



Fulbright Lecture series
Disaster Risk Reduction and Resilience
How Far Have We Come ?

2015 Gorkha Earthquake Reconstruction

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Project Director
NRA CLPIU (Building)

30th April 2018



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- 2. Construction of Public Buildings**
- 3. Resettlement/ Relocation**
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Most of poorly constructed Houses collapsed





Hilly settlements were hit harder: Ridge effect





31 Earthquake Affected Districts





2015 Gorkha Earthquake: Basic Facts



- 25 April 2015 Saturday 11:56 am Local time (6:11 GMT)
- Magnitude: 7.8 (M_w)
- Depth: 8.2 Km
- Epicentre: Near Barpak Village, Gorkha (78km North West from Kathmandu, similar distance to the East from Pokhara)



Impacts of Gorkha Earthquake-According to PDNA



❑ Total Death – 8857

- ❖ Male – 3952
- ❖ Female - 4899
- ❖ Unknown - 6

S.N.	Types of Buildings	Completely Collapsed	Partially Damaged
1	Residential Buildings	4,98,852	2,56,697
2	Government Buildings	2,656	3,622
3	Historical and Archaeological Sites/ Monuments	133	95 partially collapsed • 515 partly damaged

Total losses: US \$7 Billion (about) and Budget Required for Reconstruction is 9.4 Billion US Dollar



After Disaster



- **Rescue**
- **Relief**
- **Rehabilitation**
- **Reconstruction**



Housing Reconstruction Outline



Overall Goal

To **“Build Back Better”**

Project Purpose

To recover and improve housing environment for disaster victims through provision of government grant to reconstruct the house in accordance with **earthquake resistance standards**

Technical Assistance Purpose

To support household to build earthquake resistant house



Emergency Response Foreign Support Commitment and Agreement

- On June 25, 2016 Donor Conference were conducted by Government of Nepal.

Commitment

- Total **3.43** billion dollar has been committed by the different Development Partners
- Grant : \$1.29 Billion
- Loan \$2.14 Billion

Agreement

- Total Agreement \$2.63 billion
- Grant \$ 0.89 billion
- Loan \$1.89
- Amount reflect in budget : \$2.25 Billion out of that \$ 0.78 Billion directly disbursed
- Emergency response has been successfully done
- Development Partners in Housing Reconstruction:
 - **JICA**: Supporting for 50,000 HHs
 - **World Bank**: Supporting for 55,000 HHs and Support for additional 95,000 HHs.
 - **GOI**: Supporting for 50,000 HHs
 - **INGOS/ NGOS**: 10000HHs
- Reconstruction of the houses is going on through **Owner Driven Approach**.



Mechanism for implementing Earthquake Reconstruction Program



**Nepal Reconstruction Authority
(NRA)**



**Central Level Project
Implementation Unit
Building**

**Central Level Project
Implementation Unit
Grant Management
and Local
Infrastructure**

**Central Level Project
Implementation Unit
Education**

**Department of
Archeology
Central Level Project
Implementation Unit**



- Technical support for Individual Housing Reconstruction
- Government Office Building Construction
- Resettlement Planning

- Grant distribution for Individual Housing Reconstruction
- Rural road reconstruction: 880 km
- Monastries Reconstruction: 1039 nos

- School Building Reconstruction

- Archeologically important monuments reconstruction



Overall Scenario of Reconstruction after Earthquake



- About 767705 Private Houses are to be constructed in 31 affected districts (that value may increase because verification of Grievances is going on) and 24991 private houses are to be retrofitted out of which 177245 houses have started construction and 73749 houses are already completed.
- 666185 individual households have done participatory agreement, 6,96,193 HHs have got first tranche, **380171** HHs have got second tranche and **126304** HHs Have got third tranche.
- 185820 grievances have been resolved.
- Training for around **2570** Engineering Technicians about Earthquake resistant Technology and Inspection Manual Training, Correction and Exceptional Manual (through IDA fund) is being conducted.



Overall Scenario of Reconstruction after Earthquake

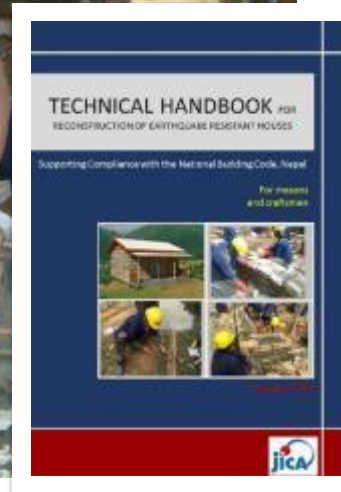
- **Mason Trainings** in all affected district is being conducted through IDA fund, JICA fund and different I/NGOs. About 50000 masons have been prepared and Government is planning for another 50000.
- Awareness Program to House-owner and community through IEC material, interactive session, door to door service through DLPIU Engineers and other communication mediums is ongoing.
- **Design Catalogue Volume I ,Volume II** for alternative technologies, more design on RCC Structure, Dry-stone with confinement, Confined Masonry is approved by CLPIU for implementation in the field.



