

सं०-55/ख-3-19

Phone/ Fax:- 0135-2531742/2530431



कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष,  
"नियोजन-III"



लोक निर्माण विभाग उत्तराखण्ड देहरादून

Office of the Engineer in Chief, PWD, Dehradun uttarakhand

Web-http://pwd.uk.gov.in

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पत्रांक :- 1191/02 भवन-नि0-III/2018

दिनांक- 31 / 12 / 2018

सेवा में,

सचिव,  
वन एवं पर्यावरण अनुभाग-3  
उत्तराखण्ड शासन।

विषय :- Construction of Building with Bamboo as Main Construction Material आगणन के सम्बन्ध में।

सन्दर्भ:- आपका पत्र संख्या 921(1)/ख-3-18-04(03)2018, दिनांक 05.11.2018  
महोदय,

कृपया उपरोक्त विषयक सन्दर्भित पत्र का अवलोकन करने का कृपा करें जिसके द्वारा राज्य में बांस आधारित भवनो के निर्माण हेतु शासन के पत्र संख्या 921(1)/ख-3-18-04(03)2018, दिनांक 05.11.2018 समिति का गठन किया गया था। उक्त भवन के निर्माण हेतु बांस परिषद् द्वारा प्रेषित मानचित्र में 420 स्क्वायर फीट जिसमें 20' X 15' का कमरा व 20 X 6' का बरामदा सम्मिलित है आगणन हेतु प्रस्तुत किया गया समिति द्वारा निर्धारित भवन निर्माण में प्रयुक्त होने वाली निर्माण सामग्री के सापेक्ष लोक निर्माण विभाग के एस0ओ0आर0 में उपलब्ध मदो की दरें तथा अन्य मदो की दरें जो Bamboo Board द्वारा दी गई हैं, को सम्मिलित करते हुये निर्माण की लागत रू0 409100.00 आंकलित की गई है इस प्रकार निर्माण कार्य हेतु प्रतिवर्ग फुट रू0 975.00 की दरें आंकलित की गई हैं, इन दरों पर सेनेटरी का कार्य सम्मिलित नहीं है।

संलग्न-आगणन 2 प्रति में।

31.12.18

(सत्येन्द्र शर्मा)

मुख्य अभियन्ता (मुख्यालय)

प्रतिलिपि:-समिति के नामित सदस्य

- 1 Bamboo Board/CEO इन्दिरा नगर फारेस्ट कालोनी देहरादून
- 2 श्री देवेन्द्र शाह, अधिशासी अभियन्ता, विभागाध्यक्ष कार्यालय, लोक निर्माण विभाग देहरादून।
3. श्री मैरी श्यांग, स्ट्रक्चर इंजिनियर, बांस एवं रेशा विकास परिषद्, इन्दिरा नगर फारेस्ट कालोनी देहरादून।
- 4 श्री दिनेश जोशी, प्रोग्राम मैनेजर, बांस एवं रेशा विकास परिषद्, इन्दिरा नगर फारेस्ट कालोनी देहरादून।
- 5 श्री चमन लाल, रेंज अधिकारी बांस एवं रेशा विकास परिषद्, इन्दिरा नगर फारेस्ट कालोनी देहरादून।

प्रतिलिपि:-अधिशासी अभियन्ता निर्माण खण्ड, लो0नि0वि0 देहरादून को उनके पत्र संख्या 4243/1सी0बी0 दिनांक 29.12.2018 के कम में सूचनार्थ प्रेषित।

प्रतिलिपि:-कनिष्ठ अभियन्ता (प्रा0) विभागाध्यक्ष कार्यालय,प्रमुख अभियन्ता, लोक निर्माण विभाग देहरादून।

संलग्न:- आगणन की एक प्रति।

मुख्य अभियन्ता (मुख्यालय)



**Schedule of Rates for  
Construction of Building with  
Bamboo as Main Construction  
Material  
(2018-2019)**

Uttarakhand Bamboo and Fiber Development Board  
WMD-Indira Nagar Forest Colony  
Dehradun-248006  
Uttarakhand







## Preface


All items of works contained in this Schedule and in the Amendments to the Schedule of Rates issued and referred to in the Term Contract, shall be executed in accordance with the conditions and stipulations as provided in the mentioned documents, and in compliance with all requirements on workmanship, materials, plant, measurement and any other requirements as stipulated in the above documents.


