GOVERNMENT OF THE PUNJAB
IRRIGATION & POWER DEPARTMENT

REVISED PC-I OF
FAN MANAGEMENT OF MITHAWAN HILL
TORRENT IN D.G.KHAN DISTRICT

D.G.KHAN CONSTRUCTION DIVISION, DERA GHAZI KHAN.
PROJECT CIRCLE, IRRIGATION DERA GHAZI KHAN.
D.G.KHAN IRRIGATION ZONE, DERA GHAZI KHAN.

FAN MANAGEMENT OF MITHAWAN HILL TORRENT IN D.G.KHAN DISTRICT

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TORRENTS

GENERAL MAP OF D. G. KHAN HILL TORRENT.

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BALUCHISTAN

SINDH

TO D.I.KHAN

TAUNSA BARRAGE

GHAZI GHAT BRIDGE

RIVER INDUS

GUDDU BARRAGE

VEHOVA

KAURA

SANGHAR

SORI LUND

VIDORE

SHAKTU

SURWAR

MT. VAWAN

KAHA

CHACHAR

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ZANGI

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D. G. KHAN CANAL

KITAB CANAL

QADRA CANAL

RIGHT BANK CANAL

CHASHMA

PC – I PROFORMA

GOVERNMENT OF PAKISTAN
PLANNING COMMISSION
PC-I FORM
(INFRASTRUCTURE SECTORS)

1	Name of the project.	Fan Management of Mithawan Hill Torrent in DG Khan District (Construction machinery for facility of watershed in Mithawan)
2	Location.	The project area is located in the south west of Punjab & is bordered by the province of Sind in South, Baluchistan in the West & N.W.F.P. in the North. It lies between the Indus River & Suleman Mountain Range. In addition to this geographical classification, the area can be classified into hilly region, the PACHAD, the canal command area & riverain area. The area falls under the administrative control of D.G.Khan District. The area is situated between latitudes 69 10' E 70 49' E & longitudes 28 35 20' N.

3   Authorities responsible for:

i)	Sponsoring	Irrigation & Power Department Government of Punjab.
ii)	Execution	Irrigation & Power Department Government of Punjab.
iii)	Operation & maintenance.	Irrigation & Power Department Government of Punjab.
iv)	Concerned Federal Ministry.	Water & Power.

4	Plan provision.	2005 – 06 & 2006 – 07.
5	Project objectives and its relationship with sector objectives.	The project will contribute to achieve following main objectives :-

The project will contribute to achieve following main objectives :-

a) Eradication of hill torrent flood damages to the valuable agricultural lands, public properties, villages, abadies & a large irrigation system.

b) Protection to the cultivable lands by flood control measures to arrest erosion & harness the flows of hill torrents.

c) Make maximum use of flood water for irrigation in PACHAD area.

d) Rural area development.

e) Poverty alleviation of local inhabitants.

f) Eradication of flood damages in the canal command area as well as the PACHAD.

g) Make maximum use of flood water for agriculture in the PACHAD to increase production.

h) Establish stable farming in the PACHAD area.

i) To save local inhabitants from onslaught of flash floods.

j) To irrigate vast area (37897 acres) of Mithawan hill torrent.

k) To increase in yield from 40% to 60%.

l) Improvement in Civic values by enhancing their income, potential.

6	Description, justification, technical parameters & technology transfer aspects (enclose feasibility study for projects costing Rs. 300.00 Million & above)

Area & Population.

Mithawan hill torrent is one of the thirteen hill torrents emerging out of Koh Suleman with watershed of about 741 KM Sq.The major town in the project area is D.G.Khan with population about 190542. The population of the D.G.Khan District is 1.643 Million with population density of 65 inhabitants per Km2 . The annual growth rate is assumed to be 3.06 % similar to national average. In rural areas where most project activities exist, Saraiki is spoken by 78 % & Baluchi 18 %, Urdu & Punjabi about 2.6 %. The literacy ratio in rural area of DGKhan District is 12 % (19 % male & 5 % female) obviously much below the provincial average.

Physiography.

The torrent flows fan out from the hilly regions, the PACHAD area is formed with alluvial fan & piedmont alluvial plain. On west side reverain average area has RL 1000' an on east Suleman Range has elevation of more than RL. 7000'.

Climate.

The climate of the area is characterized by a semi-arid to arid climate. The distribution of average rainfall differs according to the altitude & gradually decreases from north to south. The winter rains are meagre & sporadic. It amounts to approximately 310 mm in the north western hilly region & 200 mm at the foot of the hills. The average annual rain fall is 144.2 mm (1978-90). The winter season extends from December to March & summer season lasts from June to September. The area has hot summers & mildy cold winters. The hottest month of June when the average maximum temperature is 41.7 °C. A maximum temperature of 48.0 °C has been recorded in the year 1995. January is the coldest month & mean maximum & minimum temperatures are 40 °C & 20 °C respectively. Monthly mean maximum temperature is 37.9 °C in June & monthly mean minimum temperature is 24 °C in January.

Geology.

Formation of sedimentary rocks of cretaceous to Tertiary are dominant in the area. Sedimentary rocks of mainly sand stone & lime stone in Cretaceous to Jurassic are formed at west side of suleman range axis within the catchment area of those hil torrents located at middle to northern part of the project area i.e. Kaura, Vehova, Sanghar, Vidore & Mithawan. The alluvial deposits, under laying the project area, constitute sand with clay, silt & fine gravel as subordinate thin layers in small lenses. The lithology is pre-dominated by medium sand. In some localities course sand & fine gravel have also been encountered. The silty clay caps the coarser deposits, particularly in the western part of the project area.

Soil.

Two distinct land forms are found namely the piedmont plains (57.8 %) & river plains (41.7%). Both are quite distinct in nature & can be easily recognized due to their general relief position & mode of deposition. (crops, yields, etc.) Land capability classification is a method of appraisal & grouping of soils to show their relative suitability for crops. The area has good agriculture land & suitable for Wheat, Bajra, Fodder etc.

Irrigation.

The land owners construct four to five feet high bunds around their fields (Kamarahs) having areas about five acres to 20 acres or more depending upon the holding & command from respective wahs. The flood water is diverted into these bounded fields, by constructing Gandas across the bunds of wahs and sub wahs at suitable sites.

Ground water.

There is shortage of ground water in PACHAD area. Ground water potential for agriculture is limited. It is practised in small scale in the northern part & area along the irrigation canal.

Drainage.

The Mithawan hill torrent water finds natural drainage southward which accumulates along the right bank of D.G.Khan Canal. It is in excessive quantity, breaches the canal & damages the crops, abadies villages, public property in canal command area other wise it passes through the constructed X-drainage structures at the canal.Flood damages are concentrated in canal irrigated area. With the proposed arrangements the intensity of the flooding will be low. Resulting, effective control of the drainage will prevail.

Agriculture.

The project area has an arid climate characterized by rain fall less than 300 mm concentrated during Kharif season. Consequently, the average under cultivation is less. The main feature of the economy is agrarian & live stock. The agriculture production & crop yield is low due to erratic rain fall. Jawar is the main crop. Cultivation of Bajra, Wheat & Gram is limited. There is scope of increasing yields by addressing the relevant problem which among other include improved water management.

Technical parameters.

Mithawan is one of the major hill torrents originating from *Suleman* Range with a catchment area of 275 sq miles. The 25 years return period discharge of the torrent is 78000 Cusecs. JICA during the year 1995-96 carried out works for watershed managements and irrigation development in *Mithawan*. They constructed sediment pocket and dispersion structure at *Choti Nallah* and similarly a weir check dams and small impounding pond were constructed together with watershed management through plantation in *Dholi* Area. With these contributions the flood peak is reduced from 78000 Cusecs to 67000 Cusecs. Further utilization of 17000 Cusecs in the sub-mountainous area like *Choti* dispersion, *Nangar* dispersion, *Sori* and *Rakhi* dispersion. The balance 50000 Cusecs will be available below *Choti Bala* in PACHAD Area.

The Distributor Structure has been completed at site as per drawing prepared by M/S NESPAK and cleared by the Experts of Irrigation & Power Department. The discharge coming through the torrent is used for irrigation purpose by the inhabitants of the area according to their rights, fixed under water act of 1906 and principle of *Saropa-Paina*. For this purpose, distributor structure was constructed at the junction of three branches i.e. Northern Branch, Southern Branch and *Ganahar* Branch.

The total discharge of 50,000 cusec as per 25 years return period, reaching at this structure has to be distributed as per *Haqooq* of the branches mentioned as under:-

Northern Branch	=	15000 Cs:
Southern Branch	=	15000 Cs:
Ganahar Branch	=	20000 Cs

The Distributor structure is constructed on the alluvial unstable sandy bed of *Mithawan* hill torrent and are spread over about one mile width across the flashy hill torrent bed. Due to unstable bed and sand bars on the upstream

side, the structure behaved not good regarding distribution of hill torrent water. The distribution of water of the branches was experienced uneven through the distributor structures. The public is demanding distribution of *Mithawan* hill torrent water in all the three branches according to their water rights and they emphasized their necessity through their representatives and approached the higher offices to resolve this issue.

The matter was referred to the Chief Engineer, Research to achieve the objectives of fair distribution of water according to the water rights.

Model Study recommendations.

Initially, a number of rough tests were performed on the model. These tests were performed to simulate the model with prototype flow conditions. On the basis of these tests, the model was found true replica of the prototype. It was further verified by the field formation who visited the model running for base test at Hydraulic Research Station *Nandipur* on 02.10.2005. The Chief Engineer, Research issued model study report No. IRR – 1179 in January 2006 and has recommended the following structures for fair distribution of *Mithawan* hill torrent.

1. **A partition bund existing in between Northern and Southern distributors is modified as under :-**

i. Straight part 280 feet.

ii. Curved part length 785 feet with its radius of 900 feet.

2. **Hockey spur tied to the left bank of the stream bund with the following details :**

i. Shank length 430 feet and hockey part length 264 feet with radius 252 feet.

ii. Left existing low level bund of the torrent was given proper shape of bund to the tie point of shank of hockey spur.

3. **Hudwali bund modifications :-**

i. Straight part 720 feet.

ii. Curved part 376 feet with radius 540 feet.

The recommendations and test results of the model are annexed with the revised PC-I for perusal.

Feasibility.

Feasibility of the project has already been completed by NESPAK in 1983-84. The Technical Experts of the Irrigation & Power Department cleared the project drawings of main distributor structure. Model study has also run at Nandipur Research Station and

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construction of structures have been provided in the revised PC-I as per model study report issued by the Chief Engineer, Research No. IRR – 1179.

The construction of Management Structures has been deleted from the revised PC-I for the time being and Stake holder's awareness has been added to convince the water user to adopt the realistic distribution in the revised PC-I. These structures will be constructed with the final decision of Stake holder's awareness Committees through separate PC-I.

Provision of a Training Centre have also made in the revised PC-I to conduct the workshops regarding the importance of Management Structures. The local, Technical / Revenue staff and member of water users committee will be trained to achieve the objectives of the project.

Economic characteristic of area.

At present the project area is considered as economically very back ward having very low production in agriculture.

7	Capital cost estimates.

Local   Rs. 155.530 Million

FEC   Rs. 162.00 Million

Total :- Rs. 317.530 Million

8	Annual operating and maintenance cost after completion of the project.

Des:	Salary (M)	Non Salary (M)	Total (M)
Local	4.128	2.223	6.351
Foreign	---	---	---
Total :-	4.128	2.223	6.351

The project will be operated & maintained by I&P Department

9	Demand and supply analysis.
10	Financial plan and mode of financing.

Des:	Local (M)	FEC (M)	Total (M)
Federal Govt. share	---	---	---
Provincial Govt. share	155.530	---	155.530
Beneficiaries share	---	---	---
Donor's share	---	162.00	162.00
Total :-	155.530	162.00	317.530

The balance scope of work will be completed in 15 months.

Year	Financial Target
2003 – 05	112.50 + 162.00 (GOJ) = 274.50
2005 – 06	19.268
2006 – 07	23.762

(Rs. 162.00 Million worth of machinery already procured from Govt. of Japan under Grand in Aid)

11	Project benefits and analysis.	
	i) Financial	No revenue receipts as water rates for areas beyond canal command are not applicable.
	ii) Economic	Rs. 6.351 Million.
	iii) Social benefits with indicators.	Crop yield of 33500 acres will increase and more jobs will be created due to the implementation of the project. Project will provide the opportunity to enhance green forestation.
	iv) Employment generation (direct and indirect)	Local labour, skilled & unskilled will be involved during construction and operation of the project.
	v) Environmental impact	No adverse environmental effects are envisaged. On the contrary the works included in programme would help in protecting environmental hazards i.e. erosion of the land by floods, etc.
	vi) Impact of delays on project cost and viability.	
12	Implementation schedule.	April 2006 to June 2007 (15 months)
13	Management structure & manpower requirements including specialized skills during construction and operational phases.	No additional staff will be needed for the execution of the project. Existing establishment of Construction Division, D.G.Khan will do the job. However for routine ward & watching & repair & maintenance the 25 No. Beldars would be required. No other additional staff would be required for maintenance works / activities.
14	Additional projects / decisions required to maximize socio-economic benefits from the proposed project.	---

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the proposed project.

15   Certified that the project proposal has been prepared on the basis of instructions provided by the Planning Commission for the preparation of PC-I for infrastructure sector projects.

PREPARED BY:

(MOHABBAT KHAN)
EXECUTIVE ENGINEER,
D.G.KHAN CONSTRUCTION DIVISION,
DERA GHAZI KHAN.
Ph: 0642 - 9260257

CHECKED BY:

(ABDUR RAHMAN BAIG)
SUPERINTENDINGENGINEER,
PROJECT CIRCLE, IRRIGATION,
DERA GHAZI KHAN.
Ph: 0642 - 9260248

APPROVED BY:
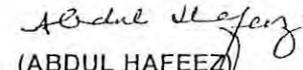
(ABDUL HAFEEZ)
CHIEF ENGINEER,
IRRIGATION ZONE,
DERA GHAZI KHAN.
Ph: 0642 - 9260245

(ARIF NADEEM)
SECRETARY,
GOVERNMENT OF THE PUNJAB,
IRRIGATION & POWER DEPARTMENT,
LAHORE.

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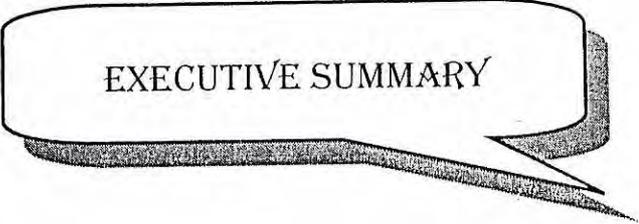
EXECUTIVE SUMMARY

EXECUTIVE SUMMARY OF THE PROJECT.

The scheme of "Fan Management of *Mithawan* Hill Torrent in *D.G.Khan* District" was approved by ECNEC on 20.03.2003 with the cost of Rs. 364.268 Million (Rs. 202.0 GOP share and Rs. 162.00 Million GOJ share in shape of Machinery). The approved project envisaged for the construction of two main components i.e. Distributor Structure and Management Structures.

Mithawan is one of the major hill torrents originating from *Suleman* Range with a catchment area of 275 sq miles. The 25 years return period discharge of the torrent is 78000 Cusecs. JICA during the year 1995-96 carried out works for watershed managements and irrigation development in *Mithawan*. They constructed sediment pocket and dispersion structure at *Choti Nallah* and similarly a weir check dams and small impounding pond were constructed together with watershed management through plantation in *Dholi* Area. With these contributions the flood peak is reduced from 78000 Cusecs to 67000 Cusecs. Further utilization of 17000 Cusecs in the sub-mountainous area like *Choti* dispersion, *Nangar* dispersion, *Sori* and *Rakhi* dispersion. The balance 50000 Cusecs will be available below *Choti Bala* in *PACHAD* Area.

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fixed under water act of 1906 and principle of *Saropa-Paina*. For this purpose, distributor structure was constructed at the junction of three branches i.e. Northern Branch, Southern Branch and *Ganahar* Branch.

The total discharge of 50,000 cusec as per 25 years return period, reaching at this structure has to be distributed as per *Haqooq* of the branches mentioned as under:-

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The matter was referred to the Chief Engineer, Research to achieve the objectives of fair distribution of water according to the water rights.

MODEL STUDY RECOMMENDATIONS.

Initially, a number of rough tests were performed on the model. These tests were performed to simulate the model with prototype flow conditions. On the basis of these tests, the model was found true replica of the prototype. It was further verified by the field formation who visited the model running for base test at Hydraulic Research Station *Nandipur* on 02.10.2005. The Chief Engineer, Research issued model study report No. IRR – 1179 in January 2006 and has recommended the following structures for fair distribution of *Mithawan* hill torrent and stability of distribution structure.

4. **A partition bund existing in between Northern and Southern distributors is modified as under :-**
   i. *Straight part 280 feet.*
   ii. *Curved part length 785 feet with its radius of 900 feet.*

5. **Hockey spur tied to the left bank of the stream bund with the following details :**
   i. *Shank length 430 feet and hockey part length 264 feet with radius 252 feet.*
   ii. *Left existing low level bund of the torrent was given proper shape of bund to the tie point of shank of hockey spur.*

6. **Hudwali bund modifications :-**
   i. *Straight part 720 feet.*
   ii. *Curved part 376 feet with radius 540 feet.*

The recommendations and test results of the model are annexed with the revised PC-I for perusal.

MAIN OBJECTIVES OF THE PROJECT.

The main objectives of the project are mentioned as under :-

i)   Reduction in damages to infrastructure in the area.

ii)   *Canal breaches will stop.*

iii) Damages to the standing crops in canal command area will be minimized.

iv) Enhanced irrigation supplies in the *PACHAD* area.

v) Improvement in the economic condition of the area.

The objective mentioned from Sr. i – iii have almost been achieved by the construction of Distributor structure but for enhanced irrigation supply in the *PACHAD* area and to improve the economic condition of the inhabitants, the construction of additional works as recommended in Model Study report are essential. The design of the Management Structures has been cleared by the Central Design Office, Irrigation & Power Department, Lahore, wherein proportionate distribution of water has been suggested. The water users do not agree to it because they want to get supply in accordance with *Saropa-Paina* principle. This law basically provides that the upstream users will always have the priority rights over downstream users. There is no other any economical option for the Management Structures, except with the proposed design.

Consequently the construction of Management Structures has been deleted from the revised PC-I for the time being and programme for Stake Holder's Awareness has been added to convince the water user to adopt the realistic distribution in the revised PC-I. These structures will be constructed after the Stake Holder's are agreed through separate PC-I.

Provision of a Training Centre have also made in the revised PC-I to conduct the workshops regarding the importance of Management Structures. The local, Technical / Revenue staff and member of water users committee will be trained to achieve the objectives of the project.

Provision for initial launching has been made in revised PC-I to make good the launched apron caused due to operation of main regulator and its allied works, during previous year hill torrents flood flow. The provision is made at 10% of the total quantity of apron of this structure.

Early revision of PC-I is requested please.

SUPERINTENDING ENGINEER,
PROJECT CIRCLE, IRRIGATION,
DERA GHAZI KHAN.

EXECUTIVE ENGINEER,
D.G.KHAN CONSTRUCTION DIVISION,
DERA GHAZI KHAN.
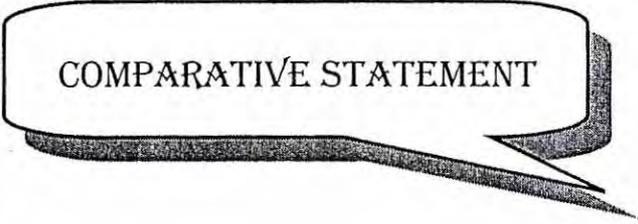
COMPARATIVE STATEMENT

COMPARATIVE STATEMENT
REVISED PC-I OF FAN MANAGEMENT OF MITHAWAN HILL TORRENT

Rs in Million

DESCRIPTION	Orignal PC-1	REVISED PC-I			Difference	Remarks
		Work done	Work to be done	Total		
Distributor, Bed Fixer & U/s Left Bank	134.803	114.740		114.740	-20.063	Saving is due to less tender rate.
Management structure	58.755	0	0	0.000	-58.755	The pacca structures can distribute the flood water proportionately but the beneficieries do not agree. They want to get water according to Saropa Paina principle. Social Mobilization is needed before construction of structure and therefore deleted.
Additional work recommended in Model study		0	22.137	22.137	22.137	Due to formation of sand bars in the bed of Mithawan nullah, the low floods are not distributed as proposed in the PC-I. Model study was carried out by IRI Lahore & recommended additional works which will help equitable distribution of water among Northern & Southern branch and stability of Distributor structure.
Stake holder's awareness.		0	3.132	3.132	3.132	Social Mobilization is necessary to have a dialogue with the beneficiaries of management structures, the construction of which have been postponed in the revised PC-I. Management structures will be constructed under a new ADP scheme, when beneficiaries agree.
Training center and training material & Honouraria		0	5.027	5.027	5.027	Provision of training centre has been made to conduct work shop regarding importance of Management structures. The local technical Revenue staff and members of water users committees will be trained to achieve the objective of the project.
Stone for initial launching.		0	2.676	2.676	2.676	Provision of Reserve/stock of stone material has been made to cope with any emergency arising at site during operation of main regulator and its allied works. Stone is also needed to restore the design top level of launched apron.
Total	193.558	114.740	32.972	147.712	-45.846	

E:\TAUNSA SUB DIVISION 1\Revised PC-I of MithawanCom.M

DESCRIPTION	Orignal PC-1	REVISED PC-I			Difference	Remarks
		Work done	Work to be done	Total		
Cost of Machinery (GOJ)	162.000	162.000	0	162.000	0.000	
Total	355.558	276.740	32.972	309.712	-45.846	
3 year O&M Cost / Maintenance of executed work	8.710	0.000	7.000	7.000	-1.710	Due to hill torrent flood flow, after completion of main regulator and its allied structures, some damages and launching of aprons has taken place. Repair is necessary under the project funds, because no funds under O&M are available.
Total	364.268	276.74	39.972	316.712	-47.556	
Add w.c & contigency			0.815	0.815	0.815	
G.Total	364.268	276.740	40.787	317.530	-46.738	

SUB DIVISIONAL OFFICER
TAUNSA CONSTRUCTION SUB DIVISION
DERA GHAZI KHAN

SUPERINTENDING ENGINEER
PROJECT CIRCLE IRRIGATION
DERA GHAZI KHAN.

