	0.44	5.77	234	2,092		WAPDA	
4	242	7660/L	7660	2335	2660	811	118/SB	2.37	0.067	2.61	13.74	0.39	6.38	258	1,859			
5	243	11800/L	11800	3597	4140	1262		1.17	0.033	1.29	11.37	0.32	3.80	154	1,601		New Outlet	
6	244	13485/R	13485	4110	1685	514	117/SB	0.74	0.021	0.81	10.20	0.29	2.59	105	1,447			
7	244	13485/L	13485	4110	0	0	122/SB	1.78	0.050	1.96	9.46	0.27	6.26	253	1,342		WAPDA/OFWM	
8	245	17865/L	17865	5445	4380	1335	122/SB	1.97	0.056	2.17	7.68	0.22	6.79	275	1,089		OFWM	
9	246	19800/TL	19800	6035	1935	590	121/SB	1.34	0.038	1.47	5.71	0.16	4.71	191	814		OFWM	
10	247	19800/TF	19800	6035	0	0	121/SB	2.27	0.064	2.50	4.37	0.12	8.00	324	623		OFWM	
11	248	19800/TR	19800	6035	0	0	121/SB	2.10	0.059	2.31	2.10	0.06	7.40	299	299		OFWM	
								17.40	0.49				3,866	2,374				
								17.40	0.49				2,374					
<b>Hunde Minor (RD 155000/R, Kirana Distributary)</b>																		
1	249	300/L	300	91	300	91	123/SB	0.34	0.010	0.37	12.95	0.37	1.19	48	1,778			
2	250	4265/L	4265	1300	3965	1209	124/SB	0.89	0.025	0.98	12.61	0.36	3.15	127	1,730			
3	251	5520/L	5520	1682	1255	383	124/SB	1.28	0.036	1.41	11.72	0.33	4.52	183	1,603		OFWM	
4	253	9000/R	9000	2743	3480	1061	118/SB	0.30	0.008	0.33	10.44	0.30	L.S.	1,420				
5	252	9230/L	9230	2813	230	70	124/SB	1.43	0.040	1.57	10.14	0.29	4.49	182	1,420		OFWM	
6	254	9860/L	9860	3005	630	192	129/SB	1.79	0.051	1.97	8.71	0.25	6.32	256	1,238		WAPDA	
7	255	10500/L	10500	3200	640	195	124/SB	0.70	0.020	0.77	6.92	0.20	2.41	98	982		OFWM	
8	256	11000/R	11000	3353	500	152	125/SB	1.84	0.052	2.02	6.22	0.18	6.49	263	885		WAPDA	
9	257	16135/TL	16135	4918	5135	1565	129/SB	2.31	0.065	2.54	4.38	0.12	8.13	329	622		OFWM	
10	258	16135/TR	16135	4918	0	0	125/SB	2.07	0.059	2.28	2.07	0.06	7.24	293	293		OFWM	
								12.95	0.37				4,394	1,778				
								12.95	0.37				1,778					

Table B - I (1/3) Breakdown of Authorized and Design Discharge Calculation for LJC Area

No.	No. of (original) Watercourse	RD (feet)	Section Distance (feet)	Village	Check No.	Outlet Discharge		Section		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Improved under	Remarks	
						Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)						
<b>Killa Minor( RD 166450/L,Kirana Distributary)</b>															
							8.16	0.23						1.147	
1	259 2246/R	2246	685	2246	125/SB	0.91	0.026	1.00	8.16	0.23	9.48	0.269	319	129	1.147
2	261 4465/L	4465	1361	2219	126/SB	1.20	0.034	1.32	7.25	0.21	8.38	0.237	422	171	1.017 OFWM
3	262 7300/L	7300	2225	2835	126/SB	1.53	0.043	1.68	6.05	0.17	6.96	0.197	539	218	847
4	263 10550/R	10550	3216	3250	126/SB	0.61	0.017	0.67	4.52	0.13	5.17	0.146	215	87	628
5	264 13440/TL	13440	4097	2890	130/SB	1.25	0.035	1.38	3.91	0.11	4.39	0.124	438	177	541 OFWM
6	265 13440/TF	13440	4097	0	130/SB	1.29	0.037	1.42	2.66	0.08	2.93	0.083	438	177	364
7	266 13440/TR	13440	4097	0	130/SB	1.37	0.039	1.51	1.37	0.04	1.51	0.043	462	187	187 OFWM
						8.16	0.23				2.833	1.147			
											1.146				
<b>Dhabian Minor( RD 183550/R,Kirana Distributary)</b>															
							5.78	0.16							822
1	267 195/L	195	59	195	133/SB	1.17	0.033	1.29	5.78	0.16	6.60	0.187	411	166	822 OFWM
2	268 3580/R	3580	1091	3385	131/SB	1.21	0.034	1.33	4.61	0.13	5.30	0.150	420	170	656 OFWM
3	269 7775/R	7775	2370	4195	134/SB	1.74	0.049	1.91	3.40	0.10	3.86	0.109	615	249	486
4	270 7890/L	7890	2405	115	135/SB	1.66	0.047	1.83	1.66	0.05	1.83	0.052	586	237	237 OFWM
						5.78	0.16				2.032	822			
											822				Proposed tail



Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD		Section Distance (m)	Village	Chak No.	Outlet Discharge		Section		Design		Outlet CCA (ha)	Section CCA (ha)	Project (Improvement)	Remarks	
			(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)					
<b>West Circle</b>																		
<b>Sarang Wala Distributary</b>																		
1	885	780/L	780	238	780	238	102/B	0.32	0.01	70.21	1.99	86.74	2.456	115	47	6,627	W Bank	
2	886	2602/R	2602	793	1822	555	103/B	0.53	0.02	69.89	1.98	86.26	2.443	187	76	6,580		
3	887	3225/L	3225	983	623	190	102/B	1.03	0.03	69.36	1.96	85.38	2.418	361	146	6,504	W Bank	
4	888	9945/L	9945	3031	6720	2048	102/B	0.97	0.03	1.07	68.33	1.94	84.14	250	101	6,358		
5	889	9945/R	9945	3031	0	0	103/B	0.31	0.01	0.34	67.36	1.91	82.00	108	44	6,257		
6	890	10970/L	10970	3344	1025	312	102/B	1.13	0.03	1.24	67.05	1.90	81.66	364	147	6,213		
7	891	11096/R	11096	3382	126	38	103/B	0.87	0.02	0.96	65.92	1.87	80.26	307	124	6,066		
8	892	14515/L	14515	4424	3419	1042	106/B	0.57	0.02	0.63	65.05	1.84	79.23	200	81	5,942		
9	893	17213/R	17213	5247	2698	822	110/B	0.53	0.02	0.58	64.48	1.83	78.12	292	118	5,861	US Aid	
10	894	18614/L	18614	5674	1401	427	106/B	0.68	0.02	0.75	63.95	1.81	77.12	238	96	5,743		
11	895	19657/R	19657	5991	1043	318	110/B	1.75	0.05	1.93	63.27	1.79	76.16	559	226	5,646	W. Bank + 4 Drg	
12	896	20893/L	20893	6368	1236	377	106/B	0.91	0.03	1.00	61.52	1.74	74.08	521	130	5,420		
13	897	21930/L	21930	6687	1046	319	109/B	5.47	0.15	5.80	60.61	1.72	72.89	2,064	5,290		Lothran Minor	
14	898	24497/R	24497	7467	2558	780	110/B	1.47	0.04	1.62	55.14	1.56	67.09	1,900	519	210	5,290	W Bank
15	899	28751/R	28751	8763	4254	1297	110/B	0.53	0.02	0.58	53.67	1.52	65.33	1,850	188	76	5,080	
16	543	28942/L	28942	8822	191	58	108/B	0.93	0.03	1.02	53.14	1.50	64.39	1,824	326	152	5,004	US Aid
17	544	33220/L	33220	10125	4278	1304	108/B	0.25	0.01	0.28	52.21	1.48	62.78	1,778	89	36	4,872	
18	545	33894/R	33894	10331	674	205	110/B	0.97	0.03	1.07	51.96	1.47	62.48	1,769	341	138	4,836	
19	546	35830/L	35830	10921	1936	590	108/B	1.07	0.03	1.18	50.99	1.44	60.83	1,723	378	153	4,698	
20	547	39194/R	39194	11946	3364	1025	108/B	0.66	0.02	0.73	49.92	1.41	59.57	1,687	233	94	4,545	
21	548	39608/L	39608	12073	414	126	108/B	1.43	0.04	1.57	49.26	1.40	58.58	1,659	494	200	4,451	
22	549	41246/L	41246	12572	1638	499	107/B	1.96	0.06	2.16	47.83	1.35	56.57	1,602	690	279	4,251	
23	550	41296/L	41296	12587	50	15	116/B	0.29	0.01	0.32	45.87	1.30	54.36	1,540	102	41	3,972	
24	551	41720/L	41720	12716	424	129	116/B	1.26	0.04	1.39	45.58	1.29	53.84	1,525	442	179	3,930	
25	552	42510/R	42510	12957	790	241	116/B	0.25	0.01	0.28	44.32	1.26	52.45	1,485	R.H.	150	3,752	
26	553	42526/L	42526	12962	16	5	116/B	1.17	0.03	1.29	44.07	1.25	52.12	1,476	371	150	3,752	
27	554	44835/L	44835	13666	2309	704	116/B	1.77	0.05	1.95	42.90	1.21	50.73	1,437	566	229	3,601	
28	555	45950/R	45950	14006	1115	340	119/B	1.00	0.03	1.10	41.13	1.16	48.79	1,382	454	184	3,372	
29	556	46964/R	46964	14315	1014	309	119/B	1.09	0.03	1.20	40.13	1.14	47.41	1,343	385	156	3,189	
30	557	50500/L	50500	15392	3536	1078	117/B	0.96	0.03	1.06	39.04	1.11	46.08	1,305	337	136	3,033	
31	558	52706/L	52706	16065	2206	672	117/B	3.50	0.10	3.85	38.08	1.08	44.91	1,272	L.S.	2,896		
32	559	54905/R	54905	16735	2199	670	119/B	1.85	0.05	2.04	34.58	0.98	40.66	1,152	605	245	2,896	
33	560	54906/L	54906	16735	1	0	119/B	1.16	0.03	1.28	32.73	0.93	38.39	1,087	392	159	2,652	
34	561	56005/R	56005	17070	1099	335	119/B	1.15	0.03	1.27	31.57	0.89	36.89	1,045	290	117	2,493	
35	562	62421/L	62421	19026	6416	1956	117/B	1.69	0.05	1.86	30.42	0.86	35.63	1,009	593	240	2,376	
36	563	62610/R	62610	19084	189	58	117/B	1.39	0.04	1.53	28.73	0.81	33.66	953	432	175	2,136	
37	564	64639/R	64639	19702	2029	618	119/B	1.50	0.03	1.27	27.34	0.77	31.52	893	438	177	1,961	
38	565	65940/R	65940	20099	1301	397	119/B	1.65	0.04	1.65	26.19	0.74	30.24	856	B.S.	1,784		
39	566	67950/R	67950	20711	2010	613	120/B	1.16	0.03	1.28	24.69	0.70	28.40	804	189	76	1,784	
40	567	68872/R	68872	20992	922	281	120/B	0.50	0.01	0.53	23.53	0.67	27.01	765	B.S.	1,707		
41	568	69147/R	69147	21076	275	84	121/B	0.94	0.03	1.03	23.03	0.65	26.29	745	259	105	1,707	
42	569	70850/L	70850	21595	1703	519	121/B	0.57	0.02	0.63	22.09	0.63	25.18	713	183	74	1,602	
43	570	71706/R	71706	21836	836	261	120/B	1.70	0.05	1.87	21.52	0.61	24.53	695	516	209	1,528	
44	571	73526/L	73526	22411	1820	555	120/B	0.87	0.02	0.96	19.82	0.56	22.53	638	299	121	1,319	
45	572	75036/R	75036	22871	1510	460	120/B	1.09	0.03	1.20	18.95	0.54	21.50	609	317	128	1,198	
								1.72	0.05	1.89	17.86	0.51	20.17	571	32	1,070		

**Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area**

No.	No. (original)	Watercourse No.	RD (feet)	Section Distance (m)	Village	Chak No.	Outlet Discharge		Section		Design		Outlet CCA (acre)	Section CCA (ha)	Project (Improvement)	Remarks	
							Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (cusec)	Discharge (cusec)	Discharge (cusec)					
46	573	77009/R	77009	23472	1973	601	120/JB	0.31	0.01	0.34	16.14	0.46	18.17	0.515	B.S.	1,038	
47	574	77016/L	77016	23474	7	2	122/JB	1.10	0.03	1.21	15.83	0.45	17.69	0.501	387	157	1,038
48	575	78144/L	78144	23818	1128	344	122/JB	0.90	0.03	0.99	14.73	0.42	16.48	0.467	317	128	881
49	576	78300/L	78300	23866	156	48	122/JB	0.72	0.02	0.79	13.83	0.39	15.42	0.437	215	87	753
50	577	79000/R	79000	24079	700	213	122/JB	1.80	0.05	1.98	13.11	0.37	14.62	0.414	B.S.	666	
51	578	79190/L	79190	24137	190	58	P.M.College	1.50	0.04	1.65	11.31	0.32	12.60	0.357	C.S.	666	
52	579	82079/TR-1	82079	25018	2889	881	123/JB	1.94	0.05	2.13	9.81	0.28	10.94	0.310	672	272	666
53	580	82079/TR-2	82079	25018	0	0	123/JB	1.31	0.04	1.44	7.87	0.22	8.66	0.245	462	187	394
54	581	82079/TR-3	82079	25018	0	0	124/JB	0.90	0.03	0.99	6.36	0.19	7.22	0.204	313	127	207
55	582	82079/TL-1	82079	25018	0	0	123/JB	0.66	0.02	0.73	5.66	0.16	6.23	0.176	199	81	81
56	583	82079/TL-2	82079	25018	0	0	F.D.A	5.00	0.14	5.50	5.00	0.14	5.50	0.156	B.S.	0	
							70.21							16.374			
														6.626			

**Nasrana Distributary**

1	1275	1105/L	1105	337	1105	337	46/JB	1.44	0.04	1.58	247.90	7.02	313.30	8.873	508	206	34,677	US. Aid	34,677
2	1276	3519/R	3519	1073	2414	736	49/JB	1.05	0.03	1.16	246.46	6.98	311.35	8.817	378	153	34,472		
3	1277	4518/L	4518	1377	999	304	46/JB	1.10	0.03	1.21	245.41	6.95	309.38	8.762	388	157	34,319	US. Aid	
4	1278	5650/L	5650	1722	1132	345	46/JB	1.44	0.04	1.58	244.31	6.92	307.84	8.718	507	205	34,162	US. Aid	
5	1279	8430/R	8430	2569	2780	847	50/JB	0.67	0.02	0.74	242.87	6.88	305.87	8.662	236	96	33,956	US. Aid	
6	1280	10999/L	10999	3352	2569	783	47/JE	1.28	0.04	1.41	242.20	6.86	304.21	8.615	450	182	33,861	US. Aid	
7	1281	11284/R	11284	3439	285	87	47/JE	4.07	0.12	4.75	240.92	6.82	301.96	8.551	1,780	720	33,679		Saduana Minor(4.75)
8	1282	15780/R	15780	4033	842	257	50/JB	1.78	0.05	1.96	234.58	6.64	294.25	8.333	625	253	32,635		
9	1283	17532/R	17532	5344	1752	534	50/JB	1.02	0.03	1.12	231.12	6.55	289.35	8.194	270	109	32,145		
10	1284	18609/R	18609	5672	1077	328	50/JB	1.38	0.04	1.52	230.10	6.52	287.66	8.147	484	196	32,035		
11	1285	19229/R	19229	5861	620	189	53/JB	1.38	0.04	1.52	228.72	6.48	285.80	8.094	486	197	31,839	W Bank	
12	1286	19493/L	19493	5941	264	80	51/JB	1.25	0.04	1.38	227.34	6.44	284.08	8.045	438	177	31,643		
16	1290	20828/L	20828	6348	1335	407	51/JB	1.88	0.05	2.07	226.09	6.40	282.62	8.004	545	221	31,465		
13	1287	20971/L	20971	6392	143	44	51/JB	2.09	0.06	2.30	224.21	6.35	280.13	7.933	535	217	31,245	US. Aid	
15	1289	21064/R	21064	6420	93	28	53/JB	1.26	0.04	1.39	222.12	6.29	277.79	7.867	444	180	31,028		
14	1288	21196/L	21196	6461	132	40	53/JB	1.86	0.05	2.05	220.86	6.25	276.37	7.827	546	221	30,849		
17	1291	21892/R	21892	6673	696	212	53/JB	1.21	0.03	1.33	219.00	6.20	274.28	7.724	610	247	30,456	W Bank	
18	1292	24735/R	24735	7539	2843	867	54/JB	0.66	0.02	0.73	216.06	6.12	269.95	7.645	232	94	30,209	M.P.A.	
19	1293	25064/R	25064	7640	329	100	54/JB	1.34	0.04	1.47	215.40	6.10	269.12	7.621	472	191	30,115		
20	1294	25099/L	25099	7650	35	11	51/JB	0.54	0.02	0.59	214.06	6.06	267.64	7.580	190	77	29,924	W Bank	
22	1296	25113/L	25113	7654	14	4	52/JE	1.38	0.04	1.52	213.52	6.05	267.04	7.563	487	197	29,847	W Bank	
24	1298	27564/R	27564	8402	2451	747	54/JE	0.57	0.02	0.63	212.14	6.01	265.52	7.519	210	85	29,650	W Brnk	
23	1297	27811/L	27811	8477	247	75	52/JE	1.34	0.04	1.47	211.57	5.99	264.14	7.480	472	191	29,565	M.P.A.+W Bank	
		28979/L	28979	8833	1168	356		1.30	0.04	1.43	210.23	5.95	262.59	7.437	459	186	29,374		
		30292/R	30292	9233	1313	400		1.33	0.04	1.43	208.93	5.92	260.80	7.386	429	174	29,188		
25	1299	31856/L	31856	9710	1564	477	52/JB	1.01	0.03	1.11	207.63	5.88	258.97	7.334	355	144	29,015		
26	1300	31956/R	31956	9740	100	30	57/JB	2.29	0.06	2.52	206.62	5.85	257.39	7.289	807	327	28,871	W Bank	
		32000/R	32000	9754	44	13		9.09	0.26	10.65	204.33	5.79	254.84	7.217	3,196	1,293	28,544		
27	1301	36158/L	36158	11021	4158	1267	58/JB	1.13	0.03	1.24	195.24	5.53	244.18	6.915	397	161	27,251	M.P.A.+W Bank	Khiliana Minor(10.65)
28	1302	37586/R	37586	11456	1428	435	57/JB	1.48	0.04	1.63	194.11	5.50	241.72	6.845	513	208	27,090		
29	1303	40670/L	40670	12396	3084	940		2.11	0.06	2.32	192.63	5.46	239.68	6.788	758	307	26,883		

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD (feet)	Section Distance (feet)	Village	Chak No.	Outlet Discharge		Section		Design		Outlet CCA (acre)	Section CCA (ha)	Project (Improvement)	Remarks		
							Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)						
30	1304	41736/L	41736	12721	1066	325	1.59	0.05	1.75	190.52	5.40	226.46	6.97	234	26,576	M.P.A.+W Bank		
31	1305	43601/R	43601	13290	1865	568	1.02	0.03	1.12	188.93	5.35	234.41	6.638	352	142	26,342	W Bank	
32	1306	45930/R	45930	13999	2329	710	2.82	0.08	3.10	187.91	5.32	232.75	6.592	814	329	26,200		
33	1307	45980/R	45980	14015	50	15	0.96	0.03	1.06	185.09	5.24	228.99	6.485	254	103	25,870		
34	1308	46139/L	46139	14063	159	48	1.68	0.05	1.85	184.13	5.21	227.92	6.455	573	232	25,768	M.P.A.	
35	1309	46140/R	46140	14063	1	0	0.38	0.01	0.42	182.45	5.17	226.02	6.401	135	55	25,536		
36	1310	46582/R	46582	14198	442	135	1.73	0.05	1.90	182.07	5.16	225.60	6.389	622	252	25,481	W Bank	
37	1311	48308/R	48308	14724	1726	526	0.83	0.02	0.91	180.34	5.11	223.58	6.332	291	118	25,229		
38	1312	49108/L	49108	14968	800	244	1.03	0.03	1.13	179.51	5.08	222.18	6.292	377	153	25,112	M.P.A.	
39	1313	49338/L	49338	15038	230	70	0.50	0.01	0.55	178.48	5.05	220.83	6.254	L.S.	24,959	M.P.A.+W Bank		
40	1314	51511/R	51511	15701	2173	662	2.01	0.06	2.21	177.98	5.04	220.22	6.236	708	287	24,959	M.P.A.+W Bank	
41	1315	52609/L	52609	16035	1098	335	1.25	0.04	1.38	175.97	4.98	217.40	6.157	321	130	24,673		
42	1316	52624/L	52624	16040	15	5	1.27	0.04	1.40	174.72	4.95	215.73	6.109	445	180	24,543		
43	1317	56070/R	56070	17090	3446	1050	1.85	0.05	2.04	173.45	4.91	214.33	6.070	651	263	24,363	W Bank	
44	1318	57159/L	57159	17422	1089	332	0.81	0.02	0.89	171.60	4.86	211.36	5.986	286	116	24,099	M.P.A.	
45	1319	59395/L	59395	18104	2236	682	2.34	0.07	2.57	170.79	4.84	210.17	5.952	825	334	23,983		
46	1320	62300/R	62300	18989	2905	885	1.46	0.04	1.61	168.45	4.77	207.00	5.862	514	208	23,649	W Bank	
47	1321	62933/L	62933	19182	633	193	14.57	0.41	17.10	166.99	4.73	204.62	5.795	5,286	2,139	23,441		Narwala Minor(17.1)
48	1322	64533/L	64533	19950	388	118	1.59	0.05	1.75	152.42	4.32	187.35	5.306	558	226	21,302	M.P.A.+W Bank	
49	1323	67750/R	67750	20650	2297	700	1.74	0.05	1.91	150.83	4.27	185.06	5.241	607	246	21,076		
50	1324	68063/R	68063	20746	313	95	3.02	0.09	3.32	149.09	4.22	183.05	5.184	1,065	431	20,831		
51	1325	72236/L	72236	22018	4173	1272	1.47	0.04	1.62	146.07	4.14	179.16	5.074	519	210	20,400		
52	1326	73298/L	73298	22341	1062	324	1.13	0.03	1.24	144.60	4.10	177.46	5.026	396	160	20,190	W Bank	
53	1327	73600/R	73600	22433	302	92	1.51	0.04	1.66	143.47	4.06	175.20	4.962	532	215	20,029	M.P.A.+W Bank	
54	1328	78783/L	78783	24013	5183	1580	1.36	0.04	1.50	141.96	4.02	173.28	4.907	478	193	19,814	W Bank	
55	1329	81872/R	81872	24955	3089	942	1.50	0.04	1.63	139.30	3.94	169.04	4.787	509	206	19,439	W Bank	
56	1330	83296/L	83296	25389	1424	434	2.21	0.06	2.43	137.80	3.90	166.66	4.720	750	304	19,233		
57	1331	86336/R	86336	26315	3040	927	1.29	0.04	1.42	135.39	3.84	163.89	4.641	411	166	18,929	M.P.A.	
58	1332	87054/L	87054	26534	718	219	1.57	0.04	1.73	134.30	3.80	161.76	4.581	547	221	18,763		
59	1333	87478/R	87478	26663	424	129	1.40	0.04	1.54	132.73	3.76	159.87	4.527	493	200	18,542	W Bank	
60	1334	88229/L	88229	26892	751	229	2.25	0.06	2.48	131.33	3.72	158.23	4.481	793	321	18,342		
61	1335	88513/R	88513	26979	284	87	1.61	0.05	1.77	129.08	3.66	155.58	4.406	559	226	18,021	W Bank	
62	1336	89480/L	89480	27274	967	295	1.22	0.03	1.34	127.47	3.61	153.75	4.354	430	174	17,795	US Aid	
63	1337	90816/R	90816	27681	1336	407	1.30	0.04	1.43	126.25	3.58	152.19	4.310	475	192	17,621		
64	1338	94825/R	94825	28903	1033	315	7.10	0.20	8.23	124.95	3.54	150.46	4.261	2,507	1,015	17,429		Sattiana Minor(8.23)
65	1339	95026/L	95026	28964	201	61	1.30	0.04	1.43	117.85	3.34	141.56	4.009	456	185	16,414		
66	1340	95740/L	95740	29182	714	218	1.36	0.04	1.50	116.55	3.30	139.91	3.962	477	193	16,230	US Aid	
67	1341	96010/L	96010	29264	270	82	0.04	0.00	0.04	115.19	3.26	138.37	3.919	14	6	16,037		
68	1342	96965/R	96965	29555	773	236	0.04	0.00	0.04	115.15	3.26	138.18	3.913	L.S.	16,031			
69	1343	97249/L	97249	29641	284	87	1.39	0.04	1.53	115.11	3.26	138.08	3.910	489	198	16,031		
70	1344	99455/L	99455	30314	2206	672	1.30	0.04	1.43	113.72	3.22	136.51	3.866	457	185	15,833		
71	1345	101694/L	101694	30996	2239	682	1.09	0.03	1.20	112.42	3.18	134.91	3.821	385	156	15,648	US Aid	
72	1346	102566/R	102566	31262	872	266	1.54	0.05	1.69	111.33	3.15	133.66	3.785	530	214	15,492		
73	1347	104980/L	104980	31998	2414	736	1.64	0.05	1.80	109.79	3.11	131.50	3.724	576	233	15,278	US Aid	
74	1348	105980/R	105980	32303	1000	305	1.56	0.04	1.72	108.15	3.06	129.24	3.660	549	222	15,045		
		106799/L	106799	32552	819	250	1.18	0.03	1.30	106.59	3.02	127.34	3.606	415	168	14,823	US Aid	
							1.38	0.04	1.52	105.41	2.99	125.55	3.556	480	194	14,655		Nabheri Minor(15.4)
							13.29	0.38	15.40	104.03	2.95	123.83	3.507	4,448	1,800	14,460		

