## CHAPTER -1

**Salient features of Rasul Division**

* 1. **Location**

Rasul Head Works Division LJC Rasul was created in the year 1901 at the time of construction of Rasul Head Works on Jhelum River with head quarter in Canal Colony Rasul about 14 km from Mandi Bahauddin. This Division now comprises of two Sub Divisions viz. Rasul Head Works Sub Division Rasul and Rasul Qadirabad Link Sub Division Mandi Bahauddin. The jurisdiction of this Division falls in District Mandi Bahauddin.

The length of channels is as under:-

1. Lower Jhelum Canal (RD: 0-196+830) = 42.50 miles

2. Rasul Qadirabad Link Canal (RD 0-145+256) = 29.05 miles

 **Total = 71.55 miles**

As per administration set up (Organizational Chart attached), the Executive Engineer is the overall in-charge / responsible for the maintenance and operation of :-

1. Rasul Barrage with all River Training Works and Flood Protection Bunds.
2. Lower Jhelum Feeder Canal
3. Lower Jhelum Canal
4. Rasul Qadirabad Link Canal RD 0- tail.
	1. **General Description**

**(A) HEADWORKS SUB DIVISION**

The Sub Divisional Officer Head Works Sub Division is responsible for regulation and operation of Lower Jhelum Canal and also holding charge of Head works Sub Division for the regulation and supervision of Rasul Barrage, Lower Jhelum Canal (42.5 miles) and R.Q, link R.D 0-10(2 miles). There are 6 No. Sub Engineer sections in this Sub Division with no revenue work.

The main canal consists of about 40 miles in length and was constructed / completed in the year 1918 (off taking from Rasul Head Works) with design discharge of 4169 Cusecs.

The aim of this channel is to supply water for irrigation purpose to the lands falling in Districts Mandi Bahauddin, Sargodha and Jhang through different Canals, Branches and Distributaries. The culturable command area of whole system is 15.18 lac acres.

During the year 1951, a Branch Canal named Shahpur Branch Canal off taking from RD 141+400 LJC was constructed / completed. Due to construction of this channel, the capacity of LJC was enhanced from 4169 Cs: to 5280 Cs:

The capacity of the Lower Jhelum Canal had been revised with design discharge 6600 Cs: under the Project executed by Development Division Mandi Bahauddin under I.S.R.P.

**Rasul Barrage with its allied River Training works& flood protection Bunds**

The Sub Divisional Officer Head Works Sub Division is responsible for Regulation & supervision of Rasul Barrage, allied River Training Works & Flood Protection Bunds.

Rasul Barrage was constructed under Indus Basin project. The construction of this Barrage was started in 1965 and was completed in 1967. The structure was handed over to Irrigation Department i.e. Rasul Head Works Division LJC Rasul during the year 1973.

 The Salient features of the above mentioned structures are as under:

**(i) LJC Feeder Canal**

Lower Jhelum Canal feeder off- takes from left flank of Rasul Barrage and meets with the Lower Jhelum Canal at RD: 18+000.The water of Rasul Power Channel falls in old LJC at RD: 4+000 which meets with the LJC Feeder Canal at RD: 8+724 where starts old Lower Jhelum Canal.

The Designed data of the LJC Feeder Canal is as under:

* + - Length = RD 0– 8+724 (1.74 Mile)
		- Designed capacity = 6600 Cs
		- Bed Width = 120’
		- Full Supply depth = 7.5’

**(ii) Rasul Qadirabad Link Canal**

The Channel off takes from the left flank of Rasul Barrage. The total length of channel is 29 mile. The Sub Divisional Officer HeadWorks is only responsible from RD: 0-10+000.

The designed data of the channel is as under: -

* Length = RD:0-145+256 (29.0 miles)
* Designed discharge = 19000 Cs.
* Bed width = 330 ft.
* Full supply depth = 14.0 ft.

**(B) RASUL QADIRABAD SUB DIVISION**

The Sub Divisional Officer Rasul Qadirabad Sub Division is responsible for regulation and operation with repair and supervision of Rasul Qadirabad Link Canal from RD: 10+000 to RD: 145+256 (tail) with headquarter at Mandi Bahauddin. There are 3No. Sub Engineer sections in this Sub Division with no revenue work.

**(i) Rasul Qadirabad Link Canal**

The Channel off takes from the left flank of Rasul Barrage. The total length of channel is 29 mile.

The designed data of the channel is as under: -

* Length = RD:0-145+256 (29.0 miles)
* Designed discharge = 19000 Cs.
* Bed width = 330 ft.
* Full supply depth = 14.0 ft.

**(C) SALIENT FEATURES OF RIVERS**

**RIVER JHELUM**

The Old Rasul Head Works was constructed on river Jhelum during the period from 1898 to 1901 to feed Lower Jhelum Canal. This canal irrigates the lands in Mandi Bahauddin, Sargodha and Jhang Districts.

Later on a new Barrage, about 2.50 miles downstream of old Head Works was constructed under the Indus Basin project in the years 1965-1967 to transfer water from Mangla storage on River Jhelum to River Chanab, Ravi and Sutlej through Rasul Qadirabad Link, Qadirabad Balloki Link and Balloki Suleimanki Link.

The Rasul Barrage is situated about 45 miles D/S of Mangla Dam. The designed capacity of barrage is 8, 50,000Cusecs. Two canals namely Rasul Qadirabad Link and LowerJhelumCanal Feeder off takes from its left flank and nowadays a new Canal named Jalalpur Canal is also under construction at site off-taking from right flank of Barrage.

The River Jhelum, U/S of Rasul Barrage, receives water from its tributaries, Koterra, Darapur, Bunha, Chan, Skettar, JabaKass and other torrents of Pabbi Hills (left side) in addition to D/S releases from Mangla reservoir. The slope along the course from Mangla to Jhelum and Jhelum to Rasul is 5.24 ft and 1.85 ft per mile respectively. Releases from Mangla are regulated according to the demand of Irrigation subject to availability of water in the reservoir.

**RIVER CHENAB**

Floods in River Chenab can pose threat to the safety of Rasul Qadirabad Link Canal and its adjoining abadies in reach RD: 99+000 to 145+256 (Tail) R.Q Link Canal was constructed under Indus Basin Project to supplement the supplies in River Chenab from River Jhelum, during low supplies in River Chenab. R.Q Link used to remain closed from July to September when the flow in River Chenab is sufficient.

* 1. **ADMINISTRATIVE SETUP**

**CHAPTER -2**

 **FLOOD PROTECTION AND RIVER TRANING WORKS**

**2.1 Design parameters of training works**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Sr.No.** | **Structure** | **Length (ft.)** | **Top width****(ft.)** | **Slope country side** | **Slope river side** | **Free Board with respect to H.F.L 1992** | **Length in Mile** |
| 1 | Guides Banks L / Side | 3360 | 40 ft | 2:1 | 2:1 | 5.0' | 0.67 |
| 2 | Guides Banks R / Side | 2121 | 40 ft | 2:1 | 2:1 | 5.0' | 0.42 |
| 3 | Left Marginal Bund | 17170 | 25 ft | 3:1 | 3:1 | 5.0' | 3.43 |
| 4 | Left T-Spur | 1950 | 20 ft | 3:1 | 3:1 | 5.0' | 0.39 |
| 5 | Right Closure Bund | 3420 | 25 ft | 5:1 | 3:1 | 5.0' | 0.68 |
| 6 | Right Bank Spur | 2762 | 25 ft | 3:1 | 3:1 | 5.0' | 0.55 |
| 7 | Right T – Spur | 3260 | 20 ft | 3:1 | 2:1 | 5.0' | 0.65 |
| 8 | Right Retired Embankment | 4200 | 15 ft | 2:1 | 2:1 | 5.0' | 0.84 |
| 9 | Flood Embankment along LJC | 70000 | 20 ft | 1.5:1 | 1.5:1 | 5.0' | 14.0 |
| 10 | Right Guide Bund of old Rasul weir. | 4700 | 30 ft | 2:1 | 2:1 | 5.0' | 0.94 |

**2.2 Location MAP**

**Attached at Page No.7**

**CHAPTER-3**

**BRIEF HISTORY OF PAST FLOOD EVENTS*.***

###### RIVER JHELUM

During 1992, a super flood passed at Rasul Barrage on 10-09-1992 with a peak discharge of 9,52,170 Cusecs. The flood water overtoped the left Marginal Bund between R.D 14-17 and caused breach in it. The uncontrolled water also entered in LowerJhelumCanal and caused damage to the canal banks and bridges, three number foot bridges and one number V.RBridge collapsed completely while other two number bridges were damaged partially. Soon after flood, the main breach in the Left Marginal Bund was closed with the help of machinery of Mechanical CircleLahore. Damaged V.R Bridges at R.D 6+416 & R.D 12+525 were repaired and opened for traffic. The aforesaid four number bridges had also been reconstructed under FDRP 1992 and were opened for public traffic.

