

NATIONAL GAMES 2010 – KERALA

TECHNICAL SPECIFICATIONS FOR SPORTS ARENA LIGHTING OF INDOOR MULTI-PURPOSE STADIUMS

BACKGROUND:

The state of Kerala will host the National Games 2010. It is proposed to provide sports arena flood lighting for the following indoor multi-purpose stadiums:

- 1) IRC Shanmugam indoor stadium.
- 2) Jimmy George indoor stadium.
- 3) Kannur indoor stadium.
- 4) Rajiv Gandhi indoor stadium.
- 5) Thrissur indoor stadium.
- 6) Vellayani agricultural college indoor stadium.
- 7) VKK Menon indoor stadium.

It is proposed to illuminate the playing arena of the above stadia with a view to holding international level competitions and with facility for colour TV transmission. Facility for selective switching for practice level matches shall also be provided. Illumination of other areas in the stadia is being carried out by other agency.

Drawings indicating the layout of the stadia with playing arena marked therein are enclosed.

Bidders are requested to visit the site in their own interest and acquaint themselves further of the site details.

SCOPE OF WORK: Following work shall be included in the bidder's scope:

- Illumination design of the playing arena of the above stadia as per latest international standards and measurement of illumination levels.
 - Design, supply, installation, testing & commissioning of following equipment:
 - Flood light luminaires complete with control gear, lamps and accessories.
 - Main, sub lighting, switching control panels and mimic panels.
 - Cables.
 - Earthing for panels and luminaires.

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BASIS OF ILLUMINATION DESIGN:

Bidders shall consider following parameters for the purpose of illumination design:

Name of the stadium	Games to be played during National Games	Average vertical illuminance (E _v avg) at 1.5m above GL facing the main camera	Size of playing arena
IRC Shanmugam stadium	Marshal Arts	1000 lux for entire playing arena	21.5m x 16m
Jimmy George indoor stadium	Multi-purpose	1000 lux for entire playing arena	49m x 23m
Kannur stadium	Wrestling / Basketball	1000 lux for entire playing arena	56m x 36m
Rajiv Gandhi stadium	Badminton / Table Tennis	1500 lux for entire playing arena	50m x 34m
Thrissur stadium	Judo / Wrestling	1500 lux for entire playing arena	32m x 18m
Vellayani agricultural college stadium	Multi-purpose	1000 lux for entire playing arena	46m x 28m
VKK Menon stadium	Volleyball / Kick volleyball	1500 lux for entire playing arena	30m x 25m

Following are other requirements:

- **UNIFORMITY RATIO**
 - a) $E_{v \text{ min}} / E_{v \text{ max}}$ shall not be less than 0.4
 - b) $E_{h \text{ min}} / E_{h \text{ max}}$ shall be better than 0.5
- In addition to the above specified requirements for conducting televised events, bidders shall design lighting system for achieving average horizontal lighting levels of 750 lux and 400 lux over the entire playing arena for catering to un-televised and practice games. The uniformity ratios for these levels shall be $E_{\text{min}} / E_{\text{max}} = 0.40$ and $E_{\text{min}} / E_{\text{avg}} = 0.60$.
- Maintenance factor of 0.80 shall be considered for the purpose of lighting design.
- Glare rating shall not exceed 0.50.

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Bidders shall furnish computer printouts on a grid of 2m X 2m indicating vertical and horizontal illumination levels with other parameters as specified above. Aiming angles along with coordinates shall also be furnished together with photometric details of luminaires considered, for the purpose of evaluation.

Evaluation of offers

The offers shall be evaluated based on the bill of quantities for various stadiums enclosed with the tender documents to determine the lowest responsive bidder.

Bidders shall confirm in their technical bid that they will achieve the desired lighting levels within the quantity of flood light fixtures specified in the tender document supported by illumination design print outs and other required information.

During evaluation in case it is determined that additional number of luminaires are required to achieve the specified design parameters, prices shall be loaded for additional luminaires together with associated equipment as well as for additional power consumption.

In case of any deficiency in the design parameters found during execution stage after measurement of lighting levels, the successful bidder shall overcome the same by re-aiming or supplying and fixing additional luminaires and other associated equipment at his own cost.

SCHEDULE OF ITEMS

1) FLOODLIGHTS

Floodlights to be mounted on catwalks provided inside the stadia as shown in drawing, shall be suitable for metal halide lamps so as to achieve the design parameters specified. Floodlights shall be supplied complete with accessories such as ballast, capacitor, ignitor etc. in a separate cast aluminium control gear box. The flood lights shall generally conform to following constructional requirements:

- The body of the flood lights shall be of die cast aluminium with powder coated finish.
- The flood lights shall be provided with a separate internal high purity polished and anodised aluminium reflector.
- The flood lights shall be non-integral type with separate die cast aluminium control gear box complete with ballasts, capacitor, ignitor and terminals.