Table B - I (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD		Section Distance (ft)	Village	Chak No.	Outlet Discharge		Section		Design		Outlet CCA (acre)	CCA (ha)	Project (Improvement)	Remarks	
			(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (cusec)					
75	1349	106812/L	106812	32556	13	4	80/JB	1.61	0.05	1.77	90.74	2.57	108.27	3.066	562	227	12,660 W Bank	
76	1350	106922/L	106922	32590	110	34	80/JB	1.59	0.05	1.75	89.13	2.52	106.50	3.016	561	227	12,433	
77	1351	108375/R	108375	33033	1453	443	75/JB	1.79	0.05	1.97	87.54	2.48	104.73	2.966	632	256	12,206	
78	1352	109110/R	109110	33257	735	224	81/JB	0.98	0.03	1.08	85.75	2.43	102.50	2.903	344	139	11,950	
79	1353	112100/R	112100	34168	2990	911	81/JB	1.34	0.04	1.47	84.77	2.40	101.28	2.868	442	179	11,811 W Bank	
80	1354	112275/L	112275	34221	175	53	80/JB	1.45	0.04	1.60	83.43	2.36	99.23	2.812	512	207	11,632 W Bank	
81	1355	113092/R	113092	34470	817	249	81/JB	2.24	0.06	2.46	81.98	2.32	97.65	2.766	759	307	11,425 W Bank	
82	1356	113103/R	113103	34474	11	3	82/JB	3.06	0.09	3.37	79.74	2.26	95.05	2.692	1,076	435	11,118	
83	1357	114556/R	114556	34917	1453	443	82/JB	2.13	0.06	2.34	76.68	2.17	91.68	2.596	737	298	10,682	
84	1358	115900/L	115900	35326	1344	410	84/JB	1.52	0.04	1.67	74.55	2.11	89.09	2.523	565	229	10,384 W Bank	
85	1359	117864/R	117864	35925	1964	599	83/JB	1.69	0.05	1.86	73.03	2.07	87.19	2.469	594	240	10,155	
86	1360	120488/L	120488	36725	2624	800	84/JB	1.55	0.04	1.71	71.34	2.02	85.01	2.408	547	221	9,915 W Bank+US Aid	
87	1361	121450/R	121450	37018	962	293	83/JB	1.61	0.05	1.77	69.79	1.98	82.89	2.347	566	229	9,693	
88	1362	121531/L	121531	37043	81	25		18.50	0.52	21.36	68.18	1.93	80.96	2.293	6,465	2,616	9,464	Domra Minor(21.36)
89	1363	121552/L	121552	37049	21	6	89/JB	2.16	0.06	2.38	49.68	1.41	59.59	1.688	750	304	6,848 W Bank	
90	1364	124979/R	124979	38094	1569	478	83/JB	1.90	0.05	2.09	47.52	1.35	57.21	1.620	653	264	6,544	
91	1365	128786/R	128786	39254	3807	1160	90/JB	0.63	0.02	0.69	45.62	1.29	54.88	1.554	221	89	6,280	
92	1366	129111/L	129111	39353	325	99	91/JB	1.72	0.05	1.89	44.99	1.27	53.99	1.529	605	245	6,191 W Bank	
93	1367	129111/L	129111	39353	0	0	91/JB	1.98	0.06	2.18	43.27	1.23	51.62	1.462	659	267	5,946 US Aid	
94	1368	130415/R	130415	40209	2809	856	91/JB	1.96	0.06	2.16	41.29	1.17	49.40	1.399	652	264	5,679	
95	1369	131920/L	131920	40209	2809	856	91/JB	0.98	0.03	1.08	39.33	1.11	47.25	1.338	346	140	5,415	
96	1370	136205/R	136205	41515	4285	1306	90/JB	0.55	0.02	0.61	38.35	1.09	46.17	1.308	186	75	5,275	
97	1371	137887/L	137887	42028	1682	513	91/JB	0.17	0.00	0.19	37.80	1.07	45.24	1.281 B.S.	5200	2000	5,200	
98	1372	137916/L	137916	42037	29	9	90/JB	0.97	0.03	1.07	37.63	1.07	45.06	1.276	343	139	5,200	
99	1373	139764/R	139764	42600	1848	563	91/JB	1.92	0.05	2.11	36.66	1.04	43.51	1.232	677	274	5,061 US Aid	
100	1374	143156/R	143156	43634	3392	1034	90/JB	1.73	0.05	1.90	34.74	0.98	41.21	1.167	610	247	4,787	
101	1375	144718/L	144718	44110	1562	476	91/JB	1.21	0.03	1.33	33.01	0.93	39.30	1.113	396	160	4,540	
102	1376	144868/L	144868	44156	150	46	93/JB	0.14	0.00	0.15	31.80	0.90	37.78	1.070	50	20	4,380	
103	1377	145737/R	145737	44421	869	265	91/JB	0.05	0.00	0.06	31.66	0.90	37.28	1.056	18	7	4,360 W Bank	
104	1378	149900/L	149900	45690	952	290	92/JB	1.78	0.05	1.96	31.61	0.90	37.06	1.050	623	252	4,353	
105	1379	150103/R	150103	45751	36	11	92/JB	0.72	0.02	0.79	29.83	0.84	35.09	0.994	257	104	4,100 W Bank	
106	1380	150213/L	150213	45785	110	34	93/JB	1.90	0.05	2.09	29.11	0.82	34.21	0.969	813	329	3,996	
107	1381	153150/L	153150	46680	2937	895	93/JB	0.25	0.01	0.28	27.21	0.77	32.12	0.910	L.S.	L.S.	3,667 W Bank	
108	1382	153168/L	153168	46686	18	5	92/JB	0.13	0.00	0.14	26.96	0.76	31.55	0.893	L.S.	L.S.	3,667 W Bank	
109	1383	154557/L	154557	47109	1389	423	94/JB	1.51	0.04	1.66	26.83	0.76	31.32	0.887	531	215	3,667	
110	1384	156142/R	156142	47592	1585	483	94/JB	1.09	0.03	1.20	25.32	0.72	29.64	0.839	384	153	3,452 W Bank	
111	1385	158764/L	158764	48391	2622	799	94/JB	1.13	0.03	1.24	24.23	0.69	28.44	0.805	400	162	3,297 W Bank	
112	1386	161727/R	161727	49294	2963	903	94/JB	1.13	0.03	1.24	24.23	0.69	28.44	0.805	400	162	3,297 W Bank	
113	1387	164500/L	164500	50140	2773	845	94/JB	1.64	0.05	1.80	23.10	0.65	27.19	0.770	576	233	3,135 W Bank	
114	1388	165350/R	165350	50399	850	259	96/JB	1.57	0.04	1.73	21.46	0.61	25.13	0.712	415	168	2,902	
115	1389	166330/L	166330	50697	980	299	96/JB	2.41	0.07	2.65	19.89	0.56	23.41	0.663	799	323	2,734 W Bank	
116	1390	168878/R	168878	51474	2548	777	95/JB	0.97	0.03	1.07	17.48	0.50	20.65	0.585	341	138	2,411 W Bank	
117	1391	168914/L	168914	51485	36	11	95/JB	1.39	0.04	1.53	16.51	0.47	19.46	0.551	474	192	2,273 W Bank	
118	1392	173599/L	173599	52913	4685	1428	97/JB	0.69	0.02	0.76	15.12	0.43	17.75	0.503	242	98	2,081	
							97/JB	1.64	0.05	1.80	14.43	0.41	16.79	0.476	403	163	1,983 W Bank	
							95/JB	0.52	0.01	0.57	12.79	0.36	14.81	0.419	183	74	1,820	
							97/JB	1.43	0.04	1.57	12.27	0.35	14.19	0.402	505	204	1,746 W Bank	
							95/JB	0.45	0.01	0.50	10.84	0.31	12.56	0.356	160	65	1,542 W Bank	
							97/JB	1.15	0.03	1.27	10.39	0.29	11.92	0.338	406	164	1,477 W Bank	
							95/JB	0.26	0.01	0.29	9.24	0.26	10.65	0.302	93	38	1,312	

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD (feet)	Section Distance		Village	Chak No.	Outlet Discharge		Section Discharge		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (ha)	Section CCA (ha)	Project (Improvement)	Remarks			
				(m)	(feet)			Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)								
119	1393	173950/R	173950	53020	351	107	957/B	0.72	0.02	0.79	8.98	0.25	10.14	0.287	253	102	1,275 W Bank		
120	1394	177973/R	177973	54246	4023	1226	997/B	0.94	0.03	1.03	8.26	0.23	9.33	0.264	329	133	1,172 W Bank		
121	1395	179251/TL	179251	54636	1278	390	987/B	1.97	0.06	2.17	7.32	0.21	8.11	0.230	686	278	1,039 W Bank		
122	1396	179251/TF	179251	54636	0	0	987/B	2.71	0.08	2.98	5.55	0.15	5.89	0.167	951	385	762 W Bank		
123	1397	179251/TR	179251	54636	0	0	997/B	2.64	0.07	2.90	2.64	0.07	2.90	0.082	931	377	377 W Bank		
								247.90	7.02					85.686	34.677				
																		34.675	
<b>Saduana Minor (RD 11284/L, Nasrana Distributary)</b>																			
1	1401	7925/TL	7925	2416	7925	2416	487/B	1.49	0.04	1.64	4.07	0.12	4.75	0.135	659	267	720 W Bank+4 Drg	720	
2	1402	9042/R	9042	2756	1117	340	557/B	1.58	0.04	1.74	2.58	0.07	2.86	0.081	558	226	454		
3	1403	9042/L	9042	2756	0	0	577/B	1.00	0.03	1.10	1.00	0.03	1.10	0.031	563	228	228 W Bank		
								4.07	0.12					1.780	720				
<b>Khiliiana Minor (RD 32000/R, Nasrana Distributary)</b>																			
1	1404	9042/R	9042	2756	9042	2756	5577/B	1.58	0.04	1.74	9.09	0.26	10.65	0.302	558	226	1,293 W Bank	1,293	
		9042/L	9042	2756	0	0		1.60	0.05	1.76	7.51	0.21	8.47	0.240	563	228	1,068		
2	1405	14532/TR	14532	4429	5490	1673	557/B	1.70	0.05	1.87	5.91	0.17	6.71	0.190	604	244	840 W Bank		
3	1406	14532/TL	14532	4429	0	0	567/B	2.41	0.06	2.41	4.21	0.12	4.63	0.131	770	312	595 W Bank		
4	1407	14532/TF	14532	4429	0	0	567/B	2.02	0.06	2.22	2.02	0.06	2.22	0.063	701	284	284		
								9.09	0.26					3.196	1,293				
																		1,293	
<b>Narwala Minor (RD 62933/L, Nasrana Distributary)</b>																			
1	1408	9750/R	9750	2972	9750	2972	657/B	1.22	0.03	1.34	14.57	0.41	17.10	0.484	428	173	2,139 W Bank	2,139	
2	1409	10877/L	10877	3315	1127	344	667/B	1.27	0.04	1.40	13.35	0.38	15.13	0.428	646	261	1,966 W Bank		
3	1410	11398/L	11398	3474	521	159	667/B	1.32	0.04	1.45	12.08	0.34	13.66	0.387	474	192	1,705		
4	1411	13613/L	13613	4149	2215	675	667/B	1.57	0.04	1.73	10.76	0.30	12.18	0.345	553	224	1,513		
5	1412	14696/R	14696	4479	1083	330	657/B	1.12	0.03	1.23	9.19	0.26	10.33	0.293	363	147	1,289 W Bank		
6	1413	15804/L	15804	4817	1108	338	667/B	1.80	0.05	1.98	8.07	0.23	9.05	0.256	632	256	1,142		
7	1414	16900/R	16900	5151	1096	334	657/B	1.10	0.03	1.21	6.27	0.18	7.02	0.199	371	150	886 W Bank		
8	1415	19103/TR	19103	5823	2203	671	677/B	1.73	0.05	1.90	5.17	0.15	5.76	0.163	607	246	736 W Bank		
9	1416	19103/TL	19103	5823	0	0	677/B	1.54	0.04	1.69	3.44	0.10	3.78	0.107	542	219	490 W Bank		
10	1417	19103/TF	19103	5823	0	0	677/B	1.90	0.05	2.09	1.90	0.05	2.09	0.059	670	271	271 W Bank+M.P.A.		
								14.57	0.41					5.286	2,139				
																		2,139	
<b>Satiana Minor (RD 93792/R, Nasrana Distributary)</b>																			
1	1418	300/R	300	91	300	91	717/B	0.72	0.02	0.79	7.10	0.20	8.23	0.233	255	103	1,015 W Bank	1,015	
2	1419	6009/L	6009	1832	5709	1740	727/B	1.76	0.05	1.94	6.38	0.18	7.43	0.210	619	251	911 W Bank		
3	1420	6009/R	6009	1832	0	0	717/B	0.83	0.02	0.91	4.62	0.13	5.26	0.149	294	119	661 W Bank		
4	1421	12002/TR	12002	3658	5993	1827	727/B	1.28	0.04	1.41	3.79	0.11	4.35	0.123	454	184	542 US Aid		
5	1422	12002/TF	12002	3658	0	0	727/B	1.35	0.04	1.49	2.51	0.07	2.76	0.078	476	193	358 US Aid+MPA+W.B.		
6	1423	12002/TL	12002	3658	0	0	727/B	1.16	0.03	1.28	1.16	0.03	1.28	0.036	409	166	166 US Aid+W Bank		
								7.10	0.20					2.507	1,015				
																		1,015	

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	Watercourse No. (original)	RD (feet)	Section (m)	Village	Chak No.	Outlet Discharge		Section		Design		Orific CCA (acre)	Section CCA (ha)	Project (Improvement)	Remarks		
						Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)						
<b>Nathari Minor (RD 106799/L, Nasrana Distributary)</b>																	
1	1424 7850/L	7850	2393	7850	2393	77/JB	2.18	0.06	2.40	13.29	0.38	15.40	0.436	1,800	US Aid		
2	1425 8826/R	8826	2690	976	297	79/JB	0.83	0.02	0.91	11.11	0.31	12.53	0.355	1,492	US Aid		
3	1426 9357/R	9357	2852	531	162	79/JB	1.79	0.05	1.97	10.28	0.29	11.56	0.327	508	1,380	US Aid	
4	1427 10074/L	10074	3071	717	219	77/JB	2.13	0.06	2.34	8.49	0.24	9.56	0.271	751	1,175	W Bank	
5	1428 12440/R	12440	3792	2366	721	79/JB	0.88	0.02	0.97	6.36	0.18	7.18	0.203	302	871		
6	1429 14345/L	14345	4372	1905	581	250/RB	1.09	0.03	1.20	5.48	0.16	6.12	0.173	305	749		
7	1430 15097/R	15097	4602	752	229	78/78/JB	2.16	0.06	2.38	4.39	0.12	4.85	0.137	760	625	US Aid+W Bank	
8	1431 15097/L	15097	4602	0	0	78/78/JB	2.23	0.06	2.45	2.23	0.06	2.45	0.069	785	318	318	W Bank
							13.29	0.38					4,448	1,800			
<b>Domra Minor (RD 121531/L, Nasrana Distributary)</b>																	
1	1432 4950/L	4950	1509	4950	1509	Railway St.	0.05	0.00	0.06	18.50	0.52	21.36	0.605	17	7	2,616	
2	1433 5050/L	5050	1539	100	30	84/JB	2.18	0.06	2.40	18.45	0.52	20.94	0.593	767	310	2,610	
3	1434 6308/R	6308	1923	1258	383	88/JB	2.24	0.06	2.46	16.27	0.46	18.53	0.525	789	319	2,299	
4	1435 7992/R	7992	2436	1684	513	88/JB	1.17	0.03	1.29	14.03	0.40	15.98	0.453	394	159	1,980	
5	1436 9561/L	9561	2914	1569	478	85/JB	1.15	0.03	1.27	12.86	0.36	14.59	0.413	405	164	1,820	M.P.A.+W Bank
6	1437 9794/L	9794	2985	233	71	85/JB	1.16	0.03	1.28	11.71	0.33	13.23	0.375	406	164	1,656	
7	1438 11150/L	11150	3399	1356	413	85/JB	2.12	0.06	2.33	10.55	0.30	11.94	0.338	732	296	1,492	W Bank
8	1439 12645/R	12645	3854	1495	456	88/JB	1.57	0.04	1.73	8.43	0.24	9.54	0.270	547	221	1,196	W Bank
9	1440 13230/L	13230	4033	585	178	86/JB	1.78	0.05	1.96	6.86	0.19	7.74	0.219	625	253	975	W Bank
10	1441 18069/L	18069	5507	4839	1475	86/JB	1.59	0.05	1.75	5.08	0.14	5.76	0.163	560	227	722	M.P.A.+W Bank
11	1442 18069/R	18069	5507	0	0	87/JB	1.79	0.05	1.87	3.49	0.10	3.84	0.109	601	243	495	W Bank
12	1443 18069/T	18069	5507	0	0	87/JB	1.79	0.05	1.97	1.79	0.05	1.97	0.056	622	252	252	W Bank
							18.50	0.52					6,465	2,616			
<b>Gojra Distributary</b>																	
1	2957 155/L	155	47	155	47	361/JB	2.00	0.06	2.20	57.79	1.64	68.96	1.953	705	285	7,540	
2	2958 160/L	160	49	5	2	361/JB	1.01	0.03	1.11	55.79	1.58	66.74	1.890	357	144	7,255	W Bank
3	2959 180/L	180	55	20	6	361/JB	1.27	0.04	1.40	54.78	1.55	65.63	1.859	446	180	7,110	W Bank
4	2960 517/L	517	158	337	103	362/JB	1.92	0.05	2.11	53.51	1.52	64.23	1.819	655	265	6,930	W Bank
5	2961 4360/L	4360	1329	3843	1171	362/JB	1.70	0.05	1.87	51.59	1.46	62.07	1.758	468	189	6,665	W Bank
6	2962 5495/L	5495	1675	1135	346	362/JB	1.50	0.04	1.65	49.89	1.41	59.68	1.690	520	210	6,475	
7	2963 7634/L	7634	2327	2139	652	363/JB	1.63	0.05	1.79	48.39	1.37	57.88	1.639	535	217	6,265	W Bank+US Aid
8	2964 13254/L	13254	4040	5620	1713	364/JB	1.26	0.04	1.39	46.76	1.32	55.81	1.581	443	179	6,048	
9	2965 13266/L	13266	4062	72	22	363/JB	1.10	0.03	1.21	45.50	1.29	53.71	1.521	376	152	5,869	W Bank+US Aid
10	2966 16923/R	16923	5158	3597	1096	364/JB	1.43	0.04	1.57	44.40	1.26	52.49	1.487	422	171	5,717	W Bank+US Aid
11	2967 18961/L	18961	5779	2038	621	363/JB	0.77	0.02	0.85	42.97	1.22	50.48	1.429	269	109	5,546	W Bank
12	2968 19302/R	19302	5883	341	104	364/JB	1.72	0.05	1.89	42.20	1.20	49.38	1.399	509	206	5,438	
13	2969 22191/R	22191	6764	2889	881	365/JB	0.92	0.03	1.01	40.48	1.15	47.45	1.344	310	125	5,232	
14	2970 22850/R	22850	6965	659	201	365/JB	1.02	0.03	1.02	39.56	1.12	46.10	1.306	281	114	5,106	
15	2971 22897/R	22897	6979	47	14	365/JB	1.02	0.03	1.12	38.63	1.09	45.01	1.275	358	145	4,992	
16	2972 22897/L	22897	6979	0	0	363/JB	1.65	0.05	1.82	37.61	1.07	43.88	1.243	575	233	4,847	W Bank
17	2973 28915/R	28915	8813	6018	1834	370/JB	1.25	0.04	1.38	35.96	1.02	42.06	1.191	198	80	4,615	
18	2974 29090/R	29090	8867	175	53	FDR GOJRA	0.55	0.02	0.61	34.71	0.98	40.04	1.134	RLY T.	80	4,535	