EXECUTIVE ENGINEER
D.G.KHAN CONSTRUCTION DIVISION
DERA GHAZI KHAN.

CHIEF ENGINEER
IRRIGATION ZONE
DERA GHAZI KHAN.

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[COMPARATIVE STATEMENT OF REVISED PC - I OF MITHAWAN HILL TORRENT IN DISTRICT D.G.KHAN.]

Sr. No.	Description	Unit	Distributor	Bed fixer	Left bank	Management	Total Qty.	Rates	Amount	Qty. of Distributor Bed fixer/Left bank	tender rate	Premium	Amount	Qty. of Additional works	Qty. of Management	Total quantity	Rates as per 2ND QUARTER MRS 06	Amount	Amount 14+19	+ive	-ive	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1	Dumping stone at site without boat including handling of material within 3.0 chains.	%Cft	2226679	356840	612000	0	3191519	521.80	16653346	2390304	521.8	-29%	8855550	144314	0	144314	707.85	1021527	9877077		-6776269	Due to change in scope of work
2	Dumping stone at site without boat (Labour rate only).	%Cft	0	0	0	384247	384247	158.80	610184						0	0		0	0		-610184	Due to change in scope of work
3	Coursed rubble masonary 1:6 other than building.	%Cft	0	0	0	0	0		0	74334	3651.65	-8%	2497264	10716	0	10716	5486.05	587885	3085149	3085149		Due to change in scope of work
4	Coursed rubble masonry hammer dressed in foundation and plinth 1:3	%Cft	362190	0	0	0	362190	4114.95	14903937	346685	4114.95	-8%	13124641	0	0	0		0	13124641		-1779296	Due to change in scope of work
5	Providing & laying stone pitching for top layer only on slope.	%Cft	1641848	199561	222768	0	2064177	976.80	20162881	1762501	976.8	-29%	12223438	283078	0	283078	1372.7	3885812	16109250		-4053631	Due to change in scope of work
6	Providing & laying stone pitching for top layer only on slope.(Labour rate only)	%Cft	0	0	0	391169	391169	580.80	2271910						0	0		0	0		-2271910	Due to change in scope of work
7	Providing & laying spawl on slope /Baire 1/8" to 2"	%Cft	884091	107456	128520	0	1120067	519.50	5818748	949039	464.5	-29%	3129883	182181	0	182181	1684	3067928	6197811	379063		Due to change in scope of work
8	Providing & laying spawl on slope (Labour rate only)	%Cft	0	0	0	210629	210629	189.50	399142						0	0		0	0		-399142	Due to change in scope of work
9	Providing & laying spawl on level.	%Cft	113193	126845	0	0	240038	472.20	1133459	213790	417.2	-29%	633272	0	0	0		0	633272		-500188	Due to change in scope of work
10	Providing & laying spawl on level (Labour rate only)	%Cft	0	0	0	176136	176136	142.20	250465					250465	0	0		0	0		-250465	Due to change in scope of work
11	Supplying & filling in wire crates, including sewing crates excluding cost ofr crates.	%Cft	429559	240822	0	0	670381	665.50	4461386	668107	665.5	-29%	3156839	319233	0	319233	959.65	3063519	6220358	1758973		Due to change in scope of work
12	Supplying & filling in wire crates, including sewing crates excluding cost ofr crates (labour rate only)	%Cft	0	0	0	563944	563944	302.50	1705931						0	0		0	0		-1705931	Due to change in scope of work
13	Cement concrete plain including placing, compacting, finishing & oxuring complete (including screening and washing of stone aggregate) ratio 1:3:6	%Cft	333306	0	0	638790	1291864	4777.40	61717511	581671	4777.4	At par	27788750	0	0	0		0	27788750		-33928760	Due to change in scope of work
14	Main distributor shuttering work	Job											2537871						2537871	2537871		Due to change in scope of work
15	Carriage of 100 Cft of all materials like stone, aggregate, spawl, kankar lime (unslaked), surkhi etc or 150 Cft of timber by truck or by any other means owned by the contractor, site of work lead 20 Km(13 mile) Hilly and kacha.	%Cft	6249753	1131202	1069042	0	8449997	265.19	22408547	7063096	265.19	-29%	13298554	1042492	0	1042492	600	6254952	19553506		-2855041	Due to change in scope of work
16	Dressing of earth work (done by machinery or otherwise and left undressed) to design section.	%Sft	1754409	381717	298860	1066382	3501368		491150					3647073	0	3647073		291036	291036		-200114	Due to change in scope of work
17	Earth work excavation in ashes, and and soft soil or silt clearance undressed lead upto 300 ft by machine.	%Cft	4739971	955428	612000	1344086	7651485		2053185					475870	0	475870		268458	268458		-1784727	Due to change in scope of work
18	Earthwork outside borrow pits in ordinary soill undressed transportation of earthwork upto lead 300 ft	%oCft	8042146	2393388	3125280	8690850	22251664		5765436					3647073	0	3647073		2057467	2057467		-3707969	Due to change in scope of work
19	Earthwork outside borrow pits in ordinary soill undressed transportation of earthwork lead upto 5 miles.	%oCft	533560	381717	470220		1385497		4268060					224303	0	224303		1234241	1234241		-3033819	Due to change in scope of work

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Table columns (left to right): Sr. No. | Description | Unit | **Quantity** [Distributor, Bed fixer, Left bank, Management, Total Qty] | Rates | Amount | **Work done** [Qty of Distributor Bed fixer Left bank, tender rate, Premium, Amount] | **Revised PC-1 Work to be done** [Qty of Additional works, Qty of Management, Total quantity, Rates as per 2ND QUARTER MRS 06, Amount, Amount 14+19] | **Difference 20-10** [+ive, -ive, remarks]

Sr. No.	Description	Unit	Distributor	Bed fixer	Left bank	Management	Total Qty	Rates	Amount	Qty of Distributor, Bed fixer, Left bank	tender rate	Premium	Amount	Qty of Additional works	Qty of Management	Total quantity	Rates as per 2ND QUARTER MRS 06	Amount	Amount 14+19	+ive	-ive	(23)
			4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1		%Cft	0	0	0	1899178	1899178		19678851	19678851						0	0	0	0		-19678851	Due to change in scope of work
20	Carriage of stone by department	Nos	6876	3867	0	19798	30541							5109	0	5109	0	0	0	0		Due to change in scope of work
21	Providing & supplying Gabions.	Job												5109	0	5109		134943	134943	134943		Due to change in scope of work
	Carriage of gabion from D.G.Khan to site of work													475870	0	475870		268451	268451	268451		Due to change in scope of work
23	Refilling of earth work	%oCft											22962123		0	0	0			22962123	22962123		Due to change in scope of work
24	Main distributor departmental work	Job				0			634108						0	0	0		0	0		-634108	Due to change in scope of work
25	Shifting and Mobilization of machinery	Job				0			694468				988276		0	0	0		988276	988276	293808		Due to change in scope of work
26	Camp office	Job				0			888844						0	0	0		0	0		-888844	Due to change in scope of work
27	Approached road	Job				0			1812018						0	0	0		0	0		-1812018	Due to change in scope of work
28	Running Govt: Vehicles	Job				0			200000						0	0	0		0	0		-200000	Due to change in scope of work
29	Supply of water for sprinkling on road	Job																	3132000	3132000	3132000		Due to change in scope of work
30	Stake holder's awareness.	Job																	5026673	5026673	5026673		Due to change in scope of work
31	Training center & Training material for social mobilization	Job																	7000000	7000000	7000000		Due to change in scope of work
32	Maintenance cost of executed work	Job																	2676559	2676559	2676559		Due to change in scope of work
33	Stone for initial launching.	Job												3543601							3543601			
35	Misc: Work																					-3272053	

Total:- 189983567 | 114740063 | Total:- 39971.451 | 154711514 |

GOI:- 162000000 | COST OF MACHINERY | 162000000 | Total:- 162000000 | 0.000 | 162000000 | 0 |

Add 3% W.C & Contigency 4574923 | Add 3% W.C & Contigency | 814887 | 814887 | -3760036

Total:- 355558490 | TOTAL 276740063 | Total:- 40786338 | 317526401 | -38032090

Rs. In Million 355.558 | Rs. In Million 276.740 | Rs. In Million 40.786 | 317.526 | -38.032

3 year O & M cost @ 1.5%P.year 8,710 | 3 year O&M @ 1.5% p.year 0 | 3 year O&M @ 1.5% p.Year 0.000 | 0.000 | -8.710

Sub Total GOP 364.268 | Sub Total GOP 276.740 | Sub Total GOP 40.786 | 317.530 | -46.738

G.Total:- 364.268 | G.Total:- 276.740 | G.Total:- 40.786 | 317.530 | -46.738

EXECUTIVE ENGINEER,
D.G.KHAN CONSTRUCTION DIVISION,
DERA GHAZI KHAN.

SUB DIVISIONAL OFFICER,
TAUNSA CONSTRUCTION SUB DIVISION,
DERA GHAZI KHAN.

14A

GEN: ABSTRACT OF COST

Estimate

REVISED PC-I OF FAN MANAGEMENT OF MITHAWAN HILL TORRENT IN DISTRICT D.G.KHAN.

GENERAL ABSTRACT OF COST

Sr. No	Description	Amount
1	Distributor	111196462
2	Misc:	3543601
3	Cost of machinery	162000000
	Total work done (A)	276740063
4	Additional works recommended in model study	22136224
5	Stake holder's awareness.	3132000
6	Construction of training center, training material and honouraria	5026673
7	3 year O&M Cost / Maintenance cost of executed works	7000000
8	Stone for initial launching.	2676559
	Total work to be done (B)	39971456
	Total:- (A+B)	316711519
	Add W.C& contigency on additional work (item No. 4 and 6) @ 3%	814887
	G.Total:-	317526406
	Rs. In Million.	317.530

EXECUTIVE ENGINEER,
D.G.KHAN CONSTRUCTION DIVISION,
DERA GHAZI KHAN.

SUPERINTENDING ENGINEER,
PROJECT CIRCLE, IRRIGATION,
DERA GHAZI KHAN.

30/05
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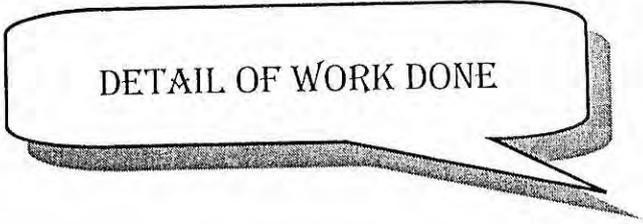
DETAIL OF WORK DONE

REVISED PC-I OF FAN MANAGEMENT OF MITHAWAN HILL TORRENT IN DISTRICT D.G.KHAN

ABSTRACT OF COST

WORK DONE

DISTRIBUTOR

Main distributor contractor work	=	84708192
Main distributor shuttering work	=	2537871
Main distributor departmental work	=	22962123
Camp office, Workshop & machinery shed	=	988276
Sub Total:- =		111196462

MISCELLANEOUS

Total station, Multimedia, Digital Camera, Model study, Adjustment of vehicles, computer with printer, Wireless sets	=	3543601

COST OF MACHINERY

	=	162000000
G.Total:- =		276740063

WORK TO BE DONE

ADDITIONAL WORK RECOMMENDED IN MODEL STUDY

Departmental work	=	4254597
Contractor work	=	17881627
Sub Total:- =		22136224
Stake holder's awareness.	=	3132000
Construction of training center	=	5026673
Maintenance cost of executed work	=	7000000
Stone for initial launching.	=	2676559
Sub Total:- =		17835232
Total:- =		39971456
Add W.C & Contigencies =		814887
G.Total:- =		40786343
SAY :- =		40.786
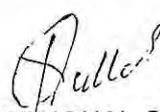
SUB DIVISIONAL OFFICER
TAUNSA CONSTRUCTION SUB DIVISION
DERA GHAZI KHAN.

EXECUTIVE ENGINEER
D.G.KHAN CONSTRUCTION DIVISION
DERA GHAZI KHAN.

COMPARATIVE STATEMENT OF MITHAWAN PROJECT.

CONTRACTOR WORK.

S/No	Description	Actual work done at site.			
		Quantity	Rate	Premium	Cost
1	Supplying and dumping stone at site.	2390304	521.80	-29%	8855550
2	Carriage of stone lead 20 Km Hilly kacha.	7063096	265.19	-29%	13298743
3	Coursed rubble masonary 1:6.	74334	3651.65	-8%	2497264
4	P/L Spawl filling on slope.	949039	464.50	-29%	3129883
5	P/l Stone pitching on slope.	1762501	976.80	-29%	12223438
6	Coursed rubble masonary 1:3.	346685	4114.95	-8%	13124641
7	P.C.C 1:3:6.	581671	4777.40	at par	27788750
8	P/L spawl on level.	213790	417.20	-29%	633272
9	Supplying and filling stone in wire crates.	668107	665.50	-29%	3156839
				Total:-	84708192

Sub Divisional Officer
Taunsa Construction Sub Division
Dera Ghazi Khan

Executive Engineer
Construction Division (Irrg)
Dera Ghazi Khan

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CONTRACTOR WORK

DISTRIBUTOR , BED FIXER AND U/S LEFT BANK

DETAIL OF QUANTITIES   (WORK DONE)

1. Supply and dumping at site without boat including handling of material with in 3 chain stone or boulders.

Description	Calculation	=	Quantity
U/s Hud wali to escape R/s U/s Guide bund	1 × 457 × 10 × 3	=	13710
	1 × 403.5 × 10 × 3	=	12105
	1 × 2559 × 10 × 3	=	76770
Main bank escape right side U/s	1 × 309.5 × 10 × 3	=	9285
Escape right side U/s guide bank	1 × 313 + 356 / 2 × 18 × 4	=	24084
Escape R/s D/s Guide bund to escape B/F R/s U/S G.bund+D/s guide bund+back			
Escape right side D/s guide bank	1 × 378.5 + 316 / 2 × 18 × 4	=	25002
Main bund escape right side D/s	1 × 309.5 × 8 × 3	=	7428
D/s right bank # 2	1 × 920.5 × 8 × 3	=	22092
Main bund escape B/F R/side U/s	1 × 246 × 8 × 3	=	5904
Main bund escape B/F R/side D/s	1 × 224 × 8 × 3	=	5376
Escape B/F right side U/s G/bank	1 × 287 + 313 / 2 × 8 × 3	=	7200
Escape B/F right side D/s G/bank	1 × 286.5 + 311 / 2 × 8 × 3	=	170
Tandowani Bund(Left bank)+Main bund L/distributore L/S U/S guide bank.			
Left distributor L/s U/s G/bank	1 × 473 + 602 / 2 × 35 × 4	=	75250
Left distributor L/side bank	1 × 138 × 10 × 3	=	4140
Main bund L/distributor L/s U/s	1 × 1007.5 × 10 × 3	=	30225
Tandowani Bund(Left bank)	1 × 1187.0 × 10 × 3	=	35610
	1 × 402.0 × 10 × 3	=	12060
	1 × 755.3 × 10 × 3	=	22658
Main bund L/D L/S D/s+D/s G.bund+D/S left bank.			
L/distributor L/s D/s G/bank	1 × 489.5 + 330 / 2 × 55 × 4	=	90145
L/distributor main bund D/s	1 × 700.5 × 8 × 3	=	16812
D/s left bank	1 × 783.0 × 8 × 3	=	792
Main bund Left B/F U/S L/side+D/s G.banks			
Left B/F L/S U/s G/bank	1 × 300 + 277 / 2 × 8 × 3	=	6924
Left B/F L/S D/s G/bank	1 × 312 + 287 / 2 × 8 × 3	=	7188
Left B/F main bund U/S	1 × 502.0 × 8 × 3	=	12048
Left B/F main bund D/S	1 × 81.0 × 8 × 3	=	1944
Escape L/S U/S guide bank+Main bund escape left side U/S + main bund R/dist U/S + G.Bank R/S U/S.			
Escape L/s U/S G/bank	1 × 302 + 357.5 / 2 × 18 × 4	=	23742
Main bund escape L/s U/s	1 × 426.25 × 10 × 3	=	12788
Main bund R/distributor R/s U/s	1 × 440.5 × 10 × 3	=	13215
R/distributor R/s U/s G/bank	1 × 635 + 482 / 2 × 35 × 4	=	78190
	1 × 30 × 35 / 2 × 4	=	2100
	1 × 100 + 96 / 2 × 10 × 3	=	2940
Main bund escape L/S D/S+D/s G.Bank.			
Main bund escape L/s.	1 × 342.75 × 8 × 3	=	8226
Main bund escape L/s corner.	1 × 8.00 × 18 / 2 × 3	=	216
D/s G/bank escape L/s	1 × 369 + 311 / 2 × 18 × 4	=	24480

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Circular bund (D/s R/bund.l)															
Circular bund outer side	=	1	x	969	+	948.5	/	2	x	8	x	3		=	23010
	=	1	x	18	x	8	/	2	x	3				=	216
Circular bund inner side	=	1	x	938	+	931	/	2	x	8	x	3		=	22428
D/s right bund # 1	=	1	x	1500.25	x	8	x	3						=	36006
	=	1	x	688.75	x	8	x	3						=	16530
	=	1	x	6.00	x	6	/	2	x	3				=	54
D/s right bund # 1 X-spur	=	1	x	17.5	+	8	/	2	x	8	x	3		=	306
	=	1	x	72.00	x	8	x	3						=	728
	=	1	x	92.5	+	116	/	2	x	8	x	3		=	2502
	=	1	x	67.00	x	8	x	3						=	1608
	=	1	x	21	+	16	/	2	x	8	x	3		=	444
Main bund R/distributor R/s D/s+G.Bank															
R/distributor R/s D/s G/bank	=	1	x	506	+	300	/	2	x	55	x	4		=	88660
	=	1	x	47	x	20	/	2	x	4				=	1880
	=	1	x	56.5	x	17	/	2	x	4				=	1921
R/distributor main bund D/s	=	1	x	403.50	x	8	x	3						=	9684
	=	1	x	151.00	x	8	x	3						=	3624
Main bund Right B/F R/S U/S+U/S & D/s guide bank															
Right B/F main bund	=	1	x	707.50	x	8	x	3						=	16980
Curve	=	1	x	33.75	+	39	/	2	x	8	x	3		=	873
R/s B/F main bund	=	1	x	648.00	x	8	x	3						=	15552
R/s B/F U/s G/bank	=	1	x	314.50	+	302	/	2	x	8	x	3		=	7398
R/s B/F D/s G/bank	=	1	x	315.00	+	293	/	2	x	8	x	3		=	7296
R. B/F main bund D/s	=	1	x	52.25	x	8	x	3						=	1254
Main bund R/distributor L/s U/s+C.Bund U/S R/s(U/s+D/s G.Bank)															
R/distributor L/s U/s G/bank	=	1	x	460.00	+	610	/	2	x	35	x	4		=	74900
	=	1	x	156.00	x	10	x	3						=	4680
R/distributor main Bund U/s	=	1	x	374.75	x	10	x	3						=	11243
Central bund R/side U/S	=	1	x	302.75	x	10	x	3						=	9083
R/distributor L/side D/s G/bank	=	1	x	508.00	+	339	/	2	x	55	x	4		=	93170
R/distributor main bund D/s	=	1	x	396.00	x	8	x	3						=	9504
Central bund from R/s distributor to B/F D/s	=	1	x	950.50	x	8	x	3						=	22812
Main bund L/distributor R/s U/s+D/s+U/s centeral bund(U/S&D/s G.Banks).															
L/distributor U/s G/bank	=	1	x	644.00	+	481	/	2	x	35	x	4		=	78750
	=	1	x	31.00	x	35	/	2	x	4				=	2170
	=	1	x	83.00	x	10	x	3						=	2490
L/distributor main bund U/s	=	1	x	417.50	x	10	x	3						=	12525
Centeral bund U/s	=	1	x	291.50	x	10	x	3						=	8745
L/distributor D/s G/bank	=	1	x	500.00	+	314	/	2	x	55	x	4		=	89540
L/distributor main bund D/s	=	1	x	418.50	x	8	x	3						=	10044
Centeral bund D/s	=	1	x	905.50	x	8	x	3						=	21732
Main bund Left B/F U/S R/side+U/S&D/s G.banks+C.Bund															
Left B/F U/s G/bank R/side.	=	1	x	319.00	+	293	/	2	x	8	x	3		=	7344
Left B/F D/s G/bank R/side.	=	1	x	326.00	+	295	/	2	x	8	x	3		=	7452
Left B/F main bund U/S R/s	=	1	x	201.00	x	8	x	3						=	4824
Left B/F main bund U/S R/s curve	=	1	x	8.00	+	21.75	/	2	x	8	x	3		=	357
Left B/F main bund D/S R/s	=	1	x	165.00	x	8	x	3						=	3960
Centeral bund D/s B/F bund L/side	=	1	x	952.25	x	8	x	3						=	22854
X-spur(U/S75.75+D/s80=155.75	=	1	x	155.75	x	8	x	3						=	3738
Main bund Right B/F L/S U/S+D/S & D/s guide bank+C.Bund															
Right B/F U/S guide bank left side	=	1	x	331	+	291	/	2	x	8	x	3		=	7464
Right B/F D/s guide bank Left side	=	1	x	308	+	284	/	2	x	8	x	3		=	7104

