

**STANDARD LETTER OF AGREEMENT BETWEEN  
THE UNITED NATIONS DEVELOPMENT PROGRAMME AND  
INSTITUTE OF ENGINEERING (IOE)- CENTER FOR DISASTER STUDIES  
ON SUPPORT TO DEVELOP CONCRETE BLOCKS FROM SALVAGE MATERIALS/DEBRIS OF THE APRIL  
EARTHQUAKE THROUGH UPCYCLING PROCESS  
WHEN UNDP SERVES AS IMPLEMENTING PARTNER**

Your Excellency,

1. Reference is made to the consultations between officials of the United Nations Development Programme (hereinafter referred to as "UNDP") in Nepal and officials of Institute of Engineering (IOE)- Center for Disaster Studies (CDS) with respect to the realization of activities by *IOE-CDS* in the implementation to develop concrete blocks from salvage materials/debris of the April Earthquake through Upcycling process as specified in Attachment 1: Project Document, for which IOE has been selected as implementing partner.
2. In accordance with the Project Document and with the following terms and conditions, we confirm our acceptance of the activities to be provided by *IOE-CDS* towards the project, as specified in Attachment 2: Description of Activities (hereinafter referred to as "Activities"). Close consultations will be held between *IOE-CDS* and UNDP on all aspects of the Activities.
3. *IOE-CDS* shall be fully responsible for carrying out; with due diligence and efficiency, all Activities in accordance with its financial regulations, rules and other directives, only to the extent they are consistent with UNDP's Financial Regulations and Rules. In all other cases, UNDP's Financial Regulations and Rules must be followed.
4. In carrying out the activities under this Letter, the personnel and sub-contractors of *IOE-CDS* shall not be considered in any respect as being the employees or agents of UNDP. UNDP does not accept any liability for claims arising out of acts or omission of *IOE-CDS* or its personnel, or of its contractors or their personnel, in performing the Activities or any claims for death, bodily injury, disability, damage to property or other hazards that may be suffered by *IOE-CDS*, and its personnel as a result of their work pertaining to the Activities.
5. Any subcontractors, including NGOs under contract with *IOE-CDS*, shall work under the supervision of the designated official of *IOE-CDS*. These subcontractors shall remain accountable to *IOE-CDS* for the manner in which assigned functions are discharged.
6. The total amount of this agreement is **NPR 489,000 (NPR Four lakh eighty-nine thousand)**. Upon signature of this Letter, UNDP will make payments to *IOE-CDS*, according to the schedule of payments specified in Attachment 3: Schedule of Activities, Facilities and Payments. Following is the bank detail:

**Bank's Name: Himalayan Bank, Pulchowk**

**Account Holder's Name: IOE, Centre for Disaster Studies**

**Account Type: Current.**

**Account Number: 00600953280016**

7. *IOE-CDS* shall not make any financial commitments or incur any expenses which would exceed the budget for the Activities as set forth in Attachment 3. *IOE-CDS* shall regularly consult with UNDP concerning the status and use of funds and shall promptly advise UNDP any time when *IOE-CDS* is aware that the budget to carry out these Activities is insufficient to fully implement the project in the manner set out in the Attachment 2. UNDP shall have no obligation to provide *IOE-CDS* with

any funds or to make any reimbursement for expenses incurred by *IOE-CDS* in excess of the total budget as set forth in Attachment 3.

