

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram

**भीमफेदी आवासुका**

+977 57410050  
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# CONFINED CONCRETE BLOCK MASONRY

This technique consists of an anti-seismic wall composed of reinforced concrete blocks surrounded by horizontal and vertical structural RCC elements. The whole set forms a high resistance structural unit with a very good response to earthquake demands. The wall organizes closed volumetric units, designed with anti-seismic criteria, which determines a good behaviour of the building. This construction system is widely used in various parts of the world that are subject to earthquake demands.

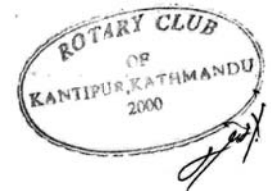
The horizontal structural RCC elements are located at the plinth beam, floor beam and upper ring beam; and the vertical ones (every 3m minimum) at the corners of each room. The concrete block wall is also reinforced vertically every 80 cm, plus in both sides of all openings (doors and windows); and horizontally at least every three block-rows.

The roof system is designed out of tubular profiles of 2" diameter that rest on the concrete walls, leaning on the upper ring-beam. The roof is finished with CGI sheets, allowing attachment of false-ceiling and bamboo insulation.

The featured typology is presented in its simplest layout: 2 ground-floor rooms and 1 verandah. This is a simple variation of the basic typology, which consists in 4 ground-floor rooms, 4 first-floor rooms and 1 verandah, in order to adapt it to the users' needs, reducing it to 2 spaces only. The basic typology has already been approved by NRA.

### MATERIAL PROPERTIES

Block Size:	400 x 200 x 150mm
Minimum Compressive strength of block:	5 N/mm <sup>2</sup>
Grade of Steel:	Fe 500 MPa
Nominal Mix Ratio:	1 : 1,5 : 3 (C : S : A)

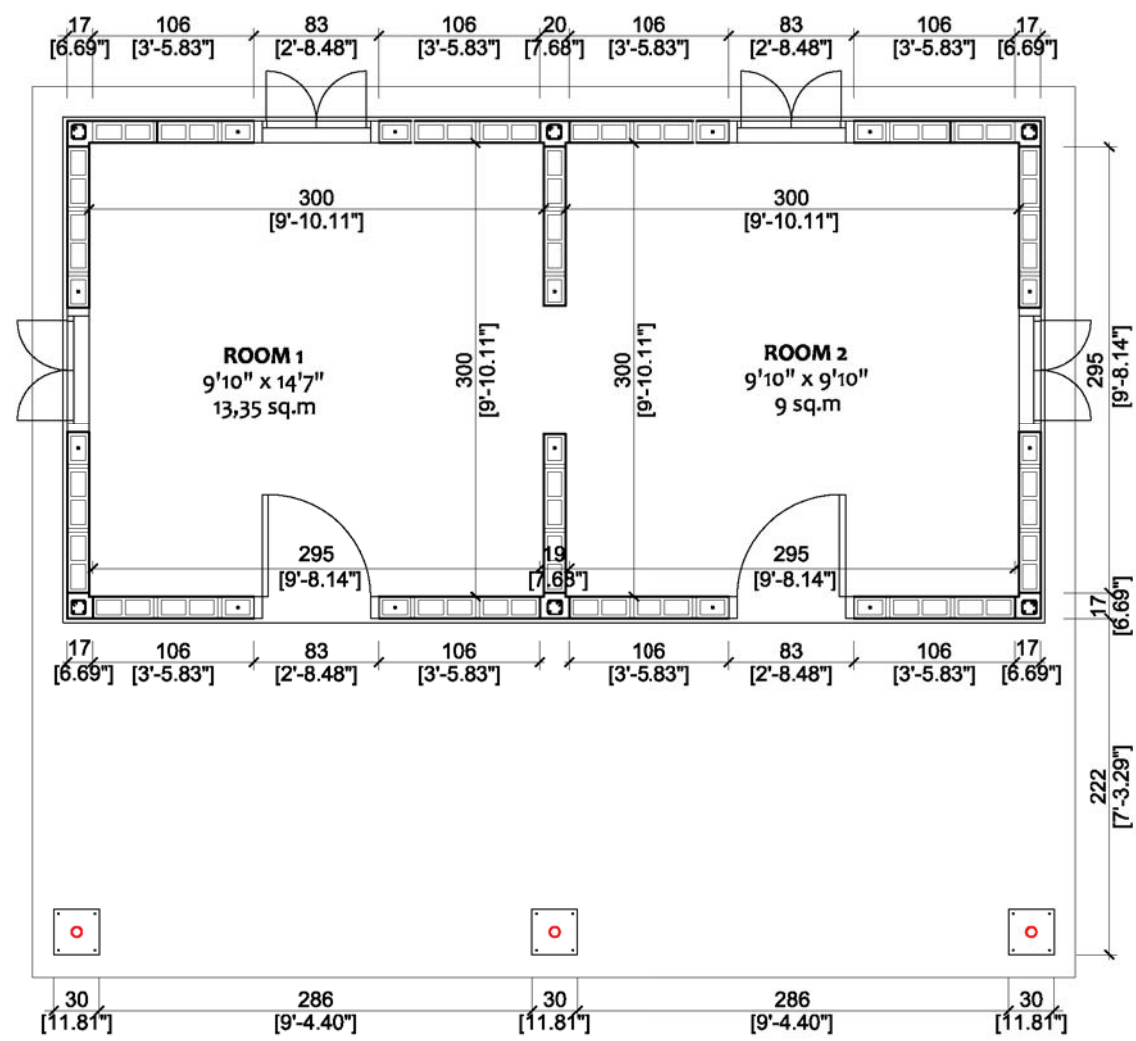


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<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>	
<b>DRAWING TITLE: SYSTEM DESCRIPTION</b>	<b>DATE: 11/2017</b>
	<b>A.01</b>



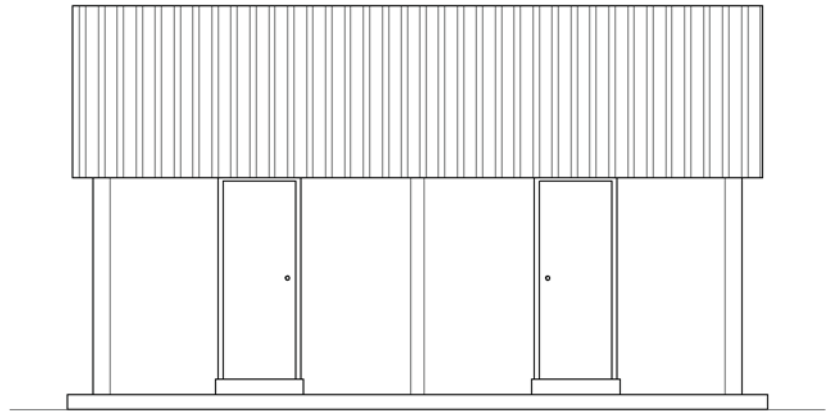
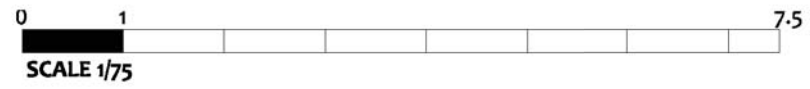
GROUND FLOOR



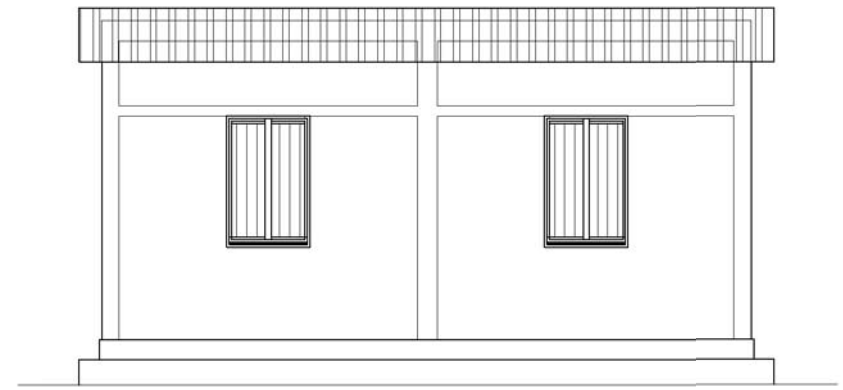
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<p><b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b></p> <p><b>DRAWING TITLE: PLAN VIEWS</b></p>	<p>SCALE: 1:50</p>	<p><b>A.02</b></p>
	<p>DATE: 11/2017</p>	

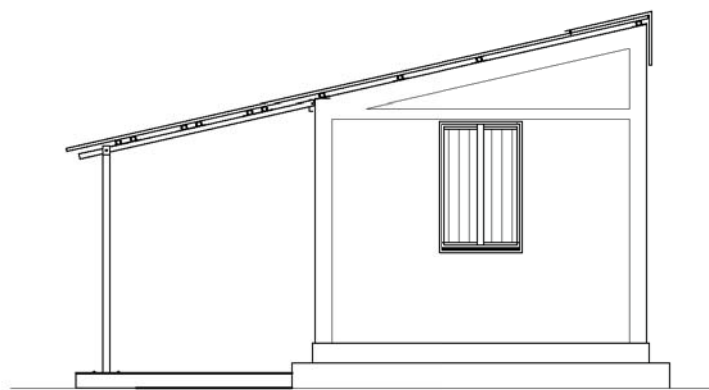




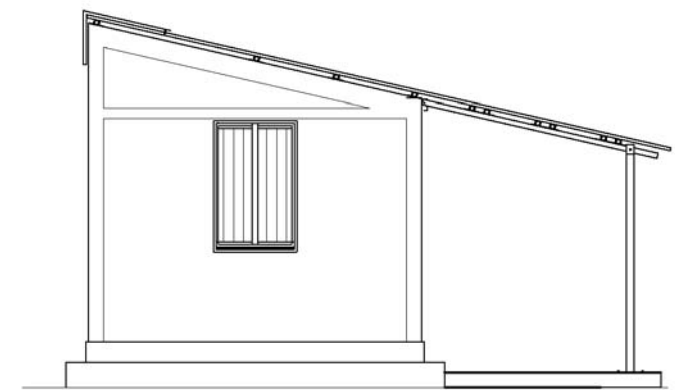
FRONT ELEVATION



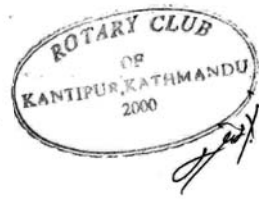
BACK ELEVATION



SIDE ELEVATION



SIDE ELEVATION



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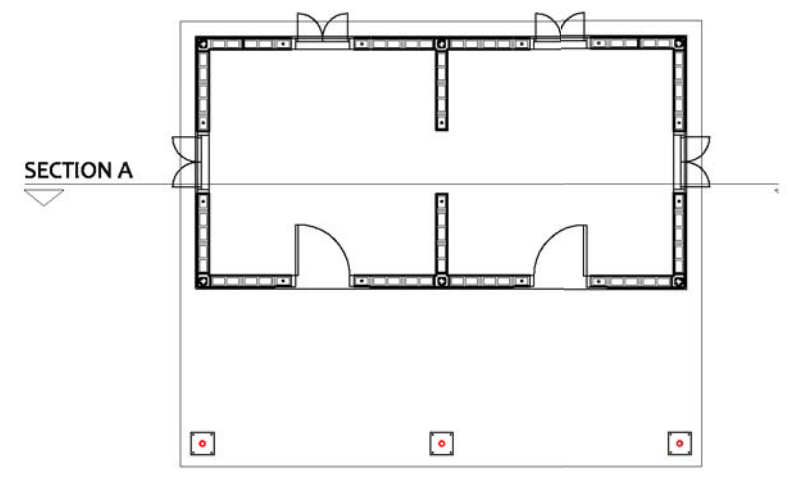
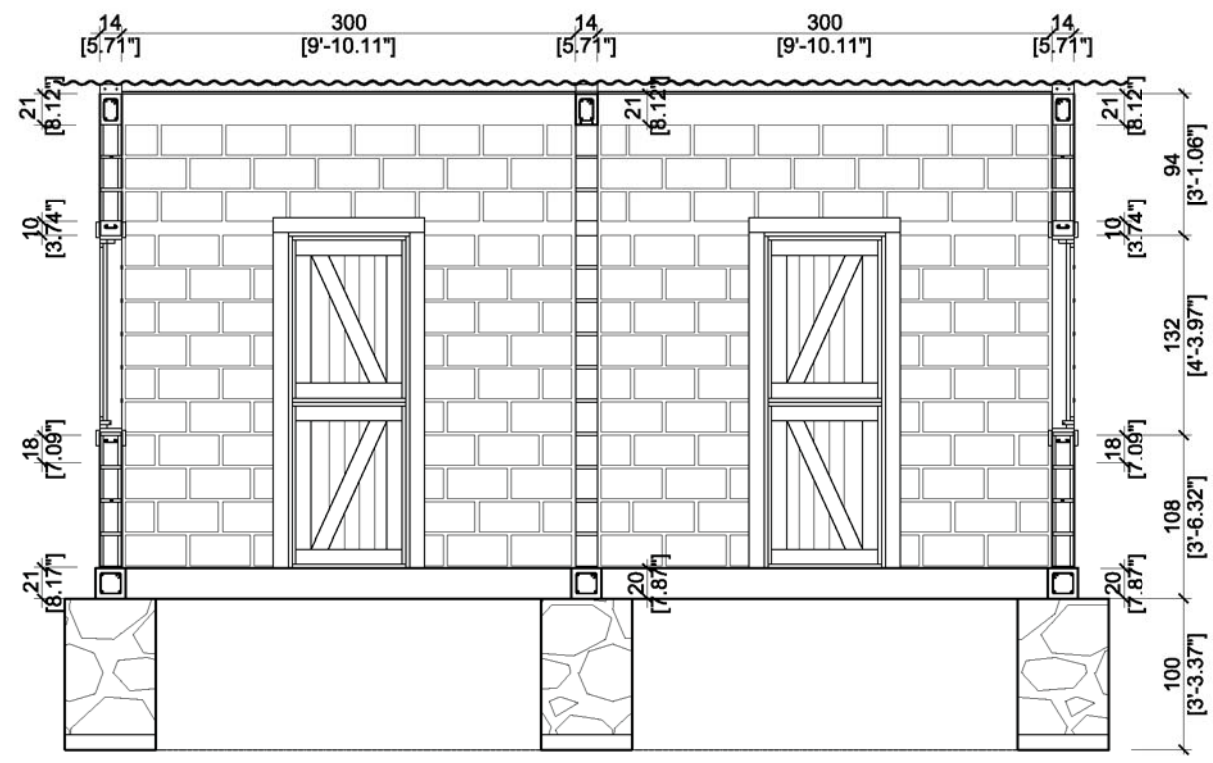
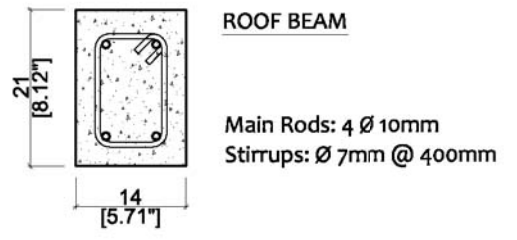
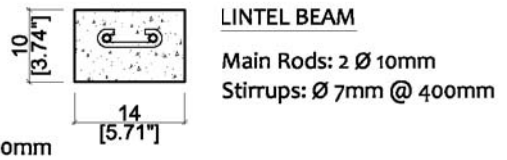
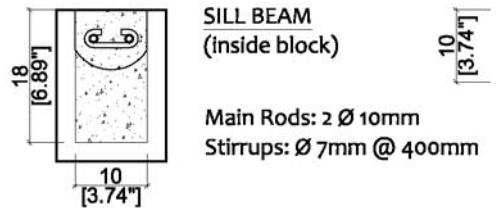
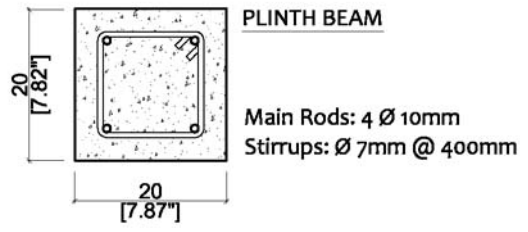
**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: ELEVATIONS**

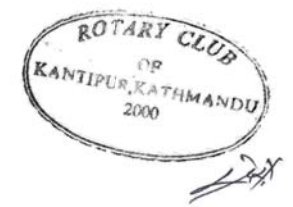
SCALE: 1:75  
 DATE: 11/2017

**A.03**

# HORIZONTAL BANDS (BEAMS)



SECTION A

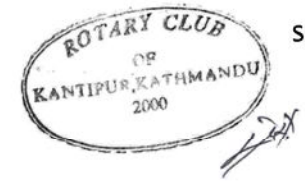
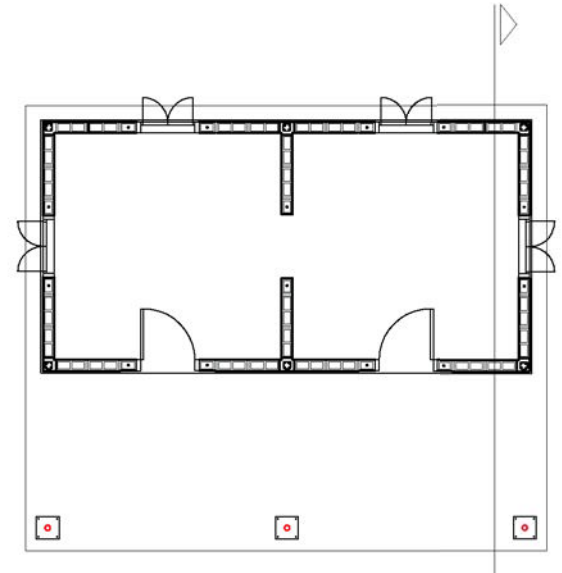
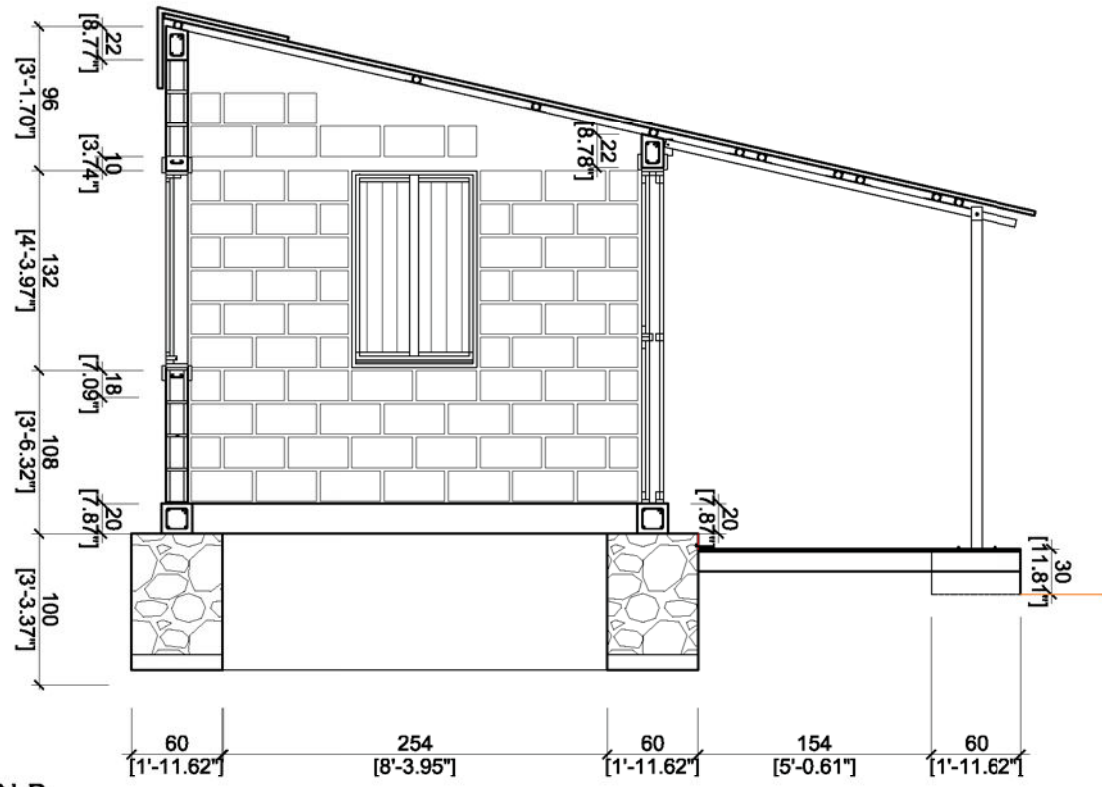
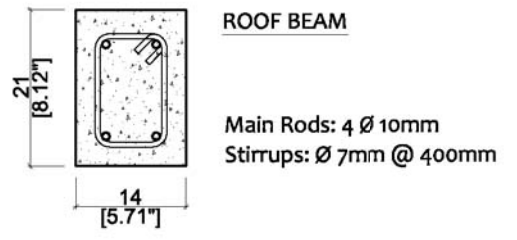
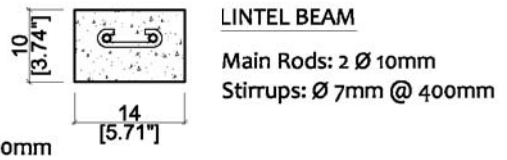
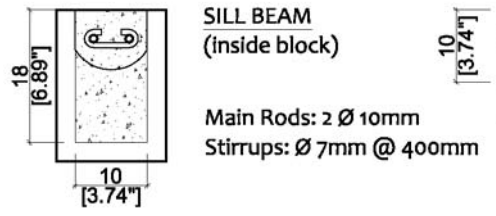
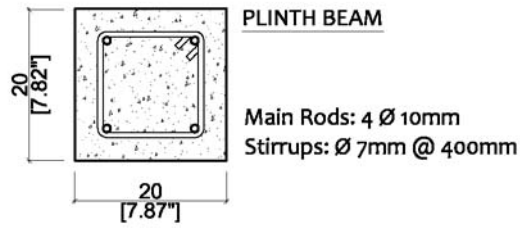


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<p><b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b></p> <p><b>DRAWING TITLE: CONSTRUCTIVE SECTION</b></p>	<p>SCALE: 1:50</p>	<p><b>A.04</b></p>
	<p>DATE: 11/2017</p>	



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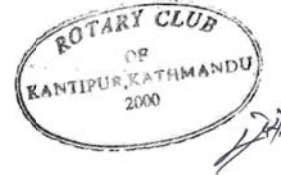
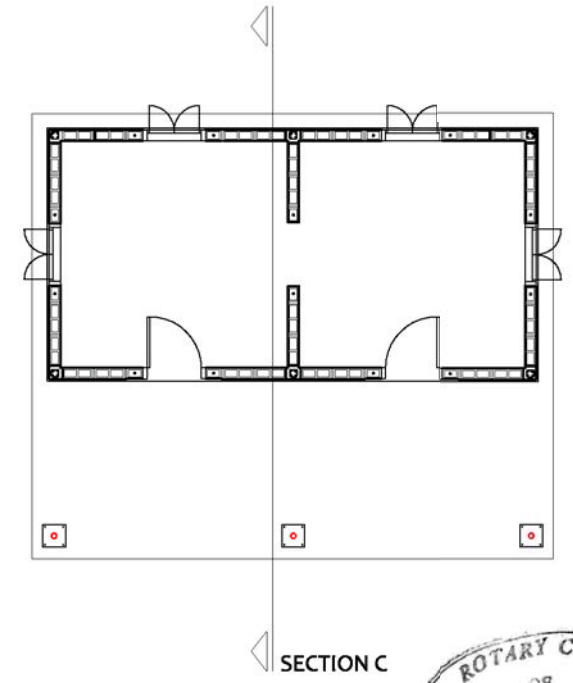
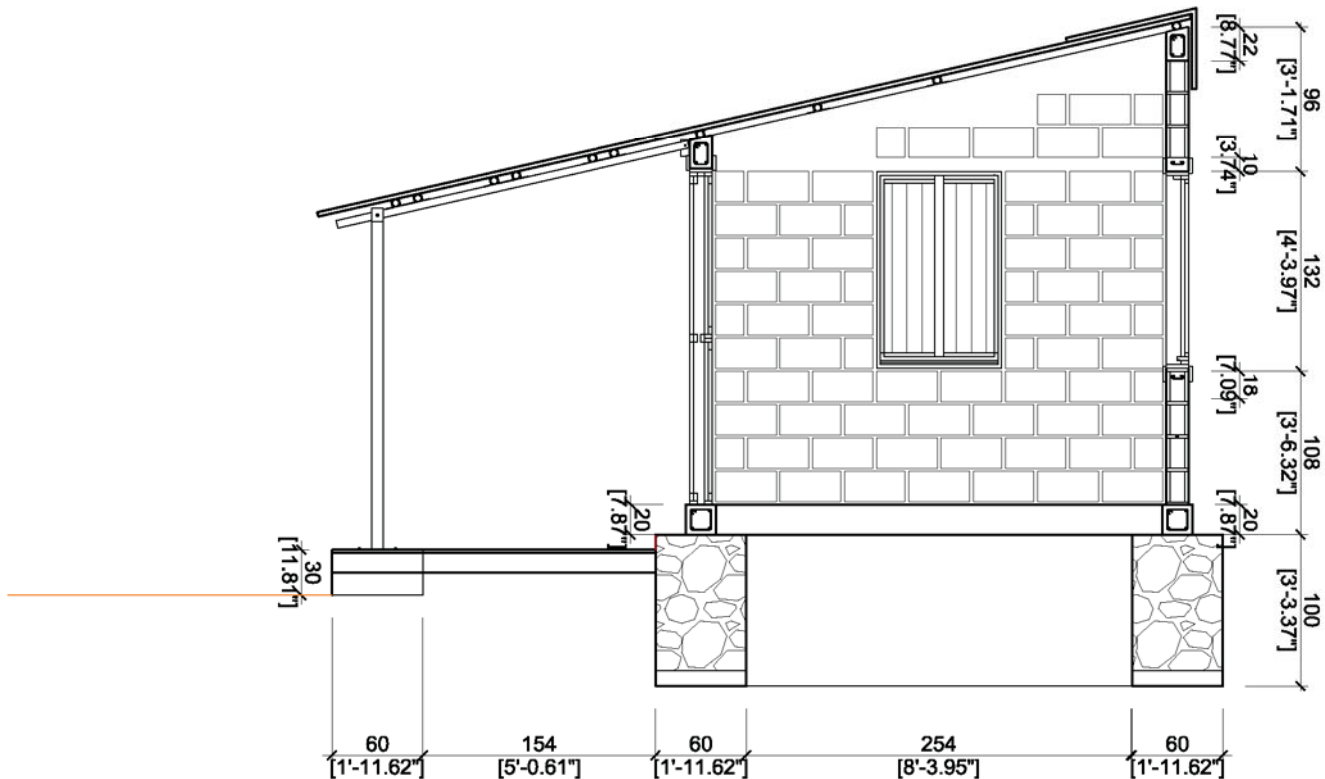
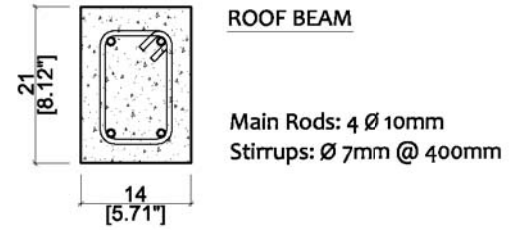
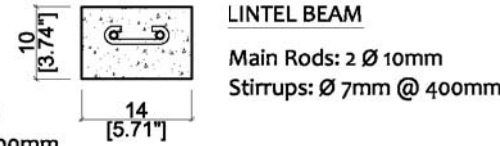
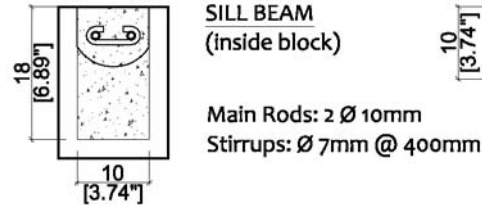
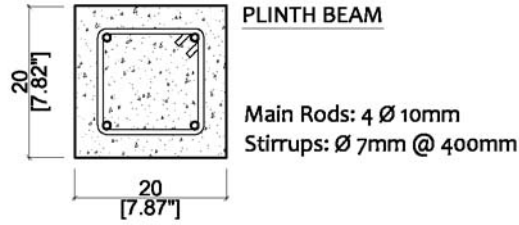
**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: CONSTRUCTIVE SECTION**

SCALE: 1:50  
DATE: 11/2017

**A.05**

# HORIZONTAL BANDS (BEAMS)



SECTION C

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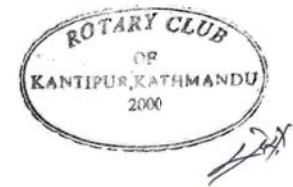
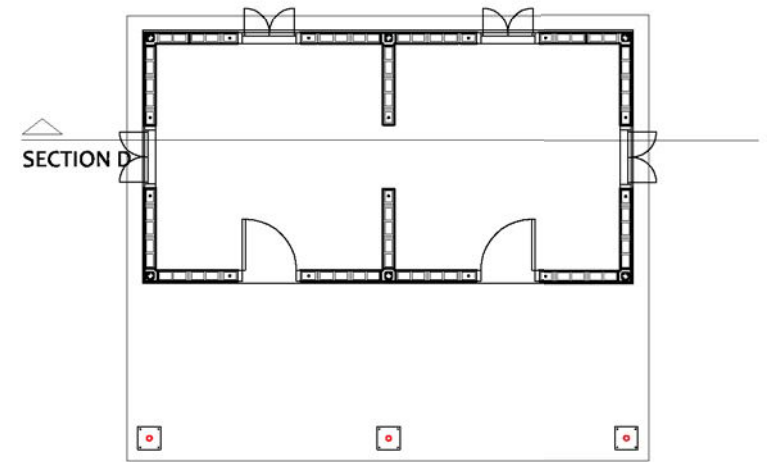
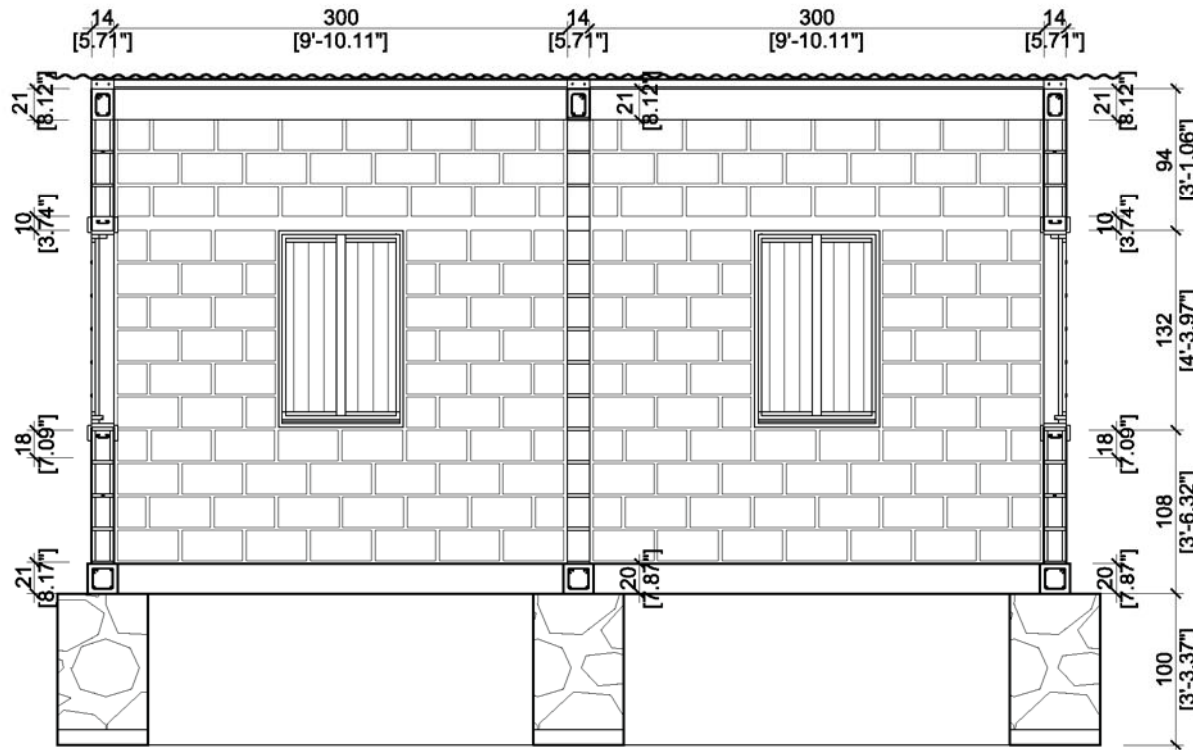
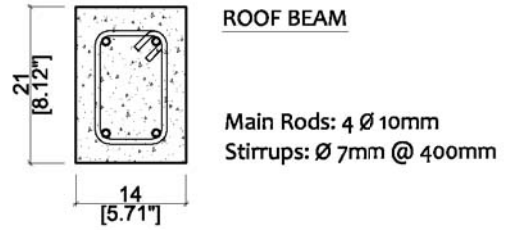
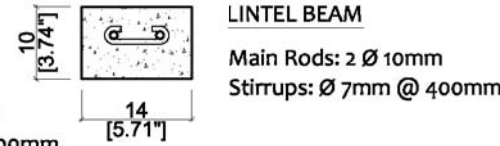
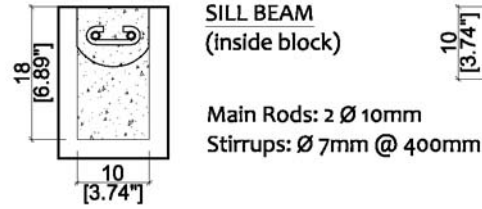
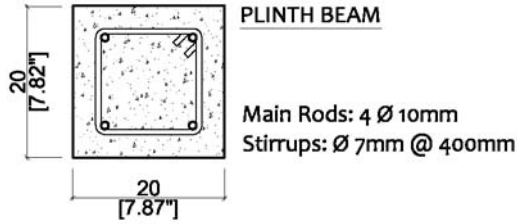
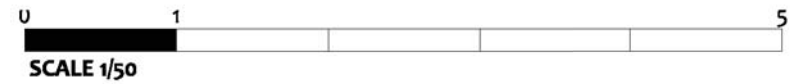
**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: CONSTRUCTIVE SECTION**

SCALE: 1:50  
 DATE: 11/2017

**A.06**

# HORIZONTAL BANDS (BEAMS)



SECTION D

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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: CONSTRUCTIVE SECTION

