Agenda & Notes

2008-09: Special Meeting

of the

Building & Works Committee

Venue of the Meeting

Wing-C Shastri Bhawan, MHRD

New Delhi

Date and Time of the Meeting

January 05, 2009 at 12.00 Hrs

PDPM
Indian Institute of Information Technology, Design and Manufacturing Jabalpur

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY,
DESIGN & MANUFACTURING JABALPUR
(An Institute Established by MHRD Govt. of India)
IT Bhawan, Jabalpur Engineering College Campus, Gokalpur, Jabalpur 482 011 India

IIITDMJ/B&W/08/12/1943
December 26, 2008

Dear Madam/ Sir(s),

The 2008~~-09~~ 09.10 Special meeting of the Building and Works Committee of Pt. Dwarka Prasad Mishra Indian Institute of Information Technology, Design & Manufacturing (PDPM-IIITDM) Jabalpur, is scheduled to be held on Monday January ~~05, 2009~~ 12010 at 12:00 hours at Wing "C", Shastri Bhawan, New Delhi.

Kindly make it convenient to attend the meeting.

With regards,

Sincerely,

26/12/08

(Raghunath)

1. Prof. S Bhargava
   Director (Ex-officio)
   PDPM-IIITD Jabalpur

2. Mrs. Seema Raj
   Director (Technical) MHRD
   'C' Wing Shastri Bhawan
   New Delhi 110 001
   (Nominated by the GOI)

3. Prof. Aparajita Ojha
   Professor
   PDPD-IIITDM
   Jabalpur
   (Nominee of the Board)

Ph.: +91-761-2632 273 **Fax: +91-761-2632 524** **email: query@iiitdm.in** **Website: www.iiitdm.in**

4. Prof Amit Ray,
   Professor in Charge Planning
   IIIT DM Jabalpur

5. Shri Shri B K Nema
   O/o. Supreintendent Engineer
   PWD, Jabalpur
   (Nominee of the Board)

6. Shri P S Manglani
   Superintending Engineer
   O/o. Chief Engineer
   Upper Narmada Zone
   Bargi Hills, Jabalpur
   (Nominee of the Board)

7. Shri Raghunath Bhattacharya
   Administrative Officer,
   IIIT DM Jabalpur

Special Invitee

1. Er T. S. Anand
   Assistant Engineer
   IIITDM Jabalpur

26/12/08

PDPM
INDIAN INSTITUTE OF INFORMATION TECHNOLOGY
DESIGN & MANUFACTURING JABALPUR

Agenda Notes for the

Special meeting of Buildings & Works Committee, 2008-09

[to be held on Monday, January 05, 2009 at Shastri Bhawan, New Delhi]

Table of Contents

B&WC/2008-09: 2.01 **Opening Remarks by the Chairman**

Remarks by the Chairman will be presented in the meeting itself.

B&WC/2008-09: 2. 02 **Confirmation of Minutes of the 2008-09/ 1st Meeting of the B&WC held on October 13, 2008**

Minutes were circulated after the meeting and are annexed with here as **Annexure-1** at [p 4 to 6]. The Building & Works Committee is requested to confirm the same.

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DESIGN & MANUFACTURING JABALPUR

Annexure 1

MINUTES OF THE 2008-09 MEETING OF THE BUILDING AND WORKS COMMITTEE HELD ON OCTOBER 13, 2008 AT SHASTRI BHAWAN, MINISTRY OF HRD, NEW DELHI

Present:

1.	Prof. Sanjeev Bhargav Director PDPM IIITDM Jabalpur	Chairman
2.	Mrs. Seema Raj Director (Technical) Ministry of HRD.	Member
3.	Prof. Aparajita Ojha Professor PDPM IIIT DM Jabalpur	Member
4.	Shri B K Nema Ex-Superintending Engineer PWD, Jabalpur	Member
5.	Prof Amit Ray Professor in Charge Planning PDPM IIIT DM Jabalpur	Member
6.	Shri Raghunath Bhattacharya Administrative Officer PDPM IIIT DM Jabalpur	Acting Secretary
7.	Mrs. Alice Chacko, Ministry of HRD.	Special Invitee
8.	Shri T S Anand AE PDPM IIIT DM	Special Invitee

Leave of Absence:

1.	Mr. P. S. Manglani	Member

B&WC/08-09. 01. 01 **Opening remarks by the Chairman, B&WC**

The Chairman welcomed all members of the B & WC and presented the overview report circulated along with the Agenda Notes. The Chairman informed the Committee of various developments since last meeting of the Buildings & Works Committee held on November 19, 2007.

