FULL TITLE OF THE PROJECT: THANA PLAUN (191MW) HYDROELECTRIC PROJECT

PROPOSAL NO.: FP/HP/HYD/8255 /2014

DATE OF PROPOSAL: NOVEMBER 29TH,2014

CHECK LIST SERIAL NUMBER: -19

(IN CASE OF VOILATION OF THE PROVISION OF THE FCA, 1980 OR ANY OTHER FOREST ACT, A DETAILED REPORT ON THE VOILATION TO BE SUBMITTED)

Himachal Pradesh Power Corporation Limited
(A State Government Undertaking)
Office of General Manager
Triveni Mahadev (78 MW) & Thana Plaun HEP (191 MW),
Kotli, Distt. Mandi-175003
Ph.No.: 01905-281081, Email: - **gmtpbnhppcl@gmail.com**

45(a)

Full Title of the Project: Diversion of 406.79 ha. of Forest land in favour of Himachal Pradesh Power Corporation, Ltd., Thana Plaun & Triveni Mahadev HEPs, HPPCL, Tehsil Kotli Distt. Mandi, HP for the construction of Thana Plaun (191MW) HEP within the jurisdiction of Jogindernagar and Mandi Forest Divisions, Distt. Mandi. H.P.

Proposal No. : FP/HP/HYD/8255 /2014

Date of Proposal: November 29th, 2014

CHECK LIST SERIAL NUMBER: - 19

CERTIFICATE ON VOILATION OF THE PROVISIONS OF THE FCA, 1980

I, Ajay Kumar Bisht, General Manager, Triveni Mahadev and Thana Plaun HEP's, HPPCL, Kotli, District Mandi, Himachal Pradesh on behalf of Himachal Pradesh Power Corporation Limited hereby, certify that no violation of the provisions of the Forest Conservation Act, 1980 has been done by this office. Further, certified that no project work except, Survey and Investigation works has been taken up by this office on Forest land.

Date: 28.11.2019
Place: Kotli

(Signature of User Agency)
Office seal

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

Countersigned by:-

Divisional Forest Officer
Forest Division
Office seal

Divisional Forest Officer
Jogindernagar Forest Division
Jogindar Nagar (H.P.)

FULL TITLE OF THE PROJECT: THANA PLAUN (191MW) HYDROELECTRIC PROJECT

PROPOSAL NO.: FP/HP/HYD/8255 /2014

DATE OF PROPOSAL: NOVEMBER 29TH,2014

CHECK LIST SERIAL NUMBER: -20

(CERTIFICATE FROM THE CHIEF SECRETARY REGARDING NON-AVAILABILITY OF NON-FOREST LAND IN THE STATE FOR RAISING COMPENSATORY AFFORESTATION)

Joint Certificate of Non-Availability of Non-Forest Land For raising Compensatory Afforestation

It is certified that there is no non-forest government land available in District Mandi, for raising compensatory afforestation in lieu of 406.79 hectare of forest land required to be diverted for the construction of Thana Plaun Hydro-Electric Project (191MW) within the jurisdiction of Mandi & Jogindernagar Forest Division, Distt. Mandi (HP); as all government land or land over which govt. has proprietary rights, has been classified as forest land, vide notification No. Ft(a)-1/52 dated 15th January,1952 by the Secretary to Chief Commissioner of the erstwhile Chief Commissioner's Province, Mandi. Consequently, compensatory afforestation has been proposed over forest land.

Date :- ~~05-06-2015~~ 21/11/2015

Place:- Mandi

Collector,
District Collector
Mandi, District Mandi (H.P.)
Mandi, District Mandi (HP).

Divisional Forest Officer,
V.K. Babli (IFS)
Forest Division Mandi. (HP).
Divisional Forest Officer
Mandi Forest Division,
MANDI

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

CERTIFICATE FOR NON-AVAILABILTY OF NON-FOREST LAND FOR RAISING COMPENSATORY AFFORESTATION

Certified that more than 68% of the total geographical area in the state of Himachal Pradesh in the category of "Legally Classified Forest Area". It is further certified that no suitable non-forest land is available for raising compensatory afforestation plantation in the state. Hence, the compensatory afforestation shall be done in degraded forest land/ government land on double the area being diverted for the construction of THANA PLAUN HEP (191MW), HPPCL within the jurisdiction of Mandi & Jogindernagar Forest Divisions, District Mandi, Himachal Pradesh.

Chief Secretary to the
Govt. of Himachal Pradesh

FULL TITLE OF THE PROJECT: **THANA PLAUN (191MW) HYDROELECTRIC PROJECT**

PROPOSAL NO.: **FP/HP/HYD/8255 /2014**

DATE OF PROPOSAL: **NOVEMBER 29TH,2014**

CHECK LIST SERIAL NUMBER: -21

(APPROVAL OF THE PROPOSAL FOR WHICH DIVERSION OF FOREST LAND IS PROPOSED BY THE COMPETENT AUTHORITY OF THE CONCEREND ORGANISATION)

Authorization Letter

CERTIFICATE OF AUTHORIZED SIGNATORY

Certified that Er. Ajay Kumar Bisht, General Manager, Triveni Mahadev (78MW) and Thana Plaun (191MW) HEPs, HPPCL, Kotli, Distt. Mandi (HP) is hereby authorized to sign all the documents of statutory clearances of Triveni Mahadev and Thana Plaun HEPs of HPPCL located in river Beas of H.P.

Specimen signature is hereby attested

Authorized signatory

Er. Ajay Kumar Bisht
General Manager,
TM&TP HEPs,
HPPCL, Kotli, Distt. Mandi,
(HP)-175003

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

Authorized signatory

Er. Ajay Kumar Bisht
General Manager
TM&TP HEPs,
HPPCL, Kotli, Distt. Mandi,
(H.P.)-175003

Managing Director
HPPCL, Himfed Building,
BCS, New Shimla-171009.

FULL TITLE OF THE PROJECT: **THANA PLAUN (191MW) HYDROELECTRIC PROJECT**

PROPOSAL NO.: **FP/HP/HYD/8255 /2014**

DATE OF PROPOSAL: **NOVEMBER 29TH,2014**

CHECK LIST SERIAL NUMBER: -24

(DOCUMENTS/INFORMATION REQUIRED FOR PROPOSALS OF HYDRO ELECTRIC PROJECTS)

STATEMENT SHOWING COMPONENTWISE/DIVISION WISE DETAIL OF TOTAL LAND COMING UNDER THANA PLAUN (191 MW) HYDROELECTRIC PROJECT IN DISTRICT MANDI OF HIMACHAL PRADESH

Sr.No.	Component	Jogindernagar Forest Division			Mandi Forest Division			Total Forest Land in Hectares		
		Open	Under ground	Pvt. Forest land kism jungle jhari	Open	Under ground	Pvt. Forest land kism jungle jhari	Open	Under ground	Pvt. Forest land kism jungle jhari
1	**Dam** & requisite associated Job facilities	0.4854	0	0	2.5831	0	0	3.0685	0	0
2	**Coffer Dam** & requisite associated Job facilities	0.0809	0	0	0.0809	0	0	0.1618	0	0
3	**Plunge Pool** i/c D/s of Coffer Dam	0.1618	0	0	0.1618	0	0	0.3236	0	0
4	**Pot Head Yard, Cable Tunnel** & requisite associated Job facilities	0.1294	0	0	0	0	0	0.1294	0	0
5	**Magazine**	0.2124	0	0	0	0	0	0.2124	0	0
6	**Road / Job facility**	27.2957	0	0	3.5834	0	0	30.8791	0	0
7	**Dumping Sites**	10.3491	0	0	0	0	0	10.3491	0	0
8	**Quarry Sites**	45.9421	0	0	0	0	0	45.9421	0	0
9	**Submergence**	80.826	0	0	227.2733	0	1.3375	308.0993	0	1.3375
10	**Diversion Tunnel** & requisite associated Job facilities	0	0	0	0	1.2136	0	0	1.2136	0
11	**Intake** & requisite associated Job facilities	0	0.1618	0	0	0	0	0	0.1618	0
12	**HRT** & requisite associated Job facilities	0	1.1068	0	0	0	0	0	1.1068	0
13	**MAT** & requisite associated Job facilities	0	1.0518	0	0	0	0	0	1.0518	0
14	**Power House** & requisite associated Job facilities	0	0.3236	0	0	0	0	0	0.3236	0
15	**Pressure Shaft/ Penstock**	0	0.2427	0	0	0	0	0	0.2427	0

Sr.No.	Component	Jogindernagar Forest Division			Mandi Forest Division			Total Forest Land in Hectares		
		Open	Under ground	Pvt. Forest land kism jungle jhari	Open	Under ground	Pvt. Forest land kism jungle jhari	Open	Under ground	Pvt. Forest land kism jungle jhari
16	**Transformer Cavern i/c draft tube & escape tunnel, cable Tunnel &** requisite associated Job facilities	0	1.6181	0	0	0	0	0	1.6181	0
17	**Tail Race Tunnel &** requisite associated Job facilities	0	0.1618	0	0	0	0	0	0.1618	0
18	**Adit** & requisite associated Job facilities	0	0.4086	0	0	0	0	0	0.4086	0
	Total	**165.4828**	**5.0752**	**0**	**233.6825**	**1.2136**	**1.3375**	**399.1653**	**6.2888**	**1.3375**
	Grand Total	**170.558**			**236.2336**			**406.7916**		

GENERAL MANAGER
Triveni Mahadev & Thana Plaun Hep's
Himachal Pradesh Power Corporation Ltd
Sujanpur Tihra Distt Hamirpur HP-176110
Ph. 01972272200 Fax : 01972272201

Checklist No. 24(b) 459

HP POWER CORPORATION LTD.

MEMORANDUM OF ASSOCIATION

OF

HIMACHAL PRADESH POWER CORPORATION LIMITED

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

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Form 1

Certificate of Incorporation

Corporate Identity Number : U40101HP2006SGC030291 2006 - 2007

I hereby certify that HIMACHAL PRADESH POWER CORPORATION LIMITED is this day incorporated under the Companies Act, 1956 (No. 1 of 1956) and that the company is limited.

Given under my hand at Jalandhar this EIGHTEENTH day of DECEMBER TWO THOUSAND SIX.

Registrar of Companies
Punjab, Himachal Pradesh &
Chandigarh

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MEMORANDUM OF ASSOCIATION OF HIMACHAL PRADESH POWER CORPORATION LIMITED

(4B)

MEMORANDUM OF ASSOCIATION
OF
HIMACHAL PRADESH POWER CORPORATION LIMITED
(A joint Venture of Govt. of Himachal Pradesh and H.P. State Electricity Board)

Name of the company

I. Name of the Company is Himachal Pradesh Power Corporation Limited.

Registered Office

II. The registered office of the Company will be situated in the state of Himachal Pradesh

Objects

III. The objects for which the Company is Established are:

Main Objects

A. Main objects to be pursued by the Company on its Incorporation:

Development of Hydroelectric Power

1. (a) To plan, promote, organize and execute Power Projects in Hydro Electric Power, Thermal Power, Solar Power, Wind Power etc within and outside State of Himachal Pradesh and outside Country/Overseas.

(b) To undertake, [illegible]

Co-ordination and Control

2. To Coordinate the activities of its subsidiaries to determine their economic and financial objectives/ targets and review, control, guide and direct their performance with a view to secure optimum utilisation of all resources placed at their disposal.

Agent of Public Sector Financial Institutions

3. To act as an agent of Government/ Public Sector financial Institutions, to exercise all the rights and powers exercisable at any meeting of any Company engaged in the planning, investigations, research, design and preparation of preliminary, feasibility and definite [illegible] power stations and [illegible] power in respect of any shares held by the Governments, Public financial Institutions, nationalised banks, nationalised insurance companies with a view to secure the most effective utilisation of the financial investments and loans in such companies and the most efficient development of the concerned industries.

Manufacturing Trading and other business

4. To carry on the business of [illegible] manufacturers, dealing in all aspects of planning, investigation, research, design and preparation of preliminary, feasibility and definite Project reports, construction, generation, operation and

[illegible]

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maintenance of hydroelectric power, hydroelectric power development, ancillary and other allied industries and for that purpose to install, operate and manage all necessary plants, establishments and works.

B. **Objects incidental or ancillary to the attainment of the main objects.**

As a helper and servicing agency for the Subsidiaries

1. To arrange, secure and make available to its subsidiary and other concerned organisations such facilities, resources, input and services as may be required.

To obtain charters, Concessions etc.

2. To enter into any arrangement with the Government of India or with any other Government of State or any Local or State Government or with authorities, foreign, international, national, local, municipal or otherwise or with any person for the purpose of directly or indirectly carrying out the objects or furthering the interests of the Company or its members and to obtain from any such Government, State authority or person any charters, subsidies, loans, indemnities, grants, contracts, decrees, rights, sanctions, privileges, licenses or concessions whatsoever, (whether statutory or otherwise) which the Company may think it desirable to obtain and carry out, exercise and comply with the same.

To borrow money

3. To borrow money or to receive money or deposits for the purpose of financing the business of the company either with security or mortgage or other security charged on the undertaking or all or any of the assets of the Company including uncalled capital and to increase, reduce or pay off such securities.

To acquire and lease property

4. To acquire by purchase, lease, exchange, hire or otherwise or to construct and maintain factories, works, buildings and conveniences of all kinds, land, buildings, apartments, plant, machinery and hereditament of any tenure or description, situated in India or any other part of the World and any estate or interest therein and any rights over or connected with land so situated and turn the same to account in any manner as may seem expedient, necessary or convenient to the Company for the purpose of its business.

To acquire business/ companies

5. To acquire, possess and undertake the whole or any part of the business, assets, property, goodwill, rights and liabilities of any person, firm, society, association, Corporation or company carrying on any business which the Company is authorised to carry on.

To obtain authority etc. to carry out its objects

6. To obtain, apply for, arrange for the issue or enactment of order or Act or Legislature or Act of Authority in India or any other part of the World for enabling the Company to obtain powers, authorities protection, financial and other help, necessary or expedient to carry out or extend any of the objects of the Company or for any other purpose which may seem expedient and to oppose any proceedings, or application or any other endeavours, steps or measures which may seem calculated directly or indirectly to prejudice the Company's interests.

To acquire 'know how' etc.

7. To apply for, purchase or otherwise acquire any trade marks patents, brevets or inventions, licences, concessions and the like, conferring any exclusive or non-exclusive or limited right to use of any secret or other information as to any invention which may seem capable of being used for any of the purposes of the Company or the acquisition of which may seem calculated, directly or indirectly, to benefit the Company and to use, exercise, develop or grant licences in respect of or otherwise turn to account the property, right or information, so acquired.

To undertake research, development and training

8. (a) To establish, provide, maintain and conduct or otherwise subsidise research laboratories and experimental workshops for scientific, technical or research experiments and to undertake and carry on directly or in collaboration with other agencies scientific and technical research experiments and tests of all kinds and to process, improve and invent new products and their techniques of manufacture as to promote, encourage, reward in every manner, studies and research, scientific and technical investigations and invention of any kind that may be considered likely to assist, encourage and promote rapid advances in technology, economics, import substitution or any business which the Company is authorized to carry on.

(b) To establish, maintain and operate technical training institutions and hostels for engineers of all types and all other technical staff and artisans and mechanics of all types and kinds and accountants and others in India or in any part of the World; to make such other arrangements as may be expedient for the training of all categories of officers, workers, clerks,

storekeepers and other personnel likely to be useful to or assist in any business which the Company is authorised to carry on.

To improve property etc.

9. To sell, improve, manage, develop, exchange, lease or let, under lease, sub-let, mortgage, dispose of, deal with any manner, turn to account or otherwise deal with any rights or property of the Company.

To invest money

10. To accumulate funds and to invest otherwise employ moneys belonging to or with the Company and not immediately required, in the purchase or acquisition of any shares, securities or other investments whatsoever, whether movable or immovable upon such terms as may be thought proper and from time to time to vary all or any such investment in such manner as the Company may think fit.

To undertake joint ventures

11. To enter into partnership or into any arrangement for joint working, sharing or pooling profits, amalgamation, union of interests, cooperation, joint venture, reciprocal concession or otherwise or amalgamate with any person or company carrying on or engaged in or about to carry on or engaged in any business or transaction which the company is authorized to carry on or engaged in or any business undertaking, or transaction which may seem capable of being carried on or conducted so as directly or indirectly to benefit the Company.

To provide for Welfare of employees

12. To provide for the amelioration and welfare of persons of employed or formerly employed by the Company and the wives, families and dependants of such persons by building or contributing to the building of houses, dwelling or by grants of money, pensions, allowances, bonus or other payments or by creating and from time to time subscribing or contributing to provident fund and other associations, institutions, funds or trust or by helping persons employed by the Company to effect or maintain insurance on their lives by contributing to the payment of premium or otherwise and by providing or subscribing or contributing towards places of instruction and recreation, hospitals and dispensaries, medical and other attendance and other assistance as the Company shall think fit.

To sell property

13. To sell or dispose of the undertaking of the Company or any other thereof for such consideration as the Company may think fit and in particular for shares, debentures or

securities of any other association, corporation or company, to promote or aid in the promotion of any other company or partnership for the purpose of acquiring all or any of the properties, rights or liabilities of the Company or for any other purposes which may seem directly or indirectly calculated to benefit the company.

To enter into contracts

14. (a) To enter into agreements and contracts with foreign individuals, companies or other organizations for purchase of equipments and for technical, financial or any other assistance, for carrying out all or any of the objects of the Company.

(b) To enter into any agreement with any Government or authorities (municipal, local or otherwise) or any corporations, companies or persons which may seem conducive to the Company's objects and to obtain from any such Government, authorities, corporation, company or persons any contract right, privilege and concessions which the Company may think desirable and to carry out, exercise and comply with any such contract, right, privilege and concession.

(c) To enter into contract of indemnity and guarantee.

To establish agencies etc.

15. To establish and maintain agencies, branch places and local registers, to procure registration or recognition of the Company and to carry on business in any part of the World and to take such steps as maybe necessary to give the Company such rights and privileges in any part of the World as are possessed by local companies or partnership or as may be thought desirable.

To subscribe for shares

16. To subscribe for ,, underwrite, purchase, otherwise acquire and to hold, dispose of any deal with the shares, stocks, securities and evidences of indebtedness or the right to participate in profits or other similar documents issued by any Government, authority, corporation or body or by any company or body of persons and any option or right in respect thereof.

To create depreciation fund

17. To create any depreciation fund, reserve fund, sinking fund, insurance fund or any other fund, whether for depreciation or for repairing, improving, extending or maintaining any of the properties of the Company or redeemable preferences shares or for any other purposes whatsoever conducive to the interests of the Company.

To open accounts in Bank.

18. To open an account or accounts with any individual, firm or company or with any bank or bankers or shroffs and to pay into and with draw money from such account or accounts.

Acquisition of Companies

19. To acquire, stocks or securities in or of any company carrying on any business which this Company is entitled to carry on or of any other company or undertaking the acquisition of which, may seem likely or calculated directly or indirectly to promote or advance the interests of or be advantageous or beneficial to the Company and to sell or dispose of or transfer any such shares, stocks or securities.

To carry on Consultancy services

20. To promote, organise or carry on the business of consultancy services in any field of activity in which it is engaged in.

To promote other companies

21. To promote or concur in the promotion of any company, the promotion of which shall be considered desirable in furtherance of the objects or any object of the Company.

To carry on convenient Business

22. Generally to do all such other things as may be deemed incidental or conducive to the attainment of the above objects or any of them and to carry on any business which may seem to the Company capable of being conveniently carried on in connection with any of the Company's objects or calculated directly or indirectly to enhance the value of or render profitable any of the Company's property or rights.

C. Other objects

To act as an entrepreneur

1. To act as an entrepreneur on behalf of the Government of Himachal Pradesh and H.P State Electricity Board to identify new areas of economic investment and to undertake investigations of other hydroelectric projects or participate in the undertaking of such investments.

To lend money

2. To lend money on property or on mortgage of immovable property or against Bank Guarantee and to make advances of money against future supply of goods and services on such terms as the Directors may consider necessary and to invest money of the company in such manner as the Directors may think fit and to sell, transfer or deal with the same.

To Collect information etc.

3. To arrange, receive and collect all relevant information in regard to any business carried on by the Company.

To carry on the business of carriers by land etc.

4. To carry on the business of carriers by land, sea and air as may be required from time to time.

To deal with goods etc. dealt with by subsidiaries

5. To carry on the business of trading in and dealing in any manner whatsoever in all commodities, goods and things manufactured, produced or dealt with in any manner by any of the subsidiaries of the Company and it is hereby declared that:

a. The word 'company' saves when used in reference to this Company in this clause, shall be deemed to include any partnership or other body of persons, whether incorporated or not incorporated, whether domiciled in India or elsewhere.

b. The term 'India' when used in this clause unless repugnant to the context, shall include all territories from time to time comprised in the Union of India.

c. The term 'Himachal Pradesh' when used in this clause, unless repugnant to the context, shall include all territories from time to time that comprise the State of Himachal Pradesh.

Limited liability

The liability of members is limited.

Share Capital

The authorised share capital of the corporation is Rs. 300 crores (Rupees Three hundred crores only)

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We, the several persons, whose names and addresses are subscribed, are desirous or being formed into a Company in pursuance of this Memorandum of Association and we respectively agree to take the number of shares in the capital of the Company set opposite our respective names:-

Sr. No.	Name of subscriber, Address, Description and occupation, if any	Number of Shares taken by each subscriber	Signature of Subscriber	Signature of witnesses and their addresses, description and occupation, if any
1.	Governor of Himachal Pradesh Through			
	Sh. Surjeet Singh Parmar S/o Late Sh. Jagat Singh Chief Secretary Govt. of H.P. Shimla, Govt. Service Set No. 13, Richmond U.S. Club, Shimla - 171001	10 (Ten)	Sd/-	Sd/- Anil Kapil S/o Late Sh. Ravinder Nath Kapil Set No. 17, Type- IV Officers Colony Kasumpti, Shimla - 9
	Sh. Jai Prakash Negi S/o Late Sh. Sunder Lal Negi Pr. Secy. (Power) Govt. H.P. Shimla Dyerton Cottage No. 3, Khalini, Shimla - 171002	10 (Ten)	Sd/-	
	Sh. Sutanu Behuria S/o Late Sh. N.C. Behuria Pr. Secy. (Finance) Govt. of H.P. Shimla Set No. 8, Benmore, Shimla - 2	10 (Ten)	Sd/-	
2.	Himachal Pradesh State Electricity Board Through			
	Kanwar Bhemsher Singh S/o Late Sh. Sita Ram Chairman HPSEB, Shimla Govt. Service, Victoria Place, near Nigam Vihar, Shimla - 171 002	10 (Ten)	Sd/-	Anil Kapil S/o Late Sh. Ravinder Nath Kapil Set No. 17, Type- IV Officers Colony Kasumpti, Shimla - 9
	Sh. Roshan Lal Chauhan S/o Late Sh. Kahna Singh Member(Civil) HPSEB Shimla - 171004 Govt. Service Kahna Niwas, Kelestan, Shimla - 171001	10 (Ten)	Sd/-	
		50 (Fifty)		

Place: Shimla
Date: 5th Dec. 2006

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HIMACHAL PRADESH POWER CORPO LIMITED
(A STATE GOVERNMENT UNDER)
Himfed Bhawan, (Below Old MLA's Quarters), Tutikandi, 005
(Phone Nos: 0177-2633810 Fax No.: 0177-2633821, Web. pcl.gov.in)

CERTIFICATE OF AUTHORISED SIGNATORY

Certified that Er. Vipen Kapoor, General Manager, Triveni Mahadev & Thana Plaun HEPs, HPPCL, Sujanpur Tihra, Distt. Hamirpur (H.P) is hereby authorised to sign all the documents of statuary clearances of Thana Plaun, HEP of HPPCL located in river Beas basin of H.P. and Solar Power Project Berra-Dol.

Specimen signature is hereby attested:-

Authorised Signatory	Authorised Signatory
(Er. Vipen Kapoor) General Manager, TM & TP HEPs, HPPCL, Sujanpur Tihra, Distt. Hamirpur- 176110,	(Er. Vipen Kapoor) General Manager, TM & TP HEPs, HPPCL, Sujanpur Tihra, Distt. Hamirpur- 176110.

07/04/2016
Managing Director,
HPPCL, Himfed Bhawan,
Tutikandi, Shimla- 171005.

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HIMACHAL PRADESH POWER CORPORATION LTD.
(A State Government Undertaking)

No HPPCL/CP/Thana Plaun/Vol-VII/13- 1359.06-07 Dated:- 27/11/13

To

The Director (P.A.C.),
Central Electricity Authority,
IIIrd Floor, Sewa Bhavan,
R.K. Puram, New Delhi.

Subject: Detailed Project Report of Thana Plaun HEP (191 MW)- Techno-Economic Clearance thereof.

Sir,

Thana Plaun HEP is a storage cum run-of-the rive scheme on Beas river in Mandi District of Himachal Pradesh. The Project has been allotted by Govt. of H.P. vide letter No. MPP(F)2-1/2008, dated: 22.09.2009 (Copy enclosed) for execution to H.P. Power Corporate Ltd. a State PSU.

The hydrology chapter of the Thana Plaun HEP (191 MW) has been approved by CWC vide letter No. 29/81/2012-PA(N)/67, dated 08.01.2013. Further the power potential studies has been approved by CEA vide No. 201/43/2013/HPA/1292, dated 04.09.2013.

In this context, enclosed please find five sets of the Detailed Project Report of Thana Plaun HEP (191 MW) for according Techno-economic clearance please.

This is for your information and necessary action please.

DA: 5 sets of the DPR

Yours faithfully,

27/11/13

General Manager (CP),
HPPCL, Himfed Bhawan,
Shimla-5.

Copy forwarded to GM (TP&TPM) HEP's, HPPCL Siyanpur Tihra, Distt. Hamirpur, H.P. -17110 for information please.

Corporate Planning Cell,
HPPCL, Himfed Bhawan, Panjri, (Below old MLA Quarters), Shimla
Ph. No:0177- 2633823, 2633920 Fax No: 0177-2633813, E-mail:- secphppcl@gmail.com

DGM/SR. MANAGER
MANAGER
DEPUTY MANAGER
P&A, F&A, R&R

Copy to:-
(i) Dy GM of T/O.
(ii) Sr Manager TP, HEP

T&TP HEP's HPPCL Diary No. 998 dated 28/11/13 Distt. HMR.

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No. MPP(F)2-1/2008 MOST IMMEDIATE

Government of Himachal Pradesh
Department of MPP and Power

From

The Pr. Secretary(Power) to the
Government of Himachal Pradesh.

To

1. The Special Officer,
HPSEB, Vidyut Bhawan,
Shimla-4.
2. The Directorate of Energy,
Thakur Vatika Khalini,
Shimla-2.
3. The Managing Director,
HP Power Corporation Ltd.,
Himfed Bhawan, Below Old MLA Quarters,
Shimla-4.

Dated Shimla-2, the 22-9 -2009

Subject: Creation of additional capacity in State Sector.

Sir,

I am directed to refer to the subject cited above and to say that in order to create additional capacity in State Sector to meet the ever increasing demand for power the cabinet has approved:-

(i) that in general projects in Chenab valley in Lahaul and Satluj basin in Spiti valley may be allotted to private sector/joint sector.

(ii) the Gyspa and Khab projects be kept in State Sector and efforts be made at Govt. level to declare Khab project as project of national Importance.

(iii) that projects of 2070 MW capacity enumerated below be reserved for State Sector/HPPCL/HPSEB. HPPCL will give the presentation before the Board regarding its timeline for the completion of the projects for which a MoU will be signed with the Government:-

Sr.	Project	District	Installed Capacity MW	River/Tributary
1.	Gyspa	Lahaul & Spiti	300	Bhaga-National Importance Project
2.	Chhoti Saichu HEP	Pangi (Chamba)	26	Chenab basin
3.	Saichu Sach Khas	-do-	104	Chenab basin.
4.	Lojaj HEP	-do-	45	Chenab basin.
5.	Saichu	-do-	43	Chenab basin.
6.	Surgani Sundla	Chamba Churah	42	Ravi basin.
7.	Deothal Chanju	Chamba	38	Ravi basin.
8.	Chanju-III	Chamba	42	Ravi basin.
9.	Tosh+Parvati-I	Kullu	400	Beas
10.	Beri Nichli	Kangra	78	Beas
11.	Thana Pisan	Mandi	141	Beas
12.	Khab	Kinnaur	636	Satluj
13.	To HPSEB (5-25 MW)		175	
		Total	2070	

(66)

(136)

-2-

(iv) that the State should have about 2000 MW capacity in Thermal and Gas Sector wherein 1500MW capacity be attempted by getting coal blocs in the name of the State Government and about 500MW capacity be tried through share under Ultra Mega Power projects in addition to tie up for gas based project(s).

You are, therefore, requested to take necessary action to comply with the decision of the cabinet, under intimation to this department, immediately.

Yours faithfully,

Spl. Secretary(Power) to the
Government of Himachal Pradesh.

Endst. No. As above. Dated Shimla-2, the

Copy is forwarded to the Spl. Secretary(GA) to the Govt. of Himachal Pradesh w.r.t. Item No. 14 of the Cabinet meeting held on 9.9.09 for information.

Spl. Secretary(Power) to the
Government of Himachal Pradesh.

Save Water Save Life

Himachal Pradesh
Irrigation and Public Health Department

No. IPH-SNR-WS-WA-Miscellaneous -NOC /2013- 18531-35 Dated:- 26/9/13

To

The General Manager
TM &TP HEP's HPPCL at Sujanpur Tihra
Distt. Hamirpur Pin-176110.

Subject: Request for issuance of NOC in respect of Thana Plaun HEP (Revised Capacity 191 MW) of HPPCL in river Beas Basin of HP.

Sir,

In pursuance to Principal Secretary (IPH) to the Govt. of HP Shimla letter No. IPH-B(F)5-4/2006 dated 29-8-2007, no objection certificate is hereby granted in favour of the General Manager TM &TP HEP's HPPCL at Sujanpur Tihra Distt. Hamirpur for the execution of above project subject to the following conditions:-

1. The firm shall enter into legal agreement with the department by signing an agreement with Executive Engineer, I&PH division, Mandi and Padhar.
2. All the conditions of the agreement so signed shall be strictly adhered to by the firm.
3. The department reserves the right to use water of **Beas River for its existing as well as proposed schemes.** The requirement of department shall have precedence over requirement of firm under all circumstances.
4. Permission to make alternative arrangements will be given subject to the condition that the arrangement will not affect adversely any existing or proposed water supply sources being used by the I&PH Department. It will be located at a sufficient distance from an existing ground water source and down-stream of any existing surface water source. It will also require approval oil Gram Sabha of concerned Gram Poanchyat before execution of the project.
5. The NOC and permission to make alternative arrangements shall be granted by IPH Executive Engineer concerned.
6. The firm shall ensure that the quantum of minimum flow of water to be released and maintained through out the year immediately downstream of the diversion site is a threshold value of not less that 15% of the minimum in flow observed in the lean season, to the main river water body whose water is being harnessed by the project. The firm shall also ensure adequate minimum environmental flow in the river below the diversion site to take care of aquatic life and ecology of the area.
7. An alternative arrangement will have to be made by project agency well in advance in case running water supply schemes/ irrigation is effected so that supply of water is not disrupted.
8. In case intake point of the existing scheme get disturbed an alternative arrangement should be made at the first instance before taking up of the work of project in hand.
9. The amounts intimated vide this office letter No. IPH-SNR-EA-Misc-NOC/2013-18022 dated 11.9.2013 to be paid to the IPH Department should be confirmed by project agency in writing before signing aggrement.
10. As per direction of Addl. Chief Secretary IPH to the Govt. of HP efforts will have to be made by project agency for getting permission of FCA for relocation of structures of IPH Department.
11. In the event of violation of aforesaid terms and conditions of the NOC by the firm, the NOC shall be treated as cancelled with out any notice.

DGM/SR. MANAGER
MANAGER
DEPUTY MANAGER
P&A, Feb, Amb

Superintending Engineer,
I&PH Circle Sunder Nagar.

Copy forwarded to the Principal Secretary (IPH) to the Govt. of HP Shimla-2 with reference to their office letter No. IPH-B(F)5-4/2006 dated 29-8-2007 for favour of information please.

Copy forwarded to the Engineer-in-Chief, I&PH department Shimla-1 for favour of information please.

Copy forwarded to the Chief Engineer (MZ) I&PH department Mandi for favour of information please.

Copy forwarded to the Executive Engineer, I&PH Division, Mandi and Padhar with reference to their office letter No. 18031 dated 8.11.2012 & No. 9209 dated 31.7.2013 for information and necessary action.

Superintending Engineer
I&PH Circle Sunder Nagar.

476

Registered

No. FSH-F (2)-39/2010-ARC-Thana Plaun- 7361
Directorate of Fisheries,
Himachal Pradesh.

From

The Director-cum-Warden of Fisheries,
Himachal Pradesh.

To

The General Manager,
TM & TP HEPs HPPCL at Sujanpur Tihra,
District Hamirpur (HP) -176 110.

Dated Bilaspur-174001 the, 3-7-15

Subject:- **Regarding NOC of Fisheries department for implementation of Thana Plaun HEP(191 MW) of HPPCL in river Beas basin in Distt Mandi of H.P.**

Sir,

I invite a reference of your letter No. HPPCL/GM-TM&TP HEP's/TP-E&F/K-1/2014-2750 dated 15.01.2015, HPPCL/F&A/Banks/2014/Vol.– II - 16738-42 dated 05.01.2015 and HPPCL/GM-TM&TP HEP's/Cash & Bank/2015-726-28 dated 27.06. 2015 vide which you have transferred the fisheries development funds to the tune of **Rs. 76.00 Lac and Rs. 20.00 Lac respectively through RTGS** along with duly notarized affidavit, regarding above cited subject.

Keeping in view the realization of requisite funds and undertaking/affidavit given for the disposal of silt/muck and sustenance of aquatic fauna, the Department of Fisheries, H.P. has no objection if the project is started at the site.

This may be treated as **NO OBJECTION CERTIFICATE**.

Yours faithfully,

(Gurcharan Singh)
Director-cum-Warden of Fisheries,
Himachal Pradesh, Bilaspur.
E-mail : fisheries-hp@nic.in
Tel/Fax: 01978-224068

DGM/SR. MANAGER
MANAGER
DEPUTY MANAGER
P&A, F&A, R&R

Endst No. As above Dated:-

Copy forwarded for favour of information to:-

1. The Additional Chief Secretary(Fisheries) to the Govt. of H.P. Shimla-171002;
2. The Director, Directorate of Energy, GoHP, Shimla-2;
3. The Chief Engineer(P&M) HPSEBL, Vidyut Bhawan, Shimla-4;
4. The Assistant Director of Fisheries, Mandi, Distt-Mandi(HP)
5. Incharge, Web Cell, Directorate of Fisheries, H.P. for information and n/a.

(Gurcharan Singh)
Director-cum-Warden of Fisheries,
Himachal Pradesh, Bilaspur.
E-mail : fisheries-hp@nic.in
Tel/Fax: 01978-224068

Registered 477

No. FSH-F (2)-39/2010-ARC-Thana Plaun- 7261
Directorate of Fisheries,
Himachal Pradesh.

From

The Director-cum-Warden of Fisheries,
Himachal Pradesh

To

The General Manager,
TM & TP HEPs HPPCL at Sujanpur Tihra,
District Hamirpur (HP) -176 110.

Dated Bilaspur-174001 the, 2-7-15

Subject Regarding NOC of Fisheries department for implementation of Thana Plaun HEP(191 MW) of HPPCL in river Beas basin in Distt Mandi of H.P.

Sir,

I invite a reference of your letter No HPPCL/GM-TM&TP HEP's/TP-E&F/K-1/2014-2750 dated 15.01.2015, HPPCL/F&A/Banks/2014/Vol - II 16738-42 dated 05.01.2015 and HPPCL/GM-TM&TP HEP's/Cash & Bank/2015 726-28 dated 27.06 2015 vide which you have transferred the fisheries development funds to the tune of **Rs. 76.00 Lac and Rs. 20.00 Lac respectively through RTGS** along with duly notarized affidavit, regarding above cited subject.

Keeping in view the realization of requisite funds and undertaking/affidavit given for the disposal of silt/muck and sustenance of aquatic fauna, the Department of Fisheries, H.P. has no objection if the project is started at the site.

This may be treated as **NO OBJECTION CERTIFICATE**

DGM SR MANAGER

P&G, L&A, R&R

Yours faithfully,

(Gurcharan Singh)
Director-cum-Warden of Fisheries,
Himachal Pradesh, Bilaspur.

Endst No. As above: Dated -

Copy forwarded for favour of information to:-

1. The Additional Chief Secretary(Fisheries) to the Govt. of H.P. Shimla-171002.
2. The Director, Directorate of Energy, GoHP, Shimla-2.
3. The Chief Engineer(P&M) HPSEBL, Vidyut Bhawan, Shimla-4.
4. The Assistant Director of Fisheries, Mandi, Distt Mandi(HP)
5. Incharge, Web Cell, Directorate of Fisheries, H.P. for information and n/a

(Gurcharan Singh)
Director-cum-Warden of Fisheries,
Himachal Pradesh, Bilaspur.

9.11 478

HIMACHAL PRADESH
PUBLIC WORKS DEPARTMENT

No. PW-JND-WA/NOC/2011 19055-56 Dated: 7/11/2011
To

The General Manager (Chief Engineer(C/M),
Triveni Mahadev & Thana Plaun HEP's,
HPPCL, Sujanpur-Tihra Distt. Harmirpur.

Subject:- Thana Plaun HEP (141MW) of HPPCL in river Bias basin of H.P.

Reference:- Your office letter No. HPPCL/GM-TM&TPHEP's/TM-E7F/K-1/11-2018-20 dated 20/09/2011.

As per proposal of Thana Plaun HEP (141MW), it is intimated that this department may have no objection for the implementation of this scheme if during the execution of this project, whatever assets fall under the submergence of the reservoir basin are rehabilitated.

Executive Engineer,
B&R Division HP PWD,
Joginder Nagar

Copy to the Assistant Engineer, Joginder Nagar Sub Division No.-II, HP PWD, Joginder Nagar for information with reference to his office letter No. 5395 dated 09/11/2011.

Executive Engineer,
B&R Division HP PWD,
Joginder Nagar

H.P.P.C.L. Sujanpur Tihra Distt. Hamirpur (H.P.) Diary No. 864 Dated 11/11/11

To Keep in record & endorse to Corp office at [illegible]

CHDM

GM 11/11/2011

94

4?6 479 (244)

Himachal Pradesh
Public Works Department

No:-PW-MDII-WA –NOC /11.- 18407-08 Dated:- 4/11/011

To

The Genral Mangner
Thana Plaul HEP,s HPPCL,
Sujanpur , Tihra Distt. Hamipur

Subject - ,

Thana Plaun HEP, s (141MW) of HPPCL in river Bias Basin of HP.

Reference-

Your offices letter no -2102-2111 dt 27.09.2011.

As per your proposal of Thana Plaun HEP s (141 MW) it is intimated that this department has no objection for the implementation of this scheme with the condition that during the execution of this project, whatever assets fall under the submergence of the reservoir basin are needed to be rehabilitated.

Executive Engineer,
Mandi Division No II
HPPWD Mandi.

Copy to the Assistant Engineer, Kotli Sub-Divn. No. HPPWD Kotli for taking further necessary action.

Executive Engineer,
Mandi Division No II
HPPWD Mandi.

G.M.

DGM/SR. MANAGER

MANAGER

DEPUTY MANAGER

PG/... ...SR/... GDH

Sujanpur Tihra
... B37
Dated 4/11/11
Distt. Hamirpur (H.P.)

Check...

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No. 22(14)/2014-D (Coord)
Government of India
Ministry of Defence

216, 'B' Wing, Sena Bhavan,
New Delhi, the 10 November, 2014.

Office Memorandum

Subject:- Grant of Defence clearance to Thana Plaun HEP (191 MW) in Distt. Mandi, Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd. -reg.

The undersigned is directed to refer to Ministry of Power's O.M. No. 13/6/2014-H-II, dated 06.05.2014 on the above subject and to say that Ministry of Defence has no objection to the construction of Thana Plaun HEP (191 MW) in Distt. Mandi, Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd., subject to the following conditions:-

(a) The vertical extent (highest point) of the Dam at Latitude 31° 49' 28.22" N and Longitude 76° 50' 20.53" E shall not exceed 719 metres above mean sea level or 85 metres above ground level whichever is lower.

(b) The vertical extent (highest point) of the Pot Head tower at Latitude 31° 49' 28.22" N and Longitude 76° 50' 20.53" E shall not exceed 788 metres above mean sea level or 20 metres above ground level whichever is lower.

(c) Any extension or structure permanent or temporary (eg. Antennas, lightening arrester, etc.) shall not be permitted above the cleared height of the chimney or any associated structures.

(d) Standard obstruction markings and lightings as per IS 5613 notification and International Civil Aviation Organization(ICAO) standards as stipulated in ICAO-Annex-14 is to be provided by the company. The lights shall be switched 'ON' at all times. Provision shall be made for standby power supply to keep the lights 'ON' during power failure.

(e) Periodic maintenance of obstruction lights to be carried out by the company at regular intervals to keep them in servicable and visible condition.

(f) No lights or combination of lights which by reasons of its intensity, configuration or colour may cause confusion with aeronautical ground lights of an airport shall be installed at the site at any time during or after construction of the Dam and associated structures.

G.M.
DGM/SR. MANAGER
MANAGER
DEPUTY MANAGER
P&A, F&A, R&R | GHbm AE(C)
19/11/14

M & TP HEPs HPPCL
Dairy No. 1303
dt. 19/11/14

1.

(g) The commencement, completion of works inclusive of installation of obstruction lights shall be intimated to following:
AOC, AF Station Chandigarh.
CATCO, HQ WAC, IAF, Subroto Park, New Delhi-10

(h) Failure to render these certificates within the stipulated time may lead to cancellation of NOC.

(i) The Validity of this NOC is five years from the date of issue. If the construction for which NOC has been issued, does not complete within five years of issue or found to be in deviation from original proposal the NOC shall be deemed null and void. It will be responsibility of the applicant to obtain fresh NOC for the proposal

(j) Required security clearance should be obtained through MHA/IB of the Indian representative of the foreign company employed/to be employed by the company in India.

(k) An Undertaking duly signed by the authorized rep. of the concerned firm, certifying that no individual of foreign origin/nationality will be employed by the company at any stage of the project. If foreign national are to be employed as an inescapable requirement, it will be the responsibility of the company to get their credentials verified by the Ministry of Defence and to obtain the required security clearance through MHA/IB.

(l) Aspects of all individuals working as part of the project will be verified by the police and the company will be responsible for submitting a certificate to this effect, prior to commencement of work.

(m) A legal undertaking shall be signed by the firm executing the project giving details of new roads and helipads that are planned to be constructed.

(n) Details of all communication equipments likely to be used must be provided to the Army by the firm.

(o) Monitoring of Radio Set Communication by own Electronic Warfare elements to avoid passage of any sensitive information to Chinese during Construction and Operationalisation stage.

(p) Technical collaboration with Chinese firms must be banned due to security reasons.

(q) Additional force allocation for Rear Area Security (RAS) be catered for.

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(r) Reallignment/diversion task of roads and tracks will be undertaken by the agencies other than BRO

(s) Inner line permits be obtained for all employees. This is being accorded by civil Intelligence agencies and State Govt.

(t) Army authorities should have the right to carryout random check of all vehicles, persons and premises of the company.

Rajesh Choudhary

(Rajesh Choudhary)
Under Secretary to the Govt. of India.

To

Ministry of Power,
(Shri Ajit Kumar, Under Secretary),
Shram Shakti Bhavan,
Rafi Marg, New Delhi.

✓**Copy to:-**

The General Manager, Triveni Mahadev & Thana Plaun HEPs, Himachal Pradesh Power Corporation Ltd., Sujanpura Tihra. Distt. Hamirpur, Himachal Pradesh-176110

Copy also to:-

1. Section Officer(N-II/Ops)- w.r.t. MOD ID No. 5(5)/10-D-495 (Vol. III) dated 02-06-2014
2. Desk Officer (GS-III)-w.r.t. MOD ID No. 23/1/2014- D (GS-III), dated 24th Oct, 2014
3. Section Officer (Air-II)-w.r.t. . MOD ID No. 3(7)/ 2014-D(Air-II), dated 15th September , 2014.

3.

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HIMACHAL PRADESH STATE ELECTRICITY BOARD LIMITED

(A State Government Undertaking)

OFFICE ORDER

Himachal Pradesh State Electricity Board Limited is pleased to accord approval to issue NOC for construction of Thana Plaun HEP (141 MW) revised capacity 191MW & Triveni Mahadev HEP (78MW) by HPPCL in river Beas basin of Himachal Pradesh subject to deposit of the estimated cost in advance along with the affidavit for right of way for installation of lines and substations without any cost to HPSEB Ltd.

Chief Engineer, (Central Zone) HPSEB Mandi — Dy. No. 7939 Date 20/8/14

14/8/14
Er. A.C.Sandal
Chief Engineer (P&M)
HPSEB Ltd., Shimla-4
Ph.0177-2812500
Email-cepm@hpseb.in.

No. HPSEBL/Sectt/409- (NOC)TP&TM/2013-29859-66 Dated: 14-8-14

Copy forwarded to the following for information & necessary action:-

1. The Chief Engineer (Op.)Central Zone, HPSEB Ltd, Mandi w.r.t. his office letter No. HPSEBL/CEOCZ/Civil-Misc./2013-9800-9801 dated 14.11.2013.
2. The Executive Director (Personnel), HPSEB Ltd, Shimla-4 along with copy of approved memorandum.
3. The Chief Accounts Officer, HPSEB Ltd, Shimla - 4 along with copy of approved memorandum.
4. The Sr. PSs/PSs to MD/Directors for kind information of MD/Directors.

S.E.(W) Dy. Secy 80

AE (Civil) 19/8

14/8/14.
Er. A.C.Sandal
Chief Engineer (P&M)
HPSEB Ltd., Shimla-4
Ph.0177-2812500
Email-cepm@hpseb.in.

Endst. No. HPSEB/CEOCZ/Civil-misc/2014 5602-03 Dated 20-8-14

Copy of above forwarded to the following for information & necessary action:-

1. The General Manager, Triveni Mahadev & Thana Plaun HEPs, HPPCL Sujanpur-Tihra Distt Hamirpur (HP) - 176110
2. The Superintending Engineer, Operation Circle, HPSEBL Mandi (HP)

DGM/SR. MANAGER

MANAGER

DEPUTY MANAGER AE (E) 23/8/14

P&A, F&A, R&R

Chief Engineer (Op.),
Central Zone HPSEB Ltd.,
Mandi (H.P.)

(97)

489 (464)

No. Ind Bus (Geo-7)Engg.-Hamirpur-7/2002 -6064
Government of Himachal Pradesh,
Department of Industries,
"Geological Wing"

Dated, Shimla - 171001, the -24-9- 2013

To,

The General Manager,
Triveni Mahadev HEP(78MW)&
ThanaPlaun HEP (141MW),
Sujanpur-Tihra, Distt. Hamirpur-176110, H. P.

Subject:- **Regarding NOC for implementation of Thana Plaun HEP and Triveni Mahadev HEP of HPPCL in river Beas Besin of H. P.**

Sir,

Kindly refer to your letter No. HPPCL/GM-TM&TP HEP's/TP-E&F/R-1/2013-511 dated 15-5-2013 and letter dated 7-8-2013 on the subject cited above.

In this connection, it is to inform that as per report of Mining Officer Mandi, Distt. Mandi, H. P. and Mining Officer, Hamirpur, Distt. Hamirpur, H. P. that there is not any mining lease/auction area falling in stretch of above cited Hydro Projects in Distt. Mandi Hence this office has no objection in the implementation of Thana Plaun and Triveni Mahadev Hydro Electric Projects of Himachal Pradesh Power Corp. Ltd., in river Beas basin of Himachal Pradesh.

Yours faithfully,

(INDRESH DHIMAN)
State Geologist
Directorate of Industries
(Geological Wing)
Himachal Pradesh
Shimla-171001
Contact No.-0177 2657339

(96)

Full Title of the Project:	**Thana Plaun (191MW) Hydroelectric Project**
Proposal No.:	**FP/HP/HYD/8255 /2014**
Date of Proposal:	**November 29th,2014**

CHECK LIST SERIAL NUMBER: - 32(l)

EVACUATION OF POWER (TRANSMISSION) PLAN

The Power generated from Thana Plaun Hydro Electric Project (191MW) will be evacuated by LILO arrangement of planned 220 KV Double Circuit (Twin Moose) line from 132/220 KV Sub-station preposed near Dehan to 132/220 KV Sub-station at Mattansidh (Hamirpur). It has also been proposed that instead of LILO arrangement, there should be dedicated Double Circuit Line from Thana Plaun to Triveni Mahadev and again Double Circuit Line from Triveni Mahadev to proposed Dehan 132/220 KV Sub-station or existing 220 KV Sub-station at Mattansidh (Hamirpur).

It is however, clarified that the transmission system shall be done by Himachal Pradesh Power Transmission Corporation (HPPTCL) Limited (a State Govt. Undertaking) and the forest acse/private land case shall be dealt by HPPTCL separately.

(Signature of User Agency)

Office seal: General Manager, TM & TP HEP's, HPPCL, Sujanpur Tihra, Distt Hamirpur (H.P)

Date---04.09.16

Place---Sujanpur

C

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HIMACHAL PRADESH POWER CORPORATION LIMITED
(A State Government Undertaking)
HIMFED Bhawan, Bypass Road, Tutikandi, Shimla 171005
Phone 0177-2633818, Fax: 0177-2633818

No. HPPCL/Dir(E)/Thana-Plaun-Triveni-Mahadev/12- Dated: 15.06.2012

To

The General Manager (Planning & Contracts),
HPPTCL, Barowalias House,
Khalini, Shimla-171002

Subject: FCA case for Triveni-Mahadev (78 MW) and Thana-Plaun (141 MW) HEPs.

Ref.: No. HPPTCL/Interconnection-Vol-III/2012-1404-07 dated 07.06.2012

Sir,

Kindly refer to your office letter under reference addressed to Dy. General Manager (EC), HPPCL, Shimla with copy to this office and others. Point wise comments are as under:-

a) As per the above referred letter of HPPTCL, LILO arrangement of planned 220 kV Double Circuit (Twin Moose) Double Circuit line from 132 /220 kV Sub Station proposed near Dehan to 132/220 kV Sub Station at Mattansidh (Hamirpur) has been proposed. In this context, HPPCL is of the view point that instead of LILO arrangement, there should be dedicated Double Circuit Line from Thana-Plaun to Triveni-Mahadev and again a Double Circuit Line from Triveni-Mahadev to proposed Dehan 132/220 kV Sub Station or to the existing 220 kV Mattansidh Station (in case two no. 220 kV bays are available in 220 kV Mattansidh Station). The present practice of providing LILO should be avoided to make the system more reliable from Operation and Maintenance point of view. The 'LILO' proposal may, therefore, kindly be re-examined.

b) Against Item No. 2 of above letter of HPPTCL, it has been proposed that LILO of 220kV Dehan to Mattansidh Line for Beri-Nichil and Thana Plaun HEP(s) will be in the scope of HPPCL. This is not acceptable to HPPCL, as the Evacuation of Power is covered in the scope of HPPTCL/STU. Further action to this effect may please be taken accordingly.

DEPUTY MANAGER

Thanking you,

Yours faithfully,

DEPUTY MANAGER

Director (Electrical)

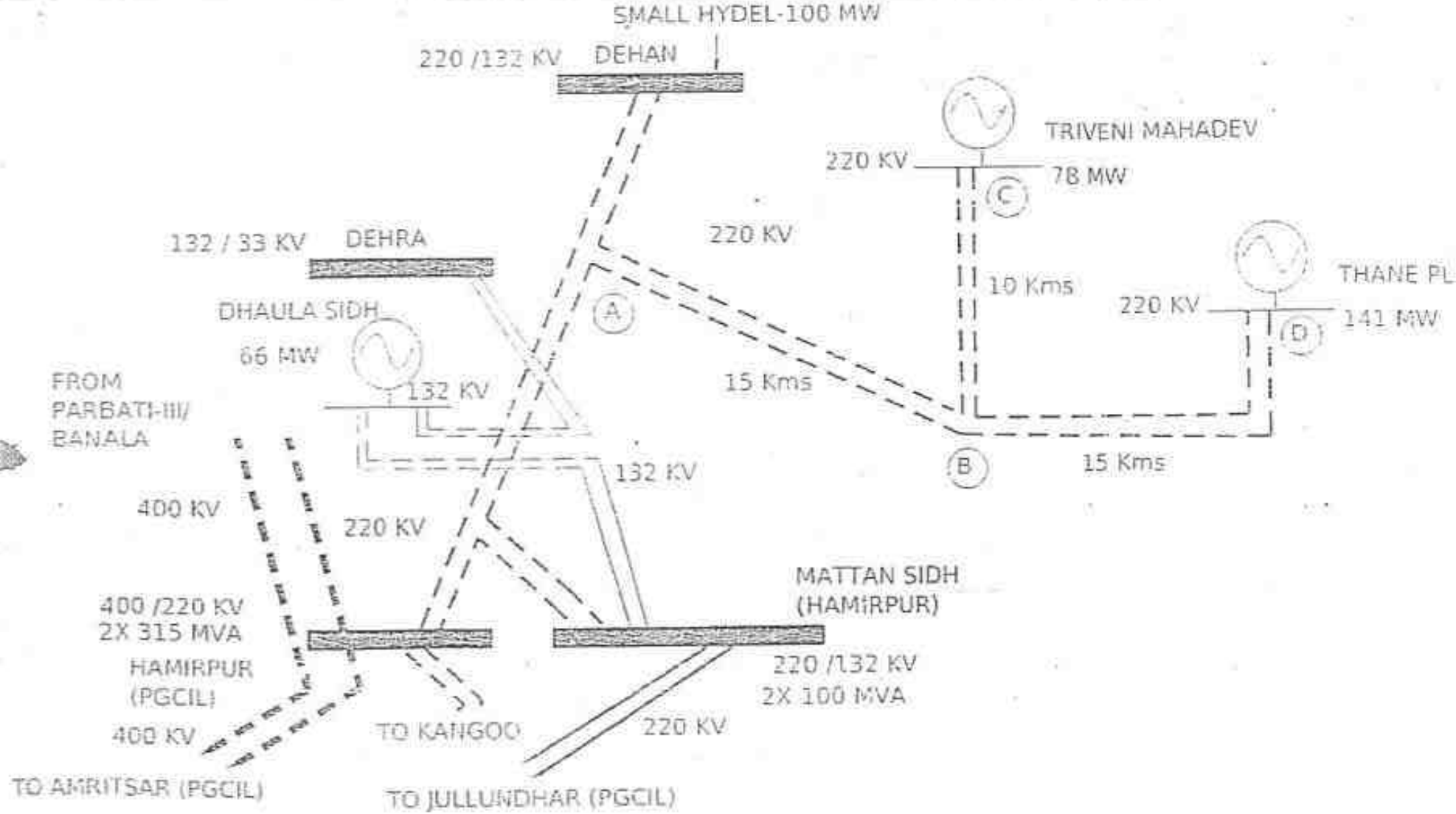
P&A, F&A, R&R

Copy of above is forwarded to:-

1. The Managing Director, HPPTCL, Barowalia House, Khalini, Shimla-02 for kind information please.
2. The Managing Director, HPPCL, Himfed Bhawan, Shimla for kind information please.
3. The Director (Planning & Contracts), HPPTCL, Barowalia House, Khalini, Shimla for kind information please.
4. The General Manager (E), HPPCL, Chakkar, Shimla for kind information and further necessary action please.
5. The General Manager Thana-Plaun and Trevni-Mahadev HEP for kind information and further necessary action please.
6. The Dy General Manager (EC), HPPCL, for kind information and further necessary action please.

HPPCL Sujanpur Tira, Diary No., Dated, Distt. Hamirpur (H.P.)

Director (Electrical)


SMALL HYDEL-100 MW
220 /132 KV DEHAN
TRIVENI MAHADEV
220 KV
78 MW
C
132 / 33 KV DEHRA
220 KV
10 Kms
THANE PL
220 KV
141 MW
D
DHAULA SIDH
66 MW
A
FROM
PARBATI-III/
BANALA
132 KV
15 Kms
B
15 Kms
132 KV
400 KV
220 KV
MATTAN SIDH
(HAMIRPUR)
400 /220 KV
2X 315 MVA
HAMIRPUR
(PGCIL)
220 /132 KV
2X 100 MVA
400 KV
TO KANGOO
220 KV
TO AMRITSAR (PGCIL)
TO JULLUNDHAR (PGCIL)

FULL TITLE OF THE PROJECT: THANA PLAUN (191MW) HYDROELECTRIC PROJECT

PROPOSAL NO.: FP/HP/HYD/8255 /2014

DATE OF PROPOSAL: NOVEMBER 29TH,2014

CHECK LIST SERIAL NUMBER: -27

(STATUS OF CLEARANCE UNDER THE ENVIRONMENT (PROTECTION) ACT, 1986)

Minutes of the 20th Meeting of the Expert Appraisal Committee for River Valley & Hydroelectric Projects held on 27.11.2018 at Teesta Meeting Hall, First Floor, Vayu Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi–3.

The 20th meeting of the re-constituted EAC for River Valley & Hydroelectric Projects was held on 27.11.2018 with the Chairmanship (Acting) Dr. D.K. More in the Ministry of Environment, Forest & Climate Change at Teesta Meeting Hall, First Floor, Vayu Wing, Indira Paryavaran Bhawan, Jor Bagh Road, New Delhi–3. The following members were present:

1.	Dr. D.M. More	- Chairman (Acting)
2.	Shri Sharvan Kumar	- Representative of CEA
3.	Shri N.N. Rai	- Representative of CWC
4.	Dr. J.A. Johnson	- Representative of WII
5.	Shri T.P. Singh	- Member
6.	Prof. S.R. Yadav	- Member
7.	Dr. S. Kerketta	- Member Secretary

Dr. S.K. Jain, Shri Chetan Pandit, Dr. A.K. Sahoo, Dr. Vijay Kumar, Prof. S.K. Kohli and Dr. (Mrs.) Poonam Kumria could not be present due to pre-occupation.

The deliberations held and the decisions taken are as under:

Item No. 20.0 Confirmation of minutes of 19th EAC meeting.

