



**कार्यालय : रक्षा लेखा नियंत्रक सेना (, मेरठ छावनी)**

Office of the Controller of Defence Accounts (Army).

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No AN/VII/3239/Misc

Dated: 15.03.2023

To

The Officer-in-charge  
All Sub-Offices

**Subject: Guidelines for selection of LED Lights for Married Accommodation other than Married Accommodation and LED Security Lights and Technical Scrutiny and vetting of original Electrical and Mechanical (E/M) Schemes.**

**Reference:** HQrs office letter No 18001/AT-X/Misc/E-3909 dated 27.02.2023

A copy of Dte. Of Works, E-in-C's Branch, New Delhi letter No.A/37696/Gen/Pol /E2W(PPC) dated 30/12/2022 and 05.01.2023 received under HQrs office letter M/8001/AT-X/E-3909 dated 27.02.2023 on the above subject is forwarded for information and necessary action at your end.

Encls: As stated

— sd —  
ACDA (AN)

Copy:-


1. O/o CGDA

AT-X, Ulan Batar Road Palam , ----- For information w.r.t. your office letter  
Delhi Cantt-10 dt. 27.02.2023.

2. IT&S Cell(Local)

----- For uploading on website.

Sr.Accounts Officer(AN)

	<p style="text-align: center;">“हर काम देश के नाम” कार्यालय, रक्षा लेखा महानियंत्रक <b>Office of the Controller General of Defence Accounts</b> उलान बटार मार्ग, पालम, दिल्ली छावनी -110010 <b>Ulan Batar Road, Palam, Delhi Cantt -110010</b> <b>(Audit-X Section)</b> Phone: 011-25665594 email: atxcgda.dad@gov.in</p>	
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No. 18001/AT-X/Misc/E-3909

Date: 27.02.2023

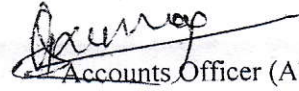
To

All Regional PCsDA/CsDA &  
CDA (IDS) New Delhi

Subject: Guidelines for selection of LED Lights for Married Accommodation, other than Married Accommodation and LED Security Lights and Technical Scrutiny and vetting of original Electrical and Mechanical (E/M) Schemes.

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Letters bearing No. A/37696/Gen/Pol/E2W(PPC) dated 30.12.2022 and 05.01.2023 received from Dte of Works, E-in-C's Branch, New Delhi on the above subject are forwarded herewith for your information and necessary action at your end please.

Enclosures: As stated above

  
Accounts Officer (AT-X)

8772/2023/RnD

Total Pages -05

Policy No 01/ 2023

Tele : 23019646

E2 Works (PPC) Sub Dte  
Dte of Works, E-in-C's Branch  
Integrated HQ of MoD (Army)  
Kashmir House, Rajaji Marg,  
New Delhi – 110011.

A/37696/Gen/Pol/E2W (PPC)

05 Jan 2023

List 'A' and 'B'

(Through MES Website)

**TECHNICAL SCRUTINY AND VETTING OF  
ORIGINAL ELECTRICAL AND MECHANICAL (E/M) SCHEMES**

1. Reference the following:-

- (a) Amendment to Para 60.7 of E-in-C's Standing Orders issued vide E-in-C's branch letter No A/37696/OSDPL/Pol/E2W (PPC) dated 19 Jun 2014 (Policy No. 11/ 2014).
- (b) Para 48.2.4 and Annexure 'G1' to 'G5' of E-in-C's Standing Orders.
- (c) Appx 'B' to E-in-C's branch letter No A/95533/22-20/Pol/E2W (PPC) dated 23 Apr 2021 (Policy No. 05/ 2021).

2. Para 60.7 of E-in-C's Standing Orders states, "Original Schemes" costing more than ₹ 500 lakh for Army Works and ₹ 250 lakh for Air Force & Navy Works are required to be submitted to E-in-C's branch for prior technical scrutiny. Rough Indication Cost (RIC) for such "Original Schemes" are to be issued by competent engineer authority in consonance to Para 1(b) of Appendix 'B' to Policy No. 05/ 2021, whereas the Approximate Estimates are to be technically scrutinised and vetted at appropriate levels. Similarly, execution of agreements or memoranda of terms for taking bulk supplies of electric energy or water from outside sources for military building beyond ₹ 500 lakh are vested with the E-in-C as per Ser No 10 of Table 'B' of RMES.

