सार्वजनिक खरिद ऐन २०६३ को दफा ६५ को उपदफा (१) को खण्ड (ग) ले दिएको अधिकार बमोजिम सार्वजनिक खरिद अनुगमन कार्यालयबाट जारी गरिएको

STANDARD BIDDING DOCUMENT (SBD)

Procurement of Works (NCB)

Without Qualification Requirement

Single-Stage: Single-Envelope Bidding Procedure

[For use in NCB Works up to NRs.20 Million]

Issued by:

Government of Nepal

Public Procurement Monitoring Office (PPMO)

Kathmandu

(Revised on september 2026)

BIDDING DOCUMENT

for

THE PROCUREMENT OF
Construction of RCC Canal lining and canal Associated works of Gairikateri Bans Phota IP, DudhPokhari-2, Lamjung

National Competitive Bidding (NCB)

Single-Stage: Single-Envelope Bidding Procedure

Water Resource and Irrigation Development Division Office, Lamjung

Issued on:2026/09/21 AD (2083/06/05 BS)

Issued to: All Eligible Bidders

Invitation for Bids No.:

WRIDDOL/GKIP/NCB/W/01/2083/84

Contract Identification No.:

WRIDDOL/GKIP/NCB/W/01/2083/84

Abbreviations

BD ... . Bidding Document

BDF .... Bidding Forms

BDS .... Bid Data Sheet

BOQ ... . Bill of Quantities

COF ..... Contract Forms

DP ... . Development Partners

DoLI..... Department of Local Infrastructure

e-GP……. Electronic Government Procurement

ELI ... . Eligibility

EEC... .... Evaluation and Eligibility Criteria

GCC ... . General Conditions of Contract

GoN[1] ... . Government of Nepal

ICC ..... International Chamber of Commerce

IFB …….. Invitation for Bids

ITB ... . Instructions to Bidders

JV ... . Joint Venture

NCB ... . National Competitive Bidding

NRs ..... Nepalese Rupees

PAN ... . Permanent Account Number

PPA ... . Public Procurement Act, 2063

PPMO ... . Public Procurement Monitoring Office

PPR ... . Public Procurement Regulations, 2064

PS …….. Provisional Sum

SBD .... Standard Bidding Document

SCC ... . Special Conditions of Contract

TS ..... Technical Specifications

VAT ... . Value Added Tax

WRQ ... . Works Requirements

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[1] "GoN" word indicates all public entities according to Public Procurement Act, 2063

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Invitation for Bids

Gandaki Province Government

Ministry of Energy, Water Resources and Water Supply

Water Resources and Irrigation Development Division Office

Beshishahar Lamjung

Invitation for Bids No: WRIDDOL/GKIP/NCB/W/01/2083/84

Date of publication: 2026/09/21 AD (2083/06/05 BS)

1. ***Water Resource and Irrigation Development Division Office, Lamjung*** invites sealed bids from Nepalese eligible bidders for the ***Construction of RCC Canal lining and canal Associated works of Gairikateri Bans Phota IP, DudhPokhari-2, Lamjung*** under National Competitive Bidding procedures. The estimated amount for the works is Rs. ***11,855,578.91*** *(without VAT & Contingency but including PS)*
2. Eligible Bidders may obtain further information and inspect the Bidding Documents at the office of ***Water Resource and Irrigation Development Division Office, Lamjung*** or may visit PPMO website www.bolpatra.gov.np/egp.
3. Pre-bid meeting shall be held at Water Resource and Irrigation Development Division Office, Lamjung at 2026/10/05 AD (2083/06/19 BS) 11:00 Hrs.
4. A complete set of Bidding Documents may be purchased from the office Water Resource and Irrigation Development Division Office, Lamjung by eligible Bidders on the submission of a written application, along with the copy of company/firm registration certificate, and upon payment of a non-refundable fee of NPR 3000 till 2026/10/12 AD (2083/06/26 BS) during office hours in the account as specified below

   Information to deposit the cost of bidding document in Bank:
   Name of the Bank: Rastriya Banijya Bank Ltd, Beshishahar, Lamjung
   Name of Office : Water Resource and Irrigation Development Division Office, Lamjung
   Office Code no. : 3400337014
   Account no.: 1000100200010000
   Rajaswa (revenue) Shirshak no. :14229

5. Sealed bids must be submitted through hand/courier on or before 2026/10/13 AD (2083/06/27 BS) 12:00 hours . Bids received after this deadline will be rejected
6. The bids will be opened in the presence of Bidders' representatives who choose to attend at 2026/10/13 AD (2083/06/27 BS) 13:00 Hrs hours. at the office of Water Resource and Irrigation Development Division Office, Lamjung. Bids must be valid for a period of 90 days from the bid submission deadline and must be accompanied by a bid security or scanned copy of the bid security in .pdf format in case of e-bid, amounting to a minimum of NRs. 335000/-. which shall be valid for 30 days beyond the validity period of the bid. Details for cash deposit for bid security:

a. Name of the Bank: Rastriya Banijya Bank Ltd, Beshishahar, Lamjung
b. Name of Office: Water Resource and Irrigation Development Division Office, Lamjung
c. Dharauti Account No: 3040100202030000
d. Office Code no.: 3400337014

7. If the last date of purchasing and /or submission falls on a government holiday, then the next working day shall be considered as the last date. In such case the validity period of the bid and bid security shall remain the same as specified for the original last date of bid submission.

Part - I Bidding Procedures

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SECTION– I: Instructions to Bidders

This section specifies the procedures to be followed by Bidders in the preparation and submission of their Bids. Information is also provided on the submission, opening, and evaluation of bids and on the award of contract.

A. General	
1. Scope of Bid	1.1 In connection with the Invitation for Bids indicated in the **Bid Data Sheet (BDS)**, the Employer, as indicated **in the BDS**, issues this Bidding Document for the procurement of Works as specified in Section V (Works Requirements). The name, identification, and number of lots (Contracts) / multiple contracts of the National Competitive Bidding (NCB) are provided **in the BDS.**
	1.2 Throughout this Bidding Document: (a) the term "in writing" means communicated in written form and delivered against receipt through e-GP system or e-mail or fax or courier ; (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and (c) "day" means calendar day.
2. Source of Funds	2.1 GoN Funded: In accordance with its annual program and budget, approved by the GoN, the implementing agency indicated **in the BDS** plans to apply a portion of the allocated budget to eligible payments under the contract(s) for which this Bidding Document is issued. Or Public Entities' own Resource Funded: In accordance with its annual program and budget, approved by the public entity, the implementing agency indicated **in the BDS** plans to apply a portion of the allocated budget to eligible payments under the contract(s) for which this Bidding Document is issued. Or DP Funded: The GoN has applied for or received financing (hereinafter called "funds") from the Development Partner (hereinafter called "the DP") indicated **in the BDS** toward the cost of the project named in the BDS. The GoN intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.
	2.2 DP Funded: Payment by the DP will be made only at the request of the GoN and upon approval by the DP in accordance with the terms and conditions of the financing agreement between the GoN and the DP (hereinafter called the "Loan/Grant Agreement"), and will be subject in all respects to the terms and conditions of that Loan/Grant Agreement. No party other than the GoN shall derive any rights from the Loan Agreement or have any claim to the funds.
3. Fraud and Corruption	3.1 Procuring Entities as well as bidders, suppliers and contractors and their sub-contractors under GoN/DP-financed contracts, shall adhere to the highest

	standard of ethics during the procurement and execution of such contracts. In pursuance of this; (a) the Employer adopts, for the purposes of this provision, the terms as defined below: (i) "corrupt practice" means the offering, giving, receiving, or soliciting, directly or indirectly, anything of value to influence improperly the actions of another party; (ii) "fraudulent practice" means any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation; (iii) "coercive practice" means impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party; (iv) "collusive practice" means an arrangement between two or more parties designed to achieve an improper purpose, including influencing improperly the actions of another party. (v) "obstructive practice" means (a) deliberately destroying, falsifying, altering, or concealing of evidence material to an investigation; (b) making false statements to investigators in order to materially impede an investigation; (c) failing to comply with requests to provide information, documents, or records in connection with an investigation; (d) threatening, harassing, or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (e) materially impeding GoN/DP's contractual rights of audit or access to information; and (vi) "integrity violation" is any act which violates Anticorruption Policy, including (i) to (v) above and the following: abuse, conflict of interest, violations of GoN/DP sanctions, retaliation against whistleblowers or witnesses, and other violations of Anticorruption Policy, including failure to adhere to the highest ethical standard. (b) the Employer will reject a proposal for award if it determines that the Bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations in competing for the contract; (c) DP will cancel the portion of the financing allocated to a contract if it determines at any time that representative(s) of the GoN or of a beneficiary of DP-financing engaged in corrupt, fraudulent, collusive, or coercive practices or other integrity violations during the procurement or the execution of that contract, without the GoN having taken timely and appropriate action satisfactory to DP to remedy the situation. (d) DP will impose remedial actions on a firm or an individual, at any time,

	in accordance with DP's Anticorruption Policy and related Guidelines (as amended from time to time), including declaring ineligible, either indefinitely or for a stated period of time, to participate in DP-financed, -administered, or -supported activities or to benefit from an DP-financed, -administered, or -supported contract, financially or otherwise, if it at any time determines that the firm or individual has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices or other integrity violations; and (e) The Contractor shall permit the GoN/DP to inspect the Contractor's accounts and records relating to the performance of the Contractor and to have them audited by auditors appointed by the GoN/DP, if so required by the GoN/DP.
	3.2 The Bidder shall not carry out or cause to carry out the following acts with an intention to influence the implementation of the procurement process or the procurement agreement : (a) give or propose improper inducement directly or indirectly, (b) distortion or misrepresentation of facts, (c) engaging in corrupt or fraudulent practice or involving in such act, (d) interference in participation of other competing bidders, (e) coercion or threatening directly or indirectly to cause harm to the person or the property of any person to be involved in the procurement proceedings, (f) collusive practice among bidders before or after submission of bids for distribution of works among bidders or fixing artificial/uncompetitive bid price with an intention to deprive the Employer the benefit of open competitive bid price, (g) contacting the Employer with an intention to influence the Employer with regards to the bids or interference of any kind in examination and evaluation of the bids during the period from the time of opening of the bids until the notification of award of contract.
	3.3 PPMO, on the recommendation of the Procuring Entity may blacklist a Bidder for a period of one (1) to three (3) years for its conduct including on the following grounds and seriousness of the act committed by the bidder: (a) if convicted by a court of law in a criminal offence which disqualifies the Bidder from participating in the contract, (b) if it is established that the contract agreement signed by the Bidder was based on false or misrepresentation of Bidder's qualification information, (c) if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive, or obstructive practices in competing for, or in executing, a GoN/DP-financed contract. (d) if the successful bidder fails to sign the contract. (e) if the bidder fails to inform or informs after the specified time about the

	saturation of maximum number of contracts as per ITB 4.9. (f) a Bidder requests for withdrawal or modification of its bid: (i) after the Bid Submission deadline and during the period of validity specified by the Bidder on the Letter of Bid, in case of electronic submission; (ii) from the period twenty-four hours prior to bid submission deadline up to the period of bid validity specified by the Bidder on the Letter of Bid, in case of hard copy submission. (g) if the bidder does not provide clarifications of its Bid by the date and time set in the Employer's request for clarification pursuant to ITB 24.1. (h) a Bidder changes the prices or substance of the bid while providing information pursuant to ITB 24.1.
	3.4 A bidder declared blacklisted and ineligible by the GoN, Public Procurement Monitoring Office (PPMO), by a competent authority under the prevailing law for failure to repay a loan disbursed by a bank or financial institution, and/or the DP in case of DP funded project, shall be ineligible to bid for a contract during the period of time determined by the GoN, PPMO, the competent authority and/or the DP. 3.5 In case of a natural person or firm/institution/company which is already declared blacklisted and ineligible by the GoN, any other new or existing firm/institution/company owned partially or fully by such Natural person or Owner or Board of director of blacklisted firm/institution/company; shall not be eligible bidder.
	3.6 Furthermore, Bidders shall be aware of the provisions of GCC 28.3 and GCC 72.3(j).
4. Eligible Bidders	4.1 A Bidder may be a natural person, private entity, or government - owned entity—subject to ITB 4.5—or any combination of them in the form of a Joint Venture (JV) under an existing agreement, or with the intent to constitute a legally-enforceable joint venture. In the case of a JV: (a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms. Maximum number of JV shall be as specified **in the BDS**. The eligibility criteria requirement of the parties to the JV shall be as specified in Section III Evaluation and Eligibility Criteria, and (b) the JV shall nominate a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the bidding process and, in the event the JV is awarded the Contract, during Contract execution.
	4.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of any country or eligible countries mentioned **in the BDS**. A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of

	proposed sub Contractors or suppliers for any part of the Contract including related services.
	4.3 A Bidder shall not have a conflict of interest. A Bidder found to have a conflict of interest shall be disqualified. if any of, including but not limited to, the following apply: (a) they have controlling partners in common; or (b) they receive or have received any direct or indirect subsidy from any of them; or (c) they have the same legal representative for purposes of this bid; or (d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or improperly influence on the Bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or (e) a Bidder participates in more than one bid in this bidding process either individually or as a partner in a joint venture. This will result in the disqualification of all Bids in which it is involved. However, subject to any finding of a conflict of interest in terms of ITB 4.3 (a)-(d) above, this does not limit the participation of the same subcontractor in more than one bid; or (f) a Bidder or any of its affiliated entity, participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of the Bid; or (g) a Bidder was affiliated with a firm or entity that has been hired (or is proposed to be hired) by the Employer as Engineer for the Contract. or (h) a Bidder that has a close business or family relationship with a professional staff of the Procuring Entity.
	4.4 A firm that is under a declaration of ineligibility by the GoN/DP in accordance with ITB 3, at the date of the deadline for bid submission or thereafter, shall be disqualified. A firm shall not be eligible to participate in any procurement activities under an DP-financed, -administered, or -supported project while under temporary suspension or debarment by DP pursuant to the DP's Anticorruption Policy (see ITB 3), whether such debarment was directly imposed by the DP, or enforced by other DPs pursuant to the Agreement for Mutual Enforcement of Debarment Decisions. A bid from a temporary suspended or debarred firm will be rejected.
	4.5 Enterprises owned by Government shall be eligible only if they can establish that they are legally and financially autonomous and operate under commercial law, and that they are not a dependent agency of the GoN.
	4.6 Bidders shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.
	4.7 Firms shall be excluded in any of the cases, if (a) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations,

	Nepal prohibits any import of goods or Contracting of works or services from that country or any payments to persons or entities in that country. (b) DP Funded: as a matter of law or official regulation, Nepal prohibits commercial relations with that country, provided that the DP is satisfied that such exclusion does not preclude effective competition for the supply of goods or related services required; (c) DP Funded: a firm has been determined to be ineligible by the DP in relation to their guidelines or appropriate provisions on preventing and combating fraud and corruption in projects financed by them.
	4.8 The Bidder, including all parties constituting the Bidder, shall be ineligible to participate in the open competitive bidding process if it has already secured maximum number of construction contracts (in open competitive bidding) **as specified in BDS** and has not yet completed the work as stipulated in the respective contracts. 4.9 For the purpose of ITB 4.8 above, the bidder shall declare that the bidder, and all parties constituting the Bidder have not already secured maximum number of construction contracts (in open competitive bidding in procurement of works) **as specified in BDS**. If the bidder, and all parties constituting the Bidder has participated in bidding processes of many public entities and during that period the maximum number of contracts have been attained as specified saturates due to issuance of letters of acceptance by a particular public entity, the bidder shall inform in writting to all other concerned public entities, where the bidder have participated in bidding process, within three days of issuance of last letter of acceptance that saturates the maximum number of contracts as specified.
5. Eligible Materials, Equipment and Services	5.1 The materials, equipment and services to be supplied under the Contract shall have their origin in any source countries as defined in **the BDS** and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, Bidders may be required to provide evidence of the origin of materials, equipment and services.
	5.2 For purposes of ITB 5.1 above, "origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.
B. Contents of Bidding Documents	
6. Sections of Bidding Document	6.1 The Bidding Document consist of Parts I, II, and III, which include all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB 8. PART I Bidding Procedures Section I Instructions to Bidders (ITB) Section II Bid Data Sheet (BDS)

	Section III Evaluation and Eligibility Criteria (EEC) Section IV Bidding Forms (BDF) PART II Requirements Section V Works Requirements (WRQ) Section VI Bill of Quantities (BOQ) PART III Conditions of Contract and Contract Forms Section VII General Conditions of Contract (GCC) Section VIII Special Conditions of Contract (SCC) Section IX Contract Forms (COF)
	6.2 The Invitation for Bids (IFB) issued by the Employer is not part of the Bidding Document.
	6.3 The Employer is not responsible for the completeness of the Bidding Document and their Addenda, if they were not obtained directly from the source stated by the Employer in the Invitation for Bids.
	6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document and to furnish with its bid all information and documentation as is required by the Bidding Documents. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.
7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting	7.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the Employer in writing at the Employer's address indicated **in the BDS** or raise any question or curiosity during the pre-bid meeting if provided for in accordance with ITB 7.4. The Employer will respond in writing to any request for clarification, provided that such request is received within the period as mentioned in ITB 7.5. The Employer shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 17.2
	7.2 The Bidder is advised to visit and examine the Site of Works and its surroundings and obtain for itself, on its own risk and responsibility, all information that may be necessary for preparing the bid and entering into a Contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.
	7.3 The Bidder and any of its personnel or agents will be granted permission by the Employer to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the Employer and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
	7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if

	provided for **in the BDS.** The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage. 7.5 The Bidder is requested, as far as possible, to submit any questions in writing, to reach the Employer as mentioned **in BDS**.
	7.5 The Bidder is requested, to submit any questions in writing, to reach the Employer as mentioned **in BDS**.
	7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the Employer exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.
	7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
8. Amendment of Bidding Document	8.1 At any time prior to the deadline for submission of bids, the Employer may amend the Bidding Document by issuing addendum or several addenda.
	8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the Employer in accordance with ITB 6.3.
	8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the Employer may, at its discretion, extend the deadline for the submission of bids, pursuant to ITB 19.2. However, the time available to submit bids shall not be less than five (5) days since amendment in bidding document.
C. Preparation of Bids	
9. Cost of Bidding	9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Employer shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
10. Language of Bid	10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the Employer, shall be written in the language specified **in the BDS**. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified **in the BDS**, in which case, for purposes of interpretation of the Bid, such translation shall govern.
11. Documents Comprising the Bid	11.1 The Bid shall comprise the following: (a) Letter of Bid; (b) completed Bill of Quantities (BoQ), in accordance with ITB 12 and ITB 13, or as stipulated **in the BDS**; (c) Bid Security, in accordance with ITB 16;

	(d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 17.2; (e) documentary evidence of establishing the Bidder's eligibility; (f) Bids submitted by a Joint Venture shall include a copy of the Joint Venture Agreement entered into by all partners. Alternatively, a Letter of Intent to execute a Joint Venture Agreement in the event of a successful Bid shall be signed by all partners and submitted with the Bid, together with a copy of the proposed agreement. The Joint Venture agreement, or letter of intent to enter into a Joint Venture including a draft agreement shall indicate at least the parts of the Works to be executed by the respective partners; (g) Table of Price Adjustment (if applicable); and (h) any other required documents required, in the **BDS**.
	11.2 The Bidder is solely responsible for the authenticity of the submitted documents.
12. Letter of Bid and Schedules	12.1 The Letter of Bid, Schedules, and all documents listed under ITB 11, shall be prepared using the relevant forms in Section IV (Bidding Forms) and in Section VI (Bill of Quantities).The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.
13. Bid Prices and Discounts	13.1 The prices and discounts quoted by the Bidder in the Letter of Bid and in the Schedules shall conform to the requirements specified below.
	13.2 The Bidder shall submit a bid for the whole of the works described in ITB 1.1 by filling in prices for all items of the Works, as identified in Section VI (Bill of Quantities). In case of Unit Rate Contracts, the Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities.
	13.3 The price to be quoted in the Letter of Bid shall be the total price of the Bid, excluding any discounts offered. Absence of the total price in the Letter of Bid may result in rejection of the Bid.
	13.4 The Bidder shall quote any discounts and the methodology for their application in the Letter of Bid, in accordance with ITB 12.1.
	13.5 If so indicated in ITB 1.1 and ITB 29.4, bids are invited for individual Contracts or for any combination of Contracts (packages). Bidders wishing to offer any price reduction for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with ITB 13.4, provided the bids for all Contracts are submitted and opened at the same time.
	13.6 Unless otherwise provided **in the BDS** and the Conditions of Contract, the prices quoted by the Bidder shall be fixed. If the prices quoted by the Bidder are subject

	to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract, the Bidder shall furnish the indices and weightings for the price adjustment formulae in the Table of Adjustment Data in Section IV (Bidding Forms) and the Employer may require the Bidder to justify its proposed indices and weightings.
	13.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 30 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total bid price submitted by the Bidder.
14. Currency of Bid and Payment	14.1 The currency of the bid and payment shall be in Nepalese Rupees.
15. Period of Validity of Bids	15.1 Bids shall remain valid for the period specified **in the BDS.** The bid validity period shall starts from the bid submission deadline as prescribed by the Employer in accordance with ITB 19.1. If the prescribed bid submission deadline date falls on a government holiday, then the next working day shall be considered as the bid submission deadline date. In such case the validity period of the bids shall be considered from the original bid submission deadline date. In the case of electronic bid submission, if any technical issue arises in the handling of the e-GP system, the PPMO may extend the deadline for bid submission. However, the validity period of the bids shall still be counted from the original bid submission deadline. A bid valid for a shorter period shall be rejected by the Employer as nonresponsive.
	15.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Employer may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 16, it shall also be extended 30 days beyond the deadline of the extended validity period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its bid and to include any additional conditions against the provisions specified in Bid Documents.
16. Bid Security	16.1 The Bidder shall furnish as part of its bid, in original form, a bid security as specified **in the BDS.** In case of e-submission of bid, the Bidder shall upload scanned copy of Bid security letter at the time of electronic submission of the bid. The Bidder accepts that the scanned copy of the Bid security shall, for all purposes, be equal to the original. The details of original Bid Security and the scanned copy submitted with e-bid should be the same otherwise the bid shall be non-responsive.
	16.2 The bid security shall be, at the Bidder's option, in any of the following forms: (a) an unconditional bank guarantee from Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law or; (b) a cash deposit voucher in the Employer's Account as specified **in BDS**.

	In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section IV (Bidding Forms) or in another Form acceptable to the employer. The form must include the complete name of the Bidder. The bid security shall be valid for minimum thirty (30) days beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 15.2. A bid security valid for a shorter period shall be rejected by the Employer as nonresponsive.
	16.3 Any bid not accompanied by an enforceable and substantially compliant bid security shall be rejected by the Employer as nonresponsive. In case of e-Submission, if the scanned copy of an acceptable Bid Security letter is not uploaded with the electronic Bid then Bid shall be rejected.
	16.4 The public entity shall return the bid securities except those that are to be forfeited as per ITB 16.5 to the respective bidders within three (3) days after the successful bidder has furnished the required performance security and signed the Contract Agreement pursuant, to ITB 34.1 and ITB 35.1.
	16.5 The bid security shall be forfeited if: (a) a Bidder requests for withdrawal or modification of its bid, except as provided in ITB 15.2: (i) during the period of bid validity specified by the Bidder on the Bid, in case of electronic submission; (ii) from the period twenty-four hours prior to bid submission deadline up to the period of bid validity specified by the Bidder on the Letter of Bid, in case of hard copy submission. (b) a Bidder changes the prices or substance of the bid while providing information pursuant to ITB 24.1; (c) a Bidder involves in fraud and corruption pursuant to ITB 3.1; (d) the successful Bidder fails to: (i) furnish a performance security in accordance with ITB 29.5, ITB 29.8 and ITB 34.1; or (ii) sign the Contract in accordance with ITB 35.1 or (iii) accept the correction of arithmetical errors pursuant to ITB 28.1; (e) if the bidder fails to inform about the saturation of the maximum number of contracts as per ITB 4.9.
	16.6 The Bid Security of a JV shall be in the name of the JV that submits the bid. If the JV has not been legally constituted at the time of bidding, the Bid Security shall be in the names of all future partners as named in the letter of intent mentioned in ITB 4.1.
17. Format and Signing of Bid	17.1 The Bidder shall prepare one original of the documents comprising the bid as described in ITB 11 and clearly mark it ORIGINAL". In addition, the Bidder shall submit copies of the bid in the number specified **in the BDS**, and

	clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail. In case of e-submission of bid, the Bidder shall submit his bid electronically in PDF or web forms files as specified in ITB Clause 18.1(b),
	17.2 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified **in the BDS** and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the bid, except for un amended printed literature, shall be signed or initialed by the person signing the bid.
	17.3 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.
D. Submission and Opening of Bids	
18. Sealing and Marking of Bids	18.1 Unless otherwise specified **in BDS**, Bidders shall submit their bids by electronic or by mail/by hand/by courier. Procedures for submission, sealing and marking are as follows: (a) Bidders submitting bids by mail, by hand or by courier i. Bidders shall enclose the original and each copy of the Bid. These envelopes containing the original and the copies shall then be enclosed in one single envelope. ii. The inner and outer envelopes shall: (aa) bear the name and address of the Bidder; (bb) be addressed to the Employer as provided **in BDS**19.1; (cc)bear the specific identification of this bidding process indicated **in BDS** 1.1; and (dd) bear a warning not to open before the time and date for bid opening. iii. If all envelopes are not sealed and marked as required, the Employer will assume no responsibility for the misplacement or premature opening of the bid. (b) Bidders submitting Bids electronically shall follow the electronic bid submission procedure specified **in BDS**.
19. Deadline for Submission of Bids	19.1 Bids must be received by the Employer at the address and no later than the date and time indicated **in the BDS**. In case of e-submission, the standard time for e-submission is Nepalese Standard Time as set out in the server. The e-procurement system will accept the e-submission of bid from the date of publishing of notice and will automatically not allow the e-submission of bid after the deadline for submission of bid.
	19.2 The Employer may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the Employer and Bidders previously subject to the

	deadline shall thereafter be subject to the deadline as extended.
20. Late Bids	20.1 The Employer shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 19. Any bid received by the Employer after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.
21. Withdrawal, and Modification of Bids	21.1 A Bidder may withdraw, or modify its bid after it has been submitted either in hard copy or by e-submission. Procedures for withdrawal or modification of submitted bids are as follows: (i) Bids submitted in hard Copy a) Bidders may withdraw or modify its bids by sending a written notice in a sealed envelope, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 17.2 before 24 hours prior to the last deadline of submission of bid. The corresponding modification of the bid must accompany the respective written notice. All notices must be: (aa) prepared and submitted in accordance with ITB 17 and ITB 18, and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL", "MODIFICATION;" and (bb) received by the Employer twenty-four hour prior to the deadline prescribed for submission of bids, in accordance with ITB 19. ii) E-submitted bids. a) Bidder may submit modification or withdrawal prior to the deadline prescribed for submission of bids through e-GP system by using the forms and instructions provided by the system.
	21.2. Bids requested to be withdrawn in accordance with ITB 21.1 shall not be opened. In case of hard copy submission, the Bid will be returned unopened to the Bidders.
	21.3 Except in case of any modification or correction in bid document made by procuring entity, Bidder may submit request for withdrawal or modification only one time. 21.4 In case of hard copy bid, no bid may be withdrawn if the bid has already been modified; except in case of any modification or correction in bid document by procuring entity.
	21.5 Request for withdrawal or modification must be made through the same medium of submission. Request for withdrawal or modifications through different medium shall not be considered.
	21.6 The following provisions apply for withdrawal or modification of the Bids: (i) In case of bids submitted in hard copy no bid shall be withdrawn or modified in the interval between 24 hours prior to the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

	(ii) In case of e-submitted bids no bids shall be withdrawn or modified in the interval between deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.
	21.7 Once a Bid is withdrawn, bidder will not be able to submit another bid for the same bid.
22. Bid Opening	22.1 The Employer shall open the bids in public at the address, date and time specified **in the BDS** in the presence of Bidders` designated representatives who choose to attend.
	22.2 The Employer shall download the e-submitted bid files. The e-GP system allows the Employer to download the e-submitted bid files (report) only after bid opening date and time after login simultaneously by two members of the Bid opening committee.
	22.3 Electronically submitted bid shall be opened at first in the same time and date as specified above. Electronic Bids shall be opened one by one and read out. The e-submitted bids must be readable through open standards interfaces. Unreadable and or partially submitted bid files shall be considered incomplete.
	22.4 Thereafter, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be Permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening. Next, envelopes marked "MODIFICATION" shall be opened and read out with the corresponding bid. No bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at bid opening. Only envelopes that are opened and read out at bid opening shall be considered further.
	22.5 All other envelopes shall be opened one at a time, reading out: the name of the Bidder; the Bid Price(s), including any discounts and alternative bids and indicating whether there is a modification; the presence of a bid security and any other details as the Employer may consider appropriate. Only discounts and alternative offers read out at bid opening shall be considered for evaluation. No bid shall be rejected at bid opening except for late bids, in accordance with ITB 20.1.
	22.6 The Employer shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, or modification; the Bid Price, per Contract if applicable, including any discounts and alternative offers; and the presence or absence of a bid security. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record.

E. Evaluation and Comparison of Bids	
23. Confidentiality	23.1 Information relating to the examination, evaluation, comparison, and recommendation of Contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.
	23.2 Any attempt by a Bidder to influence the Employer in the evaluation of the bids or Contract award decisions may result in the rejection of its bid.
	23.3 Notwithstanding ITB 23.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Employer on any matter related to the bidding process, it may do so in writing.
24. Clarification of Bids	24.1 To assist in the examination, evaluation, and comparison of the bids, the Employer may, at its discretion, ask any Bidder for a clarification of its bid. Any clarification submitted by a Bidder that is not in response to a request by the Employer shall not be considered. The Employer's request for clarification and the response shall be in writing. No change in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Employer in the evaluation of the bids, in accordance with ITB 28. In case of e-submission of bid, upon notification from the employer, the bidder shall also submit the original of documents comprising the bid as per ITB 11.1 for verification of submitted documents for acceptance of the e-submitted bid.
	24.2 If a Bidder does not provide clarifications of its bid by the date and time set in the Employer's request for clarification, its bid shall be rejected.
25. Deviations, Reservations, and Omissions	25.1 During the evaluation of bids, the following definitions apply: (a) "Deviation" is a departure from the requirements specified in the Bidding Document; (b) "Reservation" is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and (c) "Omission" is the failure to submit part or all of the information or documentation required in the Bidding Document.
26. Determination of Responsiveness	26.1 The Employer's determination of a bid's responsiveness is to be based on the contents of the bid itself, as defined in ITB 11.
	26.2 A substantially responsive bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that, (a) if accepted, would: (i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or (ii) limit in any substantial way, inconsistent with the Bidding Document, the Employer's rights or the Bidder's obligations under the proposed

	Contract; or (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive bids.
	26.3 If a bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the Employer and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
	26.4 In case of e-submission bids, the Employer evaluates the bid on the basis of the information in the electronically submitted bid files. If the Bidder cannot substantiate or provide evidence to establish the information provided in e-submitted bid through documents/ clarifications as per ITB Clause 24.1, the bid shall not be considered for further evaluation.
	26.5 In Case, a corruption case is being filed to Court against the Natural Person or Board of Director of the firm/institution /company or any partner of JV, such Natural Person or Board of Director of the firm/institution /company or any partner of JV such bidder's bid shall be excluded from the evaluation, if public entity receives instruction from Government of Nepal.
27. Nonconformities, Errors, and Omissions	27.1 Provided that a bid is substantially responsive, the Employer may waive any non-conformities in the bid that do not constitute a material deviation, reservation, or omission.
	27.2 Provided that a bid is substantially responsive, the Employer may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the bid. Failure of the Bidder to comply with the request may result in the rejection of its bid.
	27.3 Provided that a bid is substantially responsive, the Employer shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the methods indicated in Section III (Evaluation and Eligibility Criteria).
	27.4 If the monetary value of such non-conformities is found to be more than fifteen percent of the Bid Price of the bidder on account of minor discrepancies pursuant to ITB 27.3, such bid shall be considered non responsive and shall not be involved in evaluation.
28. Correction of Arithmetical Errors	28.1 Provided that the bid is substantially responsive, the Employer shall correct arithmetical errors on the following basis: (a) only for unit price Contracts, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;

	(b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and (c) If there is a discrepancy between the bid price in the Summary of Bill of Quantities and the bid amount in item (c) of the Letter of Bid, the bid price in the Summary of Bill of Quantities will prevail and the bid amount in item (c) of the Letter of Bid will be corrected. (d) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) ,(b) and (c) above.
	28.2 If a Bidder does not accept the correction of arithmetical errors, its bid shall be disqualified and its bid security shall be forfeited.
29. Evaluation of Bids	29.1 The Employer shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.
	29.2 To evaluate a bid, the Employer shall consider the following: (a) the bid price, excluding Value Added Tax and Provisional Sums in the Summary Bill of Quantities, for Unit Rate Contracts, or Schedule of Prices for lump sum Contracts, but including Day work items, where priced competitively; (b) adjustment for correction of arithmetic errors in accordance with ITB 28.1; (c) adjustment due to discounts offered in accordance with ITB 13.4; (d) adjustment for nonconformities in accordance with ITB 27.3; (e) application of all the evaluation factors indicated in Section III (Evaluation and Eligibility Criteria); If the evaluated Bid Price of the Bidder is more than 30 (thirty) percent below the cost estimate, or substantially higher than the cost estimate the Employer shall reject the Bid as non-responsive.
	29.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.
	29.4 If this Bidding Document allows Bidders to quote separate prices for different Lots (Contracts), and to award multiple Contracts to a single Bidder **as specified in BDS**, the methodology to determine the lowest evaluated price of the Contract combinations, including any discounts offered in the Letter of Bid, is specified in Section III (Evaluation and Eligibility Criteria).
	29.5If the bid for a Unit Rate Contract, evaluated as per ITB 30.1, is front-loaded or has quoted abnormally high rate for any item believing that the item was underestimated, the Employer **shall** require the Bidder to provide clarification along with detailed rate analysis, for any or all items of the Bill of Quantities as per ITB 24.1. The rate analysis submitted shall be analyzed and compared against prevailing norms and rates, on the basis of the work execution methodology, technology, and management methods specified by the bidder.

SECTION - II
Bid Data Sheet

This section consists of provisions that are specific to each procurement and supplement the information or requirements included in Section I. Instructions to Bidders.

A. General	
ITB 1.1	The number of the Invitation for Bids is : WRIDDOL/GKIP/NCB/W/01/2083/84
ITB 1.1	The Employer is: Water Resource and Irrigation Development Division Office, Lamjung
ITB 1.1	**Multiple Contract or lots (contracts) is *not applicable***
ITB 2.1	The name of the Project is: Construction of RCC Canal lining and canal Associated works of Gairikateri Bans Phota IP, DudhPokhari-2, Lamjung The implementing agency is: Water Resource and Irrigation Development Division Office, Lamjung
ITB 4.1 (a)	Maximum number of partner in a joint venture shall be : ***3 (three)***
ITB 4.2	For GoN funded: Eligible countries: ***Nepal***
ITB 4.4	For GoN: ***https://blacklist.ppmo.gov.np/blacklisted***
ITB 4.8 & ITB 4.9	For GoN Funded: The Bidder, including all parties constituting the Bidder, shall be ineligible to participate in the open competitive bidding process if it has already secured **five (5)** construction contracts (in open competitive bidding) and has not yet completed the work as stipulated in the respective contracts. Following Procurement of Works contracts shall not be counted for this purpose: a) The works for which tender were invited or contracts accepted before 2078-12-03 B.S (March 17, 2022 A.D) b) The works for which tender have been invited and contracts accepted after 2078-12-03 B.S (March 17, 2022 A.D) but the work acceptance report has been approved according to Rule 117 of PPR. c) The works for which tenders were invited or contracts accepted under all types of foreign assistance.
ITB 5.1	For GoN funded: For the purpose of Country of Origin: "all Countries"
B. Bidding Document	
ITB 7.1	For clarification purposes only, the Employer's address is: Water Resource and Irrigation Development Division Office, Lamjung

ITB 7.4	A Pre-Bid meeting **shall** held.Pre-Bid Meeting will Take place at the following date, time and place: Date: 2026/10/05 AD (2083/06/19 BS) Time: 11:00 Hrs Place: Water Resource and Irrigation Development Division Office, Lamjung A site visit ***shall not be*** organized by the Employer.
ITB 7.5	Time for request: Requests for clarification should be received by the Employer no later than 10 days prior to the deadline for submission of bids.
C. Preparation of Bids	
ITB 10.1	The language of the bid is: English / Nepali
ITB 11.1 (b)	In accordance with ITB 12 and ITB 14, the following schedules shall be submitted with the bid, including the priced Bill of Quantities for Unit Rate Contracts and Schedule of Prices for lump sum contracts: **NA**
ITB 11.1 (h)	The Bidder shall submit with its bid the following additional documents: **NA**
ITB 13.6	The prices quoted by the Bidder ***shall not be*** subject to adjustment during the performance of the Contract.
ITB 15.1	The bid validity period shall be: ***Ninety (90) days***.
ITB 16.1	The Bidder shall furnish a bid security, from Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law in Nepal with a minimum of **NRs *335000/-***, which shall be valid for 30 days beyond the validity period of the bid.
ITB 16.2 (b)	Name of office: Water Resource and Irrigation Development Division Office, Lamjung Bank Name: Rastriya Banijya Bank Ltd, Bank Address: Beshishahar, Lamjung Dharauti Account Number: 3040100202030000 Office Code no.: 3400337014
ITB 17.1	In addition to the original of the bid, the number of copy/ies is/are: ***Not Applicable***
ITB 17.2	The written confirmation of authorization to sign on behalf of the Bidder shall indicate: (a) The name and description of the documentation required to demonstrate the authority of the signatory to sign the Bid such as a Power of Attorney; and (b) In the case of Bids submitted by an existing or intended JV, an undertaking signed by all parties (i) stating that all parties shall be jointly and severally liable, and (ii) nominating a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution.