1. Housing Reconstruction



- **Mason Training (2,157)** : Dec 2015 ~ Mar 2017

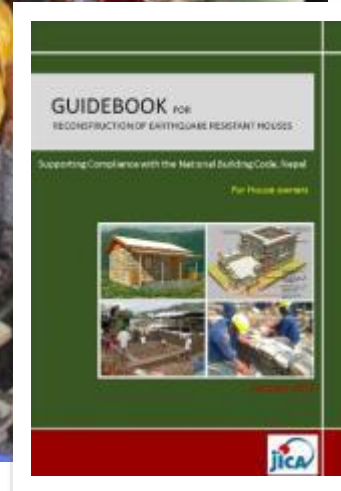




1. Housing Reconstruction



- **Mason Training (2,157)** : Dec 2015 ~ Mar 2017
- **House owner Training (6,518) and Public awareness campaign** : Jan 2016 ~ Mar 2017





1. Housing Reconstruction Outline



- **Mason Training (2,157)** : **Dec 2015 ~ Mar 2017**
- **House owner Training (6,518) and Public awareness campaign** : **Jan 2016 ~ Mar 2017**
- **Enrolment camp for Participation Agreement** : **Apr 2016 ~ Sep 2016**





1. Housing Reconstruction



- **Mason Training (2,157)** : **Dec 2015 ~ Mar 2017**
- **House owner Training (6,518) and Public awareness campaign** : **Jan 2016 ~ Mar 2017**
- **Enrolment camp for Participation Agreement** : **Apr 2016 ~ Sep 2016**
- **Minimum Requirement and Inspection sheet** : **Nov 2016**





1. Housing Reconstruction



- **Mason Training (2,157)** : **Dec 2015 ~ Mar 2017**
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- **Enrolment camp for Participation Agreement** : **Apr 2016 ~ Sep 2016**
- **Minimum Requirement and Inspection sheet** : **Nov 2016**
- **Training for DLPIU Engineers (ToT: 493 Inspection training: 401)** : **Dec 2016**





Housing Reconstruction with Earthquake Resilience

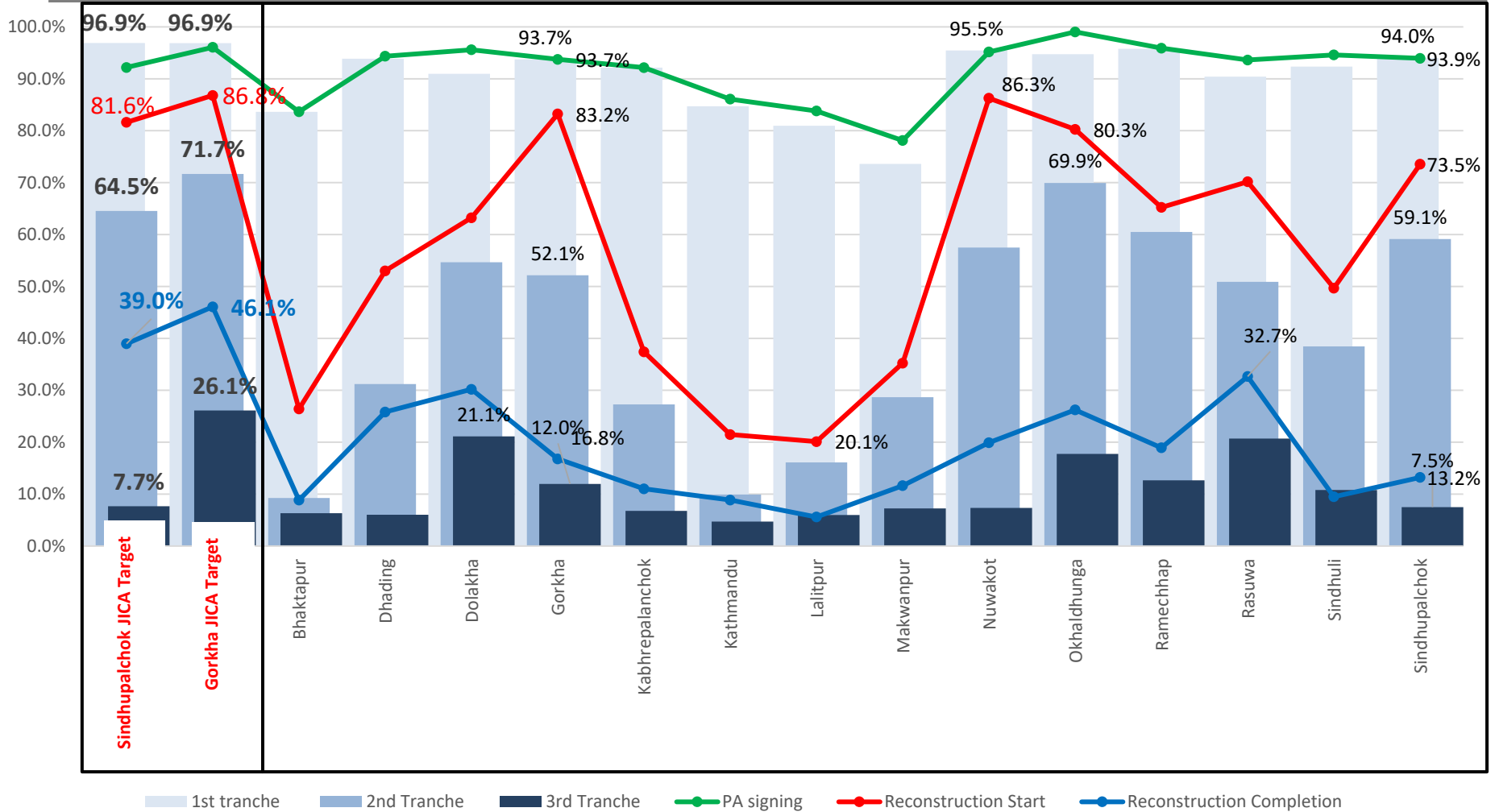




Housing Reconstruction Status up to date



District



निजि आवासको विवरण अनलाइनबाट नै इन्जिनियरबाट Update हुने

← → C Not secure | 202.45.144.197/nfdnfis/clpiu/index.htm

Ministry of Urban Development
Central Level Project Implementation Unit
MIS

Welcome Map Portal ::Entry:: ::Government Building Construction:: ::Data Entry VDC Level(DLPIU):: ::Map Individual House