The Schedule rates in this Schedule are derived from the basic rates of provisions of labour, materials, plant and all other provisions as stated in this Schedule including adjustments made to the basic rates giving due consideration of factors including market trends, trade practices and the management efficiency and bidding strategies as reflected in the past term contracts procurement.

### LAND TRANSPORT

The land transport facilities shall include the provision of private utility vehicle, or multi-purpose vehicle (MPV) and the driver services as specified in the Contract.

The rates for land transport facilities shall be measured each and on a monthly basis for the period from the date when such land transport facilities are provided for use under the Contract until the expiry of the Contract Period as specified in the Contract, and any further period of provision of the land transport facilities that the Maintenance Surveyor expressly confirms in writing.

  
Mehisiyang Kumai  
Structure Engineer  
UBFDB D. Dum

  
रमेश चंद  
सहायक  
वन मंत्री  
दिल्ली

  
DINESH JOSHI  
Manager Programme/Livelihood  
Uttarakhand Bamboo and Fiber Development Board  
WMD Indira Nagar Forest Colony Dehradun



## Untreated Bamboo poles

Sl No	Particular of items	Size	Rate(Rs)
1	28 foot bamboo poles	3 inch dia.	150
2	24 foot bamboo poles	3 inch dia	135
3	18 foot bamboo poles	3 inch	110
4	14 foot bamboo poles	2 inch dia	75
5	12 foot bamboo poles	2 inch dia	65
6	7 foot bamboo poles	1.5 inch	45

### Primary processing

Bamboo will be cut and into required length with the powered tools prior to the treatment process. Half culm and bamboo slats will be also split for wall cladding and for making a grid wall.

### Bamboo treatment

Sl No	Particulars of Items	Unit	Rate(Rs)
1	CCA	Kg	165
2	CCB(Copper Chrome Boron)	Kg	170
3	Treatment cost	Per Rft	4

### Chromated copper arsenate (CCA) and Copper Chrome Boron(CCB)

In CCA treatment, copper is the primary fungicide, arsenic is a secondary fungicide and an insecticide, and chromium is a fixative which also provides ultraviolet (UV) light resistance. Recognized for the greenish tint it imparts to timber, CCA is a preservative that was extremely common for many decades.

In the pressure treatment process, an aqueous solution of CCA is applied using a vacuum and pressure cycle, and the treated wood is then stacked to dry. During the process, the mixture of oxides reacts to form insoluble compounds, helping with leaching problems.

The process can apply varying amounts of preservative at varying levels of pressure to protect the wood against increasing levels of attack. Increasing protection can be applied (in increasing order of attack and treatment) for: exposure to the atmosphere, implantation within soil, or insertion into a marine environment.

*Mein Singh Panwar  
Structure Engineer*

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**DINESH JOSHI**  
Manager Programme/Livelihood  
Uttarakhand Bamboo and Fiber Development Board  
Wild. Indus. Naga - Forest Colony, Dehradun



Bamboo can also be treated with CCB in the same pressure impregnation method like the way CCA is treated. CCA (6%) can be used as a reference preservative. A visual on-site assessment of decay on every test stake was made every three months for two years and every six months for each of the following years. The amount of preservative retained in the treated wood was determined by chemical analysis after 6 and 12 months exposure at the test site. The relationships between type of preservative, preservative concentration, test site and wood species were statistically determined. CCB preservative at the recommended concentration gave about the same degree of protection as CCA in ground contact.

### Engineered Bamboo Mat Board

SL	Particular of Items	Unit	Rate
1	3mm thick	sqm	1,658
2	4mm thick	sqm	1,888.
3	6mm thick	sqm	2,248.
4	9mm thick	sqm	2,838.
5	12mm thick	sqm	3,265

### Engineered Bamboo Mat corrugated sheets and Ridge cap

SI No	Particulars if items	Unit	Rate
1	3.5 mm - 4.00 mm	Sqm	2,798
2	3.5 mm - 4.00 mm	Rm	2,720.

