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CENTRAL RESERVE POLICE FORCE



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WORKS MAGAZINE

WORKS DIRECTORATE
GENERAL

Edition # 5

E-MAGAZINE

SPECIAL ARTICLE ON COMPONENTS OF A BUILDING

Manipur & Nagaland Sector, Manipur

The Manipur & Nagaland sector was established on 1st March, 1994 as OPS and from 2004 as Adm. sector and since then the Office of IGP is functioning in the campus of the Group Center located at Langjing, Imphal. The sector HQRs is responsible for the operational efficiency, training and welfare of the force personnel in Units deployed in the Ops area of responsibility (i.e Manipur & Nagaland state) and other Adm. units.



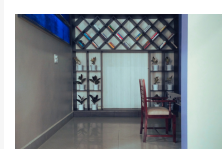
Manipur and Nagaland sector is performing various roles in the state of Manipur & Nagaland State like protection of Governor of Manipur and Nagaland, Chief Minister of Manipur, CRPF is also guarding the ongoing NF railway project in Manipur and other vital installations. CRPF is taking care of Convoy and Escort duty of petroleum and FCI goods and other essential commodities which is space of Manipur & Nagaland. Law and Order responsibility in the state of Manipur and Nagaland also looked after by CRPF.

The Sector is Co-located in Group Center along with DIG (Range), 2nd Signal BN & CH Imphal.

The recent constructions in the MN Sector are

1. Composite Hospital at GC Manipur.
2. GOs Mess, SOs mess & Men's club along with Canteen and Unit Hospital at 143 BN

constructed beautifully with great ambiance by the concerned officers with the help of able officers from CPWD. The architecture is a visual art it only possible with decent combination of colours. The decent colours are giving grandness to the buildings. The contribution of estate officer is fully appreciable.



Officers from Works Dte. Visit to CBRI Roorkee

The Officers from Works Dte. visited Central Building Research Institute Roorkee to study and implement

- The latest research and technology in construction field.
- The research on sustainable and cost effective materials.
- Retrofitting practices in construction.
- Skill development and training

The Central Building Research Institute, Roorkee, India has been vested with the responsibility of generating, cultivating and promoting building science and technology in the service of the country.

The Institute has been assisting the building construction and building material industries in finding timely, appropriate and economical solutions to the problems of materials, rural and urban housing, energy conservation, efficiency, fire hazards, structural and disaster mitigation.

To carry out R&D on all aspects of building and housing and assist the building industry in solving problems of planning, designing, foundations, materials and

construction including disaster mitigation. All kinds of buildings with a view to achieve economy, comfort, functional efficiency, speed, productivity in construction, environment preservation and energy conservation.

Objectives and Scope of CBRI Roorkee

- Engineering solutions for mitigating disasters due to landslides, earthquakes and fire and post disaster shelter.
- Design and development of innovative wireless and FBG sensors for Health Monitoring of Buildings and damage detection system.



Officers from Works Dte. at CBRI, Roorkee.



- Development of an Intelligent Building System integrating intelligent and smart features and construction of a model intelligent residential building.



ALTERNATE BUILDING

MATERIALS used and suggested by CBRI.

- Aluminum
- Bitumen Materials
- Soil Conditioning Agents
- Tempered Glass
- Crumb Rubber
- Fibre Reinforced Polymer
- Glass Fibre Reinforced Plastics
- Bamboo reinforced plastics
- Ferro-cement
- Polyester Fibres

ALTERNATIVE COMPONENTS FOR BUILDING CONSTRUCTION DEVELOPED BY CBRI:

PRE CAST BRICK PANEL:

There are made of first class bricks & reinforced with two TMT bars of 6mm dia.

The joints are filled with M20 concrete. The length of brick panel varies from 900 mm to 120 mm but width is normally kept at 540 mm.



PRE CAST BRICK PANEL

PRE CAST CHANNEL UNIT:

It is used for faster & economical construction of floors & roofs in single & multi-storey buildings. It consists of a full span though shaped RCC unit which can be used for floor & roofs supported on suitable structures like brick/stone walls & RCC beams.



PRE CAST CHANNEL UNIT

PRE CAST L PANEL:

Prefabricated L-Pan roofing consist of full span RCC L-shaped components. Sheetting & purlins/battens, normally used for a conventional sloping roofs. These precast L-panels can be supported over masonry gable walls, trusses, portal frames or sloping beams.



PRE CAST L PANEL

RE-INFORCED BRICK CONCRETO (RBC) SLABS.

Reinforced brick (RB) & Reinforced Brick concrete (RBC) floors & roofs are widely adopted, particularly in the Northern parts of the country where good quality of bricks are available and stone chips for concreting are costly.



RE-INFORCED BRICK SLABS

BRICK PYRAMIDAL ROOF:

A pyramidal shaped roof cast using locally available clay bricks &



BRICK PYRAMIDAL ROOF

cement mortar M/20 concrete. In costal regions steel reinforced cement concrete slabs get badly corroded by salt bearing marine winds. In this pyramidal roof, No steel bars are used in the roof- so no corrosion.

GREEN ROOFS:

It is an extension of existing roof which involves high quality water proofing, root repellent system, drainage system, filter cloth, a light weight grousing medium & plants.

It is capable of reducing electro-magnetic radiation penetration by 99.4%.

It reduces demand on power plant/air conditioning and decreases the CO₂ foot print.