Thereafter, an exceptionally high flood with discharge of 5,49,598Cusecs was passed through Rasul Barrage on 27/08/1997,which damaged the apron of Left T-Spur D/S Rasul Weir however the same was got repaired / restored.During 2014, anexceptionally high flood of 516387 Cusecs passed through Rasul Barrage safely on 06/09/2014 whereas, during the flood season 2021, maximum discharge of 31420 cusecs had passed safely without any damages.

**RIVER CHENAB**

During floods of 1973,1976,1988 and 1996, the flood water entered into R.Q Link Canal through its Tail Regulator by over topping the gates. Moreover BudhiNullah carrying a discharge 16,000 Cs also discharges into R.Q Link at RD. 99+000, through intake structure. The synchronization of flood in BudhiNullah and River Chenab during flood 1973 created havoc in reach RD. 99+000 to 142+000 and R.Q Link was breached at RD. 110+000/R ininundating vast agricultural land of Tehsil Phalia. The village abadiesof left side of R.Q Link in the reach RD. 128+000 were also endangered due to high flood level in R. Q Link Canal.

A precarious situation was arisen during September 1992, Super flood in River Jhelum caused unpleasant situation at Rasul Headworks and flood water entered into R.Q Link in reach RD. 0+000 to RD. 25+000 after over topping and breaching left bank of R.Q Link. Against design capacity of 19,000 Cs.flood water to the scale of 26,000 Cs.passed into R. Q Link causing heavy damages to R. Q Link again throughout its length. High flood in River Chenab at Qadirabad Barrage also shared negatively and back water of River Chenab entered into the R.Q Link Canal after over topping the gates of tail regulator. R. Q Link in reach RD. 130+000 to 145+256 although received serious blow but with efforts on war-footings basis, it was saved. Similar situation arose during exceptionally high flood in River Chenab in 1996 &1997.in 1997 the Zamindars of village Audo, Sukhali, ChakJanoKhurd, ChakJanoKalan, Egroia, Eargani and Basi made a deliberate cut in the left bank at RD. 104-105 to drain out their fields. The cut was repaired after flood. Similarly tail reach RD142-145 came under serious erosion/sloughing. The channel was saved by flood fighting. In view of the past experience tail reach of R.Q Link (RD.130+000-145+256) need special attention to avoid unpleasant situation during flood season.

**CHAPTER-4**

**DESIGNED DATA, HISTORIC PEAK FLOOD DATA AND PREVIOUS FIVE YEARS FLOOD DATA OF HEAD WORKS AND OTHER CONTROL POINTS OF RASUL BARRAGE.**

1. **(a) Barrage**

i Year of Construction 1965-67

ii Year of Commencing 1968

iii Maximum design capacity 8,50,000 Cusecs

iv Highest flood passed (During 1992) 9,52,000 Cusecs

v Normal Pond level 719.00 ft

vi Crest level – Standard bays 703.00 ft

vii Crest level – Under sluice bays 698.50 ft

viii Number of bays 48

ix Number of Under sluice bays 1 - 6

x Number of Normal bays 7 - 48

xi Width of each bay 60 ft

x Total width of water way 2,880 ft

xi Width of between abutments 3,209 ft

xii No. of Divide wall 2 No.

xiii Thickness of wall 7 ft

xiv Top level of wall 724.00

xv Top level of each gate 721.50

xvi Apron D/S level 686.00

xvii Length of U/S floor of normal bay 159 ft

xviii Length of D/S floor of normal bay 262 ft

xix Length of U/S floor of under sluice 620.60 ft

xx Length of D/S floor of under sluice L/side 686.7

xxi Length of D/S floor of under sluice R/side 309.75

xxii Company Harza Engineering Co. international Chicago as their general consultants

xxiii No. of Piles U/S normal bays 2x42 84 No.

xxiv No. of Piles D/S of normal bays 2x42 84 No.

xxv No. of Piles U/S under sluice 3x6 18 No.

xxvi No. of Piles D/S under sluice 2x6 12 No.

xxvii Total surface area of one gate of normal bay 4841 Sft:

xxviii Total surface area of one gate of under sluice 6465 Sft:

xxix Total surface area of one No. Gate of R.Q.Link and

 LowerJhelumCanal Feeder. 2173 Sft

**(b) OFF TAKING CHANNELS.**

1. **R.Q. Link Canal*.***

Designed discharge 19,000 cusecs

 Crest Level 708.50 ft

 No. of Bays 6

 Width of each Bay 40 ft

 Total width of water way 240 ft

 Bed width 330 ft

 Width between abutments 270 ft

 Full Supply depth 14.0 ft

 Total surface area of one No. Gate of R.Q. Link 2173 Sft:

1. **LJC Feeder Canal.**

 Design discharge 6,600 Cusecs

 Crest level 708.50 ft

 No. of bays 2

 Width of each bay 40 ft

 Total width of water way 80 ft

 Bed Width 120 ft

 Width between abutments 86 ft

 Full supply depth 7.5 ft

 Total surface are of one No. Gate of LJC Feeder. 2173 Sft:

 Length of concrete floor 128.75 ft

1. **Pressure Pipes.**

No. of pressure pipes. 50 No.

Chocked ones 5 No.

**(d) Relief Wells**

No. of relief well 24 No

Chocked ones 24 No.

**4.1 Flood Limits fixed by Flood Commission**

|  |  |  |
| --- | --- | --- |
| **Flood limits** | **River Jhelum** | **River Chenab** |
| **Discharge ranges (Cusecs)** |
| Low Flood  | 75,000-1,10,000 | 1,00,000-1,50,000 |
| Medium Flood | 1,10,000-1,50,000 | 1,50,000-2,00,000 |
| High Flood | 1,50,000-2,25,000 | 2,00,000-4,00,000 |
| Very High Flood  | 2,25,000-3,00,000 | 4,00,000-6,00,000 |
| Exceptionally High Flood | Above 3,00,000 | Above 6,00,000 |

**4.2 Time lag from Mangla to Rasul Barrage (Distance 45 miles)**

|  |  |
| --- | --- |
| **Discharge** | **Time lag (hours)** |
| Low Supplies | 16 to 20 |
| Low Flood | 15 |
| Medium Flood | 12 |
| High Flood | 10 |
| Very High Flood | 8 |
| Exceptionally High Flood | 1. to 7
 |

**4.3 Highest Floods in River Jhelum**

|  |  |  |
| --- | --- | --- |
| **Date** | **Discharges (Cs)** | **Pond Level (ft.)** |
| 02-07-1959 | 8,70,000 | 719.00 |
| 11-07-1960 | 8,60,000 | 721.80 |
| 10-09-1992 | 9,52,170 | 721.70 |
| 27-08-1997 | 5,49,598 | 716.00 |
| 06-09-2014 | 5,16,387 | 720.40 |

* 1. **Peak Discharges in River Jhelum**

|  |  |  |
| --- | --- | --- |
| **Date** | **Discharges (Cs)** | **Pond Level (ft.)** |
| 02-07-1959 | 8,70,000 | 719.00 |
| 11-07-1960 | 8,60,000 | 721.80 |
| 10-07-1972 | 1,05,150 | 716.00 |
| 09-08-1973 | 2,69,330 | 716.80 |
| 23-08-1975 | 1,23,034 | 715.00 |
| 04-08-1976 | 2,69,330 | 715.00 |
| 12-08-1978 | 93,382 | 719.00 |
| 19-08-1980 | 73,583 | 719.00 |
| 26-07-1981 | 1,04,424 | 716.00 |
| 06-08-1983 | 97,251 | 719.00 |
| 15-08-1984 | 95,905 | 719.00 |
| 08-08-1986 | 1,13,528 | 717.00 |
| 12-06-1987 | 1,27,950 | 717.00 |
| 22-07-1988 | 1,54,389 | 718.00 |
| 01-08-1989 | 1,53,174 | 718.00 |
| 18-08-1990 | 75,259 | 719.00 |
| 11-06-1991 | 97,704 | 719.00 |
| 10-09-1992 | 9,52,170 | 721.70 |
| 14-07-1993 | 1,00,998  | 718.00 |
| 23-08-1995 | 1,29,392 | 717.00 |
| 28-7-1994 | 2,85,071 | 715.00 |
| 27-06-1996 | 1,36,712 | 716.00 |
| 27-08-1997 | 5,49,598 | 716.00 |
| 18-05-1998 | 73,597 | 719.00 |
| 17-07-2005 | 92,246 | 719.00 |
| 13-07-2006 | 1,65,947 | 720.85 |
| 15-08-2007 | 23,608 | 719.00 |
| 03-05-2008 | 27,515 | 719.00 |
| 16-08-2009 | 69,952 | 719.10 |
| 30-07-2010 | 2,63,795 | 718.00 |
| 17-09-2011 | 96,864 | 718.00 |
| 05-08-2012 | 43,135 | 719.00 |
| 24-08-2013 | 35,325 | 719.00 |
| 06-09-2014 | 5,16,387 | 720.40 |
| 27-07-2015 | 99,103 | 718.20 |
| 30-08-2016 | 40,425 | 718.10 |
| 02-05-2017 | 60,723 | 719.20 |
| 02-10-2018 | 43,135 | 719.20 |
| 18-06-2019 | 91,904 | 719.20 |
| 28-08-2020 | 126,951 | 716.80 |
| 29-06-2021 | 31,420 | 719.10 |
| 16-06-2022 | 23,610 | 719.10 |