Table B - I (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD		Section Distance (m)	Village	Chak No.	Outlet Discharge		Section		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Project (Improvement)	Remarks		
			(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)							
19	2975	29319/R	29319	8936	229	70 Factories		0.50	0.01	0.55	34.16	0.97	39.41	1.116	4	2	4,535	
20	2976	30559/R	30559	9314	1240	378	370/B	0.38	0.01	0.42	33.66	0.95	38.84	1.100	122	49	4,533	
22	2978	31158/L	31158	9497	599	183	366/B	1.58	0.04	1.74	33.28	0.94	38.29	1.084	555	225	4,484	W Bank
21	2977	31230/R	31230	9519	72	22	370/B	1.75	0.05	1.93	31.70	0.90	36.49	1.033	W.S.		4,259	
23	2979	31258/R	31238	9521	8	2	371/B	0.72	0.02	0.79	29.95	0.85	34.56	0.979	253	102	4,259	
24	2980	32471/L	32471	9897	1233	376	366/B	1.16	0.03	1.28	29.23	0.83	33.77	0.956	408	165	4,157	W Bank-US Aid
25	2981	33707/L	33707	10274	1236	377	366/B	2.38	0.07	2.62	28.07	0.79	32.37	0.917	687	278	3,992	W Bank
26	2982	33707/R	33707	10274	0	0	371/B	0.95	0.03	1.05	25.69	0.73	29.64	0.839	334	135	3,714	W Bank
27	2983	36186/R	36186	11029	2479	756	371/B	1.19	0.03	1.31	24.74	0.70	28.59	0.810	407	165	3,578	W Bank
35	2991	39482/R	39482	12034	3296	1005	371/B	1.36	0.04	1.50	23.55	0.67	27.07	0.767	479	194	3,414	W Bank
28	2984	40990/L	40990	12494	1508	460	367/B	2.48	0.07	2.73	22.19	0.63	25.29	0.716	860	348	3,220	W Bank
29	2985	41305/R	41305	12590	315	96	370/B	7.77	0.22	8.93	19.71	0.56	22.44	0.636	2,949	1,193	2,872	Zeera Minor(8.93)
30	2986	41367/R	41367	12609	62	19	369/B	2.12	0.06	2.33	11.94	0.34	13.49	0.382	729	295	1,678	W Bank-US Aid
31	2987	43908/L	43908	13383	2541	774	367/B	1.40	0.04	1.54	9.82	0.28	11.15	0.316	487	197	1,383	
32	2988	49414/TF	49414	15061	5506	1678	369/B	1.91	0.05	2.10	8.42	0.24	9.48	0.269	647	262	1,186	W Bank
33	2989	49414/FR	49414	15061	0	0	369/B	1.40	0.04	1.54	6.51	0.18	7.38	0.209	488	197	924	
34	2990	49414/TL	49414	15061	0	0	368/B	2.24	0.06	2.46	5.11	0.14	5.62	0.159	787	318	727	W Bank
								2.87	0.08	3.16	2.87	0.08	3.16	0.089	1,009	408	408	W Bank-US Aid
								57.79	1.64						13,632	7,540		

Zeera Minor (RD 41305/R, Gojra Distributary)

1	2992	4058/L	4058	1237	4058	1237	371/B	0.87	0.02	0.96	7.77	0.22	8.93	0.253	517	209	1,193	1,193	W Bank
2	2993	8897/TL	8897	2712	4839	1475	372/B	1.46	0.04	1.61	6.90	0.20	7.79	0.221	515	208	984	W Bank-US Aid	
3	2994	8897/FR	8897	2712	0	0	372/B	1.37	0.04	1.51	5.44	0.15	5.98	0.169	483	195	776	W Bank-US Aid	
4	2995	8897/TF	8897	2712	0	0	373/B	4.07	0.12	4.48	4.07	0.12	4.48	0.127	1,434	580	580		
								7.77	0.22						2,949	1,193			
															1,193				

East Circle

Kilianwala Distributary

1	582	380/L	380	116	380	116	437/B	1.15	0.03	1.27	199.87	5.66	245.65	6.937	340	138	21,019	21,019	
2	583	860/R	860	262	480	146	438/B	1.30	0.04	1.43	198.72	5.63	244.27	6.918	389	157	20,882		
3	584	3845/R	3845	1172	2985	910	438/B	1.11	0.03	1.22	197.42	5.59	242.70	6.873	386	156	20,724		
4	585	6991/L	6991	2131	3146	959	437/177/B	1.78	0.05	1.96	196.31	5.56	240.61	6.814	625	253	20,568		
5	586	7136/L	7136	2175	145	44	437/B	1.12	0.03	1.23	194.53	5.51	237.74	6.733	395	160	20,315	W Bank	
6	587	10000/R	10000	3048	2864	873	439/B	1.53	0.04	1.68	193.41	5.48	236.47	6.697	524	212	20,155		
7	588	12500/L	12500	3810	2500	762	437/B	1.13	0.03	1.24	191.88	5.43	233.96	6.626	398	161	19,943	W Bank	
8	589	12559/R	12559	3828	59	18	445/B	1.03	0.03	1.13	190.75	5.40	232.00	6.570	361	146	19,782	4 Drg	
9	590	15000/R	15000	4572	2441	744	439/B	0.99	0.03	1.09	189.72	5.37	230.85	6.538	349.5	141	19,636	W Bank	
10	591	15063/L	15073	4594	73	22	440/B	1.50	0.04	1.65	188.73	5.34	229.07	6.487	497	201	19,494		
11	592	15867/R	15867	4836	794	242	447/B	1.12	0.03	1.23	187.23	5.30	227.40	6.440	391	158	19,293	US Aid-W Bank	
12	593	19629/L	19629	5983	3762	1147	440/B	1.79	0.05	1.97	186.11	5.27	225.95	6.399	627	254	19,135		
			20000/R	6096	371	113	439/B	0.89	0.03	0.98	184.32	5.22	223.93	6.313	200	81	18,881		
13	594	23370/L	23370	7123	3370	1027	440/B	1.75	0.05	1.93	183.43	5.19	221.84	6.283	615	249	18,800		
14	595	27867/R	27867	8494	4497	1371	439/B	1.22	0.03	1.34	181.68	5.15	218.99	6.202	428	173	18,551	W Bank	
16	597	28780/L	28780	8772	913	278	441/B	1.57	0.04	1.73	180.46	5.11	216.41	6.129	541	219	18,378		

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD		Section Distance (m)	Village	Chak No.	Outlet Discharge		Section		Design		Outlet CCA (ha)	Section CCA (ha)	Project (Improvement)	Remarks	
			(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (cusec)					
15	596	2892/L	2892	8817	147	45	441/GB	1.83	0.05	2.01	178.89	5.07	214.43	6.073	621	251	18,159 US Aid	
16	599	30100/R	30100	9174	1173	358	442/GB	1.36	0.04	1.50	177.06	5.01	212.38	6.015	429	174	17,908	
17	598	30130/L	30130	9184	30	9	441/GB	1.60	0.05	1.76	175.70	4.98	210.56	5.963	564	228	17,734	
19	600	30157/R	30157	9192	27	8	442/GB	1.11	0.03	1.22	174.10	4.93	208.80	5.913	361	146	17,506	
20	601	31354/L	31354	9557	1197	365	441/GB	1.62	0.05	1.78	172.99	4.90	207.57	5.878	562	227	17,360	
21	602	33484/R	33484	10206	2130	649	442/GB	1.04	0.03	1.14	171.37	4.85	205.47	5.819	340	138	17,133	
22	603	35763/R	35763	10901	2279	695	442/GB	1.39	0.04	1.53	170.33	4.82	203.76	5.770	462	187	16,995 US Aid	
23	604	36968/L	36968	11268	1205	367	443/GB	1.11	0.03	1.22	168.94	4.78	201.63	5.710	317	128	16,808	
24	605	38000/R	38000	11582	1032	315	444/GB	0.91	0.03	1.00	167.83	4.75	200.09	5.666	303	123	16,680	
25	606	40620/R	40620	12381	2620	799	444/GB	0.97	0.03	1.07	166.92	4.73	198.82	5.630	317	128	16,557 US Aid	
		41830/L	41830	12750	1210	369	444/GB	1.49	0.33	13.65	165.95	4.70	197.07	5.581	4,303	1,741	16,429	Minor No. 3(13.65)
		43064/L	43064	13126	1234	376	444/GB	0.81	0.02	0.89	154.46	4.37	183.10	5.185	243	98	14,687	
		44950/R	44950	13701	1886	575	443/GB	0.72	0.02	0.79	153.65	4.35	181.90	5.152	254	103	14,589	
26	607	46856/L	46856	14282	1906	581	443/GB	1.30	0.04	1.43	152.93	4.33	180.64	5.116	384	155	14,486 US Aid	
27	608	46950/R	46950	14310	94	29	449/GB	0.98	0.03	1.08	151.63	4.29	178.74	5.062	342	138	14,331 US Aid+W Bank	
28	609	48275/R	48275	14714	1325	404	449/GB	1.57	0.04	1.73	150.65	4.27	177.64	5.031	554	224	14,192 US Aid+W Bank	
29	610	48491/L	48491	14780	216	66	443/GB	1.22	0.03	1.34	149.08	4.22	175.59	4.973	402	163	13,968 US Aid	
30	611	49300/L	49300	15027	809	247	443/GB	1.58	0.04	1.74	147.86	4.19	174.20	4.933	416	168	13,806	
31	612	49333/L	49333	15037	33	10	450/GB	1.04	0.03	1.14	146.28	4.14	172.26	4.878	357	144	13,637 W Bank	
32	613	49750/L	49750	15164	417	127	450/GB	1.72	0.05	1.89	145.24	4.11	171.11	4.846	603	244	13,493	
33	614	54241/L	54211	16524	4461	1360	450/GB	0.68	0.02	0.75	143.52	4.06	169.12	4.789	229	93	13,249 US Aid	
34	615	57182/R	57182	17429	2971	906	451/GB	2.03	0.06	2.23	142.84	4.05	167.31	4.738	716	290	13,156 US Aid	
35	616	58457/L	58457	17818	1275	389	450/GB	0.80	0.02	0.66	140.81	3.99	164.38	4.655	186	75	12,866	
36	617	60000/R	60000	18288	1543	470	451/GB	1.86	0.05	2.05	140.21	3.97	163.42	4.628	656	265	12,791	
37	618	64198/R	64198	19568	4198	1280	451/GB	0.96	0.03	1.06	138.35	3.92	161.01	4.560	340	138	12,525	
38	619	64198/L	64198	19568	0	0	451/GB	1.38	0.04	1.52	137.39	3.89	158.99	4.502	491	199	12,388	
39	620	65700/L	65700	20025	1502	458	452/GB	0.69	0.02	0.76	134.93	3.82	155.94	4.459	349	141	12,189 US Aid	
		69450/R	69450				452/GB	0.82	0.02	0.90	134.24	3.80	155.18	4.395	266	108	11,950	
40	621	70500/L	70500	21488	4800	1463	452/GB	2.18	0.06	2.40	133.42	3.78	154.27	4.369	700	283	11,842 US Aid	
41	622	72926/R	72926	22228	2426	739	448/GB	1.25	0.04	1.38	131.24	3.72	150.79	4.271	413	167	11,559 US Aid+W Bank	
42	623	72956/R	72956	22237	30	9	453/GB	1.30	0.04	1.43	129.99	3.68	148.88	4.216	447	181	11,392 W Bank	
43	624	72956/L	72956	22237	0	0	452/GB	1.87	0.05	2.06	128.69	3.64	147.44	4.176	652	264	11,211	
		75040/L	75040				452/GB	31.00	0.88	31.00	126.82	3.59	145.39	4.117				Kamjwani Distributary (31.0)
44	625	78418/L	78418	23902	5462	1665	452/GB	0.85	0.02	0.94	95.82	2.71	114.39	3.239	299	121	10,947	
45	626	79537/R	79537	24243	1119	341	453/GB	1.18	0.03	1.30	94.97	2.69	112.41	3.183	410	166	10,826 W Bank	
46	627	80629/R	80629	24576	1092	333	453/GB	1.48	0.04	1.63	93.79	2.66	110.90	3.141	522	211	10,660 W Bank	
47	628	80637/R	80637	24578	8	2	453/GB	1.00	0.03	1.10	91.01	2.58	107.64	3.089	457	185	10,449 W Bank	
48	629	85680/R	85680	25506	3043	928	540/GB	1.00	0.03	1.10	91.01	2.58	107.64	3.089	350	142	10,264	
49	630	85000/R	85000	25908	1320	402	540/GB	0.96	0.03	1.06	90.01	2.55	105.98	3.001	338	137	10,122	
50	631	85095/L	85095	25937	95	29	541/GB	1.19	0.03	1.31	89.05	2.52	104.68	2.964	416	168	9,986 W Bank	
51	632	85573/L	85573	26083	478	146	548/456/455/GB	1.95	0.06	2.15	87.86	2.49	103.35	2.927	664	269	9,817	
52	633	86250/R	86250	26289	677	206	540/GB	1.06	0.03	1.17	85.91	2.43	101.12	2.864	373	151	9,548 W Bank	
53	634	87487/R	87487	26666	1237	377	541/GB	1.84	0.05	2.02	84.85	2.40	99.83	2.827	647	262	9,398	
54	635	88567/R	88567	26995	1080	329	456/GB	1.52	0.04	1.67	83.01	2.35	97.59	2.764	516	209	9,136	
55	636	89602/R	89602	27311	1035	315	456/GB	1.90	0.05	2.09	79.85	2.26	93.75	2.711	578	234	8,927	
56	637	89618/R	89618	27316	16	5	456/GB	1.60	0.05	1.80	79.85	2.26	93.75	2.711	578	234	8,927	
57	638	90621/L	90621	27621	1003	306	542/GB	1.39	0.04	1.53	77.95	2.21	91.65	2.596	491	199	8,441	
58	639	90900/L	90900	27706	279	85	541/GB	1.01	0.03	1.11	76.56	2.17	89.96	2.548	358	145	8,242 W Bank	



Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No. (original)	No. Watercourse No.	RD		Section Distance	Village	Chak No.	Authorized		Design		Section		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Project (Improvement)	Remarks		
		(feet)	(m)				(cusec)	(m <sup>3</sup> /s)	(cusec)	(m <sup>3</sup> /s)	(cusec)	(m <sup>3</sup> /s)							
59	640 93094/L	93094	28375	2194	669	453/541/456/GB	1.61	0.05	1.77	75.55	2.14	88.80	2.515	566	229	8,097			
60	641 97670/R	93114	28381	20	6		1.56	0.04	1.72	73.94	2.09	86.66	2.454	552	223	7,868			
61	642 98170/R	97670	29770	4556	1389	T/Wala Sugar Mill	2.00	0.06	2.20	72.38	2.05	84.95	2.406	192	78	7,645			
62	643 98527/L	98170	29922	500	152	542/GB	1.40	0.04	1.54	70.38	1.99	82.01	2.323	492	199	7,567			
63	644 101535/R	98527	30031	357	109	543/GB	1.55	0.04	1.71	68.98	1.95	80.39	2.277	544	220	7,368	W Bank		
64	645 101825/R	101535	30948	3008	917	544/GB	1.91	0.05	2.10	67.43	1.91	78.63	2.227	672	272	7,148			
65	646 102430/L	101825	31036	290	88	544/487/GB	1.42	0.04	1.56	65.52	1.86	76.07	2.154	464	188	6,876	W Bank		
66	647 106480/L	102430	31221	605	184	543/456/GB	1.50	0.04	1.72	62.60	1.82	74.46	2.109	426	172	6,688	W Bank		
67	648 107000/R	106480	32455	4050	1234	544/GB	1.39	0.04	1.53	61.04	1.73	70.41	1.994	478	193	6,293			
68	649 108265/L	107000	32614	520	158	545/GB	1.29	0.04	1.42	59.65	1.69	68.80	1.948	451	183	6,100			
69	650 111396/L	108265	32999	1265	386	545/GB	1.00	0.03	1.10	58.36	1.65	67.20	1.903	351	142	5,918	W Bank		
70	651 113558/R	111396	33954	3131	954	487/GB	1.67	0.05	1.84	57.36	1.62	65.66	1.859	574	232	5,775			
71	652 113558/L	113558	34612	0	0		1.26	0.04	1.39	55.69	1.58	63.52	1.799	443	179	5,543			
72	653 116840/L	113558	34947	1096	334	546/GB	1.06	0.03	1.17	54.43	1.54	62.13	1.760	373	151	5,364			
73	654 116865/R	116840	35613	2186	666	458/GB	2.16	0.06	2.38	53.37	1.51	60.82	1.742	769	311	5,213		Minor No. 7(1.65)	
74	655 116871/R	116865	35620	25	8		11.65	0.33	12.35	51.21	1.45	58.15	1.647	561	227	4,902			
75	656 116936/R	116871	35622	6	2	546/GB	1.59	0.05	1.75	39.56	1.12	45.80	1.297	492	199	4,675			
76	657 117000/L	116936	35642	65	20	549/GB	0.98	0.03	1.08	36.57	1.04	42.50	1.204	336	136	4,476			
77	658 119142/R	117000	35662	64	20	546/GB	1.14	0.03	1.25	35.59	1.01	41.42	1.173	401	162	4,340			
78	659 123506/L	119142	36314	2142	653	549/GB	1.13	0.03	1.24	34.45	0.98	39.93	1.131	400	162	4,177			
79	660 125000/R	121000	36881	1858	566	550/GB	1.24	0.04	1.36	33.32	0.94	38.49	1.090	435	176	4,015			
80	661 125866/L	125000	37645	2506	764	551/GB	1.70	0.05	1.87	32.08	0.91	36.87	1.044	600	243	3,839			
81	662 126856/L	125866	38364	866	264	553/GB	1.63	0.05	1.79	30.38	0.86	34.85	0.987	573	232	3,596	W Bank		
82	663 126856/L	126856	38666	990	302	550/GB	1.63	0.05	1.79	28.75	0.81	32.97	0.934	565	229	3,364		Minor No. 8(4.93)	
83	664 130570/R	126856	38666	0	0		4.93	0.14	5.23	27.12	0.77	31.08	0.880	476	193	3,136	W Bank		
84	665 131793/L	130570	39798	3714	1132	548/550/GB	1.35	0.04	1.49	22.19	0.63	25.86	0.732	409	166	2,943			
85	666 135300/L	131793	40171	1223	373	550/GB	1.16	0.03	1.28	20.84	0.59	24.07	0.682	355	144	2,777	W Bank		
86	667 136506/L	135300	41239	3507	1069	555/GB	1.05	0.03	1.16	19.68	0.56	22.69	0.643	426	172	2,634	W Bank		
87	668 136780/R	136506	41607	1206	368	545/GB	1.92	0.05	2.11	17.42	0.49	19.85	0.562	661	268	2,461	W Bank		
88	669 138751/R	136780	41691	274	84	554/GB	2.27	0.06	2.50	15.50	0.44	17.72	0.502	778	315	2,194	W Bank		
89	670 140556/R	138751	42291	1971	601	556/GB	1.62	0.05	1.78	13.23	0.37	15.09	0.427	561	227	1,879			
90	671 140677/L	140556	42841	1805	550	555/GB	1.86	0.05	2.05	11.61	0.33	13.20	0.374	654	265	1,652	W Bank		
91	672 142239/R	140677	42878	121	37	556/GB	1.46	0.04	1.61	9.75	0.28	11.15	0.316	512	207	1,387			
92	673 143377/R	142239	43354	1562	476	556/GB	1.42	0.04	1.56	8.29	0.23	9.46	0.268	499	202	1,180			
93	674 146770/R	143377	43701	1138	347	501/GB	1.35	0.04	1.46	6.87	0.19	7.84	0.222	469	190	978			
94	675 148324/L	146770	44735	3393	1034	555/GB	1.61	0.05	1.77	4.19	0.12	4.70	0.133	564	228	597			
95	676 151086/R	148324	45209	1554	474	557/GB	0.98	0.03	1.08	2.58	0.07	2.84	0.080	347	140	368			
96	677 151086/T	151086	46051	0	0		1.60	0.05	1.76	1.60	0.05	1.76	0.050	563	228	228			
97	678 151086/T	151086	46051	0	0		199.87	5.66						51,938					
														21,018					

Minor #7 (RD 116865/R, Kilianwala Distributory)

1	717 1230/L	1230	375	1230	375	Gath	0.57	0.02	0.63	11.65	0.33			202	82	1,756		
2	718 5738/R	5738	1749	4508	1374	Gath	1.34	0.04	1.47	11.08	0.31			472	191	1,675		
	8065/L	8065	2458	2327	709		0.81	0.02	0.89	9.74	0.28			284	115	1,484		