<table>
<tr><th colspan="2">D. Submission and Opening of Bids</th></tr>
<tr><td>ITB 18.1</td><td>Bidders shall have the option of submitting their sealed bids by hand/ courier</td></tr>
<tr><td>ITB 18.1 (b)</td><td><u>Electronic bid submission procedure: NA</u>

The required forms and documents shall be part of bid.
<table>
<tr><th>No.</th><th>Document</th><th>Requirement</th><th>Remarks</th></tr>
<tr><td>1.</td><td>Letter of Bid</td><td>Mandatory</td><td></td></tr>
<tr><td>2.</td><td>Bid Security / Bank Guarantee</td><td>Mandatory</td><td></td></tr>
<tr><td>3.</td><td>Firm or Company registration Certificate</td><td>Mandatory</td><td></td></tr>
<tr><td>4.</td><td>VAT and PAN registration Certificate</td><td>Mandatory (for domestic bidders only)</td><td></td></tr>
<tr><td>5.</td><td>Business Registration Licence</td><td>Mandatory</td><td></td></tr>
<tr><td>6.</td><td>Tax Clearance Certificate for fy 082/83 / Tax return submission evidence / evidence of time extension</td><td>Mandatory (for domestic bidders only)</td><td></td></tr>
<tr><td>7.</td><td>Power of Attorney of Bid signatory</td><td>Mandatory</td><td></td></tr>
<tr><td>8.</td><td>Bank Voucher for cost of bid document</td><td>Mandatory</td><td></td></tr>
<tr><td>9.</td><td>Joint venture agreement</td><td>Mandatory in case of JV Bids Only</td><td></td></tr>
<tr><td>10.</td><td>Completed Bill of Quantities (BoQ)</td><td>Mandatory</td><td></td></tr>
<tr><td>11.</td><td>Price Adjustment Table (if Applicable)</td><td>Mandatory (If Applicable)</td><td></td></tr>
<tr><td>12.</td><td>Additional documents specified in ITB 11.2 (h)</td><td>Mandatory (If any)</td><td></td></tr>
</table>
<u>Note:</u>

a) The documents specified as “Mandatory” should be included in bid submission and non-submission of the documents shall be considered as non-responsive bid.
b) Bidders (all partners in case of JV) should verify/update their profile documents as appropriate for the specific bid before submitting their bid..</td></tr>
<tr><td>ITB 19.1</td><td><u>For bid submission purposes only, the Employer’s address is :</u>

Water Resource and Irrigation Development Division Office, Lamjung

<u>The deadline for bid submission is :</u>
Date : 2026/10/13 AD (2083/06/27 BS) Time 12:00 Hrs</td></tr>
<tr><td>ITB 22.1</td><td>The bid opening shall take place at :

Address : Water Resource and Irrigation Development Division Office, Lamjung</td></tr>
</table>

	Date : 2026/10/13 AD (2083/06/27 BS) Time : ***13:00 Hrs***
E. Evaluation and Comparison of Bids	
ITB 29.4	Bidders are ***not permitted*** to quote separate prices for lots (Contracts), and a single Bidder will be awarded multiple lots (Contracts) based on provision of ***Paragraph 1.1, Multiple Contracts Section III (Evaluation and Eligibility Criteria***
ITB 29.5	The amount of the performance security be increased by Eight (8) percent of the quoted bid price (without VAT but Including PS).
ITB 29.8	**Key Items:** The amount of the performance security be increased by **Eight (8)** percent of the quoted bid price without VAT but Including PS.
ITB 30.2	If the Bid Price of two or more bidders is found to be the Lowest Evaluated Bid Price, the Employer shall select the substantially responsive lowest evaluated bidder by draw system procedure as specified in the **BDS** in presence of Bidders' designated representatives who choose to attend in date, time and place as notified by the Employer in writing to the concerned bidders. The Bidders' representatives who are present shall be requested to sign a record evidencing their attendance. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record.

SECTION - III

Evaluation and Eligibility Criteria

This Section contains all the criteria that the Employer shall use to evaluate bids and eligible Bidders. GoN/DP requires bidders to be qualified by meeting predefined eligibility criteria. In accordance with ITB 29, no other methods, criteria and factors shall be used. The Bidder shall provide all the information requested in the forms included in Section IV (Bidding Forms).

1. Evaluation

In addition to the criteria listed in ITB 29.2 (a) - (e) the following criteria shall apply:

1.1 Multiple Contracts

Pursuant to Sub-Clause ITB 29.4 of the Instructions to Bidders, if Works are grouped in multiple contracts, evaluation will be as follows:

Works are grouped in multiple contracts and pursuant to Sub-Clause 29.4 of the Instructions to Bidders, the Employer will evaluate and compare Bids on the basis of a contract, or a combination of contracts, or as a total of contracts in order to arrive at the least cost combination for the Employer by taking into account discounts offered by Bidders in case of award of multiple contracts.

1.2 Quantifiable Nonconformities and Omissions

Subject to ITB 13.2 and ITB 29.2, the evaluated cost of quantifiable nonconformities including omissions, is determined as follows:

[***Insert in bidding document:*** "Pursuant to ITB 27.3, the cost of all quantifiable nonmaterial nonconformities shall be evaluated, but excluding omission of prices in the Bill of Quantities. The Employer will make its own assessment of the cost of any nonmaterial nonconformities and omissions for the purpose of ensuring fair comparison of bids."]

2. Eligibility

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
2.1 Conflict of Interest					
No conflicts of interest in accordance with ITB Sub-Clause 4.3.	must meet requirement	existing or intended JV must meet requirement	must meet requirement	not applicable	Letter of Bid
2.2 Government/DP Eligibility					
Not having been declared ineligible by government/DP, as described in ITB Sub-Clause 4.4.	must meet requirement	must meet requirement	must meet requirement	not applicable	Letter of Bid
2.3 Government-owned Entity					

Bidder required to meet conditions of ITB Sub-Clause 4.5.	must meet requirement	existing or intended JV must meet requirement	must meet requirement	not applicable	Letter of Bid, Forms ELI - 1, ELI - 2, with attachments
2.4 UN Eligibility					
Not having been declared ineligible based on a United Nations resolution or Employer's country law, as described in ITB Sub-Clause 4.7.	must meet requirement	existing or intended JV must meet requirement	must meet requirement	not applicable	Letter of Bid
2.5 Bidder's Running Contracts					
Bidder's have not yet secured five (5) number of construction contracts[2](in open competitive bidding) as described in ITB Sub-Clause 4.8.	must meet requirement	existing or intended JV must meet requirement	must meet requirement	not applicable	Letter of Bid, Form ELI-3
2.6 Other Eligibility					
Firm or Company Registration Certificate	must meet requirement	not applicable	must meet requirement	not applicable	Document attachment
Business Registration License	must meet requirement	not applicable	must meet requirement	not applicable	Document attachment
VAT and PAN Registration certificate	must meet requirement	not applicabl	must meet requirement	not applicable	Document attachment
Tax clearances certificate for the F/Y 2082/83 or Tax return submission evidence or evidence of tax time extension for.	must meet requirement	not applicable	must meet requirement	not applicable	Document attachment

[2]Note: Following Procurement of Works contracts shall not be counted for this purpose:

a) The works for which tender were invited or contracts accepted before 2078-12-03 B.S or March 17, 2022 A.D

b) The works for which tender have been invited and contracts accepted after 2078-12-03 B.S or i.e March 17, 2022 A.D and accepted but the work acceptance report has been approved according to Rule 117 of PPR.

c) The works for which tenders were invited or contracts accepted under all types of foreign assistance

Additional requirements ***[Insert if any]***	……..	…… …	……	……	……

SECTION - IV

Bidding Forms

This Section contains the forms which are to be completed by the Bidder and submitted as part of its Bid.

Letter of Bid

The Bidder must accomplish the Letter of Bid in its letterhead clearly showing the Bidder's complete name and address.

Date: .....

Name of the contract: .....

Invitation for Bid No.: .....

To: ***[Insert Complete name of Employer]*** ……

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) Clause 8;

(b) We offer to execute in conformity with the Bidding Documents the following Works: ***[Insert Description of the works].***

(c)The total price of our Bid, excluding any discounts offered in item (d) below is: ***[Insert one of the options below as appropriate]*** or when left blank is the Bid Price indicated in the Bill of Quantities.

Option 1, in case of single contract: Total price is: ***[insert the total price of the Bid in words and figures]***;

Or

Option 2, in case of multiple lots (contracts): (i) Total price of each lot (contracts): ***[insert the total price of each lot in words and figures]***; (ii) Total price of subject contract [say Lot1] and Lot2 [another contract] [insert the total price in words and figures]; (iii) Total price of subject contract [say Lot1]and Lot3 [another contract] ***[insert the total price in words and figures]***; Total price of subject contract [say Lot1], Lot2 [another contract], Lot3 [another contract], ……..***[insert the total price in words and figures];***

(d) The discounts offered and the methodology for their application for subject contract [single contract] are:…….. [For Bidding Documents not provisioning multiple contracts]

Add following if Bidding Document provisions applicability of multiple contracts

The discounts offered and the methodology for their application for subject contract [say Lot1] and Lot2 [another contract] are:……..

The discounts offered and the methodology for their application for subject contract [say Lot1] and Lot3 [another contract] are:……..

The discounts offered and the methodology for their application for subject contract [say Lot1], Lot2 [another contract] and Lot3 [another contract],……,
are:……..

[Note:

1. Formulate possible combinations depending upon the number of lots under Bidding Process and modify accordingly Paragraph (c) and (d)]

(e) Our bid shall be valid for a period of ……..***[insert validity period as specified in ITB 15.1]*** days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Document;

(g) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries or any countries [insert the nationality of the Bidder, including that of all parties that comprise the Bidder if the Bidder is a consortium or association, and the nationality of each Subcontractor and Supplier];

(h) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3;

(i) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB 4.3;

(j) Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible, under the Employer's country laws or official regulations or by an act of compliance with a decision of the United Nations Security Council;

(k) *[*We are not a government owned entity*] / [*We are a government owned entity but meet the requirements of ITB 4.5*]*; *

(l) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed;

(m) We declare that, we have not been black listed as per ITB 3.4 and no conflict of interest in the proposed procurement proceedings and we have not been punished for an offense relating to the concerned profession or business.

(n) We declare that we have not yet secured five (5) number of constructions contracts[3] (in open competitive bidding) as described in ITB Sub-Clause 4.9.

(o) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and

(p) If awarded the contract, the person named below shall act as Contractor's Representative:

(q) We agree to permit the Employer/DP or its representative to inspect our accounts and records and other documents relating to the bid submission and to have them audited by auditors appointed by the Employer.

(r) We declare that we are solely responsible for the authenticity of the documents submitted by us. The document and information submitted by us are true and correct. If any document/information given is found to be concealed at a later date, we shall accept any legal actions by the Employer.

Name: ***[insert complete name of the person signing the Bid]***.....

In the capacity of ***[insert legal capacity of person signing the Bid]***.....

Signed ***[signature of the person whose name and capacity are shown above]***……

Duly authorized to sign the Bid for and on behalf of ***[insert complete name of the Bidder]***……

Date ***[insert date of signing]***……....

---

[*] Note: Use one of the two options as appropriate.

[3] Note: Following Procurement of Works contracts shall not be counted for this purpose

a) The works for which tender were invited or contracts accepted before 2078-12-03 B.S (March 17, 2022 A.D).

b) The works for which tender have been invited and contracts accepted after 2078-12-03 B.S (March 17, 2022 A.D) and accepted but the work acceptance report has been approved according to Rule 117 of PPR.

c) The works for which tenders were invited or contracts accepted under all types of foreign assistance.

Table of Price Adjustment Data[4]

[To be used if Price Adjustment is applicableas per GCC 53.1]

Code	Index Description	Source of Index*	Base Value and Date	Employer's Proposed Weighting Range (coefficient)	Bidder's Proposed Weighting (coefficient)**
1	2	3	4	5	6
	Non - adjustable (A)			0.15	0.15
	Labor (b)				
	Materials (c)				
	Equipment usage (d)				
		Total			**1.00**

*Normally following source of index shall apply. Public Entity shall choose applicable Index for each item.

(a) Labor:

"National Salary and Wage Rate Index"- "Construction Labor" of Nepal Rastra Bank

or

rate fixed by District Rate Fixation Committee

(b) Material:"National Wholesale Price Index" - Construction Materials" of Nepal Rastra Bank

(c) Equipment usage:

"National Wholesale Price Index"-"Machinery and Equipment" of Nepal Rastra Bank

or

"Fuel" Price fixed by Nepal Oil Corporation.

** Bidders proposed weightings should be within the range specified by the Employer in column - 5

[4] Non-compliance of the data (stipulated by the bidder in this table) with requirements described here shall not be grounds for bid rejection and such non-compliance will be subject to clarification and rectification prior to contract award.

Table of Price Adjustment Data[5]

[To be used if Price Adjustment is applicable as per GCC 53.6]

Code	Construction Material*	Unit	Base Price (NRs/Unit) (Ex-factory)	Source (Factory)**
1	2	3	4	5

* Major construction materials to be specified by Employer in column - 2.

** Base Price and source normally to be specified by Employer (or alternatively informed to be proposed by bidder) in column 4 and5.

Note:
The base prices of the construction materials shall be taken as of 30 days before the deadline for submission of the Bid as quoted by the Bidder and verified by the Employer. For the purpose of calculation of price adjustment, the Ex-factory price of the same source shall be taken into consideration.

[5] Non-compliance of the data (stipulated by the bidder in this table) with requirements described here shall not be grounds for bid rejection and such non-compliance will be subject to clarification and rectification prior to contract award.

Bid Security

Bank Guarantee

Bank's Name, and Address of Issuing Branch or Office

(On letterhead paper of the Bank)

Beneficiary: ..... ***[Insert name and address of Employer]*** …….

Date: ……...

Bid Security No.: .....

We have been informed that . …….***.[insert name of the Bidder]*** (hereinafter called "the Bidder") intends to submit its bid (hereinafter called "the Bid") to you for the execution of ……... ***[Insert name of Contract .*** …… under Invitation for Bids No. ……***[insert IFB No.]*** ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

At the request of the Bidder, we…… . ***[Insert name of Bank]*** …….. hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of Nepalese Rupees. . ***……...[Insert amount in figures and amount in words]*** upon receipt by us of your first demand in writing accompanied by a written statement stating that the Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

(a) has withdrawn or modifies its Bid:

(i) during the period of bid validity specified by the Bidder on the Letter Bid, in case of electronic submission

(ii) from the period twenty-four hours prior to bid submission deadline up to the period of bid validity specified by the Bidder on the Letter of Bid, in case of hard copy submission; or

(b) does not accept the correction of errors in accordance with the Instructions to Bidders (hereinafter "the ITB"); or

(c) having been notified of the acceptance of its Bid by the Employer during the period of bid validity, (i) fails or refuses to execute the Contract Agreement, or (ii) fails or refuses to furnish the performance security, in accordance with the ITB; or

(d) is involved in fraud and corruption in accordance with the ITB; or

(e) a Bidder changes the prices or substance of the bid while providing information pursuant to ITB 24.1; or

(f) if the bidder fails to inform about the saturation of the maximum number of contracts as per ITB 4.9.

This guarantee will remain in force up to and including the date ……**number**……days after the deadline for submission of Bids as such deadline is stated in the instructions to Bidders or as it may be extended by the Employer, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this guarantee should reach the Bank not letter than the above date.

This Bank guarantee shall not be withdrawn or released merely upon return of the original guarantee by the Bidder unless notified by you for the release of the guarantee.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG), 2010 Revisions, ICC Publication No. 758 .except that the supporting statement under Article 15(a) is hereby excluded.

. . .Bank's seal and authorized signature(s) . . .

Note:

The bid security of ……..……. has been counter guaranteed by the Bank ……..…….. ...…… on ……....……..……. (Applicable for Bid Security of Foreign Banks).

Bidder's Information Format

Site Organization

Method Statement

Mobilization Schedule

Construction Schedule

Others

Bidder's Information

Form ELI - 1: Bidder's Information Sheet

Bidder's Information	
Bidder's legal name	
In case of JV, legal name of each partner	
Bidder's country of constitution	
Bidder's year of constitution	
Bidder's legal address in country of constitution	
Bidder's authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	
Attached are copies of the following original documents.	
1. In case of single entity, articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and 4.2. 2. Authorization to represent the firm or JV named in above, in accordance with ITB 17.2. 3. In case of JV, letter of intent to form JV or JV agreement, in accordance with ITB 4.1. 4. In case of a government-owned entity, any additional documents not covered under 1 above required to comply with ITB 4.5.	

Form ELI - 2: JV Information Sheet

Each member of a JV must fill in this form

JV / Specialist Subcontractor Information	
Bidder's legal name	
JV Partner's or Subcontractor's legal name	
JV Partner's or Subcontractor's country of constitution	
JV Partner's or Subcontractor's year of constitution	
JV Partner's or Subcontractor's legal address in country of constitution	
JV Partner's or Subcontractor's authorized representative information (name, address, telephone numbers, fax numbers, e-mail address)	
Attached are copies of the following original documents.	
1. articles of incorporation or constitution of the legal entity named above, in accordance with ITB 4.1 and 4.2. 2. Authorization to represent the firm named above, in accordance with ITB .2. 3. In the case of government-owned entity, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITB 4.5.	

Form ELI - 3: Bidder's Running Contracts****

Each member of a JV must fill in this form

	Bidder's Running Contracts				
Name of office	**Contract Identification no.**	**Source of Fund***	**Date of issuance of Letter of Acceptance**	**Status of contract****	**Date of Issuance of Taking Over Certificate*****

* Mention GON funded or DP funded or Other PE (Insert name) funded

** Mention "Yet to sign" if contract is not signed, "Running" if contract has been signed and contract is running and "Substantially completed" if taking over certificate has been issued.

*** Insert date of issuance of taking over certificate if the awarded contract has been substantially completed and taking over certificate has been issued.

****Note: Following Procurement of Works contracts shall not be counted for this purpose

a) The works for which tender were invited or contracts accepted before 2078-12-03 B.S (March 17, 2022 A.D).

b) The works for which tender have been invited and contracts accepted 2078-12-03 B.S (March 17, 2022 A.D) but the work acceptance report has been approved according to Rule 117 of PPR.

c) The works for which tenders were invited or contracts accepted under all types of foreign assistance.

Part – II

REQUIREMENTS

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SECTION - V
Works Requirements

This Section contains the Scope of Work, Specification, the Drawings, and supplementary information that describe the Works to be procured.

Scope of Work

Construction of RCC Canal lining and canal Associated works of Gairikateri Bans Phota IP, DudhPokhari-2, Lamjung

Specifications

Table of Contents

A Summary of Works

B Control of Water

C Storage of Materials

D Measurement and Payment

E Site Investigation

F Clearing and Grubbing

G Demolition of Existing Structures

H Stripping

I Excavation of Embankment

J Embankment

K Riprap and Stone Pitching Protection

L Turfing with sods.

M Pipe Conduits

N Concrete

O Masonry

P As built Drawing

A. SUMMARY OF WORKS

1.1 DRAWING

A. The location, extent, types and arrangement of the required construction and improvements are shown and noted on the drawings accompanying this Specification, which Drawings are hereby made a part of the Specification and this Contract.

B. The Drawings accompanying the Specification, along with the quantities given in the Bill of Quantities are for tendering purposes and for obtaining comparable tenders. The Drawings accompanying the Specification indicate the scope and character of the Works to be performed. They are not fully detailed and are not released for construction purposes.

C. Pursuant to the Conditions of Contract, the Engineer will issue supplemental drawings and clarifications for execution of the Contract and during the progress of the Works to more detail and clarify the works to be performed. These Drawings will be stamped or marked by the Engineer, "Released for Construction".

D. The Engineer will also issue all necessary construction drawings for the permanent works. Such drawings will include detailed drawings and will be stamped or marked by the Engineer "Released for Construction".

1.2 STANDARDS AND SUPPLEMENTARY SPECIFICATIONS

A. All workmanship, materials and components throughout shall, where applicable, and unless otherwise stated in the Contract Document, comply either:

1. With the relevant American, British, German, or Indian Standard of Code of Practice current on the date fixed for receipt of tenders, or

2. With other Standards or Codes of Practice proposed by the Contractor at the time of tendering provided that these standards of Codes of Practice are equivalent or superior to the relevant American, British, German, or Indian Standard or Code of Practice.

B. The acceptance of a tender based upon a Standard of Code of Practice proposed by the Contractor shall only signify the Engineer's general approval to the use of such Standard or Code of Practice, and shall not make the Engineer liable to accept a standard of workmanship subsequently found to be inferior to the corresponding American, British, German, or Indian Standard or Code of Practice.

C. Where the relevant standard provides for the furnishing of a certificate to the Employer or Engineer at their request, stating that the materials supplied comply in all respects with the standard, the Contractor shall obtain the certificate and forward it to the Engineer. If no standard is indicated, then the relevant American, British, German or Indian Standard, if any, shall apply.

D. Where reference is made within these documents to certain standard specifications the reference shall unless otherwise specifically stated be construed to mean the standard, with all subsequent amendments, changes or additions as thereafter adopted and published that are in effect on the date of issue of the Tender Documents.

E. Whenever in these documents references are made to particular reference standards or abbreviations thereof, their meaning shall be as listed below and copies of such standards may by obtained at the Contractor's expense from the particular organization at the address given

AASHTO	American Association of State Highway and Transportation Officials Suit 341 National Press Building Washington, DIC, 20004 U.S.A.

ACI	American Concrete Institute P.O: Box 4754 Redford Station, Detroit, Ml 48219 U.S.A.
AISC	American Institute of Steel Construction 101 Park Avenue, New York, NY 10017 U.S.A.
ASTM	American Society for Testing of Materials 1916 Race St., Philadelphia, PA19103U.S.A.
AWS	American Welding Society.lns. 2501 N:W. 7th St., Miami. PL 33125 U.S.A.
AWWA	American Water Works Association 6666 West Quincy Ave. Denver, Colorado80235U.S.A.
BSI	British Standard Institution 101 Pantonville Road London Ni 9ND, England
DIN	Deutsche Industrie Norm (German Industry Standard)
DNA	Deutscher Normenausschuss Beuth—Vertrieb, Berlin 30 Koln, Federal Republic of Germany
ISO	International Organization for Standardization 1 Rue devaremble, Geneva, Switzerland
SSPC	Steel Structures Painting Council 4400 Fifth Ave., Pittsburg, PA 15213 U.S.A.
NS	Nepal Standard
ISI	Indian Standard Institution

B. CONTROL OF WATER

1.1 GENERAL

A. The contractor shall be responsible for the control of water met within the excavations due to ground water, spring, seepage, rain or other causes. He shall take all measures and necessary precautions to control water seepage into excavations by suitable diversions and by bailing out or by pumping if necessary to keep the excavations dry during excavation, concrete construction, and embankment or backfill placement and compaction.

B. The contractor shall submit to the Engineer for approval, details of such measures as he proposes to adopt for the control of water from any source. Notwithstanding any approval by the Engineer of the Contractor's arrangement for the exclusion of water, the Contractor shall be responsible for sufficiency thereof and for keeping the works safe at all times, particularly during any floods, and for making good at his own expense any damage to the works including any that may be attributable to floods.

1.2 WORKS TO BE KEPT CLEAR OF WATER

The Contractor shall keep the works well drained until the Engineer certifies that the whole of the Works is substantially complete and shall ensure that so far as is practicable all work is carried out in the dry, Temporary works such as temporary dams, water courses and other works of all kinds including pumping and well-point dewatering that may be necessary to exclude water from the works with the approval of the Engineer's Representative. The Contractor is to take all necessary precautions to avoid floatation of any partially completed structure.

1.3 DISCHARGE OF WATER INTO EXISTING STREAMS

The contractor shall make provision for the discharge of disposal from the works and temporary works of all water and waste products however arising, and the methods or disposal shall be to the satisfaction of the Engineer and of any Authority or person having an interest in any pond or water course over or in which water and waste products may be so discharged. Care shall be taken so that discharge of drained water will not cause damage to the works, crops or any other property. The requirements of this clause shall not limit any of the Contractor's obligations or liabilities particularly as to clause of the Conditions of Contract.

1.4 COSTS

Costs incurred by the Contractor in complying with the requirements of this Section shall be deemed to be included in the price tendered for the various items of the Bill of Quantities for which the control of the water is required and no separate payment will be made there for.

C. STORAGE OF MATERIALS

1.1 GENERAL

A. Materials shall be stored so as to ensure preservation of their specified quality and fitness for the work. They shall be placed on hard, clean surface, and when required, they shall be placed under cover as approved by the Engineer. Stored materials shall be located so as to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the owner or making good the losses and providing payment to him if necessary.

B. The stockpile site shall be prepared by clearing and levelling as approved by the Engineer.

C. Aggregate storage piles shall be built up and removed in layers not exceeding 1 m. The height of such stockpiles shall be limited to 5.0 m. The center of the storage areas shall be raised and sloped to the sides, as required to provide proper drainage of excess moisture. The material shall be stored in such a manner as to prevent segregation and to ensure proper gradation and moisture content.

1.2 COSTS

The costs of providing of storage for materials shall be included in the prices tendered for the various items of the Bill of Quantities for which storage of materials is required, and no separate payment will be made there for.

D. MEASUREMENT AND PAYMENT

1.1 PRELIMINARY NOTE

A. The items as set out in the Bill of Quantities are understood to be full compensation

- For the preparation of Working Drawings for the Civil Engineering works and conforming to the requirements for the equipment and drawings as set out in the Specification, Conditions of Contract, information and Instruction, Drawings. Schedules and Appendices submitted with the Tender Documents
- For all materials, parts and labour cost as well as the cost of supervision, quantity inspection and testing and all other costs for the supply of the equipment and materials
- For all handling, packing and shipping charges, rail, road and all over other transport costs, including labour dues, dock handling charges, insurance during transit, customs outside Nepal (If any) and all other charges on the equipment and materials from any place outside Nepal until it is delivered on site
- For all cost of labour, supervising, erection of plant and temporary works, materials and other things of whatever nature required for storing, moving into final position, setting out, handling and erecting, final painting and protection, quality inspection and testing:

- For site testing and commissioning of the equipment
- For maintenance and making good
- For all duties and obligations as set out in the Conditions of Contract, the Specification. Information and Instructions, Drawings, schedules and Appendices

B. Measurement methods specified in the individual Sections of the Specification shall govern if they differ from methods specified in this Section.

C. The Engineer will compute all quantities and will take measurements as required for such computations.

1.2 MEASUREMENT OF QUANTITIES

A. MEASUREMENT STANDARDS

All works to be paid for at a Contract price per unit of measurement will be measured by the Engineer in accordance with Metric Standard Measures. A ton shall consist of 1,000 Kilograms.

B. MEASUREMENT BY WEIGHT

1. Steel shapes, castings, miscellaneous, metal fabrications, and similar items to be paid for any weight shall be measured by handbook weights for the type and quantity of material actually furnished and used.

2. The Engineer may be present to witness the weighing and to check and compile the daily record of such scale weights: however, in any case. the Engineer will require that Contractor furnish weigh slips and daily summary weigh sheets. In such case, furnish a duplicate weigh slip to the Engineer at the point of delivery of the materials.

C. MEASUREMENT BY VOLUME

1. Measurement by volume will be by the cubic dimension listed or indicated in the Bill of Quantities. Method of volume measurement will be as determined or directed by the Engineer.

2. When materials are to be measured and paid for on a volume basis and it is impractical to determine the volume by the specific method of measurement, or requested by the Contract in writing and accepted by the Engineer in writing, the material will be weighed in accordance with the requirements specified for weight in accordance with the requirements specified for weight measurement. Such weight will be converted to volume measurement for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the Engineer and shall be agreeable to the Contractor before such method of measurement of pay quantities will be accepted.

D. MEASUREMENT BY AREA

Measurement by area will be the square dimension listed or indicated in the Bill of Quantities Method of square measurement will be as determined or directed by the Engineer.

E. LINEAR MEASUREMENT

Linear measurement will be by the linear dimension listed or indicated in the Bill of Quantities. Method of linear measurement will be as determined or directed by the Engineer. Generally, items, components, or work to be measured will be measured at the centerline of the item in place.

F. LUMP-SUM MEASUREMENT

1. Lump-sum measurement will be for the entire item, unit of work, structure, or combination there of, as listed or indicated in the Bill of Quantities.

2. If the Contractor requested progress payments for lump-sum items or amounts in the Bill Quantities, such progress payments will be made in accordance with a well-balance detailed program of payment-apportioning, prepared by the Contractor and submitted to the Engineer for approval.

3. Such program for each applicable lump-sum item shall show estimated quantities and unit prices thereof as allocated by the Contractor to the different features of the work and major subdivision thereof. It shall also show the amounts allocated by the Contractor for

   (i) Costs of the various materials to be furnished.

   (ii) Direct labour cost and derivative charges.

   (iii) Other itemized costs. (iv) Overhead. (v) Insurance and (vi) Profit.

   The summation of contents of quantities and unit prices and related costs shall total, in each case, the exact amount to be paid under the lump-sum Contract price for the item.

4. Such programmes will be used for computing progress payment as provided herein, but will not be used to determine the amount of the final payment for the work of this Contract.

1.3 FIELD MEASUREMENT FOR PAYMENT

A. The Engineer will compute for payment purposes all quantities of work performed by the Contractor, or of materials and equipment delivered to the site.

B. The Contractor shall assist the Engineer in the taking of measurements by providing all equipment and workers, as required to measure quantities in accordance with provision for measurement specified herein.

C. All measurement services required of the Contractor, as specified shall be performed under the direction and supervision of the Engineer.

1.4 <u>REJECTED MATERIALS</u>

Quantities of material wasted or disposed of in a manner not called for under the Contract: rejected loads of material, including material rejected after it has been placed by reasons of the failure of the Contractor to conform to the provisions of the Contract; material not unloaded from the transporting vehicle; material placed outside the lines; indicated on the Contract Drawings or established by the Engineer; or material remaining on hand after completion of the work; will not be paid for, and such quantities shall not be included in the final total quantities. No compensation will be permitted for loading, hauling and disposing of rejected material.

1.5 Separate measurement of payment will not be made for work required under this section. All costs in connection will the work specified herein will be considered to be included with the related item of work in the Bill of Quantities, for incidental to the Project.

E. SITE INVESTIGATION

1.1 <u>GENERAL</u>

If at any time during the execution of the works the Engineer shall require the Contractor to make boreholes or to carry out exploratory excavation, such requirement shall be ordered in writing and shall be deemed to be in addition to that ordered under the provision of Clause 18 hereof unless a provisional sum in respect of such, anticipated work shall have been included in the Bill of Quantities.

F. CLEARING AND GRUBBING

1.1 <u>GENERAL DESCRIPTION</u>

This Specification Section covers clearing, grubbing; and removing of vegetation and other objectionable material from the site and the right-of-way.

2.1 CLEARING OF THE SITE-GENERAL

A. Within limits established by the Engineer, the Contractor shall remove all trees shrubs, bushes and other vegetation standing above the ground surface. The roots of all trees and other vegetation shall be removed as approved by the Engineer. Trees designated by the Engineer to remain shall be protected.

B. On the instructions of the Engineer, the Contractor shall demolish andremove all timber buildings, fences and similar structures within the same areas.

C. Where directed by the Engineer, usable materials and equipment shall be salvaged and handed over to the representative or the Employer. All other material cleared shall be disposed of by burning on site as prescribed below, or by removal to waste beyond the site boundaries. The location of such disposal areas snail be subject to approval by the Engineer before use.

3.1 CLEARING THE RIGHT OF WAY

A. All areas which require clearing for purpose of earthwork and construction, including right of way, borrow areas, stock pile sites and elsewhere as directed by the Engineer shall be cleared of trees, brush, roots, rubbish and other objectionable matter and such materials shall be removed from the site of the work or otherwise disposed of as approved by the Engineer. On the approval of the Engineer, fences, walls, buildings and ruins shall be removed from the same areas.

B. All materials to be burnt shall be piled neatly and when in a suitable condition shall be burnt completely. Piling for burning shall be done in such a manner and in such locations as to cause the least fire risks. The Contractor shall at all times take special precautions to prevent fire from spreading.

C. In general, only such trees that would interfere with the construction required under these specifications shall be removed, and trees along the right-of-way shall be left in place to the greatest extent practicable. The Contractor shall dispose of all material cleared as prescribed above.

D. During the Contractor's operations the removal of certain trees and shrubs outside the right-of way may be required, in which case the Contractor may remove such trees and shrubs after obtaining prior approval of the Engineer. All trees and shrubs designated to remain in place shall be protected from damage. Any damage to the Works and public or private property caused by the Contractor's operations in clearing and grubbing shall be repaired or replaced by the Contractor at his own cost.

4.1 MEASUREMENT AND PAYMENT

A. When indicated as an item in the Bill of Quantities, clearing and grubbing will be measured for payment either by the lump-sum for the applicable Schedule or by the number of trees of various sizes removed. Where the Bill of Quantities for a schedule does not include an item for clearing and grubbing, no separate payment will be made for such work and all costs therefore shall be included in the unit rates tendered for the various types of excavation.

G. DEMOLITION OF EXISTING STRUCTURES

1.1 GENERAL DESCRIPTION

A. This Specification Section covers the partial and complete demolition of existing structures constructed of concrete, bricks, and stone.

B. Demolition of wooden structures shall be considered clearing and is covered under Section 2B of "clearing and grubbing".

2.1 DEMOLITION

A. Existing structures shall be demolished as directed by the Engineer. Where the structure interferes with the new construction, it shall be demolished completely. Where a part or parts of an existing structure are to be incorporated into the Works, such structures shall be partially demolished as specified below.

B. Materials resulting from demolition, which are suitable for reuse, shall be considered as the property of the Employer and shall be salvaged. Sound brick and stone shall be neatly stockpiled at locations directed by the Engineer. Rubble resulting from demolition of concrete shall be stockpiled when directed by the Engineer, for use in backfill, embankment, for other purposes.

C. Partial demolition of existing structures, which are to be incorporated into the Works, shall consist of the removal of all unsound portions of the structures, and other portionsas directed by the Engineer, as necessary to incorporate the remaining, sound portions into the Works. Care shall be taken to preserve the portions be cut with a suitable saw to a depth of 40 mm before the cut-off portion is demolished. All unsound concrete which spalls when struck with a hammer shall be removed. All bricks and stones which can be easily pried loose, and all bricks and stones set in unsound mortar shall be removed.

3.1 MEASUREMENT AND PAYMENT

Separate measurement for payment will not be made for work required under this Section. All costs in connection with the work specified herein will be considered to be included with the related item of work in the Bill of Quantities or incidental to the Project. Accidental demolition of parts or structures designated to remain shall be repaired by the Contractor at his expenses.

H. STRIPPING

1.1 GENERAL DESCRIPTION

This Specification Section covers stripping of topsoil and other unsuitable materials and the stockpiling or disposal thereof.

2.1 STRIPPING

A. Stripping shall consist of the removal of all organic and unsuitable materials such as sod, topsoil from embankment foundations, from areas where the excavated material is to be further used in embankment, from the base of all roads, from approved borrow areas within the right of way, and from all other areas as may be directed by the Engineer.

B. Materials from stripping which are suitable for topsoil shall be selected during stripping operations and stockpiles for further use if so directed by the Engineer. Material not suitable for topsoil or other further use shall be disposed of in spoil banks in accordance to the Engineer's instructions.

I. EXCAVATION FOR EMBANKMENT

1.0 DESCRIPTION

A. This section covers the excavation for embankment foundations and also includes borrow excavation for embankment material. The Bill of Quantities items for excavation cover the complete excavation and transport from any excavation site moisture condition and any intermediate stockpiling.

B. The nature of material to be excavated will not be classified for payment purpose.

2.1 FOUNDATION EXCAVATION

A. The area to be occupied by the embankment shall be excavated to a depth to remove all materials unsuitable, as determined by the Engineer, for the foundations of the embankments. The unsuitable materials to be removed shall include all topsoil; all rubbish and vegetable matter, including stumps and roots; all other perishable and objectionable materials; and certain low density compressible soils.

2.2 USE AND DISPOSAL OF MATERIAL FROM EXCAVATION

A. Excavated materials that are suitable for permanent construction shall be placed in the embankment.

B. Excavated material that is unsuitable for permanent construction in accordance with embankment shall be wasted in spoil areas, used as cover for cleared vegetation disposed of by burying, or placed in spoil areas that will require no compaction other than that derived by routing the construction equipment over the fill.

2.3 BORROW EXCAVATION

Materials for the embankment shall be materials from mixtures of clayey and silty gravel, gravelly silt, clayey silt and silty clay portion of the borrow areas shown on the Drawings.

2.4 BORROW PITS

Borrow pits shall be located in places approved by the Engineer, but shall not be permitted within one meter of the toe of a completed bund, spur, guide bank or other work in the case of shallow borrow pits unless some other distance is specified herein or on the Drawings.

In general where material is not available from adjacent drains or structures as noted in Clause 3.09, suitable fill material may be gleaned by excavating to a shallow depth, not greater than 65 cm below original ground (15cms of top soil and maximum 50cms of borrow material), over areas approved by the Engineer near agricultural land adjacent to embankments, the contractor shall be fully responsible for temporary acquisition, payment of compensation, etc. required for borrow pits located in agricultural land.

The bottom of all borrow pits shall, when the works are completed, be left clean and level to a tolerance of +150 mm - 0 mm, so as to be suitable for return to agricultural use, and free draining so as not to stagnate rain water on the borrow area. Side slopes of these borrow pits shall be graded so as not to encroach private property by erosion or inadequate drainage. Borrow pits shall not cross territory of field off take alignments, unless specific provision is made at the contractor's cost for transfer of drainage and/or irrigation water to ensure that ground is left undisturbed for a minimum of five metres from such off takes and alignments.

Before any borrow pit is excavated for a bund, the site thereof shall be cleaned, by and at the cost of the contractor, of all trees, jungle, grass and vegetable mould to the satisfaction of the Engineer, and such shall be disposed of to his instructions.

As far as is practicable, the moisturecontent of materials shall be conditioned in the borrow pit before excavations.

Where deeper borrow pits are permitted by the Engineer these shall not be continuous over lengths of more than 200 m. Between lengths shall be left a strip not less than 10 m wide at the level of the original ground. The sides of borrow pits shall be sloped to avoid instability. Requirements for pits to be levelled and left free draining shall be as shallow borrow pits.

3.0 MEASUREMENT AND PAYMENT

A. Measurement for payment of Excavation will be by the cubic meter. The quantities for payment will be computed by the average and area method from lines determined by surveys conducted by the Engineer before excavation, arid the lines and grades for the completed excavation as shown on the Drawings.

B. If the Engineer orders excavation to other than the lines shown on the Drawings, the computation of the respective quantities will be to the new lines ordered by the Engineer.

C. Payment for Excavation will be at the unit price per cubic meter tendered therefore in the Bill of Quantities. Excavations to produce concrete aggregate, riprap, or filter materials will not be paid for separated as borrow.

J. EMBANKMENT

1.1 GENERAL DESCRIPTION

A. This Specification Section covers foundation preparation and construction of embankments including the requirements for quality assurance, construction equipment and overall construction preparation and procedures.

B. The embankment shall be constructed in accordance with the Specification and as shown on the Drawings; except that pursuant to the Contract provision for "Variation", the Engineer may modify, vary or change the dimension lines of the embankments.

1.2 QUALITY ASSURANCE TESTING

A. The Engineer will take soils samples and perform gradation and moisture content tests to ascertain that the work is being performed in compliance with the Specification. The Engineer will, in addition, conduct density and other tests on the fill and related laboratory testing. Tests will be made as frequently as the Engineer considers necessary. The Contractor shall remove surface material render assistance as necessary to enable sampling and testing. Precautions shall be taken to protect testing personnel from injury due to construction operations while they are performing testing operations on the embankments.

B. The Engineer may direct that inspection trenches or test pits be cut into the embankments to determine that the Specification has been met. Such trenches or pits will be of limited depth and size, and shall be backfilled with the material excavated there from of other embankment material meeting the requirements for the embankment cut into. Backfill shall be compacted to a density at least equal to that of the continuous embankment.

