

**Circulars/Analysis of Rates by CPWD for Use  
of Emerging Technologies**

F.No.28012/7/2016-W-3  
Government of India  
Ministry of Housing and Urban Affairs  
(Works Division)  
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Nirman Bhawan, New Delhi  
Dated: 20.03.2018

**OFFICE MEMORANDUM**

Sub:- Adoption of **New & Emerging Technologies** in construction works undertaken by CPWD, DDA and NBCC – regarding.  
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In continuation of this Ministry's O.M. JS/Works/OM/2016 dated 30.05.2016 and O.M. No.28012/7/2016-W-3 dated 28.12.2016 it has been decided that CPWD, DDA & NBCC may adopt the following technologies, which have been validated by Building Materials and Technology Promotion Council (BMTPC) under the Ministry of Housing and Urban Affairs, in all their projects irrespective of location and project cost:

- a. Monolithic concrete construction system using Aluminium Formwork
- b. Monolithic concrete construction system using Plastic – Aluminium Formwork
- c. Expanded Polystyrene Core Panel System
- d. Light Gauge Sheet Framed Structures (LGSF)
- e. Industrialized 3-S System using RCC precast with or without shear walls, columns, beams, Cellular Light Weight Concrete Slabs/Semi-Precast Solid Slab
- f. Speed Floor System
- g. Glass Fibre Reinforced Gypsum (GFRG) Panel Building System
- h. Factory Made Fast Track Modular Building System.

2. As decided earlier, in case, it is not found feasible to implement these provisions in particular project, specific permission should be accorded by DG, CPWD/CMD, NBCC/Vice Chairman, DDA respectively on case to case basis, with detailed justification.

3. The aforesaid modern technologies may be incorporated as per the Schedule of Rates (SoR) issued by CPWD. Further, in future, new emerging technologies, as validated by BMTPC and for which DG, CPWD has issued the SoR will also be included in the list. For this purpose, DG, CPWD is authorized to issue directions in continuation of this Office Memorandum.

4. This has the approval of Hon'ble HUAM.

  
(J. Roy Chowdhury)  
Deputy Secretary (Works)  
Tel. no. 23062425

To

1. Director General, CPWD, Nirman Bhawan, New Delhi.
2. Vice Chairman, DDA, Vikas Sadan, INA, New Delhi-110023
3. Chairman-cum-Managing Director, NBCC Limited, NBCC Bhawan, Lodhi Road, New Delhi-110003

Copy to:

1. PS to HUAM.
2. Sr. PPS to Secretary (HUA)
3. PS to all ASs/JSs in MoHUA

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F.No.JS/Works/OM/2016  
Government of India  
Ministry of Urban Development

Maulana Azad Road,  
Nirman Bhawan,  
New Delhi

Dated: 30/05/2016

**OFFICE MEMORANDUM**

**Sub: Adoption of New & Emerging Technologies in construction work of value not less than Rs.100 crores in Metropolitan cities, undertaken by CPWD, DDA and NBCC – reg.**

The subject of using Modern Technologies in the construction works of CPWD, DDA and NBCC under the Ministry of Urban Development has been under consideration of the Ministry. CPWD has recommended to MOUD, adoption of the following three Technologies, which are validated by Building Materials and Technology Promotion Council (BMPTC) under the Ministry of Housing and Urban Poverty Alleviation:

1. Monolithic Concrete Construction System using Aluminium Formwork.
2. Industrialized 3-S System using Cellular Light Weight Concrete Slabs & Precast Columns (Precast/ prefab)
3. Monolithic Concrete Construction System using Plastic - Aluminium Formwork.

2. CPWD has recommended that the adoption of the above 3 new technologies will result in the following benefits: -


- (a) Significant reduction in air & noise pollution and construction waste
  - (b) Optimum use of water
  - (c) No use of timber/ plywood for shuttering
  - (d) Form finish elements, good workmanship, assured quality and durable construction
  - (e) Increased labour productivity due to working in controlled environment
  - (f) All weather site execution
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- (g) Cost saving due to compressed completion time and rental cost reduction
  - (h) Better site organization, utilization of resources

3. CPWD has stated that adoption of the above mentioned 3 technologies will ensure neat and tidy work place with minimal environmental pollution and will be in sync with the objectives of 'Swatch Bharat Mission'. Further, adoption of these technologies will result in skill up-gradation of workers.