Logged on as **admin** Log out

VDC Level Data/गाबिस स्तरीय तथ्यांक

Lu Users

Lu Vdc Code

District Update/ जिल्लामात प्रगति

Vdc Assessment Audit

View Data Entered Status

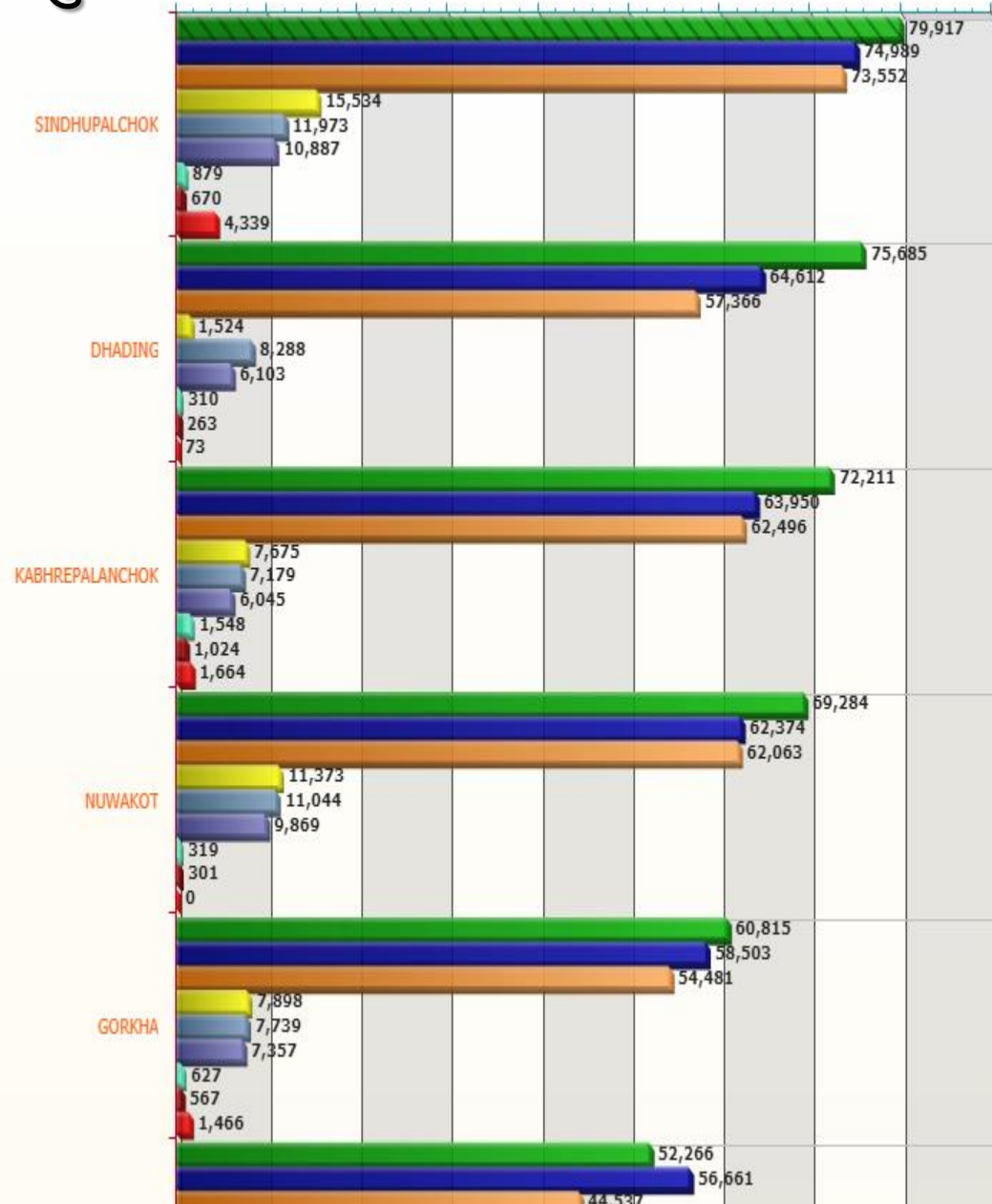
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Details found: 630

Page 1 of 7

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<input type="checkbox"/>	847	KABHREPALANCHOK	Gauri Bisauna Deupur
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<input type="checkbox"/>	1126	LALITPUR	Gotikhel
<input type="checkbox"/>	1124	LALITPUR	Gimdi
			Count: 100 To



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District	Vdc Municipality	Engineer Name	Engineer Contact No	Notentered
KABHREPALANCHOK	Simthali	pradip pokharel	9851213857	32 days 00:22:26.88875
KABHREPALANCHOK	Milche	Animesh Nepal	9842084633	31 days 20:34:53.88875
KABHREPALANCHOK	Koshidekha			31 days 17:58:31.88875
LALITPUR	Bhardeu	Binod Bahadur Pal, Asst. Eng. Shikhar Poudel	9851059050, 9860838727	31 days 05:39:44.88875
GORKHA	Kerauja	Narayan Pandey	9867248679	31 days 02:01:42.88875
GORKHA	Chunchet			31 days 02:01:05.88875
GORKHA	Panchkhuwa Deurali	Amardip Kumar Shah	9849942655	31 days 01:56:50.88875
GORKHA	Prok	Ajit Tiwari	9849032790	31 days 01:56:35.88875
GORKHA	Bihi	Prabin Bhurtel	9848466395	31 days 01:56:14.88875
GORKHA	Laparak			31 days 01:53:49.88875
GORKHA	Lho			31 days 01:53:17.88875
GORKHA	Samagaun			31 days 01:52:38.88875
GORKHA	Palungtar	Binaya Raj Singh Tharu, Saroj Adhikari, Subash Ghimire, Homnath Upadhyaya	9849485776, 9841389526, 9849350834, 9849613540	31 days 01:49:09.88875