The Committee took note of progress of Core Labs, Single Seated Hall of Residence 1, Service Block, Campus wall and Peripheral road and expressed their satisfaction. The B&WC was apprised of reconstitution of Campus Advisory Committee constituted for advising the Institute on matters related to campus construction & development. The B&WC appreciated the procedure being followed by the Institute.

The Committee took note of works being undertaken by the Architects on the panel of the Institute. The Committee expressed their satisfaction on the procedure followed for procurement of Sewage treatment plant.

B&WC/ 08-09. 1. 2 **Confirmation of Minutes of the 2007-08/ 3rd Meeting of the B&WC held on October 13, 2008**

Minutes of 2007-08/3rd meeting of the B&WC held on October13, 2008 were confirmed. Copy of minutes is placed at pages 3 to 5 of the Agenda.

B&WC/ 08-09. 1. 3 **Adoption of Revised Norms of CPWD**

The B&WC took a note of revision of the Plinth Area Rates of CPWD, Delhi Schedule of Rates (DSR) and Works Manual. The Committee discussed the procedure followed and agreed that the President/Central Works Board be read as the Board of Governors and Director General (Works) being read as the Chairman, Building & Works Committee (Director) to follow its procedures and estimation of PE and DE respectively.

The B&WC adopted the revised norms of CPWD and delegation of powers and recommend the same to the Board of Governors for adoption of the same.

B&WC/ 08-09. 1. 4 **To Consider the Concept plans of the Academic and Hostel Zones of the campus**

The plans submitted by M/s Architect Atelier, Chandigarh and M/s Datta & Datta Associates, Ahmedabad for Academic and Hostel zone respectively were discussed. The Committee took note of placement of various blocks and the footprint covered. It was suggested that all the Architects should design their buildings in a manner which gives a harmonious look between the both zones. Committee further opined that these plans for zones be as guide for the further planning of buildings and services.

The B&WC gave in principal approval to overall plan of academic and hostel zones and desired that they be further detailed for placement of various buildings and recommends to the Board of Governors for approval the same.

B&WC/ 08-09. 1. 5 **To consider preliminary estimate for construction of Triple Seated Hall of residence 1**

The concept drawings, design, specification and preliminary estimates of Triple Seated Hall of residence 1 were presented to the committee and discussed in detail. The members took note of the philosophy for designing triple seated rooms, design and specifications of proposed building. It was opined that the building should be taken up immediately.

The B&WC accepted the preliminary estimates amounting to Rs.1690 Lacs and requested the Finance Committee to recommend the same to the Board of Governors for administrative approval and financial sanction for above work.

B&WC/ 08-09. 1. 6 **To consider preliminary estimate for construction of Lecture Hall & Tutorial Complex**

The concept drawings, design, specification and preliminary estimates of the Lecture Hall & Tutorial Complex were presented to the committee and discussed in detail. The members appreciated design and specifications of the building .

The B&WC accepted the preliminary estimates amounting to Rs. 2409 Lacs and requested the Finance Committee to recommend the same to the Board of Governors for administrative approval and financial sanction for above work.

B&WC/ 08-09. 1. 7 **Electrification of the Campus**

The Committee discussed the various options for internal electric supply system of the Institute. The Committee took the cognizance of the efficiency, voltage drop, safety, maintainace and overall cost of the system. It was further suggested that the system be developed in phases.

The B&WC gave in principal approval for the concept submitted and desired that the detailed proposal be made.