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No. (feet)	RD (m)	Village	Chak No.	Outlet Discharge		Section		Design Discharge (m <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Project (Improvement)	Remarks	
						Authorized (cusecs)	Design (cusecs)	Discharge (cusecs)	Discharge (m <sup>3</sup> /s)							
3	719	13715/R	13715	4180	5650	1722	Garh	1.43	0.04	1.57	8.93	0.25	500	202	1,369	
4	720	13715/TC	13715	4180	0	0	Garh	1.81	0.05	1.99	7.50	0.21	637	258	1,166	
5	721	13715/TCR	13715	4180	0	0	Garh	1.41	0.04	1.55	5.69	0.16	497	201	909	
6		13715/TL	13715	4180	0	0		2.90	0.08	3.19	4.28	0.12	1,262	511	707	
		13715/LCL	13715	4180	0	0		1.38	0.04	1.52	1.38	0.04	486	197	197	
								1.65	0.33				4,340			
													1,756			
<b>Minor #3 (RD 41830/L, Kulanwala Distributary)</b>																
1	700	4662/R	4662	1421	4662	1421		0.57	0.02	0.63	11.49	0.33	202	82	1,741	
2	701	6837/R	6837	2084	2175	663		0.65	0.02	0.72	10.92	0.31	230	93	1,660	US Aid+W Bank
3	702	9038/R	9038	2755	2201	671		0.62	0.02	0.68	10.27	0.29	212	86	1,567	US Aid+W Bank
4	703	11361/L	11361	3463	2323	708		1.34	0.04	1.47	9.65	0.27	449	182	1,481	
5	704	12559/R	12559	3828	1198	365		0.52	0.01	0.57	8.31	0.24	358	145	1,299	4 Drg
8	707	15867/R	15867	4836	3308	1008		1.11	0.03	1.22	7.79	0.22	391	158	1,154	US Aid
9	708	17210/R	17210	5246	1343	409		1.51	0.04	1.66	6.68	0.19	533	216	996	W Bank+4 Drg
10	709	18682/L	17600	5364	390	119		1.38	0.04	1.52	5.17	0.15	575	233	780	
11	710	19420/R	19420	5919	1820	555		1.14	0.03	1.25	3.79	0.11	454	184	548	
12	711	21859/TC	21859	6663	2439	743		1.94	0.06	2.13	2.65	0.08	656	265	364	
13	712	21859/TF	21859	6663	0	0		0.71	0.02	0.78	0.71	0.02	243	98	98	
								1.149	0.33				4,303			
													1,741			
<b>Minor #8 (RD 126856/L, Kulanwala Distributary)</b>																
1	714	6290/R	6290	1917	6290	1917		1.43	0.04	1.57	4.93	0.14	504	204	704	W Bank
2	715	8600/TF	8600	2621	2310	704		1.85	0.05	2.04	3.50	0.10	653	264	500	
3	716	8600/TL	8600	2621	0	0		1.65	0.05	1.82	1.65	0.05	582	236	236	US Aid
								4.93	0.14				1,739			
													704			
<b>Mungi Distributary</b>																
1	1929	960/R	960	292.6	960	293		1.25	0.04	1.38	142.99	4.05	439	178	19,161	
2	1930	1000/L	1000	304.8	40	12		1.51	0.04	1.66	141.74	4.01	530	214	18,984	W Bank
3	1931	4030/L	4030	1228	3030	924		1.12	0.03	1.23	140.23	3.97	336	136	18,769	W Bank
4	1932	8200/L	8200	2499	4170	1271		1.44	0.04	1.58	139.11	3.94	493	200	18,633	W Bank
5	1933	10576/L	10576	3224	2376	724		2.09	0.06	2.30	137.67	3.90	737	298	18,434	
5	1934	11000/L	11000	3353	424	129		2.18	0.06	2.40	135.58	3.84	754	305	18,135	
5	1935	12350/L	12350	3764	1350	411		1.03	0.03	1.13	133.40	3.78	340	138	17,830	
6-B	1937	12600/R	12600	3840	250	76		0.80	0.02	0.88	132.37	3.75	274	111	17,693	
6-A	1938	15125/L	15125	4610	2525	770		1.11	0.03	1.22	131.57	3.73	366	148	17,582	W Bank
7	1939	17942/L	17942	5469	2817	899		1.34	0.04	1.47	130.46	3.69	438	177	17,434	W Bank
7-A		19500/L	19500	5944	1558	475		0.25	0.01	0.28	129.12	3.66	480	L.S.	17,256	
8	1940	21945/L	21945	6689	2445	745		1.46	0.04	1.61	128.87	3.65	587	238	17,256	W Bank
9	1941	22491/R	22491	6855	546	166		1.88	0.05	2.07	127.41	3.61	608	246	17,019	
10	1942	24526/L	24526	7476	2035	620		1.13	0.03	1.24	125.53	3.56	354	143	16,773	W Bank
11	1943	24592/R	24592	7496	66	20		1.76	0.05	1.94	124.40	3.52	593	240	16,629	W Bank
12	1944	27119/L	27119	8266	2527	770		1.27	0.04	1.40	122.64	3.47	439	178	16,389	W Bank

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD (feet)	M (m)	Section		Village	Chak No.	Outlet Discharge			Section			Design			Outlet CCA (acre)	CCA (ha)	Section CCA (ha)	Project (Improvement)	Remarks
					Distance (feet)	Distance (m)			Authorized (cusec)	Design (cusec)	Authorized (cusec)	Design (cusec)	Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)						
14	1945	29150/R	29150	8885	2031	619			1.25	0.04	1.38	121.37	3.44	147.60	4.180	426	172	16,212	US Aid			
14-A	29700/R	29700	9053	550	168		244/GB		1.14	0.03	1.25	120.12	3.40	145.77	4.128	401	162	16,039				
15	1946	30962/L	30962	9437	1262	385	244/GB		1.29	0.04	1.42	118.98	3.37	144.40	4.089	412	167	15,877				
15	1947	31795/R	31795	9691	833	254	245/GB		1.76	0.05	1.94	117.69	3.33	142.71	4.041	618	250	15,710	W Bank			
16	1948	32071/R	32071	9775	276	84	245/GB		1.74	0.05	1.91	115.93	3.28	140.59	3.982	553	224	15,460	W Bank			
17	1949	32405/L	32405	9877	334	102	243/GB		2.03	0.06	2.23	114.19	3.23	138.62	3.926	624	253	15,236				
18	1950	34800/R	34800	10607	2395	730	245/GB		1.53	0.04	1.68	112.16	3.18	136.31	3.860	534	216	14,984	W Bank			
19	1951	34820/L	34820	10613	20	6	246/GB		1.24	0.04	1.36	110.63	3.13	134.12	3.798	386	156	14,768	W Bank			
20	1952	34900/R	34900	10638	80	24	245/GB		1.71	0.05	1.88	109.39	3.10	132.76	3.760	562	227	14,611	W Bank			
21	1953	37400/L	37400	11400	2500	762	246/GB		1.41	0.04	1.55	107.68	3.05	130.86	3.706	388	157	14,384	W Bank			
22	908	40181/L	40181	12247	2781	848	246/GB		2.16	0.06	2.38	106.27	3.01	128.79	3.647	472	191	14,227	W Bank			
23	910	41015/L	41015	12501	834	254	246/GB		1.72	0.05	1.89	104.11	2.95	125.85	3.564	432	175	14,036	W Bank			
24	911	42230/R	42230	12872	1215	370	248/GB		2.05	0.06	2.26	102.39	2.90	123.79	3.506	713	289	13,861	W Bank			
25	43906/L	43906	13383	1676	511		247/GB		1.19	0.03	1.31	100.34	2.84	121.29	3.435	385	156	13,573				
26	912	44696/R	44696	13623	790	241	248/GB		1.96	0.06	2.16	99.15	2.81	119.65	3.389	674	273	13,417	W Bank			
25	913	45114/L	45114	13751	418	127	247/GB		1.19	0.03	1.31	97.19	2.75	117.34	3.323	385	156	13,144	W Bank			
27	914	46432/L	46432	14152	1318	402	247/GB		1.47	0.04	1.62	96.00	2.72	115.95	3.284	442	179	12,988				
28	915	48723/R	48723	14851	2291	698	248/GB		1.62	0.05	1.78	94.53	2.68	114.08	3.231	568	230	12,809	W Bank			
29	916	48754/L	48754	14860	31	9	248/GB		1.36	0.04	1.50	92.91	2.63	111.86	3.168	320	130	12,580				
30	917	51000/R	51000	15545	2246	685	249/GB		1.64	0.05	1.80	91.55	2.59	110.36	3.125	525	212	12,450				
31	918	51034/L	51034	15555	34	10	247/GB		2.36	0.07	2.60	89.91	2.55	108.14	3.062	542	219	12,238				
32	919	51715/R	51715	15763	681	208	249/GB		1.81	0.05	1.99	87.55	2.48	105.53	2.989	604	244	12,018				
33	920	51734/R	51734	15769	19	6	249/GB		1.78	0.05	1.96	85.74	2.43	103.42	2.929	560	227	11,774				
34	921	54455/L	54455	16598	2721	829	250/GB		1.22	0.03	1.34	83.96	2.38	101.46	2.873	384	155	11,547				
35	922	56430/R	56430	17200	1975	602	251/GB		2.17	0.06	2.39	82.74	2.34	99.63	2.822	735	297	11,392	W Bank			
36	923	58783/R	58783	17917	2353	717	251/GB		1.08	0.03	1.19	80.57	2.28	96.89	2.744	351	142	11,095				
37	924	58972/L	58972	17975	189	58	250/GB		1.81	0.05	1.99	79.49	2.25	95.30	2.699	526	213	10,952				
38	925	63360/R	63360	19312	4388	1357	251/GB		1.26	0.04	1.39	77.68	2.20	93.27	2.641	429	174	10,740				
39	926	63380/L	63380	19318	20	6	250/GB		1.52	0.04	1.67	76.42	2.16	91.14	2.581	498	202	10,566				
40	927	64120/L	64120	19544	740	226	253/GB		1.49	0.04	1.64	74.90	2.12	89.47	2.534	521	211	10,364				
41	928	65724/R	65724	20033	1604	489	252/GB		1.87	0.05	2.06	73.41	2.08	87.70	2.484	641	259	10,154				
42	929	67450/L	67450	20359	1726	526	253/GB		1.01	0.03	1.11	71.54	2.03	85.38	2.418	330	134	9,894				
43	930	67987/R	67987	20722	537	164	252/GB		1.42	0.04	1.56	70.53	2.00	83.99	2.379	476	193	9,761				
44	931	69130/R	69130	21071	1143	348	252/GB		1.26	0.04	1.39	69.11	1.96	82.34	2.332	416	168	9,568				
45	71443/L	71443	21776	2313	705		253/GB		1.67	0.05	1.84	67.85	1.92	80.78	2.288	547	221	9,400				
46	932	73479/R	73479	22396	2036	621	255/GB		2.10	0.06	2.31	66.18	1.87	78.58	2.225	719	291	9,178				
47	933	74880/L	74880	22823	1401	427	254/GB		1.51	0.04	1.66	64.08	1.81	75.95	2.151	457	185	8,887				
48	934	76861/R	76861	23427	1981	604	255/GB		2.05	0.06	2.26	62.57	1.77	74.08	2.098	666	270	8,702				
49	935	77930/R	77930	23753	1069	326	255/GB		2.33	0.07	2.56	60.52	1.71	71.53	2.026	777	314	8,433	US Aid			
50	936	78126/L	78126	23813	196	60	258/GB		1.24	0.04	1.36	58.19	1.65	68.81	1.949	376	152	8,118				
51	937	78166/L	78166	23825	40	12	258/GB		1.59	0.05	1.75	56.95	1.61	67.42	1.909	511	207	7,966				
52	938	78961/R	78961	24067	795	242	256/GB		1.48	0.04	1.63	55.36	1.57	65.66	1.860	502	203	7,759	US Aid			
53	939	80237/R	80237	24456	1276	389	256/GB		2.17	0.06	2.39	53.88	1.53	63.92	1.810	745	302	7,556	US Aid			
54	940	81610/L	81610	24875	1373	418	258/GB		0.95	0.03	1.05	51.71	1.46	61.36	1.738	325	132	7,255	W Bank			
55	941	83832/L	83832	25552	2222	677	258/GB		0.95	0.03	1.05	50.76	1.44	60.13	1.703	335	136	7,123	W Bank			
		84970/R	84970	25594	138	42	256/GB		1.53	0.04	1.68	49.81	1.41	58.79	1.665	487	197	6,987				
56	943	84992/R	84992	25906	1022	312	256/GB		1.81	0.05	1.99	48.28	1.37	57.09	1.617	621	251	6,790				
57	944	85165/R	85165	25958	173	53	257/GB		2.18	0.06	2.40	46.47	1.32	54.97	1.557	767	310	6,539				
58	945	90176/R	90176	27486	5011	1527	257/GB		1.92	0.05	2.11	44.29	1.25	52.55	1.488	665	269	6,229				

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD (feet)	Section Distance (feet)	Village	Chak No.	Outlet Discharge		Section		Design		Outlet CCA (acre)	Section CCA (ha)	Project (Improvement)	Remarks
							Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (mbs)	Discharge (cusec)	Discharge (mbs)				
59	946	90342/L	90342	27536	166	51	0.85	0.02	0.94	42.37	1.20	49.82	1.411	113	5,959 W Bank	
60	947	94151/L	94151	28697	3809	1161	1.74	0.05	1.91	41.52	1.18	48.86	1.384	240	5,846 W Bank	
61	948	95407/R	95407	29080	1256	383	2.50	0.07	2.75	39.78	1.13	46.50	1.317	880	5,607	
62	949	95437/L	95437	29089	30	9	1.09	0.03	1.20	37.28	1.06	43.61	1.235	384	5,250 W Bank	
63	950	96301/L	96301	29353	864	263	1.43	0.04	1.57	36.19	1.02	42.40	1.201	501	203 5,095	
64	951	96737/R	96737	29485	436	133	1.39	0.04	1.53	34.76	0.98	40.74	1.154	490	198 4,892	
65	952	100785/R	100785	30719	4048	1234	1.22	0.03	1.34	33.37	0.95	39.16	1.109	430	174 4,694	
66	953	100814/R	100814	30728	29	9	1.97	0.06	2.17	32.15	0.91	37.40	1.059	692	280 4,520	
67	954	102190/R	102190	31148	1376	419	1.16	0.03	1.28	30.18	0.85	35.23	0.998	408	165 4,240	
68	955	103470/R	103470	31538	1280	390	0.66	0.02	0.73	29.02	0.82	33.82	0.958	233	94 4,075 US Aid	
69	956	104857/R	104857	31960	1387	423	0.94	0.03	1.03	28.36	0.80	32.97	0.934	352	134 3,981 US Aid	
70	957	108210/L	108210	32982	3353	1022	0.87	0.02	0.96	27.42	0.78	31.80	0.901	305	123 3,846	
71	958	108300/R	108300	33010	90	27	10.98	0.31	12.73	26.55	0.75	30.53	0.865	3,716	1,504 3,723	Mungl Minor(12.73)
72	959	108500/R	108500	33071	200	61	1.33	0.04	1.46	15.57	0.44	17.80	0.504	469	190 2,219	
73	960	112650/R	112650	34336	3680	1122	1.64	0.05	1.80	14.24	0.40	16.32	0.462	577	234 2,029	
74	961	114760/R	114760	34979	2110	643	1.20	0.03	1.32	12.60	0.36	14.49	0.410	421	170 1,796	
75	962	114778/L	114778	34984	18	5	1.21	0.03	1.33	11.40	0.32	12.95	0.367	425	172 1,625	
76	963	116557/L	116557	35527	1779	542	0.73	0.02	0.80	10.19	0.29	11.50	0.326	246	100 1,453	
77	964	117800/L	117800	35905	1243	379	1.25	0.04	1.38	9.46	0.27	10.69	0.303	439	178 1,354	
78	965	121278/L	121278	36966	3478	1060	1.56	0.04	1.72	8.21	0.23	9.23	0.261	560	227 1,176	
79	966	121278/R	121278	36966	0	0	1.60	0.05	1.76	6.65	0.19	7.46	0.211	566	229 949	
80	967	121278/TCL	121278	36966	0	0	1.09	0.03	1.20	5.05	0.14	5.56	0.157	383	156 720	
81	968	121278/TCR	121278	36966	0	0	1.91	0.05	2.10	3.96	0.11	4.36	0.123	673	272 565	
							2.05	0.06	2.26	2.03	0.06	2.26	0.064	722	292 292	
							142.99	4.05						47.347	19,161	
														19,160		
Mungl Minor (RD 108300/R, Mungl Distributory)																
1	973	5750/L	5750	1753	5750	1753	1.10	0.03	1.21	10.98	0.31	12.73	0.360	352	142 1,504	
2	974	9956/L	6150	1875	400	122	0.85	0.02	0.94	9.88	0.28	11.20	0.317	299	121 1,361	
4	976	10213/R	9956	3035	3806	1160	1.75	0.05	1.93	9.03	0.26	10.25	0.290	617	250 1,240	
5	977	10576/L	10213	3113	257	78	0.53	0.02	0.58	7.28	0.21	8.14	0.230	81	33 991	
6	978	11300/L	10576	3224	363	111	2.09	0.06	2.30	6.75	0.19	7.54	0.214	737	298 958	
7	979	12520/R	11300	3444	724	221	0.33	0.01	0.36	4.66	0.13	5.23	0.148	117	47 660 US Aid	
8	980	14160/R	12520	3816	1220	372	1.79	0.05	1.97	4.33	0.12	4.84	0.137	620	251 612	
10	982	14160/TF	14160	4316	1640	500	1.84	0.05	2.02	2.54	0.07	2.83	0.080	647	262 361	
							0.70	0.02	0.77	0.70	0.02	0.77	0.022	246	100 100	
							10.98	0.31						3,716	1,504	
														1,504		
Janiwala Distributory																
1	1898	200/R	200	6096	200	61	1.62	0.05	1.78	27.12	0.77	32.22	0.913	571	231 3,820	
2	1900	770/R	770	2347	570	174	1.43	0.04	1.57	25.50	0.72	30.42	0.862	504	204 3,589	
3	1899	1900/R	1900	579.1	1130	344	1.95	0.06	2.15	24.07	0.68	28.80	0.816	687	278 3,385	
4	1901	6473/R	6473	1973	4573	1394	1.20	0.05	1.32	22.12	0.63	26.55	0.752	391	158 3,107 W Bank	
5	1902	9873/R	9873	3009	3400	1036	1.48	0.04	1.63	20.92	0.59	24.85	0.704	513	208 2,948	
		11235/R	11235	3424	1362	415	15.10	0.43	17.90	19.44	0.55	22.95	0.650	5,319	2,153 2,741	Amur Wala Minor (17.9)
6	1903	11410/R	11410	3478	175	53	1.64	0.05	1.80	4.34	0.12	4.94	0.140	550	222 588 W Bank	

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No.	RD (feet)	Section (m)	Distance (feet)	Village	Chak No.	Outlet Discharge		Section		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (acre)	Section CCA (ha)	Project (Improvement)	Remarks	
								Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)						
7	1904	15561/R	15561	4743	4151	1265	194/CB	1.14	0.03	1.25	2.70	0.08	365	148	366		
8	1905	18989/R	18989	5788	3428	1045	154/CB	1.56	0.04	1.72	1.56	0.04	538	218	218	218 W Bank	
								27.12	0.77			9438					
								3.819									
<b>Hamza Distributary</b>																	
9	1906	23665/R	23665	7213	23665	7213	154/CB	1.60	0.05	1.76	19.24	0.54	497	201	2693	2693 W Bank	
10	1907	25567/L	25567	7793	1902	580	160/CB	1.20	0.03	1.32	17.64	0.50	422	171	2492	2492 W Bank	
11	1908	29049/L	29049	8854	3482	1061	160/CB	1.19	0.03	1.31	16.44	0.47	411	166	2321	2321 W Bank	
12	1909	31100/L	31100	9479	2051	625	160/CB	1.18	0.03	1.30	15.25	0.45	417	169	2155	2155 W Bank	
13	1910	32443/R	32443	9889	1343	409	159/CB	1.14	0.03	1.25	14.07	0.40	378	153	1986		
14	1911	32243/R	32243	9828	200	-61	159/CB	1.12	0.03	1.23	12.93	0.37	393	159	1833	1833 W Bank	
15	1912	34804/L	34804	10608	2561	781	162/CB	1.35	0.04	1.49	11.81	0.33	468	189	1674		
16	1913	36062/L	36062	10992	1258	383	162/CB	1.22	0.03	1.34	10.46	0.30	431	174	1485	1485 W Bank	
17	1914	36970/R	36970	11268	908	277	163/CB	0.70	0.02	0.77	9.24	0.26	247	100	1311	1311 W Bank	
18	1915	38266/R	38266	11663	1296	395	163/CB	1.04	0.03	1.14	8.54	0.24	366	148	1211	1211 W Bank	
19	1916	40643/TL	40643	12388	2377	725	162/CB	1.79	0.05	1.97	7.50	0.21	628	254	1062		
20	1917	40643/TR	40643	12388	0	0	162/CB	1.40	0.04	1.54	5.71	0.16	487	197	808		
21	1918	40643/TF	40643	12388	0	0	162/CB	4.31	0.12	4.74	4.31	0.12	1510	611	611		
								19.24	0.54			6.655	2.693				
								2.693									
<b>Amirwala Minor (RD 11235/R Janiwalwa Distributary)</b>																	
1	1919	5980/L	5980	1823	5980	1823	155/CB	1.41	0.04	1.55	15.10	0.43	495	200	2153	2153 W Bank	
2	1920	7270/L	7270	2216	1290	393	155/CB	1.30	0.04	1.43	13.69	0.39	457	185	1952	1952 W Bank	
3	1921	12960/R	12960	3950	5690	1734	157/CB	1.25	0.04	1.38	12.39	0.35	442	179	1767	1767 US Aid	
4	1922	13167/L	13167	4013	207	63	159/CB	1.50	0.04	1.65	11.14	0.32	527	213	1589		
5	1923	15466/R	15466	4714	2299	701	157/CB	1.02	0.03	1.12	9.64	0.27	360	146	1375	1375 US Aid+W Bank	
6	1924	15900/L	15900	4846	434	132	156/CB	1.60	0.05	1.76	8.62	0.24	562	227	1229		
7	1925	17604/R	17604	5366	1704	519	157/CB	1.75	0.05	1.93	7.02	0.20	616	249	1002	1002 US Aid+W Bank	
8	1926	20187/L	20187	6153	2583	787	156/CB	0.64	0.02	0.70	5.27	0.15	226	91	753	753 W Bank	
9	1927	25000/TL	25000	7620	4813	1467	158/CB	2.11	0.06	2.32	4.63	0.13	744	301	661	661 W Bank	
10	1928	25000/TF	25000	7620	0	0	158/CB	2.52	0.07	2.77	2.52	0.07	890	360	360		
								15.10	0.43			5.319	2.153				
								2.153									
<b>Pir Mahal Distributary</b>																	
1	1220	13850/L	13850	4221	13350	4069	360/CB	2.06	0.06	2.27	136.97	3.88	725	293	18242	18242	
3	18137/R	18137	5528	4287	1307			1.90	0.05	2.09	134.91	3.82	663	268	17948		
4	18164/R	18164	5536	27	8			3.00	0.08	3.30	133.01	3.77	250	101	17680		
5	18300/L	18300	5578	136	41			1.31	0.04	1.44	130.01	3.68	239	97	17579		
6	19000/R	19000	5791	700	213			2.40	0.07	2.64	128.70	3.64	200	81	17482		
7	19700/R	19700	6005	700	213			0.64	0.02	0.70	126.30	3.58	53	21	17401		
8	1221	28000/R	28000	8534	8300	2530		2.41	0.07	2.65	125.66	3.56	439	178	17380		
9	1222	31000/R	31000	9449	3000	914		0.60	0.02	0.66	123.25	3.49	211	85	17202		
10	36992/R	36992	11275	5992	1826			0.67	0.02	0.74	122.65	3.47	237	96	17116		
								1.11	0.03	1.22	121.98	3.45	161.02	148	17.021		

**Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area**

No.	No. (original)	Watercourse No.	RD		Section Distance (feet)	Village	Chak No.	Outlet Discharge		Section		Design		Outlet CCA (acre)	CCA (ha)	Project (Improvement)	Remarks	
			(feet)	(m)				Authorized (cusec)	Design (cusec)	Discharge (cusec)	Discharge (cusec)	Discharge (m <sup>3</sup> /s)	Discharge (m <sup>3</sup> /s)					
11	1224	42122/R	42122	12839	5130	1564	263/GB	0.94	0.03	1.03	120.87	3.42	158.41	4.486	297	120	16.872	
12	1226	45749/R	45749	13944	3627	1106	263/GB	1.43	0.04	1.57	119.93	3.40	156.21	4.424	355	144	16.752	
		45800/R	45800	13960	51	16	263/GB	1.52	0.04	1.67	118.50	3.36	153.81	4.356	528	214	16.609	
13	1229	49600/R	49600	15118	3800	1158	264/GB	3.26	0.09	3.59	116.98	3.31	152.13	4.308	1,147	464	16.395	
		49730/R	49730	15158	130	40	265/GB	2.73	0.08	3.00	113.72	3.22	147.69	4.183	962	389	15.931	
14	1230	63560/R	63560	19373	13830	4215	265/GB	1.25	0.04	1.38	110.99	3.14	144.66	4.097	410	166	15.542	W Bank
17	1231	65920/L	65920	20092	2360	719	660/GB	1.74	0.05	1.91	109.74	3.11	140.30	3.973	698	282	15.376	
		67080/R	67080	20446	1160	354		6.82	0.19	8.02	108.00	3.06	137.88	3.905	2,501	1,012	15.093	Thera Minor(8.02)
		68455/R	68455	20865	1375	419		12.98	0.37	15.80	101.18	2.87	129.61	3.671	4,491	1,818	14.081	Magnea Minor(15.8)
		68560/R	68560	20897	105	32		1.13	0.03	1.24	88.20	2.50	113.53	3.215	399	161	12.263	
18	1232	68958/R	68958	21018	398	121	664/GB	1.83	0.05	2.01	87.07	2.47	112.27	3.179	646	261	12.102	W Bank
19	1233	70076/R	70076	21359	1118	341	660/GB	1.31	0.04	1.44	85.24	2.41	110.18	3.120	463	187	11.841	
20	1234	72321/R	72321	22043	2245	684	660/GB	1.30	0.04	1.43	83.93	2.38	108.53	3.074	457	185	11.653	
21	1235	78584/L	78584	23952	6263	1909	771/GB	0.93	0.03	1.02	82.63	2.34	106.68	3.021	323	131	11.468	
24	1237	84716/R	84716	25821	6132	1869	661/GB	1.70	0.05	1.87	81.70	2.31	104.52	2.960	573	232	11.338	W Bank
25	1238	88990/R	88990	27094	4174	1272	661/GB	1.33	0.04	1.46	80.00	2.27	101.54	2.876	442	179	11.106	W Bank
26	1239	89250/L	89250	27203	360	110	678/GB	1.63	0.05	1.79	78.67	2.23	99.33	2.813	574	232	10.927	
		89320/R	89320	27225	70	21		33.44	0.95	41.74	77.04	2.18	97.47	2.760	11,620	4,703	10.695	Juregwala Minor(41.74)
27	1242	91240/R	91240	27810	1920	585	669/GB	1.49	0.04	1.64	43.60	1.23	55.72	1.578	524	212	5.992	
28	1240	93543/L	93543	28312	2303	702	678/GB	1.61	0.05	1.77	42.11	1.19	53.84	1.525	536	217	5.780	
29	1241	98080/L	98080	29895	4537	1383	678/GB	1.64	0.05	1.80	40.50	1.15	51.78	1.466	576	233	5.563	
30	1243	99192/R	99192	30234	1112	339	679/GB	1.72	0.05	1.89	38.86	1.10	49.42	1.400	594	240	5.330	W Bank
31	1244	102584/R	102584	31268	3392	1034	679/GB	1.77	0.05	1.95	37.14	1.05	47.40	1.342	623	252	5.090	
32	1245	107058/R	107058	32631	4474	1364	680/GB	1.41	0.04	1.55	35.37	1.00	45.06	1.276	494	200	4.837	
33	1246	111631/R	111631	34025	4573	1394	680/GB	1.45	0.04	1.60	33.96	0.96	43.00	1.218	510	206	4.637	W Bank
		112614/R	112614	34325	983	300		5.47	0.15	6.36	32.51	0.92	40.91	1.159	1,994	807	4.431	
34	1247	113917/R	113917	34722	1303	397	681/GB	1.69	0.05	1.86	27.04	0.77	34.44	0.975	594	240	3.624	
35	1248	115000/L	115000	35052	1083	330	719/GB	0.86	0.02	0.95	25.35	0.72	32.46	0.919	302	122	3.384	
36	1249	119000/L	119000	36271	4000	1219	719/GB	0.72	0.02	0.79	24.49	0.69	31.41	0.889	252	102	3.261	W Bank
37	1251	121930/L	121930	37164	2930	893	720/GB	1.54	0.04	1.69	23.77	0.67	30.25	0.857	542	219	3.159	
38	1250	121985/R	121985	37181	55	17	681/GB	1.85	0.05	2.04	22.23	0.63	28.29	0.801	617	250	2.940	
		125410/L	125410	38225	3425	1044	720/GB	1.65		1.82			26.25	0.743	571			
39	1252	127346/R	127346	38815	1936	590	682/GB	1.42	0.04	1.56	20.38	0.58	24.15	0.684	499	202	2.690	
40	1253	128230/R	128230	39085	884	269	683/GB	1.68	0.05	1.85	18.96	0.54	22.44	0.635	592	240	2.489	
41	1254	133970/L	133970	40834	5740	1750	687/GB	1.56	0.04	1.72	17.28	0.49	20.52	0.581	551	223	2.249	
42	1255	133972/R	133972	40835	2	1	688/GB	2.16	0.06	2.38	15.72	0.45	18.39	0.521	758	307	2.026	
43	1256	143147/R	143147	43631	9175	2797	684/GB	1.48	0.04	1.63	13.56	0.38	16.02	0.454	520	210	1.719	
44	1258	144854/L	144854	44151	1635	498	684/GB	1.56	0.04	1.72	12.08	0.34	13.82	0.391	551			
46	1260	149942/R	149942	45702	5088	1551	689/GB	1.62	0.05	1.78	10.52	0.30	12.01	0.340	572	231	1.509	
47	1259	149963/R	149963	45709	21	6	685/GB	1.54	0.04	1.69	8.90	0.25	10.22	0.289	564	228	1.277	W Bank
48	1261	151195/R	151195	46084	1232	376	685/GB	1.18	0.03	1.23	7.36	0.21	8.28	0.235	396	160	1.049	
49	1262	151200/L	151200	46086	5	2	685/GB	1.18	0.03	1.30	6.24	0.18	7.05	0.200	414	168	889	W Bank
50	1263	156082/R	156082	47574	4882	1488	688/GB	1.72	0.05	1.89	5.06	0.14	5.70	0.161	606	245	721	
51	1264	156082/TL	156082	47574	0	0	688/GB	1.27	0.04	1.40	3.34	0.09	3.81	0.108	446	180	476	
								2.07	0.06	2.28	2.07	0.06	2.28	0.064	730	295	295	
								138.62	3.88						46,196	18,242		
															18,695			

Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area

No.	No. (original)	Watercourse No. (feet)	RD (m)	Section Distance (feet)	Village	Chak No.	Outlet Discharge		Section		Design		Project (Improvement)	Remarks
							Authorized (cusec) (m <sup>3</sup> /s)	Design (cusec) (m <sup>3</sup> /s)	Discharge (cusec) (m <sup>3</sup> /s)	Discharge (cusec) (m <sup>3</sup> /s)	Discharge (cusec) (m <sup>3</sup> /s)	Discharge (cusec) (m <sup>3</sup> /s)		
<b>Thera Minor (RD 67080/R, Pir Mahal Distributary)</b>														
1	1265	593/L	180.7	593	181	662/GB	1.31	0.04	1.44	6.82	0.19	8.02	0.227	1.012
2	1266	5018/L	5018	1529	4425	662/GB	1.08	0.03	1.19	5.51	0.16	6.55	0.185	1.012
3	1267	9275/L	9275	2827	1298	662/GB	1.19	0.03	1.31	4.43	0.13	5.19	0.147	1.012
4	1268	15915/TR	15915	4851	6640	663/GB	1.67	0.05	1.84	3.24	0.09	3.74	0.106	670
5	1269	15915/TL	15915	4851	0	663/GB	1.57	0.04	1.73	1.57	0.04	1.73	0.049	501
							6.82	0.19					2.501	1.012
							6.82	0.19					1.012	1.012
<b>Magneja Minor (RD 68455/R, Pir Mahal Distributary)</b>														
1	1270	7494/L	7494	2284	7494	664/GB	0.85	0.02	0.94	12.98	0.37	15.80	0.447	1.818
2	1271	12275/L	12275	3741	4781	662/GB	0.80	0.02	0.88	12.13	0.34	14.40	0.408	1.818 W Bank
3	1272	13375/L	13375	4077	1100	664/GB	0.68	0.02	0.75	11.33	0.32	13.24	0.375	1.818
4	15900/L	15900	4846	2525	770	664/GB	1.20	0.03	1.32	10.65	0.30	12.43	0.352	1.563
5	1274	15970/L	15970	4868	70	666/GB	0.85	0.02	0.94	9.45	0.27	10.97	0.311	1.511
6	1275	17490/L	17490	5331	1520	665/GB	1.68	0.05	1.85	8.60	0.24	10.03	0.284	1.365
7	1276	18900/R	18900	5761	1410	666/GB	1.40	0.04	1.54	6.92	0.20	8.11	0.230	1.221
8	1277	25766/L	25766	7853	6866	668/GB	0.89	0.03	0.98	5.52	0.16	6.51	0.184	1.99
9	1278	25771/R	25771	7855	5	668/GB	1.39	0.04	1.53	4.63	0.13	5.27	0.149	985
10	1279	32430/TR	32430	9885	6659	668/GB	1.41	0.04	1.55	3.24	0.09	3.75	0.106	786
11	1280	32430/TF	32430	9885	0	668/GB	1.32	0.04	1.45	1.83	0.05	2.01	0.057	198
12	32430/TF	32430	9885	0	0	667/GB	0.51	0.01	0.56	0.51	0.01	0.56	0.016	200
							12.98	0.37					4.491	1.818
							12.98	0.37					1.817	1.818
<b>Juncjwala Minor (RD 89320/R, Pir Mahal Distributary)</b>														
2	1281	2500/L	2500	762	2500	669/GB	1.57	0.04	1.73	34.44	0.98	41.75	1.182	4.703
3	1283	6619/R	6619	2017	4119	665/GB	1.10	0.03	1.21	32.87	0.93	39.76	1.126	4.703
4	1284	8164/L	8164	2488	1345	669/GB	1.86	0.05	2.05	31.77	0.90	38.11	1.079	4.479
5	1285	9770/R	9770	2978	1606	667/GB	1.68	0.05	1.85	29.91	0.85	35.91	1.017	4.322
6	1286	17560/L	17560	5352	7790	670/GB	2.18	0.06	2.40	28.23	0.80	33.90	0.960	4.057
7	17905/L	17905	5457	345	105	670/GB	1.98	0.06	2.18	26.05	0.74	30.76	0.871	3.818
8	1287	19122/R	19122	5828	1217	671/GB	0.60	0.02	0.66	24.07	0.68	28.55	0.809	3.532
9	1288	22620/R	22620	6895	3498	671/GB	2.11	0.06	2.32	22.84	0.65	26.79	0.759	3.249
10	1289	23720/L	23720	7230	1100	670/GB	1.10	0.03	1.21	20.73	0.59	24.38	0.690	3.075
11	1290	27210/R	27210	8294	3490	671/GB	1.40	0.03	1.40	19.63	0.56	22.89	0.648	2.817
12	1291	27290/R	27290	8318	80	671/GB	1.33	0.04	1.46	18.36	0.52	21.49	0.609	2.702
13	1292	28436/L	28436	8667	1146	672/GB	0.96	0.03	1.06	17.03	0.48	19.94	0.565	2.582
14	1293	29650/R	29650	9037	1214	673/GB	1.02	0.03	1.12	16.07	0.46	18.80	0.532	2.397
15	1295	31950/R	31950	9738	2300	672/GB	0.76	0.02	0.84	15.05	0.43	17.51	0.496	2.268
16	1296	34290/R	34290	10452	2340	673/GB	1.71	0.05	1.88	14.29	0.40	16.52	0.468	2.130
17	1298	35420/L	35420	10796	1130	672/GB	1.02	0.03	1.12	12.58	0.36	14.57	0.413	2.022
18	1300	37790/R	37790	11518	2370	673/GB	1.13	0.03	1.24	11.56	0.33	13.31	0.377	1.779
19	1301	40548/L	40548	12359	2758	674/GB	1.12	0.03	1.23	10.43	0.30	11.91	0.337	1.633
20	1302	41234/L	41234	12568	686	674/GB	1.55	0.04	1.71	9.31	0.26	10.64	0.301	1.473
21	1301	41918/L	41918	12777	684	674/GB	1.63	0.05	1.79	7.76	0.22	8.90	0.252	1.313
22	1302	44541/L	44541	13576	2623	675/GB	1.63	0.05	1.79	7.76	0.22	8.90	0.252	1.092

**Table B - 1 (2/3) Breakdown of Authorized and Design Discharge Calculation for LCC Area**

No. (original)	Watercourse No.	RD		Section Distance (feet)	Section Distance (m)	Village	Chak No.	Outlet Discharge		Section Discharge		Design Discharge		Outlet CCA (ha)	Section CCA (ha)	Project (Improvement)	Remarks		
		(feet)	(m)					Authorized (cusec)	(m <sup>3</sup> s)	Design (cusec)	(m <sup>3</sup> s)	Design (cusec)	(m <sup>3</sup> s)						
21	1303 46935/L	46935	14306	2394	730		675/GB	1.61	0.05	1.77	0.13	0.17	6.99	0.198	553	224	868		
22	1304 49730/R	49730	15158	2795	852		265/GB	2.73	0.08	3.00	4.52	0.13	5.12	0.145	962	389	645	-	
23	1306 52740/TL	52740	16075	3010	917		275/GB	1.79	0.05	1.97	1.79	0.05	2.03	0.057	631	255	255		
								34.44	0.98					11,620	4,703				
																4,702			
<b>Jandwala Minor (RD Pir Mahal Distributary)</b>																			
1	2975/R	2975	906.8	2975	907		680/GB	1.80	0.05	1.98	5.47	0.15	6.36	0.180	632	256	807		
2	1308 6675/L	6675	2035	3700	1128		681/GB	1.30	0.04	1.43	3.67	0.10	4.26	0.121	459	186	551		
3	1309 6785/L	6785	2068	110	34		681/GB	0.32	0.01	0.35	2.37	0.07	2.72	0.077	181	73	365		
4	1310 12276/T	12276	3742	5491	1674		682/GB	2.05	0.06	2.26	2.05	0.06	2.37	0.067	722	292	292		
								5.47	0.15							1,994	807		
																		807	



Table B - 1 (3/3) Breakdown of Authorized and Design Discharge Calculation for CBDC Area

No.	No. (original)	Water Course	RD (feet)	RD (m)	Section Distance (feet)	Section Distance (m)	Village	Chak No.	Outlet Discharge		Section Discharge		Design Discharge		Outlet CCA (acre)	Section CCA (ha)	Improved	Remarks		
									Authorized (cusec)	Design (cusec)	Authorized (cusec)	Design (cusec)	Authorized (cusec)	Design (cusec)						
1	1351	657/L	657	200	657	200	Raja Jhang		0.45	0.01	127.28	3.60	152.80	4.327	115	47	16,390	Un Improved		
2	1352	5164/L	5164	1573	4507	1373	Raja Jhang		0.75	0.02	0.83	26.83	3.59	152.15	4.309	252	102	16,343	Improved OFWM Phase-II	
3	1353	5990/R	5990	1825	826	252	Raja Jhang		3.76	0.11	4.14	126.08	3.57	150.32	4.257	1,139	461	16,241	Un Improved	
4	1354	6000/L	6000	1828	10	3	Raja Jhang		2.99	0.08	3.29	122.32	3.46	146.00	4.135	977	395	15,780	Un Improved	
5	1355	6800/L	6800	2072	800	244	Raja Jhang		3.60	0.10	3.96	119.33	3.38	142.71	4.041	1,222	495	15,383	Improved OFWM Phase-II	
6	471	8500/R	8500	2590	1700	518	Aulakh Aurtar		0.61	0.02	0.67	115.73	3.28	138.57	3.924	203	82	14,896	Improved OFWM Phase-II	
7	1356	9385/L	9385	2860	885	270	Raja Jhang		1.09	0.03	1.20	115.12	3.26	137.54	3.895	341	138	14,808	Un Improved	
8	1357	11283/R	11283	3439	1900	579	Raja Jhang		0.48	0.01	0.53	114.03	3.23	136.16	3.856	147	59	14,670	Un Improved	
9	1358	13430/L	13430	4092	2145	654	Matta		2.69	0.08	2.96	113.55	3.22	135.23	3.830	578	234	14,610	Un Improved	
10	1359	13469/R	13469	4104	39	12	Bhamba Kalan		2.40	0.07	2.64	110.86	3.14	131.82	3.733	805	326	14,377	Un Improved	
11	1360	14226/L	14226	4335	757	231	Matta		1.16	0.03	1.28	108.46	3.07	129.17	3.658	390	158	14,051	Improved OFWM Phase-I	
12	1361	14900/R	14900	4540	674	205	Matta		0.31	0.01	0.34	107.30	3.04	127.74	3.618	105	42	13,893	Improved 4th drainage	
13	1362	19869/R	19869	6054	4969	1514	Matta		0.69	0.02	0.76	106.99	3.03	127.26	3.604	197	80	13,850	Un Improved	
14	20817/R		20817	6543	948	289			3.18	0.09	3.50	106.30	3.01	125.50	3.554	428	13,771	Un Improved		
15	1364	22307/R	22307	6797	1490	454	Kot Mehtab Khan		3.62	0.10	3.98	103.12	2.92	121.81	3.450	1,213	491	13,343	Un Improved	
16	1365	23400/L	23400	7130	1093	333	Matta		1.97	0.06	2.17	99.50	2.82	117.53	3.328	646	261	12,852	Improved 4th drainage	
17	24848/L		24848	7571	1448	441			1.14	0.03	1.25	97.53	2.76	115.15	3.261	337	136	12,591	Un Improved	
18	1367	25140/R	25140	7660	292	89	Kot Mehtab Khan		1.41	0.04	1.55	96.39	2.73	113.62	3.218	390	158	12,454	Un Improved	
19	459	25333/L	25333	7719	193	59			29.16	0.83	33.95	94.98	2.69	112.01	3.172	9,207	3,726	12,296		Kala Minor(33.95)
20	452	25632/L	25632	7810	299	91	Jaja		0.86	0.02	0.95	63.82	1.86	78.03	2.210	295	119	8,570	Un Improved	
21	452	29350/R	29350	8943	3718	1133	Kot Mehtab Khan		1.02	0.03	1.12	64.96	1.84	77.04	2.182	350	142	8,451	Improved OFWM Phase-I	
22	1368	31020/R	31020	9452	1670	509	Abdul Atta		0.84	0.02	0.92	63.94	1.81	75.35	2.134	283	115	8,309	Un Improved	
23	1370	31520/L	31520	9604	500	152	Rakh Khadian		2.73	0.02	0.80	63.10	1.79	74.17	2.101	62	8,195	Un Improved		
24	453	34141/R	34141	10403	961	293	Murcilian		1.38	0.04	1.52	60.30	1.71	70.77	2.004	462	187	7,852	Un Improved	
25	1372	35187/L	35187	10721	1046	319	Gner Wala		0.72	0.02	0.81	58.92	1.67	69.11	1.957	342	138	7,665	Un Improved	
26	1373	35700/R	35700	10878	513	156	Gner Wala		1.08	0.02	1.16	57.90	1.64	67.84	1.921	229	93	7,527	Un Improved	
27	1374	39650/L	39650	12081	3950	1204	Auhkaba		1.35	0.04	1.49	57.12	1.62	66.91	1.895	357	144	7,434	Improved OFWM Phase-II	
28	1375	39907/R	39907	12160	257	78	Rawd Jhagin		3.75	0.11	4.13	55.77	1.58	64.87	1.837	1,259	510	7,290	Un Improved	
29	1376	42682/L	42682	13005	2775	846	Rakh Teui		1.35	0.04	1.49	52.02	1.47	60.71	1.719	454	184	6,597	Un Improved	
30	1377	42690/R	42690	13008	8	2	Cheena Utra		0.92	0.03	1.01	50.67	1.43	58.85	1.667	307	124	6,597	Un Improved	
31	475	42718/L	42718	13016	28	9	China Utor		1.82	0.05	2.00	49.75	1.41	57.84	1.638	612	248	6,472	Improved OFWM Phase-II	
32	43110/L		43110	13136	392	119			0.99	0.03	1.09	47.93	1.36	55.83	1.581	331	134	6,235	Improved OFWM Phase-I	
33	1379	45507/R	45507	13866	2397	730	Rakh Umer Utra		1.22	0.03	1.34	46.94	1.33	54.69	1.549	409	166	6,091	Un Improved	
34	1380	45646/L	45646	13908	139	42	Rakh Dhal		1.41	0.04	1.55	45.72	1.29	53.05	1.502	475	192	5,925	Improved OFWM Phase-II	
35	1381	45806/R	45806	13957	160	49	Rakh China		0.50	0.01	0.55	44.31	1.25	51.48	1.458	152	62	5,733	Un Improved	
36	473	46797/R	46797	14259	991	302	Rakh China		1.20	0.03	1.32	43.81	1.24	50.91	1.442	396	160	5,671	Improved 4th drainage	
37	1383	47018/R	47018	14326	221	100	Rakh China		1.00	0.03	1.10	42.61	1.21	49.47	1.401	303	123	5,511	Un Improved	
38	1384	47717/R	47717	14539	699	213	Rakh China		0.25	0.01	0.28	41.61	1.18	48.34	1.369	55	22	5,389	Un Improved	
39	49826/L		49826	15182	2109	643			2.37	0.07	2.61	41.36	1.17	47.99	1.359	794	321	5,366	Un Improved	
40	1386	50853/L	50853	15495	1027	313	Rakh Dhal		5.88	0.17	6.47	38.99	1.10	45.13	1.278	1,970	797	5,045	Un Improved	
41	1387	51153/L	51153	15586	300	91	Rakh Dhal		1.56	0.04	1.72	33.11	0.94	38.55	1.092	522	211	4,248	Un Improved	
42	1388	51860/R	51860	15802	707	215	Rakh Dhal		1.58	0.04	1.74	31.55	0.89	36.80	1.042	323	131	4,036	Improved OFWM Phase-II	
43	1389	53870/L	53870	16414	2010	612	Rakh Dhal		0.40	0.01	0.44	29.97	0.85	34.99	0.991	85	34	3,906	Un Improved	
44	1390	53993/R	53993	16452	123	37	Har Rehman		1.28	0.04	1.41	29.57	0.84	34.36	0.973	430	174	3,871	Improved OFWM Phase-II	
45	1391	56395/L	56395	17184	2402	732	Rakh Dhal		1.72	0.05	1.89	28.29	0.80	32.94	0.933	575	233	3,697	Un Improved	
46	56499/L		56499	17215	104	32			1.72	0.05	1.89	26.57	0.75	30.82	0.873	515	208	3,465		
47	1392	57098/L	57098	17398	599	183	Rakh Dhal		2.00	0.06	2.20	24.85	0.70	28.91	0.819	670	271	3,256	Un Improved	
48	1393	58365/L	58365	17784	1267	386	Rakh Dhal		1.06	0.03	1.17	22.85	0.65	26.66	0.755	375	152	2,985	Un Improved	