Description															Result
B/F bund U/S	=	1	x	212.25	x	8	x	3						=	5094
B/F bund U/S curve	=	1	x	9	+	33.5	/	2	x	8	x	3		=	510
B/F bund D/S	=	1	x	210.50	x	8	x	3						=	5052
B/F bund D/S curve	=	1	x	9	+	21.25	/	2	x	8	x	3		=	363
Centeral bund R/side D/S from B/F bund	=	1	x	950.50	x	8	x	3						=	22812
Centeral bund+Shirti bund															
Centeral bund R/side	=	1	x	2005.00	x	8	x	3						=	48120
Centeral bund R/side	=	1	x	1901.00	x	8	x	3						=	45624
Centeral bund R/side	=	1	x	1302.50	x	8	x	3						=	31260
Centeral bund L/side	=	1	x	1980.00	x	8	x	3						=	47520
Centeral bund L/side curve	=	1	x	28	+	32	/	2	x	8	x	3		=	720
Shirti bund	=	1	x	1559.50	x	8	x	3						=	37428
B/F escape main bund+G.bank L/S U/S+D/s															
U/s guide bank of escape B/F left side	=	1	x	276	+	303	/	2	x	8	x	3		=	6948
U/s guide bank of escape B/F left side curve	=	1	x	32	+	17	/	2	x	8	x	3		=	588
B/F bund U/s left side	=	1	x	60.00	x	8	x	3						=	1440
B/F bund curve	=	1	x	10	+	0	/	2	x	8	x	3		=	120
D/s guide bank left side	=	1	x	265	+	290	/	2	x	8	x	3		=	6660
D/s guide bank left side curve	=	1	x	42	+	27	/	2	x	8	x	3		=	828
B/F bund D/s left side	=	1	x	53.50	x	8	x	3						=	1284
B/F bund D/s left side curve	=	1	x	33.5	+	20	/	2	x	8	x	3		=	642
Phulco bund															
Phulco bund U/S	=	1	x	597.50	x	8	x	3						=	14340
Phulco bund D/S	=	1	x	597.50	x	8	x	3						=	14340
D/s Shirti bund	=	1	x	594.75	x	8	x	3						=	14274
Ghariba Wah	=	1	x	1712.33	x	8	x	3						=	41096
Left distributor U/S apron	=	1	x	340.00	x	35	x	3.3						=	39270
Left distributor D/S apron	=	1	x	300.00	x	53.9	x	1						=	16170
Left distributor D/S apron	=	1	x	300.00	x	55	x	3						=	49500
Rigth distributor U/S apron	=	1	x	340.00	x	35	x	3.3						=	39270
Rigth distributor D/S apron	=	1	x	300.00	x	53.9	x	1						=	16170
	=	1	x	300.00	x	55	x	3						=	49500
Left B/F apron	=	1	x	804.00	x	20	x	3						=	48240
Right B/F apron	=	1	x	804.00	x	20	x	3						=	48240
Escape U/s apron	=	1	x	1664.00	x	21	x	3						=	104832
Escape D/s apron	=	1	x	1664	x	11	+	10	/	2	x	4		=	69888
Escape D/s apron	=	1	x	1664	x	11.18	+	10.75	/	2	x	4		=	72983

Total:- = 2390304

2 Coursed rubble masonary hammer dressed other than building in cement sand morter 1:6 (profiles)

Description									Result
U/s right bund & escape right side U/S guide bund	=	4	x	29.06	x	2	x	2	=	465
	=	5	x	28.55	x	2	x	2	=	571
	=	25	x	28.58	x	2	x	2	=	2858
	=	3	x	40.47	x	2	x	2	=	486
	=	6	x	40.54	x	2	x	2	=	973
Escape right side D/S guide bund	=	6	x	40.36	x	2	x	2	=	969
Main bund D/S	=	3	x	40.30	x	2	x	2	=	484
D/S right bund	=	10	x	28.54	x	2	x	2	=	1142
Main bund escape B/F U/S	=	4	x	28.99	x	2	x	2	=	464
Main bund escape B/F D/S	=	4	x	28.91	x	2	x	2	=	463
U/S guide bund	=	5	x	28.71	x	2	x	2	=	574
D/S guide bund	=	5	x	28.14	x	2	x	2	=	563

Tandowani bund (U/S left bank)&
main bund and L.distributor U/S and
guide bund.

U/S guide bund	=	14	x	40.71	x	2	x	2	=	2280
U/S main bund	=	11	x	40.21	x	2	x	2	=	1769
	=	8	x	25.68	x	2	x	2	=	822
	=	5	x	21.98	x	2	x	2	=	440
	=	4	x	22.00	x	2	x	2	=	352
	=	8	x	21.81	x	2	x	2	=	698

Main bund left distributor D/S and
D/S guide bund and D/s left bank.

D/s guide bund	=	7	x	41.10	x	2	x	2	=	1151
	=	9	x	40.04	x	2	x	2	=	1441
	=	9	x	28.90	x	2	x	2	=	1040

Main bund left B/F left side U/S & D/S
and guide banks

U/S guide banks	=	8	x	28.86	x	2	x	2	=	924
U/S main bund	=	6	x	28.57	x	2	x	2	=	686
D/s guide bund	=	7	x	29.06	x	2	x	2	=	814
D/s main bund	=	2	x	29.06	x	2	x	2	=	232

Escape left side U/s guide
bund&Main bund escape left side U/S

U/S guide bund	=	6	x	39.82	x	2	x	2	=	956
	=	5	x	40.28	x	2	x	2	=	806
	=	5	x	40.50	x	2	x	2	=	810
	=	11	x	40.58	x	2	x	2	=	1786

Main bund escape left side D/s and
guide bank D/s

U/s guide bund	=	6	x	40.27	x	2	x	2	=	966
	=	4	x	40.50	x	2	x	2	=	648

Circular bund (D/s right bund No.I)

outer side	=	12	x	29.02	x	2	x	2	=	1393
Inner side	=	12	x	28.67	x	2	x	2	=	1376
	=	16	x	28.98	x	2	x	2	=	1855
	=	8	x	28.40	x	2	x	2	=	909

Main bund Right distributor D/s and
guide bund right side D/s.

D/S guide bund	=	5	x	40.35	x	2	x	2	=	807
D/s main bund	=	5	x	40.86	x	2	x	2	=	817
	=	1	x	34.66	x	2	x	2	=	139
	=	1	x	29.06	x	2	x	2	=	116

Main bund right bed fixer right side
U/s and U/s &D/s guide bund

U/s guide bund	=	7	x	28.05	x	2	x	2	=	785
U/S main bund	=	7	x	28.39	x	2	x	2	=	795
inclined	=	8	x	28.55	x	2	x	2	=	914
D/S guide bund	=	6	x	28.53	x	2	x	2	=	685
D/s main bund	=	2	x	28.16	x	2	x	2	=	225

Main bund right distributor left side
U/s and central bund U/s right side
D/s.

U/S guide bund	=	11	x	40.39	x	2	x	2	=	1777
Main bund	=	6	x	40.79	x	2	x	2	=	979
Centeral bund U/s right side	=	4	x	28.63	x	2	x	2	=	458
D/S guide bund	=	7	x	40.77	x	2	x	2	=	142
Main bund	=	6	x	40.84	x	2	x	2	=	980
Centeral bund right side D/s	=	11	x	28.94	x	2	x	2	=	1273

Main bund left distributor U/s and U/s
& D/s guide bund and U/s centeral
bund

U/S guide bund	=	14	x	40.39	x	2	x	2	=	2262

Main bund U/s	=	5	x	40.93	x	2	x	2			=	819
U/s centeral bund	=	4	x	28.64	x	2	x	2			=	458
D/S guide bund	=	6	x	41.10	x	2	x	2			=	986
Main bund D/S	=	5	x	40.83	x	2	x	2			=	817
Central bund D/s left side	=	11	x	28.88	x	2	x	2			=	1271

Main bund left B/F right side U/S&D/s and guide bund U/S&D/s

Left B/F main bund U/s right side	=	3	x	28.66	x	2	x	2			=	344
Left B/F main bund U/s guide bund	=	6	x	28.63	x	2	x	2			=	687
D/S guide bund	=	7	x	28.87	x	2	x	2			=	808
D/s main bund	=	3	x	28.88	x	2	x	2			=	347
Central bund left side	=	11	x	28.49	x	2	x	2			=	1254

Main bund right B/F left side U/s and D/s and guide bund U/s

Right B/F left side U/s guide bund	=	7	x	29.01	x	2	x	2			=	812
Right B/F left side main bund	=	4	x	28.84	x	2	x	2			=	461
D/S guide bund	=	7	x	28.54	x	2	x	2			=	799
Main bund	=	4	x	29.01	x	2	x	2			=	464
Central bund right side	=	11	x	29.00	x	2	x	2			=	1276

Central bund and shirti bund

Central bund right side	=	20	x	28.84	x	2	x	2			=	2307
	=	19	x	28.69	x	2	x	2			=	2180
	=	14	x	28.55	x	2	x	2			=	599
Central bund left side	=	21	x	28.79	x	2	x	2			=	2418
Shirti bund	=	17	x	28.52	x	2	x	2			=	1939

B/F escape main bund and guide bund left side U/s and D/s

U/s guide bund	=	8	x	29.00	x	2	x	2			=	928
D/S guide bund	=	7	x	29.00	x	2	x	2			=	812
Phulco bund D/s	=	1	x	23.00	x	2	x	2			=	92
	=	1	x	22.00	x	2	x	2			=	88
	=	1	x	23.25	x	2	x	2			=	93
	=	1	x	22.33	x	2	x	2			=	89
	=	1	x	23.00	x	2	x	2			=	92
	=	1	x	21.75	x	2	x	2			=	87
	=	1	x	21.50	x	2	x	2			=	86
Phulco bund U/s	=	1	x	35.25	x	2	x	2			=	141
	=	1	x	35.75	x	2	x	2			=	143
	=	1	x	34.50	x	2	x	2			=	138
	=	1	x	34.75	x	2	x	2			=	139
	=	1	x	35.50	x	2	x	2			=	142
	=	1	x	34.16	x	2	x	2			=	137
	=	1	x	33.58	x	2	x	2			=	134
D/s shirti bund	=	1	x	23.08	x	2	x	2			=	92
	=	1	x	22.16	x	2	x	2			=	89
	=	1	x	22.67	x	2	x	2			=	91
	=	1	x	22.75	x	2	x	2			=	91
	=	1	x	22.25	x	2	x	2			=	89
	=	1	x	21.75	x	2	x	2			=	87
	=	1	x	22.50	x	2	x	2			=	90
										Total:- =		¯1334

3 Providing laying stone pitching for top layer only on slope.

a U/s Hud wali to escape R/s U/s Guide bund

U/s Hadwali	=	1	x	457.50	x	29.06	x	1.3			=	17283
	=	1	x	30.00	x	29.06	/	2	x	1.3		=	567
	=	1	x	403.50	x	28.55	x	1.3			=	14976
	=	1	x	2559.00	x	28.58	x	1.3			=	95077
Curve	=	1	x	(0+55.5)/2	x	(29.06+40.75)/2	x	1.30			=	1259
Main bund	=	1	x	319.50	x	40.47	x	1.3			=	16809
Curve	=	1	x	(0+65.75)/2	x	(40.33+40.83)/2	x	1.30			=	1734

Guide bund	=	1	x	199.50 + 325.00 /	2.00 x	40.54 x	1.30	=	13821

b Escape R/s D/s Guide bund to escape B/F R/s U/S G.bund+D/s guide bund+back

U/s guide bund	=	1	x 212.50 + 333.00 /	2.00 x	40.36 x	1.30	=	14311
Main bund	=	1	x 317.50 x 40.3 x	1.3			=	16634
Curve	=	1	x (0+52.50)/2 x	(40.30+28.54)/2 x	1.30		=	1175
D/S right bund	=	1	x 920.50 x 28.54 x	1.3			=	34152
Main bund B/F U/s	=	1	x 254.00 x 28.99 x	1.3			=	9572
Main bund B/F D/s	=	1	x 224.00 x 28.91 x	1.3			=	8419
U/s curve	=	1	x 0.00 + 43.50 /	2.00 x	28.95 x	1.30	=	819
U/s guide bund	=	1	x 220.00 + 295.00 /	2.00 x	28.71 x	1.30	=	9611
D/S guide bund	=	1	x 213.50 + 294.50 /	2.00 x	28.14 x	1.30	=	9292
D/s curve	=	1	x 0.00 + 44.50 /	2.00 x	28.52 x	1.30	=	825

c Tandwani bund (U/s left bank)+main bund L.distributor U/s + guide bund.

U/s guide bund	=	1	x 496.00 + 621.00 /	2.00 x	40.71 x	1.30	=	29557
Curve	=	1	x 0.00 + 61.75 /	2.00 x	40.50 x	1.30	=	1626
Main bund	=	1	x 1007.50 x 40.21 x	1.3			=	52665
Curve	=	1	x (0+47.50)/2 x	(35+27.83)/2 x	1.30		=	970
	=	1	x 700.00 x 25.68 x	1.3			=	23369
	=	1	x 497.00 x 21.98 x	1.3			=	14201
	=	1	x 402.00 x 22 x	1.3			=	11497
	=	1	x 755.25 x 21.81 x	1.3			=	21414

d Main bund left distributor D/s+D/s guide bund+D/s left bank

D/s guide bund	=	1	x 215.50 + 338.00 /	2.00 x	41.10 x	1.30	=	14787
Curve	=	1	x 0.00 + 62.00 /	2.00 x	40.57 x	1.30	=	1635
Main bund	=	1	x 700.50 x 40.04 x	1.3			=	36462
Curve	=	1	x (0+50.25)/2 x	(39+30.50)/2 x	1.30		=	1135
D/s left bund	=	1	x 791.00 x 28.9 x	1.3			=	29718

e Main bund left B/f Left side U/s+D/s +guide banks.

U/S guide bund	=	1	x 205.00 + 285.00 /	2.00 x	28.86 x	1.30	=	9192
Curve	=	1	x 0.00 + 42.00 /	2.00 x	28.70 x	1.30	=	784
D/s main bund	=	1	x 502.00 x 28.57 x	1.3			=	18645
D/S guide bund	=	1	x 215.00 + 295.00 /	2.00 x	29.06 x	1.30	=	9633
D/s main bund	=	1	x 81.00 x 29.06 x	1.3			=	3060

f escape L/s U/s guide bund +main bund escape L/s U/s

Main bund right distributor U/s + guide bund R/s U/S

Escape L/s U/s Guide bund	=	1	x 189.50 + 312.00 /	2.00 x	39.82 x	1.30	=	12980
Curve (A)	=	1	x 0.00 + 69.00 /	2.00 x	40.05 x	1.30	=	1796
	=	1	x 426.25 x 40.28 x	1.3			=	22320
Curve	=	1	x 0.00 + 29.25 /	2.00 x	40.34 x	1.30	=	767
	=	1	x 440.50 x 40.5 x	1.3			=	23192
U/s guide bund	=	1	x 505.00 + 622.00 /	2.00 x	40.58 x	1.30	=	29727
cure	=	1	x 0.00 + 64.00 /	2.00 x	40.54 x	1.30	=	1686

g Main bund escape L/s D/s+guide bund D/s

D/S guide bund	=	1	x 211.00 + 328.00 /	2.00 x	40.27 x	1.30	=	14109
Curve	=	1	x 0.00 + 71.00 /	2.00 x	40.33 x	1.30	=	1861
Main bund	=	1	x 352.75 x 40.5 x	1.3			=	18572

h Circular bund

outer side	=	1	x 984.50 + 964.00 /	2.00 x	29.02 x	1.30	=	36755
Inner side	=	1	x 938.00 + 951.25 /	2.00 x	28.67 x	1.30	=	35207
	=	1	x 1500.25 x 28.98 x	1.3			=	56520
	=	1	x 688.75 x 28.4 x	1.3			=	25429
	=		x	x			=	646
	=		x	x			=	2714

		=		x		x						=	2158
		=		x		x						=	2526
		=		x		x							1626

i Main bund right distributor D/s and guide bund right side D/s.

D/S guide bund	=	1	x	224.00 + 346.00 /	2.00	x	40.35	x	1.30	=	14950
Curve	=	1	x	0.00 + 61.00 /	2.00	x	40.50	x	1.30	=	1606
D/s main bund	=	1	x	403.50 x 40.86 x	1.3					=	21433
Tapper	=	1	x	151 x 40.75 + 29 / 2	x	1.3				=	6846

j Main bund right bed fixer right side U/S and U/s & D/s guide bund.

U/s guide bund	=	1	x	265.00 + 302.00 /	2.00	x	28.05	x	1.30	=	10338
	=	1	x	648.00 x 28.39 x	1.3					=	23916
Curve	=	1	x	39.00 + 57.00 /	2.00	x	28.50	x	1.30	=	778
	=	1	x	707.50 x 28.55 x	1.3					=	26259
D/S guide bund	=	1	x	259.00 + 298.00 /	2.00	x	28.53	x	1.30	=	10329
	=	1	x	52.25 x 28.16 x	1.3					=	1913

k Main bund right distributor left side U/s and central bund U/s right side D/s.

U/s guide bund	=	1	x	499.00 + 616.00 /	2.00	x	40.39	x	1.30	=	29273
curve	=	1	x	0.00 + 62.25 /	2.00	x	40.50	x	1.30	=	1639
main bund	=	1	x	394.75 x 40.79 x	1.3					=	20932
curve	=	1	x	(0+52.75)/2 x (40.79+28.63)/2 x	1.30					=	1190
Centeral bund U/s right side	=	1	x	302.75 x 28.63 x	1.3					=	11268
D/S guide bund	=	1	x	224.50 + 347.00 /	2.00	x	40.77	x	1.30	=	15145
Curvve	=	1	x	0.00 + 56.00 /	2.00	x	40.80	x	1.30	=	1485
Main bund D/S	=	1	x	396.00 x 40.84 x	1.3					=	21024
Curve	=	1	x	(0+52.50)/2 x (40.84+28.94)/2 x	1.30					=	1191
Centeral bund right side D/s	=	1	x	905.50 x 28.94 x	1.3					=	34067

l Main bund left distributor U/s and U/s & D/s guide bund and U/s centeral bund

U/s guide bund	=	1	x	498.00 + 608.00 /	2.00	x	40.39	x	1.30	=	29036
curve	=	1	x	(0+65)/2 x (40.39+40.93)/2 x	1.30					=	1718
Main bund U/s	=	1	x	417.50 x 40.93 x	1.3					=	22215
curve	=	1	x	(0+48.25)/2 x (40.93+28.64)/2 x	1.30					=	1091
Centeral bund	=	1	x	301.50 x 28.64 x	1.3					=	11225
D/S guide bund	=	1	x	321.00 + 212.00 /	2.00	x	41.10	x	1.30	=	14239
curve	=	1	x	(0+63.50)/2 x (41.10+40.83)/2 x	1.30					=	1691
Main bund D/S	=	1	x	418.50 x 40.83 x	1.3					=	22214
curve	=	1	x	(0+49.50)/2 x (40.83+28.88)/2 x	1.30					=	121
Centeral bund D/s left side	=	1	x	905.50 x 28.88 x	1.3					=	33996

m Main bund left bed fixer right side U/s&D/s and guide bund U/s&D/s

U/s curve	=	1	x	21.75 + 63.25 /	2.00	x	28.66	x	1.30	=	1583
U/S main bund	=	1	x	201.00 x 28.66 x	1.3					=	7489
U/s guide bund	=	1	x	261.00 + 300.00 /	2.00	x	28.63	x	1.30	=	10440
D/S guide bund	=	1	x	261.00 + 306.00 /	2.00	x	28.87	x	1.30	=	10640
D/s main bund	=	1	x	165.00 x 28.88 x	1.3					=	6195
Centeral bund D/s left side	=	1	x	952.25 x 28.49 x	1.3					=	35268
										=	1103
										=	8162
										=	1301

n Main bund right bed fixer left side U/s & D/s and guide bund U/s

U/s guide bund	=	1	x	213.00 + 291.50 /	2.00	x	29.01	x	1.30	=	9513
curve	=	1	x	(4+43)/2 x (29.01+28.84)/2 x	1.30					=	884
U/S main bund	=	1	x	212.25 x 28.84 x	1.3					=	7958
curve	=	1	x	33.50 + 63.00 /	2.00	x	28.84	x	1.30	=	1809
D/S guide bund	=	1	x	213.00 + 279.00 /	2.00	x	28.54	x	1.30	=	9127
curve	=	1	x	0.00 + 40.50 /	2.00	x	28.75	x	1.30	=	757