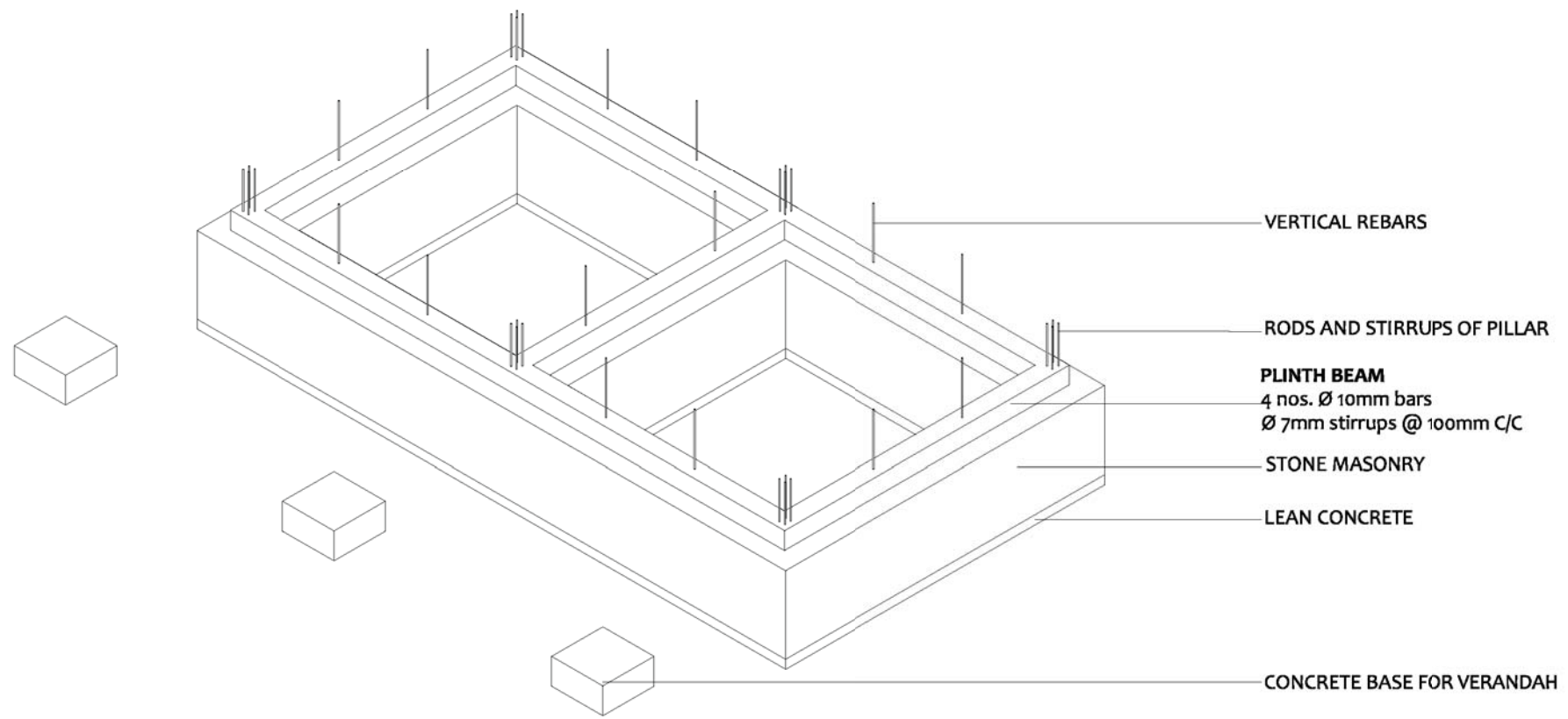


SCALE: 1:50

DATE: 11/2017

A.07

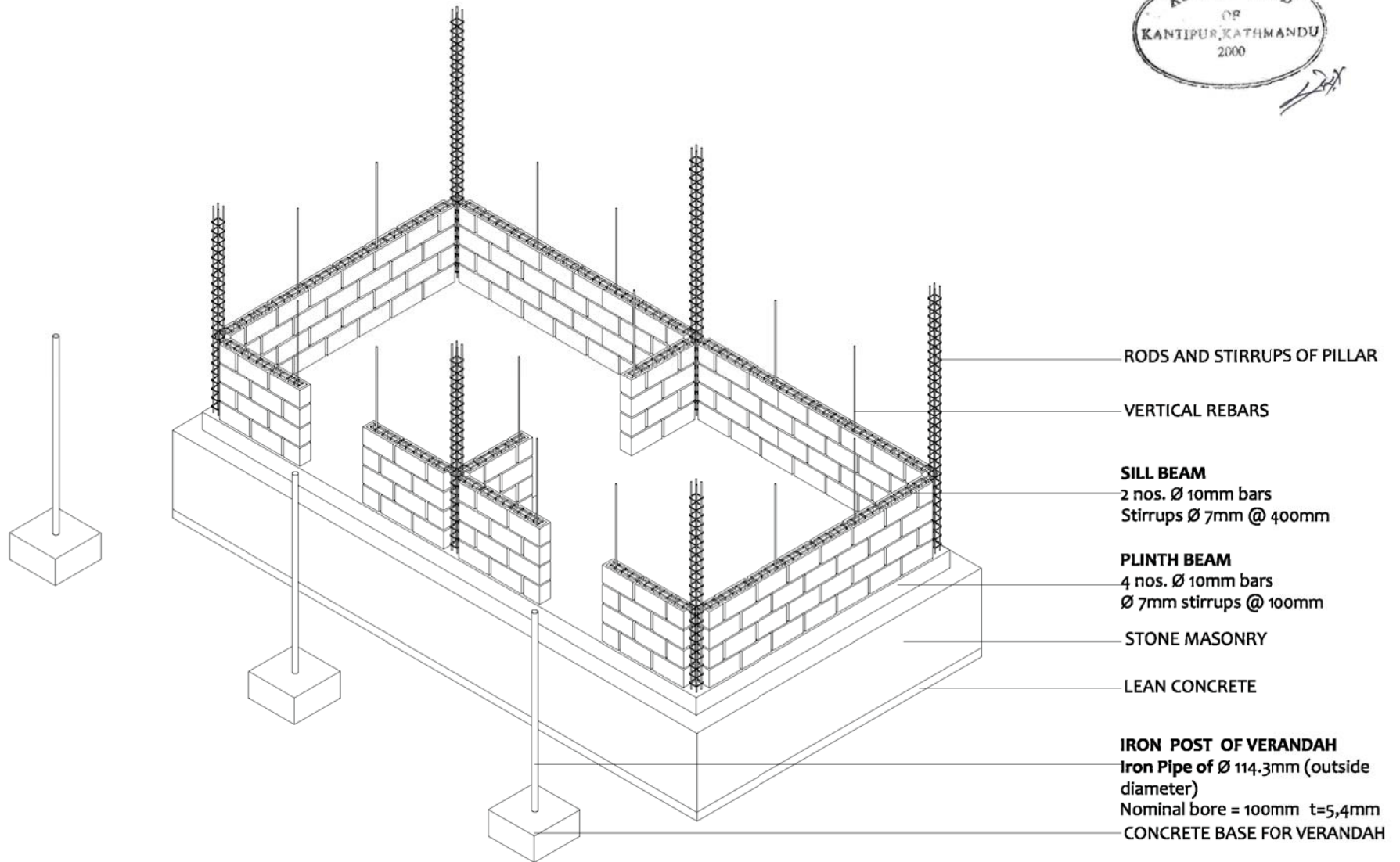




STEP 1

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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<b>CONFINED CONCRETE BLOCK MASONRY</b>		DATE: 11/2017	P.01
<b>DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 1</b>			



STEP 2

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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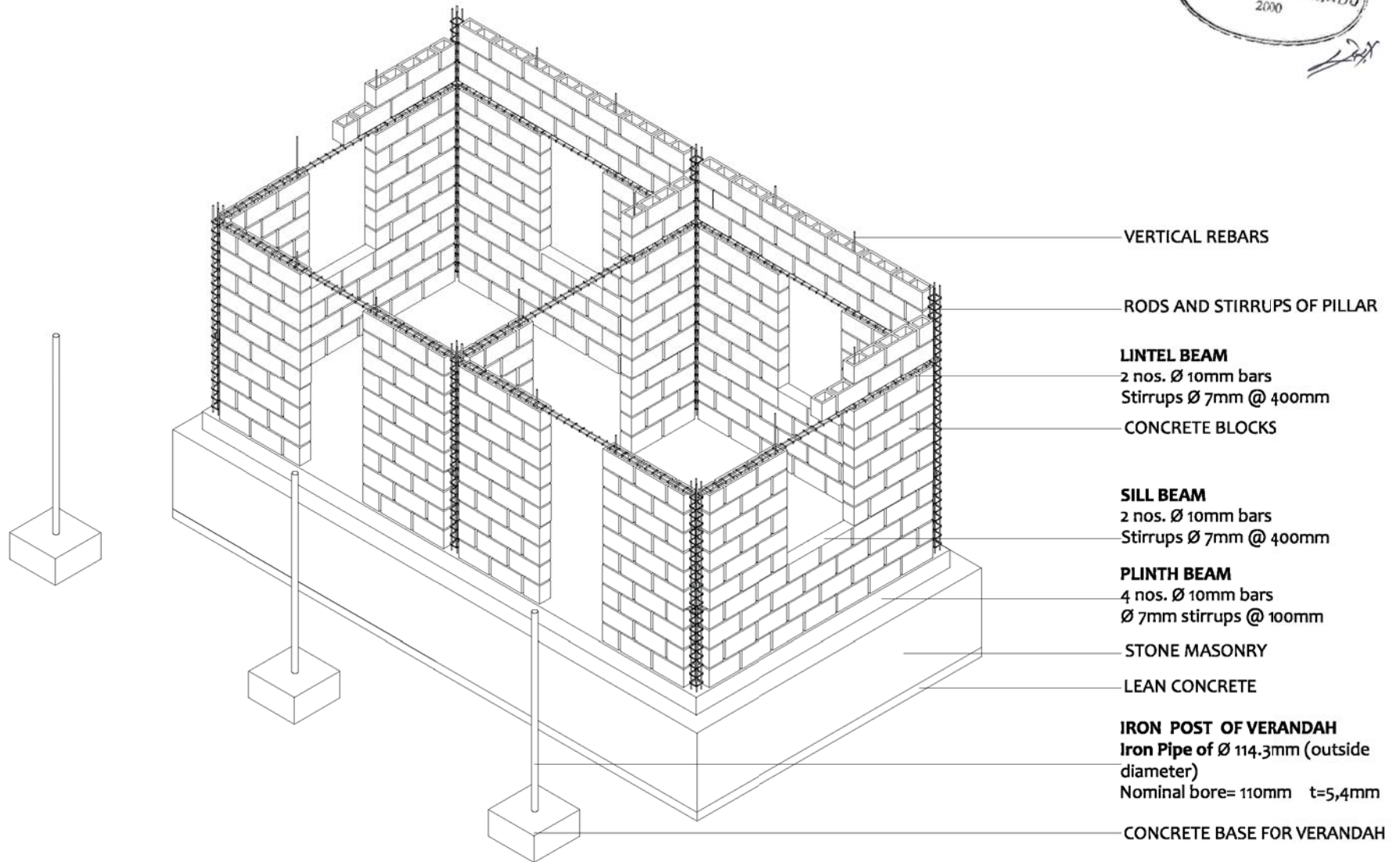
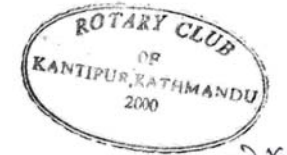
**CONFINED CONCRETE BLOCK MASONRY**

**DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 2**



DATE: 11/2017

P.02



STEP 3

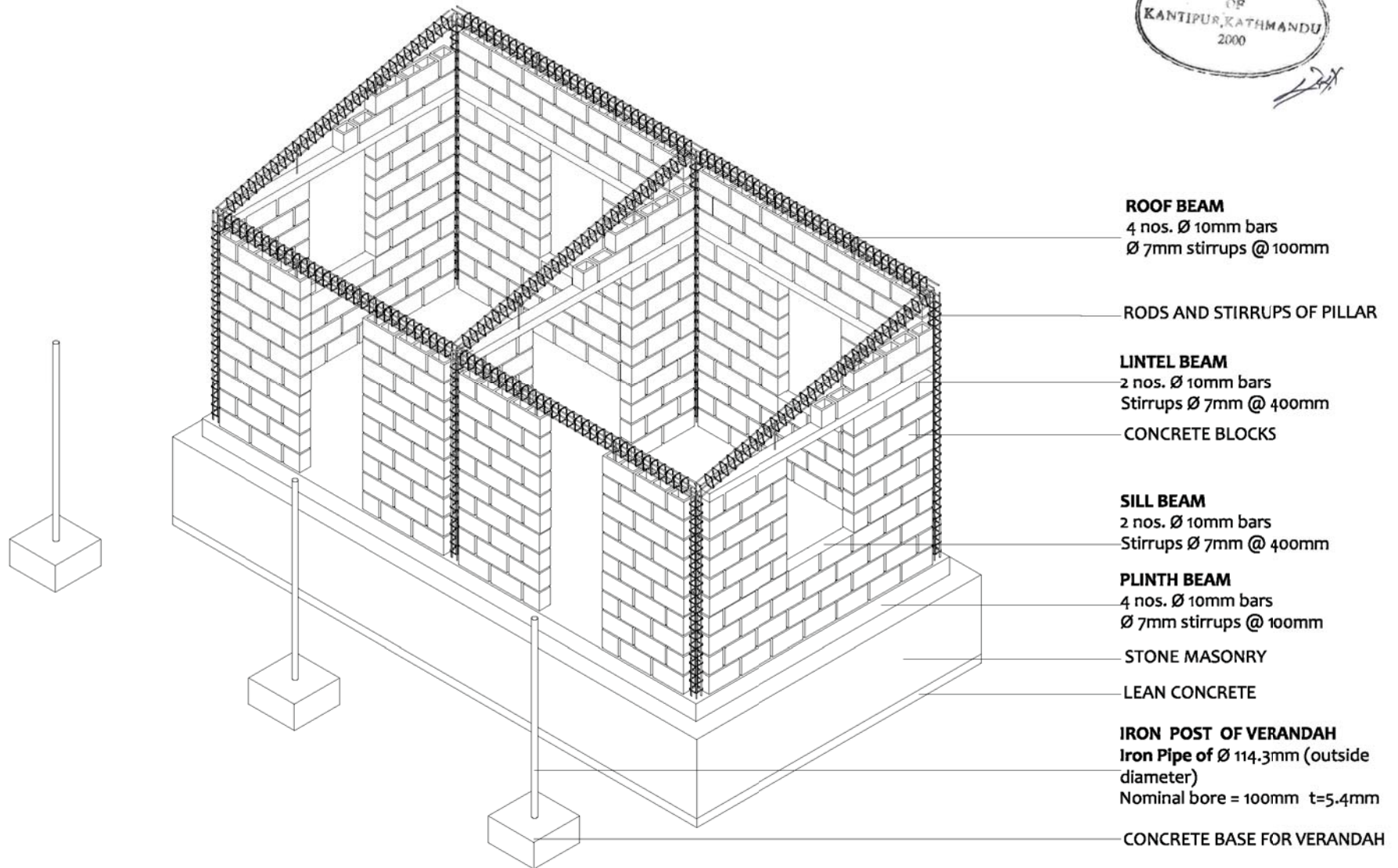
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**CONFINED CONCRETE BLOCK MASONRY**

**DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 3**

**DATE: 11/2017**

**P.03**



STEP 4

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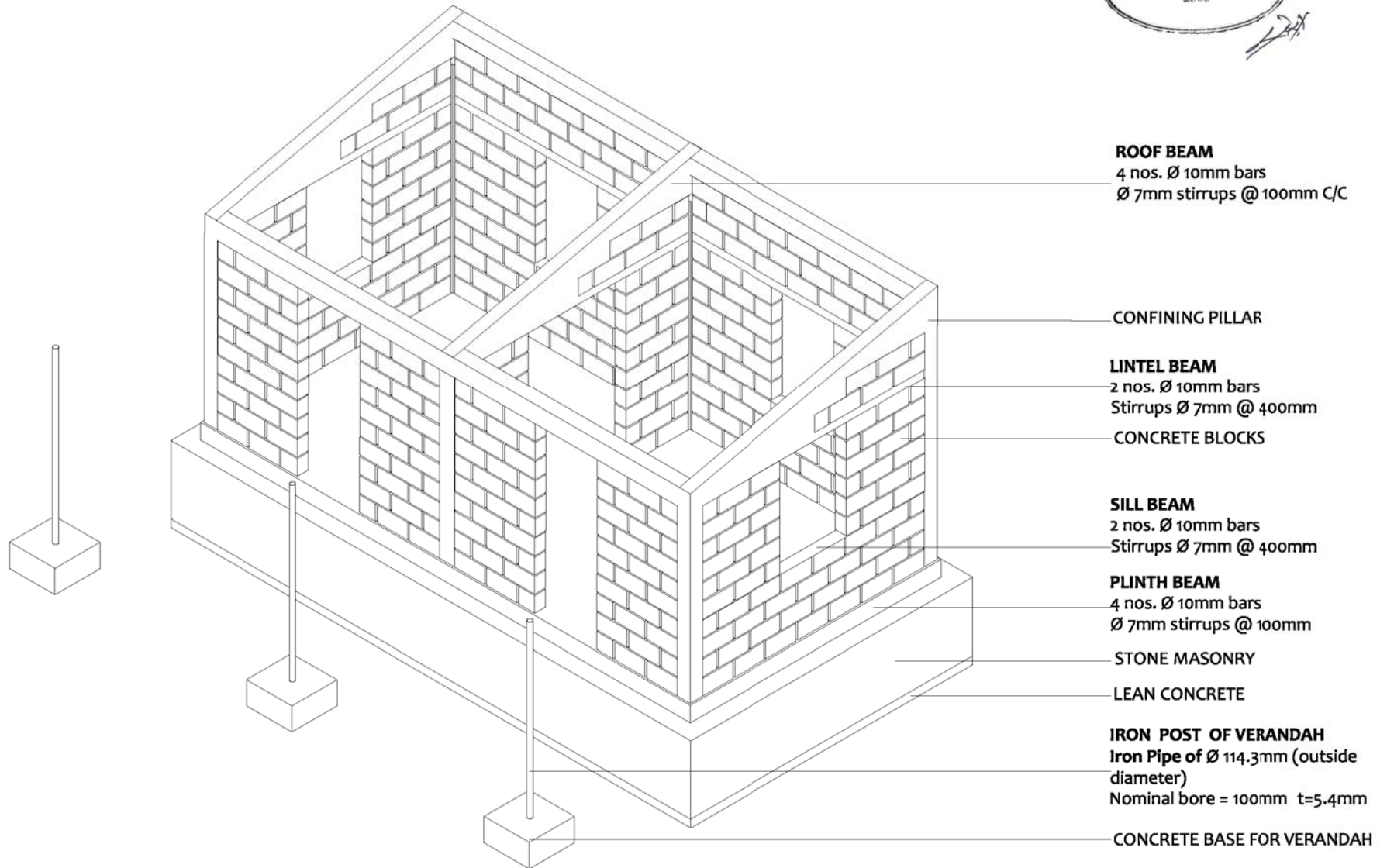
**CONFINED CONCRETE BLOCK MASONRY**

**DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 4**

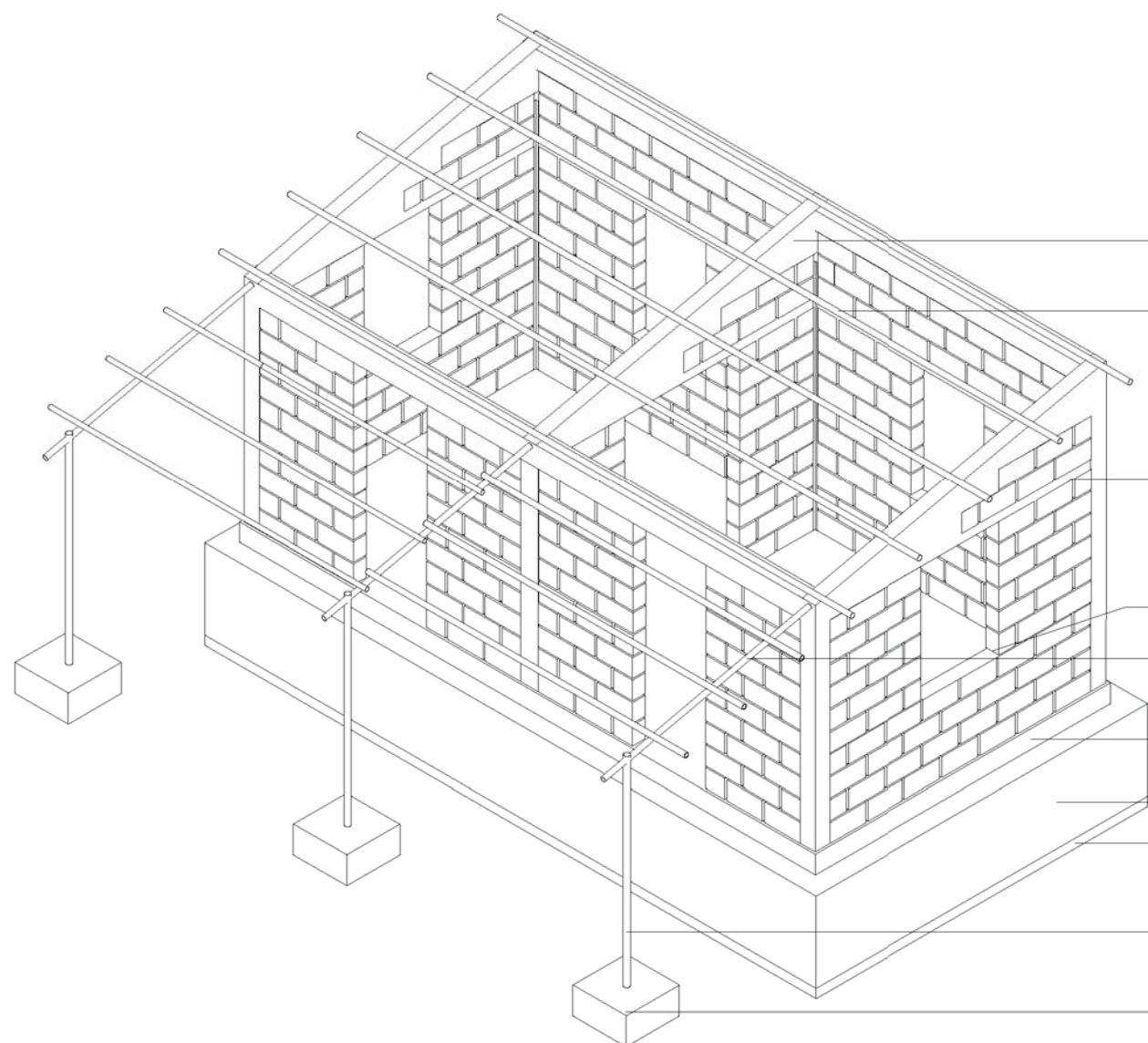


DATE: 11/2017

P.04



STEP 5



- ROOF BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups @ 100mm
- ROOF PURLINS**  
Iron Pipes of Ø 60.3mm (outside diameter)  
nominal bore = 50mm t=4.5mm
- LINTEL BEAM**  
2 nos. Ø 10mm bars  
Stirrups Ø 7mm @ 400mm
- SILL BEAM**  
2 nos. Ø 10mm bars  
Stirrups Ø 7mm @ 400mm
- VERANDAH RAFTERS**  
Iron Pipes of Ø 50mm
- PLINTH BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups @ 100mm
- STONE MASONRY
- LEAN CONCRETE
- IRON POST OF VERANDAH**  
Iron Pipe of Ø 114.3mm (outside diameter)  
Nominal bore=100mm t=5.4mm
- CONCRETE BASE FOR VERANDAH

STEP 6

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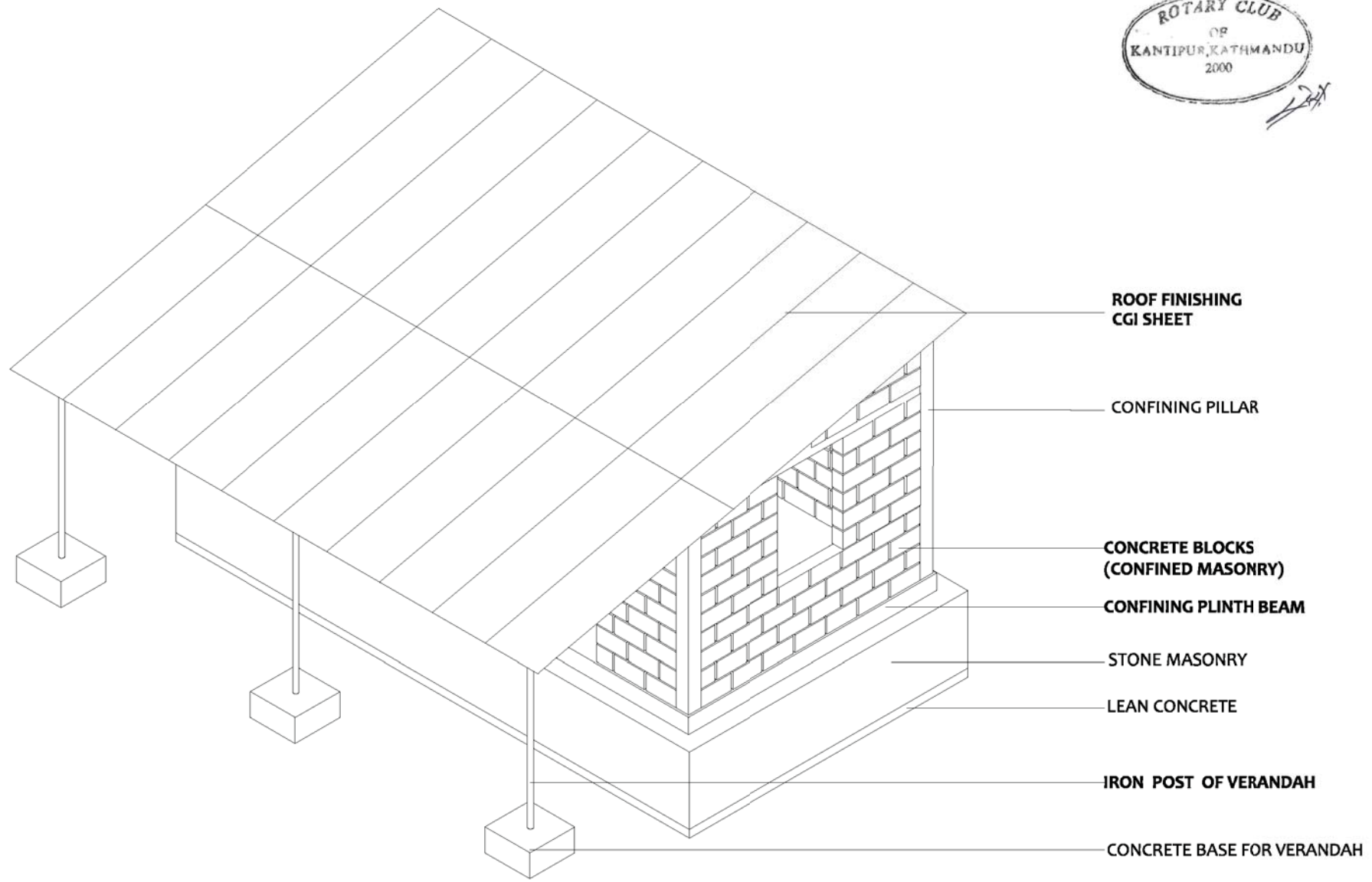
**CONFINED CONCRETE BLOCK MASONRY**

**DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 6**



DATE: 11/2017

P.06



STEP 7

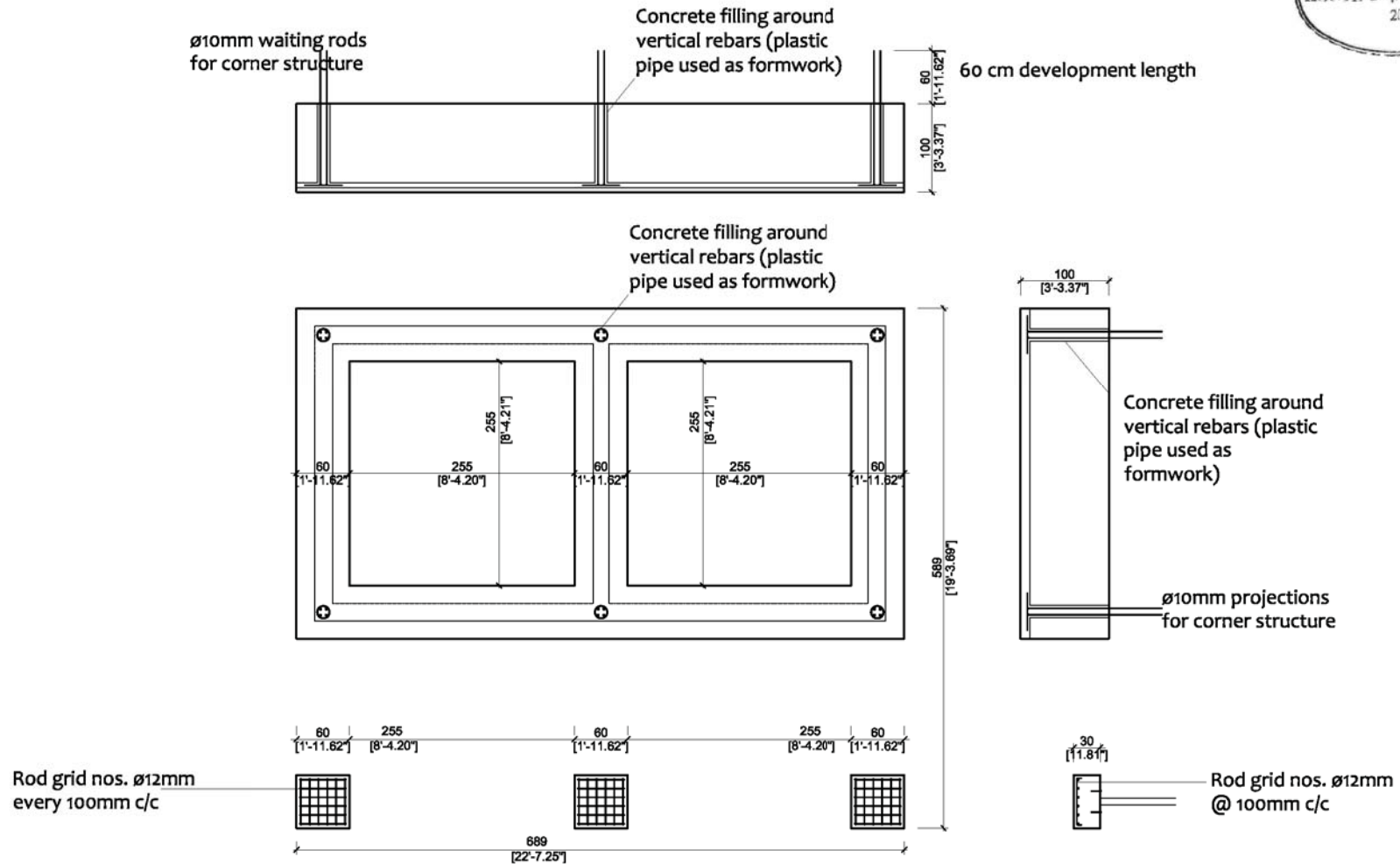
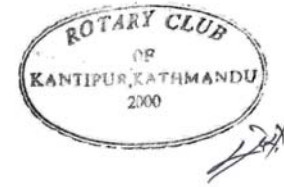
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**CONFINED CONCRETE BLOCK MASONRY**

**DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 7**

**DATE: 11/2017**

**P.07**

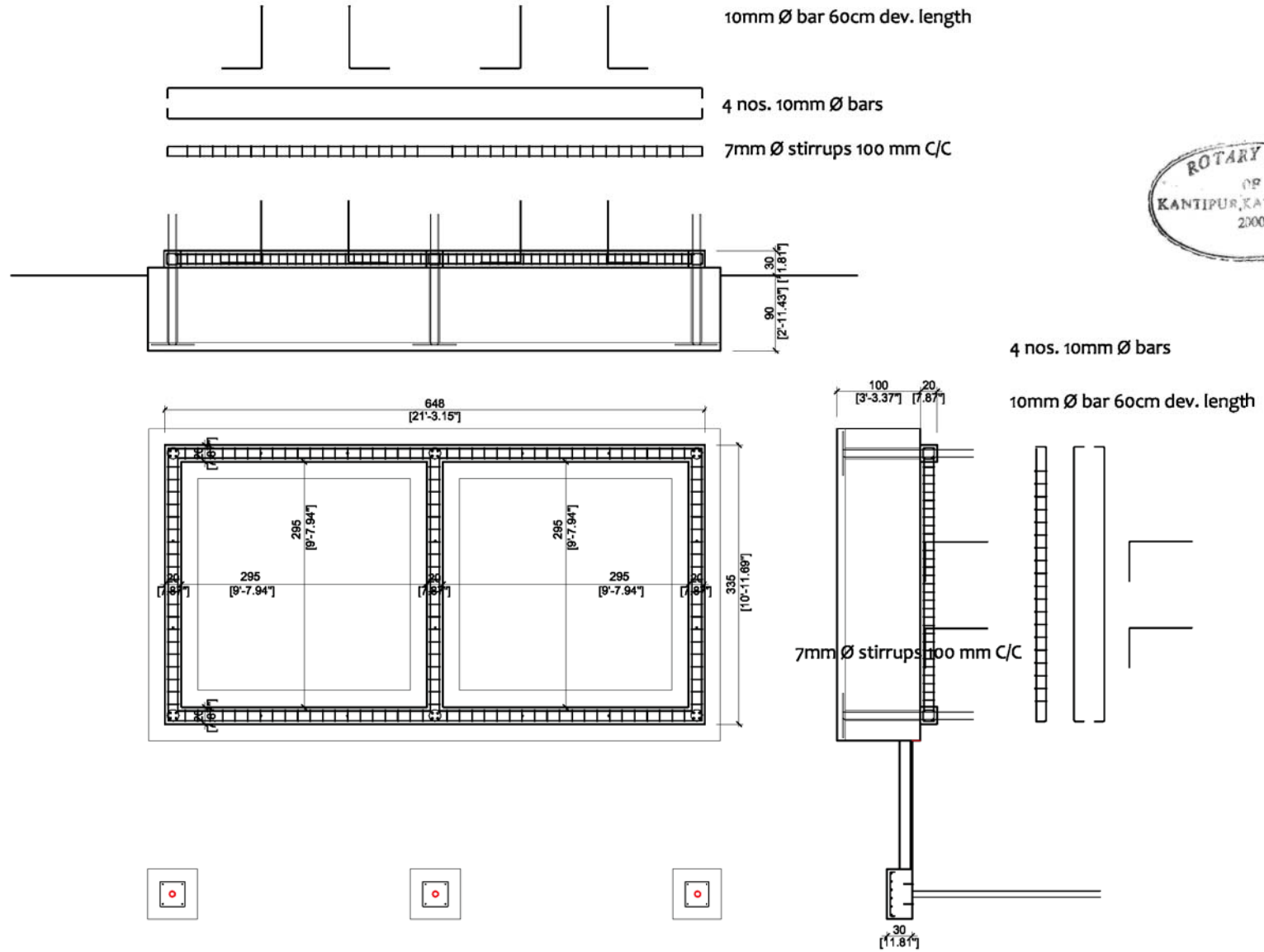


MAT FOUNDATION SECTIONS + ROD DISTRIBUTION

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<p><b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b></p>		<p>SCALE: 1:75</p>	<p><b>S.01</b></p>
<p><b>DRAWING TITLE: MAT FOUNDATION</b></p>		<p>DATE: 11/2017</p>	





PLINTH BEAM LEVEL

PLINTH BEAM SECTIONS + ROD DISTRIBUTION

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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

