3-19

Phone/ Fax:- 0135-2531742/2530431



कार्यालय प्रमुख अभियन्ता एवं विभागाध्यक्ष, "नियोजन—।।।"



लोक निर्माण विभाग उत्तराखण्ड देहरादून

Office of the Engineer in Chief, PWD, Dehradun uttarakhand

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

E-mail: eicpwduk@nic.in

दिनांक-3/ /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)/x-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 आधरित भवनों के निर्माण हेतु शासन के पत्र संख्या 921(1)/x-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 सम्मलित है आगणन हेतु प्रस्तुत किया गया समिति द्वारा निर्धारित भवन निर्माण में प्रयुक्त होने वाली निर्माण सामग्री के सापेक्ष लोक निर्माण विभाग के एस०ओ०आर० में उपलब्ध मदो की दरें तथा अन्य मदो की दरें जो Bamboo Board द्वारा दी गई हैं, को सम्मलित करते हुये निर्माण की लागत रू० 409100.00 आंकलित की गई है इस प्रकार निर्माण कार्य हेतु प्रतिवर्ग फुट रू० 975.00 की दरें आकलित की गई हैं, इन दरों पर सेनेटरी का कार्य सम्मलित नहीं हैं।

संलग्न-आगणन 2 प्रति में।

(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 मेरी श्यांग, स्ट्रक्चर इंजिनियर, बांस एवं रेशा विकास परिषद्, इन्दिरा नगर फारेस्ट कालोनी देहरादून।

4 श्री दिनेश जोशी, प्रोग्राम मैनेजर, बास 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, लो०नि०वि० देहरादून को उनके पत्र संख्या

4243 / 1सी0बी0 दिनांक 29.12.2018 के कम में सूचनार्थ प्रेषित।

प्रतिलिपि:-किनष्ठ अभियन्ता (प्रा०) विभागाध्यक्ष कार्यालय,प्रमुख अभियन्ता, लोक निर्माण विभाग

संलग्न:- आगणन की एक प्रति।

देहरादून।

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

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Sl No	Sub-Head	Page
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	Joinery and Hardware	3
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	Basic Rates for Labour	4
1	Fabrication and erection of Bamboo column	5
2	Fabrication and erection of Bamboo wall	5
3	Fabrication and erection of Bamboo Trusses	5
4	Laying and fixing of Bamboo purlins	5
5	Laying and Fixing of the roofing sheets on the bamboo purlins.	5
6	Electrification work, plumbing sanitary work, polishing and finishing work and civil work.	5

Meisisiyung Pamai 23. Statucturi Enginer Ottorukhund Beumboo 2 Fiber Dave Board D. Dun

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Manager Programme/Livelihood
Urtarakhand Bamboo and Fiber Develop
WEST Indira Napa: Forest Estern Tracket

DINESH JOSHI

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.

DINESH JOSHI

Menager ProgrammalLivelihood

Uttarakhand Bamboo and Fiber Development Project

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1

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.

2

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Mein singung laman et nutre Engineer

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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

Sl 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)

Sl No	Particulars if items	Unit	Rate
1	PU2K	Litre	775
2	PUII \	Litre	375

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Warakhand Bamboo and Fiber Development Program

WMD, Indira Nagar Forest Calony, Delivadali

Labour

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

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

Manager Programme/Livelihood
Uttarakhand Bamboo and Fiber Development To accommod to a common to a com

WHAT Indira Mapar Forest Chieny Upwarded

Sl 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 coumn foundation depth of 2 feet.	RM	351
2	Fabrication of 1 inch width bamboo split/slats grid panel in a dimension 0f 5 x5 inch square for wall panelling and fix a chicken mesh over it and plaster with cement mortar of 1 cement: 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

Meisisigang Pamai Structura Engineer UBFDB D. Pur

DINESH JOSHI Manager Programme/Livelihood

Uttarakhand Bamboo and Fiber Development Program
WND, Indira Nagar Forest Colony, Delirada.

Plinth Area/ Built up Area= 420 Sqft.