**CHAPTER-5**

**FLOOD FIGHTING STRATEGY**

* 1. **RIVER JHELUM**

The flood fighting operation has the five stages.

 i **Stage No.1(Discharge between 75,000 to 1,10,000 cusecs)**

The river water is entirely contained within its natural banks. During this stage Sub Divisional Officer,Head Workswill bethe overall in-charge of the operation. Whereas, Sub Engineer Barrage will be supervising operation system at Barrage,Sub Engineer Head works will superviseriver training works of the left and right side of the River, Sub Engineer Main line and Sub Engineer station will supervise the flood embankment along lower Jhelum canal from RD 00 to 70000/R.Special watching staff will be deployed at the rate of one man per mile length which will be available round the clock to cope with any emergent situation.

ii **Stage No.2 (Discharge between 1,10,000 to 1,50,000 Cusecs)**

During this stage Sub Divisional Officer, Head Workswill bethe overall in-charge of the operation. Whereas, Sub Engineer Barrage will be supervising operation system at Barrage, Sub Engineer Head works will superviseriver training works of the left and right side of the River.Sub Engineer Main line and Sub Engineer station will supervise the flood embankment along lower Jhelum canal from RD 00 to 70000/R. Special watching staff will be deployed at the rate of two men per mile length which will be available round the clock to cope with any emergent situation.

iii **Stage No.3 (Discharge between 1,50,000 to 2,50,000 Cusecs)**

The flood will be passed through the Barrage according to regulation rules. The watching establishment for bunds and spurs will be deployed at the rate of three men per mile length.

Reach wise duties of supervisory staff will be as under.

|  |  |  |
| --- | --- | --- |
| **DESIGNATION** | **REACH** | **SITE OF CAMP** |
| Sub Engineer Station0308-6650717 | Flood Embankment alongLJC RD 00-25000 | RD 25+000 of LJC |
| Sub Engineer H/Works0323-8008001 | Right Guide Bund of Rasul H/Works, Right T-Spur, Right Retired Embankment, Right Bank Spur and Left T-Spur. | RD 12+000 of LMB at Left flank of old Rasul Head Works. |
| Sub Engineer Barrage0345-5865559 | Right & Left U/Sand D/S Guide Bund (Right Closure Bund) | (i) Left flank of Rasul Barrage(ii) Right Flank of Rasul Barrage |
| Sub Engineer Main Line0342-9992656 | Flood Embankment along LJC RD 25-70. | RD 50+000 LJC |

iv **Stage No. 4 (Discharge between 2,25,000 to 3,00,000 Cusecs)**

The strength of watching establishment will be increased from three to five men per mile when the discharge starts rising beyond 225,000 Cusecs Sub Engineer Barrage will pay full attention to regulation work. Other arrangements will be as per stage 3 above. Sub Divisional Officer, Head Works will be the in-charge of Rasul Barrage and its allied river training works.

v **Stage No.5 (Discharge above 3,00,000 Cusecs)**

Flood will be passed through the Barrage according to Regulation Rules. The watching establishment on bunds and spurs will be enhanced to two times than that of stage 4 supra.

Sub Divisional Officer, Head works will keep close liaison with the Assistant Commissioner and Assistant Superintendent of Police Mandi Bahauddin in order to procure additional volunteer labour if required. Overall distribution of duties will be as under.

|  |  |
| --- | --- |
| Sub Divisional Officer, Head works | Barrage / Head Works and flood protection works |
| Sub Engineer Barrage | Rasul Barrage, Left & Right U/S & D/S guide bunds & Right Closure Bund |
| Sub Engineer Head Works | Right Guide Bund of Rasul Weir, Right bank Spur, L & R T-Spur, Right Retired embankment & L.M.B |
| Sub Engineer Station | Flood embankment RD. 0-25 of LJC |
| Sub Engineer Main Line | Flood embankment RD 25-70/R of LJC |

* 1. **RIVER CHENAB**

Flood warnings from MaralaHeadworks and KhankiHeadworks will be transmitted through Telephone to flood information center, Jhelum as well as Sub Divisional Officer, R.Q Link at Mandi Bahauddin.

**i)** **Low Medium Floods (1.5 to 2.0 Lac Cs)**

Sub Engineer II R.Q Link will shift to BudhiNullah Regulator and Sub Engineer III to tail regulator of R.Q Link.

**ii)** **HIGH FLOOD (2.0 to 4.0 Lac Cs)**

Sub Divisional Officer, R.Q Link will shift to tail Regulator and will supervise watching operations of banks of R.Q link from RD. 90 to 145 (Tail).

**iii)** **Very High Flood (4.0 to 6.0 Lac Cs) And BudhiNullah Discharge over 0.10 Lac Cs**

District Coordination Officer and Superintendent of Police, Mandi Bahauddin will be approached to assist the Department in case of any emergency.

**iv) Exceptionally High Floods (6.0 Lac Cs and above)**

Full mobilization of all resources shall be done. All the flood works will be kept under day and night watch.

**CHAPTER-6**

**FLOOD DAMAGES RESTORATION WORKS**

No flood damages restoration work was carried out during the year 2022. Only 23610Cs water was passed Down Stream of Rasul Barrage during Flood season 2022. However, normal repair works such as rain cuts and gharas have been carried out partially through Contractor &departmental labor.

**CHAPTER-7**

**FLOOD FIGHTING / WATCHING ARRANGEMENTS**

**7.1 Pre-Flood Arrangement**

The necessary repairs of the river training works will be carried out before start of flood season. Moreover, arrangements to establish flood camps will be ensured and deficient quantity of flood fighting material and equipment will be procured before time for watching during flood season.

The flood fighting material will be kept in stores which are located in the premises of Canal Colony at Rasul under the control/ custody of the Sub Engineers concerned.

**Consolidated status of reserve stock of stone**

|  |  |  |  |
| --- | --- | --- | --- |
| **Sanction Limit (Lac CFT)** | **Available Quantity** **(Lac CFT)** | **Balance Quantity Required****(Lac CFT)** | **Remarks** |
| 5.25 | 3.631 | 1.599 | Efforts are being made to the procurement. The balance quantity is required |

|  |
| --- |
| **UPDATED STRUCTURE-WISE POSITION OF STONE FORRESERVE STOCK**  |
| **Sr.#** | **Name of Division / Name of Intervention** | **Sanctioned Limit of reserve stock** **(LAC CFT)** | **Minimum Quantity required 70% (LAC CFT)** | **Stone available at site** **(LAC CFT)** | **Balance Quantity Required** **(LAC CFT)** | **Funds Required to meet with requirement as per column 6** | **Remarks** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** |
| 1 | Guides Banks L / Side | 1.75 | 1.225 | 1.131 | 0.619 | 24.000 Million | 100 % reserve stock of stone is available at 2 No. vulnerable sites |
| 2 | Guides Banks R / Side | 1.25 | 0.875 | 1.23 | \_ |
| 3 | Left Marginal Bund | 0.75 | 0.525 | 0.655 | 0.095 |
| 4 | Left T-Spur | 0.25 | 0.175 | 0.139 | 0.111 |
| 5 | Right Bank Spur | 1.0 | 0.70 | 0.375 | 0.624 |
| 6 | Right T - Spur | 0.25 | 0.175 | 0.1 | 0.15 |
| **Total** | **5.25** | **3.68** | **3.631** | **1.599** |

However, there is no deficiency as per minimum requirement.

