सिंचाई विभाग, उत्तराखण्ड

अपार शक्तेः स्त्रौतः गंगेयम

सिंचाई बढ़ाएं खुशहाली लाएं।

योजना का नाम –: जनपद पिथौरागढ़ के धारचूला विकास खण्ड मे काली नदी के दॉये पार्श्व मे स्थित आर्मी कैम्प–1 की काली नदी से सुरक्षा हेतु बाढ़ सुरक्षा योजना।

अनुमानित लागत : रु0 2451.07 लाख

वर्ष : 2024–25

सिंचाई कार्य मण्डल, पिथौरागढ़।

सिंचाई खण्ड, धारचूला।

कार्यालय मुख्य अभियन्ता (स्तर–।।)
सिंचाई विभाग, उत्तराखण्ड, अल्मोड़ा

पत्रांकः– 1252 /मु0अ0(स्तर–।।)/ई–14 / दिनांकः– 11.06.2024

–:कार्यालय ज्ञाप:–

जनपद पिथौरागढ़ के धारचूला विकास खण्ड में काली नदी के दाँये पार्श्व में स्थित आर्मी कैम्प–1 की काली नदी से सुरक्षा हेतु बाढ़ सुरक्षा योजना लागत रू0 2451.07 लाख (रू0 चौबीस करोड़ इक्यावन लाख सात हजार मात्र) को लेखाशीर्षक 8443 डिपोजिट मद के अन्तर्गत तकनीकी स्वीकृति निम्न प्रतिबन्धों के साथ एतद्द्वारा प्रदान की जाती है।

01. योजना के कियान्वयन के समय डिपोजिट मद की गाईड लाईन व निदिष्टियों का पालन करते हुए आवंटित बजट का उपयोग भारतीय सैन्य विभाग के पत्र सं0 1189/Kali River Dated 06.03.2024 के अनुसार किया जाये।
02. स्वीकृति योजना में प्राविधानित राशि से किसी भी दशा में व्ययाधिक्य न हो।
03. स्वीकृति योजना के स्वरूप में किसी भी प्रकार के फेरबदल से पहले आवश्यक स्वीकृति प्राप्त कर लें।
04. कार्य की गुणवत्ता एवं समयबद्धता हेतु संबंधित अधिशासी अभियन्ता पूर्ण उत्तरदायी होंगे।
05. योजना में ली गई कार्यों की दरों हेतु सम्बन्धित अधीक्षण अभियन्ता उत्तरदायी होंगे।

उपरोक्त स्वीकृति इस कार्यालय के प्राक्कलन पंजिका के क्रमांक– 04/सीई(स्तर–।।)/वर्ष 2024–25 में पंजीकृत की जाती है।

(चन्द्रशेखर सिंह)
मुख्य अभियन्ता(स्तर–2)

पत्रांकः–1252 /मु0अ0(स्तर–।।)/ई–14/ तद्दिनांक।

प्रतिलिपि निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषितः–

01. महालेखाकार लेखा एवं हकदारी महालेखाकार भवन, पो0 आफिस–सब पोस्ट मॉस्टर पेट्रोलियम संस्थान कौलागढ़, जिला–देहरादून।
02. प्रमुख अभियन्ता (बजट अनुभाग) माधो सिंह भण्डारी भवन, सिंचाई विभाग उत्तराखण्ड, देहरादून।
03. अधीक्षण अभियन्ता, सिंचाई कार्य मण्डल, पिथौरागढ़ को उनके पत्रांकः– 1674/सिकामपि/पी–2 प्राक्कलन दिनांकः 31.05.2024 के सन्दर्भ में स्वीकृत योजना की प्रति सहित अग्रिम आवश्यक कार्यवाही हेतु प्रेषित है।
04. अधिशासी अभियन्ता, सिंचाई खण्ड धारचूला को स्वीकृत योजना की प्रति सहित अग्रिम आवश्यक कार्यवाही हेतु प्रेषित है।
05. पत्रावली हेतु।

(चन्द्रशेखर सिंह)
मुख्य अभियन्ता(स्तर–2)

IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

INDEX

IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

Check List for Preliminary Examination of Flood Protection/Anti-erosion Schemes

S.N.		Particulars	YES/NO
1		Has the Scheme formulated in accordance with instructions/guidelines issued so far by G.F.C.C. and T.A.C.?	Yes
2		Has the toposheet prepared by Survey of India, showing the catchment area of the river/nala at scheme site, been enclosed? If not, why?	Yes
3		Have the following information/data been furnished and discussed in the Detailed Project Report?	
	(a)	Flood Frequency for which the scheme has been designed.	50 Years
	(b)	Broad discussions of the problem comprising history of past floods,frequency, hydrology of the stream, tendency of flow, mode of observation of gauge/discharge and works executed in the past with their results obtained.	Yes
	(c)	Inspection details of the area affected/protected, any scheme in progress or proposed in vicinity.	Yes
	(d)	General discussions on viable alternatives and justification for adopting this proposal out of them.	Yes
	(e)	Basis of criteria/rates adopted for evaluating the property damaged/protected to arrive at Benefit Codt ratio duly supported by flood damage data for past ten years, duly certified by revenue	Yes
	(f)	Surveys conducted in formulation of the scheme with description of designed features.	Yes
	(g)	Construction Programme.	Yes
	(h)	Recommendations.	Yes
4		Have the Index map and layout plan to scale, showing past flood bank line, contours and spot levels, (with reference to level book,surveyed by, date of survey, bench marks etc.) area affected and layout of proposed work duly approved been enclosed ?	Yes
5		Have the L-Section and X-Sections of the river/nala at suitable intervals indicating bed levels, G.L., formation level, hydraulic gradients, design H.F.L. (with reference to level book etc.) duly approved been enclosed ?	Yes
6		Have the Design/working drawings, supported by design calculations, duly approved been enclosed?	Yes
7		Has the scheme formulated after superimposing on Satellite imageries maps? If not why?	Yes
8		Has the surveys conducted with latest digital method?	Yes
9		Whether silt factor has been worked out/examined by I.R.I.,Roorkee? If Yes, mention in full, if not quote reason.	Yes
10		Have the gauge/discharge sites been established to observe actual discharge? Are calculations for design flood enclosed?	No
11		Whether this project is original or revised? If revised, quote reason for revising it with previous references.	Original
12		Whether free board is kept as per actual water depth or as per BIS Code? Mention Water depth/BIS Code as the case may be.	Actual Water Depth
13		Are the sizes of proposed C.C. blocks, wire crates and boulders in abutment pitching as per BIS Code? Mention respective Code No.	Yes
14		Is it an Inter-State scheme? If so, has the concurrence of the concerned authority obtained and discussed in the project?	No
15		Has the concurrence from the departments like Railways, National Highways, Forests, etc. been obtained, if they are affected?	No
16		Are individual detailed reports by E.E., S.E. and C.E. enclosed?	Yes