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- Design Catalogue for Reconstruction (1st Volume) of Earthquake Resistant Houses been approved

DESIGN CATALOGUE FOR RECONSTRUCTION OF EARTHQUAKE RESISTANT HOUSES

Volume I



October, 2015 (Aswin, 2072)

The Catalogue Provides Design Options but not Compulsory, People may design their houses their selves from a qualified Engineer



Nepal Housing
Reconstruction Programme

Government of Nepal
Ministry of Urban Development
Department of Urban Development and Building Construction
Babarmahal, Kathmandu



TYPE DESIGNS OF EARTHQUAKE RESISTANT BUILDINGS PREPARED BY DUDBC





TYPE DESIGNS OF EARTHQUAKE RESISTANT BUILDINGS PREPARED BY DUDBC



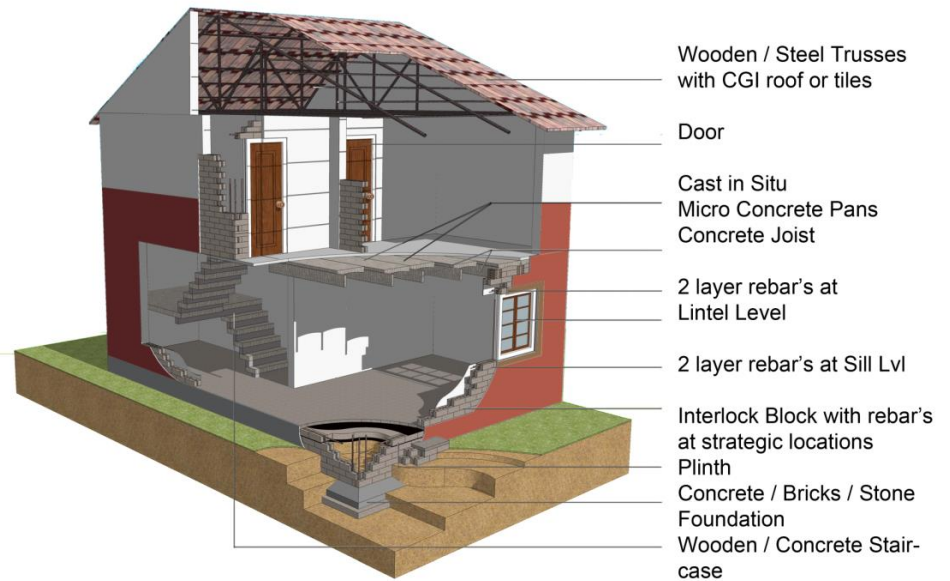


TYPE DESIGNS OF EARTHQUAKE RESISTANT BUILDINGS PREPARED BY DUDBC



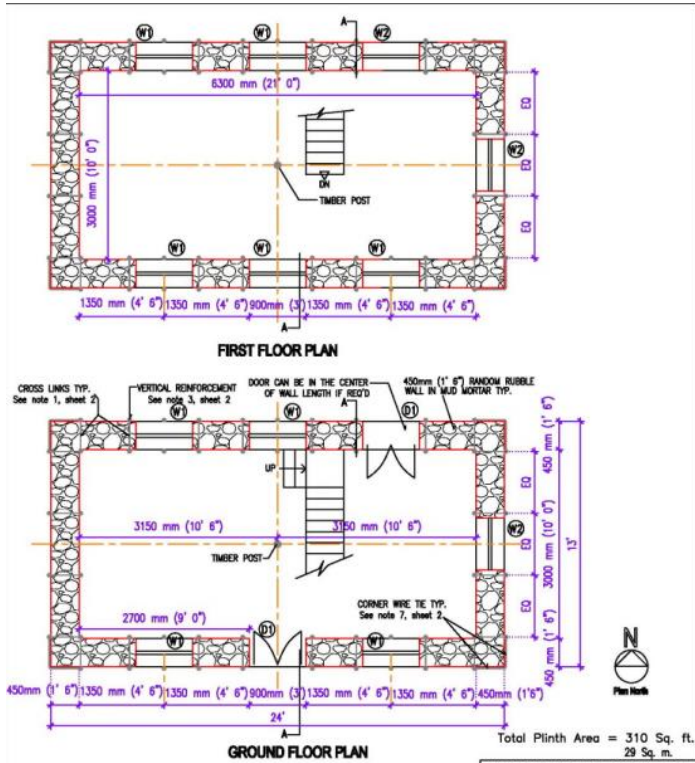
EHRP (Current Status and Implementation Issues/ Challenges)

**Design Catalogue Second Volume under preparation-
5 Design has been approved others are under review**



SECTIONAL 3D VIEW OF HABITECH BUILDING SYSTEM
WITH INTERLOCK BRICKS

Design Catalogue Second Volume



DOOR WINDOW OPENING SCHEDULE				
	WIDTH	HEIGHT	SILL	LINTEL
D1	3'0"	6'0"	-	6'0"
W1	3'0"	3'0"	3'0"	6'0"
W2	2'9"	3'0"	3'0"	6'0"
V	1'0"	1'0"		