Total Cost of Construction= Rs. /- only

					4							ω									.51		2								_	SI No.
\ Long wall	Verandah	Short wall	Long wall	Class room	foundation bed till Plinth level					Verandah Column	Class room column	1:2:4 cement concrete works in columns with 20mm 3 stone aggregate			(日) 第二次の (日)		Short wall	Long wall	Verandah	Short wall	Long wall	Class room	bed the concrete of z med thick in foundation	14.6	Short wall	Long wall	Verandah Wall	Short wall	Long wall	Class room	Earth work in excavation in foundation in dense soil.	Particulars of items
		2	2							5	14						2	1	\$100	2	2				2	1		2	2			No
20		15	20			C.Agg	Sand	Cement		1.33	1.33		C. Agg	Sand	Cement		6	20		15	20				6	20		15	20			Length(Ft) Breadth(Ft)
1.5		1.5	1.5			165.585	165.585	165.585		1.5	1.5		45.9	45.9	45.9		1.5	1.5		1.5	1.5				1.5	1.5		1.5	1.5			
4		4.5	4.5			0.88	0.44	0.192	Total	4	4.5		0.96	0.48	0.105	Total	0.3	0.3			0.3			Total		2		2	2			Height(Ft)
120		202.5	270			145.7148 cft	72.8574 cft	31.79232 bags	165.585 cft	39.9	125.685		44.064 cft	22.032 cft	4.8195 bags	45.9 cft	5.4	9		13.5	18			306 cft	36	60		90	120			Quantity U
						Ť	t .	ags	t				Ť	1	ags	t								*		100						Unit
									164.38	1						134.28	1							4.99	1					1 (30,000)		Rate
									27218.8623	\		E(T) P.W.D.	CHECK	ロコンコー		6163.45	/							1526.94	/							Amount(Rs.)
									27218.8623 SOR PWD 4.1.3							6163.45 SOR PWD 4.1.8								1526.94 SOR PWD 2.8.1								Remarks

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Unager Programme/Livelihood

Utarakhard Bamboo and Fiber Develop: 905 Project

WMD, Indira Magar Forest Colony, Delication

Plinth Area/ Built up Area= 420 Sqft.
Total Cost of Construction= Rs. /- only

SI No. 0 Half Brick Masonry work in 1:5 cement mortar mix upto window sill level of 3 ft height on wall Particulars of items glass partition and a finishing coat of neat (20mm stone aggregate & down gauge)with 2 inch thick cement concrete flooring 1:2:4 Class room 1:2:4 concrete works in D.P.C.in external wall, 2 Deduction Earth work in plinth filling with the available excavated earth and a lead from 50 ft. Column Volume Class Room Verandah Class room Short wall Short wall short wall Verandah Long wall Long wall S Bricks/ Stone C.Agg Sand Sand Length(Ft) Breadth(Ft) Height(Ft) Quantity Cement Cement 18.5 13.5 20 5 20 15 498.9 498.9 498.9 13.5 420 420 -1.5 4.5 0 15 Total Net Tota 0.0524 0.192 Total Total 14.56 Total 0.44 Total 2.5 26.14236 bags 7263.984 Nos 121.5 **745.875** cft 624.375 119.736 cft 80.64 bags 664.5 cft 498.9 cft 165.6 184.8 cft 420 Sqft 120 210 Sqft 90 105 Sqft 60 45 Unit Rate 142.48 67.32 31.51 35.68 3,77 2811 94875 CHECKED Amount(Rs.) Remarks JEAN P.W.D. 71083.272 SOR PWD 6.1.2 14985.6 SOR PWD 11.3.1 3308.55 SOR PWD 4.11 14137.2 SOR PWD 6.13.2 **SOR PWD 2.25**

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DINESH JOSHI GHERM
Manager Programmet...silbood
Uttanchand Bamboo and Fiber Development Board

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Plinth Area/ Built up Area= 420 Sqft.