AEE

Adhoc Station Headquarters
Dharchula
c/o KUMAON SCOUTS
PIN – 911 300
c/o 56 APO

1189/Kali River

06 Mar 2024

rrigation Dept, Dharchula

COMMENCEMENT OF DEPOSIT WORK AT MILITARY STATION DHARCHULA

1. Please refer MoU between Ministry of Defence through the Station Headquarter, Dharchula and SE Pithoragarh through Irrigation Dept Dharchula.

2. Rs 16,88,58,200/- (Rupees sixteen crores eighty eight lakhs fifty eight thousand two hundred only) out of Rs 33 Crores (40% of the first instalment of agreed amount) has been cleared by CDA (Army), Meerut & ready to be transferred to your account. This Headquarter has taken up a case for credit of balance of amount also i.e Rs 16,11,41,800/- (Rupees sixteen crores eleven lakhs forty one thousand eight hundred only). The same will also be credited into your account on receipt.

3. You are requested to share the bank details (Account No, IFSC & MICR No) directly with GE (MES), Pithoragarh so that the amount can be transferred into the account.

4. An early action is requested pl.

Station Headquarter
Dte
C/o Kumaon Scouts

(Gita Nand)
Maj
SSO
for Stn Cdr

Copy to :-

HQ Central Comd (Q)
HQ UB Area (Q)
HQ UK Sub Area (Q)
HQ 119 (I) Inf Bde Gp (Q) - for info pl
CWE (Hills), Pithoragarh
GE (MES) & AO GE (MES), Pithoragarh
AGE (MES), Dharchula

Adhoc Station Headquarters
Dharchula
c/o KUMAON SCOUTS
PIN – 911 300
c/o 56 APO

1189/Kali River

09 Mar 2024

Executive Engineer
Irrigation Dept, Dharchula
Pithoragarh

REGARDING EXECUTION OF FLOOD PROTECTION WORKS AT MILITARY ESTABLISHMENTS SITUATED AT RIGHT BANK OF KALI RIVER IN DHARCHULA BLOCK DISTRICT-PITHORAGARH

1. It is intimated that Rs 33 Cr (40% of the total amount) was transferred to carry out flood protection work at following locations as deposit work The project wise allocation of funds is as under :-

S No	Location	Estimate cost (in Lacs)	40% of Cost transfer
(a)	Army Camp-2 Battalion campus Galati	4060.10	15.47 Cr
(b)	Army Camp-1	2451.07	9.804 Cr
(c)	Army camp-2 family campus Tallahaat	1600.13	6.40 Cr
(d)	Army camp-2 family campus Mallahaat	331.61	1.326 Cr

2. Keeping in view the urgency of above works, you are requested to take appropriate action at your end to get the above works done as early as possible for the protection of military area land to complete the above projects within stipulated time.

3. You are also requested to intimate the present status of the tender action and tentative date on which work at above four location is going to commence.

4. Above details are required to be forward to the higher formation for their perusal. Hence, the same be intimated at the earliest.

(Gita Nand)
Maj
SSO
for Stn Cdr

Copy to :-

HQ UK Sub Area (Q)
HQ 119 (I) Inf Bde Gp (Q) } - for info pl.

सिंचाई कार्यमण्डल पिथौरागढ़।
सिंचाई खण्ड, धारचूला।

योजना का नाम :– जनपद पिथौरागढ़ के धारचूला विकास खण्ड मे काली नदी के दोंये पार्श्व मे स्थित आर्मी कैम्प–1 की काली नदी से सुरक्षा हेतु बाढ़ सुरक्षा योजना।

आख्या

जनपद पिथौरागढ़ उत्तराखण्ड राज्य का सीमान्त एवं पर्वतीय जनपद है। इसका भौगोलिक क्षेत्रफल 7218 वर्ग कि0मी0 है। इस जनपद की पूर्वी सीमा नेपाल से मिलती है। जनपद की पूर्वी सीमा पर बहने वाली काली नदी भारत नेपाल सीमा का निर्धारण करती है। नदी के पूर्वी छोर पर नेपाल सीमा स्थित है। नदी का उद्गम क्षेत्र हिमालय है।

वर्ष 2016–17 मे नेपाल सरकार द्वारा काली नदी के बाँये पार्श्व पर नेपाल राष्ट्र की ओर धारचूला से गलाती तक दार्चुला ग्राम मे लगभग 6 कि0मी0 लम्बाई मे आर0सी0सी0 कंक्रीट द्वारा निर्मित सुरक्षा दीवार, दीवार के पीछे सडक एवं दीवार के आगे एप्रन एवं अतिरिक्त ब्लॉक (छोटे स्पर) का निर्माण कार्य कराया गया। एवं जौलजीबी से सुंजी तक अपनी ओर (नेपाल राष्ट्र की ओर) मकानो एवं भूमि बचाये जाने हेतु अन्य स्थानो मे वायर क्रेट के स्पर बनाये गये है। जिससे नदी का रुख भारतीय तट की ओर स्थित ग्रामो, भारतीय सुरक्षा विभाग, भारतीय सैन्य बलों के ईकाई एवं पूर्व मे बनी सुरक्षा दीवारो की ओर हो गया है। कई स्थानो पर मानसून अवधि के दौरान भू–कटाव हुआ है। वर्तमान मे सामान्य जन, जनप्रतिनिधियों एवं भारतीय सुरक्षा विभाग, भारतीय सैन्य बलों के द्वारा काली नदी के किनारे भारतीय तट के ग्रामो एवं भूमि को नदी के कटान से बचाये जाने हेतु सुरक्षात्मक कार्य कराये जाने हेतु बार–बार अनुरोध किया जा रहा है। जिससे भारतीय तट पर मानसून अवधि मे काली नदी के किनारे स्थित मकानो एवं भूमि को नदी के तीव्र कटान से सुरक्षा प्रदान की जा सके। दिनांक 28.10.2020 एवं 29.10.2020 को सिंचाई विभाग एवं भारतीय सुरक्षा विभाग द्वारा काली नदी के किनारे नेपाल राष्ट्र द्वारा किये गये कार्यों का स्थलीय निरीक्षण किया गया। निरीक्षण के दौरान भारतीय तट को सुरक्षा प्रदान किये जाने हेतु धारचूला व भारतीय सैन्य बलों के ईकाई, सैन्य परिसेत्र की सुरक्षा हेतु बाढ़ सुरक्षा कार्य किया जाना अति आवश्यक है। यह कार्य जनहित मे कराया जाना आवश्यक है। उक्त परिसेत्र की बाढ सुरक्षा कार्य सम्पादनार्थ हेतु भारतीय सैन्य विभाग द्वारा अपने पत्र 1189/Kali River Dated 06.03.2024 के माध्यम से उक्त बाढ़ सुरक्षा कार्य के सापेक्ष की वित्तीय स्वीकृति भी प्रदान किया गया है।