D/s main bund	=	1	x	210.50	x	29.01	x	1.3						=	7939
curve	=	1	x	21.25	+	68.00	/	2.00	x	29.01	x	1.30		=	1683
Centeral bund	=	1	x	950.50	x	29.01	x	1.3						=	35846

o **Centeral bund and shirti bund**

Centeral bund	=	1	x	2005.00	x	28.84	x	1.3						=	75171
	=	1	x	1901.00	x	28.69	x	1.3						=	70902
	=	1	x	1302.50	x	28.55	x	1.3						=	48342
	=	1	x	1980.00	x	28.79	x	1.3						=	74105
curve	=	1	x	32.00	+	57.50	/	2.00	x	28.60	x	1.30		=	1664
Shirti bund	=	1	x	1569.50	x	28.52	x	1.3						=	58191

p **B/F escape main bund and guide bund left side U/s&D/s**

U/s guide bund	=	1	x	182.00 + 276.00 /	2.00	x	29.06	x	1.30	=	8651
curve	=	1	x	(81+32)/2	x	(29+31+29)/3	x	1.30	=	2179
Main bund U/s	=	1	x	62.00 + 60.00 /	2.00	x	29.06	x	1.30	=	2304
curve	=	1	x	(64.50+10)/2	x	(29+36+29)/3	x	1.30	=	1517
D/s guide bund	=	1	x	180.00 + 265.00 /	2.00	x	29.06	x	1.30	=	8406
curve	=	1	x	(82+42)/2	x	(29+29.5+29)/3	x	1.30	=	2351
Main bund U/s	=	1	x	58.00 + 53.50 /	2.00	x	29.06	x	1.30	=	2106
curve	=	1	x	(75+33.5)/2	x	(29+29.5+29)/3	x	1.30	=	2057

q **Phulco bund D/s**	=	1	x	597.50	x	22.4	x	1.3	=	17399
U/s	=	1	x	597.50	x	34.78	x	1.3	=	27015
Shirti bund	=	1	x	594.75	x	22.45	x	1.3	=	1.358

Total:- = 1810821

D/d profile (quantity of item No.2)	=	74334	x	1.3	/	2	=	48317

Net:- = 1762501

4 **Providing and laying stone or spawl filling on slope.**

(Quantity of item No. 3)	=	1810821	x	0.7	/	1.3	=	975058
D/d profile (quantity of item No.2)	=	74334	x	0.7	/	2	=	26017

Net:- = 949039

5 **Coursed rubble masonary hammer dressed other than building in cement sand morter 1:3 (weir portion)**

Left distributor	=	1	x	410.00	x	20	x	7					=	400
Rigth distributor	=	1	x	410.00	x	20	x	7					=	57400
Escape	=	1	x	1700.00	x	6	+	11.84	/	2	x	1.46	=	22139
	=	1	x	1700.00	x	11.84	x	4					=	80512
	=	1	x	1700.00	x	18.97	+	19.04	/	2	x	4	=	129234

Total:- = 346680

6 **Providing and laying stone or spawl filling on level.**

Left distributor	U/S apron	=	1	x	340.00	x	35	x	0.7	=	8330
	U/S wire crates	=	1	x	410.00	x	19.6	x	0.7	=	5625
	D/S wire crates	=	1	x	410.00	x	30.9	x	0.7	=	8868
Right distributor	U/S apron	=	1	x	340.00	x	35	x	0.7	=	8330
	U/S wire crates	=	1	x	410.00	x	19.6	x	0.7	=	5625
	D/S wire crates	=	1	x	410.00	x	30.9	x	0.7	=	8868
Escape	U/S apron	=	1	x	1700.00	x	21	x	1	=	35700
	U/S wire crates	=	1	x	1700.00	x	6.89	x	1	=	11713
	D/S wire crates	=	1	x	1700.00	x	24.14	x	1	=	41038
Escape bed fixer		=	1	x	1700.00	x	6.89	x	0.7	=	8199
		=	1	x	1700.00	x	27.52	x	0.7	=	32749
	corners	=	2	x	29.00	x	6.9	x	0.7	=	280
Left bed fixer		=	1	x	820.00	x	6.89	x	0.7	=	3955
		=	1	x	820.00	x	27.52	x	0.7	=	15796
	corners	=	1	x	29.00	x	6.9	x	0.7	=	140
Right bed fixer		=	1	x	820.00	x	6.89	x	0.7	=	3955

			=	1	x 820.00	x 27.52	x 0.7								=	15796
		corners =	2	x 29.00	x 6.9	x 0.7							=	280
		x-spur =	1	x 102.00	+ 121	/ 2	x 6.9	x 0.7	=	204

TOTAL = 2?,790

7 Supplying and filling stone in wire crates

Left distributor	=	1	x 410.00	x 19.6	x 2.25	=	18081
	=	1	x 410.00	x 20.7	x 3	=	25461
Escape	=	1	x 410.00	x 30.9	x 2.25	=	28505
	=	1	x 410.00	x 31.05	x 3	=	38192
Rigth distributor	=	1	x 410.00	x 19.6	x 2.25	=	18081
	=	1	x 410.00	x 20.7	x 3	=	25461
	=	1	x 410.00	x 30.9	x 2.25	=	28505
	=	1	x 410.00	x 31.05	x 3	=	38192
Escape	=	1	x 1700.00	x 6.89	x 2.625	=	30747
	=	1	x 1700.00	x 24.14	x 2.625	=	107725
corners =	2	x 10.45	x 17.25	x 7.86	=	.834
Escape bed fixer	=	1	x 1700.00	x 6.89	x 2.625	=	30747
	=	1	x 1700.00	x 27.52	x 2.625	=	122808
corners =	2	x 29.00	x 6.9	x 2.625	=	1051
Left bed fixer	=	1	x 820.00	x 6.89	x 2.625	=	14831
	=	1	x 820.00	x 27.52	x 2.625	=	59237
corners =	1	x 29.00	x 6.9	x 2.625	=	525
Right bed fixer	=	1	x 820.00	x 6.89	x 2.625	=	14831
	=	1	x 820.00	x 27.52	x 2.625	=	59237
corners =	2	x 29.00	x 6.9	x 2.625	=	1051
x-spur =	1	x 102.00	+ 121	/ 2	x 6.9	x 2.625 =	2016

TOTAL = 668107

8 P.C.C 1:3:6

Left distributor

cutoff =	2	X 410	x 78	=	63960
Abutment & Wing wall L&R =	2	X 16919	x	=	33838

Right distributor

cutoff =	2	X 410	x 78	=	63960
Abutment & Wing wall L =	1	X 20181	x	=	20181
Abutment & Wing wall R =	1	X 16919	x	=	16919

Left bed fixer

cutoff =	820	X 78	x	=	63960
Abutment & Wing wall L&R =	2	X 11798	x	=	23596

Right bed fixer

cutoff =	820	X 78	x	=	63960
Abutment & Wing wall L&R =	2	X 11798	x	=	23596

Escape

cutoff =	2	X 1700	x 29.25	=	??45C
Abutment & Wing wall L&R =	2	X 17465	x	=	34930

Escape bed fixer

cutoff =	1	X 1700	x 29.25	=	49725
Abutment & Wing wall L&R =	2	X 11798	x	=	23596

Totall = 581671

9 Carriage of stone from quarry to site of work lead 20Km. Hilly and kacha

Quantity of item No:1(Dumping)	= 2390304	x 1.1	=	2629334
Quantity of item No:2(Masonary 1:6)	= 74334	x 1	=	74334
Quantity of item No:3(Pitching)	= 1762501	x 1.2	=	2115001
Quantity of item No:4(Spawl onslope)	= 949039	x 1	=	949039
Quantity of item No:5(Masonary 1:3)	= 346680	x 1	=	346680
Quantity of item No:6(Spawl on level)	= 213790	x 1	=	213790
Quantity of item No:7(wire crates)	= 668107	x 1.1	=	734918

Total = 7063096

Sub Divisional Officer
Taunsa Construction Sub Division
Dera Ghazi Khan

MAIN DISTRIBUTOR SHUTTERING WORK

DETAIL

1	Right distributor									
		U/s cutoff =	2	x	410	x	18	=	14760	
		D/s cutoff =	2	x	410	x	18	=	14760	
		Right abutment =	1	x	304	x	20	=	6080	
		Left abutment =	1	x	304	x	23	=	6992	
							Total:- =		**42592**	Sft
2	Left distributor									
		U/s cutoff =	2	x	410	x	18	=	14760	
		D/s cutoff =	2	x	410	x	18	=	14760	
		Right abutment =	1	x	304	x	20	=	6080	
		Left abutment =	1	x	304	x	20	=	6080	
							Total:- =		**41680**	Sft
3	Right bed fixer									
		cutoff =	2	x	820	x	18	=	29520	
		Right abutment =	1	x	228	x	20	=	4560	
		Left abutment =	1	x	228	x	20	=	4560	
							Total:- =		**38640**	Sft
4	Left bed fixer									
		cutoff =	2	x	820	x	18	=	29520	
		Right abutment =	1	x	228	x	20	=	4560	
		Left abutment =	1	x	228	x	20	=	4560	
							Total:- =		**38640**	Sft
5	Escape									
		U/s cutoff =	2	x	390	x	10	=	7800	
		D/s cutoff =	2	x	390	x	10	=	7800	
		Right abutment =	1	x	171	x	3	=	513	
		Left abutment =	4	x	284	x	3	=	3408	
							Total:- =		**19521**	Sft
6	Escape									
		U/s cutoff =	2	x	1310	x	2	=	5240	
		=	2	x	1260	x	3	=	7560	
		=	2	x	1060	x	3	=	6360	
							Total:- =		**19160**	Sft
7	Escape									
	D/s cutoff	=	2	x	1310	x	2	=	5240	
		=	2	x	1310	x	3	=	7860	
		=	2	x	1310	x	3	=	7860	
		=	2	x	700	x	2	=	2800	
							Total:- =		**23760**	Sft
8	Escape									
	Abutment right	=	3	x	284	x	3	=	2556	
		=	1	x	179.52	x	3	=	539	
		=	4	x	281.34	x	3	=	3376	
							Total:- =		**6471**	Sft
9	Escape bed fixer	=	2	x	250	x	2	=	1000	
							Total:- =		**1000**	Sft

10	Escape										
	D/s cutoff		=	2	x	610	x	2	=	2440	
	U/s cutoff		=	2	x	50	x	3	=	300	
			=	2	x	50	x	3	=	300	
			=	2	x	200	x	3	=	1200	
			=	2	x	1310	x	2	=	5240	
	Escape abutment		=	2	x	281.34	x	3	=	1688	
			=	1	x	281.34	x	2	=	563	
	Escape bed fixer		=	2	x	1450	x	2	=	5800	
			=	2	x	1700	x	3	=	10200	
			=	2	x	1700	x	3	=	10200	
			=	2	x	1700	x	2	=	6800	
	B/F abutment	L/s =		1	x	224	x	20	=	4480	
		R/s =		1	x	224	x	20	=	4480	

Total:- = 53691 Sft

G.Total:- = 285154 Sft

@ 8.90 P.Sft

Total cost:- = 2537871

Sub Divisional Officer
Taunsa Construction Sub Division
Dera Ghazi Khan

28

MAIN DISTRIBUTOR, BED FIXER AND U/S LEFT BANK

DETAIL OF DEPARTMENTAL WORK

1. Earth work excavation, earth work excavation from out side B.pits, lead 300' in ashes sand and soft soil undressed and refilling of earth work arround structure
   Total quantity of work done = 29720757 Cft

2. Transportation of pucca earth for covering on top and back slopes of banks average lead upto 5 mile
   Total quantity of work done = 774353 Cft

3. Dressing of earth work
   Total quantity of work done = 2566902 Sft

4. Running of truck trailer
   Total quantity of work done = 1717 Km

5. Running of Dozer
   Total quantity of work done = 8783.20 Hours

6. Running of tractor / Trolly
   Total quantity of work done = 10550.30 Hours

7. Running of Loader
   Total quantity of work done = 1467.70 Hours

8. Shifting and mobilization of machinery from D.G.Khan to site of work
   Total quantity of work done = 1.00 Job

9. Carriage of gabion from D.G.Khan store to site of work
   Total quantity of work done = 10709 Nos

Total cost of work done by the department on distributor, U/s left bank, Bed fixer. = Rs:- 22962123

SUB DIVISIONAL OFFICER
TAUNSA CONSTRUCTION SUB DIVISION
DERA GHAZI KHAN.

29

FAN MANAGEMENT OF MITHAWAN HILL TORRENT.

ABSTRACT OF COST. (Camp Office)

Sr. No.	Quantity	Unit	Description.	Rate	Amount
1	2961.52	%o Cft.	E/work excavation in foundation lead 100' shingle or grave.	1471.35	4357
2	1480.76	% Cft.	P.C.C 1:4:8	3011.80	44598
3	2315.218	% Cft.	Pacca brick work other than building upto 10' height, cement sand mortor ratio 1:6.	3297.10	76335
4	1594.06825	% Cft.	Pacca brick work in foundation and plinth in cement sand mortor ratio 1:6.	3186.75	50799
5	226.5	% Sft.	Providing & laying damp proof course of cement concrete 1:2:4 (using cement sand and shingle) including bitumen coating with one coat bitumen and one coat polythine sheet 1 1/2" thick.	1158.95	2625
6	4303.85	% Cft.	Pacca brick work in ground floor cement sand mortor 1:6.	3377.90	145380
7	198.94	P.Cft.	Reinforced cement concrete in roof slab, beams columns lintels,girders and other structure members laid in precast lain, in position or prestressed members cast in situ comploete in all respects, nominal mix 1:2:4.	94.15	18730
8	564.49	% Kg.	Febrication of mild steel reinforcement for cement concrete including cutting, bending, laying in position, making joints and fastenings, including cost of binding wire and labour charges for binding of steel reinforcement (also includes removal of rust bars).	2442.40	13787
9	3154.50	P.Sft.	Providing laying precost prestressed roof slab with beam of approved size and quantity.	60.00	189270
10	3154.50	% Sft.	Single layer of tiles 9"x4 1/2"x1 1/2" laid over 4" earth and 1" mud plaster without bhosa gronted with cement sand 1:3 on top of R.C.C roof bitumen coating sand blinded.	1177.55	37146
11	766.00	P.Sft.	Providing and fixing 1 1/2" thick deodar wood panelled or panelled glazed doors and windows, with mild steel chowkhat etc, comp;lete in all respects (excluding sliding bolt or lock) with M.S angle iron 1 1/2"x1 1/2"x1/4" welded with M.S flat 2"x1/4".	151.60	116126
12	412.00	P.Ft.	Providing fixing G.I wire gauge 22 SWG, 12x12 meshes per square inch fixed to chowkhat, with 3/4" thick fixed to chowkhat, with 3/4" thick deodar wood strip and screws.	16.45	6777
13	412.00	P.Sft.	M.S flat 1/2"x1/8" frame in window of approved design including painting 3 coats complete.	61.30	25256
14	5516.50	% Sft.	Cement plaster 1:4 upto 20' height 3/4" thick.	522.80	28840
15	6981.25	%0 Cft.	Borrowpit excavation undressed lead upto 1 mile in ordianry soil.	1853.35	12939

16	1888.00	% Cft.	Dry brick paving laid flat, sand grouted, including preparation of bed by watering, ramming and bringing the same to proper camber, by 1/2" thick mud plaster.	650.15	12275
17	499.50	% Cft.	Providing, laying watering and ramming brick ballast 1½" to 2" gauge mixed with 25% sand, for floor foundation, complete in all respects.	1003.85	5014
18	999.00	% Sft.	Providing and layign topping of cement concrete 1:2:4 including surface finishing and divding in pannels 1½" thick.	954.30	9533
19	3.00	E.No.	Providing and fixing glazed earthen ware water closet, squatter type combined with foot rest, white.	809.65	2429
20	7.00	E.No.	Providing and fitting P.Trap 4" glazed.	65.55	459
21	60.00	P.Rft.	Providing and fitting PVC 4" dia, including laying and jointing in trenches.	63.25	3795
22	3.00	E.No.	Providing and fixing looking glass 55x40 Cm size, and 5 mm thick first quality.	376.30	1129
23	3.00	E.No.	Providing and fitting glazed earthen ware wash hand basin 55x40 Cm including bracket set, waste pipe and waste coupling etc: white, with pedestal.	1438.10	4314
24	3.00	E.No.	Providing and fitting plastic made low down flushing cistern 3 gallon capacity, including bracket set, copper connection etc complete white.	902.45	2707
25	6.00	E.No.	Providing and fixing chromium mixing valve.	586.10	351
26	9.00	E.No.	Providing and fixing chromium plated tee stop cock heavy 2 Cm.	100.35	903
27	7.00	E.No.	Providing and fixing chromium plated bib cock 1/2".	138.85	972
28	90.00	P.Sft.	Making and fixing steel grated doors, complete with locking arrangement angle iron 2"x2"x3/8" and 3/4" square bars 4" centre to centre.	197.50	17775
29	456	P.Rft.	Providing laying, cutting jointing testing and disinfecting G.I. pipe line in trenches, with socket joints, using G.I. pipes of BBS 1387-1967 complete in all respects, with specials and valves light quality 1/2" dia.	18.75	8550
30	100	P.Rft.	Providing laying, cutting, jointing, testing and disinfecting G.I. pipe line in trenches, with socket joints, using G.I. pipes of BBS 1387-1967 complete in all respects, with specials and valves, light quality 3/4" dia.	25.60	2560
31	1	E.No.	Providing laying water tank made of fiber glass/Plastic 250 gallon.	5000.00	5000
32	700	%.Rft	Providing and fixing barbed wire fencing on compound wall, consisting of 1 1/2"x1 1/2"x3/16" angle iron post 3' long, 4' part embeded in cement concrete 1:4:8 base of size 6"x6"x9" and 4 rows of barbed wire, including binding wire, paintaing posts, etc. complete in all respects.	3489.10	24424
33			Providing camp furniture.		

	15	No.	Steel Charpai	1000.00	15000
	2	No.	Steel Almarah.	4000.00	8000
	2	No.	Offioce table.	3000.00	6000
	8	No.	Office Chair.	600.00	4800
	2	No.	Table steel.	800.00	1600
	6	No.	Chair steel.	600.00	3600
	4	No.	Choldari (double fly).	4000.00	16000
	4	No.	Supply of Balti	150.00	600
	50	No.	Mats	20.00	1000
	1	No.	Utensils.	15000.00	15000
34	1428	% Sft.	Painting new surface. Prepariong surface & painting of door & windows any type (including edges) 3 coats.	531.95	7596
35	10473	% Sft.	White washing new surface 3 coats.	27.65	2896
36	159.58	% Sft.	White glazed tiles 1 1/4" thick dado jointed in white cement mud mortor 3/4" thick including finished.	5663.10	9037
37	11	E.No.	Sliding bolts 12" long.	65.65	722
38	1	E.No.	Providing fitting glazed earthen ware water closet europeon type excluding seat cover white.	1124.35	1124
39	1	E.No.	Providing fitting double seat cover only.	166.05	160
40	6	E.No.	Providing and fixing shower rose chromium plated.	586.10	3517
41	1	E.No.	Providing fitting plastic paper holder.	105.20	105
42	1	E.No.	Providing and fitting plastic i/c towel rail.	77.25	77
43	1	E.No.	Providing and fitting plastic soap dish.	51.55	52
44	1	E.No.	Providing and fitting plastic shelf.	69.80	70
45	3	P.Rft.	Providing and fitting waste pipe 1 1/4" dia.	18.35	55
46	4	E.No.	Providing and fitting flushing bend plastic.	24.35	97
47	9	E.No.	Providing and fitting 1 1/2" dia connection rubber connection.	26.10	235
48	2	E.No.	Providing and fitting water pump electric motor.	2500.00	5000
49	550	P.Rft.	Supplying and errectionof PVC pipe too wring on surface i/c damp and inspect boxes, pull boxes hands, tees joints labairina surface etc complete.	6.85	3768
50			Supply and errection of single core PVC insulated copper conductor cable in prelaid PVC pipe (ratio for cable only) 250 440 volts).		
i)	2400	P.Rft.	3/0.029	2.45	588
ii)	1800	P.Rft.	7/0.029	4.00	7200
51			Supply and errection of copper conductor cable for service connection on prepaid pipe ratior for cable only PVC insulated PVC sheeted wire core 250-440.		
i)	300	P.Rft.	3/0.029	5.60	1680
ii)	300	P.Rft.	7/0.029	9.10	2730

52	24	E.No.	Supply and errection of tube light i/c rod, choke starter with frame flexible wire i/c connection from ceiling core etc single rod with one choke & starter.	340.60	8174
53	34	E.No.	Supply and errection of ceiling rose baklite.	19.05	648
54	1	E.No.	Supply and errection of 3 pin switches & plug combined recessed type.	58.25	58
55	8	E.No.	Supply and errection of cat out open type.	17.00	136
56			Supply and errection of teak wood board 1 3/4" thick.		
i)	15	E.No.	7" x 4"	31.45	472
ii)	2	E.No.	10" x 12"	59.40	119
iii)	5	E.No.	10" x 8".	43.15	216
57	200	E.No.	Supply and errection of switches 5 Amp complete.	16.65	3330
				Total:-	988276

Sub Divisional Officer
Younas Construction Sub Divi...
Dera Ghazi Khan
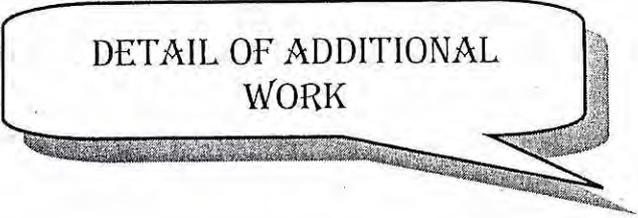
DETAIL OF ADDITIONAL WORK

ITEM WISE DETAIL OF THE EQUIPMENTS
MACHINERY AND MATERIAL FOR PROJECT

Sr. No.	Item.	Unit	Quantity	Cost. (Rs. in Million)
1	Bulldozer (24 tons) with spare parts.	No.	4	49.16
2	Bulldozer (27 tons) with spare parts with ripper	No.	1	13.90
3	Wheel loader (1-2 m^3)	No.	1	4.70
4	T.H. Trailer with spare parts.	No.	1	7.69
5	Front blade tractor (78 HP) with trolley spare parts.	No.	10	12.30
6	Tractor (48 HP) with water tanker and spare parts.	No.	3	2.28
7	4 WD single cabin pick-up with spare parts.	No.	2	1.60
8	Portable concrete mixer with spare parts.	No.	4	3.36
9	Vibratory concrete compactor with generator and spare parts.	No.	3	0.54
10	Conveyor belt with spare parts.	No.	6	0.36
11	Gabions crates.	No.	38900	58.73
12	Geo-textile filters.	M	2350	7.38
			G.TOTAL.	162.00

ADDITIONAL WORK RECOMMENDED IN MODEL STUDY

DEPARTMENTAL WORK

DETAIL & COST.