8. *IOE-CDS* shall submit an inception report on 4<sup>th</sup> Dec, 2015 after signing the contract and due date of the remaining deliverables will be towards the end of Jan, 2016. The report will be submitted to UNDP through the UNDP Country Director or UNDP Resident Representative within 30 days following those dates. The format will follow the standard UNDP expenditure report [a model copy of which is provided as Attachment 4]. UNDP will include the financial report by *IOE-CDS* in the financial report for [Project: Comprehensive Disaster Risk Management Programme ID: 00077652].
9. *IOE-CDS* shall submit such progress reports relating to the Activities as may reasonably be required by the project manager in the exercise of his or her duties.
10. *IOE-CDS* shall furnish a final report within 12 months after the completion or termination of the Activities, including a list of non-expendable equipment purchased by *IOE-CDS* and all relevant audited or certified financial statements and records related to such Activities, as appropriate, pursuant to its Financial Regulations and Rules.
11. Equipment and supplies that may be furnished by UNDP or procured through UNDP funds will be disposed as agreed, in writing, between UNDP and *IOE-CDS*.
12. Any changes to the Project Document which would affect the work being performed by *IOE-CDS* in accordance with Attachment 2 shall be recommended only after consultation between the parties.
13. For any matters not specifically covered by this Letter, the Parties would ensure that those matters shall be resolved in accordance with the appropriate provisions of the Project Document and any revisions thereof and in accordance with the respective provisions of the Financial Regulations and Rules of the *IOE-CDS* and UNDP.
14. The arrangements described in this Letter will remain in effect until the end of the project, or the completion of activities of *IOE-CDS* according to Attachment 2, or until terminated in writing (with 30 days' notice) by either party. The schedule of payments specified in Attachment 3 remains in effect based on continued performance by *IOE-CDS* unless it receives written indication to the contrary from UNDP.
15. Any balance of funds that is undispersed and uncommitted after the conclusion of the Activities shall be returned within 90 days to UNDP.
16. Any amendment to this Letter shall be effected by mutual agreement, in writing,
17. All further correspondence regarding this Letter, other than signed letters of agreement or amendments thereto should be addressed to [name and address of Country Director/Resident Representative, UNDP].
18. *IOE-CDS* shall keep the UNDP Country Director/Resident Representative fully informed of all actions undertaken by them in carrying out this Letter.
19. UNDP may suspend this Agreement, in whole or in part, upon written notice, should circumstances arise which jeopardize successful completion of the Activities.
20. Any dispute between the UNDP and *IOE-CDS* arising out of or relating to this Letter which is not settled by negotiation or other agreed mode of settlement, shall, at the request of either party, be submitted to a Tribunal of three arbitrators. Each party shall appoint one arbitrator, and the two arbitrators so appointed shall appoint a third arbitrator, who shall be the chairperson of the Tribunal. If, within 15 days of the appointment of two arbitrators, the third arbitrator has not been appointed, either party may request the President of the International Court of Justice to appoint

the arbitrator referred to. The Tribunal shall determine its own procedures, provided that any two arbitrators shall constitute a quorum for all purposes, and all decisions shall require the agreement of any two arbitrators. The expenses of the Tribunal shall be borne by the parties as assessed by the Tribunal. The arbitral award shall contain a statement of the reasons on which it is based and shall be final and binding on the parties.

21. If you are in agreement with the provisions set forth above, please sign and return to this office two copies of this Letter. Your acceptance shall thereby constitute the basis for IOE-CDS participation in the implementation of the project.

Yours sincerely,

**Signed on behalf of UNDP**



**Sophie Kemkhadze**  
Deputy Country Director (P), UNDP

*Date: 3 December, 2015*

**Signed on behalf of IOE-CDS**



**Nagendra Raj Sitoula**  
Director, Center for Disaster Studies (CDS)

*Date: 3 December, 2015*



**Attachment 1**

**PROJECT DOCUMENT (Attached separately)**

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## Attachment 2

### DESCRIPTION OF ACTIVITIES

Project number: 00077652

Project title: Support to develop concrete blocks from salvage materials/debris of the April Earthquake through Upcycling process

Results to be achieved by *IOE-CDS*

Provide a summary of the results to be achieved by *IOE-CDS*, particularly the outputs they are expected to produce.

- To develop, test concrete blocks made out of the salvage material with different proportions of cement and document results
- To develop guideline manual and CD with video for producing such blocks

Work to be performed by *IOE-CDS*

Explain the activities to be carried out by *IOE-CDS*.

- Debris from the field will be collected from three to four different sites with stratified sampling methods. The sample will be brought to the material testing lab of the institute.
- The debris will be segregated and cleaned so that it could be used in the concrete mix.
- A Block making key/mould will be prepared in the size of 8"X6"X12 so that the wt of the block does not exceed 20 kg for proper handling at the construction site
- From each type of material at least 3 types of concrete block will be developed with varying proportion of cement mix.
- The strength of the blocks will be tested for 7days, 14 days, 21 days and 21/28 days curing. At least 4 or 5 blocks should be made for each proportion, each infill type and each curing period. The number of blocks that will be prepared and tested will be 2X3X3X4 or 5=72 to 90.
- Documentation of process and outcomes will be prepared and submitted
- Simple guideline manual for producing block illustrated with photographs showing each step

Description of inputs:

Provide a detailed description of the project inputs by activity. This may include personnel, contracts, and training, and equipment, miscellaneous and micro-capital grants.