प्रस्तावित कार्य :–
काली नदी के दांये तट पर कुल 580.00 मी0 लम्बाई मे सी0सी0 में 8.50 मी. ऊंची एवकी दीवार का निर्माण प्रस्तावित है। सुरक्षा दीवार के आगे मध्य से मध्य 15 मी0 दूरी पर सी0सी0 एम20 के स्टड ब्लॉक का प्रावधान किया गया है।

लाभ लागत :–
इस योजना के निर्माण से 80 भवनो एवं 11.5 हैक्टे. कृषि भूमि का बचाव हो सकेगा तथा लगभग 580 जनसंख्या लाभान्वित होगी। योजना की कुल लागत रू0 2451.07 लाख तथा योजना का लाभ–लागत अनुपात 1.40: 1 है।

संस्तुति :–
उक्त वर्णित बिन्दुओं से स्पष्ट है कि योजना अत्यन्त लाभप्रद एवं धारचूला में भारतीय सैन्य बलों के ईकाई, सैन्य परिक्षेत्र की सुरक्षा महत्वपूर्ण है। भारतीय सैन्य विभाग द्वारा भी यथावश्यक कार्यवाही हेतु मांग की गई है। अतः उक्त के दृष्टिगत प्रस्तुत योजना तकनीकी स्वीकृति हेतु प्रबन्ध संस्तुति सहित प्रेषित है।

सहायक अभियन्ता–।
सिंचाई खण्ड, धारचूला।

अधिशासी अभियन्ता
सिंचाई खण्ड, धारचूला।

अधीक्षण अभियन्ता
सिंचाई कार्यमण्डल पिथौरागढ़।

IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

CERTIFICATE TO BE FURNISHED BY THE SUPERINTENDING ENGINEER

Certified that :

1	The report of the Superintending Engineer (duly signed) has been enclosed	Yes
2	The report of the Chief Engineer concerned has been enclosed	Yes
3	The drawings have been singed by the Superintending Engineer.	Yes
4	The Drill Performa has been enclosed and signed by the Superintending Engineer and the Executive Engineer	Yes
5	The project estimates have been checked by the Computer of the circle and signed by him	Yes
6	The survey maps, L-Section, X-Section giving the levels bear the certificate of the Junior Engineer that the Survey has been done by Private Surveyer and the place and the levels of the starting Bench Mark and closing Bench Mark have been recorded.	Yes
7	The certificates of the Assistant Engineer to the effect that he supervised the surveys carried out by the Private Surveyer and that he is fully satisfied about their correctness, is enclosed.	Yes

Superintending Engineer
IWC Pithoragarh

IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

DRILL PERFORMA

1	Name of the Project Estimate	Flood Protection Work Along Right Bank Of Kali River At Army Camp -I In Block Dharchula ,District Pithoragarh
2	Estimate amount and head of account	Rs. 2451.07 Lacs 4711 Capital Outlay on Constructing Flood Protection Works
3	Has the work been started in anticipation of sanction of the estimate and if so, under what authority? The date of starting the work along with the reasons for doing so and whether the A.G. has been informed	No.
4	Date of completion if the work has already been completed if not the stage of progress of work.	Questions does not arises.
5	Is the estimate based on figures of expenditure as actually incurred, if completed	No.
6. i	Name of the project head and subhead of the project estimate showing the amount provided for	4711 Capital Outlay on Constructing Flood Protection works Rs.2451.07 Lacs
ii	Total amount of estimate already sanctioned in subhead by Chief Engineer & Superintending Engineer	Nil
iii	Total amount of liabilities already incurred against unsanctioned estimate and anticipated excess over sanctioned estimate	Nil
iv	The Total amount of further estimate proposed to be sanctioned in the sub-head	Nil
v	Can the estimate be met out of saving in the sub-head, if not how is the excess, proposed to be met.	Not applicable
7	Have the drawing been approved and signed by the Chief Engineer/Superintending Engineer	Yes signed by Superintending engineer
8	Has the L-section submitted with estimate been approved by the Chief Engineer	Not required

9	Have the analysis of rates been prepared in accordance with standard laid down in Chief Engineer office Memo No. 2825-VI, dated May, 3 1961 and subsequent amendment thereof and are the labour rates adopted n conformity with the sanctioned schedule of labour rates of Divisional/Circle?	Yes
10	Are the rates adopted for earth work by machines in accordance with the latest instructions issued by the Chief Engineer, and where these do not apply in accordance with the recommendations of the rates and cost committee, full justification be given?	No earth work is to be done by machine
11	If the rates provided are the tendered rates, have these rates been mentioned below the rates worked out on the basis of prescribed standar.! analysis of rates that will be cost of work on the basis of the standard rates been together have full reasons been given in this project?	No tender has been invited so far. The estimate has been prepared on the basis of sanctioned schedule of rates and current market rates.
12	Project has been carefully checked and certificate of check recorded thereon of your computer.	Yes
13	Are you satisfied that all the design quantities and rates are in the order and confirm to the principle of safety and economy and the work so constructed fulfill the purpose for which they are proposed? Have you appended detail rates on the estimates embodying your views on these points.	Yes