The Minutes of the 19th EAC (River Valley & Hydroelectric Projects) meeting held on 26.10.2018 were confirmed.

Item No. 20.1 Cumulative Impact Assessment and Carrying Capacity Study of Beas River Basin, Himachal Pradesh- Reconsideration of the study report before the EAC

Further to discussion on Cumulative Impact Assessment and Carrying Capacity Study of Beas River Basin, Himachal Pradesh in 19th EAC meeting, where Directorate of Energy, Government of Himachal Pradesh had made a presentation on the pending concerns of EAC. EAC deliberated in detailed and sought further information from Directorate of Energy to which they made presentation before EAC on the pending issues. As per the presentation including the facts presented by the Director of Energy, the Committee discussed the following:

Jobrie HEP (12 MW) – Govt. of Himachal Pradesh (GoHP) confirmed that as recommended by EAC, the HEPs will be developed as per the applicable norms and restrictions of project development in protected areas and Eco-sensitive Zones.

Manalsu HEP (21.9 MW) - A newly identified project falls within Manali WLS and was therefore recommended for dropping. However, on representation by the PP, EAC had asked State Govt. to submit the details of the locations of the project features of the Manalsu HEP *vis-a-vis* the boundary of the Manali WLS for further consideration of the EAC. Government of Himachal Pradesh submitted that diversion structure as well as part of tunnel falls within the Manali WLS while the rest of the components including powerhouse is outside the WLS. The project

Accordingly, the CWC revised the DPR and submitted it to J&K Govt. in December, 2017. As per revised DPR, the Maximum Water Level (MWL) is 609.5 m, Full Reservoir Level (FRL) is 608.00 m. The area under submergence has decreased to 34.50 km^2 from 41 km^2 and number of families affected due to submergence decreased to 1698 from 2235. The total cost of the project as envisaged in DPR is Rs 4750 crores and B.C. ratio is 1.062.

The Govt. has approved the implementation of Ujh MPP as per revised DPR.

The EAC after the detailed presentation by the PP observed that earlier Ujh MPP proposal for accord of ToR was appraised in Expert Appraisal Committee (EAC) for River Valley & Hydro Electric Power Project (RV&HEP) in its meeting held on 11-12th December, 2014. TOR was issued vide No. J-12011/39/2014-IA-I dated 30.01.2015 with validity of 3 years up to 29.01.2018. Project Proponent informed to the Ministry that EIA studies could not be initiated due to direction for reducing the submergence caused by the reservoir of the project. A fresh DPR has been prepared by Monitoring & Appraisal Directorate, Central Water Commission, Jammu and was submitted to J&K Government in December, 2017. FRL has now been reduced from 614.0 m to 608.00m and reduction in submergence area from 41.00 km^2 to 34.5 km^2. Accordingly, PP has made application a fresh for the ToR.

The EAC in its present meeting (20th) after detailed deliberations, recommended for the grant of ToR of the project with the additional conditions covered in TOR issued vide No. J-12011/39/2014-IA-I dated 30.01.2015.

Item No. 20.7 Construction of Thana Plaun HEP (191 MW) Project in Mandi District of Himachal Pradesh by M/s Himachal Pradesh Power Corporation Ltd – for Fresh Environment Clearance- reg. F. No. J- 12011/12/2011-IA.I, Proposal No. IA/HP/RIV/75041/2013.

The proposed Thana Plaun HEP (191 MW) is a storage scheme and the water conductor system of the project is on the left bank of river Beas. The project envisages the construction of concrete gravity dam across river Beas in the Mandi District of Himachal Pradesh, with a live storage capacity of 44.93 MCM to enhance the peaking benefits during the lean months. The entire catchment comprises mountainous terrain with steep hill slopes and is very thinly populated. For construction of the project, about 444.29 hectare land, out of which forest land (forest land, Govt. (Deemed Forest Land) and private (Deemed Forest Kismvani land) altogether constituted 406.79 ha.

The Terms of Reference for carrying out the EIA studies and preparation of EMP as per the provisions of Environmental Impact Assessment Notification 2006 and subsequent Notification in 2009 was approved and permission for pre-construction activities was accorded vide letter No. J-12011/12/2011-IA-I dated 29.11.2012 for Thana Plaun HEP with installed capacity of 141 MW of Mandi District of Himachal Pradesh by M/s. HPPCL.

M/s HPPCL submitted application dated 12.09.2013 for revalidation of approved ToR for the enhanced installed capacity for the project from earlier 141

MW to revised installed capacity of 191 MW which entailed change in layout also. EAC noted that the capacity of the project has been enhanced from 141 MW to 191 MW and it is not a case of merely extension of the validity of TOR. The scope of the project has been changed as the capacity has been substantially revised to 191 MW. Therefore, the project will be reconsidered by the EAC.

The project proponent submitted Form-1 afresh and the same has been presented before the EAC at its meeting held during 20-21 February, 2014. The EAC recommended for a fresh TOR for Thana-Plaun HEP (191 MW) as per MoEF& CC norms and also recommended to use already collected base line data for the purpose of EIA/EMP studies subject to the condition that the data should not be older than 3 years and with some additional TOR conditions. The ToR was accorded on 05.06.2014 for a period of 3 years, which was further extended for one year. Hence, the validity of the ToR was up to 04.06.2018. Public Hearing for the proposed project has been conducted by the Himachal Pradesh State Pollution Control Board, Himachal Pradesh at villages Mahan, Khalanu, Kotli and Kudakalayan, Tarnosh, Kotli and Gram Panchayat Office at Barhi, Dharampur, Mandi during on 22-23 March, 2018.

PP has submitted the application for EC online on 19.05.2018. However, the base line data collected for the EIA / EMP studies is from 1st March 2013 to 31st December, 2013. EAC noted that the data collected for the study is more than three years old and hence could not be considered for appraisal of the project. After detailed deliberation, considering all the facts as presented by the project, EAC in its 15th meeting recommended that PP should collect baseline data for one more season afresh and resubmit the EC application. The following more additional information were also sought:

I. Recommendation of E-flow and maintenance of free flow stretches between two HEPs as per the CIA and CC of Beas River Basin studies to be followed.

II. Resultant pollution loads of all the environmental parameters be derived again for all the possible pollution sources. Based on the findings, mitigative measures be suggested including allocation of capital budgets for different heads.

PP has submitted the details sought in the 15th EAC meeting held on 28.06.2018 to the Ministry, accordingly the proposal has been considered in the present meeting wherein PP has informed to EAC that base line studies were conducted within 10km radius during monsoon season in the months of July-August-September 2018. Project Proponent committed that, E-flows have to be followed as per recommendation under CIA & CCS of Beas River Basin studies under consideration with MoEF&CC, GOI. Provisions finally approved in respect of environmental flow will be adhered by the project authorities of Thana Plaun HEP. PP also presented before the Expert Appraisal Committee impacts of the proposed project on environmental attributes such as water, air, noise, land & biological environment and social-economic environment along with mitigation measures.

Summary of total cost estimated towards EMPs under Thana Plaun HEP

S. No.	Name of the EMPs	Proposed cost (Rs. In Lacs)
1	Catchment Area Treatment Plan	5560.00
2	Compensatory Afforestation Plan	1011.27
3	Green Belt Development Plan	20.00
4	Biodiversity Management Plan	160.00
5	Fisheries Management Plan	117.00
6	Reservoir Rim Treatment	200.00
7	Muck Management Plan	176.00
8	Restoration Plan for Quarry Sites and Landscaping	35.00
9	Plan for Public Health Delivery System	100.00
10	Energy Conservation Plan	130.00
11	Solid Waste Management Plan	160.00
12	Rehabilitation and Resettlement Plan	3522.00
13	Local Area Development Plan*	3335.00*
14	Plan for Air, Water & Noise Quality Management	50.00
15	Disaster Management Plan & Risk Assessment	80.00
16	Environment Monitoring Plan	249.00
17	Road Management Plan	21.00
	Total	**11591.57 say 11592.00**
*Cost already included in the project establishment cost		

After detailed deliberations, the EAC in its present meeting (20th) recommended for grant of Environmental Clearance to the proposed project subject to the following additional conditions:

1. Environment Clearance in respect of Thana Plaun HEP (191 MW) subject to adhering with the conditions/recommendations under CIA & CCS of Beas River Basin studies under consideration with MoEF&CC, GOI.
2. Submission of FC stage I Clearance to the Ministry.

Item No. 20.8 Any other items with the permission of the Chair

Item No. 20.8 (a) Ashti Lift Irrigation Scheme-III at district Beed, Maharashtra by M/s Water Resource Department, Govt. of Maharashtra, Aurangabad, Maharashtra – For fresh Environmental Clearance. (File No. J-12011/14/2015-IA.I & Online No. IA/MH/RIV/28875/2011)

Earlier the Member Secretary informed the EAC that vide Ministry's letter dated 14.08.2018, Ashti Lift Irrigation Scheme III (Ashti LIS-III) in Beed District of Maharashtra is having culturable command area (CCA) of less than 50,000 ha, which is now to be considered in the State level by SEIAA, Maharashtra. However, the Member Secretary further informed that

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

LIST OF MEMBERS

25TH MEETING OF SUB-CONSTITUTED EXPERT APPRAISAL COMMITTEE (EAC) FOR RIVER VALLEY & HYDROELECTRIC PROJECTS

DATE : 27th November 2018
TIME : 10:30 am onwards
VENUE : Teesta Hall, Indira Paryavaran Bhawan, New Delhi

Sl.No.	Name of Member	Signature
1.	Dr. Sharad Kumar Jain, Chairman	Abs
2.	Shri [illegible] Singh, Member	
3.	Shri [illegible] Kumar, Member	
4.	Shri [illegible] Rao, Member	
5.	Dr. [illegible], Member	
6.	Dr. [illegible], Member	Abs
7.	Dr. [illegible], Member	Abs
8.	Prof. [illegible] Agrawal, Member	Abs
9.	Dr. [illegible], Member	Abs
10.	Dr. [illegible] Mudgal, Member (Vice Chairman)	
11.	Prof. [illegible] Kaushik, Member	Abs
12.	Dr. [illegible], Member	
13.	Dr. [illegible] Sinha, Member	Abs
14.	Dr. [illegible] K., Member	Abs
15.	Dr. [illegible], Member Secretary	27.11.2018

FULL TITLE OF THE PROJECT: **THANA PLAUN (191MW) HYDROELECTRIC PROJECT**

PROPOSAL NO.: **FP/HP/HYD/8255 /2014**

DATE OF PROPOSAL: **NOVEMBER 29TH,2014**

CHECK LIST SERIAL NUMBER: -30

(DETAILED SCHEME FOR REHABILITATION OF THE PROJECT AFFECTED PERSONS)

H.P. POWER CORPORATION LIMITED

HP
POWER CORPORATION LTD.

REHABILITATION AND RESETTLEMENT PLAN

General Manager
TM & TP HEP's, HPPCL,
Sujanpur Tihra, Distt [illegible]pur H.P

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RELIEF & REHABILITATION PLAN

INTRODUCTION

Power is a critical for the socio-economic development, and efforts at accelerating the rate of economic growth in the new globalised economy. Development of hydro power is essential for the sustainable development of the country. Large untapped hydro potential exists in the Himalayas, which can make a substantial contribution to the total power generation in the country. The Government of Himachal Pradesh is committed to this onerous task and is doing its best to develop the total hydro power potential of the State, which is to the tune of 21,000MW.

Himachal Pradesh is a mountainous State, located in the North of the country. The State has a diverse topography-high mountain ranges interspersed with deep gorges and valleys to fertile Gangetic plains in its south East. The attitude ranges from 350 meters to 6975 meters above mean sea level. Himachal Pradesh is blessed with abundant water resources in its five major rivers i.e. Chenab, Ravi, Beas, Satluj and Yamuna, which emanate from the western Himalayas and flow through the State. These snow fed rivers and their tributaries carry copious discharge all the year round which can be exploited for power generation. All the rivers basins and its valleys are connected by roads, other communication network and strong base of other social infrastructure like health & education etc.

PROJECT AT A GLANCE:

[Description of the Concerned Project will be given here]

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SALIENT FEATURES OF THE PROJECT

(The Salient features of the concerned project will be given here)

1. Location
2. Hydrology
3. River diversion works
4. Main dam /Barrage
5. Reservoir/ Storage
6. Spillway
7. Penstock
8. Power House Complex
9. Transmission Lines
10. Power Generation
11. Cost –Estimate
12. Financial Aspects

PART-1

INFORMATION OF PARTICULARS IN RESPECT OF R&R PLAN OF_____ PROJECT

1. **The following information/details of particulars in respect of Rehabilitation & Resettlement plan of the concerned project will be given here.**
   (a) The extent of land to be acquired for the project and the name (s) of the affected village(s);
   (b) A village wise list of the affected persons, family-wise, and the extent and nature of land and immovable property owned or held in their procession in the affected area and the extent and nature of such land and immovable property which they are likely to loose or have lost, indicating the survey numbers thereof.
   (c) A list of agricultural labourers in such area and the names of such persons whose livelihood depends on agriculture activities;
   (d) A list of persons who have lost or likely to loose their employment or livelihood or who have been or likely to be alienated wholly or substantially from their main sources of trade, business, occupation or vocation consequent to the acquisition of land for the project or involuntary displacement due to any other cause;
   (e) A list of non-agriculture labourers, including artisans;
   (f) A list of landless affected family, including those without homestead land and below poverty line families;
   (g) A list of honorable affected persons;
   (h) A list of occupiers, if any;
   (i) A list of public utilities and Govt. buildings which are affected or likely to be affected;
   (j) Details of public and community properties, assets and infrastructure;
   (k) A list of benefits and packages which are to be provided to the affected families;
   (l) Details of the extent of land available in the resettlement area for resettling and for allotment of land to the affected families;
   (m) Details of the amenities and infrastructure facilities which are to be provided for resettlement;
   (n) The time schedule for shifting and resettling the displaced persons in the resettlement area or areas; and
   (o) Such other particulars as the Administrator for Rehabilitation and Resettlement may consider necessary.

PART-II

RESETTLEMENT AND REHABILITATION SCHEME FOR PROJECT AFFECTED FAMILIES OF _____ PROJECT.

2.1 Whereas for the construction of _____Project besides the Government land, lot of private land is also required to be acquired from private persons. Due to acquisition of private land for the Project, a good number of families will be affected. The construction of the project will also involve under ground works, transportation of large quantities of material, submergence of number of villages due to construction of Dam more than usual activity in the area and therefore, all this is likely to have an impact on the lives of people living in the area. H.P. Power Corporation Limited would like to improve the life of people living in the area besides mitigating any hardships that may arise due to the construction of the project.

And whereas to protect the interests of the project affected people and landless family (and any other family affected during construction stage of the project),.A scheme for Resettlement and Rehabilitation of the persons affected on this account has been prepared incorporating adequate arrangements for their resettlement and rehabilitation.

Now, therefore, the H.P. Power Corporation Limited hereby proposes the following scheme for Resettlement and Rehabilitation of the persons affected on account of acquisition/ of their Land Acquisition Act.1894 for the construction of_____Project in_____ District. This has been prepared by taking into consideration the R&R Policy notified by Govt. of HP vide notification No Rev(PD)F(5)-1/1999dated 27-4-06 National Rehabilitation and Resettlement Policy 2007 and National Hydro Policy 2008.

2.2 **OBJECTIVES:**

2.2.1 To compensate the families affected adversely by construction of the project.

2.2.2 To improve the quality of life of the people of the area through better infrastructure, sustainable income and better skills and generally contribute to and be a part of the development of the area and the people.

2.2.3 To create a good will for the organization and have a good long term relationship.

2.2.4 To ensure that rights of individual and society particularly those belonging to the weaker section of the society are adequately protected.

2.3 BASIC ISSUES AND NEED FOR R&R ACTION PLAN:

Whereas efforts are made to minimize the land acquired and not displace too many families, some times it becomes unavoidable. When this happens it is important that the affected families get due care and attention.

Acquisition of land generally induces change in land use pattern and can disturb the economic base. The R&R Action Plan is therefore formulated with an objective to resettle the families rendered landless or affected families whose land/house/shop is acquired and to rehabilitate them in such a manner that they improve or at least regain their previous standard of living, earning capacity and production level. Besides, it is imperative that the transition gap is to be reduced to the minimum possible extent.

With proper resettlement and rehabilitation plan, an amicable relationship with PAFs can be maintained which is essential for efficient operation of the project. It is generally seen that the displacement during acquisition of land is involuntary and the PAFs have to face a new social setup. During such transition period, the rural economic environment is generally transformed into higher cost of living and reduction in traditional sources of income. In general, PAFs face difficulty to cope with the new environmental set up.

Domestic changes in the land use patterns substantially alter the agro based rural economy and lifestyle of affected families.

2.4 RELIEF REHABILITATION STRATEGIES:

- Each Project Affected Family will be suitably and adequately compensated to ensure replacement of the assets lost or acquired.
- The local population of the Project Affected Area will be provided guidance and counseling education through scholarships, sponsorships guidance for better living conditions and better livelihood including training in the area of common occupations like Agriculture, Horticulture etc.
- General Development of the project area by building or improving infrastructure such as roads, footpaths, bridges, water supply, irrigation through public participation and community development works etc.
- Creating opportunities of employment for local people through self employment schemes or indirect employment in project activities.
- Maintaining a friendly contact with the public through regular meetings, Public Information Centre, printed material, PAF identity card, functions etc.

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- Providing direct help to the people in extreme hardship.

PART-III

DEFINITIONS

3.1 This Scheme may be called the Resettlement and Rehabilitation Scheme of **Himachal Pradesh** Power Corporation Limited for the project affected families of _____Project (hereinafter called R&R Scheme for Project).

It shall extend to the whole of area affected or likely to be affected as a result of construction of _____within _____Tehsil _____District of Himachal. Panchayat will be taken as a unit and all Panchayats where either land is acquired or where underground works are undertaken will constitute the project affected area.

The Commissioner for Resettlement & Rehabilitation appointed by the State Government for supervising the relief and welfare works of various Projects in Himachal Pradesh would also be the Commissioner for welfare of the affected population so that the welfare works are carried out under his directions and guidance.

The Deputy Commissioner, in whose jurisdiction the Project Affected Area falls, will be the Administrator for Welfare of the area so that the Relief and Welfare works are carried out and controlled under her supervision.

3.2 Definitions:

3.2.1 Family

'Family' means husband/wife of the person who is entered as owner/co-owner of the land in the revenue record, their children including step or adopted children, grand children and includes his/her parents and those brothers and sisters who are living jointly with him/her as per entries of Panchayat Parivar Register as on date of notification under Section-4 of the Land Acquisition Act, 1894.

Explanation:

Only the Panchayat Parivar Register Entry, as it stood on the date of Notification under Section-4 of the Land Acquisition Act, 1894, shall be taken into account for the purpose of separate family for rehabilitation benefits as well as for consideration of employment.

3.2.2 Project Affected Family (PAF)

(i) A family whose primary place of residence or other property or source of livelihood is adversely affected by the acquisition of land for a project or involuntary displacement for any other reason; or

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(ii) Any tenure holder, tenant, lessee or owner of other property, who on account of acquisition of land (including plot in the *abadi* or other property) in the affected area or otherwise, has been involuntarily displaced from such land or other property; or -

(iii) Any agricultural or non-agricultural labourer, landless person (not having homestead land, agricultural land, or either homestead or agricultural land), rural artisan, small trader or self-employed person; who has been residing or engaged in any trade, business, occupation or vocation continuously for a period of not less than three years preceding the date of declaration of the affected area, and who has been deprived of earning his livelihood or alienated wholly or substantially from the main source of his trade, business, occupation or vocation because of the acquisition of land in the affected area or being involuntarily displaced for any other reason;

Explanation

The date of declaration will be taken as the date of notification under Section 17(4) or 4 of Land Acquisition Act, 1894. The period of residence of not less than three years will not be applicable in respect of PAFs who own land in the Project Affected Area. The period of residence of not less than three years as well as effects on source of livelihood would be determined by the Deputy Commissioner concerned.

3.2.3 "Main Project Affected Family"

Main Project Affected Family is a Project Affected Family whose land or house/ building is acquired for the project.

3.2.3 (a) Main Project Affected family Rendered Landless

The Main PAF rendered landless means that family whose whole agricultural land is acquired for the project or in whose case balance agriculture land left after acquisition is less than 5 bighas. For this purpose agriculture land held by project area by all such persons and their family members shall be taken into account. Person losing land on acquisition of building and land appurtenant there to shall not be treated as landless Project Affected Family. The landless PAF shall be duly certified by the Deputy Commissioner of concerned area.. To arrive at balance land, with a family, land hold by them outside the project affected area will also be considered. The definition of landless family will be as given by Govt. of H.P. this may therefore vary if the definition is changed by Govt. of H.P. The definition as applicable on the date of section 4 notification will be made applicable.

3.2.3 (b) Main Project Affected Family Rendered Houseless.

The Main Project Affected Family rendered houseless means the family whose dwelling house is acquired for the project, which shall be duly certified by the Deputy Commissioner.

3.2.3 (c) In addition to above two categories, there will be Main Project Affected Families who will be rendered landless as well as houseless as per definitions given above. Such cases shall be eligible for benefits of project-affected families rendered landless and project affected families rendered houseless, which shall be duly certified by the Deputy Commissioner.

3.2.3 (d) MPAF-S (only applicable to Renukaji Dam Project) The joint ownership of the villagers on pastures and wastelands, part of the forest surrounding villages, river beds, irrigation channel and common paths and if the above mentioned area has/been acquired by project proponent for project related activities then the whole villagers will be declared as MPAF-S.

The MPAF-S category will be eligible for:-

(a) providing grants;

(b) placing them after PAF for other benefits like scholarship, sponsored admission to ITI;

The MPAF-S category will, however, be excluded from:

(1) Employment benefit;

(2) Land for cultivation;

3.2.4 Project Affected Area:

Project Affected Area means area as notified by the Project Authority or where land is acquired for construction of any component of the project, **submergence area**, infrastructure, township, offices, construction facilities, welfare facilities etc. land where under ground works are taken up. Unit for declaring Project Affected Area would be Panchayat.

3.2.5 Project Affected Zone:

Project Affected Zone means zone as notified by the project authority or project affected area plus the area surrounding this project affected area where impact of the project on the lives of people is considerable even if no direct project activity is taking place in these surrounding areas. Unit for declaring this would be Panchayat.

Explanation:

Project Affected Area will consist of only Panchayat where project work actually takes place (both on surface and under ground) **including submergence area due to reservoir of the Project**. Adjoining panchayat may also be affected due to high vehicular traffic; blasting or dust etc. These Panchayats can be included in the Project Effected Zone. The thumb rule would be area located ½ to 1 KM. beyond the project affected area.

3.2.6 **"Agricultural Labourer"** means a person primarily resident in the affected area for a period of not less than three years immediately before the declaration of the affected area who does not hold any land in the affected area but who earns his livelihood principally by manual labour on agricultural land therein immediately before such declaration and who has been deprived of his livelihood;

3.2.7 **"Agricultural land"** includes lands being used for the purpose of-

(i) agriculture or horticulture;

(ii) dairy farming, poultry farming, pisciculture, breeding of livestock or nursery growing medicinal herbs;

(iii) raising of crops, grass or garden produce; and

(iv) land used by an agriculturist for the grazing of cattle, but does not include land used for cutting of wood only;

3.2.8 **"Appropriate Government"** means The State Government.

3.2.9 **"Project Authority"**

Himachal Pradesh Power Corporation Limited.

3.2.10 **"BPL family':** The below poverty line (BPL) families shall be those as defined by the Planning Commission of India from time to time and included in a BPL list for the time being in force;

3.2.11 **"Administrator for Rehabilitation and Resettlement"** means an officer not below the rank of District Collector in a State appointed for the purpose of rehabilitation and resettlement of affected person; normally this will be the Deputy Commissioner of the district concerned where the project is located or where major portion of the project is located.

3.2.12 **"Commissioner for Rehabilitation and Resettlement"** means the Commissioner for Rehabilitation and Resettlement appointed by the State Government not below the rank of Commissioner or of equivalent rank of that Government;

3.2.13 **"DDP block"** means a block identified under the Desert Development Programme of the Government of India;

3.2.14 **"Holding"** means the total land held by a person as an occupant or tenant or as both;

3.2.15 **"Khatedar"** means a person whose name is included in the revenue records of the parcel of land under reference;

3.2.16 **"Land acquisition"** or *"acquisition of land"* means acquisition of land under the Land Acquisition Act, 1894 (1 of 1894), as amended from time to time, or any other law of the Union or a State for the time being in force;

3.2.17 **"Marginal farmer"** means a cultivator with an un-irrigated land holding up to one hectare or irrigated land holding up to half hectare;

3.2.18 **"Non-agricultural labourer"** means a person who is not an agricultural labourer but is primarily residing in the affected area for a period of not less than three years immediately before the declaration of the affected area and who does not hold any land under the affected area but who earns his livelihood principally by manual labour or as a rural artisan immediately before such declaration and who has been deprived of earning his livelihood principally by manual labour or as such artisan in the affected area;

3.2.19 **"Notification"** means a notification published in the Gazette of India or, as the case may be the Gazette of a State;

3.2.20 **"Occupiers"** mean members of the Scheduled Tribes in possession of forest land prior to the 13th day of December, 2005;

3.2.21 **"Resettlement area"** means any area so declared.

3.2.22 **"Small farmer"** means a cultivator with an un-irrigated land holding up to two hectares or with an irrigated land holding up to one hectare, but more than the holding of a marginal farmer.

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PART-IV

SOCIAL IMPACT ASSESSMENT

4.1 A Social Impact Assessment Study will be carried out in the project affected area through an independent, professional agency in order to determine the impact that the project can have on the people, their lives, the community and the society. This study will be done before the start of work on Main Project Components.

4.2 The study will cover impact on public and community properties (particularly common grazing grounds, forest right); available infrastructure like roads, water supply, irrigation schools, medical facilities, fairs and festivals power supply, places of worship, burial and cremation grounds, etc. access to adjoining villages across the water source being dammed or diverted, livelihood sources; reduction in land and other natural resources etc.

4.3 Public hearing will be done along with the public hearing for EIA or separately. This R&R Plan will be appropriately modified if need is felt after the SIA report is obtained.

4.4 Base Line Survey:

A base line survey will be conducted in the project affected area which will *inter-alia* cover:

(i) Information about families living in the area, their occupation, income, education, housing available and dependence on common resources.

(ii). Available infrastructure and resources.

(iii). Land holdings.

(iv) Members of the family who are permanently residing engaged in any trade, business, occupation or vocation in the affected area;

(v) Families who are likely to lose, or have lost, their house, agricultural land, employment or are alienated wholly or substantially from the main source of their trade, business, occupation or vocation;

(vi) Agricultural labourers and non-agricultural labourers;

(vii) Families belonging to the Scheduled Caste or Scheduled Tribe categories;

(viii) Vulnerable persons such as the disabled, destitute, orphans, widows, unmarried girls, abandoned women, or persons above fifty years of age; who are not provided or cannot immediately be provided with alternative livelihood, and who are not otherwise covered as part of a family.

(ix) Families that are landless (not having homestead land, agricultural land, or either homestead or agricultural land) and below poverty line, but residing continuously for a period of not less than three years in the affected area preceding the date of declaration of the affected area; and

(x) Scheduled Tribes families who are or were having possession of forest lands in the affected area prior to the 13th day of December, 2005.

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PART-V

SANCTION OF WELFARE GRANT OR FACILITIES AND GRANT TO THE PAF RENDERED LANDLESS OR HOUSELESS OR BOTH.

5. Resettlement Grant.

5.1 The PAF rendered landless on account of acquisition of land shall be eligible for landless grant in the following manner.

1. Family whose land before acquisition was more than 5 bighas and is left with one biswa or no agriculture land after acquisition, Rs. 2.50 lac lump sum.
2. Family whose land before acquisition was less than five bighas and is left with one biswa or no agriculture land after acquisition, Rs. 1.50 lac lump sum.
3. Family whose land holding is left with more than one biswa and less than 2-10-0 bighas of land after acquisition, Rs. 1.00 lac lump sum.
4. Family whose land holding is left with more than 2-10-0 and less than five bighas of land after acquisition, Rs. 75,000/- lump sum.
5. **Other families whose land has been acquired and land holding left after acquisition is more than 5 bighas, amount equal to the land compensation paid subject to a minimum of 5000/- and maximum of 50,000/- .**
6. Family whose cattle shed is acquired in the project area, shall get one time financial assistance of Rs. 10,000/-. In no case the grant shall exceed Rs. 25,000/- per family.

5.2 Each PAF rendered landless as well as houseless (both) or houseless will be provided an independent house with a built up plinth area of 150 Sqm. Alternatively, PAF can also be offered a plot of size 250 Sqm. which allows construction of built up house of 150 Sqm. plinth area plus construction cost of the house @ Rs. 4000 per Sqm. (limited to 150 Sqm. plinth area).

A family which does not opt for house/plot but constructs a house at own cost with a plinth area of 150 Sqm or more shall be paid the construction cost of the house @ of Rs. 5000 per Sqm (upto a plinth area of 150 Sqm maximum). Options from such families will be asked at an appropriate time. In case any of such family constructs house of less than 150 Sqm. Plinth area on his own plot or plot offered by the Project then amount to be given will be worked out on pro-rata basis.

This facility will be available in the event of acquisition of dwelling houses in the farm land (Dhogri) also.

5.3 Displaced shopkeepers will be given shops in allotment in the market complex of the Project Township wherever the Project constructs such market places. In addition, they will be entitled to one time displacement grant of Rs. 20,000/-. The

commercial premises/ shops allotted to such displaced shopkeepers shall be utilized by them or their successors in interest for bonafide use only. In case the project is unable to provide shops, displaced shopkeepers shall get financial assistance of Rs. 2,00,000/-

5.4 Infrastructure facilities in the Rehabilitation colony will include water supply, sewage, drainage, electricity, streets community centre, green area, park and approach path/roads at the project cost.

5.5 Transportation at the project cost will be provided for physical movement of all the PAFs, and displaced shopkeepers and their house hold goods/ shop goods, as soon as the houses/shop get constructed in the Rehabilitation colony or a sum of Rs. 20,000/- in lump sum shall be paid, for which option will be invited from the affected families/ shopkeepers.

5.6 Stamp duty and other fees payable for registration shall be bome by the Project Authority. Rehabilitation grant shall be provided by the Project Authorities and placed at the disposal of the Deputy Commissioner, for disbursement to the eligible PAF's.

5.7 Transitional/ Subsistence Allowance based on 25x12 months minimum wages to each Project Affected Family will be paid if the family has become houseless and has to shift house or become landless and has to shift livelihood to a different location or change livelihood or has been involuntarily displaced.

5.8 Whereas it is not possible to provide land in exchange of land acquired but in case some agricultural land is available for distribution, upto 5 bighas land will be given to each PAF by giving priority to landless. This land will be given only to such PAF's who are primarily dependent on agriculture and the livelihood is substantially affected by land acquisition. In no case will land to be given in excess of that acquired. Giving of agricultural land will not be a right and will be only a welfare measure to be given only if possible.

If it is not possible to give land, a financial assistance at the rate of Rs. 50,000/-per bigha of cultivable land acquired and Rs. 20000/- per bigha for uncultivable land acquired will be paid as an additional assistance to the project affected family for purchasing land. This assistance will only be given if the Project Affected Family is able to prove that this will be utilized to purchase land of a value more than the money paid to the Project Affected Family under this clause (Clause-5.8).

If waste land or degraded land is allotted under this clause, then a land development charge of Rs. 15,000/- per bigha will be paid. The PAF's who are allotted land or those who purchase agricultural land will also get Rs.10, 000/- cash for agricultural production.

Each PAF which is displaced and has Cattle will be given Rs.20,000/- for construction of cattle shed.

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Each PAF who is a artisan, small trader or self employed person and has been displaced shall get a one time financial assistance of Rs.50,000/- for construction of working shed or shop.

The families who have to shift house due to the project will be provided temporary accommodation at project cost for 3 to 6 months depending on their need.

5.9 Loss of income from Forest or Govt. Land :

If PAF's have rights over minor forest produce like herbs, chilgoza etc and acquisition of such Govt/Forest land will deprive them of income/benefit which they were deriving from their right they may be suitably compensated by a lum-sum grant. If some portion of such land being acquired & not being submerged or used for construction and is to remain as such or as a buffer zone around the reservoir or around the project, the PAF's may be allowed to extract minor forest produce if it safe for them.

NOTE: All the above grants shall be in addition to the compensation paid under Land Acquisition Act, 1894.

6. Employment

One member of each Project Affected Family rendered landless will be provided employment by the Project Authority in the category of skilled/ semiskilled/ unskilled workmen subject to fulfilling the requisite criteria/qualification and as and when any fresh recruitment is done in these categories, it would be ensured that land oustees eligible for employment as mentioned above are given chance first and normal recruitment would be made only if none are eligible & willing from amongst them. However, persons who are allotted shops shall not be eligible for benefit of employment and vice versa.

The following criteria will be adhered to by the Deputy Commissioner concerned for providing of preference while sponsoring the names for employment to the Project Authority.

i. Affected families whose entire land has been acquired.

ii. Affected families who have become landless on account of acquisition of land by the project.

iii. Other affected families.

Within these categories preference will be given on the basis of quantum of land acquired. Those who lose more land will come first.

6.0(a) If there are some families who have lost their source of livelihood completely and do not have the capabilities or the financial strength to take on any other occupation and are not even provided alternate land, the project authorities may consider to provide direct employment to the members of such families as a

special case on recommendation from the Deputy Commissioner and after due verification.

6.1 The main PAF who are eligible for direct employment but have not been provided employment will be given a special rehabilitation/employment grant equivalent to 1000days of minimum wage for labour per family. (The employment here will mean regular employment in the organization building of the project). The PAF's will be given option to wait for direct employment.

6.2 Annuity Policy will be arranged for each vulnerable PAF [disabled, destitute, orphans, widows, unmarried girls (with no financial support), abandoned women, or poor persons above fifty years of age(who are unsupported)] who are not provided or cannot immediately be provided with alternative livelihood and who are not otherwise covered as part of a family which will provide a pension of Rs. 1000/-PM to the family starting from a date 5 years after the date of implementations of this plan and will continue for 10 years after that date. The Vulnerable PAF's will be those which are identified by the administrator under this plan.

6.3 Secondary Employment

The PAF's will be provided help to get employment other than direct employment in the project in the following manners:-

6.3.1 Merit scholarship scheme for the wards of Project Affected Families (PAFs) and other residents of project affected zone who may be pursuing vocational or professional course will be introduced by the Project Authorities as per scheme to be drafted by the Project Authority in consultation with Government of Himachal Pradesh. The project authorities will also consider getting some special seats in ITI's for the project affected families and other residents of the project affected zone. Some schemes to provide apprenticeship or on the job training to increase the employability of the residents of the project affected zone will also be started. Merit scholarship scheme for school going students of project affected zone will be started.

6.3.2 The Project Authorities will also consider award of petty contracts to the cooperatives of eligible families on preferential basis so that some may be engaged in such jobs. Further, the Project Authorities will advise their contractor to engage eligible persons from amongst affected families on a preferential basis wherever possible during construction stage. Other employment opportunities like hiring vehicles from PAF's will also be made available. Normally all contracts upto a value of Rs. 5 lakh will be given to PAF's and if PAF's are not available to families living in project affected zone. All vehicles hired by the project will be from PAF's and if not available from PAF's then from residents of Project Affected Zone. The new vehicles hired from PAF's may be hired for 3+1 years.

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6.3.3 The Project Affected Families (such as rural artisans/small traders and self employed persons) will be assisted to start various suitable self-employment occupations, which include dairy farming, poultry, weaving, bakery, handicraft, cottage industries unit/shops and hiring of vehicle to the corporation. The Project Authority will provide a grant of Rs. 50,000/- per family towards seed capital. The grant will be given once only.

"Only those families who have not been provided with employment in the Project or have not been allotted any shop will be eligible for this grant"

Families residing in the project affected area other then PAF's can also be considered for this on merit and if they are needy.

Explanation:

The Deputy Commissioner, will certify the effect on source of livelihood in case of rural artisans, small traders and self employed persons for eligibility of the grant.

6.3.4 The PAF's and other fishermen having fishing rights in the river will also get fishing rights in the reservoir.

6.3.5 If any manpower is obtained by the project authorities through outsourcing at any time during construction or running of the project for services like house keeping, gardening, typing, maintenance, computer work, office help etc first opportunity will be given to PAF's as contractors and also as personnel hired by contractor for their jobs. If PAF's are not willing then other residents of project affected zone may be considered.

7 R&R Benefits for PAF's belonging to ST & SC.

7.1 In case the families loose access to forest due to the project a special plan will be formulated for development of alternate fuel, fodder and non timber forest produce.

7.2 Each PAF of ST followed by SC categories shall be given preference in allotment of land if any land is available for allotment to PAF's.

7.3 Each ST family will get an addition one time financial assistance of 500 days minimum wages for labour for loss of customary right's or usage of forest produce.

7.4 ST. PAF's will be resettled as far as possible in the same schedule area in a compound block so that they can retain their ethnic, linguistic and cultural identity.

7.5 The resettlement area prominently inhabited by ST's shall get 1000 Sqm. Land free of cost for community and religious gatherings.

7.6 The ST's families resettled out of the district will get 25% higher resettlement grant.

8. Other benefits:-

8.1 Each PAF will be provided 100 units of electricity per month for a period of 10 years from the date of commissioning of the project. If the consumption of the PAF is less than that then the difference will be compensated in cash.

8.2 **Medical fund:**

A medical fund will be created for the PAF's. This fund will be need for providing treatment to the member of PAF's in hardship due to illness or in extreme illness or accident cases. Medicines may also be provided to other residents in the area.

8.3 Free medical treatment will be provided to PAF's at the project medical Facility.

8.4 Medical camps will be organized in various places in the project affected zone from time to time.

8.5 In order to help the families living in the project affected zone and to improve their skills in their occupation Agriculture, Horticulture and animal husbandry training and awareness camps will be organized by the Project Authorities from time to time Training camps on other subjects like finance and accounts, how to run small business, alternatives for self employment etc. will also be organized from time to time.

8.6 If it is felt that the fuel supply of the local residents is affected due to construction of the project, a scheme will be formulated to provide alternative fuel or fuel saving devices to the families whose fuel supply is affected.

8.7 Each PAF will be given an identity card which will have names of all the members of PAF.

8.8 The project authorities will set up one or more Project Information Officer for providing information and guidance to the local people particularly the PAF's.

8.9 Project authorities will set up a cultural fund for providing grants for organizing local fairs, festivals and functions.

9 **Infrastructure Development:**

Construction of the project is a major development activity for the area. It will be ensured that the available infrastructure in the area improves with the project.

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9.1 If any available infrastructure is damaged due to the project, it will be restored. This includes water supply, irrigation, roads, paths, schools, places of worship, community building etc.

9.2 The local people will be allowed use of the infrastructure created primarily for the project like roads, bridges, schools, etc.

9.3 A fund under the name LADF will be created for development of infrastructure in the project affected area. The project authorities will contribute 1.5% of the project cost towards the funds. This fund will be administered by a Local Area Development Committee in accordance with the orders of the appropriate Government. The 80% of the funds available in LADF will be divided amongst the Panchayats falling within the Project affected area on the basis of a formula giving equal weightage to 3 criteria i.e.

(i) Number of project affected families.
(ii) Area acquired.
(iii) Extent of underground works and disturbance in the area.

The remaining 20% funds may be used for common works or for works in the project affected zone or for completion of incomplete works.

9.4 The project authorities will also build infrastructure over and above LADF at their own which will benefit local population.

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FULL TITLE OF THE PROJECT: **THANA PLAUN (191MW) HYDROELECTRIC PROJECT**

PROPOSAL NO.: **FP/HP/HYD/8255 /2014**

DATE OF PROPOSAL: **NOVEMBER 29TH,2014**

CHECK LIST SERIAL NUMBER: -31

(UNDERTAKING REGARDING CATCHMENT AREA TREATMENT PLAN)

- **Undertaking:**

Himachal Pradesh Power Corporation Limited
(A State Government Undertaking)
Office of General Manager
Triveni Mahadev (78 MW) & Thana Plaun HEP (191 MW),
Kotli, Distt. Mandi-175003
Ph.No.: 01905-281081, Email: - **gmtpbnhppcl@gmail.com**

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Full Title of the Project: Diversion of 406.79 ha. of Forest land in favour of Himachal Pradesh Power Corporation, Ltd., Thana Plaun & Triveni Mahadev HEPs, HPPCL, Tehsil Kotli, Distt. Mandi, HP for the construction of Thana Plaun (191MW) HEP within the jurisdiction of Jogindernagar and Mandi Forest Divisions, Distt. Mandi. H.P.

Proposal No. : FP/HP/HYD/8255 /2014
Date of Proposal: November 29th, 2014

CHECK LIST SERIAL NUMBER: - 31
CERTIFICATE AND UNDERTAKING FOR PAYMENT OF COST OF CATCHMENT AREA TREATMENT (CAT) PLAN

I, Ajay Kumar Bisht, General Manager, Triveni Mahadev and Thana Plaun HEP's, HPPCL, Kotli, District Mandi, Himachal Pradesh on behalf of Himachal Pradesh Power Corporation Limited hereby, undertake to pay the entire amount for Catchment Area Treatment (CAT) Plan for Thana Plaun HEP (191MW) duly approved by Principal CCF (HoFF), Himachal Pradesh vide Ft. No. CAMPA/2016/Thana Plaun/Vol.I/, dated 3.1.2019, amounting to Rs. 56,00,31,000/- (Rupees Fifty Six Crore & Thirty One Thousand), only to H.P. State CAMPA Authority. Further undertaken, that in case the total project cost of Thana Plaun HEP (191MW) increases from the present estimated cost of Rs. 2223.59 crores as a result of TEC approval, the HPPCL will also pay the differential cost of CAT Plan i.e. 2.5 of total project cost as per TEC to H.P. State CAMPA Authority.

(Name & Signature of User Agency)

Date: 22.11.2019

Office seal

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

Place: Kotli

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FULL TITLE OF THE PROJECT: **THANA PLAUN (191MW) HYDROELECTRIC PROJECT**

PROPOSAL NO.: **FP/HP/HYD/8255 /2014**

DATE OF PROPOSAL: **NOVEMBER 29TH,2014**

CHECK LIST SERIAL NUMBER: -32

(DETAILED RECLAMATION PLAN)

:

Full Title of the Proposal: Diversion of 406.79 ha. of Forest land in favour of Himachal Pradesh
No. : FP/HP/HYD/8255 /2014
Date of Proposal: November 29th,2014

RECLAMATION PLAN FOR MUCK DUMPING

Dumping yard-I stituated at village Neri Kotla, Tehsil Jogindernagar, Range Jogindernagar, Forest Division Jogindernagar, District Mandi having capacity of 747947 cum will be used for dumping of excavated muck from the project. After leveling, dumping site will be rehablitated by planting shisham, dreak, and other suitable site specific species. The reclamation plan for the dumping yard is preapared

Particulars of works	Area in ha. For raising of 500 tall plants per ha. With 4 stand RCC fence post	Norms of ha. Wage rate of Rs. 200/- per day	Add 25% increase due to increase in wage rate from 200/- to 250/- on the norms depicted in col. 3	Years of execution of works	Add 10% escalation in subsequent years	Tentative rates	Total amount (Rs.)	Area planted 3.85 ha. (1925 tall plant planted)
a) Initial cost for plantation	(For 5 ha.)- 2500 tall plants	168000 (2016-17)	209998	2020-21	21000	230998	1154990	
b) SC works				L/S			288750	
Total a+b							1443740	1111679.8
Detail of Maintenance of plantation for Ten Years								
1st Year	5 ha.	9500	11875	2021-22	2494	14369	71845	55320.65
2nd Year	5 ha.	4800	6000	2022-23	1986	7986	39930	30746.1
3rd Year	5 ha.	4800	6000	2023-24	2785	8785	43925	33822.25
4th Year	5 ha.	2900	3625	2024-25	2213	5838	29190	22476.3
5th Year	5 ha.	2900	3625	2025-26	2797	6422	32110	24724.7
6th Year	5 ha.	2000	2500	2026-27	2372	4872	24360	18757.2
7th Year	5 ha.	2000	2500	2027-28	2859	5359	26795	20632.15
8th Year	5 ha.	2000	2500	2028-29	3395	5895	29475	22695.75
9th Year	5 ha.	2000	2500	2029-30	3984	6484	32420	24963.4
10th Year	5 ha.	2000	2500	2030-31	4633	7133	35665	27462.05
Total maintainence								281600.55
Total a+b+c								1393280.4
Add contingencies charges @ 5%								69664.018
Sub Total								1462944.4
Add. Departmental Charges supervision @ 17.5%								256015.26
G. Total								1718959.6

Muck Dumping Certificate: It is certified that the tree standing on the proposed land will be felled as per the norms of HP Forest Department under the supervision of HP State Forest Development Corporation Ltd. It is also certified that the said area will be developed by user agency.

Date 14-11-2014
Place: KOTLI

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

Divisional Forest Officer
Joginder Nagar Forest Division
Joginder Nagar (H.P.)

Full Title of the Project Diversion of 406.79 ha. of Forest land in favour of Himachal Pradesh Power
Proposal No. : FP/HP/HYD/8255 /2014
Date of Proposal: November 29th,2014

RECLAMATION PLAN FOR MUCK DUMPING

Dumping yard-II stituated at village Neri Kotla, Tehsil Jogindernagar, Range Jogindernagar, Forest Division Jogindernagar, District Mandi having capacity of 1470759 cum will be used for dumping of excavated muck from the project. After leveling, dumping site will be rehablitated by planting shisham, dreak, and other suitable site specific species. The reclamation plan for the dumping yard is preapared as under:

Particulars of works	Area in ha. For raising of 500 tall plants per ha. With 4 stand RCC fence post	Norms of ha. Wage rate of Rs. 200/- per day	Add 25% increase due to increase in wage rate from 200/- to 250/- on the norms depicted in col. 3	Years of execution of works	Add 10% escalation in subsequent years	Tentative rates	Total amount (Rs.)	Area planted 6.5 ha. (3250 tall plant planted)
a) Initial cost for plantation	(For 5 ha.)-2500 tall plants	168000 (2016-17)	209998	2020-21	21000	230998	1154990	
b) SC works				L/S			288750	
Total a+b							1443740	1876862
Detail of Maintenance of plantation for Ten Years								
1st Year	5 ha.	9500	11875	2021-22	2494	14369	71845	93398.5
2nd Year	5 ha.	4800	6000	2022-23	1986	7986	39930	51909
3rd Year	5 ha.	4800	6000	2023-24	2785	8785	43925	57102.5
4th Year	5 ha.	2900	3625	2024-25	2213	5838	29190	37947
5th Year	5 ha.	2900	3625	2025-26	2797	6422	32110	41743
6th Year	5 ha.	2000	2500	2026-27	2372	4872	24360	31668
7th Year	5 ha.	2000	2500	2027-28	2859	5359	26795	34833.5
8th Year	5 ha.	2000	2500	2028-29	3395	5895	29475	38317.5
9th Year	5 ha.	2000	2500	2029-30	3984	6484	32420	42146
10th Year	5 ha.	2000	2500	2030-31	4633	7133	35665	46364.5
Total maintainence								475429.5
Total a+b+c								2352291.5
Add contingencies charges @ 5%								117614.58
Sub Total								2469906.1
Add. Departmental Charges supervision @ 17.5%								432233.56
G. Total								2902139.6

Muck Dumping Certificate: It is certified that the tree standing on the proposed land will be felled as per the norms of HP Forest Department under the supervision of HP State Forest Development Corporation Ltd. It is also certified that the said area will be developed by user agency.

Date: 14.11.2019
Place: KOTLI

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

Divisional Forest Officer
Joginder Nagar Forest Division
Joginder Nagar (H.P.)

Himachal Pradesh Power Corporation Limited
(A State Government Undertaking)
Office of General Manager
Triveni Mahadev (78 MW) & Thana Plaun HEP (191 MW),
Kotli, Distt. Mandi-175003
Tel. No. 01905-281081, Email: - gmtpbnhppcl@gmail.com

5.2.1 (A)

Annexure-VI

Full Title of the Project: Diversion of 406.79 ha. of Forest land in favour of Himachal Pradesh Power Corporation, Ltd., Thana Plaun & Triveni Mahadev HEPs, HPPCL, Tehsil Kotli, Distt. Mandi, HP for the construction of Thana Plaun (191MW) HEP within the jurisdiction of Jogindernagar and Mandi Forest Divisions, Distt. Mandi. H.P.

Proposal No. : FP/HP/HYD/8255 /2014

Date of Proposal: November 29th, 2014

CERTIFICATE FOR RECLAMATION OF MUCK DUMPING SITES

I, Ajay Kumar Bisht, General Manager, Triveni Mahadev and Thana Plaun HEP's, HPPCL, Kotli, District Mandi, Himachal Pradesh on behalf of Himachal Pradesh Power Corporation Limited hereby, undertake that the forest area to be diverted for dumping sites will be developed/afforested as per the reclamation plan of HP Forest Department.

I, Ajay Kumar Bisht, General Manager, Triveni Mahadev and Thana Plaun HEP's, HPPCL, Kotli, District Mandi, Himachal Pradesh on behalf of Himachal Pradesh Power Corporation Limited further, undertake that the forest land diverted for muck dumping sites will be return back to HP Forest Department.

(Name & Signature of User Agency)

Date: 20.12.19

Office seal: General Manager TM & TP HEPs HPPCL Kotli, Distt. Mandi (H.P.)

Place: Kotli

CHAPTER-7
MUCK MANAGEMENT PLAN

7.1 INTRODUCTION

For construction of different components of the project substantial surface and underground excavation in over burden and rock for diversion tunnel, dam, spillway, powerhouse of main and regulating dam and appurtenant works shall be involved. The excavation shall result in large quantity of excavated material *i.e.,* muck which shall have to be evacuated, disposed off and roller compacted or laid on mild slopes with the excavation work, to such designated areas where muck piles do not substantially interfere with either environment/ecology or the river flow regime and cause turbidity impairing the quality of water. The development of the disposal areas would advance with the progress of the job which it is catering for. First of all, any trees/property in the disposal area boundary would be dealt with as required. As the muck for disposal would be progressively received at the disposal site, it would be dozed and leveled in a manner as to gradually cover the designated area. Measures to protect/retain the toe of the muck fill would be adopted beforehand so that no loss or injury is caused to the public/ property and no muck roles into the river or other water bodies.

The disposal of muck has been scientifically planned keeping in view the pecuniary aspects necessitating proximity of the muck generating component to the dumping site which reduces travel time of dumpers, no interference to surface flow & ground water aquifer, far away from habitation and on stable slopes away from the active landslides . So far as possible the dumping sites should be located adjacent to the existing approach roads.

In the present case, the total bulk quantity of the muck generated due to project will be 20 lac Cum. Assuming 35% of excavated material will be used in project work, the remaining bulk quantity of muck will be 13 Lac Cum. The disposed muck shall be properly stacked and roller compacted or dumped on slopes and treated to mix and match with the surrounding environment with least change in landscape. No disposal would be made in rivers or nallahs. The toes of the disposal piles would be retained and protected by providing suitably designed gabion walls erected over concrete bases. Gabion walls would be preferred over conventional masonry or concrete toe walls because of various reasons. They are easy to build with locally available

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

stones/boulders from the muck itself. They do not require any setting/strengthening time as in the case of concrete/masonry walls. Not much technical skill is required for making gabion walls. Prefabricated gabion boxes of different dimensions could be used for obtaining better quality and durability.

Based on the excavation quantities, a muck management plan has been formulated to manage the disposal of muck and restore such areas from further degradation of the environment. The disposed muck shall be either roller compacted to provide stable terraces for green belt development, or dumped in designated areas to provide stable slopes. The location of various dumping sites is depicted in **Annexure II** and details are furnished in Table 7.1. Layout plan and cross-sections of all the three dumping site are attached in **Annexure II.**

Table 7.1: Details of muck generation in Thana-Plaun HEP

S.N.	Name of component from where Muck are to be generated	Qty. Of Muck to be generated (Cum)	Add 20% for over breaks/land slides (cum)	Add 45% swell factor on Qty. of Muck generated (cum)	Total Qty. in cum.	Description & Location of Dumping Site	Capacity after use of 35% for construction material, use in coffer dam
1	Diversion	624580	124916	334273	1086769	Dumping Yard	706400
2	Diversion	29746	5949.2	16063	51758	Dumping Yard Neri Kotla-I	33643
3	Head race	13915	2783	7514	24212	Dumping Yard Neri Kotla-I	15738
4	Power House	244220	48844	131879	424943	Dumping Yard Neri Kotla-II	276213
5	T.R.T	22465	4493	12131	39089	Dumping Yard Neri Kotla-II	25408
6	Road Cutting	60000	12000	32400	104400	Dumping Yard Neri Kotla-II	67860
7	Pressure	12361	2472.2	6675	21508	Dumping Yard Neri Kotla-II	13980
8	Adits	70741	14148.2	38200	123089	Dumping Yard Neri Kotla-II	80008
9	Intake	80000	16000	43200	139200	Dumping Yard Neri Kotla-II	90480
	Total	**1158028**	**231606**	**622335**	**2014968**		**1309730**

Total Excavation Rock: 20,14,969 cum (say 20 Lac Cum)

35% of Excavated muck shall be used as construction material: 705239

Balanced muck quantity required to be dumped: 13,09,730 Cum (Say 13.10 Lac Cum)

Capacity of proposed dumping yards:

Neri Kotla-I: 7, 47,947 cum

In addition to this, isolation and screening of specialized strains of mycorrhizal fungi, Rhizobium, Azotobacter and phosphate solubilizers (bio-fertilizers inoculum) in accordance with the suitability of the spoil tips will be done at the site based on the following:-

- Inoculation of plants with specific biofertilizers and mycorrhizal strains.
- Periodical evaluation of rhizosphere development for physical, chemical, and microbiological parameters.
- Monitoring of growth response in different plant species periodically and identification of corrective measures, if necessary.

7.2.2.1 Plantation Technique

In view of the peculiar site conditions, particularly soil conditions, the planting technique for all categories of plants has to be very site specific and suited to stress conditions as anticipated and discussed above. The plantation areas would need to be considerably improved to support the plants in their initial stages of establishment. Moisture retention capability, availability of nutrients and soil aeration, permeability and porosity would require intervention and assistance.

Multistoried and multipurpose plantations are proposed to be raised on the muck dumping sites as also on-road side strips using grasses, shrubs and bushes in the under storey and trees in the upper storey. Nursery raised grass slips, seedlings of shrubs and bushes and trees species would be planted in the area combined with grass sowing in patches. In addition, cuttings of bushes and shrubs can also be planted to supplement nursery raised stock but this would substitute requirement of raising the nursery of these species. Intimate mixture of species would be avoided right at the planning stage and would be strictly followed during planting. Each patch should contain maximum of two species. Grasses would be mixed by groups in rows, shrubs and bushes by group again in rows.

Grass slip planting and grass seed sowing would be done in strips at 0.10 m x 0.10 m spacing in the prepared staggered patches of 1 m x 0.5 m with a depth of 0.30 m. Soil mixture would be used while filling the patches. Balance dug up soil/muck will be stacked along the patch on the downhill side for rain water tapping and enhanced percolation in the patch. Number of such patches in each hectare is proposed to be 500.

Neri Kotla-II: 14, 70,759 cum

7.2 IMPLEMENTATION OF ENGINEERING & BIOLOGICAL MEASURES

Engineering measures like providing of GI wire crates and RCC retaining walls will provide stability to the profile of muck pile (whether stacked temporarily or permanently).

7.2.1 Engineering Measures

It has been observed that after excavation, disposal of muck creates problem as it is susceptible to scattering unless muck disposal yards are supported with engineering measures such as retaining structures, crate walls and gabions. In the present case, two muck disposal sites are proposed to be located near the river banks, and therefore, needs proper handling to avoid spilling of muck into the river water while dumping and in the post dumping stages. The muck disposal sites have to be developed from the ground level by providing in. It is proposed to develop of the muck disposal sites for terraces for labour colonies etc., by erecting RCC toe wall with wire crates.

After placing of the boulder at the toe of muck disposal sites, along the flow and towards the hill side to protect the muck from spilling into the river, the muck shall be brought in dumpers and spread in layers behind the wire crate walls and, then, roller compacted till the level of top most tiers is achieved. The retaining wall shall be laid with proper berm and the muck dumped behind it in layers and compacted by rollers. The process shall be repeated upto the desired height (approximately average 12-15 m) with provision that no dumping shall be done once the maximum slope of 45^0 (max slope 1:1) is met. A buffer of 1.5 m height will be kept to avoid the rollover falling into the river.

7.2.2 Biological Measures

Biological measures require special efforts as the muck disposed in disposal yards will in general be devoid of nutrients and soil contents to support vegetation. The selection of soil for spreading over such an area would require nutrient profiling of soil for different base elements. Suitable admixture of nutrients such as NPK would be done before placing the soil on the top surface of muck disposal areas to support growth of vegetation.

Shrubs and bushes would be planted in elongated strips of 1.5 m x 0.5 m with a depth of 0.45m. Soil mixture would be used while filling the patches. Balance dug up soil/muck will be stacked along the patch on the downhill side for water tapping and better percolation in the patch. These would be staggered throughout the area numbering 500 per hectare. Each patch would have two rows of planting with staggered spacing between the plants in a row as 15 cm and distance between rows as 15 cm.

Planting of trees would be done in contour staggered pits of 0.60 m x 0.60 m x 0.60 m size numbering 800 per hectare. Out of these 800 plants, about 200 plants per hectare are meant for planting along the periphery of the area. If the periphery gets filled up with lesser numbers, the remainder would be planted in the core/main area. Soil mixture would be used while filling the pits. Balance dug up soil/muck will be stacked on downhill side of the pit for tapping the rain water and allowing it to percolate in the pit.

It is proposed to use soil mixture in the pits and patches consisting of soil imported from nearby areas mixed with compost or humus or vermicompost or all of these. The ratio for the mix would be 5 parts compost: manure 2 parts: Sand 2 parts and humus or vermicompost 1 part. This will make nutrients really available for the plants in the preliminary stages and also help increase soil aeration, porosity & permeability and improve moisture available for the plants.