3. Of late, it has been noticed that up-gradation/ renewal works such as replacement of functional VCBs/ OCBs with RMUs, replacement of functional electrical networks (O/H to UG) and transformers with new equipment etc are being taken up as original schemes. Similarly in water supply schemes, pumping water from bore wells to service reservoir, bore well & service reservoir combinations are proposed as original schemes without assessing expected yield-life of bore wells. Similarly, draft agreement for water supply and electric supply are also not accompanied with relevant details. These may lead to delays in scrutiny/ vetting of schemes, avoidable iterations/ correspondence and also un-warranted observations during technical examination/ audit etc.

*Shahin*



4. All E/M schemes for electric supply, water supply, fire detection, alarm and fire-fighting, sewage/ effluent treatment and disposal, heating, ventilation and air-conditioning etc shall be planned comprehensively with overall network of electric supply, water supply, sewage system in the station, along with availability, present utilisation and justification for initiation of such work. Such schemes shall invariably be submitted with accompanying details as per formats given at Para 48.2.4 and Annexure 'G1' to 'G5' of E-in-C's Standing Orders. These instructions shall also be followed for IDS and CG works exceeding ₹ 250 lakh.

5. Every "Original Scheme" should be supported with existing network, reasons for such new schemes and should contain following specific information:-

(a) Electric Supply.

- (i) Existing system with site plan, line diagram including location of transformers, control system and electrical network.
- (ii) RMD, CMD of station.
- (iii) Source of power supply such as through PPA/LEX, along with copy of agreement with DISCOM.
- (iv) Solar Power availability along with utilisation and evacuation.
- (v) Tabular details regarding date of installation of transformers, SCADA, circuit breakers and electrical networks along with problem encountered leading to initiation of such work.
- (vi) Load calculation details as per authorisation.

(b) Water Supply.

- (i) Availability of water from civil authority i.e. pumping for civil treatment plant/ canal/ river along with type of water such as raw/ treated water.
  - (ii) Water requirement calculation.
  - (iii) In case of jack well/ bore wells, Number of bores, yield, year wise draw down, year of construction, depth of bore with size of casing pipes and residual life expected out of bore well.
  - (iv) CGWB report in case bore wells are to be retained and to be dug in future.
  - (v) Complete distribution network, type of rising and distribution mains (CI/DI/MS/PPR), pumping installation, OHR, sump, duly marked in site plan.
  - (vi) Tabular details regarding date of installation of pump, SCADA, pipe network.
  - (vii) Details of agreement with station.
- Signature*

(c) Sewage/ Effluent Treatment and Disposal. Information required has already been specified vide the following letters issued by this HQ:-

- (i) 86435/Misc/E4(U3) dated 19 May 2017.
- (ii) A/37696/Gen/Pol/E2W(PPC) dated 02 Mar 2022.
- (iii) 86440/Policy/22/E4(U3) dated 21 Sep 2022.

(d) Water Supply Agreements. The following documents are required for Water Supply Agreements:-

- (i) Statement of case duly recommended by CE Command/ ADG.
- (ii) Accommodation Statement Part I & II duly signed by Station HQ.
- (iii) Last three years water drawn statement.
- (iv) Bills paid in last one year.
- (v) Previous water agreement copy, if renewal.
- (vi) Water tariff rates.
- (vii) Agreement duly signed by concerned authority.
- (viii) As per Model form given at Annx 'Q' of E-in-C's Standing Orders.

(e) Electric Supply Agreements. The following documents are required for Water Supply Agreements:-

- (i) Statement of case duly recommended by CE Command/ ADG.
- (ii) RMD/ CMD of last one year.
- (iii) Details of penalty paid, if any.
- (iv) Bills paid in last one year.
- (v) Previous electric agreement copy, if renewal.
- (vi) Electric tariff rates.
- (vii) Agreement duly signed by concerned authority.

(f) Air Conditioning Scheme. Air conditioning plant and accessories such as chiller unit, AHU, ducting etc requiring replacement shall be planned with environment friendly refrigerant and energy efficiency as a basic requirement in line with India Cooling Action Plan. Following details needs to be included :-

- (i) Existing system with layout of plant room, hot & chilled water lines, AHUs, ducting, cooling tower etc in case of renewal.
- (ii) Heat load calculation of spaces to be air conditioned in both the cases renewal as well as original scheme.
- (iii) Type of existing chiller unit, AHUs, pipe lines insulation, ducts insulation.