	Amount

1. Dressing of earth work (done by machinery or otherwise and left undressed) to design section.

Total Quantity	=	3647073	Cft					
Cooly required @ 0.12 per %o Cft	=	438	Nos	x	165	=	72212	
Earth work Dresser @ 0.2 per %o Cft	=	729	Nos	x	300	=	218824	
						Total:- =		291036

2. Earthwork excavation in ashes and soft soil or silt clearance undressed lead upto 300 ft: by machine.

Total Quantity	=	475870	Cft:							
Progress of Dozer	=	5117	Cft/hour							
Due to lead less progress @ 30%.	=	5117	x	0.7	=	3582				
Working hours.	=	475870 /	3582	=	133	Hours.				
Add idle hours @ 10%.	=	133	x	1.10	=	146	x	1837	=	**268458**

3. Earthwork outside borrow pits in ordinary soil undressed transportation of earth work upto lead 300 ft:

Total Quantity	=	3647073	Cft:							
Progress of Dozer	=	5117	Cft/hour							
Due to lead less progress @ 30%.	=	5117	x	0.7	=	3582				
Working hours.	=	3647073 /	3582	=	1018	Hours.				
Add idle hours @ 10%.	=	1018	x	1.10	=	1120	x	1837	=	**2057467**

4. Earthwork outside borrow pits in ordinary aoil undressed transprotation of earthwork lead upto 5 miles.

Totall quantity	=	224303	Cft:							

(I) CARRIAGE.

Capacity of Trolley	=	150	Cft:							
No. of trip.	=	224303 /	150	=	1495	No:				
Time required for 1 No. trip.	=	2	hours.							
Working hours.	=	1495	x	2	=	2991				
Add idle hours @ 10%.	=	2991	x	1.10	=	3290	x	343	=	1128393

(II) LOADING.

Quantity	=	224303	Cft:				
Capacity of loader.	=	2014	Cft:/hour				
Working hours.	=	224303 /	2014	=	111	Hours	

	Add idle hours @ 10%.	=	111	x	1.1	=	123	x	864	=	105848
								Total:-		**=**	**1234241**
5	Refilling of excavated Earth work										
	Quantity	=	475870		Cft:						
	Capacity of Dozer.	=	5117		Cft:/hour						
	Due to lead less progress.	=	3582		Cft.						
	Working hours.	=	475870		3582	=	133		Hours		
	Add idle hours @ 10%.	=	133	x	1.1	=	146	x	1837	=	268451
6	Shifting of gabion from store D.G.Khan to site of work.	=									
	Total quantity of gabiob	=	5109		Nos						
	Qty: of each trip	=	100		Nos						
	Time required for one trip	=	7		Hours						
	Total hours required	=	358		Hours						
	Add idle hours @ 10%.	=	358	x	1.1	=	393	x	343	=	**134943**
								G.Total		**=**	**4254597**

SUB DIVISIONAL OFFICER,
TAUNSA CONSTRUCTION SUB DIVISION,
DERA GHAZI KHAN.

ADDITIONAL WORK AS PER RECOMMENATION OF MODEL STUDY

CONTRACTOR WORK

ABSTRACT OF COST

Sr.No.	Description	Quantity			Total quantity	Unit	Rate as per MRS Jan 2006	Amount
		Guide wall	Hadwali	Hocky spur				
1	E/work excavation in irrigation channel lead 300'	122944	95559	257368	475870	%oCft	Department	
2	E/work borrow pits lead 300'	421842	354236	2870995	3647073	%oCft	Department	
3	Supplying and dumping stone at site	23647	12667	108000	144314	%Cft	707.85	1021525
4	Supplying and filling stone in wire crates	96082	75766	147385	319233	%Cft	959.65	3063518
5	Providing laying stone pitching for top layer only on slope.	51862	31051	200164	283078	%Cft	1372.7	3885810
6	Providing laying graded bajri 1/8" to 2" on slope	47594	21256	113331	182181	%Cft	1684	3067929
7	Supply of gabion	1538	1213	2359	5109	No	Department	
8	Coursed rubble masonary other than building 1:6	2097	1631	6989	10716	%Rft	58215	570260
9	Carriage of stone	243627	157425	641440	1042492	%Sft	600	6254952
10	Dressing of earth work	87183	65838	582345	735366	%oCft	Department	
11	Pucca earth work	23739	9700	190864	224303	%Sft	Department	
12	Refilling of earth work	122944	95559	257368	475870	%oCft	Department	
							Total:-	17863994

Sub Divisional Officer
Taunsa Construction Sub Division
Dera Ghazi Khan

Executive Engineer
Construction Division (Irr)
Dera Ghazi Khan

E TAUNSA SUB DIVISION \ Revised PC-I of MithavanAbs Mod

ADDITIONAL WORK RECOMMENDED IN MODEL STUDY

GUIDE WALL

ABSTRACT OF QUANTITY

1 E/work excavation in irrigation channel lead 300'

U/s apron	=	1	x	814.21	+	826.25	/	2.00	x	13.80	+	19.05	/	2	x	5.25	=			70729
Nose	=	1	x	105.28	+	148.65	/	2.00	x	13.80	+	19.05	/	2	x	5.25	=			10948
Bank	=	1	x	100.00	x	13.80	+	19.05	/	2.00	x	5.25					=			862
bank	=	1	x	655.78	+	649.76	/	2.00	x	6.90	+	12.15	/	2	x	5.25	=			32643

Total:- = 122944 Cft

2 E/work borrow pits lead 300'

Circular	=	1	x	785.00	x	15.00	+	67.00	/	2.00	x	13.00	= 418405
Nose	=	1	x	88.31	+	440.48	/	2.00	x	13.00				= 3437

Total:- = 421842 Cft

3 Supplying and dumping stone at site

D/s	=	1	x	655.78	+	649.76	/	2.00	x	6.90	x	5.25	= 23647

Total:- = 23647 Cft

4 Supplying and filling stone in wire crates

Apron	=	2	x	100.00	x	13.80	x	5.25					= 14490
Apron nose	=	1	x	105.28	+	148.65	/	2.00	x	13.80	x	5.25	= 915
U/s circular	=	1	x	726.25	+	714.21	/	2.00	x	13.80	x	5.25	= 52181
Slope	=	2	x	100.00	x	29.12	x	2.63					= 15288
Nose	=	1	x	23.57	+	105.28	/	2.00	x	29.12	x	2.625	= 4925

Total:- = 96082 Cft

5 Providing laying stone pitching for top layer only on slope.

U/s	=	1	x	714.21	+	691.54	/	2.00	x	29.12	x	1.30	= 26608
D/s	=	1	x	678.45	+	655.78	/	2.00	x	29.12	x	1.30	= 25254

Total:- = 51862 Cft

6 Providing laying graded bajri 1/8" to 2" on slope

Slope (wire crates)	=	2	x	100.00	x	29.12	x	1.00					= 5824
Nose (wire crates)	=	1	x	23.57	+	105.28	/	2.00	x	29.12	x	1.00	= 1876
U/s (Pitching)	=	1	x	714.21	+	691.54	/	2.00	x	29.12	x	1.00	= 2046
D/s (Pitching)	=	1	x	678.45	+	655.78	/	2.00	x	29.12	x	1.00	= 19426

Total:- = 47594 Cft

7 Supply of gabion

Qty: as per item 4	=	96082	/	62.48	= 1538

Total:- = 1538 Nos

8 Coursed rubble masonary other than building 1:6

	=	18	x	29.12	x	2.00	x	2.00 = 2097

Total:- = 2097 Cft

9 Carriage of stone

Qty: as per item 3	=	23647	x	1.10	= 26011
Qty: as per item 4	=	96082	x	1.10	= 105690
Qty: as per item 5	=	51862	x	1.20	= 62235
Qty: as per item 6	=	47594	x	1.00	= 4759*
Qty: as per item 8	=	2097	x	1.00	= 2097

Total:- = 243627 Cft

10 Dressing of earth work

Top	=	785.40	x	20.00							= 15708
Sides	=	2	x	785.40	x	29.12					= 45742
Apron	=	2	x	785.40	x	14.00					= 21991
Nose top	=	1	x	3.14	x	15.00	/	8.00	x	15.00	= 88
Nose slope	=	1	x	23.57	+	105.28	/	2.00	x	29.12	= 1876
Nose apron	=	1	x	105.28	+	148.65	/	2.00	x	14.00	= 1778

Total:- = 87183 Cft

11	Pucca earth work																	=	23562
	Top	=	2	x	785.40	x	15.00	x	1.00									=	23562
	Nose	=	2	x	3.14	x	15.00	x	15.00	/	4.00	x	2.00	x	1			=	177
															Total:-	=	2375. Sft

12	Refilling of earth work								
	Qty: as per item No. 1	=	122944					=	122944
							Total:-	=	122944 Cft

Sub Divisional Officer
Taunsa Construction Sub Divisic
Dera Ghazi Khan

CURVED PORTION & MOLE

5.25'

13.80'

STONE IN GABION

U/S

SPAWAL = 0.70'

2:1

STONE   IN   GABION

15.00'

13.00'

D/S

STONE   IN   GABION

2:1

6.90'

2.625'   2.625'

5.25'

PLAN

100.00'

APRON

STONE

105.28' 148.65'

IN

23.57'

STONE IN GABION

STONE IN GABION

GABION

100.00'

13.80'   26.00'   15.00'   26.00'   13.80'

826.25'

13.80'

814.21'

STONE PITCHING 1.30'
SPAWL ILLINT 0.70'

791.54'

785.00'

778.45'

STONE PITCHING 1.30'
SPAWL ILLINT 0.70'

755.78'

6.90'

749.76'

U/S

D/S

U/S =

D/S =

Sub Divisional Officer
Taunsa Construction Sub Division
Dera Ghazi Khan

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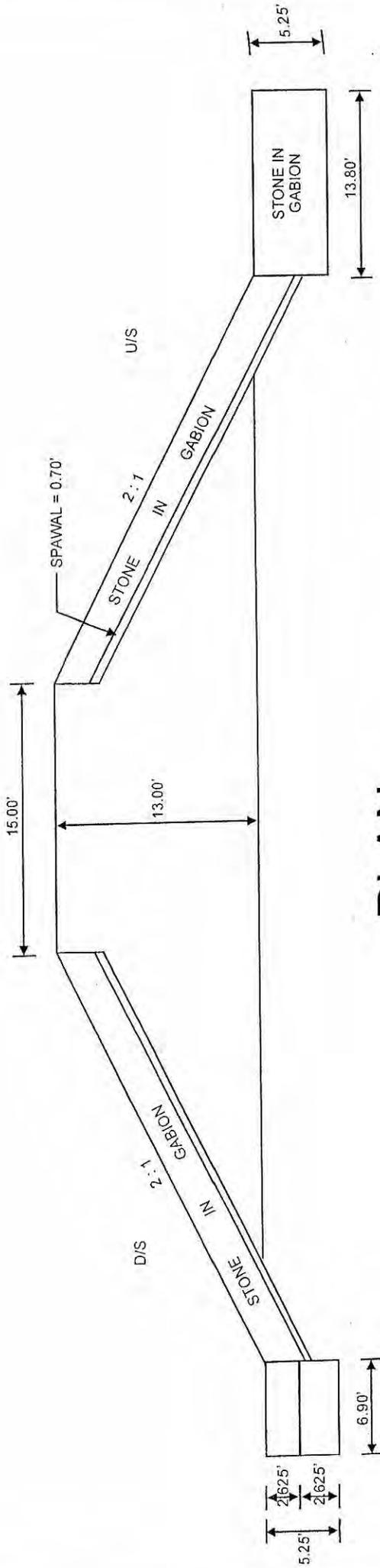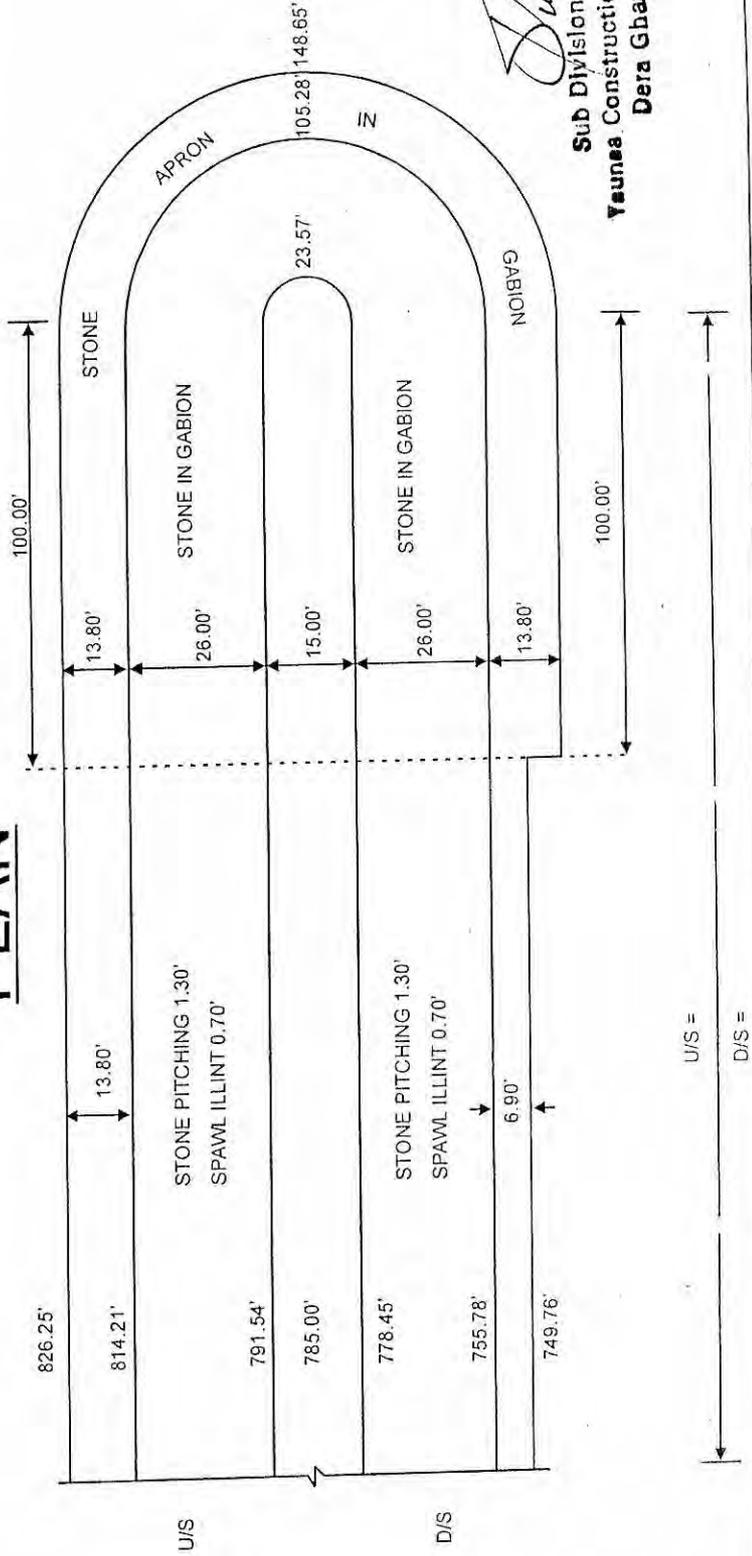
														=	5824
	U/s+D/s slope(w/c)	=	2	x	100	x	29.12								
	Nose (w/d)	=	1	x	31.42	+	113.14	/	2	x	29.12			=	2105
													Total:- =		65838 Cft

11 Pucca earth work

											=	9700
	Top	=	1	x	485	x	20	x	1			
										Total:- =		970 Sft

12 Refilling of earth work

					=	95559
	Qty: as per item No. 1	=	95559			
				Total:- =		95559 Cft

Sub Divisional Officer
Taunsa Construction Sub Division
Dera Ghazi Khan

ADDITIONAL WORK RECOMMENDED IN MODEL STUDY

HOCKY SPUR

ABSTRACT OF QUANTITY

1	E/work excavation in irrigation channel lead 300'																			
	Shank	=	1	x	3600	x	10	+	13	/	2	x	3						=	124200
	U/s straight	=	1	x	430	x	13.8	+	19.05	/	2	x	5.25						=	37079
	U/s circular	=	1	x	315.5	+	301.44	/	2	x	13.8	+	19.05	/	2	x	5.25	=	26600
	Nose	=	1	x	113.14	+	156.51	/	2	x	13.8	+	19.05	/	2	x	5.25	=	11626
	Back	=	1	x	100	x	13.8	+	19.05	/	2	x	5.25						=	8623
	Back	=	1	x	126.08	+	118.85	/	2	x	6.9	+	12.15	/	2	x	5.25	=	6124
	Tondowani wah	=	1	x	500	x	13.8	+	19.05	/	2	x	5.25						=	43116
																	Total:-	=	257368 Cft

2	E/work borrow pits in ordinary soil lead 300'															
	Shank	=	1	x	3600	x	20	+	72	/	2	x	13.00		=	2152800
	Straight	=	1	x	430	x	20	+	72	/	2	x	13.00		=	257140
	Circular	=	1	x	263.76	x	20	+	72	/	2	x	13.00		=	157728
	Nose	=	1	x	157	+	508.68	/	2	x	13				=	4327
	Tondowani wah	=	1	x	500	x	20	+	72	/	2	x	13.00		=	299000
														Total:-	=	2870995 Cft

3	Supplying and dumping stone at site									
	Shank	=	1	x	3600	x	10	x	3	=	108000
										Total:-	=	108000 Cft

4	Supplying and filling stone in wire crates														
	Straight	=	1	x	430	x	13.8	x	5.25				=	31154
		=	1	x	430	x	6.9	x	5.25				=	15577
	Circuler	=	1	x	301.44	+	315.5	/	2	x	13.8	x	5.25	=	22349
	Nose	=	1	x	113.14	+	156.51	/	2	x	13.8	x	5.25	=	9768
	Back	=	1	x	100	x	13.8	x	5.25				=	7245
	Back	=	1	x	116.08	+	118.85	/	2	x	6.9	x	5.25	=	4255
	Sloping portion	=	2	x	100	x	29.12	x	2.625				=	15288
	Nose	=	1	x	31.42	+	113.14	/	2	x	29.12	x	2.625	=	5525
	Tandwani wah	=	1	x	500	x	13.8	x	5.25				=	36225
										Total:-	=	147385 Cft

5	Providing laying stone pitching for top layer only on slope.														
	Shank	=	1	x	3600	x	29.12	x	1.3				=	136282
	U/s+D/s straight	=	2	x	430	x	29.12	x	1.3				=	32556
	U/s circular	=	1	x	174.22	+	201.44	/	2	x	29.12	x	1.30	=	7110
	D/s circuler	=	1	x	153.29	+	126.08	/	2	x	29.12	x	1.30	=	5288
	Tandowani wah	=	1	x	500	x	29.12	x	1.3				=	18928
										Total:-	=	200164 Cft

6	Providing laying graded bajri 1/8" to 2" on slope														
	Shank	=	1	x	3600	x	29.12	x	0.7				=	73382
	U/s+D/s straight	=	2	x	430	x	29.12	x	0.7				=	17530
	U/s circular	=	1	x	174.22	+	201.44	/	2	x	29.12	x	0.70	=	3829
	U/s+D/s gabion	=	2	x	100	x	29.12	x	0.7				=	4077
	D/s circuler	=	1	x	153.29	+	126.08	/	2	x	29.12	x	0.70	=	2847
	Nose	=	1	x	31.42	+	113.14	/	2	x	29.12	x	0.70	=	1473
	Tandowani wah	=	1	x	500	x	29.12	x	0.7				=	10192
										Total:-	=	113331 Cft

7	Supply of gabion						
	Qty: as per item No. 4	=	147385	/	62.48	=	2359
						Total:-	=	2359 Nos

8   Coursed rubble masonary
    other than building 1:6

=	60	x	29.12	x	2	x	2			=	6989
									Total:- =		6989 Cft

9   Carriage of stone

Qty: as per item 3	=	108000	x	1.10	=	118800
Qty: as per item 4	=	147385	x	1.10	=	162124
Qty: as per item 5	=	200164	x	1.20	=	240197
Qty: as per item 6	=	113331	x	1.00	=	11333
Qty: as per item 8	=	6989	x	1.00	=	6989
				Total:- =		641440 Cft