4. Accordingly, the Ministry of Urban Development has decided that CPWD, DDA and NBCC would mandatorily adopt the 3 Technologies enumerated in para 1 above and validated by BMPTC at their construction sites initially in the Metropolitan Cities of India, and where the value of works is Rs.100 crores or more. It has also been decided that these organizations (CPWD, DDA and NBCC) will also invariably obtain Third Party Certification related to Green Building Concept from agencies recognized by MoEF, apart from installing rooftop solar power plants, wastewater recycling and rainwater harvesting in all such projects.

5. This issues with the approval of Hon'ble Minister for Urban Development.

  
30/5/16  
(B. Anand)

Joint Secretary (W&H)

To

1. Vice Chairman, DDA, Vikas Sadan, INA, New Delhi- 110 023.
2. Director General, CPWD, Nirman Bhawan, New Delhi - 110 011.
3. CMD, NBCC Limited, NBCC Bhawan, Lodhi Road, New Delhi - 110 003.

Copy for information to :

1. PS to Hon'ble UDM, PS to Hon'ble MoS, PPS to Secretary(UD), PPS to AS(UD) & PPS to AS(SC).
2. All Joint Secretaries/Economic Adviser/OSD(UT)/JS&FA in M/o UD.
3. All Director/D.S. in M/o UD.
4. Office Memorandum file - US(W-3).
5. IT Cell for uploading in e-office.

Ps to. JS(H)

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CENTRAL PUBLIC WORKS DEPARTMENT  
OFFICE MEMORANDAM  
DG/DSR/010  
ISSUED BY AUTHORITY OF DIRECTOR GENERAL, CPWD

NIRMAN BHAWAN NEW DELHI

DATED 24/06/2016

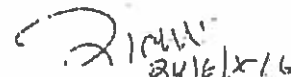
Sub: -Correction slip No.5 to Delhi Schedule of Rates 2014.  
OFFICE MEMORANDAM

It has been decided with the approval of DG, CPWD to include following new technology items in Delhi Schedule of Rates 2014. The nomenclature of these new technology items and their relevant Analysis of Rates are also included in CPWD DAR-2014.

S.No	Item No	Particulars of technology	Number of items
I	New technology item No. 1	Expanded Polystyrene core panel system	2 items
II	New technology item No. 2	Light gauge steel framed structure	5 items
III	New technology item No. 3	Aluminium formwork for monolithic construction	1 item

Particulars and details of these items detailing their nomenclature and relevant Analysis of Rates are uploaded on CPWD website.

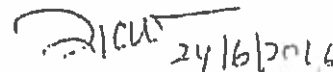
This issues with the approval of DG, CPWD.

  
(R.B. Garg)

Executive Engineer (TAS-II)  
CSQ, CPWD, Nirman Bhawan, New Delhi

No.133/SE(TAS)/CS-DSR-2014/2015-16/ 172-E  
Copy to: All the SDG/ADG/CEs/CPMs through CPWD website <http://cpwd.gov.in>

Dated: 24.06.2016

 24/6/2016

Executive Engineer (TAS-II)  
CSQ, CPWD, Nirman Bhawan, New Delhi







CENTRAL PUBLIC WORKS DEPARTMENT  
OFFICE MEMORANDAM  
DG/DSR/011

ISSUED BY AUTHORITY OF DIRECTOR GENERAL, CPWD

NIRMAN BHAWAN NEW DELHI

DATED 17/08/2016

OFFICE MEMORANDAM

Subject: Adoption of New & Emerging Technologies in projects/ Works of value not less than 100 crores in Metropolitan Cities.

MoUD vide No. JS/Works/OM/2016 dated 30th May, 2016 has issued an office memorandum for use of following three technologies in CPWD works:-

1. Monolithic Concrete Construction System using Aluminium Formwork.
2. Industrialized 3-S system using Cellular Light Weight Concrete Slabs & Precast Columns (Precast/Prefab)
3. Monolithic Concrete Construction System using Plastic - Aluminium Formwork.

Adopting the above technologies, a Turnkey project item with scope and payment schedule is here by added to DSR 2016. The rates of the items are according to the scope of work as mentioned in annexure and are indicative only; the NIT approving authority may modify and add or delete these rates as per the work/ project requirements/conditions/scope.