**7.2 Watching Establishment to be Employed During Flood Season**

Deployment of watching establishment will be as given inChapter 5.

|  |  |
| --- | --- |
| **Site** | **Flood Limits** |
| **Low** | **Medium** | **High** | **Very High** | **Exceptionally High** |
| **Man** | **Shift** | **Man** | **Shift** | **Man** | **Shift** | **Man** | **Shift** | **Man** | **Shift** |
| Rasul Barrage | 3 | 8 Hrs | 5 | 8 Hrs | 8 | 8 Hrs | 10 | 8 Hrs | 12 | 8 Hrs |
| LMB | 3 | 8 Hrs | 5 | 8 Hrs | 7 | 8 Hrs | 8 | 8 Hrs | 12 | 8 Hrs |
| Flood Embankment | 3 | 8 Hrs | 4 | 8 Hrs | 7 | 8 Hrs | 10 | 8 Hrs | 12 | 8 Hrs |
| RQLink RD:65-99 | 3 | 8 Hrs | 4 | 8 Hrs | 6 | 8 Hrs | 8 | 8 Hrs | 10 | 8 Hrs |
| RQLink RD:100-145 | 3 | 8 Hrs | 6 | 8 Hrs | 8 | 8 Hrs | 10 | 8 Hrs | 12 | 8 Hrs |

**7.3Arrangement at Sensitive Sites**

During exceptionally high flood, necessary arrangements will be made during flood season 2023 as per approved flood fighting plan. Necessary machinery will be arranged through departmental Machinery Circle Lahore or private source.

###### 7.4 a) WatchingMaterial required for HeadWorks Sub Division

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No.** | **Description** | **Total QuantityRequired** | **Available Quantity** | **Balance Quantity Required** |
| 1 | Gunny bags/F.C.Bags | 1400 No. | 700 No. | 700 No. |
| 2 | Sutli | 50 Kg | 20 Kg | 30 Kg |
| 3 | Axes | 36 No. | 24 No. | 12 No. |
| 4 | Sewing needles | 60 No. | ---- | 60 No. |
| 5 | Kassies with Handles | 150 No. | 100 No. | 50 No. |
| 6 | Killas | 500 No. | 500 No. | -- |
| 7 | LED Torches | 30 No. | 8 No. | 22 No. |
| 8 | Umbrella | 30 No. | 6 No. | 24 No. |
| 9 | Polythene Bags (50Kg) | 5000 No. | 2500 | 2500 |
| 10 | Ballies 10 ft long | 70 No. | 40 No. | 30 No. |
| 11 | Tooth Baskets | 175 No. | 175 No. | -- |
| 12 | Trungers | 700 No. | 240 No. | 460 No. |
| 13 | Manila rope | 500 lft | 280 Lft | 220 lft |
| 14 | G.I Wire | 7 cwt | 02 Cwt | 5cwt |
| 15 | Pick Axes | 14 No. | 12 No. | 2 No. |
| 16 | Munjtrungers | 700 No. | -- | 700 No. |
| 17 | Wooden Mallets | 14 No | 10 No. | 4 No |
| 18 | Rubber Gum Shoes | 30Pairs | -- | 30Pairs |
| 19 | Rain Coats | 30 No. | 6 No. | 24 No. |
| 20 | Mosquito Nests | 30 No. | -- | 30 No. |
| 21 | Bamboo | 200No. | -- | 200 No. |
| 22 | Life belts / Jackets | 50 No. | 12 No. | 38 No. |
| 23 | Water Glasses | 50 No. | -- | 50 No. |
| 24 | Water Cooler (Large) | 12 No. | -- | 12 No. |
| 25 | Plasticlottas | 18 No. | -- | 18 No. |
| 26 | Mugs/Tea Cups | 60 No. | -- | 60 No. |
| 27 | Search Lights (100 W) | 4 No. | -- | 4 No. |
| 28 | Portable generators | 2 No. | 1 No. | 1No. |
| 29 | Plastic Chair | 06 Set | 2 Set | 4 Set |
| 30 | Gas Cylinder (6 kg capacity) | 30 No. | 2 No. | 28 No. |
| 31 | Tents | 3 No. | 1 No. | 2 No. |
| 32 | Copper Conductor Cable double core 7/0.029 | 4 Coil | 1 Coil | 3 Coil |
| 33 | Energy Savors (25W) | 60 No. | -- | 60 No. |
| 34 | Super Petrol for running Generator | 420 Litre | -- | 420 Litre |

Balance quantity will be arranged before start of flood season 2023.

**b) Watching Material required for Rasul Qadirabad Link Sub Division**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sr. No.** | **Description** | **Required Quantity** | **Available Quantity** | **Balance Quantity** |
| 1. | Torches Chargeable (Medium) | 10 No. | NIL | 10 No. |
| 2. | New Gunny Bags (4-6 Cft) with Sulti and sewing needles | 100 No. | NIL | 100 No. |
| 3. | Axes large | 5 No. | NIL | 5 No. |
| 4. | Kassies with Handles | 10 No. | NIL | 10 No. |
| 5. | Ballies | 50 No. | NIL | 50 No. |
| 6. | Patha Baan | 10 Kg | NIL | 10 Kg |
| 7. | Jug Glass (1 Jug +6 Glass) | 1 Set. | NIL | 1 No. |
| 8. | Shouldari Medium | 1 No. | NIL | 1 No. |
| 9. | G.I.Wire | 100 Kg | NIL | 100 Kg |
| 10. | Generator set.  | 1 No. | NIL | 1 No. |
| 11. | Service Cable | 4 Coils | NIL | 4 Coils |
| 12. | Search light (Large) | 2 No. | NIL | 2 No. |
| 13. | Wooden Mallet | 2 No. | NIL | 2 No. |
| 14. | Petrol | 500 Liter | NIL | 500 Liter |
| 15. | M. Oil | 10 Liter | NIL | 10 Liter |
| 16. | Pitching Stone | 50000 Cft. | NIL | 50000 Cft. |
| 17. | Water Cooler (Medium Size) | 2 No | NIL | 2 No. |
| 18. | First aid Box | 1 No. | NIL | 1 No. |

Balance quantity will be arranged before start of flood season 2023.

**7.5 Arrangement for Sounding & Probing**

 The required material for observing sounding & probing is available.

1. 1 No. Small Boat
2. 1 No. Sounding Rod
3. 100 Meter Manila Rope
4. 1 No. Measurement Tape
5. 1 No. Boat Man
6. 1 No. Helper Boat Man
7. 1 No. Sounding Mistary

**7.6 Lighting Arrangement**

Sub Engineer Barrage will keep all these arrangements in proper form with the help of foreman and electrical staff. Sub Engineer will keep ready all the lightning equipment such as torches, tube lights, search lights etc. Standby generator will also be kept ready for operation in case of failure of main generator. All the mechanical, electrical staff and technical staff besides foreman will be ready round the clock to meet with emergent situation.

**7.7** **Ration Arrangements**

The regular establishment and supervisory staff will have their own food arrangements. During flood, civil administration will be requested to arrange ration for five hundred men, consisting of sugar, flour, ghee, wheat, grams and pulses.

**7.8** **POL Arrangements for Vehicle**

Before the start of flood season 2023, 500 gallons of diesel oil will be kept reserved at the Barrage to meet with the any emergent situation.

**7.9 Transportation**

Two vehicles are available in Rasul Division. For transportation of material, available tractor trolley will be used and kept ready during emergency. Tractor trolley available with the local contractor may also be hired for the transportation of labour and material etc, if desired.

**7.10 Law and order**

Sufficient strength of Police guards will be posted at the barrage during flood. However, additional strength will be requisitioned during very high flood condition to watch and safeguard against any unauthorized cutting of bunds. In this regard, Superintendent of police, Mandi Bahauddin will be requested to arrange such extra guards.

 **7.11 Medical Arrangement for Labour**

A mobile dispensary will be requisitioned from District Co-ordination Officer and Health Department during high flood period to cater for emergency requirements.

**7.12Liaison with other Departments**

Executive Engineer Rasul Division LJC Rasul and Sub Divisional Officer Head Works Division, Rasul will keep close liaison with their counter parts in other Departments. Moreover higher authorities will be approached if needed through Superintending Engineer, Lower Jhelum Canal Circle, Sargodha and Chief Engineer Irrigation Sargodha.

* 1. **7.13 Role of the Army**

The Pakistan army on the written request of Executive Engineer, Rasul Division LJC, Rasul will activate the breaching section when critical situation arises. In case of emergency i.e. when flood discharge is likely to exceed 3 Lac cusecs, at least 100 Jawans will be required to help the irrigation establishment.

**7.14Duties of Telephone Attendant**

Permanent telephone attendants are already available at the barrage for communication of urgent messages.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sr. No.** | **Name of official** | **Period** | **Time** |
| **From** | **To** |
| 1 | Abdul Sattar | 24 Hrs | 08:00AM | 04:00PM |
| 2 | Muhammad Arslan | 04:00 PM | 12:00AM |
| 3 | Muhammad Ramzan | 12:00AM | 08:00AM |

**7.15Wireless Arrangement**

A base station on right flank of Rasul Barrage would be installed by the telecommunication wing of the Punjab Police Department before the flood season. One wireless set will be installed on each vehicle of Executive Engineer, Rasul Division and Sub Divisional Officer, Head works Sub Division LJC Rasul .The Flood warning massages, flood gauges, discharges and other information regarding floods would be received and transmitted by the base station to the flood emergency center at Lahore. In addition to above, a wireless set will be installed by the Irrigation Department in Divisional Office Rasul, which will be also used for such purposes.