2.1 MATERIALS

A. Materials for embankments shall be obtained from excavation for permanent construction borrows areas as specified in excavation above. Physical characteristics and composition of materials as well as their source that will determine their final position in the embankments shall meet the requirements specified below.

2.2 COMPACTION EQUIPMENT

A. General

1. Compaction equipment shall conform to the requirements specified herein. The compaction equipment shall be maintained in first class condition at all times and, upon direction of the Engineer, any adjustments necessary to obtain the required compaction shall be made immediately.

2. Compactors for embankment materials shall be tamping rollers/vibratory rollers.

3. When rollers are operated in sets or tandem, or sets of rollers are operated one behind the other in the same track, all rollers operated in this manner shall be of the same dimensions, widths, weights, and operating characteristics. Equipment used to pull rollers shall have sufficient power to pull the rollers satisfactorily when the rollers are subjected to the specified weight.

B. <u>Tamping Rollers</u>

1. Tamping rollers shall each consist of a heavy-duty cylindrical unit with a cylinder diameter of not less than 1.52 meters and an individual roller length of not more than 1.83 meters. Each roller shall have staggered feet uniformly spaced over the cylindrical surface such as to provide approximately Stamping feet for each 0.186 square meter of roller surface. The tamper feet shall be 178 to 254 mm in clear projection from the cylindrical surface of the roller and each foot shall have a contact face area of not less than 32 cm2 nor more than 64.5 cm2. The roller shall be equipped with cleaning fingers, designed to prevent the accumulation of material between the tamping feel, and these cleaning fingers shall be maintained at their full length throughout the periods of use of the roller. The weight of the roller alone, or roller plus ballast shall not less than 5950 kg per meter of roller length. The design and operation of the tamping roller shall be subject to approval of the Engineer. The Engineer shall have the right at any time during the prosecution of the work to direct such repairs to the tamping feet and minor alternations to the roller as may be found necessary to secure optimum compaction to tire earth fill materials.

2. The roller shall be self-propelled or pulled by a crawler-type tractor at speeds not to exceed 11 kilometers per hour.

C. <u>Special Compactors</u>

Special compactors shall be of the heavy duty power driven types. They shall be capable of producing densities at least equal to those produced by the equipment specified in B above. All such equipment will be subject to approval of the Engineer. Compactors, which do not obtain the required density with a reasonable amount of coverage of each, layer and at a production rate consistent with the adjacent embankment, shall not be used in the work. Compacted layer thickness by this equipment will be subject to approval by the Engineer and will generally by limited to 75 mm.

3.1 GENERAL CONSTRUCTION PROCEDURES

A. Embankment shall not be placed on any portion of the foundations or against or upon any structure until the Engineer has approved such portions and structure. The Engineer will furnish the Contractor written designation of approved foundation area. Any damage to an approved foundation surface shall be repaired as directed by the Engineer prior to placement of embankment.

B. No brush, roots, stumps, sod or other organic or unsuitable materials shall be placed in the embankments. The suitability of all materials for use in construction will be determined by the Engineer. Work shall be scheduled so that excavated material may be hauled directly to its permanent location; however, when this is impracticable, the material may be placed in temporary stockpiles at the Contractor's expense and subject to the approval of the Engineer. In general, the Engineer will designate the locations or area on which fills are to be placed. The embankment shall be continuously maintained in a manner satisfactory to the Engineer until the final completion and acceptance of the Embankment.

C. Material incorporated into embankment and determined by the Engineer to be in violation of Specification requirements shall be removed from the embankment. Unless otherwise specified, blending of materials for purposes of modifying the material to meet the Specification gradation requirements will not be permitted on the embankments, and such blending shall he performed at the excavation site or in stockpiles away from the embankments.

D. All placement of embankment material shall be performed in the dry.

E. Unless otherwise specified or specifically permitted by the Engineer, embankment shall be constructed in continuous and approximately horizontal layers for their full length and width.

F. Haul routes may be constructed across embankment slopes provided that they do not adversely affect the stability of the slopes. Haul roads across embankment slopes shall be obliterated. Unless otherwise specified or directed by the Engineer, obliteration of haul roads shall consist of eliminating the roadway fills by grading the materials to blend smoothly into the surrounding embankment contours.

3.2 PREPARATION OF FOUNDATION FOR EMBANKMENT

A. After completion of required excavation operations the ground surface below all embankments to be constructed as shown on the drawings or as may be directed by the Engineer thoroughly to a depth of not less than 15 centimeters (or the top-soil may be stripped to a depth of 15-15 centimeters and discarded as the Engineer may require). The materials shall then be moistened/dried if so required by the Engineer, and shall be compacted together with the first layer of the embankment to the satisfaction of the Engineer. Except for stripping unsuitable material under embankment the cost of all works described herein for preparation of ground surface shall be included in the unit rate quoted in the Bill of Quantities for the construction of embankment.

B. Where so directed by the Engineer, an unsuitable material occurring in the embankment foundation shall be removed and replaced by approved materials suitably compacted.

C. Surface upon or against which the portions of the embankment are to be placed shall be cleaned of all loose and objectionable materials in an approved manner by hand work or other effective means immediately prior to placing the first layer of embankments. Each portion of the foundation, immediately prior to placing the embankment, shall have all water removed from depressions and shall be properly moistened and sufficiently cleaned to obtain a suitable bond with the embankment.

3.3 PLACING AND COMPACTING

A. GENERAL

The material to be compacted shall be deposited in horizontal layers of not more than 15 centimeters after being compacted, and the distribution of materials shall be such that the compacted material will be homogeneous and free of lenses, pockets, streaks or other imperfections. The excavation and placing operations shall be such that the materials and layers when compacted will be blended sufficiently to secure the best practicable degree of compaction, impermeability and stability. The material in compacted embankments shall be compacted by tamping rollers with the specified tampers until the dry density of the compacted materials is not less than 95% of the laboratory maximum dry density as determined by the Standard Proctor Compaction Test, for the materials being compacted. Successive layers of embankment shall not be placed until the layer under construction has been thoroughly compacted as specified. Clods or hard lumps of earth shall be broken before the materials in the embankment fill are rolled and compacted, to have maximum size of 150 mm when being placed in the layer of the embankment and a maximum size of 60 mm when being placed in the top 0.5 meter portion of the embankment.

B. COMPACTIONS

All methods of compaction employed by the Contractor for this purpose are subjected to the Engineer s approval. The Engineer with the aid of the contractor and with suitable equipment provided by the Contractor shall test the compaction achieved and where in the Engineer's opinion the compaction does not meet the requirements, the Contractor shall recompact or replace the embankments at no extra cost to the Employer as may be directed by the Engineer. When density measurements reveal the soft areas in the embankments, further compaction shall be carried out as directed by the Engineer. If in spite of that the specified compaction is not achieved, the material in soft areas shall be removed and replaced by approved material, compacted to the density requirements and ' satisfaction of the Engineer. All permanently exposed

surfaces shall, after compaction to oversize as may be necessary are trimmed and finished to a uniform profile and appearance.

C. MOISTURE CONTENT

1. Moisture content of the material shall be checked at the source of supply and if found less than that specified for compaction, the same shall be made good either at the source or after spreading the soil in loose thickness for compaction. In the latter case water shall be sprinkled as directed on the material. Flooding shall not be permitted under any circumstances. The water for this requirement shall be furnished by the Contractor.

2. If the material delivered at the site is wet, it shall be dried by aeration and exposed to the sun, until the moisture content is acceptable for compaction. Should circumstances arise, where owning to wet weather, the moisture content cannot be reduced to the required amount by the above procedure, work on compaction shall be suspended.

3. Moisture content of each layer of soil shall be checked in accordance with IS:2720 (Part II), and unless otherwise mentioned, shall be so adjusted, making due allowance for evaporation losses, that at the time of compaction it is in the range of 1 percent above to 2 percent below the optimum moisture content determined in accordance with IS:2720 (Part VII). Highly expensive clays shall, however, be compacted at 2 to 4 percent above the optimum moisture content.

4. After adding the required amount of water, the soil shall be processed by means of harrows, rotary mixtures or as otherwise approved until the layers are uniformly wet.

D. FINISHING OPERATIONS

1. Finishing operation shall include the work of shaping and dressing the slopes to conform to the alignment, levels, cross-sections and dimensions shown on the drawings or as directed by the Engineer. Both the upper and lower ends of the side slopes shall be rounded off to improve appearance and to merge the embankment with the adjacent terrain.

2. In case it is not to be covered by riprap, the soil, removed and conserved earlier, shall be spread over the fill slope as directed by the Engineer to facilitate the growth of vegetation. Slopes shall be roughened and moistened slightly prior to the application of the topsoil in order to provide satisfactory bond. The depth of the topsoil shall be sufficient to sustain plant growth, the usual thickness being from 75 to 150 mm.

3. Where directed, the slopes shall be turfed with sods in accordance with turfing provisions. If seeding and mulching of slopes is prescribed, this shall be paid for in accordance with the "Variation" provisions of the Conditions of Contract.

4. Where directed or shown on drawing the embankment guide banks shall be pitched with stones and boulders over a layer of filter operations that have been substantially completed. The work area shall be cleared of all debris and ugly scars in the construction so that any objectionable appearance is eliminated.

3.4 EMBANKMENT CONSTRUCTION UNDER SPECIAL CONDITIONS

A. EMBANKMENT/BACKFILL AROUND STRUCTURES

1. Backfill/Embankments about any structures shall be considered incidental to the embankment construction and shall be placed to the lines shown on the Drawings, as prescribed in this paragraph, or as directed by the Engineer. The type of material used for backfill, the amount there-of, and the manner of deposition of the material shall be subject to approval. In so far as is practicable, backfill material shall be obtained from material moved in excavating for structures, but when sufficient

suitable material is not available from this source of adjacent excavation, additional material shall be obtained from approved borrow pits.

2. Backfill around or on sides of any structures or portions of structures shall be compacted to slopes shown on the Drawings from the top of the concrete wall, provided that where the structure is located in compacted embankment, the backfill shall be compacted to the elevation prescribed for the adjacent compacted embankments.

3. To avoid interference with the construction of abutments, wing walls or return walls, the Contractor shall, at points to be determined by the Engineer, suspend work on embankments forming approaches to such structures, until such times as the construction of the latter is sufficiently advanced to permit the completion of approaches without the risk of interference or damage to the works.

4. Unless directed otherwise, the filling around the structures shall be carried out independent of the work on the main embankment. The fill material shall not be placed against any abutment or wing wall unless permission has been given by the Engineer, but in any case, not until the concrete or masonry has been in position for 14 days. The embankment shall be brought up simultaneously in equal layers on each side of the structure to avoid displacement and unequal pressure. The sequence of work in this regard shall be approved by the Engineer.

5. The material used for backfilling shall not be an organic soil of highly plastic clay having plasticity index and liquid limit more than 20 and 40 respectively when tested according to IS:2720 (Part V). The fill material shall be deposited in horizontal layers not exceeding 150 mm in loose thickness and compacted to the same density as specified for the embankment.

6. Where the provision of any filter medium is specified behind abutment, the same shall be laid in layers simultaneously with the laying of fill material. Filter material shall consist of sand, gravel or crushed stone free from dirt, decomposed and cohesive material obtained from approved sources. The material used in the sand/gravel filter shall comply with the appropriate grading tabulated below and shall be compacted in layers of thickness specified on the drawings or as directed by the Engineer.

Percentage Passing

Sieve size	Sand	Filter	Gravel	Filter
20mm	-	85	-	100
10mm	-	50	-	85
2.36 mm	100	15	-	50
0.10 mm	85	0	-	15
0.075mm	0-	15		

If during construction the grading of the filter material is found to differ from that used in the initial filter design then the grading shall be amended as necessary. The cost of any such revision shall be included in the Contract rates.

The thickness of filter material shall be 300 mm comprising of graded gravel 200 mm and graded sand 100 mm. The graded gravel layer shall be placed in contact with the coarser surface and the graded and in contact with the finer surface as directed by the Engineer.

7. Where it may be impracticable to use the specified tampers compaction shall be carried out by special the compactors as specified in paragraph 2.2 C above. Care shall be taken to see that the compaction plant does

not hit or come too close to any structural member so as to cause any damage to them or excessive pressure against the structures.

8. In placing and compacting backfill or embankment adjoining concrete pipes or small structures, sufficient material shall be carefully placed and compacted in layers equally along the sides of the pipes or structures in order to firmly establish line and grade before placing and compacting the adjoining embankment. The Contractor shall be responsible for any damage to structures caused by this operation in placing or compacting embankment of backfill material: adjoining to structure, and shall repair damage to the full satisfaction of the Engineer. Construction traffic shall not use the prepared surface of the embankment without the prior permission of the Engineer. Any damage arising out of such use shall, however, be made good by the Contractor at this own expense.

3.5 TESTING OF MATERIAL USED AND COMPACTION CONTROL

A. BORROW MATERIAL

1. Sand content (IS:2720 Part IV) One to two tests per 8000 cu. meters of soil.
2. Plasticity Test (IS:2720 Part V) Each type to be tested, 1—2 per 8000 cu. meters of soil.
3. Density Test (IS:2720 Part VII) Each soil type to be tested, 1—2 tests per 8000 cu. meters of soil.
4. Deleterious Content Test (IS: 2720 Part VII) as and when required by the Engineer.
5. Moisture Content Test (IS: 2720 Part I) One test for every 250 cu. meters of soil.

B. COMPACTION CONTROL

1. Control shall be exercised by taking at least one measurement of density for each 1000 square meters of compacted areas, a minimum of three tests per day/shift/lift pit to evaluate a day's work on statistical basis. The determination of density shall be in accordance with IS: 2720 Part XXVII)
2. Test location shall be chosen only through random sampling techniques. Control shall not be based on the result of any one test but on the mean value of a set of 5-10 density determinations. The number of tests in one set of measurements shall be 5 as long as it is felt that sufficient control over borrow material and the method of compaction is being exercised. If considerable variations are observed between individual density results, the minimum number of tests in one set of measurement shall be increased to 10. The acceptance of work shall be subject to the conditions that the mean dry density equals or exceeds the specified density and the standard deviation for any set of results in below 0.08 gm/cc.
3. However, for material in the top 500 mm portion of the embankment below the top finished surface, at least one density measurement shall be taken for every 500 sq. meters of the compacted area provided further that the number of tests in each set of measurements shall be at least 10. In other respects, the control shall be similar to hat described earlier.

4.1 MEASUREMENT AND PAYMENT

A. Embankment (and incidental backfill construction) shall be measured by taking cross sections at intervals in the original position before the work starts and after its completion and computing the volumes of embankment in cubic meters by the method of average end areas.

B. The measurement of embankment to filling will be carried out as per embankment of filled section established after proper compaction as per specification. For the work of embankment filling no separate payment will be given for -barrow excavation.

C. The Contract unit rate for the embankment (including any incidental backfill construction) shall include the following

1. Setting out;
2. Compacting original ground;
3. Scarifying or cutting continuous horizontal benches 0.20 m wide on side slope of existing embankment of slopes as applicable;
4. Compaction to specification requirements;
5. Shaping and dressing top and slopes of the embankment and backfill including rounding off corners;
6. Working on narrow widths of embankments;
7. Restricted working at sites of structures;
8. Excavation in all soils from designated borrow areas and transporting the material to embankment site within all lifts and leads;
9. All labour, material, tools, equipment and incidentals necessary to complete the work to the Specification.

N. CONCRETE

GENERAL

1.1 STANDARDS AND CODES OF PRACTICE

All concrete work shall be carried out in accordance with British Standard BS 8110 unless otherwise specified herein.

1.2 COSTS OF TESTING AND SAMPLING OF CONCRETE AND CONCRETE MATERIALS

The costs of all sampling, transport of samples and testing in connection with the concrete shall be in accordance with chapter 2 or the Specification and where such costs are to be borne by the contractor they shall be included in and covered by the contract rates for concrete.

1.3 FAILURE TO MEET SPECIFIED REQUIREMENTS

If the specified requirements have not been met, the contractor shall take such remedial action as the Engineer may order, and shall before proceeding further with Concreting, submit for their approval details of the action proposed to ensure that the concrete still to be placed in the works will comply with the Specification.

CONCRETE MATERIALS

1.4 CEMENT

a. Quality and type

The cement used in the works shall be ordinary Portland cement complying with BS 12. For the purposes of cement testing under BS 12, the site shall be deemed to have a tropical climate.

b. Packing

The cement shall be packed in six-ply paper bags or polythene lined, polypropylene bags of approved quality and the net mass of each bag shall be 50 kg. The permissible tolerance on the mass of cement supplied in bags shall be +2.5% per bag with and overall tolerance of + 0.5% per 10 tonnes wagon load of bagged cement.

c. Transport and storage

The method of delivery, transport, handling and storing shall be subject to the approval of the Engineer.

The cement shall be delivered to the site in good condition and shall be kept dry at all times until used in the works. The contractor shall be responsible for all risks of damage to the cement by water or otherwise. Defective, damaged or condemned cement shall be removed without delay from the site.

On delivery at the site, the cement shall be stored in suitable thoroughly dry and well ventilated sheds with raised timber floors. Each consignment shall be kept separate and suitable labels or markings shall be made on the bags to distinguish the consignment. Bagged cement shall not be stacked more than 10 bags high.

d. Records, certificates and samples

Prior to delivery to the site, the contractor shall supply to the Engineer the manufacturer's test certificate for each consignment of cement received at the site as provided for in clauses 10 and 12 of BS 12. When each consignment is delivered to the site, the contractor shall hand to the Engineer a statement showing the number of the consignment, the name of the manufacturer, the number of tonnes in the consignment and the number of bags.

The contractor shall forward a weekly report to the Engineer giving full particulars of the various consignments in store.

The contractor shall maintain a record available for inspection by the Engineer of the locations of concrete made from each consignment.

The contractor shall supply samples of cement for test and send them for testing by the inspecting Engineer when requested by the Engineer both from the contractor's store on site and from the place of manufacture.

1.5 AGGREGATES

a. Supply and Classification

The contractor shall make his own arrangements for procuring, crushing, grading and delivering aggregate for the Works as required from sources to be approved by the Engineer.

Separate fine and coarse aggregates shall be used for the manufacture of concrete. The term "fine aggregate" is used to designate aggregate mainly passing a 5.00 mm. BS 410 test sieve and containing only so much coarser materials as is permitted for the various grading zones given in Table 1.2. The term 'coarse aggregate' is used to designate well graded aggregate mainly retained on a 5.00 mm, BS 410 test sieve and mainly passing a 37.50 mm, BS 410 test sieve and only containing such coarser or finer materials as is given in table 1.1

Coarse aggregate shall be supplied in the following primary sizes:

Size designation	Normal size range
10	5 mm to 10 mm
20	5mm to 20mm
40	5 mm to 40 mm

Aggregates shall be graded to produce a workable dense concrete.

b. Quality

All aggregates to be used in concrete shall be clean, hard, dense, sound, chemically inert, of limited porosity and uncoated particles free from clayey or organic matter.

- Aggregates for concrete shall comply with BS 882: Part 2and the followings
- Grading: In accordance with Table 1.1 and 1.2 herein
- Mechanical properties: When tested in accordance with BS 812, Part 3 the 'ten percent fines value' shall be not less than 50 kN.
- Silt, clay and dust fraction: When determined in accordance with the decantation method given in BS 812, Part 1 the silt clay and dust fraction by weight shall not exceed 1% for coarse aggregates, 3% for natural sand and 15% for crushed sand.
- Water Absorption: When tested in accordance with BS 812 Part 2 the water absorption after 24 hours shall not exceed 4%.
- Aggregate impact value: When determined in accordance with BS 812 Part 3 shall not exceed 45%.
- Soundness: When tested in accordance with the sodium sulphate soundness test specified in ASTM C88 the aggregate shall have a percentage loss of less than 15
- Alkali-aggregate reactivity: When tested in accordance with ASTM C-289 aggregates exhibiting evidence of alkali aggregate reactivity will not be acceptable unless the Contractor can show that the proposed cement aggregate combination, when tested in accordance with ASTM C227 or other tests, will not produce deleterious alkali- aggregate reactivity, as to which the Engineer shall be the sole Judge.
- Shrinkage: When determined in accordance with the BRE digest 35 tests the drying shrinkage shall not exceed 0.065%.
- Mica Content; shall not exceed 1% by weight or as otherwise approved by the Engineer.

c. Testing

Testing of aggregates is to be in accordance with BS 812 or as specified herein.

For each source of aggregate and at least six weeks prior to the preparation of trial mixes samples of aggregates together with the results listed below shall be submitted to the Engineer for approval of the sources of aggregate and quality

- Grading analysis to BS 812, Part 1.
- Mechanical properties. Ten percent fines value test to BS 812, Part 3.
- Silt, clay and dust fraction in both fine and coarse aggregates decantation method to BS 812, Part 1.
- Specific gravity and water absorption to BS 812, Part .2.
- Sodium sulphate soundness test to ASTM, C88.
- Alkali aggregate reactivity to ASTM C227 and/or ASTM 289.
- Chloride content test to BS 812, Part 4.
- Mica content by microscopic examination.
- Flakiness and elongation indices to BS 812, Part 1.
- Shrinkage test to BRE Digest 35 (2nd series).

Approval of a source of aggregate by the Engineer shall not be construed as constituting the approval of the materials to be taken from that source and the contractor shall be responsible for the specified quality of all such materials used in the works. The contractor shall not obtain aggregates from sources, which have not been approved by the Engineer.

During the course of the contract, the contractor shall supply to the Engineer samples of aggregates taken in accordance with BS 812 at a frequency of at least once a week, or as directed by the Engineer from each aggregate stockpile. The samples shall be delivered to the site laboratory for testing under the supervision of the Engineer. If the routine tests carried out by the Engineer show the aggregates to be not to the same standard as originally approved, then subsequent testing to obtain acceptable aggregates shall be undertaken by the contractor at his own cost.

d. Washing and screening

Aggregates shall be washed and screened as necessary to produce aggregates meeting the specified requirements. All such washing and screening shall be to the satisfaction of the Engineer.

Should mica be present in unacceptable quantities, its removal shall be effected by techniques approved by the Engineer. The costs of all washing and screening shall be included in the contract rates.

e. Storage

Aggregates shall be stored in separate stockpiles in such a manner that the intermingling of materials from separate stockpiles or bins is not possible and so as to prevent contamination by mud, rubbish, windblown dust or vegetation. Aggregate stockpiles shall be provided with adequate drainage to ensure rapid drainage of the aggregates. The storage arrangements shall be to the approval of the Engineer.

f. Coarse aggregates

Coarse aggregates shall consist of river gravel or natural crushed gravel or rock. If river gravel is used, the gravel of 5 mm to 20 mm and 20 mm to 40 mm size shall be stacked separately. The different sizes of coarse aggregates are finally mixed to attain the required gradation as per Table 1.1. The source (quarry site) of the river gravel and crushed aggregates shall be approved by the Engineer.

Friable and flaky pieces of such aggregates shall be removed to the satisfaction of the Engineer.

Table 1.1PERCENTAGE BY WEIGHT PASSING STANDARD SIEVESBS 410 Standards

Mesh (mm)	*10mm to 5mm*	*20mm to 5mm*	*40mm to 5mm*
75.0	-	-	100
37.5	-	100	95-100
20.0	100	95-100	35-70
10.0	85-100	30-60	10-40
5.0	0-25	0-10	0-5

g. Fine aggregates

Fine aggregate shall consist of natural sand or a mixture of natural sand and crushed gravel or crushed rock. The Engineer shall permit the addition of crushed gravel or crushed rock fine aggregate to the natural sand only where in his opinion it is impracticable to obtain the required fine aggregate grading otherwise than by such addition.

The grading of the fine aggregate shall lie within one of the grading zones as set out in Table 1.2 below and specified in BS 882.

Table 1.2Percentage by weight passing standard sieves

BS 410 standard mesh	Grading zone 1	Grading zone 2	Grading zone 3	Grading zone 4
10.00mm	100	100	100	100
5.00mm	90-100	90-100	90-100	95-100
2.36mm	60-95	75-100	85-100	95-100
1.18mm	30-70	55-90	75-100	90-100

600mm-^{3}	15-34	35-59	60-79	80-100
300mm-^{3}	5-20	8-30	12-40	15-50
150mm-^{3}	0-10	0-100	0-10	0-15

1.6 Water for making concrete etc.

Water used in mixing concrete, mortar or grout shall be clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials or other substances that may be deleterious to concrete or steel. The water shall be to the approval of the Engineer and in accordance with BS 3148, including Appendix A thereof.

The contractor shall, at least six weeks prior to the making of the trial mixes, sample the water he proposes to use and deliver the sample to the Engineer or Inspecting Engineer for testing.

1.7 Chemicals in concrete

The total sulphate content, whether as gypsum or more soluble salts, of the concrete ingredients when measured as sulphur trioxide shall not exceed 4% or the weight of cement in the concrete.

The chloride content of the concrete ingredients when measured as chloride ion shall not exceed o.2% of the weight of cement in the concrete.

If instructed by the Engineer the contractor shall obtain samples from the concrete for testing, all in accordance with BS 1881, Part 6. The cost of sampling and transport shall be covered by the contract rates for concrete.

1.8 Additives

Concrete shall be made from cement, aggregates and water as specified. No other ingredient shall be mixed with the concrete or mortar without the Engineer's approval.

If the use of retarding or workability agents is approved by the Engineer their use shall be subject to the following conditions:

- There shall be no reduction in characteristic strength at 28 days compared with additive free concrete of the same grade and class.
- There shall be no reduction of minimum cement content specified-and
- The use of the admixture shall be strictly in accordance with the manufacture's instructions in respect of the conditions at the site. Admixtures shall be introduced to the concrete with the aid of an approved dispenser.

The contractor may use a retarder to facilitate the preparation of construction joints subject to the approval of the Engineer on the composition of the retarder and its methodof application.

1.9 Steel reinforcement.

a. Quality

Steel for the reinforcement of concrete shall be hot-rolled bars complying with BS 4449.

b. Testing and test certificates

Reinforcing steel ordered from the mills shall be examined at the mills by the inspecting Engineer and, wherever possible, and unless otherwise approved shall be tested in his presence in accordance with BS 4449. The copies of all works tests certificates relating thereto shall be forwarded to the inspecting Engineer.

In the case of steel not tested in the presence of the inspecting Engineer, whether ordered from the mills or from stockholders, copies of works test certificates shall be supplied as prescribed herein and the Engineer or the inspecting Engineer reserves the right to carry out such further tests as he may consider necessary.

Copies of the inspecting Engineer's test certificates or works test certificates in respect of each consignment of steel reinforcement delivery of reinforcement to the site. Every consignment and its related test certificates shall carry reference markings such that they are uniquely identified.

The contractor shall supply samples of reinforcement from the stocks on site when required by the Engineer and shall forward the samples to the inspecting Engineer for testing as directed.

c. Storage

Reinforcement shall be stored clear of the ground and supported to prevent distortion.

At the time of incorporation in the Works, reinforcement shall be clean and free from defects, oil or grease, loose mill scale and loose rust, or any other substance, which may adversely affect the steel, concrete or reduce bond. Bars, which have become bent, shall not be straightened or re-bent for incorporation in the works without the approval of the Engineer.

Concrete properties and tests.

1.10 Classes and grades of concrete

The concrete used in the works shall be of the grades or classes shown on the drawings or indicated in the Bill of Quantities or ordered by the Engineer.

The characteristics of the mixes of concreteto be used in the works shall be as given in Table 5.3 unless otherwise approved by the Engineer.

1.11 Maximum sizes of aggregate to be used

Unless shown on the Drawings or given in the Bill of Quantities the maximum size of coarse aggregate in concrete for any part of the works shall be the largest of the sizes given in table 5.3 the use of which is practical from the standpoint of satisfactory workability and consolidation of the concrete. The contractor shall obtain the approval of the Engineer for the maximum size to be used for each section of the works. Generally 20 mm aggregate shall be used for sections equal to or less than 350 mm and 10 mm aggregate for sections equal or less than 125 mm in thickness i.e. the lesser of the dimension of the section.

1.12 Compressive strength compliance

The compressive strength of the concrete shall be based on the compression testing of 150 mm concrete cubes, made and tested in accordance with section 2 of this specification. The compressive strength of the concrete is specified by the characteristic compressive strength; Table 1.3 lists the values for each grade of concrete.

The characteristic compressive strength of the concrete is the value of the cube compressive strength, when tested at an age of 28 days, below which not more than 5% of results shall fall. The concrete in the works shall be considered to comply with the compressive strength requirements specified in table 1.3 if the 28 day, cube strengths are equalled or exceeded in Table 1.4.

Table 1.3Classes of Concrete

Concrete grades	M25		M20		M15		M10	
	25/40	25/20	20/40	20/20	15/20	15/40	10/20	10/40
Maximum aggregate size (mm)	40	20	40	20	10	40	20	40

Characteristic compressive strength N/mm^2	25	25	20	20	15	15	10	10
Minimum cement content of concrete (kg/m^3)	350	350	290	330	330	240	260	220
Maximum cement content of concrete (kg/m^3)	425	425	400	400	400	400	400	400
Maximum free water-cement ratio by weight	0.50	0.50	0.50	0.50	0.50	0.55	0.60	0.60

Table 1.4Cube strength compliance value

Concrete grade	Individual cube-result (N/sq. mm)	Mean of any four consecutive cube results
M25	21.2	25+0.82s
M20	17	20+0.82s
M15	12.8	15+0.82s
M10	8.5	10+0.82s

The standard deviation, s in table 1.4, shall be determined from cube results of at least 40 separate batches of concrete for each concrete grade produced on site from similar materials by the same plant under similar supervision. When 40 cube results are not available and for the initial mix designs the value of the standard deviation shall be taken as:

Concrete grade	Standard deviation's (N/sq. mm)
M25	9
M20	9
M15	6
M10	4

The concrete represented by a group of four consecutive test cubes shall include the batches from which samples were taken to make the first and last cubes in jhe group of four together with all the intervening batches.

If only one cube result fails to meet the minimum individual cube strength given in Table 1.4 then the result shall be considered to represent only the particular batch of concrete from which that cube was taken, provided that the average strength of the group of four results in which the low cube occurs satisfies the second requirement of Table 1.4.

The action to be taken in respect of the concrete represented by test cubes which fail to meet the compliance values given in Table 1.4 shall be determined by the Engineer which may range from qualified acceptance in less severe causes, to rejection and removal.

1.13 Water cement ratio

The maximum water cement ratios specified in Table 1.3 shall be the ratios by weight of free water to cement in the mix based on the aggregates being in a saturated surface dry condition.

Throughout concrete production the actual water cement ratio shall be strictly monitored and the batch quantities of aggregates and water regularly adjusted to maintain the design water cement ratio.

1.14 Workability

Concrete shall be of such consistency that it can be readily worked into the corners and angles of the formwork and around reinforcement without segregation of the materials or bleeding of free water at the free surface or against formwork. On stripping the formwork the concrete shall present a face, which is uniform, free from honeycombing, surface crazing, or excessive dusting, and which shall not, in the opinion of the Engineer be inferior to the specified standards.

Workability of the concrete shall be measured by the slump method or other approved method in accordance with BS 1881, Part 2 and the approval of the Engineer.

Concrete workability shall be as low as practical for the placement and workability and shall be within the limits given in Table 1.5 unless otherwise approved by the Engineer. The tolerances given in Clause 5.8.40 of BS 8110 shall not apply.

Table 1.5 Range of slump values (mm)

Kind of concrete	Slump(mm)
Precast concrete	10 to 50
Mass concrete and blinding	25 to 75
Reinforced concrete	50 to 100

1.15 Design

The contractor shall design suitable mixes for each grade of concrete required for the works as shown in table 1.3. Each grade of concrete shall be designed to a target mean strength of at least;

Concrete grade	Target mean strength (N/sq. mm)
M25	25+1.64s
M20	20+1.64s
M15	15+1.64s
M10	10+1.64s

The standard deviations, shall be as specified in clause1.12.

For each grade of concrete and well in advance of construction, the Contractor shall submit to the Engineer for his approval, information as follows:

- Full details of tests and trial mixes.
- The mix designs with the proposed quantities of constituents per cubic meter of fully compacted concrete and value of workability.
  If the cube results are consistently and significantly in excess of the target mean strength then the contractor may modify the mix proportions provided the requirements of clause 1.12 are still met and subject to approval of the Engineer and any additional trial mixes that may be required to be made.
  If the cube results are consistently below the target mean strength than the contractor shall cease production of the relevant class of concrete, investigate the cause of the relative low strength and rectify accordingly to the satisfaction of Engineer.

1.16 Trial mixes

Trial mix design work may he undertaken by the contractor in the site laboratory. At least five weeks before using any concrete in the works the contractor shall produce and test trial mixes for each grade of concrete using the same type of construction plant and the same materials as are proposed for the works. The contractor shall give 24 hours' noticeof such trials to enable the Engineer to attend.

For each trial mix of concrete three batches shall be made. Three cubes shall be made from each batch for testing at 28 days and three cubes made for testing at 7 days.

The trial mix proportions will be approved if the average compressive strength of the nine cubes tested at 28 days exceeds.

Concrete grade	Average compressive strength of nine cubes (N/sq. mm)
M25	25+1.64s-3.5
M20	20+1.64s-3.5
M15	15+1.64s-3.5
M10	10+1.64s-3.5

The contractor shall not commence placing concrete in the works until the results of the trial mixes are available and the proposed initial mix designs have been approved by the Engineer. Once the proportions of the various mixes have been approved, the Contractor shall not vary either the proportion of the mixes or the source of any constituent material without the approval of the Engineer.

1.17 Concrete sampling and testing

Sampling and testing shall be in accordance with BS 1881.

The contractor shall establish a system for regular sampling and testing of concrete to the approval of the Engineer. Samples shall be taken from randomly selected batches of each class of concrete used in the works, and at approximately equal intervals throughout the placement. Where more than one mixer is in use, sampling shall be from each mixer in turn. Higher rates of sampling and testing may be used to the start of the works to establish the quality quickly or during periods of production when quality is in doubt.

The contractor shall provide the necessary equipment, labour and transport for carrying out the sampling and testing in the site laboratory.

The concrete test cubes shall be stored and tested at the site laboratory under the supervision of the Engineer.

Records of concrete sampling and testing shall be kept by the contractor and forwarded to the Engineer within 24 hours of sampling and testing. Samples for testing shall be taken at the point of discharge into the works.

1.18 Ready mixed or truck mixed

Ready mixed concrete maybe used only with the approval of the engineer and shall comply with all requirements or the contract.

The concrete shall be carried in purpose made agitators, operating continuously, or truck mixers, which shall comply with BS 4251, or similarly approved specification. For each batch of concrete the time of introduction of cement and water to the aggregates shall be recorded on a delivery return to be forwarded to the Engineer. Water shall be added either at the delivery point or at the central batching plant. In no circumstances shall water be added in transit.

Concrete shall be discharged and placed within one hour after the time of loading or other such time as may be found necessary and approved by the Engineer to ensure that the concrete has the required workability at the time of discharge and placing. The time of loading shall be the time of contact between the cement and aggregates or, where these are surface dry, between cement and added water.

1.19 Production and workmanship

The solid constituents of the concrete mix shall be measured by weight.

A separate weighing device shall be provided for the cement. Alternatively, the cement shall be measured using a number of whole bags in each batch, the use of part bags in a batch will not be permitted.

The added water shall be measured by volume or weight using a water measuring device fitted to the mixer which shall automatically cut off the supply when the required quantity has been added. Solid admixtures shall be measured by weight and liquid or paste admixtures by weight or volume.

When weighing the aggregates due allowance shall be made for the weight of water in the aggre gates.

Approved equipment for quick and frequent measurement of the moisture content of the aggregates shall be provided at the batching plant.

The accuracy of the measuring equipment shall be within + 3% of the quantity of cement, water or total aggregates being measured and within + 5% of the quantity of any admixture being used. All measuring equipment shall be maintained in a clean, serviceable condition and shall be zeroed daily and calibrated monthly.

The mixers shall comply with the requirements of BS 1305 or approved equivalent. The mixing time shall not be less than that used by the mixer manufacturer in assessing its performance.

Mixers, except continuous mixers, shall be emptied before being charged with a new batch of concrete. Mixers shall not be loaded in excess of the manufacturer's rated capacity, which shall be displayed on the mixer in terms of volume of mixed concrete.

Concrete shall not be placed in standing or running water unless specified or approved.

The contractor shall obtain the approval of the Engineer of the arrangements he proposes to use for transporting, placing and compacting concrete.

The concrete shall be handled so that at the point of deposition it is of the specified quality and approved consistency, nothing having been added to it or lost from it since leaving the mixer.

Where chutes are used to convey the concrete, their slopes shall not be such as to cause segregation, and suitable spouts or baffles, shall be provided to prevent segregation during discharge. Concrete shall not be allowed to fall freely more than 2 m.

Ground surfaces, blinding or other concrete shall be surface dry immediately prior to the placement of new concrete thereon, provided that such joints shall be kept moist for 24 hours prior to concrete placement. Ground surfaces shall be well damped down prior to placement of concrete thereon. A mortar layer shall not be used on surfaces of construction joints.

In all cases concrete shall be deposited in lifts, layers or sections of such height, thickness and size as shall suit the dimensions of the work in hand and the method of compaction as to which the Engineer shall be the judge, but lifts shall not normally exceed 1.5 m for members more than 1.5 m in width.

Where steps, splays and kickers occur these shall be cast in one with the slab and additional care shall be taken during vibration and finishing to ensure that thorough compaction is achieved.

All concrete which has reached a temporary set or has become so stiff that proper placing without tempering cannot be assured, shall not be used.

Concrete having required characteristic strengths greater than 10 N/sq. mm shall be compacted by mechanical vibrator. Vibration shall not be applied by way of the reinforcement and every care shall be taken to avoid contact with the reinforcement. The contractor shall provide sufficient vibrators, in serviceable condition, so that standby vibrators are always available in the event of breakdowns. The number and type of vibrators used on concrete placement shall be to the approval of the Engineer.

Where immersion type vibrators are used, they shall have a minimum frequency of vibration of 7,000 revolutions per minute when immersed in the concrete. Form vibrators shall be securely fastened to the forms and shall operate at speeds of at least 8,000 revolutions per minute when vibrating concrete. Concrete shall, not be subjected to vibration between it taking its initial set and 24 hours after compaction. Vibrators shall not be used to move concrete along the forms. Over vibration causing segregation, surface laitance and leakage thorough formwork shall be avoided.

Concrete having required characteristic strengths not greater than 10 N/sq. mm may be compacted by hand but shall be deposited in layers not exceeding 300mm in thickness and shall be well worked with special tools and rods until it has settled closely in place and is free from air bubbles.

Deposited layers of concrete shall not exceed 0.6 m in depth prior to compaction. Care shall be taken to ensure that reinforcement projecting from concrete recently placed is not shaken or disturbed.