The stabilization sites from the time of execution of biological measures would be protected with barbed wire fencing on 2m high RCC posts and provided with inspection paths. Since the muck dumping sites are being provided with RCC tow walls with the wire crate (gabion) wall on the valley side (towards river) which is not negotiable by animals and human being, fencing would not be required along the entire perimeter. Hence, it would be done on the vulnerable sections, i.e., towards the hillside only. The proposed costs include nursery costs for initial planting and also for mortality replacement.

The biological measures shall be taken up towards the end of construction. The plantations would be maintained for a period of 5 years by irrigating the plantation during dry seasons, mortality replacement and repair of fencing and inspection paths within the area. The task of irrigation would be performed by the watch & ward staff provided in the cost estimate.

Although the sites would be either leveled or finished in a grade. However, due to rains and sliding etc, it tends to develop rills and gulley causing acceleration in the rate of erosion. Therefore, while carrying out plantation suitable soil conservation measures would also be taken.

7.3 COST ESTIMATE FOR MUCK DISPOSAL PLAN

The cost estimate for muck disposal plan indicating engineering, biological measures and maintenance is provided in Table 7.2.

Table 7.2: Cost estimate for Muck Disposal Plan

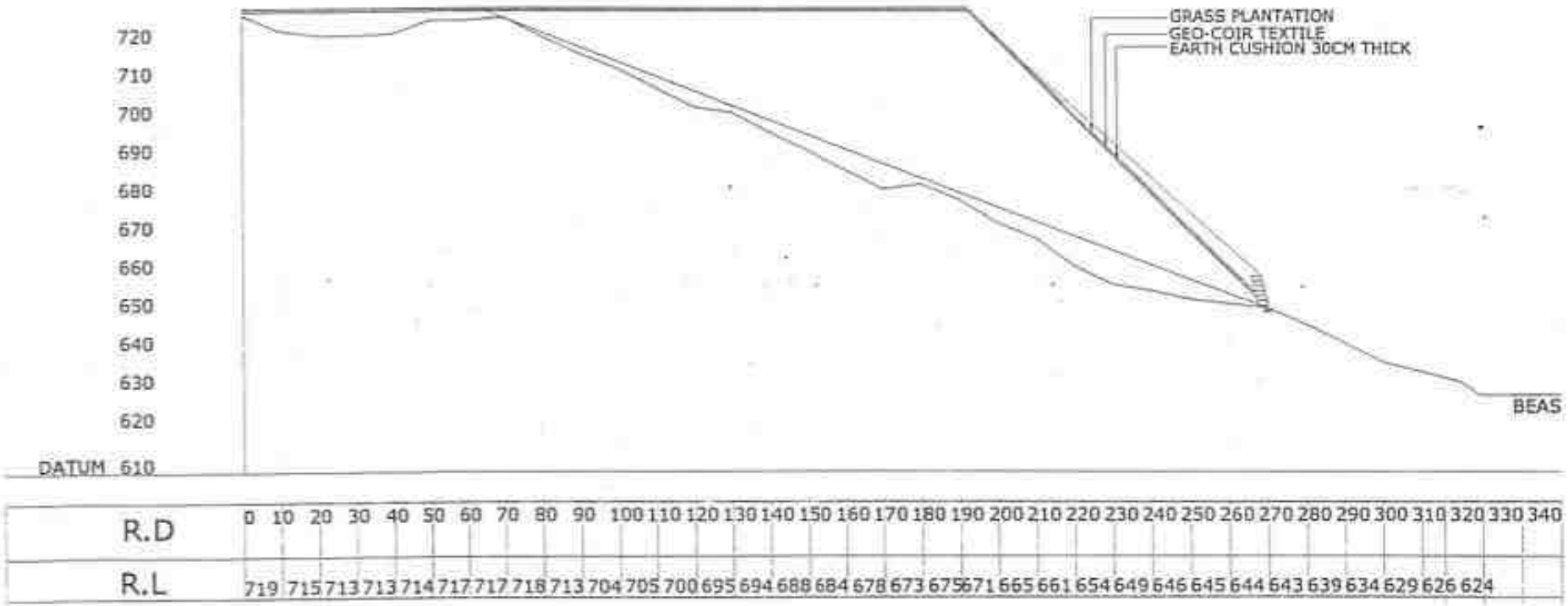
S. No.	Particulars	Quantity	Unit	Rate (INR)	Amount in INR
A.	**Engineering Measures**				
1	Supplying and placing in position GI wire crate 8 SWG, 10 cm size (2.25m x 1.25m x 1.25m) at toe on dumping site MD-1 and MD-2. Total length = 366m; no of wire crates in one row : 366/2.25 =163; Total no of rows : 6*163 =978	978	no	4500	4401000
2	CC (M-20) for RCC wall as Toe of wire crates; a) Base = 366 x 1.85 x 0.30 b) Stem = 366 x 1.00 x 0.45	 203 165	 m^3 m^3	 5500 5500	 1116500 907500
3.	Cost of Centering and shuttering a) 2 x 366 x 0.30 b) 2 x 366 x 1.00	 220 732	 m^2 m^2	 200 200	 44000 146400
4.	Cost of Steel reinforcement	22	MT	57500	1265000
	Sub Total (A)				**7880400**
B.	**Biological Measures**				
1.	Plantation of muck disposal sites	15	Ha	500000	7500000
2.	Barbed wire fencing on 2m high RCC posts	15	Ha	30000	450000
3.	Cost of portable pump with accessories	3	No	150000	450000
4.	Cost of sprinkler system of irrigation	5	No	40000	200000
5.	Watch and ward 3 no. @ Rs. 6000 p.m. for 5 years (3 x 12 x 5)	180	Man Months	6000	1080000
				Subtotal (B)	**9680000**
				Grand Total (A + B)	**17560400**
				Say (In Lac)	**176.00**

- L.S : Lump Sum
- RM: Running Meter

General Manager
TM-E, TR HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

ANNEXURE-II

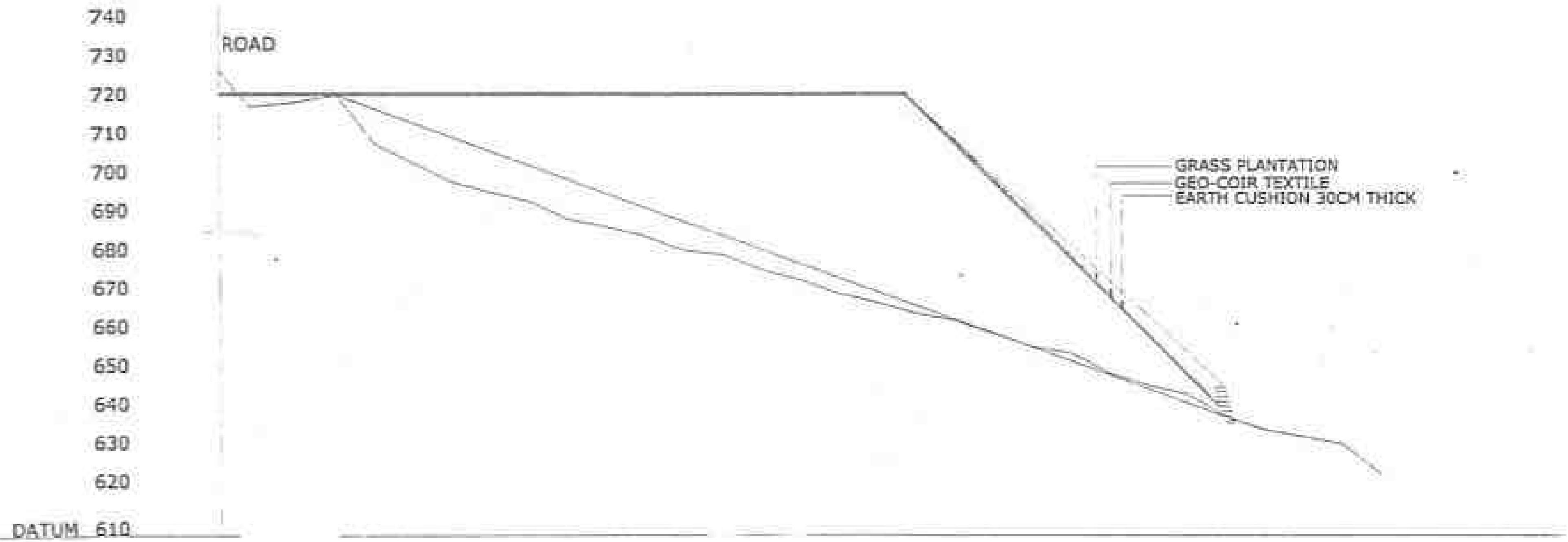
X-SECTION OF MUCK DUMPING SITE-1



R.D	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
R.L	719	715	713	713	714	717	717	718	713	704	705	700	695	694	688	684	678	673	675	671	665	661	654	649	646	645	644	643	639	634	629	626	624		

R.L at 719 Mtrs.

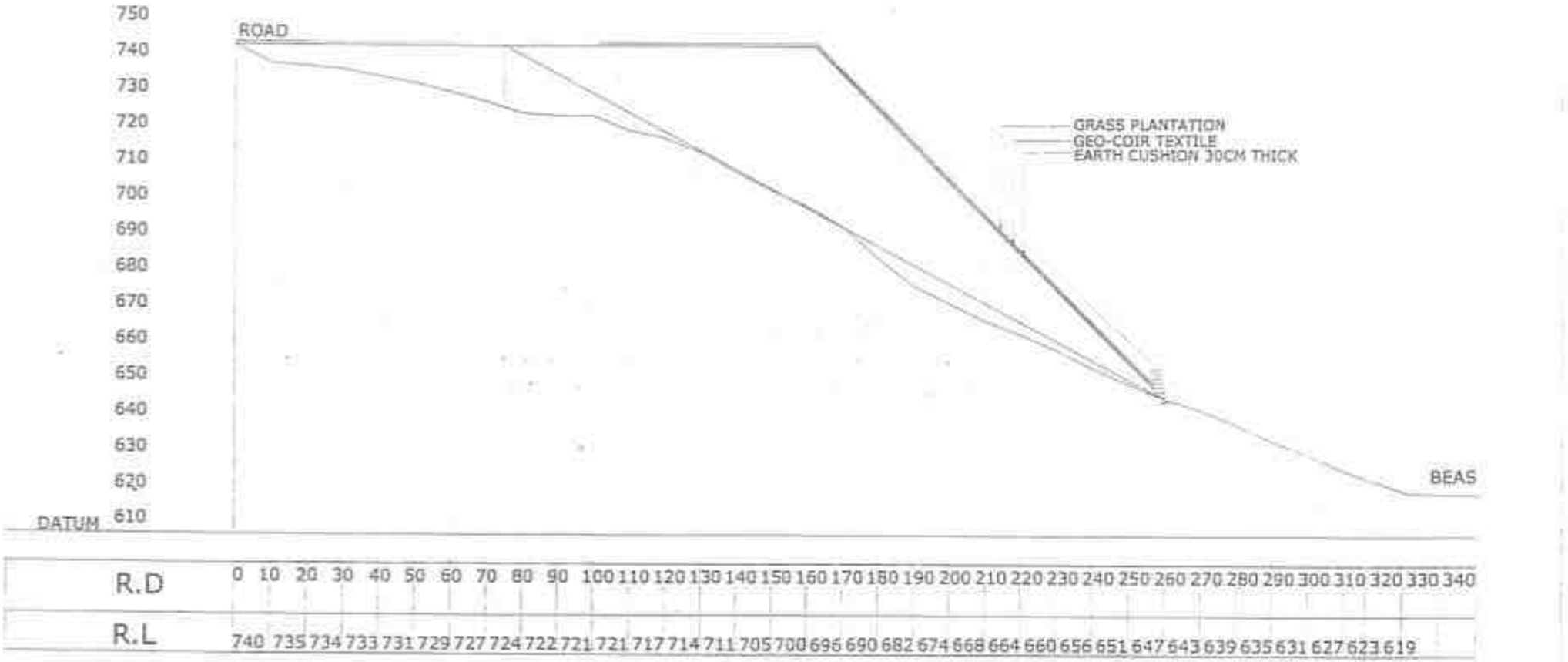
X-SECTION OF MUCK DUMPING SITE-1



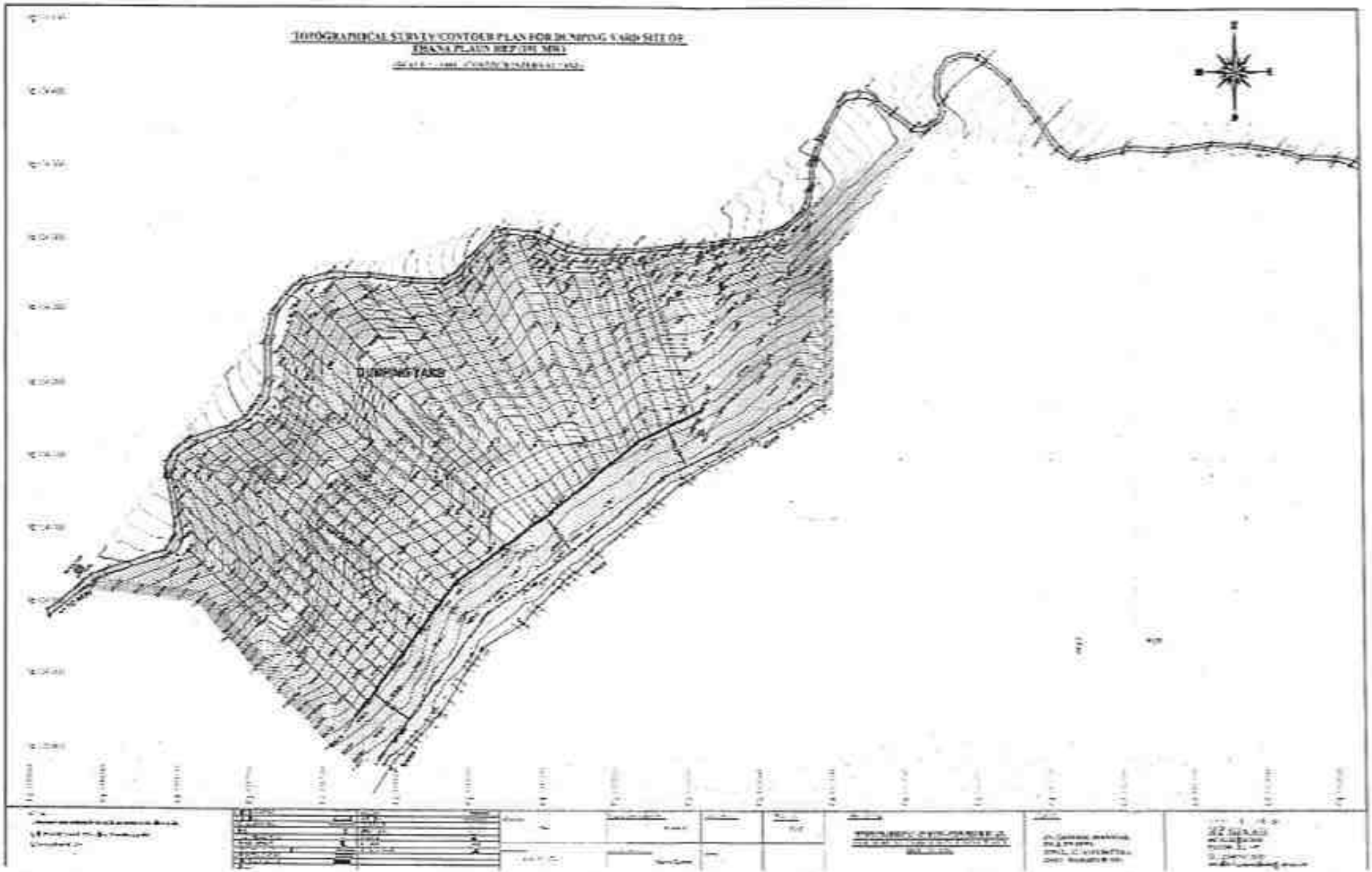
R.D	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	210	220	230	240	250	260	270	280	290	300	310	320	330	340
R.L	721	718	719	720	708	703	699	696	692	688	687	684	680	678	675	672	669	667	665	661	660	665	660	657	654	650	647	643	640	637	631	629	627	625	623

R.L at 721 Mtrs.

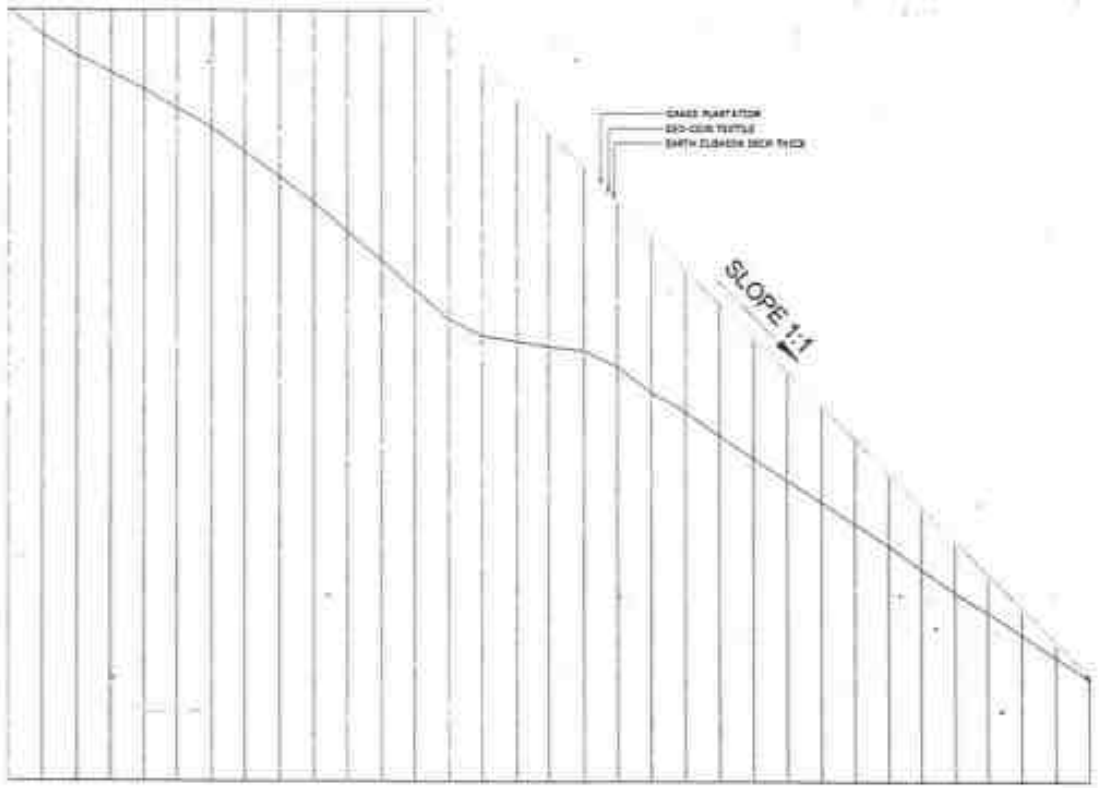
X-SECTION OF MUCK DUMPING SITE-1



R.L at 740 Mtrs.


TOPOGRAPHICAL SURVEY CONTOUR PLAN FOR DUMPING YARD SITE OF
DHANA PLAIN REF (191 MW)
DUMPING YARD

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 620.0M

CHAINAGE	ELEVATION
0.000	733.000
5.000	729.329
10.000	726.325
15.000	723.898
20.000	721.402
25.000	718.712
30.000	715.668
35.000	712.414
40.000	709.710
45.000	705.006
50.000	700.786
55.000	696.814
60.000	692.220
65.000	687.942
70.000	685.546
75.000	684.717
80.000	683.920
85.000	683.323
90.000	681.039
95.000	677.290
100.000	674.525
105.000	670.925
110.000	667.582
115.000	664.369
120.000	661.195
125.000	658.031
130.000	654.765
135.000	651.316
140.000	647.813
145.000	644.674
150.000	641.525
155.000	638.278
160.000	635.093

RD At 0 Mtrs.

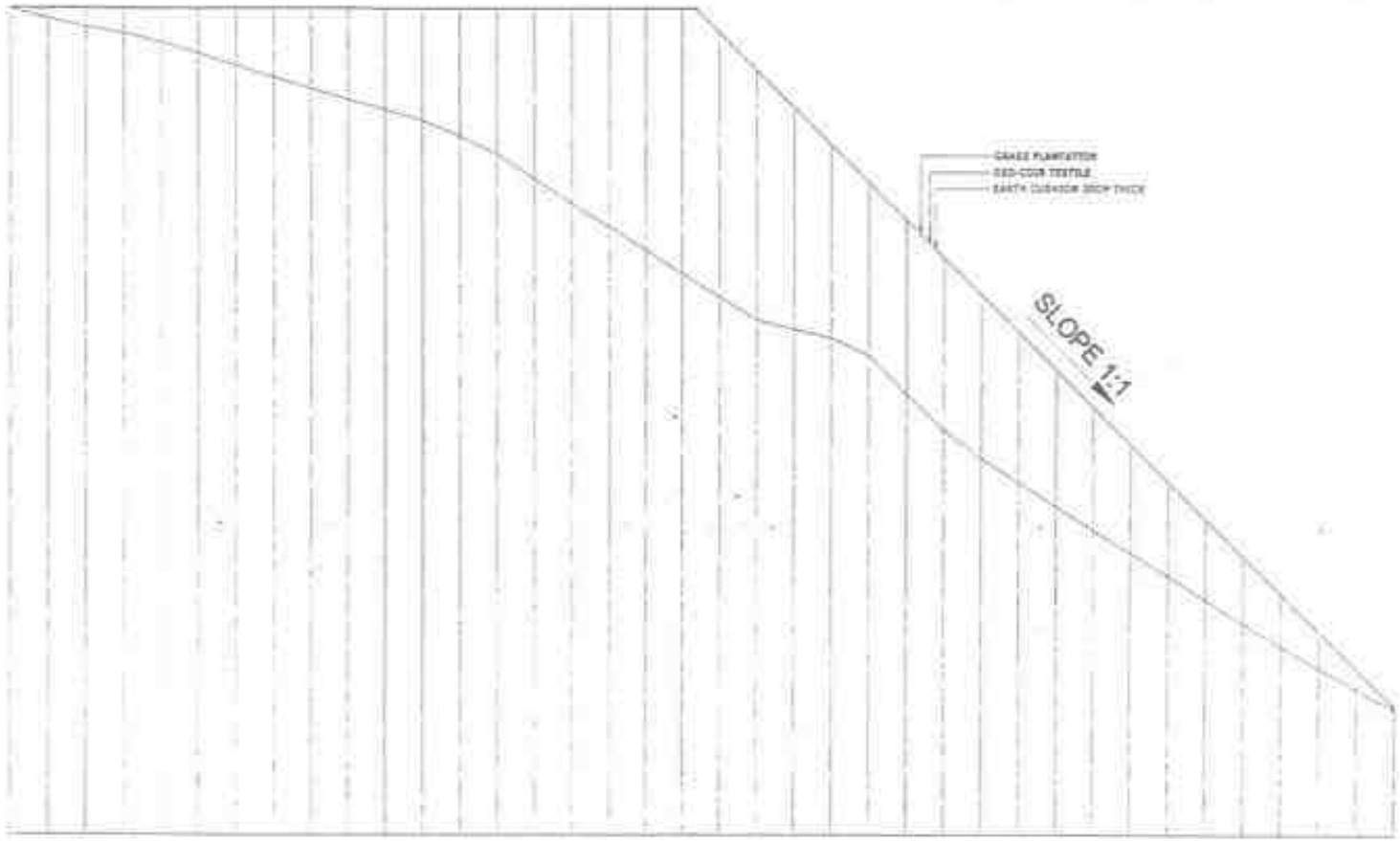
RD At 10 Mtrs.

CHAINAGE	ELEVATION
0.000	732.000
5.000	730.316
10.000	728.510
15.000	726.157
20.000	723.946
25.000	722.325
30.000	720.818
35.000	719.478
40.000	717.523
45.000	715.038
50.000	710.741
55.000	706.554
60.000	702.620
65.000	698.567
70.000	694.628
75.000	691.164
80.000	689.010
85.000	687.474
90.000	685.970
95.000	685.233
100.000	681.634
105.000	676.860
110.000	672.764
115.000	669.490
120.000	666.335
125.000	663.173
130.000	660.014
135.000	656.861
140.000	653.722
145.000	650.537
150.000	647.286
155.000	644.037
160.000	640.674
165.000	637.907
167.800	636.038

DATUM: 620.0M

SLOPE 1:1

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 620.0M

CHAINAGE	ELEVATION
0.000	730.000
5.000	728.589
10.000	727.548
15.000	726.650
20.000	725.464
25.000	723.908
30.000	722.346
35.000	720.774
40.000	719.269
45.000	717.870
50.000	716.477
55.000	715.057
60.000	712.917
65.000	710.611
70.000	707.275
75.000	703.903
80.000	700.893
85.000	697.813
90.000	694.728
95.000	691.645
100.000	688.630
105.000	687.342
110.000	686.135
115.000	683.839
120.000	678.647
125.000	673.881
130.000	670.137
135.000	666.921
140.000	663.750
145.000	660.626
150.000	657.566
155.000	654.472
160.000	651.280
165.000	648.128
170.000	645.120
175.000	642.198
180.000	639.378
184.000	636.727

RD At 20 Mtrs.

X-SECTION OF MUCK DUMPING SITE

DATUM: 620.0M

CHAINAGE	ELEVATION
0.000	728.000
5.000	727.427
10.000	726.006
15.000	724.653
20.000	723.330
25.000	722.007
30.000	720.907
35.000	719.714
40.000	718.075
45.000	716.442
50.000	714.832
55.000	713.305
60.000	711.820
65.000	710.344
70.000	708.857
75.000	707.367
80.000	705.725
85.000	703.480
90.000	700.817
95.000	698.119
100.000	695.286
105.000	692.362
110.000	689.448
115.000	686.560
120.000	683.334
125.000	680.316
130.000	677.467
135.000	674.142
140.000	671.870
145.000	668.296
150.000	665.193
155.000	662.156
160.000	659.152
165.000	656.162
170.000	653.141
175.000	650.095
180.000	647.072
185.000	644.088
190.000	641.190
196.00	637.000

RD At 30 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2

DATUM: 625.0M

CHAINAGE	ELEVATION
0.000	728.000
5.000	725.431
10.000	723.158
15.000	721.464
20.000	720.079
25.000	718.726
30.000	717.376
35.000	716.025
40.000	714.511
45.000	712.994
50.000	711.434
55.000	709.869
60.000	708.246
65.000	706.640
70.000	705.090
75.000	703.540
80.000	701.900
85.000	700.436
90.000	698.873
95.000	697.293
100.000	695.416
105.000	693.304
110.000	691.077
115.000	688.523
120.000	685.673
125.000	682.865
130.000	680.053
135.000	677.244
140.000	674.535
145.000	671.494
150.000	668.230
155.000	665.187
160.000	662.213
165.000	659.235
170.000	656.237
175.000	653.241
180.000	650.264
185.000	647.314
190.000	644.382
195.000	641.478
201.000	637.000

RD At 40 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2

RD At 50 Mtrs.

CHAINAGE	ELEVATION
0.000	728.000
5.000	725.440
10.000	722.976
15.000	720.639
20.000	718.008
25.000	715.419
30.000	713.101
35.000	711.123
40.000	709.569
45.000	708.163
50.000	706.577
55.000	704.969
60.000	703.322
65.000	701.680
70.000	700.066
75.000	698.483
80.000	696.951
85.000	695.393
90.000	693.837
95.000	692.217
100.000	690.594
105.000	688.853
110.000	687.169
115.000	685.293
120.000	683.177
125.000	680.436
130.000	677.424
135.000	674.364
140.000	671.530
145.000	669.143
150.000	666.691
155.000	664.058
160.000	661.592
165.000	659.219
170.000	656.254
175.000	653.247
180.000	650.171
185.000	647.304
190.000	644.395
195.000	641.535
200.000	637.521

DATUM: 625.0M

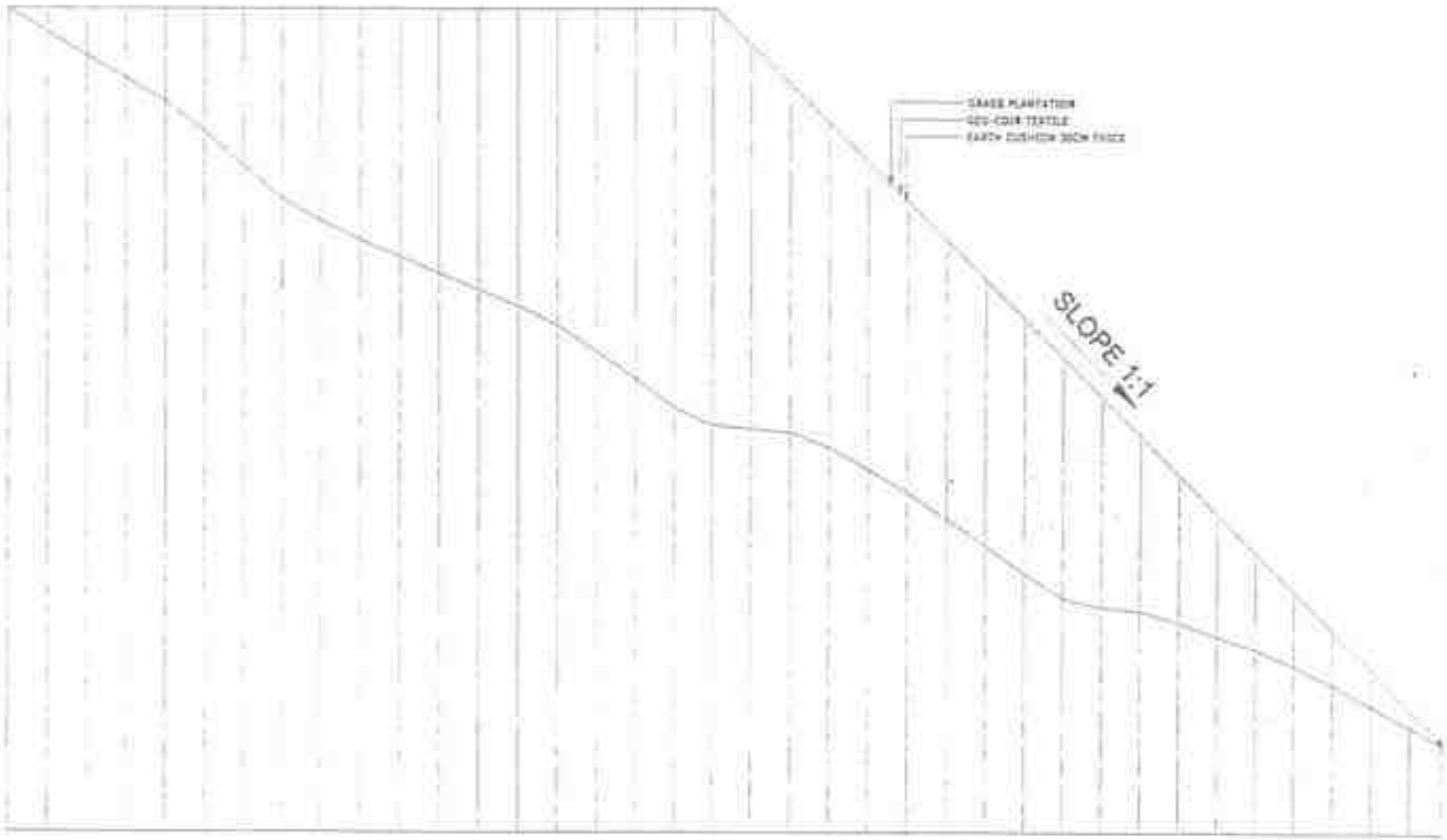
X-SECTION OF MUCK DUMPING SITE-2

DATUM: 520.0M

CHAINAGE	ELEVATION
0.000	726.000
5.000	725.000
10.000	721.890
15.000	718.775
20.000	715.662
25.000	712.533
30.000	709.327
35.000	705.809
40.000	701.409
45.000	697.030
50.000	694.213
55.000	692.528
60.000	691.450
65.000	690.372
70.000	688.637
75.000	686.367
80.000	683.414
85.000	680.480
90.000	677.389
95.000	675.271
100.000	673.989
105.000	673.646
110.000	673.304
115.000	672.671
120.000	669.720
125.000	666.732
130.000	663.874
135.000	660.980
140.000	658.279
145.000	655.676
150.000	653.666
155.000	651.864
160.000	650.062
165.000	647.399
170.000	644.900
175.000	642.383
180.000	639.689
185.000	636.974
191.000	633.524

RD At 70 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 620.0M

CHAINAGE	ELEVATION
0.000	725.000
5.000	721.915
10.000	718.979
15.000	716.065
20.000	713.137
25.000	709.338
30.000	704.995
35.000	700.652
40.000	697.947
45.000	695.532
50.000	693.366
55.000	691.271
60.000	689.184
65.000	687.111
70.000	684.656
75.000	681.296
80.000	677.759
85.000	674.226
90.000	671.926
95.000	671.499
100.000	671.071
105.000	669.086
110.000	666.237
115.000	663.297
120.000	659.877
125.000	656.529
130.000	653.079
135.000	649.856
140.000	648.675
145.000	648.204
150.000	646.756
155.000	644.959
160.000	643.371
165.000	641.212
170.000	638.735
175.000	636.100
180.000	633.447
184.000	631.241

RD At 80 Mtrs.

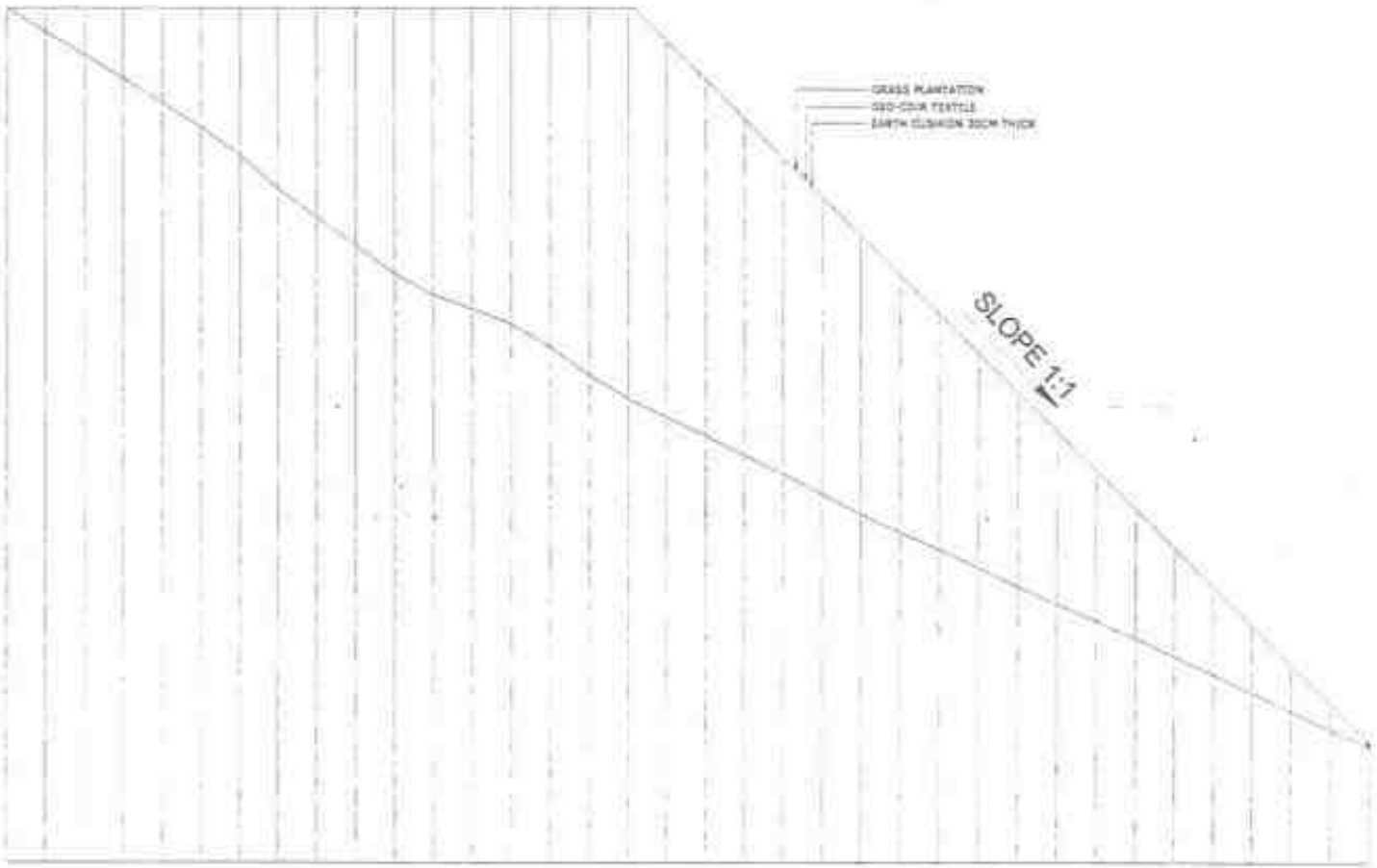
SECTION OF MUCK DUMPING SITE-2

RD At 90 Mtrs.

CHAINAGE	ELEVATION
0.000	725.000
5.000	722.232
10.000	719.035
15.000	715.607
20.000	712.096
25.000	708.299
30.000	704.386
35.000	701.584
40.000	698.599
45.000	695.565
50.000	692.226
55.000	689.142
60.000	686.669
65.000	684.055
70.000	681.146
75.000	678.078
80.000	675.217
85.000	672.794
90.000	670.357
95.000	667.878
100.000	665.398
105.000	662.737
110.000	660.040
115.000	657.403
120.000	654.786
125.000	652.357
130.000	649.941
135.000	647.950
140.000	645.979
145.000	644.104
150.000	642.331
155.000	640.559
160.000	638.398
165.000	636.059
170.000	633.612
175.000	631.076
178.000	630.000

DATUM: 615M

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 615M

CHAINAGE	ELEVATION
0.000	724.000
5.000	720.943
10.000	717.941
15.000	714.963
20.000	711.863
25.000	708.673
30.000	705.238
35.000	700.987
40.000	697.334
45.000	693.763
50.000	690.122
55.000	687.463
60.000	685.629
65.000	683.751
70.000	680.732
75.000	677.125
80.000	674.161
85.000	671.762
90.000	669.364
95.000	666.868
100.000	664.562
105.000	661.996
110.000	659.428
115.000	657.104
120.000	654.920
125.000	652.582
130.000	650.215
135.000	647.986
140.000	645.771
145.000	643.547
150.000	641.258
155.000	638.928
160.000	636.566
165.000	634.196
170.000	631.911
175.000	629.708

RD At 100 Mtrs.

545 (368)

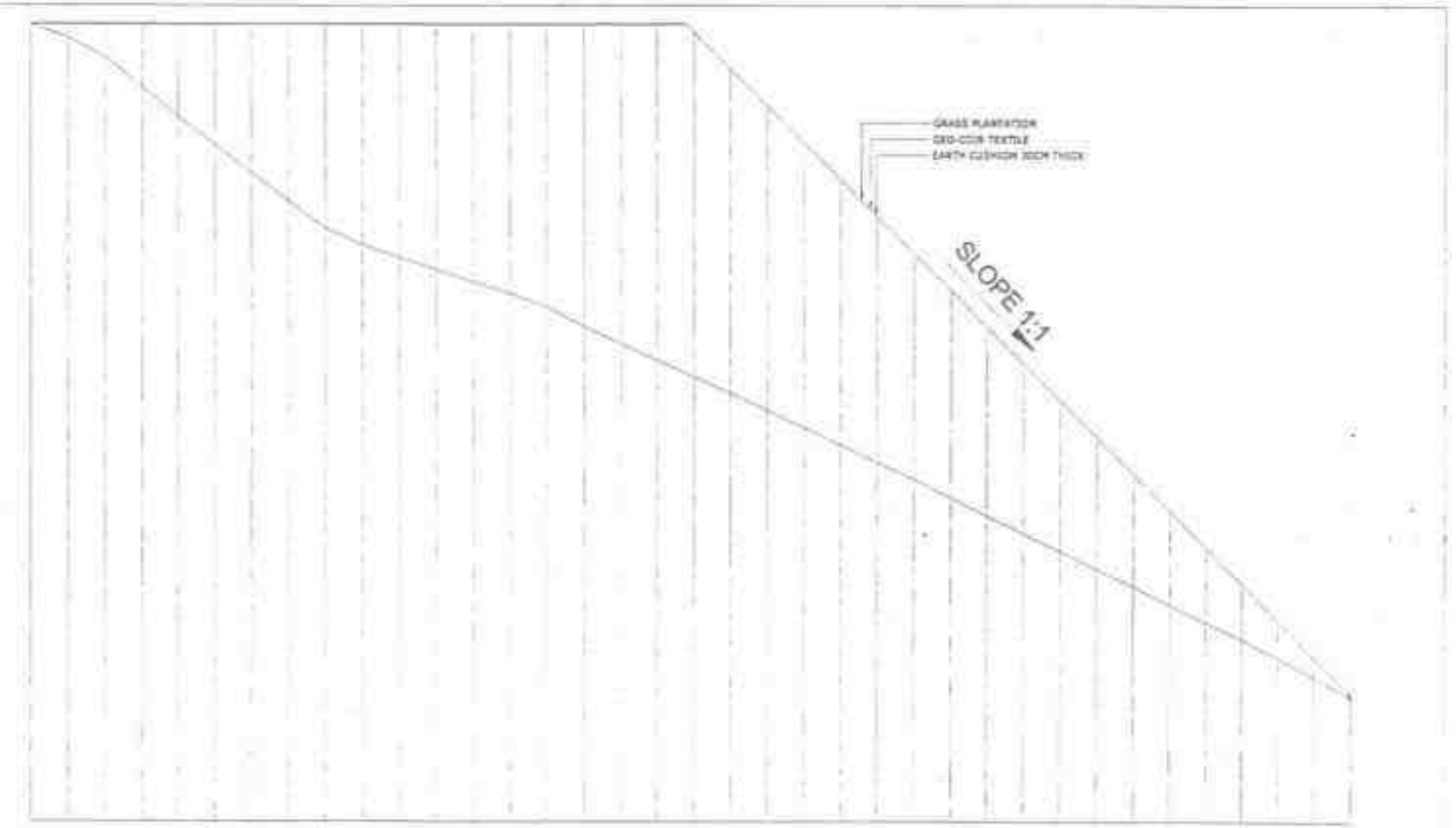
RD At 110 Mtrs.

DATUM: 615M

CHAINAGE	ELEVATION
0.000	723.000
5.000	721.532
10.000	719.987
15.000	717.094
20.000	713.033
25.000	708.730
30.000	704.428
35.000	700.093
40.000	696.196
45.000	693.099
50.000	690.011
55.000	687.516
60.000	686.126
65.000	684.890
70.000	682.557
75.000	678.561
80.000	675.877
85.000	673.681
90.000	671.428
95.000	669.156
100.000	666.912
105.000	664.645
110.000	662.347
115.000	660.025
120.000	657.791
125.000	655.560
130.000	653.293
135.000	650.987
140.000	648.661
145.000	646.351
150.000	644.075
155.000	641.794
160.000	639.441
165.000	637.088
170.000	634.748
171.000	631.000

(124)

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 615M

CHAINAGE	ELEVATION
0.000	723.000
5.000	721.148
10.000	718.536
15.000	714.420
20.000	710.467
25.000	706.632
30.000	702.829
35.000	699.032
40.000	695.403
45.000	693.153
50.000	691.468
55.000	689.779
60.000	688.142
65.000	686.593
70.000	684.744
75.000	682.089
80.000	679.740
85.000	677.511
90.000	675.282
95.000	673.059
100.000	670.733
105.000	668.365
110.000	666.012
115.000	663.711
120.000	661.433
125.000	659.912
130.000	656.463
135.000	654.046
140.000	651.651
145.000	649.262
150.000	646.878
155.000	644.377
160.000	642.061
165.000	639.723
170.000	637.204
175.000	634.643
180.000	631.798

RD At 120 Mtrs.

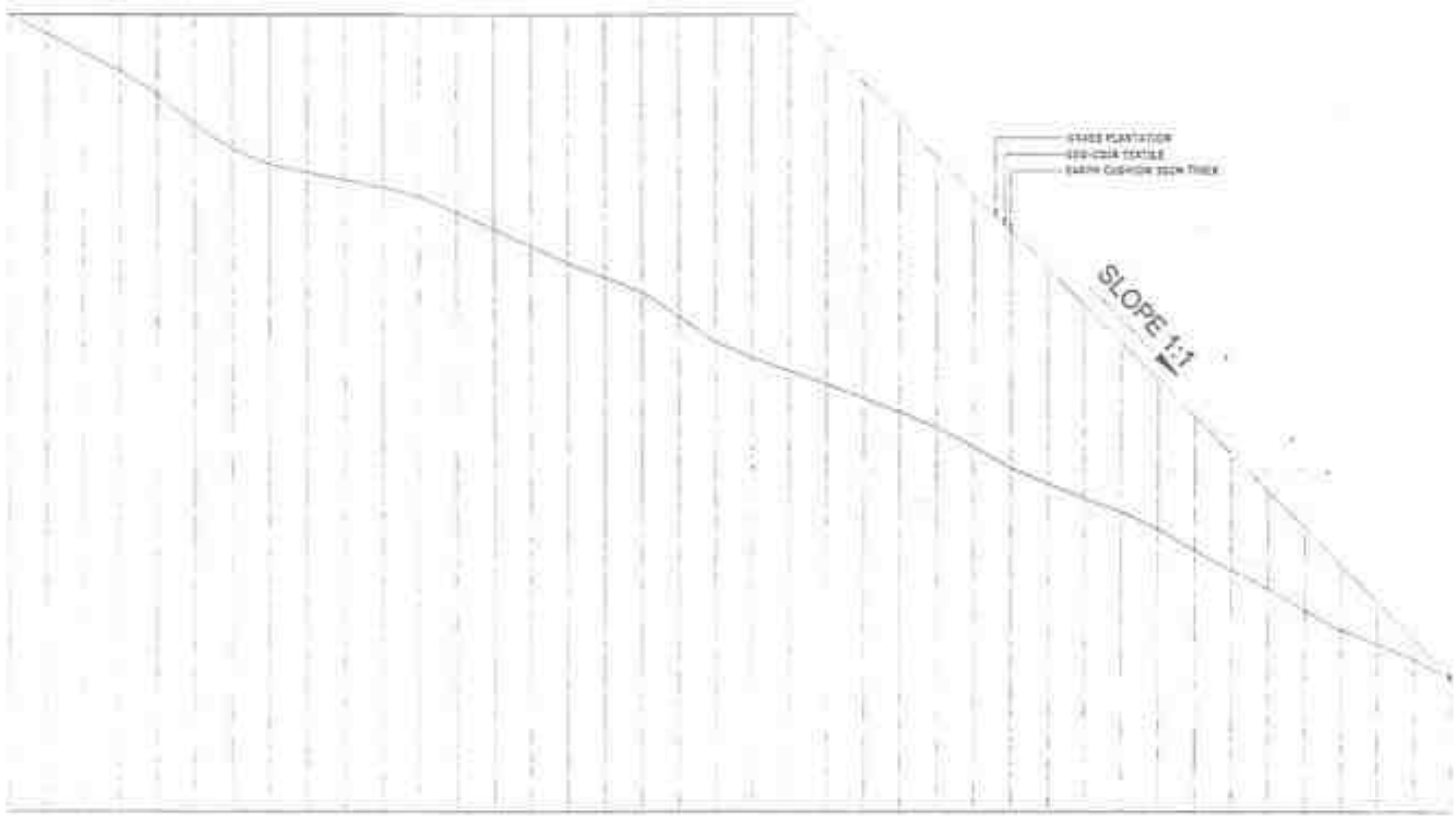
A-SECTION OF MUCK DUMPING SITE-2

RD At 130 Mtrs.

DATUM: 615M

CHAINAGE	ELEVATION
0.000	723.000
5.000	720.097
10.000	716.739
15.000	712.910
20.000	709.019
25.000	705.369
30.000	702.646
35.000	700.880
40.000	699.653
45.000	698.399
50.000	694.520
55.000	692.899
60.000	691.249
65.000	689.560
70.000	687.794
75.000	685.712
80.000	683.066
85.000	679.987
90.000	677.714
95.000	675.561
100.000	673.793
105.000	672.015
110.000	670.049
115.000	667.469
120.000	664.474
125.000	661.514
130.000	658.980
135.000	656.876
140.000	654.833
145.000	652.411
150.000	649.926
155.000	647.309
160.000	644.739
165.000	642.742
170.000	640.165
175.000	637.443
180.000	635.118
185.000	632.171

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 615M

CHAINAGE	ELEVATION
0.000	722.000
5.000	719.514
10.000	717.016
15.000	714.495
20.000	711.242
25.000	707.182
30.000	704.003
35.000	701.953
40.000	700.897
45.000	699.849
50.000	698.839
55.000	697.636
60.000	695.490
65.000	693.199
70.000	690.665
75.000	688.594
80.000	686.658
85.000	684.714
90.000	681.437
95.000	678.024
100.000	676.008
105.000	674.180
110.000	672.363
115.000	670.554
120.000	668.646
125.000	666.544
130.000	663.961
135.000	661.094
140.000	659.023
145.000	657.069
150.000	655.293
155.000	652.931
160.000	650.075
165.000	647.441
170.000	644.947
175.000	641.912
180.000	639.359
185.000	637.447
190.000	635.456
195.000	632.722

RD At 140 Mtrs.

549 (510

X-SECTION OF MUCK DUMPING SITE

RD At 150 Mtrs.

DATUM: 615M

CHAINAGE	ELEVATION
0.000	721.000
5.000	717.594
10.000	714.914
15.000	712.860
20.000	710.690
25.000	708.087
30.000	704.939
35.000	701.464
40.000	699.140
45.000	697.574
50.000	696.335
55.000	695.104
60.000	693.190
65.000	691.212
70.000	689.009
75.000	686.461
80.000	684.316
85.000	682.738
90.000	681.159
95.000	679.721
100.000	678.670
105.000	677.124
110.000	675.020
115.000	673.158
120.000	671.234
125.000	669.223
130.000	666.463
135.000	663.342
140.000	662.039
145.000	660.871
150.000	658.120
155.000	655.455
160.000	652.940
165.000	650.467
170.000	647.790
175.000	645.077
180.000	642.345
185.000	639.770
190.000	636.585
195.000	634.243
200.000	632.810
205.000	631.603

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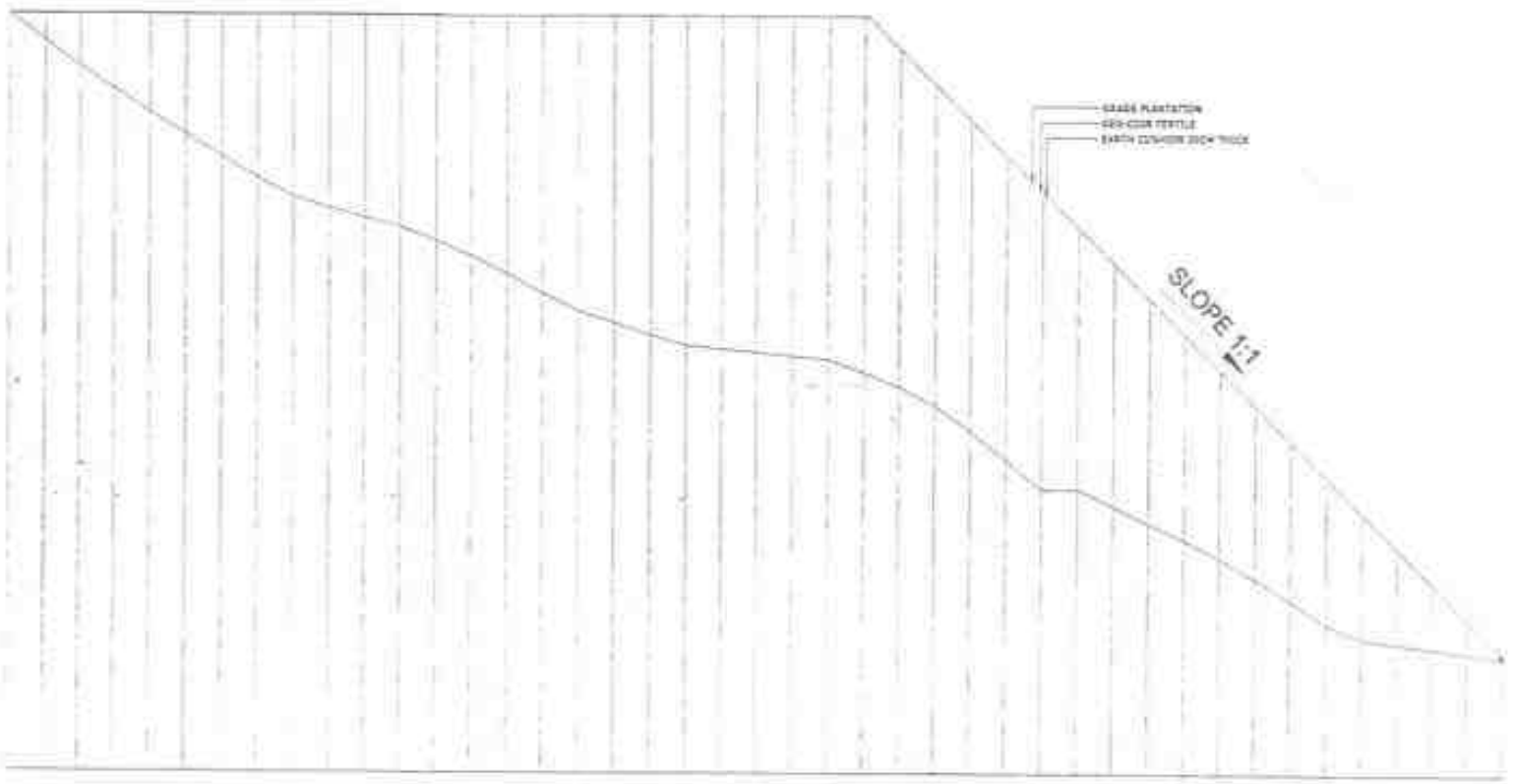
X-SECTION OF MUCK DUMPING SITE-2

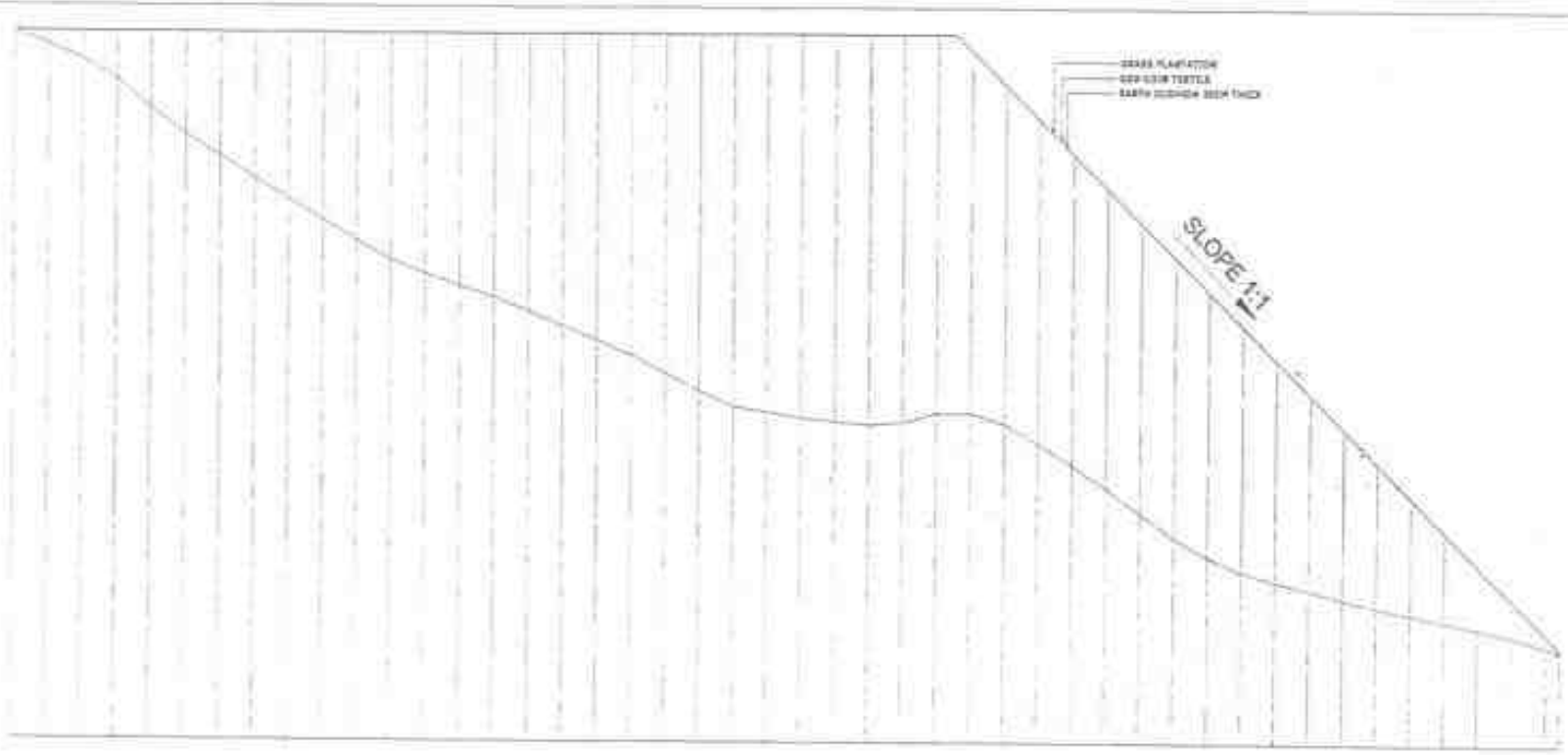


DATUM: 615M

CHAINAGE	ELEVATION
0.000	721.000
5.000	717.250
10.000	713.709
15.000	710.470
20.000	707.277
25.000	704.211
30.000	701.157
35.000	698.151
40.000	695.615
45.000	694.048
50.000	692.735
55.000	691.424
60.000	689.511
65.000	687.310
70.000	684.912
75.000	682.222
80.000	679.709
85.000	678.038
90.000	676.367
95.000	674.812
100.000	674.431
105.000	673.050
110.000	673.409
115.000	672.053
120.000	671.112
125.000	669.200
130.000	666.462
135.000	663.017
140.000	658.917
145.000	654.832
150.000	654.943
155.000	652.541
160.000	650.139
165.000	647.853
170.000	645.329
175.000	642.423
180.000	639.433
185.000	636.016
190.000	634.072
195.000	633.379
200.000	632.723
205.000	632.066
210.000	631.322

RD At 160 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2



DATUM 615M

CHAINAGE	ELEVATION
0.000	716.000
5.000	716.042
10.000	713.970
15.000	710.987
20.000	708.742
25.000	703.048
30.000	699.680
35.000	696.783
40.000	693.729
45.000	690.735
50.000	687.786
55.000	684.903
60.000	682.989
65.000	681.246
70.000	679.584
75.000	677.516
80.000	675.447
85.000	673.411
90.000	671.270
95.000	668.642
100.000	666.007
105.000	663.845
110.000	663.022
115.000	662.199
120.000	661.972
125.000	661.240
130.000	661.685
135.000	662.962
140.000	663.000
145.000	661.369
150.000	656.543
155.000	655.431
160.000	652.129
165.000	648.473
170.000	644.898
175.000	642.104
180.000	639.993
185.000	639.611
190.000	637.346
195.000	636.108
200.000	634.894
205.000	633.692
210.000	632.893
215.000	631.909
220.000	630.724
222.000	630.000

RD At 180 Mtrs.