- Technical support to IOE-CDS to institutionalize development of concrete blocks from salvage materials/debris of the April Earthquake through Upcycling process
- Report writing and monitoring the activities
- Funding support as per the agreement.

Annexes:

Attach, as appropriate, job descriptions for consultants, terms of reference for contracts, technical specifications for equipment items, training nomination forms, etc. **As per project proposal**

**Attachment 3**

**Scheduled of Activities, Facilities and Payments**

Year 2015/2016

EXPECTED CP OUTPUTS and indicators including annual targets	PLANNED ACTIVITIES <i>List all activities to be undertaken during the year towards stated outputs</i>	Planned Budget		Budget Description	Amount NRs	Q4	Q1
		2015 - Q4	2016 - Q1				
	Transportation of Debris to the site				15,000	15,000	
	Cleaning and Segregation of Debris for Aggregate				5,000	5,000	
	Construction of key/mould for concrete block				4,000	4,000	
A guideline manual for producing block out of salvage materials based on quality testing	Casting and curing of blocks for 28 days ( it includes cement and other materials except salvage materials)				90,000	90,000	
	Testing of blocks				90,000	90,000	
	Preparation of Guideline Manual illustrating different stages of block preparation and testing				2,00,000	2,00,000	
	Preparation of report exhibiting the test results and its interpretations				50,000	50,000	
	A CD with small video capturing different stages of block preparation and testing				5,000	5,000	
	Printing, Stationary,				30,000	30,000	
					<b>4,89,000</b>	<b>4,89,000</b>	

Note:

- Expenditures for personnel services may be limited to salary, allowances and other entitlements, including the reimbursement of income taxes due and travel costs on appointment to the project, duty travel within the programme country or region and repatriation costs.
- UNDP shall be responsible for providing miscellaneous services such as secretarial assistance, postage and cable services and transportation as may be required by *IOE-CDS* in carrying out their assignment.
- Adjustments within each of the sections may be made in consultation between UNDP and *IOE-CDS*. Such adjustments may be made if they are in keeping with the provisions of the Programme Support/Project Document and if they are found to be in the best interest of the project.

Attachment 4

**MODEL UNDP EXPENDITURE REPORT**

Period Dec 2015 to Jan 2016

EXPECTED CP OUTPUTS and indicators including annual targets	PLANNED ACTIVITIES <i>List all activities to be undertaken during the year towards stated outputs</i>	Planned Budget		Payments and Expenditures		
		Budget Descrip tion	Amount	Payments received	Expenditures	Balance
A guideline manual for producing block out of salvage materials based on quality testing	Transportation of Debris to the site		15,000			
	Cleaning and Segregation of Debris for Aggregate		5000			
	Construction of key/mould for concrete block		4000			
	Casting and curing of blocks for 28 days ( it includes cement and other materials except salvage materials)		90,000			
	Testing of blocks		2,00,000			
	Preparation of Guideline Manual illustrating different stages of block preparation and testing		50,000			
	Preparation of report exhibiting the test results and its interpretations		50,000			
	A CD with small video capturing different stages of block preparation and testing		5000			
	Printing, Stationary,		30,000			
	<b>Total</b>		<b>4,89,000</b>			



**Payment Schedule**

- 100 % payment of total amount of NRs **4,89,000** will be given to the IOE-CDS after the contract has been signed.