Except where otherwise directed concrete shall not be placed unless the engineer or his representative is present and has previously examined and approved the positioning, fixing and condition of the reinforcement and alignment and suitability of the containing surfaces. At least 24 hours notice shall be given in writing to the Engineer of the placing of concrete and request for approval to concrete.

a. **Concreting in adverse conditions**

The Contractor shall not place concrete in the works

- during heavy rains or dust storms
- when the (shade) air temperature exceeds 3 8°C
- When the air temperature is less than 2°C
- if the temperature of the concrete is less than 4°C or more than 3 0°C without taking the necessary measures to ensure acceptable concrete temperatures to the approval of the Engineer
- When the (shade) air temperature exceeds 30°C, without taking precautions to the approval of the Engineer to ensure that the maximum internal temperature of the concrete does not exceed .38°C during the initial set, and
- when the temperature of the formwork or reinforcement exceeds 30°C.

1.21 Curing and protection

The contractor shall for not less than 7 days protect the concrete from the harmful effects of frost, wind, sun, high and low temperatures, rapid temperature change, premature loading, deflection, impact, running water and aggressive groundwater. Protruding steel shall be kept cool.

All exposed concrete surfaces shall be kept continuously moist for not less than 7 days after casting, by watering, by covering with hessian or sacking which shall be kept fully saturated stall times or by other methods approved by the Engineer.

Curing membranes approved by the Engineer shall be applied in conformity with the manufacturer's instructions. They shall be applied to unshuttered surfaces as soon as the moisture film has disappeared from the concrete, but while the surface is still damp and shall incorporate an approved reflecting agent. Surfaces with applied curing membrane shall be shaded from the sun.

1.22 Preparation of reinforcement drawings

The contractor shall prepare at his own expense all detailed reinforcement drawings. The drawings shall include all bar-placing drawings, bar-bending schedules, bar fabrication and placement of reinforcement bars.

Reinforcement drawings shall be submitted to the Engineer for approval at least two months prior to commencing fixing the reinforcement. In preparing the working reinforcement drawings the contractor shall keep laps to the minimum number and length required. No additional payment will be made for laps which in the opinion of the Engineer are unnecessary for construction of the works.

1.23 Cutting Bending and Fixing Reinforcement

Reinforcement shall be cut from straight bars and cold bent, using a bending machine approved by the Engineer. Cutting, bending and marking shall be in accordance with BS 4466 unless otherwise specified, or ordered by the Engineer. The contractor shall place and fix reinforcement accurately in the positions shown on the approved reinforcement detail drawings, and shall ensure that it remains in position during the placing of concrete. Welding of reinforcement will not be permitted. Reinforcement shall be firmly bound together at all intersections using Nr 16 gauge annealed steel wire or approved equivalent. The ends of such typing wire shall be bent away from the formwork.

Reinforcement projecting from previously cast concrete mustnot be bent without the prior approval of the Engineer.

All reinforcement shall be supplied in the full lengths indicated on the Drawings. No splicing of bars other than in locations shown in the drawings, will be permitted without the approval of the Engineer.

Before any steel reinforcement is embedded in the concrete, any scale, loose rust, oil grease or other deleterious matter shall be removed. Partially set concrete which may be adhered to the exposed bars during Concreting operations shall likewise be removed.

When the reinforcement has been placed and is ready for Concreting, it will be inspected by the Engineer and no concrete shall be placed until the reinforcement has been approved by him. The contractor shall inform the Engineer at least 24 hours in advance of his intention to have the reinforcement ready for inspection.

All reinforcement left exposed for future work shall be protected against exposure and corrosion to the approval of the Engineer.

1.24 Cover to reinforcement

The cover to reinforcement shall be at least 50 mm unless shown otherwise on the drawings. Cover shall be maintained by the use of the minimum practical number of purpose made concrete blocks or approved spacers. Concrete spacer blocks shall be made from cement, sand and small aggregate to match the mix proportions of the surrounding concrete as far as is practicable to ensure comparable strength, durability and appearance. The cost of spacer blocks and chairs shall be included in the contract rates for concrete.

1.25 Mechanical splicers in reinforcement

Mechanical compression and tension splicers shall not be used without the prior approval of the Engineer. Where such splicers are approved they shall be fitted strictly in accordance with the manufacture's recommendations.

1.26 Built-in items

Where pipes, sleeves, water stops or other items are built into concrete, they shall be rigidly secured in position to prevent movement and shall be free from external coatings which might adversely affect the bond. The contractor shall take precautions as approved or directed by the Engineer to prevent the formation of air pockets, voids or other defects whilst the concrete is being placed around built-in items.

1.27 Concrete records

The contractor shall furnish daily to the Engineer record, in a form to be approved by the Engineer, showing the quantities of cement, the number and volume of mixings of each grade of concrete used in each section of the works and in temporary works and details of sampling and testing.

1.28 Surface finishes

The types of finishes required on the various concrete surfaces shall be as specified below unless indicated otherwise in the specification or on the drawings.

Where a surface is partly below and partly above the final ground level, the finish for the exposed surface shall extend for 0.5 m below the final ground level.

All permanently exposed arises shall be formed with a 20 mm x 20 mm chamfer unless otherwise shown on the drawings.

A concrete surface which in the opinion of the Engineer fails to achieve the required standard shall render that section of concrete, the number of which it is a part, or in extreme cases the whole structure, liable to be rejected by the Engineer. No remedial work to defective concrete surfaces shall be started before the defective work has been inspected by the Engineer. If remedial work is permitted as an alternative to reconstruction, the contractor shall submit his proposals in respect of the repair to the Engineer for his approval.

Finishes for surfaces formed by shuttering shall be:

Back

Finish for surfaces against backfill or against which further concrete will be placed. It shall be formed using hewn boards, sheet metal or any other suitable material which will prevent the loss of any constituents when the concrete is vibrated. Surfaces shall be free from voids, honeycombing or other large blemishes. This surface will, in general require no treatment after the removal of formwork other than curing and repair of defective concrete if approved.

Face

Finish for surfaces prominently exposed to view and where accurate alignment and density and soundness of surface are of importance to prevent the destructive effects of water action. The finish shall be obtained by the use of forms having a hard, smooth surface. The resulting concrete surfaces shall be smooth with true, clean arises. Only very minor surface blemishes shall be permitted and there shall be no staining or discoloring from release agent. Joints between panels shall be arranged as for as possible to coincide with architectural features or changes in direction of the surface and shall be vertical and horizontal unless otherwise directed. Joints between slab soffit panels shall be parallel to the supports. If the Engineer considers it necessary, the surface shall be sack-rubbed to fill small pits and air holes. Sack-rubbing shall be done as soon as the forms have been removed but after any approval of repairs have been carried out. The sack

rubbing shall be carried out in an approved manner. After surface treatment has been carried out the specified curing shall continue.

Finishes for unshuttered concrete surfaces shall be:

Screeded

This finish shall be used unless otherwise specified for the surfaces of roadways, footpaths, foundations, base slabs and structural units to be covered by backfill, subsequent stages of construction, bonded concrete toppings or mortar beds. It shall be obtained by levelling and screeding the concrete to produce an even uniform plain or lightly ribbed surface without laitance, and surplus concrete shall be struck off by a straight edge immediately after completion. Screeded finish is the first stage of subsequent grades of finish.

Before carrying out this finish on roads and footpaths the contractor shall obtain the approval of the Engineer as to the direction of the ridges on the surface and the method of screeding.

Trowelled

This is a hard smooth finish for surfaces of concrete paving, tops of walls, copings and uniformed surfaces or architectural features including precast unit, for surface of beds and slabs to receive thin flexible sheet and the paving bedded in adhesive and seating for metal items. This finish is required for concrete surfaces exposed permanently or temporarily to water flow. Finishing shall initially be screeded and floated. Floating may be performed by use of hard or power driven equipment. Floating shall be started as soon as the screeded surface has hardened sufficiently and shall be the minimum necessary to produce a uniform surface free from screed marks. Floating shallcontinue until a small amount of mortar without excess water is brought to the surface so as to permit effective trowelling. Trowelling shall not commence until the moisture film has disappeared and the concrete has hardened sufficiently to prevent excess fine material from being worked to the surface. The surface shall be trowelled under firm pressure such as will flatten the sandy mixture of the surface and produce a dense uniform surface free from blemishes and trowel marks.

Finishes of concrete surfaces shall be performed only by skilled workmen and in the presence of the Engineer.

No extra payment shall be made for finishes to unshuttered concrete surfaces.

1.29 Formwork

a. General

The terms formwork and shuttering shall be interpreted as meaning one and the same thing. Formwork shall include all temporary or permanent forms required to obtain the profiles and finishes as specified and shown on the drawings.

False-work shall be interpreted as meaning all temporary or permanent work required to support the formwork such that it shall remain rigid during the placing and setting of the concrete and such that dimensional deviations in the finished concrete structure do not exceed the specified limits. All formwork and false work shall be designed and detailed by the contractor. All designs and details shall be submitted to the Engineer for approval well in advance of construction.

The Engineer's approval of the formwork shall not relieve the contractor of his responsibilities under the contract for any damage or injury that might result from any inadequacy in the formwork.

False work shall be designed to withstand the worst combination of self weight, formwork weight, formwork forces, reinforcement weight, wet concrete weight, construction and wind loads, together with all incidental dynamic effects caused by placing, vibrating and compacting the concrete.

Joints between sections of formwork shall be sufficiently tight to prevent loss of grout or mortar from the forms.

Top formwork shall be provided to concrete faces where the slope exceeds one in three unless otherwise approved by the Engineer.

Reuse of formwork shall be at the discretion of the Engineer having regard to the specified surface finish.

Prior to the inspection by the Engineer for approval for Concreting the formwork shall be thoroughly cleaned to remove all dirt, debris and standing water.

Surfaces of the formwork to be in contact with concrete shall be free from adhering foreign matter, projecting nails and the grooves, splits, and other defects, and shall be treated with an approved non-staining release agent applied strictly in accordance with the manufacturer's instructions. Release agent shall not be allowed to come into contact with adjacent concrete or the reinforcing steel.

Temporary openings to facilitate cleaning and inspection shall be provided at the base of column, wall and deep beam formwork. Formwork for walls and other thin sections of considerable height shall be provided with openings, to the approval of the Engineer for polishing and compacting the concrete.

When forms have been built and have been prepared ready for Concreting, they will be inspected by the Engineer and no concrete shall be placed until the forms have been approved by him. In order to avoid delays in obtaining approval, the contractor shall inform the Engineer, at least 24 hours in advance, of his intention to have the forms ready for inspection.

b. Tie-bolts etc.

Before placing any concrete, all bolts and the like (if required and which are to be built in) shall be fixed in their correct positions, and cores and other devices for forming holes, openings, etc. shall be fixed to the forms. No holes shall be cut in any concrete unless approved by the Engineer. The use of wire ties for supporting the forms shall not be permitted in concrete walls which are to be subject to water, or when the finished surface, required as determined by the Engineer, is to be permanently exposed; wire ties used for other concrete works shall be cut off flush with the concrete surface, after the forms are removed. In case embedded metal rods are used for holding forms, the rods shall terminate not less than 3 centimeters from the formed surface of the concrete in which the maximum size of aggregate is 40 millimeters.

c. Removal of form work

The Engineer shall be informed in advance when the contractor intends to remove any formwork. The time at which the formwork is removed shall be the contractor's responsibility.

Formwork shall only be removed with the permission of the Engineer and the work of removing it after receipt of such permission shall be carried out under the supervision of a competent foreman. Great care shall be exercised during the removal to avoid shocks to or reversal of stress in the concrete.

Provided the concrete strength is confirmed by tests on cubes stored under the same conditions, formwork supporting cast in situ concrete in flexure may be removed when the cube strength is 10 N/sq. mm, or twice the stress to which it will be the subjected, whichever is the greater.

Formwork shall not be removed where unacceptable deflections are likely to result. The contractor shall supply the Engineer with the necessary calculations in support of the above.

Materials and contractor's equipment shall not be stored on any newly constructed member without the permission of the Engineer.

In the absence of cube test results, Table 1.6 below shall be followed for the minimum period before removing formwork from concrete using ordinary Portland cement and admixtures.

Unless soffit formwork has been designed so that it can be removed without disturbing the props, it shall be retained in position for the minimum period given in Table 1.6 for the removal of the props.

Table 1.6Minimum period before removing formwork.

Type of formwork	Minimum period before removal for average surface temperature of concrete since casting.		
		$16^{O}C$	$7^{O}C$
Vertical	Columns, walls and beams	18 hours	24 hours
Soffit	Slabs	4 days	7 days
	Beams	8 days	14 days
Props	Slabs	11 days	14 days
	Beams	15 days	21 days

Where cements other than ordinary Portland are used, or surface temperatures differ significantly from those shown, the periods may be adjusted at discretion of the Engineer.

1.30 Dimensional deviation in in-situ concrete work

Deviations from the specified dimensions, locations and levels for the various classes of in-situ concrete finish shall not exceed the limits shown in Table 1.7. Deviations exceeding these limits will render the structure member or section of a member concerned liable to rejection by the Engineer.

Table 1.7Dimensional deviations in in-situ concrete work

Typical structure	Type of deviation Maximum permissible deviation in (mm) for classes of finish				
		Back	Face	Screeded	Trowelled
Buried concrete in foundations, retaining walls, etc.	Departure from alignment and level	+25 -10	-	+10	-
	Variations in cross sectional dimensions(l) Deviation from template in long dimensions (2) Abrupt (3)	+10 +10 -5 +10 -5	- -	- +10 -5 +10 -5	- - +5 -5
Exposed concrete in piers, columns retaining walls, etc.	Departure from alignment and level	-	+5 -5	-	
Floor slabs, bridge decks, waterways, etc.	Variations in cross- sectional dimensions (1) Deviation from template	- -	+10 -5 +5	- +3	 +3

	in long dimensions (2) Abrupt (3)			-3	-3
Floor slabs to receive finishes Bridge decks etc.	Departure from alignment Departure from longitudinal level Departure from trans-verse cross sectional tern-plate Deviation from 3 m. straight edge on longitudinal section Back	+10 -10 - - -	- - - -	+10 -5 +10 -5 +10 -5	

Note: The numbers in brackets under the type of deviation refer to:

1. The cross sectional dimensions of structural members such as walls, columns, beams, etc. where, for structural or other reasons, it is necessary to keep the tolerances within closer limits than those for alignment and level.

2. Gradual deviations caused by misalignment or formwork from the dimensions shownon the drawings and measured for a 3 along template.

3. Offsets and fins caused by displaced or misplaced formwork sheathing, lining or support by loose knots in forms or by otherwise defective from work.

1.31 Precast Concrete

a. Storage of pre-cast units

When pre-cast units are stored they shall be supported at such positions as will ensure that the stresses induced in them are always less then the permissible design stresses.

b. Handling and placing of precast units

Pre-cast units shall be lifted or supported only at points described in the contract or approved by the Engineer and shall be handled and placed without impact.

c. Manufacture of pre-cast units

The method of manufacture shall be approved by the Engineer. Each mould for concrete work which is specified or approved by the Engineer to be pre-cast shall have a different embossed or recessed identification mark in a position to the approval of the Engineer.

Each pre-cast unit shall be indelibly marked with the date of casting and if they are of symmetrical section, a clear indication of the face which will be uppermost when the member is in its correct position in the works. The markings shall be so located that they are not exposed to view when the member is in its permanent position.

Pre-cast units shall not be disturbed until 28 days after removal form the mould, unless elevated temperature curing is used.

d. Hydraulic tests

A series of hydraulic tests are required to be performed on a territory outlet structure to determine the as built flow characteristics for final sizing of the orifice plates. At the direction of the Engineer the contractor should install a territory outlet in stage II at a location determined by the Engineer and carry out the tests instructed and supervised by the Engineer.

e. Elevated temperature curing

The method of curing shall be approved by the Engineer. At least four hours must elapse from completion of the placing of concrete before its temperature is raised. The rise in temperature within any period of 30 minutes shall not exceed 10°C and the maximum temperature attained shall not exceed 70°C. The rate of subsequent cooling shall not exceed the rate of heating.

The method of curing used shall minimize the loss of moisture from the concrete.

f. Dimensional deviations in pre-cast concrete work

Unless shown otherwise on the Drawings, deviations from the specified dimensions for pre-cast members shall not exceed the value shown in Table 5.8. If deviations exceed the target value, the contractor shall take the necessary steps to bring subsequent work within the target. !f deviations exceed the maximum allowable value the member may be rejected by the Engineer.

Squares of corner

If the longer side of a member is taken as a base, then the shorter adjacent side should not vary form the perpendicular so that the distance between the greatest and shortest dimensions is not exceeded by more than the following:

Twist

Any corner should not be more than the deviation stated from the plane containing the other three corners.

	Maximum	
	Target value (mm)	Allowable value (mm)
Up to 600 mm wide and	±5	±6
Up to 6 min length Flatness	±9	±12
Maximum deviation from a 1.5 m.		
straight edge	5	6

1.32 Joints in concrete

a. General

Joints shall only be formed in the positions shown on the drawings or approved by the Engineer. Construction, contraction and expansion joints shall be formed to the details shown on the Drawings and as specified herein, and from the specified materials.

b. Construction Joints

Whenever concrete is placed on or against previously placed concrete which has become so hard that the new concrete cannot be monolithically compacted therewith the resulting place of separation shall be defined as a construction Joint.

Where the locations of construction joints have not been shown on the drawings then the contractor shall decide the locations of construction joints to suit the Concreting program. The positions of construction joints shall be to the approval of the Engineer which shall be obtained before concreting takes place. The contractor shall submit to the Engineer drawings showing the positions of construction joints. Construction Joints shall he located so that in conjunction with the program for Concreting, the effects of shrinkage and temperature are minimized. Construction joints shall he formed in straight lines at right angles to the general direction of the member and shall take account of shear and other stresses, and as far as is practical shall he located at points of least shear. Construction joints shall be formed with clean sharp arises.

Construction joints shall be formed using rigid shuttering or other approved method, with Joint lines at exposed surfaces of concrete being straight and continuous, plumb, level or inclined. Before placing new concrete against that which has already set, the latter shall he treated carefully to expose the aggregate over the full section and to leave a sound irregular clean surface free from laitance. Loose and foreign matter obtained buy green cutting using an air/water jet, by chipping or other approved means.

The cost of forming all construction joints shall be included in the contract rates for concrete including, where the Engineer requires, a water stop.

c. Contraction Joints

Contraction Joints shall be as located and detailed on the drawings. The joints shall be made by forming with smooth forms the concrete on the side of the joint and allowing it to set before placing concrete on the other side of the joint. The concrete surface on the side of each joint shall be given two coats of approved bitumen before the concrete on the other side of the joint is placed.

d. Expansion Joints

Expansion joints shall be constructed in the locations and to the details shown on the drawings. Performed joint filter, bond breeder and joint sealing compound, water stops, dowel bares and bitumen coating shall be placed in the joints in accordance with the drawings and instruction of Engineer.

e. Installation of joint sealer

The contractor shall prepare the surfaces of the joint and shall fill or caulk the recess completely with the joint sealer strictly in accordance with the manufacturer's instructions. The application of joint sealer shall not be commenced without the contractor having first obtained the approval of the Engineer.

Where a polysulphide joint sealer is used an approved bond breaker shall be provided between the joint filler and the sealer.

f. Payment for contraction and expansion joints

The cost of supplying and fitting all materials for contraction and expansion joints will be covered by the items in the bill of quantities for forming the joints.

1.33 PVC Waterstops

a. Scope

The Contractor shall furnish and install water stops of polyvinyl chloride in the shape and dimensions specified, and in the locations as shown on the Drawings, or as directed by the Engineer. For convenience of placement in forms, a water stop utilizing a split flange may be used; however, prior to placement of final concrete, the split flange portion shall be jointed in an approved manner such that no concrete or mortar can enter between the two split portions of the flange.

Material

Water stops shall be manufactured by the extrusion process from an electrometric plastic compound, the basic resin of which is one hundred (100) per cent polyvinyl chloride (PVC). The water stops should be 230 mm wide and 4-5 mm thick web Maruti MT-108 or equivalent, which shall be dense, homogeneous and free from holes and other imperfections complying IS8543..

The water stops as described herein shall have the following physical properties:

Specific gravity	1.33 + 0.03 at 23°C
Tensile strength	13.80 N/sq.mm at 23°C
Ultimate elongation	285% at 23°C
Brittleness	- 25°C
Hardness	65 degrees
Maximum water absorption	0.6 %
after 2 days at 20°C	5%
Tear Resistance	74.90 N/sq.mm

The Contractor shall provide the Engineer with a sample to be used in the Works and the manufacturer's test certificate for the Engineer's approval, before issuing the purchasing order to the suppliers, and shall, if requested, supply a sufficient length of each sample for confirmatory tests to be carried out in accordance with the appropriate test procedure, at the Contractor's own expense.

c. Workmanship

The Contractor shall furnish all materials, equipment and electric power required for making field splices and installing the waterstops. Field splices for water stops shall be made by cutting the waterstops as required, heating the ends to the melting point and jointing them to form the desired splice. The heating of the splice ends shall be made by means of the splicing machine recommended by the waterstop manufacturer or by any other approved electric heating device acceptable to the Engineer.

Care shall be taken when installing the waterstops to ensure that the centres of the waterstops coincide at the joints. The Contractor shall suitably support and protect the waterstops during the progress of the Works. The stop-boards on each side of the waterstop shall be accurately wrought to match the profile of the waterstop. The concrete shall be carefully compacted under and around the waterstop so as to leave no cavities.

d. Measurement and Payment

Measurement for payment of waterstops shall be made for the length in metres of waterstops in place, measured along the centreline of the waterstops, in accordance with the Drawings and accepted by the Engineer. Payment for waterstop shall be made at the respective unit rates per linear metre for respective item of the Bill of Quantities, which unit rates shall include all costs of furnishing and placing the waterstop as described above.

1.34 Boring holes into existing concrete for new fixings, dowels, etc.

The system and plant for boring holes in existing concrete for dowels, anchor bolts and special fixings shall be to the approval of the Engineer and strictly in accordance with the recommendations of the manufacturer of the fixing. The method of boring holes shall leave a rough surface finish to the inside of the hole. The holes shall be cleaned out and temporarily sealed to prevent the ingress of debris and/or water, until the dowels, anchor or fixings are installed.

The positions of holes shall be accurately set out and maintained during drilling by strong templates or other approved means. Where the holes are being drilled in reinforced concrete the locations of reinforcement shall be ascertained by an approved method in advance of drilling and the hole location shall be suitably adjusted to avoid the reinforcement.

1.35 Embankment of steel work etc.

Block outs and gaps left for the installation of steel work, machinery, brackets and other metal items shall be filled with grout or mortar or fine concrete as shown on the drawings or as directed by the Engineer.

The concrete surfaces against which grout or mortar or fine concrete is to be placed shall be roughened by chipping to ensure a satisfactory bond between the first stage concrete and the filling material. Immediately prior to placing the filling material the concrete surfaces shall be cleaned with air/water jets.

The filling material shall contain a non-shrink additive manufactured by an approved manufacturer and used in strict accordance with the manufacturer's instructions.

1.36 Concreting of massive structures

In concrete masses intended to form a watertight curtain in the ground, the concrete shall be placed in the operation from the bottom of the trench up to ground level or up to general foundation level over the whole length between two pre-arranged construction joints.

In other structures the concrete is to be shuttered off in rectangular sections the width of the block sufficient for the days work and each section must be completely filled in one continuous operation.

All lift joints in mass concrete structures shall be provided with share keys unless otherwise ordered by the Engineer. Shear keys of minimum depth 0.15 m. shall be formed in the lower lift.

Lean concrete mixes shall be used as specified in the B.O.Q. or approved by Engineer.

1.37 Prevention of cracking in mass concrete

Without prejudice to the requirements of clauses 1.20 and 1 .31 for mass concrete the contractor shall control the temperature of the mix and the setting concrete to the satisfaction of the engineer to ensure a sound uncracked structure.

This shall be achieved by controlling the temperature;

1. Of the concrete ingredients and the concrete mix, and
2. Of the concrete during placing and curing.

The temperature of the concrete during curing shall not exceed $5^{O}C$. To achieve this it is anticipated that water-cooling or an ice making plant may be required to reduce placing temperatures of the concrete.

Concreting shall be carried out in alternate blocks. Lifts shall not exceed 1.50 m and shall be poured in 3 layers each starting at the upstream face.

The time interval between lifts shall not be less than two days or in general, more than seven days. If the period between lifts exceeds ten days the height of the subsequent lift shall not exceed 0.75 m.

At any one time the difference in level between adjacent blocks shall not exceed 4.50 m.

1.38 Measurement

1. Concrete shall be measured ill cubic meters in the final structure to tile hues and levels shown on the Drawings or as directed by the Engineer. In reinforced concrete the volume occupied by the reinforcement shall not be deducted.

2. Lean concrete under the structures etc. shall be measured in cubic meters in the final structure to the lines and levels shown on the Drawings or as directed by tile Engineer. Tile concrete mix is to be approved by the Engineer.

3. Each different grade of concrete shall be measured separately.

4. Reinforcement shall be measured in MT (1000 kg). The weight shall be calculated on the basis of IS 1732 or the relevant AASHTO specification. Wastage overlaps, couplings, spacer bars and annealed steel wire for binding shall not be measured and the cost of these items shall be deemed to be included in the unit rate for reinforcement.

1.39 Payment

1. The concrete quantities, measured as provided above, shall be paid for at the Contract unit prices per cubic or square meter of concrete for the different grades of concrete and the various structural elements.

2. The Contract unit prices for concrete of the various grades shall be considered full and final compensation to the Contractor for all expenditures incurred in providing and placing the concrete in its final position in the structure including the cutting of piles to the required level and exposure of reinforcement for casting of pile caps in case of driven pile foundation to the satisfaction of the Engineer. The unit prices shall also be deemed to cover all expenditure incurred by the Contractor in testing the concrete as directed and to the satisfaction of the Engineer.

3. The steel reinforcement quantities measured as provided above, shall be paid for at the Contract unit price per MT of reinforcement.

The contractor's unit price for steel reinforcement shall be considered full and final compensation to the Contractor for all expenditures incurred in providing, cutting, bending, placing and fixing the reinforcement in its final position in the structure to the satisfaction of the Engineer.

O. MASONRY

1.1 Stone masonry

Stone shall be the best available of its kind, sound, durable, free from flaws and soft, weathered or decomposed parts. The stone and the source from which it is obtained shall be subject to approval of the Engineer before any of that material is brought to site.

Stone for stone masonry shall have a minimum density of 2,650 kg/m3. Stones as delivered to site shall have no dimension less than 100 mm nor greater than 450 mm.

Stone masonry shall be uncoursed random rubble stone masonry with fair face; exposed surfaces provided with hammer dressed, split boulder face and corners. Stone masonry shall comply with the appropriate Indian Standards.

No stones are to tail to point, nor into the wall less than 1.5 times their height. The height shall not be greater than the breadth.

Joints shall not exceed 25 mm thick. The exposed joints shall be pointed flush with the surface of adjacent stones, or as approved by the Engineer.

Concealed faces shall be finished with natural boulders and the joints filled to give an even durable surface. No rendering or pointing is required, unless directed by the Engineer.

Parallel face walls up to 300 mm thick shall have a minimum of 1 bond stone per m2. Bond stones shall run from face to face of the wall.

Masonry shall be carried up evenly and uniformly, no portion being raised more than 1m above another at any one time. Joints shall be filled as stones are laid. Unfinished masonry shall be steeped back and immediately before new work is added the previous work shall be thoroughly cleaned.

Hearting shall consist of whole or split stones, with no dimension less than 100 mm Stones shall be carefully laid, hammered down with a wooden mallet and solidly bedded with mortar, chips and spalls being inserted to avoid thick beds of joints and mortar.

The conditions governing the laying of masonry in unfavorable weather shall be as specified for concrete in clause 1.20. Exposed faces of masonry shall be kept moist for ten days after construction.

1.2 Tolerance

Masonry shall be carried out to the lines and levels shown on the drawings or as directed by the Engineer. The tolerances shall be similar to these for concrete as specified in clause 1.30 and presented on Table 1 .7.

1.3 Mortar

a. Cement

Cement shall be as specified in clause 1.4 hereof.

b. Mortar sand

Sand for mortar shall be furnished by the contractor in accordance with clause 1.5 g of the concrete specification. Blending sand for mortar may be obtained locally or from other sources, but the resulting mixture shall comply with British Standard 1200. Stockpiles shall be placed on boards or metal sheeting and not directly on theground.

c. Water

Water shall be as specified in Clause 1.6 hereof

d. Mortar mixes

Mortar shall, unless otherwise specified, consist of one part Portland cement to three pails of damp loose mortar sand by volume and sufficient water to produce the required consistency for use. For increased workability and where approved by the Engineer, hydrated lime putty may be added, but shall not exceed 25% by volume, of the dry cement.

e. Mixing mortar

Mortar shall be mixed by an approved machine and all tools used for mixing shall be kept clean. Materials shall first be thoroughly mixed dry and then only sufficient water added to make tile mortar workable. Only a sufficient quantity of mortar shall be mixed for the immediate needs of the work.

Each batch shall be used within thirty minutes after mixing or such time as may be determined by the Engineer, and no partially set mortar shall be used in the work.

f. Use of mortar

Mortar already spread which becomes diluted by rain shall be removed and replaced before continuing with the work. Masonry shall not be constructed during rains sufficiently heavy or prolonged to wash the mortar from the bricks or stones. Batched mortar shall be protected from rain and if not so protected shall not be used in the work.

1.4 Transport

The methods and equipment used for carrying bricks or dressed stones shall be such as will not damage them.

1.5 Masonry Construction

a. Placing

All masonry shall be placed only after the foundation surfaces have been prepared satisfactorily in accordance with these specifications and instructions of the Engineer.

b. Setting

No personnel or further masonry will be allowed on any section of work before it is fully set to the satisfaction of the Engineer.

c. Wetting stones

All bricks and stones to be used in masonry with mortar joints shall be moistened with clean water for three to four hours before they are used, by a method which will ensure that each brick or stone is thoroughly and uniformly wetted. All bricks and stones shall be free from water adhering to their surface when they are placed in the masonry.

d. Laying

Stone masonry shall be skillfully built up in uncoursed random rubble stone masonry with fair face, exposed surfaces provided with Hammer dressed, split boulder, face and corners.

Masonry constructed for a waterway will be of the best standard of workmanship obtainable. The specified bond shall be maintained at all times.

e. **Jointing**

Stone Masonry - Joints shall not exceed 25 mm thick. The exposed joints shall be pointed flush with the surface of adjacent stones, or as approved by the Engineer.

All fair face stone work shall be provided with hammer dressed, split boulder, face and corners and shall be finished with struck joints, such work being carried out immediately after the laying of the stone whilst the mortar is still damp. Any extra mortar necessary shall be the same as that used in the stone work.

f. **Plumb bob and straight edge**

Where applicable masonry shall be taken up truly plumb and each set of four masons shall be provided with a plumb bob and straight edge.

g. **Pointing of Masonry**

In the event of fair faced masonry not being finished with struck joints whilst the mortar is still damp, pointing may be carried out with tile approval of the Engineer. In this case all joints shall be raked out to a depth of 20 mm, cleaned free from all loose material and any putlogs filled in. The area to be pointed shall then be thoroughly soaked before pointing takes place, the mortar used being to the satisfaction of the Engineer.

h. **Progress**

Masonry shall be carried up regularly and no portion of the work shall be left more than I m. lower than another. Temporary steps, left during construction, shall be raked back and not toothed. Straight edges supplied to masons and used for brickwork shall have courses marked on them with saw cuts, or measuring rods provided, and heights of courses frequently checked so as to keep them level.

i. **Cleanliness**

Care shall be taken to keep all masonry free from mud splashing, mortar and bitumen droppings, etc. and it shall be well cleaned down before being handed over.

1.6 **Scaffolding**

The contractor is responsible for providing, erecting and dismantling and removing safe and adequate scaffolding where required. Except in the case of 155 mm brick walls only headers will be left out to take putlogs and these will be sited so as not to affect the strength of the masonry and no two will be adjoining.

1.7 **Protecting and curing**

Protecting and curing of masonry shall be carried out in accordance with Clause 1.21 of concrete hereof. The Water used for curing shall be clean and in accordance with clause 1 .6 of concrete.

1.8 **Repairing masonry**

If, after the completion of masonry, any of it is out of alignment or level, or shows a defective surface, it shall be removed and replaced by the contractor at his own expense and to the satisfaction of the Engineer.

P. AS BUILT DRAWINGS

1.1 "As-Built" Drawings

The Contractor shall submit whole two (2) sets of printed "As-Built" Drawings of the completed Works in A3 format with one set of electronic copy in Compact Disk within the period mentioned in Contract Data. The "As-Built" Drawings shall clearly show plan, section and the lines and dimensions of the permanent construction actually made based on the original design and/or change of design from time to time ordered by the Engineer or proposed by the Contractor and approved by the Engineer.

1.2 Measurement and Payment

The cost incurred by the Contractor to provide and submit "As-Built" Drawings shall be deemed included in the unit rate of corresponding item of the Bill of Quantities.

Particular Technical Specifications

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A. EXCAVATION WORKS

1. Scope

A. This Specification Section covers excavation required for works such as apron, check dam, retaining walls, spurs and embankment protection works.

B. Excavation shall consist of excavation, removal and satisfactory disposal of all materials necessary for the construction of permanent works in accordance with the requirements of the Specification to the lines, grades and cross-sections shown on the Drawings or as otherwise directed by the Engineer. This work shall include the hauling and stacking, or hauling to sites of embankment also the disposal of unsuitable materials in specified manner, de-watering and pumping, and the trimming and finishing of excavation lines to such widths, depths, levels and profiles as shown on drawings or to such other dimensions and levels as may be ordered by the Engineer

2. Construction Operations

A. Preliminary Operations

1. Prior to any excavation the work shall be set out as specified in the drawing.

2. Before commencement of excavation a survey of the existing ground levels shall be made by the Engineer. The survey records shall serve as initial measurement for the determination of the final quantities of excavation performed under the Contract, and for related purposes.

3. Clearing and grubbing shall be performed in all excavation areas.

4. Stripping and storing of topsoil shall be performed as specified.

B. General Requirements

1. All excavation shall be made in accordance with the provisions stated herein or as directed by the Engineer and to the grades shown on the Drawings or established by the Engineer.

2. Change of Slopes: During progress of the work it may be found necessary or desirable by the Engineer to vary the slopes of excavation or the slopes of embankments and the dimensions dependent thereon, and the Contractor shall execute the work in accordance with these specifications.

3. Sliding Material: Materials which will not stand on the slopes shown on the Drawings or established by Engineer, and materials which are a part of slides extending beyond the established lines of excavation which move into excavated areas, shall be removed by the Contractor in an approved manner, and the slopes shall be refinished to lines and grades established by the Engineer. The Contractor shall be required to excavate potential slide areas beyond the limits of the originally staked excavation where, in the judgment of the Engineer, such excavation is necessary to prevent damage to the work.

4. Excavation lines: Where excavations are not to be covered by structures or other required construction, they shall be made to the full dimensions required and shall be finished to the neat lines and grades shown on the Drawings or to such other lines and levels determined by the Engineer All necessary precautions shall be taken to preserve the material below the lines of all excavation in the soundest possible condition. Any over excavation made for the convenience of the Contractor or for any purpose or reason, except as otherwise provided herein, shall be refilled and compacted by the Contractor at his expense.

5. Use of Material: It is anticipated that most of the materials from required excavations will be suitable for use in the construction required under the Contract. All suitable materials shall be placed in the designated final locations directly from the excavation as directs b the Engineer. As far as practicable, as determined by the Engineer, all materials designated for use in compacted embankments shall be brought to the proper water content before and during excavation.

6. Subsurface Water: Part of the required excavation will be below the subsurface water level. Any lines of water levels shown on the Drawings can be considered as tentative information only. The Contractor shall not be entitled to derive and claim there from and he shall select his equipment and programme, his constructional operations and the timing of these operations so as to complete the works to the satisfaction of the Engineer

7. Surface Water: The Contractor shall take all, necessary precautions to protect the work from surface water by constructing provisional bunds drains or similar means, or by pumping, as may be approved or directed by the Engineer.

8. Whenever it becomes necessary during the course of the work to determine the volume of excavation in channels which are filled or partially filled with water, the Contractor shall furnish and maintain the required equipment for measuring and shall assist the Engineer in making such measurements.

9. Spoil Banks: Excavated materials containing stumps, roots, vegetable matter and other objectionable materials and excavated materials that are not required for backfill, embankments and other permanent construction shall be placed in designated spoil banks in waste areas designated by the Engineer. Spoil banks adjacent to the embankments shall be continuous except for gaps at suitable intervals for transverse drainage as shown on the Drawings or as directed by the Engineer. All spoil banks and waste areas shall be levelled

and sloped to drain and trimmed to reasonably regular lines as shown on Drawings or as directed by the Engineer.

C. Preparation of Foundation

1. Upon completion of the excavation of the lines and levels shown on the Drawings or directed by the Engineer, the foundation shall be inspected by Engineer and the formation shall be prepared to receive the base course as directed by the Engineer.

2. Where material in a poor state of compaction (that is density less than 95 percent of the maximum dry density determined according to IS: 2720 - Part VII) is encountered at the foundation level it shall be treated suitably as directed by the Engineer.

3. The bottom of the foundation shall be levelled both longitudinally and transversely or stepped as directed by the Engineer. In the event of the foundation having been made deeper than that shown on the drawings or as otherwise ordered by the Engineer, the extra depth shall be made up with riverbed materials to the foundation grade at the contractors cost.

4. When rock or other hard stratum is encountered, it shall be left free of alt soft and loose material, cleaned out to a firm surface either level, stepped or separated as directed by the Engineer.

D. Finishing Operations

1. Finishing operations shall include the work of properly shaping and dressing all excavated surfaces.

2 When completed, no point from the slopes shall vary from the designated slopes by more than 150 mm measured at right angles to the slope, except where excavation is in rock (hard or soft) where no point shall vary more than 600mm from the designated slope. In no case shall any portion of the slope encroach on the finished lines of structures.

3. The finished cut formation shall satisfy the surface tolerance as prescribed by the Engineer.

4. Where directed, the topsoil removed earlier and stored shall be spread over cut slopes, embankments and other disturbed area. Slopes may be roughened and moistened slightly prior to the application of topsoil in order to provide satisfactory bond. The depth of topsoil shall be sufficient to sustain plant growth, the usual thickness being 75mm to 150 mm.

3. Measurements and Payments

A. Measurement

1. Excavation shall be measured by taking cross sections at suitable intervals in the original position before the work starts and after its completion and computing the volume in cubic meters by the method of average end areas. Where it is not feasible to compute volumes by this method because of erratic location of isolated deposit, the volume shall be computed by other accepted method.

2 At the option of the Engineer, the Contractor shall leave depth indication during excavation of such shape and size and in such positions as directed so as to indicate the original ground level as accurately as possible. The Contractor shall see that these remain intact the final measurements are taken.

3 Excavation shall be measured in cubic meters for the respective features, limited to the dimension shown on the Drawings or as otherwise directed by the Engineer

B. Payment

1. Payment for the various types of excavation shall be made at the Contract unit rates tendered there for in the Bill of Quantities. The Contract unit rates for the items of excavation shall include full compensation for the following operations:

a. Site clearance where the Bill of Quantities contains no item for clearing and grubbing in the Schedule.

b. Assistance in setting out profiles.

c. Removal of boulders including loosening to required depth for the removal of surface boulders and other unsuitable materials if any backfilling and compacting, if required.

d. Excavation in all types of materials.

e. Transportation of the excavated material and depositing on the sides of embankments, banks or stacking as directed.

f. When rock or other hard stratum is encountered, it shall be left free of all soft and loose material cleaned out to a firm surface either level, stepped or separated as directed by the Engineer.