553 (3)

X-SECTION OF MUCK DUMPING SITE-2

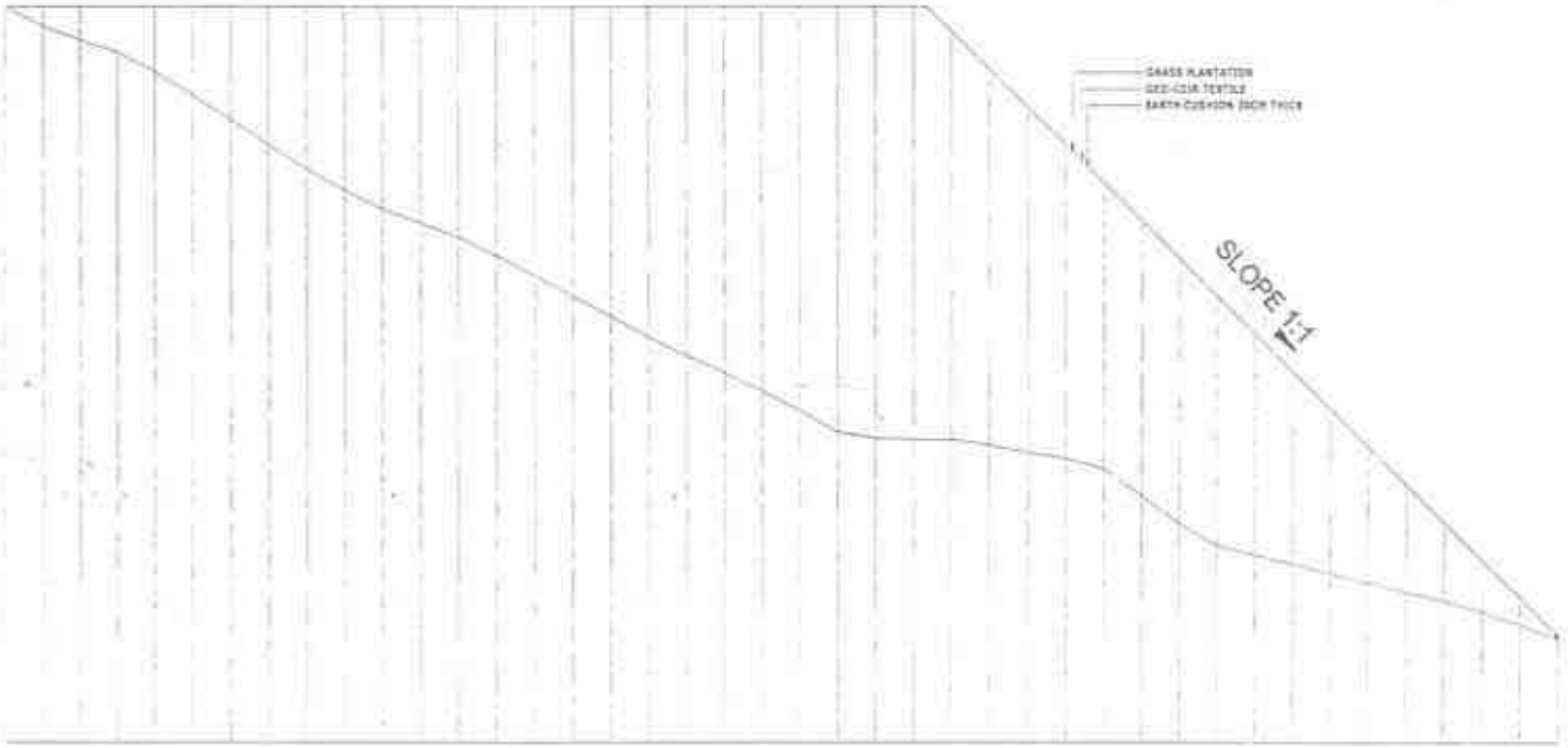
DATUM: 615M

CHAINAGE	ELEVATION
0.000	716.000
5.000	713.121
10.000	710.627
15.000	708.173
20.000	705.591
25.000	702.332
30.000	698.890
35.000	695.430
40.000	692.121
45.000	689.364
50.000	686.434
55.000	684.172
60.000	682.791
65.000	681.327
70.000	679.973
75.000	678.027
80.000	675.534
85.000	672.870
90.000	670.203
95.000	667.477
100.000	664.654
105.000	662.201
110.000	660.193
115.000	658.244
120.000	657.198
125.000	657.746
130.000	658.252
135.000	658.722
140.000	658.510
145.000	657.024
150.000	654.761
155.000	652.300
160.000	646.760
165.000	644.900
170.000	642.548
175.000	640.116
180.000	638.828
185.000	637.584
190.000	636.339
195.000	635.092
200.000	634.051
205.000	633.028
210.000	631.890
215.000	630.365
217.000	629.521

RD At 190 Mtrs.

130

X-SECTION OF MUCK DUMPING SITE-2

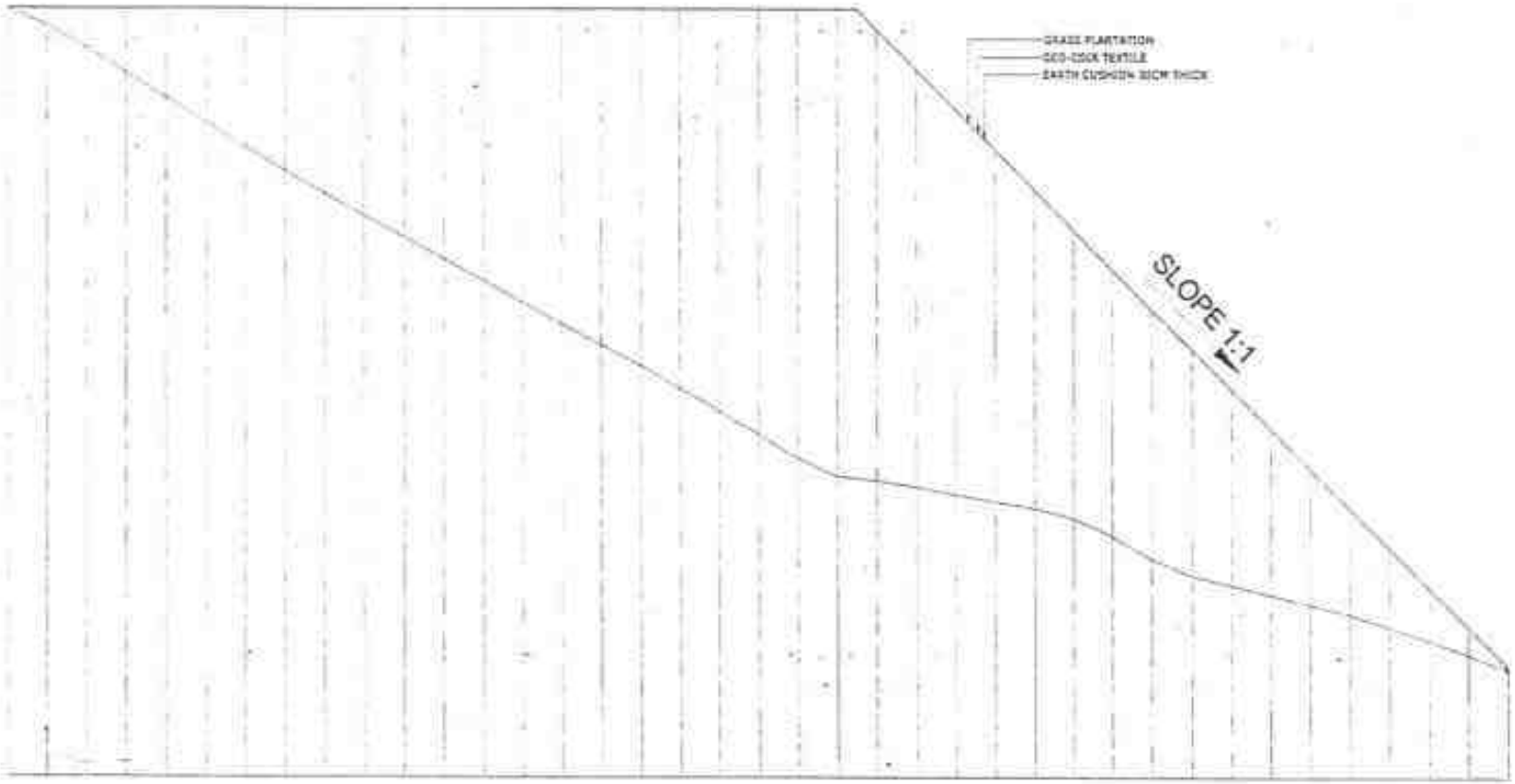


DATUM: 615M

CHAINAGE	ELEVATION
0.000	712.000
5.000	709.389
10.000	707.670
15.000	706.000
20.000	703.435
25.000	700.304
30.000	697.111
35.000	693.828
40.000	690.638
45.000	687.841
50.000	685.385
55.000	683.572
60.000	681.700
65.000	679.233
70.000	676.567
75.000	673.882
80.000	671.204
85.000	668.490
90.000	665.969
95.000	663.783
100.000	661.388
105.000	658.712
110.000	655.940
115.000	655.141
120.000	655.000
125.000	655.000
130.000	654.265
135.000	653.220
140.000	652.486
145.000	651.000
150.000	647.474
155.000	643.845
160.000	640.934
165.000	639.725
170.000	638.514
175.000	637.299
180.000	636.065
185.000	634.838
190.000	633.673
195.000	632.252
200.000	630.557
205.000	628.647

RD At 200 Mtrs.

SECTION OF MUCK DUMPING SITE-2

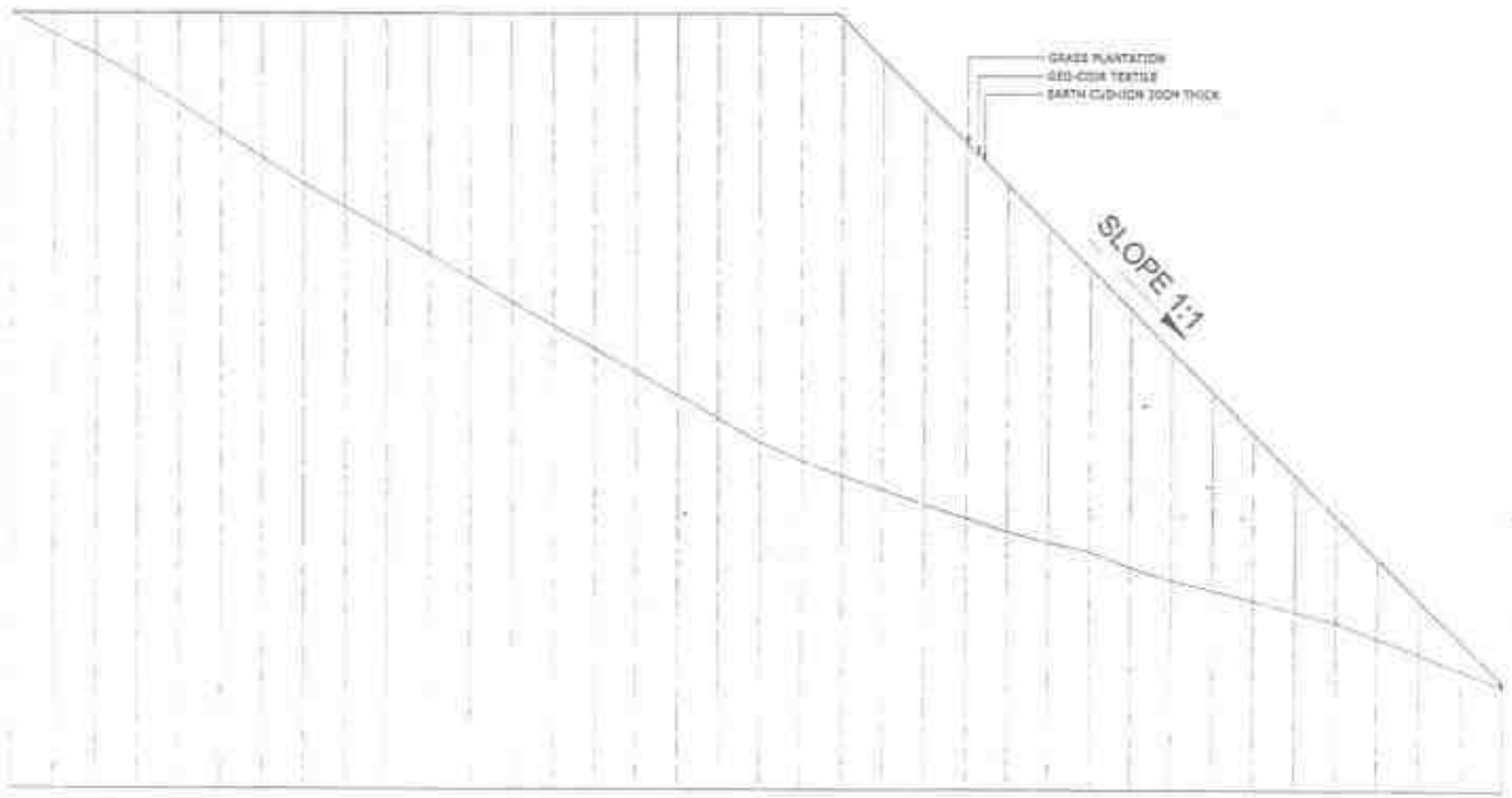


DATUM: 615M

CHAINAGE	ELEVATION
0.000	711.000
5.000	708.814
10.000	706.093
15.000	703.017
20.000	699.920
25.000	696.846
30.000	693.772
35.000	690.803
40.000	688.005
45.000	685.291
50.000	682.580
55.000	679.877
60.000	677.138
65.000	674.395
70.000	671.604
75.000	669.158
80.000	666.581
85.000	663.757
90.000	660.915
95.000	657.976
100.000	654.996
105.000	652.807
110.000	652.271
115.000	651.432
120.000	650.486
125.000	649.660
130.000	648.791
135.000	647.598
140.000	645.344
145.000	642.418
150.000	640.362
155.000	639.155
160.000	637.943
165.000	636.735
170.000	635.484
175.000	633.866
180.000	632.201
185.000	630.415
191.000	628.214

RD At 210 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 615M

CHAINAGE	ELEVATION
0.000	708.000
5.000	705.512
10.000	703.108
15.000	700.335
20.000	697.193
25.000	693.904
30.000	690.689
35.000	687.548
40.000	684.742
45.000	681.958
50.000	679.112
55.000	676.304
60.000	673.439
65.000	670.623
70.000	667.847
75.000	665.036
80.000	662.218
85.000	659.464
90.000	656.630
95.000	654.456
100.000	652.066
105.000	650.957
110.000	649.257
115.000	647.588
120.000	646.034
125.000	644.708
130.000	643.625
135.000	641.717
140.000	640.202
145.000	638.964
150.000	637.752
155.000	636.483
160.000	635.121
165.000	633.273
170.000	631.368
175.000	629.384
180.000	627.436

RD At 220 Mtrs.

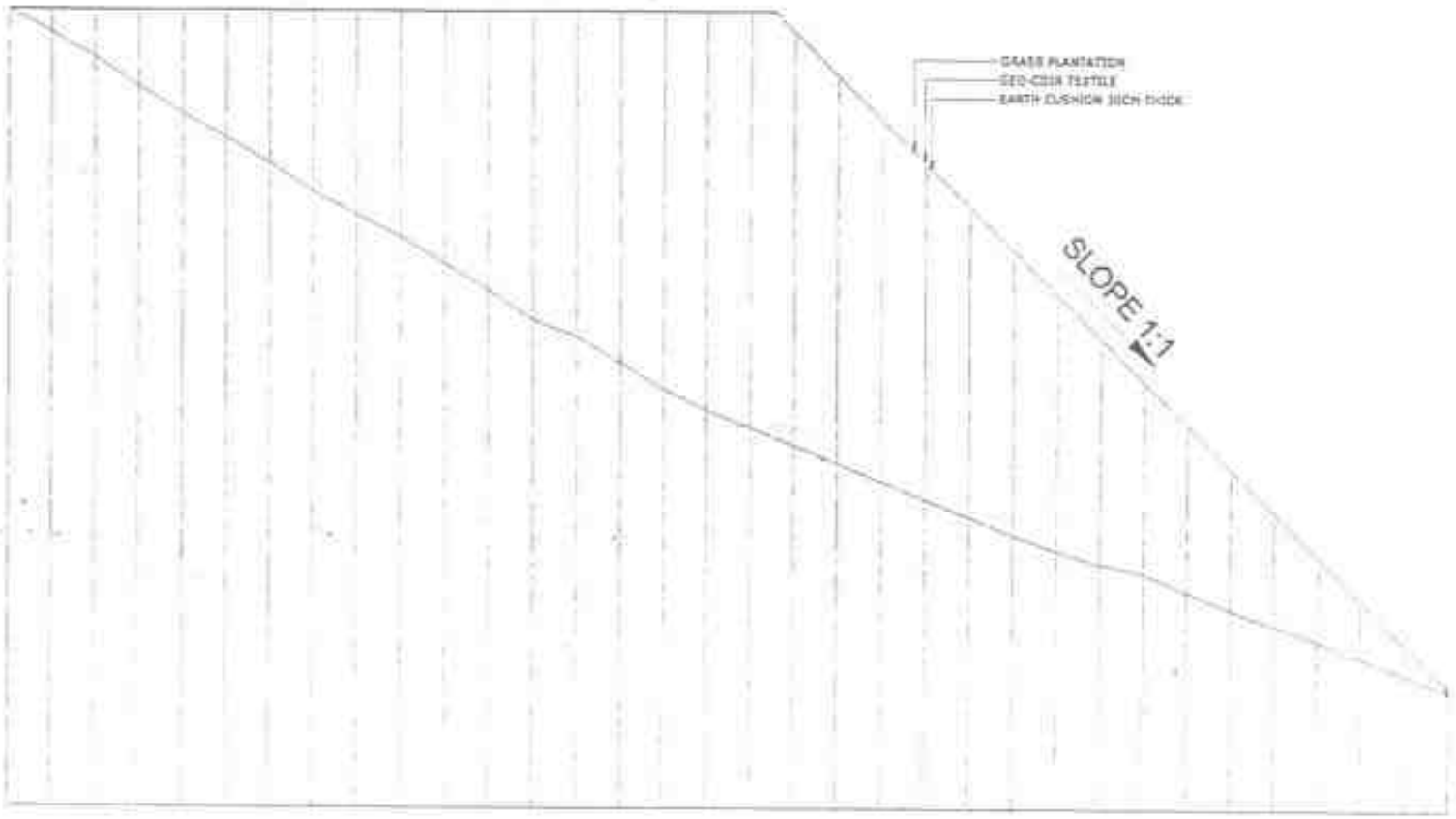
X-SECTION OF MUCK DUMPING SITE-2

RD At 230 Mtrs.

DATUM: 615M

CHAINAGE	ELEVATION
0.000	707.000
5.000	703.282
10.000	699.620
15.000	695.925
20.000	692.564
25.000	690.070
30.000	687.293
35.000	684.439
40.000	681.605
45.000	678.762
50.000	675.971
55.000	673.104
60.000	670.230
65.000	667.392
70.000	664.585
75.000	661.720
80.000	658.947
85.000	656.800
90.000	654.917
95.000	653.093
100.000	651.291
105.000	649.476
110.000	647.645
115.000	645.767
120.000	643.880
125.000	642.083
130.000	640.367
135.000	639.033
140.000	637.820
145.000	636.520
150.000	635.038
155.000	633.141
160.000	631.207
165.000	629.253
168.000	628.142

X-SECTION OF MUCK DUMPING SITE-2

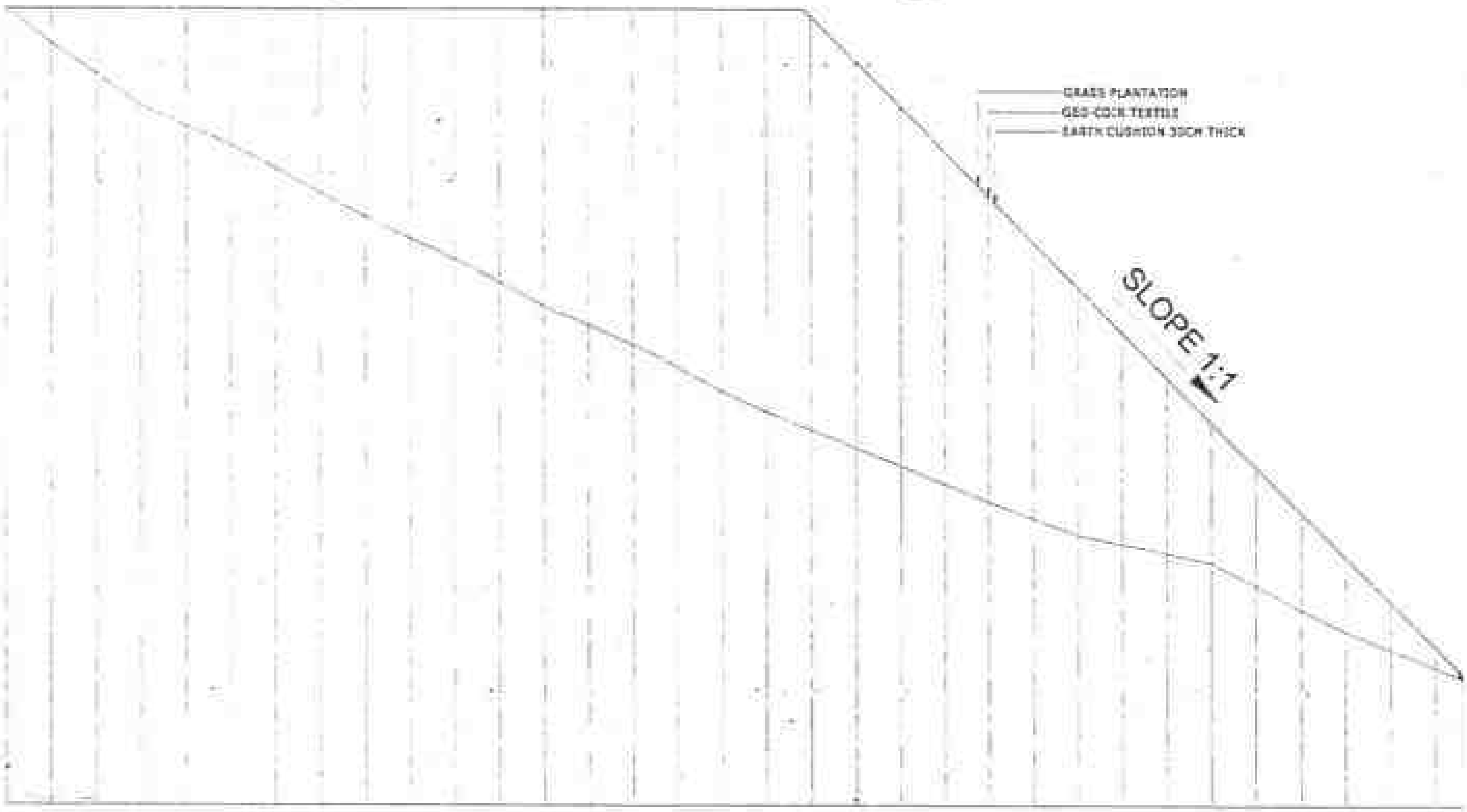


DATUM: 615M

CHAINAGE	ELEVATION
0.000	706.000
5.000	703.436
10.000	700.544
15.000	697.273
20.000	694.151
25.000	691.464
30.000	688.526
35.000	685.286
40.000	682.716
45.000	680.210
50.000	677.253
55.000	674.132
60.000	670.804
65.000	668.853
70.000	665.900
75.000	662.898
80.000	660.546
85.000	658.500
90.000	656.502
95.000	654.479
100.000	652.437
105.000	650.380
110.000	648.352
115.000	646.320
120.000	644.491
125.000	643.051
130.000	641.981
135.000	639.925
140.000	637.868
145.000	636.074
150.000	634.364
155.000	632.431
160.000	630.502
165.000	628.586

RD At 240 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2

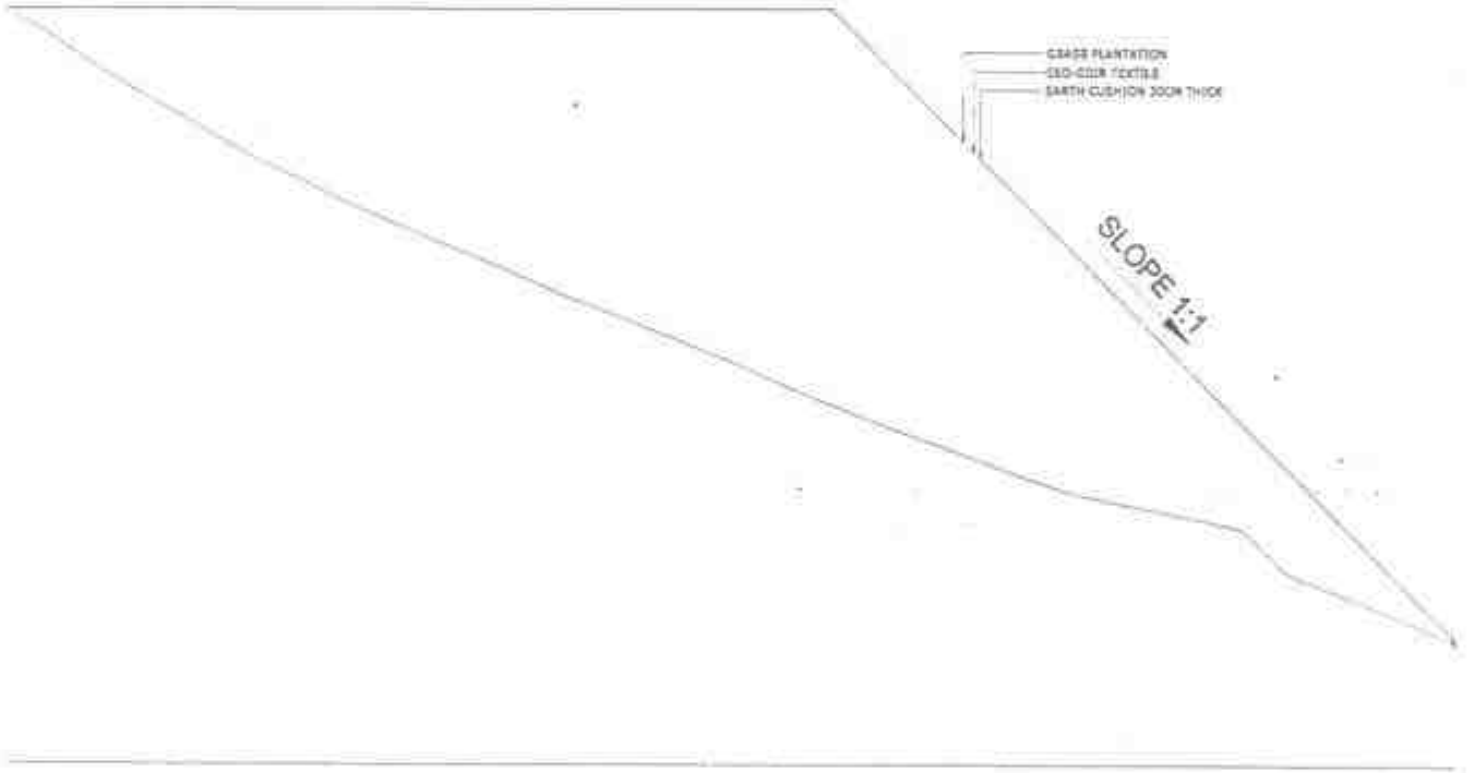


DATUM: 615M

CHAINAGE	ELEVATION
0.000	703.000
5.000	699.184
10.000	695.772
15.000	692.360
20.000	690.045
25.000	688.038
30.000	685.480
35.000	682.746
40.000	680.113
45.000	677.719
50.000	675.492
55.000	672.954
60.000	670.303
65.000	668.209
70.000	666.075
75.000	663.579
80.000	660.914
85.000	658.678
90.000	656.674
95.000	654.672
100.000	652.669
105.000	650.671
110.000	648.712
115.000	646.884
120.000	645.055
125.000	644.034
130.000	643.037
135.000	642.040
140.000	639.434
145.000	636.761
150.000	634.320
155.000	632.330
160.000	630.340
163.000	629.251

RD At 250 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 615M

CHAINAGE	ELEVATION
0.000	703.000
5.000	700.053
10.000	696.583
15.000	693.517
20.000	690.698
25.000	687.832
30.000	684.978
35.000	682.776
40.000	680.221
45.000	678.158
50.000	676.066
55.000	674.015
60.000	671.882
65.000	669.623
70.000	667.684
75.000	665.727
80.000	663.764
85.000	661.781
90.000	659.590
95.000	657.481
100.000	655.534
105.000	653.682
110.000	651.865
115.000	650.039
120.000	648.160
125.000	646.591
130.000	645.527
135.000	644.588
140.000	643.657
145.000	642.436
150.000	637.471
155.000	635.469
160.000	633.549
165.000	631.516
170.000	629.265

RD At 260 Mtrs.

SD 576

X-SECTION OF MUCK DUMPING SITE-2

DATUM: 615M

CHAINAGE	ELEVATION
0.000	702.000
5.000	698.269
10.000	695.000
15.000	691.904
20.000	689.431
25.000	686.920
30.000	684.273
35.000	681.756
40.000	679.866
45.000	678.193
50.000	676.291
55.000	674.271
60.000	672.071
65.000	669.837
70.000	667.644
75.000	665.768
80.000	664.052
85.000	662.660
90.000	661.648
95.000	660.343
100.000	658.628
105.000	658.842
110.000	654.993
115.000	653.190
120.000	651.483
125.000	649.782
130.000	648.572
135.000	647.429
140.000	645.862
145.000	643.923
150.000	641.755
155.000	637.811
160.000	635.440
165.000	633.287
170.000	630.704

RD At 270 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2

DATUM: 615M

CHAINAGE	ELEVATION
0.000	700.000
5.000	697.389
10.000	694.771
15.000	691.922
20.000	689.833
25.000	687.880
30.000	685.229
35.000	683.203
40.000	681.251
45.000	679.313
50.000	677.425
55.000	675.675
60.000	673.922
65.000	672.168
70.000	670.268
75.000	668.560
80.000	666.929
85.000	665.166
90.000	663.258
95.000	661.020
100.000	658.790
105.000	656.605
110.000	654.408
115.000	652.210
120.000	649.799
125.000	647.523
130.000	645.409
135.000	643.374
140.000	641.348
145.000	638.992
150.000	636.568
155.000	633.708

RD At 290 Mtrs.

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X-SECTION OF MUCK DUMPING SITE-2

DATUM: 615M

CHAINAGE	ELEVATION
0.000	698.000
5.000	693.979
10.000	690.327
15.000	686.983
20.000	684.853
25.000	682.942
30.000	680.788
35.000	678.428
40.000	676.192
45.000	674.080
50.000	672.031
55.000	669.974
60.000	667.949
65.000	665.875
70.000	663.601
75.000	661.159
80.000	658.738
85.000	656.493
90.000	654.154
95.000	651.803
100.000	649.306
105.000	646.874
110.000	644.516
115.000	642.375
120.000	640.144
125.000	637.753
130.000	635.363
135.000	632.695

RD At 300 Mtrs.

X-SECTION OF MUCK DUMPING SITE-2

RD At 310 Mtrs.

DATUM: 615M

CHAINAGE	ELEVATION
0.000	697.000
5.000	693.815
10.000	690.334
15.000	687.358
20.000	684.918
25.000	682.469
30.000	679.833
35.000	677.403
40.000	674.995
45.000	672.584
50.000	670.303
55.000	668.094
60.000	665.752
65.000	663.232
70.000	660.735
75.000	658.328
80.000	655.923
85.000	653.453
90.000	650.943
95.000	648.474
100.000	646.031
105.000	643.583
110.000	641.144
115.000	639.393
120.000	637.164
125.000	634.471
130.000	631.803

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X-SECTION OF MUCK DUMPING SITE-2

DATUM: 615M

CHAINAGE	ELEVATION
0.000	695.000
5.000	691.118
10.000	687.998
15.000	685.301
20.000	682.424
25.000	680.030
30.000	677.637
35.000	675.206
40.000	672.676
45.000	669.944
50.000	667.009
55.000	664.081
60.000	661.199
65.000	658.466
70.000	655.812
75.000	653.302
80.000	651.097
85.000	649.036
90.000	647.059
95.000	645.120
100.000	643.208
105.000	641.309
110.000	639.267
115.000	636.911
120.000	634.458
123.000	632.721

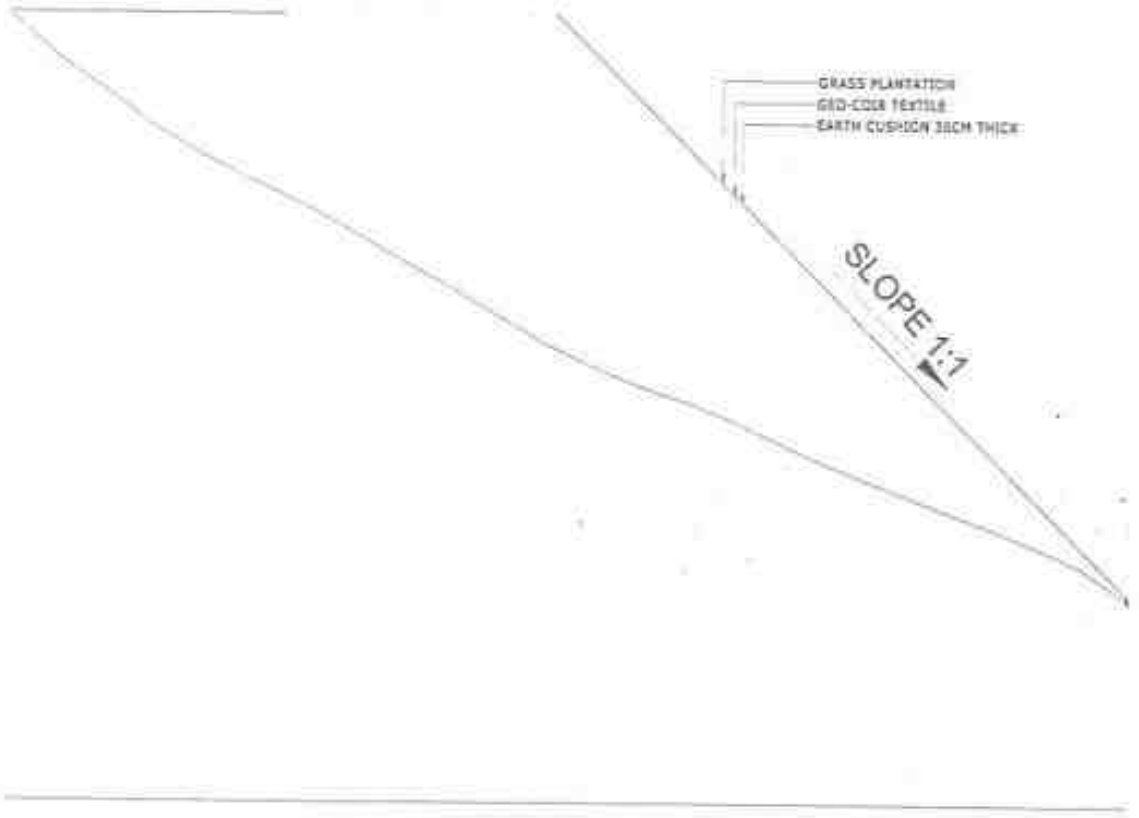
RD At 320 Mtrs.

RD At 330 Mtrs.

DATUM: 615M

CHAINAGE	ELEVATION
0.000	695.000
5.000	691.036
10.000	687.459
15.000	684.630
20.000	681.945
25.000	679.528
30.000	677.140
35.000	674.383
40.000	671.627
45.000	668.787
50.000	665.840
55.000	662.892
60.000	659.943
65.000	657.037
70.000	655.034
75.000	653.109
80.000	651.041
85.000	649.055
90.000	647.153
95.000	645.250
100.000	643.345
105.000	641.440
110.000	639.371
115.000	636.796
120.000	633.976

X-SECTION OF MUCK DUMPING SITE-2



DATUM: 615M

CHAINAGE	ELEVATION
0.000	695.000
5.000	690.528
10.000	687.050
15.000	683.428
20.000	680.512
25.000	677.985
30.000	675.678
35.000	672.978
40.000	670.115
45.000	667.351
50.000	664.414
55.000	661.569
60.000	659.177
65.000	657.169
70.000	655.555
75.000	653.470
80.000	651.096
85.000	649.022
90.000	647.113
95.000	645.200
100.000	643.302
105.000	641.406
110.000	639.167
115.000	635.706

RD At 340 Mtrs.

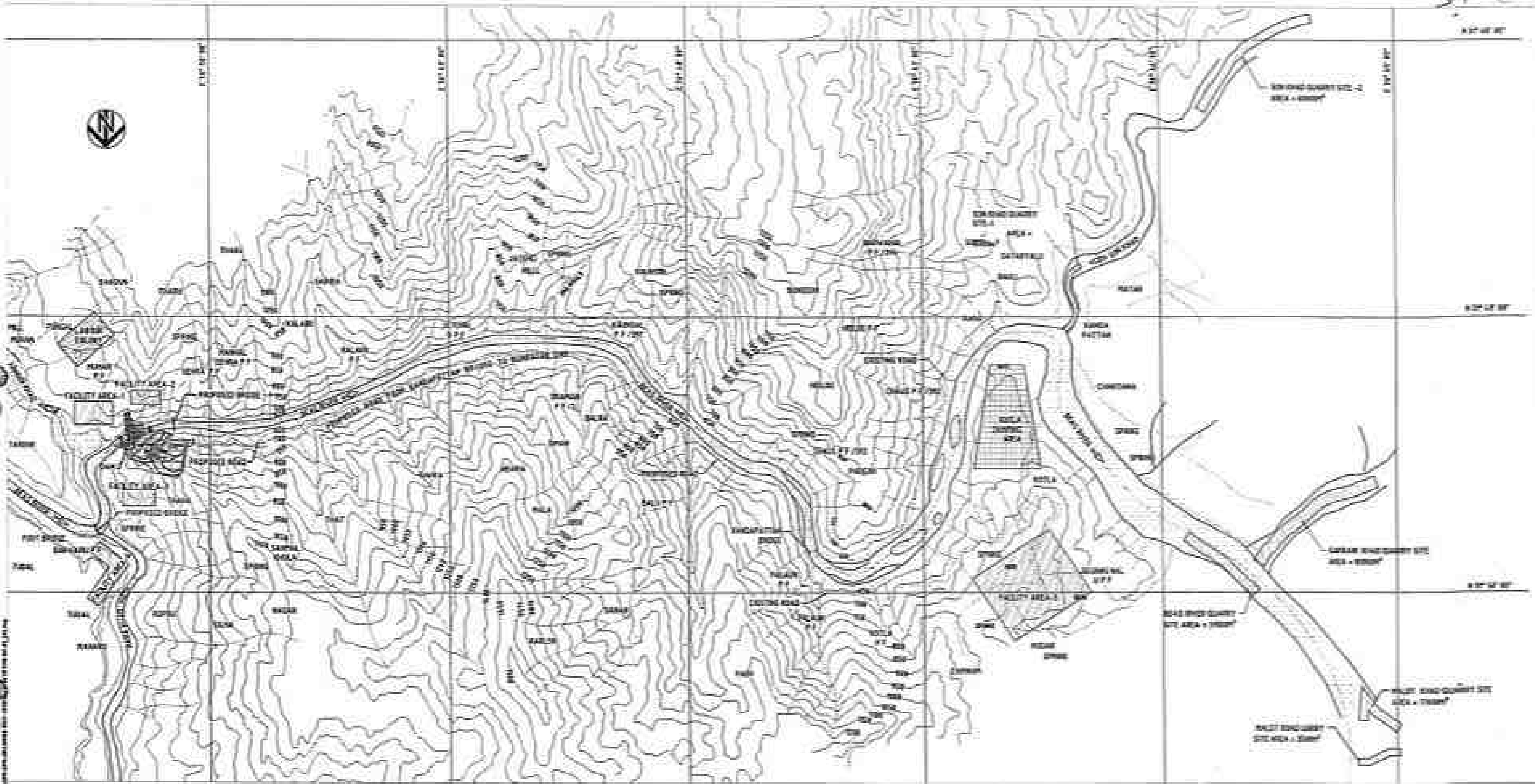
X-SECTION OF MUCK DUMPING SITE-2

DATUM: 615M

CHAINAGE	ELEVATION
0.000	694.447
5.000	689.595
10.000	685.651
15.000	682.113
20.000	679.427
25.000	676.856
30.000	674.219
35.000	671.415
40.000	668.587
45.000	665.939
50.000	663.016
55.000	660.455
60.000	658.627
65.000	656.991
70.000	655.408
75.000	653.192
80.000	650.767
85.000	648.655
90.000	646.681
95.000	644.632
100.000	642.545
105.000	639.993
110.000	636.771
113.000	634.000

RD At 345 Mtrs.

570



LAND REQUIREMENT FOR INFRASTRUCTURE WORKS

SL. NO.	LEGENDS	DESCRIPTION	AREA (m²)
1.		LABOUR COLONY-1	[illegible]
2.		FACILITY AREA-1	[illegible]
3.		FACILITY AREA-2	[illegible]
4.		FACILITY AREA-3	[illegible]
5.		FACILITY AREA-4	[illegible]
6.		FACILITY AREA-5	[illegible]
7.		MALST ROAD QUARRY SITE AREA-1	[illegible]
8.		MALST ROAD QUARRY SITE AREA-2	[illegible]

LAND REQUIREMENT FOR INFRASTRUCTURE WORKS

SL. NO.	LEGENDS	DESCRIPTION	AREA (m²)
9.		SIR KHAD QUARRY SITE AREA-1	[illegible]
10.		SIR KHAD QUARRY SITE AREA-2	[illegible]
11.		BEAS RIVER QUARRY SITE AREA	[illegible]
12.		SAKRAIN KHAD QUARRY SITE AREA	[illegible]
13.		MUCK DISPOSAL AREA-3	[illegible]
14.		APPROACH ROADS	[illegible]
15.		POWER HOUSE TO TRT AREA	[illegible]

SL. NO.	DESCRIPTION	AREA (m²)
16.	[illegible]	[illegible]

NOTES:-

1. ALL DIMENSIONS AND LEVELS ARE IN METERS, UNLESS OTHERWISE SPECIFIED.
2. NO DIMENSIONS SHALL BE MEASURED FROM THE DRAWING. ONLY WRITTEN DIMENSIONS ARE TO BE FOLLOWED.

Rev	Revision		
A	ISSUED FOR APPROVAL		

HIMACHAL PRADESH POWER CORPORATION LTD.

SMEC

HIMACHAL PRADESH POWER CORPORATION LIMITED

THANA PLAUN HYDRO ELECTRIC PROJECT, H.P.

PROPOSED LAYOUT INFRASTRUCTURE WORKS

A1 | D.P.R. | 1338-INV-01 | A

139

FULL TITLE OF THE PROJECT: **THANA PLAUN (191MW) HYDROELECTRIC PROJECT**

PROPOSAL NO.: **FP/HP/HYD/8255 /2014**

DATE OF PROPOSAL: **NOVEMBER 29TH,2014**

CHECK LIST SERIAL NUMBER: -33

(COST BENEFITS ANALYSIS)

572.

Name of Project: Thana Plaun HEP (191MW) in Distt. Mandi, H.P
Name of Executing Agency: Himachal Pradesh Power Corporation Limited.
Forest land involved: 406.79 Ha.

CHECKLIST NO:33

Cost Benefit Analysis

Case under which a cost –benefit analysis for forest diversion are required

Sr.No.	Nature of proposal	Applicable /not applicable	Remarks
1.	All categories of proposals involving forest land up to 20 hectares in plains and up to 5 hectare in hill.	Not applicable	
2.	Proposal for defence installation purposes and oil prospecting (prospecting only).	Not applicable	
3.	Habitation, establishment of industrial, units, tourist lodges complex and other building construction.	Not applicable	
4.	All other proposals involving forestland more than 20 hectares in plains and more than 5 hectares in hills including roads, transmission lines, minor, medium and major irrigation projects, hydro projects , mining activity ,railway lines, location specific installations like micro-wave stations, auto repeater centres, TV towers etc.	Applicable	Thana Plaun Hydro-electric Project (191 MW) is conceived as storage cum run-of-river scheme. The proposed Thana Plaun Hydro-electric Project located in Mandi District of Himachal Pradesh, lies between Longitude 76^0 15' to 77^0 45' East and Latitude 35^0 45' to 32^0 30' North. After detailed survey/studies the land requirement for the project has been finalised. Total Forest land required for the construction of the project is **406.79 hectares.**

General Manager
T.M & TP HEPs HPPCL
Distt. Mandi (H.P.)

Parameters of Evaluation of Loss of Forest (Cost)

No.	Parameters	Rates of NPV (in Rs.)	Value of loss (in Rs)
1.	Ecosystem services losses due to proposed forest diversion.	6, 57,000/- per Ha.	267261030/-
2	Loss of animal husbandry productivity, including loss of fodder.	10 % of NPV	26726103/-
3.	Cost of human resettlement	Nil	Nil
4.	Loss of public facilities and administrative infrastructure (Roads, building, schools, dispensaries, electric lines, railways, etc.) on forest land, which would require forest land if these facilities were diverted due to the project.	Nil	Nil
5	Possession value of forest land diverted	30 % of NPV	80178309/-
6.	Cost of suffering to oustees	Nil	Nil
7.	Habitat Fragmentation cost	50 % of NPV	133630515/-
8.	Compensatory afforestation and soil & moisture conservation cost.	----------	182060121/-
	Total		**689856078/-**
			Or say Rs. 6898 lakh.

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

PARAMETERS OF EVALUATION OF BENEFITS NOT WITH STANGING LOSS OF FORESTS (BENEFITS).

Nature of Proposal			Hydro Electric Project		
Sr. No.	**Parameter**	**Applicability vis-à-vis nature of proposal and explanation.**	**Quantity of Benefit**	**Rate in Rupees**	**Monetary Value of Benefit (Rs. in lakh)**
1.	increase in productivity attributable to the specific project	Applicable as in case of HEP. Though irrigation is not feasible in this run of the river project hence in primary sector no benefit may accrue yet the productivity increase in secondary and tertiary sector is likely to increase. This excludes revenue from sale of power *	500 units	10 000/- unit per year	2500.00
2.	Benefits to economy due to specific project.	Revenue from sale of power annually. For the total project period ^ it would increase tremendously.	668.07 Gwh (Giga-watt-hour) or 668070000 units Per year	3.00 per unit	2004.21
3.	No. of population benefited due to specific project.	Increase availability of power will give impetus to industry and service sector as indirect employment etc#	5000 persons	1000 per capita per year	2500.00
4.	Economic benefit due to direct and indirect Employment due to the project.	Direct employment (for period of three years)$ (construction phase)	1200 persons	150000 per year	8100.00
		Direct employment (for a period of 50 years)$ (Post construction phase)	200	240000 per year	24000.00
5	Economic benefits due to Compensatory afforestation.		50 years	NIL	0
	Total (Benefits)	-	-	-	**39104.2 Lakh**

Notes @ Explanations.

1.*The benefiting units in terms of an increase in productivity vary greatly in secondary and tertiary sectors. As such this kind of distant benefit is difficult to quantify and monetize. However, the taking the beneficiary as units (whether as industries, service sectors companies or individuals) the quantity of benefit is attempted to be defined for a period of 50 years. This is highly conservative estimate.

2. ^If the benefit to the economy is calculated for a period of 50 years (ie expected life of the project) then it comes to 100210.5 lac Rupees.

3. #However, the indirect employment in a post construction scenario is expected to then rise as the power supply begins to the industries and urban areas. About 5000 people are expected to benefit annually for a period of 50 years in the secondary and tertiary sectors @ Rs 1000 per person in a year gaining benefit of Rs 100 lac annually.

4. $Direct employment of people during construction period is to be the tune of 1200 persons @Rs 225 per day for about 300 days in a year. During the construction phase approximately 250 people in service and trade would also benefit for which no monetization is possible. The direct employment would come down drastically in a post construction phase and about 200 persons would be there for maintenance and for power supply as regular employees @ Rs 20000/-pm average salary (annual Rs 240000/-)

Cost Benefit Analysis.

	Rs in lakh
Total loss(cost)	**6898 lakh**
Total Benefit	**39104.2 Lakh**
Cost Benefit Ratio	**1:5.7**

DATE : 14/11/2019
PLACE : KOTLI

General Manager
TM & TP HEPs HPPCL
Kotli, Distt. Mandi (H.P.)

575

FULL TITLE OF THE PROJECT: **THANA PLAUN (191MW) HYDROELECTRIC PROJECT**

PROPOSAL NO.: **FP/HP/HYD/8255 /2014**

DATE OF PROPOSAL: **NOVEMBER 29TH,2014**

CHECK LIST SERIAL NUMBER: -34

(ADDITIONAL INFORMATION)

Joint Inspection Report in respect of Forest & Govt. land required for proposed Thana Plaun Hydro-Electric Project (191MW) of HPPCL in Distt. Mandi in the Jurisdiction of Forest Division Jogindernagar (HP).

A joint inspection for the site of the proposed Thana Plaun Hydro-Electric Project (191MW) of HPPCL in Distt. Mandi (HP) was conducted by the officers/officials of State Forest Department, Revenue Department, HPPCL Engineers & other Govt. Department on dated 16.07.2015.

Thana Plaun Hydro-Electric Project (191MW) is located between latitude $76^0$15'E to $77^0$45'E and a longitude $31^0$30' to $32^0$30' in Distt. Mandi of Himachal Pradesh on Beas river about 1 Km downstream of Kunkatar bridge and 500 M downstream of confluence of Rana khad with river Beas. The scheme has been planned as a run-off river cum storage scheme on the right bank of river Beas with its Dam across the river Beas and underground Power house located on right bank of river Beas near village Thana. The Reservoir of the proposed dam at full reservoir level (FRL) ±716 m will submerge the area along both banks of river Beas up-to Village Arthi/Bijan, village Mahan along Arnodi Khad and up-to Village Bharmera/Banogi along Rana khad in Distt. Mandi (HP).

During the joint inspection, Forest land 163.95 Hectare in the jurisdiction of forest Division Jogindernagar for Project components i.e Dam, underground Power House & Transformer Cavern, Pothead Yard, Submergence area, Roads, Dumping sites and Quarry sites was inspected and following points were discussed:-

a) The proposed alternative was discussed and minimum use of forest land to be used in the project in respected Muhals and Khasra numbers wise detail of Forest land which comes in submergence of river Beas & Rana khad, Project Components and Roads was discussed and examined.

b) "No archaeological monuments or defence establishment" are located and involved for displacement at site or near the proposed site of project.

c) It was examined that there is no danger to rare and endangered species of Flora & Fauna involved in the identified forest land area and nearby.

Accordingly, the committee recommended the proposal for implementation of the project by HPPCL. It is brought to the notice of HPPCL that Forest & Govt. land may not be used for construction of main works except geological exploration works, topographical & detailed survey works, geological mapping work before prior approval of Central Govt. under Forest (Conservation) Act, 1980. FCA of required forest land shall be prepared in due course of time for due approval of competent authority.

Rajeev Kaundal,
Divisional Forest Officer,
Forest Division, Mandi
Distt. Mandi (HP)

Rahul Chauhan,
Sub-Divisional Magistrate,
Sub-Division, Joginder nagar,
Distt. Mandi (HP).

Gian Chand,
Naib Tehsildar,
Tehsil Padhar,
Distt. Mandi (HP).

Pawan Kumar,
Naib Tehsildar,
Tehsil Dharampur,
Distt. Mandi (HP).

Er. Balbir Singh,
Senior Manager -II,
Thana Plaun HEP,
HPPCL, Sujanpur Tihra,
Distt Hamirpur (H.P).

Er. D.C. Kaundal,
Senior Manager,
O/o GM TM &TP, HEP 's
HPPCL, Sujanpur Tihra,
Distt Hamirpur (H.P).

Er. Sanjay Kumar Ranot,
Assistant Engineer (E),
Thana Plaun HEP,
HPPCL, Sujanpur Tihra,
Distt Hamirpur (H.P).

Er. Vishal Sharma,
Engineer (Environment),
O/o GM TM &TP, HEP 's
HPPCL, Sujanpur Tihra,
Distt Hamirpur (H.P).

Nagender Guleria,
Range Officer,
Range Office -
Joginder nagar,
Distt. Mandi (HP).

Rattan Chand,
Range Officer,
Range Office,
Dharampur,
Distt. Mandi (HP).

O.P. Chandel,
Range Officer,
Range Office Urla,
Distt. Mandi (HP).

Er. D.K. Chauhan,
Junior Engineer,
HPPWD Sub-Div-II,
Joginder nagar,
Distt. Mandi (HP).

Er. Sanjeev Kumar,
Junior Engineer,
HP I&PH
Sub-Division, Padhar,
Distt. Mandi (HP).

578
377

Joint Inspection Report in respect of Forest & Govt. land required for proposed Thana Plaun Hydro-Electric Project (191MW) of HPPCL in Distt. Mandi in the Jurisdiction of Forest Division Mandi (HP).

A joint inspection for the site of the proposed Thana Plaun Hydro-Electric Project (191MW) of HPPCL in Distt. Mandi (HP) was conducted by officers/official of State Forest Department, Revenue Department & HPPCL on dated 27.04.2015.

Thana Plaun Hydroelectric Power Project is located between latitude 76°15'E to 77°45'E and longitude 31°45'N to 32°30'N in Distt. Mandi of Himachal Pradesh on Beas River about 1 Km downstream of Kunkatar bridge and 500 M downstream of confluence of Rana Khad with river Beas. The scheme has been planned as a run-off river cum storage scheme on right bank of river Beas with its Dam across the river Beas and underground Power house located on right bank of river Beas near village Thana. The Reservoir of the proposed dam at full reservoir level (FRL) ± 716 m in Mandi Distt. will submerge the area along both banks of river Beas up-to Village Arthi, and village Mahan along Arnodi Khad in Distt. Mandi (HP).

During the inspection, Forest Land 242.84 Hectare in Mandi Distt. for road, Dam site and land coming under submergence area in length of 16.3 KM along river Beas and 1.5 KM length along Arnodi Khad was inspected and following points were discussed:-

a) The proposed alternative was discussed and minimum use of forest land to be used in the project in respected Muhals and Khasra numbers wise detail of Forest land which comes in submergence of river Beas & Arnodi khad, road and Dam site was discussed and examined.
b) "No archaeological monuments or defence establishment" are located and involved for displacement at site or near the proposed site of project.

579/18

c) It was examined that there is no danger to rare and endangered species of Flora & Fauna involved in the identified forest land area and nearby.

Accordingly, the committee recommend the proposal for implementation of the project by HPPCL. It is brought to the notice of HPPCL that Forest & Govt. land may not be used for construction of main works except geological exploration works, topographical & detailed survey works, geological mapping work before prior approval of Central Govt. under Forest (Conservation) Act, 1980. FCA of required forest land shall be prepared in due course of time for due approval of competent authority.

Vasanth Kiran Babu (IFS),
Divisional Forest Officer,
Forest Division, Mandi,
Distt. Mandi (HP)

Vivek Bhatia (IAS),
Sub-Divisional Magistrate,
Sub-Division, Mandi,
Distt. Mandi (HP)

Er. Balbir Singh,
Senior Manager -II,
Thana Plaun HEP HPPCL,
Sujanpur Tihra,
Distt Hamirpur (H.P).

Er. Sanjay Kumar Ranot,
Assistant Engineer (E),
Thana Plaun HEP HPPCL,
Sujanpur Tihra,
Distt Hamirpur (H.P).

Er. Vishal Sharma,
Engineer (Environment),
Thana Plaun HEP HPPCL,
Sujanpur Tihra,
Distt Hamirpur (H.P).

Er. Vishal Chopra,
Assistant Engineer,
Sub-Division No. -IV,
HPPWD Mandi,
Distt. Mandi (H.P).

Er. Rajneesh Onkar,
Assistant Engineer,
Sub-Division HP I&PH Saigloo,
Distt. Mandi (H.P).

Full Title of the project: **Diversion of 406.79 hect. Forest Land (170.55 ha. J/Nagar and 276.24 ha. Mandi Forest Division) in favour of HP Power Cor. Ltd. for the construction of Thana Plaun (191 MW) within the jurisdiction of Joginder Nagar and Mandi Forest Division, Distt. Mandi, HP**

File No. **: FP/HP/HYD/8255/2014.**

"CERTIFICATE INDICATING AERIAL DISTANCE OF DIVERSION AREA FROM SANCTUARY"

It is certified that the aerial distance of the diversion area for proposed Thana Plaun (191MW) Hydro Electric Project from the boundary of Nargu Wild Life Sanctuary is about 18 Km.

Place: Joginder Nagar

Dated. 15-11-2019

Divisional Forests Officer,
Forest Division, Joginder Nagar
Office Seal

Divisional Forest Officer
Joginder Nagar Forest Division
Joginder Nagar (H.P.)