2 ½ storey house with containment reinforcement Plans dwn by : Arpit
 National Center for Peoples'-Action in Disaster Preparedness (NCPDP-CEDAP) ckd by : Rupal
 103, * Antarikah *, Panjarapole Cross Roads, Dr. Vikram Sarabhai Marg, Ahmedabad, Guj. 380015, INDIA. Sheet = 1/6



Design Catalogue Second Volume

MODEL HOLLOW CONCRETE BLOCK

DOUBLE-STORY



Nepal Housing
Reconstruction Programme

TYPE OF HOUSE: MODEL HOLLOW CONCRETE BLOCK
DRAWING TITLE: 3 DIMENSIONAL VIEWS

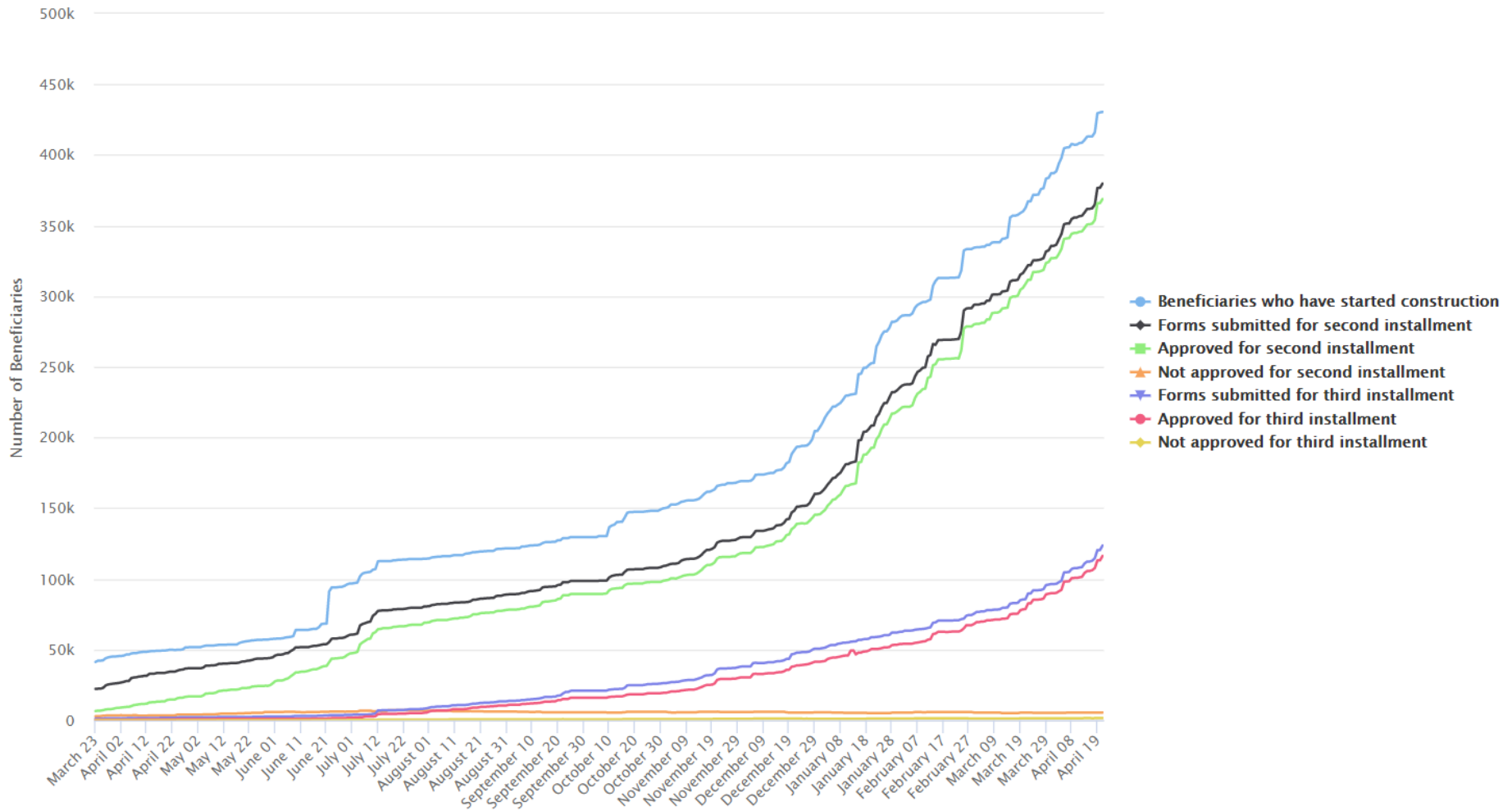
SCALE: 1:50
DATE: JAN 5, 2016
DESIGNED BY: BUILD CHANGE

A-13

Progress of Housing Reconstruction

EHRP Progress, March 23, 2017–April 23, 2018

Source: Ministry of Urban Development (MoUD)



Technical Inspection and recommendation for Grant

First Installment NRs. 50,000 is given after completion of the agreement with the house owner