### Joinery and Hardware

SI No	Particulars if items	Unit	Rate
1	8mm draw/grub bolts	Rm	45
2	10mm draw/grub bolts	Rm	35
3	8mm Nuts	Kg	75
4	10 mm Nuts	Kg	75

### Polish Material (water proof)

SI No	Particulars if items	Unit	Rate
1	PU2K	Litre	775
2	PU11	Litre	375

MP  
 Meisisingh Kumar  
 Structure Engineer  
 UBFB B.Pun

मिनीसिंग कर्मार  
 २१/१०/२०१७  
 १०/१०/२०१७


DINESH JOSHI  
 Manager Programme/Livelihood  
 Orakhand Bamboo and Fiber Development Board  
 WMO, Indira Nagar Forest Colony, Dehri

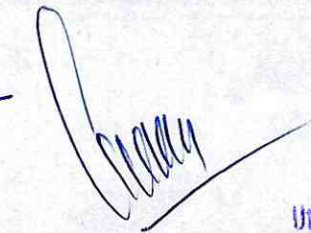


## Labour

NOTE:- Labour rates are exclusive of contractor's profit & overheads are inclusive of wages for weekly for day of rest.

Sl No	Particulars	Units	Rate per day
1	Carpentar 1 <sup>st</sup> class	Each	487
2	Carpentar 2 <sup>nd</sup> class	Each	448
3	Mason 1 <sup>st</sup> class	Each	487
4	Mason 2 <sup>nd</sup> class	Each	448
5	Excavator	Each	368
6	Mazdoor	Each	368
7	White washer/Painter	Each	448

  
Mevsiyung Jaisri  
Structural Engineer  
UBFDB D.DUM.

  
DINESH JOSHI  
Manager Programme/Livelihood  
Uttarakhand Bamboo and Fiber Development Board  
WABD, Indira Nagar, Forest Colony, Uttarakhand

  
DINESH JOSHI  
Manager Programme/Livelihood  
Uttarakhand Bamboo and Fiber Development Board  
WABD, Indira Nagar, Forest Colony, Uttarakhand



SI No	Description	Unit	Rate(Rs)
1	Fabrication of 3 inch bamboo column and bundle the column with 3 poles and tighten it 10 mm draw bolt/grub bolt and 10mm nuts and washer. Erect the column by grouting in a concrete mix of 1 cement: 2 coarse sand: 4 S.Aggregate from the counn foundation depth of 2 feet.	RM	351
2	Fabrication of 1 inch width bamboo split/slates grid panel in a dimension Of 5 x5 inch square for wall panelling and fix a chicken mesh over it and plaster with cement mortar of 1cement: 5 fine sand and Fix it on the erected bundle bamboo column and tie it on the 8mm steel rod with a binding wire.	Sqm	257
3	Fabrication of 3 inch 2 pole bundled treated bamboo principal rafter with double side lapping with 3 inch dia. Bamboo tied and fix it with 8mm draw/grub bolt with 8mm nuts and washer. Place the fabricated directly on the middle member of the bamboo column and fix it with 10mm grub/draw bolt and nuts.	RM	351
4	Join all the trusses with 2 inch diameter treated bamboo purlins with 12 feet D. strictus species.	RM	113
5	Laying and Fixing of the roofing sheets on the bamboo purlins.		Same as SOR of PWD/CP WD
6	Electrification work, plumbing sanitary work, polishing and finishing work and civil work.		Same as SOR of PWD/CP WD

MP

Meisising Ramai  
Structural Engineer  
UBFD B D.Pur

मेसिसिंग रामै  
21/11/2018  
20/11/2018  
गणेशजी

**DINESH JOSHI**  
Manager Programme/Livelihood  
Uttarakhand Bamboo and Fiber Development Board  
WMD, Indira Nagar Forest Colony, Dehradun



DETAIL ESTIMATES AND BILL OF QUANTITIES FOR 1 ROOM BAMBOO HUT FOR CLASS ROOM and on plinth wall

Plinth Area/ Built up Area = 420 Sqft.