CHAPTER-8
RESTORATION PLAN FOR QUARRY SITES AND LANDSCAPING

8.1 INTRODUCTION

The dam site location downstream of confluence of Arnodi Khad with Beas river in Jogindernagar Tehsil of District Mandi, Himachal Pradesh is accessible from the Jogindernagar-Neri-Dharampur highway through existing unmetalled approach roads constructed by PWD (major district road on the left bank of the river) through a foot track. Power house location and other components are also accessible by the same track as these are located just downstream of the dam. As the place is visited by tourists and is a mountaineering destination in Himalaya, the tourist shall certainly visit the area. The stretch of river Beas behind the main the project will definitely add up to the natural ambience of the forests when the reservoir lake gets created. The project on completion will be a masterpiece of technology and landscape planning of the project will further add to its aesthetic value.

8.2 EXCAVATION PLAN

The investigations carried out comprise identification of borrow areas and their exploration by trial pits including collection of disturbed representative sample (DS); their testing and analysis in the laboratory as per USBR **Earth Manual / IS Code**. The borrow areas identified for the project are tabulated in the following Table 8.1.

A perusal of **Annexure III** in respect of petrographic examination report of drift rock and core samples show that the rock is geologically identified to be sandstone comprising monocrystalline quartz, feldspar, biotite, muscovite and accessory minerals. Based on review of the average values in respect of mechanical and physical properties, it is seen that the natural fine aggregates can be categorized as suitable for use in concrete for non – wearing and wearing surfaces. The total rock required from quarry sites is in the order of 730000 cum for which sites have been identified.

In-site estimated quantity of raw material at the proposed quarry site = 918800 cum

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Table 8.1: Reserve estimation of the quarry site

S. No.	Location	Quarry Area in Ha	Approximate Reserve Quantity of RBM, m^3
1	RBM at Saklain Khad quarry site	20.5	410000
2	RBM at Sen Khad quarry site	4.1	82000
3	RBM at Beas River quarry site	4.12	82400
4	RBM at Molad Khad	7.72	154400
5	RBM at Thodu Khad	9.5	190000
	Total	45.94	918800

It is estimated that 25% of the excavated quantity from quarry shall be replenished during monsoon season =29700 cum

Total= 1148500 cum

Estimated quantity of aggregates (CA & FA) required for construction of project = 730000 cum

Quantity of aggregates required considering (38% losses) as per CWC guidelines = 1007000 cum

Hence, quantity of raw aggregate available in proposed quarry sites is sufficient to meet the required quantity.

The quantity of coarse and fine aggregates required for wearing and non-wearing concrete surface;

a) Wearing surface

Coarse aggregate	=	53940 m^3
Fine aggregate	=	29471 m^3

b) Non-wearing surface

Coarse aggregate	=	403212 m^3
Fine aggregate	=	201605 m^3
Total	=	693228 m^3
Total required quantity (i/c shortcrete etc.)	=	730000 m^3

Availability of coarse aggregate and aggregate for wearing and non-wearing surface; out of total estimated raw RBM material of 1148500 cum available for coarse and fine aggregate (1148500-103000) = 1045500 cum is suitable for wearing and non-wearing surfaces. Quantity of raw material *i.e.* (82400x1.25 = 103000 cum) available from Beas river bed is suitable for non-wearing surfaces only.

Based on techno-economic considerations involving suitability of material for use, it is recommended that the materials from the excavated muck may be exploited for various civil components of Thana Plaun HEP, the quarries identified above shall be exploited only during exigency.

The breakup of 38% total losses as per CWC guidelines is given in Table 8.2.

Table 0.2: Breakup of total loss

S. No.	Description	Percentage
1	Rejection at Quarry Site	20
2	Transit losses from quarry to aggregate processing plant	5
3	In process rejection	10
4	Transit losses from aggregate processing plant to batching plant	3
	Total	**38**

(Source: DPR)

584

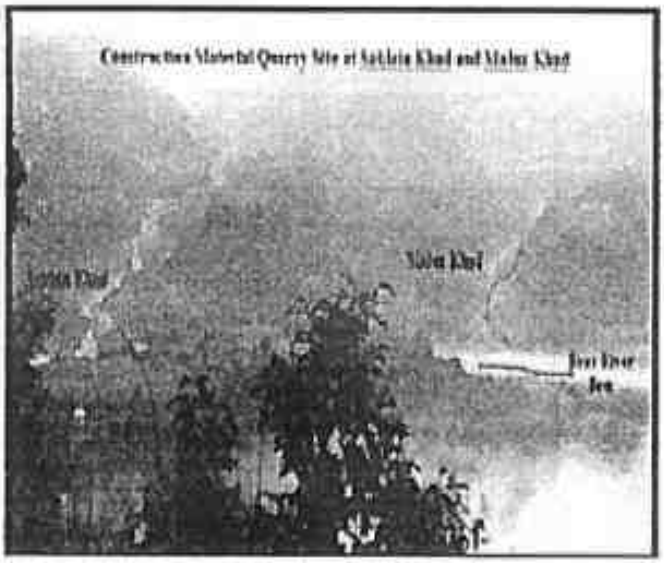


Plate 1 : Borrow area for construction work *(Source: DPR)*

Plate 2 : Borrow area for construction work *(Source: DPR)*

Before starting the excavation activities, the area would be cleared of all trees. The excavation of the quarry material would be done in a controlled and systematic way so that the abandoned site, after extraction of material, is safe and orderly.

8.3 DISTURBED SITES & THEIR RESTORATION

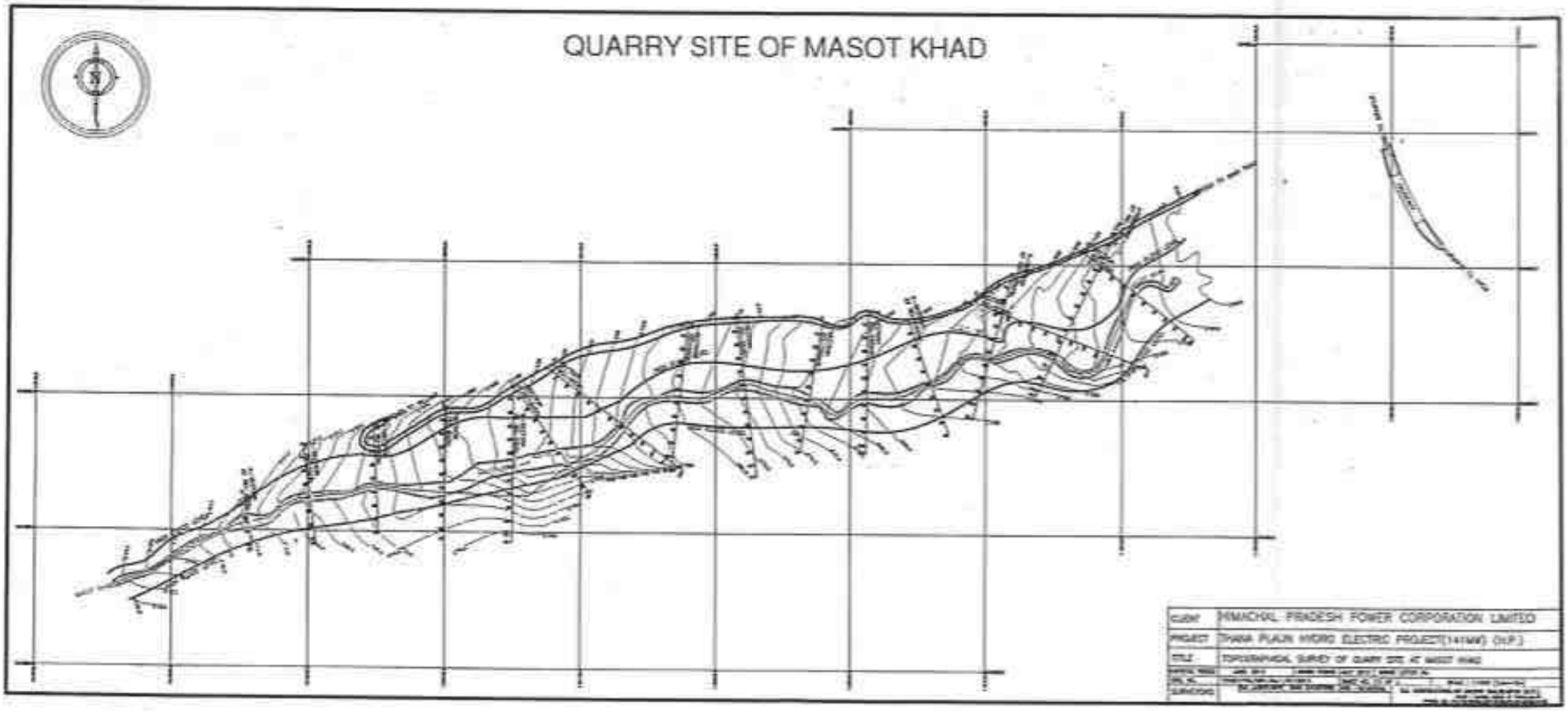
Construction activities like roads, muck dumping sites, quarry sites, colonies, workshops, offices, etc. which will change the existing land use land cover in the region. After completion of the construction work, it is required to restore the disturbed area to its original condition. Various engineering and biological measures have been suggested for the restoration of Thana-Plaun HEP affected areas. Proposed mitigation measures will also help to arrest soil erosion in the region. Restoration of quarry sites, roads and colony area is discussed and a detailed plan is given for the landscaping of the region. In the process of excavation of material, environmental degradation in and around the quarry sites, and along the haul roads is inevitable as the quarrying operation is a forced activity. In the present case, all the quarry sites are river bed shoal deposits in the Beas River, Malod, Thodu, Son and Saklan Khads, their annual replenishment shall take place during Monsoon. Such borrow areas will only need soil conservation measures to avoid the erosion of the banks of river / Khads **(Plate 1 & 2)**. The cost estimate for restoration of borrow areas has been kept for Rs. 25.00 lacs. The Financial Provisions of Landscape and Quarry Restoration Works for Thana Plaun HEP are given in Table 8.3.

There will be indirect disturbance to the area due to increase in the human population and traffic movement. It will be essential for the project authority to restore the area (Landscape) back to its original state for which a budget allocation of Rs. **10.00 lacs** is being made. Thus, the total provision under this plan shall be **Rs. 35.00 lacs.** The quarry sites drawings are attached as **Annexure III.**

Table 8.1: Financial provisions of landscape and quarry restoration works for Thana Plaun HEP

S.No	Name of Work	Amount (Rs. in Lacs)
1.	Provision for site development in and around of the project due to human intervention and traffic	10.00
2.	Restoration of Borrow Area *i.e.* bank protection activities around the quarry sites	25.00
	Total	35.00

ANNEXURE-III

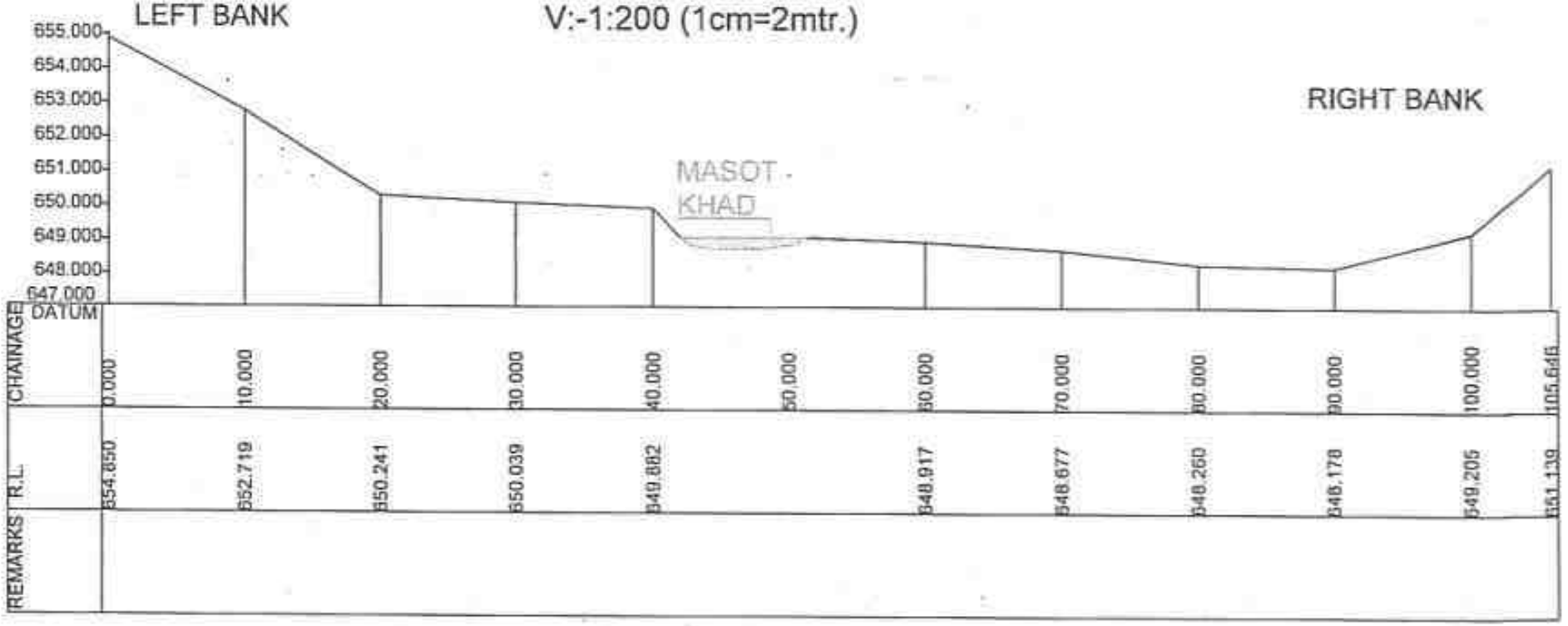

QUARRY SITE OF MASOT KHAD
CLIENT
HIMACHAL PRADESH POWER CORPORATION LIMITED
PROJECT
DHARA PLAIN HYDRO ELECTRIC PROJECT(141MW) (H.P.)
TITLE
TOPOGRAPHICAL SURVEY OF QUARRY SITE AT MASOT KHAD

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

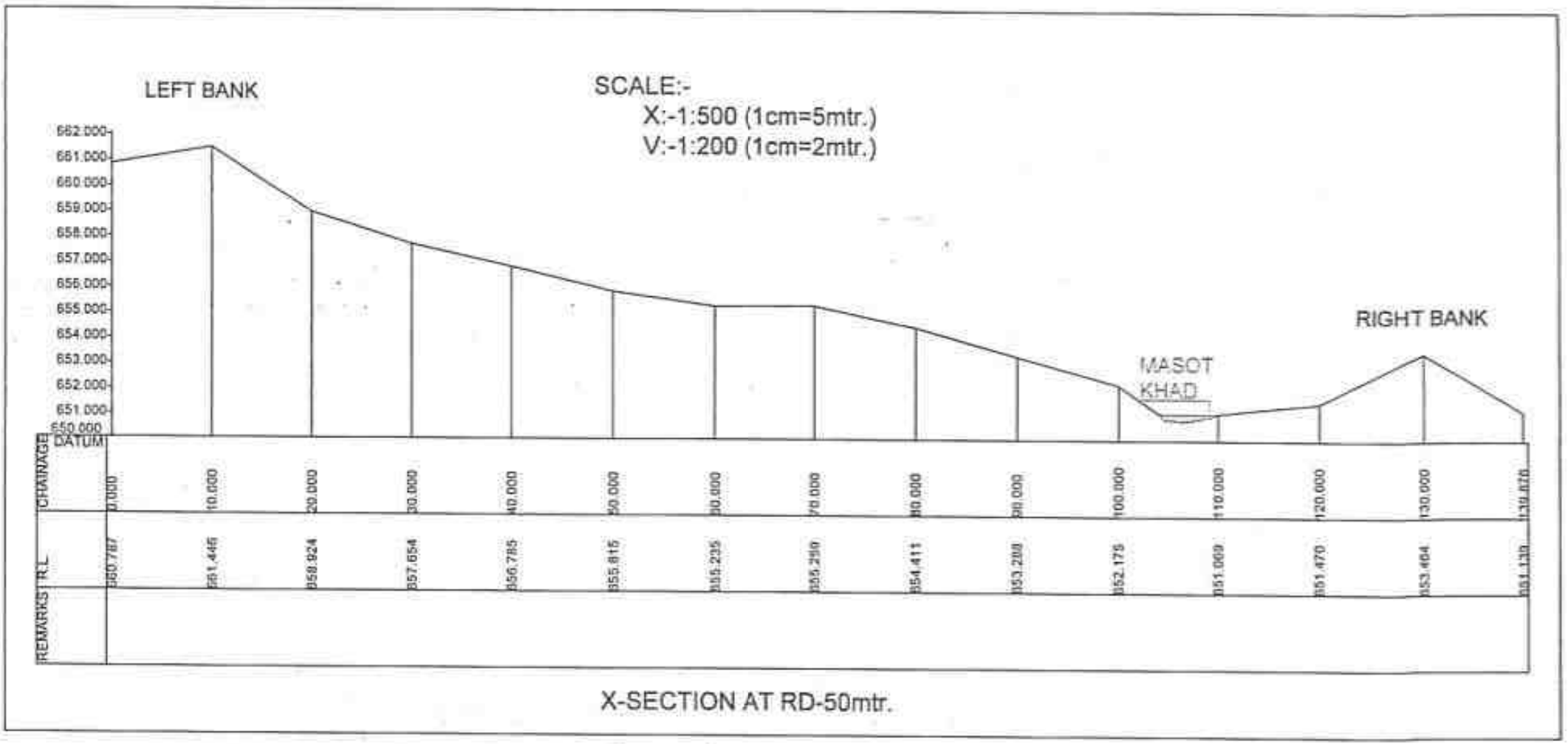
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	105.646
R.L.	654.850	652.719	650.241	650.039	649.882		648.917	648.677	648.260	648.178	649.205	651.139
REMARKS												

X-SECTION AT RD-0mtr.

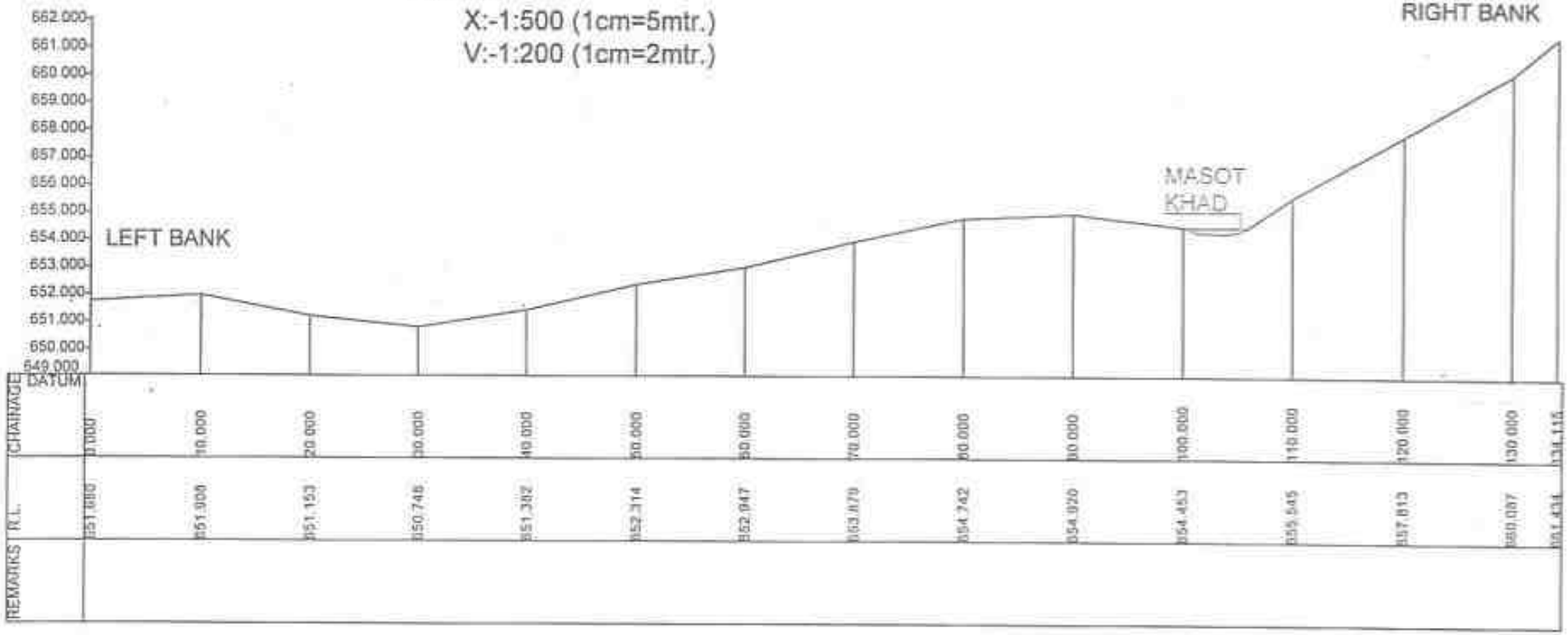
QUARRY SITE OF MASOT KHAD



X-SECTION AT RD-50mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



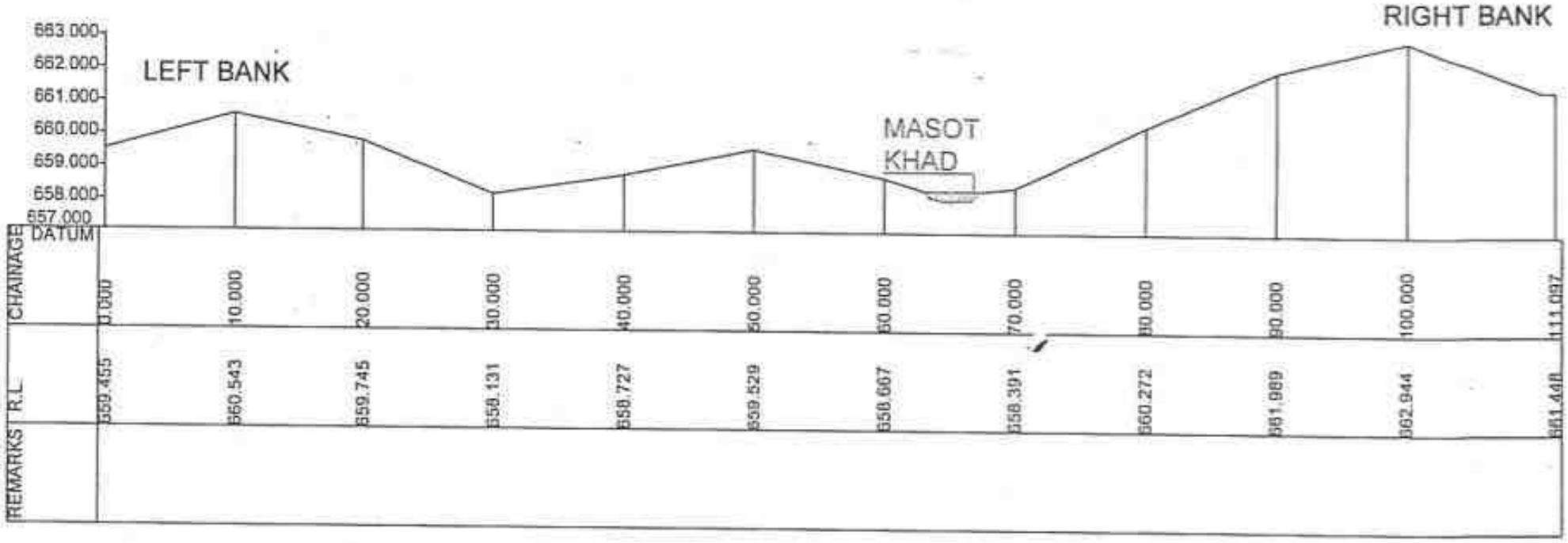
X-SECTION AT RD-100mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



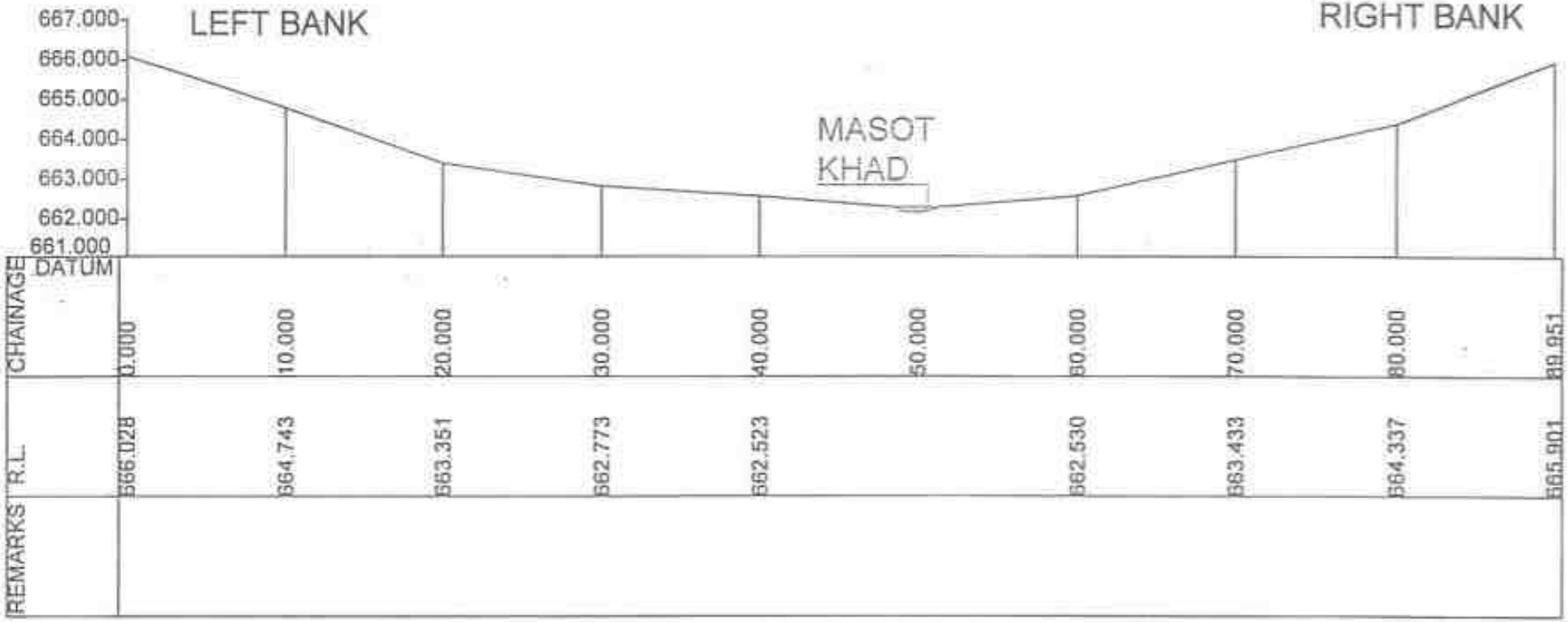
X-SECTION AT RD-150mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



X-SECTION AT RD-200mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)

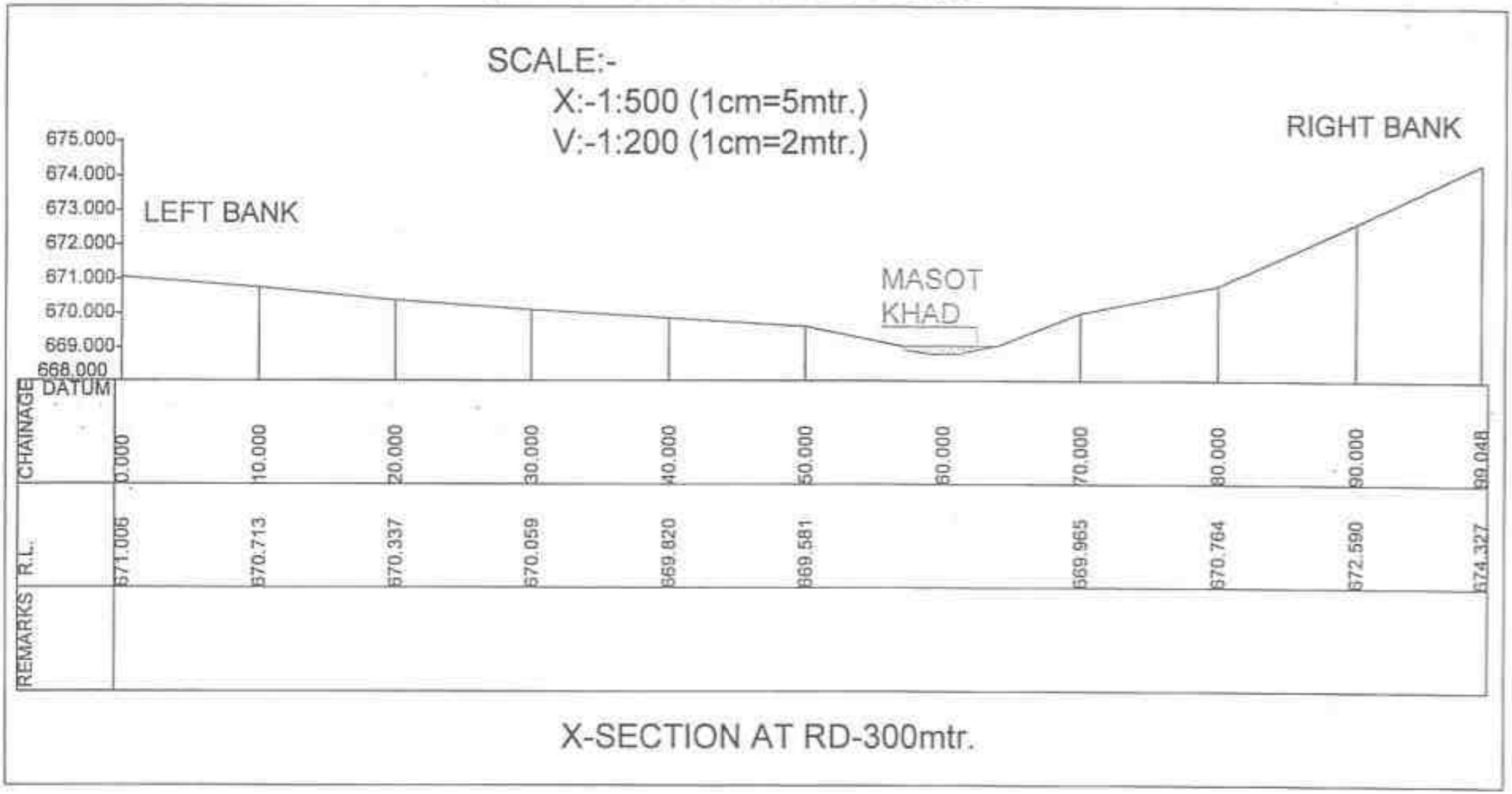
X-SECTION AT RD-250mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



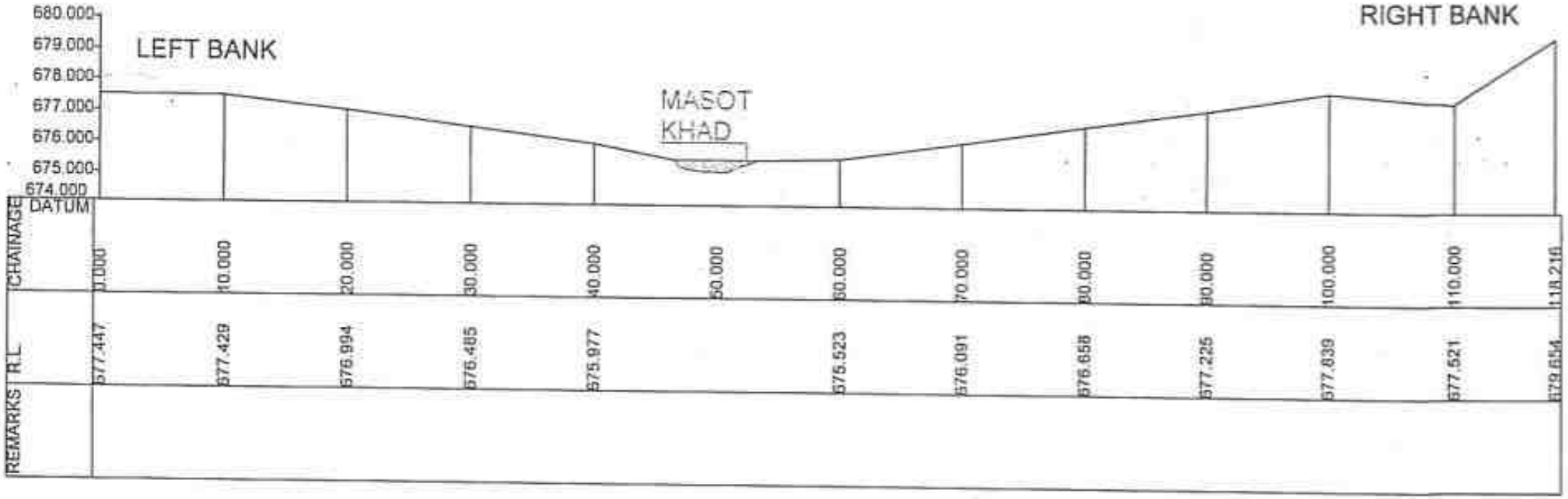
X-SECTION AT RD-300mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



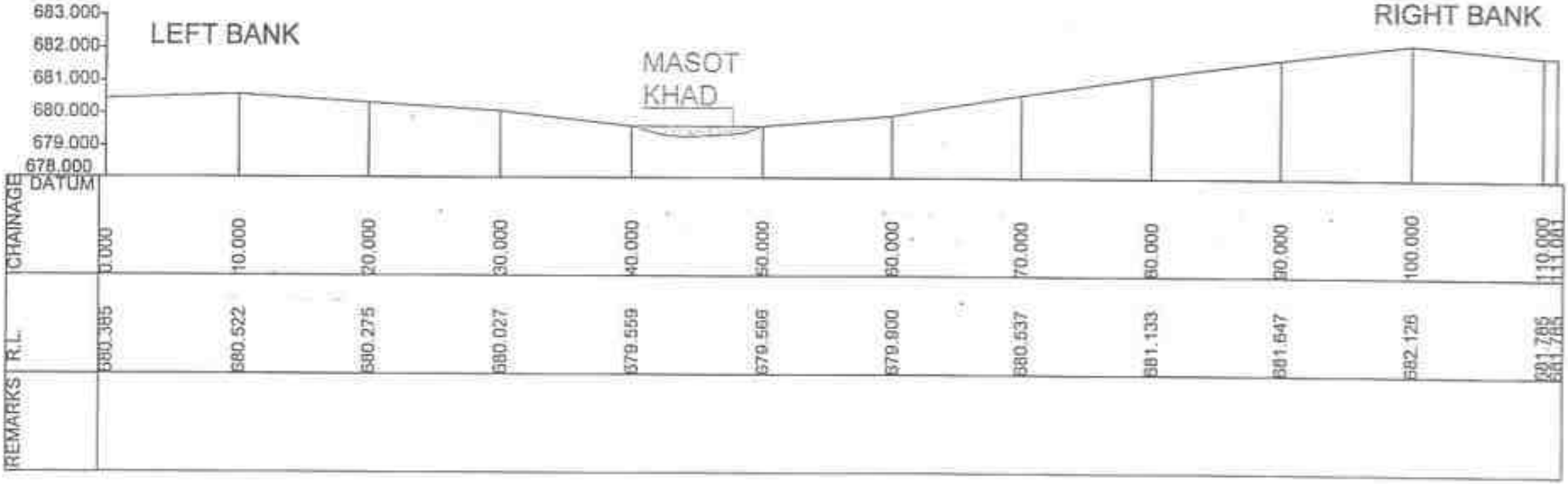
X-SECTION AT RD-350mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



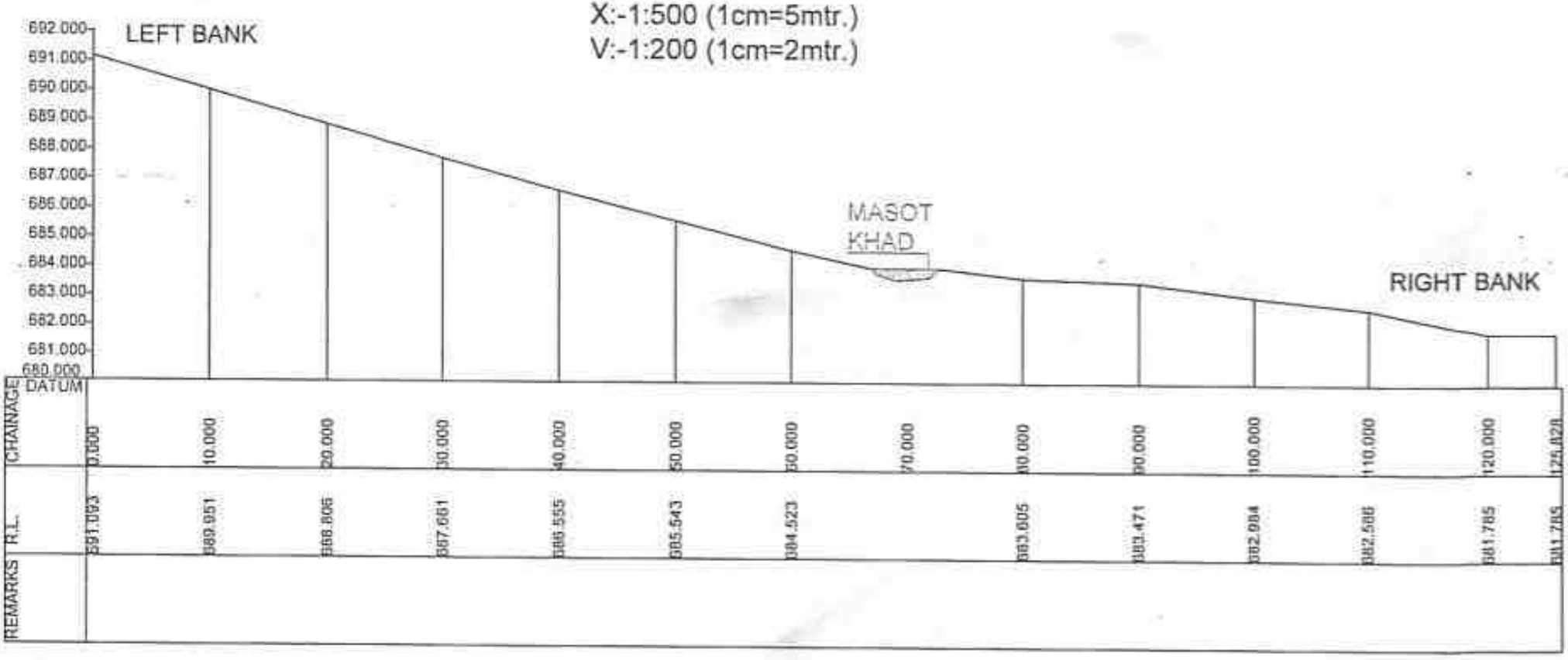
X-SECTION AT RD-400mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

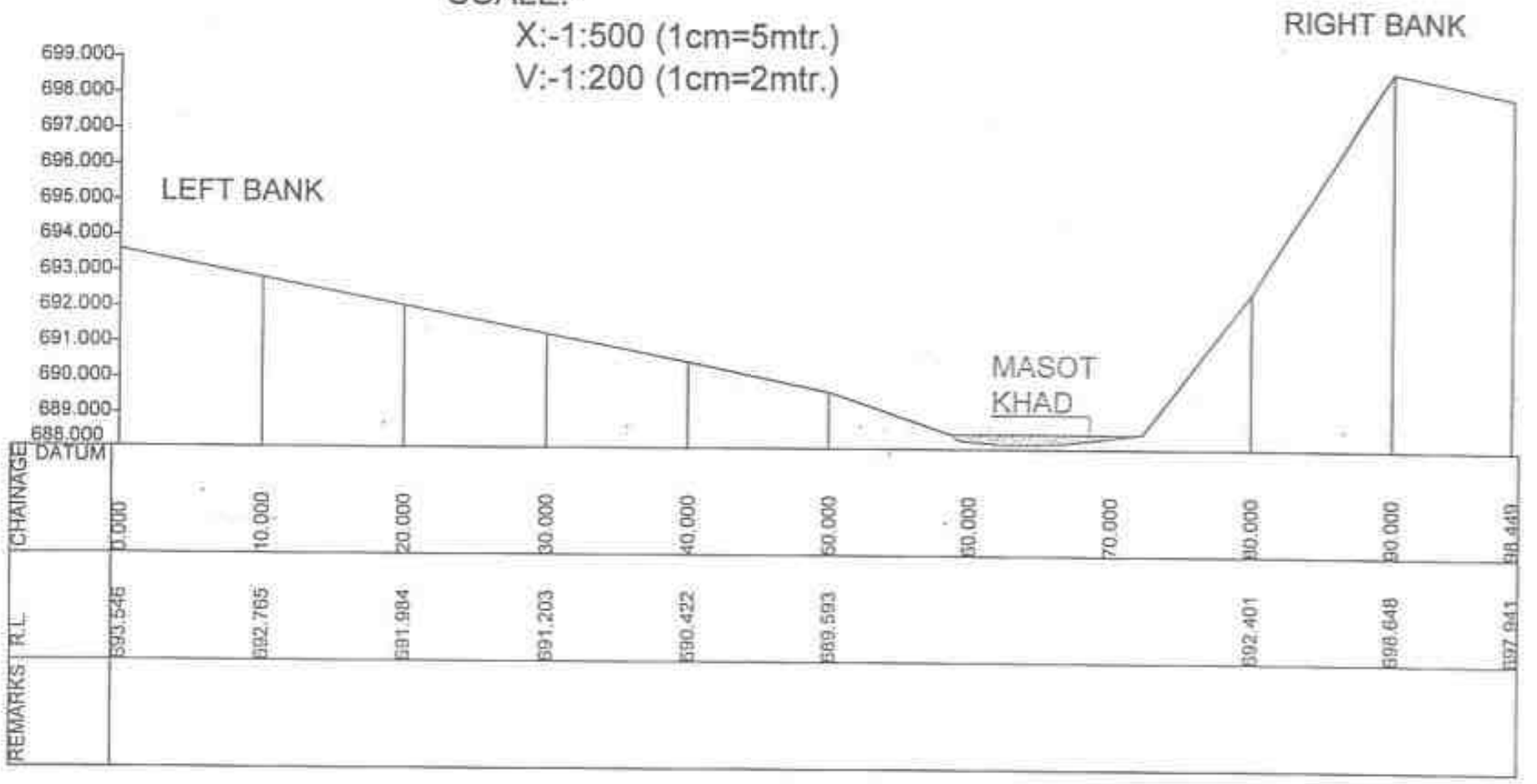
V:-1:200 (1cm=2mtr.)



X-SECTION AT RD-450mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)

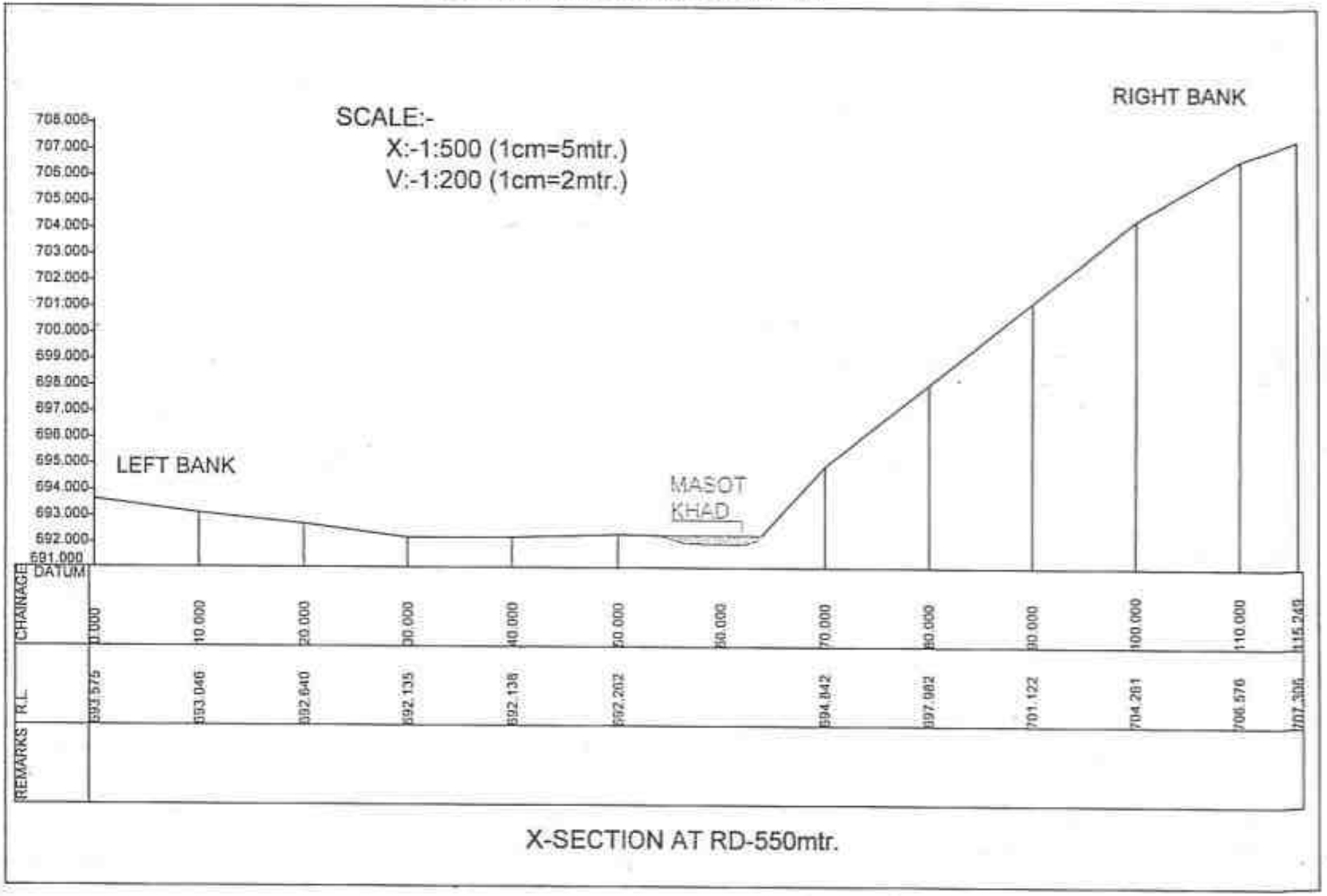


CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	98.449
R.L.	693.546	692.765	691.984	691.203	690.422	689.593			692.401	696.648	697.941
REMARKS											

X-SECTION AT RD-500mtr.

S98

QUARRY SITE OF MASOT KHAD



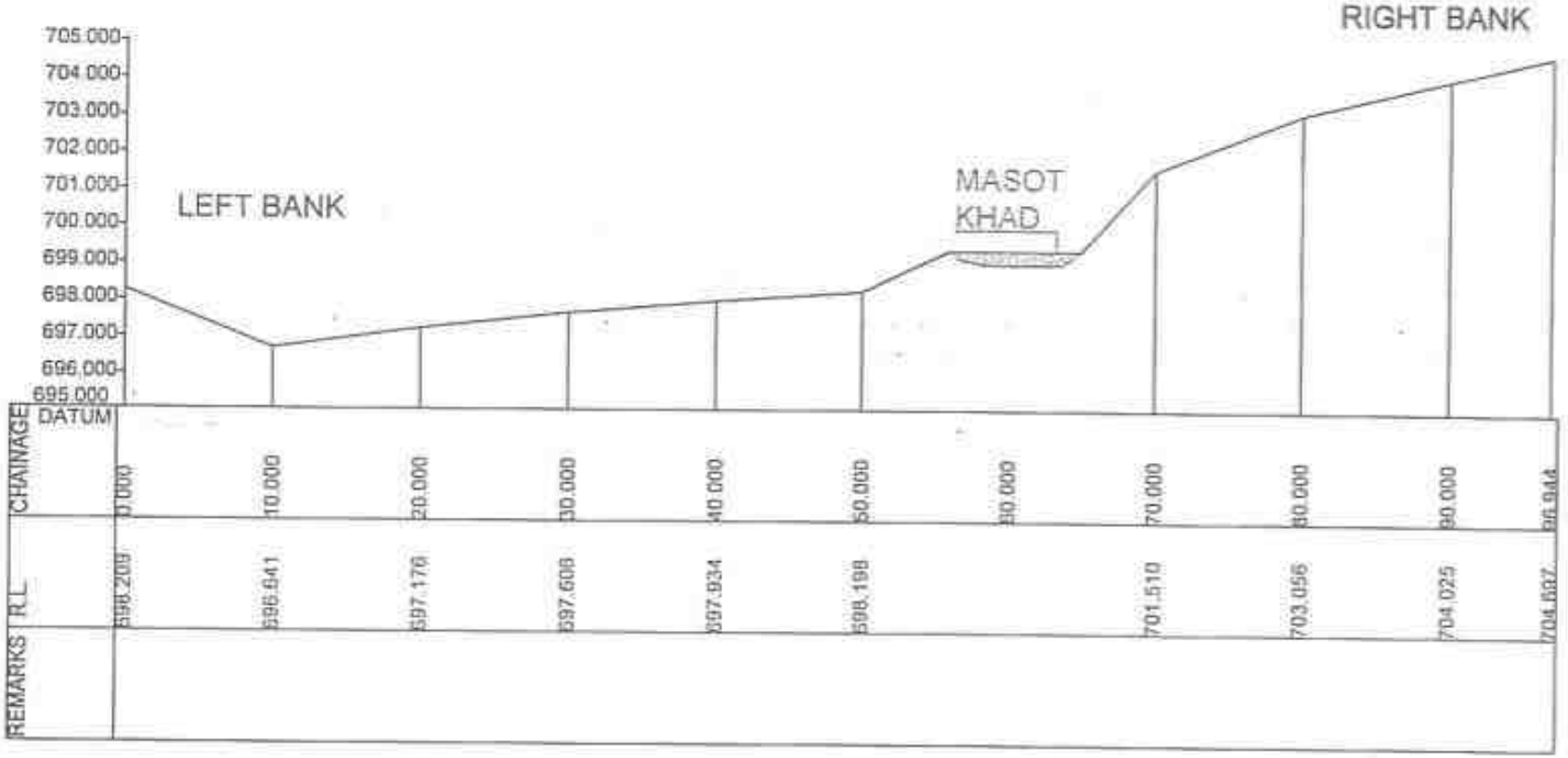
X-SECTION AT RD-550mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	96.944
R.L	698.209	696.641	697.176	697.606	697.934	698.198		701.510	703.056	704.025	704.687
REMARKS											

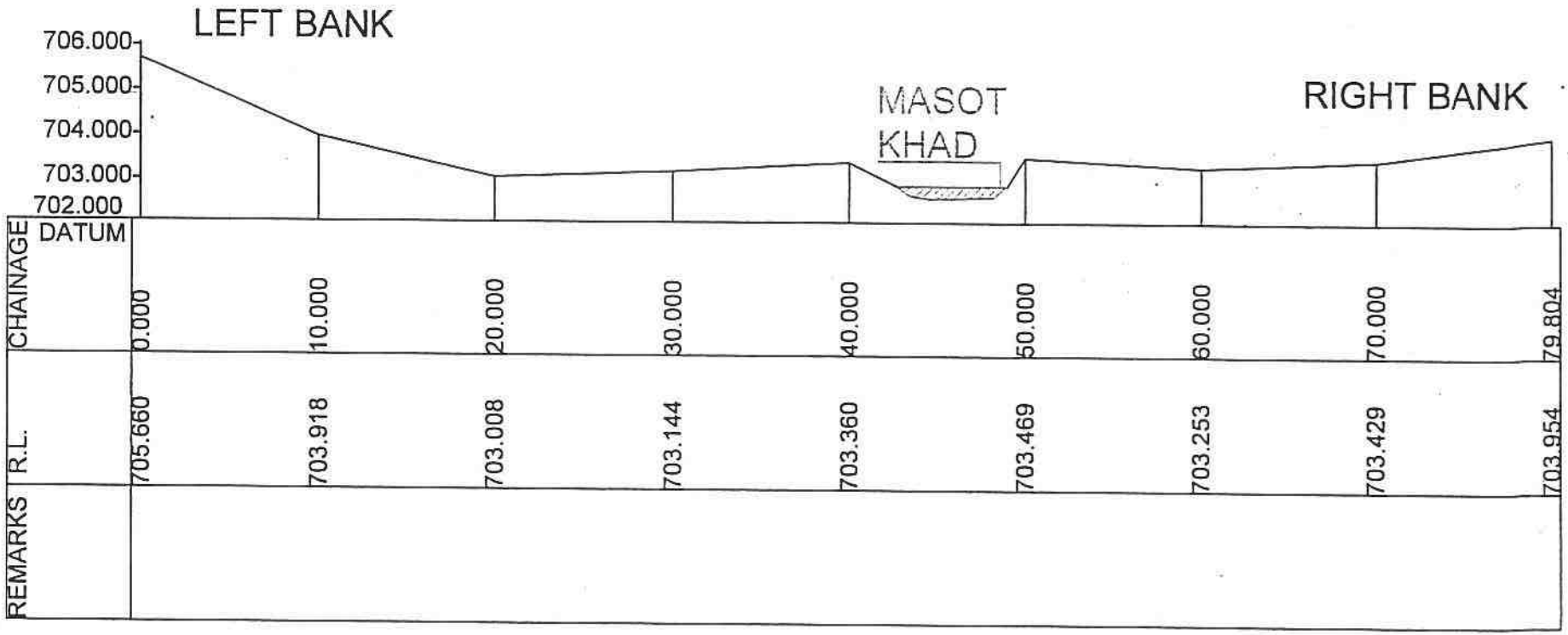
X-SECTION AT RD-600mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



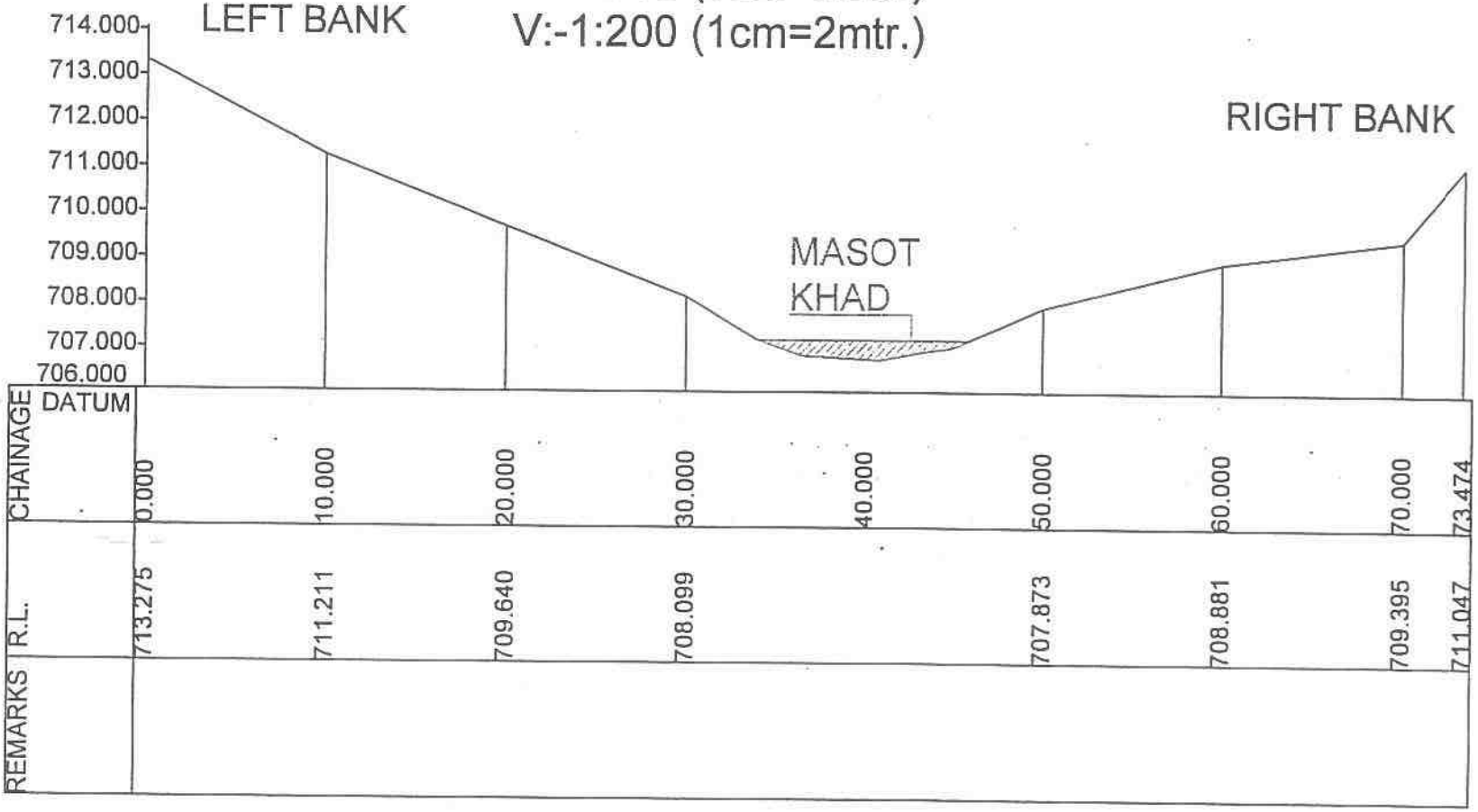
X-SECTION AT RD-650mtr.

QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



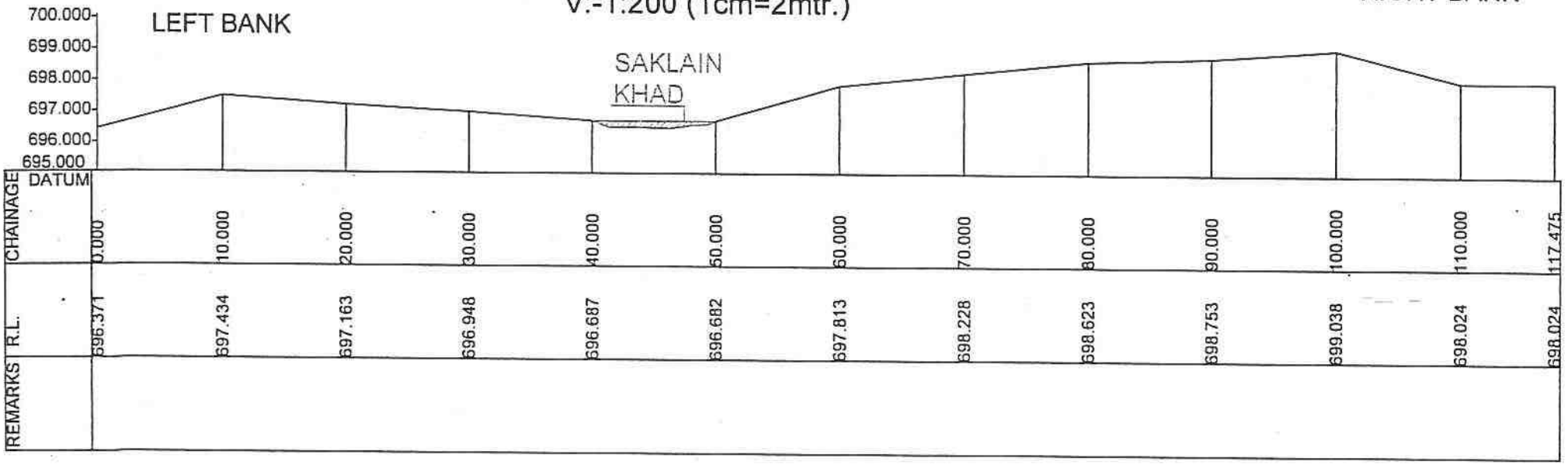
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	73.474
R.L.	713.275	711.211	709.640	708.099		707.873	708.881	709.395	711.047
REMARKS									

X-SECTION AT RD-700mtr.

602

QUARRY SITE OF SAKLAIN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)

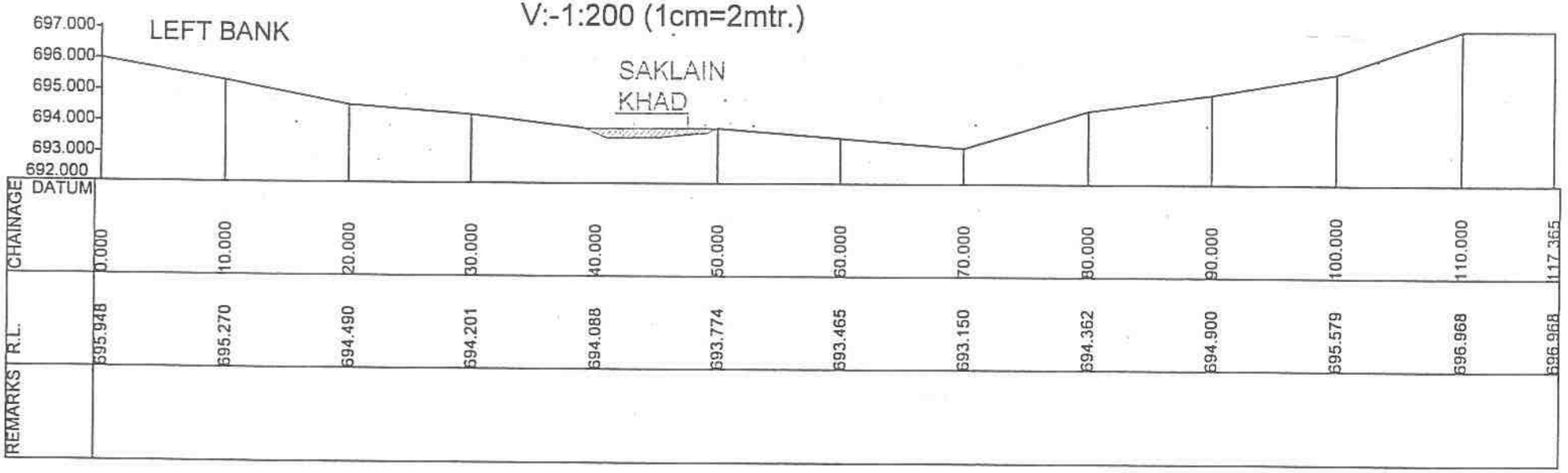


CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	117.475
R.L.	696.371	697.434	697.163	696.948	696.687	696.682	697.813	698.228	698.623	698.753	699.038	698.024	698.024
REMARKS													

X-SECTION AT RD-950mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)

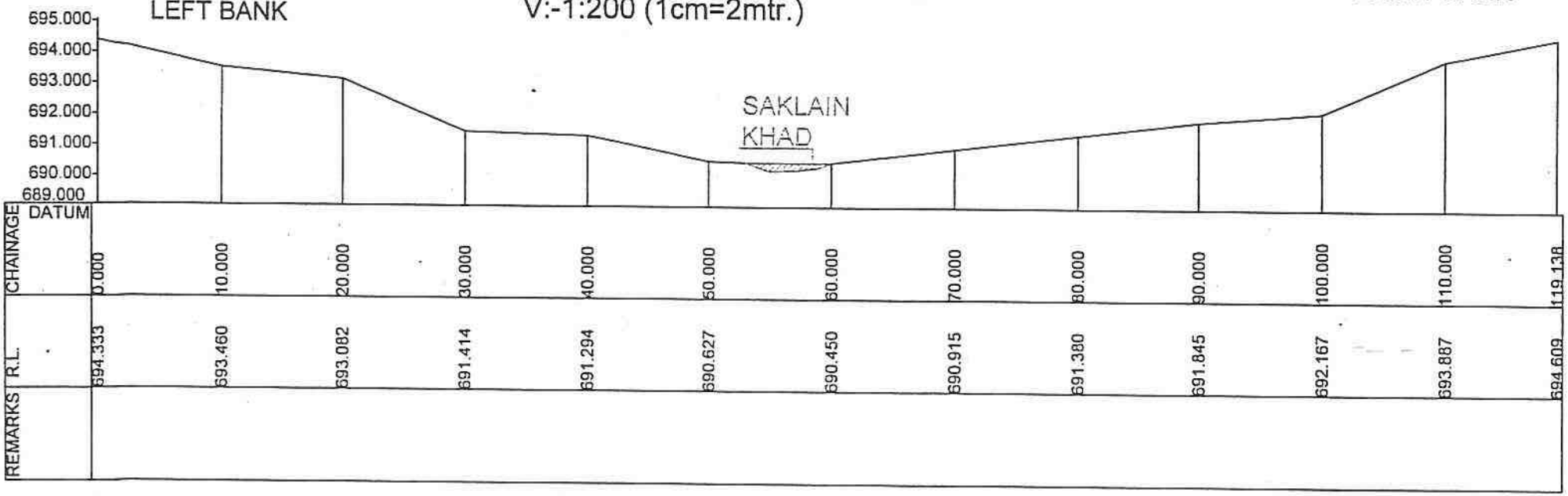


CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	117.365
R.L.	695.948	695.270	694.490	694.201	694.088	693.774	693.465	693.150	694.362	694.900	695.579	696.968	696.968
REMARKS													

X-SECTION AT RD-900mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	119.138
R.L.	694.333	693.460	693.082	691.414	691.294	690.627	690.450	690.915	691.380	691.845	692.167	693.887	694.609
REMARKS													

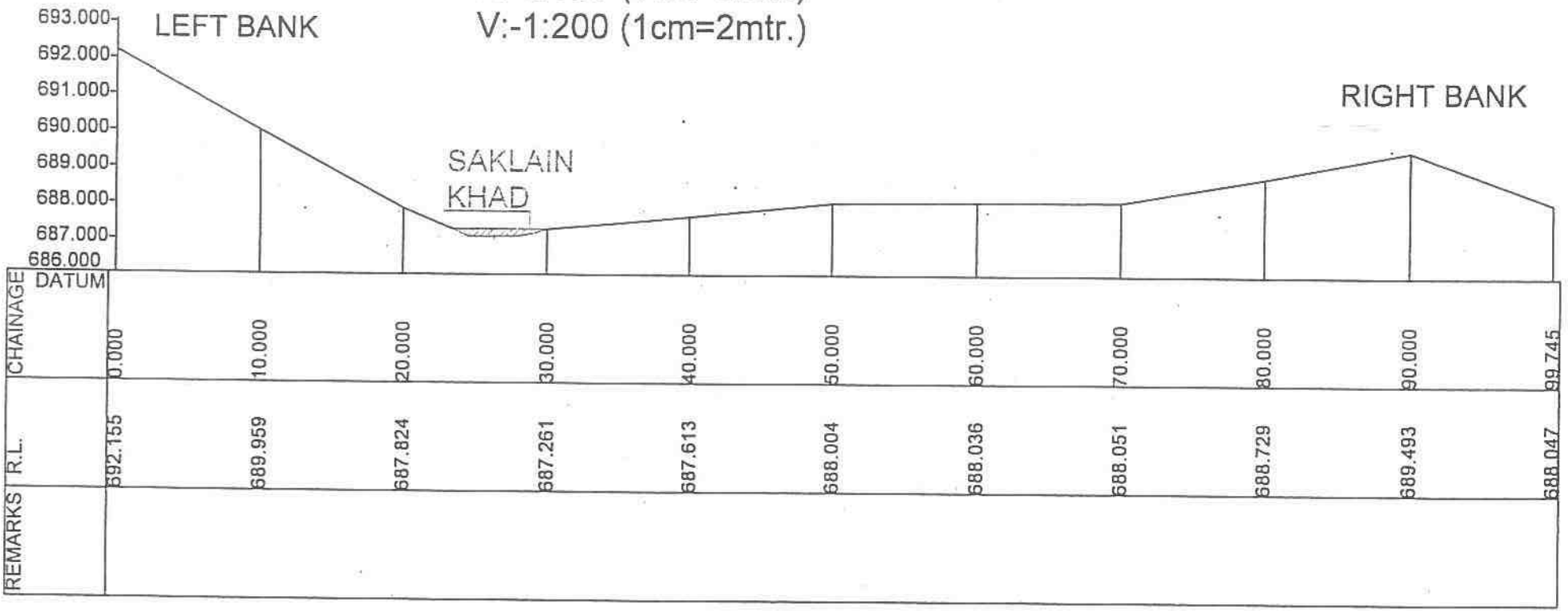
X-SECTION AT RD-850mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	99.745
R.L.	692.155	689.959	687.824	687.261	687.613	688.004	688.036	688.051	688.729	689.493	688.047
REMARKS											

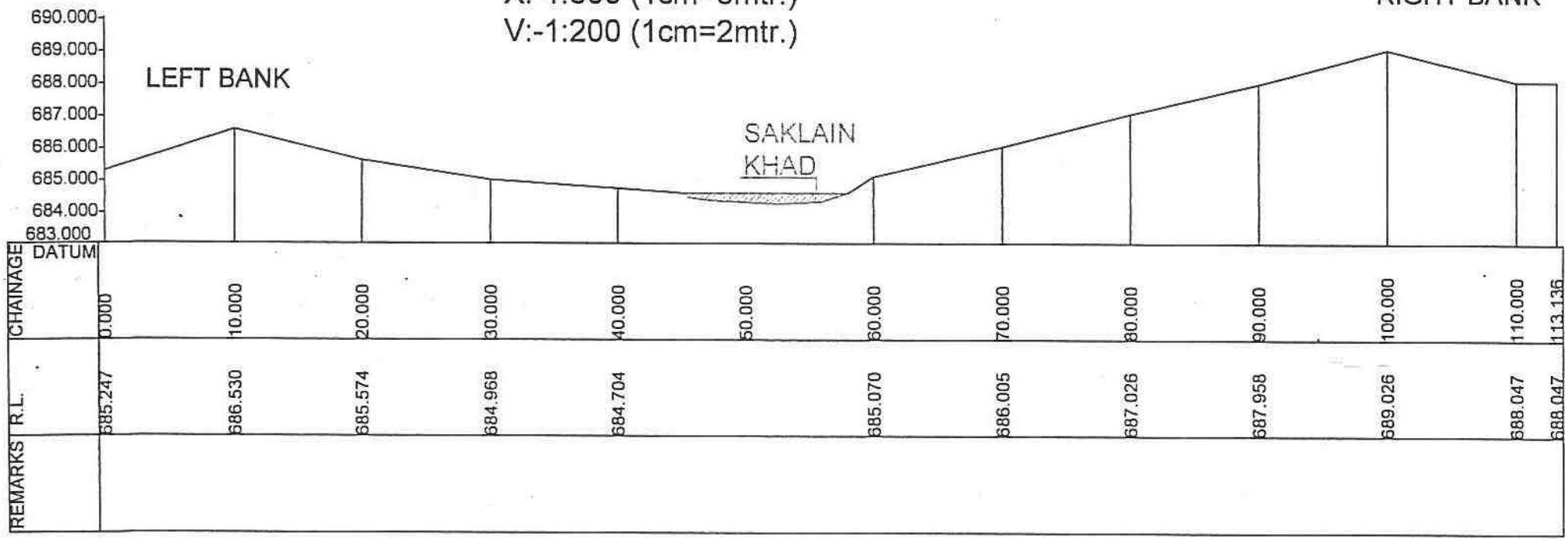
X-SECTION AT RD-800mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	113.136
R.L.	685.247	686.530	685.574	684.968	684.704		685.070	686.005	687.026	687.958	689.026	688.047	688.047
REMARKS													

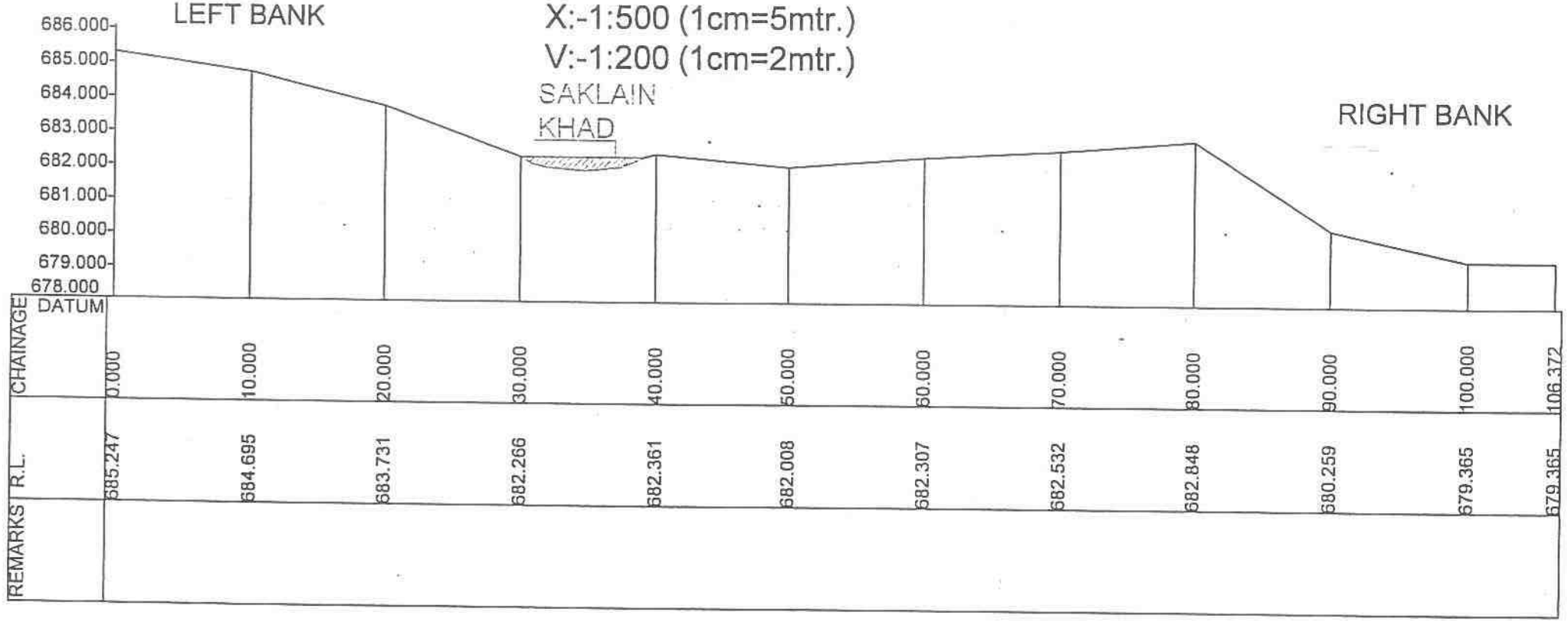
X-SECTION AT RD-750mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	106.372
R.L.	685.247	684.695	683.731	682.266	682.361	682.008	682.307	682.532	682.848	680.259	679.365	679.365
REMARKS												

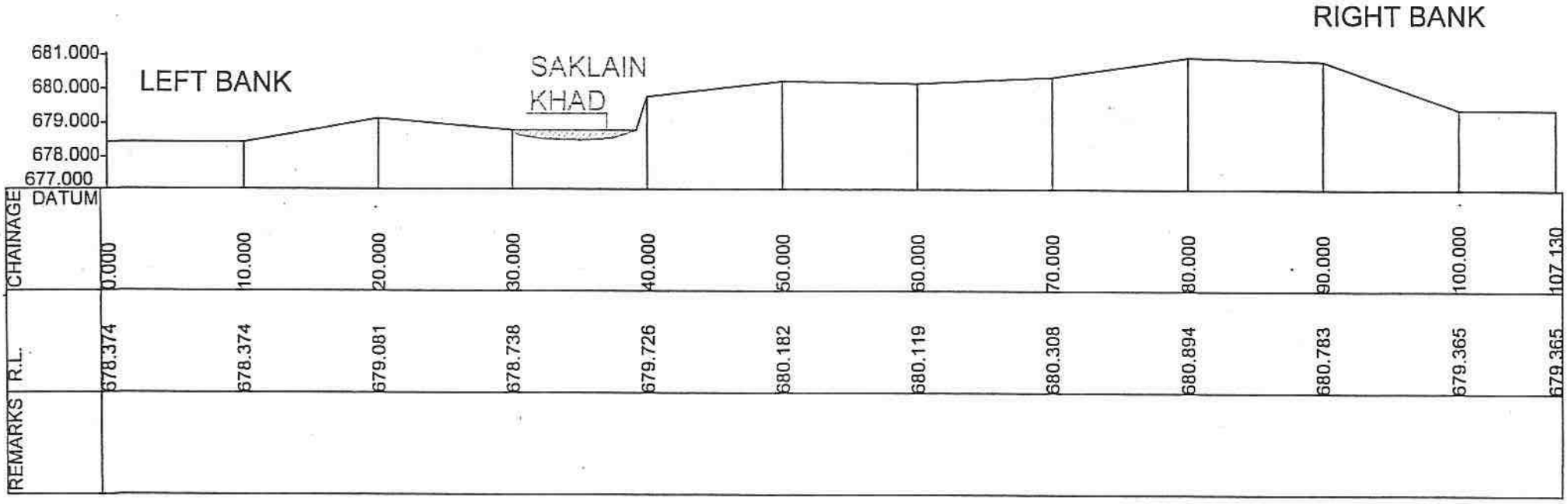
X-SECTION AT RD-700mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



X-SECTION AT RD-650mtr.

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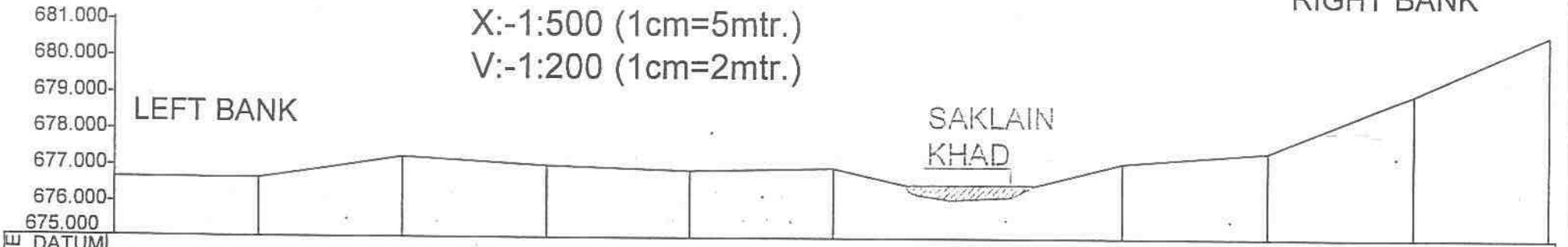
QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	99.258
R.L.	676.614	676.614	677.199	676.973	676.841	676.920		677.073	677.372	678.966	680.590
REMARKS											

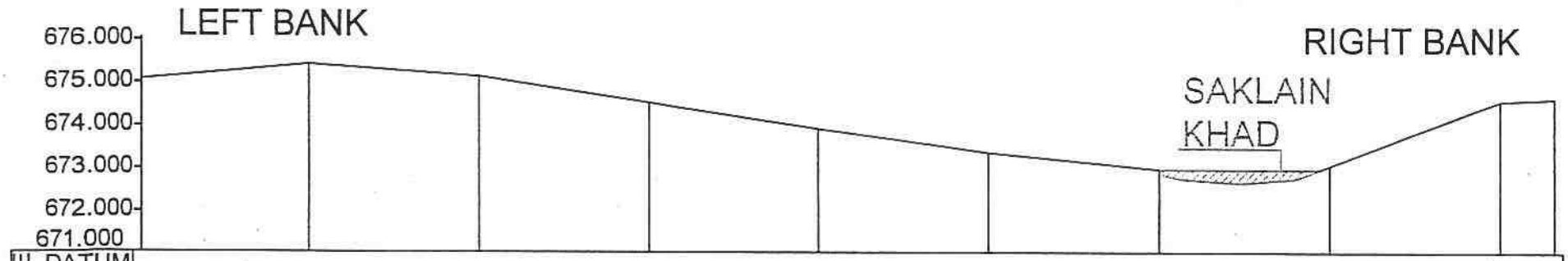
X-SECTION AT RD-600mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	83.154
R.L.	675.026	675.376	675.098	674.491	673.885	673.337	672.941	673.029	674.538	674.601
REMARKS										

X-SECTION AT RD-550mtr.

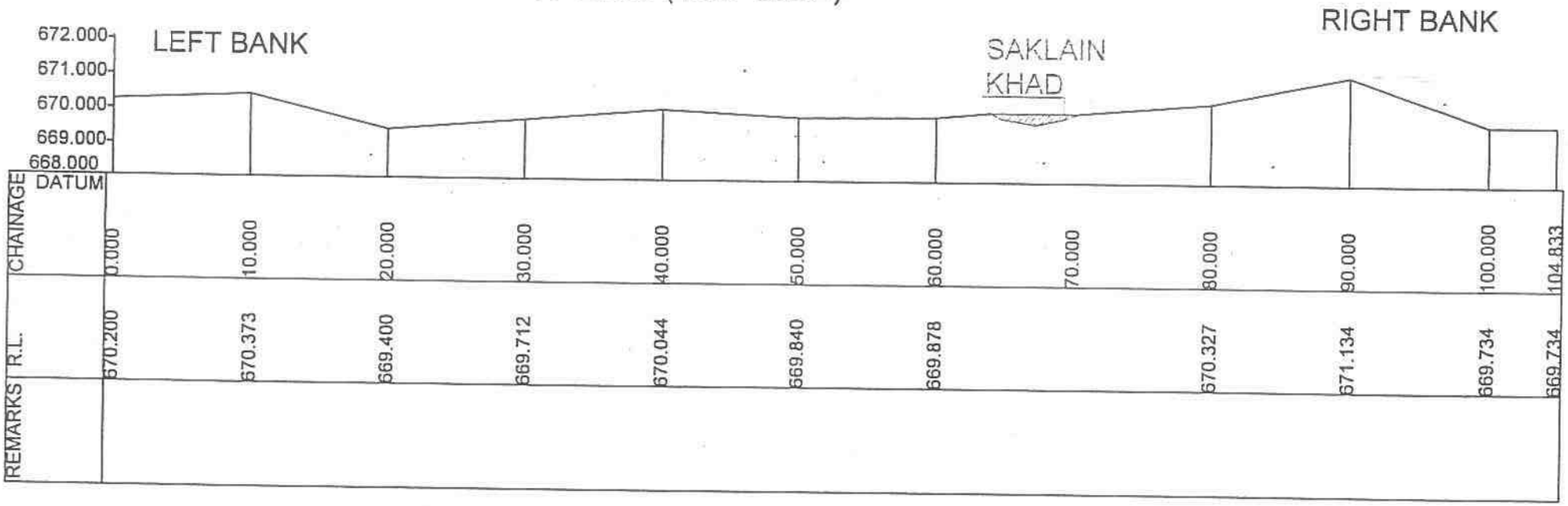
49

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	104.833
R.L.	670.200	670.373	669.400	669.712	670.044	669.840	669.878		670.327	671.134	669.734	669.734
REMARKS												

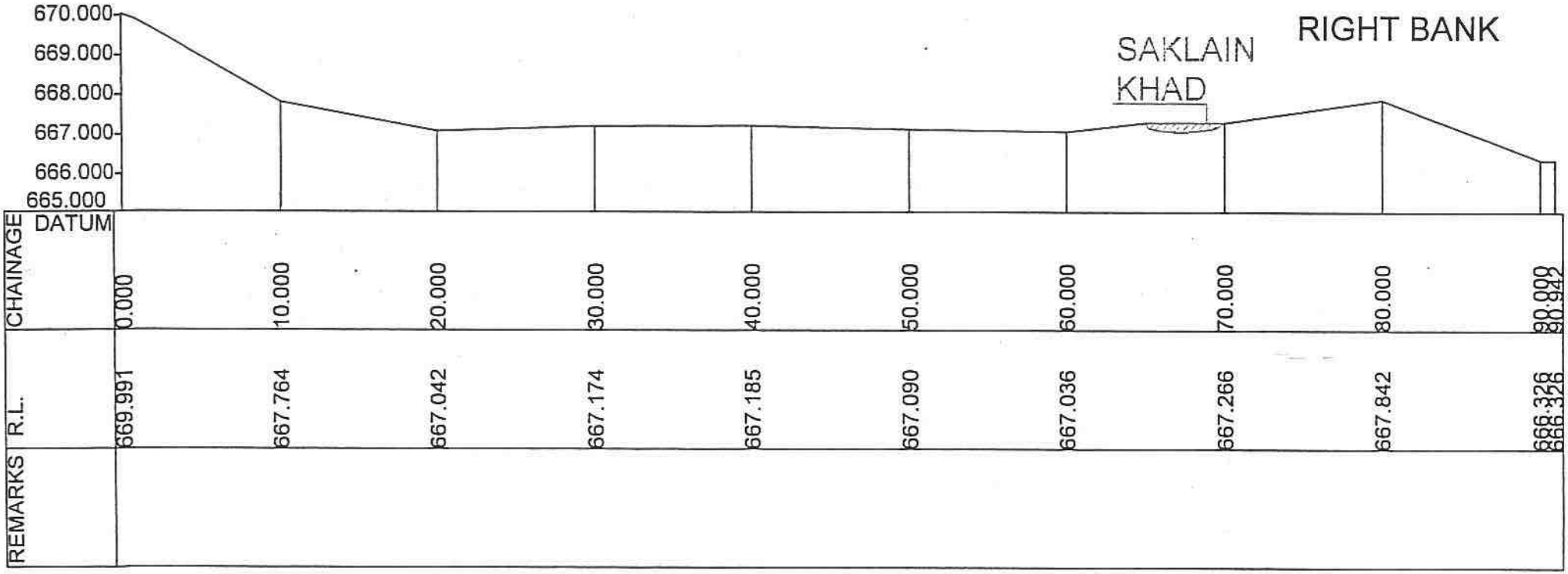
X-SECTION AT RD-500mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

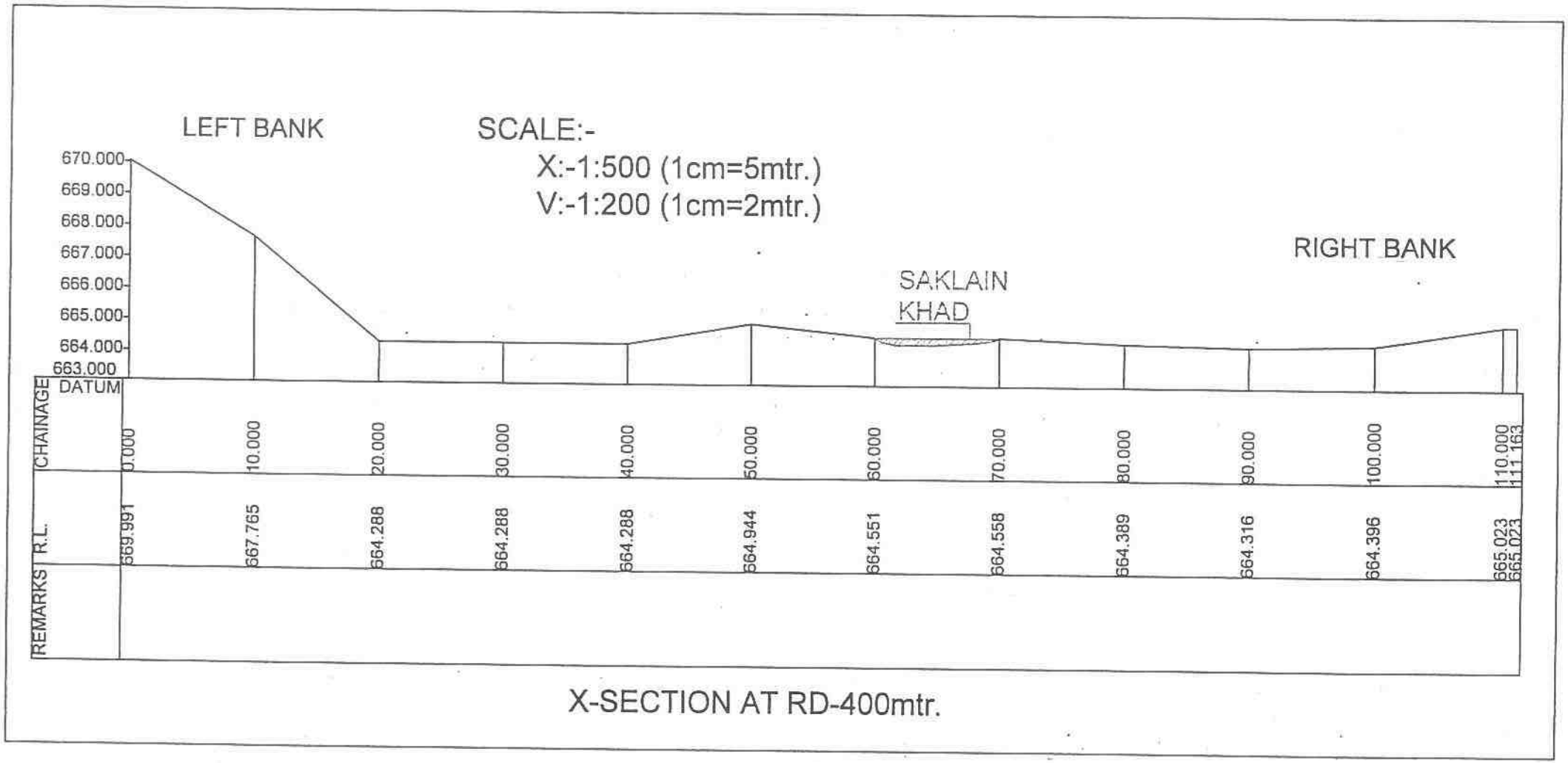
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000
R.L.	669.991	667.764	667.042	667.174	667.185	667.090	667.036	667.266	667.842	666.326
REMARKS										

X-SECTION AT RD-450mtr.

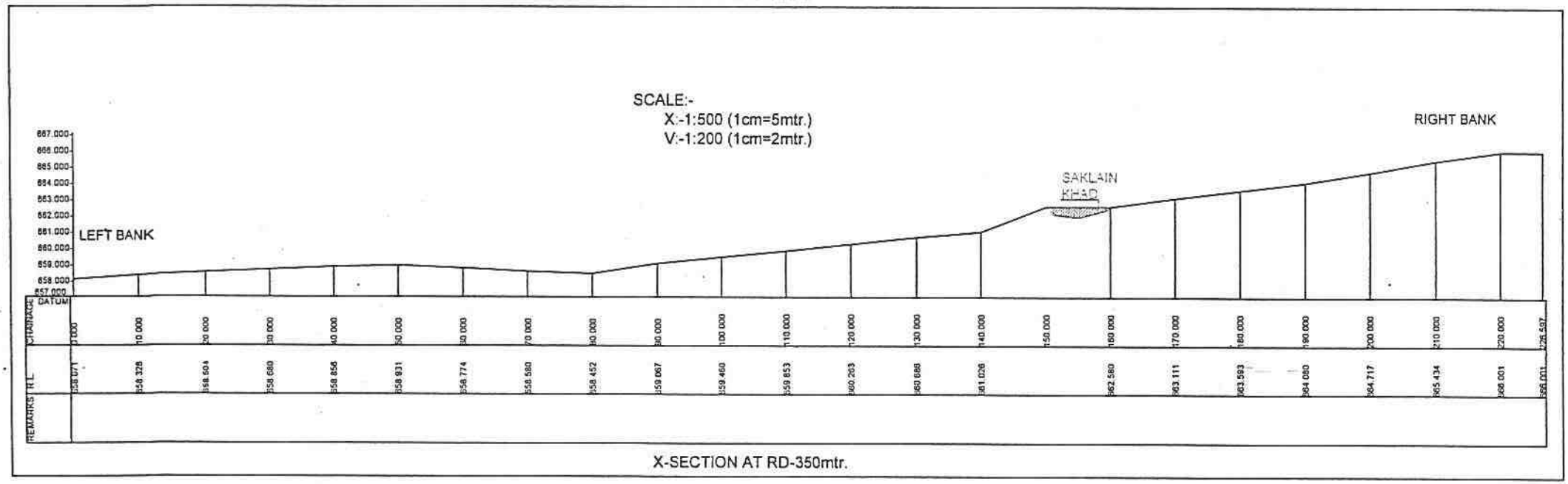
QUARRY SITE OF SAKLAIN KHAD



X-SECTION AT RD-400mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



X-SECTION AT RD-350mtr.

195

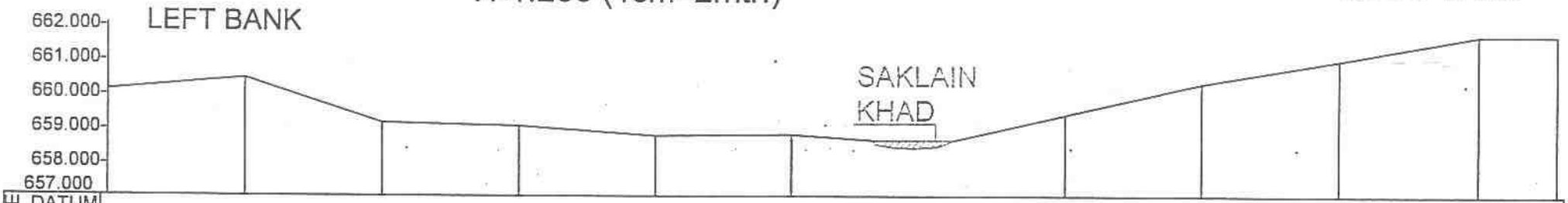
596

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	105.647
R.L.	660.069	660.422	659.130	659.034	658.757	658.795		659.365	660.269	660.945	661.659	661.659
REMARKS												

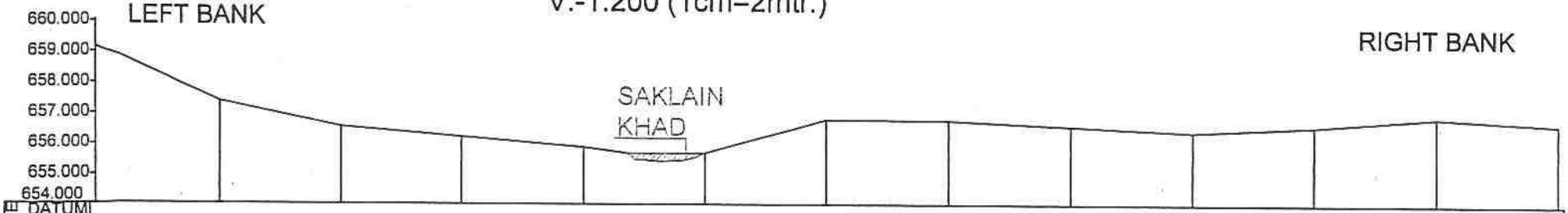
X-SECTION AT RD-300mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



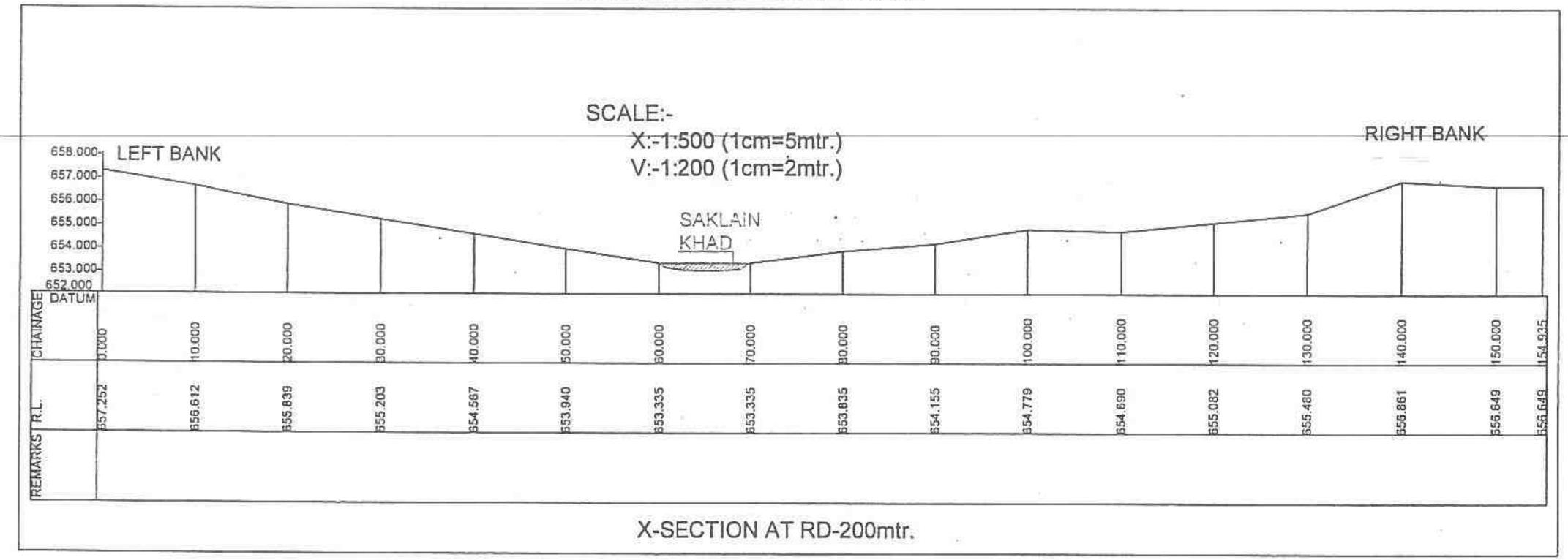
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	119.942
R.L.	659.120	657.340	656.522	656.192	655.858	655.669	656.776	656.748	656.563	656.377	656.564	656.868	656.649
REMARKS													

X-SECTION AT RD-250mtr.

617

QUARRY SITE OF SAKLAIN KHAD

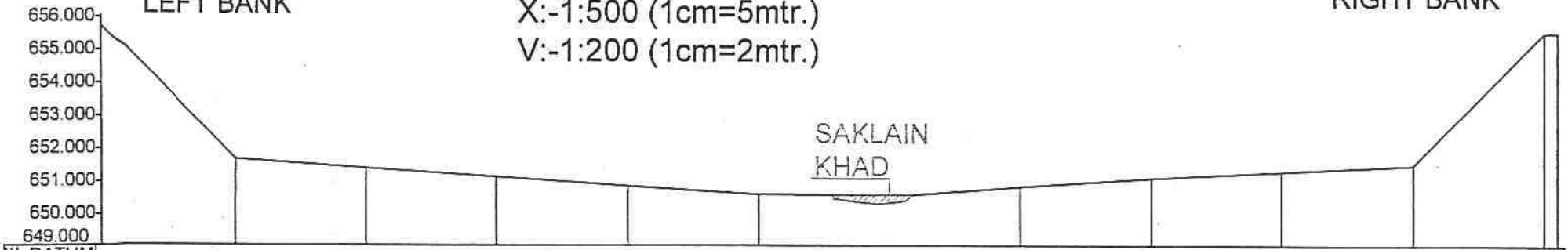
SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



X-SECTION AT RD-200mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000		70.000	80.000	90.000	100.000	110.000 111.036
R.L.	655.679	651.619	651.349	651.079	650.809	650.553	650.546	650.791	651.052	651.253	651.453	655.480 655.480
REMARKS												

X-SECTION AT RD-150mtr.

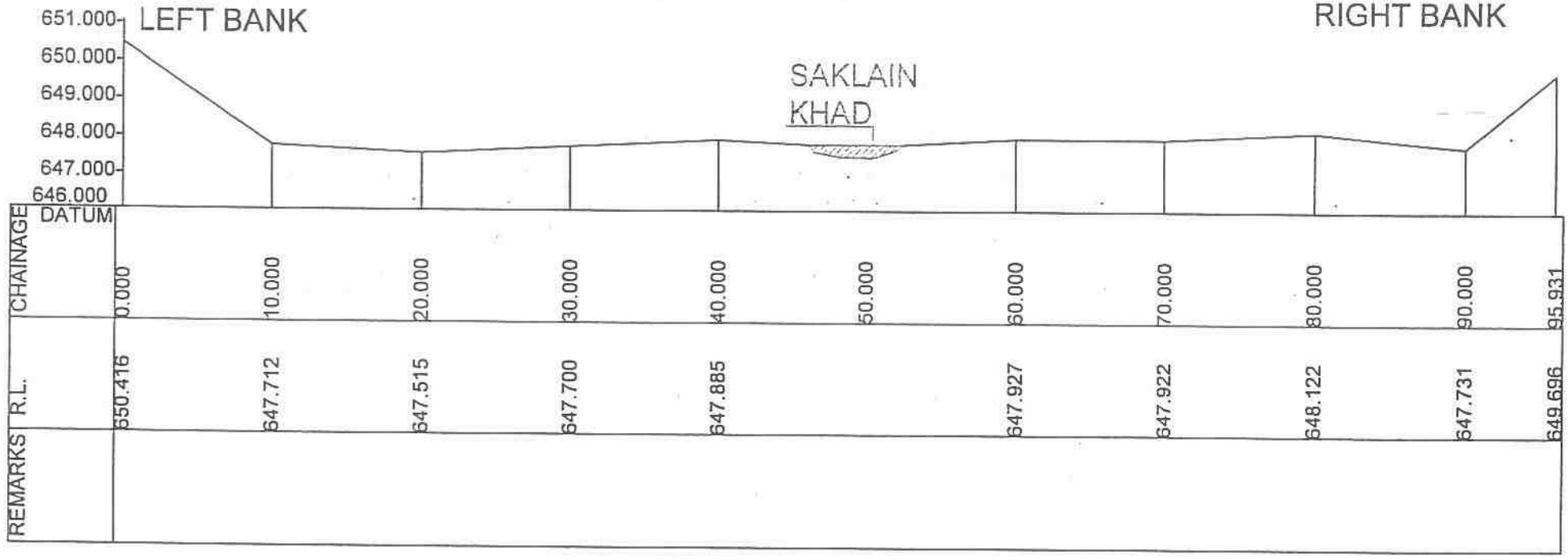
617

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



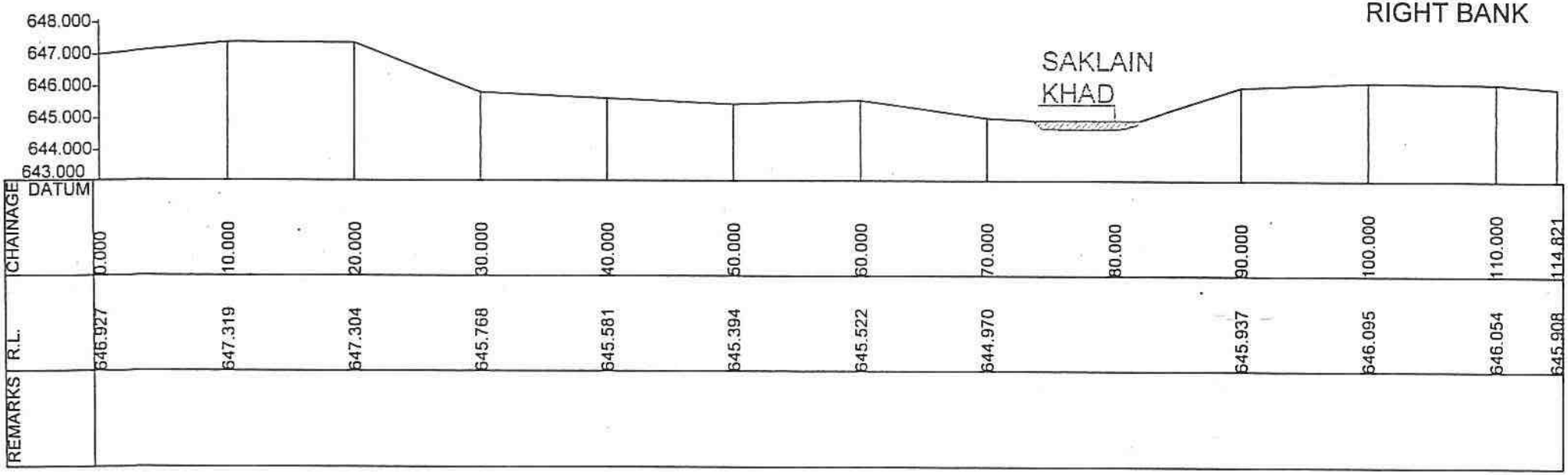
X-SECTION AT RD-100mtr.

QUARRY SITE OF SAKLAIN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)

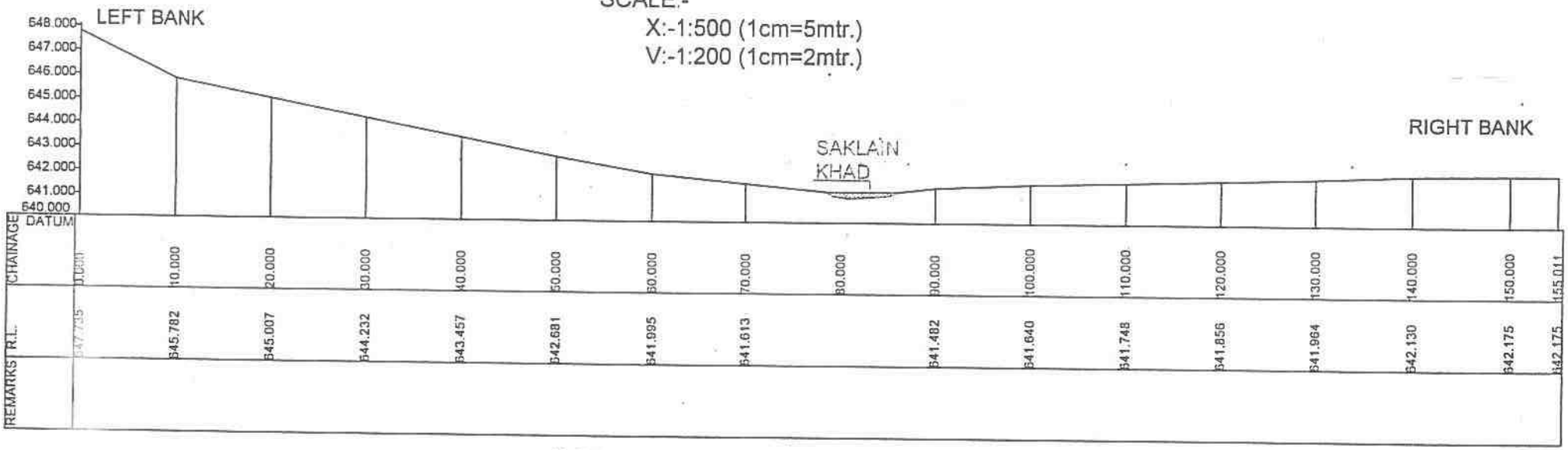


CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	114.821
R.L.	646.927	647.319	647.304	645.768	645.581	645.394	645.522	644.970		645.937	646.095	646.054	645.908
REMARKS													

X-SECTION AT RD-50mtr.

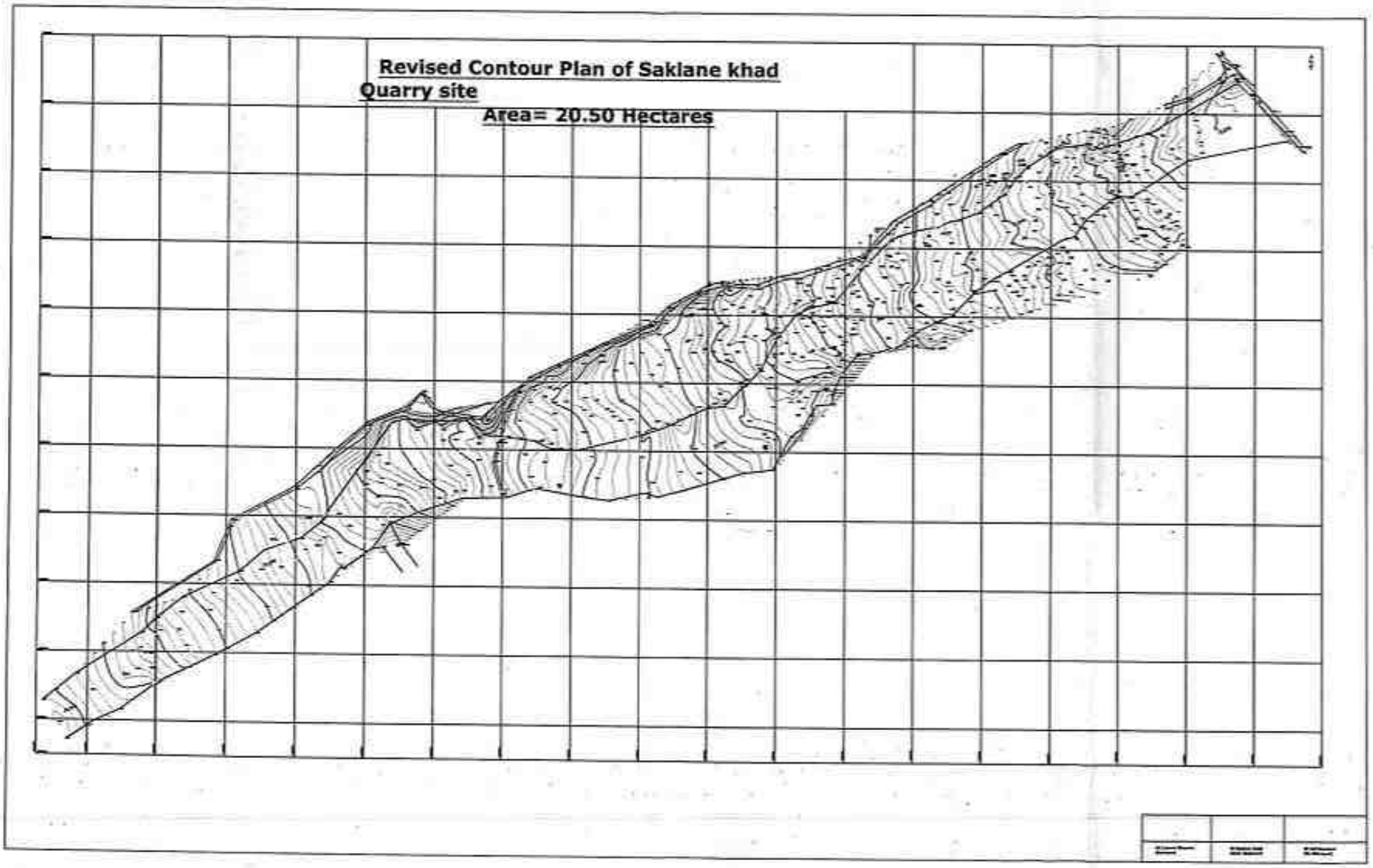
QUARRY SITE OF SAKLAIN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	155.011
R.L.	647.735	645.782	645.007	644.232	643.457	642.681	641.995	641.613		641.482	641.640	641.748	641.856	641.964	642.130	642.175	642.175
REMARKS																	

X-SECTION AT RD-0mtr.


Revised Contour Plan of Saklane khad
Quarry site
Area= 20.50 Hectares

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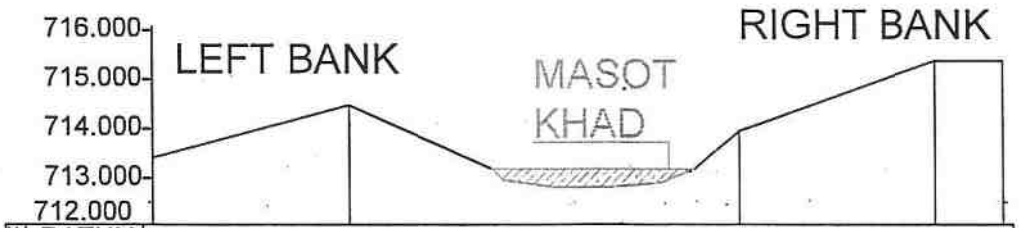
QUARRY SITE OF MASOT KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



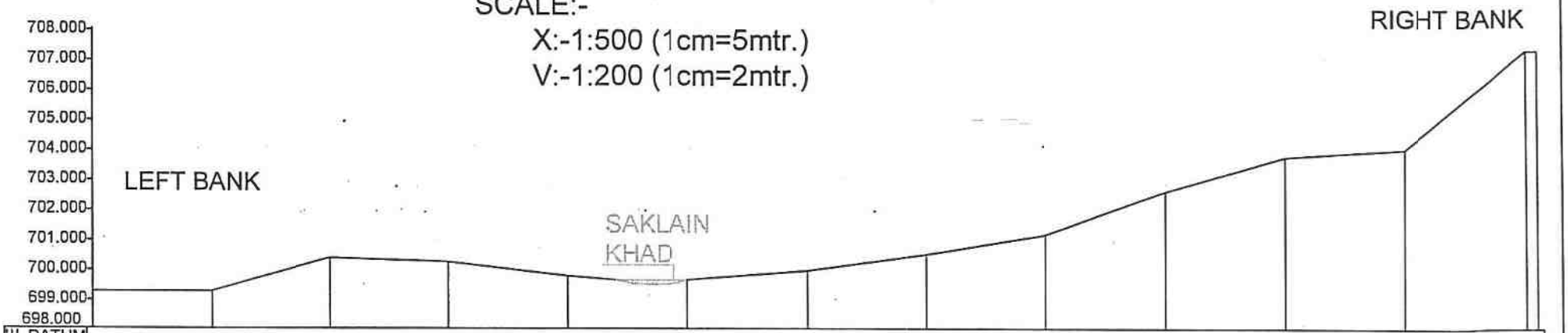
CHAINAGE	0.000	10.000	20.000	30.000	40.000	43.416
R.L.	713.344	714.416		713.888	715.316	715.316
REMARKS						

X-SECTION AT RD-750mtr.

625

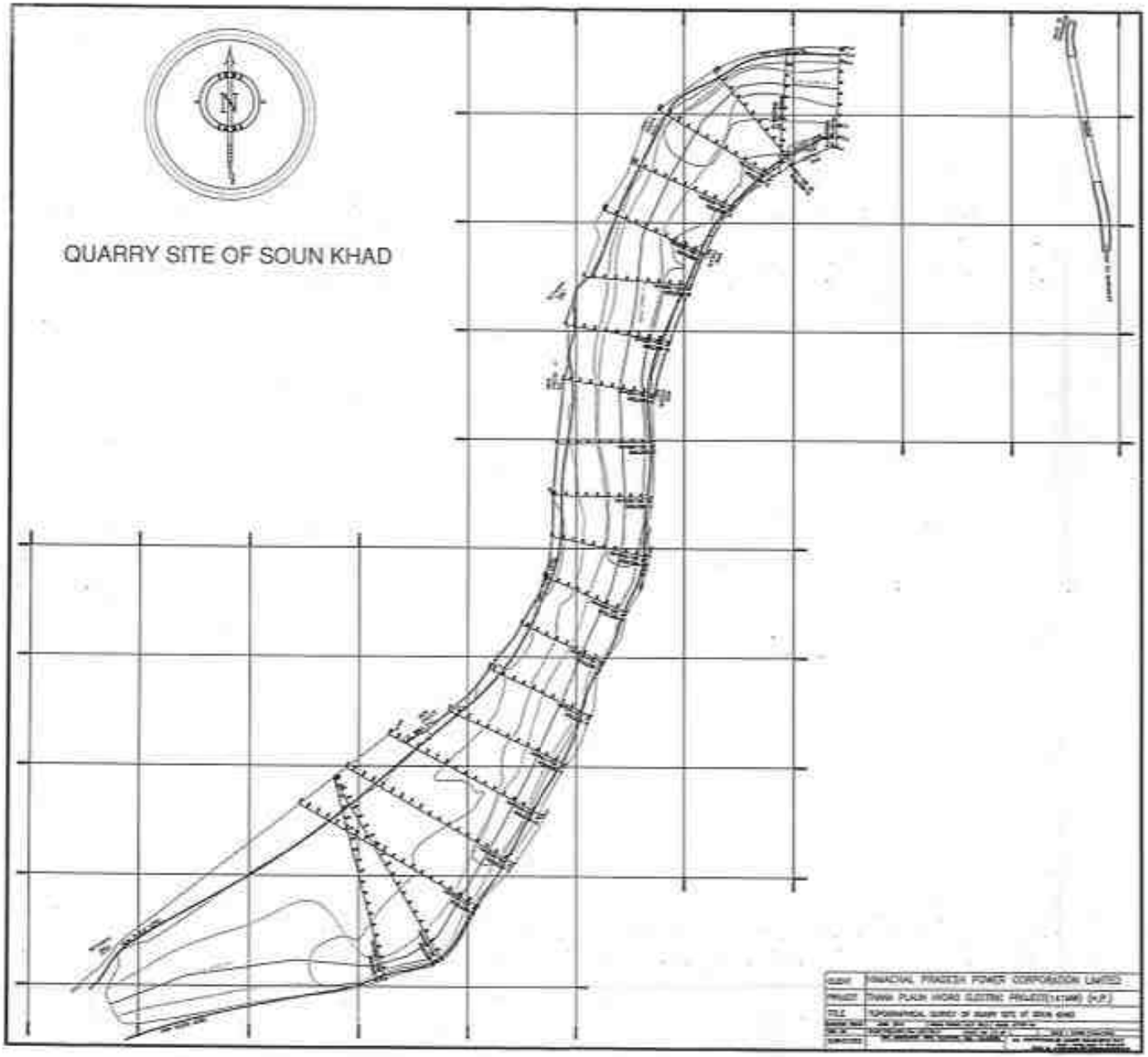
QUARRY SITE OF SAKLAIN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000
R.L.	699.237	699.237	700.342	700.209	699.748	699.623	699.913	700.466	701.141	702.563	703.720	703.983	707.276
REMARKS													

X-SECTION AT RD-1000mtr.