Final Inspection

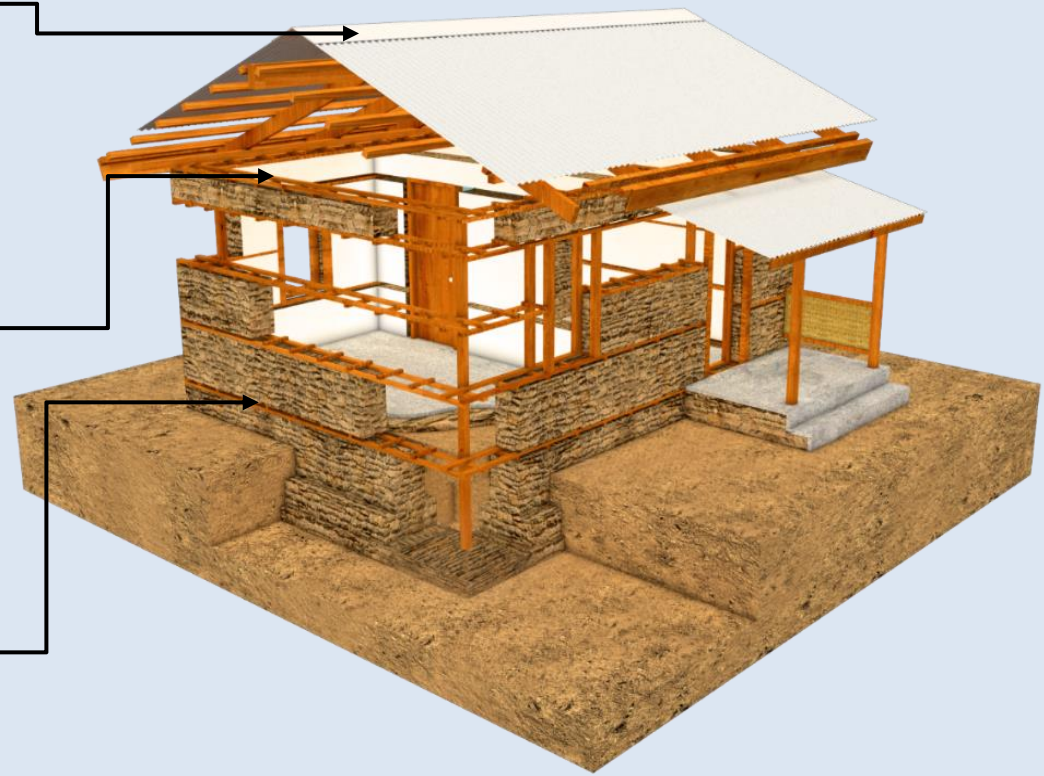
After completion of all works (final finishing)

Second Inspection

- After Completion of Roof Band
- Recommend for Final Installment (100,000)

First Inspection

- After Completion of Damp Proof Course (DPC)/Plinth Level
- Recommend for Second Installment (150,000)



One Story Masonry Building

Technical Inspection and recommendation for Grant

First Installment NRs. 50,000 is given after completion of the agreement with the house owner

Final Inspection

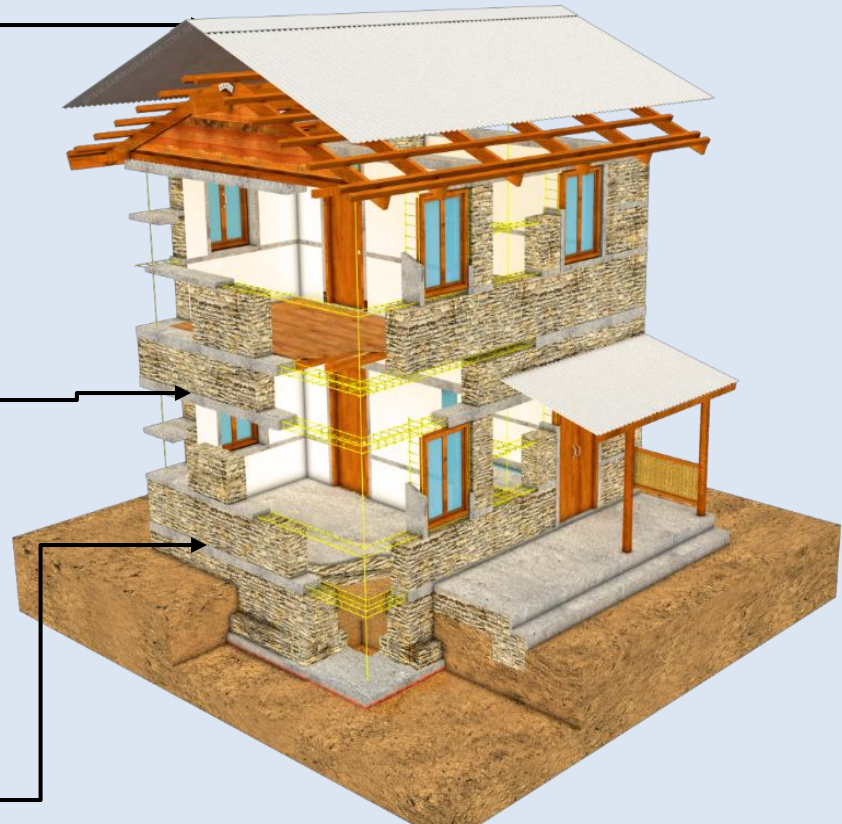
After completion of all works (final finishing)

Second Inspection

- After Completion of Roof Band
- Recommend for Final Installment (100,000)

First Inspection

- After Completion of DPC
- Recommend for Second Installment (150,000)



Two-story Masonry Building



Public Building Reconstruction

New Program	New Construction	Repair/Retrofitting	Total
Total Nos. of Public Building to Reconstruct	230	253	483
Reconstruction Completed Public Buildings	6	214	220
Public Buildings Under Reconstruction	150	27	147
Public Buildings Under Design Phase	11	12	5
Cancelled	63	0	63
Public Buildings Complete within this FY 2074/75	18	66	84