Table B - 1 (3/3) Breakdown of Authorized and Design Discharge Calculation for CBDC Area

No.	No. (original)	Water Course	RD (feet)	Section Distance (m)	Village	Chak No.	Outlet Discharge		Section Discharge		Design Discharge		Outlet CCA (acre)	Section CCA (ha)	Improved	Remarks		
							Authorized (cusec)	Design (cusec)	Authorized (m <sup>3</sup> /s)	Design (cusec)	Authorized (m <sup>3</sup> /s)	Design (cusec)						
49	1394	58375	17787	10	3 Raksh Shah Annayet		2.01	0.06	2.21	21.79	0.62	25.39	0.719	190	2,833	Un Improved		
50	1395	59077	18001	702	214 Raksh Shah Annayet		2.38	0.07	2.62	19.78	0.56	23.18	0.656	787	318	2,643	Un Improved	
51	1396	63293/L	19285	4216	1285 Raksh Shah Annayet		1.20	0.03	1.32	17.40	0.49	20.50	0.581	416	168	2,525	Improved OFWM Phase-III	
52	1397	66732/R	20333	3439	1048 Raksh Shah Annayet		1.28	0.04	1.41	16.20	0.46	18.88	0.535	429	174	2,156	Un Improved	
53	1398	69052/L	21040	2320	707 Hailoke		0.98	0.03	1.08	14.92	0.42	17.24	0.488	330	134	1,983	Un Improved	
54	1399	69052/R	21040	0	0 Hailoke		1.76	0.05	1.94	13.94	0.39	16.01	0.453	591	239	1,849	Un Improved	
55		72280/L	22024	3228	984		0.67	0.02	0.74	12.18	0.34	14.07	0.398	208	84	1,610	Un Improved	
56	1400	73065/R	22263	785	239 Hailoke		1.52	0.04	1.67	11.51	0.33	13.14	0.372	508	206	1,526	Un Improved	
57	1401	76352/L	23264	3287	1002 Pamir Hitar		1.26	0.04	1.39	9.99	0.28	11.43	0.324	403	163	1,320	Improved OFWM Phase-II	
58	1402	76552/L	23325	200	61 Pamir Hitar		1.90	0.05	2.09	8.73	0.25	9.87	0.280	569	230	1,157	Improved OFWM Phase-I	
59	1403	78232/R	23837	1680	512 Pamir Hitar		1.11	0.03	1.22	6.83	0.19	7.77	0.220	372	151	927	Un Improved	
60	1404	80678/R	24583	2446	745 Pamir Hitar		1.11	0.03	1.22	5.72	0.16	6.48	0.184	372	151	776	Improved OFWM Phase-II	
61	1405	83556/TR	25460	2878	877	Chak 16	1.26	0.04	1.39	4.61	0.13	5.17	0.146	421	170	626	Un Improved	
62	1406	83556/L	25460	0	0	Chak 16	1.65	0.05	1.82	3.35	0.09	3.69	0.104	554	224	453	Un Improved	
63	1407	83556/L	25460	0	0	Chak 16	1.70	0.05	1.87	1.70	0.05	1.87	0.053	571	231	231	Improved OFWM Phase-II	
							127.28	3.60					40.498	16.390				

Kala Minor (RD 25333/L, Chinna Distributary)

No.	Water Course	RD (feet)	Section Distance (m)	Village	Chak No.	Outlet Discharge		Section Discharge		Design Discharge		Outlet CCA (acre)	Section CCA (ha)	Improved	Remarks			
						Authorized (cusec)	Design (cusec)	Authorized (m <sup>3</sup> /s)	Design (cusec)	Authorized (m <sup>3</sup> /s)	Design (cusec)							
1	1409	1435/L	437	1435	437 Raksh Aulike		0.36	0.01	0.40	29.16	0.83	33.95	0.961	121	49	3,726	Un Improved	
2		4140/L	1261	2705	824		3.31	0.09	3.64	28.80	0.82	33.41	0.946	1,100	445	3,677		
3	1410	6000/L	1828	1860	567 Raksh Aulike		1.73	0.05	1.90	25.49	0.72	29.51	0.836	554	224	3,232	Improved OFWM Phase-I	
4		6029/R	1837	29	9		1.92	0.05	2.11	23.76	0.67	27.45	0.777	203	82	3,008		
5	1412	9300/R	2834	3271	997 Raksh Aulike		0.61	0.02	0.67	21.84	0.62	25.33	0.717	203	82	2,926	Improved OFWM Phase-II	
6	1413	11043/R	3365	1743	531 Raksh Aulike		0.47	0.01	0.52	21.23	0.60	24.39	0.691	112	45	2,843	Un Improved	
7		11245/L	3426	202	62		0.66	0.02	0.73	20.76	0.59	23.74	0.672	220	89	2,798		
8	1414	1275/L	3435	30	9 Raksh Aulike		0.65	0.02	0.72	20.10	0.57	23.00	0.651	211	85	2,709	Improved OFWM Phase-III	
9	1415	14590/L	4446	3315	1010 Auloke Uttar		0.72	0.02	0.79	19.45	0.55	22.28	0.631	241	98	2,624	Improved OFWM Phase-II	
10	1416	14770/R	4500	180	55 Auloke Uttar		0.72	0.02	0.79	18.73	0.53	21.24	0.601	244	99	2,526	Improved OFWM Phase-I	
11	1408	16001/R	4876	1231	375 Raksh Aulike		0.62	0.02	0.68	18.01	0.51	20.43	0.579	197	80	2,427	Un Improved	
12	1417	16976/R	5173	975	297 Auloke Uttar		0.54	0.02	0.59	17.39	0.49	19.66	0.557	182	74	2,348	Un Improved	
13	1418	17078/R	5204	102	31 Raksh Naut		0.72	0.02	0.79	16.85	0.48	19.00	0.538	242	98	2,274	Improved OFWM Phase-II	
14	1419	18057/R	5502	979	298 Raksh Uttar		0.30	0.01	0.33	16.13	0.46	18.20	0.515	69	28	2,176	Improved OFWM Phase-II	
15		19119/R	5826	1062	324		1.92	0.05	2.11	15.83	0.45	17.80	0.504	643	260	2,148		
16	1420	19150/R	5835	31	9 Naut Uttar		1.22	0.03	1.34	13.91	0.39	15.62	0.442	406	164	1,888	Un Improved	
17	1421	19575/L	5965	425	129 Kali		0.69	0.02	0.76	12.69	0.36	14.27	0.404	219	89	1,724	Un Improved	
18	1422	20050/R	6109	475	145 Kali		0.81	0.02	0.89	12.00	0.34	13.49	0.382	604	244	1,635	Improved OFWM Phase-III	
19		21961/L	6692	1911	582		1.89	0.05	2.08	11.19	0.32	12.57	0.356	606	245	1,391		
20	1423	22967/L	6998	1006	307 Kali		1.76	0.05	1.94	9.30	0.26	10.39	0.294	589	238	1,145	Un Improved	
21		24637/L	7507	1670	509		2.61	0.07	2.87	7.54	0.21	8.40	0.238	629	255	907		
22	1424	25390/L	7736	753	229 Kali		0.60	0.02	0.66	4.93	0.14	5.46	0.155	126	51	652	Un Improved	
23	1425	25632/L	7810	242	74 Frye		1.63	0.05	1.79	4.33	0.12	4.77	0.135	549	222	601	Un Improved	
24	1426	25632/TF	7810	0	0 Aulike		1.07	0.03	1.18	2.70	0.08	2.97	0.084	360	146	379	Un Improved	
25	1427	25632/TR	7810	0	0 Jhingur		1.63	0.05	1.79	1.63	0.05	1.79	0.051	577	234	234	Improved OFWM Phase-III	
							29.16	0.83					9.207	3.726				

Theman Distributary

1	650/L	650	198	650	198	R.H.	0.50	0.01	0.55	256.68	7.27	292.75	8.291	RH	424	172	9,816	Improved OFWM Phase-III	REST HOUSE
2	5022/L	5022	1530	4372	1332		1.78	0.05	1.96	256.18	7.26	291.99	8.269				9,816		

Table B - 1 (3/3) Breakdown of Authorized and Design Discharge Calculation for CBDC Area

No.	No. (original)	Water Course	RD (feet)	Section Distance (m)	Section Distance (feet)	Village	Chak No.	Outlet Discharge		Section		Design Discharge (m <sup>3</sup> /s)	Outlet CCA (ha)	Section CCA (ha)	Improved	Remarks		
								Authorized (cusec)	Design (cusec)	Authorized (cusec)	Design (cusec)							
3	4	5390/R	1642	368	112	Chahin Wala	0.71	0.02	0.78	254.40	7.20	288.62	8.174	247	100	288.62	Un Improved	
4	3	9340/L	2846	3950	1204	Chahin Wala	1.11	0.03	1.22	253.69	7.18	287.72	8.148	389	157	9.544	Un Improved	
5	5	11185/R	3408	1845	562	Lil	0.79	0.02	0.87	252.58	7.15	285.24	8.078	277	112	9.387	Un Improved	
6	6	13835/L	4216	2650	807	Vegal	1.49	0.04	1.64	251.79	7.13	283.78	8.037	520	210	9.275	Un Improved	
7	7	14260/L	4345	425	129	Vegal	0.43	0.01	0.47	250.30	7.09	281.30	7.966	149	60	9.064	Improved OFWM Phase-II	
8	8	17300/R	5271	3040	926	Ibrehambol	1.30	0.04	1.43	249.87	7.08	280.69	7.949	447	181	9.004	Un Improved	
9	9	25309/L	7712	8009	2440	Green Kor	85.00	2.41	90.10	248.57	7.04	278.30	7.881	456	185	8.823	Un Improved	Kaur Minor
10	10	32407/L	7850	455	139		98.00	2.78	103.88	182.27	4.60	184.75	5.232	216	87	8.638	Un Improved	Ahpuir Minor
11	11	34633/L	9874	6643	2024	Sirhin Khurd	0.63	0.02	0.69	64.27	1.82	80.76	2.287	81	33	8.551	Un Improved	
12	12	34675/R	10553	2226	678	Sirhin Khurd	0.23	0.01	0.25	63.64	1.80	79.03	2.238	345	140	8.518	Un Improved	
13	13	36395/L	10565	42	13	Luliane	1.10	0.03	1.21	63.41	1.80	78.43	2.221	410	166	8.379	Improved OFWM Phase-III	
14	14	39392/L	11090	1720	524	Luliane	1.17	0.03	1.29	62.31	1.76	77.21	2.187	316	128	8.213	Un Improved	
15	15	41017/R	12498	4622	1408	PED Lillane	0.90	0.03	0.99	61.14	1.73	75.66	2.143	59	24	8.085	Un Improved	
16	16	41140/L	12535	123	37	Mustafabad	1.23	0.03	1.35	60.04	1.70	73.76	2.089	429	174	8.061	Un Improved	
17	17	43477/L	13247	2337	712	Luliane	1.36	0.04	1.50	58.81	1.67	72.39	2.050	476	193	7.887	Un Improved	
18	18	49245/L	15005	5768	1758		1.20	0.03	1.32	57.45	1.63	70.55	1.998	419	170	7.695	Un Improved	
19	19	54147/L	16499	4902	1494	Dafni	1.00	0.03	1.10	56.25	1.59	68.39	1.937	349	141	7.525	Un Improved	
20	20	56435/L	17196	2288	697	Dafni	1.70	0.05	1.87	55.25	1.56	66.59	1.886	591	239	7.384	Improved 4th drainage	
21	21	61794/L	18829	5359	1633	Dafni	1.14	0.03	1.25	53.55	1.52	64.40	1.824	401	162	7.145	Un Improved	
22	22	62750/R	19120	956	291	Dafni	0.59	0.02	0.65	52.41	1.48	62.41	1.767	207	84	6.982	Un Improved	
23	23	66080/L	20135	3330	1015		1.75	0.05	1.93	51.82	1.47	61.63	1.745	615	249	6.899	Un Improved	
24	24	68026/R	20728	1946	593	Sathoke	0.43	0.01	0.47	50.07	1.42	59.26	1.678	152	62	6.650	Un Improved	
25	25	68045/L	20733	19	6	Arora Sathoke	2.46	0.07	2.71	49.64	1.41	58.53	1.658	862	349	6.588	Un Improved	
26	26	70000/R	21329	1955	596	Sathoke	0.63	0.02	0.69	47.18	1.34	55.82	1.581	220	89	6.239	Un Improved	
27	27	70250/L	21405	250	76	Arora Sathoke	0.35	0.01	0.39	46.55	1.32	54.88	1.554	125	51	6.150	Improved OFWM Phase-III	
28	28	72000/L	21938	1750	533	Rukha Wala	0.19	0.01	0.21	46.20	1.31	54.46	1.542	68	28	6.100	Un Improved	
29	29	72096/R	21968	96	29	Rukhan Wala	0.26	0.01	0.29	46.01	1.30	54.03	1.530	92	37	6.072	Un Improved	
30	28	73613/L	22430	1517	462	Rukhan Wala	1.08	0.03	1.19	45.75	1.29	53.74	1.522	68	28	6.035	Un Improved	
31	29	73615/R	22430	2	1	Mir Muhammad	1.63	0.05	1.79	45.56	1.29	53.34	1.511	571	231	6.007	Un Improved	
32	30	74950/L	22837	1335	407	Rukhan Wala	0.77	0.02	0.85	43.93	1.24	51.54	1.460	197	80	5.776	Un Improved	
33	36	75968/R	23147	1018	310	Rukhan Wala	1.08	0.03	1.19	43.16	1.22	50.53	1.431	253	102	5.697	Un Improved	
34	34	77950/R	23751	1982	604		0.43	0.01	0.47	42.08	1.19	49.22	1.394	100	40	5.594	Un Improved	
35	37	78200/R	23828	250	76	Rukhan Wala	0.75	0.02	0.83	41.65	1.18	48.52	1.374	262	106	5.554	Un Improved	
36	40	78750/L	23995	550	168	Rukhan Wala	1.36	0.04	1.50	40.90	1.16	47.66	1.350	475	192	5.448	Un Improved	
37	42	79500/R	24224	750	229	Mir Muhammad	0.80	0.02	0.88	39.54	1.12	46.10	1.306	280	113	5.255	Un Improved	
38	47	79500/L	24224	0	0		0.50	0.01	0.55	38.74	1.10	45.13	1.278	R.H.	5.142			
39	43	80780/R	24614	1280	390	Raja Lang	1.74	0.05	1.91	38.24	1.08	44.58	1.263	608	246	5.142	Improved OFWM Phase-II	
40	44	83015/L	25295	2235	681	Rukha Wala	1.25	0.04	1.38	36.50	1.03	42.53	1.204	351	142	4.896	Un Improved	
41	48	84030/R	25604	1015	309	Raja Jang	0.94	0.03	1.03	35.25	1.00	40.91	1.159	330	134	4.754	Un Improved	
42	48	84030/L	25604	0	0		24.93	0.71	28.99	34.31	0.97	39.76	1.126	7,949	3,217	4,620		
43	47	85200/L	25960	1170	356	Raja Jang	0.75	0.02	0.83	33.38	0.97	37.77	1.077	305	106	4.403	Un Improved	
44	51	88750/R	27012	3450	1051		1.32	0.04	1.45	8.63	0.24	9.89	0.280	463	187	1.297		
45	52	88935/R	27098	125	38	Jank	1.45	0.04	1.60	7.31	0.21	8.27	0.234	707	286	1,110	Un Improved	
46	49	90280/L	27508	1345	49	Rena	0.53	0.02	0.58	5.86	0.17	6.67	0.189	185	75	824	Un Improved	
47	53	94600/L	28825	4320	410	Raja Jang	1.49	0.04	1.64	5.33	0.15	6.08	0.172	523	212	749	Un Improved	
48	54	95950/R	29236	1350	1316	Kala Khara	2.39	0.07	2.63	3.84	0.11	4.40	0.124	818	331	537	Un Improved	
					411	Kala Khara	0.49	0.01	0.54	1.45	0.04	1.64	0.046	173	70	206	Un Improved	

Sabaran Minor(28.99)

Table B - 1 (3/3) Breakdown of Authorized and Design Discharge Calculation for CBDC Area

No.	No. (original)	Water Course	RD		Section Distance (m)	Village	Chak No.	Outlet Discharge		Section Discharge		Design Discharge		Outlet CCA		Section CCA (ha)	Improved	Remarks	
			(feet)	(m)				(cusec)	(m <sup>3</sup> /s)	(cusec)	(m <sup>3</sup> /s)	(cusec)	(m <sup>3</sup> /s)	(acre)	(ha)				
49	56	96607/L	96607	29436	657	200 Raha		0.67	0.02	0.74	0.96	0.03	1.07	0.030	235	95	136	Un Improved	
50	57	97960/R	97960	29848	1353	412 Kala Khara		0.29	0.01	0.32	0.29	0.01	0.33	0.009	101	41	41	Un Improved	
								256.68	7.27			24.254	9.816						
<b>Saharan Minor (RD 84030/L, Theman Distributary)</b>																			
1	2213/R		2213	674	2213	674 Rukhawala		0.38	0.01	0.42	24.93	0.71	28.99	0.821	117	47	3.217	Un Improved	
2	2995/L		2995	913	782	238 Kot arup Svigh		1.25	0.04	1.38	24.55	0.70	28.33	0.804	356	144	3.170		
3	3640/L		3640	1109	645	197 Sbahalpur Rukh.		0.59	0.02	0.65	23.30	0.66	26.94	0.763	183	74	3.026	Improved OFWM Phase-I	
4	4370/L		4370	1332	730	222 Atra ullar/Milzawala		2.51	0.07	2.76	22.71	0.64	26.23	0.743	653	264	2.951		
5	6015/L		6015	1833	1645	501 Theh Saharan		0.39	0.01	0.43	20.20	0.57	23.41	0.663	137	55	2.687	Improved OFWM Phase-II	
6	10500/L		10500	3199	4485	1367 Theh Saharan		0.84	0.02	0.92	19.81	0.56	22.85	0.647	295	119	2.632	Un Improved	
7	11455/L		11455	3490	955	291 Malloke Rakh		2.36	0.07	2.60	18.97	0.54	21.59	0.611	787	318	2.512		
8	11633/L		11633	3545	178	54 Ravi Thaman		0.39	0.01	0.43	16.61	0.47	18.92	0.536	104	42	2.194	Improved OFWM Phase-III	
9	13050/R		13050	3976	1417	432 Ravi Thaman		1.18	0.03	1.30	16.22	0.46	18.48	0.523	412	167	2.152	Improved OFWM Phase-II	
10	15050/L		15050	4586	2000	609 Rakh Maluki		1.73	0.05	1.90	15.04	0.43	17.08	0.484	505	204	1.985	Improved OFWM Phase-I	
11	15685/L		15685	4779	635	193 Rakh Maluki		1.52	0.04	1.67	13.31	0.38	15.05	0.426	505	204	1.781	Un Improved	
12	15720/R		15720	4790	35	11 Theh Rosa Rakh M.		1.32	0.04	1.45	11.79	0.33	13.34	0.378	463	187	1.576	Un Improved	
13	18300/L		18300	5576	2580	786 Koti Rai Abubakar		3.09	0.09	3.40	10.47	0.30	11.88	0.337	941	381	1.389	Improved OFWM Phase-II	
14	18830/L		18830	5738	530	161 Theh Rosa		0.44	0.01	0.48	7.38	0.21	8.35	0.236	145	59	1.008	Improved OFWM Phase-II	
15	23683/R		23683	7216	4853	1479 Shero Kahva		0.93	0.03	1.02	6.94	0.20	7.84	0.222	261	106	949		
16	23763/TL		23763	7241	80	24 Kotli Rai Abu Bakar		1.80	0.05	1.98	6.01	0.17	6.61	0.187	635	257	844	Un Improved	
17	23763/TF		23763	7241	0			2.40	0.07	2.64	4.21	0.12	4.63	0.131	839	340	587	Un Improved	
18	23763/TR		23763	7241	0			1.81	0.05	1.99	1.81	0.05	1.99	0.056	611	247	247	Improved OFWM Phase-III	
								24.93	0.71			24.93	0.71	7.949	3.217				
3.217																			

Table B-2 Material for Canal Lining

No. Material	Sample Specification	Cost <sup>1</sup>		Water <sup>2</sup>		Endurability <sup>3</sup>		Available Roughness		Remarks
		(Brick = 1)	Tightness	Penetration	Abbration	Degradation	Anti-Alkali	in Market	(Exposed)	
A1 Earth	Bentonite Lining (5% mix 4 inch thick)	0.7-1.5	95	L	L	M	M	*	0.02	
A2	Soil Cement (10% mix of cement 8 inch thick)	0.5-1.0	70(vary)	M	M	M	M	M-H	0.02	
A3	Compacted Clay (4 inch thick)	0.4-0.7	70	L	L	L	M	*	0.02	
A4	Stone Lining (4 inch thick some masonry)	2.0-4.0	85	H	H	M	H	*	0.018-0.02	Price high and supply short in Punjab
B1 Asphalt	Pre-mixed Asphalt Concrete ( 2 inch thick)	1.5-3.0	85(vary)	H	H	M	H	*	0.018-0.02	
B2	Prefabricated Asphalt/Bitumen mix or buried into soil	1.5-2.0	80(vary)	L	M	L	H	*	0.018-0.02	
C1 Tile	Brick Tile Lining (4.5 inch brick on edge pitched by mortar)	(1.0)	85	M	H	M	L-M	*	0.017-0.02	
C2	Ceramic Tile (0.5 inch thick tile pitched by mortar)	3.0-4.0	85	H	H	M	M-H	*	0.016-0.018	Price is very high
D1 Concrete	Precast Concrete Flume/Pipe	2.0-3.5	95	H	H	H	H	*	0.015	
D2	Cement Concrete Lining ( 1:2:4 mix 3 inch thick )	1.0-1.2	98	H	H	H	H	*	0.015	
D3	Mortar (Shot-crete) Lining (1:3 mix )	0.75-1.25	90	H	H	M	M-H	*	0.015-0.016	to be combined with geotextile/eg
D4	Precast Concrete Slab/Block	1.5-2.0	95	H	H	H	H	*	0.016-0.018	
D5	Reinforced Concrete Lining	6.0	98	H	H	H	H	*	0.015	
E1 Textile	Grouted Fabric Mat ( Synthetic Fabric Sheet filled by mortar)	5.0	90	H	H	M	H		-	to be combined with other material
E2	Geo-textile ( for subgrade or support of other materials)	0.8-2.0	vary	M	H	M	H		-	
F1 Rubber	Vulcanized Synthetic Rubber Sheet (0.75mm thick )	3.0-5.0	100	H	H	M-H	H		0.015-0.018	under experiment in Pakistan
F2	Same above reinforced by fiber(1.0mm)	5.0-7.0	100	H	H	H	H		0.015-0.018	under experiment in Pakistan
	Non-vulcanized (1.0 mm thick)	2.5-4.5	100	H	H	M-H	H		0.015-0.018	
G1 Resin	Polyvinyl(PVC) Sheet (0.1-0.2 mm thick)	0.3-0.4	100	L	H	L-M	H	*	0.013-0.015	local product are low quality
G2	Polyethylene Sheet (0.1-0.2 mm thick)	0.25-0.35	100	L	H	L	H	*	0.013-0.015	local product are low quality
G3	EVA( Vinyl Acetate) Sheet (0.1-0.2 mm thick)	0.3-0.5	100	L	H	L-M	H		0.013-0.015	
G4	Polyethylene Sheet (HDPE,etc 0.8-1.2 mm thick)	3.0-5.0	100	H	H	M-H	H		0.013-0.015	Planned for FESS Project
H1 Sealants	Natural or artificial sealant material	-	vary	L	-	-	L	M	-	temporary treatment material
H2 Mix	Combination of above	-	vary	-	-	-	-	-	-	

Notes: \*1: costs include material, fabrication and finishing and exclude apparent earthworks required particularly per unit area. Total cost may vary wider.