B&WC/ 08-09. 1. 8 **Issues related to Future Development of the Campus**

The Committee deliberated on various building proposed to be taken up in near future and expressed their satisfaction. The Committee expressed satisfaction on the constitution of the Reconciliation Committee for resolving points raised by M/s Kanvinde Rai & Chowdhury.

B&WC/ 08-09. 1. 9 **Any other item with the permission of the chair**

The meeting ended with vote of thanks to the Chair.

Sd/-
(Raghunath)
Acting Secretary

Sd/-
(S Bhargava)
Chairman
Building and Works Committee

B&WC/2008-09: 2. 03 **<u>To consider Preliminary Estimate for Electric Supply & Management System Phase 1 (ES&MS1)</u>**

The proposal of the Electric Supply & Management System (ESMS), as mentioned in Annexure 2, was presented before the Buildings & Works Committee in its meeting held on October 13, 2008 for which an "in-principle' approval was accorded. The Preliminary Estimate for setting up of the Electric Supply & Management System Phase 1 has been prepared on the Market rates. The details of the estimate amounting to Rs **726** lacs along with concept drawings, history, design & scope, specifications are placed at **Annexure 2** [p 8 to p 25]. This cost does not include (a) Architect's Fee, (b) Project Management Consultancy Charge, (c) Contingencies and (d) the Labour Cess. Similarly, provisions for External Lighting and LT cabling have not been included. The estimates for the external lighting and LT cabling will be submitted soon.

The B&WC is requested to consider the Preliminary Estimate of Electric Supply & Management System Phase 1 amounting to Rs 726 Lacs and recommend the same to the Finance Committee for the administrative approval and expenditure sanction by the Board of Governors.

DLs from CPWD

Annexure 2

Name of work: **Electric Supply & Management System Phase 1 (ES & MS1)**

Head of Account: Chargeable to Plan Budget.

Preliminary estimate amounting to Rs 726 Lacs (Rs. Seven hundred and twenty six Lacs only) prepared by M/s Architect Atelier, Chandigarh excluding cost of project management + Architects Fees & contingencies and labour cess to meet the cost of the above mentioned work.

History

The Campus Advisory Committee went through various options for electrification system for distribution of electricity within the campus viz. stepping down from 33 to 11KV and then from 11 to .415 KV , stepping down directly from 33 to .415 KV and then distribution on .415 KV etc. Taking into account various factors like efficiency, voltage drop, safety, maintainace, over all cost etc. it was recommended to go for 33/11 KV system.

The 33 /11 KVA system to be followed was discussed at length in the 2008-09:1st meeting of B&WC held on October 13, 2008. The Design note submitted by M/s Architects Atelier for the proposed system to be followed for electrification of the campus was given in principal approval.

The Campus Advisory Committee went through the detailed proposal submitted by the Architect and concluded that the system be developed in Phases in line with the phased development of campus.

Design & Scope : The design of the proposed system has the following features:

i) The construction External Substation Phase 1 is conceived for a capacity of 8 MVA. In the first Phase facility shall be developed for 4 MVA with provision for expansion.

ii) 33 KV underground line from the point of metering to the substation with auto reclosers at both the ends. This line is envisaged keeping in mind the future expansion upto 8 MVA of electrical load.

iii) Substation shall have one 33/11 KVA of 4 MVA ONAN transformer in the phase 1.The second transformer to be added latter in the subsequent phase.

iv) Supply Cables (11 KV) from main substation to compact substation at various locations.

v) Compact Sub station (CSS) to be outdoor type 11/.4

vi) Supply from the CSS to various building to be done on LT.

vii) Compact Sub station for the following have been considered in Phase 1

a. Core Lab Complex and Library & Computer Center

b. Lecture Hall & Tutorial Complex

c. Single Seated Hall of Residence 1 & 2

viii) One 1000 KVA DG set at 11 KV for Standby power requirement of Phase 1. In addition to it one 250 KVA DG for essential/ critical services, UPS charging, external & security lighting. Both the DG to be kept at central location. One more DG to be added later in phase 2.

viii) Detailed design note submitted by the M/s Architect Atelier is placed at p 10 to p 25.