Total Cost of Construction = Rs. /- only

SI No.	Particulars of Items	No	Length(Ft)	Breadth(Ft)	Height(Ft)	Quantity	Unit	Rate	Amount(Rs.)	Remarks		
1	Earth work in excavation in foundation in dense soil. Class room											
		Long wall	2	20	1.5	2	120					
		Short wall	2	15	1.5	2	90					
		Verandah Wall										
		Long wall	1	20	1.5	2	60					
		Short wall	2	6	1.5	2	36					
		Total						306	ctf	4.99	1526.94	SOR PWD 2.8.1
		2 bed										
		1:4:8 cement concrete of 2 inch thick in foundation										
		Class room										
	Long wall	2	20	1.5	0.3	18						
	Short wall	2	15	1.5	0.3	13.5						
Verandah												
	Long wall	1	20	1.5	0.3	9						
	Short wall	2	6	1.5	0.3	5.4						
Total						45.9	ctf	134.28	6163.45	SOR PWD 4.1.8		
Cement						4.8195	bags					
Sand						22.032	ctf					
C. Agg						44.064	ctf					
3 1:2:4 cement concrete works in columns with 20mm stone aggregate												
	Class room column	14	1.33	1.5	4.5	125.685						
	Verandah Column	5	1.33	1.5	4	39.9						
Total						165.585	ctf	164.38	27218.8623	SOR PWD 4.1.3		
Cement						31.79232	bags					
Sand						72.8574	ctf					
C. Agg						145.7148	ctf					
4 Brick/ Stone Masonry work in 1:5 cement mortars in foundation bed till Plinth level												
Class room												
	Long wall	2	20	1.5	4.5	270						
	Short wall	2	15	1.5	4.5	202.5						
Verandah												
	Long wall	1	20	1.5	4	120						

CHECKED  
JETT) P.W.D.

M. Meera Sanyal Jami  
21/11/2018

Director Jishi  
Manager Program and Livelihood  
WMD, Indra Nagar Forest Colony, Delhi 110049

V. P. S. (P.W.D.)  
P. P. D.















DETAIL ESTIMATES AND BILL OF QUANTITIES FOR 1 ROOM BAMBOO HUT FOR CLASS ROOM and on plinth wall

Plinth Area/ Built up Area= 420 Sqft.

Total Cost of Construction= Rs. /- only

SI No.	Particulars of items	No	Length(Ft)	Breadth(Ft)	Height(Ft)	Quantity	Unit	Rate	Amount(Rs.)	Remarks
	W/1	1	4.75		4	19		161.92	14097.04	SOR PWD 9.5.2.2
					Total	87	Sqft			
15	Woodworks in frames of false ceiling of 2"x2" size of approved quality wood									
	1 Ply board(4'x 8')(32 sqft) will take 40 feet length(Assume)	1	20		15	300	Sqft	101.42	30426.00	SOR PWD 9.37.1
	300/32 x 40= 375 ft									SOR PWD
16	Colour coated G I Sheet for roofing and Ridge in roofing of 16" ridge width	2	25		11	550				
	Class room roof	1	25		8.5	212.5				
	Verandah Roof	1	25		1.33	33.25				
	Ridge				Total	795.75				
	Add 5 % for lapping					39.7875				
					Net Total	835.5375	sqft	68.93	57593.60	SOR PWD 12.1.3
17	Colour coated plain steel sheets, 0.45 mm thick and 8" width for eave boards									
	Long wall	2	25			33.5				
	Short wall	2	19.5			26.13				
					Total	59.63	Sqft	68.93	4110.30	SOR PWD 12.1.3
					Total	530	Sqft	9.73	5156.90	SOR PWD 13.48.1
18	Paints and its accessories.									
19	Glass pane for window & ventilator openings 4mm thick									
	Area= same as window & ventilator opening area									
	Area= 83.87 sqft					87	Sqft	67.8	5898.6	SOR PWD 10.30.1
20	Door & Window accessories									
21	Chicken Mesh for walling reinforcement, same as item No. 10									
	Transportation cost of materials									
22	Labour									
	Skilled Carpenter	2				60	M D	487		
	Semi-Skilled Carpenter	2				60	M D	448		
						30	Man days			
						30	Man days			