Executive Engineer
Irrigation Division Dharchula

Superintending Engineer
IWC Pithoragarh

IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

SALIENT FEATURES OF FLOOD PROTECTION SCHEME

1	**Name of Scheme**	FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH
2	**District**	Pithoragarh
3	**River and Bank**	Kali River & Right Bank
4	a. Area affected	11.5 Ha
	b. Area benefited	11.5 Ha
5	a. House & Property damaged	80 Houses , Rs. 1300 Lacs
	b. House & Property benefited	80 Houses , Rs. 1300 Lacs
6	a. Population affected	580.00
	b. Population benefited	580.00
8	**Hydrology**	
	a. Design discharge	4244 Cumecs
	b. Maximum observed H.F.L.	5.00 M
	c. Design H.F.L.	5.00 M
9	**Proposals**	
	Length	580 m
	Main Work to be done under this Scheme	CC Wall- Foundation 10.0x 5.0 x2.0 m(M20),P/Wall 10.0 x(5.0+0.6)/2 X6.5 Apron Block-6.25x6.75x1.5 m (M15) Additional Block-5.5x5.75x2.0m (M15) @ 20 m C/C
10	**Cost of scheme**	Rs. 2451.07 Lacs
11	**Benefit Cost Ratio**	1.4:1

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IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -I IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

STATEMENT - I : SHOWING DAMAGES AND RELIEF MEASURES BEFORE COMPLETION OF SCHEME

Name of River	Kali River
Name of Scheme	FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -I IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

1	**Nature of Flood**	
	i) Year	Every Year
	ii) Area affected	11.50
	iii) Frequency of flood	Every Year
	iv) Duration of inundation	Nil
	v) Probable death of inundation	Nil
2	**Damages**	
	a) Land and Crops	
	i) Area of inundation	Nil
	ii) Value of crops	Nil
	iii) Area eroded	11.5
	iv) Value of land	Rs. 5520 Lacs
	b) Damages of House	
	i) Nos.	80.00
	ii) Value	Rs. 1300 Lacs
	iii) Loss of human life	Nil
	c) Cattle Loss	
	i) Nos.	Nil
	ii) Values	Nil
	d) Damages to Public Utility	Nil
	Total Damages	Rs. 6820 Lacs
3	**Relief Measures**	
	i) Gratuitous relief	Nil
	ii) Agriculture	Nil
	iii) Remission of land revenue	Nil
	iv) Other relief measures	Nil
	Total Relief Expenditure	Nil
4	**Total cost of relief and damages**	**Rs. 6820 Lacs**
5	**Extent of beneficial value fertilising silt.**	**Nil**
6	**Net annual flood losses**	**Rs. 547.45 Lacs**

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IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

STATEMENT-II OF FLOOD DAMAGES AND RELEIF MEASURES AFTER COMPLETION OF THE SCHEME

1-	Name of Project	FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH	
2-	Name of River	Kali River	
3-	Area protected by the scheme		
	(a)-Houses	80	Nos (Approx)
	(b)-Land	11.5	Ha
4-	Population protected by the scheme	580.00	Nos (Approx)
5-	Annual flood losses after completion of the scheme	No damages expected after completion of the scheme	
6-	Population likely to be still affected	NiL	
7-	Frequency of flood	Every year in rainy season	
8-	Depth of inundation in m	NiL	
9-	Damages to crops	NiL	
10-	Total damages in lacs	NiL	
11-	Indicate approximate estimate of probable expenditure that may still be necessary	NiL	
12-	Net amount of flood losses	NiL	

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FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

STATEMENT III BENEFIT-COST ANALYSIS

I Name of Project	FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH			
i) Net annual losses due to flood		Rs	547.45	Lacs
ii) Net annual losses after completion of the scheme			NiL	
II Cost				
a) Cost of Scheme		Rs	2451.07	Lacs
b) Cost of existing works			NiL	
c) Annual interest payable @ 10% on capital cost		Rs	245.11	Lacs
d) Annual depriciation @ 2% on capital cost		Rs	49.02	Lacs
e) Requaring annual maintainence charges @ 4% on capital cost		Rs	98.04	Lacs
	Total	Rs	392.17	Lacs

Benefit Cost Ratio = $\frac{547.45}{392.17}$ = 1.40 : 1

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IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

STATEMENT OF AVERAGE ANNUAL LOSSES FOR THE YEAR 2022-23

1a.	Agricultural Area endangered by erosion by kali River		0.0	Ha
1b	Non Agricultural Area endangered by erosion by kali River		11.5	Ha
1c	Cost per ha for Agricultural Land	Rs	363.0	Lacs
1d	Cost per ha for Non Agricultural Land	Rs	480.0	Lacs
2a	Pucca Houses endangered by erosion by kali River		50	Nos
2b	Kachcha Houses endangered by erosion by kali River		30	Nos
2c	Cost per Pucca Houses	Rs	20	Lacs
2c	Cost per Kachcha Houses	Rs	10	Lacs
3a	Cost of 0Ha Agricutural Land	Rs	0.00	Lacs
3b	Cost of 11.5Ha Non Agricutural Land	Rs	4174.50	Lacs
4	Cost of houses			
a)	Cost of Pucca Houses	Rs	1000.00	Lacs
b)	Cost of Kachcha Houses	Rs	300.00	Lacs
	Total	**Rs**	**5474.50**	**Lacs**
5	Net average losses due to erosion assuming 10 years period	Rs	5474.50	Lacs
6	Average annual losses	Rs	547.45	Lacs

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IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -I IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

ABSTRACT OF COST OF PROJECT

1	कार्य की लागत	रु0 2451.07	लाख
2	अप्रत्यक्ष व्यय		
	(अ) अधिष्ठान पर व्यय	–	
	(ब) यंत्र संयत्र पर व्यय	–	
3	प्रत्यक्ष व्यय		
	(अ)आडिट एवं एकाउन्ट पर व्यय	–	
	सम्पूर्ण योग	रु0 2451.07	लाख