10								3																							SI No.	
10 Bamboo 2 inch dia. For purlins		Extras 30% for cutting and wastage		Required poles= 450 rft	= 386.6 R ft	Thus total length of bamboo pole required	Total wall area= 386.6 sqft	Long wall	Wall area	e) Wall slats(To be splited) for grid walling	Rafter	Verandah	Tie	Principal rafter	Class room	c) Trusses	Short wall	Long wall	c) Post plates/Wall plates(Verandah)	Short wall	Long wall	b) Post plates/Wall plates(Class room)	3 Pole bundle column along long wall	Verandah	3 pole bundle column long short wall	3 pole bundle column along long wall	Class Room	a) Columns from foundation	9 Wall Slats.(2.5"-3" dia bamboo)	Treated Bamboo for Columns, Trusses, Tie members Raffers Post Plates & Wall Plates &	_	
2×6											5		2 x 5	5 2 2 2	3		2	4		2	4		5		3 x 4	3 x 10	a production of				No	
25								Area= Same			8.5		11.5	11			6	4.25	15.00	15	4.25			2001							Length(Ft)	
								Area= Same as item No 11=								X 100 H 100 H 100															Breadth(Ft)	
	Total		Sub Total					1= 386.6 sqft															10.5		17.5	14.5					Height(Ft)	
300		712.26	2374.2	450	386.6			386.6			42.5		115	220			12	17		30	17		52.5			435					Quantity	
TO THE STREET	TÎ.		263	The second				Sqft								Period C															Unit	
		1													F																Rate	
	12 37037.52				JEN 111	A CONT	0	5.450																							Amount(Rs.)	
SAMOS	74	,				1																									Remarks	

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Plinth Area/ Built up Area= 420 Sqft.

Total Cost of Construction= Rs. /- only

		14		T	13 d					12 🗸	0	fc	(y	=	7				01				1	.			0	11 a 2		15	ÞΤ	T<	01 140.
	W. III	Wood works/MS works for glazed shutters for 14 windows.		DŢ	Marine grade 35mm Flush door for shutters for doors.		W1	W	D	12 Wood works/MS works for frames of doors.	0.183 cft	, cement= 0.038 bags and Sand	sand= 18.3 cft Thus	inch thick by analysis, cement = 3.8 bags and	Materials required for plastering 100 sqft of 2	W1	W	D	Deduction		Gable walls	Short wall	Long wall	Plinth wall	Short wall	Long wall	Class room wall	2 inch thick inside outside wall plastering over a bamboo slats weave panel and plinth wall		Cad oo to for carried wastage	dd 30% for cutting/wastage	Verandah Roof	a distriction of motion
	4			2			_	4	2		(0	0				1	4	2		,	2	2	4		6	8				1		5	
	4.25			4.25			17.5	16.5	18.25		Sand	Cement				4.75	4.25	4.25		, 100	Area=	21	20		5	5						25	Tought of
											5:	50					100				26 25						S 5 5 5 5 5						A. C. L.
			Total			Total					530 0.183	30 0.038		Net Total	Total					Total			2.5						lotal	+	Sub Total		
,	4 6		SALL IN	7 59.5			17.5	66	36.			1.15				19	6	7 59.5			52 5				7 210	7 280			111 6.766		425	12	
	68		59.5 sqft	5		120 rft	5	6	5		96.99 cft	4 bags		530 Sqft	5	9	8	5		5	5	4	9	1	0	0			O III	h 0	5	5	0
1			153.48			109.86								23.63			100																-
0			9132.06				\	12(1):	MOND.	CHECKE	,	COLUMN A PROPERTY.			1														9 49/2.3	١	1	1170000000	runount with
			06 SOR PWD 9.21.1			13183.2 SOR PWD 10.14.1.1								12523.90 SOR PWD 13.3.1		\				7 Ca Ol D- /2 X 10 X	Area of A= 1/2 x15x3 5								1.	The same to	1		, inclination

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Manager Programme Livelihend Roald Very Chron

Plinth Area/ Built up Area= 420 Sqft.