**UNITED NATIONS DEVELOPMENT PROGRAMME**  
**Comprehensive Disaster Risk Management Programme (CDRMP)**

**Terms of Reference**

**Support to develop concrete blocks from salvage materials/debris of the April Earthquake through Upcycling process**

**Duty Station:** Sindhupalchowk and Kathmandu

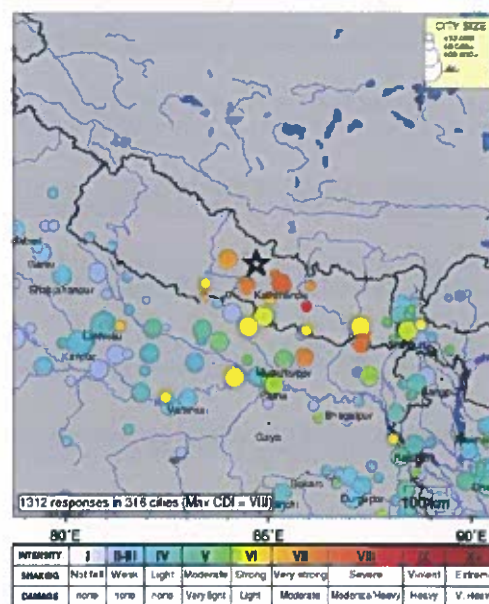
**Duration:** 2 months

**Execution Modality:** LOA

**1. Background :**

The M 7.8 Nepal earthquake of April 25, 2015 struck at 11:56: NST, with its epicenter located at 28.147°N 84.708°E in Barpak Gorkha Area of Nepal, at a shallow focal depth of 15.0 km causing huge losses to human life and economy. The mega earthquake followed by numerous aftershocks of lower magnitude, and the M 6.8 scale aftershock with epicenter in Dolkha/Sindhupalchowk caused devastation in Dolkha, Sidhupalchowk, Gorkha and surrounding districts. The unfortunate event killed more than 8000 people and injured more than 15000 populations. Further the earthquake cause damage to more than 800000 structures in the country including numerous school and health buildings. The earthquake has impacted the housing and human settlements sector the most. The total effect (damage and loss) on this sector is valued at NPRs 350,379 million, with total damage valued at NPRs 303,631 million and total loss at NPRs 46,748 million.

The PDNA carried out by Government of Nepal reveals that 31 districts badly affected by the earthquake and hence announced different packages of reliefs to its citizen. For reconstruction and rehabilitation, the GON has announced to provide Nrs 200000.00 support to the rural community whose houses are completely damaged. The support is not sufficient to reconstruct a modest house complying all the codes and standards and therefore looking towards the new alternatives in terms of materials and technologies which could be safe and affordable. Further the destruction data exhibits that most of the building collapsed are traditional buildings with stone masonry wall with mud mortar. The debris is comprised of stone, mud and wood in case of rural areas of the affected districts. In this background if a salvage material somehow could be used for the reconstruction works then it will address various issues of reconstruction ie debris management, reuse of salvage material, affordability of local people and most important the pace of construction required for reconstruction.



## **2. Rationale of the study**

The rapid damage assessment carried out by different national and international organization along PDNA of NPC revealed the fact that most of the buildings have collapse or damaged mainly due to poor workmanship, poor materials and non compliance of standards. The PDNA revealed that reconstruction could not be completed within given time frame unless new affordable and safer technology and materials are made available at the doorstep of affected people. Debris removal and management has emerged as major issues in early reconstruction. Therefore, it has been concluded that there is need for construction materials like concrete blocks which could be manufactured at local level with minimum level of skill transfer. The material need to be developed out of debris available, however the block need to strong enough to face the future disasters.

## **3. Objectives of Research:**

The overall objective of the research is to develop a concrete block out of the debris materials that could be used as major construction materials to make reconstruction affordable and faster.

The specific objectives of the program are:

1. To Develop Concrete Block out of the salvage material with different proportions of cement
2. To carry out testing of these blocks and recommend for the new constructions

## **4. Methodology**

- i. Debris from the field will be collected from three to four different sites with stratified sampling methods. The sample will be brought to the material testing lab of the institute.
- ii. The debris will be segregated and cleaned so that it could be used in the concrete mix.
- iii. A Block making key/mould will be prepared in the size of 8”X6”X12 so that the wt of the block does not exceed 20 kg for proper handling at the construction site
- iv. From each type of material at least 3 types of concrete block will be developed with varying proportion of cement mix. The three types of proposed blocks can be defined as -
  - a) blocks with stone infill;
  - b) blocks with brick infill; and
  - c) blocks with soil & stone aggregate mix
- v. The above three type of blocks also need to be made with at least two different proportion of concrete M15 and M20.
- vi. The strength of the blocks will be tested for 7days, 14 days, 21 days and 21/28 days curing. At least 4 or 5 blocks should be made for each proportion, each infill type and each curing period. The number of blocks that will be prepared and tested will be 2X3X3X4or 5=72 to 90.
- vii. Documentation of process and outcomes will be prepared and submitted
  - o photographic and video documentation of the block making and testing process
  - o Simple guideline manual for producing block illustrated with photographs showing each step (debris cleaning, separating, preparing concrete mix, casting in the mould, demoulding process, curing and stacking