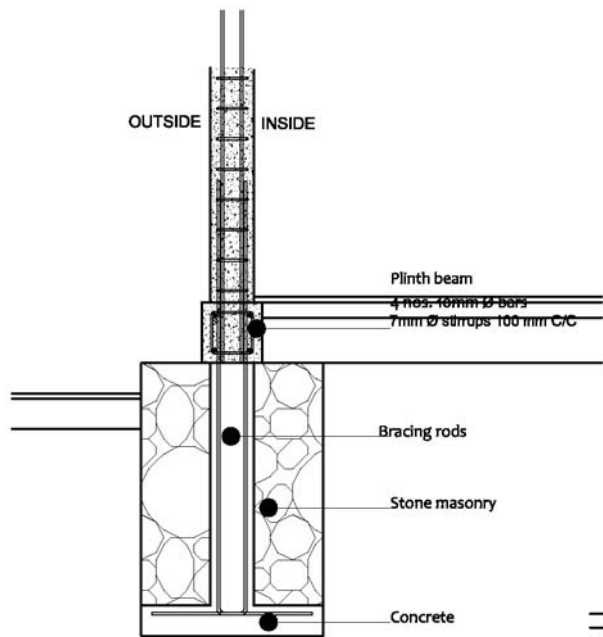
DRAWING TITLE: PLINTH BEAM



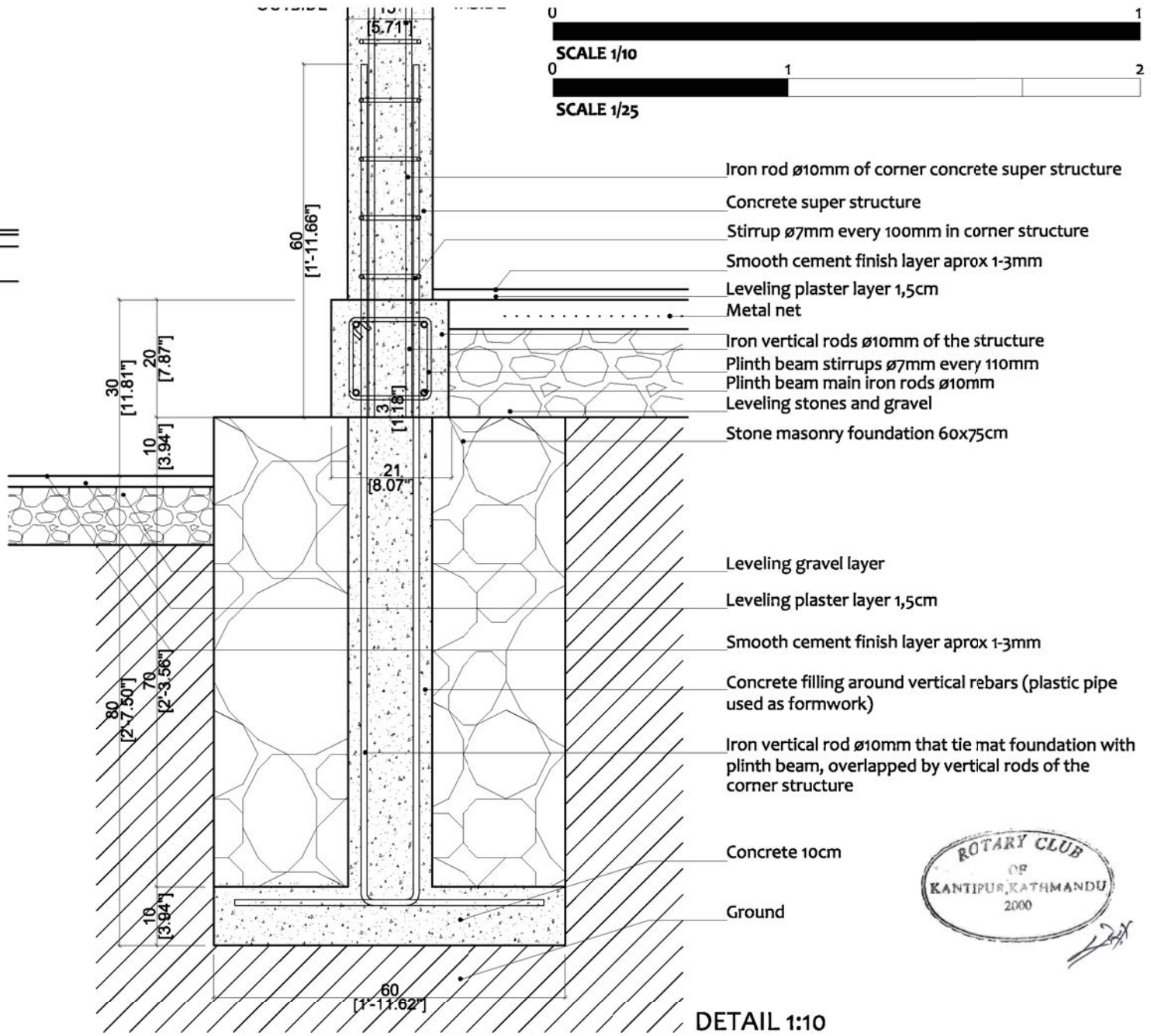
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DATE: 11/2017

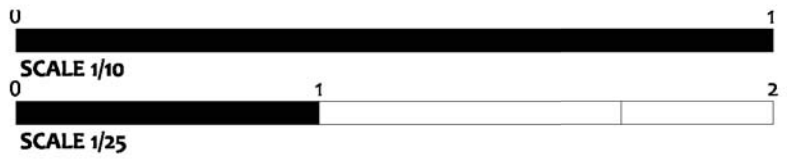
S.02



DETAIL 1:25



DETAIL 1:10



PILLAR-FOUNDATION DETAIL

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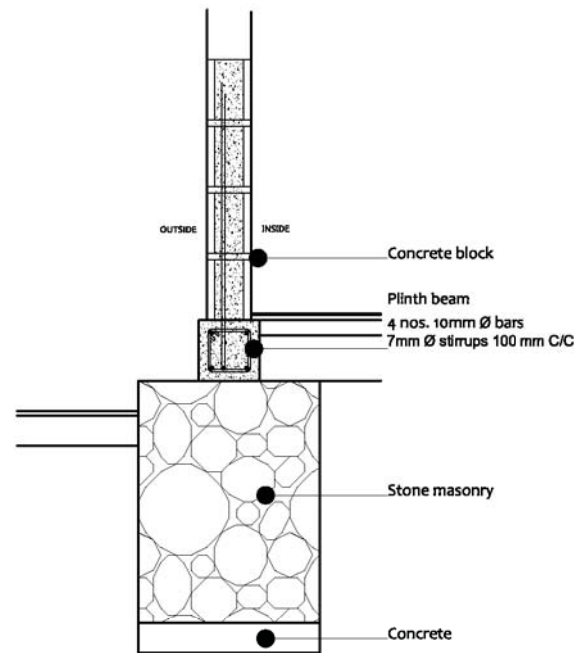
**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: FOUNDATION DETAILS**

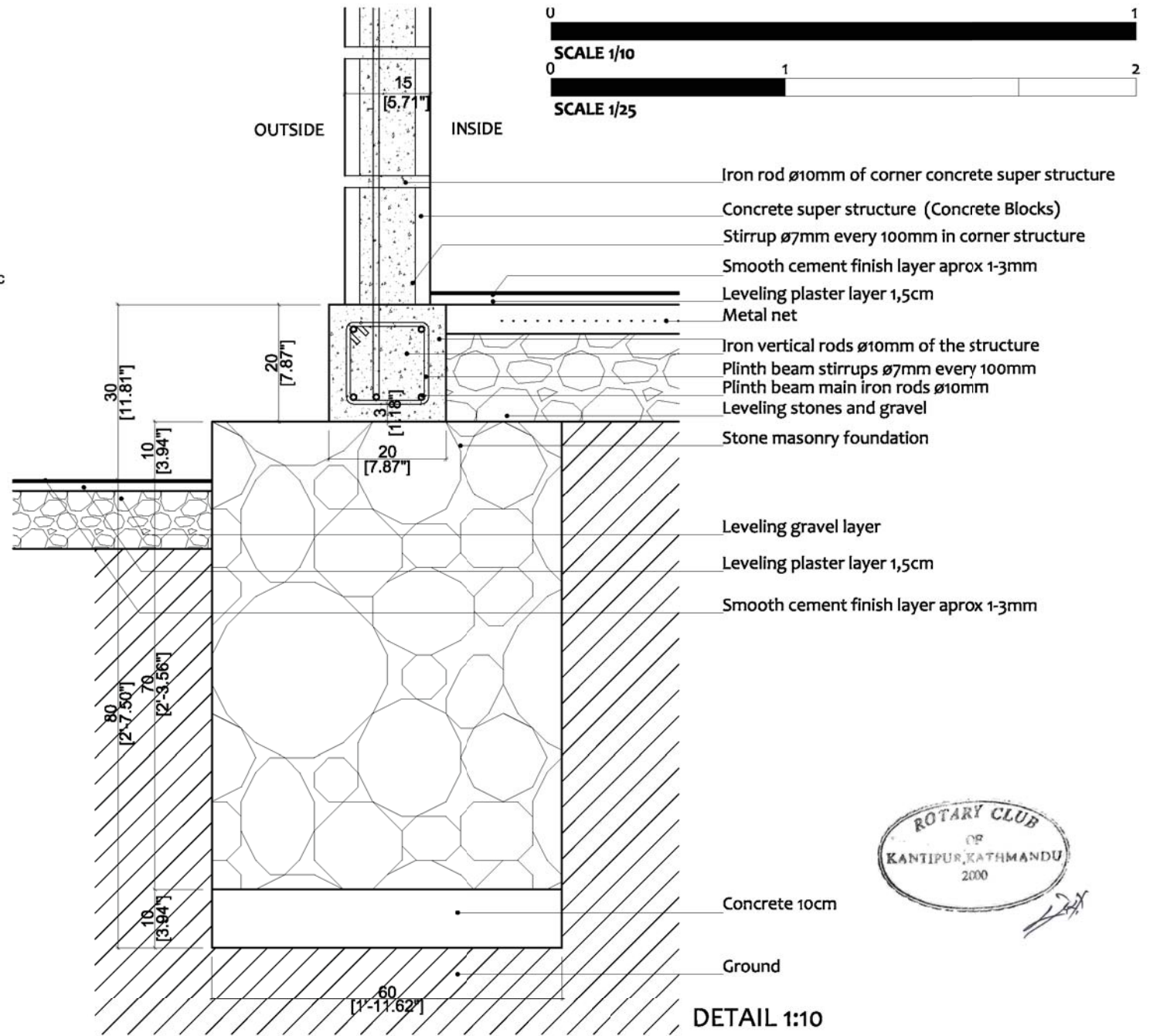
SCALE: 1:25 / 1:10

**S.03**

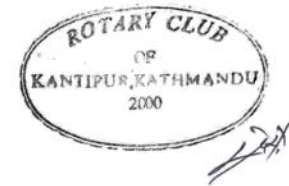




DETAIL 1:25



DETAIL 1:10



WALL- FOUNDATION DETAIL

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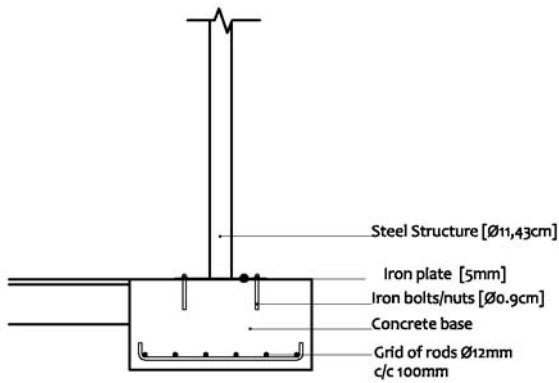
**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: FOUNDATION DETAILS**

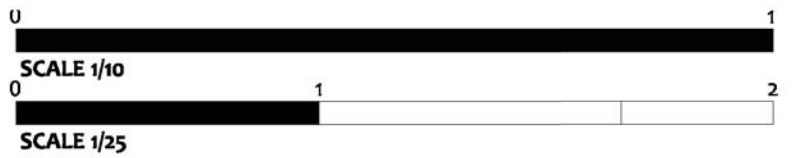
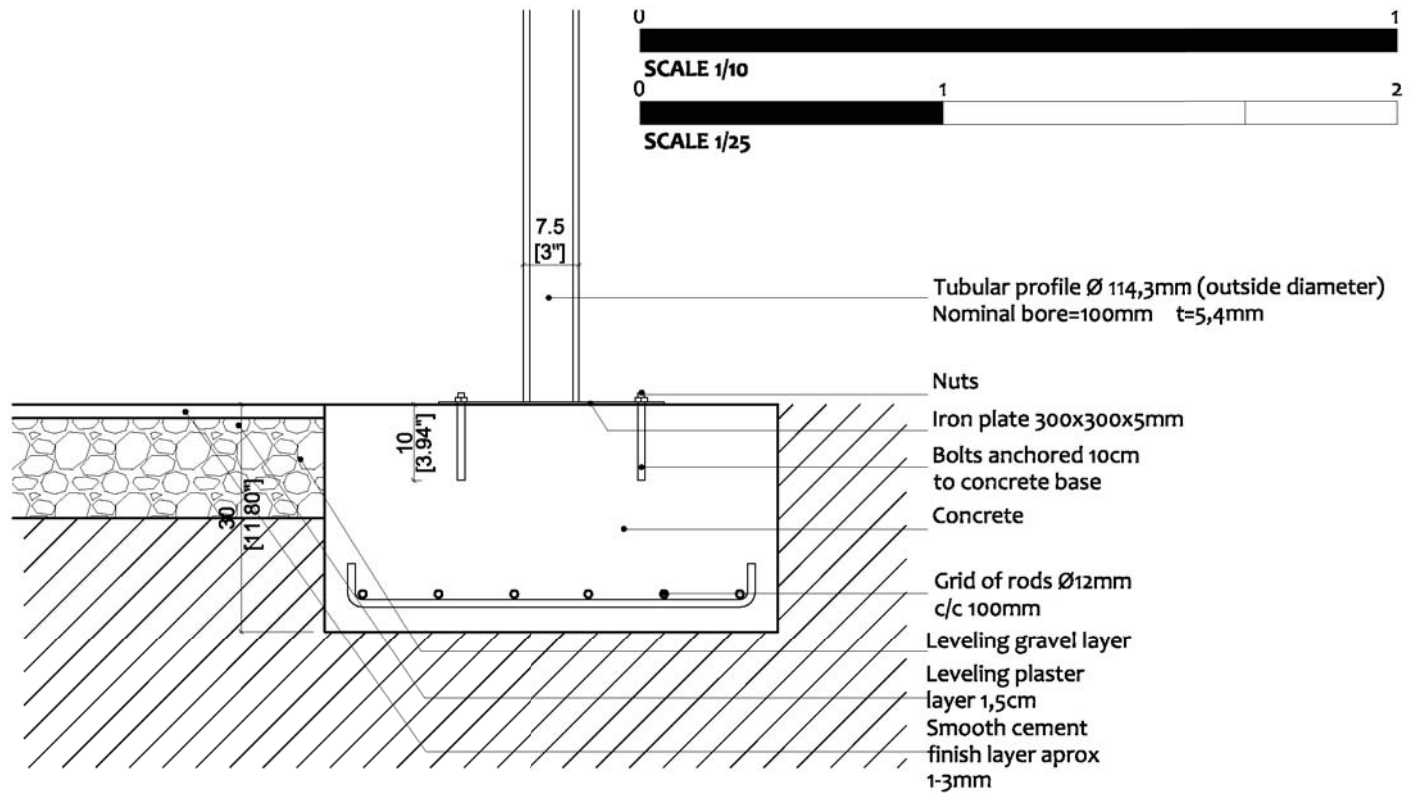
SCALE: 1:25 / 1:10

DATE: 11/2017

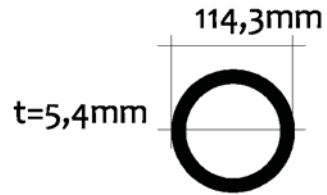
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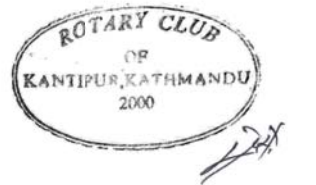
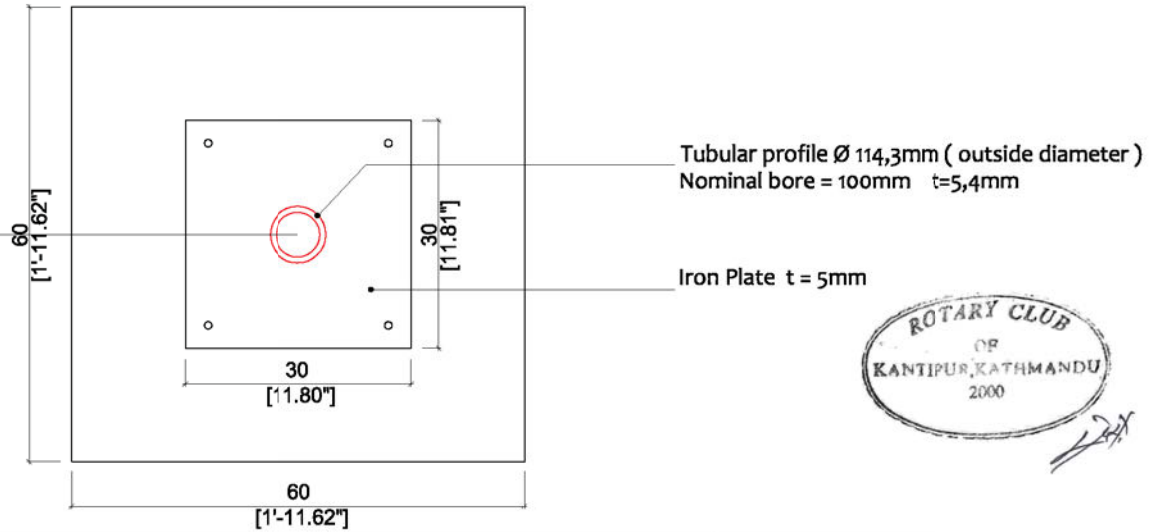
DETAIL 1:25



TUBULAR PROFILE VERANDAH 1:5



DETAIL 1:10



VERANDAH POST-FOUNDATION DETAIL

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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: FOUNDATION DETAILS

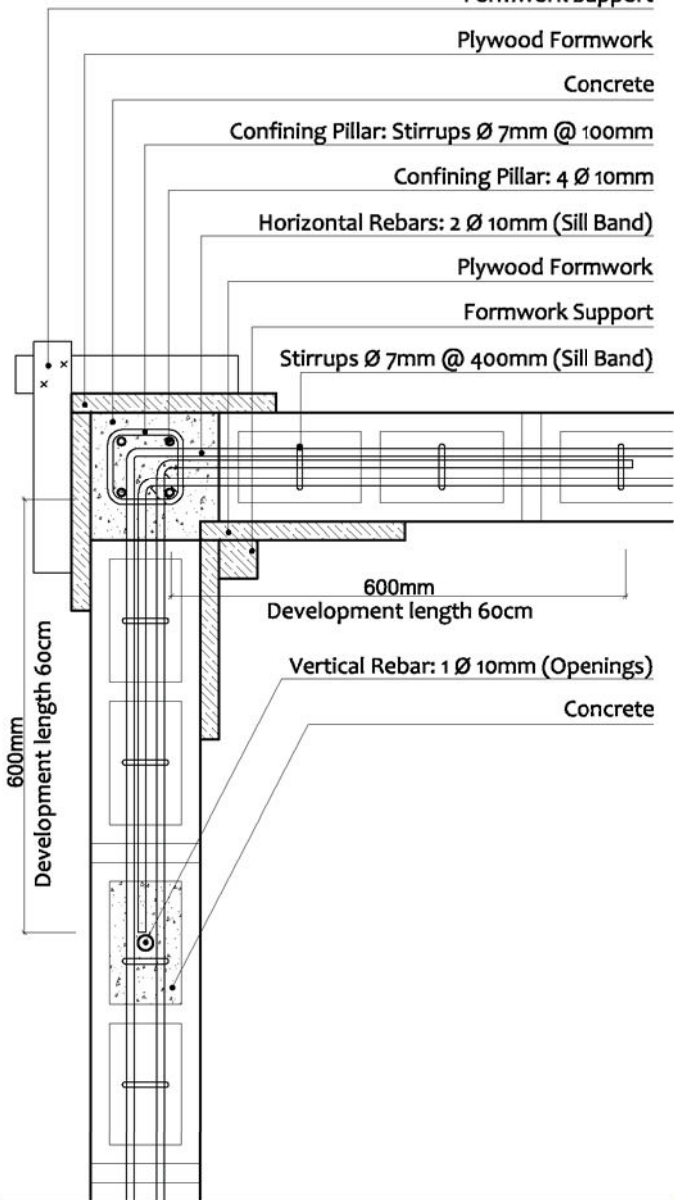


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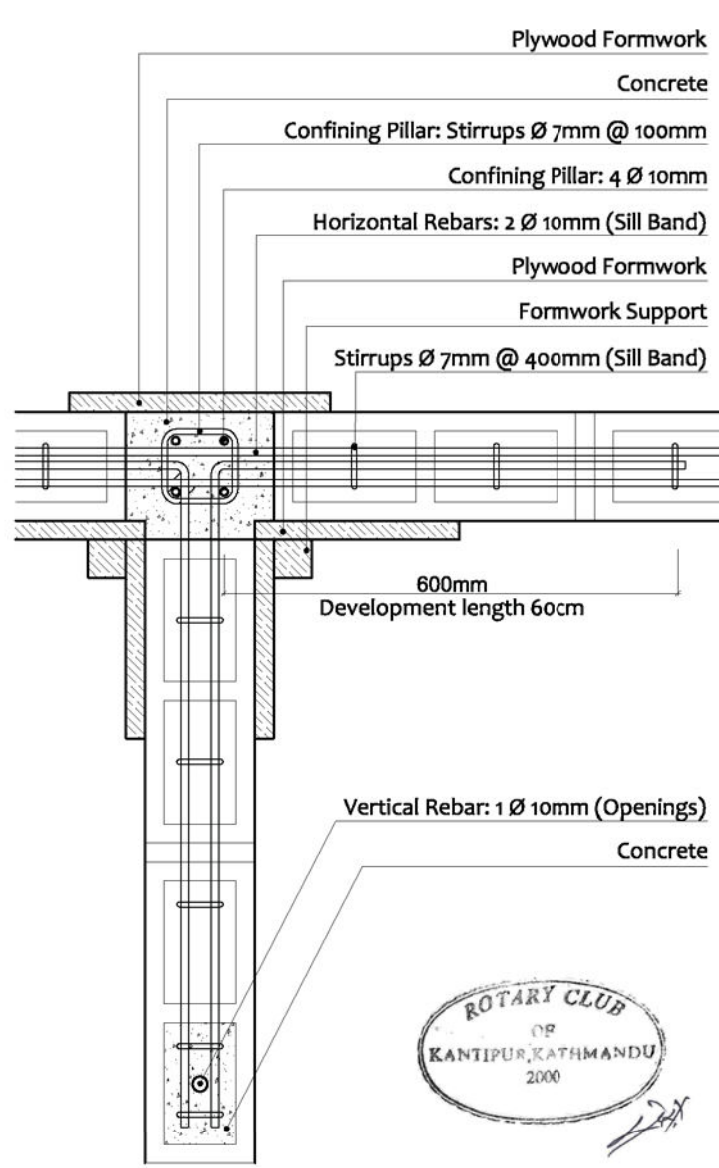
DATE: 11/2017

S.05

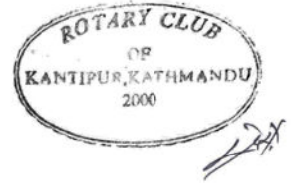
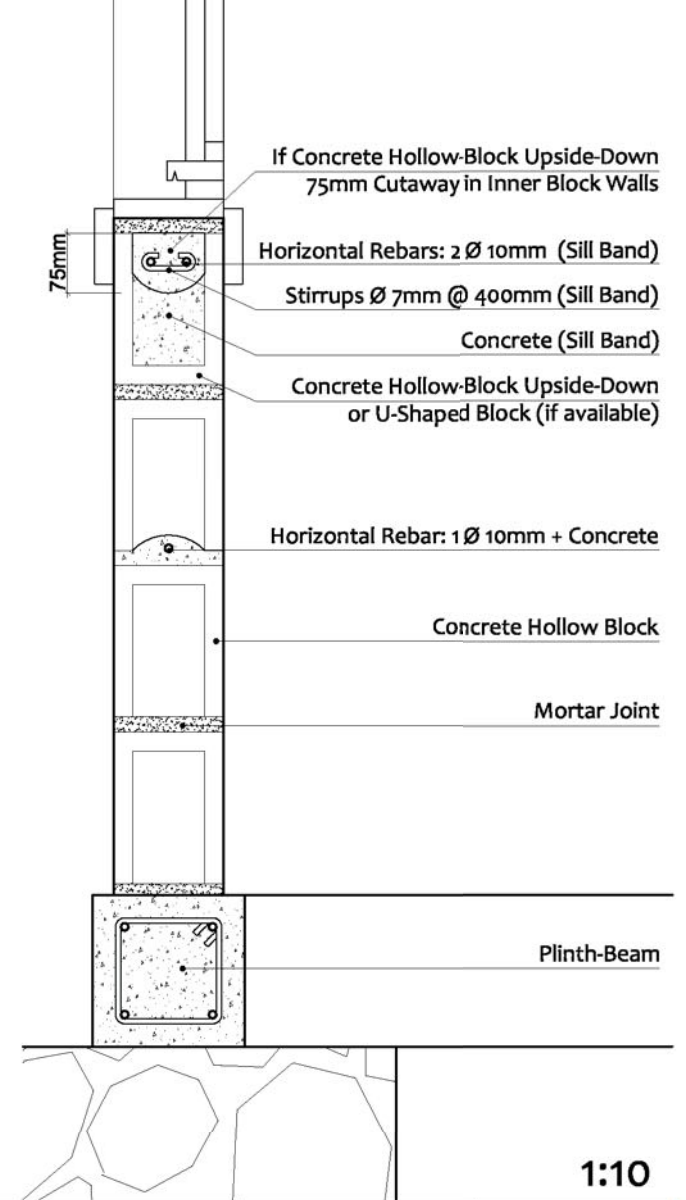
DETAIL 1  
PLAN VIEW SILL BEAM



DETAIL 2  
PLAN VIEW SILL BEAM



DETAIL 3  
WALL - WINDOW SECTION



1:10

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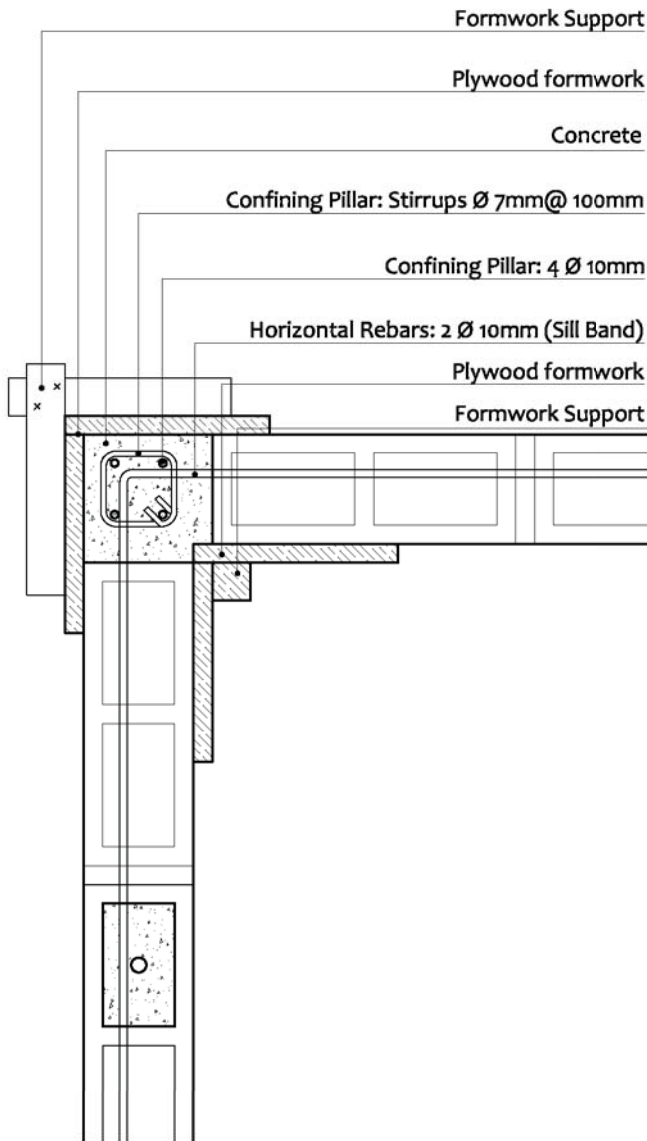
**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: WALLS & PILLAR DETAILS - SILL BEAM**

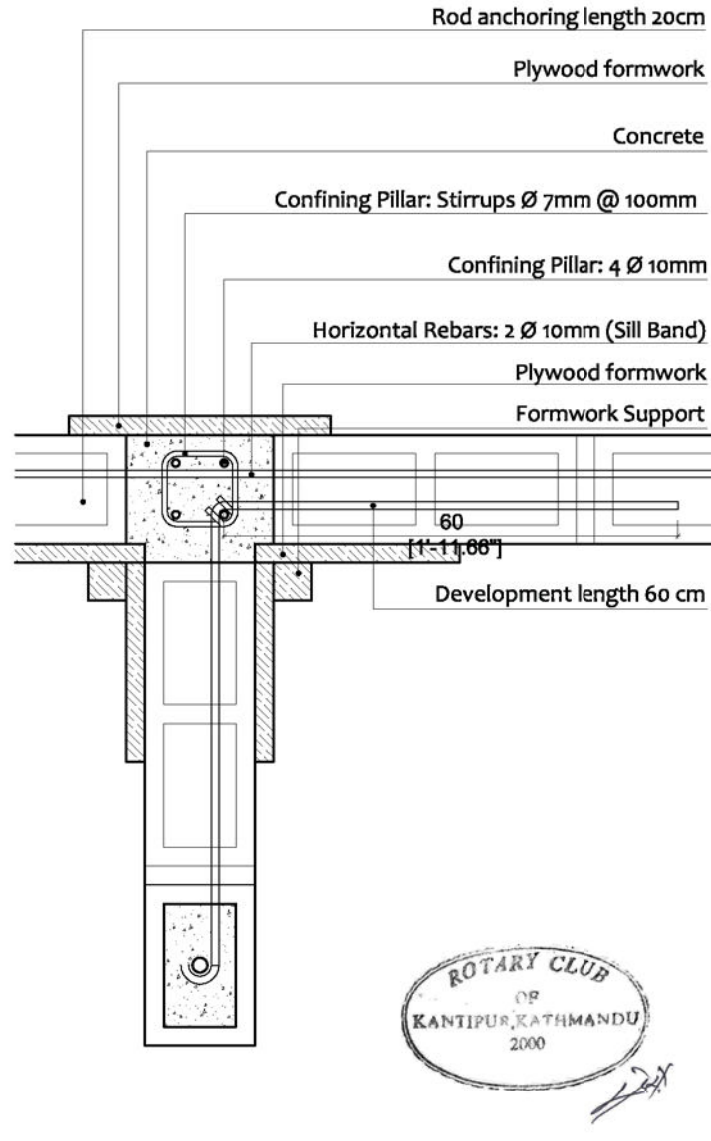
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**S.06**

DETAIL 1  
PLAN VIEW JAMB LEVEL

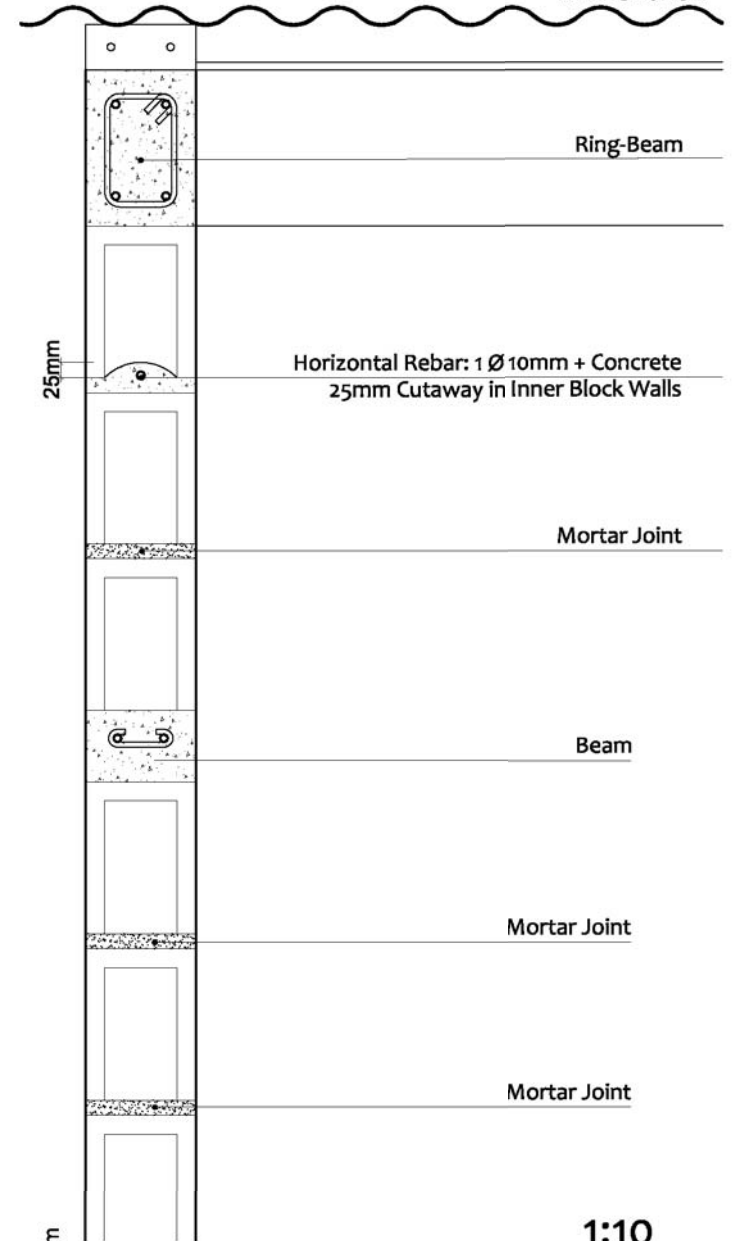


DETAIL 2  
PLAN VIEW JAMB LEVEL



SCALE 1/10

DETAIL 3  
WALL SECTION



1:10

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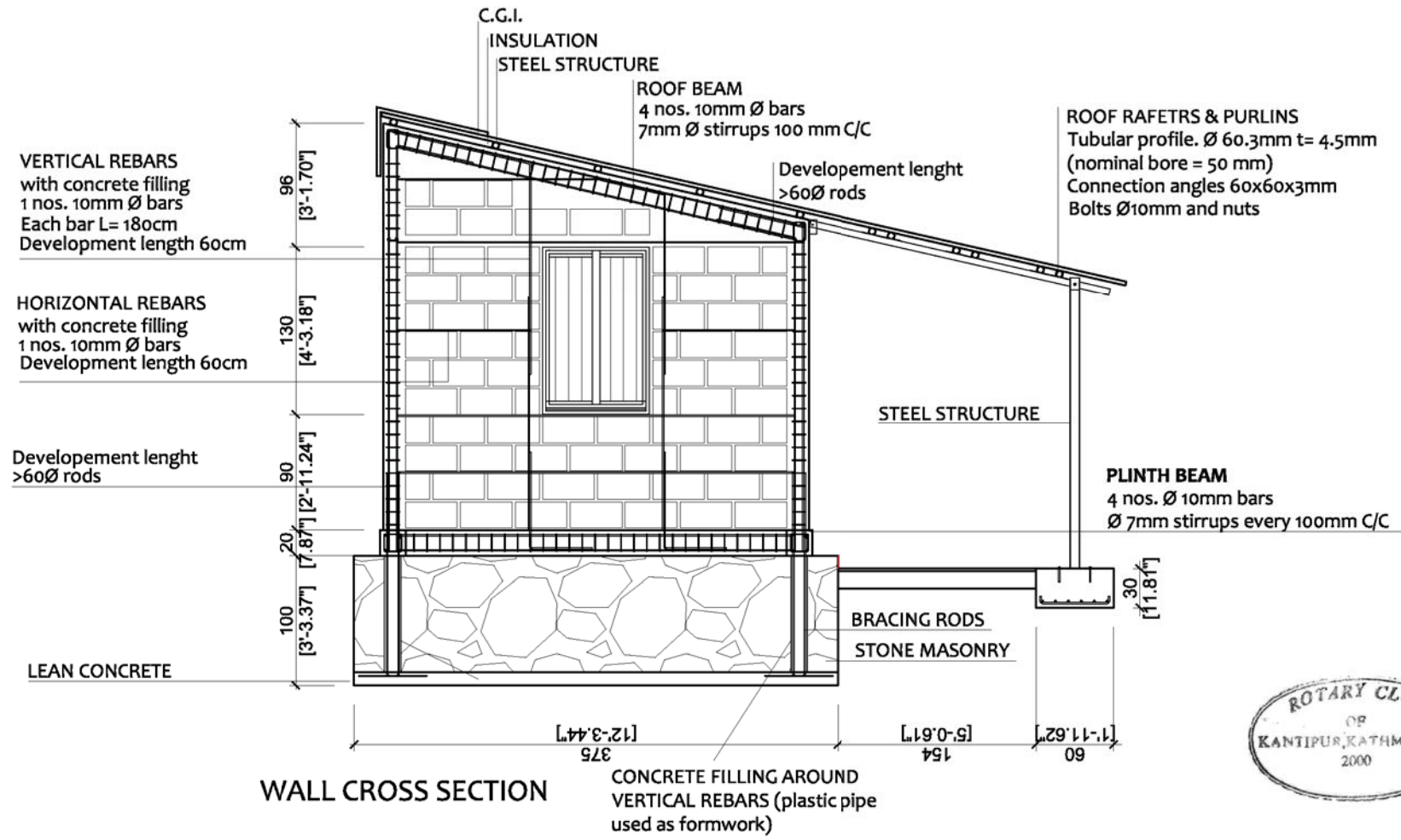
CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: WALLS & PILLAR DETAILS