Building status is also updating in NRA/ADB system as well

Secure | <https://pmis.nra.gov.np/create-civil-work.php>



Welcome **Ashwin Dhakal**



Civil Works

Home / Data Entry / Civil Works

Civil Works



- Add Contract
- Planned
- On Going**
- Closed

S.No.	Civil Work	Project	Contract ID	Start Date	End Date	Delete	Edit	Manage	Details	Generate PDF
1	Contract No. 5 4 New Office Building Construction Building Office of District Attorney, Post Office, DWSS Division DUDBC Division <i>Package No. - 1</i>	Loan 3260 Earthquake Emergency Assistance Project	MOUD/CLPIU/Works/2072-073/NCB-05			Delete	Edit	Open	Detail	PDF
2	Contract No. 7 Maintenance of 4 Office Buildings Agriculture Development Office, Tuber Vegetable Development Center, Revenue Office and CDO Quarter in Sindhuli <i>Package No. - 4</i>	Loan 3260 Earthquake Emergency Assistance Project	MOUD/CLPIU/Works/2072-073/NCB-07		09-06-2019	Delete	Edit	Open	Detail	PDF
3	Construction of Government office building District Water Supply Sanitation Office, DI IDRC Division Office and	Loan 3260 Earthquake Emergency Assistance	MOUD/CLPIU/Works/2072-073/NCB-08			Delete	Edit	Open	Detail	PDF

Dashboards

Data Entry

Project Proposal

Data Analysis

User & Reporting Unit

Grievances

Baseline

Survey

सरकारी भवन निर्माण कार्यको मोवाइल एप समेत तयार भएको छ

← → ↻ 202.45.144.197/nfdnfs/clpiu/index.htm

Ministry of Urban Development
Central Level Project Implementation Unit
MIS

Welcome Map Portal ::Entry:: ::Government Building Construction:: ::Data Entry VDC Level(DLPIU):: ::Map Individual Household :: ::NRA PMIS:: ::EEAP Building Update:: ::Salary and Bonus for Engineers:: ::EHRP:: ::NRA ::

Nepali ▶
View By ▶

back to project

अहिलेको अवस्था / कामको हाल स्थिति

- Preliminary Design 0
- Detailed Design 0
- IFB Published 0
- bidding 0
- contract award 0
- work started 1**
- Not Specified 0

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Question	Response
today	2017-07-23
जिल्ला	DOLAKHA
गाउँ पालिका / नगर पालिका	RtHtr
वार्ड नम्बर	5
Contract नम्बर	8
भवन को नाम	Dyttjg
Contractor Company	Gif

Leaflet | © Mapbox © OpenStreetMap Improve this map @ DigitalG

NEPAL RASTRA BANK, THAPATHALI

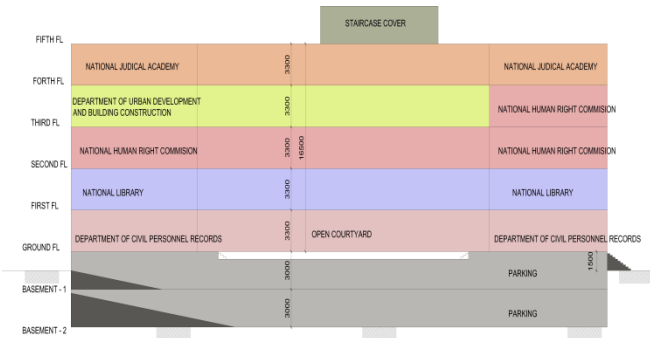




**NEPAL RASTRA
BANK, BALUWATAR**



HARIHAR BHAWAN



CONCEPTUAL SECTION





STAFF COLLEGE





North-West 3D view of the building, showing vehicular circulation and entry towards the main PSC office building at Kamal-pokhari



South-East 3D views from the frontal open space, giving grandeur view of the proposed PSC office building at Kamal-pokhari.