Specification : Specifications of work are placed at Annexure Pages p10 to p 25

Rates : Rates are worked including Supply, Installation, Testing and commissioning charges at market rates.

Period of Construction : Total three months.

Mode : On contract through call of competitive Tenders.

Sd/-
(T S Anand)
A E

Sd/-
(Amit Ray)
Professor in Charge Planning

DESIGN NOTE ON ELECTRIC SUPPLY & MANAGEMENT SYSTEM FOR PDPM IIITDM, JABALPUR

INTRODUCTION

The external power distribution system for the project has been conceptualized based on the International design standards to produce a concept which is an integrated whole. Conservation of energy, optimization of resources, fire-safety and eco-friendliness shall be the key factors in the design concept with State of Art Technology, to ensure minimum maintenance requirements.

Every effort will be made to design the layouts and installation of equipment in locations which will tend to encourage routine preventive maintenance by providing easy access for maintenance personnel. Manual isolation will be provided to enable servicing, expansion or renovation of any part of the system, without interrupting the services in adjacent areas.

Considering application, equipment selection shall be made which requires very less maintenance. All equipments shall be designed to cater and accommodate any future expansion in the system.

1. POWER DISTRIBUTION

33 KV High voltage panel (VCB) shall receive the mains power from utility. This power shall be received near main gate of the campus. A small pole mounted substation shall be constructed and provision of utility metering shall be kept.

Power shall be transmitted through cable to central substation through 33KV (E) XLPE cable. This cable shall be housed in pucca trench.

Capacity of the cable and substation near entrance shall be considered such so that it can cater for future expansion and in case of future additions no changes are required. At central substation, power shall be received and controlled by pole mounted 33KV auto reclosure having numerical relays, battery, battery charger, control transformer and lightning arrestors etc.

The power shall be stepped down to 11KV through a 4 MVA (for Phase 1) outdoor oil cooled transformer. This transformer shall be having automatic voltage regulating relay and on load tap changer for better voltage output and un-interrupted operation. Tap steps shall be in 1.25% and cater for +5 to -15% of input voltage variation. Transformer shall have Buccholz and Surge relays apart from oil and winding temperature monitoring.