सहायक अभियन्ता–।
सिंचाई खण्ड, धारचूला।

अधिशासी अभियन्ता
सिंचाई खण्ड, धारचूला।

IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

Calculation Of Discharge & Scour Depth

1	Catchment Area	(A)	=		2330.00	Sq. km
2	Slit factor	(f)	=		10.40	
3	Rugosity coefficient of channel	(n)	=		0.025	
4	Slope of channel (S)	(S)	=		17.827	M/Km
5	Bed Width	(B)	=		60.00	m
6	Water Depth	(D)	=		5.00	m
7	Free Board	(h)	=		1.50	m
National Institute of Hydrology-						
8	Return Period	(T)	=		25.00	
9	Coefficient for 25 Year return Period	(C)	=	C = [-5.654+10.724{1/(T-1)}-.165]	= 12.46	
10	**Peak flood discharge**	**(Q)**	**=**	**$C(A)^{0.771}$**	**= 4918.74**	**Cumec**
Design discharge By Dicken's Method :						
11	Return Period	(T)	=		= 50.00	Year
12	constant, for North Indian rivers	(C)	=		= 11.40	
13	**Design Discharge**	**(Q)**	**=**	**$C(A)^{2/3}$**	**= 3823.15**	**Cumec**
By Area Velocity Method:						
14	Area	(A')	=	BxD	= 300.000	Sqm
15	Wetted Perimeter	(P)	=	B+2D	= 70.000	m
16	Hydraulic Depth	(R)	=	A'/P	= 4.286	
17	$(R)^{2/3}$	$(R)^{2/3}$	=		= 2.639	
18	$(S)^{1/2}$	$(S)^{1/2}$	=		= 0.134	
19	**Discharge**	**(Q)**	**=**	**$A'x(R)^{2/3}x(S)^{1/2}/n$**	**= 4243.51**	**Cumec**
20	**Velocity**	**(V)**	**=**	**Q/A'**	**= 14.15**	**m/Sec**
21	Adopted Discharge	(Q)	=		= 4244.00	Cumecs
Design of Scour Depth:						
22	Lacey Wetted Perimeter	(Placey)	=	$4.75(Q)^{1/2}$	= 309.44	m
		(Placey) >		(P)		
23	Thus discharge intensity per metre bed width of river	(q)	=	Q/B	= 70.73	Cumec /m
24	Scour depth	(R)	=	$1.35 \times (q^2/f)^{1/3}$	= 10.58	m
In Straight Reach:						
25	Taking 1.25 times of R,Scouring depth below H.F.L.	(D1)	=	1.25 x R	= 13.23	m
26	Depth of Scour below Bed level	(D2)	=	D1-D	= 8.23	m
In Curved Reach:						
27	Taking 1.50 times of R,Scouring depth below H.F.L.	(D1)	=	1.50x R	= 15.87	m
28	Depth of Scour below Bed level	(D2)	=	D1-D	= 10.87	m

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IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

Calculation For Height of Wall

1	Water Depth	(D)	=	5.00 m
2	Depth of Scour below Bed level (Straight Reach)	(D2)	=	8.23 m
3	Take Scour Depth of Wall	(h1)	=	2.00 m
4	Free Board	(h)	=	1.50 m
5	Total Height of Wall	(H)	=	8.50 m

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FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -I IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

Design of Apron

1	Velocity	(v)	=			14.15 m/Sec
2	Angle of repose of protection material	(ϕ)	=			30 °
3	Angle of sloping bank	(θ)	=			26.56 °
4	Sin(ϕ)		=			0.50
5	Sin(θ)		=			0.45
6	Specific gravity of Concrete.	Ss	=			2.40
7	Depth of Scour Below RBL (Straight Reach)	(D2)	=			8.23 m
8	Take Depth of Apron Below Bed Level	(D3)	=			1.50 m
9	Remaining Depth =	(D')		D2-D3	=	6.73 m
10	Provide Width of Apron Length of Apron Block Perpendicular to River Flow			1*D'	=	6.73 m
		Take			=	6.75 m

3.0 m Extra Toe Protection By RCC Wall.

11 $(K) = [\{1-\sin^2\theta/\sin^2\phi\}]^{1/2} = 0.447$

12 $(Wreq) = \frac{0.02323*V^6}{k(Ss-1)^3} = \frac{186460.93}{1.23}$

151594.25 Kg

(Wreq) = 151.59 tonne

Adopted Size of Apron -

Grade of Apron Block		CC M15
NO. Of Apron Provide in Front of Wall	(N)	1.00 m
Length of Apron Block Perpendicular to River Flow	(L)	6.75 m
Width of Apron Block	(B)	6.25 m
Height of Apron Block	(H)	1.50 m
Volume of Apron Block	(V)	63.28 Cum
Density of Apron CC Block		2.40 t/Cum
Weight of Apron Block	(W)	151.87 Tonne

(W) > (Wreq)

Provide 1 no Apron of size 6.75x6.25x1.5m in front of wall.

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FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

Design of Stud

1	Velocity	(v)	=	14.15 m/Sec
2	angle of repose of protection material	(ϕ)	=	30 °
3	angle of sloping bank	(θ)	=	26.56 °
4	Sin(ϕ)		=	0.50
5	Sin(θ)		=	0.45
6	specific gravity of Concrete,	Ss	=	2.40

Adopted Size of Additional Block:

Width of Flow (B) = 60.00 m

Length of Additional Block perpendicular to River Flow = Should not exceed 1/5 th of width of flow

= 1/5 x 60.00

= 12.00 m

Adopted = 6.00 m

C/C Spacing of Additonal Block in Front of wall = 2 to 5 times of effective length of Stud

12.00 to 30.00

Adopted = 20.00 m

Grade of Additional Block = CC M15

Length of Additional Block perpendicular to River Flow = 5.75 m

Width of Additional Block = 5.50 m

Height of Additional Block = 2.00 m

Volume of Additional Block = 63.25 Cum

Density of Additional Block = 2.40 t/Cum

Weight of Additional Block (W) = 151.80 Tonne

(W) > (Wreq)

Provide CC M15 Additional Block of size 5.75x5.5x2m in front of wall C/C20 m.