*Signature*



(iv) Proposed units as per heat load calculation and authorisation of Air Conditioning facilities comprising of environment friendly and energy efficient chiller unit, AHUs, pumping sets alongwith latest type of insulation for ducting, pipe lines etc.

(g) Fire Fighting Scheme. The fire detection, alarm and fighting system, wherein renewal/ replacements envisaged should be as per NBC-2016 with the approval of CFEES, clearly indicating existing system and proposal for obtaining approval of CFEES. Following documents are required :-

(i) Layout of existing fire detection, alarm and fire fighting system alongwith regular check reports and initial approval of CFEES, in case of renewal.

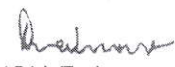
(ii) Proposed layout of system as per NBC 2016 alongwith CFEES approval.

(iii) Methodology to execute such renewals of fire detection, alarm and fire fighting system.

6. Further, it has been observed that the infrastructure E/M schemes of water supply, electric supply, STP, Air Conditioning, Fire Fighting etc are being forwarded to this HQ for vetting and approval after listing the same in AMWP. Though such provision for RIC exists as per letter referred in Para 1(c), it has been considered appropriate to have preliminary scrutiny before work is included in AMWP. Henceforth, all the infrastructure E/M schemes, major replacement works, new technological advancement works including augmentation works, as per Para 2 above, shall be scrutinised by this HQ at RIC stage.

7. It is reiterated that E/M schemes/ agreements shall be holistically prepared and thoroughly checked at CE Zone before forwarding to this HQ so as to have minimum observations/ iterations and ensure timely processing of cases.

8. These are to be read in consonance with all other instructions on the subject and shall be disseminated up to AGE/ JE level for strict compliance.

  
(SH Rahuman)  
Brig  
DDGW (PPC & Est)  
For E-in-C

Copy to: -

MoD / D (Works- I&II )

QMG's Branch / DG LW&E

IHQ of MoD (Navy) / Dte of Works

IHQ of MoD (Air Force) / Dte of AF Works

HQ IDS / Works Dte

Coast Guard HQ / Dte of Works

HQ SFC

CME / Faculty of Construction Management

CGDA, Delhi Cantt

Internal

HQ DG MAP

All Sub Dtes of Works Dte

Automation Cell

- For uploading on the MES website with restricted access.

Tele : 23019646

**Policy No 19/ 2022**

E2 Works (PPC) Sub Dte  
Dte of Works, E-in-C's Branch  
Integrated HQ of MoD (Army)  
Kashmir House, Rajaji Marg,  
New Delhi – 110011.

A/37696/Gen/Pol/E2W (PPC)

30 Dec 2022

**List 'A' and 'B'**

(Through MES Website)

**GUIDELINES FOR SELECTION OF LIGHT EMITTING DIODE (LED) LIGHTS FOR  
MARRIED ACCOMMODATION, OTHER THAN MARRIED ACCOMMODATION-AND  
LED SECURITY LIGHTS**

1. **Introduction.** Light Emitting Diode (LED) technology is a fast evolving technology with significant energy saving potential. LED lights are being used for internal and external lighting in various categories of accommodation including Security lights etc. The guidelines given in succeeding paragraphs shall be adhered to bring uniformity in selection of light fittings, required lumens, wattage and life of the lamps. These guidelines bring clarity based on relevant IS codes and aims to enhance efficiency in maintenance works as well as planning of new works.

2. **Parameters for LED lighting System.** The important parameters for assessing requirement and selection of LED lights/ fittings are given below:-

(a) **Lux Levels.** Calculation of lux levels for arriving at capacity of LED lighting to be provided shall be in consonance to Table 60.I, Scales of Accommodation for Defence services 2022 (SoA 2022).