*M. Meisisingy Panwar*

*27/11/2024*

**DINESH JOSHI**  
Manager, Program and Field Development

*Verifed by*  
*18/11/2024*

**JETIPW.D.**  
**CHECKED**  
**SOR PWD**

**SOR PWD**

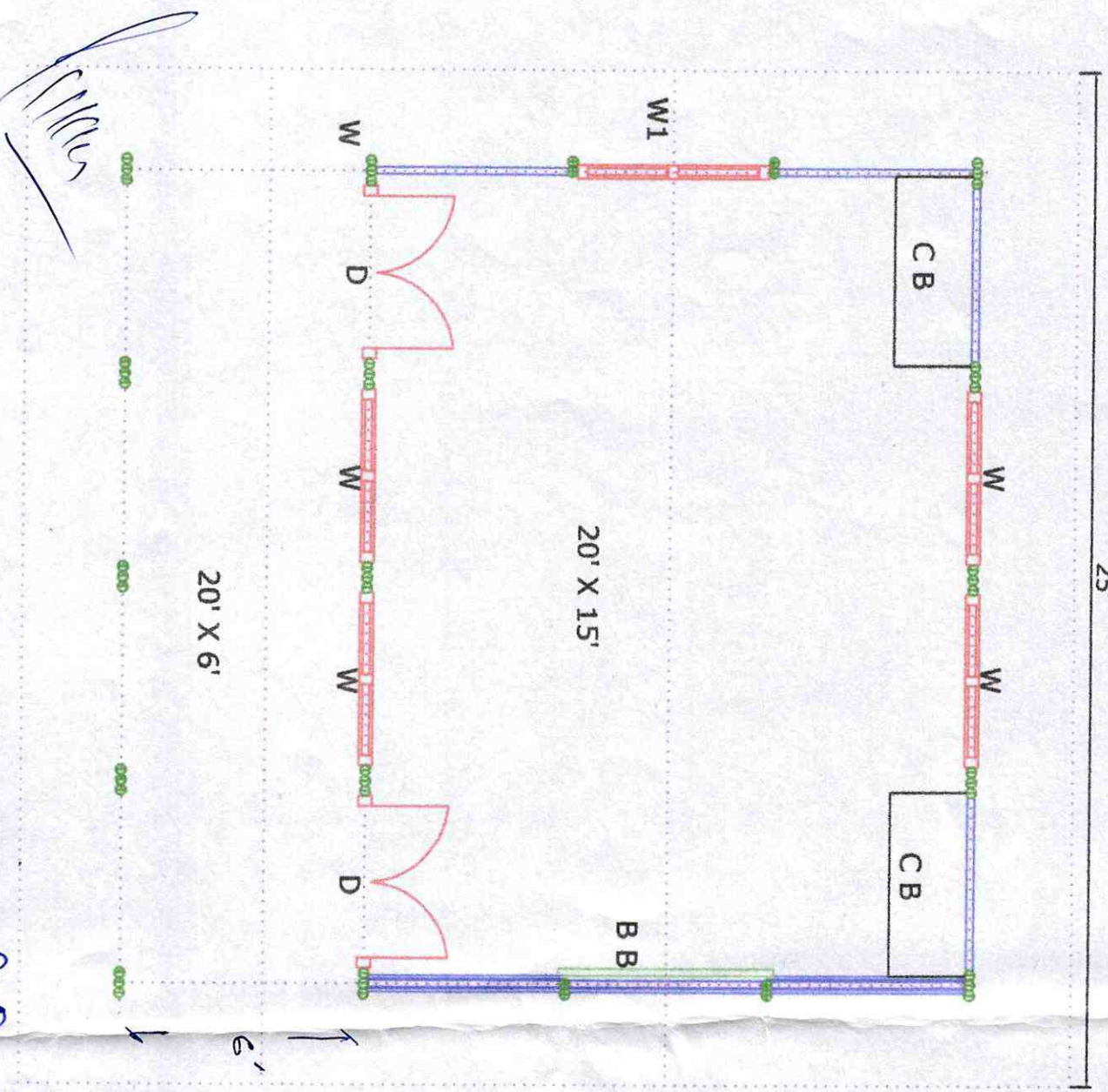






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 Main Signature Page  
 Structure Engineer

27/11/2024  
 27/11/2024



ROOM PLAN/ FLOOR PLAN

DINESH JOSHI

Manager, Program, Livelihood  
 Universal Bamboo and Fiber Development Board  
 WMO - Firoz Nagar Forest Colony, Dehri, Bihar