10   Dressing of earth work

Shank top	=	2	x	3600	x	20							=	144000
Apron	=	1	x	3600	x	10							=	36000
Shank Pitching side	=	1	x	3600	x	29.12							=	104832
Back side	=	2	x	3600	x	29.12							=	209664
Hocky spur top	=	2	x	430	x	20							=	17200
Apron	=	2	x	430	x	7	+	14	/	2			=	9030
H.spur(straight) U/s	=	1	x	430	x	29.12							=	12522
H.spur(straight) D/s	=	1	x	430	x	29.12							=	12522
Circuler top	=	2	x	263.76	x	29.12							=	15361
Apron	=	2	x	263.76	x	7	+	14	/	2			=	5539
Sides	=	2	x	263.76	x	29.12							=	153c
Nose top	=	2	x	3.14	x	20	x	20	/	8			=	314
											Total:- =		582345 Cft

11   Pucca earth work

Shank top	=	1	x	3600	x	20	x	1					=	72000
Back	=	1	x	3600	x	29.12	x	1					=	104832
H.spur straight	=	1	x	430	x	20	x	1					=	8600
Circuler	=	1	x	263.76	x	20	x	1					=	5275
Nose	=	1	x	3.14	x	20	x	20	/	8			=	157
											Total:- =		190864 Cft

12   Refilling of earth work

Qty: as per item No. 1	=	257368	=	257368
			Total:- =	257368 Cft

Sub-Divisional Officer
Taunsa Construction Sub Division
Dera Ghazi Khan

PROPOSED X-SECTION OF HOCKEY SPUR
CURVED PORTION & MOLE
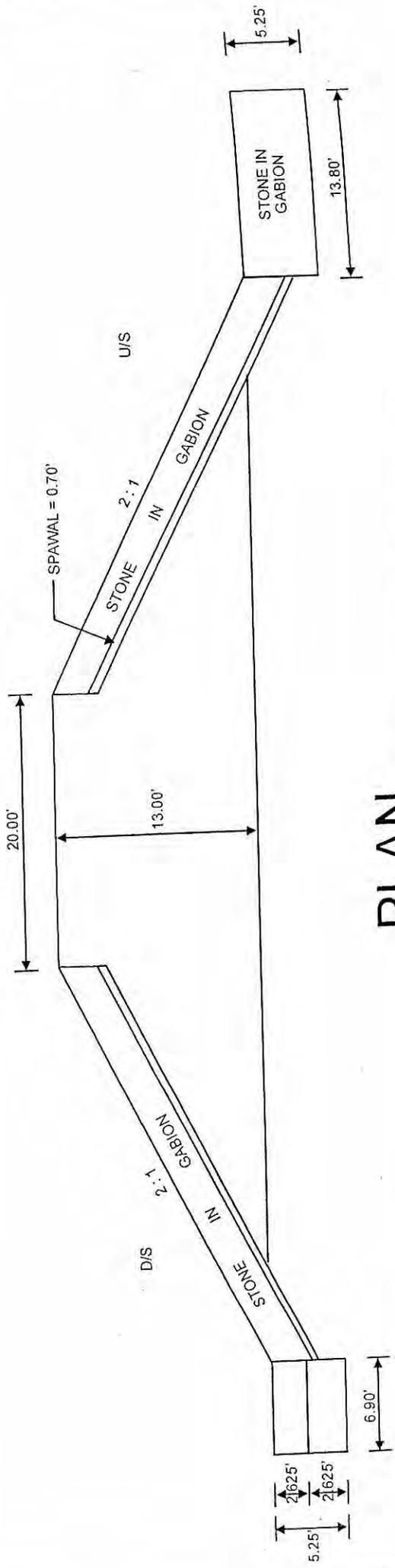
STONE IN GABION

5.25'

13.80'

U/S

SPAWAL = 0.70'

2:1

STONE   IN   GABION

20.00'

13.00'

D/S

2:1

GABION   IN   STONE

6.90'

2.625' 2.625'

5.25'

PLAN

100.00'

STONE   APRON   IN   GABION

113.14' 156.51'

31.42'

STONE IN GABION

20.00'

STONE IN GABION

13.80'   26.00'   20.00'   26.00'   13.80'

100.00'

13.80'

STONE PITCHING 1.30'
SPAWL ILLINT 0.70'

STONE PITCHING 1.30'
SPAWL ILLINT 0.70'

6.90'

315.50'

301.44'

276.22'

263.76'

253.29'

226.08'

218.85'

U/S

D/S

U/S =

D/S =
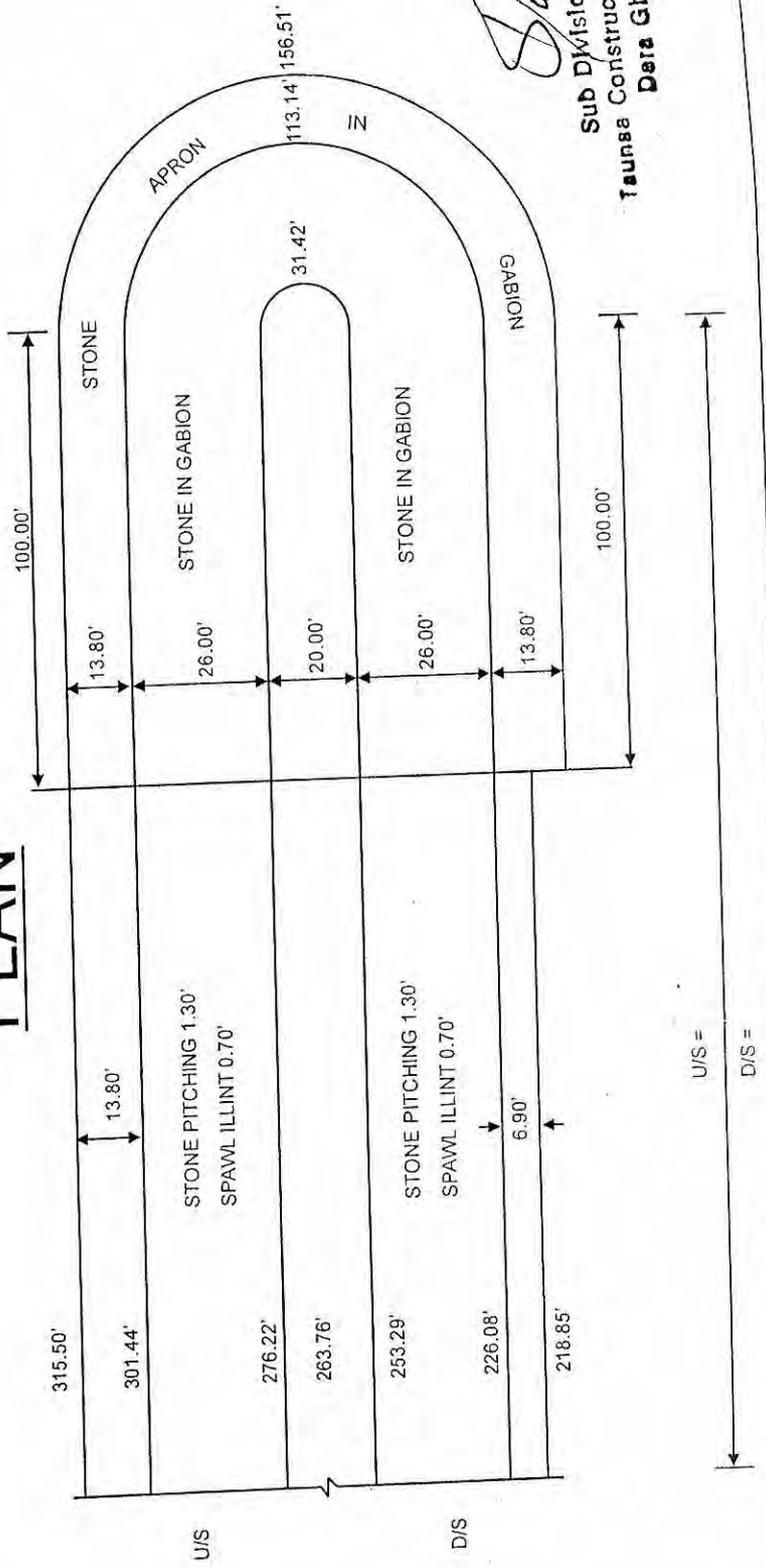
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Taunsa Construction Sub Division
Dera Ghazi Khan
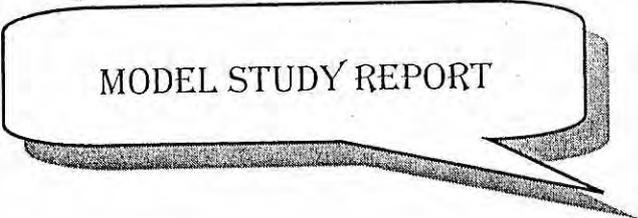
MODEL STUDY REPORT

From

Chief Engineer (Research)
Irrigation & Power Department
Lahore

To

Chief Engineer Irrigation
D.G. Khan Zone D.G. Khan

No. 86   /695-C/   Dated: 04. 01. 06

Subject: MODEL STUDY OF FAN MANAGEMENT OF MITHANWAN HILL
            TORRENT D.G. KHAN DISTRICT (HYDRAULIC MODEL STUDY)

Please find enclosed herewith Report No. IRR--1179 /January 2006
in respect of Hydraulic Model Study on the above subject for use in the field.

D.A. As Above.
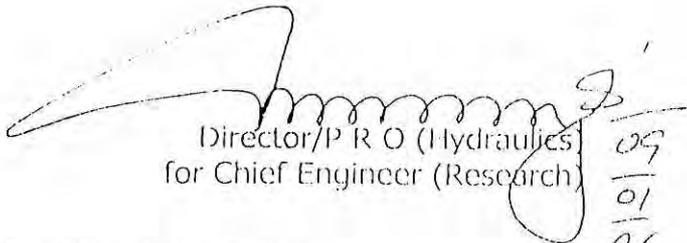
Director/P R O (Hydraulics)
for Chief Engineer (Research)

C.C. with a copy of Report No.IRR-1179 for information to the:

1-   Secretary Irrigation & Power Department, Lahore.
2-   Superintending Engineer, Derajat Circle, D.G. Khan.
3-   Principal Research officer (Hydraulics), IRI, Lahore.
4-   Executive Engineer, Construction Division, D.G. Khan
5-   Senior Research Officer, Hydraulic Research Station, Nandipur.
6-   Library IRI Lahore and Nandipur.

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IRRIGATION RESEARCH INSTITUTE
IRRIGATION & POWER DEPARTMENT
GOVERNMENT OF THE PUNJAB

MODEL STUDY OF FAN MANAGEMENT
OF MITHAWAN HILL TORRENT
D.G. KHAN DISTRICT
(HYDRAULIC MODEL STUDY)

JANUARY, 2006   IRR – 1179

**MODEL STUDY OF FAN MANAGEMENT
OF MITHAWAN HILL TORRENT
D.G. KHAN DISTRICT
(HYDRAULIC MODEL STUDY)**

CONTENTS

FOREWORD

The final draft of report contains an account of experimental work carried out for the distribution of flow through the distributors.

In the light of above objective, details of experiments have been embodied in the subsequent sections of the report for the guidance of practising engineers.

EXECUTIVE SUMMARY

A battery of distributors in Mithawan Hill Torrent was constructed to distribute flood discharge in accordance with the rights of inhabitants. Due to complex nature of morphological conditions of the torrent, difficultly was being felt to achieve objectives of proper distribution of discharge through the distributors. For achieving the objectives, experimental work was carried out at Hydraulic Research Station Nandipur and details of experiments with ultimate conclusion have been embodied in the report for the guidance of the designers.

MODEL STUDY OF FAN MANAGEMENT
OF MITHAWAN HILL TORRENT
D.G. KHAN DISTRICT

AUTHORITY

The study was referred by Executive Engineer D.G. Khan Construction Division, Dera Ghazi Khan vide his letter No. 893/37-W dated 25-06-2005. The work was started at Hydraulic Research Station Nandipur on receipt of funds and pertinent data.

BACKGROUND

Mithawan is one of the major hill torrents of D.G. Khan district, originating from the Suleman range. The discharge coming through the torrent is used for Irrigation purpose by the inhabitants of the area according to their rights, fixed under water act of 1906 and principle of Saropa-Paina. For this purpose, distribution structures have been constructed at the junction of three branches i,e Northern branch, Southern branch and Ganahar branch.

The total discharge of 50,000 cusec as per 25 years return period, reaching at these structures has to be distributed as per Haqooq of the branches mentioned as under.

Northern branch   =   15000 Cusec

Southern branch   =   15000 Cusec

Ganahar branch   =   20000 Cusec

The structures have been constructed on the alluvial unstable sandy bed of Mithawan Hill Torrent and are spread over about one mile width across the flashy hill torrent bed. Due to unstable bed and sand bars on the upstream side, the structures were formed during the current year flood. The distribution of water of the branches was experienced uneven through the distributors. The public is demanding distribution of Mithawan Hill Torrent water in the branches according to their water rights and they emphasized through their representatives for the proper distribution of water in all the three branches of the Hill Torrent.

The problem was referred to Irrigation Research Institute to study the same on a scale model for achieving fair distribution of Mithawan Hill Torrent water as per share of the branches mentioned above.

The main purpose of the study is to evolve out suitable scheme of flood works to ensure, the following objectives.

1. The desired discharge distribution at different stages of flow in the Hill Torrent.

2. The safety of the existing structures.

3. No flow situation through main Ganahar distributor upto Nullah stage of 10,000 Cusec.

MODEL

In order to achieve the objectives and to study the performance of existing distributors, a model of Mithawan Hill Torrent was set up in one of the experimental trays of Hydraulic Research Station Nandipur. The model was constructed on 1:36 geometrical scale according to the latest plantable survey and cross-sections supplied by concerned field formation. A reach of the stream, about 3 miles upstream and 1 mile downstream of the distributors was represented on the model (Fig. 1.1). The bed of the torrent was moulded in sand of average dia (d_{50}=0.22 mm) keeping in view the d_{50} (mm) of prototype bed material to correlate the model and prototype roughness. The arrangement of discharge measurement was made on the upstream side of the model to pass accurate discharge to complete the hydrograph of the Hill Torrent.

The arrangements were also made to measure the discharge passing through each branch by fitting V-notches on downstream side of all the distributors. The distributors were constructed in sand cement mortar. Water level gauges were installed on upstream and downstream side of all the distributors to record water levels at different stages of flood. The central bund and Hudwali Bund were also incorporated in the model as per data provided by the sponsors.

EXPERIMENTS

Initially, a number of rough tests were performed on the model. These tests were performed to simulate the model with prototype flow conditions. On the basis of

these tests, the model was found true replica of the prototype. It was further verified by the field formation who visited the model running for base test at Hydraulic Research Station Nandipur on 02-10-2005. After performing these tests, regular testing program was started and the following tests were performed on the model.

TEST – 1   **CALIBRATION / BASE TEST**
Fig. (1.3 to 1.11)

TEST – 2   **WITH**
Fig. (2.1 to 2.10)

    i.   A partition bund existing in between Southern and Northern distributors was extended in curved shape upto 958 feet with a radius of 900 feet.

    ii.   The length of existing Hudwali Bund along right flank of the torrent was reduced by 108 feet.

TEST – 3   **AS TEST-2 BUT ELIMINATING EXISTING EARTHEN BUND FROM ITS RD 14 TO 16**
Fig. (3.1 to 3.9)

TEST – 4   **WITH**
Fig. (4.1 to 4.9)

    i.   Head part of Hudwali Bund was given a curvature to its length of about 515 feet and remaining length of 1068 feet was kept straight.

    ii.   An additional Gunda Bund near RD 13 was provided.

    iii.   The partition guide bund was kept as it was in Test-2.

TEST – 5   **WITH**
Fig. (5.1 to 5.14)

    i.   A hockey spur (Fig. 5.2) was tied to the existing left bank at its RD 11+240 for guiding the flow in the centre of the Nullah.

    ii.   The straight part of Hudwali Bund was reduced to 826 feet (Fig. 5.3).

TEST – 6   WITH
Fig. (6.1 to 6.10)

i.   The length of straight part of Hudwali Bund was reduced to 626 feet (Fig. 6.2).

ii.   Modification in the protrusion of Hockey spur.

TEST – 7   WITH
Fig. (7.1 to 7.37)

1.   A partition bund existing inbetween Northern and Southern distributors was modified as under:-

    i.   Straight part 280 feet.

    ii.   Curved part length 785 feet with its radius of 900 feet (Fig. 7.2).

2.   Hockey spur (Fig. 7.4) tied to the left bank of the stream bund with the following details:-

    i.   Shank length 430 feet and hockey part length 264 feet with radius of 252 feet.

    ii.   Left existing low level bund of the torrent was given proper shape of bund to the tie point of shank of hockey spur (Fig. 8).

3.   Hudwali Bund modifications:-

    i.   Straight part 720 feet.

    ii.   Curved part 376 feet with radius of 540 feet.

DISCUSSION OF RESULTS

TEST – 1

This test was carried out with original conditions on the fresh moulded model. The model was first run with low discharge, the discharge was gradually raised and the hydrograph was completed up to a peak of 50,000 Cusec (Fig. 1.2). The observations of flow currents, water levels and discharge distribution were recorded. The perusal of the results indicated:-

1.   That the torrential flow approaching the distributors took leftward embayment at all the stages of the stream and resulted in an excessive

discharge intensity through the Northern distributor over its design capacity of flow.

2.   That the existing Hudwali Bund was not guiding the flow properly towards the newly constructed distributors.

3.   That inefficient guidance of the partition bund to the flow towards Southern distributor was found on the model.

4.   That the approaching flow conditions towards the distributors were found non-uniform at the torrent flow of 10,000 cusec. The discharge distribution through each distributor was recorded.

   a.   Northern distributor took 4396 Cusec.

   b.   Southern distributor received 75 Cusec.

   c.   Ganahar distributor got 523 Cusec.

5.   That a standing wave phenomenon just downstream of broad crested weirs (Northern and Southern) was found starting from low stages to the torrential flow stage of 50,000 Cusec. Moreover, number of standing waves downstream of the above weirs were also found increased with the increase in discharge intensity through the weirs. A discharge distribution through the distributors for all stages of the stream flow has been elaborated in tabular as well as bar chart diagram in Fig. 1.11.

TEST – 2

In this test, the following scheme of existing structures was modified to achieve the objective of requisite distribution of discharge of torrential flow through the distributors.

1.   A partition bund existing in between Southern and Northern distributors was extended in curved shape upto 958 feet with a radius of 900 feet.

2.   The length of existing Hudwali Bund along right flank of the torrent was reduced by 108 feet.

It was conceived from the model in base test that an extension of the above existing partition bund would reduce flow entry into the Northern distributor and increase flow entry into the Southern distributor. Moreover, leftward push of the Hudwali Bund to the torrential flow may also be mitigated by reducing its length by 108 feet on the model.

With the above setup, the model test indicated as under:-

1. That a requisite flow distribution through the distributors was achieved on the model just upto the stream flow of 10,000 Cusec.

2. That no flow conditions through the Ganahar distributor (main) was achieved on the model. A detail of discharge distribution through the distributors has been elaborated in tabular as well as bar diagram in Fig. 2.10.

Meanwhile, Chief Engineer D.G. Khan Zone visited Hydraulic Research Station Nandipur along with his field formation on 02-10-2005 and visualised the model. They made refinements regarding the posture of the local earthen bunds constructed in the bed of stream upstream of the distributors. They also apprised the model men that the water users are controlling low flows of the stream in accordance with their Irrigation requirements with the help of these local bunds but these bunds lose the control on the stream flows at higher stages.

These local bunds existing in the bed of stream were also incorporated on the model. The test run was repeated and model results were found almost similar as reported above. It was noted on the model that these bunds lost their existing posture at and above Nullah stage of 20,000 Cusec. The information regarding the distribution of discharge through the distributors has been given in Fig. 2.10.

TEST – 3

In this test, the infrastructure of Test-2 were kept intact on the model but, earthen bund from RD 14-16 was removed from the model. The results of the model were found almost similar as achieved in test No. 2. The distribution of discharge is embodied in Fig. 3.9. It was considered necessary that some other scheme of flood works should be tested on the model to achieve the requisite objective of distribution of water through the distributors.

TEST – 4

At this phase of experimental work on the model, test No. 2 was amended as under:-

1. Head part of Hudwali Bund was given a curvature to its length of about 515 feet and remaining length of 1068 feet was kept straight.

2. An additional Gunda Bund near RD 13 was provided.

3. The partition guide bund was kept as it was in Test-2.

The test run gave the following results:-

1. That a requisite distribution of the discharge through the distributors was found upto Nullah stage of 30,000 Cusec.

2. That Hudwali Bund gave adequate guidance to the flow but its further modification was found necessary on the model. A distribution of flow through the distributors is given in Fig. 4.9.

TEST – 5

The following scheme of flood works was introduced on the model and test run was completed for full hydrograph of the Hill Torrent.

1. A hockey spur (Fig. 5.2) was tied to the existing left bank at its RD 11+240 for guiding the flow in the centre of the Nullah.

2. The straight part of Hudwali Bund was reduced to 826 feet (Fig. 5.3).

The inclusion of hockey spur showed its due role for patronizing uniform flow intensity in the center of stream bed upstream of the distributors. Similarly, the Hudwali Bund also gave favourable results by guiding the flow towards the distributors but still it was felt that the scheme would have to be modified to achieve efficacy for all stages of the stream flows. A distribution of discharge is given in Fig. 5.14.

TEST – 6

In this test, the following modified scheme of flood works was incorporated on the model:-

1   The length of straight part of Hudwali Bund was reduced to 626 feet (Fig. 6.2).

2. Modification in the protrusion of Hockey spur.

The results were found similar as in case of test-5 and the same have been highlighted in Fig. 6.10.