\*2: initial water tightness on % saving of seepage against unlined case provided that joint are perfect. \*3: H(high resistance), M(medium) and L(low)

Table B-3 Summary Table of Canal Route Survey for LJC Area

No.	Name of Distributary	Name of Minor	Original Data			Surveyed Data			Remarks											
			Length (km)	Outlet (NOS)	Lining (unit :km)		Outlet (NOS)	Length (km)		Lining (unit :km)										
					from (RD)	To (RD)				Distance (km)	Kind	from (RD)	To (RD)	Distance (km)	Kind					
1	Pindi		6.86	10																
2	Hujan		33.98	59	109,000	114,473	1	Brick												
3	Hujan	Arian	5.43	6																
4	Hujan	Kot Moman	6.78	12																
5	Hujan	Kot Raja	2.81	5																
6	Hujan	Bhikhi	6.34	9																
7	Hujan	Sahawal	5.76	7																
8	Hujan	Marulianwala	5.87	5																
9	Hujan	Tangu	4.84	5																
10	Hujan	Jaspal	8.32	14																
11	Kirana		62.95	112	176,100	206,542	9.19	Concrete												
					(160350-176100 are within urgent programme by PID)															
12	Kirana	Saraji	1.59	2																
13	Kirana	Hadda	4.11	8																
14	Kirana	Maikana	10.16	16																
15	Kirana	Wasunna	6.89	8																
16	Kirana	Tandalian	3.96	10																
17	Kirana	Rodian	6.04	11																
18	Kirana	Funde	4.92	10																
19	Kirana	Killa	4.10	7																
20	Kirana	Dhabian	2.41	4																
	<b>Grand Total</b>		<b>194.12</b>	<b>320.00</b>			<b>9.94</b>		<b>199.17</b>	<b>317.00</b>										<b>13.69</b>

Remarks : Original Data obtain from Punjab Irrigation and Power Department.  
 Total Original Length for LJC Area are = 184.18 km  
 Total Surveyed Length for LJC Area are = 185.48 km

Table B-4 Summary Table of Canal Route Survey for LCC Area

No.	Name of Distributory	Name of Minor	Original Data			Surveyed Data			Remarks (* is omitted for design)						
			Length (km)	Outlet (NOS)	Lining (unit :km) from (RD) To (RD)	Distance (km)	Kind	Length (km)		Outlet (NOS)	Lining (unit :km) from (RD) To (RD)	Distance (km)	Kind		
1	Sarangwala		25.04	56	10,000	11,000	0.20	Side	25.01	56	10,000	11,000	0.30	Bricks	
2	Nasrana		54.64	131			0.00		54.67	130	78,150	82,070	1.20	Bricks	
3	Nasrana	Sadwana	2.76	3			0.00		2.42	2	0	3,610	1.10		
4	Nasrana	Khiliana	4.43	5			0.00		4.44	6			0.00		
5	Nasrana	Narwala	3.82	10	16,900	19,103	0.67	Brick	5.83	10	0	130	0.04	Bricks	*
6	Nasrana	Satiana	3.66	6	0	1,300	0.40	Side	3.66	7	11,000	19,103	2.47	Bricks	
7	Nasrana	Natheri	4.60	8	0	13,000	3.97	Side	4.61	9	5,936	6,058	0.21	Bricks	*
8	Nasrana	Domra	5.51	12	15,000	18,069	0.94	Side	5.49	11	7,930	8,043	0.03	Bricks	*
9	Gojra		15.06	35	28,500	49,414	1.08	Brick	15.07	40	11,400	12,000	0.18	Bricks	
10	Gojra	Zeeza	2.71	4	8,397	8,897	0.10	Brick	2.71	4	3,300	4,000	0.21	Bricks	
11	Mungi		36.97	88	108,300	121,278	3.96	Brick	36.98	90	14,000	15,123	0.34	Bricks	
12	Mungi		4.32	9	0	6,000	1.83	Brick	4.35	9	4,000	5,030	0.31	Bricks	
13	Janiwala/Hamuza		10.96	21					5.80	9	6,928	7,108	0.05	Bricks	*
14		Amurwala	7.62	10					7.70	11	17,000	18,000	0.30	Bricks	
15									4.75	15	21,880	23,179	0.40	Bricks	Left side only *
16	Pir Mahal	Thera	47.57	51			0.00		47.57	45	28,547	29,731	0.36	Bricks	
17	Pir Mahal	Magreja	4.85	5			0.00		4.88	5	31,994	35,980	1.21	Bricks	
18	Pir Mahal	Jungejwala	9.89	12			0.00		9.83	11	49,000	49,446	0.14	Bricks	
19	Pir Mahal	Jandwala	16.08	24			0.00		15.99	23	8,400	88,996	0.15	Bricks	
20	Pir Mahal	Jandwala	3.74	4			0.00		3.76	3	108,262	121,325	3.98	Bricks	
21	Kilianwala	Minor #3	46.05	103	100,000	151,586	15.73	Brick	46.33	63	100,533	152,033	15.70	Bricks	
22	Kilianwala	Minor #7	6.66	11			0.00		4.19	14			0.00		
23	Kilianwala	Minor #8							2.62						
24	Kilianwala														
Grand Total			318.94	608.00			28.87		325.33	573.00			29.38		

Remarks: Original Data obtain from Punjab Irrigation and Power Department.

Total Original Length for LCC Area are = 290.07 km

Total Surveyed Length for LCC Area are = 295.95 km

Table B-5 Summary Table of Canal Route Survey for CBDC Area

No.	Name of Distributry	Name of Minor	Original Data			Surveyed Data			Remarks (* is omitted for design)
			Length (km)	Outlet (NOS)	Lining (unit :km) From (RD) To (RD) Distance (km)	Length (km)	Outlet (NOS)	Lining (unit :km) from (RD) To (RD) Distance (km)	
1	Therman		29.85	50	56,000	66,000	3.02	Brick	
2	Therman China	Saharan	7.24	18					
		China	22.46	63					
	China	Kala	7.81	25					
	<b>Grand Total</b>		<b>70.36</b>	<b>156.00</b>			<b>3.02</b>		

Remarks : Original Data obtain from Punjab Irrigation and Power Department.  
 Total Original Length for CBDC Area are = 67.34 km  
 Total Surveyed Length for CBDC Area are = 66.65 km



**Table B-6 Sedimentation Date for Lower Jelem Canal**

No.	Bed Material		Suspended Load					
	Distribution (microns)		Concentration (unit: PPM)			Distribution (microns)		
	50% Pass	St. Deviation	< 62 microns	> 62 microns	Total	50% Pass	90% Pass	
1	285	1.39	23	5	28	70	120	
2	258	1.39	33	2	35	20	55	
3	250	1.47	38	8	46	20	70	
4	263	1.38	39	6	45	25	70	
5	299	1.4	69	3	72	20	60	
6	309	1.39	99	4	103	15	55	
7	310	1.41	165	4	169	15	35	
8	339	1.39	14	3	17	25	70	
9	311	1.34	25	2	27	20	60	
10	345	1.39	34	3	37	30	62	
11	311	1.31	20	10	30	25	90	
12	275	1.47	24	3	27	20	60	
13	285	1.39	23	5	28	30	70	
14	286	1.43	47	76	123	75	150	
15	282	1.39	26	3	29	25	65	
16	290	1.39	21	2	23	25	60	
17	312	1.37	122	1	123	20	50	
18	273	1.5	29	2	31	20	55	
19	262	1.53	47	1	48	20	50	
20	252	1.33	175	12	187	30	55	
21	325	1.37	12	5	17	25	70	
22	302	1.61	29	3	32	40	60	
23	277	1.42	24	7	31	25	70	
24	274	1.47	26	11	37	25	75	
25	277	1.36	96	32	128	25	75	
26	260	1.31	105	6	111	20	55	
27	300	1.27	112	1	113	20	55	
28	265	1.33	73	4	77	35	55	
29	269	1.3	56	8	64	20	55	
30	282	1.41	33	4	37	25	65	
31	270	1.26	36	5	41	20	65	
32	249	1.29	58	27	85	70	140	
33	255	1.33	36	4	40	20	60	
34	250	1.27	31	7	38	25	70	
35	240	1.29	113	3	116	25	55	
36	300	1.37	123	6	129	30	55	
37	350	1.63	77	2	79	25	50	
38	280	1.4	96	7	103	25	55	
39	297	1.37	42	1	43	20	50	
40	311	1.37	220	4	224	20	50	
41	272	1.29	29	3	32	25	60	
42	288	1.27	38	5	43	25	65	
43	269	1.29	39	11	50	30	70	
44	288	1.36	50	13	63	25	70	
45	265	1.29	54	12	66	20	70	
ave	284.71	1.38	59.58	7.69	67.27	27.00	66.27	

Table B-7 Sedimentation Date for Lower Chenab Canal System

No.	Bed Material		Suspended Load				
	Distribution (microns)		Concentration (unit: PPM)		Total	Distribution (microns)	
	50% Pass	St. Deviation	< 62 microns	> 62 microns		50% Pass	90% Pass
UG 1	326	1.4	150	178	328	129	215
2	122	1.4	117	283	400	128	216
3	193	1.7	161	202	363	119	214
4	254	1.5	189	250	439	123	225
5	313	1.7	535	125	660	104	167
6	357	1.4	583	124	707	82	120
7	274	1.4	161	190	351	113	192
8	172	1.5	121	115	236	117	213
9	274	1.5	427	328	755	156	288
10	200	1.6	183	222	405	109	167
11	304	1.4	158	93	251	135	244
12	217	1.5	585	170	755	91	162
13	94	1.5	91	87	178	120	225
14	167	1.7	680	310	990	157	341
15	138	1.3	275	125	400	118	173
16	151	1.9	695	381	1076	106	259
17	246	1.5	119	206	325	121	238
18	244	1.4	143	91	234	125	173
19	235	1.5	620	91	711	80	141
LG 1	258	1.4	137	217	354	133	217
2	242	1.4	30	188	218	133	153
3	229	1.3	93	399	492	151	229
4	268	1.3	123	364	487	140	210
5	236	1.3	125	359	484	140	225
6	223	1.3	116	439	555	155	240
7	226	1.3	178	541	719	182	246
8	241	1.2	147	455	602	128	215
9	203	1.3	121	539	660	128	214
LS 1	93	1.4	290	168	458	100	158
2	108	1.7	2182	231	2413	103	160
3	120	1.3	166	43	209	109	248
4	116	1.2	1922	223	2145	96	182
5	97	1.3	1635	158	1793	83	122
ML 1	171	1.2	42	55	97	151	277
2	166	1.3	292	44	336	90	192
3	162	1.3	1041	193	1234	98	162
4	163	1.2	62	50	112	116	243
5	169	1.2	204	328	532	154	232
6	154	1.2	1135	196	1331	114	165
7	158	1.2	404	84	488	130	166
8	176	1.3	194	378	572	148	213
9	184	1.3	95	175	270	124	174
10	179	1.3	137	150	287	126	167
11	168	1.3	1089	245	1334	129	173
12	175	1.3	67	175	242	85	168
13	179	1.3	320	229	549	141	192
14	159	1.3	1290	264	1554	121	185
15	170	1.2	93	153	246	126	207
16	154	1.3	150	212	362	131	178
17	187	1.4	233	44	277	82	163
18	147	1.3	163	80	243	102	197
US 1	144	1.3	1719	125	1844	82	170
KR 1	145	1.2	381	88	469	8	154
AJ 1	91	1.2	442	155	597	82	120
2	94	1.2	2309	524	2833	84	120
3	105	1.3	686	496	1182	80	120
4	105	1.2	1754	516	2270	95	125
5	96	1.2	366	145	511	100	188
6	96	1.2	346	135	481	101	153
7	96	1.3	2770	542	3312	87	154
8	96	1.2	2541	256	2797	101	141
9	101	1.2	407	153	560	101	147
10	89	1.3	406	220	626	85	120
11	93	1.3	676	487	1163	101	153
NS 1	157	1.3	620	398	1018	81	122
2	159	1.2	2239	495	2734	83	121
3	94	1.3	1693	571	2264	86	147
SE 1	98	1.2	2585	484	3069	81	153
2	102	1.2	877	164	1041	99	144
Average	172.80	1.34	624.43	244.99	869.42	111.87	185.48

Table B-8. Summary of Survey Data of Soil Mechanics

Lab. Sample No.	% PASS U.S.S.										Pipette analysis		Per cent		Classification	Atterberg's limit			Proctor compaction test		Specific gravity	Natural moisture content %	Natural dry density lbs/cft	Co-efficient of permeability cm/sec. at natural dry density (Lab)
	4		8	16	30	50	100	200	.05	.005	sand	silt	clay	liquid limit %		plastic limit %	shrinkage limit %	Optimum moisture content %	Maximum dry density lbs/cft					
	100	99.9	99.9	99.9	99.9	99.9	99.9	99.9																
LCC	6996	1	100	99.7	99.4	99.3	99.1	79.8	64.0	8.0	36.0	56.0	8.0	28.2	8.0	Sandy silt	Non plastic	12.7	107.1	2.71	13.89	91.25	9.11*10 <sup>-5</sup>	
	6997	2	100	99.8	99.6	99.2	99.0	89.1	78.5	28.2	21.5	50.3	28.2	28.2	28.2	Clay silt	12.7	112.4	2.67	12.73	95.00	4.13*10 <sup>-7</sup>		
	6998	3	100	99.8	99.1	98.5	97.9	87.7	80.0	28.5	20.0	51.5	28.5	28.5	28.5	Clay silt	10.1	111.6	2.69	19.33	93.13	3.54*10 <sup>-7</sup>		
	6999	4	100	99.1	98.4	98.3	98.2	97.4	84.2	20.7	25.8	53.5	20.7	20.7	20.7	Clay silt	7.7	114.0	2.70	11.11	92.50	7.59*10 <sup>-6</sup>		
	7000	5	100	100	99.9	99.8	99.7	99.0	92.2	14.2	17.8	68.0	14.2	14.2	14.2	Sandy silt	11.8	109.8	2.69	19.18	92.50	1.84*10 <sup>-5</sup>		
LJC	7001	1	100	97.0	95.9	95.8	95.7	94.7	91.2	33.0	8.8	58.2	33.0	33.0	33.0	Silty clay	14.7	111.4	2.59	21.65	96.25	7.08*10 <sup>-7</sup>		
	7002	2	100	97.9	96.9	96.7	96.4	96.0	90.2	23.2	19.8	57.0	23.2	23.2	23.2	Clay	15.5	117.1	2.69	22.54	99.38	7.08*10 <sup>-7</sup>		
	7003	3	100	99.1	98.6	98.2	97.1	85.1	77.7	9.0	34.3	56.7	9.0	9.0	9.0	Sandy silt	Non plastic	11.4	102.8	2.72	10.37	90.00	5.95*10 <sup>-4</sup>	
	7004	4	100	100	99.9	99.8	99.6	98.8	84.5	34.7	15.5	49.8	34.7	34.7	34.7	Silty clay	13.7	111.2	2.58	12.86	96.25	8.85*10 <sup>-7</sup>		
CBDC	7005	1	100	97.7	96.5	95.9	95.3	94.1	85.5	19.5	14.5	66.0	19.5	19.5	19.5	Sandy silt	15.9	110.1	2.71	20.77	95.63	1.24*10 <sup>-5</sup>		

6996 IRURI DISTY: R.D. 4-L. Distance from left bank of diisy: = 125 ft.(LCC-1)  
 6997 KARKAN MINOR RD 5200-L. Distance from left bank of minor = 60 ft.(LCC-2)  
 6998 MADJANA DISTY: RD 35-R. Distance from right bank of diisy: = 98 ft.(LCC-3)  
 6999 TANDIANWALA DISTY:RD-8850-L. Distance from left bank of diisy: = 50 ft.(LCC-4)  
 7000 SEWAL MINOR RD-8850-L. Distance from left bank of minor = 85 ft.(LCC-5)  
 7001 KIRANA DISTY: R.D. 62400-L. Distance from left bank of minor: = 400 ft.(LJC-1)  
 7002 KIRANA DISTY: R.D. 105700-R. Distance from right bank of diisy: = 350 ft.(LJC-2)  
 7003 BALOCHRA DISTY: R.D. 35006-L. Distance from left bank of diisy: = 110 ft.(LJC-3)  
 7004 NAURANG DISTY: Distance from right bank of diisy: = 250 ft.(LJC-4)  
 7005 MADAL DISTY: R.D. 28-L. Distance from left bank of diisy: = 335 ft.(CBD-1)

Lab. Sample No.	BoreHole	Sample	c (Um <sup>2</sup> /sec)	φ
6996	1 PTT 1	10574	0.000	31
6997	2 PTT 2	10574/QTXL	0.000	40
		10575	5.100	30
6998	3 PTT 3	10575	1.530	19
		10576/QTXL	7.140	25
6999	4 PTT 4	10576/A	0.408	17
		10577/QT	5.100	29
7000	5 PTT 5	10577/CU	0.408	18
		10578/QTXL	2.550	29
		10578	1.070	18
LJC	1 PTT LJC-1	UD/BL0CK	4.284	24
		UD/BL0CK	3.672	14
7002	2 PTT LJC-2	UD/BL0CK	2.142	29
		UD/BL0CK	2.040	14
7003	3 PTT LJC-3	UD/BL0CK	0.000	40
		UD/BL0CK	0.000	22
7004	4 PTT LJC-4	UD/BL0CK	1.836	31
		UD/BL0CK	2.448	14
CBDC	1			

Table B-9 Cost Comparison of Lining on Distributaries and Minors by Different B/D Ratio

Work Item	Specification	Unit	Unit Cost (Rs.)	Discharge=100 Cusec							Discharge=200 Cusec							Discharge=300 Cusec							Discharge=400 Cusec													
				Work Volume Per Linear Meter							Discharge=100 Cusec							Discharge=200 Cusec							Discharge=300 Cusec							Discharge=400 Cusec						
				1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7	1	2	3	4	5	6	7							
<b>1. Earthwork</b>																																						
1.1	Excavation for Canal Prim	m <sup>3</sup>	39	4.31	4.46	4.72	4.53	5.16	9.29	9.48	9.40	9.25	9.46	11.22	10.70	10.22	10.22	10.5	165.9	171.7	181.7	174.4	198.7	357.67	365	361.9	356.1	364.2	432	412	393.5	393.5	402.7					
1.2	Embankment and Compaction of Band	m <sup>3</sup>	58	6.13	6.99	6.84	6.8	6.7	13.5	13	13.7	13.7	14.8	14.7	14.7	15.1	16.7	354.9	404.7	396	393.7	387.9	781.07	755	792.1	792.1	859.2	852.3	852.3	852.3	873.7	908.1						
1.3	Borrow & Haul within 75 m	m <sup>3</sup>	55	3.98	4.76	4.48	4.54	4.12	8.95	8.3	8.98	9.06	10.1	9.11	9.37	9.61	9.98	11.5	217	259.9	244.6	247.6	225	482.04	453.2	490.3	494.4	552	497.4	511.6	524.7	544.9	627.4					
1.4	Trimming & Surface Finishing	m <sup>2</sup>	9	6.56	6.56	6.98	7.29	8.19	7.95	8.07	8.44	8.86	10.7	9.05	9.33	9.75	10.2	12.7	59.67	59.67	63.49	66.31	74.53	72.52	73.41	76.78	80.60	97.73	82.33	84.87	88.70	93.16	115.99					
1.5	Excavation for Diversion Work	m <sup>3</sup>	39															0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
1.6	Embankment for Diversion Work	m <sup>3</sup>	52															0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Sub-total																	797.6	896	885.9	882	886.1	1694	1647	1721	1723	1873	1864	1861	1859	1905	2114						
<b>2. Lining Work</b>																																						
2.1	Mortar Plaster 1" thick	m <sup>2</sup>	52	6.56	6.56	6.98	7.29	8.19	7.95	8.07	8.44	8.86	10.7	9.05	9.33	9.75	10.2	12.7	339.6	339.6	361.4	377.5	424.2	411.65	417.9	437	458.8	468.6	483.1	504.9	530.3	656.8						
2.2	Concrete in situ 2" thick	m <sup>3</sup>	2,986	0.50	0.50	0.53	0.56	0.62	0.61	0.61	0.64	0.67	0.82	0.69	0.71	0.74	0.78	0.97	1497	1497	1593	1664	1870	1814.4	1842	1926	2022	2452	2066	2129	2225	2337	2895					
2.3	Precast Panel	m <sup>3</sup>	3,300															0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
2.4	Rubber Joint	m	25	2.19	2.19	2.33	2.43	2.73	2.65	2.69	2.81	2.95	3.58	3.02	3.11	3.25	3.41	4.23	54.64	54.64	58.14	60.72	68.25	66.22	67.22	70.31	73.81	89.50	75.39	77.72	81.22	85.31	105.67					
2.5	Geomembrane with geotextile	m <sup>2</sup>	340															0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Sub-total																	1891	1891	2012	2102	2362	2292.2	2327	2434	2535	3098	2610	2690	2811	2953	3657						
<b>Construction Cost</b>																																						
																		2689	2787	2898	2984	3248	3986	3973	4155	4278	4971	4474	4551	4671	4858	5771						

Note: Categories 1 to 7 in Work Volume stand for B/D ratio of 0.8, 1.5, 3, 4.5, 6, 7.5 and 8.5