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FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

SILT FACTOR

1.0	Name of Laboratory	Irrigation Division Dharchula
2.0	Name of River/Nala	Kali River
3.0	Type of Sample	Mixture of Aggregate & Sand
4.0	Name of Test	Seive Analysis
5.0	Quantity of Sample	10 kg
6.0	Date of Testing Sample	1-03-2022
7.0	Name of Site	ARMY CAMP-I

DETAIL OF MEASUREMENT				SILT FACTOR ESTIMATION		
S.N.	Seive Size	Weight Retain	Remarks	Mean dia of particle, di	pi	Σ (pi x di)
1.00	80 mm	0.690	-	80.00	0.69	55.20
2.00	63 mm	1.505	-	63.00	1.51	94.82
3.00	40 mm	0.844	-	40.00	0.84	33.76
4.00	20 mm	2.559	-	20.00	2.56	51.18
5.00	16 mm	0.335	-	16.00	0.34	5.36
6.00	12.50 mm	0.355	-	12.50	0.36	4.44
7.00	10 mm	0.330	-	10.00	0.33	3.30
8.00	4.75 mm	0.180	-	4.75	0.18	0.86
9.00	2.36 mm	0.240	-	2.36	0.24	0.57
10.00	1.18 mm	0.106	-	1.18	0.11	0.13
11.00	Balance	2.860	-	-	-	-
	Total	**10.00**			**7.14**	**249.60**

$$dm = \frac{\Sigma(pi \times di)}{\Sigma pi} = 34.94$$

Silt Factor = $1.76 \times (dm)^{1/2}$ = 10.40

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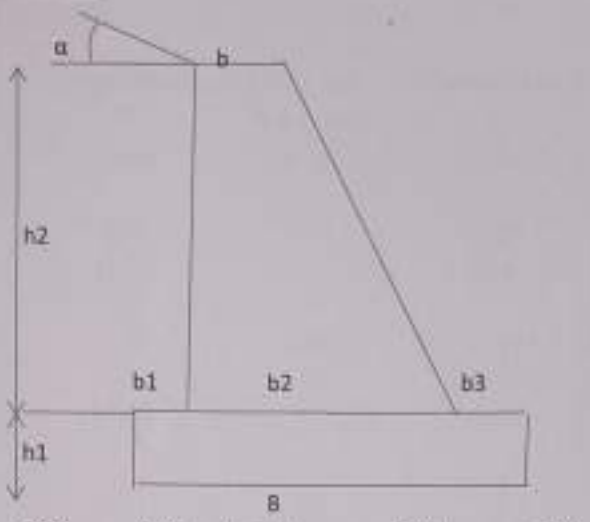
STABILITY ANALYSIS OF 8.5 M HIGH RETAINING WALL

Design For Wall

h1=	2	m
h2=	6.5	m
H= h1 + h2	8.5	m
top wid. of fill, X = b1	0	m
b2=	5	m
b3=	0	m
B=	5	m
top width of wall,b=	0.6	m



Let,

$\gamma(t/m^3)$=	2.0
Angle of repose of soil,Φ(deg)=	37
Coefficient of earth pressure, Ka=cosα x [{ cosα -sqrt ($\cos^2\alpha$ - $\cos^2\Phi$)} / { cosα + sqrt ($\cos^2\alpha$ - $\cos^2\Phi$)}]	0.25
unit weight of wall,$\gamma w(t/m^3)$=	2.40

Forces:

Horizontal component of earth pressure, Ph= 0.5 x Ka x γ x cos α x H^2	Ph =	17.96 at	2.83 from toe
Vertical component of earth pressure, Pv= Ph tan α	Pv=	0.00 at	5 from toe

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STABILITY ANALYSIS OF 8.5 M HIGH RETAINING WALL

CALCULATION OF VERTICAL FORCES & MOMENTS

Sl.No.	Description	Vertical forces, V	Lever arm w.r.t. toe,	Moment(t.m), M
1	Weight of the base = h1 x B x γc x B/2	24.00	2.50	60.00
2	Weight of the wall over base,			
a	b x h2 x γw x (b2+b3)-b/2	9.36	4.70	43.99
b	0.5 x (b2-b) x h2 x γw x (b3 + (b2-b) x 2/3	34.32	2.93	100.67
3	Weight of the soil above heel			
a	b1 x h2 x γ x (B - b1/2)	0.00	5.00	0.00
4	Vertical component of earth pressure, Pv =	0.00	5.00	0.00
	Total, ∑V	**67.68**	**∑M**	**204.66**

Safety against sliding-

F.O.S = μ x ∑V/Ph FOS= **3.01 >1.5**

Safety against Overturning-

F.O.S =∑ M/ Ph x L.A FOS= **4.02 >2**

Foundation stability-

Total moment about toe,∑Mh= ∑M - Ph x L.A 153.78

vertical load, ∑V= 67.68

eccentricity of vertical load,e= B/2 - (∑Mh/∑V) < B/6 **0.228** < **0.833**

P_{max} = (1 + 6 e/b) x (∑V/B) **17.24** < bearing capacity (20 t/m^2)