**CHAPTER-8**

 **DETAIL OF ENCROACHMENTS**

There is no encroachment on flood works of Rasul HeadWorks Division Rasul which may affect /obstruct the flow of river.

(A)

|  |  |  |
| --- | --- | --- |
| **Total Encroachments** | **Removed Encroachments** | **Balance Encroachments** |
| NIL | N/A | NIL |

**Critical ENCROACHMENTS**

(B)

|  |  |  |
| --- | --- | --- |
| **Total Encroachments** | **Removed Encroachments** | **Balance Encroachments** |
| NIL | N/A | NIL |

**CHAPTER-9**

**DUTY ROSTER / FLOOD FIGHTING PROGRAMME**

River Discharge Limit Above 3.0 Lac cusec

Operational In-charge Executive Engineer, Rasul Division

**CONTROLLING OFFICERS FOR RIVER JHELUM**

|  |  |  |
| --- | --- | --- |
| i | Sub Divisional OfficerHeadworks Sub Division | In-charge of Barrage / Head Works and flood protection works. |
| ii | Sub Engineer Barrage | Rasul Barrage, Left & Right U/S & D/S guide bunds & Right Closure Bund |
| iii | Sub Engineer Head Works | Right Guide Bund of Rasul Weir, Right bank Spur, L & R T-Spur, Right Retired embankment & L.M.B. |
| iv | Sub Engineer Station | Flood embankment RD. 0-25 of LJC. |
| v | Sub Engineer Main Line | Flood embankment RD 25-70/R of LJC. |

**CONTROLLING OFFICERS FOR RIVER CHENAB**

|  |  |  |
| --- | --- | --- |
| i | Sub Divisional OfficerRQ Link Sub Division | In-charge of RQ Link Canal and its associated intakes |
| ii | Sub Engineer Link-II | Budhi Nallah Regulator at RD: 99 RQ Link |
| iii | Sub Engineer Link-III | Tail Regulator at RD: 145+256 RQ Link |

In addition to above following staff will perform their duties:

**Gauge Readers**

Gauge Readers will be deputed to record hourly gauges fixed at every mile of LMB. The Gauge at RD 12 LMB is the most important one. As the breaching section on Right Closure Bund will be activated with reference to this gauge site, therefore, an efficient gauge reader will be posted at this site.

**Chowkidars**

A whole time chowkidar will be provided at each camp site to look after stores etc.

**Signalers**

Telegraph office at the Head works will work round the clock during flood season. One signaler accompanied by one official would be on duty for each shift of eight hours duration. The Head Clerk Rasul Division LJC, Rasul will monitor the duties of signalers in addition to his office staff during flood season.

**CHAPTER-10**

**EMERGENCY TELEPHONE NUMBERS**

|  |  |  |
| --- | --- | --- |
| **Sr.#** | **Designation** | **Contact No.** |
| **Office** | **Residence/Mobile** |
| 1 | Secretary Irrigation Department Lahore.**Muhammad Shehyar Sultan** | 042-99212117042-99212118 | 042-992010530304-0920033 |
| 2 | Chief Engineer Irrigation Zone Sargodha.**Ghulam Murtaza** | 048-9230445 | 048-92304510333-6941690 |
| 3 | Chief Engineer Drainage & Flood Zone Lahore. | 042-99233551042-35291304 | - |
| 4 | Superintending Engineer Mandi Bahauddin Canal Circle Jhelum**Nauman Baig** | 0544-920332 | 0320-48101500300-4810150 |
| 5 | Superintending Engineer Drainage Circle Sargodha.**Sana Ullah** | 048-9230450 | 0308-8637291 |
| 6 | Executive Engineer, Operation/ Flood Emergency Officer, Irrigation Zone Sargodha. **Ghulam Yaseen** | 048-9230446 | 048-37400500302-9079639 |
| 7 | Executive Engineer Rasul HeadWorks Division Rasul.**Adnan Amjid** | 0546-553211 | 0345-51657640302-4844342 |
| 8 | Executive Engineer Jhelum Canal Division Jhelum**Naveed Akbar** | 0544-920331 | 0301-6623908 |
| 9 | Executive Engineer Highway M&R-II Rawalpindi. | 0544-280237 | - |
| 10 | Commanding Officer 108-Engrs Battalion, Kharian. | 053-9240053 | - |
| 11 | Headquarters Engrs 1-Corps Kharian. | - | - |
| 12 | Deputy Commissioner Mandi Bahauddin. | 0546-504220 | 0546-504200 0304-0920068 |
| 13 | Deputy Commissioner Sargodha. | 048-9230025 | 048-9230046 0304-0920053 |
| 14 | Deputy Commissioner Jhelum. | 0544-920081 | 0544-9270082 0304-0920071 |
| 15 | Deputy Commissioner Jhang | 047-9200181047-9200100 | 047-9200201 |
| 16 | Sub Divisional Officer Head Works LJC Rasul.**Arif Ali Khan** | 0546-553664 | 0300-72470860347-1146970 |
| 17 | Sub Divisional Officer RQLink Sub Division MBDin.**Muhammad Qasim Hussnain** | - | 03487553236 |
| 18 | Telegraph Office Rasul | 0546-553212 | - |
| 18 | Rescue 1122 | 1122 |  |

**CHAPTER-11**

**STANDARD OPERATING PROCEDURE (SOP) FOR BREACHING SECTION**

**11.1 History of the Breaching Section**

The safety of the barrage is of prime importance and if a condition of exceptionally high flood is reached, releasing some discharge through Right Closure Bund provides relief to the barrage structure. To meet with this situation, a breaching section has been approved by flood Commission on 02/05/1981 between RD: 2+500-3+000 of right closure Bund. This will be activated when the critical level of gauge fixed at RD 12 of LMB will attain RL 727.40 and still rising or discharge U/S Rasul barrage approaches 850,000 still increasing whichever is earlier. The operation of breaching section will provide an immediate additional relief of 50,000 Cusecs.

During exceptional high flood of 1992, the breaching section was tried to be operated, but owing to construction of road on right closure bund, the liners were buried/chocked as a result of which, same could not be operated. Therefore, choked liners were replaced during 1997-98 and which again choked in the year 2016.In order to get relief of 50,000 Cs a new breaching section adjacent to old weir constructed in the year 2017 along with tuff pavers on road surface which are in working condition. However, it has been proposed that a dozer is to be deployed in addition so that breaching section be excavated when the discharge rises above 6.40 Lac cusecs below Jhelum bridge under the collective control of military and civil administration.

**11.2 Location, Design, Quantity and Variety of the Explosive Required for Detonation**

The Breaching Section of Rasul barrage is situated between RD 2+500-3+000 of right closure bund. 169 No. breaching liners have been installed in 13 lanes along the bund whereas each lane has 13 No. liners. However, five No. lanes exist on both river side and country side, whereas, 3 No. lanes exist on the top of bund. The plan and cross-section is attached on Page No. 33.

The explosive material for breaching section has been shifted to Kharian Cantonment for safety whereas in flood season it has been temporary stored in building situated near the barrage or transported to barrage when discharge more than 3,00,000 lac start from Mangla.

Status of explosive / Accessories for flood season 2023 are as under.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr. No.** | **Name of Explosive Accessories** | **Total Quantity Required** | **Available Quantity** | **Balance Quantity** | **When Arranged** |
| 1 | PE-3A (500 Gm. Slab) | 6559 Kg | 6559 Kg | Nil | N/A |
| 2 | Wabo Card 10 Gm. | 2000 Meter | 2000 Meter | Nil | N/A |
| 3 | Safety Fuse | 200 Meter | 200 Meter | Nil | N/A |
| 4 | Bamboos 10'-1" to 12.0' long | 2 No. | 2 No. | Nil | N/A |
| 5 | Bamboos 14'-1" to 16.0' long | 4 No. | 4 No. | Nil | N/A |
| 6 | Bamboos 16'-1" to 20' long | 4 No. | 4 No. | Nil | N/A |
| 7 | Bamboos 20'-1" to 22' long | 3 No. | 3 No. | Nil | N/A |
| 8 | Wheel burrows | 13No. | 13No. | Nil | N/A |
| 9 | 1/2HP Mono Block Pump with accessories | 3 No. | 3 No. | Nil | N/A |
| 10 | Shovels with handle | 13 No. | 13 No. | Nil | N/A |
| 11 | Pickaxes with handle | 13 No. | 13 No. | Nil | N/A |
| 12 | Umbrellas | 13 No. | 13 No. | Nil | N/A |

**Note:** No outstanding dues / liabilities on account of purchase of explosive / accessories is pending.

**11.3 Arrangements of Explosive and Security of Explosive Stores**

All the Explosive Materials has been stored at Kharian Cantt under the control of Military Authorities and security of explosive store lies with Pak Army personnel.