SCALE: 1:10

S.07

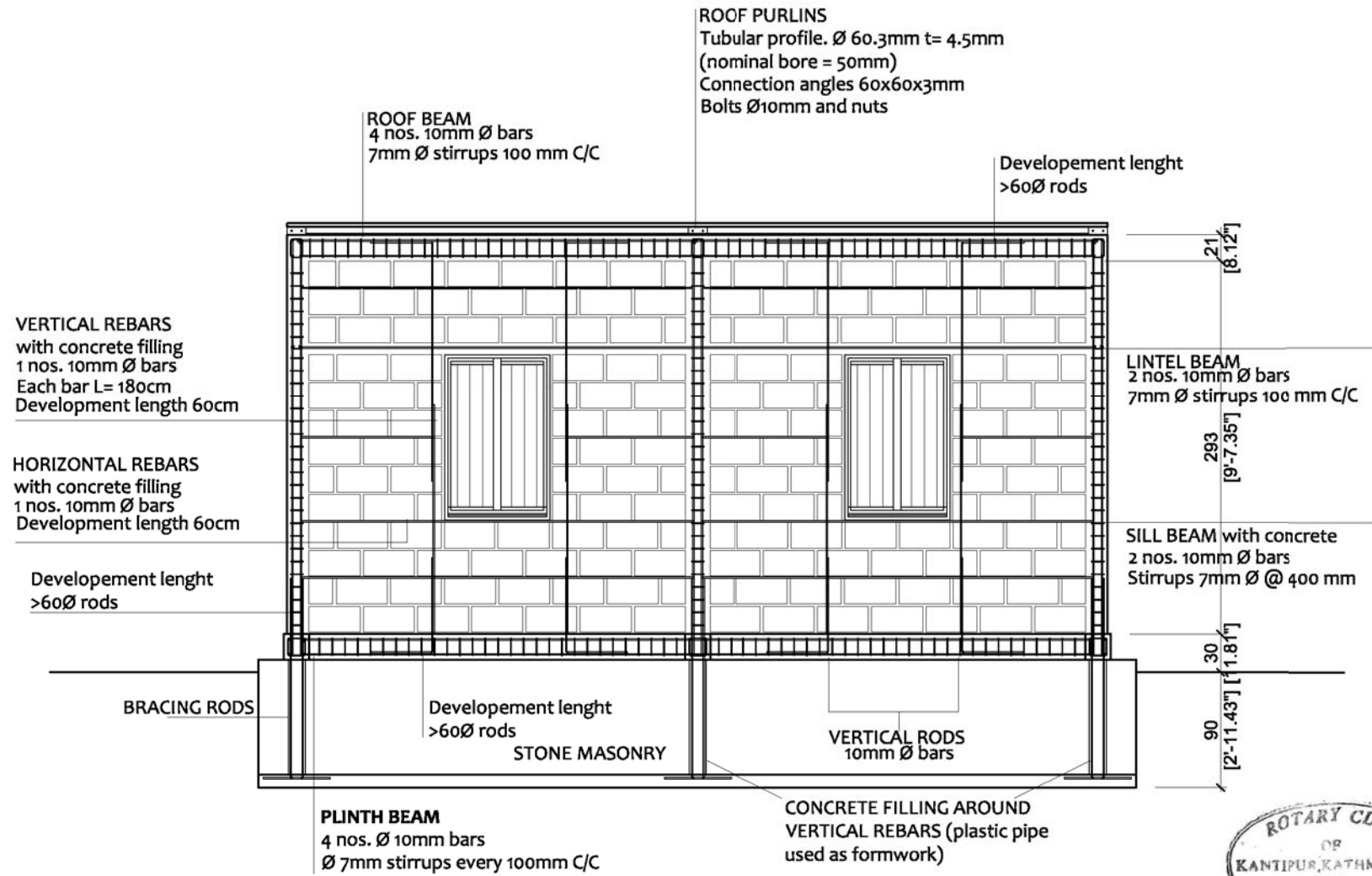


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<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>		SCALE: 1:50	<b>S.08</b>
<b>DRAWING TITLE: WALL SECTION B</b>		DATE: 11/2017	



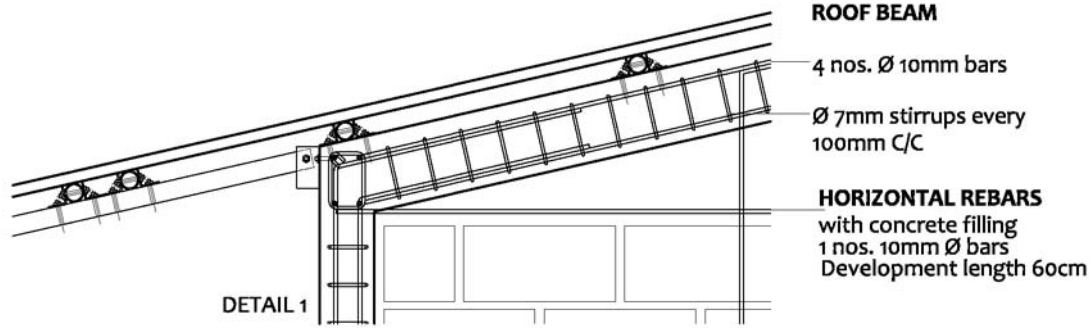
WALL SECTION A

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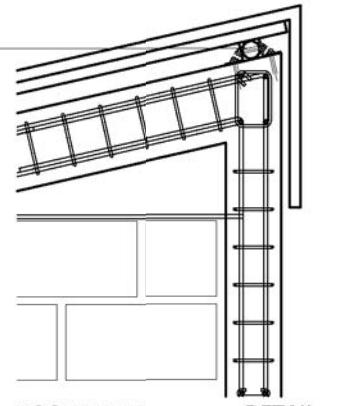
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<p><b>DRAWING TITLE: WALL SECTION A</b></p>	<p>DATE: 11/2017</p>	





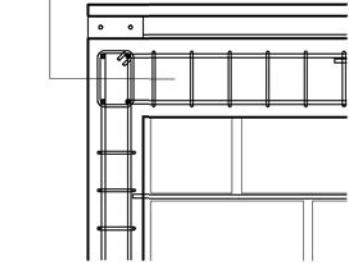
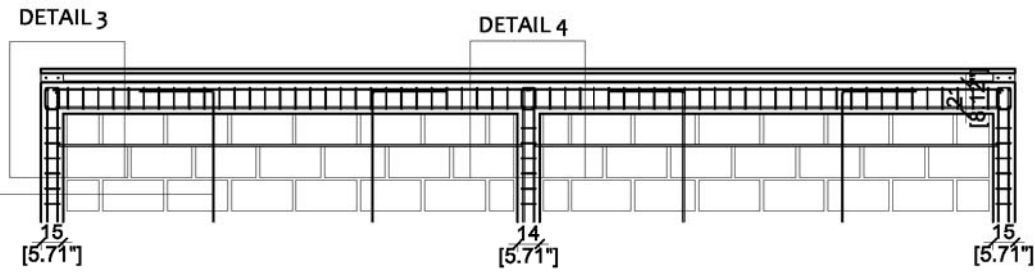


**ROOF PURLINS**  
Tubular profile. Ø 60.3mm t= 4.5mm  
(nominal bore = 50mm)  
Connection angles 60x60x3mm  
Bolts Ø10mm and nuts

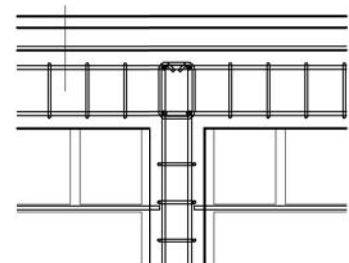


**ROOF BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups every 100mm C/C

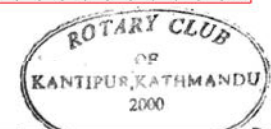
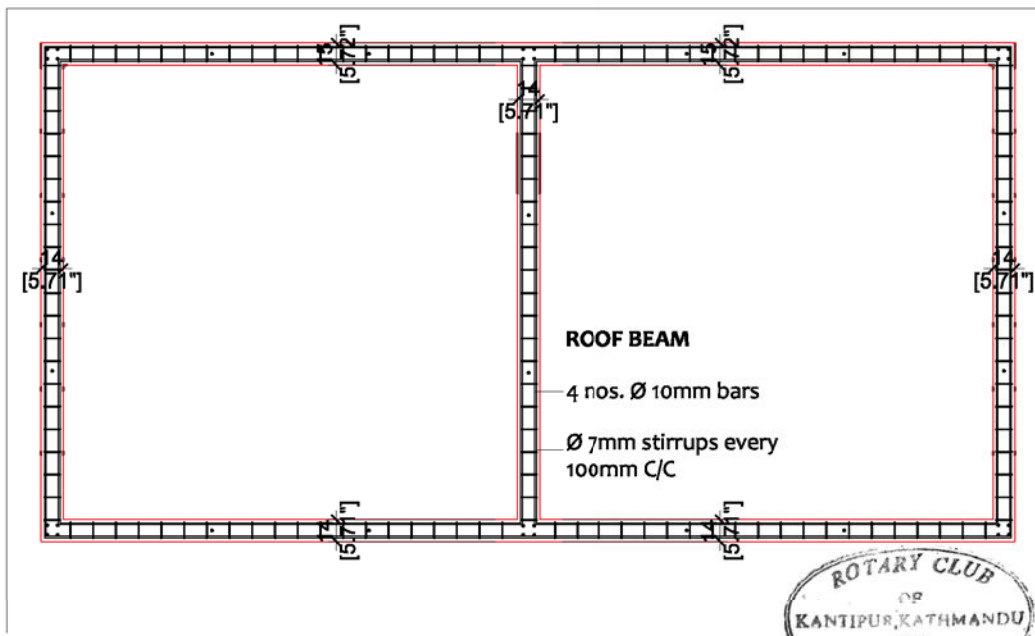
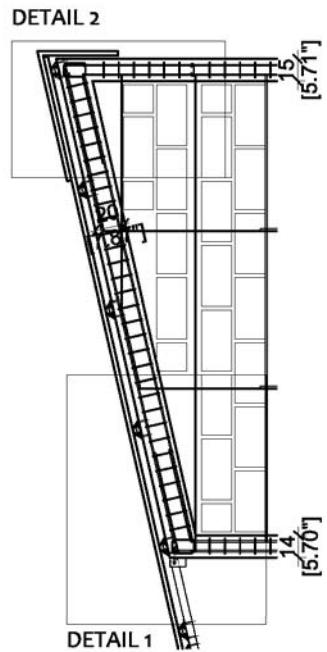
**VERTICAL REBARS**  
with concrete filling  
1 nos. 10mm Ø bars  
Each bar L= 180cm  
Development length 60cm



**ROOF BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups every 100mm C/C



DETAIL 4



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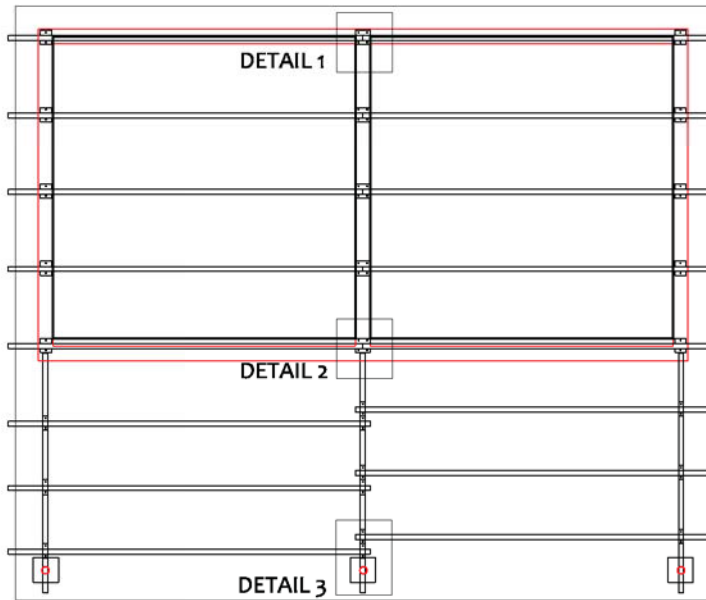
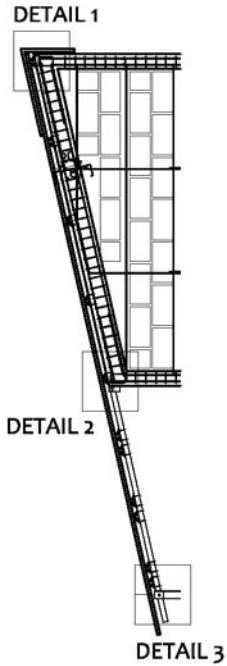
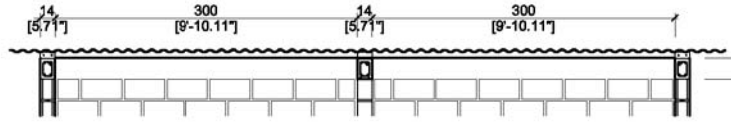
**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: ROOF FLOOR**

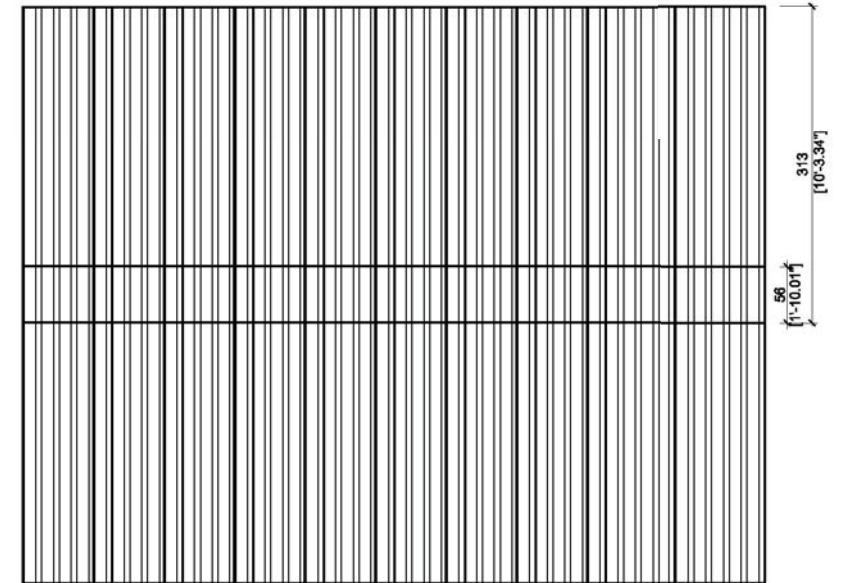
SCALE: 1:50

DATE: 11/2017

**S.10**



PURLINS: TUBULAR PROFILE Ø 60.3mm t=4.5mm



CGI sheet 10 feet/313 cm\_20 sheets



METAL PIPES for ROOF SYSTEM

CGI LAYOUT

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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

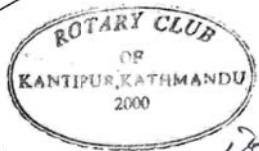
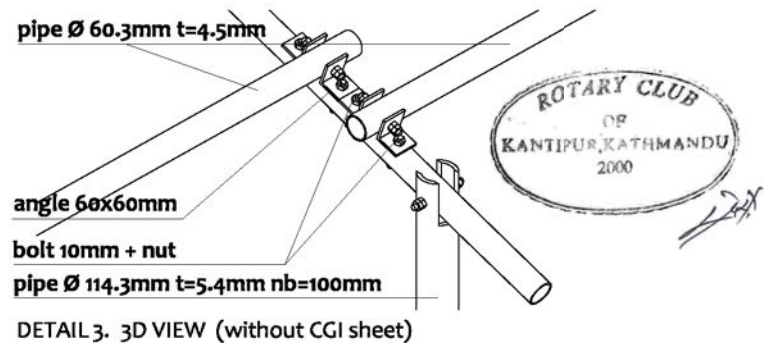
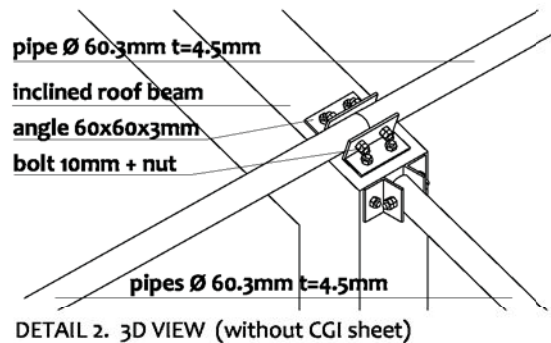
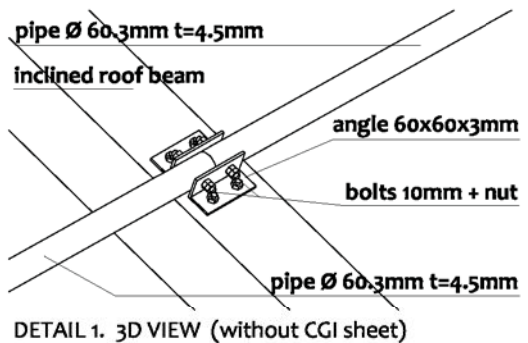
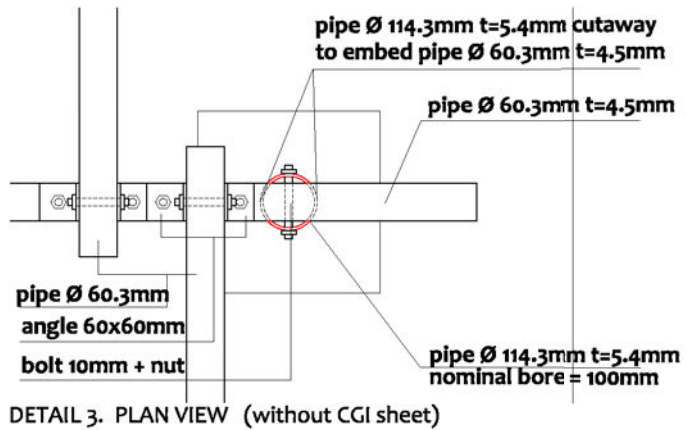
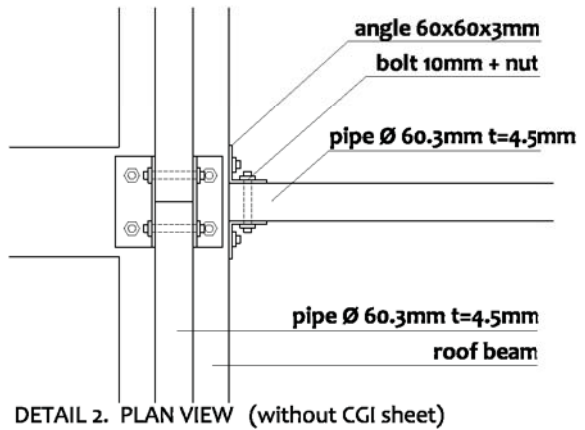
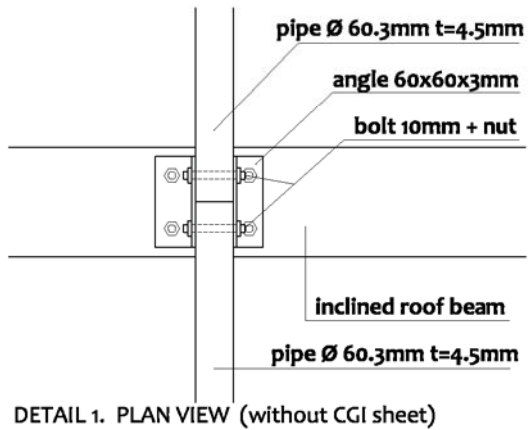
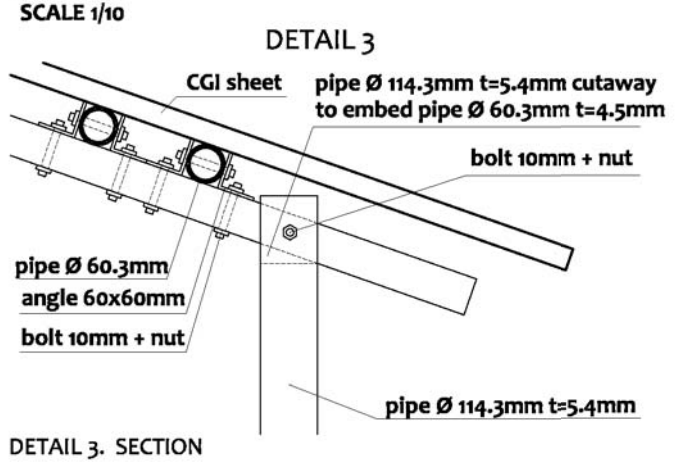
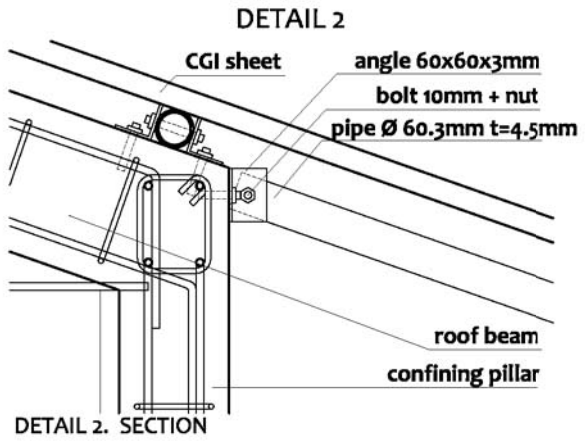
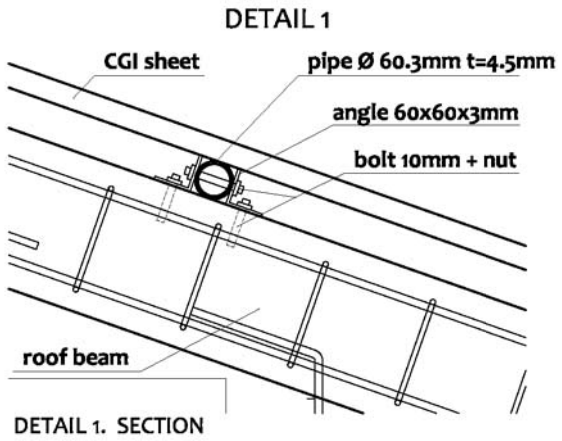
DRAWING TITLE: ROOF. STEEL STRUCTURE & FINISHING



SCALE: 1:75

DATE: 11/2017

S.11



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**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

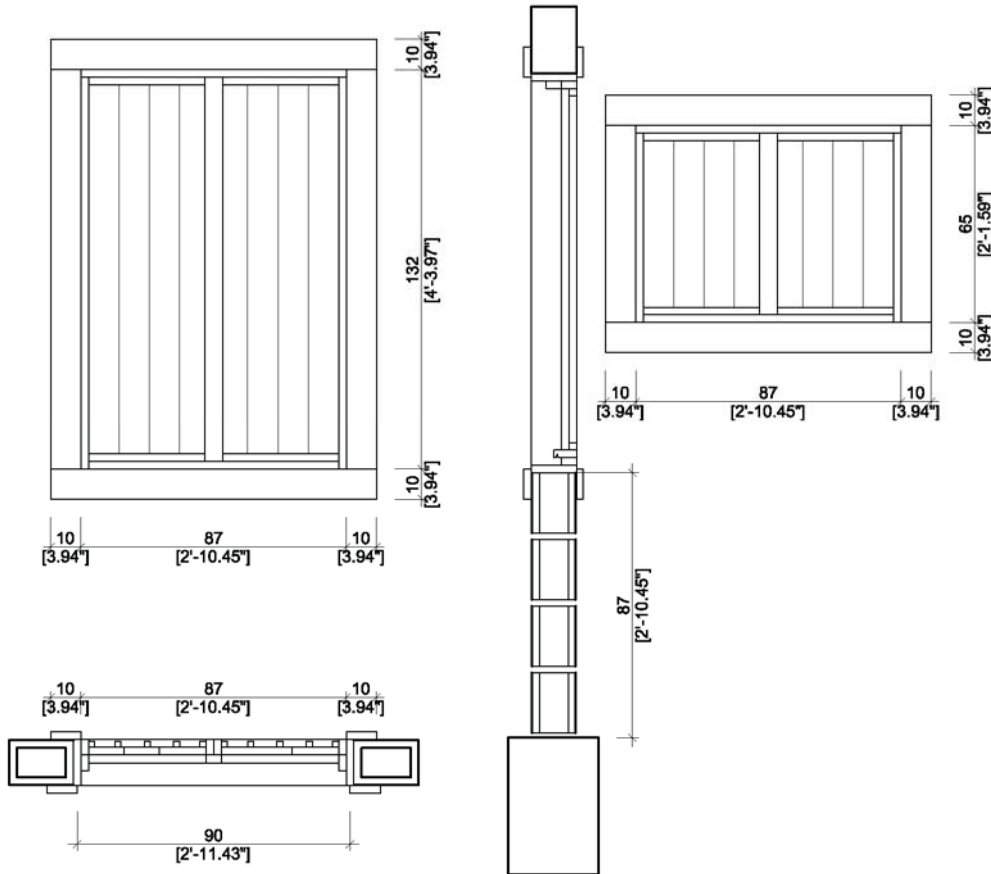
**DRAWING TITLE: ROOF. IRON STRUCTURE CONNECTION DETAILS**

SCALE: 1:75/1:10

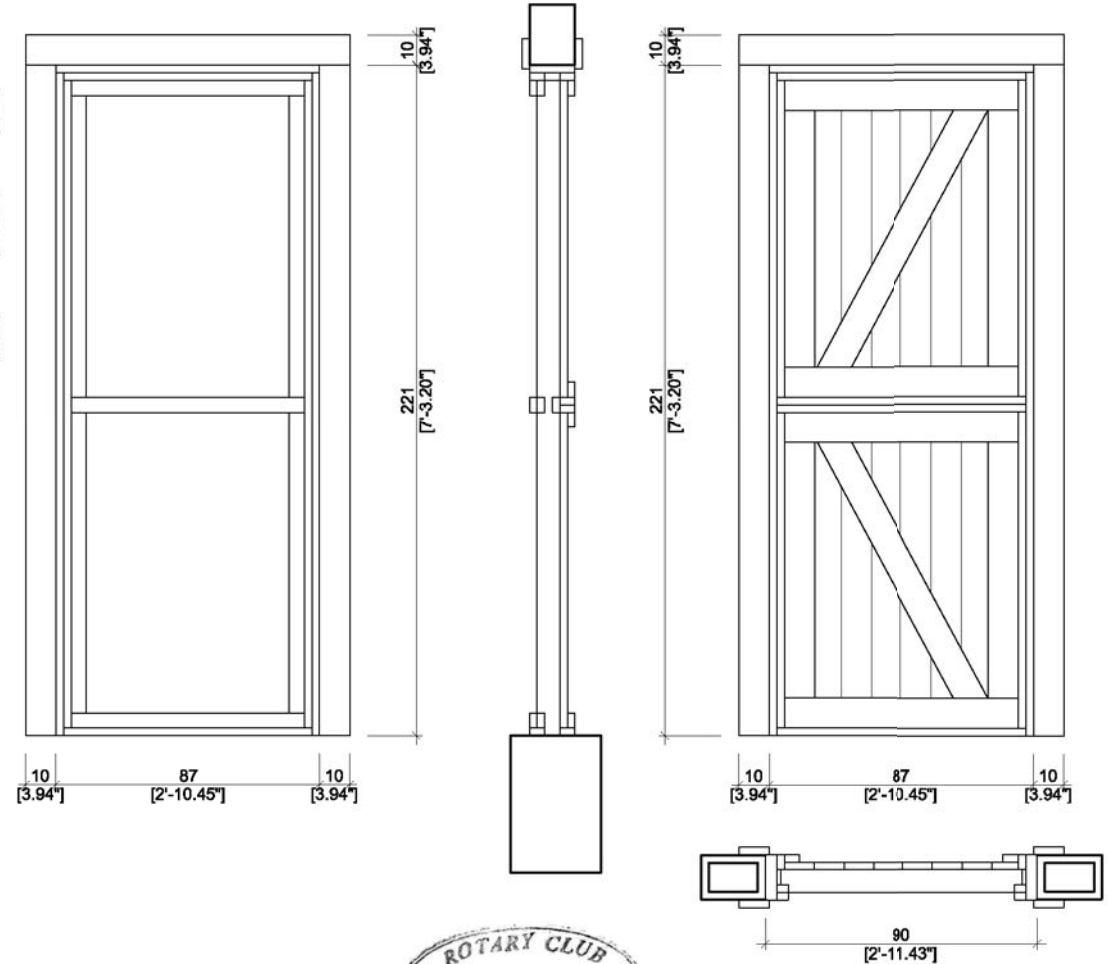
DATE: 11/2017

**S.12**

WINDOWS



DOOR



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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: OPENINGS



SCALE: 1:25

DATE: 11/2017

S.13

## TECHNICAL REQUIREMENTS

<b>STRUCTURAL SYSTEM</b>	Confined concrete block wall, vertically reinforced every 80cms and in all openings' sides; and horizontally, at least every three rows. Surrounded by vertical and horizontal structural concrete elements: vertical pillars at the corners of the rooms (every 3m maximum) and horizontal rings in: plinth beam, floor beam and upper ring beams. All reinforcements are continuous, always overlapping with one another.
<b>FOUNDATION</b>	Shall be done at the required depth and width, depending on the type of soil defined by Nepal National Building Code: soft, medium or hard. Done with cyclopean concrete: stone and concrete ( 1 : 3 : 6 ), resting on a layer of lean concrete.
<b>PLINTH BEAM</b>	Concrete ( 1 : 1,5 : 3 ), of size 30 cms x 45 cms (horizontal and vertical dimensions respectively), reinforced with 4 nos. 10mm $\emptyset$ bars with 7mm stirrups at 100mm c/c
<b>WALL SYSTEM</b>	Concrete blocks shall be of size 400 x 200 x150mm and be of good quality, reinforced with 10mm $\emptyset$ bars. Vertical concrete elements ( 1 : 1,5 : 3 ), reinforced with 4 nos. 10mm $\emptyset$ bars with 7mm $\emptyset$ stirrups at 100mm c/c
<b>SILL BAND</b>	Openings (doors and windows) shall reach up to the floor beam.
<b>LINTEL BAND</b>	Concrete ( 1 : 1,5 : 3 ), shall be of size 15 x 20cms (horizontal and vertical dimensions respectively), reinforced with 4 nos. 10mm $\emptyset$ bars with 7mm $\emptyset$ stirrups at 100mm c/c.
<b>FLOOR BEAM</b>	Concrete ( 1 : 1,5 : 3 ), reinforced with 4 nos. 10mm $\emptyset$ bars with 7mm $\emptyset$ stirrups at 100mm c/c. NOT EXISTING in this variation.
<b>GROUND FLOOR</b>	100mm thick reinforced concrete slab ( 1 : 1,5 : 3 ), resting on a 200mm thick hard rock bed and finished with a 50mm thick layer of lean concrete.
<b>FIRST FLOOR</b>	Wooden floor with variable size of wooden beams. NOT EXISTING in this variation.
<b>ROOF</b>	Metal roof designed out of a tubular profile $\emptyset$ 2"



# BHIMPHEDI AWASUKA



Program developed by:

**Amics del Nepal - Base-A - CCD-UPC University - Agragaami Krishak Krishi Sahakaari - Rotary Club Kantipur**

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**Mònica Sans Duran**, Architect - Musician, **Amics del Nepal NGO**, Barcelona

Technical Coordinator

**Berta Marín Pascal**, Architect, **base-A NGO**, Barcelona

Program Advisor

**Pedro Lorenzo Gálligo**, PhD. Architect, **CCD-UPC University**, Barcelona

Local Counterpart

**Agragaami Krishak Krishi Sahakaari Sastaa**, Bhimpheedi

Local Partner

**Rotary Club Kantipur**, Kathmandu

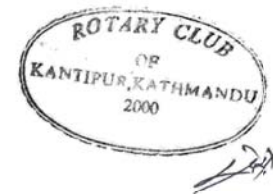
Technical Team

**Architecture:** Andrea Llanas, Valèria Cid, Àlex Espina, Diego Guerra, Victoria Tous, Adrian Àlvarez, Alba Corbella, Andrea Martín, Jose Carlos Sánchez, Andreu Llull, Àngel Joaniquet, Marta Guilera, Irene Vidal, Victoria Solina, Marc Socias, Martí Domènech, Irina Berdonces, Arnau Montoya, Nerea Gezuraga, Mikel Zubiaga. **Surveying:** Marc Crespo. **Geology:** Yuliya Zuck. **Local Coordinator:** Niranjan Pudassainee.