Meanwhile, the Executive Engineer Construction Division D.G. Khan was requested to visit the model to see discharge distribution so far achieved on the model by incorporating different flood works. He visited Hydraulic Research Station Nandipur on 01-11-2005 alongwith Principal Research Officer (Hydraulics) and visualised the working of the devices on model. A detail discussion was also conducted to arrive at more workable and acceptable structures to achieve the full objectives of requisite distribution of discharge through distributors at all stages of stream flow. A number of efforts were made on the model to achieve the requisite distribution of flow through the distributors.

TEST - 7

The following scheme of flood works was incorporated on the model:-

1. A partition bund existing inbetween Northern and Southern distributors was modified as under:-

    i. Straight part 280 feet.
    ii. Curved part length 785 feet with its radius of 900 feet (Fig. 7.2).

2. Hockey spur (Fig. 7.4) tied to the left bank of the stream bund with the following details:-

    i. Shank length 430 feet and hockey part length 264 feet with radius of 252 feet.

    iii. Left existing low level bund of the torrent was given proper shape of bund to the tie point of shank of hockey spur (Fig. 8).

4. Hudwali Bund modifications:-

    i. Straight part 720 feet.
    ii. Curved part 376 feet with radius of 540 feet (Fig. 7.3).

A test run with the scheme of flood works mentioned above was tested on the model and it was seen that requisite discharge distribution through the distributors was achieved on the model. The objectives of the study elaborated in the preceding sections were fully achieved on the model. The test was repeated twice and results were

found satisfactory on the model and discharge distribution through the distributors was recorded as in Table-I.

Table-I

Discharge in Cusec	Share of distributors		
	Northern distributor	Southern distributor	Ganahar distributor
5,000	2286	2214	0
10,000	4571	4464	0
15,000	6500	6464	1980
20,000	8246	8175	3573
30,000	11085	11175	7733
40,000	13560	13700	12666
50,000	15050	15000	19947

NOTE:- Error in sum of used discharge is owing to percolation of water to the model bed and other losses.

After achieving the above results, the following field officers were invited and they visited Hydraulic Research Station Nandipur alongwith PRO (H) on 03-12-2005.

ii.   Chief Engineer Irrigation D.G. Khan Zone.

iii.   Superintendant Engineer Drainage.

iv.   Executive Engineer D.G. Khan Construction Division, Dera Ghazi Khan.

The model was operated in their presence and they found satisfactory functioning of the flood works for achieving requisite discharge distribution through the distributors. However, the Chief Engineer Irrigation D.G. Khan showed his concern on the formation of standing wave phenomenon occuring on the model downstream of the Northern and Southern distributors.

Later on, the same test was repeated for noting the effect of standing wave phenomenon just downstream of broad crest of Northern and Southern distributors. The scour phenomenon recorded on the model is as under:-

i.   The maximum scour just downstream of the Northern distributor is found 11 feet on the model (Fig. 7.35).

ii.   The maximum scour just downstream of the Southern distributor is found 9 feet on the model (Fig. 7.35).

A full detail of distribution of discharge of individual distributor has been elaborated in Fig. 7.31, 7.32, 7.33, & 7.34.

RECOMMENDATION

To cope with the situation, the following flood works tested in Test-7 are recommended for implementation at site:-

1.   **A partition bund existing inbetween Northern and Southern distributors is modified as under:-**

    i.   **Straight part 280 feet.**

    ii.   **Curved part length 785 feet with its radius of 900 feet (Fig. 7.2).**

2.   **Hockey spur (Fig. 7.4) tied to the left bank of the stream bund with the following details:-**

    i.   **Shank length 430 feet and hockey part length 264 feet with radius 252 feet.**

    ii.   **Left existing low level bund of the torrent was given proper shape of bund to the tie point of shank of hockey spur (Fig. 8).**

3.   **Hudwali Bund modifications:-**

    i.   **Straight part 720 feet.**

    ii.   **Curved part 376 feet with radius 540 feet.**

The general layout and co-ordinates of the proposed river training works are elaborated in the river survey plan provided by the field formation (Fig. 8). It is recommended that curved portions of the above proposed flood works may be provided with adequate stone pitching and flexible apron. It is further suggested that the existing earthen local low level bund marked as B in Fig. 8 may be maintained at the site for achieving objectives of requisite discharge distribution through the distributors.

It is advisable that alignment of the flood works may be got checked by Irrigation Research Institute at the time of their execution.

ACKNOWLEDGEMENT

COMPARISON OF DISCHARGE DISTRIBUTION THROUGH MITHAWAN HILL TORRENT WEIRS

	NOR.Weir	SOU.Weir	GAN.Weir	Total DIS.
1	2486	2500	0	5000
2	5092	4900	0	10000
3	7508	5695	1792	15000
4	10790	7000	1200	20000
5	15510	9780	4700	30000
6	19594	13186	7208	40000
7	23160	16463	10364	50000
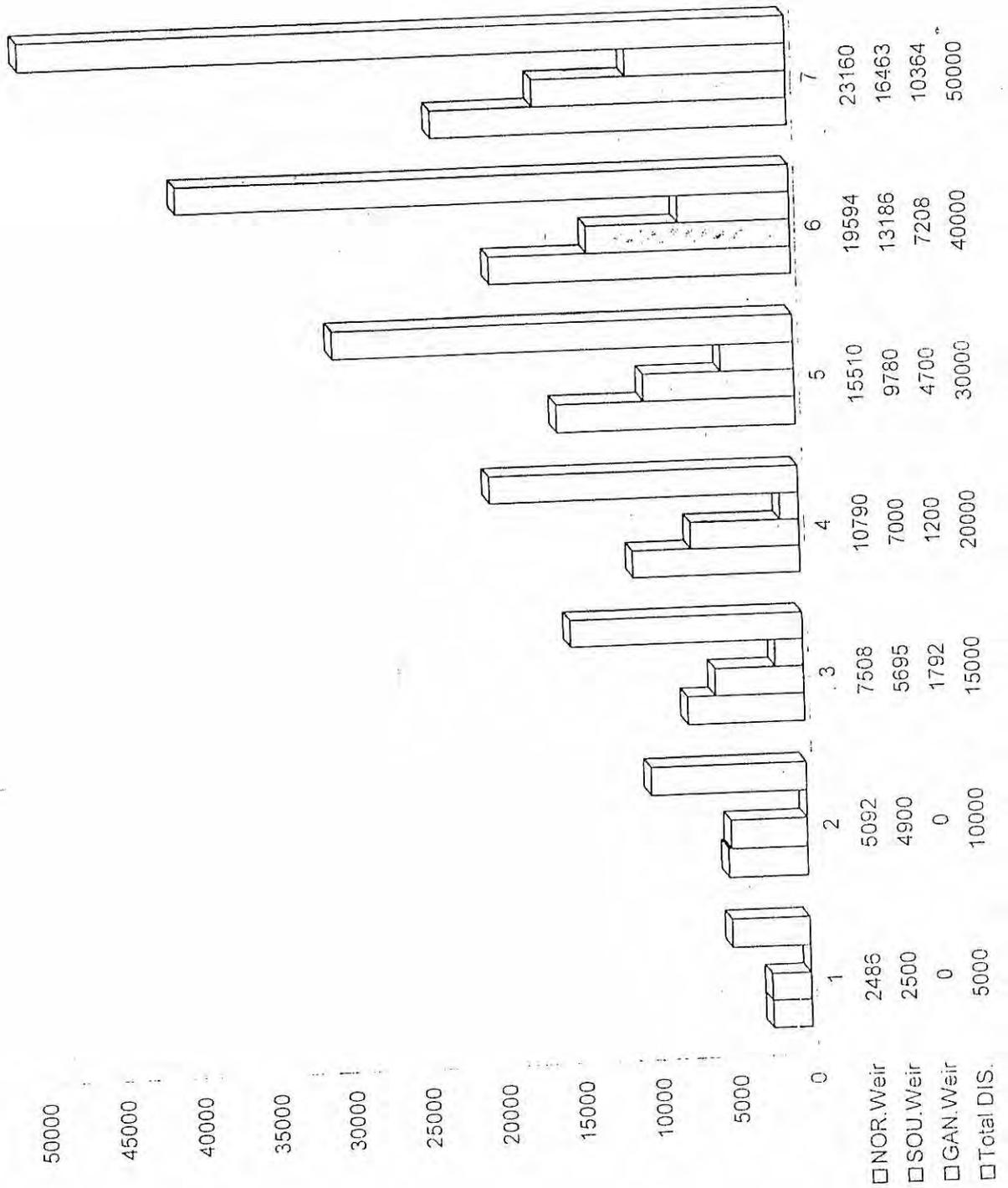
MODEL STUDY OF
MANAGEMENT OF MITHAWAN HILL TORRENT
IN D.G.KHAN DISTRICT
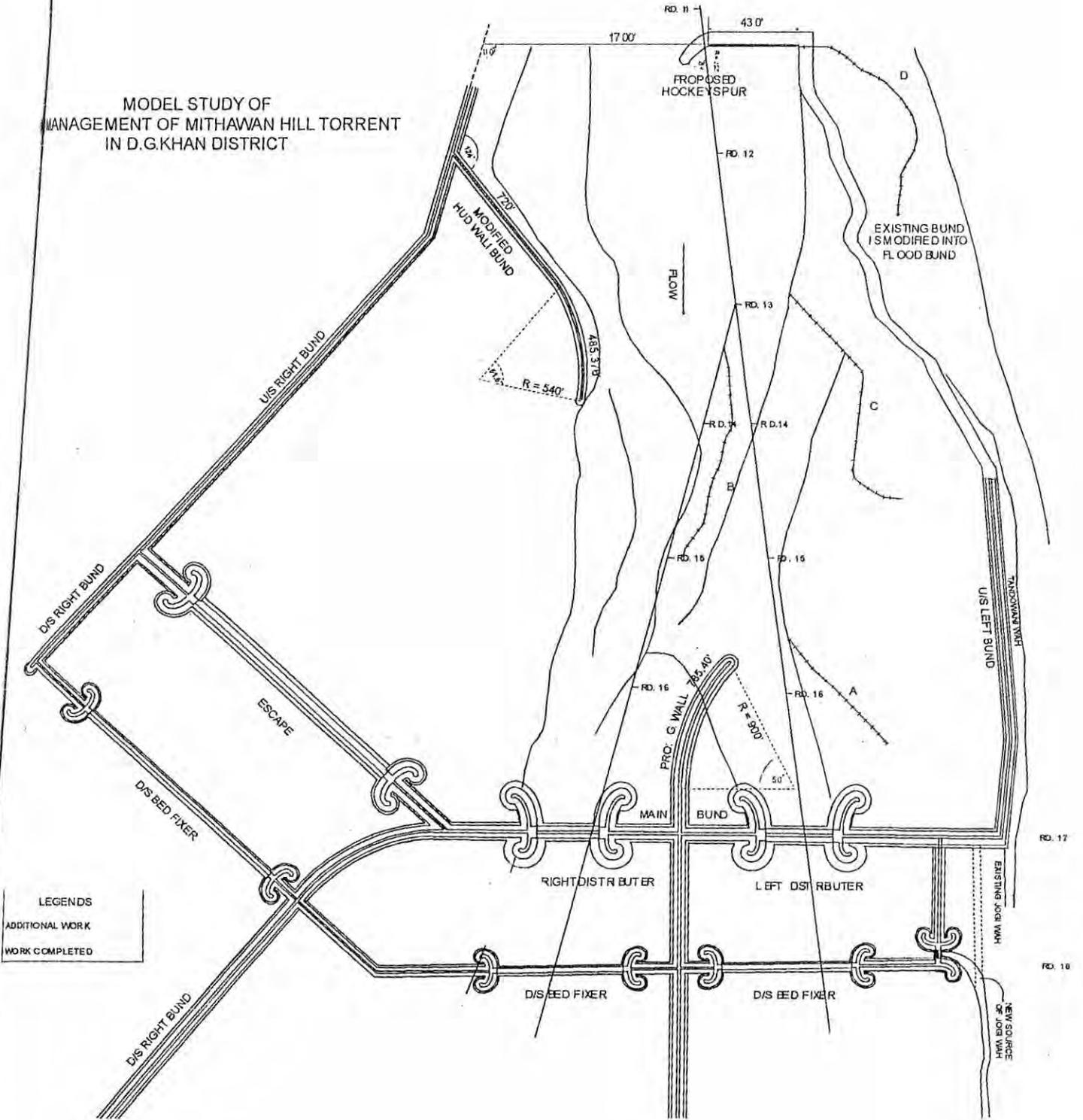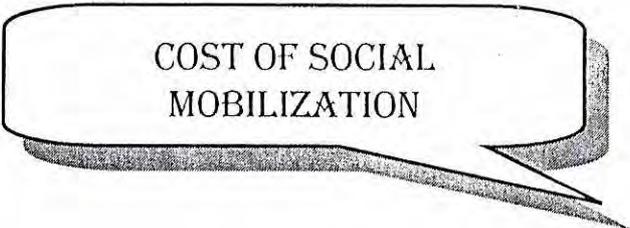
COST OF SOCIAL
MOBILIZATION

FAN MANAGEMENT OF MITHAWAN HILL TORRENT IN DISTRICT D.G.KHAN.

STAKE HOLDER'S AWARENESS

LAND ACQUISITION, WATER RIGHTS, COMMUNITY DEVELOPMENT IN CONNECTION WITH CONSTRUCTION OF MANAGEMENT STRUCTURES.

Duration	=	12	Months					
Social Mobilization Manager Salary	=	1	x	30000	x	12	=	360000
Field officers (Social Mobilization)	=	4	x	20000	x	12	=	960000
Peon / Naib Qasid	=	5000	x	12			=	60000
Office Assistant Computer Operator.	=	1	x	12	12000		=	144000
T.A/D.A	=	500	·Day					
	=	5 x 16	x	12	x	500	=	480000

Sub Total :   **2004000**

Vehicles / equipments.

Motor Cycles	=	4	70000		=	280000
Computer with accessories.	=	1	80000		=	80000
Office Rent	=	5000	x	12	=	60000
Office expenses.	=	6000	x	12	=	72000
Utilities Bill	=	3000	x	12	=	36000

POL & maintenance of vehicles. = 50000 x   12   =   600000

Sub Total :- =   1128000

TOTAL :- =   3132000

Dy: General Manager (TM)
Punjab Irrigation & Drainage
Authority, Lahore.

FAN MANAGEMENT OF MITHAWAN HILL TORRENT IN DISTRICT D.G.KHAN.

STAKE HOLDER'S AWARENESS

LAND ACQUISITION, WATER RIGHTS, COMMUNITY DEVELOPMENT IN CONNECTION WITH CONSTRUCTION OF MANAGEMENT STRUCTURES.

Social Mobilization Manager Salary required.	=	1	No:
Field officers (Social Mobilization)	=	4	No:
Peon / Naib Qasid	=	1	No:
Office Assistant Computer Operator.	=	1	No:
T.A./D.A.	=	1	Job:
Vehicle / equipment Required			
Motor Cycle	=	4	No:
Computer with accessories.	=	1	Job:
Office Rent.	=	1	Job:
Offices expenses.	=	1	Job:
Utilities bill.		1	Job:
POL & maintenance of vehicles.		1	Job:

TRAINING CENTRE

TRAINING CENTER

ABSTRACT OF COST

Sr.No.	Quantity	Unit	Description	Rate	Amount
1	9664	%oCft	E/work excavation in foundation	1267.20	12247
2	1208	%Cft	Supply & filling sand under floor	659.40	7966
3	1838	%Cft	P.C.C 1:4:8	7138.55	131212
4	3534	%Cft	Pacca brick work 1:6 in foundation & Plinth Total length of walls = 370'	5983.10	211465
5	416	%Sft	P/L D.P.C 1:2:4 1$^{1/2}$" thick 1 coat of hot bitumen+Polythene.	1928.20	8026
6	479	%Sft	P/L D.P.C with cement sand plaster and bitumen coating ratio 1:3, 3/4" thick	1364.30	6534
7	5279	%oCft	E/work excavation from out side B.pits in ordinary soil dressed lead 7.0 Km	2978.00	15722
8	3392	%Cft	Pacca brick work 1:6 in ground floor walls	6302.55	213809
9	854	P.Sft	P/L Aluminium window of approved size with tinted glass	300.00	256050
10	180	P.Sft	P/F deodar wood dolly frame having 1$^{1/2}$"x1$^{1/2}$" vertical & horizental double post with 1$^{1/2}$"x1$^{1/2}$" full width of james braches at 12" i/c filling of spaces in between braces with 1:3:6 P.C.C fixing oly of approved quality i/c holdfast complete in all respects teak wood ply.	168.50	30372
11	2125	P.Cft	R.C.C 1:2:4	144.20	306356
12	7716	%Kg	Febrication of mild steel reinforcement	4432.10	341993
13	13672	%Sft	Cement plaster 1:3 upto 20' height	945.35	129251
14	2975	%Sft	P/L roof insulation, comprising of single layer of tiles 9"x41/2"x11/2" grated with cement sand mortor 1:3 laid over 2" thick earth i/c mud plaster over thermopore sheet over polythene sheet 300 gauge over layer of bitumen complete in all respects 1" thick thermopore.	2910.55	86589
15	1100	%Cft	P/L watering & ramming brick ballast 11/2" to 2" gauge mixed with sand for floor and foundation.	1559.60	17159
16	208	%Cft	P.C.C 1:2:4	9936.95	20681

E:\TAUNSA SUB DIVISION 1\Revised PC-I of MithawanC.Tc

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Sr.No.	Quantity	Unit	Description	Rate	Amount
17	2975	P.Sft	Providing laying master glazed tiles (gronite) 24"x24" on floor complete in all respect laid over 1:6 C/s morter and gronted with white cement with glour	140.00	416500
18	472	P.Sft	P/L master glazed tiles 12"x18" for wall (coloured)	120.00	56640
19	8	P.No	P/F sliding bolt brass 10" long	111.85	895
20	133	P.Sft	First class deodar wood wrought joinery in doors & windows etc pannelled or pannelled or glazed fully glazed fixed in position i/c holdfast hinges toner bolts, chocks rubber steps cleats G.I claps, handles and chord with hocks etc complete 2" thick.	604.85	80445
21	395.63	%Cft	Pacca brick work 1:6 in 1st: floor.	6497.90	25707
22	165.00	P.Rft	P/L RCC pipe 4" dia in sewer.	28.75	4744
23	1.00	E.No	P/L cast iron main hole cover 18" dia.	763.20	763
24	24.00	P.Sft	P/F vinboard cabinet with drawers in kitchen i.c termite profing and polishing or painting with synthetic enamel as specified with handles, hinges, screws, etc complete in all respect.	262.45	6299
25	1.00	E.No	P/F stainless steel sink 48" x 24"	3951.00	3951
26	1.00	E.No	P/F glazed earthen ware water closet squatter type (Orisa pattern) combined with foot rest.	1144.40	1144
27	1.00	E.No	P/F plastic made low down flushing citern (3gallon capacity) i/c bracket sets copper connection etc complete coloured.	907.65	908
28	1.00	E.No	P/F glazed earthen ware water closet European type excluding seat cover. Coloured.	1943.50	1944
29	1.00	E.No	P/F double seat cover only.	361.40	361
30	2.00	E.No	P/F earthen water wash hand basin 22" x 16" i/c bracket set, waste pipe and waste couplin etc coloured with pedastal.	1641.75	3284
31	2.00	E.No	P/F Chromium Plated soap dish.	164.20	328
32	2.00	E.No	P/F chromium plated toilet paper holder.	284.90	570
33	1.00	E.No	P/F chromium plated towel rail.	310.80	311

Sr.No.	Quantity	Unit	Description	Rate	Amount
34	1.00	E.No	P/F looking glass 22" x 16".	331.70	332
35	1.00	E.No	P/F glass shelf 24" x 5" with chromium plated brackets only.	301.25	301
36	6.00	E.No	P/F chromium plated tee stop cock 1/2" dia.	302.80	1817
37	3.00	E.No	P/F underground stop cock with chromium plated cover.	431.85	1296
38	5.00	E.No	P/F chromium plated bib cock 1/2" dia.	294.40	1472
39	1.00	E.No	P/F chromium plated shower rose 1/2" x 4".	307.60	308
40	3.00	E.No	P/F chromium plated mixing valve for wash hand basin sink or shower.	1091.00	3273
41	4.00	E.No	P/F "P" Trap 4" glazed.	89.75	359
42	2.00	E.No	P/F chromium plated gas cock single way.	174.40	349
43			P/F G.I. pipe in trenches medium quality.		
	300.00	P.Rft	1" dia	64.90	19470
	600.00	P.Rft	3/4" dia	45.30	27180
	200.00	P.Rft	1/2" dia	35.50	7100
44	1.00	E.No	P/F fiber glass water tank i/c stand etc complete in all respect.	14000.00	14000
45	1.00	E.No	P/F electric water pump.	12000.00	12000
46	133.00	%Sft	Painting new surface any type primary coat and 2 coats.	769.80	1024
47	13672	%Sft	Primary coat of chalk under distemper.	40.85	5585
48	13672	%Sft	Distempering new surface 3 coats.	181.40	24801
49	2360	P.Sft	Painting texture paint on walls.	70.00	165200
50			S/E PVC pipe for wiring recessed in walls including inspection boxes, pull boxes, hooks, cutting jharries and repairing surface.		
	500.00	P.Rft	20 mm i/d	13.45	6725
	200.00	P.Rft	25 mm i/d	17.70	3540
51			S/E of single core PVC insulated copper conducter cables in prelaid PVC pipe 250/440 volts PVC insulated.		
	2500	P.Rft	3/0.029	4.80	12000
	1800	P.Rft	7/0.029	6.50	11700
	300	P.Rft	7/0.044	10.50	3150