* 1. **List of the security staff with detail of their training**

 In this regard security of explosive store lies with Pak Army personals.

* 1. **Detail of mechanical means as a standby arrangements in case of detonation failure**

A bulldozer would be hired from Machinery Circle Lahore or Agricultural Department and placed nearby Breaching Section as standby arrangements.

* 1. **Duty Roster in Case of Critical Situations**

**Gauge Readers**

Gauge Readers will be deputed to record hourly gauges fixed at every mile of LMB. The Gauge at RD 12 LMB is the most important one. As the breaching section on Right Closure Bund will be activated with reference to this gauge site, therefore, an efficient gauge reader will be posted at this site.

**Chowkidars**

A whole time chowkidar will be provided at each camp site to look after stores etc.

**Telephone Attendants**

Permanent telephone attendants are already available at the barrage to attend regulation/ urgent messages and other information.

**Signalers**

Telegraph office at the Head works will work round the clock during flood season. One signaler accompanied by one official would be on duty for each shift of eight hours duration.

* 1. **Breaching committee with their action plan**

The following breach operation committee has been constituted vide notification No. SO(Floods) VI-33/97 dated 15/07/2015.

|  |  |  |
| --- | --- | --- |
| (i) | District Co-ordination Officer, Jhelum | Convener |
| (ii) | District Co-ordination Officer, Mandi Bahauddin or his representative  | Member |
| (iii) | Executive Engineer Provincial Highway, C & W Department, Jhelum | Member |
| (iv) | Executive Engineer, Rasul Division LJC Rasul | Member |
| (v) | Representative from Pakistan Army, not below the rank of Lt. Colonel. | Member |
|  |  |  |

Action plan will be followed in the light of instructions and procedure as prescribed in above notification.

* 1. **List of villages likely to be inundated in case of breach**

No village is likely to be inundated in case of breach.

* 1. **Announcement and Detail of evacuation arrangements**

There is no need of such arrangements since no abadi or any other infrastructure would be effected as a consequence of a activation/flow through Breaching Section. The Breaching Section would immediately discharge into the D/S river basin.

* 1. **Detail of Coordination with Civil / Army Authorities**

On the written request of Executive Engineer, Rasul HeadWorks Division, Rasul, Civil / Army authorities will activate the breaching section, when critical situation arises and will also keep close liaison with them round the clock during flood season.

* 1. **Parallel Communication Arrangements**

A base station on right flank of Rasul Barrage would be installed by the telecommunication wing of the Punjab Police Department before the flood season. One mobile set will be installed on each vehicle of Executive Engineer, Rasul HeadWorks Division and Sub Divisional Officer, Head Works Sub Division LJC, Rasul. The flood warning messages, flood gauges, discharge and other information regarding floods would be received and transmitted by the base station to the flood emergency center at Lahore. In addition to above, a wireless set will be installed by the Irrigation Department in Divisional Office Rasul, which will be also used for such purposes.

* 1. **Index Plan**

Index Plan Attached at Page No.32.

**General**

Executive Engineer, Rasul HeadWorks Division Rasul is competent to change places of duty of officers and officials during flood days for better watching of flood embankments and regulation.

Inspection Hut at the Rasul Barrage will be used by the Irrigation officers during flood days as a control center.

|  |  |
| --- | --- |
| **Executive Engineer**Rasul Headworks DivisionRasul | **Superintending Engineer**MANDI BAHAUDDIN Canal CircleJHELUM |

**Chief Engineer**

Irrigation Sargodha Zone

Sargodha

**Chief Engineer**

Irrigation Sargodha Zone

Sargodha

**PART “B”**

**CHAPTER-12**

**VULNERABLE SITES ON FLOOD BUND / STRUCTURES**

**12.1** **Apprehended Breach sites in Flood Bunds / Structures**

If the flood water exceeds in the river than the limit of very high flood there will be 4 apprehended breach sites. The Site 1 & 2 due to flood in river Jhelum and Site 3 & 4 due to flood in river Chenab. The detail isas below:-

**Site No. 01.** RD: 0-14000 of Left Marginal Bund.

**Site No. 02.** RD: 15000 – 17000 of Left Marginal Bund.

**Site No. 03.** RD: 99+256 of R.Q Link Canal.

**Site No. 04.** RD: 145+256 of R.Q Link Canal.

**12.2** **Operation of Breaching Section**

 Detail given as per page No. 28

**12.3** **Breaching due to raising of flood water, deterioration of flood bund**

 If the flood water raises during flood and critical gauge attains its level and still in rising position, then breaching section will be operated on directions of breach operation committee in the light of prescribed instructions and procedure to avoid breach/mishap on apprehended breach sites given at 12.1.

**CHAPTER-13**

**EMERGENCY CONTINGENCY PLAN FOR VULNERABLE SITE NO. 1 &2**

* 1. **Plan showing route of Flood water coming out of the breach supported with levels for site No. 01 & 02**

Plan Showing route of flood water coming out of the breach for site No. 1 i.e. RD 00 - 14000 of LMB is attached at page No. 37.

 Plan Showing route of flood water coming out of the breach for site No. 2 i.e. RD: 15000 – 17000of LMB is attached at page No. 38.

* 1. **Detail of Villages abadies likely to be affected and this should also be shown on the plan for site No. 01 & 02**

In case of breach from site No. 01, the Flood water would be affected in the villages Dhapi, Wara balian, Samupur, Kotehra, and may damage major infrastructure of these villages. Whereas, in case of breach from site No. 02,the flood water mayaffect canal colony Rasul, Rasul college, village Boora, Shahana lok, Kot Noor Shah, Kot Bloach and Chak Feteh shah besides major damages to all the infrastructure of these villages.

* 1. **Strategy and action taken be explained in detail for site No. 01 & 02**

For apprehended breach sites at RD 00-14000 of LMB and RD 15000-17000 of LMB, following strategy / action plan will be implemented.

1. When the flood water will pass through the above cited villages and after over topping of left bank of old LJC, it will strike with left bank of R.Q Link and run along it. In this situation, a relief cut/ breach will be made at R.D 16000 to 20000 for the entrance of flood water in R.Q. Link. Then the flood water will flow in R.Q. Link and will fall in River Chenab at Qadirabad Barrage. It is also added that the design discharge capacity of R.Q.Link is 19000 Cs, which would be closed during the flood season. Therefore heavy flood water will be passed through this relief cut /breach.
2. In addition to above, a seepage drain namely KotBaloachBahauddin will carry flood water under syphon RD 22256 of R.Q.Link and will dispose to the River Jhelum through syphon under LJC at RD 59000.
3. The In-chargeSub Divisional Officer, Head Works Sub Division taking the cognizance of situation will make liaison with the Civil Administration and Police Department and will also arrange:
	* Proclamation on loudspeakers will be made for evacuation of abadies inside the flood plan.
	* Prepare maps for the area inundated and carry out immediate survey for damages to crops and other properties.
	* He will keep a close liaison with Civil Administration, Public Representatives, Army authorities and the Executive Engineer Rasul Division, LJC Rasul. List of Phone numbers of above authorities have been mentioned in this flood fighting plan.
		1. **Arrangements**
		2. **Establishment of Flood Fighting Camps**

The detail given as under:-

|  |  |  |
| --- | --- | --- |
| **DESIGNATION** | **REACH** | **SITE OF CAMP** |
| Sub Engineer H/Works | 1. 00 -14000 of LMB
2. 15000 – 17000 of LMB
 | RD 12+000 of LMB at left flank of old Rasul Head Works |

* + 1. **Duties of officers / officials and their camp sites**

The detail of duties of officer & official given as under:-

|  |  |
| --- | --- |
| Sub Divisional Officer,Head Works Sub Division | Overall In-charge of the 2 No. vulnerable sites. |
| Sub EngineerHead Works | In-charge of Camp established at RD 12+000 of LMB at left flank of old Rasul Head Works to cater for both vulnerable sites. |

* + 1. **Departmental Machinery Available**

1 No. tractor trolley is available with Rasul Division LJC Rasul.

* + 1. **Machinery available from Private Source**
1. Required machinery will be arranged through private sources. Following machinery can be hired in case of emergency, 2 No. Dozer, 1 No. Excavator, 4 No. Dumper, 1 No. Long Vehicle / Trolla and 2 No. Motor Boats.