- W = 4'3" x 4'
- W1 = 4'9" x 4'
- D = 4'3" x 7'
- C B = 4'6.5" x 7'
- B B = 5'4" x 4'

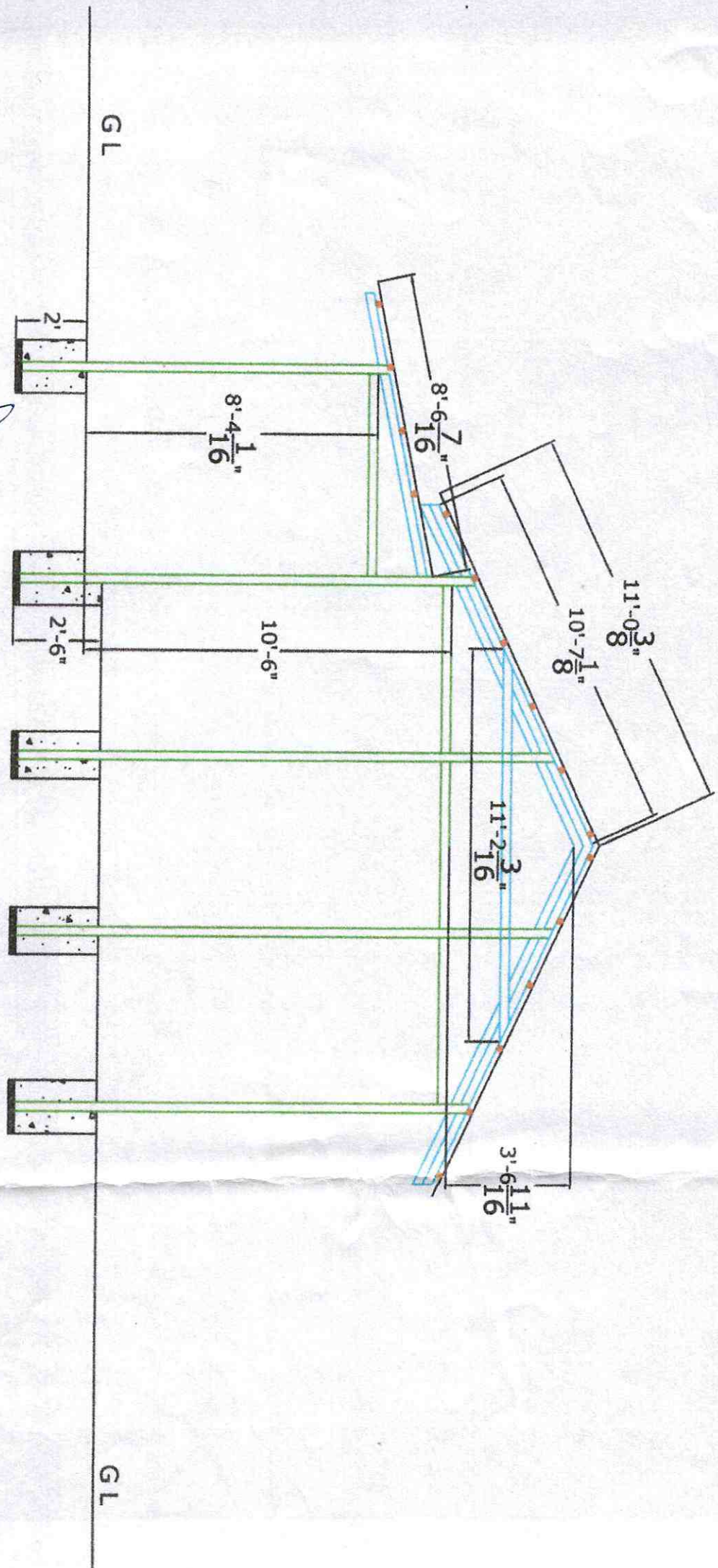
Area 420 sqft



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Meisigang Ramu  
Structure Engineer