GREEN ROOFS

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VACANT QUARTER DETAILS

J & K , COBRA & RAF DETAILS OF VACANCT QUARTERS

Zone	Sector	Institution	T-I	T-II	T-III	T-IV	T-V	T-VI	Total
J&K Zone		RTC JDPR	0	98	6	0	0	0	104
		Sec. RAJ	0	10	6	1	1	0	18
		GC N.Delhi	0	0	0	0	0	0	0
		GC Noida	0	21	1	2	2	0	26
		GC GGN A.	194	459	12	1	1	0	667
		Jyoti Kunj Dwarka	256	0	0	0	0	0	256
		CRPF H.C. Faridabad	67	4	5	0	5	1	82
		DDA G-8 PKT-1 Flats AT Narela	366	80	0	0	0	0	446
		Hallomajra Chandigarh	24	26	2	0	1	0	53
		GC JDR	69	78	7	0	0	1	155
		GC PUR	40	5	0	0	0	0	45
		GC SPT	0	49	7	5	4	0	65
		GC BTB	11	16	0	3	0	1	31
		BCS GGL	0	0	5	5	1	0	11
		GC SNR	0	112	18	0	0	2	132
		RTC SNR	1	2	1	0	0	0	4
		BCS Awantipora	2	3	0	0	0	0	5

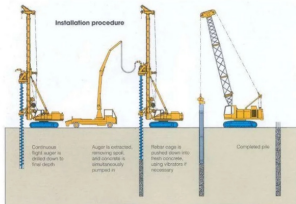
Zone	Sector	Institution	T-I	T-II	T-III	T-IV	T-V	T-VI	Total
CoBR A Sec		201 & 204	0	121	12	0	0	0	133
		202 CoBRA	0	23	6	5	1	0	35
		203 CoBRA	0	0	4	0	1	0	5
		205 CoBRA	0	0	2	0	0	0	2
		206 CoBRA	0	70	21	1	0	0	92
		207 CoBRA	0	0	7	1	0	0	8
		208 CoBRA	0	69	11	1	0	0	81
		209 CoBRA	0	14	4	2	0	0	20
		210 CoBRA	0	49	17	0	0	0	66
		CSJWT	0	0	0	0	0	0	0
RAF Sec		99 RAF	0	7	43	5	1	0	56
		100 RAF	0	0	0	0	0	0	0
		101 RAF	0	0	0	0	2	0	2
		102 RAF	0	0	3	0	0	0	3
		104 RAF	70	24	4	0	2	0	100
		105 RAF	0	1	0	0	0	0	1
		106 RAF	0	31	0	0	0	0	31
		107 RAF	5	2	7	1	0	0	15
		108 RAF	54	16	6	1	1	0	78
		GC-I Ajmer	22	13	2	0	0	0	37
		GC-II Ajmer	86	165	5	0	1	1	258

Components of a Building (Part-I)

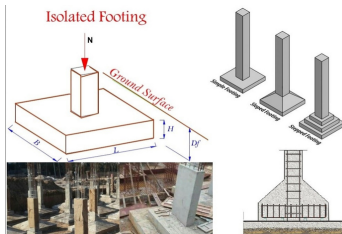
COMPONENTS OF A BUILDING : CIVIL WORKS

- **Foundation** (Substructure)
Pile foundation

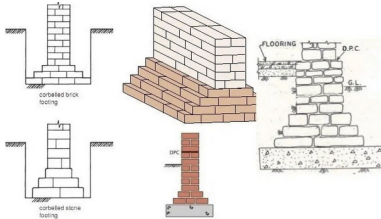
Pile foundation



- **Footing**



- **Masonry Foundations**



- **Plinth:** Dividing line between the substructure and superstructure.



- **FRAMED STRUCTURE** (Superstructure) RCC (Reinforced Cement Concrete) Structures Optimization of resources.



- **Pre-stressed Concrete** Structures Suitable for high rise buildings- longer spans, thinner slabs, lesser joints Steel cables laid along with reinforcement Hydraulic jack machine for tensioning cables

Steel cables laid along with reinforcement



Hydraulic jack machine for tensioning cables



- **Stairs / Escalators and Elevators** : An elevator is a room type of lift that can accommodate some people simultaneously. It is used to move passengers up and down across various levels of a building. On the other hand, Stairs and Escalators are moving stairs, which carry people between different levels of a building.



- **Walls:** The purposes of walls in buildings are to support roofs, floors and ceilings, to enclose a space as part of the building envelope along with a



- **Doors** give access to the inside of a room of a house and **windows** give light and ventilation



- **Lintels:** will support the walls above the openings like doors, windows, etc. to provide a safeguard of the windows and doors. Also withstand the imposed loads coming from above bricks or block including the roofing members.



- **Finishes:** Building finishing works Plastering Painting Glass / Cladding (facade) Interior finishing Tiling / Granite Driveway / Pavements / Landscape/ Compound walls/ Gates



- **Building services:** Building services Electrical works -Conduit (concealed / open) & Wiring - Cable Tray / Cable laying - Transformer / Electrical Panel / Diesel generators (Cooling tower) /Distribution board / UPS - Earthing / Lightning protection - Light fixtures / Power sockets.

will be continued in the next issue.....

Glimpse of New works



**117 no s of
Type -II Quarters
in two blocks of
102 RAF BN
built at Taloja,
Navi Mumbai.**



**Extraordinary efforts to
renovate the existing
dilapidated barracks
beautiful SO's mess &
Lounge at Nayala,
Rajasthan Sector.**