Construction shall be done on turnkey basis by adopting monolithic concrete construction system using customized aluminium /plastic aluminium form, or industrialized system using partly / fully precast slabs, beams and columns (Precast / prefab) with cast in situ joints for the superstructure and cast in situ methodology for foundation.

Payment shall be made stage wise; a payment schedule is provided as guideline. Payment schedule is indicative, NIT approving authority shall further breakup the payment stages but above percentage limits must not be exceeded for any particular stage.

The industrialized 3-S system using Cellular Light Weight Concrete Slabs & Precast Columns (Precast/Prefab) is restricted up to seismic Zone IV only.

The technology is new and idea of turnkey project/work based on these technologies is not experienced by the CPWD hence experience/suggestions/ inputs are also invited for future refinements.

This issued with the approval of DG, CPWD.

  
17.08.16  
(Kunwar Chandresh)  
Executive Engineer

CSQ, CPWD, Nirman Bhawan, New Delhi

No.133/SE(ITAS)/CS-DSR-2016/2016-17/ 198-E

Copy to: All the SDG/ADG/CEs/CPMs through CPWD website <http://cpwd.gov.in>

Dated: 17.08.2016

  
17-08-16  
Executive Engineer

CSQ, CPWD, Nirman Bhawan, New Delhi

S.No.	Item	Unit	Rate in Rs.
1	<b>TURNKEY PROJECTS (Item)</b> Construction of multi-storeyed RCC residential buildings six storeys and above including planning and designing by incorporating stipulated specifications, internal and external services (E&M and Civil), external development, horticulture works on design built and handover basis adopting monolithic concrete construction system using customised aluminium/plastic aluminium form, or industrialised system using partly/fully precast slabs, beams and columns (Precast/prefab) with cast in situ joints for the superstructure as detailed in the Annexure all complete		
	<b>1.1 Foundation work upto plinth level (without basement) ( Complete in all respect as detailed in Annexure ).</b>	Per sqm of plinth area of ground floor	
	<b>1.1.1 Isolated footing</b>		4620
	<b>1.1.2 Raft foundation</b>		10110
	<b>1.1.3 Pile foundation</b>		14610
	NOTE: NIT approving authority will pick up any one type of the foundations. Rates of raft foundation not to be included in single basement.		
	<b>1.2 Single Basement ( Complete in all respect as detailed in Annexure )</b> NOTE: Single basement rate includes raft foundation in addition to items in the Annexure.	Per sqm of plinth area of basement	17770
	<b>1.3 Stilt portion ( Complete in all respect as detailed in Annexure )</b>	Per sqm of plinth area of stilt.	9440
	<b>1.4 Super Structure ( Complete in all respect as detailed in Annexure )</b>	Per sqm of plinth area of superstructure	16820
	<b>1.5 Development works ( Complete in all respect )</b>	Per sqm of area developed	*

\* The scope and rate of development works shall be decided by the NIT approving authority as per requirements and site conditions.

**NOTE:**

1. These rates are indicative; the NIT approving authority may modify and add or delete these rates as per the work/ project requirements/conditions.
2. Development area means plot area minus plinth area at ground floor.
3. Mumty and appendages shall not be counted towards a storey.
4. The industrialised 3-S system using Cellular Light Weight Concrete Slabs & Precast Columns (Precast/Prefab) is restricted up to seismic Zone IV only.



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## Scope of Work:

The work shall be executed on Turnkey (Design, Built and handover) basis from conception to commissioning, including all services (E&M and Civil), in situ & pre cast RCC components, in accordance with layout plan and architectural / structural / Services / landscaping / Horticulture works drawings. All drawings shall be prepared by the contractor and got approved from CPWD and also from the statutory bodies. However, the scope of the work shall include but not limited to as under.

### 1. PLANNING

#### 1.1 Architectural Planning.

1.1.1 Architectural planning shall be done by the agency on the basis of requirement and Architectural control parameters supplied by CPWD Architect / Senior Architect / Chief Architect based on local byelaws/government norms, OM No. 22011/01/2008-W3 DG/Arch/6 dated 07/08/2013 etc. (NIT approving authority to give these parameters in NIT)

1.1.2 All Architectural provisions shall conform to local byelaws, ECBC and minimum three star GRIHA rating. Presentation drawings including 3D modeling, walk-through and building models may be prepared by the contractor to obtain approval from CPWD before submitting it to local bodies / authorities.