Website: <http://www.amicsnepal.org>

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**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: TEAM CREDITS**



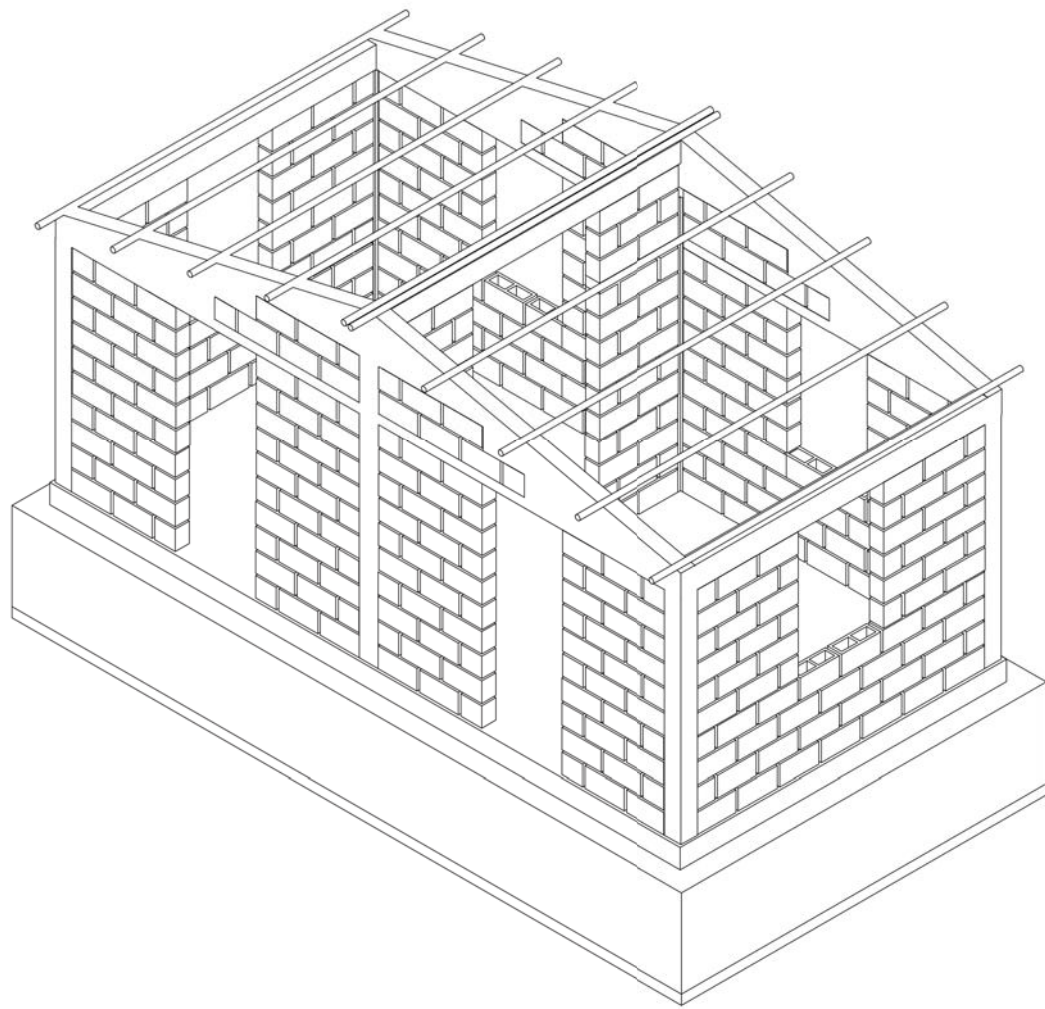
**DATE: 11/2017**

**S.15**









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# CONFINED CONCRETE BLOCK MASONRY

This technique consists of an anti-seismic wall composed of reinforced concrete blocks surrounded by horizontal and vertical structural RCC elements. The whole set forms a high resistance structural unit with a very good response to earthquake demands. The wall organizes closed volumetric units, designed with anti-seismic criteria, which determines a good behaviour of the building. This construction system is widely used in various parts of the world that are subject to earthquake demands.

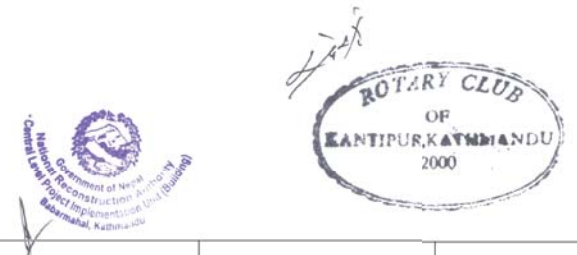
The horizontal structural RCC elements are located at the plinth beam, floor beam and upper ring beam; and the vertical ones (every 3m minimum) at the corners of each room. The concrete block wall is also reinforced vertically every 80 cm, plus in both sides of all openings (doors and windows); and horizontally at least every three block-rows.

The roof system is designed out of tubular profiles of 2" diameter that rest on the concrete walls, leaning on the upper ring-beam. The roof is finished with CGI sheets, allowing attachment of false-ceiling and bamboo insulation.

The featured typology is presented in its simplest layout: 2 ground-floor rooms and 1 verandah. This is a simple variation of the basic typology, which consists in 4 ground-floor rooms, 4 first-floor rooms and 1 verandah, in order to adapt it to the users' needs, reducing it to 2 spaces only. The basic typology has already been approved by NRA.

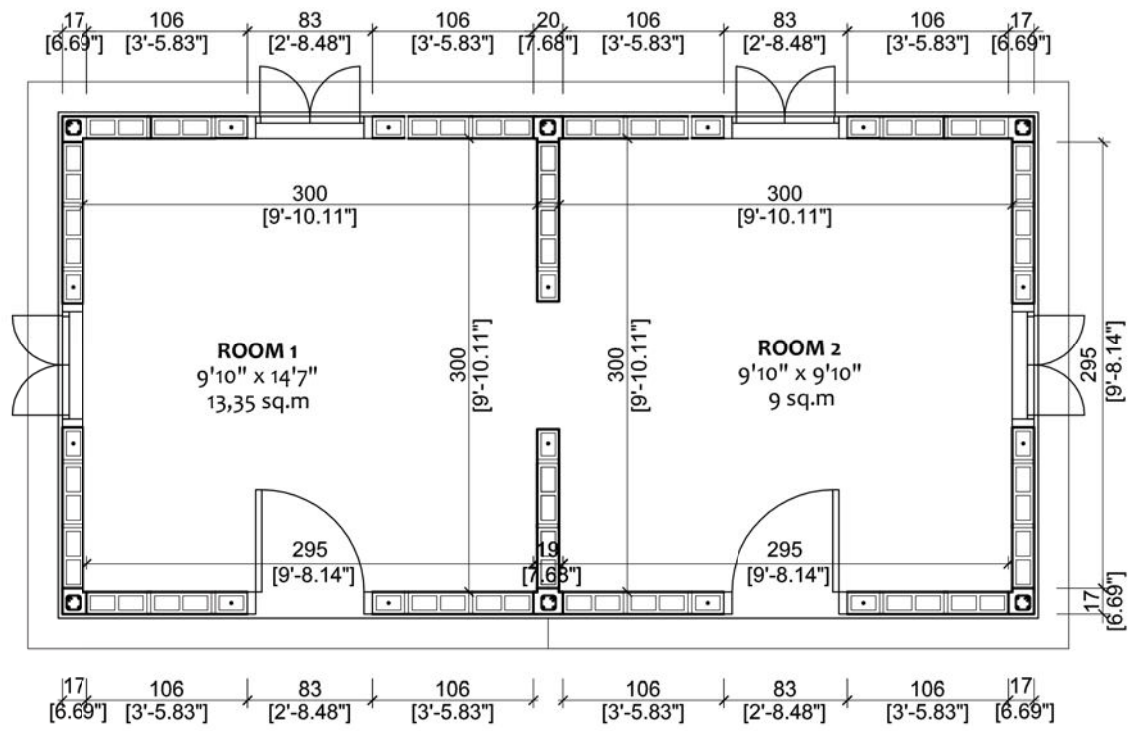
**MATERIAL PROPERTIES**

Block Size: 400 x 200 x 150mm  
 Minimum Compressive strength of block: 5 N/mm2  
 Grade of Steel: Fe 500 MPa  
 Nominal Mix Ratio: 1 : 1,5 : 3 (C : S : A)



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<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>		
<b>DRAWING TITLE: SYSTEM DESCRIPTION</b>	<b>DATE: 11/2017</b>	<b>A.01</b>

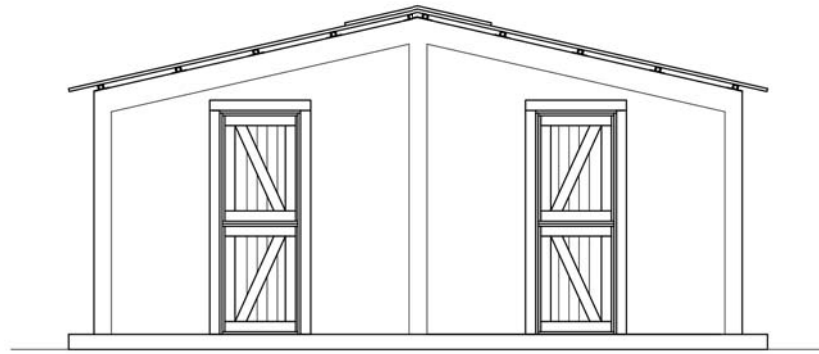
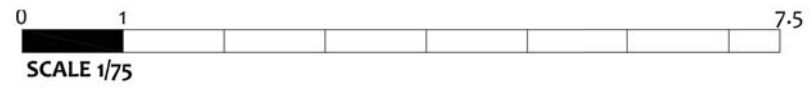


GROUND FLOOR

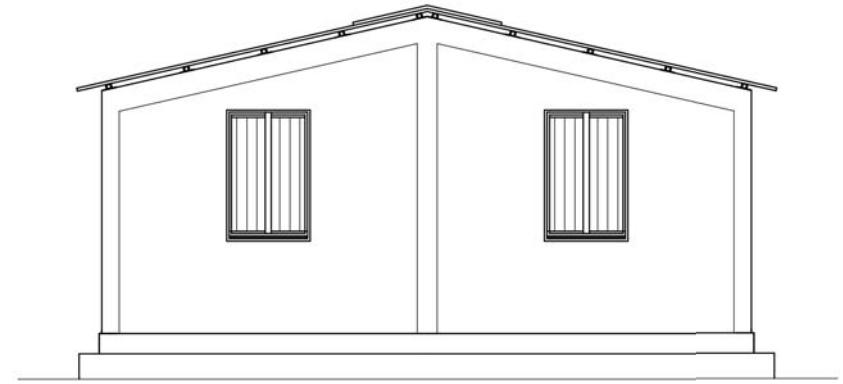


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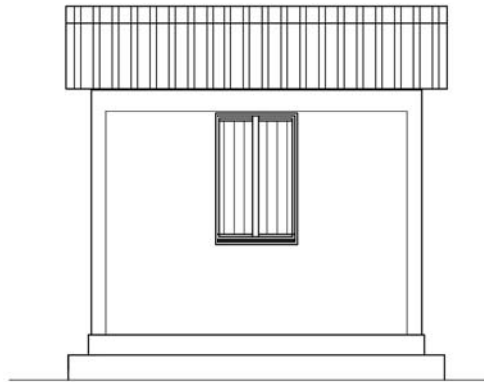
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<b>DRAWING TITLE: PLAN VIEWS</b>	<b>DATE: 11/2017</b>	



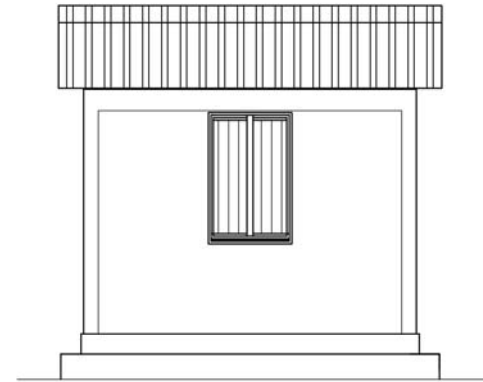
FRONT ELEVATION



BACK ELEVATION



SIDE ELEVATION



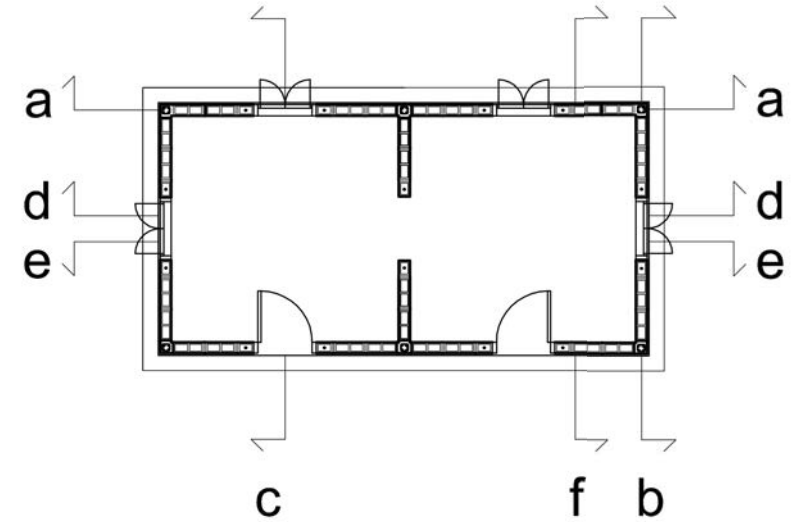
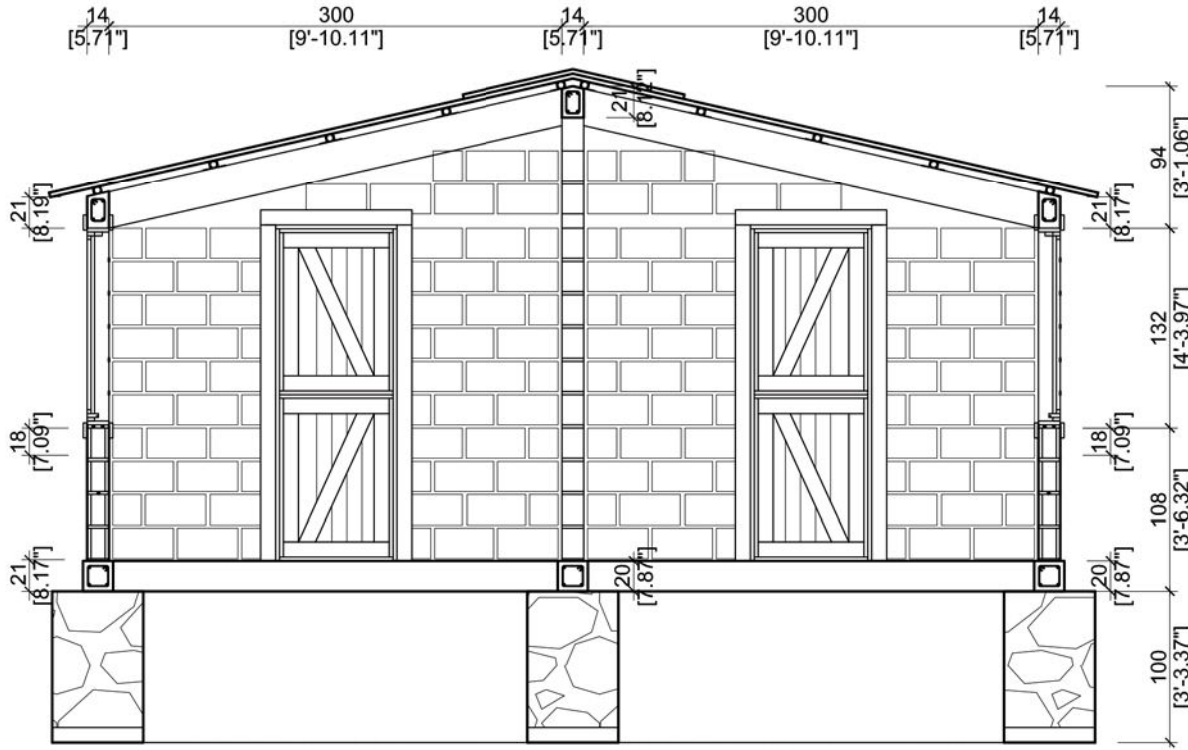
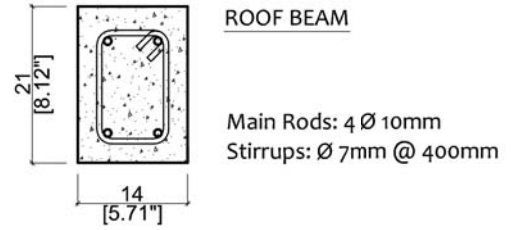
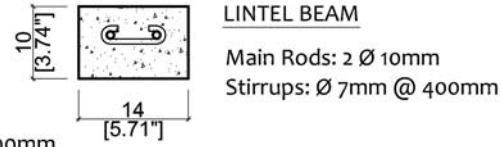
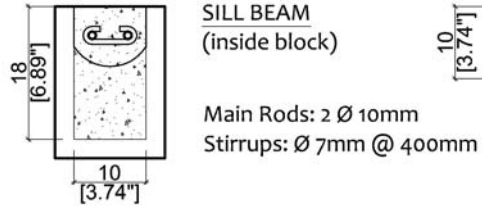
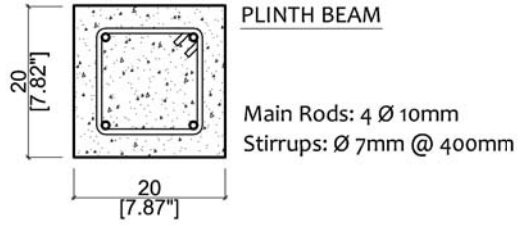
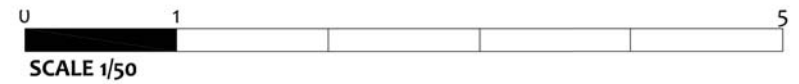
SIDE ELEVATION



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<p><b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b></p>		<p><b>SCALE:</b> 1:75</p>	<p><b>A.03</b></p>
<p><b>DRAWING TITLE: ELEVATIONS</b></p>		<p><b>DATE:</b> 11/2017</p>	

# HORIZONTAL BANDS (BEAMS)



SECTION E



**BHIMPHEDE AWASUKA** Aawaas Sudhar Karyakram  
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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: CONSTRUCTIVE SECTION

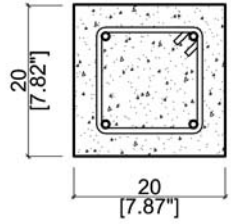
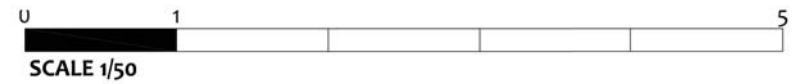


SCALE: 1:50

DATE: 11/2017

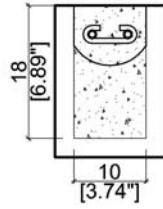
A.04

# HORIZONTAL BANDS (BEAMS)



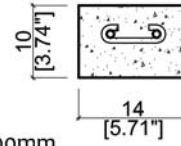
**PLINTH BEAM**

Main Rods: 4 Ø 10mm  
Stirrups: Ø 7mm @ 400mm



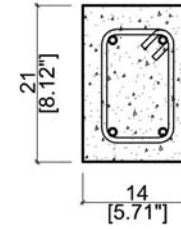
**SILL BEAM**  
(inside block)

Main Rods: 2 Ø 10mm  
Stirrups: Ø 7mm @ 400mm



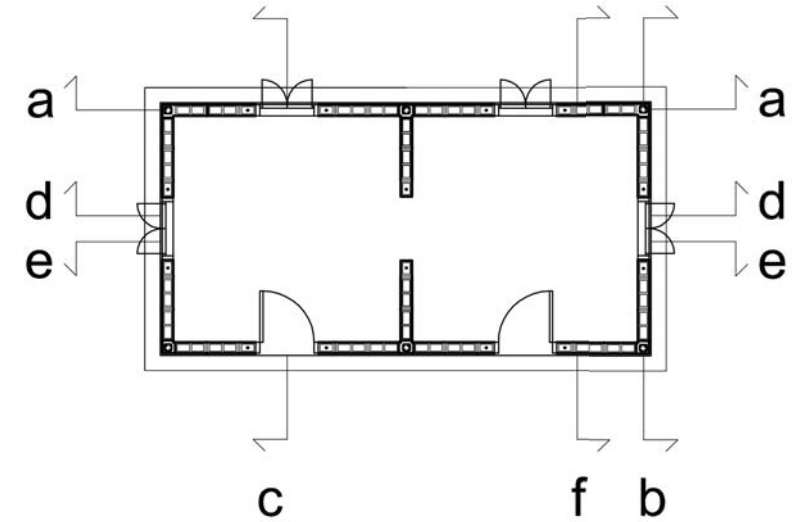
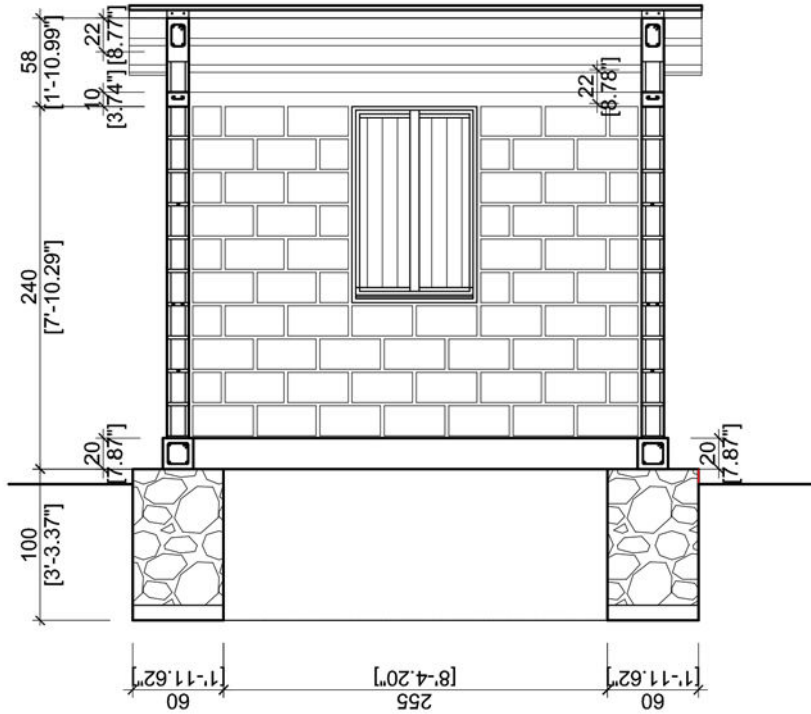
**LINTEL BEAM**

Main Rods: 2 Ø 10mm  
Stirrups: Ø 7mm @ 400mm



**ROOF BEAM**

Main Rods: 4 Ø 10mm  
Stirrups: Ø 7mm @ 400mm



SECTION F



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 bhimpheedi.awasuka@gmail.com

CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: CONSTRUCTIVE SECTION

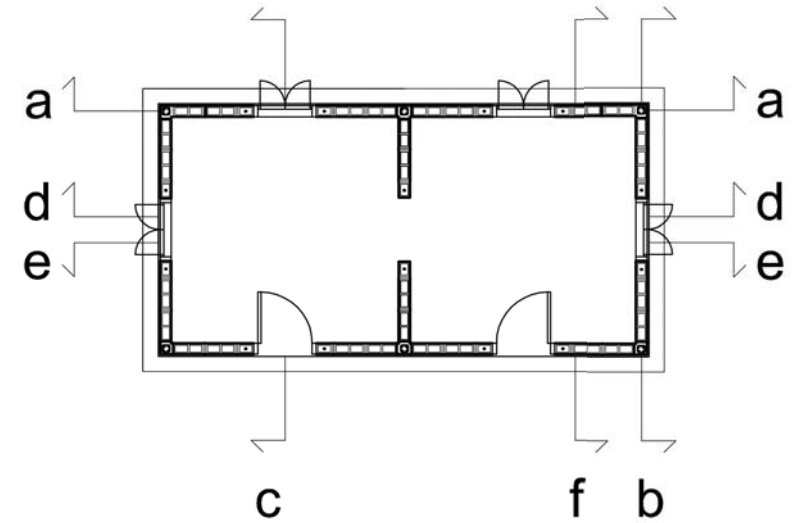
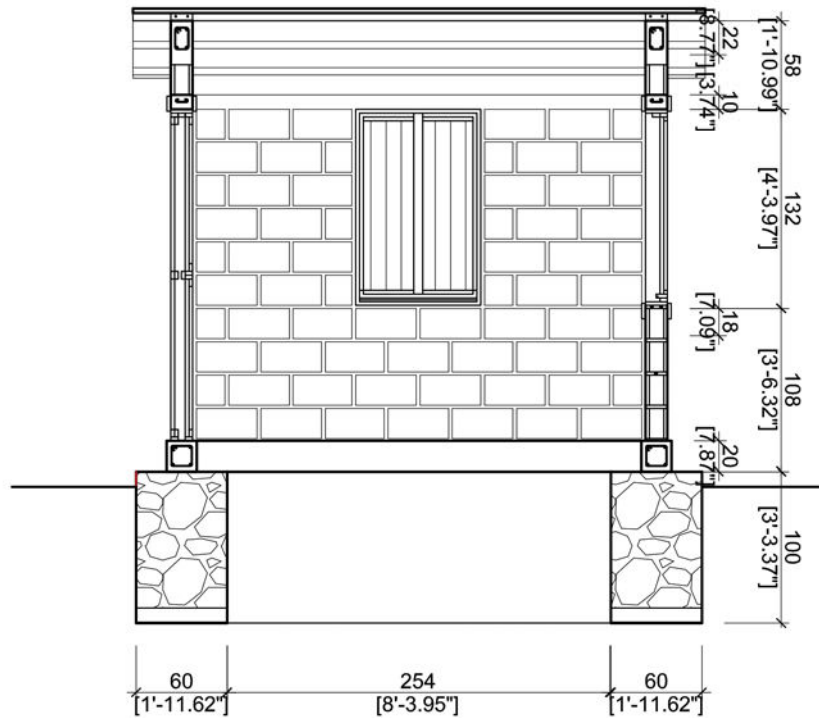
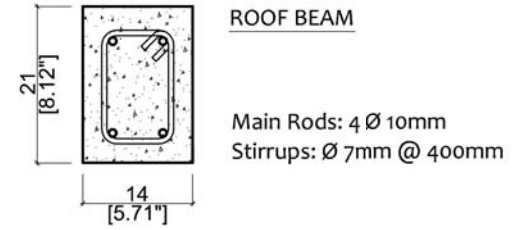
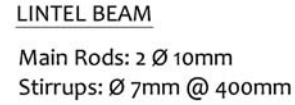
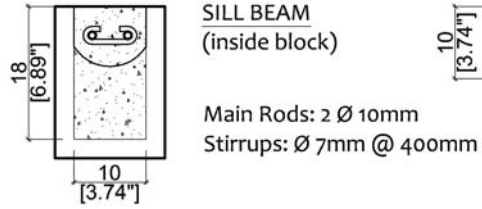
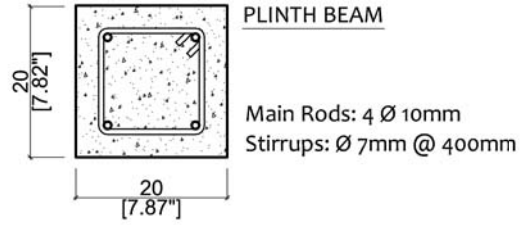
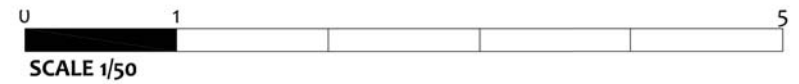


SCALE: 1:50

DATE: 11/2017

A.05

# HORIZONTAL BANDS (BEAMS)

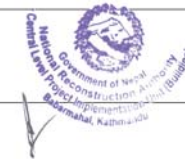


SECTION C

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: CONSTRUCTIVE SECTION

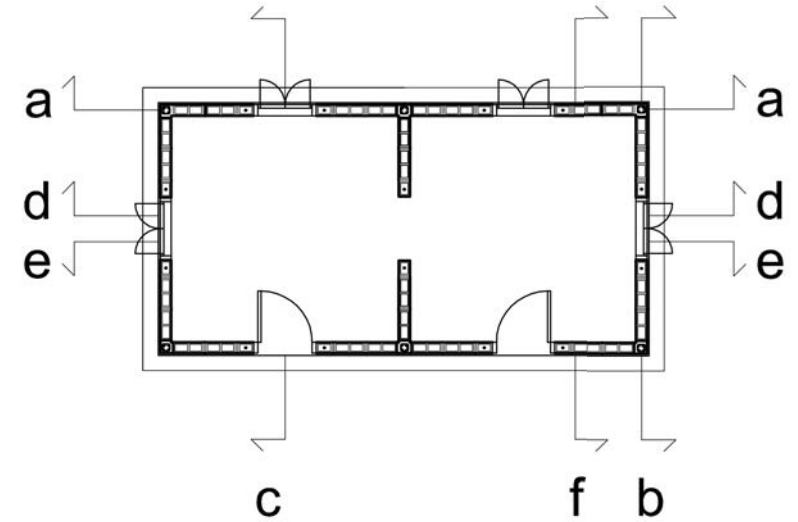
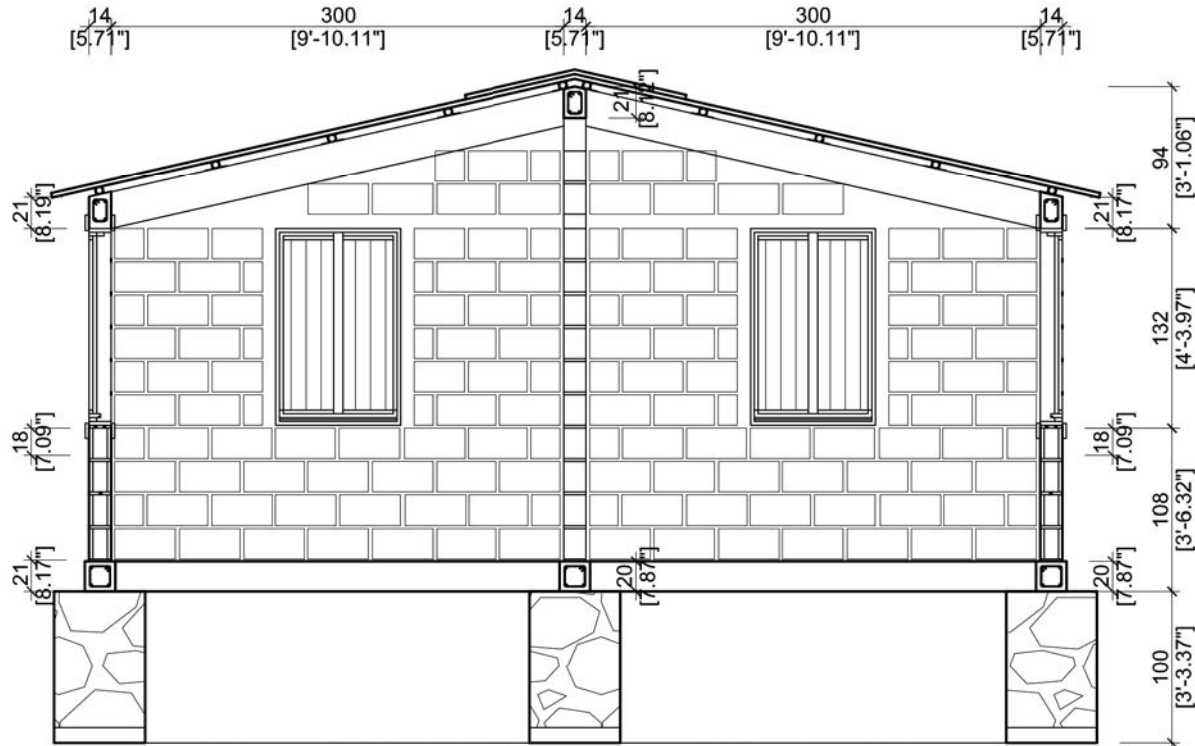
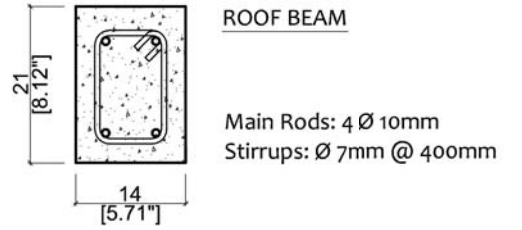
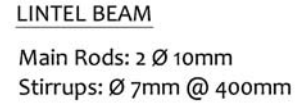
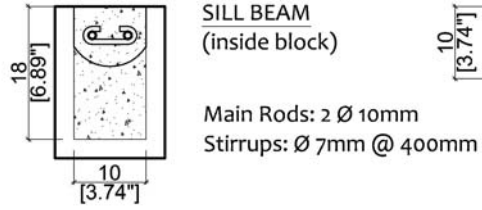
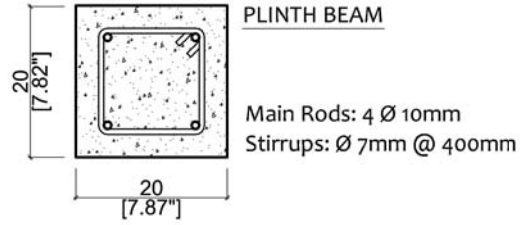
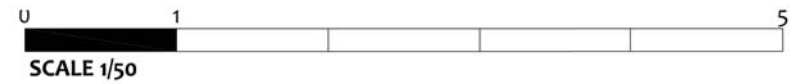


SCALE: 1:50

DATE: 11/2017

A.06

# HORIZONTAL BANDS (BEAMS)



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 bhimpheedi.awasuka@gmail.com