P_{min} = (1 -6 e/b) x (∑V/B) **9.83** safe if positive

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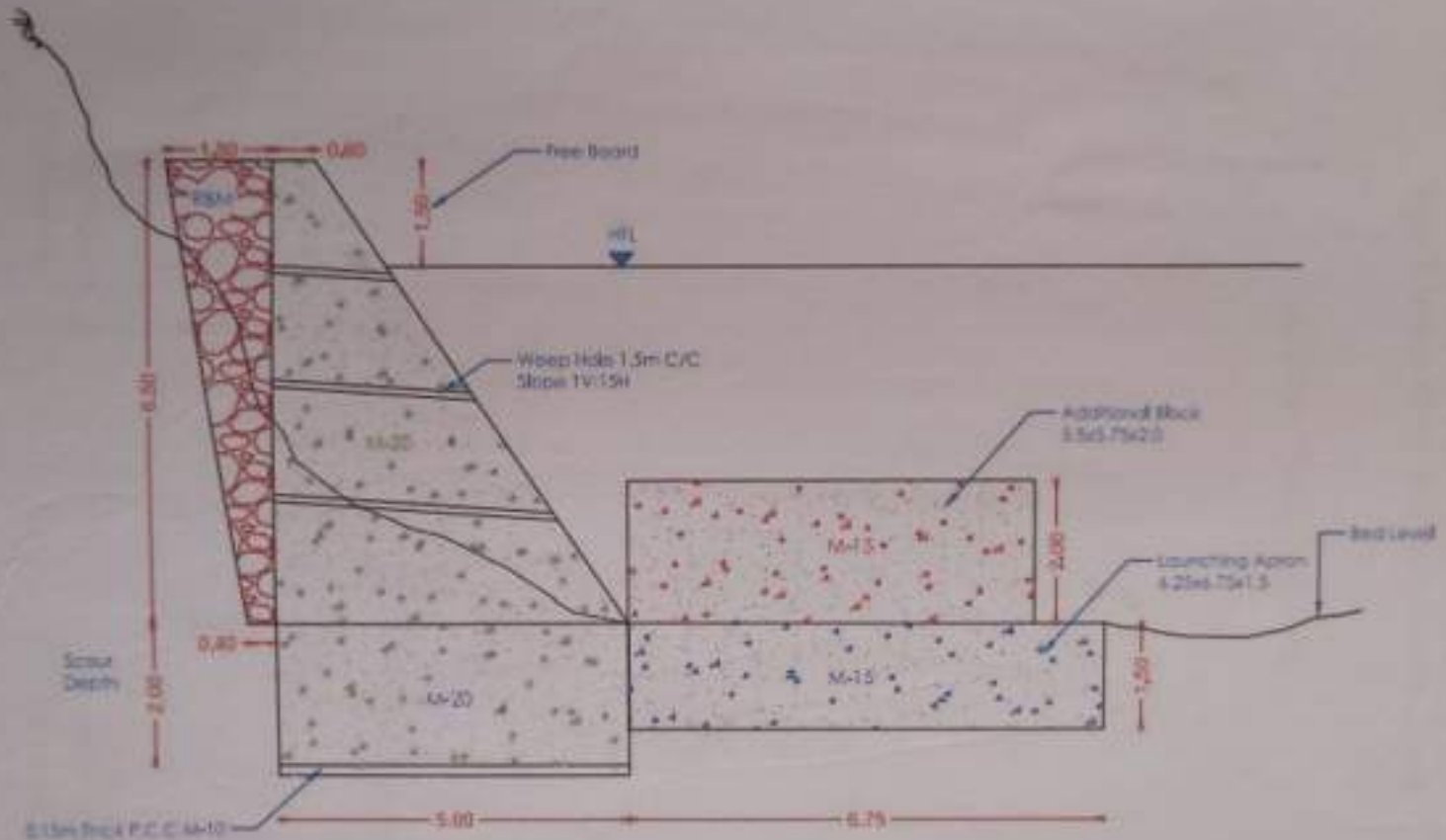
Proposed work Section at "Army Camp-1"



Typical X-Sec of Proposed Work

(All dimensions are in meter except where mentioned otherwise)

जनपद पिथौरागढ़ के धारचूला विकास खण्ड में काली नदी के दॉये पार्श्व में स्थित आर्मी कैम्प–1 की काली नदी से सुरक्षा हेतु बाढ़ सुरक्षा योजना लागत रू0 2451.07 लाख (रू0 चौबीस करोड़ इक्यावन लाख सात हजार मात्र) को लेखाशीर्षक 8443 डिपोजिट मद के अन्तर्गत तकनीकी स्वीकृति निम्न प्रतिबन्धों के साथ एतद्द्वारा प्रदान की जाती है।

01. योजना के कियान्वयन के समय डिपोजिट मद की गाईड लाईन व निदिष्टियों का पालन करते हुए आवंटित बजट का उपयोग भारतीय सैन्य विभाग के पत्र सं0 1189/Kali River Dated 06.03.2024 के अनुसार किया जाये।
02. स्वीकृति योजना में प्राविधानित राशि से किसी भी दशा में व्ययाधिक्य न हो।
03. स्वीकृति योजना के स्वरूप में किसी भी प्रकार के फेरबदल से पहले आवश्यक स्वीकृति प्राप्त कर लें।
04. कार्य की गुणवत्ता एवं समयबद्धता हेतु संबंधित अधिशासी अभियन्ता पूर्ण उत्तरदायी होंगे।
05. योजना में ली गई कार्यों की दरों हेतु सम्बन्धित अधीक्षण अभियन्ता उत्तरदायी होंगे।

उपरोक्त स्वीकृति इस कार्यालय के प्राक्कलन पंजिका के कमांक:– 04/सीई(स्तर–।।)/वर्ष 2024–25 में पंजीकृत की जाती है।

(चन्द्रशेखर सिंह)
मुख्य अभियन्ता(स्तर–2)

IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA DISTRICT PITHORAGARH.

GENERAL ABSTRACT OF COST

Sl.N.	NAME OF ITEM			AMOUNT
				Rs. Lacs
1	A - PRELIMINARY	@	0.50% Of C-Works ie Rs ~~2282.95~~ 1970.49 Lacs	9.85
2	B - LAND			-
3	C - WORK			1970.49
4	L - EARTH WORK			0.00
5	M- PLANTATION	L.S.		0.13
6	O - MISCELLANEOUS	As per statement attached		3.20
7	P - MAINTENANCE			-
8	E - T & P and WORK CHARGE ESTABLISHMENT	@	0.50% Of C-Works	9.85
9	K - BUILDING	@	0.50% Of C-Works	9.85
10	Contingency including quality control	@	4.00% Of C-Works	78.82
11	G.S.T	@	18.00% Of C-Works	368.88
			TOTAL	2451.07
			Say Rs.Lac	2451.07

Checked

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IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

ABSTRACT OF QUANTITIES OF O-MISC

Sl.No.	Name of items	L	B	H	QTY.	UNIT
1	Jeep journey	-	-	-	3600	km.
2	S/F Sign Boards	-	-	-	2	Nos.
3	Site store	-	-	-	1	Nos.
4	Making Gauge	-	-	-	2	Nos.

ABSTRACT OF COST OF O-MISC.

Sl.No.	Name of items	Unit	Qty.	Rate	Amount
				Rs./Unit	Rs.
1	Jeep journey	km.	3600	14	50400
2	S/F Sign Boards	Nos.	2	10000	20000
3	Site store	Nos.	1	250000	250000
4	Making Gauge	Nos.	0	3000	0
				Total	320400
			Say Rs.Lacs		3.2

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IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -I IN BLOCK DHARCHULA DISTRICT PITHORAGARH.