C. Finishing Operations

1. Finishing operations shall include the work of properly shaping and dressing all excavated surfaces.

2 When completed, no point from the slopes shall vary from the designated slopes by more than 150mm measured at right angles to the slope, except where excavation is in rock (hard or soft) where no point shall vary more than 600 mm from the designated slope. In no case shall any portion of the slope encroach on the finished lines of structures.

3. The finished cut formation shall satisfy the surface tolerance as prescribed by the Engineer.

4. Where directed, the topsoil removed earlier and stored shall be spread over cut slopes, embankments and other disturbed area. Slopes may be roughened and moistened slightly prior to the application of topsoil in order to provide satisfactory bond. The depth of topsoil shall be sufficient to sustain plant growth, the usual thickness being 75 mm to 150 mm.

B. GABIONS WORKS

1. Scope

This Clause covers the furnishing of materials and construction of gabion works that may be required to act as check dams within gullies, buttresses, retaining walls, catch walls, stream or river training structures, or where placed as mattresses, to prevent stream or gully erosion.

2. Materials

A. Stones

Stones used to filling the gabion boxes or mattresses shall be clean, hard, sound, unweathered and angular rock fragments. The specific gravity of the stone shall be not less than 2.20 and the stones shall not absorb water more than 5 percent when tested as per IS: 1124. The length of any stone shall not exceed three times its thickness. The smallest dimension of any stone shall be at least twice that of the longer dimension of the mesh of the crate. However smaller size of stones as spalls shall be allowed for filling voids and its volume eluding voids shall not be more than 20 percent of the total volume of the stones. Before filling any gabion boxes and mattresses the Contractor shall submit representative samples of the rock proposes to use in the gabions for approval by the engineer. Further representative samples shall be submitted for approval each time when there is a change in the type and strength of the rock.

B. Gabions

Gabions shall consist of steel wire mesh crates. The steel wire shall be mild steel wire complying with NS 169-2045. All wires used in the manufacturing crates and diaphragms, binding and connecting lids and boxes

shall be galvanized with a heavy coating of zinc by an electrolytic or hit dip galvanizing process. The weight of deposition of zinc shall be in accordance with NS 163-2045. Zinc coating shall be uniform and be able to withstand minimum number of dips and adhesion test specified as per NS 163-2045. Tolerance on diameter of wire shall be ± 2.7 percent. The tensile strength shall be between 350 to 550 N/mm^2.The gabions and mattresses if machine woven rectangular units made from double twist hexagonal mesh of heavy galvanized mild steel wire. All edges of the standard size gabions shown in Table 24.1 including the diaphragms, if any, should be mechanically selvedge in such a way to as to prevent unraveling of the mesh and to develop the full strength of the mesh.

If hand woven, the wire shall be woven into rectangular unit consisting of mesh size as specified with minimum of three twist for hexagonal mesh and two way double knot for rectangular mesh. The tightness of twisted joints shall be such that a force of 7 KN is required to pull on one wire to separate it from other wire, provided that each wire is prevented from turning and the whole process is done in one plane all edges of the boxes shall be finished with a selvedge wire at least 2 gauge heavier than the mesh wire.

Table 24.2: Standard Sizes of Mesh and Wire in Gabions

Mesh Type	Thickness of mesh wire (mm)	Thickness of binding and connecting wire (mm)	Thickness of selvedge wire (mm)
150x150	8 gauge	10 gauge	8 gauge
100x 100	10 gauge	10 gauge	8 gauge
100x120	3.0	2.40	3.90

The adhesion of the zinc coating shall be such that, when the wire wrapped six turns around a mandrel of four times the diameter of the wire, it does not flake or crack to such an extent that any flakes of zinc can be removed by rubbing with the bare fingers.

The combination of mesh type, mesh wire diameter and ultimate failure load shall be as per the Table 24.3.

Table 24.3: Ultimate failure load for different mesh types

Mesh Type	Nominal Mesh Opening and Tolerances		Wire Diameter (mm)		Ultimate Tensile strength (kN/m)	Connection to Selvedges (kN/m)
	Mesh opening	Tolerances	Mesh	Selvedge		
60x80	60 mm	+18%-4%	2.20	2.70	35.0	10.2
100x120	100mm	+16%-4%	2.70	3.40	35.0	17.0
100 x 120	100mm	+16%-4%	3.00	3.90	43.0	20.0

The twisted joints should be such that, when the wire mesh is tested in accordance with SABS 1580/1993, a force of at least 0.7 kN for the wire mesh 60 x 80 and 1.4 kN for the wire mesh 100 x 120 is required to separate one wire from the other.

3. Construction of Gabions

A. General Requirements

Before filling any gabion boxes and mattresses, the contractor shall submit samples of gabion boxes and/or gabion mattress assembled, erected and filled with stones for approval which, when approved, shall be retained for reference and comparison with the gabions built as part of the permanent works. The size, type and location of the samples shall be as directed by the Engineer.

Gabion boxes and gabion mattress shall be assembled, erected and filled with stones in the dry on prepared surfaces except as may be otherwise approved. Approval for assembling and erecting gabions in water shall be given only, if in the Engineer's opinion such a method will produce work which is otherwise in accordance with the Specification.

B. Preparation of Foundation and Surface for Bedding

The bed on which the gabion boxes or mattresses are to be laid shall be even and conform to the levels shown on the Drawing. If necessary cavities between rock protrusions shall be filled with material similar to that specified for gabion filling.

C. Arrangement of Joints

1. Walls

In walls, gabion boxes shall be placed such that vertical joints are not continuous, but staggered. Aprons shall be formed of headers. If more than one unit is required to obtain the necessary width, units of unequal length shall be used and the joints between them should be staggered.

2. Check Dams & Channel linings

In channel linings, gabion box and mattress units shall be laid so that the movement of stone inside the mesh due to gravity or flow of water is avoided. Hence, on side slopes, units shall be placed with their internal diaphragms at right angles to the direction of the slope and, on inverts, as far as possible, at right angles to the direction of flow.

D. Assembly

Gabion boxes and gabion mattresses shall be assembled on a hard flat surface. After fabrication, unpacking or unfolding, they shall be stretched out and any kinks shall be removed. Creases shall be in the correct position for forming the boxes or mattress compartments. The side and end panels shall be folded into an upright position to form rectangular boxes or compartments. The top comers shall be joined together with the thick selvedge wires sticking out of the corners of each panel. The tops of all sides and partitions shall be levelled except as may be appropriate to special units. The sides and end panels shall be tied together using lacing wire of the thickness given in Table 24.2, starting at the top of the panel by looping the wire through the comer and twisting the wire together. Binding shall continue by looping the wire through each mesh and around both selvedges with three rounds, which shall be joined tightly together by twisting and the end shall be poked inside the unit. The diaphragms shall be secured in their correct positions by binding in the same way. The bindings wire shall be fixed using 250 mm long nose fencing pliers or equivalent approved tools.

The gabion boxes and gabion mattresses shall be laid in such a manner that the hinges of the lid will be on the lower side on slopes and on the outer side in walls.

Where mattresses are laid horizontally hinges shall not be placed on the downstream side as much as practicable.

E. Filling

Except in the case of sack gabions, the crates shall be placed in their final position before filling commences. They shall be stretched to their full dimension and securely pegged to the ground or wired to adjacent gabions before filling. The vertical comers shall be kept square and to full dimension by inserting a steel bar of at least 20 mm diameter at each vertical corner, maintaining it in the correct final position throughout the filling process, and removing it when the crate is full. Before filling commences, the selvedges of the crate shall be bound to the selvedges of adjacent crates with binding wire. Where crates are being assembled in position in a wall the binding of the edges of each crate in the assembly process and the binding together of adjacent crates shall be carried out in the same operation.

Before filling with stone, gabions shall be anchored at one end or side and stretched from the opposite end or side by inserting temporary bars and levering them forward. The top and bottom shall be kept stretched by

tensioning with tie wires attached to anchorage or equivalent approved method until the gabion has been filled. The gabions shall be inspected at this stage but before filling with stone to ensure that the tie/wiring has been properly carried out and the gabion boxes or gabion mattresses are not pulling apart. Gabion boxes or gabion mattresses may be tensioned either singly or in the case of a long straight structure by straining a number of units together using an approved tensioning system.

The filling shall be carried out by placing individual stones into the gabion by hand in courses in such a manner that the stones are bedded on each other and bonded as in dry random rubble masonry. No loose stones shall be tipped into the crate and the practice of coursing and bonding the outer layer and filling the interior with unlaid stones shall not be permitted.

All 1m deep gabions shall be filled in three equal layers and 0.5m deep gabions in two equal layers. Horizontal bracing wires made with the same binding wire as used for tying shall be fixed directly above each layer of the stone in the compartments, the wires being looped round two adjoining meshes in each side of the compartment and joined together to form a double tie which shall be tensioned by wind lasing together to keep the face of the gabions even and free from bulges. Bracing wires shall be spaced horizontally along and across the gabions at distances not greater than 0.33m. Where the upper faces of gabion boxes are not covered with further gabions vertical bracing wires shall be fitted between the top and bottom mesh using two tie wires per square meter of surface.

The ties shall be fixed to the bottom of the units prior to filling and tied down to the lid on completion. Where a double layer of gabion boxes is used to form an apron both upper and lower layers shall have vertical tie wires.

F. Securing Lids

The gabion boxes and mattress compartments shall be over filled by 50mm above their tops to allow for subsequent settlement. The lids shall then be tied down with binding wire to the top of all partition panels. The lids shall be stretched to fit the sides exactly by means of a suitable tool but due care shall be taken to ensure that the gabions are not so full that the lids are overstretched. The comers shall be temporarily secured first.

G. Tolerance

On completion, the crates shall be completely and tightly filled, square, true to dimensions and the line and level shown on the Drawing. However the tolerance limit permitted in the length, height and width of the gabion boxes and mattresses as manufactured shall be ± 5 percent from the ordered size prior to filling.

4. Test and Standard of Acceptance

A. The gabion wire shall be tested for mass, uniformity and adhesion of zinc coating and tensile strength of the wire itself. Failure of test results to comply with the specifications shall lead to the rejection of gabion wires. The test on the samples, taken as per Table 24.3 from each lot of the G. I. wire received at the site of the work shall be carried out in accordance with NS 169-2045 and NS 163-2045.

Table 24.3: Scale of Sampling and Permissible Number of Defective Coil

No. of coils in a lot	No. of coils randomly selected for sampling*	Permissible no. of defective coil
Upto25	2	0
26-50	3	0
51-150	5	0

151-300	8	1
300 and above	13	1

** One sample per coil shall be tested in all respect.*

B. In each two hundred cu.m. or part there of one representative sample of completed gabion box/mattress i.e. assembled, filled with stones and tied up in position shall be dismantled during the process of construction. The dismantling shall be made in such a manner that the quality of the surrounding work is least affected. The stones having least dimension more than or equal to the specified dimension shall be gathered at one place and the rest at another place. By displacement of water total volume of these specified stones shall be determined separately. Ratio of volumes of specified stone and voids including spalls to the total volume of the gabion box shall be worked out. The test result shall meet the requirement of the Specifications.

C. The dismantled portion shall be made good by the Contractor at his own cost after completion of the test.

5. Measurement

Gabion boxes and mattresses shall be measured in square meter. The boxes and mattresses shall be physically measured and be verified with their tolerances. The lacing wires, selvedge wire and mesh wires shall not be measured separately. They are deemed to be included in the measurement of the gabion boxes and/or mattresses.

Stone filling in gabions including fixing of gabions in position, tying with binding wires and tension wires as specified shall be measured in cubic meter.

2.6. Payment

Gabion boxes, gabion mattresses, stone filling shall be paid as per respective contract unit rate which shall be the full and the final compensation to the Contractor to complete the work in accordance with these Specifications.

C. SUB-SURFACE DRAINS

1. Scope

This clause shall cover the works related to the construction of sub-surface drainage networks in slopes, slides and under road pavement. The drains shall be either main or tributary or of other types as shown in the drawing.

Sub surface drains shall consist of perforated HDP pipes surrounded by granular material laid in a trench. If specified in the contract, sub -surface drains shall also consist of perforated HDP pipes surrounded by geotextile and granular material lay in a trench.

2. Materials

The materials used for construction of sub-surface drains shall comply with following requirements:

A. Stone

Stone used for the filling and lining of sub- surface drains shall be from a quarry or riverbed boulder free from silt and clay particles. The stone shall be sound, hard, and free from cracks or other defects. The stones, when immersed in water for 24 hours, shall not absorb water by more than 5 percent of their dry weight when tested in accordance with IS: 1124.

B. Geotextile

Geotextile fabrics shall be laid before laying HDPE pipe as shown in the drawing.

C. Drain Pipe

Drain pipe shall be made of high-density polyethylene and shall comply with series II as specified by NS 40/2040. Joint of pipes shall be done by fine -cutting and heating with equipment complying with the prescription of the HDP pipe manufacturer. Pipes may be joined with angles to fit the requirements of the terrain, but angles shall not exceed the maximum specified by the manufacturer. The joints shall be watertight and develop the same strength as unjointed HDP material. The method of jointing shall be approved by the Engineer prior to starting the works. Drains pipes shall be provided with holes of minimum 5 mm diameter. The pipes shall be perforated by drilling minimum 50 holes per meter length on the upper half of the pipe in a staggered pattern uniformly distributed. The Engineer might adjust these specifications according to the site conditions.

3. Measurement and Payment

Sub-surface drain with/without geotextile shall be measured and paid as per the respective contract unit rates.

D. CLAY SEALING

1. Scope

This clause covers the sealing of slip surface of a landslide on the top to prevent the entry of rainwater into the slip area. It consists of 200 mm x 300 mm section trench excavation, plastic laying and filling with loose clay with hand compaction in each 100 mm depth.

2. Material

A. Plastic

Plastic used for the sealing should be of 500 gauges. The type of plastic to be used shall be approved by the Engineer prior to starting the works.

B. Clay

Clay used for the sealing purpose shall be of standard clay as instructed by the Engineer.

3. Measurement and Payment

The excavation of trench shall be measured and paid as per earthwork excavation. Supply and laying of Plastic shall be measured in Sq. m. and paid as per the respective contract unit rates. Similarly supply of clay and construction of clay sealing shall be measured in Cu.m. and paid as per the respective contract unit rates.

E. SLOPE TRIMMING

1. The contractor shall prepare slopes for planting operations as required by the engineer. This shall be done according to the specifications described hereunder, as and when required. The Contractor shall supply all necessary expertise, resources and facilities to ensure that these requirements are met.

2. This work includes trimming of slide mass and hills with disposal of the mass in the valley side of the road without disturbing the regular movement of the traffic.

3. As slope trimming business can be dangerous and risky to personnel, the Contractor shall be responsible to ensure the safety of his/her and Client's personnel while putting in the dangerous situation. It shall be essential to have the minimum of safety measures as listed below for a working gang of 10 people. The proportion of the safety harness shall be increased according to the requirements and labours employed on site.

4. Measurement and Payment:

Slope trimming work shall be measured in cu.m. on the basis of the trimmed volume. The payment shall be the full and the final compensation to the contractor for making arrangements for trimming, haulage of the material by thunse, disposal in the valley side of the road, traffic management, all labour, tools, equipment, safety harness and incidentals to complete the work as specified herein.

F. GEOTEXTILE FOR HYDRAULIC WORK

1. General

The geotextile fabric shall meet or exceed the following requirement in full. Product not meeting these requirements shall not be accepted.

A representative sample of the geotextile proposed to be used by the contractor shall be submitted together with appropriate product information, technical data sheets, and certificates of quality with tender documents for consideration as part of the evaluation. Material delivered to site not conforming to the requirements of the specification and meeting the quality standard of the retained representative sample will be rejected from the site.

2. Physical Property

A. The geotextile shall be of non-woven needle punched type comprising 100% polypropylene continuous fibers. Geotextile manufactured from staple (short) fibres or heat bonded shall not be accepted. The manufacturer shall certify compliance of this requirement.

B. The geotextile shall have high-level UV stabilization and retain at least 70% of residual tensile strength after 3 months outdoor weathering. Independent performance to verify this must be submitted as evidence of geotextile superior performance,

3. Mechanical and Hydraulic Properties

A. The geotextile delivered to site shall meet or exceed the technical values of the following properties. The geotextile manufacturer shall provide a quality statement and independent certification from an ISO Accredited Test Laboratory that geotextile delivered to site meets or exceeds the following requirements in full. Geotextile not meeting the required technical values shall be rejected.

Property	Test Standard	Unit	Value
Ultimate tensile strength	ISO 10319	kN/m	>==11.5
CBR puncture	ISO 12236	N	>=\750
Effective opening size (Wet sieving)	ISO 12956	mm	<=0.10
Vertical water flow @50mm head	ISO 11058	l/mVs	>=100
Mass/Area	ISO 9864	g/m^2	>=155
Thickness	ISO 9863	mm	>-1.5
UV resistance tensile Strength	Outdoor testing	Retain > 70% of original tensile strength after 3 months exposure to natural sunlight	

B. Geotextile that complies with Cl. 3.1 may be tested, under the discretion of engineers, at an independent geotextile-testing laboratory (according to the test standards given in the Specification). The technical values tested must be within the variance given below:

Mechanical properties	tolerance range	- 10% of average value
Confidence level	95%	
Hydraulic properties	tolerance range	- 30% of average value
Confidence level	95%	

C. The geotextile manufacturer must be ISO 9001 certified. Certificate of compliance must be provided to substantiate this requirement.

4. Installation

A. The higher tensile strain alignment of the geotextile should be in longitudinal direction of the drain.

B. The overlap between two geotextile pieces should be at least 0.5m.

C. The laying of geotextile should be begun from downstream side, so that the upper overlapped portion will be the part of upstream geotextile.

D. Other installation procedure of the geotextile shall be accordance with the manufacturer's instructions. The supplier shall provide a method statement detailing installation procedures.

5. Geotextile Quality Assurance Requirements

A. To facilitate site quality assurance, each roll of geotextile delivered to site shall be clearly labeled with brand name, grade and production batch number and this information is required to be clearly printed at regular intervals along the outer edge of each geotextile roll. Geotextile not meeting this requirement will be rejected from site.

The Contractor shall provide all safety measures as listed in Table below:

S. No.	Description	Quantity
1.	Safety rope (mountaineering type or similar make having a min 20 mm diameter and 30 meters in length)	For every workers
2.	Safety belt similar to tree climbers or scafolders use	For every workers
3.	Goggles and dust proof masks	For every workers
4.	Safety hats	For every workers
5.	Knee pad	For every workers
6.	First Aid Kit with necessary medicines and bandages	1 box per working gang
7.	Stretcher	1 no. working gang

G. TEMPORARY ACCESS ROADS

1. General

The Contractor shall construct and maintain the temporary access roads for construction of the Works and transportation of the materials until the intended completion period and if needed up to the defects liability period. The access roads for constructing the structures and transportation of the materials shall be constructed by rehabilitating and reinforcing the existing roads, where available. The Contractor shall also pay compensation to the owner(s) if he constructs the temporary access roads on a privately owned land.

The public and village roads may also be used as temporary access road. The Contractor shall maintain and repair them to the satisfaction of the authorities concerned.

2. Measurement and Payment

The cost incurred by the Contractor in complying with requirements of Construction and Maintenance of Temporary Access Road shall be deemed to be included in the lump sum price Construction and Maintenance of Temporary Access Road of the Bill of Quantities.

H. Disposal and Care of Ground/Surface Water, Dewatering Foundations and Temporary Diversions

H.1 General

Disposal of all water encountered during the execution of the Works under the Contract shall be the responsibility of the Contractor. Control of ground water shall be accomplished in a manner that will preserve the bearing quality of the foundation soils, will not cause instability of the excavation slopes, and will not result in damage to existing structures. Where necessary to these purposes, the water level shall be lowered in advance of excavation, utilizing wells, well points or similar methods. The water level as measured in piezometers shall be maintained a minimums of one (1.0) m below the prevailing excavation level, or it shall be lowered to a point no higher than 0.60m above the top of impermeable strata. Open pumping with sumps and ditches, if it result in boils, loss of fines, softening of the ground or instability of slopes, will not be permitted. Sumps, wells and well points shall be installed with suitable screens and filters so that continuous pumping of fines does not occur. The discharge shall be arranged to facilitate collection of samples of water by the engineers. The Contractor shall construct and maintain all necessary cofferdams, channels, flumes, drains and sumps and/or other temporary diversion and protective works. The Contractor shall furnish all materials required and shall furnish, install operate and maintain all necessary pumping and other equipment for removing water from the various parts of the work and for maintaining the foundations. All parts of the Works shall be free from water as required for construction. After having served their purpose, all dikes, coffers and other temporary dewatering facilities shall be removed or levelled so as not to interfere in any way with the operation of the canals and related structures.

The Contractor shall be responsible for and shall repair at his own expense any damage caused by flooding, water, or failure of any part of the dewatering facilities or protective works.

H.2 Dewatering Foundations

The Contractor shall keep all excavation clear of water during construction. The Contractor's method of removal of water from foundation excavation shall be subject to the approval of the Engineer. Where excavation for foundations extends below the water table, the portion below the water table shall be dewatered in advance of excavation. The dewatering shall be accomplished by the manner that will maintain the stability of the excavated slopes and bottom of the excavation, and will enable all construction operations in the dry. The Contractor shall also be required to control seepage along the bottom of the excavation within the extent of the structures which may require supplemental dewatering system or pipe drains leading to sumps from where the water will be pumped out. Review by the Engineer shall not relive the Contractor of responsibility for the adequacy of dewatering system to achieve the specified result.

The Contractor shall have sufficient number of different pumps, i.e., self-priming centrifugal pumps, submersible pumps, and a few complete sets of well points with compatible pumps.

H.3 Temporary Diversion Works

The Contractor shall have to construct temporary diversion works for construction of structures. Coffer and/or diversion channel shall be constructed in such a manner that the water can be smoothly supplied downstream without overtopping and damaging any part of the coffer and channel.

The Contractor shall not commence any temporary diversion works until the Engineer's approval thereto has been obtained. However, the approval shall not relieve the Contractor of any liability or obligation under the Contract.

The Contractor shall construct the temporary diversion works in accordance with the instruction of Engineer. The Contractor shall remove all temporary diversion works on completion of the construction work.

The cost of all the temporary diversion works, care of water including dewatering and the related temporary works including crops and land compensation related to the diversion works shall be borne by the Contractor.

H.4 Measurement and Payment

All costs incurred by the Contractor in complying with the requirement of this Sub-Clause shall be deemed to be included in the lump sum price of the Bill of Quantities. Payment for this item shall be made on pro-rata basis depending upon the total progress accomplished.

I. LABORATORY ESTABLISHMENT AND QUALITY CONTROL

I.1 Scope

This section covers the quality control system and procedure, quality assurance plan, programme of tests, trials, general procedure for acceptance as well as laboratory arrangements and related facilities which are required for the selection and control of the quality of material and workmanship.

I.2 Contractor Responsible For the Quality of the Works

All material incorporated and all workmanship performed shall be strictly in conformity with the requirements of the specification and the contractor shall be responsible for the quality of the works in the entire construction within the contract.

The contractor shall provide, use and maintain on the site, through the period of execution of the contract, a laboratory with adequate laboratory equipment operated by competent staff for carrying out tests required for the selection and control of the quality of materials and for the control of workmanship in accordance with these specifications. The list of laboratory equipments to be procured and laboratory facilities to be provided shall be got approved from the Engineer. The contractor shall assume that tests shall be required on all materials to be used in the works and all finished works or parts of works.

I.3 Quality Control System

The Quality control system comprises the methods, procedure and organization for the Quality controls of the works. The contractors shall implement the Quality control system in the following sequences:

(1) Sequence

(a) Compliant testing for materials including laboratory trials,

(b) Compliant testing for methods and equipment prior to the commencement of the work, including site trials or trials sections

(c) Control testing during construction,

(d) Acceptant testing on completed works or parts of the works

The contractor shall carry out all necessary tests and shall report to the Engineer the result of such tests before submitting materials and/or finished works or part of works to the Engineer for approval in accordance with

this specification. In certain circumstances, tests may be carried out at the place of manufacture as per the Conditions of Contract.

For satisfying himself about the quality of the works, quality control tests shall be conducted by Engineer himself or by any other agencies deemed fit by Engineer. Additional tests may also be conducted where in opinion of the Engineer such tests are needed.

Before commencement of works, the contractors shall demonstrate a trial run of all construction equipment for establishing their capability to achieve the laid down specifications and tolerance to the satisfaction of the Engineer.

(2) The supply, testing and monitoring shall be in compliance with a quality assurance plan, clause 9.4 and the provisions in the Contract.

I.4 Quality Assurance Plan

The Contractor shall submit to the Engineer for his approval, the quality assurance Plan (QAP) which shall be best on the detailed programme of the Works of these Specifications.

The Quality assurance plan shall include the following

(1) The quality Control Schedule Comprising of:
   (a) The recapitulative tests schedule and testing programme detailing the list of tests for compliance, laboratory trials, site trials, construction control tests and their frequencies, tests for acceptance of the completed works with their dates.
   (b) Recapitulative list of "critical" acceptance testing procedure, for equipment or parts of the works which corresponds to the tasks on the Critical path according to the construction programme.
   (c) Estimate the number of tests to be carried out, list and number of appropriate equipment to conduct them, list of tests to be conducted outside the site laboratory, any, identification of the outside laboratory where proposed to carry out the test.
   (d) List of staff assigned to the laboratory, their position and responsibilities in the quality control procedure, their qualification and experience, general description and detailed organization of the laboratory activities

(2) The list of source of material and /or of manufactured articles, their main characteristics, their identification mode as proved by the supplier when required; the programme of supply and procurement of material and /or manufactured articles and accordance with the programme.

(3) The list of tests of quality control procedures to be implemented by the Sub-Contracted works, which correspond to the tasks on the Critical path included in the Sub-Contracted works.

The Engineer's approval of the QAP shall neither relieve the Contractor from his responsibility of quality of the Works as per the conditions of Contract and these specifications nor shall the Engineer's approval of the QAP exempt the Contractor of any procedure to inform the Engineer in writing or request for the Engineer's approval or re-approval as specified in the Conditions of Contract and/or in these Specifications. The Contractor shall monitor and update the QAP on the basis of the decisions taken at the periodic review meetings or as directed by the Engineer and in accordance with the programme of the works and the Conditions of Contract.

The Contractor shall implement the quality Control in Compliance with the approved QAP.

Table 9.1 Testing Schedule for Concrete

COMPONENT OF THE WORKS	SECTION/ CLAUSE NO	TESTS	FREQUENCY
CONCRETE MATERIALS	VIIA-N	• Cement: Acceptance test CONTROL TESTS: Chemical composition physical properties	• Conservative samples for each supply and not less than every 200 t or part of it • Testing in case of non compliance of the mixes or storage on site for longer than one month
		• Aggregates: Acceptance tests: CONTROL TESTS: Grading Silt & clay content Mica content Shrinkage Soundness Aggregate Impact value Organic impurities Chloride content, Sulphate content, Flakiness and elongation indices Alkali reactivity Water Admixture	• For each source of aggregate • As frequently as required
		CONCRETE • TRIAL MIXES Slumps Density 7days and 28 days compressive strengths • CONTROL TESTS Compressive strength	• For each class of concrete Early works: every $6m^3$ of each class When compliance is established every 20 m^3 or part of it

I.5 Testing Procedures and Set of Tests

For ensuring the quality of the work, the materials and the workmanship shall be subjected to testing in accordance with procedure, sets of tests and frequencies as specified in respective sections of these specifications. The specified testing frequencies are not restrictive. The Engineer shall direct for the tests to be carries out as frequently as deemed necessary that the materials and workmanship comply with their specifications. Sets of tests to be carried out on the materials and the workmanship as specified in theses specifications are recapitulated in Table 9.1. Where no specific testing procedure is mentioned in the specifications, the tests shall be carried out as per the prevalent accepted engineering practice or directions of the Engineer. The physical characteristics of the cement required for the project is mentioned in Table 9.2.

Table 9.2 Requirement on the physical characteristics of cement

S/N	Physical Characteristics	OPC/ PSC	HSPC	Test Procedure
i)	Fineness, m^2/kg: (by Blaine's Air Permeability method	225	225	IS -4031 Part 2
ii)	Setting Time: a) Minimum Initial Setting Time (minutes)	45	45	IS -4031 Part 5
iii)	Soundness by Lechatelier's method, mm, maximum	10	10	IS -4031 Part 3
iv)	Compressive strength: Minimum Average Compressive Strength of three mortar cubes (N/mm) a) 3 days b) 7 days c) 28 days	 16 22 33	 27 37 53	 IS -4031 Part 6

I.6 LABORATORY

1. Location

The laboratory shall be located on the site. It may be established specially for the contract with the approval of Engineer.

2. Setup

All laboratories to be provided under the Contract shall be set up and shall be in fully operating condition not later than fifteen days after the Engineer's order to commence the work.

No Construction work shall be permitted until the laboratories have been accepted by the Engineer.

If the Contractor fails to provide the laboratories within the specified period, the Engineer shall make alternative agreements as he consider necessary. These arrangements may include the use of rented accommodation, purchased caravans, portacabins and/or the contracting of laboratory services etc. The Contractors shall bear all the cost for such temporary arrangements made by the Engineer, including that of additional transport.

3. Laboratory Equipment

All equipment necessary for testing of materials and workmanship shall be deemed to form part of the permanent work unless otherwise provided in the Contract. It shall be delivered to the site in accordance with the schedule of requirements of such equipment described in the contract. However the non-inclusion of any item of such equipment in the schedule of requirements shall not relieve the Contractor of the responsibility to supply it of it is required for the proper control of the quality of the materials and/or workmanship, notably when identified in the list of appropriate equipment to be supplied in accordance with Clause 9.4. The equipment shall be delivered to the site not later than fifteen days after the order to commence the work.

4. Ownership

Unless otherwise stated in the contract ownership of all laboratories and equipment shall revert to the contractor.

5. Attendance

The Contractor shall keep the laboratories in a well maintained, clean and habited condition. The Contractor shall keep all laboratory equipment in good working condition throughout the period of the Contract at his own expense.

The Contractor shall provide all tools, consumable items for testing and all the assistance as may be required by the Engineer and his staff for measuring and checking the works.

6. Measurement and Payment

The laboratory service shall bepaid as per the contract price on progress basis depending upon the total progress accomplished. The contract price shall be the full and the final compensation to the contractor for providing the laboratories premises; equipment, manpower, electricity supply, water supply gas and heating, attendance etc. in accordance with the requirements of the specifications.

J. INFORMATION PROVIDING

This clause includes the provision of Signboard, Time series photo monitoring and video graphic monitoring.

1. Sign Board

The signboard of size (1.8m x 1.2m) shall be erect at each site giving the details of the contract in the format and wording as directed by the Engineer. These boards shall be erected within 14 days after the Contractor has been given the Possession of site.

The contractor shall not erect any advertisement sign board on or along the work without the written approval of the Employer.

All signboards shall be removed by the Contractor by the end of the Defects Liability Period.

2. Time series Photo monitoring

The contractor shall supply digital photographs as well as the prints of different work progress. The photographs shall be taken from same point for a given structure. The digital photographs and the negatives of each photo shall be the property of the Employer. No prints from the negatives or digital copy will be supplied to any one without the permission of the Engineer.

Photographs shall be of two categories:

> Progress monitoring photographs and

> Record photographs

Both categories of photographs shall be properly referenced to the approval of the Engineer and on the back of each print shall be recorded the date of the photograph and the direction in which the camera was facing, and identifying description of the subject, and the reference.

The contractor shall supply four prints of each photographs which shall be taken at locations and time determined by the Engineer. Photographs taken for the record purposes as ordered by the engineer shall be supplied with four prints, having on the reverse of one print the signature of the Contractor and the Engineer for the purpose of attestation.

3. Payment

Payment shall be made at the contract unit rate which shall be the full and final payment to the Contractor.

K. Horizontal Pipe Drain

1. Scope

This clause shall cover the works related to the construction of Horizontal Pipe Drain (sub-surface) networks. The horizontal pipe drain shall be in single or in groups as shown in drawing or as directed by Engineer. Horizontal sub-surface pipe drains shall consist of 63 mm diameter, perforated (HDPE 4Kg/Cm^2) pipes, wrapped by Geo-textile.

2. Drilling Holes and laying pipes

The horizontal holes of 110 mm diameter shall be drilled in all types of materials and strata in such a way that a upward slope of 5^0 to 10^0 is maintained. The position, direction and length shall be as directed by the engineer. The horizontal drill holes shall be cleared and washed properly before inserting perforated pipe.

A. Geotextile

Geotextile fabrics conforming to Section 7 shall be laid before laying HDPE pipe as shown in the drawing. Geotextile sheet shall not be less than 4.5 m wide.

B. Drain Pipe

Drain pipe shall be made of high-density polyethylene and shall comply with series II as specified by NS 40/2040. Joint of pipes shall be done by fine -cutting and heating with equipment complying with the prescription of the HDP pipe manufacturer. Pipes may be joined with angles to fit the requirements of the terrain, but angles shall not exceed the maximum specified by the manufacturer. The joints shall be watertight and develop the same strength as un-jointed HDP material. The method of jointing shall be approved by the Engineer prior to starting the works. Drains pipes shall be provided with holes of minimum 5 mm diameter. The pipes shall be perforated by drilling minimum 50 holes per meter length on the upper half of the pipe in a staggered pattern and uniform distribution. The Engineer might adjust these specifications according to the site conditions.

C. Measurement and Payment

The cost incurred by the Contractor in complying with Horizontal Drilling Work (Horizontal Pipe Drain (Sub-surface) with 110mm diameter drilling hole, supply of 63 mm HDP 4Kg/ Cm2 perforated pipe, supply and wrapping of Geo-textile, and inserting in the drilling hole properly or up to the satisfaction of Engineer) shall be measured and paid as per the respective item of the Bill of Quantities.

L. Insurance

. For fulfilling the Contractor's obligations under Clause 19 of the Conditions of Contract, the Contractor shall be paid the lump sum amount of respective Item of the Bill of Quantities, which amount shall be deemed to include all the Contractor's costs incidental to providing the specified insurance. After furnishing all the documentary evidence of the insurance policy the 75% of total payment shall be made and remaining 25% shall be paid upon completion of the work i.e. at the time of final bill.

M. Preparation for Bid Security, or Performance Security/Bond, Mobilization/Demobilization of Works, Equipment and Materials

M.1 Scope of work

All the expenses of contractor in reference to preparation for Bid Security, or Performance Security/Bond including commission etc, Mobilization/Demobilization of Works, Equipment and Materials etc is included in the respective item of Bill of Quantities. The Contractor shall be responsible for the land he deems necessary for his offices, stores, warehouse, motor pool, laboratory, workshops, precast concrete factory, staff quarters and labour camp. The Contractor shall be also responsible for construction, maintenance, operation and subsequent removal or handing over if the Engineer requests, of such temporary facilities as his office, stores, warehouse, motor pool, laboratory, workshops, precast concrete factory, staff quarters and labourer camps including feeding and accommodation. The contractor shall demobilize all the plants, equipment, materials etc. upon completion of the work up to the satisfaction of the engineer.

M.2 Measurement and Payment

All costs incurred by the Contractor in complying with the requirement of this Sub-Clause shall be deemed to be included in the lump sum price of the Bill of Quantities. Payment for this item shall be made on pro-rata basis depending upon the total progress accomplished.

N. Healthcare and Security

N.1 Scope of Work

The Contractor is to arrange for a high standard of sanitation to be maintained throughout the Camp and the Works. Sanitary conveniences for the use of persons employed in the works shall be provided and maintained by the Contractor in accordance with the appropriate laws and regulations in force in Nepal to the extent and in such a manner and at such places as may be approved by the Engineer, and all persons connected with the works shall be obliged to use them.

The Contractor shall make arrangements according to the regulations for treatment on the site of casualties and sick persons. The Contractor shall make his own arrangements for treatment of casualties on the Site in such first-aid units as may be thought necessary.

The Contractor shall provide necessary protection for all persons and properties at all times. The Contractor shall take all necessary measures to protect the work and prevent accidents during the construction. He shall provide and maintain sufficient night lights, barricades, guards, temporary sidewalks, temporary bridges, danger signals, watchmen and necessary alliances and safeguards to properly protect life and property. He shall also protect all excavations, equipment and materials so that the public are not be endangered.

N.2 Measurement and Payment

All costs incurred by the Contractor in complying with the requirement of this Sub-Clause shall be deemed to be included in the lump sum price of the Bill of Quantities. Payment for this item shall be made on pro-rata basis depending upon the total progress accomplished.

O. Others

All above and other Specifications relating to this project Works shall be in accordance to prevailing respective Standard Code of Practices.



Drawings

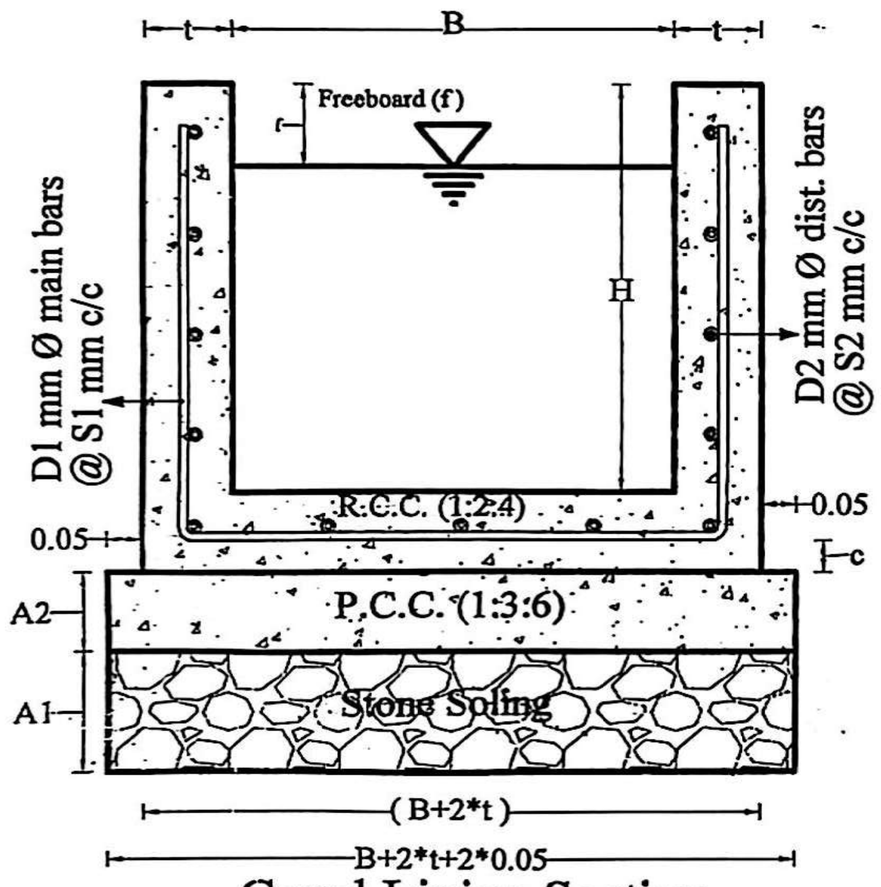
Note:

1. It is customary to bind the drawings in a separate volume, which is often larger than other volumes of the contract documents. The size will be dictated by the scale of the drawings, which must not be reduced to the extent that details are reduced illegible.