## ***FIGURES***

Figure B-1. Actual Progress of Canal Route Survey

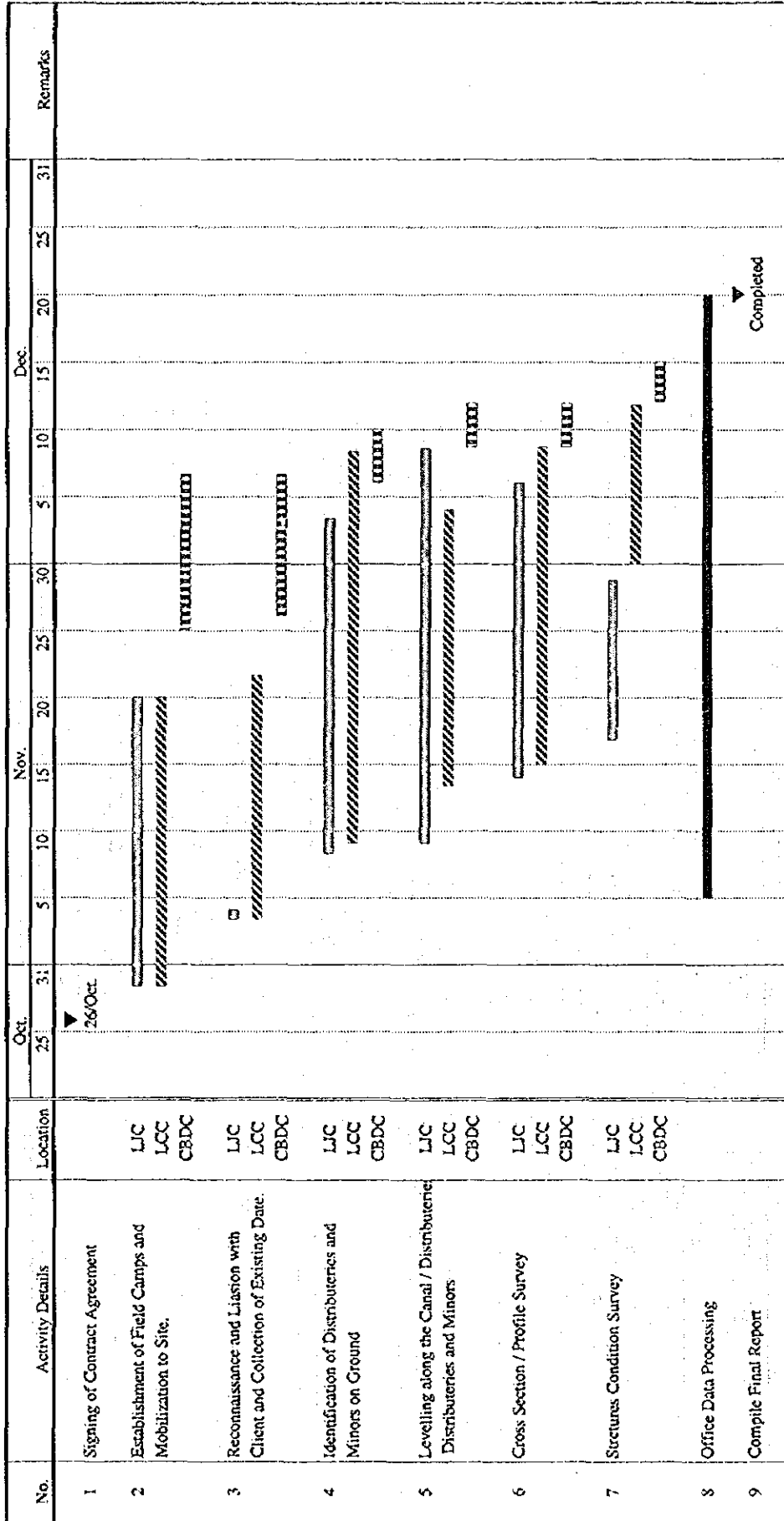


Figure B-2 Proportionality Comparison of Outlet(AOSM)

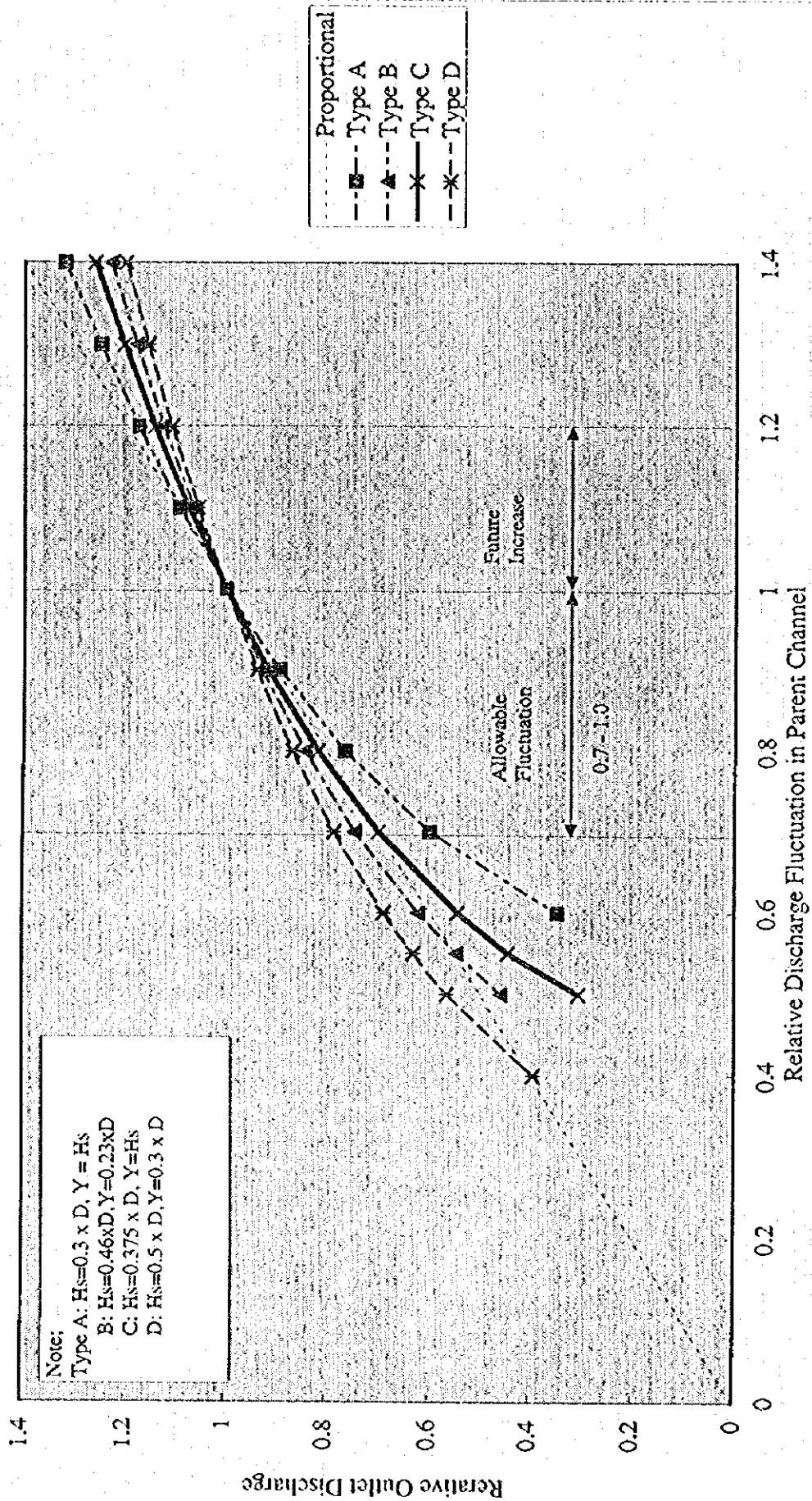
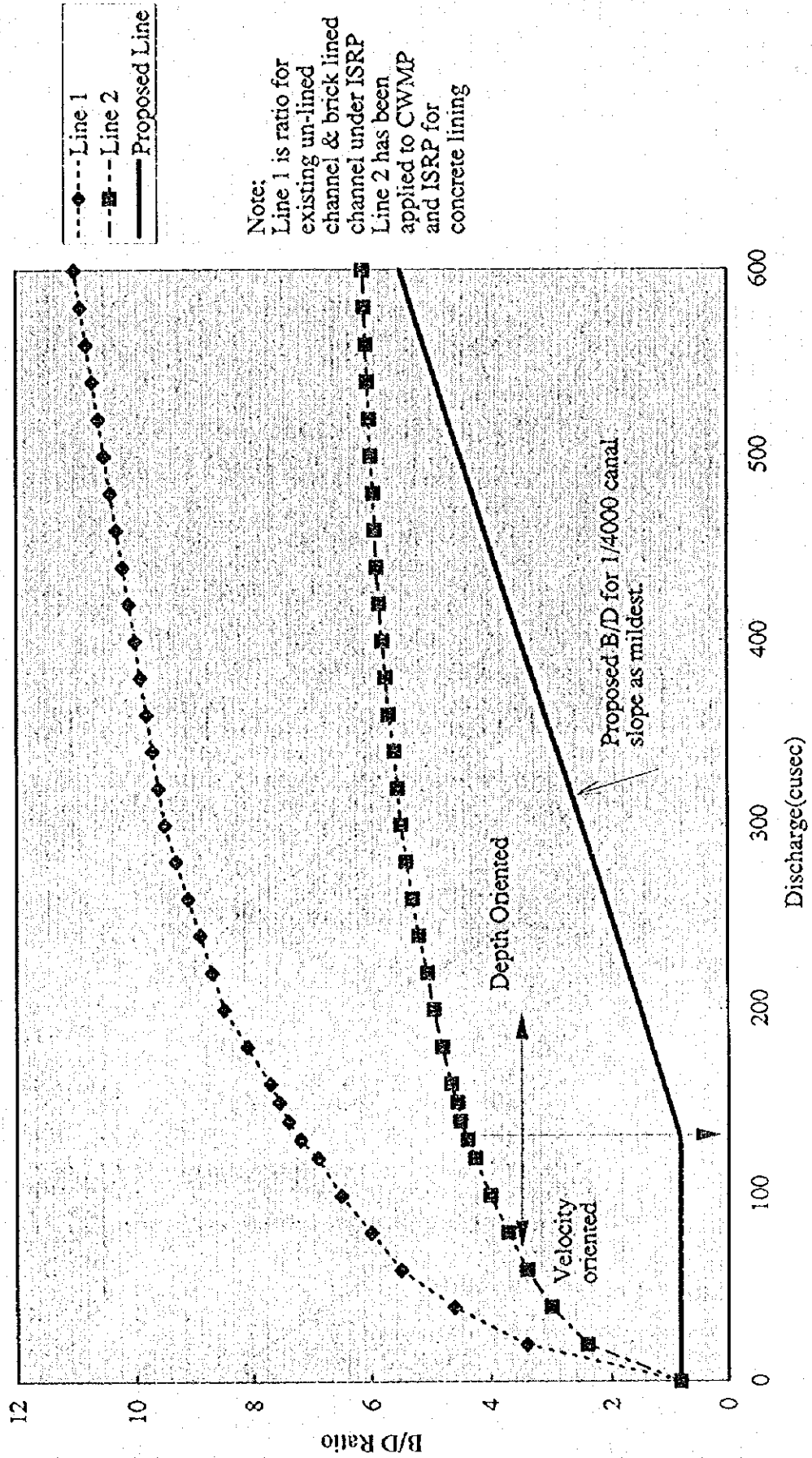
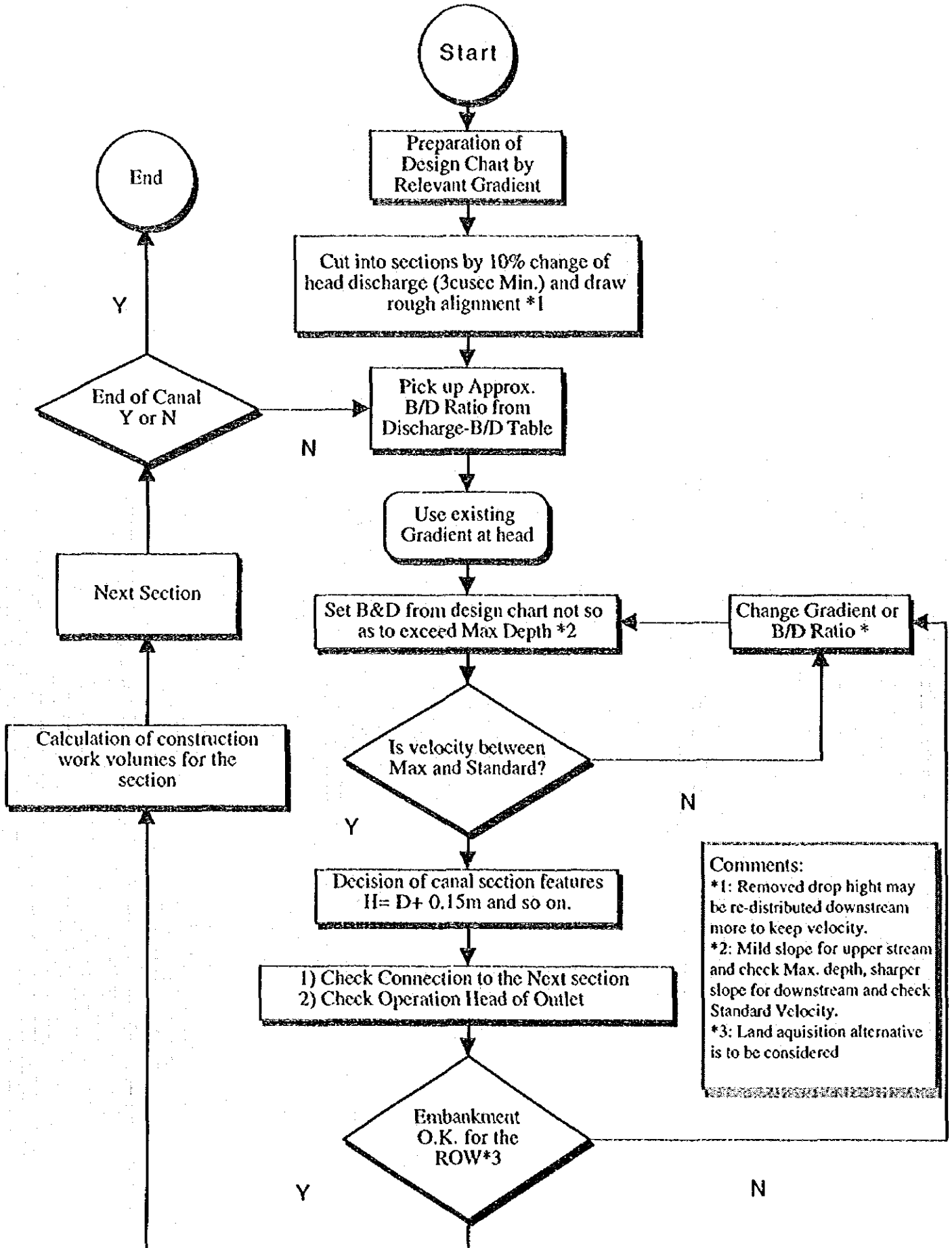


Figure B-3 Design B/D Ratio for Discharge

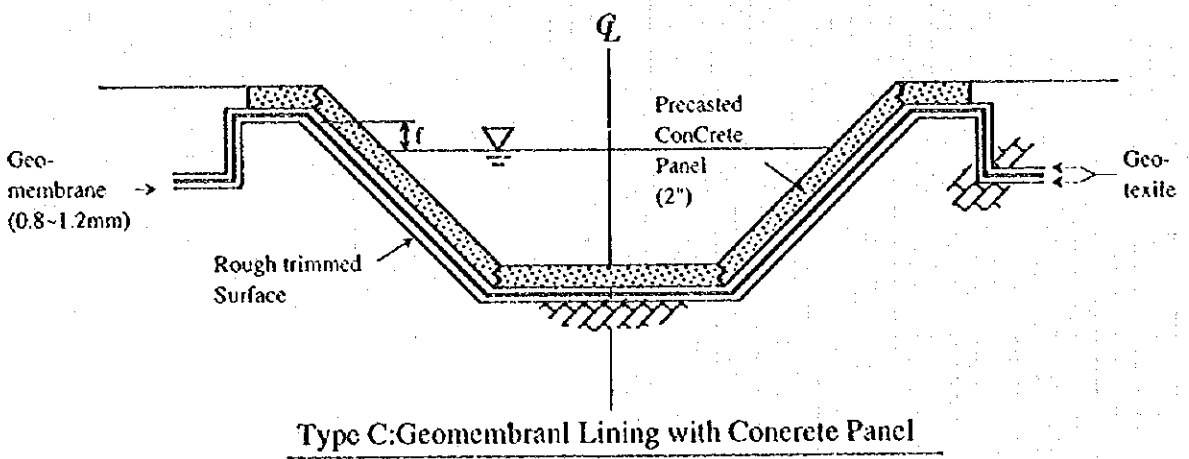
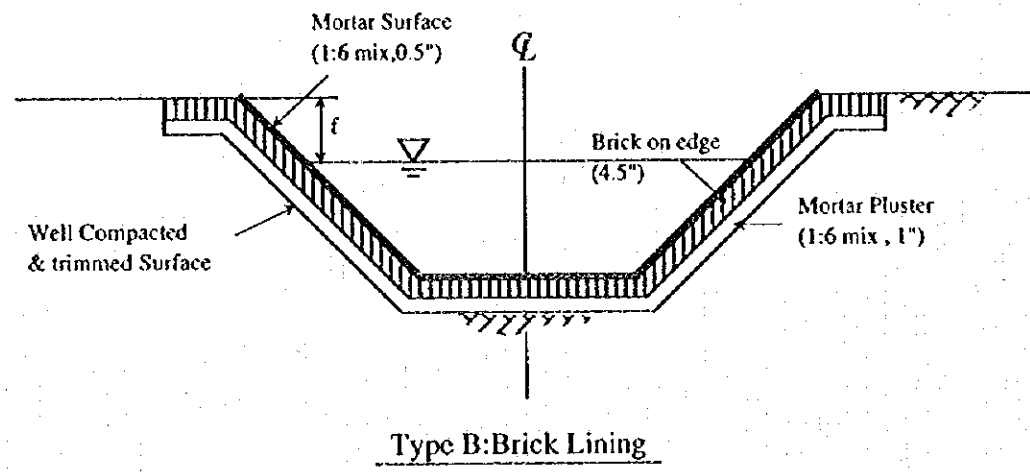
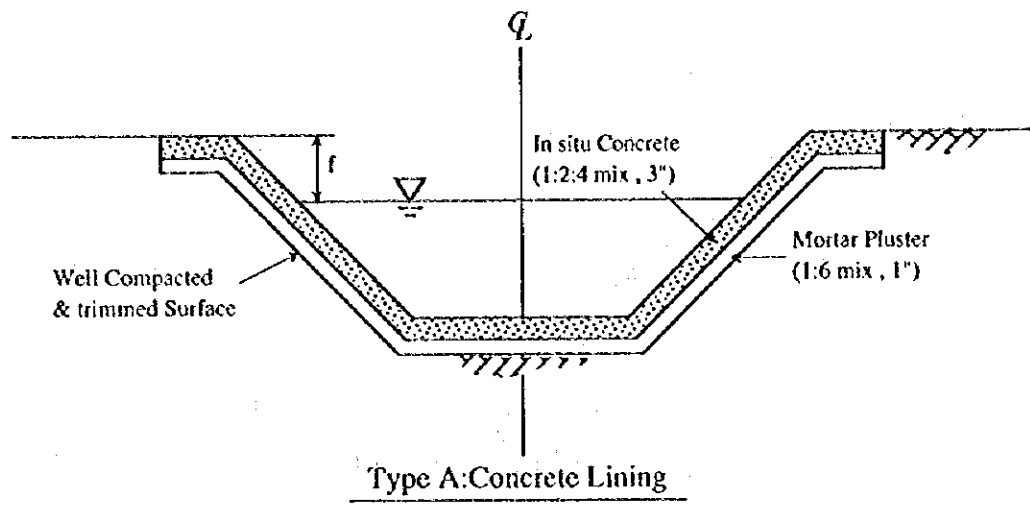




**Table B-4 Design Flow-Chart for Lining of Distributaries and Minors**



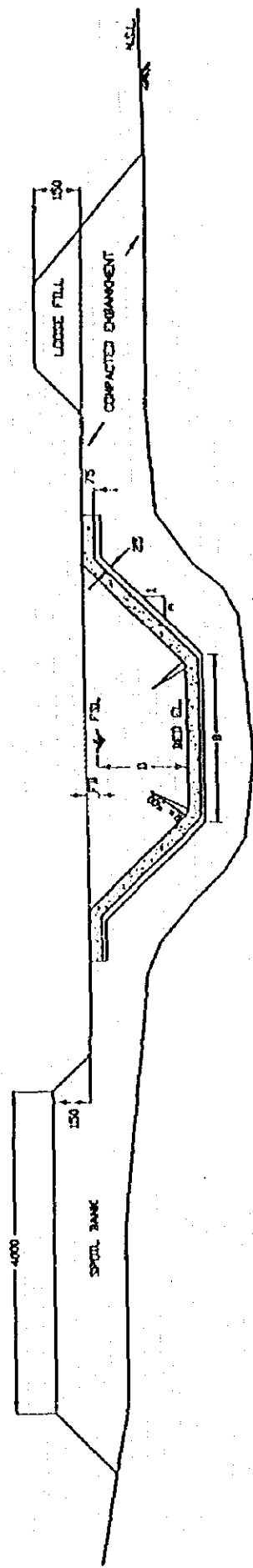
**Comments:**  
 \*1: Removed drop height may be re-distributed downstream more to keep velocity.  
 \*2: Mild slope for upper stream and check Max. depth, sharper slope for downstream and check Standard Velocity.  
 \*3: Land acquisition alternative is to be considered



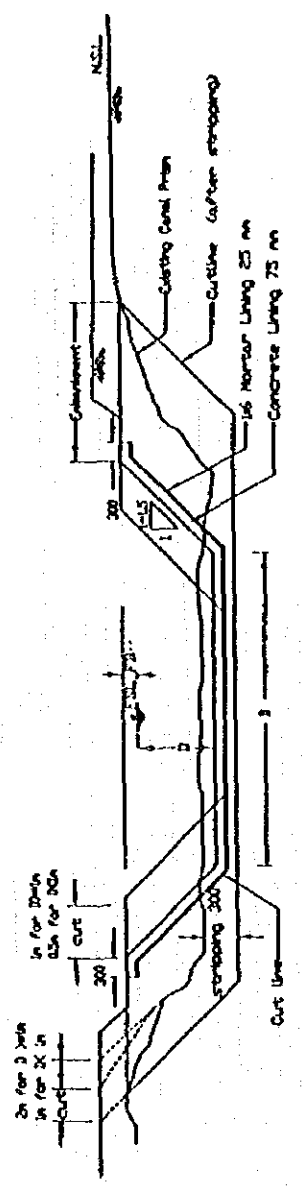
Note f: Free Board

**Figure B-5 Alternative Lined Canal Section**

Figure B - 6 Typical Cross Section of Lined Canal



TYPICAL COMPLETED CANAL FEATURES



TYPICAL CONSTRUCTION DETAILS