		23	22	21	20					19	18			u.	17								16				15				SI No.	
Semi- Skilled Carpentar /		23 Labour	Transportation cost of materials	Chicken Mesh for walling reinforcement, same as item No. 10	20 Door & Window accessories		sqft	area Area= 83.87	Area= same as window & ventilator opening	openings 4mm thick	Glass pane for window & ventilator	18 Paints and its accessories.		Short wall	Long wall	thick and 8" width for eave boards	Colour coated plain steel sheets, 0.45 mm		Add 5 % for lapping		Ridge	Verandah Roof	Class room roof	Colour coated G I Sheet for roofing and Ridge in roofing of 16" ridge width	300/32 x 40= 375 rft	length(Assume)	1 Ply board(4'x 8')(32 sqft) will take 40 feet	size of approved quality wood	Woodworks in frames of false ceiling of 2"x 2"		W1	Particulars of items
100	2	1989											2	2						1	1	2			_			No. of the last		1	No	
											Same as Plaster		19.5	25						25	25	25			20				TOTAL PROPERTY.		Length(Ft) Breadth(Ft)	
30	30										.									1.33	8.5	11			15					- 24	100	
30 Man davis	30 Man days										Total	Total	0.67	0.67			Net Total		Total		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								Total	4	Height(Ft)	
EN M	60 M D	With Part Miller		386.6 sqft		87 Sqft				000	530 Saft	59.63 Sqft	26.13	33.5			835.5375 saft	39.7875	795.75	33.25	212.5	550			300 Sqft				87 Sqft	19	Quantity Unit	
	J	4				F				ľ		7													7	1			7			
440	487					67.8				1	9 73	68.93	\				68.93						753		101.42			1	161.92		Rate	
	Recognition and an artist		Mary Services					JE OF		1	1	Our P	1				1														Amount(Rs.)	
SOB BWID	All Male Contracts		as per actual	SOR PWD		5898.6 SOR PWD 10.30.1		-	3	100000000000000000000000000000000000000	5156 90 SOR PWD 13 48 1	4110.30 SOR PWD 12.1.3					57593 60 SOR PWD 12 1.3							SOR PWD	30426.00 SOR PWD 9.37.1				14087:04 SOR PWD 9.5.2.2		Remarks	

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Plinth Area/ Built up Area= 420 Sqft.

Total Cost of Construction= Rs. /- only

						100					2.				No.		SI NO.
			Add 8% for sanitary and plumbing works, Showers, pedastal wash basin, ESWC, Tap and Wall Mixer i/c labour cost	Add 8% for electrical works including fixing and fixtures without heavy appliances like		anchorage	M.S rods 10mm dia for ground and wall	M.S Flats 6mm thick (including welding and fabrication charge)	J-Bolt, Limpet and bitumen washers	Grub screw/bolt and nuts	24 Joinery	Painter	Excavator	Mazdoor	Semi- Skilled Mason	Skilled Masons	Particulars of items
			ing works	g fixing ar									2	2	2	1	No
			s, Showers,	nd fixtures w			STATE OF THE STATE										Length(Ft)
			pedastal wash	ithout heavy ap										2	2	2	Length(Ft) Breadth(Ft) Height(Ft)
			basin, ESWC	opliances like								Area=	2 Man days	20 Man days	20 Man days	20 Man days	Height(Ft)
	10% site de	4% conti	Tap and W	geyser and I													Quantity
	10% site development	4% contingencies	Vall Mixer i/o	Fans and i/o								Sqft	4 M D	40 M D	40 M D	20 M D	Unit
Grand Total			labour cost	geyser and Fans and i/c labour cost	Total			HE TOP I	CHY	- KED		448	368	368	448	487	Rate
Grand Total 409136.0778	33535.74408	13414.29763		26828.59527	335357.4408		THE THE PERSON	O.		Ö							Amount(Rs.) Remarks
00	<u>ω</u>	ω		7	8												Remarks

(Rupees four lakh nine thousand and one hundred)

1 Sanitary work excluded in the estimate

2 Rate per sqft of construction of only the structure is Rs 975/- as as of now

The estimate prepaired by the committee formed by the Secretary Forest, Gov't of Uttarakhand, Forest section 3, vide letter No 92/(1)/x-3-18-

3 04(03)2018, dated 5 November 2018

Prepaired by

Mr. Meirisiyang Pamei

Bamboo Post Harvest Application Expert Engr.

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