(b) **BIS Standards for LEDs.**

Ser No.	IS Code	Title
(i)	16101:2012	General Lighting – LEDs and LED Modules – Terms & Definition
(ii)	16102 (Part 1) : 2012	Self - Ballasted LED lamps for General Lighting Services Part 1 - Safety Requirements
(iii)	16102 (Part 2) :2012	Self - Ballasted LED lamps for General Lighting Services Part 2 - Performance Requirements
(iv)	16103 (Part 1) :2012	LED Modules for General Lighting Part 1 – Safety Requirements



Ser No.	IS Code	Title
(v)	16103 (Part 2) : 2012	LED Modules for General Lighting Part 2 – Performance Requirements
(vi)	15885 (Part 2/ Sec13) : 2012	Safety of Lamp Control Gear Part 2 – Particular Requirements Section 13 – DC or AC Supplied Electronic Control gear for LED Modules
(vii)	16104 : 2012	DC or AC Supplied Electronic Control Gear for LED Modules Performance requirements
(viii)	16105 : 2012	Method of Measurement of Lumen Maintenance of Solid State Light (LED) Sources
(ix)	16106 : 2012	Method of Electrical and Photometric Measurements of Solid-State Lighting (LED) Products
(x)	16107 (Part 1) : 2012	Luminaries Performance Part 1 – General Requirements
(xi)	16107 (Part 2) : 2012	Luminaries Performance Part 2 – Particular Requirements
(xii)	16108 : 2012	Photo-biological Safety of Lamps and Lamp Systems

(c) **Mandatory BIS Marking.** "Electronics and Information Technology Goods (Requirement for Compulsory Registration) Order, 2012" was issued by Department of Electronics & Information Technology (DeITY). As per the Order, no person is allowed to *manufacture* or store for sale, import, sell or distribute goods which do not conform to the Indian standards specified in the order. It mandates manufacturers of these products to get their product tested from BIS recognized labs and subsequently apply for registration from BIS. Once the manufacturer is registered by BIS under its registration scheme, the manufacturer is permitted to declare that their articles conform to the Indian Standards and put the Standard Mark notified by the Bureau. The order also covers following standards for LED lamps:-

- (i) IS 15885 (Part 2/ Sec13): 2012
- (ii) IS 16102 (Part 1): 2012

*Signature*

(d) **Performance Measurement.** For any commercially available LED lamp, performance is measured based on photometric test, which measures visible light in units that are weighted according to the sensitivity of the human eye. The photometric parameters used for performance measurement of LED luminaries are:-

- (i) Total Luminous Flux (Unit-Lumens)
- (ii) Luminous intensity (Unit-Lumens per steradian)
- (iii) Luminous Efficacy (Unit-Lumens per watt)
- (iv) Chromaticity Coordinates (Specification of the quality of colour emitted)
- (v) Correlated Colour Temperature (CCT) (Measure of the colour of a light source relative to a black body at a particular temperature)
- (vi) Colour Rendering Index (CRI) (Measure of the light source's ability to reveal colours of an object)

(e) **Colour Rating, Variation and Rendering.** - As per IS 2418 (Part 2) the rated colour of a LED lamp shall preferably be one of the seven values of F 2700, F 3000, F 3500, F 4000, F 5000, F 5700 or F 6500. The standardized CCT values corresponding to these colours are given in following table :-

Ser. No.	Colour	CCT (T <sub>e</sub> )	Commercially defined as
(i)	6500°F	6400	Cool day light
(ii)	5700°F	5700	Cool day light
(iii)	5000°F	5000	Cool day light
(iv)	4000°F	4040	Cool white light
(v)	3500°F	3450	Warm white light
(vi)	3000°F	2940	Warm white light
(vii)	2700°F	2720	Warm white light

(f) **Lamp Life.** - Life of an LED lamp as is the combined effect of gradual light output degradation, mostly caused by material degradation and abrupt light output degradation, mostly caused by electrical component failure. Endurance test is therefore carried out to assess the reliability and life of the lamp. Compliance of lumen maintenance after 25 percent of life time or 6000 h implies that the lamps would have a life of 25000 h or as declared by the manufacturer with a failure fraction (Refer clause 11.1 of BIS 16102 (Part II) - 2017).