2. A simplified map showing the location of the Site in relation to the local geography, indicating major roads, posts, airports, and railroads, is helpful.

3. The construction drawings, even if not fully developed, must show sufficient details to enable bidders to understand the type and complexity of the work involved and the price the Bill of Quantities.

[Insert Drawings]



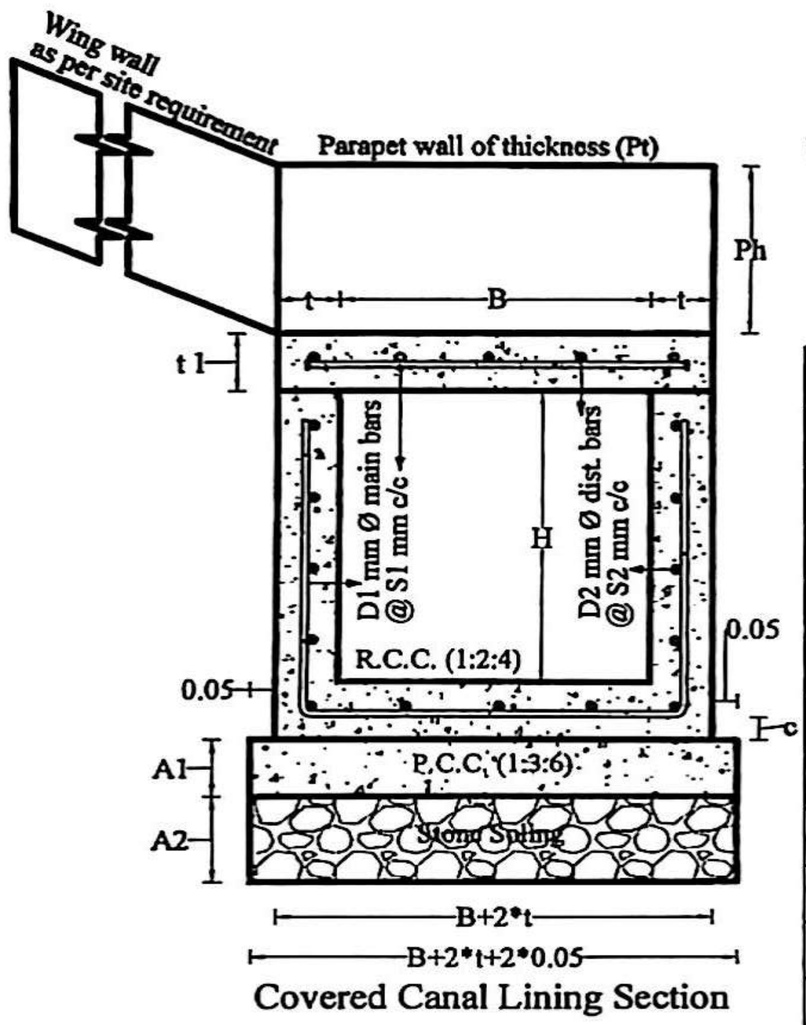
Canal Lining Section

Legend:

	Location Reference	150 d/s of ryale kholsi N 28.194387, E 84.607859 point forward	Simle Kholsi forward N 28.194377, E 84.608699 point forward	Khadkapani kholsi to takura branch N 28.191556, E 84.612648 point down	
S.N.	Particulars	Value	Value	Value	Remarks
1.	A1	0.10 m	0.10 m	0.10 m	
2.	A2	0.05 m	0.05 m	0.05 m	
3.	B	0.60 m	0.50 m	0.30 m	Different at different chainage as mentioned
4.	H	0.50 m	0.40 m	0.30 m	
5.	t	0.12 m	0.12 m	0.12 m	
6.	c	0.06/0.04 m	0.06/0.04 m	0.06/0.04 m	
7.	D1	10 mm	10 mm	10 mm	
8.	D2	8 mm	8 mm	8 mm	
9.	S1	200 mm	200 mm	200 mm	
10.	S2	200 mm	200 mm	200 mm	
11.	f	0.10 m	0.10 m	0.10 m	
12.	Length	105 m	406 m	400 m	
13.	Slope	1:500	1:500	1:500	

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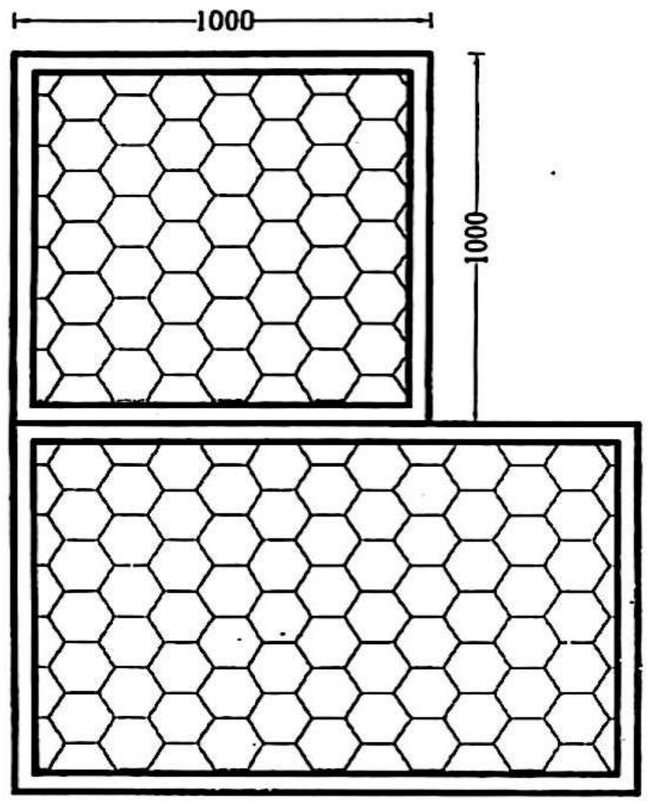
Covered Canal Lining Section

Legend:

	Location Reference	Simle kholsi N 28.194377, E 84.608699 point near	Riyale Kholsi N 28.19391, E 84.60987 point near	Birauta Kholsi N 28.193876, E 84.61039 point near	Khahare Kholsi N 28.193195, E 84.610868 point near	Kathekuwa Kholsi N 28.192903, E 84.611273 point near	Majuwa Kholsi	
S.N.	Particulars	Value	Value	Value	Value	Value	Value	Remarks
1.	A1	0.10 m	0.10 m	0.10 m	0.10 m	0.10 m	0.10 m	
2.	A2	0.05 m	0.05 m	0.05 m	0.05 m	0.05 m	0.05 m	
3.	B	0.60 m	0.50 m	0.50 m	0.50 m	0.50 m	0.50 m	Different at different chainage as mentioned
4.	H	0.50 m	0.40 m	0.40 m	0.40 m	0.40 m	0.40 m	
5.	t	0.12 m	0.12 m	0.12 m	0.12 m	0.12 m	0.12 m	
6.	c	0.06 m	0.06 m	0.06 m	0.06 m	0.06 m	0.06 m	
7.	D1	10 mm	10 mm	10 mm	10 mm	10 mm	10 mm	
8.	D2	8 mm	8 mm	8 mm	8 mm	8 mm	8 mm	
9.	S1	200 mm	200 mm	200 mm	200 mm	200 mm	200 mm	
10.	S2	200 mm	200 mm	200 mm	200 mm	200 mm	200 mm	
11.	Ph	0.50 m	0.50 m	0.50 m	0.50 m	0.50 m	0.50 m	
12.	Pt	0.12 m	0.12 m	0.12 m	0.12 m	0.12 m	0.12 m	
13.	t1	0.12 m	0.12 m	0.12 m	0.12 m	0.12 m	0.12 m	
14.	Length	6.00 m	6.00 m	8.00 m	5.00 m	5.00 m	6.00 m	

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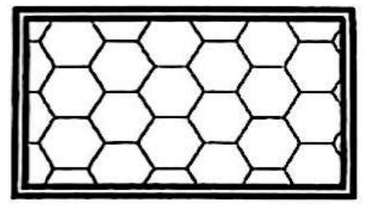
GANDAKI PROVINCE GOVERNMENT MINISTRY OF ENERGY WATER RESOURCE AND WATER SUPPLY WATER RESOURCE AND IRRIGATION DEVELOPMENT DIVISION LAMJUNG	Gairi kateri Banshphota Barhapirke IP,Dudhpokhari RM-02, Lamjung	DRAWN BY	CHECKED BY	RECOMMENDED BY	APPROVED BY	2/8



Gabion Protection Works Section (Not in Scale)

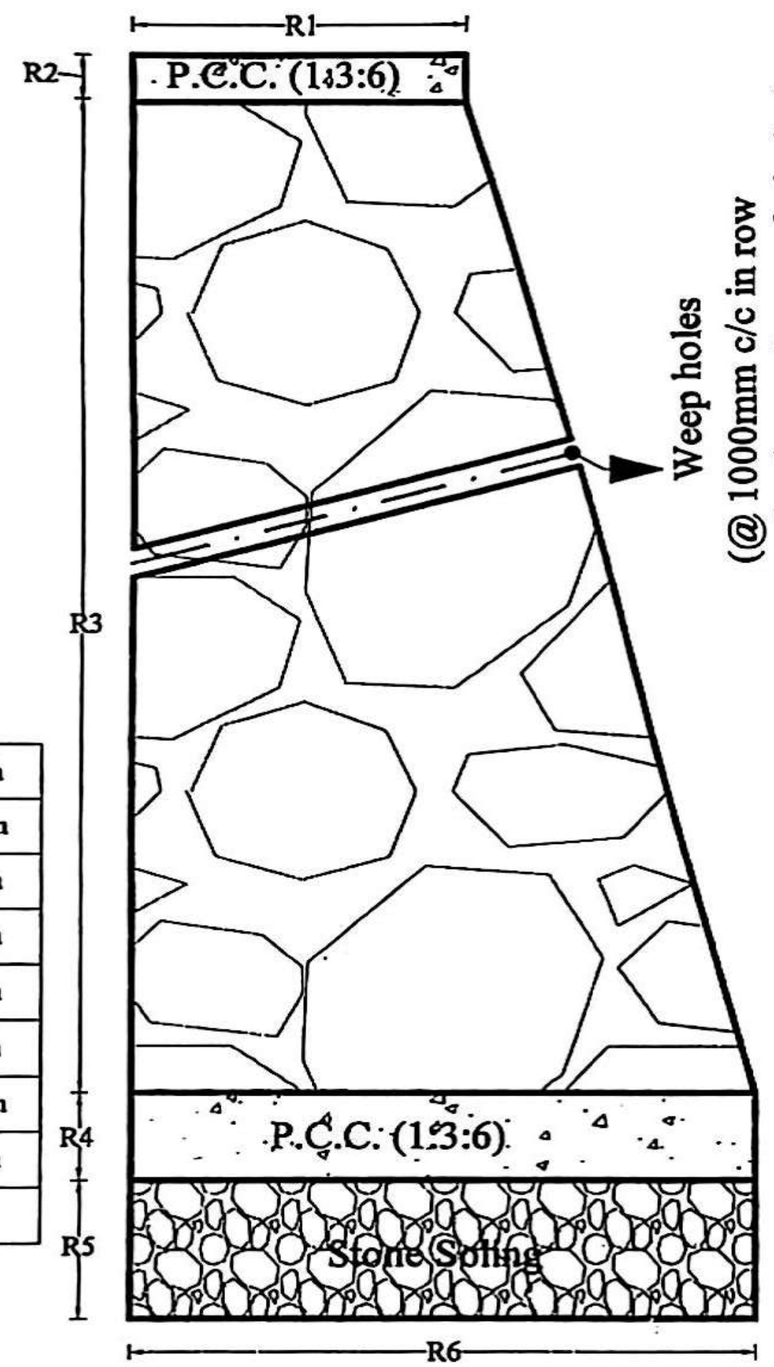
(Dimension are in mm otherwise Specified)

Machine Made Gabion



Legends:

S.N.	Location Reference	Length
1.	Ryale kholsi d/s protection	6.00 m
2.	Simle kholsi d/s protection	6.00 m
3.	Riyale kholsi d/s protection	6.00 m
4.	Birauta kholsi d/s protection	8.00 m
5.	Khahare Kholsi d/s protection	5.00 m
6.	Kathekuwa kholsi d/s protection	5.00 m
7.	Majuwa kholsi d/s protection	6.00 m



RRM wall Section

Legend:

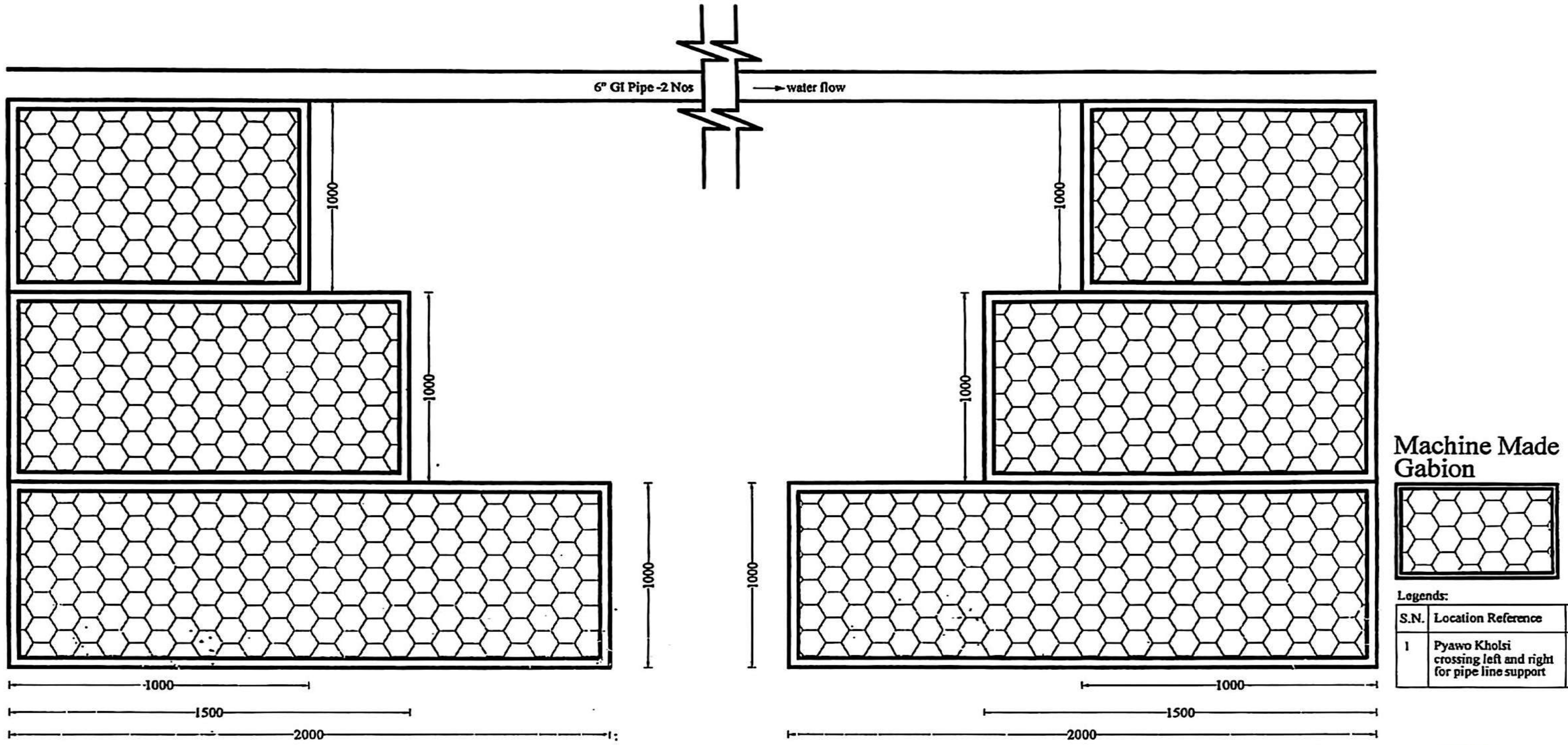
S.N.	Particulars	Location Reference: Riyale Kholsi N 28.19391, E 84.60987 point near	Location Reference: Birauta Kholsi N 28.193876, E 84.61039 point near	Remarks
1.	R1	0.50 m	0.50 m	
2.	R2	0.05 m	0.05 m	
3.	R3	2.0 m	2.50 m	
4.	R4	0.05 m	0.05 m	
5.	R5	0.10 m	0.10 m	
6.	R6	1.40 m	1.70 m	R6 = 2/3*Ht.(R3)
7.	Length	6.00 m	4+4=8.00 m	One section <= 6 m

GANDAKI PROVINCE GOVERNMENT
MINISTRY OF ENERGY WATER RESOURCE AND WATER SUPPLY
WATER RESOURCE AND IRRIGATION DEVELOPMENT DIVISION
LAMJUNG

Gairi kateri Banshphota Barhapirke IP,Dudhpokhari RM-02,
Lamjung

DRAWN BY	CHECKED BY	RECOMMENDED BY	APPROVED BY

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Machine Made Gabion

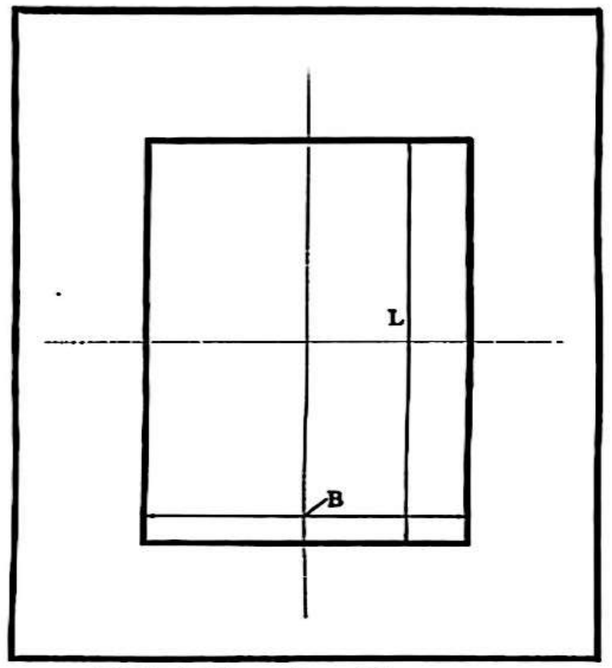
Legends:

S.N.	Location Reference	Length
1	Pyawo Kholsi crossing left and right for pipe line support	2.00 m

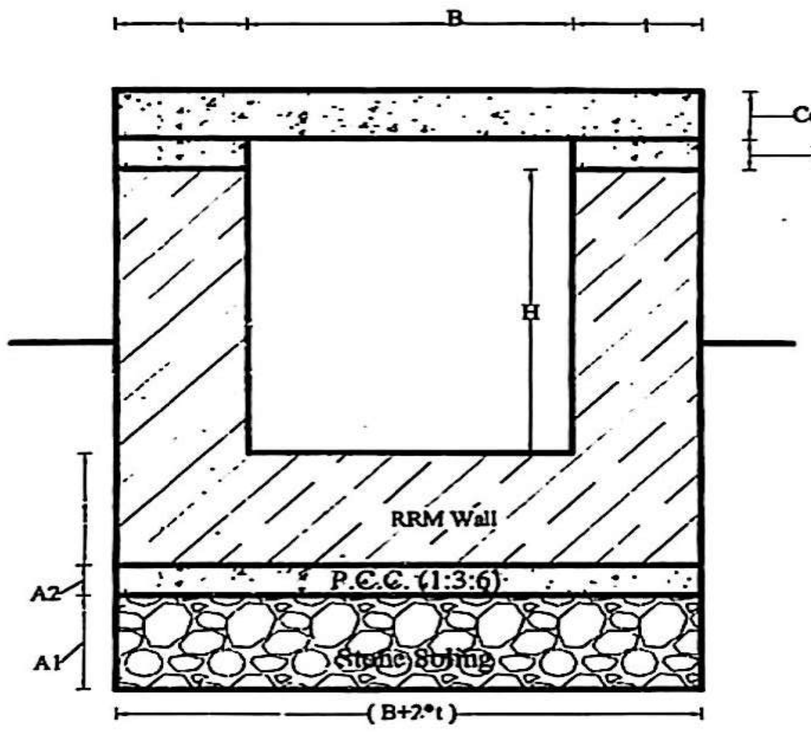
Gabion Support Works Section (Not in Scale) (Dimension are in mm otherwise Specified)

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RRM Chamber Plan



RRM Chamber Section

Cover Slab (c)

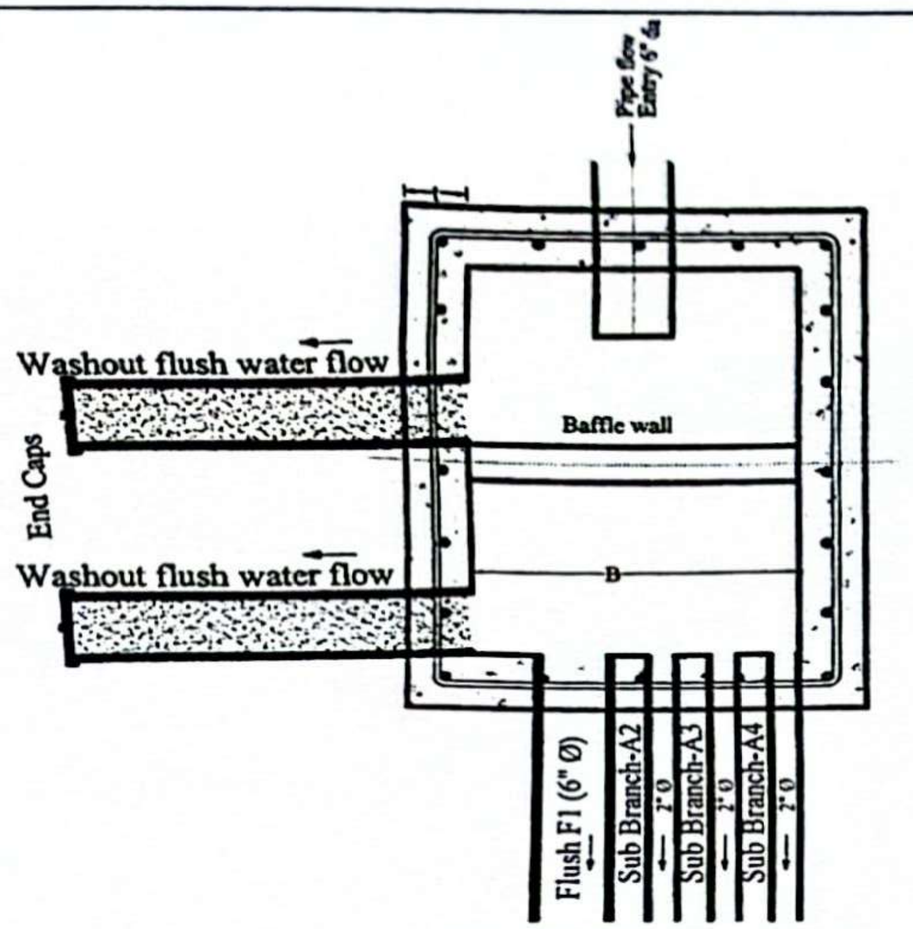
PCC Caping (1:3:6) (A2)

Legends:

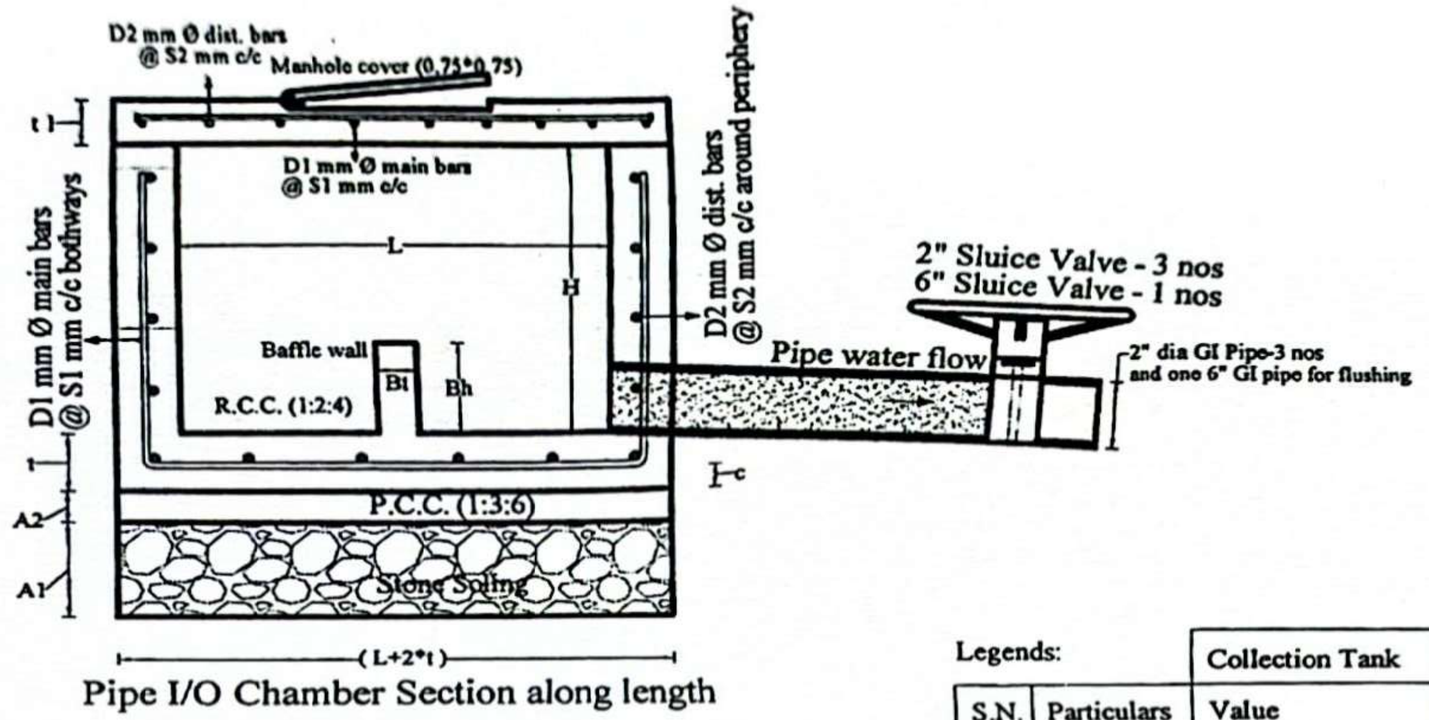
S.N.	Particulars	Humo pipe I/O Chamber-2 Nos	Valve Chamber 5 Nos	Remarks
		Value	Value	
L	A1	0.10 m	0.10 m	
2.	A2	0.10 m	0.10 m	
3.	B	1.0 m	1.50 m	
4.	H	1.0 m	1.0 m	
5.	t	0.40 m	0.30 m	
6.	c	0.10 m	0.10 m	
7.	L	1.0 m	1.50 m	

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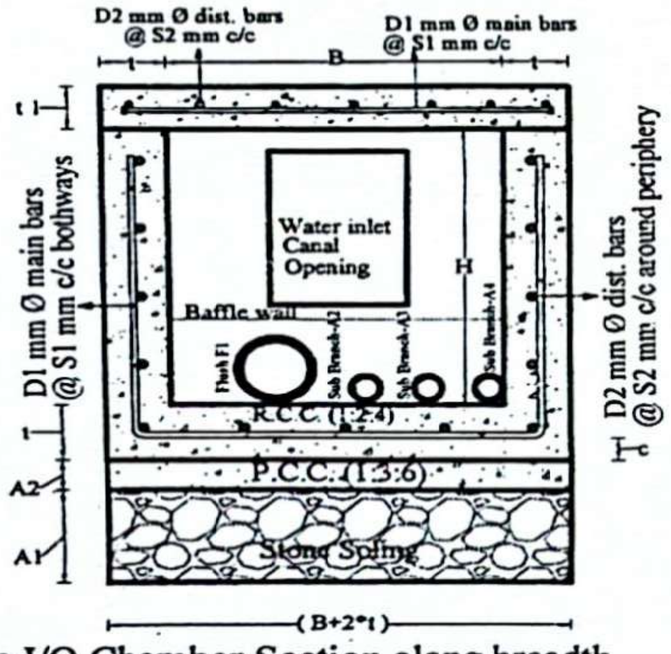
GANDAKI PROVINCE GOVERNMENT MINISTRY OF ENERGY WATER RESOURCE AND WATER SUPPLY WATER RESOURCE AND IRRIGATION DEVELOPMENT DIVISION LAMJUNG	Gairi kateri Banshphota Barhapirke IP,Dudhpokhari RM-02, Lamjung	DRAWN BY	CHECKED BY	RECOMMENDED BY	APPROVED BY	6/8



Pipe In/Out Chamber Plan



Pipe I/O Chamber Section along length



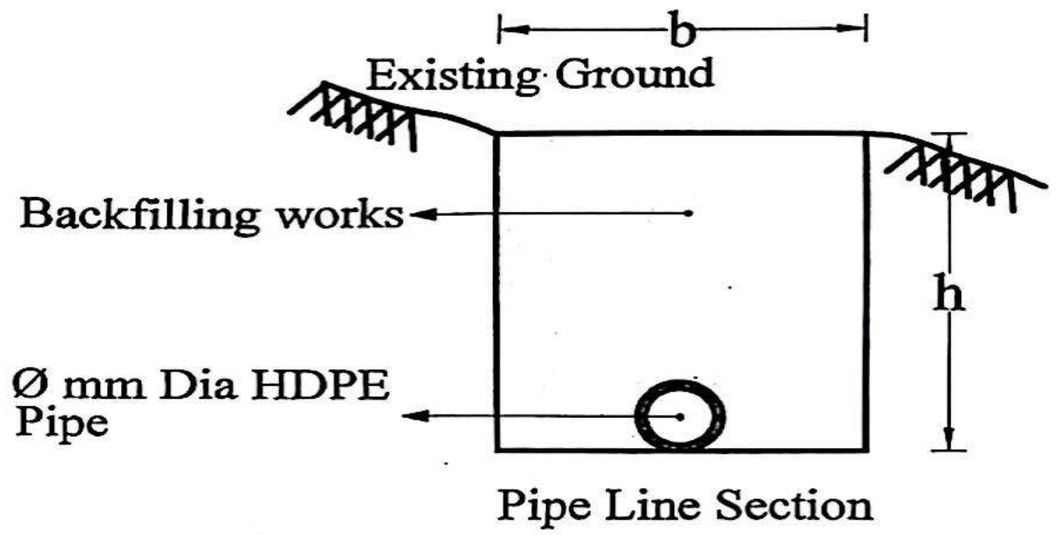
Pipe I/O Chamber Section along breadth

Legends:		Collection Tank	Remarks
S.N.	Particulars	Value	
1.	A1	0.10 m	
2.	A2	0.05 m	
3.	B	1.0 m	
4.	H	1.0 m	
5.	t	0.15 m	
6.	c	0.075 m	
7.	D1	10 mm	
8.	D2	8 mm	
9.	S1	150 mm	
10.	S2	200 mm	
11.	L	2.00 m	
12.	Bh	0.30 m	
13.	Bt	0.12 m	
14.	tl	0.12 m	

Chamber Details near Brahapirke Amasamuha Bhawan

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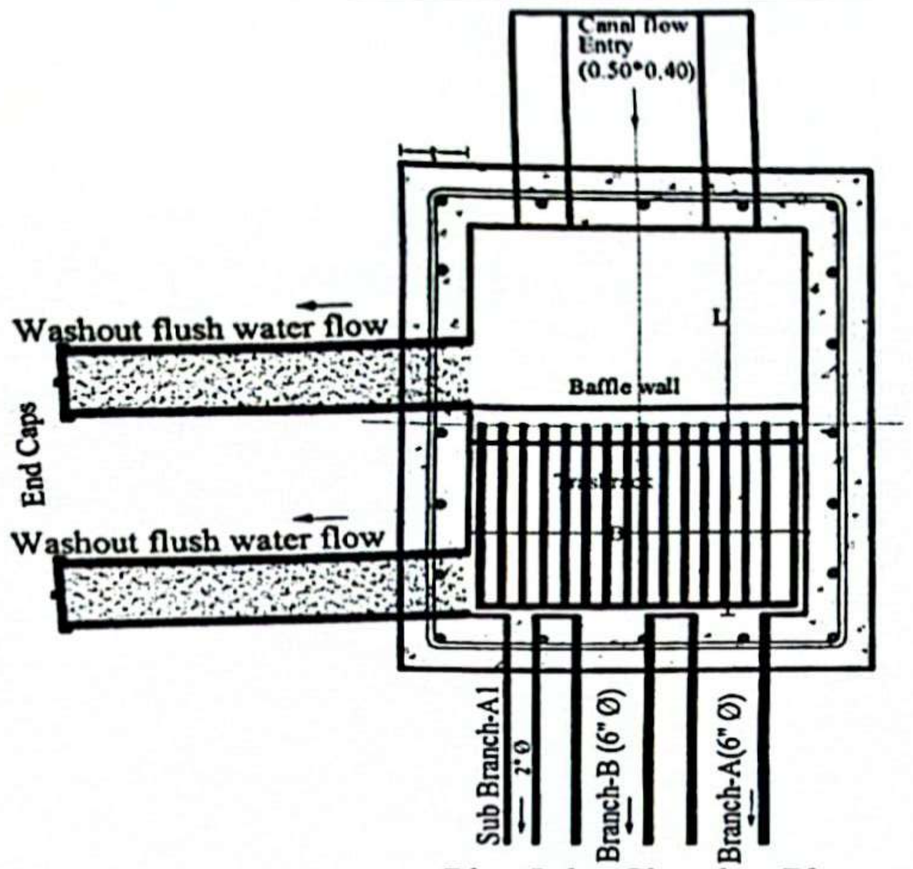
Pipe Line Section

Legends:

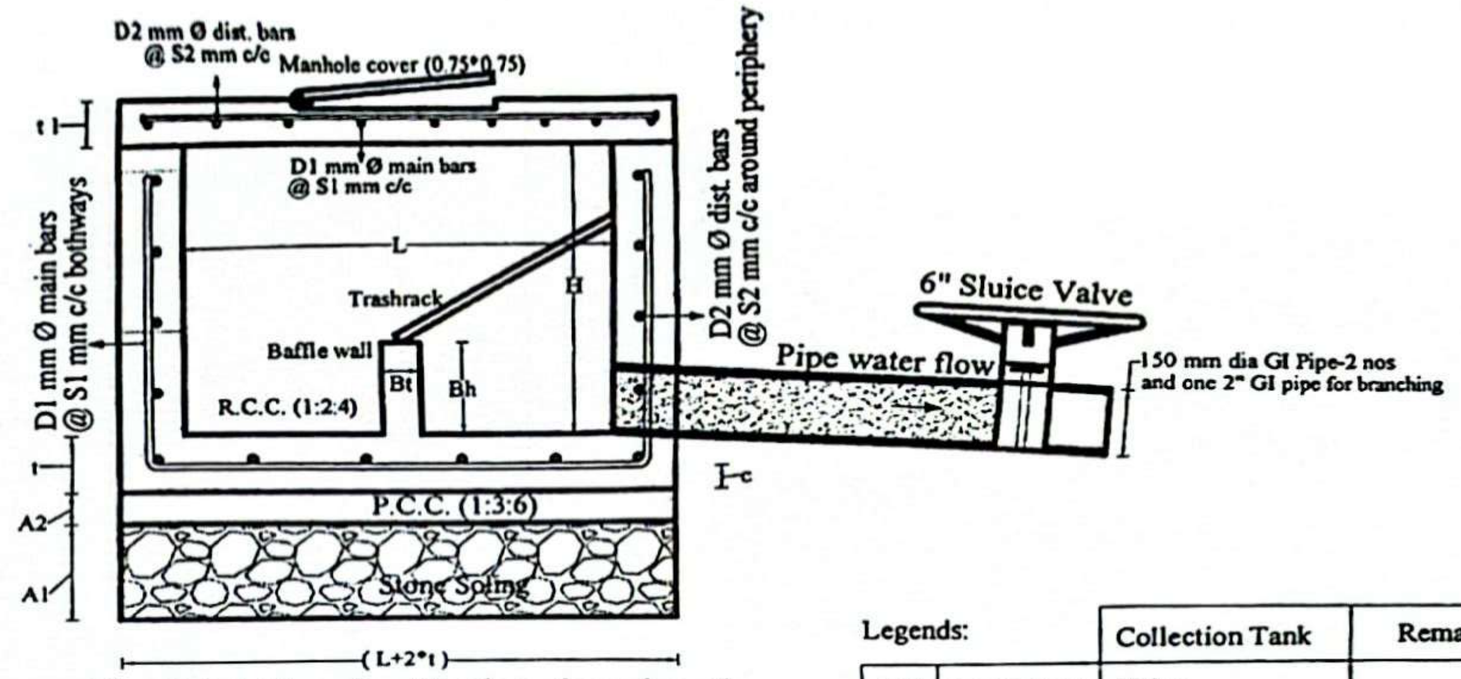
S.N.	Location reference	Dia(Ø), PN rating	Length (l)	Breadth (b)	Height (h)	Remarks
1.	From khadkapani kholsi to Barhapirke	160 mm, PN-6	368 m	0.60 m	0.70 m	Branch A only
2.	From dun danda to khadkapani kholsi	160 mm, PN-6	346 m	0.70 m	0.70 m	Branch A,B Combined
3.	Flush pipe barhapirke chamber	160 mm, PN-6	157 m	0.60 m	0.70 m	Flush F1
4.	Dum danda to local command	63 mm, PN-10	50 m	0.45 m	0.70 m	Branch A1
5.	Barhapirke chamber to command	63 mm, PN-10	50 m	0.45 m	0.70 m	Branch A2
6.	Barhapirke chamber to command	63 mm, PN-10	50 m	0.45 m	0.70 m	Branch A3
7.	Barhapirke chamber to command	63 mm, PN-10	100 m	0.45 m	0.70 m	Branch A4
7.	Raksebari outlet-1	75 mm, PN-10	12 m	0.45 m	0.70 m	Branch A5
9.	Raksebari outlet-2	75 mm, PN-10	12 m	0.45 m	0.70 m	Branch A6
10.	Manoj Neupane's house u/s	75 mm, PN-10	12 m	0.45 m	0.70 m	Branch B1

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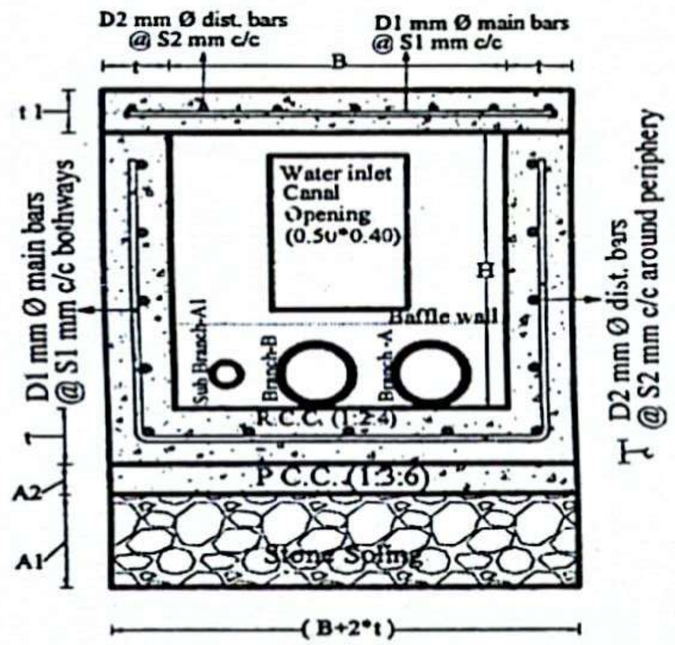
GANDAKI PROVINCE GOVERNMENT MINISTRY OF ENERGY WATER RESOURCE AND WATER SUPPLY WATER RESOURCE AND IRRIGATION DEVELOPMENT DIVISION LAMJUNG	Gairi kateri Banshphota Barhapirke IP,Dudhpokhari RM-02, Lamjung	DRAWN BY	CHECKED BY	RECOMMENDED BY	APPROVED BY	8/8



Pipe Inlet Chamber Plan



Pipe Inlet Chamber Section along length



Pipe Inlet Chamber Section along breadth

Legends:

Collection Tank	Remarks

S.N.	Particulars	Value	
1.	A1	0.10 m	
2.	A2	0.05 m	
3.	B	1.0 m	
4.	H	1.0 m	
5.	t	0.15 m	
6.	c	0.075 m	
7.	D1	10 mm	
8.	D2	8 mm	
9.	S1	150 mm	
10.	S2	200 mm	
11.	L	2.00 m	
12.	Bh	0.30 m	
13.	Bt	0.12 m	
14.	t1	0.12 m	

Chamber Details at Dum Danda

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SECTION - VI
Bill of Quantities[6]

Notes for Unit Rate Contracts :

Objectives
The objectives of the Bill of Quantities are
(a) to provide sufficient information on the quantities of Works to be performed to enable Bids to be prepared efficiently and accurately; and
(b) when a Contract has been entered into, to provide a priced Bill of Quantities for use in the periodic valuation of Works executed.