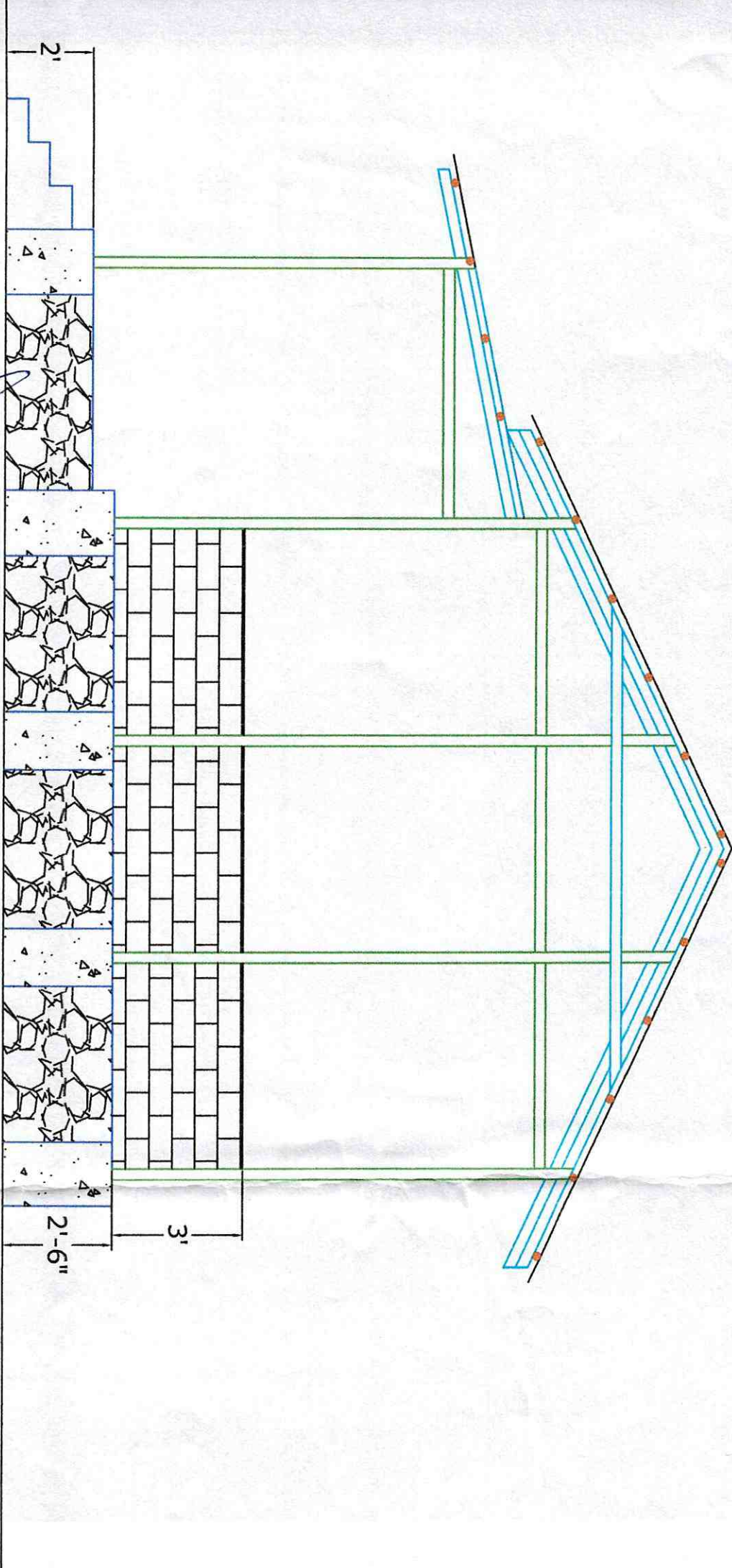
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Renuka S  
27/10/2018

SECTION ALONG COLUMN LINE



**DINESH JOSHI**  
*Handwritten signature*  
Manager, Program/Livelihood  
Uttarakhand Bamboo and Fiber Development Board  
WMD, Indira Nagar Forest Colony, Dehradun