* + 1. **Flood Fighting Material required for site No. 01 & 02**

|  |  |  |
| --- | --- | --- |
| **No.** | **MATERIAL**  | **QUANTITY** |
| 1 | Polythene Bags (500Kg) | 250No. |
| 2 | Polythene Bags (1000Kg) | 250 No. |
| 3 | Black Polythene Sheet | 20000 Sft |
| 4 | Energy Savors (25 W) | 24 No. |
| 5 | Super Petrol | 420 Litre |
| 6 | Rain Coats | 12 No. |
| 7 | Mosquito Nets | 12 No. |
| 8 | Copper conductor cable twin core 7/0.029 | 2 Coil |
| 9 | LED torches | 20 No. |
| 10 | Umbrella | 10 No. |
| 11 | Polythene bags (50 Kg) | 1000 No. |
| 12 | Sutli | 10 Kg |
| 13 | Axes | 12 No. |
| 14 | Sewing needles | 24 No. |
| 15 | Kassies with Handles | 50 No. |
| 16 | Killas | 50 No. |
| 17 | Ballies 10 ft long | 24 No. |
| 18 | Tooth Baskets | 50 No. |
| 19 | Portable generators | 2 No. |
| 20 | Trungers | 100 No. |
| 21 | Manila rope | 200 Rft |
| 22 | G.I Wire | 2 cwt |
| 23 | Pick Axes | 6 No. |
| 24 | Wooden Mallets | 6 No. |
| 25 | Rubber Gum Shoes | 8 Pairs |
| 26 | Life Belt /Jackets | 10 No. |
| 27 | Water Cooler (Large) | 4 No. |
| 28 | Water Glasses | 20 No. |
| 29 | Plasticlottas | 6 No. |
| 30 | Mugs/ Tea Cups | 24 No. |
| 31 | Search Lights | 4 No. |
| 32 | Tents | 2 No. |
| 33 | Plastic Chair with Table | 2 Set |
| 34 | Banners | 10 No. |

* + 1. **Flood Fighting Material availablefor site No. 01 & 02**

The available quantity of flood fighting material is given as under. Balance quantity will be purchased before the flood season.

|  |  |  |
| --- | --- | --- |
| **No.** | **MATERIAL**  | **QUANTITY** |
| 1 | Polythene Bags (500Kg) | -- |
| 2 | Polythene Bags (1000Kg) | -- |
| 3 | Black Polythene Sheet | -- |
| 4 | Energy Savors (25 W) | -- |
| 5 | Super Petrol | -- |
| 6 | Rain Coats | 6 No. |
| 7 | Mosquito Nets | -- |
| 8 | Copper conductor cable twin core 7/0.029 | 1 Coil |
| 9 | LED torches | -- |
| 10 | Umbrella | -- |
| 11 | Polythene bags (50 Kg) | 1000 No. |
| 12 | Sutli | 10 Kg |
| 13 | Axes | 12 No. |
| 14 | Sewing needles | -- |
| 15 | Kassies with Handles | 50 No. |
| 16 | Killas | 50 No. |
| 17 | Ballies 10 ft long | 24 No. |
| 18 | Tooth Baskets | 50 No. |
| 19 | Portable generators | 1 No. |
| 20 | Trungers | -- |
| 21 | Manila rope | 200 Rft |
| 22 | G.I Wire | 2 cwt |
| 23 | Pick Axes | 6 No. |
| 24 | Wooden Mallets | 6 No. |
| 25 | Rubber Gum Shoes | -- |
| 26 | Life Belt /Jackets | 10 No. |
| 27 | Water Cooler (Large) | -- |
| 28 | Water Glasses | -- |
| 29 | Plasticlottas | -- |
| 30 | Mugs/ Tea Cups | -- |
| 31 | Search Lights | --. |
| 32 | Tents | -- |
| 33 | Plastic Chair with Table | -- |
| 34 | Banners | -- |

* 1. **Detail of other infrastructure like electric, Sui Gas, Telephone installations, road network, other buildings, Canals and drainage network.**

In case of breach in LMB, it may damage the abadies including infrastructure like 500 Electric poles and about 300 Telephone poles and Mandi Bhauddin to Jhelum / Kharianroads & canal network etc. of the villages mentioned above in Chapter 13 (13.2).

 **EMERGENCY CONTINGENCY PLAN FOR VULNERABLE SITE NO. 5:**

 **RASUL QADIRABAD LINK CANAL AT RD 99+256**

**13.1 PLAN SHOWING ROUTE OF FLOOD WATER COMING OUT OF THE BREACH SUPPORTED WITH LEVELS.**

Plan Attached.

**13.2 DETAIL OF VILLAGES ABADIES LIKELY TO BE AFFECTED.**

Village ChakJanoKalan, ChakJanoKhurd, Basi, Sheikh Ali pur, AadoSarwani, SohawaWaraichan&Arzani.

**13.3 STRATEGY AND ACTION TAKEN BE EXPLAINED IN DETAIL**

PRK Drain crosses Rasul-Qadirabad Link Canal through Syphon at RD 99+036. Reduced capacity of the Syphon structure causes back water in the Drain when in flooded condition causing damages upstream. In case of Flooding in the Drain, the R.Q Link Canal will be reduced from its head and Intake structure at RD 99+256/L will be operated to give relief to Village Abadies upstream of the Drain. Intake Structure has capacity up to 16000 Cs of water and eventually outfalls in River Chenab.

**13.3.1 ARRANGEMENTS**

**13.3.2 ESTABLISHMENT OF FLOOD FIGHTING CAMPS**

 Flood fighting camp will be established at RD 99+256 of flood bund.

**13.3.3 DUTIES OF OFFICERS/ OFFICIALS AND THEIR CAMP SITES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Camp No.** | **Location** | **Officer****Name****Designation****Mobile #** | **Official****Name****Designation****Mobile #** |
| **5** | RASUL QADIRABAD LINK CANAL AT RD 99+256 | Sub Divisional Officer, R.Q Link | Sub Engineer, Section-II |

The Sub Divisional Officer, R.Q Link Sub Division will shift his Head Quarter to RD 99+256 R.Q Link Canal and will be responsible for flood fighting / restoration activities. Sub Engineer Section No. III and his establishment will assist the SDO R.Q Link in flood fighting activities.

**13.3.4 DEPARTMENTAL MACHINERY AVAILABLE**

1 No tractor trolley is available with this Division.

**13.3.5 MACHINERY AVAILABLE FROM PRIVATE SOURCE**

Private machinery including tractor trolleys, excavators and dumpers are available near village Mano Chak and Janoke near R.Q Link Canal RD 114-124 and can be hired as and when required.

13.3.6 **FLOOD FIGHTING MATERIAL REQUIRED**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.No.** | **ITEM** | **Required Quantity** | **Available Quantity** | **Balance Quantity** |
| 1. | Torches Chargeable (Medium) | 10 No. | NIL | 10 No. |
| 2. | New Gunny Bags (4-6 Cft) with Sulti and sewing needles | 100 No. | NIL | 100 No. |
| 3. | Axes large | 5 No. | NIL | 5 No. |
| 4. | Kassies with Handles | 10 No. | NIL | 10 No. |
| 5. | Ballies | 50 No. | NIL | 50 No. |
| 6. | Patha Baan | 10 Kg | NIL | 10 Kg |
| 7. | Jug Glass (1 Jug +6 Glass) | 1Set. | NIL | 1 No. |
| 8. | Shouldari Medium | 1 No. | NIL | 1 No. |
| 9. | G.I.Wire | 100 Kg | NIL | 100 Kg |
| 10. | Generator set. | 1 No. | NIL | 1 No. |
| 11. | Service Cable | 4 Coils | NIL | 4 Coils |
| 12. | Search light (Large) | 2 No. | NIL | 2 No. |
| 13. | Wooden Mallet | 2 No. | NIL | 2 No. |
| 14. | Petrol | 500 Liter | NIL | 500 Liter |
| 15. | M. Oil | 10 Liter | NIL | 10 Liter |
| 16. | Pitching Stone | 50000 Cft. | NIL | 50000 Cft. |
| 17. | Water Cooler (Medium Size) | 2 No | NIL | 2 No. |
| 18. | First aid Box | 1 No. | NIL | 1 No. |

13.3.7 **FLOOD FIGHTING MATERIAL AVAILABLE**

Flood Fighting Material will be purchased before flood season 2023.

**13.4 DETAIL OF OTHER INFRASTRUCTURES LIKE ELECTRIC, SUI GAS, TELEPHONE INSTALLATIONS, ROAD NETWORKS, OTHER BUILDINGS, CANAL AND DRAINAGE WORKS.**

 Electric lines and Roads.

**EMERGENCY CONTINGENCY PLAN FOR VULNERABLE SITE NO. 4: RASUL QADIRABAD LINK CANAL AT RD 145+256.**

**13.1 PLAN SHOWING ROUTE OF FLOOD WATER COMING OUT OF THE BREACH SUPPORTED WITH LEVELS.**

Plan Attached.