1.1.3 Contractor has to obtain all required statutory approval before starting the construction works from authorities concerned for example local bodies, NGT, PCBs, Ground water board etc.

1.1.4 Contractor shall carry out site survey of its own to verify the details including dimensions and levels of the available site.

#### 1.2 Structural Design

1.2.1 Structural designs shall be carried out by the contractor based upon approved Architectural designs / drawings.

1.2.2 Structural design shall be done in accordance to National building code 2005 and referred IS Codes therein; International good practices and sound Engineering practices in that order of precedence.

1.2.3 All structural designs shall be got proof checked from agency to be decided by NIT approving authority.

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1.2.4 The soil investigation shall be carried out by the contractor as per IS codes before commencing the design works.

1.3 Planning and designing of Mechanical, Electrical and Civil services.

1.3.1 Contractor shall plan and design all possible services including Civil, Electrical and Mechanical services etc. as per site requirements and Architectural requirements conforming to relevant IS codes and local bye-laws.

1.3.2 Designs shall be got proof checked from agency to be decided by NIT approving authority.

1.4 Horticulture / landscaping works: contractor shall prepare Horticulture / landscaping works as per local byelaws and requirements specified.

## 2. CONSTRUCTION

Construction shall be done on turnkey basis by adopting monolithic concrete construction system using customized aluminum/plastic aluminum form, or industrialized system using partly / fully precast slabs, beams and columns (Precast / prefab) with cast in situ joints for the superstructure and cast in situ methodology for foundation. The different component shown in schedule shall have the following scope.

2.1 Foundation up to plinth level - Construction of foundation shall be done as per the approved structural drawings.

2.1.1 Isolated footing (cast in situ) - It includes Excavation, lean concreting, reinforcing, shuttering and casting of footing, columns, beams up to plinth level as per the approved concrete design mix, all complete.

2.1.2 Raft foundation (cast in situ) - It includes Excavation, lean concreting, reinforcing, shuttering and casting of raft foundation, columns, and beams up to plinth level as per the approved concrete design mix, all complete.

2.1.3 Pile foundation - It includes all types of piles (Pre cast, bored cast in situ etc.), pile caps, including reinforcement, concreting, columns, and beams up to plinth level as per the approved concrete design mix, all complete.

2.2 Single Basement including foundation - Construction of Single basement includes excavation, leveling of surface, lean concreting, reinforcement, shuttering and casting by concrete of design mix as approved, all works required for raft foundation and all columns, beams, slabs upto roof level of basement, including concrete retaining wall all around in the basement up to the basement roof height (Height of the basement taken 3.35 metre below soffit of beam), Pressurized mechanical ventilation system, Firefighting with sprinkler system, Automatic fire alarm system, lifts serving basement, Water proofing of basement, flooring and finishing with electrical light fittings drainage system

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etc, all complete but excluding equipments pertaining to DG set , Air-conditioning, Substation.

2.3 Stilt portion - Construction of stilt includes flooring and finish as per the specifications with all services required in the stilt portion (E&M and Civil) including Fire fighting, Automatic fire alarm system, lifts serving stilt floor and finishing all complete with electrical lighting, fan fittings, internal services etc. all complete but excluding equipments pertaining to DG set , AC, Substation.

2.4 Super structure shall be constructed adopting monolithic concrete construction system using customized aluminum/plastic aluminum form, or industrialized system using partly / fully precast slabs, beams and columns (Precast / prefab) with cast in situ joints or any combination thereof including all internal Civil, Electrical and Mechanical services including plumbing ,drainage, fire fighting, fire alarm, lifts , lighting etc, all complete but excluding equipment pertaining to DG set , Air-conditioning and sub-station etc.

2.5 Development work - The scope of development works shall be decided by the NIT approving authority as per requirements and site conditions and accordingly rates are to be worked out based upon area to be developed.