**SIDE ELEVATION**

Meinisiyung Ramu,  
struktur kayu

Dr. T. N. S. Arpana

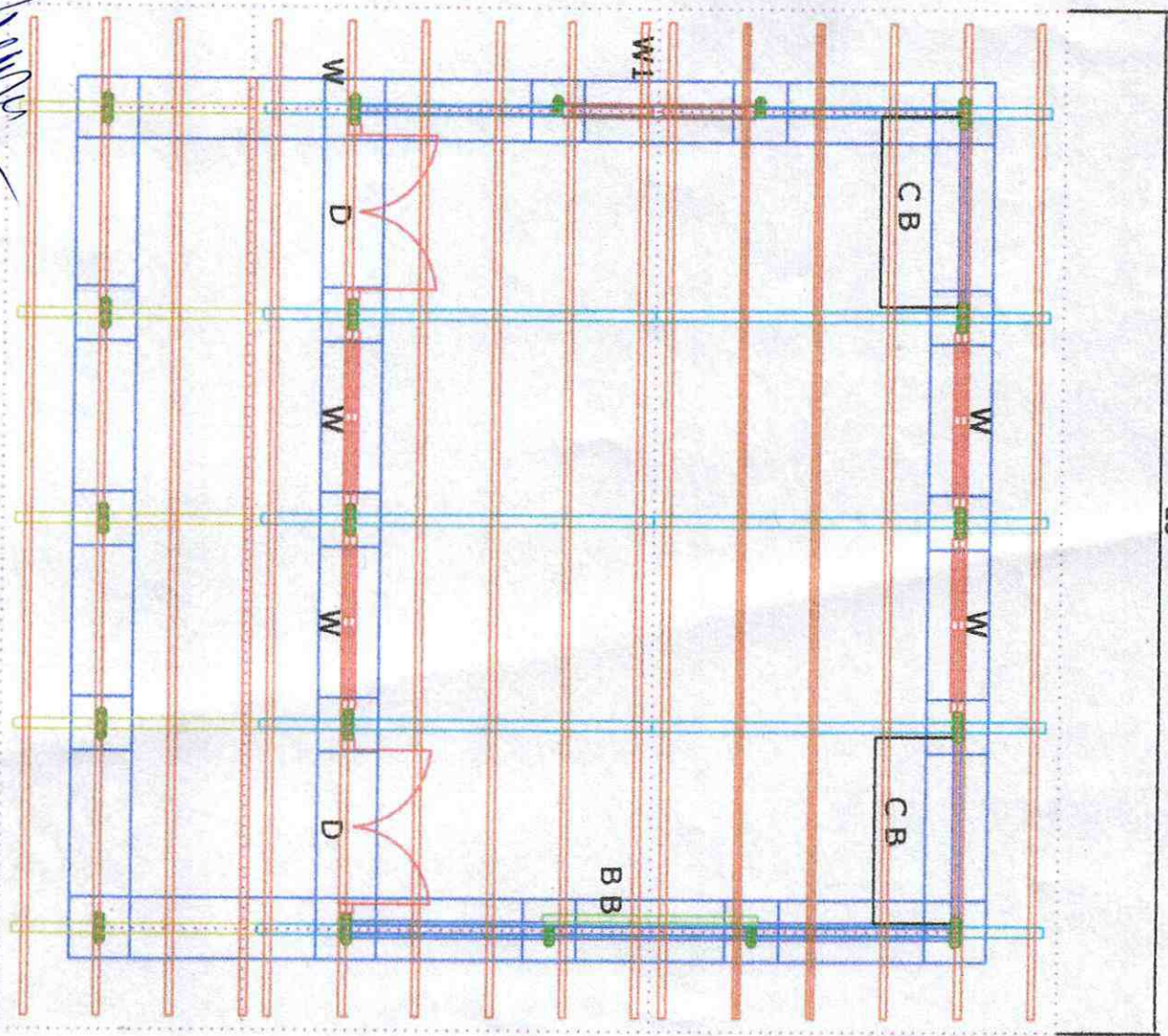
**DINESH JOSHI**  
 Manager Program/Livelihood  
 Uttarakhand Bamboo and Fiber Development Fund  
 S.M.U. and/or Nagar Forest Colony, Dehradun



MP  
 Murni Siyung Purnama

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ROOF PLAN SHOWING RAFTER AND PURLINS



25'

- W = 4'3" x 4'
- W1 = 4'9" x 4'
- D = 4'3" x 7'
- C B = 4'6.5" x 7'
- B B = 5'4" x 4'

**OMESH JOSHI**

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Manager Program and Livelihood  
 Utarakhand Bamboo and Fiber Development Centre  
 W-10, Indira Nagar Forest Colony, Dehra Dun