Sr.No.	Quantity	Unit	Description	Rate	Amount
52	15.00	E.No	S/E of underground boxes.	150.00	2250
53	120.00	E.No	S/E of switches fitted in plates complete in all respect, fancy fitting i/c dimmer of fan, plug.	220.00	26400
54			S/E of iron / aluminium clad 500 volts main switches with circuit breaker on angle iron board with 3 mm (1/8) thick M.S. sheet covering i/c bonding to earth with necessary flexible pipe and thimbles etc double pole.		
	1.00	E.No	50 Amp:	1614.70	1615
55			S/E of electric circuit breaker.		
	1.00	E.No	50 Amp:	650.00	650
56	6.00	E.No	S/E of 3 pin 10/15 Amp switches and plug combined recessed type.	78.95	474
57	1.00	E.No	P/Fitting gas geaser.	12000.00	12000
58	18.00	E.No	S/E of tube light i/c rod, choke, strater, frame flexible wire i/c connection from ceiling rose etc double rod 30 watts.	890.95	16037
59	18.00	E.No	S/E of ceiling rose.	16.10	290
60	15.00	E.No	S/E of fancy brackets for lighting.	1000.00	15000
61	2.00	E.No	S/E of leakage breaker.	5000.00	10000
62	70.00	E.No	Laying cutting jointing testing and disinfecting cast iron pipe line in trenches with spigot and socket chaulked lead joints i/c cast of material such as lead yarn, etc complete in all respect 3" dia.	25.10	1757
63	3258	P.Sft	P/L fancy glazed tile (National, Master, Solo Shabbir etc).	170.00	553775
64	720	P.Sft	P/L cement tiles for roof.	80.00	57600
65	50.00	P.Rft	P/F curtain railing.	100.00	5000
66	50.00	P.Rft	P/F curtain of approved quality.	300.00	15000
67	1.00	E.No	Providing steel almirah.	10000.00	10000
68	4.00	E.No	Providing Sofa set	25000.00	100000
69	4.00	E.No	Providing Centre table.	6000.00	24000
70	8.00	E.No	Providing side table.	3500.00	28000
71	1.00	E.No	Providing dining table with 8 No. chairs.	40000.00	40000

Sr.No.	Quantity	Unit	Description	Rate	Amount
72	1.00	E.No	Providing utensics.	30000.00	30000
73	1.00	E.No	Providing cooking range.	18000.00	18000
74	1.00	E.No	S/E of electric energy meter.	10000.00	10000
75	7.00	E.No	P/F ceiling fan 56" sweep.	3000.00	21000
76	2.00	E.No	P/F exhaust fan.	2000.00	4000
77	2	E.No	P/F floor trap of 4"x3" including concrete chember and C.I grating	309.50	619

				Total:-	3726673
			Training material for 300 persons		700000
			Honouraria		600000
				G.Total:-	5026673

TRAINING CENTRE

NORTH →

DINNING
18'-6"X14'-0"

BATH
8'-0"X10'-0"

VERANDHA 7'-0" WIDE

KITCHEN
10'-0"X12'-0"

HALL
25'-0"X30'-0"

VERANDHA 7'-0" WIDE

STORE
10'-0"X12'-0"

VERANDHA 7'-0" WIDE

49.50

39.77
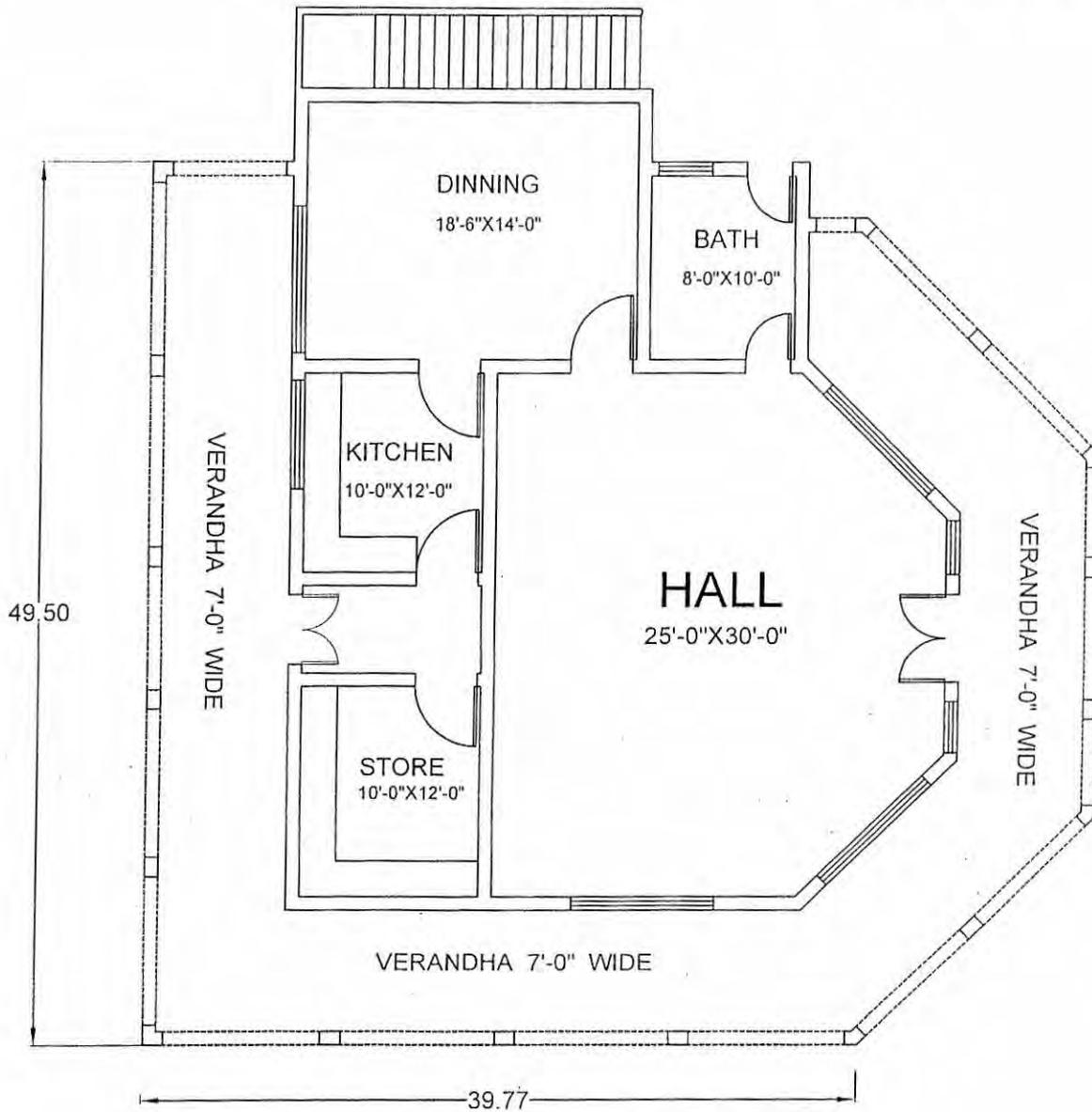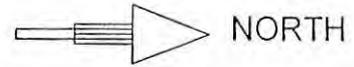
COVERED AREA
49.50x39.75   =1969.0SFT
20.0x8.375   =168.0SFT
47.50+20.50/2x16.25 = 553.0SFT
                      2690.0SFT

PLAN

Sub Divisional Officer
Taunsa Construction Sub Division
Dera Ghazi Khan

MAINTENANCE WORK

MAINTENANCE COST OF EXECUTED WORK

ABSTRACT OF COST

Sr.No.	Quantity	Unit	Description		Amount
1	1	Job	E/work, Stone work, Gabion work, Carriage		7000000
				Total:-	7000000

SUB DIVISIONAL OFFICER,
TAUNSA CONSTRUCTION SUB DIVISIC
DERA GHAZI KHAN.

COST OF RESERVE STOCK

STONE FOR INITIAL LAUNCHING.

DETAIL & COST

Sr.No.	Quantity	Unit	Description	Rate MRS Jan 2005	Amount
1	2390304	Cft	Total quantity of stone in apron of work done	*APRIL - JUNE 2005.*	
2	144314	Cft	Total quantity of stone in apron of work to be done		
Total:-	2534618	Cft	Required quantity of Reserve stock @ 10% of total quantity = 253462 Cft		
1	253462	%Cft	Supply of stone at quarry	396	1003710
2	278808.2	%Cft	Carriage of stone upto 50 Km	600	1672849
				Total:-	2676559
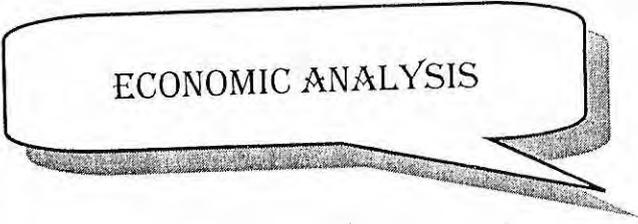
ECONOMIC ANALYSIS

ECONOMIC ANALYSIS

PROJECT COST.   317.530

COST BENEFIT RATIO   1: 1.570

NET PRESENT WORTH   165.364

E.I.R.R.   20.971

COST - BENEFIT RATIO

(Unit Rs. Million)

Year	Cost Const.	Cost O&M	Total cost.	D.F. 15%	Present Worth	Benefits	D.F. 15%	Present Worth	Net Benefits	D.F 15%	Present Worth
1	182.000	0	182.000	0.870	158.340	5.84	0.870	5.080	-176.16	0.87	-153.260
2	92.500	0.000	92.500	0.756	69.930	5.840	0.756	4.415	-86.66	0.756	-65.515
3	19.268	0.000	19.268	0.658	12.678	89.476	0.658	58.875	96.63	0.658	63.583
4	23.762	6.351	30.113	0.572	17.225	89.476	0.572	51.180	96.63	0.572	55.272
5		6.351	6.351	0.497	3.156	89.476	0.497	44.469	96.63	0.497	48.025
6		6.351	6.351	0.432	2.744	89.476	0.432	38.653	96.63	0.432	41.744
7		6.351	6.351	0.376	2.388	89.476	0.376	33.643	96.63	0.376	36.333
8		6.351	6.351	0.327	2.077	89.476	0.327	29.259	96.63	0.327	31.598
9		6.351	6.351	0.284	1.804	89.476	0.284	25.411	96.63	0.284	27.443
10		6.351	6.351	0.247	1.569	89.476	0.247	22.100	96.63	0.247	23.868
11		6.351	6.351	0.215	1.365	89.476	0.215	19.237	96.63	0.215	20.775
12		6.351	6.351	0.187	1.188	89.476	0.187	16.732	96.63	0.187	18.070
13		6.351	6.351	0.163	1.035	89.476	0.163	14.585	96.63	0.163	15.751
14		6.351	6.351	0.141	0.895	89.476	0.141	12.616	96.63	0.141	13.625
15		6.351	6.351	0.123	0.781	89.476	0.123	11.006	96.63	0.123	11.885
16		6.351	6.351	0.107	0.680	89.476	0.107	9.574	96.63	0.107	10.339
17		6.351	6.351	0.093	0.591	89.476	0.093	8.321	96.63	0.093	8.987
18		6.351	6.351	0.081	0.514	89.476	0.081	7.248	96.63	0.081	7.827
19		6.351	6.351	0.07	0.445	89.476	0.07	6.263	96.63	0.07	6.764
20		6.351	6.351	0.061	0.387	89.476	0.061	5.458	96.63	0.061	5.894
21		6.351	6.351	0.053	0.337	89.476	0.053	4.742	96.63	0.053	5.121
22		6.351	6.351	0.046	0.292	89.476	0.046	4.116	96.63	0.046	4.445
23		6.351	6.351	0.04	0.254	89.476	0.04	3.579	96.63	0.04	3.865
24		6.351	6.351	0.035	0.222	89.476	0.035	3.132	96.63	0.035	3.382
25		6.351	6.351	0.03	0.191	89.476	0.03	2.684	96.63	0.03	2.899
26		6.351	6.351	0.026	0.165	89.476	0.026	2.326	96.63	0.026	2.512
27		6.351	6.351	0.023	0.146	89.476	0.023	2.058	96.63	0.023	2.222
Total :					281.399			441.683			559.975

BENEFIT COST RATIO = 1: 1.570

NET PRESENT WORTH.

Year	Cost		Total cost.	Benefits	Incremental benefits.	D.F. 15%	Present worth
	Const.	O&M					
1	182.000	0.000	182.000	5.84	-176.161	0.870	-153.26
2	92.500	0.000	92.500	5.840	-86.660	0.756	-65.51
3	19.268	0.000	19.268	89.476	70.208	0.658	46.20
4	23.762	6.351	30.113	89.476	59.363	0.572	33.96
5		6.351	6.351	89.476	83.125	0.497	41.31
6		6.351	6.351	89.476	83.125	0.432	35.91
7		6.351	6.351	89.476	83.125	0.376	31.25
8		6.351	6.351	89.476	83.125	0.327	27.18
9		6.351	6.351	89.476	83.125	0.284	23.61
10		6.351	6.351	89.476	83.125	0.247	20.53
11		6.351	6.351	89.476	83.125	0.215	17.87
12		6.351	6.351	89.476	83.125	0.187	15.54
13		6.351	6.351	89.476	83.125	0.163	13.55
14		6.351	6.351	89.476	83.125	0.141	11.72
15		6.351	6.351	89.476	83.125	0.123	10.22
16		6.351	6.351	89.476	83.125	0.107	8.89
17		6.351	6.351	89.476	83.125	0.093	7.73
18		6.351	6.351	89.476	83.125	0.081	6.73
19		6.351	6.351	89.476	83.125	0.07	5.82
20		6.351	6.351	89.476	83.125	0.061	5.07
21		6.351	6.351	89.476	83.125	0.053	4.41
22		6.351	6.351	89.476	83.125	0.046	3.82
23		6.351	6.351	89.476	83.125	0.04	3.32
24		6.351	6.351	89.476	83.125	0.035	2.91
25		6.351	6.351	89.476	83.125	0.03	2.49
26		6.351	6.351	89.476	83.125	0.026	2.16
27		6.351	6.351	89.476	83.125	0.023	1.91
	TOTAL :-						165.36

NET PRESENT WORTH AT 15 %   165.36

E.I.R.R.
DISCOUNT CASH FLOW OF NET BENEFITS.

Year	PROJECT COSTS Capital	O&M	Total	Project benefits.	Net benefits.	RATE OF DISCOUNT (PERCENT) 15 D.F. 15%	Present worth	20 D.F. 20%	Present worth	25 D.F. 25%	Present worth
1	182.000	0.000	182	5.84	-176.160	0.870	-153.26	0.833	-146.74	0.8	-140.93
2	92.500	0	92.500	5.840	-86.660	0.756	-65.51	0.694	-60.14	0.64	-55.46
3	19.268	0	19.268	89.476	70.208	0.658	46.20	0.579	40.65	0.512	35.95
4	23.762	6.351	30.113	89.476	59.363	0.572	33.955	0.482	28.61	0.409	24.28
5	---	6.351	6.351	89.476	83.125	0.497	41.31	0.402	33.42	0.327	27.18
6	---	6.351	6.351	89.476	83.125	0.432	35.91	0.335	27.85	0.262	21.78
7	---	6.351	6.351	89.476	83.125	0.376	31.25	0.279	23.19	0.209	17.37
8	---	6.351	6.351	89.476	83.125	0.327	27.18	0.233	19.37	0.167	13.88
9	---	6.351	6.351	89.476	83.125	0.284	23.61	0.194	16.13	0.134	11.14
10	---	6.351	6.351	89.476	83.125	0.247	20.53	0.162	13.47	0.107	8.89
11	---	6.351	6.351	89.476	83.125	0.215	17.87	0.135	11.22	0.085	7.07
12	---	6.351	6.351	89.476	83.125	0.187	15.54	0.112	9.31	0.068	5.65
13	---	6.351	6.351	89.476	83.125	0.163	13.55	0.093	7.73	0.055	4.57
14	---	6.351	6.351	89.476	83.125	0.141	11.72	0.078	6.48	0.044	3.66
15	---	6.351	6.351	89.476	83.125	0.123	10.22	0.065	5.40	0.035	2.91
16	---	6.351	6.351	89.476	83.125	0.107	8.89	0.054	4.49	0.028	2.33
17	---	6.351	6.351	89.476	83.125	0.093	7.73	0.045	3.74	0.023	1.91
18	---	6.351	6.351	89.476	83.125	0.081	6.73	0.038	3.16	0.018	1.50
19	---	6.351	6.351	89.476	83.125	0.07	5.82	0.031	2.58	0.014	1.16
20	---	6.351	6.351	89.476	83.125	0.061	5.07	0.026	2.16	0.011	0.91
21	---	6.351	6.351	89.476	83.125	0.053	4.41	0.022	1.83	0.009	0.75
22	---	6.351	6.351	89.476	83.125	0.046	3.82	0.018	1.50	0.007	0.58
23	---	6.351	6.351	89.476	83.125	0.04	3.32	0.015	1.25	0.006	0.50
24	---	6.351	6.351	89.476	83.125	0.035	2.91	0.013	1.08	0.0047	0.39
25	---	6.351	6.351	89.476	83.125	0.03	2.49	0.01	0.83	0.0037	0.31
					1612.37		161.29		58.55		-1.72

NPV of benefits @ 20% = 58.554
NPV of benefits @ 25% = -1.719

$$E.I.R.R. = 20\% + \frac{58.554}{58.554 + 1.719} = 20 + \frac{58.554}{60.273} = 20 + 0.971 = 20.971$$

E.I.R.R. = 0.971

BENEFITS ACHIEVED DUE TO DAMAGES AVERTED TO INFRASTRUCTURE.

Sr. No.	Description.	Quantity	Unit	Rate (Rs. In Million)	Cost in Million.
1	HOUSES	1000	No:	0.0015	1.500
2	SCHOOLS	5	No:	0.0150	0.075
3	METALLED ROAD	100	Km	0.0150	1.500
4	BASIC HEALTH UNITS	3	No:	0.0015	0.005
5	ELECTRIC / TELEPHONE LINES	20	Km	0.0030	0.060
6	CANALS	24	Miles	0.0225	0.540
	RAILWAY TRACK	16	Km	0.0300	0.480
	FLOOD BUND	12	Miles	0.0150	0.180
	OTHER PUBLIC PROPERTY		Lump sum	1.5000	1.500
	TOTAL :-				5.84

APPROVED DRAWING

DETAIL DRAWING OF MITHAWAN HILL TORRENT PROJECT

EXISTING HAD WALI BUND

U/S RIGHT BUND

SHIRTY BUND

1350'

400'

300'

2800'

1800'

375'

400'

X - SECTION OF CENTRAL BUND
SCALE 1" = 8 FT.

X - SECTION OF D/S RIGHT SIDE CENTRAL BUND
SCALE 1" = 4 FT.

X - SECTION OF GUIDE BANK DISTRIBUTER (U/S & D/S)
SCALE 1" = 16 FT.

U/S

D/S
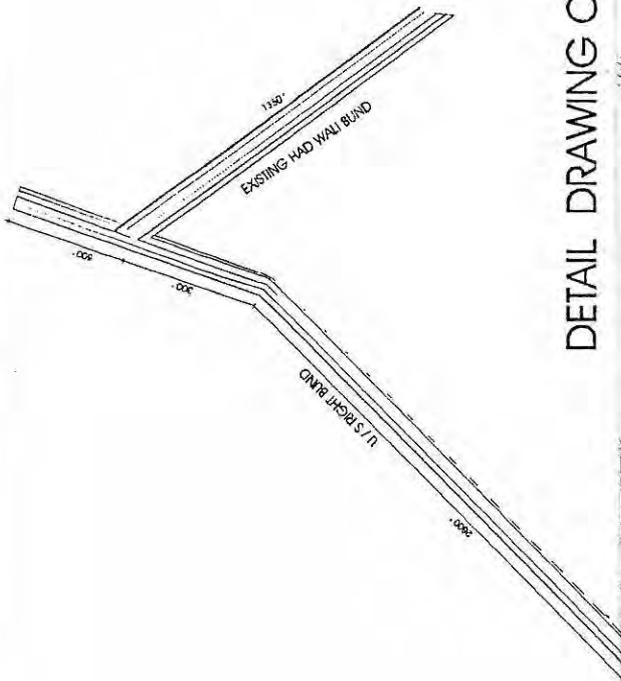
X - SECTION OF SHIRTY BUND
SCALE 1" = 8 FT.
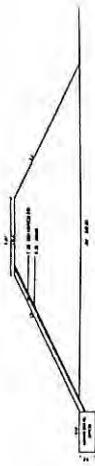
TYPICAL X - SECTION OF U/S RIGHT & LEFT BUND
SCALE 1" = 8 FT.

SECTION OF MAIN BUND
SCALE 1" = 8 FT.

SCALE 1" = 150'

RECOMMENDED

APPROVED

16/8/2002

SUB DIVISIONAL OFFICER,
TAUNSA CONSTRUCTION SUB DIVN,
DERA GHAZI KHAN.

EXECUTIVE ENGINEER,
CONSTRUCTION DIVISION, DERA
GHAZI KHAN.

SUPERINTENDING ENGINEER,
PROJECT CIRCLE, IRRIGATION,
DERA GHAZI KHAN.

CHIEF ENGINEER,
IRRIGATION D.G.KHAN ZONE,
DERA GHAZI KHAN.