**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

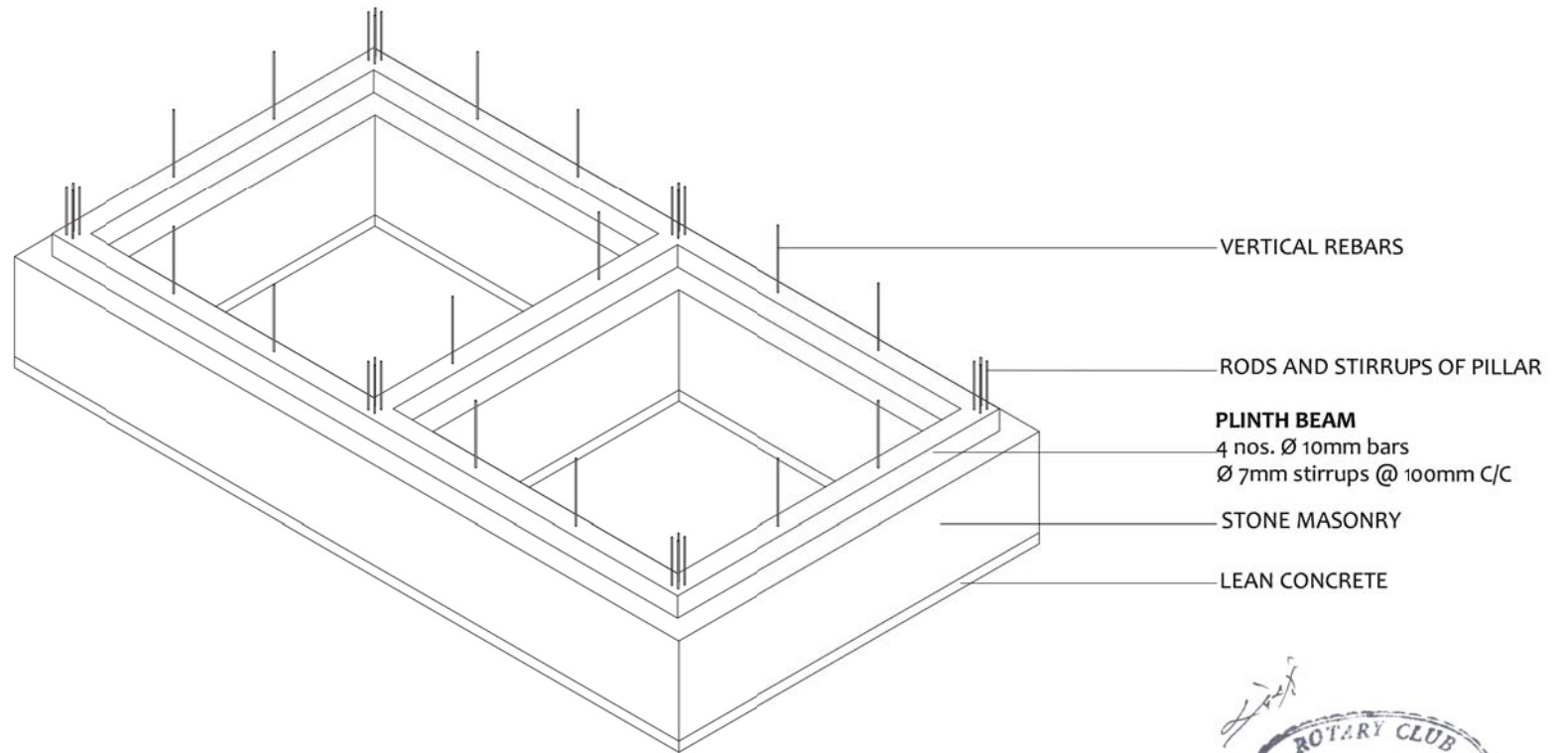
**DRAWING TITLE: CONSTRUCTIVE SECTION**

SCALE: 1:50

DATE: 11/2017

**A.07**





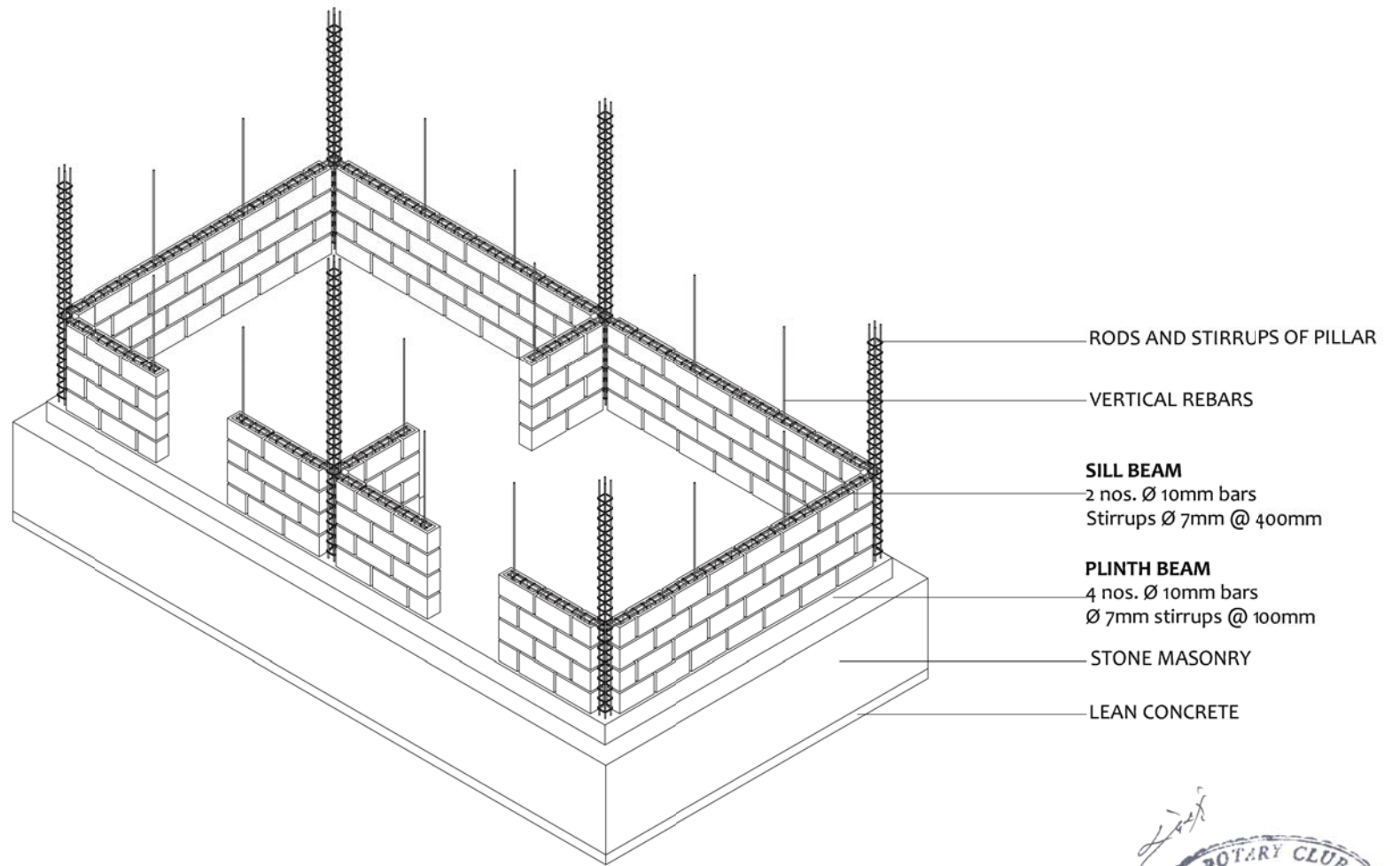
STEP 1

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram

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<p><b>CONFINED CONCRETE BLOCK MASONRY</b></p>			
<p><b>DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 1</b></p>		<p>DATE: 11/2017</p>	<p><b>P.01</b></p>



STEP 2

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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 bhimpheedi.awasuka@gmail.com

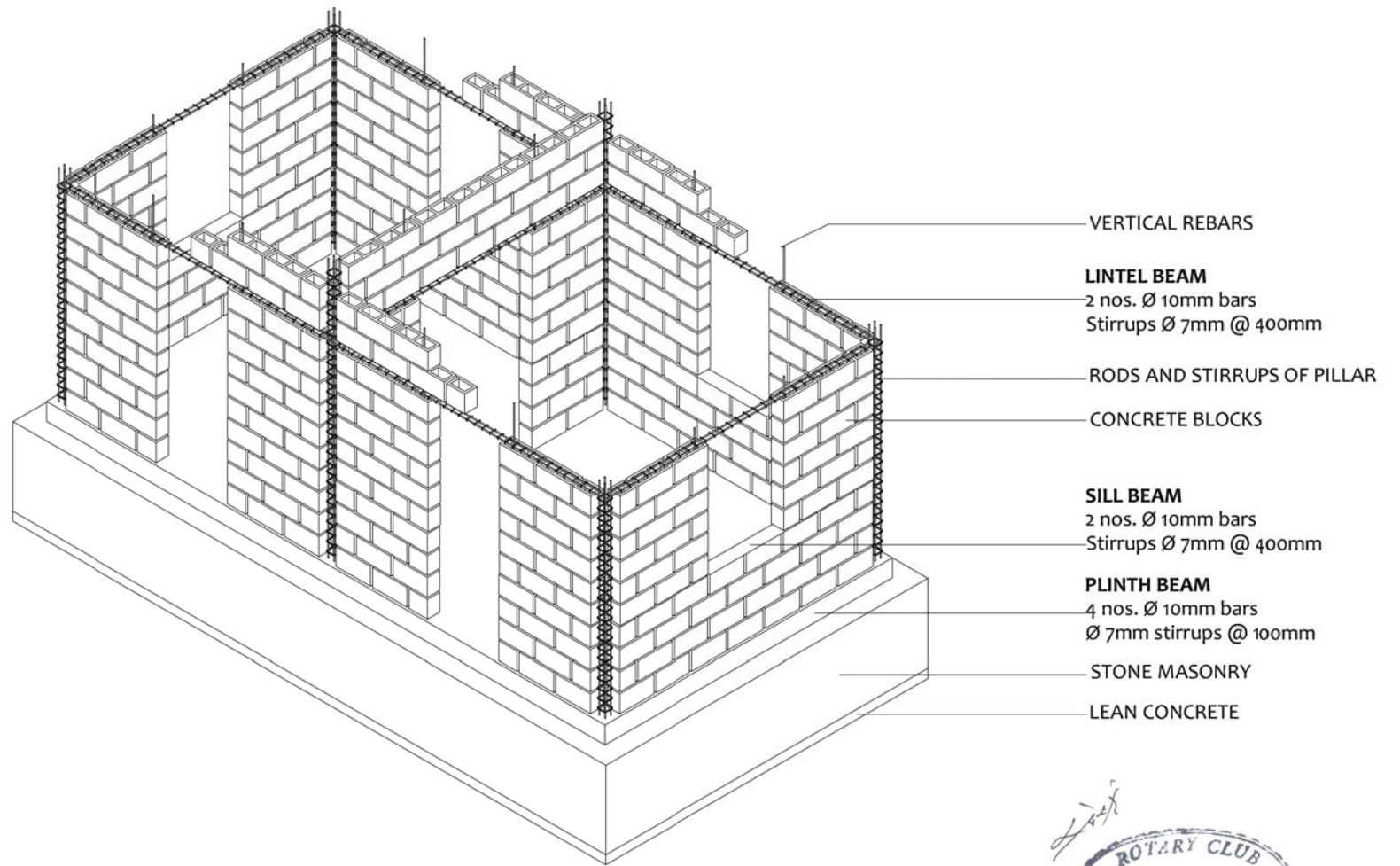
CONFINED CONCRETE BLOCK MASONRY

DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 2



DATE: 11/2017

P.02



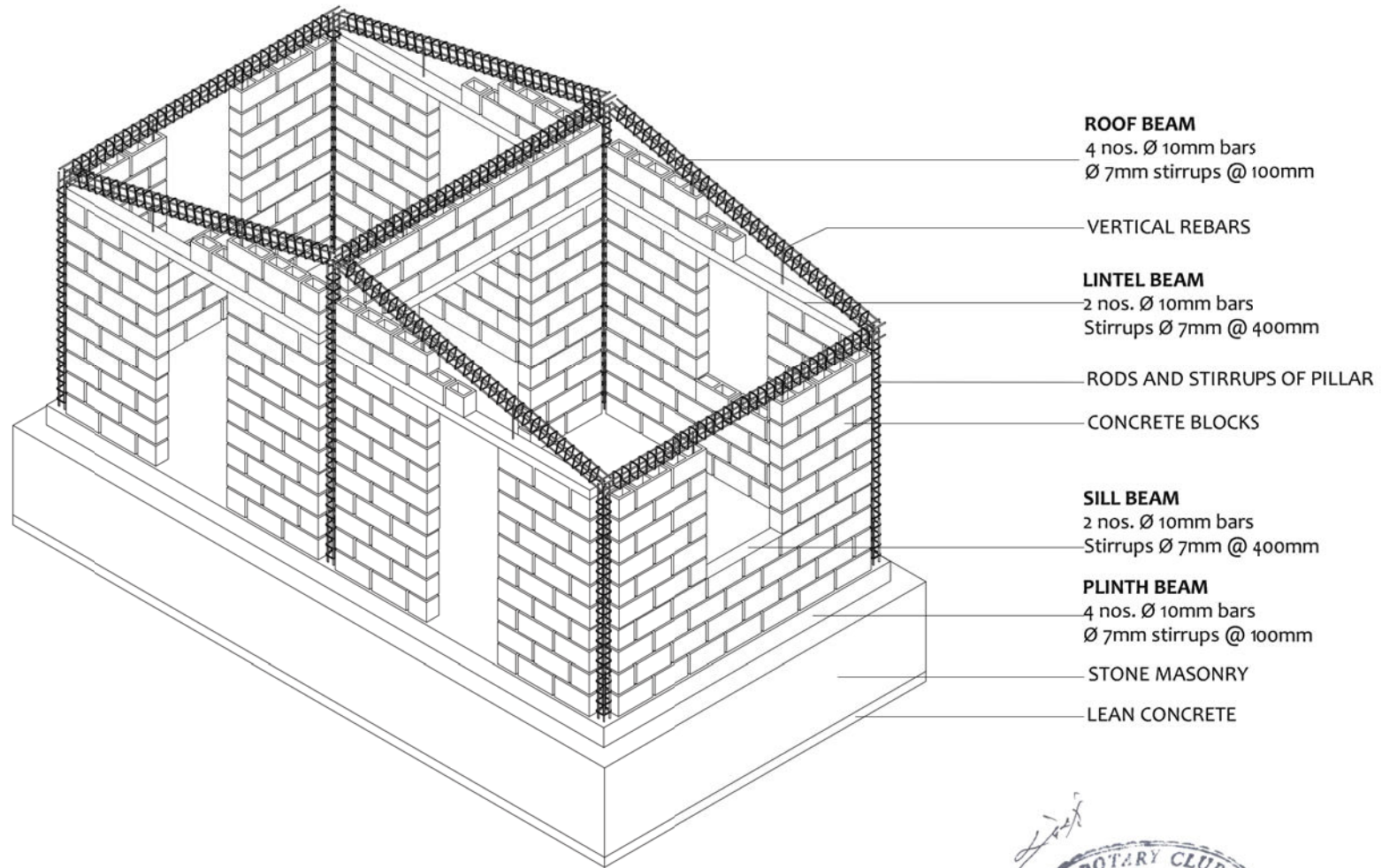
STEP 3

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram

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<p><b>CONFINED CONCRETE BLOCK MASONRY</b></p>			
<p><b>DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 3</b></p>		<p>DATE: 11/2017</p>	<p>P.03</p>



STEP 4

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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 +977 57410050  
 Bhimpheedi Rural Municipality  
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 bhimpheedi.awasuka@gmail.com

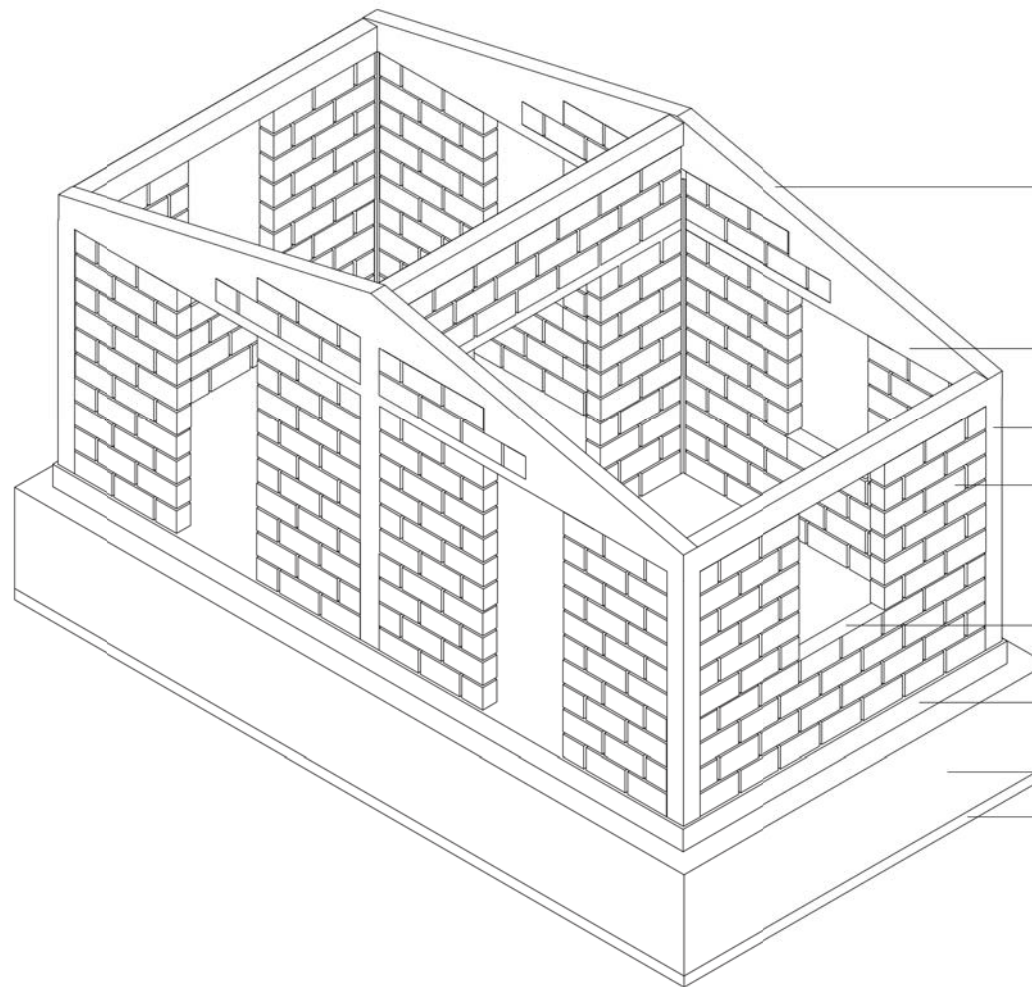
**CONFINED CONCRETE BLOCK MASONRY**

**DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 4**

Government of Nepal  
 National Reconstruction Authority (NRA)  
 National Disaster Preparedness Planning Centre (NDPPC)  
 Kathmandu, Nepal

DATE: 11/2017

**P.04**



**ROOF BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups @ 100mm

**LINTEL BEAM**  
2 nos. Ø 10mm bars  
Stirrups Ø 7mm @ 400mm

CONFINING PILLAR

CONCRETE BLOCKS

**SILL BEAM**  
2 nos. Ø 10mm bars  
Stirrups Ø 7mm @ 400mm

**PLINTH BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups @ 100mm

STONE MASONRY

LEAN CONCRETE



STEP 5

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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 +977 57410050  
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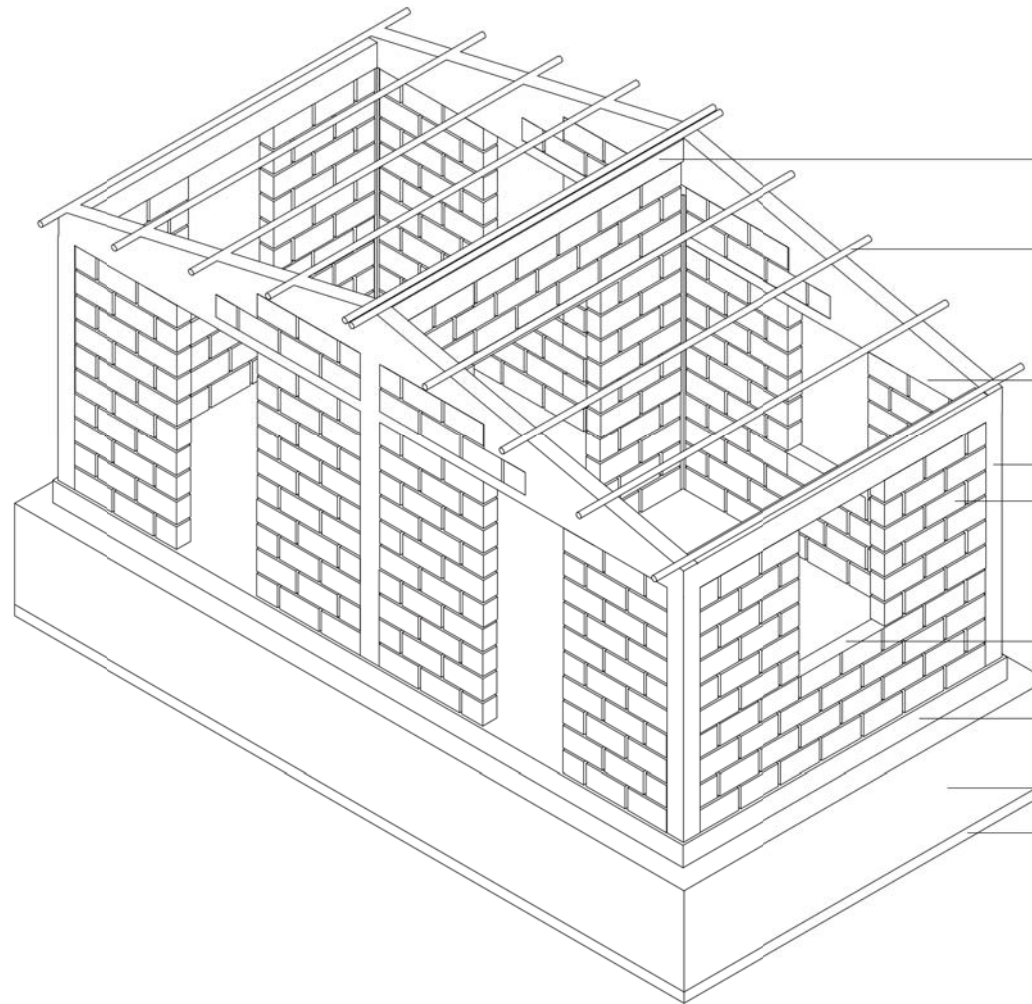
CONFINED CONCRETE BLOCK MASONRY

DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 5



DATE: 11/2017

P.05



**ROOF BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups @ 100mm

**ROOF PURLINS**  
Iron Pipes of Ø 60.3mm (outside diameter)  
nominal bore = 50mm t=4.5mm

**LINTEL BEAM**  
2 nos. Ø 10mm bars  
Stirrups Ø 7mm @ 400mm

CONFINING PILLAR  
CONCRETE BLOCKS

**SILL BEAM**  
2 nos. Ø 10mm bars  
Stirrups Ø 7mm @ 400mm

**PLINTH BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups @ 100mm

STONE MASONRY  
LEAN CONCRETE



STEP 6

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 MAKAWANPUR DISTRICT  
 bhimpheedi.awasuka@gmail.com

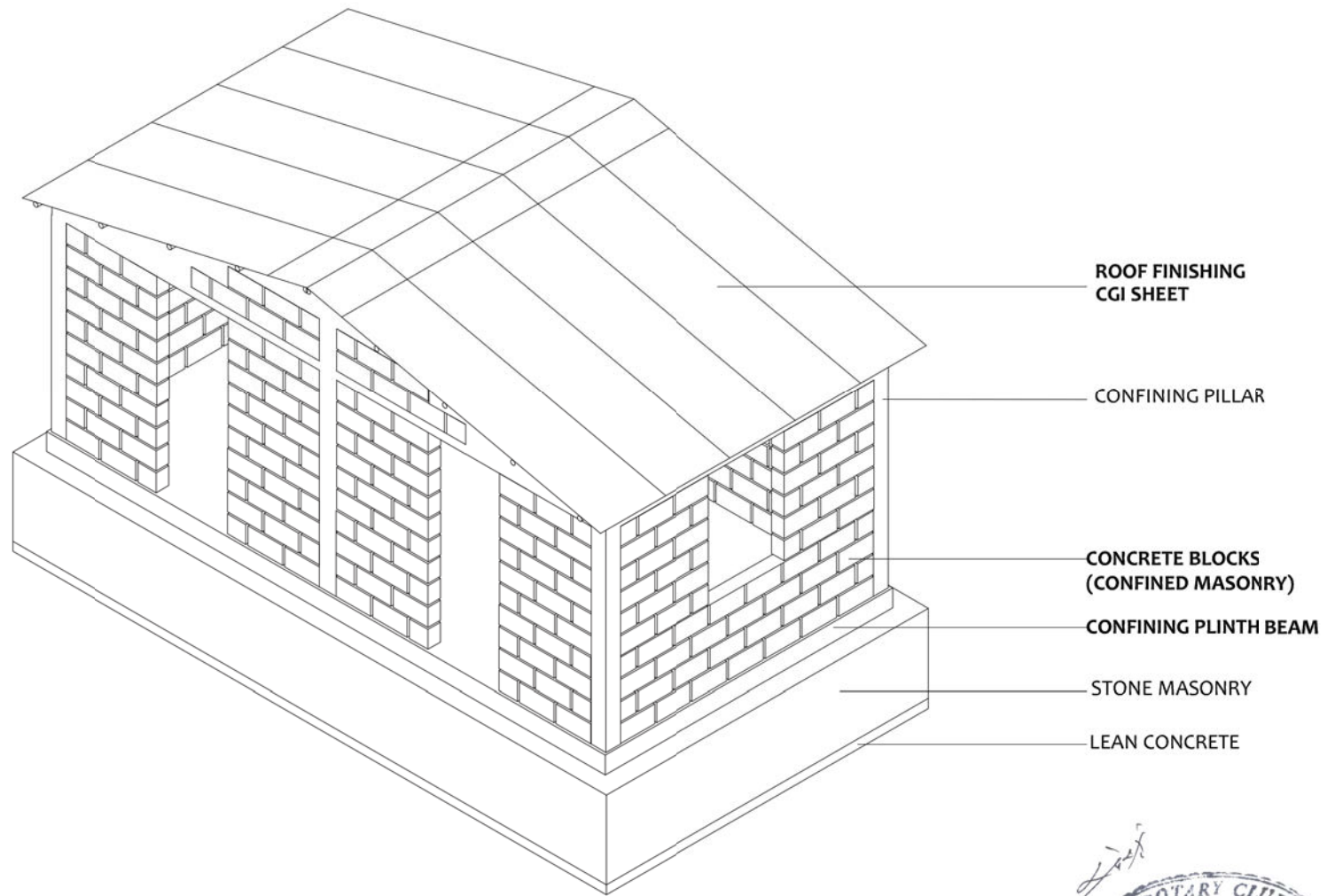
**CONFINED CONCRETE BLOCK MASONRY**

**DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 6**



DATE: 11/2017

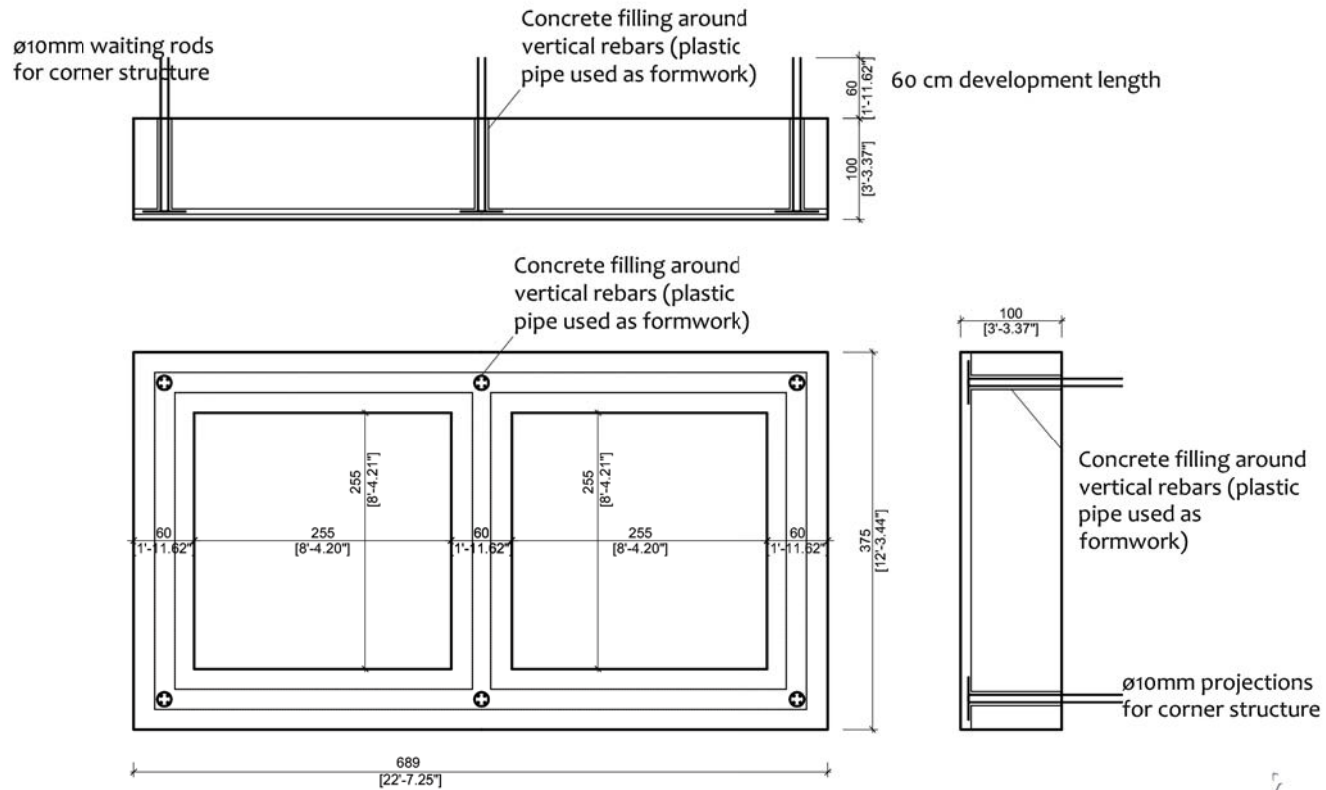
P.06



STEP 7


**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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<p><b>CONFINED CONCRETE BLOCK MASONRY</b></p>			
<p><b>DRAWING TITLE: CONSTRUCTIVE PROCESS STEP 7</b></p>		<p>DATE: 11/2017</p>	<p>P.07</p>

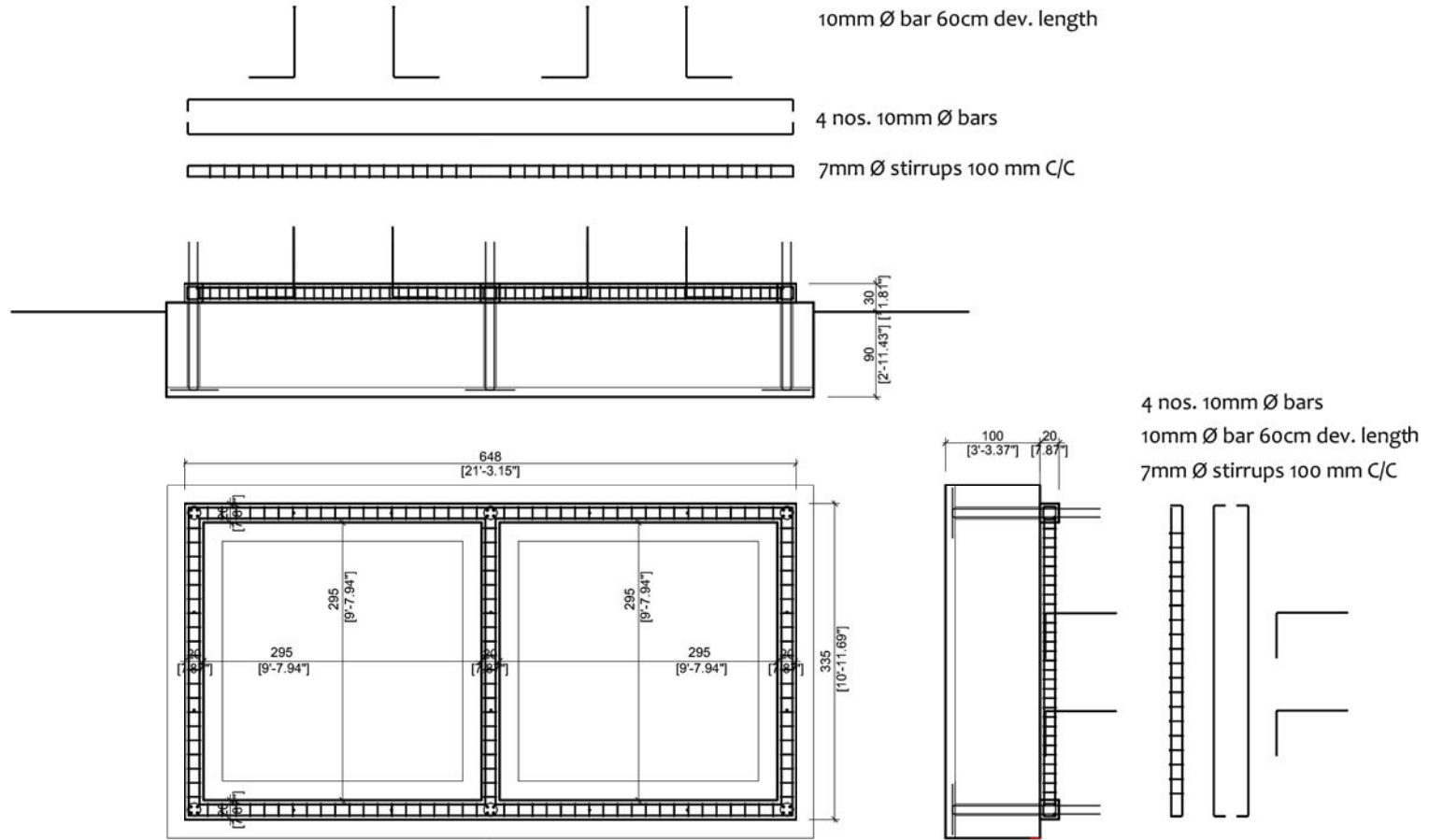


MAT FOUNDATION SECTIONS + ROD DISTRIBUTION

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
भीमफेदी आवासुका  
+977 57410050  
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MAKAWANPUR DISTRICT  
bhimpheedi.awasuka@gmail.com

<p><b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b></p> <p><b>DRAWING TITLE: MAT FOUNDATION</b></p>		<p><b>SCALE: 1:75</b></p>	<p><b>S.01</b></p>
		<p><b>DATE: 11/2017</b></p>	