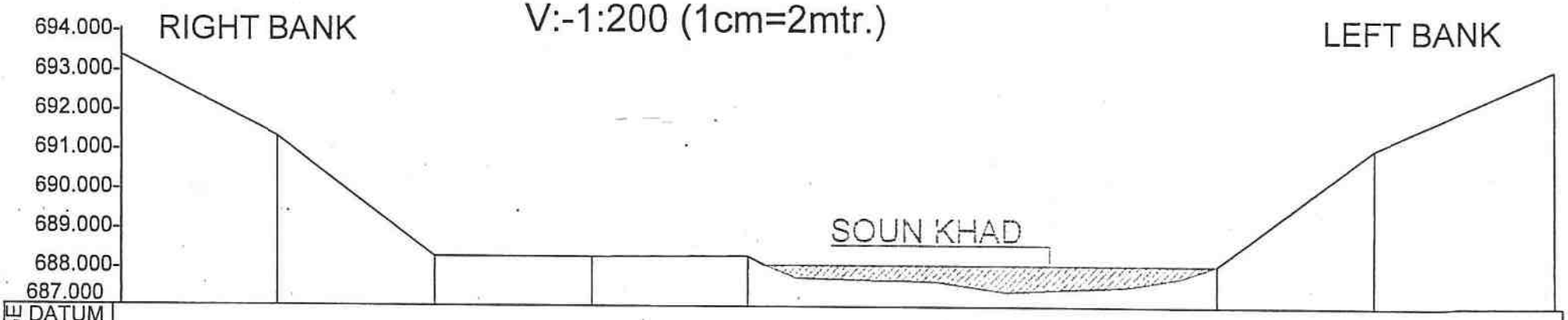

N
QUARRY SITE OF SOUN KHAD
HIMACHAL PRADESH POWER CORPORATION LIMITED
TIRAN PLAIN HYDRO ELECTRIC PROJECT(14 MW) (H.P.)

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	91.387
R.L.	693.336	691.283	688.242	688.242	688.268			688.045	691.018	694.018
REMARKS										

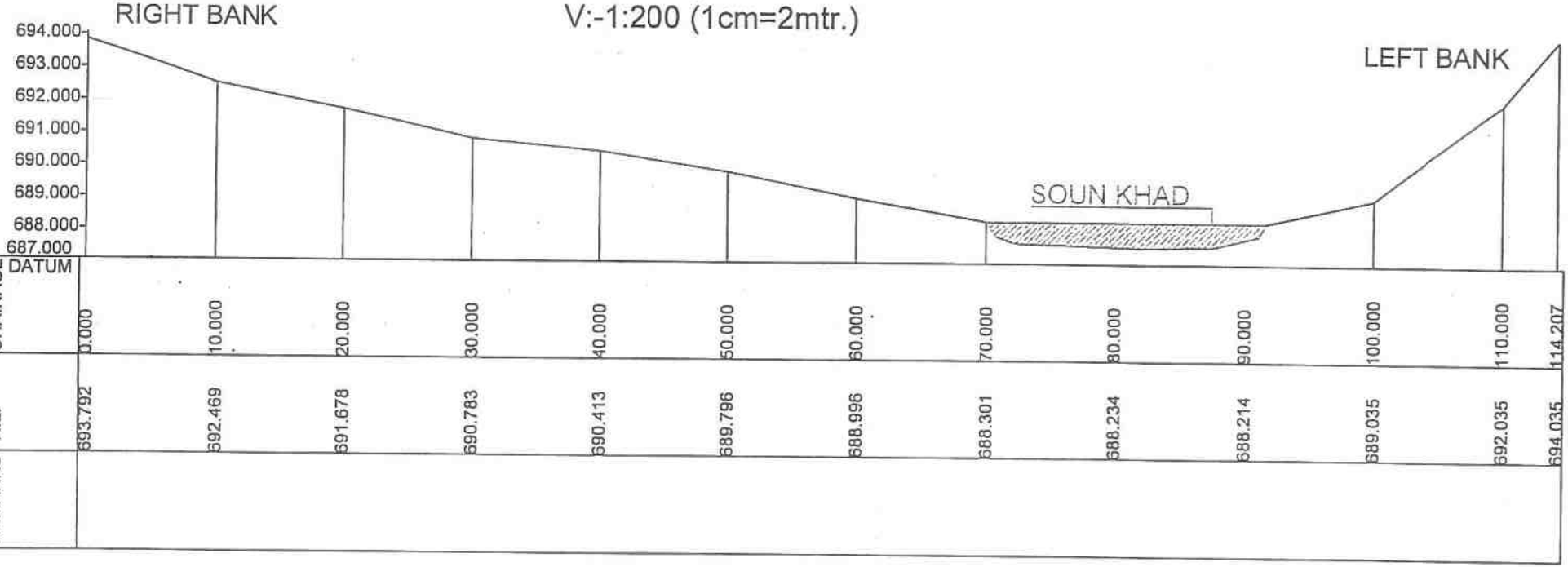
X-SECTION AT RD-0mtr.

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	114.207
R.L.	693.792	692.469	691.678	690.783	690.413	689.796	688.996	688.301	688.234	688.214	689.035	692.035	694.035
REMARKS													

X-SECTION AT RD-50mtr.

1284

(41)

629

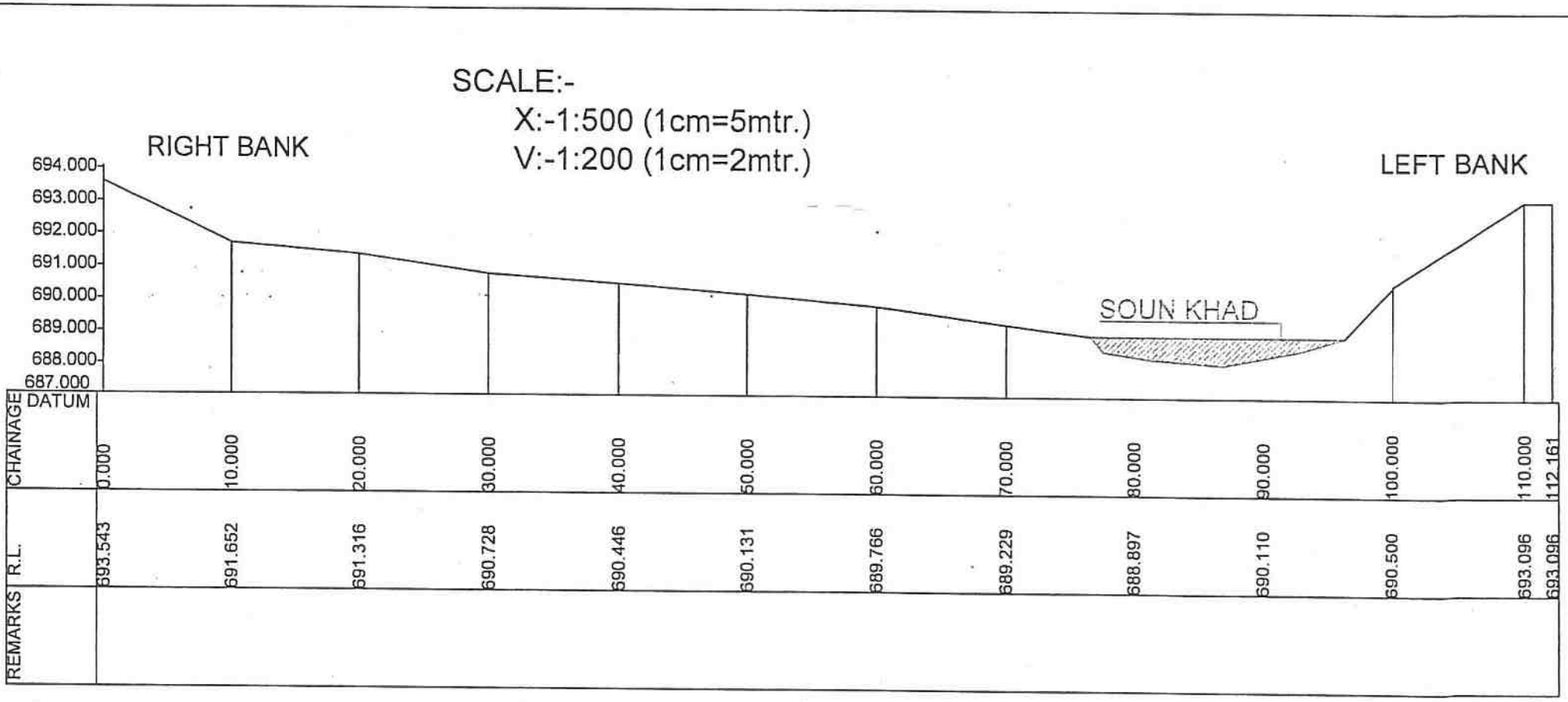
(168)

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

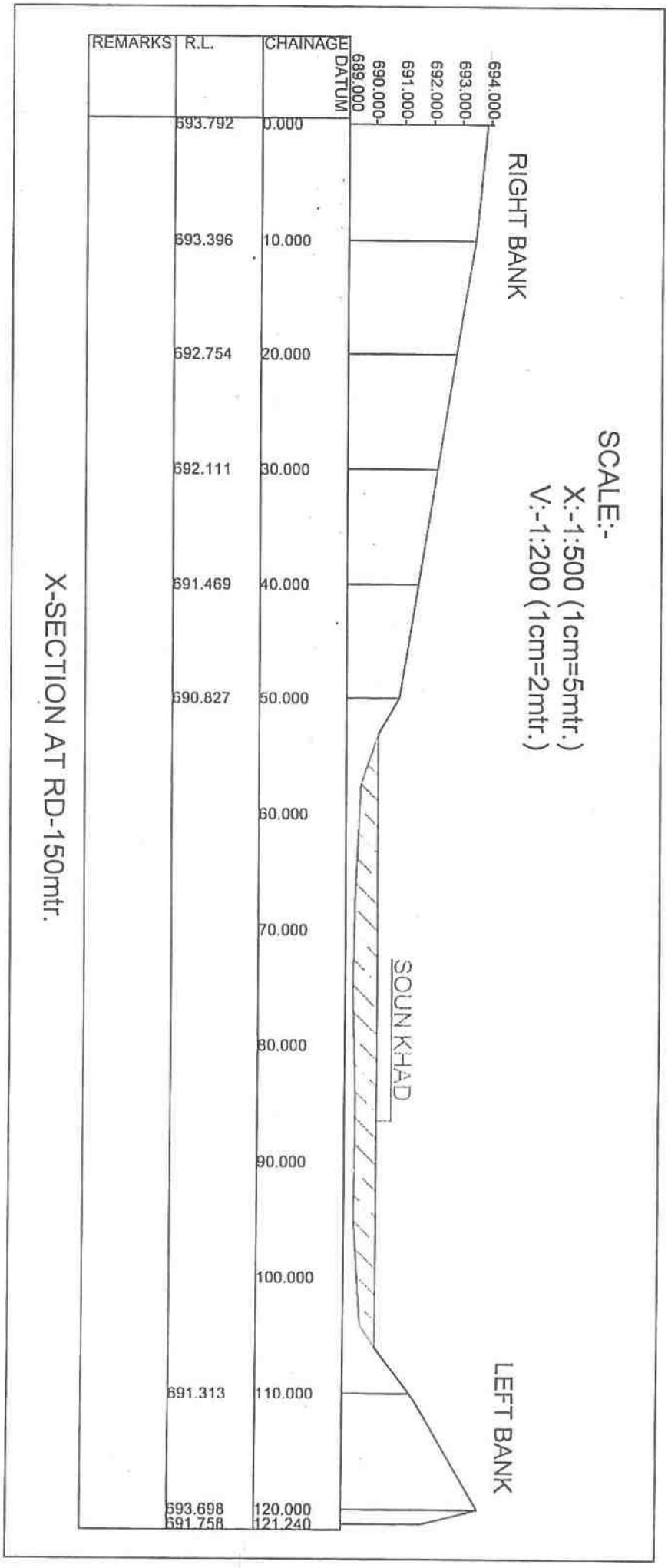
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	112.161
R.L.	693.543	691.652	691.316	690.728	690.446	690.131	689.766	689.229	688.897	690.110	690.500	693.096	693.096
REMARKS													

X-SECTION AT RD-100mtr.

630

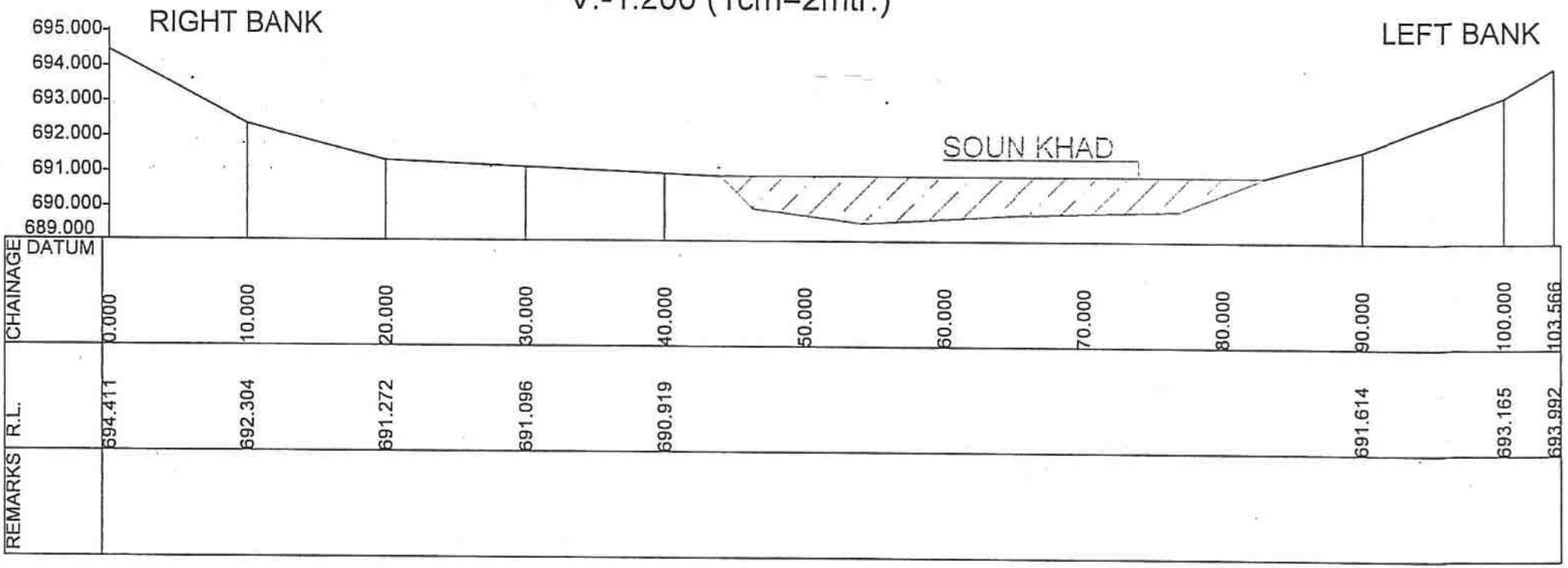

QUARRY SITE OF SOUN KHAD
SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)
694.000
693.000
692.000
691.000
690.000
689.000
DATUM
RIGHT BANK
LEFT BANK
SOUN KHAD
REMARKS
R.L.
CHAINAGE
693.792
0.000
693.396
10.000
692.754
20.000
692.111
30.000
691.469
40.000
690.827
50.000
60.000
70.000
80.000
90.000
100.000
691.313
110.000
693.698
120.000
691.758
121.240
X-SECTION AT RD-150mtr.

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



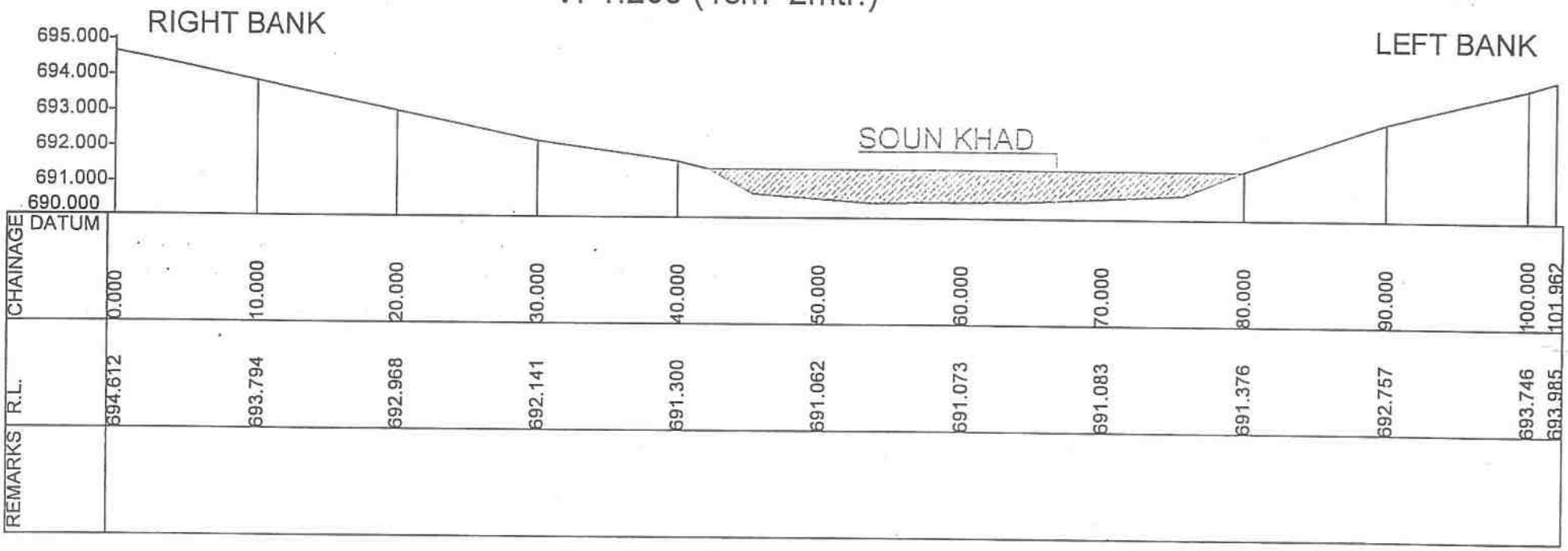
X-SECTION AT RD-200mtr.

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	101.962
R.L.	694.612	693.794	692.968	692.141	691.300	691.062	691.073	691.083	691.376	692.757	693.746	693.985
REMARKS												

X-SECTION AT RD-250mtr.

182

683 (414)

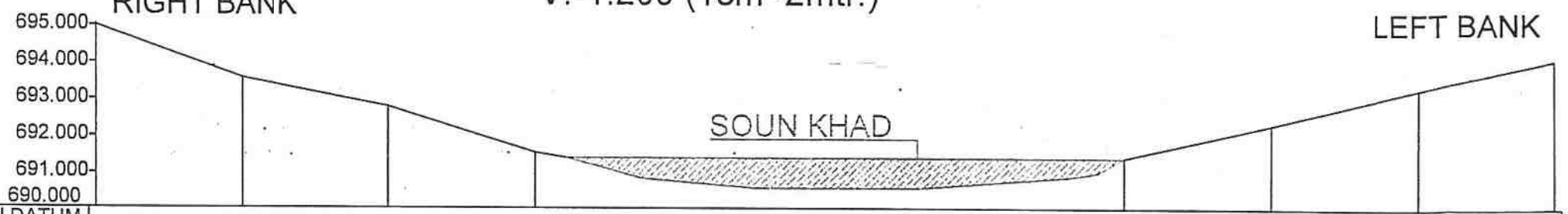
(170)

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	99.093
R.L.	694.952	693.516	692.751	691.506				691.363	692.273	693.247	694.019
REMARKS											

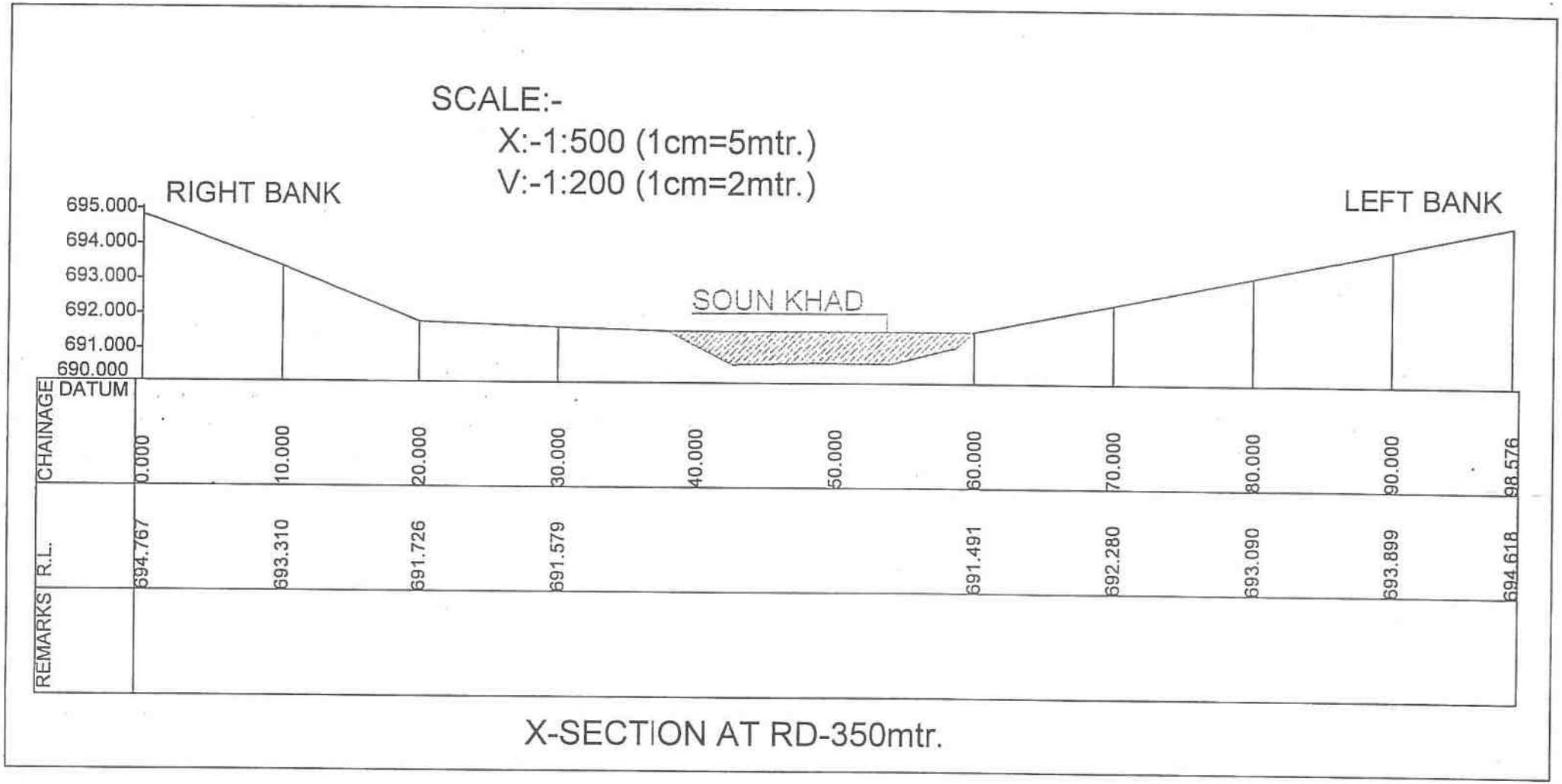
X-SECTION AT RD-300mtr.

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	98.576
R.L.	694.767	693.310	691.726	691.579			691.491	692.280	693.090	693.899	694.618
REMARKS											

X-SECTION AT RD-350mtr.

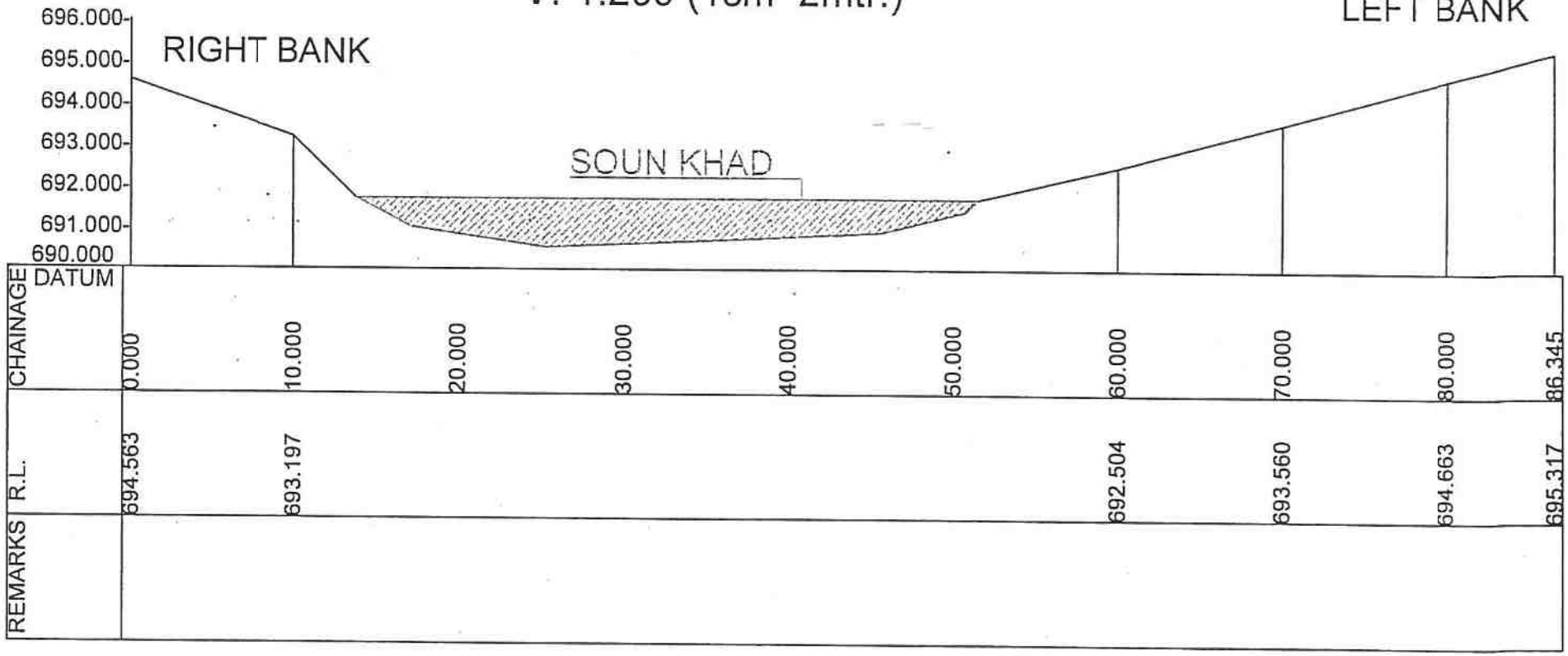
434

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

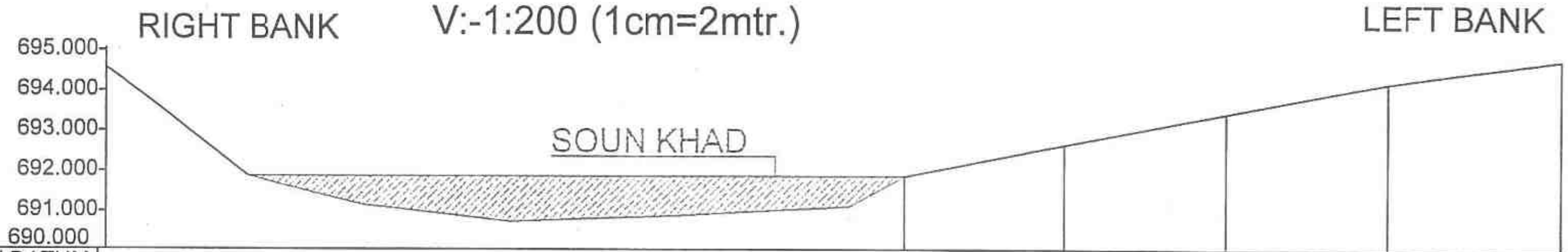
V:-1:200 (1cm=2mtr.)



X-SECTION AT RD-400mtr.

QUARRY SITE OF SOUN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.762
R.L.	694.527					691.818	692.621	693.396	694.172	694.777
REMARKS										

X-SECTION AT RD-450mtr.

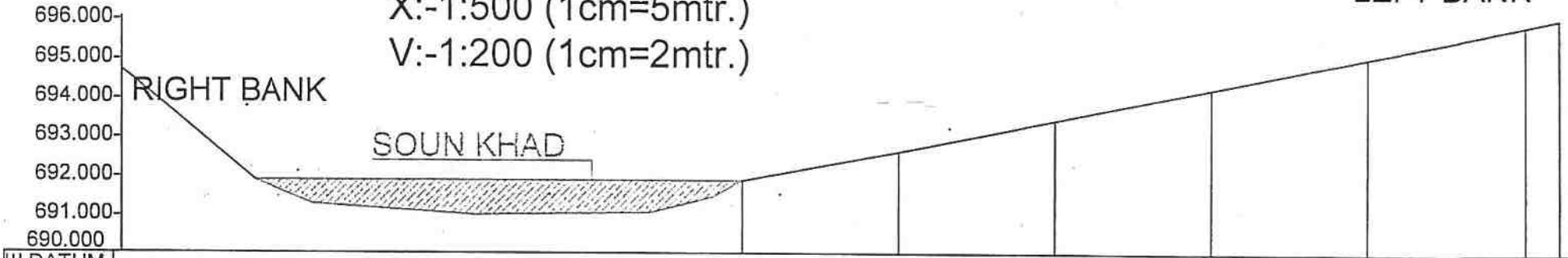
636/1

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	92.175
R.L.	694.679				691.852	692.594	693.398	694.202	695.005	695.810	695.988
REMARKS											

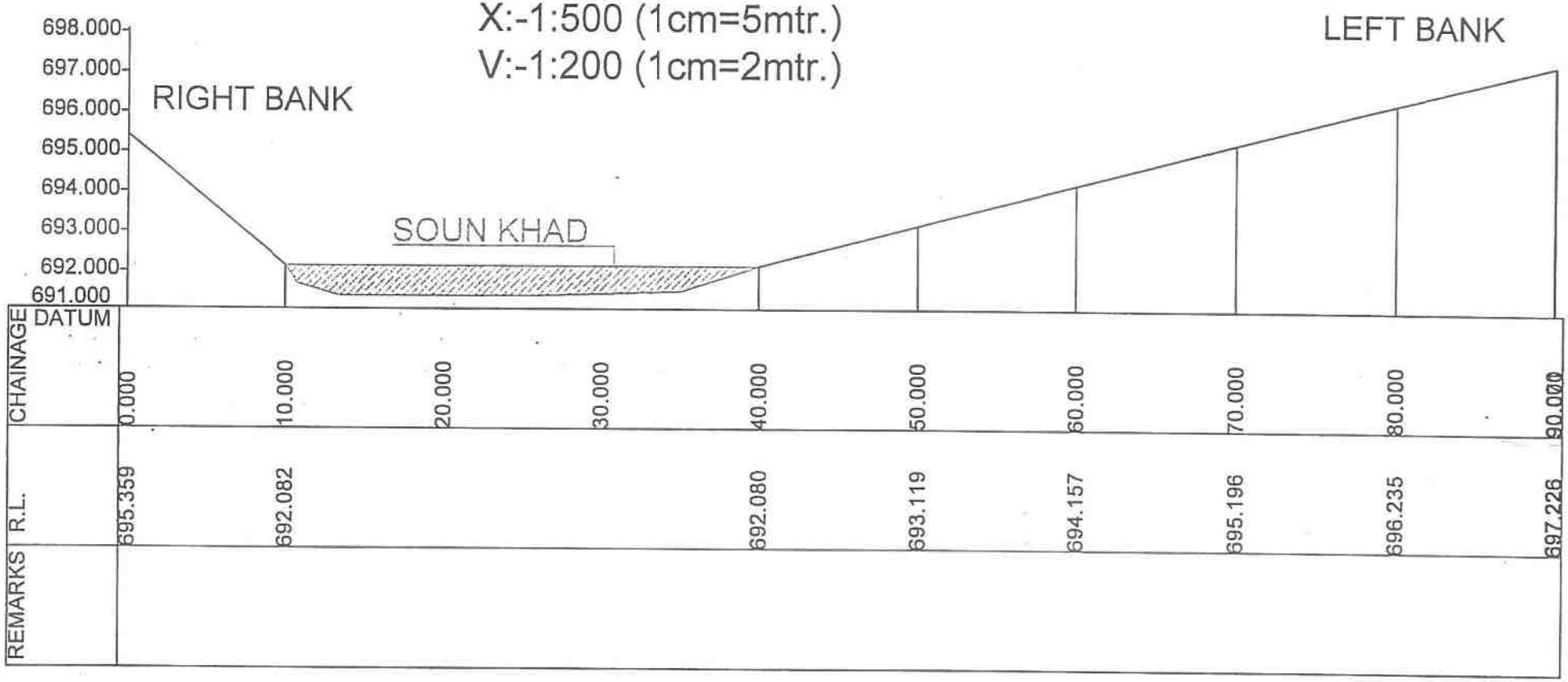
X-SECTION AT RD-500mtr.

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000
R.L.	695.359	692.082			692.080	693.119	694.157	695.196	696.235	697.226
REMARKS										

X-SECTION AT RD-550mtr.

698

(417)

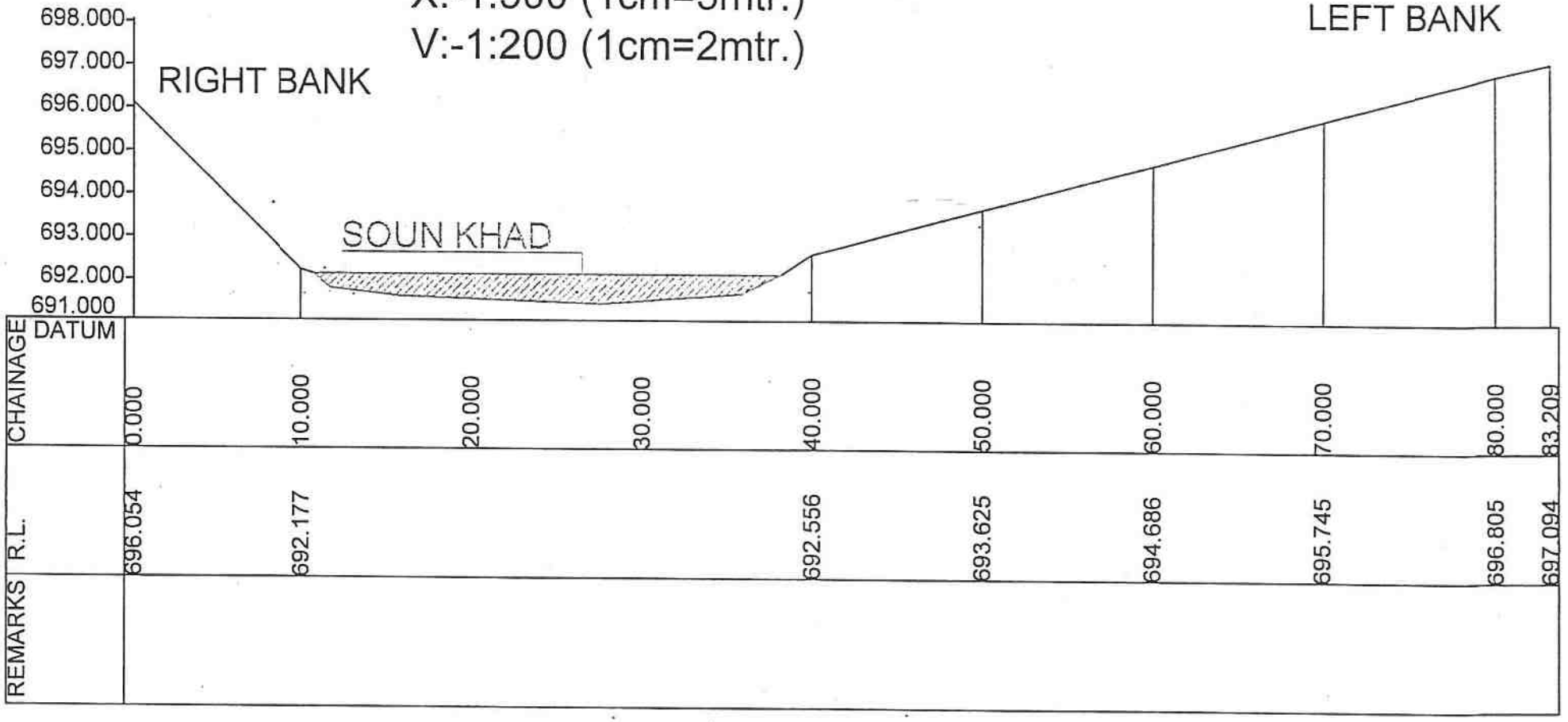
(173)

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



	DATUM									
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	83.209
R.L.	696.054	692.177			692.556	693.625	694.686	695.745	696.805	697.094
REMARKS										

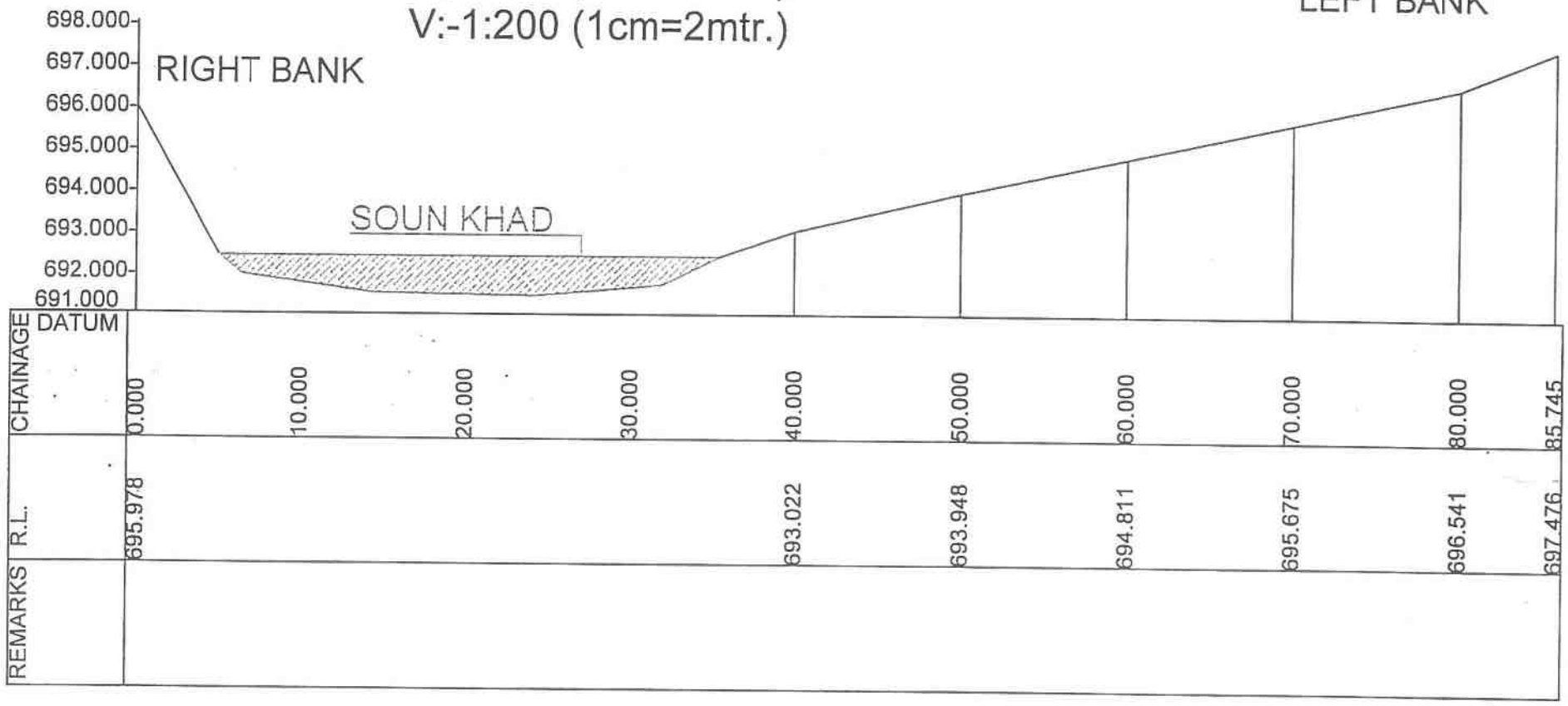
X-SECTION AT RD-600mtr.

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



	DATUM									
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	85.745
R.L.	695.978				693.022	693.948	694.811	695.675	696.541	697.476
REMARKS										

X-SECTION AT RD-650mtr.

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(174)

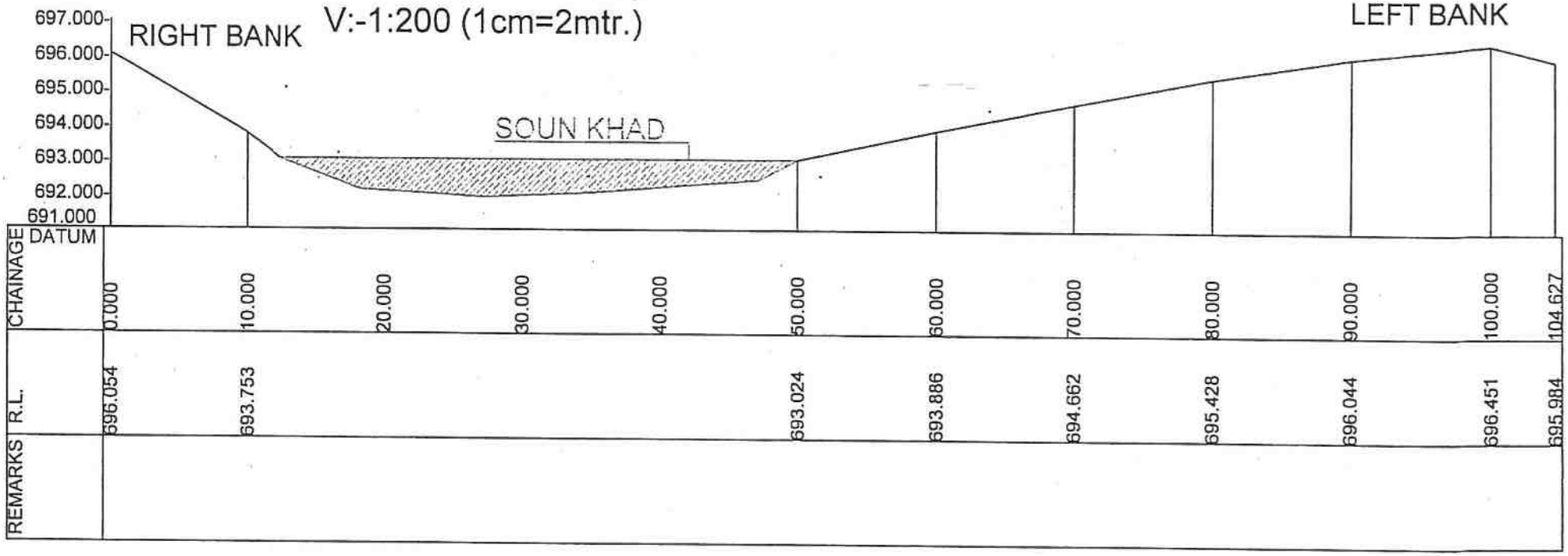
64

QUARRY SITE OF SOUN KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)

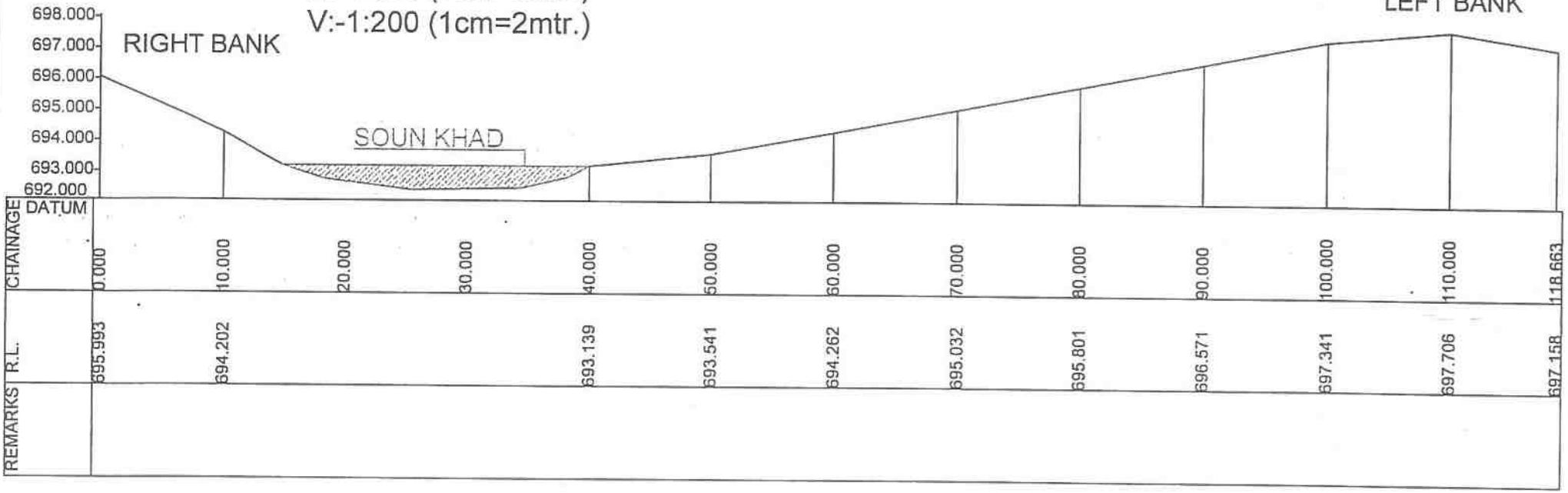


	DATUM										
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	104.627
R.L.	696.054	693.753				693.024	693.886	694.662	695.428	696.044	696.451	695.984
REMARKS												

X-SECTION AT RD-700mtr.

QUARRY SITE OF SOUN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	118.663
R.L.	695.993	694.202			693.139	693.541	694.262	695.032	695.801	696.571	697.341	697.706	697.158
REMARKS													

X-SECTION AT RD-750mtr.

642

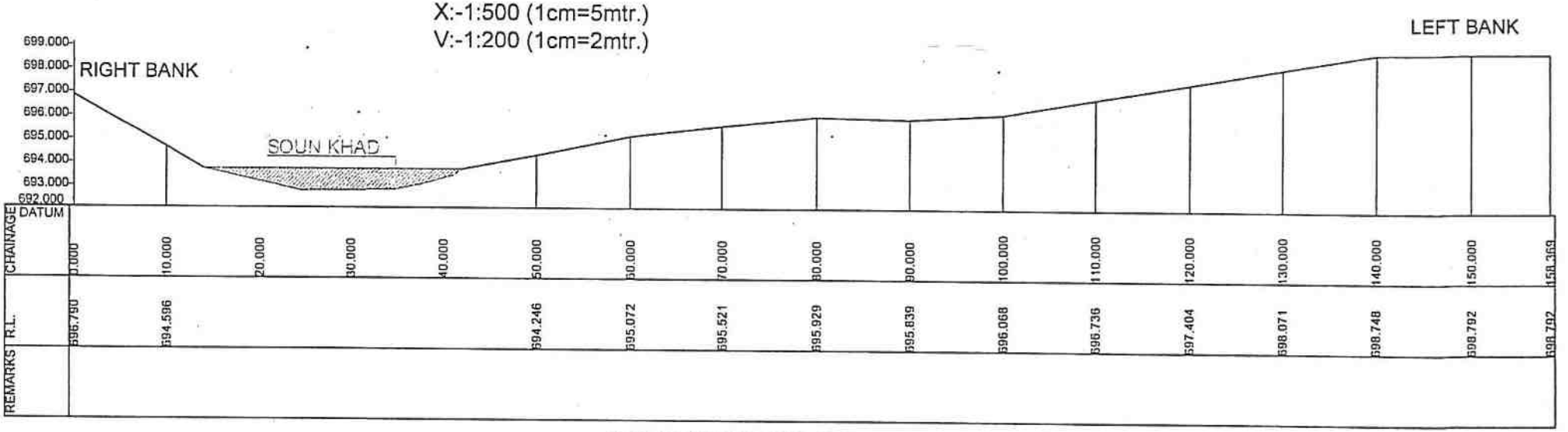
(119)

643-

(175)

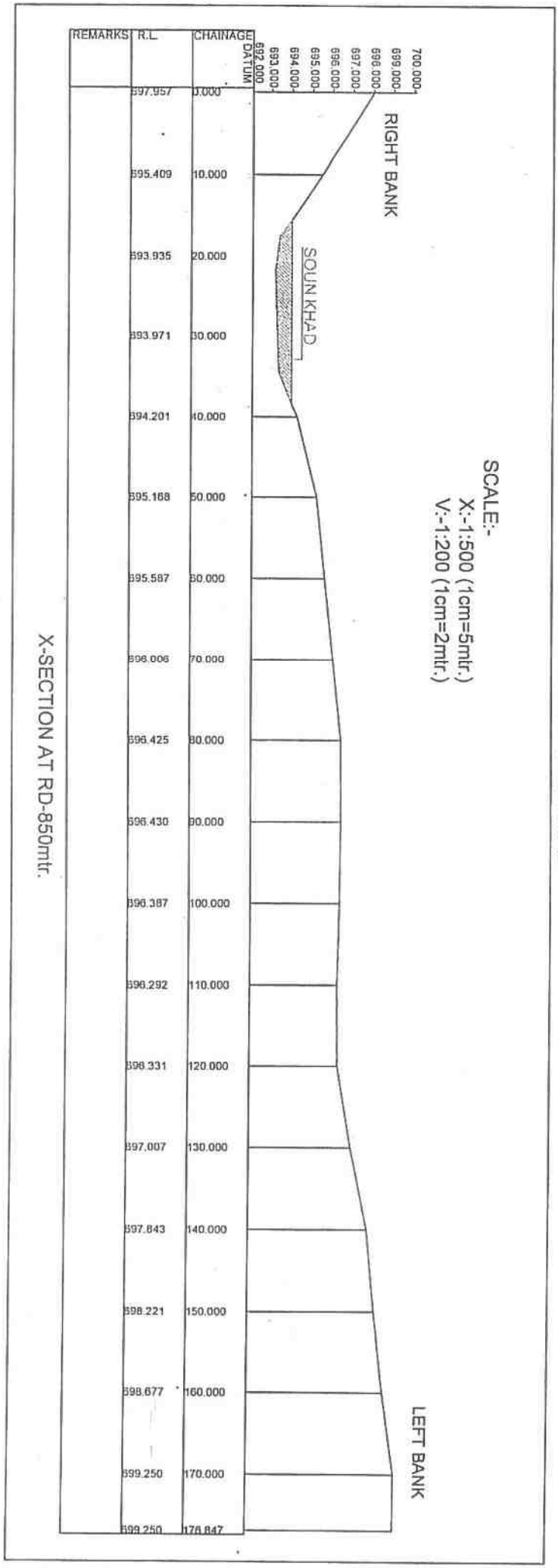
QUARRY SITE OF SOUN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)



X-SECTION AT RD-800mtr.

644

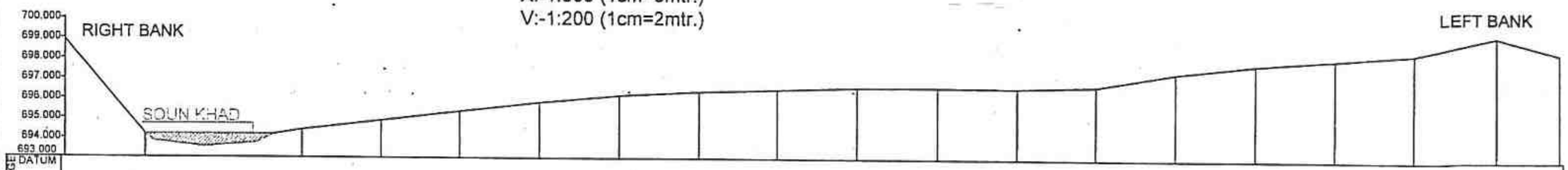

QUARRY SITE OF SOUN KHAD
SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)
X-SECTION AT RD-850mtr.
RIGHT BANK
LEFT BANK
SOUN KHAD
700.000
699.000
698.000
697.000
696.000
695.000
694.000
693.000
692.000
DATUM
REMARKS
R.L.
CHAINAGE
697.957 0.000
695.409 10.000
693.935 20.000
693.971 30.000
694.201 40.000
695.168 50.000
695.587 60.000
696.006 70.000
696.425 80.000
696.430 90.000
696.387 100.000
696.292 110.000
696.331 120.000
697.007 130.000
697.843 140.000
698.221 150.000
698.677 160.000
699.250 170.000
699.250 176.847

645

(470)

QUARRY SITE OF SOUN KHAD

SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)

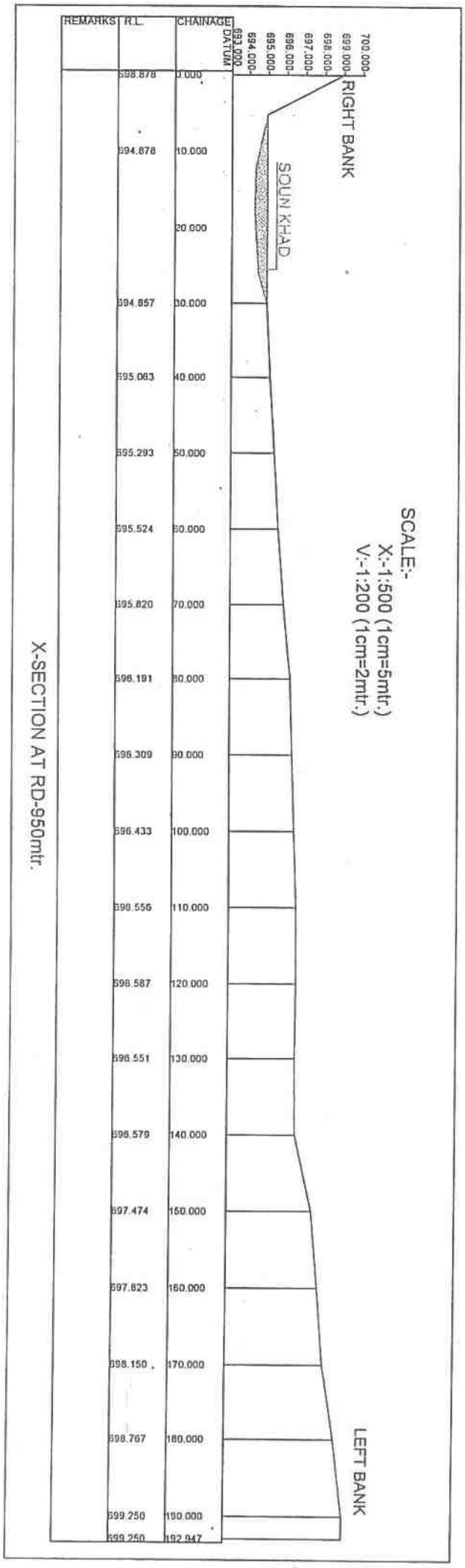


DATUM																			
CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	110.000	120.000	130.000	140.000	150.000	160.000	170.000	180.000	187.935
R.L.	698.096	694.167		694.380	694.855	695.316	695.772	696.149	696.339	696.456	696.573	696.585	696.561	696.674	697.349	697.777	698.059	698.368	699.250	698.379
REMARKS																				

X-SECTION AT RD-900mtr.