### 5. Possible Outcome:

Simple guideline manual for producing block out of salvage materials based on quality testing

### 6. . Expected deliverables and proposed payment schedule :

Area/Activity			
	M1	M2	
1. Submission of Inception Report			30%
2. Draft Report of Testing of Upcycled Blocks (as in 4.iv, v, vi)			40%
3. Guideline Manual and CD with video (as in 4.vii)			30%

### 9. Qualifications:

- Technical, research, educational and training institutes, academia, NGOs, private consultancy firms that are legally registered at national levels are eligible to submit offers
- At least 5 years of past experience of earthquake safe construction training work /procedure/ programme (including on GI containment reinforced masonry construction)with any of the CDRMP national partners listed above for each activity
- Excellent and proven track record of previous partnership preferably with Government of Nepal (and its affiliated organizations and agencies) or elsewhere in earthquake resilient building construction , structural design, planning and training works
- Sufficient human and technical resources with relevant education and experience in the field of earthquake safe construction practices in Nepal

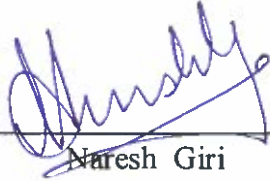
### 10. Management Arrangements and Reporting Requirements:

- The institution will work under overall supervision of CDRMP programme manager (PM) and will coordinate with the PO NBC of the CDRMP.
- The institution will provide weekly brief updates to the PM on the progress of work/challenges/ risks and will provide technical reports of each activity and areas of activities within a working week upon completion date of the activity (ies). The institution will also submit a compiled report with executive summary (not more than four page) on all provided services including analysis of lessons learned and recommendations for next courses of the programme in consultation with concerned national stakeholders in Nepal
- It will be the responsibility of the institution to consult, coordinate and liase with DUDBC and other relevant agencies to lead and carry out the activities.

**Ownership and Intellectual Property:**

- Upon payment of the contract UNDP/CDRMP and proposer agree on, the UNDP/CDRMP shall acquire ownership of all assigned deliverables in their tangible form (hard and soft copies) and their right to use them as deemed fit. The deliverables may thus not be published or used without the expressed permission of the UNDP/CDRMP.

**Prepared by:**



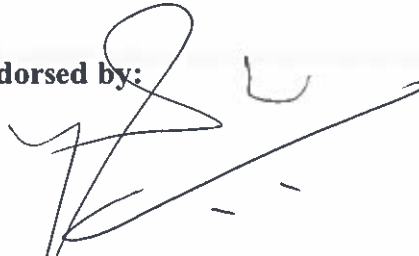
Naresh Giri  
Project Officer, NBC-RSLUP

**Approved By**



Ramraj Narasimhan  
Project Manager, a.i, CDRMP

**Endorsed by:**

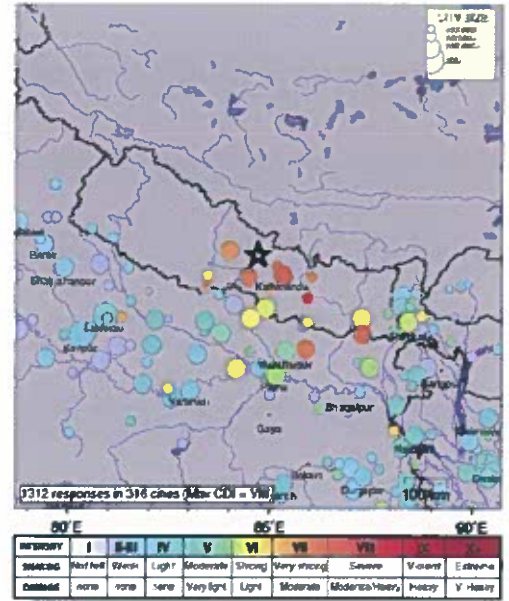


Vijaya Singh  
Assistant Country Director,  
Environment, Energy, Climate and Disaster Risk Management Unit (EECDRMU)

**A concept notes on development of concrete block from salvage materials/debris of the Mega Earthquake of April 25<sup>th</sup>, 2015**