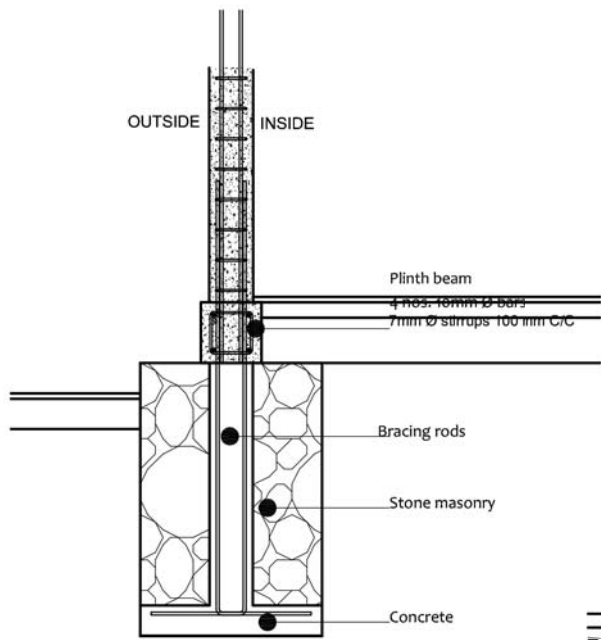
PLINTH BEAM LEVEL

PLINTH BEAM SECTIONS + ROD DISTRIBUTION

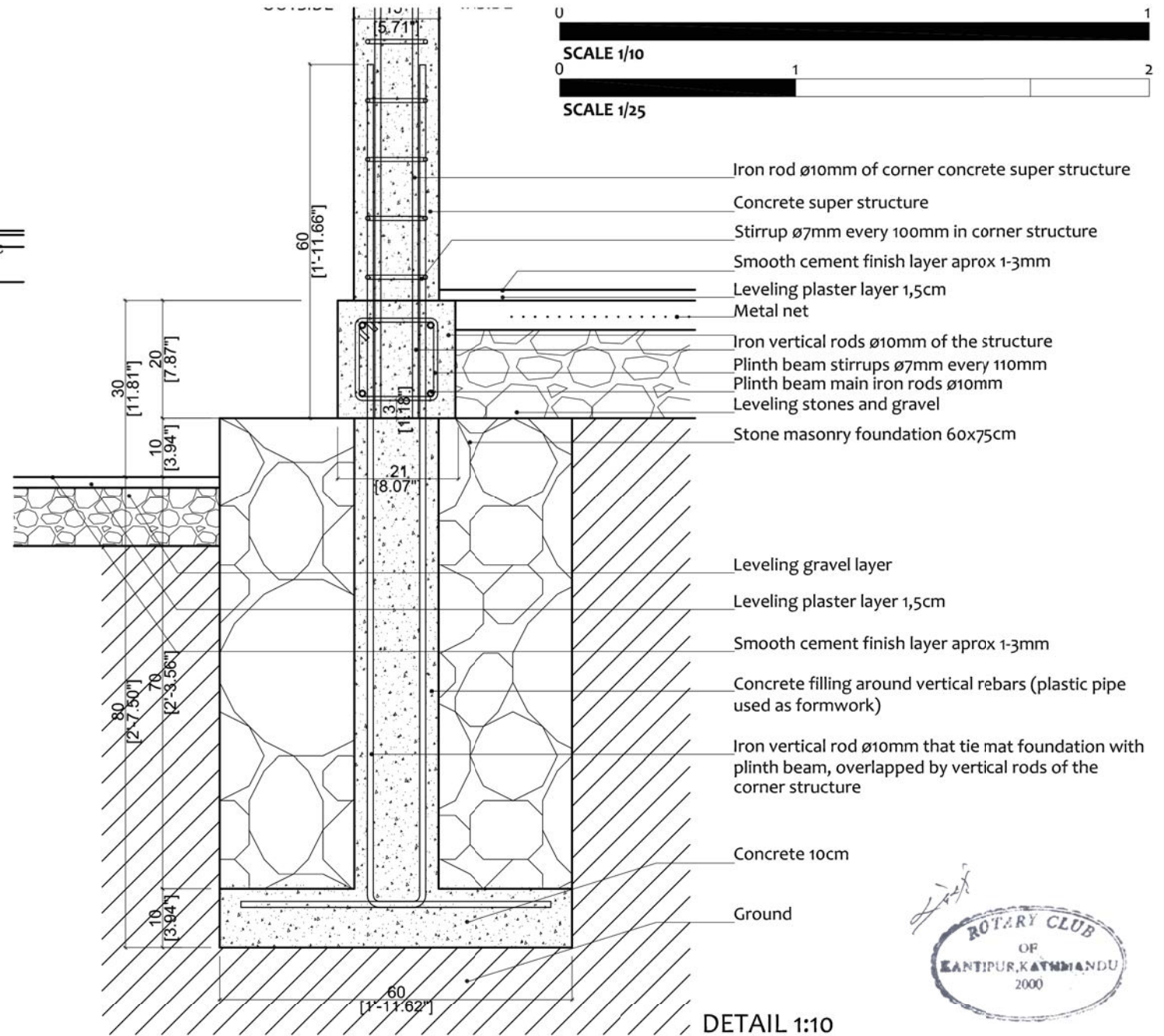


**BHIMPHEDE AWASUKA** Aawaas Sudhar Karyakram  
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<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>  <b>DRAWING TITLE: PLINTH BEAM</b>	 Government of Nepal National Reconstruction Authority (NRA) Central Level Project Implementation Division (Building) Kathmandu	<b>SCALE:</b> 1:75	<b>S.02</b>
		<b>DATE:</b> 11/2017	



DETAIL 1:25



DETAIL 1:10



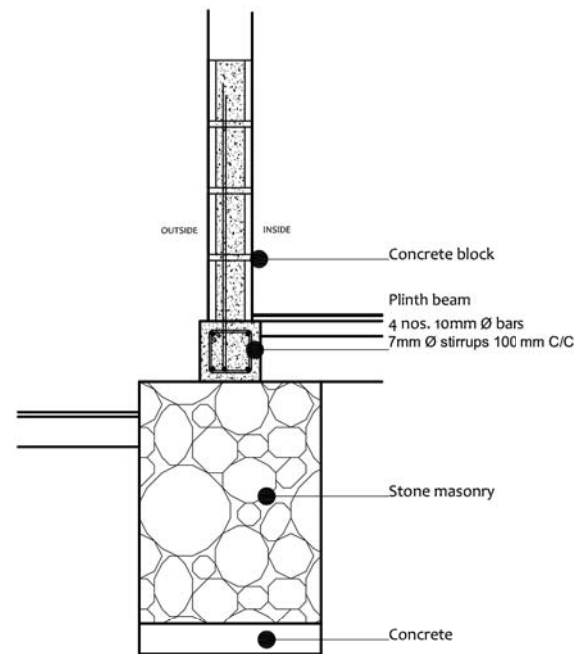
- Iron rod ø10mm of corner concrete super structure
- Concrete super structure
- Stirrups ø7mm every 100mm in corner structure
- Smooth cement finish layer aprox 1-3mm
- Leveling plaster layer 1,5cm
- Metal net
- Iron vertical rods ø10mm of the structure
- Plinth beam stirrups ø7mm every 110mm
- Plinth beam main iron rods ø10mm
- Leveling stones and gravel
- Stone masonry foundation 60x75cm
- Leveling gravel layer
- Leveling plaster layer 1,5cm
- Smooth cement finish layer aprox 1-3mm
- Concrete filling around vertical rebars (plastic pipe used as formwork)
- Iron vertical rod ø10mm that tie mat foundation with plinth beam, overlapped by vertical rods of the corner structure
- Concrete 10cm
- Ground



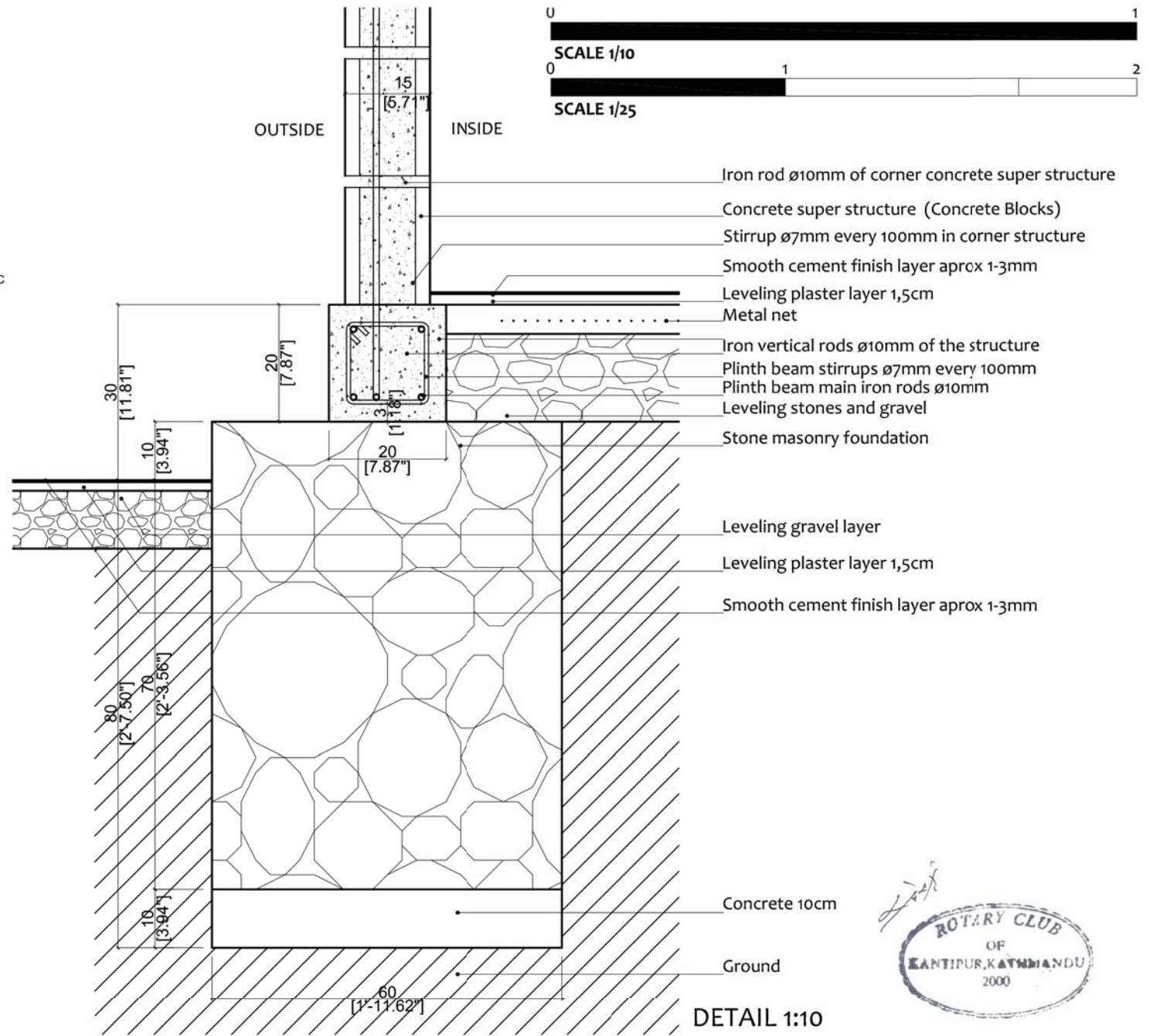
PILLAR-FOUNDATION DETAIL

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>		SCALE: 1:25 / 1:10	<b>S.03</b>
<b>DRAWING TITLE: FOUNDATION DETAILS</b>			



DETAIL 1:25



DETAIL 1:10

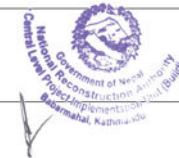


WALL- FOUNDATION DETAIL

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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 Dhangodan Ward #6  
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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

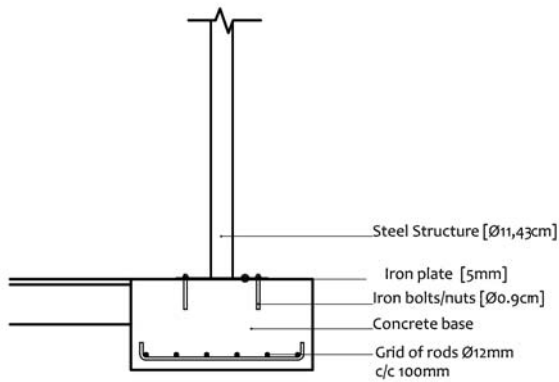
DRAWING TITLE: FOUNDATION DETAILS



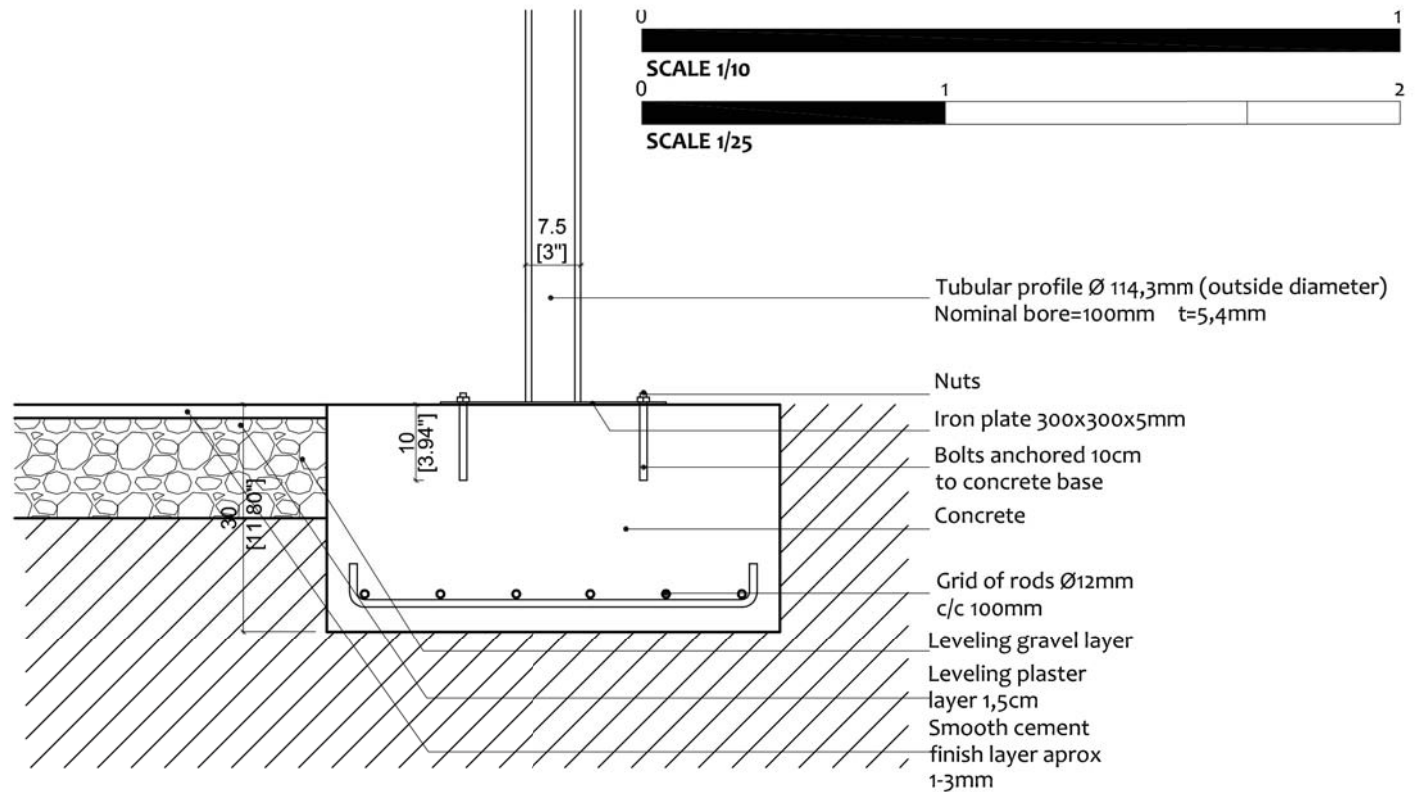
SCALE: 1:25 / 1:10

DATE: 11/2017

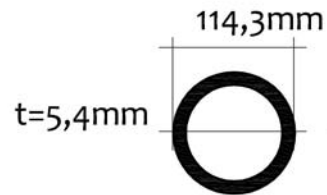
S.04



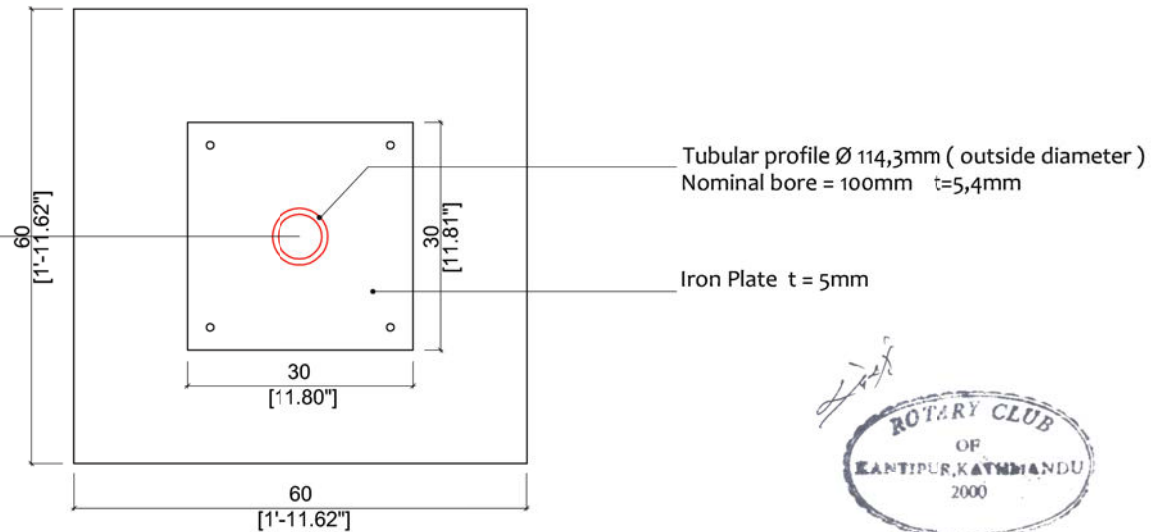
DETAIL 1:25



TUBULAR PROFILE VERANDAH 1:5



DETAIL 1:10



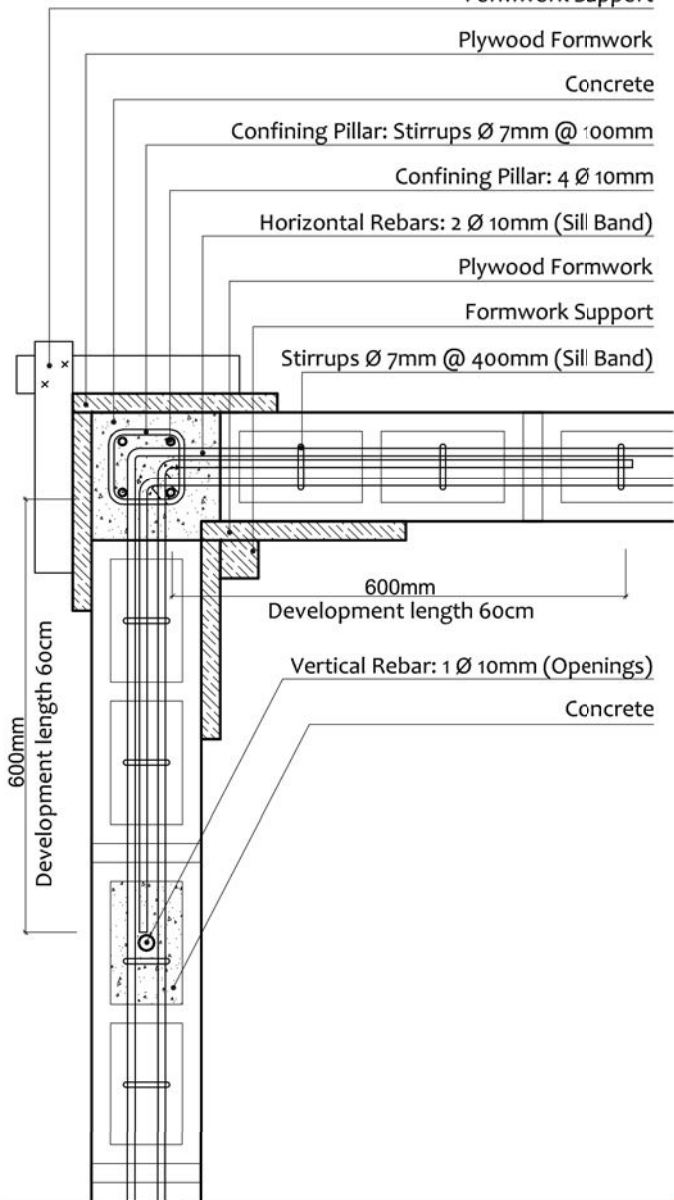
VERANDAH POST-FOUNDATION DETAIL

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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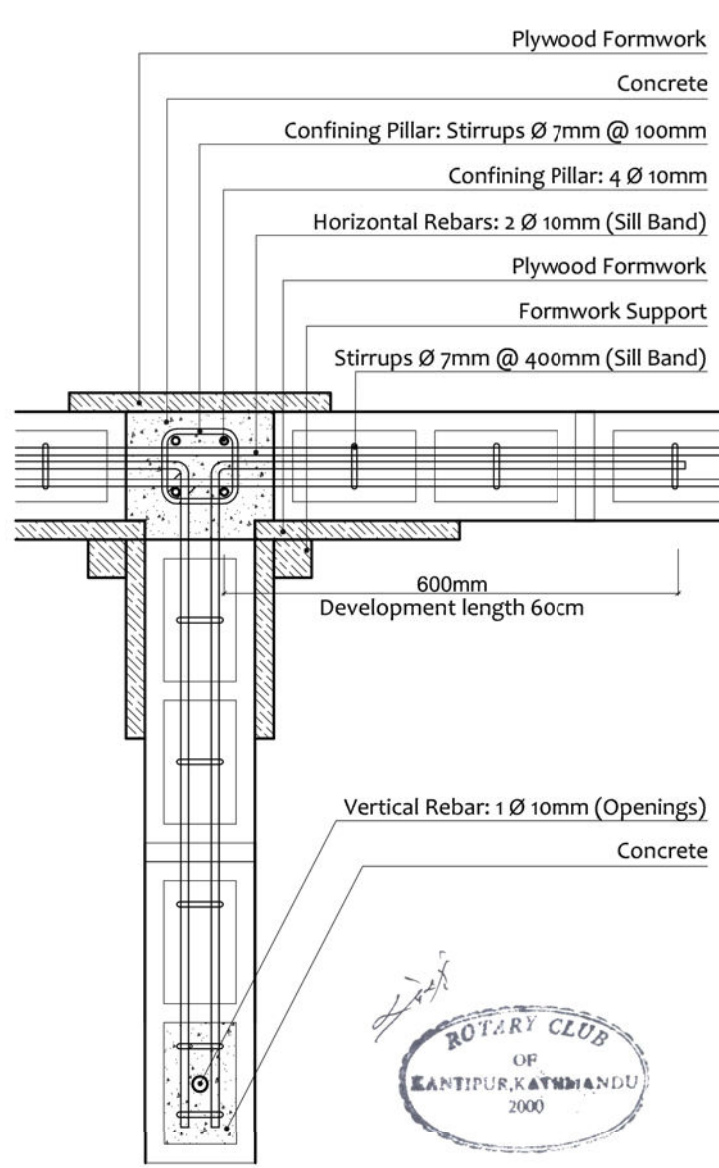
<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>  <b>DRAWING TITLE: FOUNDATION DETAILS</b>	SCALE: 1:25 / 1:10	<b>S.05</b>
	DATE: 11/2017	



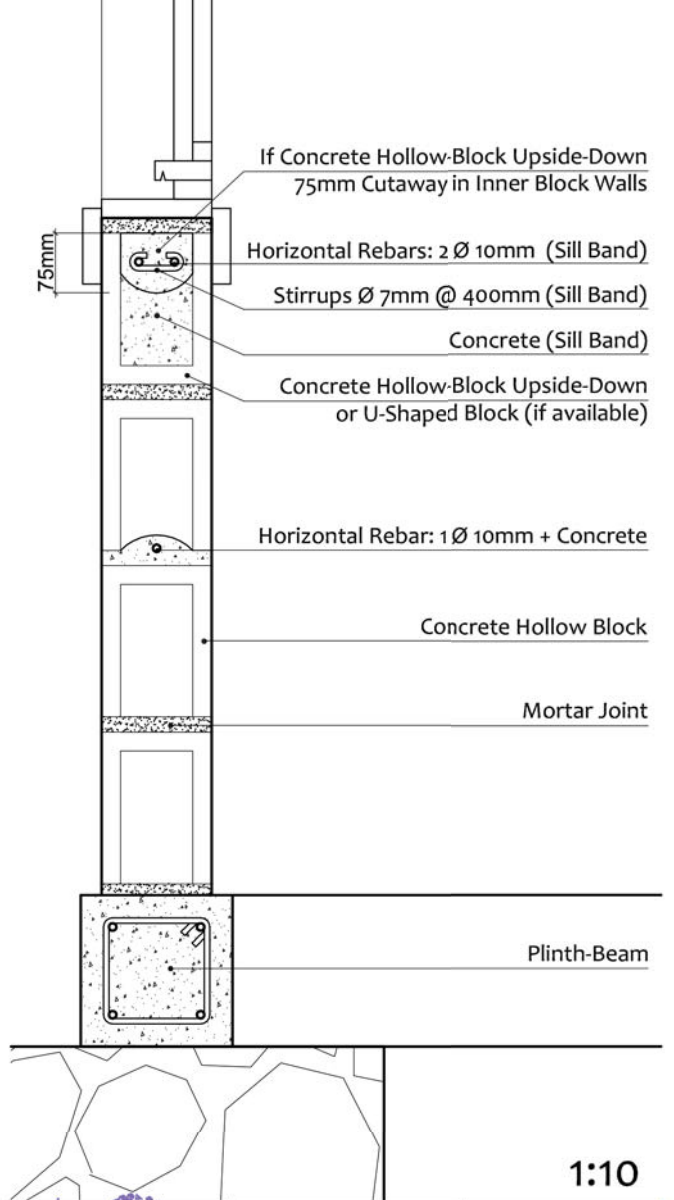
DETAIL 1  
PLAN VIEW SILL BEAM



DETAIL 2  
PLAN VIEW SILL BEAM



DETAIL 3  
WALL - WINDOW SECTION



1:10

**BHIMPHEDI AWASUKA** Aawaas Sudhar Karyakram  
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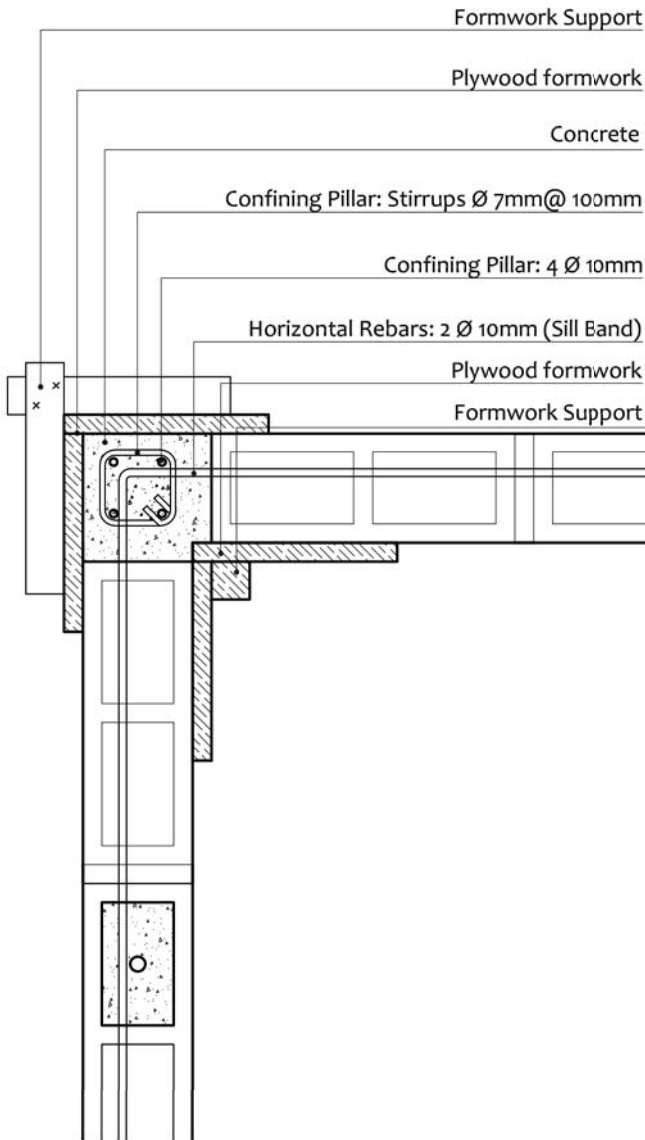
**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: WALLS & PILLAR DETAILS - SILL BEAM**

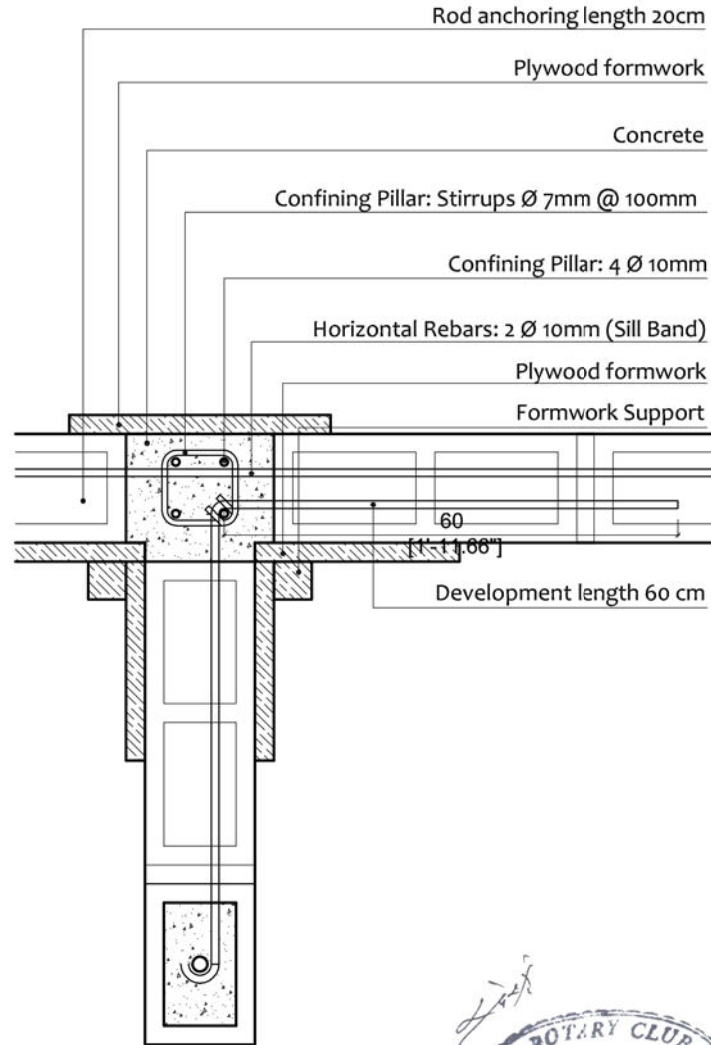
SCALE: 1:10

**S.06**

DETAIL 1  
PLAN VIEW JAMB LEVEL

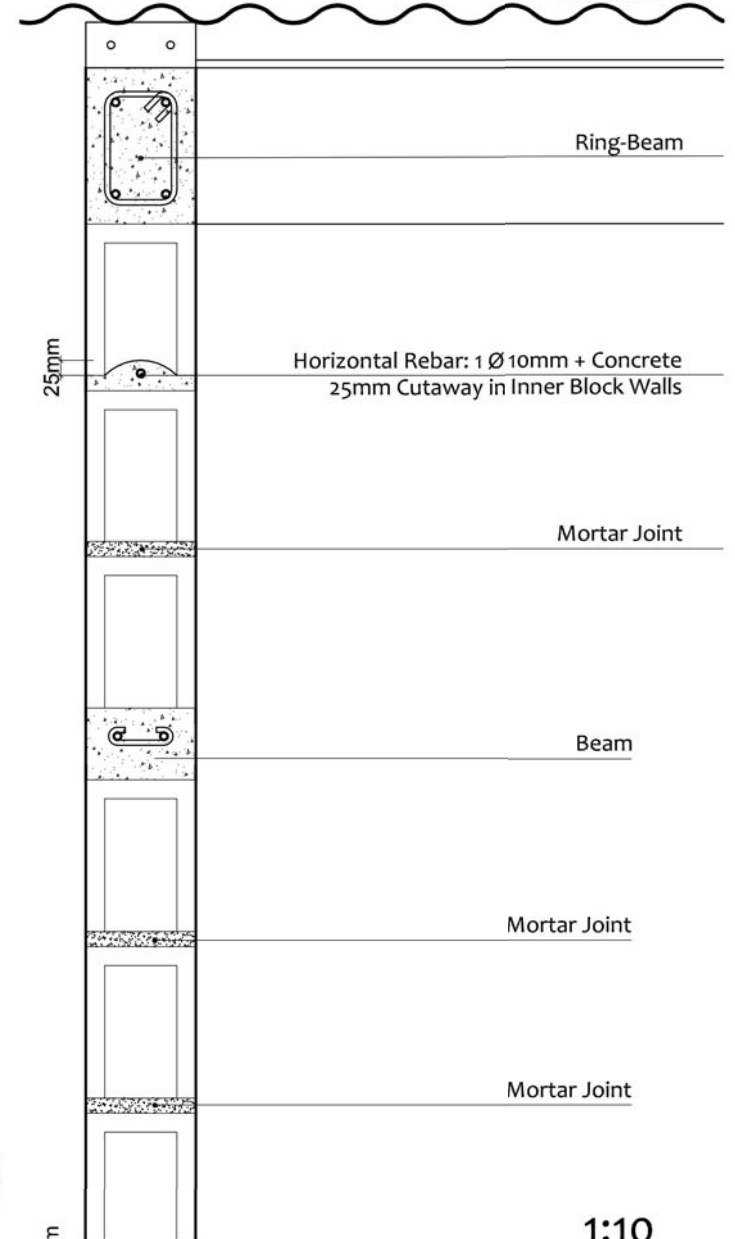


DETAIL 2  
PLAN VIEW JAMB LEVEL



U  
SCALE 1/10

DETAIL 3  
WALL SECTION

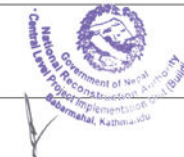


1:10

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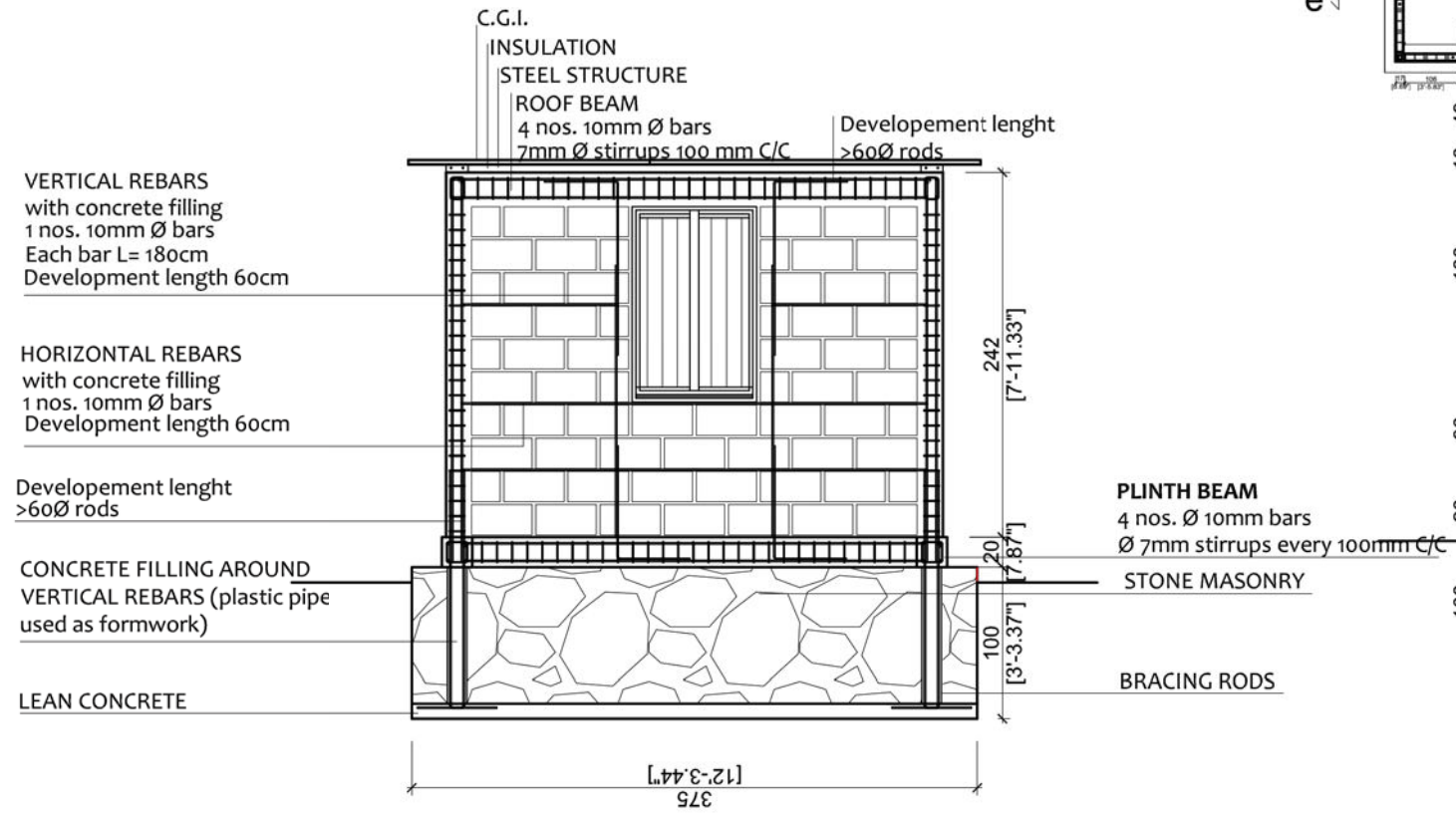
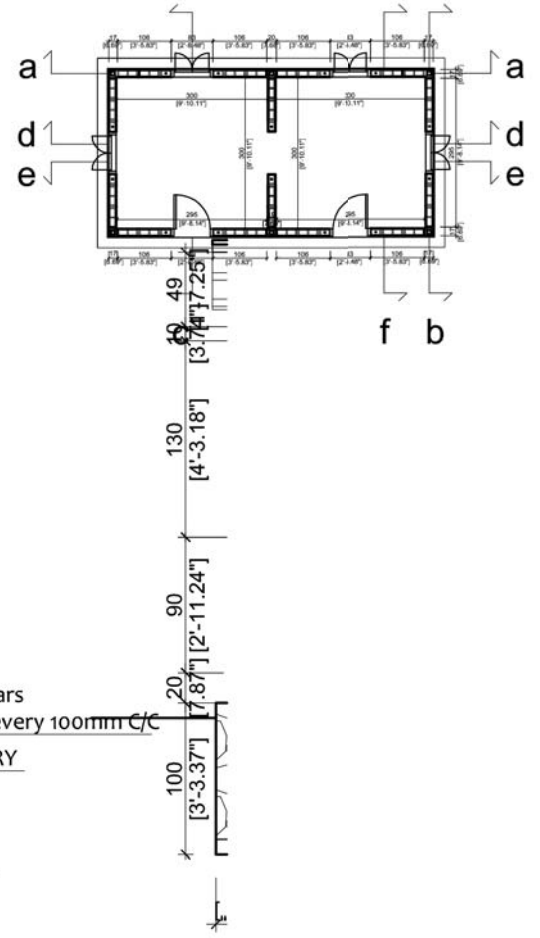
CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: WALLS & PILLAR DETAILS