3. **Technical Specifications.** Technical Specification to be adopted for LED lamps and accessories are given below:-

(a) **LED Battens.**

Ser No.	Description	Specifications of LED battens	
(i)	Dimensions	2 Feet	4 Feet
(ii)	Power Consumption (Wattage)	8W/ 10W	16W/ 20W
(iii)	CRI	80	
(iv)	Material	Polycarbonate	
(v)	Efficacy	120 Lumens per Watt	
(vi)	Color Temp. (CCT)	6500 K (Cool white) / 4000 K (Natural White)	
(vii)	Power Factor	Greater than 0.90	
(viii)	IP Rating	IP 20	

(b) **LED Lamps.**

Ser No.	Description	Specifications of Lamps		
(i)	Type of Socket	B/22/E27/E14	B/22/E27/ E14	B/22/E27/E14
(ii)	Power Consumption (Wattage)	7 W & 15 W	7 W & 15W	7 W & 15 W
(iii)	CRI	80		
(iv)	Type of Glass	Frosted Glass		
(v)	Colour Temp (CCT)	3000 K (White)	6000-6500 K (Cool day light)	2000-2700 K (Yellow)
(vi)	Efficacy	100 Lumens/Watt		66 Lumens/ Watt
(vii)	Power Factor	Greater than 0.90		
(viii)	Rated lamp life (4 Hrs/day)	Min. 25,000 Hr		
(ix)	IP Rating	IP 20		

(c) **Recommended Wattage for LED Lamps in lieu of Incandescent Lamps.**

Ser No.	Location	Incandescent lamp/ FTL	Recommended LED lamp
(i)	Rooms	40 Watt FTL	20 Watt LED batten
(ii)	Kitchen, Varandah etc	60 Watt lamp	15 Watt LED lamp
(iii)	WHB, Mirror light etc	20 Watt FTL	10 Watt LED batten
(iv)	Washrooms, Toilets etc	40 Watt lamp	7 Watt LED lamp



(d) **Emergency Lighting Mode.** - A self-contained emergency luminaire with in-built battery provides lighting when energized by its internal power source (battery) in case of the normal supply failure. Standby LED lamp/ batten light 20W with inbuilt Li-ion battery having 3 hours back up is to be used for the purpose of emergency/ standby usage as per SoA.


4. **Energy-efficient Street Lighting.** When designing or making changes in street lighting, it is important to first understand the light requirements of the road. Street lighting in India is classified in the Indian Standard (BIS, 1981) based on the traffic density of the road. Operating for an average of 10 hours per day, LEDs have a life span of up to 13 years. The LED fixture does not require a ballast or a capacitor; instead it converts the supply voltage to low voltage direct current, using a small electronic power supply. The recommended Wattage for LED lights in lieu of HPSV lights for street lighting are given below:-

Ser No	HPSV lights Wattage	Lamp life of HPSV lights (in Hr)	Recommended equivalent LED lights Wattage
(a)	70 Watt	15,000-24,000	35 Watt
(b)	150 Watt	15,000-24,000	65 Watt
(c)	250 Watt	15,000-24,000	120 Watt
(d)	400 Watt	15,000-24,000	250 Watt

5. **Solar Street Lighting.** Technical specifications for 12 W white-LED based solar street lighting system are given below:-

Ser No	Components	Specification for Solar Street Light Fitting
(a)	PV module	75 Wp under STC
(b)	Battery	Minimum 12.8V, 30 AH capacity Lithium Ferro Phosphate battery.
(c)	Light Out put	The luminaire must use high efficacy W-LED with minimum 135 lumens per watt (and UV free). [A certificate to be submitted by the system supplier to the Test Lab during certification]. The luminaire shall be tested for Electrical, Photometry and Colour parameters as per IES LM- 79:2008 or IS: 16106:2012.
(d)	Mounting of light	Pole height 5 m above the ground level and 1 m below the ground. Luminaire shall be at least 4.5 m above the ground level.
(e)	Electronics Efficiency	Overall total efficiency of the electronics should be minimum 90%

6. To ensure complete utilisation of life of lamps, they should be marked with date of procurement which will help during verification of life at the time of replacement of unserviceable lamps. Retrofitting of existing tube light fitting to LED rod should not be carried out. Instead, these should be replaced with new LED batten light fittings wherever CFL/ incandescent has become unserviceable.
7. Keeping in view the fast changing technological development in LED lighting/ equivalent lighting system, the policy guidelines will be reviewed on required basis or three years whichever is early.
8. These instructions shall be disseminated to AGE/ JE level.
9. For information and necessary action please.

  
(SH Rahuman)  
Brig  
DDGW (PPC & Est)  
For E-in-C

Copy to: -

MoD / D (Works-II)

QMG's Branch / DG LW&E

IHQ of MoD (Navy) / Dte of Works

IHQ of MoD (Air Force) / Dte of AF Works

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