RSS Building



NUWAKOT AND OKHALDHUNGA DISTRICT



***District Court
Nuwakot***



***Post Office,
Nuwakot***



***Soil Conservation,
Nuwakot***



***Water Supply,
Nuwakot***



***Soil Conservation,
Okhaldhunga***



***National Investigation,
Okhaldhunga***

DHADING DISTRICT



*District Court,
Dhading*



*Post Office,
Dhading*



*DUDBC Division Office,
Dhading*



*District Forest,
Dhading*



*District Agriculture,
Dhading*

DHADING DISTRICT



*District attorney,
Dhading*



*DTO,
Dhading*



*Staff quarter,
Dhading*



*CDO quarter,
Dhading*

SINDHULI DISTRICT



***INTEGRATED OFFICE BUIKLDING ,
Sindhuli***



***IRRIGATION,
Sindhuli***



***DFO,
Sindhuli***

RASUWA DISTRICT



*CDO Quarter,
Rasuwa*



*POST OFFICE,
Rasuwa*



*Dudbc and Water Supply,
Rasuwa*



*livestock,
Rasuwa*

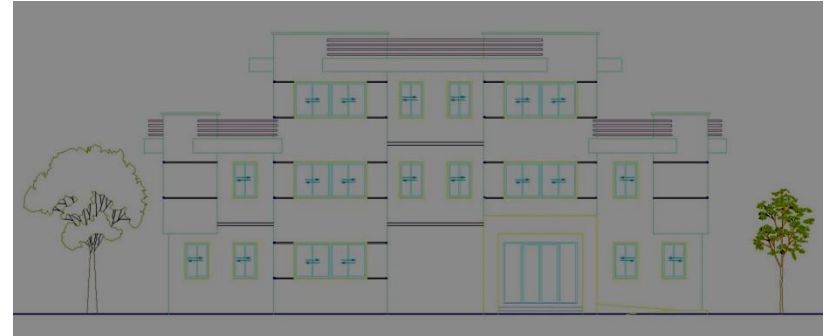


*Irrigation Office,
Rasuwa*

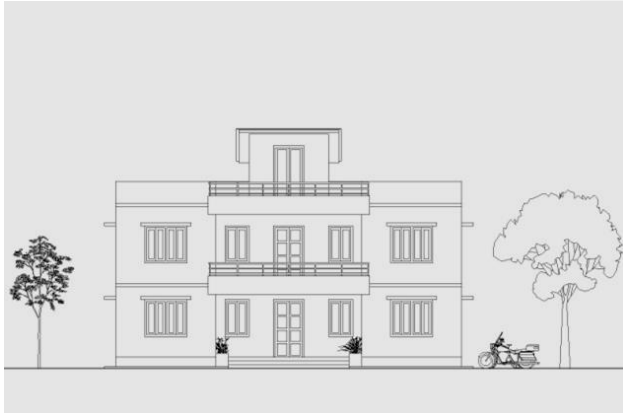
LAMJUNG DISTRICT



**DUDBC MAIN BUILDING,
LAMJUNG**



**KO.LE.NI.KA,
LAMJUNG**



**DUDBC QUARTER,
LAMJUNG**



**ANUSANDHAN,
LAMJUNG**



**IRRIGATION,
LAMJUNG**

GORKHA DISTRICT



***RASTRIYA ANUSANDHAN,
GORKHA***



***SARKARI WAKIL,
GORKHA***



***AGRICULTURE,
GORKHA***



***DFO,
GORKHA***



***Post office,
GORKHA***

SINDHUPALCHOAK AND RAMECHAP DISTRICT



*Krishi karyalaya,
sindhupalchoak*



*Pashukaryalaya,
sindhupalchoak*



*Judge Quarter,
SINDHUPALCHOAK*



*DFO MAIN OFFICE,
RAMECHAP*



*QUARTER,
RAMECHAP*



DESIGN COMPLETED TILL DATE



**Integrated Irrigation Division Office & Soil
Conservation Office, Dolakha**

RESETTLEMENT/ RELOCATION

Total completed geographic study location : 113

Safe locations: 388

Relocation not required if safety measures are applied: 310

Relocation require because fully or partially unsafe: 286

total families living in vulnerable locations: 3794

RESETTLEMENT/ RELOCATION

Resettlement Study of : 56 settlements

Integrated Study of Settlement: 29 settlements

Current issues in housing reconstruction

- Earthquake resilient houses construction with BBB Concept with in the stipulated time-period- 5 years
- Availability and quality of Construction Mason & Technical Personnel.
- Supply chain of Construction materials.
- Quality of construction materials.
- Various Typology of buildings constructed.
- Non compliance in construction work.
- Grievance and its Handling.
- Effective supervision and monitoring of housing construction and activities performed by Partner Organization (I/NGOs).

General Project Issues and Action Plan

S N	Issues/ Challenges	Activities	Responsible/Monitoring Authority
1	Completion of remaining Participatory Agreement	<ul style="list-style-type: none"> ➤ Grievance Management. ➤ Management of Land Ownership issue. ➤ Management of Right of Way issue. 	<p>NRA MoFALD-CLPIU</p>
2	Mobilization of Technical persons	<ul style="list-style-type: none"> ➤ Recruitment of sufficient technical persons for technical support (Engineers, Sub-Engineers, Assistant Sub Engineers) ➤ Mobilization of Engineers, Sub-Engineers, Assistant Sub Engineers at the local levels ➤ Supervise their activities 	<p>NRA/ MoUD-CLPIU/ MoFALD-CLPIU</p>

General Project Issues and Action Plan

S N	Issues/ Challenges	Activities	Responsible/ Monitoring Authority	Time period
3	Capacity building program for technical persons	<ul style="list-style-type: none"> ➤ Trainings (Build-Back-Better), inspection training, field visit etc. ➤ Logistic arrangement for supervision activities in the field. ➤ Monitoring of technical person activities and reporting. 	<ul style="list-style-type: none"> ➤ NRA ➤ MoUD-CLPIU ➤ MoFALD-CLPIU 	<ul style="list-style-type: none"> ➤ July 2018
4	Production of sufficient masons, crafts-man for reconstruction of houses	<ul style="list-style-type: none"> ➤ 7 days and 50 days mason-training program ➤ Refresher training program (Total requirement -100,000 masons; achieved-45000 masons and plan for this fiscal year - 55000) 	<ul style="list-style-type: none"> ➤ NRA ➤ MoUD-CLPIU ➤ MoFALD-CLPIU ➤ NGOs/IN GOs 	<ul style="list-style-type: none"> ➤ 2018 July

General Project Issues and Action Plan

S N	Issues/ Challenges	Activities	Responsible/Monitoring Authority
5	Technical inspection and certification of constructed houses	<ul style="list-style-type: none"> ➤ Mobilization of Technical Persons for technical assistance. ➤ Supervision and inspection of houses. ➤ Recommendation for tranche 	<ul style="list-style-type: none"> ➤ NRA ➤ MoUD-CLPIU ➤ MoFALD_CLPIU
6	Community mobilization for reconstruction of houses	<ul style="list-style-type: none"> ➤ Orientation/Interaction with elected representatives of Local Levels about reconstruction. ➤ Training to house owners about BBB concept, safer housing reconstruction and community role for re-construction and DRM ➤ Mobilization/participation of community for reconstruction 	<ul style="list-style-type: none"> ➤ NRA ➤ MoUD-CLPIU ➤ MoFALD_CLPIU ➤ others

CONCLUSION

Individual House Should aware
Strong Political Support

Proper Mobilization of NGO/INGOs

Availability of Construction Material

Easy Loan system

Meet of Minimum Requirement of EQ resilience Housing
Construction

Additional Support for Traditional/ vernacular architecture

THANK YOU