Abstract Of Cost

S.N.	NAME OF ITEMS	UNIT	QTY	RATE (Rs)	AMT. (Rs) WITHOUT G.ST.	AMT. (Rs) WITH G.ST.
1	Excavation of river bed material in Hilly area for foundation of Retaining wall/ Gravity wall by mechanical means without using Dozer including cutting and trimming of side slopes and disposing/ backfilling & leveling of excavated material with lead upto 1000 m as per technical specification and direction of Engineer-in-charge.	CUM	24566	183.00	4532178.00	-
2	Providing concrete for plain/ reinforced concrete in open foundations complete as per drawings and technical specifications Clause 802, 803, 1202 & 1203 P.C.C grade M 10 (Nominal mix 1:3:6)	CUM	435	6871.10	2988928.50	-
3	Providing concrete for plain concrete in open foundations complete as per drawings and technical specifications Clause 802, 803, 1202 & 1203 P.C.C grade M 20	CUM	16256	7793.80	127508104.80	-
4	Providing and laying of apron with cement concrete blocks of size as per Table 1300.1 cast-in-situ and made with nominal mix of M-15 grade cement concrete as per drawing and technical specifications Clause 1301	CUM	7783	6865.20	5343185.160	-
5	Providing weep holes in stone masonry wall with 100 mm dia PVC pipe extending through the full width of the wall with slope of 1H:20V towards drawing face complete as per drawing and technical specifications.	RM	3590	542.80	0.00	669224.00
6	Providing and laying Expansion joints using 6 mm thick and 8*4 feet size plywood as per drawing and direction of engineer in charge including cost of material, labour and T& P required for proper completion of work.	SQM	3469	357.30	0.00	1239399.30
7	Providing and laying of boulder apron laid in wire crates with 4 mm dia GI wire conforming to IS:280 and IS:4826 in 100 mm x 100 mm mesh laid with stone boulders weighing not less than 25 kg each as per drawing and technical specifications Clause 1301	CUM	587	2526.40	1482996.80	-
8	Dewatering of water due to seepage of ground water and surface water due to rain etc. including supply of all machine operator, Khalasis, POL, T&P, accessories required for proper completion of the work.	HPHR	13370	70.80	947020.80	-
9	Hydraulic Excavator 0.9/1.0 cum (including fuel & operator).	CUM	1334	1599.40	2133599.60	-
10	Providing and Laying of Mechanically Woven Double Twisted Hexagonal Shaped Gabions (Zinc plus PVC coated), of size 3mX1mX1m with two diaphragms at 1m interval, having mesh opening 100mm/120 mm, mesh wire diameter 2.7mm/3.7mm, edge/selvedge wire diameter 3.4/4.4 mm and lacing wire diameter 2.2/2.2 mm. (The work includes filling boulders in the gabions).	No	250	8904.40	2226100.00	-
11	Providing and laying of Empty Cement Bags (Gunny Bags) filled with local sand and tightened using soil and carriage upto site including preparing subgrade before placing in position, also including supply of all material, labour, T&P etc required for proper completion of the work	Bags	1650	17.10	28215.00	-
	Total				195278995.10	2008613.30
	Total Without GST				195278995.10	1770819.75
	add 4% Contingency including Quality Control				7811159.80	70800.75
	Total				285090154.90	1840810.54
	Add GST 18%				36556227.88	331347.79
	Total of C-work With GST				239646382.78	2172168.33
	Grand Total				241818551.10	
			Say	Rs.	2418.19	
					L.a.c.s	

Checked

Assistant Engineer
I.D. Dharchula

Executive Engineer
I.D.Dharchula

Superintending Engineer
I.W.C. Pithoragarh

IRRIGATION DIVISION DHARCHULA

FLOOD PROTECTION WORK ALONG RIGHT BANK OF KALI RIVER AT ARMY CAMP -1 IN BLOCK DHARCHULA ,DISTRICT PITHORAGARH

DETAILS OF MEASUREMENTS

S.NO.	NAME OF ITEMS	NOS	LENGTH	BREADTH	HT/DEPTH	CONTENTS	TOTAL
1	Excavation of river bed material in Hilly area for foundation of Retaining wall/ Gravity wall by mechanical means without using Dozer including cutting and trimming of side slopes and disposing/ backfilling & levelling of excavated material with lead upto 1000 m as per technical specification and direction of Engineer-in charge.					CUM	24766
	i) Retaining Wall Right Bank	1	580.00	(5.3+5.6)	3.50	11063.50	
	ii) Apron of C.C.Block	1.00	580.00	6.75	3.50	13702.50	
					Total	24766.00	
2	Providing concrete for plain/ reinforced concrete in open foundations complete as per drawings and technical specifications Clause 802, 803, 1202 & 1203 P.C.C grade M 10 (Nominal mix 1:3:6)					CUM	435
	i) Wall Right Bank	58	10.00	5.00	0.15	435.00	
					Total	435.00	
3	Providing concrete for plain concrete in open foundations complete as per drawings and technical specifications Clause 802, 803, 1202 & 1203 P.C.C. grade M 20					CUM	16356
	i) For Foundation	58	10.00	5.00	2.00	5800.00	
	ii) For P/Wall	58	10.00	(5.0+0.6)/2	6.50	10556	
					Total	16356.00	
4	Providing and laying of apron with cement concrete blocks of size as per Table 1300.1 cast-in-situ and made with nominal mix of M-15 grade cement concrete as per drawing and technical specifications Clause 1301					CUM	7783
	i) Apron	93	6.25	6.75	1.50	5885.16	
	iv) Stud 20 m C/C	30	5.50	5.75	2.00	1897.50	
					Total	7782.66	
5	Providing weep holes in stone masonry wall with 100 mm dia PVC pipe extending through the full width of the wall with slope of 1H:20V towards drawing face complete as per drawing and technical specifications.					RM	3589
	i) 1st Layer C/C 1.5 m	58	6.67	3.98		1539.70	
	ii) 2nd Layer C/C 3.0 m	58	5.67	2.97		976.71	
	iii) 3rd Layer C/C 4.5 m	58	6.67	1.95		754.38	
	iv) 4th Layer C/C 6.0 m	58	5.67	0.94		309.13	
					Total	3579.92	
6	Providing and laying Expansion joints using 6 mm thick and 6*4 foot size plywood as per drawing and direction of engineer in charge including cost of material, labour and T& P required for proper completion of work.					SQM	3409
	i) Wall	57		5.00	2.00	570.00	
	ii) Wall Stem	57		(5.0+0.6)/2	6.50	1037.40	
	iii) Apron	1	580.00		1.50	870.00	
		92.00		6.75	1.50	931.50	
					Total	3408.90	