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- Degree of protection of the floodlights and control gear box shall be at least IP54.

Bidders shall furnish following technical particulars in their offer:

- a) Catalogue of flood light and control gear box.
- b) IP rating
- c) Watt loss per ballast
- d) Current drawn by the flood light with capacitor connected
- e) Weight of the floodlight and control gear separately.
- f) Complete photometric data

2) LAMPS:

Lamps for flood lights shall be metal halide of rating as specified in the bill of quantities with colour temperature of 5600K with CRI greater than 90.

3) ELECTRICAL DISTRIBUTION:

One main LT panel shall be considered which shall be located inside the electrical room within the stadium. Incoming supply to this main LT panel shall be drawn from the client's nearest switchgear panel. Incoming cable upto main LT panel shall be supplied, laid and terminated under a separate package and is excluded from the scope of this tender.

All luminaires shall be controlled from sub lighting panels, which shall be conveniently located on the walls / on the catwalks near the playing arena. Cabling from main LT panel to the sub lighting panels and from sub lighting panels to the luminaires shall be included in the scope of the bidder. Load per circuit shall not exceed 2 KW. The number of panels and outgoing circuits from each panel shall be selected accordingly.

The Main LT panel shall be indoor, floor mounted, metal enclosed, single front, vermin proof with degree of protection, IP52 as per IS2147. The frames shall be enclosed with sheet steel of not less than 2.0 mm thickness with rubber gaskets all round the perimeter of removable covers and doors.

Bus bars shall be air insulated and made up of electrolytic grade Aluminium. Bus bars shall be PVC sleeved with colour strips of red, yellow, blue and black and the same shall be arranged in accordance with IS375.

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Incomer: This shall be FPMCCB of rating as indicated in the price schedule. Incomer shall be provided with ammeter and voltmeter with selector switch and indicating lamps.

Outgoings: These shall be 63A FPMCCB as per quantities indicated in the price schedule. Each MCCB feeder shall be provided with 70A TP contactor and time delay relay. Minimum 2 nos spare outgoing feeders shall be provided in each main LT panel.

MCCBS shall have fault rating of at least 25 KA.

Sub Lighting panels shall be metal enclosed, wall mounted with 63A MCB isolator as incomer. Outgoings shall comprise of 12 nos. 16A SPMCBs including 2 nos. as spares. Each outgoing feeder shall be provided with suitable CT for current sensing for mimic display purpose.

SWITCHING CONTROL CUM MIMIC DISPLAY PANEL

Each stadium shall be provided with 1 no. switching control cum mimic display panel for selective switching as well as indication of healthiness of sub lighting panel circuits. This panel shall be located in the electrical control room near the main LT panel.

The panel shall be provided with 3 sets of push buttons; each corresponding to the level of game, i.e. "INTERNATIONAL", "NATIONAL" and "PRACTICE". Outgoing MCCBS along with contactors on the main LT panels shall be operated through these push buttons.

The panel shall also be provided with LED mimic display windows. The LED's shall be powered through control cables from each SLP outgoing feeder CT. The number of windows on the mimic panels shall correspond to the total number of outgoing circuits on all the sub lighting panels in that stadium.

The panel shall be constructed using 2mm thick CRCA sheet steel, duly powder coated and shall be indoor type, wall mounted / floor mounted type. Suitable number of auxiliary contactors shall be provided along with control circuit for the purpose of selective switching. The mimic LED display shall be properly numbered / marked with corresponding circuit details.

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CABLES

Following cables shall be included in the scope:

- a) From Main LT panel to the sub lighting panels for flood light control.
- b) From Sub Lighting panels to floodlight fixtures on catwalks.
- c) From Main LT Panel to Switching control cum mimic panel.
- d) From Sub Lighting panels to switching control cum mimic panel.

Cable under a) shall be 1100V grade, PVC insulated, PVC sheathed, aluminium conductor, armoured cable. Cables under b) and c) shall be 1100V grade, PVC insulated copper conductor, armoured cables. Cables under d) shall be multi-core, 1.5 sqmm copper conductor, PVC insulated armoured control cables. Cables shall conform to IS1554 – Part-I.

Tentative quantities of different sizes of cable are indicated in the price schedule. The successful bidder shall prepare actual cable layout drawings during detailed engineering stage. Actual quantities and sizes of cables as required shall be supplied and laid as per unit rates quoted. Total voltage drop from sub station up to the flood lights shall not exceed 5% from client's main panel to flood lights.