SCALE: 1:10

S.07

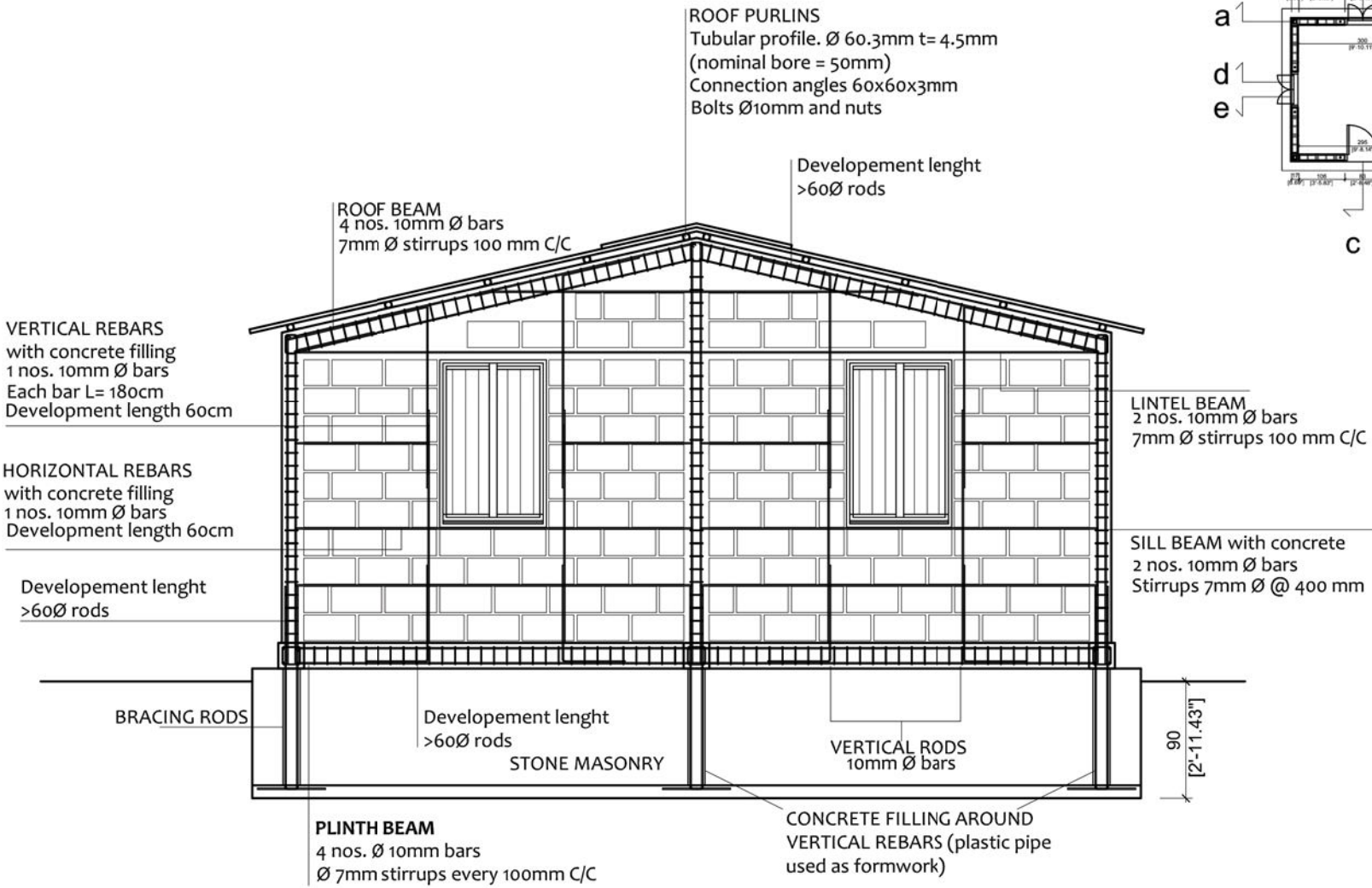
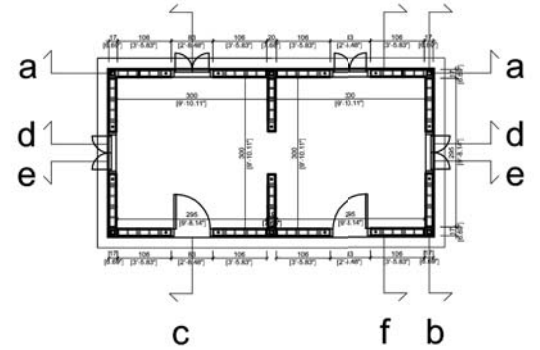


WALL CROSS SECTION



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<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>  <b>DRAWING TITLE: WALL SECTION B</b>	SCALE: 1:50	<b>S.08</b>
	DATE: 11/2017	



WALL SECTION A



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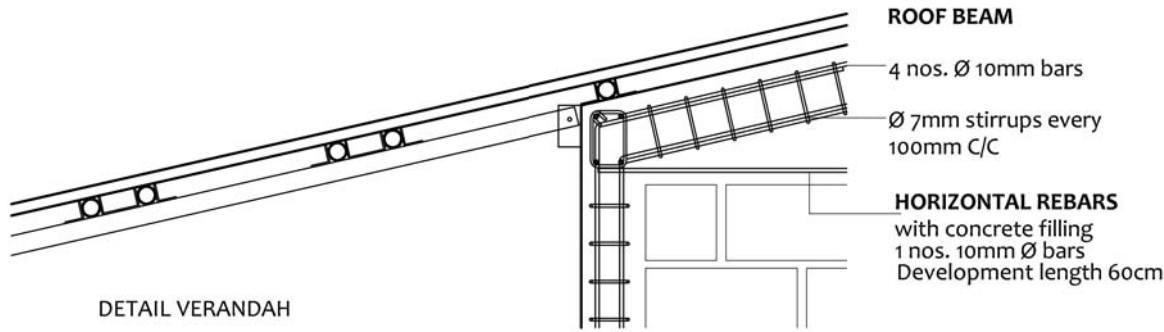
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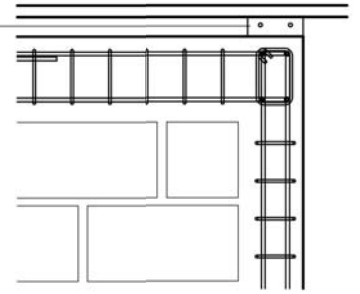
<p><b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b></p> <p><b>DRAWING TITLE: WALL SECTION A</b></p>	<p>SCALE: 1:50</p>	<p><b>S.09</b></p>
	<p>DATE: 11/2017</p>	







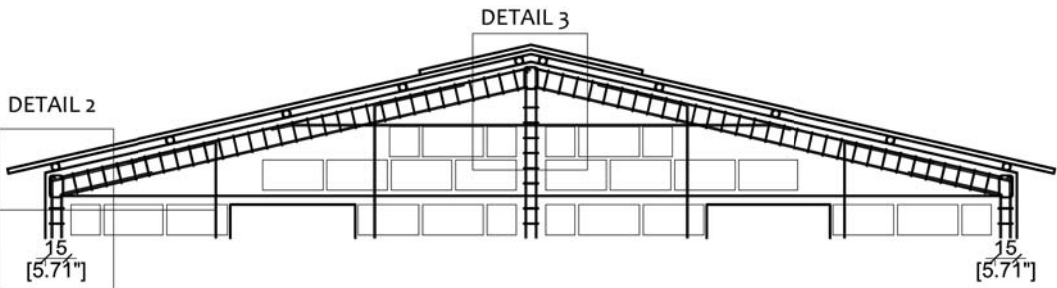
**ROOF PURLINS**  
Tubular profile. Ø 60.3mm t= 4.5mm  
(nominal bore = 50mm)  
Connection angles 60x60x3mm  
Bolts Ø10mm and nuts



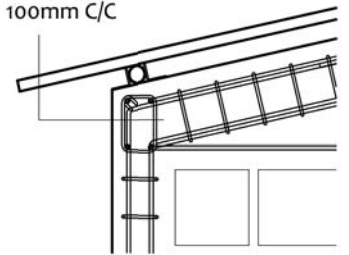
DETAIL 1

DETAIL VERANDAH

**VERTICAL REBARS**  
with concrete filling  
1 nos. 10mm Ø bars  
Each bar L= 180cm  
Development length 60cm

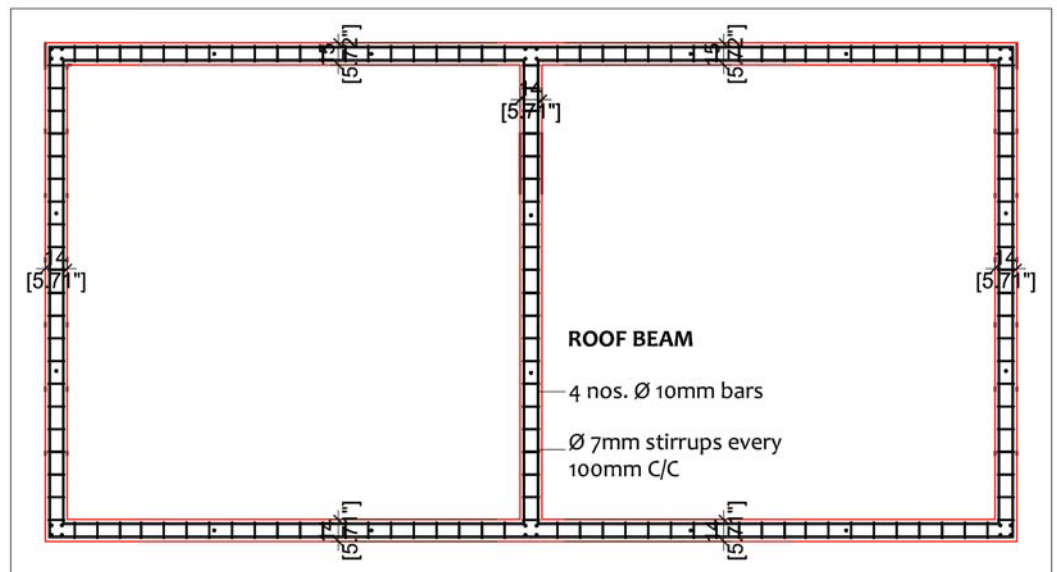
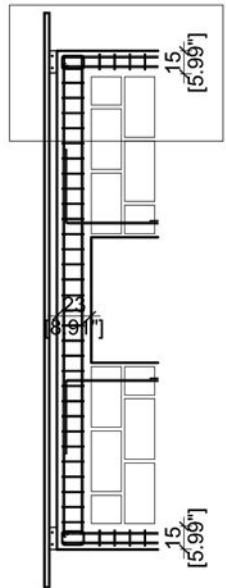


**ROOF BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups every 100mm C/C

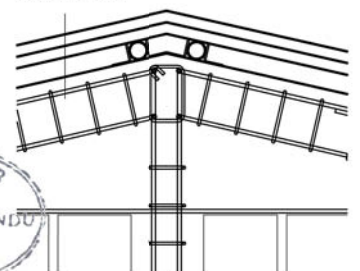


DETAIL 2

DETAIL 1



**ROOF BEAM**  
4 nos. Ø 10mm bars  
Ø 7mm stirrups every 100mm C/C



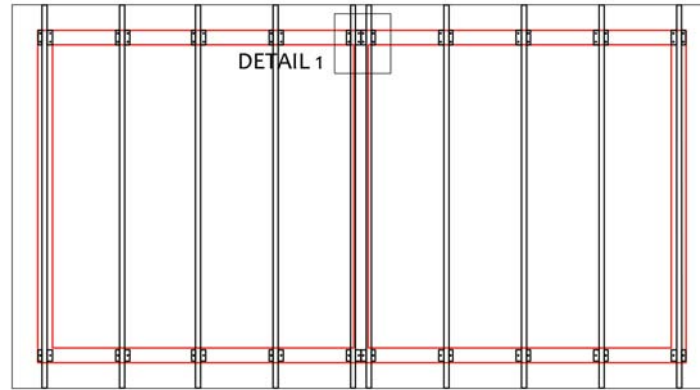
DETAIL 3



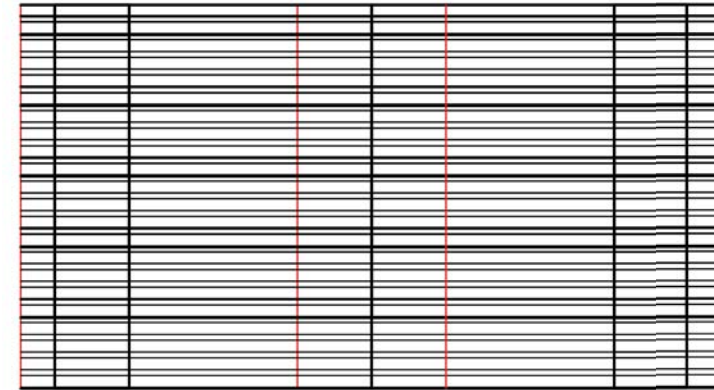
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<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>	SCALE: 1:50	<b>S.10</b>
<b>DRAWING TITLE: ROOF FLOOR</b>	DATE: 11/2017	

OPTION A: WITHOUT VERANDA

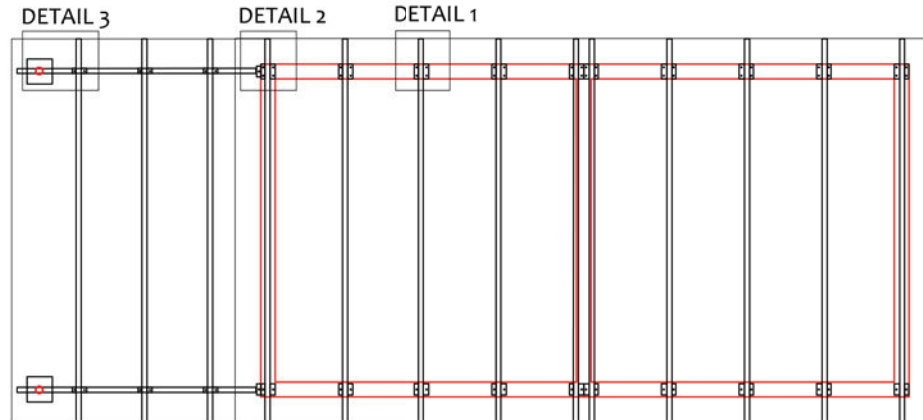
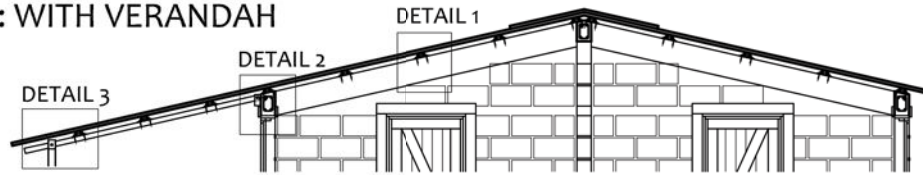


PURLINS: TUBULAR PROFILE Ø 60.3mm t=4.5mm

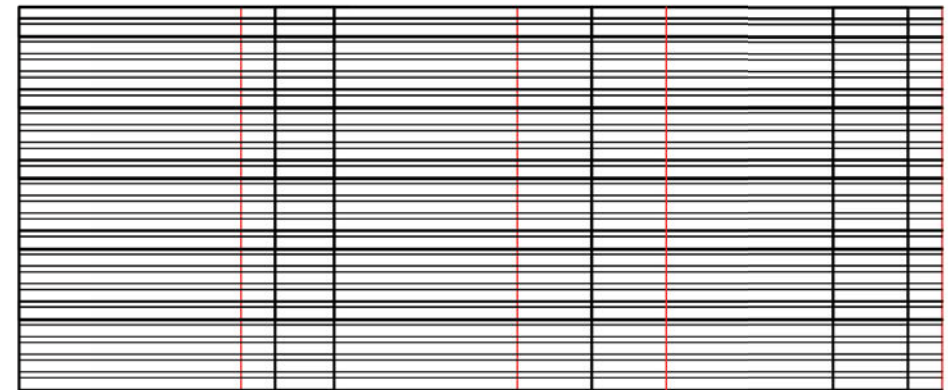


CGI sheet 10 feet/313 cm\_18 sheets

OPTION B: WITH VERANDA



PURLINS: TUBULAR PROFILE Ø 60.3mm t=4.5mm  
METAL PIPES for ROOF SYSTEM



CGI sheet 10 feet/313 cm\_24 sheets  
CGI LAYOUT

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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

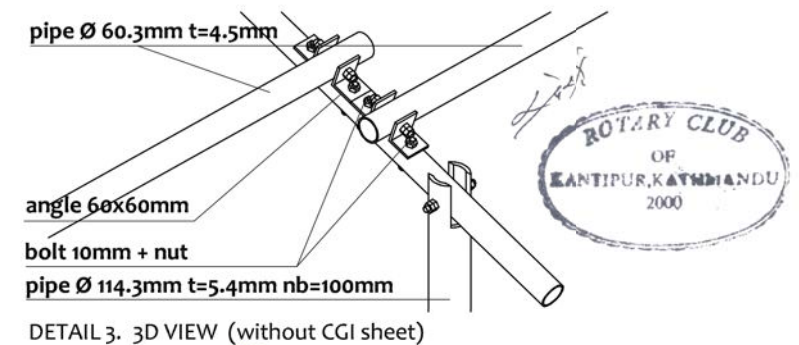
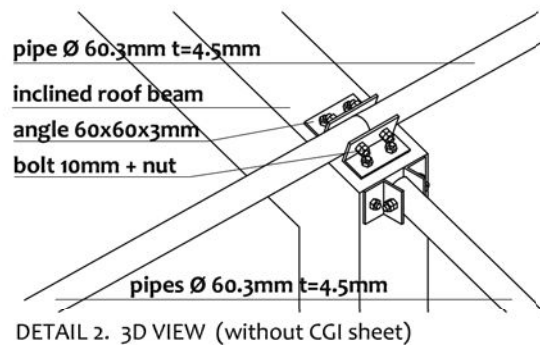
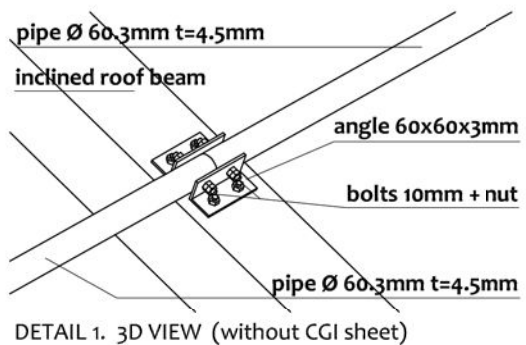
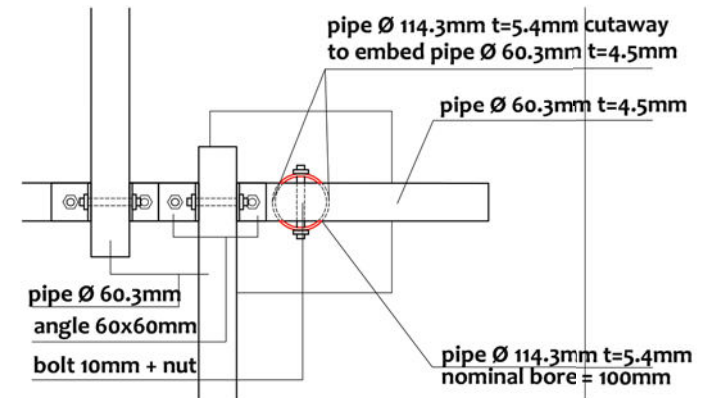
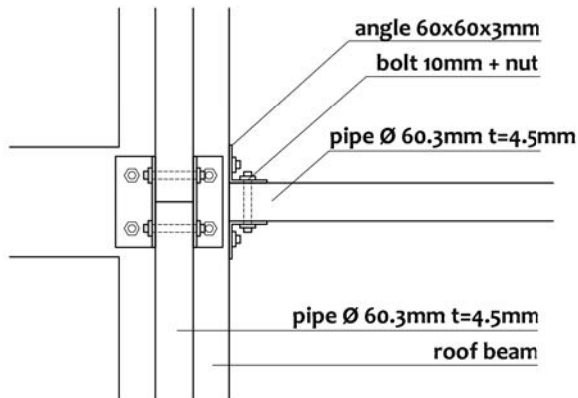
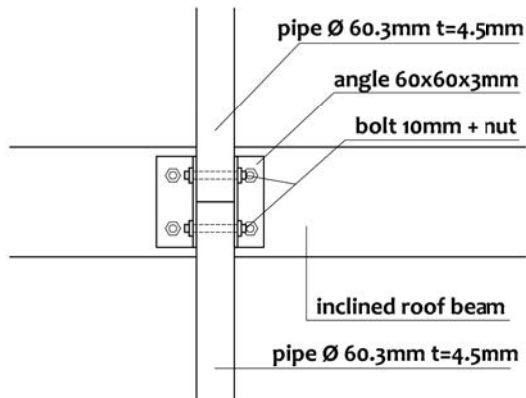
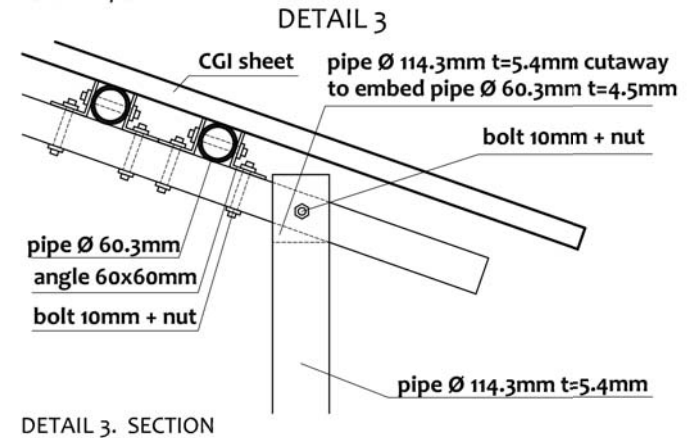
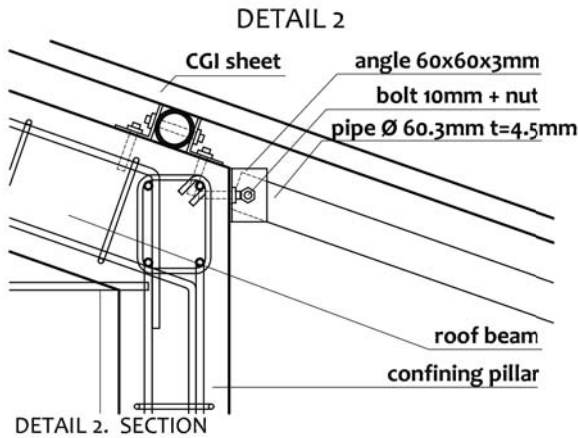
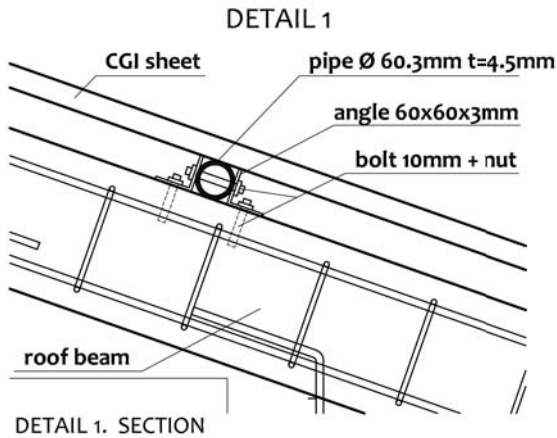
DRAWING TITLE: ROOF. STEEL STRUCTURE & FINISHING. 2 OPTIONS

SCALE: 1:75

DATE: 11/2017



S.11



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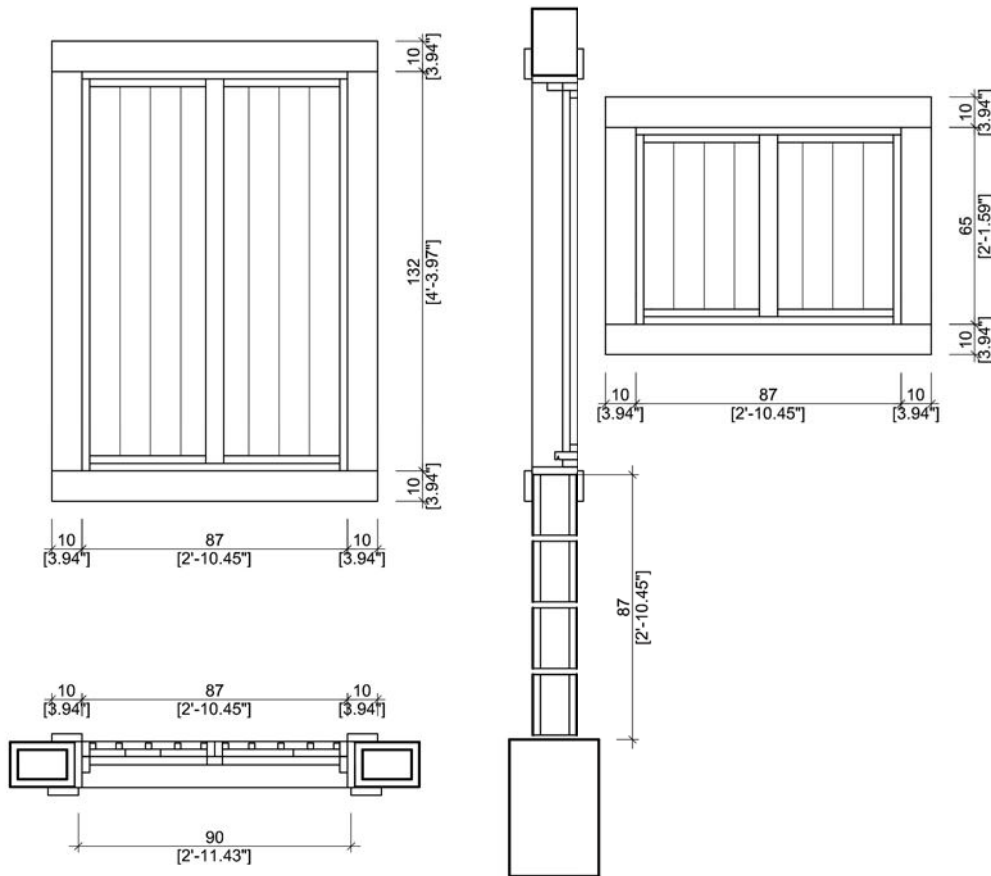
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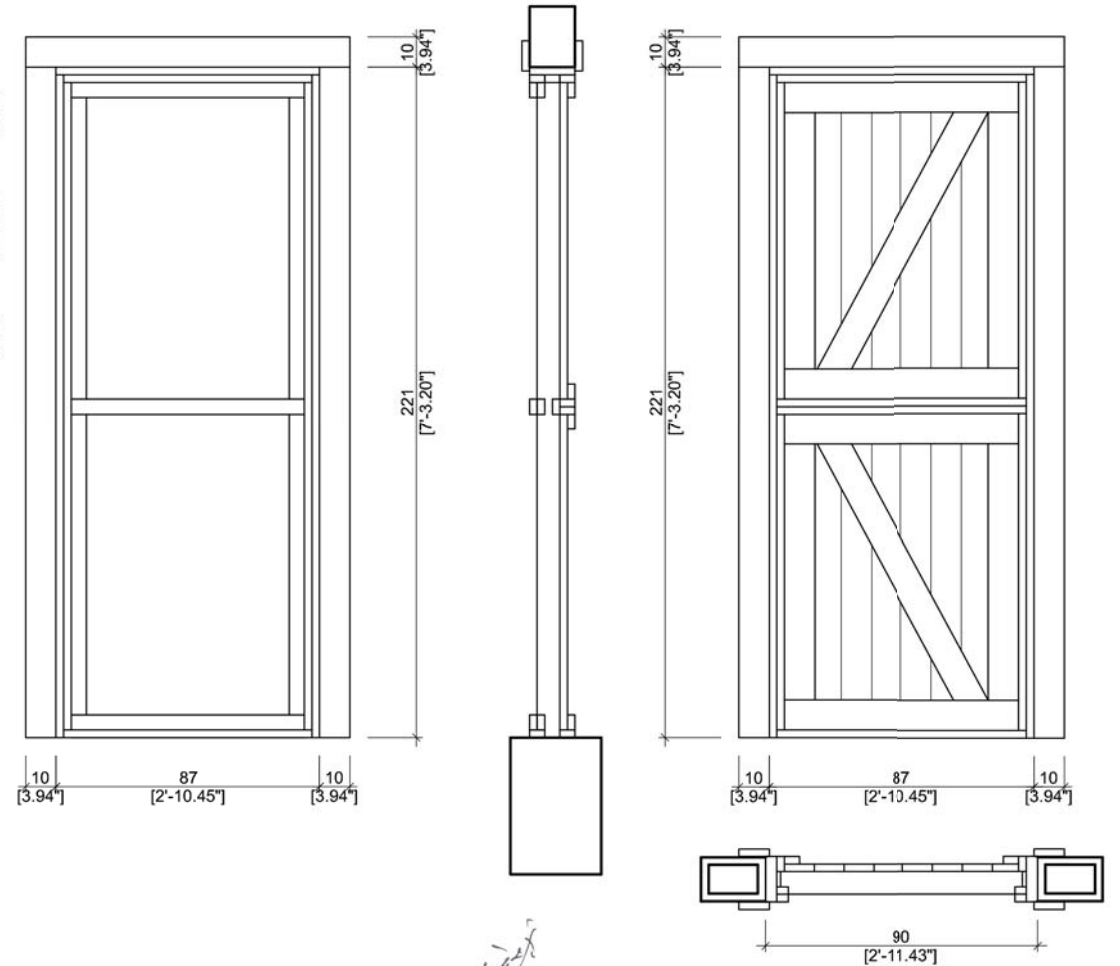
<p><b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b></p> <p><b>DRAWING TITLE: ROOF. IRON STRUCTURE CONNECTION DETAILS</b></p>	<p>SCALE: 1:75/1:10</p>	<p><b>S.12</b></p>
	<p>DATE: 11/2017</p>	



### WINDOWS



### DOOR



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CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS

DRAWING TITLE: OPENINGS

SCALE: 1:25

DATE: 11/2017

S.13

## TECHNICAL REQUIREMENTS

<b>STRUCTURAL SYSTEM</b>	Confined concrete block wall, vertically reinforced every 80cms and in all openings' sides; and horizontally, at least every three rows. Surrounded by vertical and horizontal structural concrete elements: vertical pillars at the corners of the rooms (every 3m maximum) and horizontal rings in: plinth beam, floor beam and upper ring beams. All reinforcements are continuous, always overlapping with one another.
<b>FOUNDATION</b>	Shall be done at the required depth and width, depending on the type of soil defined by Nepal National Building Code: soft, medium or hard. Done with cyclopean concrete: stone and concrete ( 1 : 3 : 6 ), resting on a layer of lean concrete.
<b>PLINTH BEAM</b>	Concrete ( 1 : 1,5 : 3 ), of size 30 cms x 45 cms (horizontal and vertical dimensions respectively), reinforced with 4 nos. 10mm $\emptyset$ bars with 7mm stirrups at 100mm c/c
<b>WALL SYSTEM</b>	Concrete blocks shall be of size 400 x 200 x150mm and be of good quality, reinforced with 10mm $\emptyset$ bars. Vertical concrete elements ( 1 : 1,5 : 3 ), reinforced with 4 nos. 10mm $\emptyset$ bars with 7mm $\emptyset$ stirrups at 100mm c/c
<b>SILL BAND</b>	Openings (doors and windows) shall reach up to the floor beam.
<b>LINTEL BAND</b>	Concrete ( 1 : 1,5 : 3 ), shall be of size 15 x 20cms (horizontal and vertical dimensions respectively), reinforced with 4 nos. 10mm $\emptyset$ bars with 7mm $\emptyset$ stirrups at 100mm c/c.
<b>FLOOR BEAM</b>	Concrete ( 1 : 1,5 : 3), reinforced with 4 nos. 10mm $\emptyset$ bars with 7mm $\emptyset$ stirrups at 100mm c/c. NOT EXISTING in this variation.
<b>GROUND FLOOR</b>	100mm thick reinforced concrete slab ( 1 : 1,5 : 3 ), resting on a 200mm thick hard rock bed and finished with a 50mm thick layer of lean concrete.
<b>FIRST FLOOR</b>	Wooden floor with variable size of wooden beams. NOT EXISTING in this variation.
<b>ROOF</b>	Metal roof designed out of a tubular profile $\emptyset$ 2"



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<b>CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS</b>		
<b>DRAWING TITLE: TECHNICAL REQUIREMENTS</b>		<b>DATE: 11/2017</b>
		<b>S.14</b>

# BHIMPHEDI AWASUKA



Program developed by:

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**CONFINED CONCRETE BLOCK MASONRY: 2 ROOMS**

**DRAWING TITLE: TEAM CREDITS**



**DATE: 11/2017**

**S.15**