In order to attain these objectives, Works should be itemized in the Bill of Quantities in sufficient detail to distinguish between the different classes of Works, or between Works of the same nature carried out in different locations or in other circumstances which may give rise to different considerations of cost. Consistent with these requirements, the layout and content of the Bill of Quantities should be as simple and brief as possible.

Content
The Bill of Quantities should be divided generally into the following sections:
(a) Preamble;
(b) Work Items (grouped into parts);
(c) Day works Schedule;
d) Provisional Sums; and
(d) Summary.

Preamble
The Preamble should indicate the inclusiveness of the unit prices, and should state the methods of measurement which have been adopted in the preparation of the Bill of Quantities and which are to be used for the measurement of any part of the works.

Work Items
The items in the Bill of Quantities should be grouped into sections to distinguish between those parts of the Works which by nature, location, access, timing, or any other special characteristics may give rise to different methods of construction, or phasing of the Works, or considerations of cost. General items common to all parts of the works may be grouped as a separate section in the Bill of Quantities.

Day work Schedule
A Day work Schedule should be included only if the probability of unforeseen work, outside the items included in the Bill of Quantities, is high. To facilitate checking by the Employer of the realism of rates quoted by the Bidders, the Day work Schedule should normally comprise the following:

(a) A list of the various classes of labor, materials, and Constructional Plant for which basic day work rates or prices are to be inserted by the Bidder, together with a statement of the conditions under which the Contractor will be paid for work executed on a day work basis.

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[6]In lump sum contracts, delete "Bill of Quantities" and replace with "Schedule of Activities" throughout this section.

(b) *Nominal quantities for each item of Day work, to be priced by each Bidder at Day work rates as bid. The rate to be entered by the Bidder against each basic Day work item should include the Contractor's profit, overheads, supervision, and other charges.*

Provisional Sums

A general provision for physical contingencies (quantity overruns) may be made by including a provisional sum in the Summary Bill of Quantities. Similarly, a contingency allowance for possible price increases should be provided as a provisional sum in the Summary Bill of Quantities. The inclusion of such provisional sums often facilitates budgetary approval by avoiding the need to request periodic supplementary approvals as the future need arises. Where such provisional sums or contingency allowances are used, the Contract Data should state the manner in which they will be used, and under whose authority (usually the Project Manager's).

Summary

The Summary should contain a tabulation of the separate parts of the Bill of Quantities carried forward, with provisional sums for Day work, for physical (quantity) contingencies, and for price contingencies (upward price adjustment) where applicable.

These Notes for Preparing Specifications are intended only as information for the Employer or the person drafting the Bidding documents. They should not be included in the final documents.

Preamble of Bill of Quantities

A. General

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, Technical Specifications, and Drawings.

2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Project Manager and valued at the rates and prices bid in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Project Manager may fix within the terms of the Contract.

3. For any item for which measurement is based on records made before or during construction the records shall be prepared and agreed between the Engineer and the Contractor. Should the Contractor carry out such work without the prior agreement of the Engineer, the Engineer may request the Contractor to carry out investigations to confirm the extent of the work and the quantity of work certified for payment shall be solely at the Engineer's discretion. The cost of any such investigation shall be borne by the Contractor.

4. The rates and prices bid in the priced Bill of Quantities shall, except as otherwise provided under the Contract, include all construction equipment, labor, supervision, materials, erection, maintenance, insurance, profit, taxes, and duties, together with all general risks, liabilities, and obligations set out or implied in the Contract.

5. A rate or price shall be entered against each item in the priced Bill of Quantities, whether quantities are stated or not. The cost of items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bill of Quantities.

6. The whole cost of complying with the provisions of the Contract shall be included in the Items provided in the priced Bill of Quantities, and where no Items are provided, the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.

7. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities. The Specification Clause references where given in the item description of the Bills of Quantities are for the convenience of bidders and generally refer to the principal relevant- specification clause but do not necessarily represent the whole of the specification requirements for the work required within the item. The presence of a Specification clause reference shall not in any way reduce the Bidders obligation to complete work in accordance with all the requirements of the Specification.

8. Provisional Sums included and so designated in the Bill of Quantities shall be expended in whole or in part at the direction and discretion of the Project Manager in accordance with the Conditions of Contract.

9. The method of measurement of completed work for payment shall be in accordance with the Specifications.

10. The abbreviations and symbols used in this Bill of Quantities are: ***[Insert as applicable]***

B. Day work Schedule

a) General

1. Work shall not be executed on a day work basis except by written order of the Project Manager. Bidders shall enter basic rates for day work items in the Schedules. These rates shall apply to any quantity of day work ordered by the Project Manager. Nominal quantities have been indicated against each item of day work, and the extended total for day work shall, be carried forward as a Provisional Sum to the Summary Total Bid Amount. Unless otherwise adjusted, payments for day work shall be subject to price adjustment in accordance with the provisions in the Conditions of Contract.

b) Day work Labor

1. In calculating payments due to the Contractor for the execution of day works, the hours for labor will be reckoned from the time of arrival of the labor at the job site to execute the particular item of day work to the time of departure from the job site, but excluding meal breaks and rest periods. Only the time of classes of labor directly doing work ordered by the Project Manager and are competent to perform such work will be measured. The time of gangers (charge hands) actually doing work with the gangs will also be measured but not the time of foremen or other supervisory personnel.

2. The Contractor shall be entitled to payment in respect of the total time that labor is employed on day work, calculated at the basis rates entered by it in the " SCHEDULE OF DAY WORK RATES: 1. LABOR". The rates for labor shall be deemed to cover all costs to the Contractor including (but not limited to) i) the amount of wages paid to such labor, transportation time, overtime, subsistence allowances, ii) any sums paid to or on behalf of such labor for social benefits in accordance with Nepal law, iii) Contractor's profit, overheads, superintendence, liabilities and insurance and iv) charges incidental to the foregoing.

c) Day work Equipment

1. The Contractor shall be entitled to payments in respect of Constructional Plant already on site and employed

on day work at the basis rental rates entered by him in the "SCHEDULE OF DAY WORK RATES:2 EQUIPMENT ". The said rates shall be deemed to include due and complete allowance for depreciation, interest, indemnity and insurance, repairs, maintenance, supplies, fuel, lubricant, and other consumables and all overhead, profit and administrative costs related to the use of such equipment. The cost of drivers, operators and assistants also shall be included in the rate of the equipment and no separately payment shall be made for it.

2. In calculating the payment due to the Contractor for Constructional Plant employed on day work, only the actual number of working hours will be eligible for payment, except that where applicable and agreed with the Project Manager, the travelling time from the part of the Site where the Construction Plant was located when ordered by the Project Manager to be employed on day work and the time for return journey there to shall be included for payment.

d) Day work Materials

1. The Contractor shall be entitled to payment in respect of materials used for day work (except for materials for which the cost is included in the percentage addition to labor costs as detailed heretofore), at the rates entered by him in the "SCHEDULE OF DAY WORK RATES: 3 MATERIALS" and shall be deemed to include overhead charges and profit as follows;

   (i) the rates for materials shall be calculated on the basis of the invoiced price, freight, insurance, handling expenses, damage, losses, etc. and shall provide for delivery to store for stockpiling at the Site.

   (ii) the cost of hauling materials for use on work ordered to be carried out as day work, from the store or stockpile on the Site to the place where it is to be used also shall be include in the same rate.

Provisional Sums

The estimated cost of specialized work to be carried out, or of special goods to be supplied, by other contractors should be indicated in the relevant part of the Bill of Quantities as a particular provisional sum with an appropriate brief description. A separate procurement procedure is normally carried out by the Employer to select such specialized contractors. To provide an element of competition among the Bidders in respect of any facilities, amenities, attendance, etc., to be provided by the successful Bidder as prime Contractor for the use and convenience of the specialist contractors, each related provisional sum should be followed by an item in the Bill of Quantities inviting the Bidder to quote a sum for such amenities, facilities, attendance, etc.

Bill of Quantities

[insert Bill of Quantities]

Gandaki Province Government
Ministry of Energy Water Resources and Water Supply
Water Resource and Irrigation Development Division Office
Besisahar, Lamjung

Bill of Quantities (BOQ)

Name of Project:- Gairi Kateri Bansh Phota Barhapirke Sinchai Yojana
Name of Works :- RCC Canal Lining and associated works
Location:- Dudhpokhari Rural Municipality-02, Lamjung
Fiscal Year: 2083/84

S.N.	Description of Works	Unit	Quantity	Rate in figure	Rate in words	Amount (NRs.)
A	**PROVISIONAL SUM**					
1	Insurance against loss of or damage to the Works of the Contract; Insurance against accident to workmen, and loss of or damage to the Plant & Equipment of the Contract; and Third party Insurance against personal injury/death and property damage as per conditions of the Contract	Ps	1	87000	Rupees EightySeven Thousand Only	87000.00
2	Lab Test	Ps	1	29000	Rupees TwentyNine Thousand Only	29000.00
3	As Built Drawing	Ps	1	5500	Rupees Five Thousand Five Hundred Only	5500.00
4	Supply and fixing of Unforseen Fitttings items, Pipe items and accessories of required specifications and size	Ps	1	100000	Rupees One Lakh Only	100000.00
	Sub-total (Provisional Sum)					**221500.00**
B.	**Construction Work**					
1	Earthwork in excavation including disposal upto 10m lead and 1.5m lift as per drawing specifications and instruction of the engineer (in hard clay & soil mixed with soft moorum, GBM soil stones upto 30cm size) all complete.	Cu.m	1196.54			
2	Cutting thick vegetation,their roots & disposal 30m far from the site of const. site(The vegetation dia <= 30cm & density > 15Nr/100m^2).	Sq.m	300.00			
3	Providing suitable material and back filling behind abutment, wing wall, return wall and other structures in 20cm layers including compaction all complete sa per Drawing and Specifications Locally available Material (Compaction by tamping rod without watering)	Cu.m	539.35			
4	Providing and laying of stones in the foundation and levelling all complete as per drawing and specification, haulage distance upto 30m. (Stone soling works)	Cu.m	78.26			
5	Providing and laying concrete (PCC) in foundation , Vertical faces, Walls and Abutments as per Drawing and Specifications, including all lead and lift. (PCC Grade M10)	Cu.m	42.37			

Bill of Quantities (BOQ)

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Fiscal Year: 2083/84

S.N.	Description of Works	Unit	Quantity	Rate in figure	Rate in words	Amount (NRs.)
6	Providing and laying concrete (RCC) in foundation , Vertical faces, Walls and Abutments as per Drawing and Specifications, haulage distance up to 30 m (PCC Grade M15)	Cu.m	170.52			
7	Supplying, Cutting, bending and placing in position as per drawing and specification and binding by binding wire of reinforced cement steel bars for RCC works including all lead and lift. (Reinforcemet works)	Kg	6466.16			
8	Providing, Preparing and Installing form work for walls including necessary supports and removing after completion all complete as per specification and direction of engineer using plywood 9mm thick and height upto 3m. (Formworks)	Sq.m	1730.42			
9	Providing fixing and fitting of rubber/PVC seal (Min. width of 150mm & Min. thickness of 4mm) of approved quality for construction and extension joints of canal lining, using plywood as joint filler in bothside as per drawing and specification all complete. (Approx @ 36m spacing)	m	35.56			
10	Supply, Fabrication, transportation and fixation of mild steel frame for stop log, trash rack, etc at required shape and size as per engineers instruction all complete.	Kg	232.41			
11	Providing fixing and fitting of wooden stop log of 5cm thick in required place as per engineer's instruction.	Sqm	0.83			
12	Providing and laying of Random rubble stone masonry works in cement sand mortar in foundation all complete as per drawing and specifications, haulauge distance up to 30m. (Cement Sand Mortar 1:6)	Cu.m	48.34			
13	Rubble masonry works including supply of hard stone blocks and const. of wall upto 5m high (haulage distance upto 30m) (a.) Drywall	Cu.m	20.00			
14	12.5mm thick cement sand(1:4) plastering works for Wall & Floor	Sq.m	120.70			
15	Providing and making 3mm thick cement punning works including curing all complete as per drawing and specifications.	Sq.m	7.16			

Bill of Quantities (BOQ)

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Fiscal Year: 2083/84

S.N.	Description of Works	Unit	Quantity	Rate in figure	Rate in words	Amount (NRs.)
16	Providing and filling random rubble boulder/ stone in gabion box of different sizes as per drawings, specifications and direction of engineer all complete.	Cum	121.00			
17	Provide mechanically woven double twisted crates/mattress with internal diaphragm at 1m center to center (internal diaphragm are not provided in box size-1.5m*1m*1m) including rolling cutting and binding with lacing wire as per specification, Heavy zinc coated hexagonal mesh, mesh type-10*12,Mesh wire-3mm, Selvage wire-3.9, Lacing wire-2.4mm.	Sq.m	654.00			
18	Providing and laying of geotextile filter.	Sq.m	62.00			
19	Supplying Hume pipe of 45cm ø NP-3 in required place as instructed by engineer all complete.	Rm	10.00			
20	Supply and Laying HDPE Pipe PE-100 including fitting works all complete. (Outer Dia 160mm PN-6)	m	1217.00			
21	Supply and Laying of GI pipe including transportaion upto 500 m all complete 150 mm (6") GI pipes.	m	24.00			
22	Supply and Laying HDPE Pipe PE-100 including fitting works all complete. (Outer Dia 63mm PN-10)	m	250.00			
23	Supply and Laying HDPE Pipe PE-100 including fitting works all complete. (Outer Dia 75mm PN-10)	m	36.00			
24	Supply of GI Pipe (MC) threaded both side cut piece of 6" (150mm) Dia	Rm	8.00			
25	Supply of Sluice valve of 6" dia Dia	Nos	5.00			
26	Supply of Reducer Tee of 6"/(2-1/2)" Dia	Nos	5.00			
27	Supply of G.I/G.I Flange Set of 6" Dia	Set	9.00			

Bill of Quantities (BOQ)

Name of Project:- Gairi Kateri Bansh Phota Barhapirke Sinchai Yojana
Name of Works :- RCC Canal Lining and associated works
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Fiscal Year: 2083/84

S.N.	Description of Works	Unit	Quantity	Rate in figure	Rate in words	Amount (NRs.)
28	Supply of G.I/HDPE Flange Set of 6" Dia	Set	10.00			
29	Supply of HDPE/HDPE Flange Set of 6" Dia	Set	7.00			
30	Supply of G.I. Nipple of 6" Dia and 6" Length	Nos	10.00			
31	Supply of G.I Elbow of 6" Dia	Nos	5.00			
32	Supply of G.I Pipe (MC) threaded both side cut piece of (2-1/2)" Dia	Rm	2.00			
33	Supply of G.I/G.I Flange Set of 2-1/2" Dia	Set	3.00			
34	Supply of G.I Elbow of (2-1/2)" Dia	Nos	2.00			
35	Supply of G.I/HDPE Flange Set of 2-1/2" Dia	Set	3.00			
36	Supply of G.I. Nipple of 2-1/2" Dia and 6" Length	Nos	3.00			
37	Supply of Sluice valve of 2-1/2" Dia	Nos	3.00			
38	Supply of GI Pipe (MC) threaded both side cut piece of 2" Dia	Rm	4.00			
39	Supply of Sluice valve of 2" Dia	Nos	4.00			
40	Supply of G.I/ G.I. Flange set of 2" Dia	Set	4.00			
41	Supply of GI/HDPE Flange set of 2" Dia	Set	4.00			

Bill of Quantities (BOQ)

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Fiscal Year: 2083/84

S.N.	Description of Works	Unit	Quantity	Rate in figure	Rate in words	Amount (NRs.)
42	Supply placing and fixing of Manhole cover metal frame set of 75cm*75cm size	Set	2.00			
43	Supply placing and fixing of G.I End Cap of 6" Daimeter	Nos	4.00			
44	Supply placing and fixing of G.I Strainer of 2" Daimeter	Nos	4.00			
45	Fitting and fixing of pipe fitting items as per required and instructed by engineer all complete. (Fitting charge)	Ls	1.00			
	Sub-Total Construction Works Items (B)					
	VAT @ 13% of B					
	Total of Constrcution works item with VAT					
	Grand Total with VAT and PS					

PART-III CONDITIONS OF CONTRACT AND CONTRACT FORMS

Section VII: General Conditions of Contract

Water Resource and Irrigation Development Division Office, Lamjung

Construction of RCC Canal lining and canal Associated works of Gairikateri Bans Phota IP, DudhPokhari-2, Lamjung

WRIDDOL/GKIP/NCB/W/01/2083/84

General Conditions of Contract

This Section provides the General Conditions of Contract that will apply to the Contract for which the Biding document is issued.

General	
1. Definitions	1.1 Boldface type is used to identify defined terms. (a) The **Accepted Contract Amount** means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects. (b) The **Activity Schedule** is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events. (c) **Bill of Quantities** means the priced and completed Bill of Quantities forming part of the Bid. (d) **Compensation Events** are those defined in GCC 50 hereunder. (e) The **Completion Date** is the date of completion of the Works as certified by the Project Manager, in accordance with GCC 68.1. (f) The **Contract** is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC 2.3 below. (g)The **Contractor** is the party whose Bid to carry out the Works has been accepted by the Employer. (h)The **Contractor's Bid** is the completed bidding document submitted by the Contractor to the Employer. (i)The **Contract Price** is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract. (j) **Days** are calendar days; months are calendar-months. (k) **Dayworks** are varied work inputs subject to payment on a time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant. (l) A **Defect** is any part of the Works not completed in accordance with the Contract. (m) The **Defects Liability Certificate** is the certificate issued by Project Manager upon correction of defects by the Contractor. (n) The **Defects Liability Period** is the period calculated from the Completion Date where the Contractor remains responsible for remedying defects. (o) **Drawings** include calculations and other information provided or approved by the Project Manager for the execution of the Contract. (p) The **Employer** is the party who employs the Contractor to carry out the Works, as **specified in the SCC**. (q) **Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works. (r) **Force Majeure** means an exceptional event or circumstance: which is beyond a Party's control; which such Party could not reasonably have provided against before entering into the Contract; which, having arisen, such Party could not reasonably

	have avoided or overcome; and, which is not substantially attributable to the other Party. (s) The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of Acceptance. (t) **In writing** or **written** means hand written, type written, printed or electronically made, and resulting in permanent record. (u) The **Intended Completion Date** is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is **specified in the SCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order. (v) **Letter of Acceptance** means the formal acceptance by the Employer of the Bid and denotes the formation of the contract at the date of acceptance. (w) **Materials** are all supplies, including consumables, used by the Contractor for incorporation in the Works. (x) **Party** means the Employer or the Contractor, as the context requires. (y) **SCC** means Special Conditions of Contract (aa) **Plant** is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function. (bb) The **Project Manager** is the person **named in the SCC** (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract. (cc) **Retention Money** means the aggregate of all monies retained by the Employer pursuant to GCC 54.1. (dd) **Schedules** means the document(s) entitled schedules, completed by the Contractor and submitted with the Letter of Bids, as included in the Contract. Such document may include the Bill of Quantities, data, lists, and schedules of rates and/or prices. (ee) The **Site** is the area defined **as such in the SCC.** (ff) **Site Investigation Reports** are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site. (gg) **Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager. (hh) The **Start Date** is given i**n the SCC**. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates. (ii) A **Subcontractor** is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site. (jj) **Temporary Works** are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works. (kk) A **Variation** is an instruction given by the Project Manager which varies the Works (ll) The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as **defined in the SCC**.

2. Interpretation	2.1 In interpreting these GCC, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.
	2.2 If sectional completion is **specified in the SCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion Date for the whole of the Works).
	2.3 The documents forming the Contract shall be interpreted in the following order of priority: (a) Contract Agreement, (b) Letter of Acceptance, (c) Letter of Bid, (d) Special Conditions of Contract, (e) General Conditions of Contract, (f) Specifications, (g) Drawings, (h) Bill of Quantities (or Schedules of Prices for lump sum contracts), and (i) Any other document **listed in the SCC** as forming part of the Contract.
3. Language and Law	3.1 The language of the Contract and the law governing the Contract are **stated in the SCC**.
	3.2 Throughout the execution of the Contract, the Contractor shall comply with the import of goods and services prohibitions in the Employer's country when (a) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Employer's Country prohibits any import of goods from, or any payments to, a particular country, person, or entity. Where the Employer's country prohibits payments to a particular firm or for particular goods by such an act of compliance, that firm may be excluded.
4.Contract Agreement	4.1 The Parties shall enter into a Contract Agreement within 15 days after the Contractor receives the Letter of Acceptance, unless the Special Conditions establish otherwise. The Contract Agreement shall be based upon the attached Contract forms in Section IX.
	4.2 Without altering the basic nature or scope of work, the contract may be amended upon mutual written consent as per prevailing Public Procurement Law.

5. Assignment	5.1 Neither Party shall assign the whole or any part of the Contract or any benefit or interest in or under the Contract. However, either Party (a) may assign the whole or any part with the prior agreement of the other Party, at the sole discretion of such other Party; and (b) may, as security in favor of a bank or financial institution, assign its right to any moneys due, or to become due, under the Contract.
6. Care and Supply of Documents	6.1 The Specification and Drawings shall be in the custody and care of the Employer. Unless otherwise stated in the Contract, one copy of the Contract and of each subsequent Drawing shall be supplied to the Contractor, who may make or request further copies at the cost of the Contractor.
	6.2 Each of the Contractor's Documents shall be in the custody and care of the Contractor, unless and until taken over by the Employer. Unless otherwise stated in the Contract, the Contractor shall supply to the Engineer six copies of each of the Contractor's Documents.
	6.3 The Contractor shall keep, on the Site, a copy of the Contract, publications named in the Specification, the Contractor's Documents (if any), the Drawings and Variations and other communications given under the Contract. The Employer's Personnel shall have the right of access to all these documents at all reasonable times.
	6.4 If a Party becomes aware of an error or defect in a document which was prepared for use in executing the Works, the Party shall promptly give notice to the other Party of such error or defect.
7. Confidential Details	7.1 The Contractor's and the Employer's Personnel shall disclose all such confidential and other information as may be reasonably required in order to verify the Contractor's compliance with the Contract and allow its proper implementation.
	7.2 Each of them shall treat the details of the Contract as private and confidential, except to the extent necessary to carry out their respective obligations under the Contract or to comply with applicable Laws. Each of them shall not publish or disclose any particulars of the Works prepared by the other Party without the previous agreement of the other Party. However, the Contractor shall be permitted to disclose any publicly available information, or information otherwise required to establish his qualifications to compete for other projects.
	7.3 Notwithstanding the above, the Contractor may furnish to its Subcontractor(s) such documents, data and other information it receives from the Employer to the extent required for the Subcontractor(s) to perform its work under the Contract, in which event the Contractor shall obtain from such Subcontractor(s) an undertaking of confidentiality similar to that imposed on the Contractor under this Clause.

8. Compliance with Laws	8.1 The Contractor shall, in performing the Contract, comply with applicable Laws of Nepal.
9. Joint and Several Liability	9.1 If the Contractor is a joint venture of two or more entities , all such entities shall be jointly and severally liable to the Employer for the fulfillment of the provisions of the Contract, and shall designate one of such persons to act as a leader with authority to bind the joint venture. **The contractor shall not handover the responsibility of the contract to any one member or some members of Joint Venture or any other parties, not involved in the contract.** The composition or the constitution of the joint venture shall not be altered without the prior consent of the Employer.
10. Project Manager's Decisions	10.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.
11. Delegation	11.1 The Project Manager may delegate any of his duties and responsibilities to other people after notifying the Contractor, and may cancel any delegation after notifying the Contractor.
12. Communications	12.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. Wherever these Conditions provide for the giving or issuing of approvals, certificates, consents, determinations, notices and requests, these communications shall be: (a) in writing and delivered by hand (against receipt), sent by mail or courier, or transmitted using any of the agreed systems of electronic transmission as **stated in the SCC**; and (b) delivered, sent or transmitted to the address for the recipient's communications as stated in the Contract. However: (i) if the recipient gives notice of another address, communications shall thereafter be delivered accordingly; and (ii) if the recipient has not stated otherwise when requesting an approval or consent, it may be sent to the address from which the request was issued. Approvals, certificates, consents and determinations shall not be unreasonably withheld or delayed.
	12.2 A Notice shall be effective when delivered or on the Notice's effective date, whichever is later.
13. Subcontracting	13.1 **For GON Funded:** A list of approved Subcontractors including its value/works is included as Article 2 (k) of contract Agreement. Approval by the Employer for any of the Subcontractors shall not relieve the Contractor from any of its obligations, duties, or responsibilities under the contract. **For DP Funded:** The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in

	writing. Subcontracting shall not alter the Contractor's obligations. Bidders may propose subcontracting up to the percentage of total value of contracts as specified in the SCC. The Sub contractor shall meet the qualification requirement as specified **in SCC.** 13.2 The contractor shall give prior notice to the Employer clearly specifying the nature, scope, and responsibilities of the work to be performed, to engage other subcontractors, material suppliers, equipment suppliers, service providers, or other persons or entities during the implementation of the contract. 13.3 Before notifying the Employer as per GCC 13.2, the contractor shall enter into a written agreement with the subcontractor, material suppliers, equipment suppliers, service providers, or other persons or entities clearly specifying the scope of work, responsibilities, quality requirements, duration, payment terms, security, labor-related obligations, and conditions relating to performance of the work. 13.3 Any subcontracting arrangement made in accordance with GCC 13.2 shall not relieve the Contractor of any of its obligations or liabilities under the Contract. 13.4 The contractor shall provide the Employer with details of the payments made to the subcontractor, material suppliers, equipment suppliers, service providers, or other persons or entities engaged under GCC 13.1 and/or GCC 13.2. 13.5 If the contractor is found not to have made payment to the subcontractor, material suppliers, equipment suppliers, service providers, or other persons or entities engaged under GCC 13.1 and/or GCC 13.2 in accordance with the terms of the agreement, the Employer may determine the amount payable to such subcontractor, material suppliers, equipment suppliers, service providers, or other persons or entities and make payment to them from any remaining dues to be paid to the contractor, retention money, or forfeited performance security.
14. Other Contractors	14.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, **as referred to in the SCC**. The Contractor shall also provide facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification
15 Personnel and Equipment	15.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid to carry out the Works, or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.
	15.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection

	with the work in the Contract.
	15.3 If the Employer, Project Manager, or Contractor determines, that any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or other prohibited practices during the execution of the Works, then that employee shall be removed in accordance with Clause 15.2 above.
16. Employer's and Contractor's Risk	16.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.
17. Employer's Risks	17.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer's risks: (a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to (i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or (ii) negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor. (b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.
	17.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer's risk except loss or damage due to (a) a Defect which existed on the Completion Date, (b) an event occurring before the Completion Date, which was not itself an Employer's risk, or (c) the activities of the Contractor on the Site after the Completion Date.
18. Contractor's Risks	18.1 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer's risks are Contractor's risks.
19. Insurance	19.1 The Contractor shall provide insurance in the joint names of the Employer and the Contractor from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles **stated in the SCC** for the following events which are due to the Contractor's risks: (a) loss of or damage to the Works, Plant, and Materials;

	(b) loss of or damage to Equipment; (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and (d) Personal injury or death.
	19.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the proportions of Nepalese Rupees required to rectify the loss or damage incurred.
	19.3 If the Contractor does not provide any of the policies and certificates required, the Employer may affect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.
	19.4 Alterations to the terms of insurance shall not be made without the approval of the Project Manager.
	19.5 Both parties shall comply with any conditions of the insurance policies.
20. Site Investigation Reports	20.1 The Contractor, in preparing the Bid, shall rely on any Site Investigation Reports referred to **in the SCC**, supplemented by any information available to the Contractor.
21. Contractor to Construct the Works	21.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.
22. The Works to Be Completed within intended Completion Date	22.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them within the intended Completion Date.
23. Design by contractor and Approval by the Project Manager	23.1 The contractor shall be responsible for the design of permanent works as **specified in SCC**.
	23.2 Contractor shall be responsible for design of the Temporary Works. The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, for his approval.
	23.3 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, shall be subject to prior approval by the Project Manager

	before their use.
	23.4 The Project Manager's approval shall not alter the Contractor's responsibility for design of temporary works.
24. Safety, Security and Protection of the Environment	24.1 The Contractor shall, throughout the execution, and completion of the works and remedying of any defects therein: a. Have full regard for the safety of all persons entitled to be upon the site and keep the site (so as the same is under his control) and the works (so far as the same are not completed or occupied by the Employer) in an orderly state appropriate to the avoidance of danger to such persons. b. Provide and maintain at his own cost all lights, guards, fencing, warning signs and watching, when necessary or required by the Project Manager or by any duly constituted authority, for the protection of the Works of for the safety and convenience of the public or others. c. Take all reasonable steps to protect the environment on and off the site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation. d. Ensure that any cut or fill slopes are planted in grass or other plant cover as soon as possible to protect them from erosion. e. Any spoil or material removed from drains shall be disposed of to designated stable tipping areas as directed by the Project Manager. f. Shall not use fuel wood as a means of heating during the processing or preparation of any materials forming part of the works. g. The Project Manager shall have the power to disallow any working practice or activity of the Contractor or direct that such practices or activities be modified should the Project Manager consider, on the advice of the relevant Government Departments, that the practices or activities will be harmful to wildlife. h. Provide on the Site such lifesaving apparatus as may be appropriate and an adequate and easily accessible first aid outfit or such outfits as may be required by any government ordinance, factory act, etc., subsequently published and amended from time to time.
	24.2 The Contractor shall comply with the Employer's Occupational Health and Safety (OHS) Policy, Guideline and/or Operating Manual, if any, **as specified in the SCC.**
25. Discoveries	25.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site shall be the property of the employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.
26. Possession of the Site	26.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date **stated in the SCC**, the Employer shall be deemed to have delayed the start of the relevant activities, and this shall be a

	Compensation Event.
27. Access to the Site	27.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.
28.Instructions, Inspections and Audits	28.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.
	28.2 The Contractor shall keep, and shall make all reasonable efforts to cause its Subcontractors and sub consultants to keep accurate and systematic accounts and records in respect of the Works in such form and details as will clearly identify relevant time changes and costs.
	28.3 The Contractor shall permit the GoN/DP and/or persons appointed by the GoN/DP to inspect the Site and/or the accounts and records of the Contractor and its sub-contractors relating to the performance of the Contract, and to have such accounts and records audited by auditors appointed by the GoN/DP if required by the GoN/DP. The Contractor's attention is drawn to Sub-Clause 73.2 which provides, inter alia, that acts intended to materially impede the exercise of the GoN's/DP's inspection and audit rights provided for under this Sub-Clause constitute a obstructive practice subject to contract termination.
29.Dispute Settlement	29.1 The Employer and the Contractor shall attempt to settle amicably by direct negotiation any disagreement or dispute arising between them under or in connection with the Contract.
	29.2 Any dispute between the Parties as to matters arising pursuant to this Contract which cannot be settled amicably within thirty (30) days after receipt by one Party of the other Party's request for such amicable settlement may be referred to Arbitration within 30 days after the expiration of amicable settlement period.
30. Procedures for Disputes	30.1 In case of arbitration, the arbitration shall be conducted in accordance with procedures in accordance with law of Nepal at the place **given in the SCC**.
B. Staff and Labor	
31. Forced Labor	31.1 The Contractor shall not employ forced labor, which consists of any work or service, not voluntarily performed, that is exacted from an individual under threat of force or penalty. This covers any kind of involuntary or compulsory labor, such as indentured labor, bonded labor, or similar labor–contracting arrangements.
32. Child Labor	32.1 The Contractor shall not employ children in a manner that is economically exploitative, or is likely to be hazardous, or to interfere with, the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development. Where national laws have provisions for employment of minors, the Contractor shall follow those laws applicable to the Contractor. Children below the age of 18 years shall not be employed in dangerous work.
33.Non-discriminatio	33.1 The Contractor shall not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. The Contractor shall base

n and Equal Opportunity	the employment relationship on the principle of equal opportunity and fair treatment, and shall not discriminate with respect to aspects of the employment relationship, including recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, promotion, termination of employment or retirement, and discipline. In countries where national law provides for non-discrimination in employment, the Contractor shall comply with national law. When national laws are silent on nondiscrimination in employment, the Contractor shall meet this Sub clause's requirements. Special measures of protection or assistance to remedy past discrimination or selection for a particular job based on the inherent requirements of the job shall not be deemed discrimination.
B1. Time Control	
34. Program	34.1 Within the time **stated in the SCC**, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.
	34.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.
	34.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period **stated in the SCC**. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount stated in the SCC from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Contractor shall Provide an updated Activity Schedule within 15 days of being instructed to by the Project Manager.
	34.4 The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.
35. Extension of the Intended Completion Date	35.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost.
	35.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information at least 21 days prior to the intended completion date. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date. Along with full

	supporting information, the contractor shall also submit a revised work schedule and ensure that the Performance Security, Insurance, and Advance Payment Security remain valid. Within fifteen (15) days of the receipt of Letter of Extension of Intended Completion Date from the Employer, the contractor shall submit Performance Security, Advanced Payment Guarantee (if any) and Insurance Policy documents as required with extended validity. 35.3 If the contractor fails to submit Performance Security, Advanced Payment Guarantee (if any) and Insurance Policy documents, as required with extended validity within the prescribed time as per ITB 35.2, the Contractor shall pay fine at the rate of 0.01% of the final contract price (without VAT but including PS) per day for a maximum of fifteen (15) days. The Employer may deduct the fine from payments due to the Contractor.
36. Acceleration	36.1 When the Employer wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.
	36.2 If the Contractor's priced proposals for acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.
37. Delays Ordered by the Project Manager	37.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.
38.Management Meetings	38.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
	38.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.
39. Early Warning	39.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.
	39.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any

	resulting instruction of the Project Manager.
C. Quality Control	
40. Identifying Defects	40.1 The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.
41. Tests	41.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.
42.Correction of Defects	42.1 The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at issuance of taking over certificate pursuant to GCC clause 69.2, and is **defined in the SCC**. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.
	42.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.
43.Uncorrected Defects	43.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.
D. Cost Control	
44. Contract Price	44.1 In the case of a Unit Rate contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.
	44.2 In the case of a lump sum contract, the Activity Schedule shall contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for Materials on Site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.
45. Changes in the Contract Price	45.1 In the case of an Unit Rate contract: (a) If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 2 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change. (b) If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.
	45.2 In the case of a lump sum contract, the Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the

	Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.
46. Variations	46.1 All Variations shall be included in updated Programs, and, in the case of a lump sum contract, also in the Activity Schedule, produced by the Contractor.
	46.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.
	46.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.
	46.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.
	46.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.
	46.6 In the case of an Unit Rate contract, if the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in **GCC 45.1** or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.
47.Cash Flow Forecasts	47.1 When the Program, or, in the case of a lump sum contract, the Activity Schedule, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast.
48.Payment Certificates	48.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.
	48.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor within 30 days of submission by contractor.
	48.3 The value of work executed shall be determined by the Project Manager.
	48.4 The value of work executed shall comprise: (a) In the case of an Unit Rate contract, the value of the quantities of work in the Bill of Quantities that have been completed; or

	(b) In the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule.
	48.5 The value of work executed shall include the valuation of Variations and Compensation Events.
	48.6 The Project Manager may exclude any item certified in a previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.
49. Payments	49.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 30 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest as **indicated in the SCC** on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made.
	49.2 If an amount certified is increased in a later certificate or as a result of an award by an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
	49.3 Items of the Works for which no rate or price has been entered in BOQ shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.
50.Compensation Events	50.1 The following shall be Compensation Events: (a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC 26.1. (b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract. (c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time. (d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects. (e) The Project Manager unreasonably does not approve a subcontract to be let. (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site. (g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons. (h) Other contractors, public authorities, utilities, or the Employer does not

	work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor. (i) The advance payment is delayed. (j) The effects on the Contractor of any of the Employer's Risks. (k) The Project Manager unreasonably delays issuing a Certificate of Completion.
	50.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.
	50.3 As soon as information demonstrating effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.
	50.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.
51. Tax	51.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 30 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC 53.
52. Currency	52.1 The currency of Contracts shall be Nepalese Rupees.
53.Price Adjustment	53.1 Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the SCC**. If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due.
	53.2 Adjustment Formulae[7]: The formulae will be of the following general type: $$pn = A + b\frac{Ln}{Lo} + c\frac{Mn}{Mo} + d\frac{En}{Eo} + etc.$$ Where:

[7] For complex Works involving several types of construction work with different inputs, a family of Formulae will be necessary. The various items of Day work may also require different formulae, depending on the nature and source of the inputs

	pn is a price adjustment factor to be applied to the amount for the payment of the work carried out in the subject month, determined in accordance with Clause 49; *A* is a constant, specified in the Bidding Forms- Table of Price Adjustment data, representing the nonadjustable portion in contractual payments;[8]b, c, d, etc., coefficients representing the estimated proportion of each cost element (labor, materials, equipment usage, etc.) in the Works or sections thereof, net of Provisional Sums, **as specified in the SCC;** *Ln, Mn, En,* etc., are the current cost indices or reference prices of the cost elements for month "n," determined pursuant to Sub-Clause 53.4, applicable to each cost element; and *Lo, Mo, Eo,* etc., are the base cost indices or reference prices corresponding to the above cost elements at the date specified in Sub-Clause 53.4
	53.3 Sources of Indices and Weightings: The sources of indices shall be those listed in the Bidding Forms- Table of Price Adjustment data, as approved by the Project Manager and stated in SCC. Indices shall be appropriate for their purpose and shall relate to the Contractor's proposed source of supply of inputs on the basis of which his Contract shall have been computed. As the proposed basis for price adjustment, the Contractor shall have submitted with his bid the tabulation of Weightings and Source of Indices in the Bidding Forms, which shall be subject to approval by the Project Manager.
	53.4 Base, Current and Provisional Indices: The base cost indices or prices shall be those prevailing on the day 30 days prior to the latest date for submission of bids. Current indices or prices shall be those prevailing on the day 30 days prior to the last day of the period to which a particular Interim Payment Certificate is related. If at any time the current indices are not available, provisional indices as determined by the Project Manager will be used, subject to subsequent correction of the amounts paid to the Contractor when the current indices become available.
	53.5 Weightings: The weightings for each of the factors of cost given in the Bidding Forms shall be adjusted if, in the opinion of the Project Manager, they have been rendered unreasonable, unbalanced or inapplicable as a result of varied or additional work already executed or instructed under Clause 46 or for any other reason.
	53.6 Where, price adjustment provision is not applicable pursuant to Sub-clause 53.1 then the Contract is subject to price adjustment only for construction material in accordance with this clause. If the prices of the construction materials stated in the contract is increased or decreased in an unexpected manner in excess of ten (10%) percent in comparison to the base price construction material stated in Section –IV, Bidding Forms-Table of Price Adjustment Data, then the

[8] Insert a figure for factor A only where there is a part of the Contractors' expenditures which will not be subject to fluctuation in cost or to compensate for the unreliability of some indices. A should normally be 0.15. The sum of A, b, c, d, etc., should be one.

	price adjustment for the increase or decrease of price of the construction material beyond 10% shall be made by applying the following formulas: For unexpected increase in price $P = [R_1 - (R_0 \times 1.10)] \times Q$ For unexpected decrease in price P $= [R_1 - (R_0 \times 0.90)] \times Q$ Where: "P" is price adjustment amount "R_1" is the present price of the construction material (Source of indices shall be those listed in the Bidding forms) "R_0" is the base price of the construction material "Q" is quantity of the construction material consumed in construction during the period of price adjustment consideration If the Base price and source is to be proposed by the Bidder as per the provision made in Section –IV, Bidding Forms-Table of Price Adjustment Data then the Base price and source filled by Bidder for the construction material stated in the Bidding Form shall be subject to the approval of the Project manager and shall be as **stated in SCC**..
	53.7 The Price Adjustment amount shall be limited to a maximum of the initial Contract Amount **as specified in the SCC**.
	53.8 The Price Adjustment provision shall not be applicable for delayed period if the contract is not completed in time due to the delay caused by the contractor or the contract is a Lump sum Contract.
54. Retention	54.1 The Employer shall retain from each payment due to theContractor the proportion **stated in the SCC** until Completion of the whole of the Works.
	54.2 Upon the issue of a Defects Liability Certificate by the Project Manager, in accordance with GCC 70.1, half the total amount retained shall be repaid to the Contractor and half when the Contractor has submitted the evidence of submission of tax return to the concerned Internal Revenue Office.
	54.3 The Contractor may substitute retention money with an unconditional bank guarantee issued from Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law if: (a) at least eighty (80) percent of the whole works have been completed, (b) progress of the works is satisfactory in accordance with the Contract as per approved work schedule, and (c) it can be assured that the works can be completed at the intended completion date. The validity of the bank guarantee under this sub-clause shall be at least 30 days

	beyond the end of Defect Liability Period.
	54.4 If retention money is substituted by bank guarantee in accordance with clause 54.3, the bank guarantee shall be submitted either using the Retention Money Security Form included in Section X (Contract Forms) or in another Form acceptable to the employer. The validity of the bank guarantee shall be at least one month more than the end of defect liability period.
55.Liquidated Damages	55.1 The Contractor shall pay liquidated damages to the Employer at the rate per day **stated in the SCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount **defined in the SCC**. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor's liabilities.
	55.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC 49.
56. Bonus	56.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day **stated in the SCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.
57.Advance Payment	57.1 Unless otherwise **stated in SCC,** the Employer shall make advance payment to the Contractor of the amounts stated in the SCC in two equal installments by the date **stated in the SCC**, against provision by the Contractor of an unconditional bank guarantee from Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law in a form acceptable to the Employer in amounts equal to the advance payment. The guarantee shall remain effective until the advance payment has been repaid, but the amount of the guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment. The validity of the bank guarantee under this sub-clause shall be at least 30 days beyond the end of intended completion date. The contractor shall submit the list of activities for which the Advance Payment for mobilization to be used along with their time schedules.
	57.2 The Contractor is to use the advance payment only to pay for the purpose of construction site preparation, establishment of temporary camp facilities, construction of workers' housing, mobilization of labors, materials or equipment etc required specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying

	copies of invoices or other documents to the Project Manager.
	57.3 The advance payment shall be repaid by deducting proportionate amounts, **as stated in SCC**, from payments otherwise due Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.
	57.4 If the advance provided under GCC 57.1 is not repaid due to non-performance of the works under the contract, by the contractor within the time period specified in the contract, the Employer shall recover the advance by enforcing the bank guarantee as provided under GCC 57.1, and shall also recover interest on the advance amount from the contractor at a rate **stated in SCC.**
58. Securities	58.1 The Performance Security, including any additional security required as per ITB 29.5 and ITB 34.1, shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount **specified in the SCC,** by a Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law in Nepal in accordance with the conditions of Contract using Sample Form for the Performance Security included in Section IX (Contract Forms), or another form acceptable to the Employer, and denominated in Nepalese Rupees. The Performance Security shall be valid until a date 30 days beyond the end of the Defect Liability Period. However, if the bidder quoted a bid price more than fifteen (15) percent below the estimated cost, the bidder may submit a separate performance security for the amount exceeding five percent of the bid price, as per ITB 34.1 (ii) , which shall be valid until a date 30 days beyond the end of the intended completion date. Any additional performance security required as per ITB 29.5 shall be valid until a date 30 days beyond the end of the intended completion date.
	58.2 The performance security issued by any foreign Bank outside Nepal must be counter guaranteed by an Commercial Bank or Financial Institution eligible to issue Bank Guarantee as per prevailing Law in Nepal.
59. Day works	59.1 If applicable, the Day works rates in the Contractor's Bid shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
	59.2 All work to be paid for as Day works shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.
	59.3 The Contractor shall be paid for Day works subject to obtaining signed Day works forms.
60. Cost of Repairs	60.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.

F. Force Majeure	
61.Definition of Force Majeure	61.1 In this Clause, "Force Majeure" means an exceptional event or circumstance, (a) which is beyond a Party's control; (b) which such Party could not reasonably have provided against before entering into the Contract; (c) which, having arisen, such Party could not reasonably have avoided or overcome; and (d) which is not substantially attributable to the other Party.
	61.2 Force Majeure may include, but is not limited to, exceptional events or circumstances of the kind listed below, so long as conditions (a) to (d) above are satisfied: (a) war, hostilities (whether war be declared or not), invasion, act of foreign enemies; (b) rebellion, terrorism, sabotage by persons other than the Contractor's Personnel, revolution, insurrection, military or usurped power, or civil war; (c) riot, commotion, disorder, strike or lockout by persons other than the Contractor's Personnel; (d) munitions of war, explosive materials, ionizing radiation or contamination by radio-activity, except as may be attributable to the Contractor's use of such munitions, explosives, radiation or radio-activity; and (e) natural catastrophes such as earthquake, hurricane, typhoon or volcanic activity.
62. Notice of Force Majeure	62.1 If a Party is or will be prevented from performing its substantial obligations under the Contract by Force Majeure, then it shall give notice to the other Party of the event or circumstances constituting the Force Majeure and shall specify the obligations, the performance of which is or will be prevented. The notice shall be given within 14 days after the Party became aware, or should have become aware, of the relevant event or circumstance constituting Force Majeure.
	62.2 The Party shall, having given notice, be excused performance of its obligations for so long as such Force Majeure prevents it from performing them.
	62.3 Notwithstanding any other provision of this Clause, Force Majeure shall not apply to obligations of either Party to make payments to the other Party under the Contract.
63. Duty to Minimize Delay	63.1 Each Party shall at all times use all reasonable endeavors to minimize any delay in the performance of the Contract as a result of Force Majeure.
	63.2 A Party shall give notice to the other Party when it ceases to be affected by the Force Majeure.

64. Consequences of Force Majeure	64.1 If the Contractor is prevented from performing its substantial obligations under the Contract by Force Majeure of which notice has been given under GCC 62, and suffers delay and/or incurs Cost by reason of such Force Majeure, the Contractor shall be entitled subject to GCC 30 to (a) an extension of time for any such delay, if completion is or will be delayed, under GCC35 ; and (b) if the event or circumstance is of the kind described in sub-paragraphs (a) to (d) of GCC 61.2 and, in the case of subparagraphs (b) to (d), occurs in the Country, payment of any such Cost, including the costs of rectifying or replacing the Works and/or Goods damaged or destructed by Force Majeure, to the extent they are not indemnified through the insurance policy referred to in GCC 19.
	64.2 After receiving this notice, the Project Manager shall proceed in accordance with GCC 10 to agree or determine these matters.
65. Force Majeure Affecting Subcontractor	65.1 If any Subcontractor is entitled under any contract or agreement relating to the Works to relief from force majeure on terms additional to or broader than those specified in this Clause, such additional or broader force majeure events or circumstances shall not excuse the Contractor's nonperformance or entitle him to relief under this Clause.
66.Optional Termination, Payment and Release	66.1 If the execution of substantially all the Works in progress is prevented for a continuous period of 90 days by reason of Force Majeure of which notice has been given under GCC 62, or for multiple periods which total more than 150 days due to the same notified Force Majeure, then either Party may give to the other Party a notice of termination of the Contract. In this event, the termination shall take effect 7 days after the notice is given, and the Contractor shall proceed in accordance with GCC 72.5.
	66.2 Upon such termination, the Project Manager shall determine the value of the work done and issue a Payment Certificate, which shall include (a) the amounts payable for any work carried out for which a price is stated in the Contract; (b) the Cost of Plant and Materials ordered for the Works which have been delivered to the Contractor, or of which the Contractor is liable to accept delivery: this Plant and Materials shall become the property of (and be at the risk of) the Employer when paid for by the Employer, and the Contractor shall place the same at the Employer's disposal; (c) other Costs or liabilities which in the circumstances were reasonably and necessarily incurred by the Contractor in the expectation of completing the Works;

	(d) the Cost of removal of Temporary Works and Contractor's Equipment from the Site and the return of these items to the Contractor's works in his country (or to any other destination at no greater cost); and (e) the Cost of repatriation of the Contractor's staff and labor employed wholly in connection with the Works at the date of termination.
67. Release from Performance	67.1 Notwithstanding any other provision of this Clause, if any event or circumstance outside the control of the Parties (including, but not limited to, Force Majeure) arises, which makes it impossible or unlawful for either or both Parties to fulfill its or their contractual obligations or which, under the law governing the Contract, entitles the Parties to be released from further performance of the Contract, then upon notice by either Party to the other Party of such event or circumstance, (a) the Parties shall be discharged from further performance, without prejudice to the rights of either Party in respect of any previous breach of the Contract; and (b) the sum payable by the Employer to the Contractor shall be the same as would have been payable under GCC 66 if the Contract had been terminated under GCC 66.
G. Finishing the Contract	
68. Completion	68.1 The Contractor shall request the Project Manager to issue a certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the work is completed.
	68.2 In addition to the other provisions, before acceptance of the completed works, Employer shall verify and assure that such works are within the set objective, quality and appropriate to operate and use.
69. Taking Over	69.1 In the contractor's Opinion, if the works are complete and ready for taking over, the contractor may apply by notice to the Project Manager for a Taking-Over Certificate. If the Works are divided into Sections, the Contractor may similarly apply for a Taking-Over Certificate for each Section.
	69.2 The Project Manager shall, within 30 days after receiving the Contractor's application: (a) issue the Taking-Over Certificate to the Contractor if physical progress of works is at least ninety (90) percent in accordance with the Contract except for any minor outstanding work and defects (as listed in the Taking-Over Certificate) which will not substantially affect the use of the Works or Section for their intended purpose (either until or whilst this work is completed and these defects are remedied); or (b) reject the application, giving reasons and specifying the work required to be done by the Contractor to enable the Taking-Over Certificate to be issued. The Contractor shall then complete this work before issuing a further

	notice under this Sub-Clause.
	69.3 If the Engineer fails either to issue the Taking-Over Certificate or to reject the Contractor's application within the period of 30 days, and if the Works or Section (as the case may be) are substantially completed in accordance with the Contract, the Taking-Over Certificate shall be deemed to have been issued on the last day of that period.
70. Final Account	70.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 60 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 60 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.
71. Operating and Maintenance Manuals	71.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the **dates stated in the SCC**.
	71.2 If the Contractor does not supply the Drawings and/or manuals by the dates **stated in the SCC** pursuant to **GCC 71.1,** or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the SCC** from payments due to the Contractor.
72. Termination	72.1 The Employer may terminate the Contract at any time if the contractor; a. does not commence the work as per the Contract, b. abandons the work without completing, c. fails to achieve progress as per the Contract.
	72.2 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.
	72.3 Fundamental breaches of Contract shall include, but shall not be limited to, the following : a) the Contractor uses the advance payment for matters other than the contractual obligations, b) the Contractor stops work for 30 days when no stoppage of work is shown on

	the current Program and the stoppage has not been authorized by the Project Manager; c) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 30 days; d) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation. e) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 90 days of the date of the Project Manager's certificate; f) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager; g) the Project Manager gives two consecutive Notices to update the Program and accelerate the works to ensure compliance with GCC Sub clause 22.1 and the Contractor fails to update the Program and demonstrate acceleration of the works within a reasonable period of time determined by the Project Manager; h) the Contractor does not maintain a Security, which is required; i) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, **as defined in the SCC**; and j) If the Contractor, in the judgment of the Employer has engaged in corrupt or fraudulent practices in competing for or in executing the Contract, pursuant to GCC 73.1. k) The Contractor fails to submit Performance Security, Advanced Payment Guarantee (if any) and Insurance Policy documents with extended validity within the time prescribed pursuant to GCC 35.3.
	72.4 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC 72.3 above, the Project Manager shall decide whether the breach is fundamental or not.
	72.5 Notwithstanding the above, the Employer may terminate the Contract for convenience.
	72.5 Notwithstanding the above, the Employer may terminate the Contract for convenience. 72.6 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.
73.Fraud and Corruption	73.1 If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 15 days' notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site.
	73.2 Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the

	Works, then that employee shall be removed in accordance with GCC Clause 15. For the purposes of this GCC 73; (i) "corrupt practice" is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party. (ii) "fraudulent practice"[5] is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation; (iii) "collusive practice"[6] is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party; (iv) "coercive practice"[7] is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party; (v) "obstructive practice" is (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or (bb) acts intended to materially impede the exercise of the GON's/DP's inspection and audit rights provided for under GCC28.3.
	73.3 The contractor shall be prosecuted for offenses under prevailing criminal laws, if the contractor: (i) Misuses the Advance Payment or payments received from the Employer; (ii) Receives payment by submitting false information or documents; (iii) Abandons the works before completion; (iv) Commits a serious violation of the contract; or (v) Causes loss or damage to the Employer.
74. Black Listing	74.1 Without prejudice to any other rights of the Employer under this Contract, GoN, Public Procurement Monitoring Office (PPMO), on the recommendation of procuring entity, may blacklist a Bidder or contractor for its conduct for a period of one (1) to three (3) years on the following grounds and seriousness of the act committed by the bidder or contractor: (a) if it is established that the Contractor has committed substantial defect in implementation of the contract or has not substantially fulfilled its obligations under the contract or the completed work is not of the specified quality as per the contract. (b) If convicted from a court of law in a criminal offense liable to be disqualified for taking part in procurement contract,

	(c) If it is established that the Contractor has engaged in corrupt or fraudulent practices in competing for or in executing the Contract.
75. Payment upon Termination	75.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.
	75.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.
	75.3 If the Contract is terminated because of fundamental breach of Contract or for any other fault by the Contractor, the Employer may: (a) withhold further payments to the Contractor until the costs of design, execution, completion and remedying of any defects, liquidated damages (if any), and all other costs incurred by the Employer, have been established, and/or (b) recover from the Contractor any losses and damages incurred by the Employer and any extra costs of completing the Works, after allowing for any sum due to the Contractor, as Government dues. After recovering any such losses, damages and extra costs, the Employer shall pay any balance to the Contractor. (c) forfeit the Performance Security. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.
76. Property	76.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default.
77.Release from Performance	77.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the Site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it and for any work carried out afterwards to which a commitment was made.
78. Suspension of DP Loan/Credit/ Grant	78.1 In the event that the DP suspends the loan/ credit/grant to the Employer from which part of the payments to the Contractor are being made: a. the Employer is obligated to notify the Contractor of such suspension within 7 days of having received the DP's suspension notice; and b. if the Contractor has not received sums due him within the 30 days for payment provided for in GCC 49.1, the Contractor may immediately issue a 15-day

	termination notice.
79. Eligibility	79.1 The Contractor shall have the nationality of an eligible country as specified in Section V of the bidding document. The Contractor shall be deemed to have the nationality of a country if the Contractor is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
	79.2 The materials, equipment, and services to be supplied under the Contract shall have their origin in eligible source countries **as specified in SCC** and all expenditures under the Contract will be limited to such materials, equipment, and services. At the Employer's request, the Contractor may be required to provide evidence of the origin of materials, equipment, and services.
	79.3 For purposes of GCC 79.2, "origin" means the place where the materials and equipment are mined, grown, produced, or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.
80.ProjectManager's Duties and Authorities	80.1 The Project Manager's duties and authorities are restricted to the extent as **stated in the SCC**.
81.Quarries and Spoil Dumps	81.1 Any quarry operated as part of this Contract shall be maintained and left in a stable condition without steep slopes and be either refilled or drained and be landscaped by appropriate planting. Rock or gravel taken from a river shall be removed over some distance so as to limit the depth of material removed at any one location, not disrupt the river flow or damage or undermine the river banks. The Contractor shall not deposit excavated material on land in Government or private ownership except as directed by the Project Manager in writing or by permission in writing of the authority responsible for such land in Government ownership, or of the owner or responsible representative of the owner of such land in private ownership, and only then in those places and under such conditions as the authority, owner or responsible representative may prescribe.
82. Local Taxation	82.1 The prices bid by the Contractor shall include all taxes that may be levied in accordance to the laws and regulations in being in Nepal on the date 30 days prior to the closing date for submissions of Bids on the Contractor's equipment, plant and materials acquired for the purpose of the Contract and on the services performed under the Contract. Nothing in the Contract shall relieve the Contractor from his responsibility to pay any tax that may be levied in Nepal on profits made by him in respect of the Contract.
83. Value Added Tax	83.1 The Contract is not exempted from value added tax. An amount specified in the schedule of taxes shall be paid by the Contractor in the concerned VAT office

	within time frame specified in VAT regulation.
84. Income Taxes on Staff	84.1 The Contractor's staff, personnel and labor will be liable to pay personal income taxes in Nepal in respect of their salaries and wages, as are chargeable under the laws and regulations for the time being in force, and the Contractor shall perform such duties in regard to such deductions as may be imposed on him by such laws and regulations.
	84.2 The issue of the Final Account Certificate pursuant to clause GCC 70 shall be made only upon submittal by the Contractor of a certificate of income tax clearance from the Government of Nepal.
85. Duties, Taxes and Royalties	85.1 Any element of royalty, duty or tax in the price of any goods including fuel oil, and lubricating oil, cement, timber, iron and iron goods locally procured by the Contractor for the works shall be included in the Contract rates and prices and no reimbursement or payment in that respect shall be made to the Contractor.
	85.2 The Contractor shall familiarize himself with GON the rules and regulations with regard to customs, duties, taxes, clearing of goods and equipment, immigration and the like, and it will be necessary for him to follow the required procedures regardless of the assistance as may be provided by the Employer wherever possible.
	85.3 The Contractor shall pay and shall not be entitled to the reimbursement of cost of extracting construction materials such as sand, stone/boulder, gravel, etc. from the river beds or quarries. Such prices will be levied by the concerned Local Government (LG) as may be in force at the time. The Contractor, sub-contractor(s) employed directly by him and for whom he is responsible, will not be exempted from payment of royalties, taxes or other kinds of surcharges on these construction materials so extracted and paid for to the concerned Local Government (LG)
86. Member of Government, etc, not Personally Liable	86.1 No member or officer of GoN or the Employer or the Project Manager or any of their respective employees shall be in any way personally bound or liable for the act or obligations of the Employer under the Contract or answerable for any default or omission in the observance or performance of any of act, matter or thing which are herein contained.
87. Approval of Use of Explosives	87.1 No explosives of any kind shall be used by the Contractor without the prior consent of the Employer in writing and the Contractor shall provide, store and handle these and all other items of every kind whatsoever required for blasting operations, all at his own expense in a manner approved in writing by the Employer.
88 Compliance with Regulations for Explosives	88.1 The Contractor shall comply with all relevant ordinances, instructions and regulations which the Government, or other person or persons having due authority, may issue from time to time regarding the handling, transportation, storage and use of explosives.

89. Permission for Blasting	89.1 The Contractor shall at all times maintain full liaison with and inform well in advance, and obtain such permission as is required from all Government authorities, public bodies and private parties whatsoever concerned or affected, or likely to be concerned or affected by blasting operation.
90.Records of Explosives	90.1 Before the beginning of the Defects Liability Period, the Contractor shall account to the satisfaction of the Project Manager for all explosives brought on to the Site during the execution of the Contract and the Contractor shall remove all unused explosives from the Site on completion of works when ordered by the Project Manager.
91. Traffic Diversion	91.1 The Contractor shall include the necessary safety procedures regarding and pedestrian traffic diversion that is needed in execution of the works. The Contractor shall include in his costing of works, any temporary works or diversion that are needed during the construction period. All traffic diversion should be designed for the safety of both the motoring public and the men at work. It shall ensure the uninterrupted flow of traffic and minimum inconvenience to the public during the period concerned. As such, adequate warning signs, flagmen and other relevant safety precautionary measures shall be provided to warn motorists and pedestrians well ahead of the intended diversion as directed by the Project Manager. All traffic devices used shall be designed in accordance with the instruction of Project Manager.
92. Social Security Fund	92.1 The contractor shall enroll the laborers, employees, or other workforce engaged in such work in the Social Security Fund in accordance with prevailing laws. 92.2 The contractor shall be responsible to disburse the remuneration, benefits, and other payments of the laborers, employees, or workforce into the bank account of the concerned individual. 92.3 The contractor shall be responsible for ensuring that the required work permit has been obtained in accordance with prevailing laws in respect of foreign personnel.

Section VIII: Special Conditions of Contract

The following Special Conditions of Contract shall supplement the GCC. Whenever there is a conflict, the provisions herein shall prevail over those in the GCC .

Water Resource and Irrigation Development Division Office, Lamjung

Construction of RCC Canal lining and canal associated works of Gairikateri Bans Phota IP, DudhPokhari-2, Lamjung WRIDDOL/GKIP/NCB/W/01/2083/84

Special Conditions of Contract

A. General	
GCC 1.1 (p)	The Employer is ***Water Resource and Irrigation Development Division Office, Lamjung***
GCC 1.1 (u)	The Intended Completion Date for the whole of the Works shall be ***2027/06/29 AD (2084/03/15 BS)***
GCC 1.1(bb) & GCC 10.1	The Project Manager is Division Chief Project Manager and Engineer are synonyms.
GCC 1.1 (ee)	The Site is located at ***Dudhpokhari-02, Lamjung***
GCC 1.1 (hh)	The Start Date shall be **7 days from the site possession date.**
GCC 1.1 (ll)	The Works consist of Construction of RCC Canal lining and canal Associated works of Gairikateri Bans Phota IP, DudhPokhari-2, Lamjung
GCC 2.2	Sectional Completions are: ***NA***
GCC 2.3 (i)	The following documents also form part of the Contract: ***a) Contract agreement*** ***b)*** Letter of acceptance ***c)*** Letter of Bid ***d)*** Special Conditions of Contract ***e)*** General Condition of contract ***f)*** Specifications ***g)*** Drawings ***h)*** Bill of Quantities Any other documents listed in SCC as forming part of contract
GCC 3.1	The language of the contract is **ENGLISH/NEPALI** The law that applies to the Contract is the law of NEPAL
GCC 11.1	The Project Manager ***may*** delegate any of his duties and responsibilities.
GCC 12.1 (a)	The agreed electronic transmission shall be: ***iddlamjung@gmail.com***
GCC 14.1	Schedule of other contractors: ***NA***

GCC 19.1	The minimum insurance amounts and deductibles shall be: 1. The minimum cover for loss of or damage to the Works, Plant and Materials is: **115 %** of the Contract Amount. 2. The maximum deductible for insurance of the Works and of Plant and Materials is: ***1 % of the sum insured.*** 3. The minimum cover for loss or damage to immovable Equipment/plants is: ***100% (i.e Replacement Cost)*** 4. The maximum deductible for insurance of immovable Equipment/plant is ***1 % of the sum insured.*** 5. The minimum cover for loss of or damage to other property is: Rs. 1,00,000 with unlimited number of occurrences 6. The maximum deductible for insurance of other property is ***1 % of the sum insured.*** 7. The minimum cover for personal injury or death insurance i. for the Contractor's employees is that specified in the Labor act of Nepal and ii. for other people is ***: 0.7 million*** with an unlimited number of occurrences
GCC 20.1	Site Investigation Reports are: ***NA***
GCC 23.1	The following shall be designed by the Contractor: NA
GCC 24.2	*NA*
GCC 26.1	The Site Possession Date(s) shall be: **Within 7 days after signing the contract**
GCC 30.1	The place of arbitration shall be: Kathmandu, Nepal
C. Time Control	
GCC 34.1	The Contractor shall submit for approval a Program for the Works within **15** days from the date of the Letter of Acceptance.
GCC 34.3	The period between Program updates is 90 days. The amount to be withheld for late submission of an updated Program is **NA**
D. Quality Control	
GCC 42.1	The Defects Liability Period is: ***365*** days.
E. Cost Control	
GCC 49.1	***prevailing interest rate*** *= 10%*
GCC 53.1	The Contract ***is not*** subject to price adjustment, and the following information regarding coefficients
GCC 53.6	NA

GCC 53.7	NA
GCC 54.1	The proportion of payments retained is: 5 (five) percent.
GCC 55.1	The liquidated damages for the whole of the Works are 0.05 Percent of the final Contract Price (without VAT but including PS) per day. The maximum amount of liquidated damages for the whole of the Works is 10 Percent of the final Contract Price (without VAT but including PS).
GCC 56.1	The provision of bonus ***Not Applicable*** in the contract.
GCC 57.1	The provision of Advance Payments ***Applicable*** in the contract. The Advance Payments shall be:***10 percent of initial contract amount (without VAT but including PS)]*** and shall be paid in two equal installments and to the Contractor. The first installment of Five percent shall be paid to the contractor within 14 days upon submission of acceptable Bank Guarantee for advance payment and the second installment of Five percent shall be paid after the contractor completes full mobilization to the satisfaction of project manager at site upon submission of acceptable Bank Guarantee for advance payment and has fulfilled contractual obligations such as submission of insurance policies and updated work program.
GCC 57.3	Deductions from Payment Certificates will commence in the first certificate in which the value of works executed exceeds 30% of the Contract Price. Deduction will be at the rate of ***40%*** of the respective Monthly Interim Payment Certificate until such time as the advance payment has been repaid; provided that the advance payment shall be completely repaid prior to the end of 80 % of the approved contract price.
GCC 57.4	Recover interest on the advance amount from the Contractor should be at a rate of **10 %**.
GCC 58.1	The Performance Security amount is: 5 % of Bid Price.
G. Finishing the Contract	
GCC 71.1	The date by which operating and maintenance manuals are required is; NA
GCC 71.2	The date by which "as built" drawings are required is: Work Completion Date The amount to be withheld for failing to produce "as built" drawings is: NRs 10000.00 (Ten Thousand only) If required
GCC 72.3 (i)	The maximum number of days is: **200**
GCC 79.2	For GoN funded: For the purpose of Country of Origin: "all Countries"
GCC 80	The Project Manager has to obtain the specific approval of the Employer for taking any of the following actions : a. Approving subcontracting of any part of the works under General Conditions of Contract Clause 13; b. Certifying additional costs determined under General Conditions of Contract Clause 50; c. Determining start date under General Conditions of Contract Clause 1; d. Determining the extension of the intended Completion Date under General Conditions of Contract Clause 35; e. Issuing a Variation under General Conditions of Contract Clause 1 and 46, except in an

	emergency situation, as reasonably determined by the Project Manager; emergency situation may be defined as the situation when protective measures must be taken for the safety of life or of the works or of adjoining property. f. Adjustment of rates under General Conditions of Contract Clause 45;

Section IX: Contract Forms

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and when required Advance Payment Security and Retention Money Security, shall only be completed by the successful Bidder after contract award.

Letter of Intent

[on letterhead paper of the Employer]

Date: ... ……

To: .....***Name and address of the Contractor***.....

Subject: …… Issuance of letter of intent to award the contract.....

This is to notify you that, it is our intention to award the contract ... .***[insert date]*** .....for execution of the ... .***[insert name of the contract and identification number, as given in the Contract BDS/SCC]*** to you as your bid price ***Nepalese Rupees*** ..... ***[insert amount of contract price in figures and words including taxes]*** as corrected and modified in accordance with the Instructions to Bidders is hereby selected as substantially responsive evaluated bid closest to the Average Bid Price.

Authorized Signature: ……

Name: ... …….

Title: …….

CC:
[Insert name and address of all other Bidders, who submitted the bid]

[Notes on Letter of Intent
The issuance of Letter of Intent is the information of the selection of the bid of the successful bidder by the Employer and for providing information to other unsuccessful bidders who participated in the bid as regards to the outcome of the procurement process. This standard form of Letter of Intent to Award should be filled in and sent to the successful Bidder only after evaluation and selection substantially responsible evaluated bid closest to the Average Bid Price.]

Letter of Acceptance

[on letterhead paper of the Employer]

Date: ……..

To: ……*Name and address of the Contractor*……...

Subject: ……*Notification of Award*

This is to notify that your Bid for the Invitation of Bids dated *.....[Insert date of bid invitation]* ……..for execution of the……..*[Insert name of the contract and identification number, as given in the Contract BDS/SCC]* ……... for the Contract price of Nepalese Rupees *[insert amount in figures and words including taxes],* as corrected in accordance with the Instructions to Bidders is hereby accepted in accordance with the Instruction to Bidders.

You are hereby instructed to contact this office to sign the formal contract agreement within 15 days with Performance Security of **NRs**. ……. in accordance with the Conditions of Contract, using for that purpose the Performance security Form included in Section X (Contract Forms) of this Bidding Document.

Authorized Signature: ……...

Name and Title of Signatory: ……

Contract Agreement

THIS AGREEMENT made the .....day of…..between……. name of the Employer ……*(hereinafter "the Employer"),* of the one part, and ……name of the Contractor ……(hereinafter "the Contractor"), of the other part:

WHEREAS the Employer desires that the Works known as …….... name of the Contract .....should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the remedying of any defects in the sum of NRs ***…..…..[insert amount of contract price in words and figures including taxes]***(hereinafter "the Contract Price").

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract documents referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
   (a) the Letter of Acceptance;
   (b) the Letter of Bid;
   (c) the Addenda Nos ..... *[Insert addenda numbers if any]*
   (d) the Special Conditions of Contract;
   (e) the List of Eligible Countries as per GCC,
   (f) the General Conditions of Contract;
   (g) the Specification;
   (h) the Drawings;
   (i) Bill of Quantities (or Schedules of Prices for lump sum contracts), and
   (j) Table of Price Adjustment Data
   (k) List of Approved Subcontractors
   (l) .....*[Specify if there are any other document]*

3. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of Nepal on the day, month and year indicated above.

Signed by …….
for and on behalf the Contractor in the presence of
Witness, Name, Signature, Address, Date

Signed by……..
for and on behalf of the Employer in the presence of
Witness, Name, Signature, Address, Date

Witness, Name Signature, Address, Date List of Approved Subcontractors

In accordance with GCC Sub-Clause 13.1,The following Subcontractors are approved for carrying out the work as specified below.

Name of Subcontractors	Description of Works	Value/Percentage of subcontract

Performance Security

(On letterhead paper of the Bank)

..... ***Bank's Name, and Address of Issuing Branch or Office*** .....

Beneficiary: ..... ***[Insert Name and Address of Employer]*** ……..

Date: .....

Performance Guarantee No.:…….

We have been informed that ... ... ***[insert name of the Contractor, which in the case of a joint venture shall be the name of the joint venture]*** (hereinafter called "the Contractor") has been notified by you to sign the Contract No. …….. ***[insert reference number of the Contract]*** for the execution of …….. ***[insert name of contract and brief description of Works]*** (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we..... ***[insert name of the Bank]*** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of Nepalese Rupees .....***[insert amount in figures* and amount in words)*** such sum being payable in Nepalese Rupees, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the……***[insert day]***……..Day of ……***[insert month, year]***…… **, and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG), 2010 Revisions,, ICC Publication No. 758 , .except that the supporting statement under Article 15(a) is hereby excluded..

……

Seal of Bank and Signature(s)

Note:

All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

* *The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract in Nepalese Rupees.*

*** Insert the date thirty days after the date specified for the Defect Liability Period. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.*

Advance Payment Security

(On letterhead paper of the Bank)

…….. Bank's Name, and Address of Issuing Branch or Office.....

Beneficiary: ……*[Insert Name and address of employer]*

Date : ……

Advance Payment Guarantee No……..

We have been informed that **……** ***[insert name of the Contractor, which in the case of a joint venture shall be the name of the joint venture]*** (hereinafter called "the Contractor") has entered into Contract No. ..... ***[insert refrence number of the contract]*** ……dated …… ***[insert agreement date]*** with you, for the execution of ***.....[Insert name of the contract and brief description of Works]*** (hereinafter called "the Contract").

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum Nepalese Rupees ……. ***[insert amount in figures*and in words]*** is to be made against an advance payment guarantee.

At the request of the Contractor, we..... ***[insert name of the Bank]*** hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of Nepalese Rupees …….***[insert*** amount in figures***. =and amount in words]*** upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor:

(a) Used the advance payment for purposes other than the costs of mobilization in respect of the Works. Or

(b) .Has failed to repay the advance payment when it has become due and payable in accordance with the conditions of the contract, specifying the amount payable by the contractor.

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that eighty (80) percent of the Contract Price has been certified for payment, or on the .. ***[insert day]***..... day of ... ***[insert month, year]***...**, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG), 2010 Revisions,, ICC Publication No. 758 , except that the supporting statement under Article 15(a) is hereby excluded..

……

Seal of Bank and Signature(s)

Note:

All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

**The Guarantor shall insert an amount representing the amount of the advance payment in Nepalese Rupees of the advance payment as specified in the Contract.*

*** Insert the date Thirty days after the expected completion date. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.*

Retention Money Security

(On letterhead paper of the Bank)

..... Bank's Name, and Address of Issuing Branch or Office.....

Beneficiary: _____ *[Insert name and Address of Employer]*

Date: _____*[Insert date of issue]*

RETENTION MONEY GUARANTEE No.: *[Insert guarantee reference number]*

We have been informed that _____ ***[insert name of Contractor, which in the case of a joint venture shall be the name of the joint venture]*** (hereinafter called "the Contractor") has entered into Contract No. _____ ***[insert reference number of the contract]*** dated _____ with the Beneficiary, for the execution of _____ ***[insert name of contract and brief description of* Works*]*** (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, the Beneficiary retains moneys up to the limit set forth in the Contract ("the Retention Money"), and that when at least eighty (80) percent of the whole works have been completed, progress of the works is satisfactory in accordance with the Contract as per approved work schedule and it can be assured that the works can be completed at the intended completion date, payment of ***[insert the amount of the Retention Money]*** is to be made against a Retention Money guarantee.

At the request of the Contractor, we, .. . ***[insert name of the Bank]*** ……., as Guarantor, hereby irrevocably undertake to pay the Beneficiary any sum or sums not exceeding in total an amount of Nepalese Rupees _____ ***[insert amount in figures andamount in words]***[1] upon receipt by us of the Beneficiary's complying demand supported by the Beneficiary's statement, whether in the demand itself or in a separate signed document accompanying or identifying the demand, stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or show grounds for your demand or the sum specified therein.

This guarantee shall expire no later than the …***[insert day]***... day of ……***[insert month, year***… [2], and any demand for payment under it must be received by us at the office indicated above on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees (URDG), 2010 Revisions,, ICC Publication No. 758 , except that the supporting statement under Article 15(a) is hereby excluded.

……

Seal of Bank and Signature(s)

Note: All italicized text (including footnotes) is for use in preparing this form and shall be deleted from the final product.

[1]*The Guarantor shall insert the amount of the Retention Money.*

[2]*Insert the same expiry date which is 30 days more than the end of Defect Liability Period. The Employer should note that in the event of an extension of this date for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee.*

Annex-1

Table of Price Adjustment Data
[GCC 53.1]

Code	Index Description	Source of Index*	Base Value and Date	Employer's Proposed Weighting Range (coefficient)	Bidder's Proposed Weighting (coefficient)**
1	2	3	4	5	6
	Non - adjustable (A)			0.15	0.15
	Labor (b)				
	Materials (c)				
	Equipment usage (d)				
		Total			**1.00**

Note: Base value and Bidder's proposed weighting coefficient to be filled as per "Bid Form of Table of Price Adjustment Data" in Bidding Forms (Section-IV) after verification by the Employer in case of the alternative provision of Bidder proposed value and weighting coefficient.

Table of Price Adjustment Data
[GCC 53.6]

Code	Construction Material*	Unit	Base Price (NRs/Unit) ** (Ex-factory)	Source (Factory)**
1	2	3	4	5

** For the purpose of calculation of price adjustment, the Ex-factory price of the same source mentioned in the table shall be taken into consideration.

Note: Base Price and source to be filled as per "Bid Form of Table of Price Adjustment Data" in Bidding Forms (Section-IV) after verification by the Employer in case of the alternative provision of Bidder proposed source and base price.