WIRING OF FLOOD LIGHTS:

Flood lights shall be wired from respective sub lighting panels using 3C X 2.5 sq mm copper armoured cable. On catwalks, cables shall run on cable trays already provided for laying of the cables. Cables from sub lighting panels along the walls up to the catwalk level shall be laid on 300mm wide perforated type GI cable trays with suitable cover.

EARTHING

The main lighting panels shall be earthed at two points using 50 x 6 mm GI flats and other panels shall be earthed using 25 X 3 mm GI flats. Each floodlight shall be earthed through a 14 Gauge GI wire.

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SPECIAL NOTES

- 1) All bidders shall note that the battery limits for the scope are start from main LT panel upto the flood light fixture. Any other items required within the battery limits to make the system complete shall be deemed to have been included in the offer. Purchaser shall not be liable to pay any charges in addition to those agreed to at the time of placement of the order.
- 2) Bidders are requested to visit the site and acquaint themselves of the site conditions before quoting.
- 3) Prices shall include for all tools and tackles as may be required for installation testing and commissioning.
- 4) Prices quoted shall be inclusive of all applicable taxes, duties, freight upto site, insurance etc.
- 5) Test reports for all equipment shall be furnished.



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List of approved makes

Following is the list of approved makes for this project:

- 1) Flood light luminaires and control gear boxes: Bajaj / Philips / GE
- 2) Metal Halide lamps: OSRAM / Philips / Bajaj
- 3) LT Electrical panels: Prathoma Switchgears / Popular Switchgears / Industrial Switchgears / Tricolite / Adlec
- 4) Switchgear Components: L&T / Schneider / C&S / MDS-Legrand / Havells
- 5) LT Cables: Polycab / Primecab / SPM / Rallison



Make of Materials (Additional)

Sl.No	Item	Make
1	HFFR Insulated Copper/ Flux Wires	R.R.Kabel / Finolex / Polycab/ Anchor
2	U G cable	Nicco / Finolex / Poly cab Gloster
3	Cable Socket / Socket for conductor	Dowells / Sieco / Jainson
4	PVC Conduct (ISI Marked)	Avon plast / Precision
5	PVC Accessories	Precision / Circle Ark
6	DWC Pipe	Rex poly Extrusion
7	GI Pipe / MS Pipe	Tata / Jindal
8	Modular boxes / Front plates /Switches / sockets / Regulators	MK india Wrap round / Siemens vega / Anchor woods / ABB
9	Ceiling rose (ISI marked poly carbonate body)	Ellyes / SSK / Anchor / CPL
10	MCB 10 / CA rated / miniature type Isolates / RCCB / REBO	Legrand / Merlin Gerin/ GE / Hager
11	MCCB AC-3 rated	Seimens/ Legrand / Merlin Gerin / ABB(Tmax)
12	Power contactors (AC 3 rated)	L&T / Siemens / Schneider
13	SDF / Isolators / COS (AC -23 A) / HRC Fuses	L&T / GE / Seimens / Merline Gerin
14	Selector Switches	Kayce / Salzer
15	Meter (Digital)	Conzerve / Schneider
16	Meter (Analogue)	Rishab / AEI
17	LED Type phase Indication	Tele mecanique / Siemens / L&T / GE.
18	Compact flouracent Lamp	Philips / Osram / Bajaj / GE
19	SV lamp fittings	SGP 325 Philips / Bajaj BGEST
20	Transformer	KEL / Intrans Unipower/ Mega win
21	11 KV LBS	Mega win/ Intrans / Seimens/ABB
22	APFC relay	L&T Beluk/ Seimens / ABB /Schneider
23	APP Capacitor / Block reactors	Meher / Shreem / Sprague/Epcos
24	Ceiling Fan	Crompton / Bajaj/ Orient
25	Tube Light Fittings/ Mirror Optic Fittings	Philips / Bajaj / GE
26	MH Lamp Fittings	Philips / Bajaj
27	Fire Pump Motor	Kirlosker / Crompton/Beacon
28	DOL Starter	L&T / Siemens / Schneider
29	Hydrant Valve Branch Pipe	New Age / Vinco/ Zenith
30	GM Valve	Kalpana / kirlosker/ Bendco
31	Fire Hose	Firex / New Age / CRC / Zenith
32	Hose Reel	Kantek / Kanta flex hose
33	Sluice Valve	Kalpana / Kirlosker / Intov Valve
34	Reflux Valve	Kalpana / Kirlosker / Benko