**13.2 DETAIL OF VILLAGES ABADIES LIKELY TO BE AFFECTED.**

Village ChanniSahanpal, Ranmal, KaluPindi, Bahu, Manga, ChanniWali Dad, Sarang, Sahnpal&Thatta.

**13.3 STRATEGY AND ACTION TAKEN BE EXPLAINED IN DETAIL.**

High Flood in River Chenab when exceeds discharge of 4 Lacs it over tops the tail Regulator Structure at RD 145+256 of R. Q Link Canal causing threats to Village Abadies of ChanniSahanpal, Ranmal, KaluPindietc at large. If such scenario arises, RQ Link Canal will be closed from its head to give some relief to adjoining abadies and flood fighting will be done if required.

**13.3.1 ARRANGEMENTS**

**13.3.2 ESTABLISHMENT OF FLOOD FIGHTING CAMPS**

 Flood fighting camp will be established at RD 145+256 R.Q Link Canal.

**13.3.3 DUTIES OF OFFICERS/ OFFICIALS AND THEIR CAMP SITES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Camp No.** | **Location** | **Officer****Name****Designation****Mobile #** | **Official****Name****Designation****Mobile #** |
| **6** | RASUL QADIRABAD LINK CANAL AT RD 145-256 | Sub Divisional Officer, R.Q Link | Sub Engineer, Section-III |

The Sub Divisional Officer, R.Q will shift his Head Quarter to RD 145+256 (tail) R.Q Link Canal and will be responsible for flood fighting / restoration activities. The Sub Engineer Section No. III and his establishment will assist the SDO R.Q Link in flood fighting activities.

**13.3.4 DEPARTMENTAL MACHINERY AVAILABLE**

1 No tractor trolley is available with this Division.

**13.3.5 MACHINERY AVAILABLE FROM PRIVATE SOURCE**

Private machinery including tractor trolleys, excavators and dumpers are available near village Mano Chak and Janoke near R.Q Link Canal RD 114-124 and can be hired as and when required.

13.3.6 **FLOOD FIGHTING MATERIAL REQUIRED**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S.No.** | **ITEM** | **Required Quantity** | **Available Quantity** | **Balance Quantity** |
| 1. | Torches Chargeable (Medium) | 10 No. | NIL | 10 No. |
| 2. | New Gunny Bags (4-6 Cft) with Sulti and sewing needles | 100 No. | NIL | 100 No. |
| 3. | Axes large | 5 No. | NIL | 5 No. |
| 4. | Kassies with Handles | 10 No. | NIL | 10 No. |
| 5. | Ballies | 50 No. | NIL | 50 No. |
| 6. | Patha Baan | 10 Kg | NIL | 10 Kg |
| 7. | Jug Glass (1 Jug +6 Glass) | 1Set. | NIL | 1 No. |
| 8. | Shouldari Medium | 1 No. | NIL | 1 No. |
| 9. | G.I.Wire | 100 Kg | NIL | 100 Kg |
| 10. | Generator set. | 1 No. | NIL | 1 No. |
| 11. | Service Cable | 4 Coils | NIL | 4 Coils |
| 12. | Search light (Large) | 2 No. | NIL | 2 No. |
| 13. | Wooden Mallet | 2 No. | NIL | 2 No. |
| 14. | Petrol | 500 Liter | NIL | 500 Liter |
| 15. | M. Oil | 10 Liter | NIL | 10 Liter |
| 16. | Pitching Stone | 50000 Cft. | NIL | 50000 Cft. |
| 17. | Water Cooler (Medium Size) | 2 No | NIL | 2 No. |
| 18. | First aid Box | 1 No. | NIL | 1 No. |

**13.3.7 FLOOD FIGHTING MATERIAL AVAILABLE**

Flood Fighting Material will be purchased before Flood Season 2023.

**13.4 DETAIL OF OTHER INFRASTRUCTURES LIKE ELECTRIC, SUI GAS, TELEPHONE INSTALLATIONS, ROAD NETWORKS, OTHER BUILDINGS, CANAL AND DRAINAGE WORKS.**

 Electric lines and Roads.

|  |  |
| --- | --- |
| **Executive Engineer**Rasul HEADwORKS DivisionRasul | **Superintending Engineer**mANDI bAHAUDDIN Canal CircleJHELUM |

**Chief Engineer**

Irrigation Sargodha Zone

Sargodha

**CHAPTER-14**

**ACTION PLAN**

* 1. **Re-shuffling/ recouping plan of reserve stone departmentally**

The current status of reserve stock of stone is as under which shows that 100 % reserve stock of stone is available at 2 No. vulnerable sites.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sr.#** | **Name of Structure** | **Sanctioned Limit of reserve stock** **(LAC CFT)** | **Minimum Quantity required 70% (LAC CFT)** | **Stone available at site** **(LAC CFT)** | **Balance Quantity Required** **(LAC CFT)** | **Remarks** |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** |
| 1 | Guides Banks L / Side | 1.75 | 1.225 | 1.131 | 0.619 | 100 % reserve stock of stone is available at 2 No. vulnerable sites |
| 2 | Guides Banks R / Side | 1.25 | 0.875 | 1.23 | - |
| 3 | Left Marginal Bund | 0.75 | 0.525 | 0.655 | 0.095 |
| 4 | Left T-Spur | 0.25 | 0.175 | 0.139 | 0.111 |
| 5 | Right Bank Spur | 1.0 | 0.70 | 0.375 | 0.624 |
| 6 | Right T - Spur | 0.25 | 0.175 | 0.1 | 0.15 |
| **Total** | **5.25** | **3.675** | **3.631** | **1.599** |

* 1. **Detail of inlet/ outlet crossing along with closing methodology**

There is no inlet/outlet crossing exist in the river training works of Rasul Barrage.

* 1. **Police Deployment Plan**

There is 1 HC and 4 FC are present at Rasul Barrage Chowki and during flood 1 FC do the job on left flank and 1 HC and 3 FC do the job on the right flank of Rasul Barrage.

**1-**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sr.** | **Site of Breaching section**  | **Concerned Canal Division** | **Concerned Police station & District** | **Police personal to be deployed** | **Remarks(if any)** |
| **Inspector / S.I / A.S.I** | **Constables** |
| 1 | Right Closuer Bund at RD 2+500 to 3+000 | Rasul Division  | Sadar, M.B.DinM.B.Din | 1 | 4 |   |
| **2-** |  |  |  |  |  |  |
| **Sr.** | **Vulnerable sites used for illegal cuts during floods** | **Concerned Canal Division** | **Concerned Police station & District** | **Police personal to be deployed** | **Remarks(if any)** |
| **Inspector / S.I / A.S.I** | **Constables** |
| 1 | RD 0+000 to 14+000 of LMB | Rasul Division  | Sadar, M.B.DinM.B.Din | 2 | 10 |   |
| 2 | RD 15+000 to 17+000 LMB | Rasul Division | Sadar, M.B.DinM.B.Din | 2 | 10 |   |
| **3-** |  |  |  |  |  |  |
| **Sr.** | **Name of Barrage** | **Concerned Canal Division** | **Concerned Police station & District** | **Police personal to be deployed** | **Remarks(if any)** |
| **Inspector / S.I / A.S.I** | **Constables** |
| 1 | Rasul Barrage | Rasul Division | Sadar, M.B.DinM.B.Din | 2 | 10 |   |
| **4-** |  |  |  |  |  |  |
| **Traffic police if required for smooth traffic flow at Barrage during flood. (add required detail)** |
| 05 Nos. Traffic Police constables will be required during flood. |
| **5-** |  |  |  |  |  |  |
| **Any other suggestions.** |
| NIL |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

* 1. **Details of Synthetic Bags with capacity of 500Kg and 1000Kg**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Items** | **Required Quantity** | **Available Quantity** |
| 1 | Synthetic Bags (500Kg Capacity) | 500 No. | -- |
| 2 | Synthetic Bags (1000Kg Capacity) | 500 No. | -- |

* 1. **Details of polythene sheet of black color to protect upstream slope against wave action and to control seepage through embankments**

|  |  |  |  |
| --- | --- | --- | --- |
| **No.** | **Items** | **Required Quantity** | **Available Quantity** |
| 1 | Black Polythene Sheet | 20000 Sft | -- |

 Balance quantity will be produced before the flood season 2023.

**CHAPTER-15**

**BACK UP DIVISIONS (IN CASE OF BREACH)**

The Jhelum Canal Division UJC Jhelum and Mandi Bahauddin Canal Division Mandi Bahauddin will be worked as back up Division in case of breach.

**Executive Engineer Superintending Engineer**

Rasul Division LJC mandi bahauddin Canal Circle

Rasul jhelum