**1. Background**

The M 7.8 Nepal earthquake of April 25, 2015 struck at 11:56: NSI, with its epicenter located at 28.147°N 84.708°E in Barpak Gorkha Area of Nepal, at a shallow focal depth of 15.0 km causing huge losses to human life and economy. The mega earthquake followed by numerous aftershocks of lower magnitude, and the M 6.8 scale aftershock with epicenter in Dolkha/Sindhupalchowk caused devastation in Dolkha, Sindhupalchowk, Gorkha and surrounding districts. The unfortunate event killed more than 8000 people and injured more than 15000 populations. Further the earthquake cause damage to more than 800000 structures in the country including numerous school and health buildings. The earthquake has impacted the housing and human settlements sector the most. The



total effect (damage and loss) on this sector is valued at NPRs 350,379 million, with total damage valued at NPRs 303,631 million and total loss at NPRs 46,748 million.

The PDNA carried out by Government of Nepal reveals that 31 districts badly affected by the earthquake and hence announced different packages of reliefs to its citizen. For reconstruction and rehabilitation, the GON has announced to provide Nrs 200000.00 support to the rural community whose houses are completely damaged. The support is not sufficient to reconstruct a modest house complying all the codes and standards and therefore looking towards the new alternatives in terms of materials and technologies which could be safe and affordable. Further the destruction data exhibits that most of the building collapsed are traditional buildings with stone masonry wall with mud mortar. The debris is comprised of stone, mud and wood in case of rural areas of the affected districts. In this background if a salvage material somehow could be used for the reconstruction works then it will address various issues of reconstruction ie debris management, reuse of salvage material, affordability of local people and most important the pace of construction required for reconstruction. Therefore, Center for Disaster Studies, Institute of Engineering is intending to carry out research on construction of concrete block out of the salvage material available around Kathmandu valley.

Center for disaster studies, a research center under the Institute of Engineering is a premier public undertaking academic institution leading the technological innovations in the country in the sector of disaster risk reduction. It does have a pool of faculties recognized at national and international level with adequate physical facilities like soil lab and material testing facilities and many more.

**2. Rationale of the study**

The rapid damage assessment carried out by different national and international organization along PDNA of NPC revealed the fact that most of the buildings have collapse or damaged mainly due to poor workmanship, poor materials and non compliance of standards. The PDNA revealed

that reconstruction could not be completed within given time frame unless new affordable and safer technology and materials are made available at the doorstep of affected people. Debris removal and management has emerged as major issues in early reconstruction. Therefore, it has been concluded that there is need for construction materials like concrete blocks which could be manufactured at local level with minimum level of skill transfer. The material need to be developed out of debris available, however the block need to strong enough to face the future disasters.

### **3. Objectives of Research:**

The overall objective of the research is to develop a concrete block out of the debris materials that could be used as major construction materials to make reconstruction affordable and faster.

The specific objectives of the program are:

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### **4. Methodology**

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  - ii) blocks with brick infill; and
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- Documentation of process and outcomes will be prepared and submitted
  - photo graphic and video of the block making and testing process
  - Simple guideline manual for producing block illustrated with photographs showing each step (debris cleaning, separating, preparing concrete mix, casting in the mould, demoulding process, curing and stacking

### **5. Time Frame**

Total Time required to accomplish the study will be about 2 months after signing the contract.

**6. Possible Outcome:**

Simple guideline manual for producing block out of salvage materials

**7. Cost Estimate of the Proposed Task:**

S. No	Description	Unit	Qty	Rate in Nrs	Amount in Nrs	Remarks
1	Transportation of Debris to the site	LS	2/3 Small Truck Load		15000	
2	Cleaning and Segregation of Debris for Aggregate	LS			5000	
3	Construction of key/mould for concrete block	No	2	2000	4000	
4	Casting and curing of blocks for 28 days ( it includes cement and other materials except salvage materials)	No	90	1000	90000	
5	Testing of blocks	No	90	1000	90000	
6	Preparation of Guideline Manual illustrating different stages of block preparation and testing				200000	
7	Preparation of report exhibiting the test results and its interpretations	Days	10		50000	
8	A CD with small video capturing different stages of block preparation and testing	Days	15		5000	
9	Printing, Stationary,				30000	
	<b>Total</b>				<b>489000</b>	

The total cost estimated for the project is Nrs. 4,89,000.