174

646


QUARRY SITE OF SOUN KHAD
SCALE:-
X:-1:500 (1cm=5mtr.)
V:-1:200 (1cm=2mtr.)
RIGHT BANK
SOUN KHAD
LEFT BANK
X-SECTION AT RD-950mtr.
CHAINAGE
R.L.
REMARKS
DATUM
693.000
694.000
695.000
696.000
697.000
698.000
699.000
700.000
698.878 0.000
694.878 10.000
20.000
694.857 30.000
695.063 40.000
695.293 50.000
695.524 60.000
695.820 70.000
696.191 80.000
696.309 90.000
696.433 100.000
696.556 110.000
696.587 120.000
696.551 130.000
696.579 140.000
697.474 150.000
697.823 160.000
698.150 170.000
698.767 180.000
699.250 190.000
699.250 192.947

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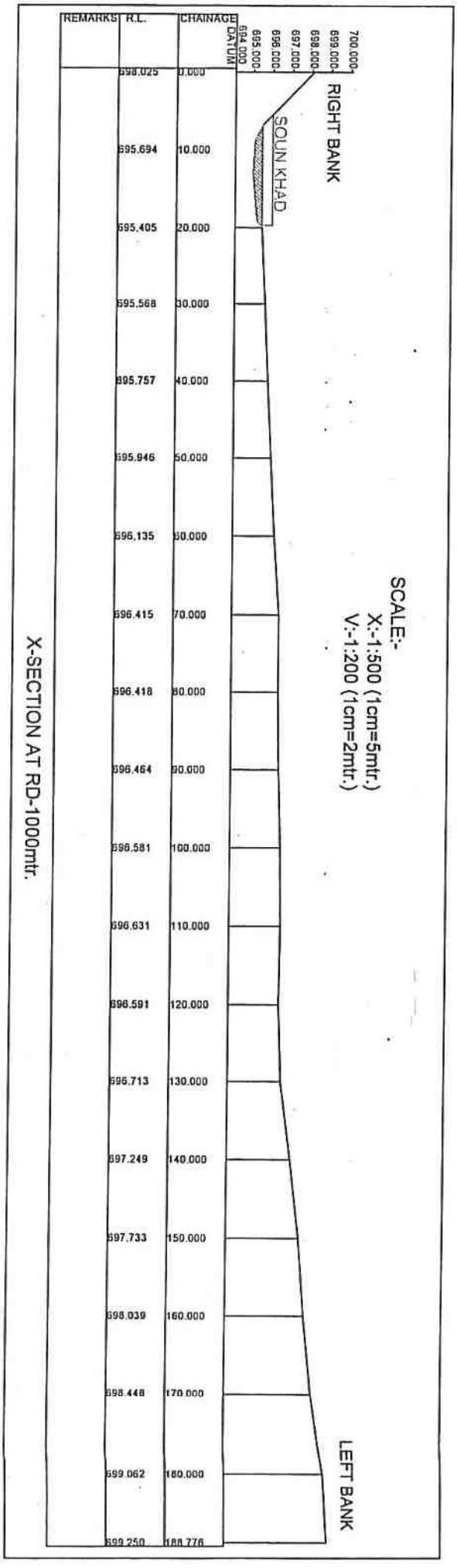

REMARKS	R.L.	CHAINAGE
	698.025	0.000
	695.694	10.000
	695.405	20.000
	695.568	30.000
	695.757	40.000
	695.946	50.000
	696.135	60.000
	696.415	70.000
	696.418	80.000
	696.464	90.000
	696.581	100.000
	696.631	110.000
	696.591	120.000
	696.713	130.000
	697.249	140.000
	697.733	150.000
	698.039	160.000
	698.448	170.000
	699.062	180.000
	699.250	188.776

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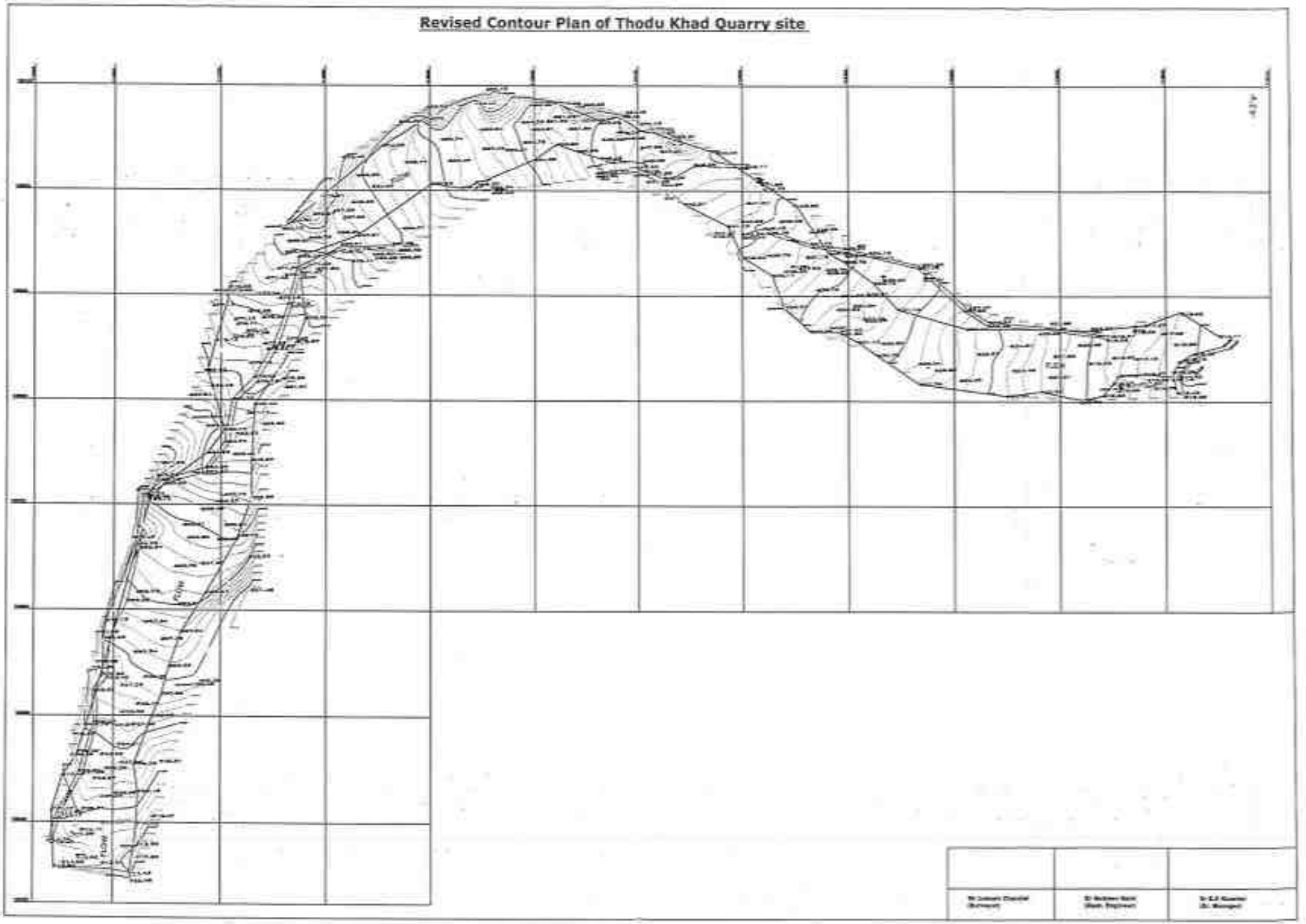
Revised Contour Plan of Thodu Khad Quarry site



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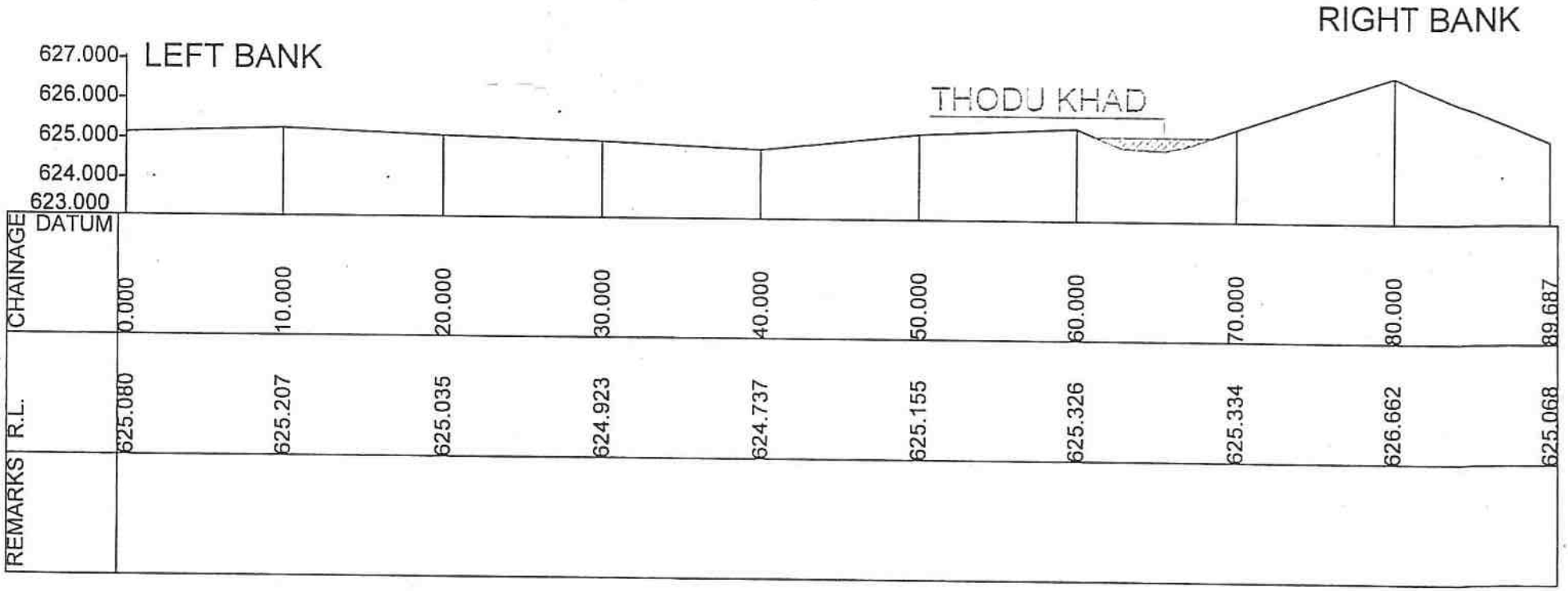
QUARRY SITE OF THODU KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	89.687
R.L.	625.080	625.207	625.035	624.923	624.737	625.155	625.326	625.334	626.662	625.068
REMARKS										

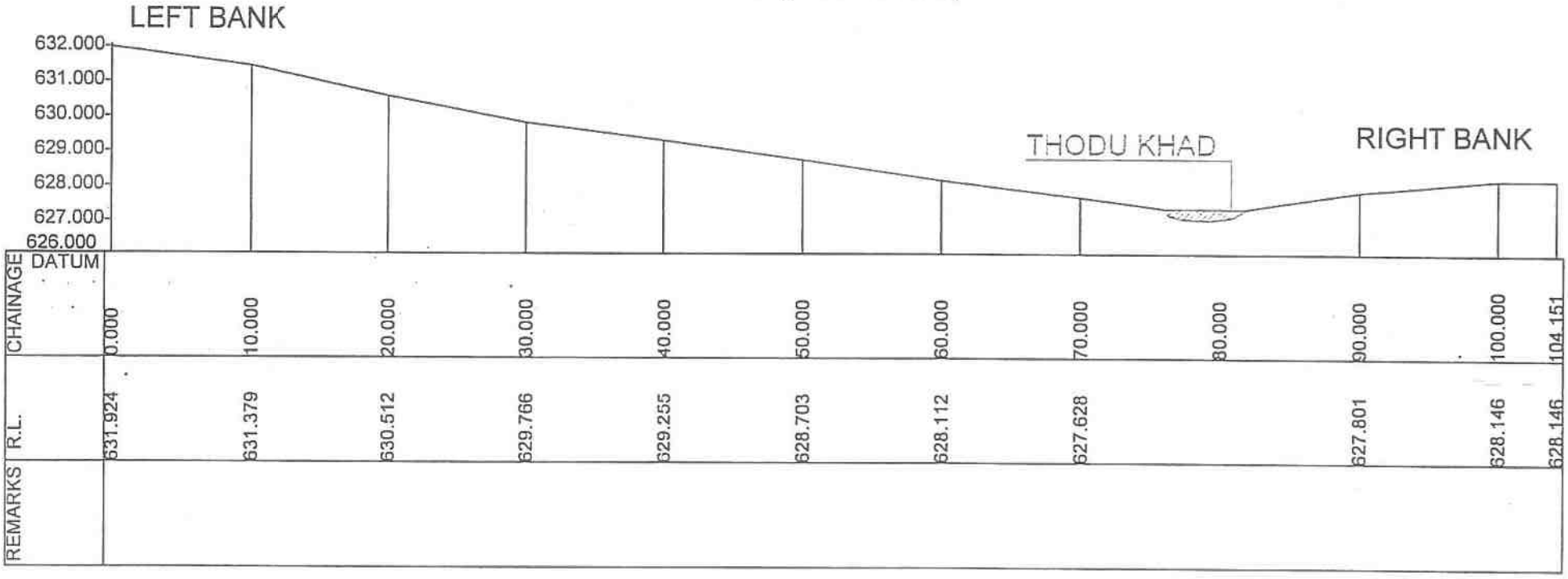
X-SECTION AT RD-0mtr.

QUARRY SITE OF THODU KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



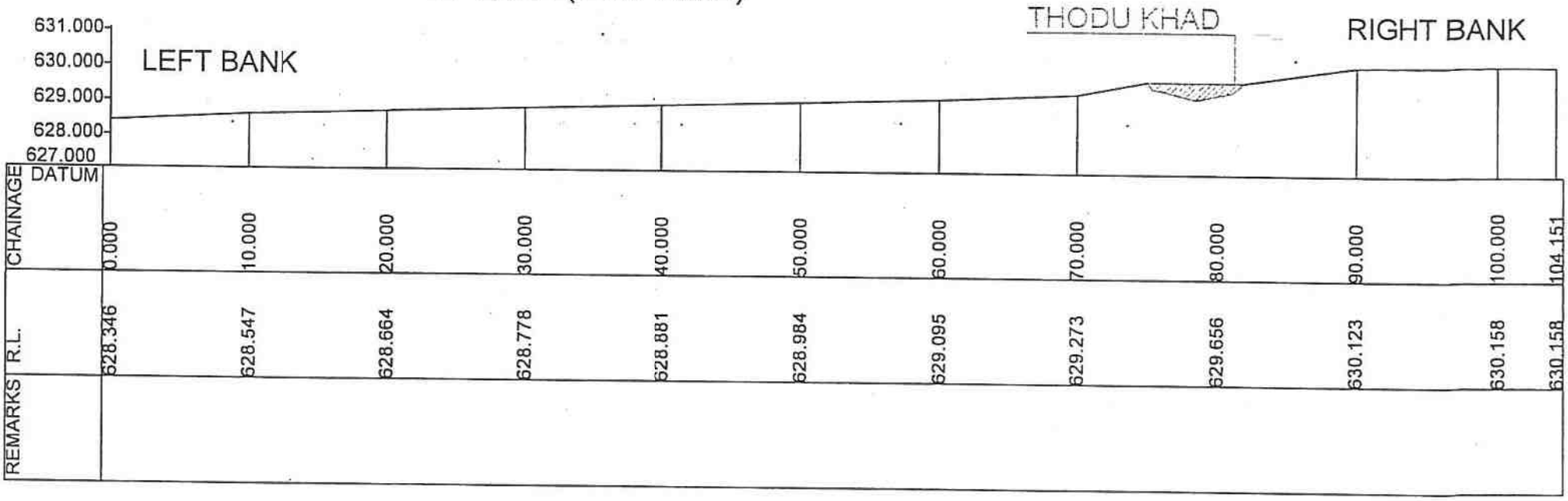
X-SECTION AT RD-50mtr.

QUARRY SITE OF THODU KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	100.000	104.151
R.L.	628.346	628.547	628.664	628.778	628.881	628.984	629.095	629.273	629.656	630.123	630.158	630.158
REMARKS												

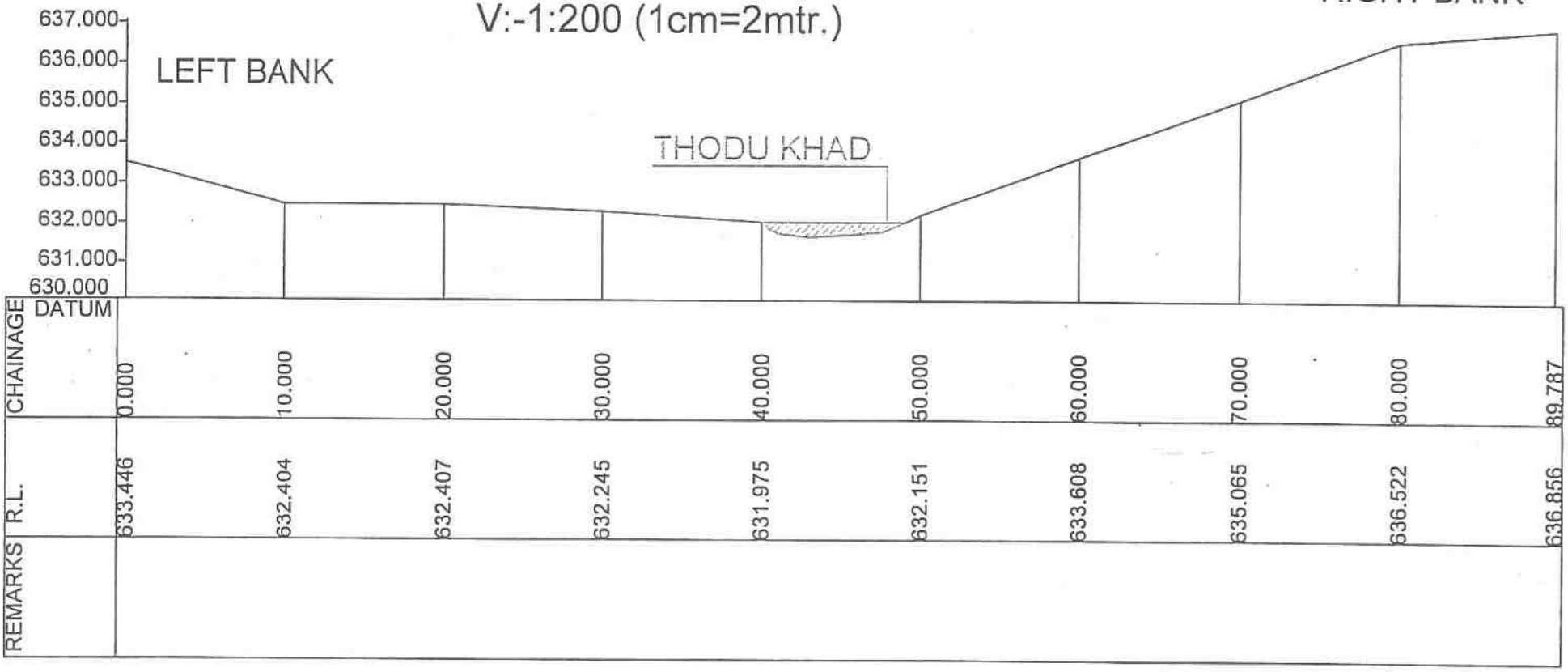
X-SECTION AT RD-100mtr.

QUARRY SITE OF THODU KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	89.787
R.L.	633.446	632.404	632.407	632.245	631.975	632.151	633.608	635.065	636.522	636.856
REMARKS										

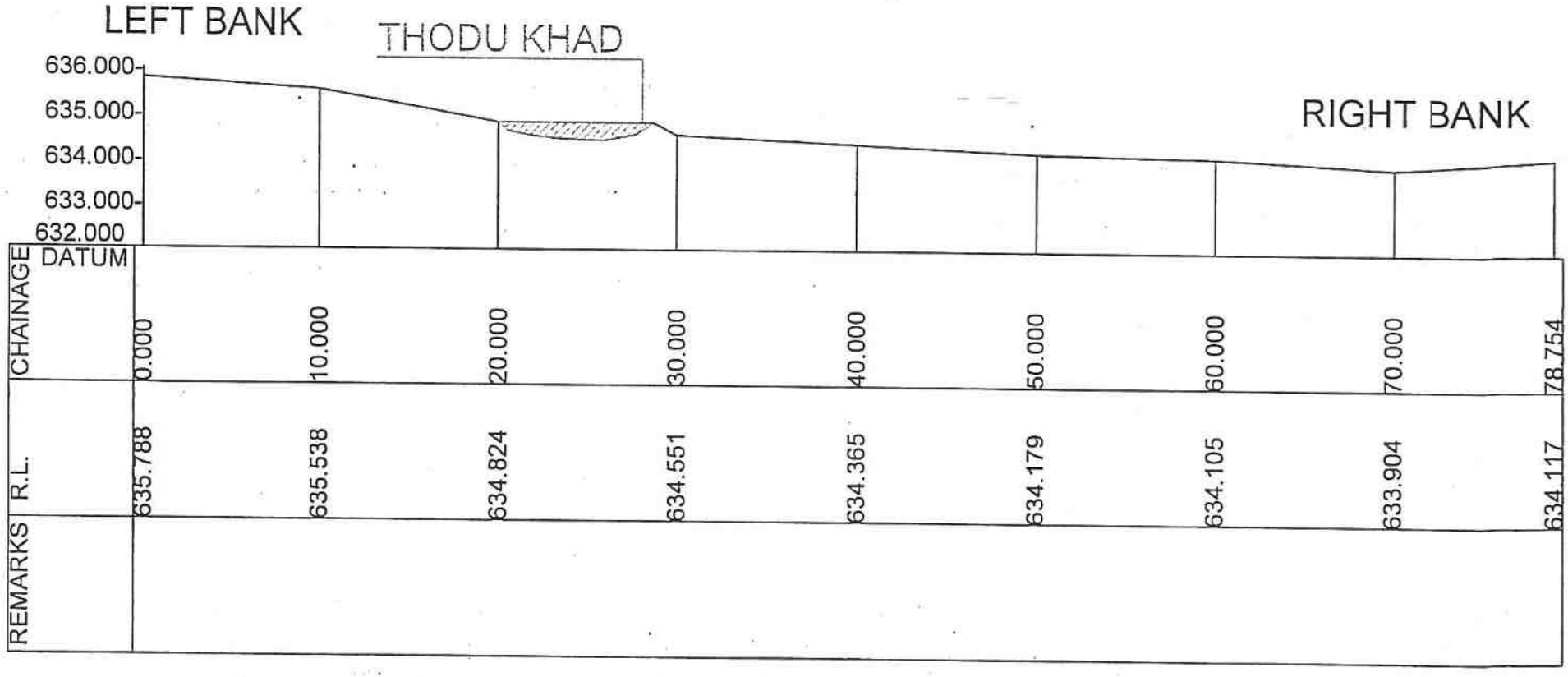
X-SECTION AT RD-150mtr.

QUARRY SITE OF THODU KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	78.754
R.L.	635.788	635.538	634.824	634.551	634.365	634.179	634.105	633.904	634.117
REMARKS									

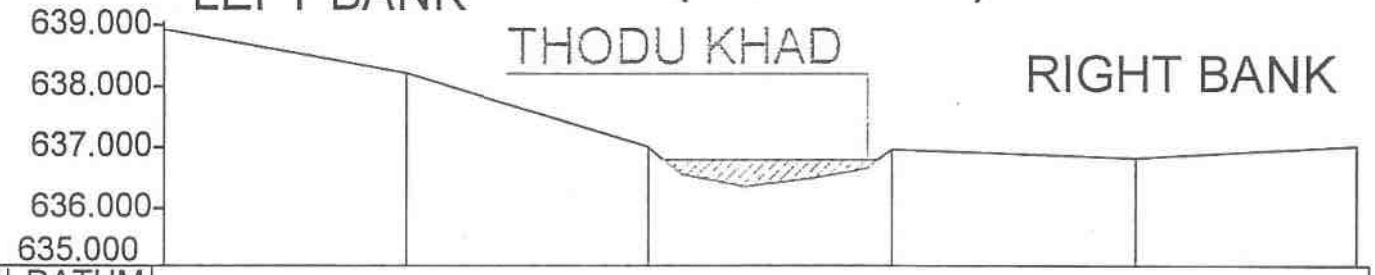
X-SECTION AT RD-200mtr.

QUARRY SITE OF THODU KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

Y:-1:200 (1cm=2mtr.)



CHAINAGE	0.000	10.000	20.000	30.000	40.000	48.988
R.L.	638.878	638.167	636.949	636.905	636.772	636.964
REMARKS						

X-SECTION AT RD-250mtr.

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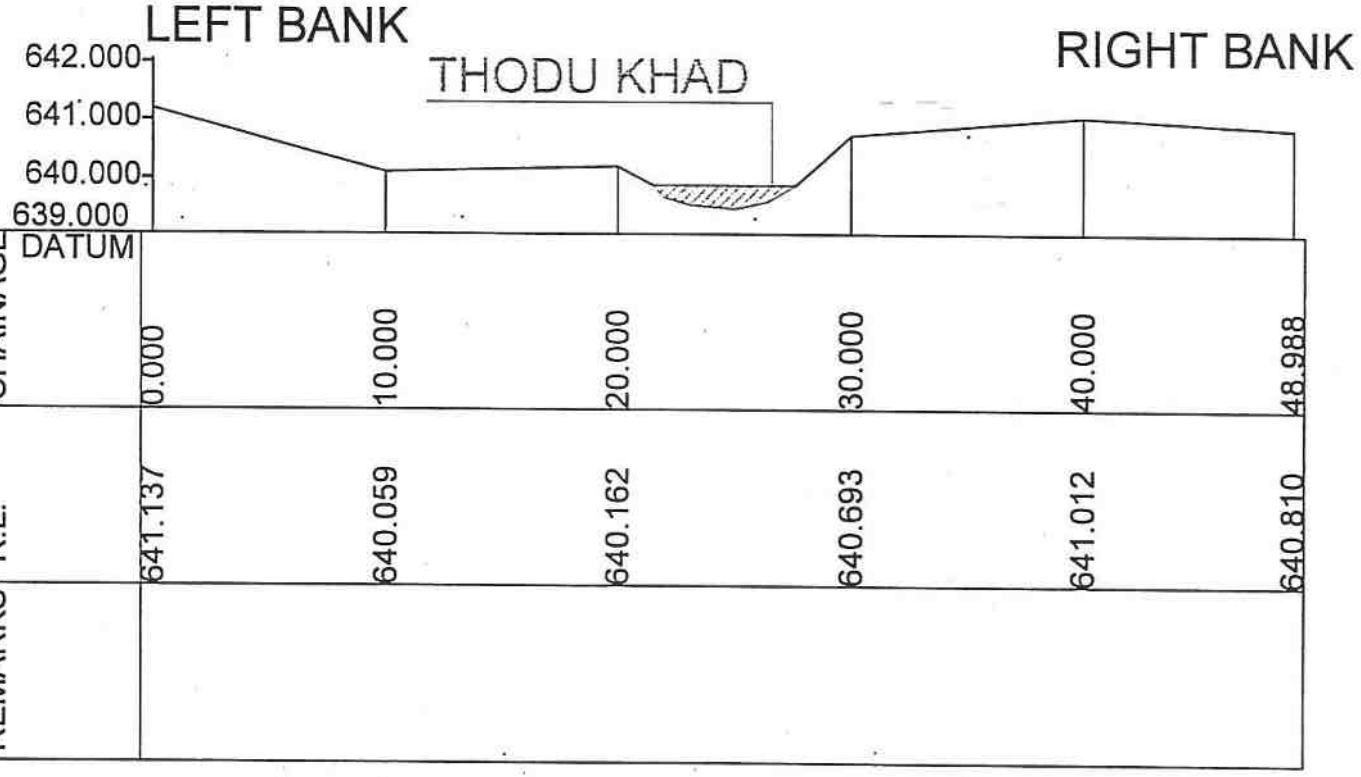
QUARRY SITE OF THODU KHAD

SCALE:-

X:-1:500 (1cm=5mtr.)

V:-1:200 (1cm=2mtr.)



X-SECTION AT RD-300mtr.

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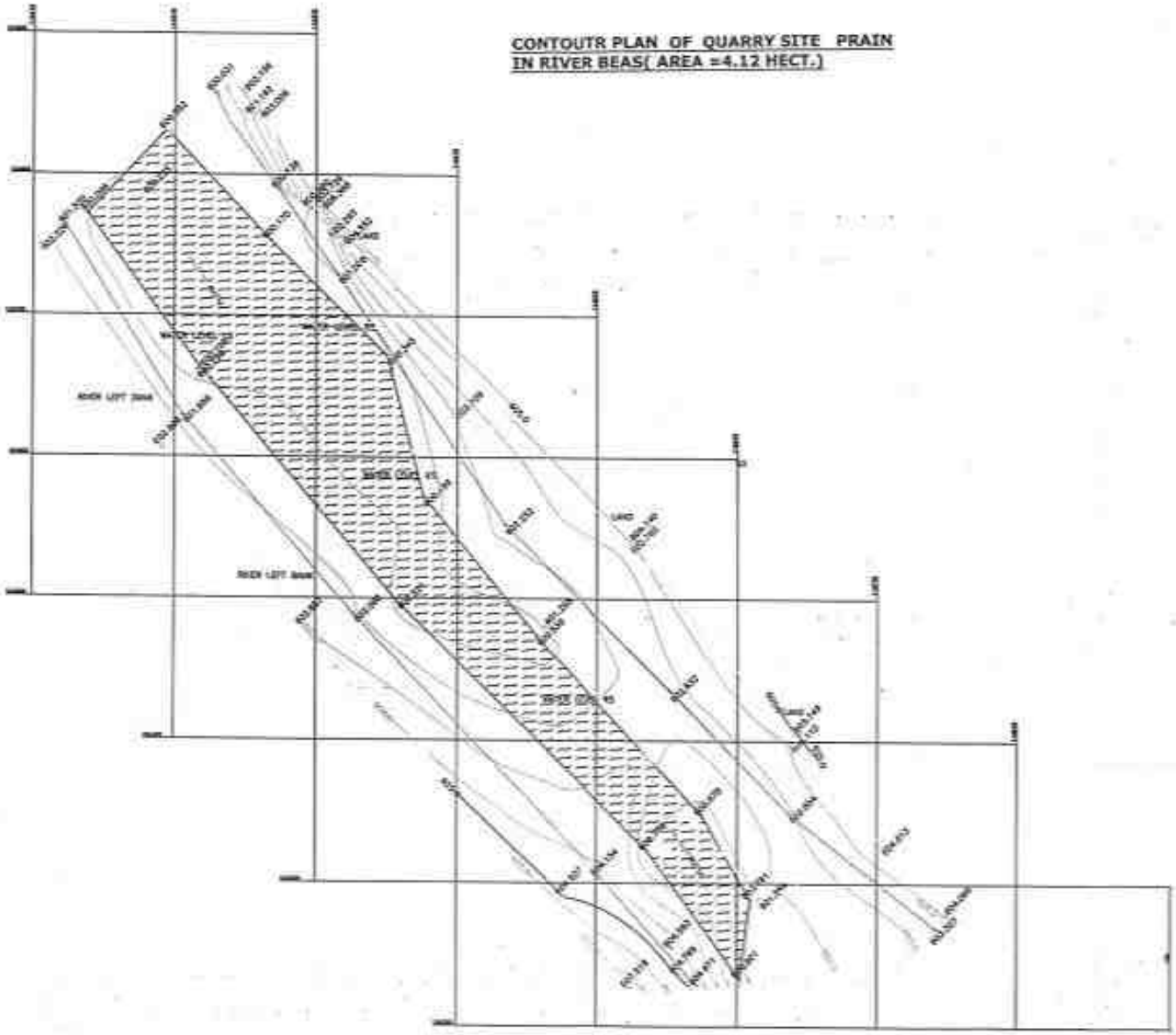
CONTOUTR PLAN OF QUARRY SITE PRAIN IN RIVER BEAS(AREA =4.12 HECT.)



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CHAPTER-8
RESTORATION PLAN FOR QUARRY SITES AND LANDSCAPING

8.1 INTRODUCTION

The dam site location downstream of confluence of Arnodi Khad with Beas river in Joginderngar Tehsil of District Mandi, Himachal Pradesh is accessible from the Joginderngar-Neri-Dharampur highway through existing unmetalled approach roads constructed by PWD (major district road on the left bank of the river) through a foot track. Power house location and other components are also accessible by the same track as these are located just downstream of the dam. As the place is visited by tourists and is a mountaineering destination in Himalaya, the tourist shall certainly visit the area. The stretch of river Beas behind the main the project will definitely add up to the natural ambience of the forests when the reservoir lake gets created. The project on completion will be a masterpiece of technology and landscape planning of the project will further add to its aesthetic value.

8.2 EXCAVATION PLAN

The investigations carried out comprise identification of borrow areas and their exploration by trial pits including collection of disturbed representative sample (DS); their testing and analysis in the laboratory as per **USBR Earth Manual / IS Code.** The borrow areas identified for the project are tabulated in the following Table 8.1.

A perusal of **Annexure III** in respect of petrographic examination report of drift rock and core samples show that the rock is geologically identified to be sandstone comprising monocrystalline quartz, feldspar, biotite, muscovite and accessory minerals. Based on review of the average values in respect of mechanical and physical properties, it is seen that the natural fine aggregates can be categorized as suitable for use in concrete for non – wearing and wearing surfaces. The total rock required from quarry sites is in the order of 730000 cum for which sites have been identified.

In-site estimated quantity of raw material at the proposed quarry site = 918800 cum

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Table 8.1: Reserve estimation of the quarry site

S. No.	Location	Quarry Area in Ha	Approximate Reserve Quantity of RBM, m^3
1	RBM at Saklain Khad quarry site	20.5	410000
2	RBM at Son Khad quarry site	4.1	82000
3	RBM at Bens River quarry site	4.12	82400
4	RBM at Molad Khad	7.72	154400
5	RBM at Thodu Khad	9.5	190000
	Total	**45.94**	**918800**

It is estimated that 25% of the excavated quantity from quarry shall be replenished during monsoon season =29700 cum

Total= 1148500 cum

Estimated quantity of aggregates (CA & FA) required for construction of project = 730000 cum

Quantity of aggregates required considering (38% losses) as per CWC guidelines = 1007000 cum

Hence, quantity of raw aggregate available in proposed quarry sites is sufficient to meet the required quantity.

The quantity of coarse and fine aggregates required for wearing and non-wearing concrete surface:

a) Wearing surface

Coarse aggregate	=	58940 m^3
Fine aggregate	=	29471 m^3

b) Non-wearing surface

Coarse aggregate	=	403212 m^3
Fine aggregate	=	201605 m^3
Total	=	693228 m^3
Total required quantity (i/c shortcrete etc.)	=	730000 m^3

Availability of coarse aggregate and aggregate for wearing and non-wearing surface; out of total estimated raw RBM material of 1148500 cum available for coarse and fine aggregate (1148500-103000) = 1045500 cum is suitable for wearing and non-wearing surfaces. Quantity of raw material *i.e.* (82400x1.25 = 103000 cum) available from Beas river bed is suitable for non-wearing surfaces only.

Based on techno-economic considerations involving suitability of material for use, it is recommended that the materials from the excavated muck may be exploited for various civil components of Thana Plain HEP, the quarries identified above shall be exploited only during exigency.

The breakup of 38% total losses as per CWC guidelines is given in Table 8.2.

Table 0.2: Breakup of total loss

S. No.	Description	Percentage
1	Rejection at Quarry Site	20
2	Transit losses from quarry to aggregate processing plant	5
3	In process rejection	10
4	Transit losses from aggregate processing plant to batching plant	3
	Total	**38**

(Source: DPR)

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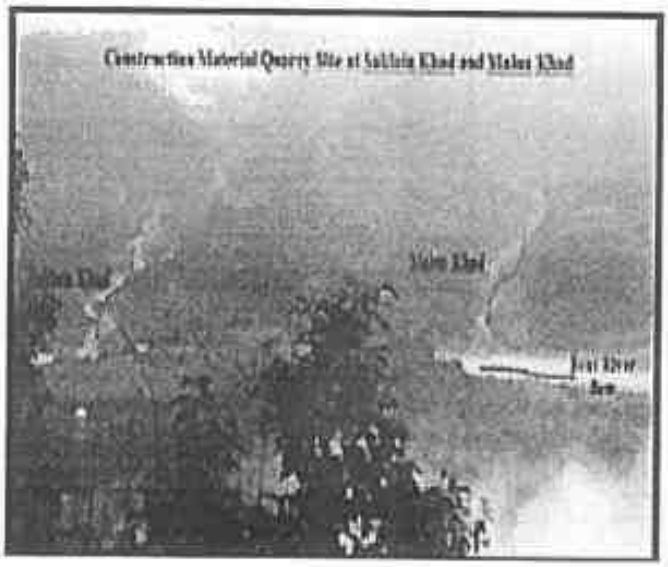

Plate 1 : Borrow area for construction work *(Source: DPR)*

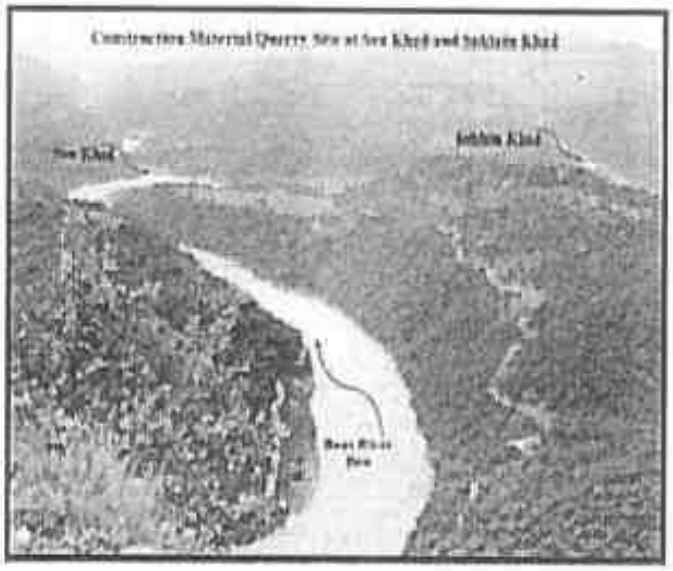

Plate 2 : Borrow area for construction work *(Source: DPR)*

Before starting the excavation activities, the area would be cleared of all trees. The excavation of the quarry material would be done in a controlled and systematic way so that the abandoned site, after extraction of material, is safe and orderly.

8.3 DISTURBED SITES & THEIR RESTORATION

Construction activities like roads, muck dumping sites, quarry sites, colonies, workshops, offices, etc. which will change the existing land use/ land cover in the region. After completion of the construction work, it is required to restore the disturbed area to its original condition. Various engineering and biological measures have been suggested for the restoration of Thana-Plaun HEP affected areas. Proposed mitigation measures will also help to arrest soil erosion in the region. Restoration of quarry sites, roads and colony area is discussed and a detailed plan is given for the landscaping of the region. In the process of excavation of material, environmental degradation in and around the quarry sites, and along the haul roads is inevitable as the quarrying operation is a forced activity. In the present case, all the quarry sites are river bed sheal deposits in the Beas River, Malod, Thodu, Son and Saklan Khads, their annual replenishment shall take place during Monsoon. Such borrow areas will only need soil conservation measures to avoid the erosion of the banks of river / Khads (**Plate 1 & 2**). The cost estimate for restoration of borrow areas has been kept for Rs. 25.00 lacs. The Financial Provisions of Landscape and Quarry Restoration Works for Thana Plaun HEP are given in Table 8.3.

There will be indirect disturbance to the area due to increase in the human population and traffic movement. It will be essential for the project authority to restore the area (Landscape) back to its original state for which a budget allocation of Rs. **10.00 lacs** is being made. Thus, the total provision under this plan shall be **Rs. 35.00 lacs**. The quarry sites drawings are attached as **Annexure III**.

Table 0.1: Financial provisions of landscape and quarry restoration works for Thana Plaun HEP

S. No	Name of Work	Amount (Rs. in Lacs)
1.	Provision for site development in and around of the project due to human intervention and traffic	10.00
2.	Restoration of Borrow Area *i.e.* bank protection activities around the quarry sites	25.00
	Total	35.00

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H.P. POWER CORPORATION LIMITED

CENTRAL SOIL & CONCRETE TESTING LABORATORY

REPORT NO CSCL--- AGGREGATE—312

REPORT ON MATERIAL QUANTIFICATION, SUITABILITY COARSE AND FINE AGGREGATES, GRADATION AND SHEAR PARAMETERS TESTS OF SOIL FROM VARIOUS QUARR Y SITES IN RESPECT OF THANA PLAUN HEP (141 MW).

FEBRUARY-2012

NAULAKHA

(SUNDER NAGAR)

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CONTENTS

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TEST RESULTS OF MATERIAL QUANTIFICATION, SUITABILITY TEST OF COARSE AND FINE AGGREGATES GRADATRION AND SHEAR PARAMETERS OF SOIL COLLECTED FROM VARIOUS QUARR Y SITES IN RESPECT THANA PLAUN HEP (141 MW).

1.0 HISTORY.

The Dy. Manager O/O General Manager , Triveni Mahadev & Thana Plaun HEPs , HPPCL, Sujanpur Tihra, Distt. Hamirpur (HP) had supplied material for quantification ,suitability test of Coarse and Fine aggregate , gradation and shear parameters tests of soil samples collected from various quarry sites in respect of Than Plaun HEP , vide office letter No. HPPCL/GM-TM&TP HEPs /TP-Civil/G-4/2011-2835-2838 dated 21-12-2011.

2.0 LOCATION.

Material for quantification , suitability test of Coarse and Fine aggregates and gradation & shear parameters tests , collected from various quarry sites in respect of Thana Plaun HEP (141 MW)

3.0 PROCEDURE

The above said material tested for its quantification and suitability of Coarse and Fine Aggregates , gradation & shear parameters tests as mentioned below:-

4.0 COARSE AGGREGATE:-

4.1 SPECIFIC GRAVITTY & WATER ABSORPTION.

The Coarse Aggregate samples were screened through 40mm to 10mm IS: Sieves , washed, dried and tested its specific gravity & water absorption as per procedure given in IS:2386 (Part-III).

4.2 IMPACT AND CRUSHING VALUE

The Coarse aggregate samples were screened through 12.5mm to 10mm IS: Sieves and Aggregate retained on 10mm IS: Sieve tested for its Impact value and Crushing value as per procedure laid in IS:2386(Part-IV) in surface dry condition.

4.3 ABRASION VALUE (LOS ANGELES)

The tests performed as per IS:2386 (Part-IV) for determining abrasion value by using los Angles Machine .

4.4 SOUNDNESS.

The tests performed as per IS: 2386 (Part-IV) with sodium sulphate.

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5.0 FINE AGGREGATE.

5.1 SPECIFIC GRAVITY.

The Fine aggregates samples were screened through 4.75mm IS: Sieve and tested its specific gravity as per procedure laid in concrete manual (USBR).

5.2 GRADATION ANALYSIS (F.M.)

The tests were done as per procedure given in Concrete manual (USBR) determining its fineness modulus.

5.3 SILT AND CLAY CONTENTS.

The tests were performed as per procedure laid in IS: 2386(Part-I) for determining silt & clay contents i.e. material passing 75 micron IS: Sieve.

5.4 MATERIAL QUANTIFICATION;-

The gradation analysis of river bed material of various quarry sites in respect of Thana Plaun HEP have been performed in accordance with USBR earth manual / IS:1720 Part IV-1975 for approximate quantification .

5.5 GRADATION ANALYSIS & SHEAR PARAMETER TESTS:-

The Gradation analysis of the soil samples are done in accordance with USBR earth manual / IS: 2720 (part-IV)1975. The Direct Shear Tests (containing gravel) have been conducted in saturated drained conditions as per IS:2720 (Part-XXXIX, Section –I) 1977 . 70% relative density & 5 % moisture contents has been considered for conducting the test as per USBR earth manual .The soil consists gravel , sand , Silt & Clay mixture.

6.0 INTERPRETATION OF RESULTS.

From the test results it seems that the, suitability tests of Coarse and Fine aggregate samples are suitable for use in wearing surface & non-wearing surface concrete works and the angle of shearing resistance in saturated drained condition is 37^0-34^1 and value of cohesion is 0.04 kg. /cm^2 in respect of plate load test Pit of Power House Site of Thana Plaun HEP.

REFERENCES

Sr. No.	DESCRIPTION
1.	IS: 383-1970
2.	IS: 2386 (Part-I)
	IS: 2386 (Part-II)
	IS: 2386 (Part-III)
	IS: 2386 (Part-IV)
	IS: 2386 (Part-V)
3.	USBR Concrete Manual / ASTM.
4.	USBR Earth Manual / 1720 Part-IV -1975.

ANNEX- I

CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).

STATEMENT SHOWING THE QUANTITY OF RIVER BORNE MATERIAL AVAILABLE AT SAKLAIN KHAD QUARRY SITE IN RESPECT OF THANA PLAUN HEP (141 MW) .

Sr. No.	IS Sieve Size	Pit No.1	Pit No.2	Pit No.3	Pit No.4	Average %age Retained of Total pits	Total Qty. Available in (M^3)	Remarks.
1	Material above 300mm (Boulders)	7.08	9.54	7.72	12.02	9.09	14544	Approximate Reserve Quantity of River borne Const. material At Saklain Khad Quarry site As works out Is 160000M^3.
2	Material between 300 to 80mm(Cobbles)	38.29	40.37	40.93	37.39	39.24	62784	
3	-do- 80 to 40mm	11.66	11.71	12.51	11.91	11.95	19120	
4	-do- 40 to 20mm	9.81	7.74	7.25	8.24	8.26	13216	
5	-do- 20 to 10mm.	6.42	5.44	5.90	5.71	5.87	9392	
6	-do- 10 to 4.75mm	4.28	3.90	3.79	3.80	3.94	6304	
7	Material (-) 4.75mm i.e sand	20.66	19.81	20.19	19.38	20.01	32016	
8	Material (-) 75micron	1.80	1.49	1.71	1.55	1.64	2624	

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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Sr. Manager (QA),
Main Central Lab. HPPCL,
Naulakha, Sundernagar.

ANNEX- II

CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).

STATEMENT SHOWING THE QUANTITY OF RIVER BORNE MATERIAL AVAILABLE AT SON KHAD QUARRY SITE IN RESPECT OF THANA PLAUN HEP (141 MW).

Sr. No.	IS Sieve Size	Pit No.1	Pit No.2	Pit No.3	Pit No.4	Average %age Retained of Total pits	Total Qty. Available in (M^3)	Remarks.
1	Material above 300mm (Boulders)	8.02	9.46	9.92	4.76	8.04	12060	Approximate Reserve Quantity of River borne Const. materia At Son Khad Quarry site As works out Is 150000M^3.
2	Material between 300 to 80mm(Cobbles)	4016	40.31	39.65	41.76	40.47	60705	
3	-do- 80 to 40mm	13.98	12.13	13.11	13.98	13.30	19950	
4	-do- 40 to 20mm	7.10	7.76	6.87	7.28	7.25	10875	
5	-do- 20 to 10mm.	4.02	5.10	4.27	4.82	4.55	6825	
6	-do- 10 to 4.75mm	3.15	3.43	3.34	3.75	3.42	5130	
7	Material (-) 4.75mm i.e sand	21.88	20.15	21.10	21.71	21.21	31815	
8	Material (-) 75micron	1.69	1.66	1.74	1.94	1.76	2640	

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).
STATEMENT SHOWING THE QUANTITY OF RIVER BORNE MATERIAL AVAILABLE AT BEAS RIVER QUARRY SITE IN RESPECT OF THANA PLAUN HEP (141 MW).

Sr. No.	IS Sieve Size	Pit No.1	Pit No.2	Pit No.3	Average %age Retained of Total pits	Total Qty. Available in (M^3)	Remarks.
1	Material above 300mm (Boulders)	3.20	1.93	5.82	3.65	2847	Approximate Reserve Quantity of River borne Const. materia At Beas river Quarry site As works out Is 78000 M^3.
2	Material between 300 to 80mm(Cobbles)	39.04	38.83	38.82	38.90	30342	
3	-do- 80 to 40mm	13.87	13.79	12.71	13.45	10491	
4	-do- 40 to 20mm	8.67	8.45	7.98	8.37	6529	
5	-do- 20 to 10mm.	5.96	5.99	5.29	5.75	4485	
6	-do- 10 to 4.75mm	4.22	4.50	4.18	4.30	3354	
7	Material (-) 4.75mm i.e sand	22.94	24.23	22.88	23.35	18213	
8	Material (-) 75micron	2.10	2.28	2.32	2.23	1739	

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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ANNEX- IV

CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).

STATEMENT SHOWING THE QUANTITY OF RIVER BORNE MATERIAL AVAILABLE AT DIFFERENT QUARRY SITES INRESPECT OF THANA PLAUN HEP (141 MW) .

Sr. No.	Description	Percentage of material retained on IS: Sieve								Remarks.
		300	80	40	20	10	4.75	(-) 4.75	(-) 75	
1	Pit No. I at Malod Khad Quarry site	1.53	41.54	12.40	9.19	6.52	4.34	22.72	1.76	Approximate Reserve Quantity of River borne Const. Material at Malod khad 81000 M3 ,and Thodu Khad quarry site is 27000 M3
	Total Qty. Available in M^3	1239	33647	10044	7444	5281	3516	18403	1426	
2	Pit No. I at Thodu Khad Quarry site .	2.92	39.94	11.80	8.97	5.44	4.63	24.51	1.79	
	Total Qty. Available in M^3	788	10784	3186	2422	1469	1250	6618	483	

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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ANNEX-V

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CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).

TEST RESULTS OF SOIL SAMPLES COLLECTED FROM SAKLAIN KHAD OF THANA PLAUN HEP (141 MW) .

Sr. No.	Lab. Reg. No.	Description of samples	GRADATION ANALYSIS (USBR EARTH MANUAL / IS: 2720 PART-IV, 1975) Percentage Passing on IS: Sieve															
			300 mm	80 mm	40 mm	20 mm	10 mm	4.75 mm	2.36 mm	1.18 mm	600 micron	300 micron	150 micron	75 micron	Boulder	Cobble	Gravel	Sand	Silt & Clay.
1	1044	PIT NO.1	92.92	54.63	42.97	33.16	26.74	22.46	21.73	17.17	11.60	5.98	2.65	1.80	7.08	38.29	32.17	20.66	1.80
2	1045	PIT NO.2	90.46	90.09	38.38	30.64	25.20	21.30	20.54	15.85	10.95	5.41	2.51	1.49	9.54	40.37	28.79	19.81	1.49
3	1046	PIT NO.3	92.28	51.35	38.84	31.59	25.69	21.90	21.16	16.43	11.26	5.65	2.72	1.71	7.72	40.93	29.45	20.19	1.71
4	1047	Pit No.4	87.98	50.59	38.68	30.44	24.73	20.93	20.06	14.32	8.79	4.31	2.35	1.55	12.02	37.39	29.66	19.38	1.55

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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ANNEX-VI

CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).

TEST RESULTS OF SOIL SAMPLES COLLECTED FROM SON KHAD OF THANA PLAUN HEP (141 MW).

Sr. No.	Lab. Reg. No.	Description of samples	GRADATION ANALYSIS (USBR EARTH MANUAL / IS: 2720 PART-IV, 1975) Percentage Passing on IS: Sieve															
			300 mm	80 mm	40 mm	20 mm	10 mm	4.75 mm	2.36 mm	1.18 mm	600 micron	300 micron	150 micron	75 micron	Boulder	Cobble	Gravel	Sand	Silt & Clay.
1	1048	PIT NO.1	91.98	51.82	37.84	30.74	26.72	23.57	23.00	19.84	15.88	9.80	3.67	1.69	8.02	40.16	28.25	21.88	1.69
2	1049	PIT NO.2	90.54	50.23	38.10	30.34	25.24	21.81	21.33	18.58	14.96	9.16	3.49	1.66	9.46	40.31	28.42	20.15	1.66
3	1050	PIT NO.3	96.08	50.43	37.32	30.45	26.18	22.84	22.29	19.14	15.21	9.73	3.84	1.74	9.92	39.65	27.59	21.10	1.74
4	1051	Pit No.4	95.24	53.48	39.50	32.22	27.40	23.65	23.08	20.01	16.13	10.03	3.83	1.94	4.76	41.76	29.83	21.71	1.94

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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ANNEX-VI

CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).

TEST RESULTS OF SOIL SAMPLES COLLECTED FROM BEAS RIVER QUARRY SITE OF THANA PLAUN HEP (141 MW).

Sr. No.	Lab. Reg. No.	Description of samples	GRADATION ANALYSIS [USBR EARTH MANUAL / IS: 2720 PART-IV, 1975] Percentage Passing on IS: Sieve															
			300 mm	80 mm	40 mm	20 mm	10 mm	4.75 mm	2.36 mm	1.18 mm	600 micron	300 micron	150 micron	75 micron	Boulder	Cobble	Gravel	Sand	Silt & Clay.
1	1054	PIT NO.1	96.80	57.76	43.89	35.22	29.26	25.04	24.04	18.88	15.12	9.61	4.35	2.10	3.20	39.04	32.92	22.94	2.10
2	1055	PIT NO.2	98.07	59.24	45.45	37.00	31.01	26.51	25.56	20.05	15.91	10.18	4.82	2.28	1.93	38.83	32.73	24.23	2.28
3	1056	PIT NO.3	94.18	55.36	42.65	34.67	29.33	25.20	24.24	18.80	15.02	9.68	40.69	2.32	5.82	38.82	30.16	22.88	2.32

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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ANNEX-VII

CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).

TEST RESULTS OF SOIL SAMPLES COLLECTED FROM MALOD KHAD & THODU KHAD OF THANA PLAUN HEP (141 MW).

Sr. No.	Lab. Reg. No.	Description of samples	GRADATION ANALYSIS (USBR EARTH MANUAL / IS: 2720 PART-IV, 1975) Percentage Passing on IS: Sieve															
			300 mm	80 mm	40 mm	20 mm	10 mm	4.75 mm	2.36 mm	1.18 mm	600 micron	300 micron	150 micron	75 micron	Boulder	Cobble	Gravel	Sand	Silt & Clay.
1	1052	Malod Khad Pit No.I	98.47	56.93	44.53	35.34	28.82	24.48	23.60	19.19	15.18	10.77	5.09	1.76	1.53	41.54	32.45	22.72	1.76
2	1053	Thodu Khad PIT NO.I	97.08	57.14	45.34	36.37	30.93	26.30	25.40	20.51	15.20	9.94	5.21	1.79	2.92	39.94	30.84	24.51	1.79

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ANNEX – IX

MAIN CENTRAL LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR DISTT. MANDI (H.P.).

TEST RESULTS OF COARSE AGGREGATE (NATURAL) SAMPLES COLLECTED FROM VARIOUS QUARRY SITES IN R/ O THANA PLAUN HEP(141MV

Sr. No.	Lab. Reg. No.	Description	Specific Gravity IS:2386 PART-III.	Water Absorption % IS:2386 Part-III.	Impact Value % IS:2386 Part-IV.	Crushing Value % IS:2386 Part-IV.	Los Angeles Abrasion Value % IS:2386 Part-IV.	Soundness Loss with Na_2So_4 (Five cycles) IS:2386 Part-V.	Remark
	Specification for testing Procedure.								
	Specified limit as per IS: or other relevant standard		Not Less than 2.60 As per ASTM	Not more than 1% as per ASTM	Not more than 30% for wearing Surface conc. & 45% for non-wearing surface conc. Works IS: 383.	Not more than 30% for wearing surface conc.& 45% for non-wearing Surface conc. Works IS: 383.	Not more than 30% for wearing surface conc.& 50% for non-wearing surface conc. Works IS: 383.	Not more Than 12% IS:383-1970	
1	1044	C.A (Natural) from Saklain Khad quarry site	2.68	0.45	23.85	16.87	26.44	4.39	The material Is suitable For use in Wearing & Non-wearing Surface Works
2	1048	C.A (Natural) from Son Khad quarry site	2.68	0.47	25.73	21.77	28.12	4.57	
3	1052	C.A (Natural) from Malod Khad quarry site	2.68	0.46	23.02	17.33	26.20	4.29	
4	1053	CA (Natural) from Thodu Khad quarry site	2.68	0.44	23.34	17.47	26.44	4.36	
5	1054	C.A (Natural) from Beas river quarry site	2.64	0.56	35.52	28.21	46.80	6.28	Only for Non-wearing Surface works

NOTE:-RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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ANNEX X

MAIN CENTRAL LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).

TEST RESULTS OF FINE AGGREGATE (NATURAL) SAMPLES COLLECTED FROM VARIOUS QUARRY SITES IN R/O THANA PLAUN HEP (141MW).

Sr. No.	Lab Reg No	Description	Gradation Analysis (Percentage Passing on IS: Sieve)						Material Passing 75micron IS: Sieve	Fineness Modulus	Zone in which Sample fall	Specific Gravity	Remark
			4.75 mm	2.36 mm	1.18 mm	600 micron	300 micron	150 micron					
		Specification for testing procedure							IS: 2386 (Part-I)	IS: 2386 (Part-I)	IS: 383 1970	IS:2386 (Part-III)	
		Specified limit as per IS: or other relevant standard							Not more than 15 % for crushed sand and 3% for natural	Coarse sand (2.5to 3.5) Fine Sand (1.5 to2.5) as per USBR Conc. Manual.	I to IV	Not less than 2.60 as per ASTM.	
1	1044	F.A (Natural) from Saklain Khad quarry site	100	94.80	66.60	41.00	17.40	6.80	3.0	2.73	II	2.65	
2	1048	F.A (Natural) from Son Khad quarry site	100	96.00	80.40	62.40	35.00	10.00	4.0	2.15	III	2.65	
3	1052	F.A (Natural) from Malod Khand quarry site	100	96.00	73.00	55.00	36.60	18.80	8.5	2.21	Do not Fall any Zone.	2.65	
4	1053	F.A (Natural) from Thodu Khad quarry site	100	96.00	75.00	59.40	37.00	15.20	4.0	2.17	III	2.63	
5	1054	F.A (Natural) from Beas river quarry site	100	94.80	70.00	58.80	40.60	18.60	9.0	2.18	Do not Fall any Zone	2.65	

NOTE: - RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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ANNEX-XI

CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).
TEST RESULTS OF SOIL SAMPLES COLLECTED FROM TEST PIT FOR PLATE LOAD TEST AT POWER HOUSE SITE IN RESPECT OF THANA PLAUN HEP (141MW) .

Sr. No.	Lab. Reg. No.	Description	70% Relative Density gm/cc	Moisture Content (%)	Shear parameters IS:2720 (Part-XXXIX/Sec-I)1977		Remarks
					Angle of Shearing Resistance (Ø)	Cohesion In Kg/cm^2 (C')	
1.	1057	Test Pit for Plate load Test at P.H. Site.	2.00	5.0	37°–34'	0.04	1. Tests have been performed on minus 31.5mm fraction of sample. 2. Direct shear tests have been performed under saturated drained conditions.

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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ANNEX XII

CENTRAL SOIL AND CONCRETE TESTING LABORATORY, HPPCL, NAULAKHA, SUNDERNAGAR, DISTT. MANDI (H.P.).
TEST RESULTS OF SOIL SAMPLES COLLECTED FROM TEST PIT FOR PLATE LOAD TEST AT POWER HOUSE SITE IN RESPECT OF THANA PLAUN HEP (141MW) .

Sr. No.	Lab. Reg. No.	Description of samples	GRADATION ANALYSIS (Percentage Passing on IS: Sieve]														
			100 mm	80 mm	40 mm	31.5 mm	20 mm	10 mm	4.75 mm	2.36 mm	1.18 mm	600 micron	300 micron	150 micron	75 micron	Gravel	Sand	Silt & Clay.
1	1057	Test Pit for Plate load Test at P.H. Site.	100	100	98.11	84.94	69.93	55.47	43.81	41.88	34.78	27.34	21.03	18.05	14.72	56.19	39.09	14.72

NOTE :- RESULTS ARE VALID ONLY TO THE SAMPLES SUPPLIED.

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