2.6 Specifications / Amenities - The Specifications / Amenities shall conform to MOUD office memo OM No. 22011/01/2008-W 3 DG/Arch/6 dated 07/08/2013

2.7 The construction in general shall be carried out as per the CPWD Specifications Vol-I and Vol-II 2009

### 3. HANDING OVER

3.1 The contractor shall hand over the completed work / project to CPWD after removing all defects and after :

- 3.1.1 Obtaining completion certificate from local bodies.
  - 3.1.2 Obtaining GRIHA certificate.
  - 3.1.3 Water and sewer line connection.
  - 3.1.4 Road / path connection.
  - 3.1.5 Electricity connection.
  - 3.1.6 Fire clearance certificate.
  - 3.1.7 Obtaining certificate for lift operation.
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3.1.8 And any such certificate / compliance that may be required as per prevailing Bye Laws, Rules / Regulations and Court Order / Judgment etc.

3.2 The contractor shall submit all such certificate and receipt to CPWD as mentioned above for their verification and acceptance.

4. **Measurement:-** Methodology of measurement shall conform to Annexure-III of CPWD Plinth Area Rates 01.10.12 (PAR 2012) for payment.

4.1 Foundation work upto plinth level (without basement) - Plinth area of the ground floor shall be measured for payment.

4.2 Single Basement upto plinth level - Plinth area of the basement floor shall be measured for payment. Considered height of single basement is minimum 3.35 meter below soffit of beam.

4.3 Still portion - Plinth area of the still floor shall be measured for payment.

4.4 Super Structure:-

4.4.1 Plinth area of the superstructure shall be measured for payment.

4.4.2 Plinth area of the still floor shall be measured separately for payment

4.5 Development works - Development area shall mean plot area minus plinth area at ground floor. Developed area shall be measured for payment.

*PAYMENT SCHEDULE (Guidelines only)*

S.No.	Description	Individual %age	Cumulative %age
1	Submission and approval of all architectural drawings, layout, building plans containing all details, specifications required for execution of work including development plans.	0.40	0.40
2	Submission and approval of foundation designs and complete structural drawings for superstructure, UG Tank complete and other works to be executed at site for its completion.	0.40	0.80
3	Submission and approval of all services plans from local bodies/Authorities etc.	0.10	0.90
4	EIA and Environmental Clearance	0.10	1.00
5*	Completion of structure work including foundation, superstructure and corresponding electrical and civil works etc.	50.00	51.00
6*	Finishing all complete including all civil ,electrical and mechanical works/services etc. fully functional	40.00	91.00
7	On completion of project	5.00	96.00
8	On handing over of flats as per scope of work.	4.00	100.00

(\*) Payment schedule is indicative NIT approving authority shall further breakup the payment stages according to factual situation of project and for maintaining regular cash flow, but the sum total of percentages of the breakup stages shall not exceed the above percentage limits.

F.No.28012/7/2016-W-3  
Government of India  
Ministry of Urban Development  
(Works Division)  
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Nirman Bhawan, New Delhi  
Dated the 28<sup>th</sup> December, 2016

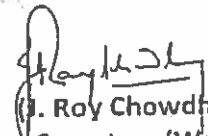
**OFFICE MEMORANDUM**

**Subject:-** Adoption of New & Emerging Technologies in construction work of value not less than Rs.100 crores in Metropolitan cities, undertaken by CPWD, DDA and NBCC – reg.

Reference is invited to Ministry of Urban Development's OM dated 30.05.2016 on the above mentioned subject wherein inter alia it was mandated that CPWD, DDA and NBCC would adopt 3 (three) new Technologies viz. (i) Monolithic Concrete Construction System using Aluminium Formwork, (ii) Industrialized 3-S System using Cellular Light Weight Concrete Slabs & Precast Columns (Precast/prefab) and (iii) Monolithic Concrete Construction System using Plastic – Aluminium Formwork, initially in the Metropolitan Cities of India, where the value of works is Rs.100 crore or more.

2. The matter has been considered further. It has been now decided that the aforesaid new technologies may be mandatorily adopted for all projects across the country, irrespective of location and project cost with effect from 01.04.2017. In case, it is not found feasible to implement these provisions in a particular project, specific permission should be accorded by DG, CPWD/CMD, NBCC/Vice Chairman DDA respectively on case to case basis, with detailed justification.

3. This has the approval of Hon'ble UDM.

  
J. Roy Chowdhury  
Deputy Secretary (Works)  
Tel. No. 23062425

To

1. Vice Chairman, DDA, Vikas Sadan, INA, New Delhi-110023.
2. Director General, CPWD, Nirman Bhawan, New Delhi -110011.
3. CMD, NBCC Limited, NBCC Bhawan, Lodhi Road, New Delhi-110003.

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