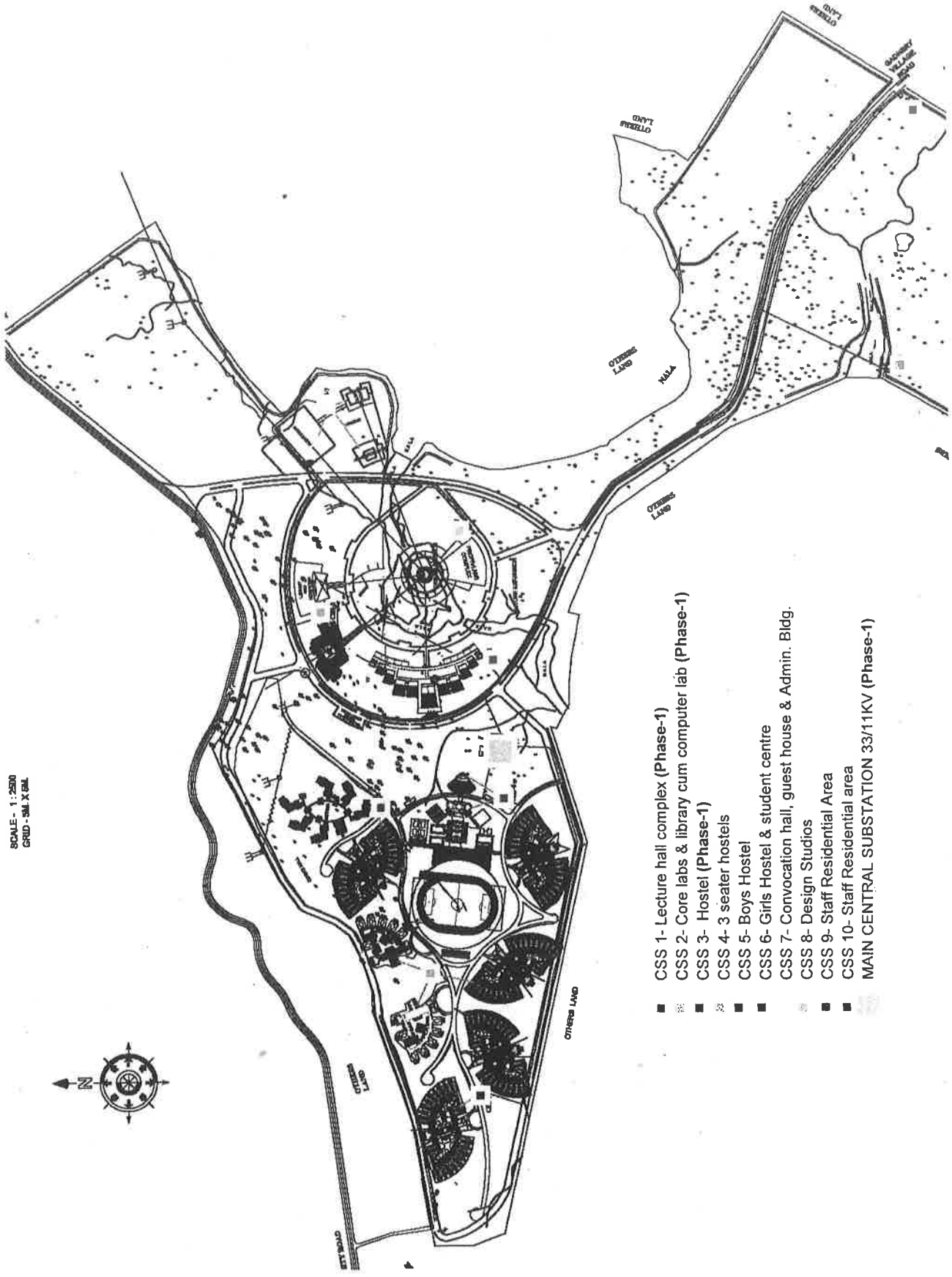
For standby power, in first phase 1000 KVA of DG set (silent type) has been envisaged, total standby power later shall be 2000 KVA supplied by 2x1000 KVA at 11 KV and 1x250 KVA generator 415 volts for critical services, charging of UPS, external lighting etc. This shall supply power at 11KV and supply the power to 11KV distribution Panel Board. Advantage of generation at 11 KV shall be advantageous because:

- It shall make distribution simpler because every building shall not need separate stand by need.
- Capacity of standby power shall be optimized because of central location. Otherwise each building shall have separate DG set.
- It shall reduce switchgear costs.
- Operation can be controlled and monitored from central substation.

11KV distribution board shall have provision of expansion to accommodate the later phases. Additional DG set and Transformers can be added to it in due course. Board shall be 630A 25KA VCB panel board with transformer incomer , DG Incomer, Buscoupler and outgoings. Sufficient spare feeders shall be provided for expansion and emergency need. All protection relays shall be microprocessor based numeric relays with facility for SCADA communication. Busbars of panels shall be copper and VCB shall be horizontal draw out type.

2. DISTRIBUTION IN CAMPUS

11 KV power from the HT panel shall be distributed to the entire campus through 11KV (E) cable of size 3CoreX 300 Sqmm. This cable shall be placed on cable racks in pucca trench. Power shall be fed to Compact substations in each building through ring feeders. Ring feeders shall enhance reliability of power many folds. In case of outage of one source of power (cable or switchgear), power can be resorted immediately through second route.


SCALE - 1 : 2500
GRID - 5M X 5M
CSS 1- Lecture hall complex (Phase-1)
CSS 2- Core labs & library cum computer lab (Phase-1)
CSS 3- Hostel (Phase-1)
CSS 4- 3 seater hostels
CSS 5- Boys Hostel
CSS 6- Girls Hostel & student centre
CSS 7- Convocation hall, guest house & Admin. Bldg.
CSS 8- Design Studios
CSS 9- Staff Residential Area
CSS 10- Staff Residential area
MAIN CENTRAL SUBSTATION 33/11KV (Phase-1)
OTHERS LAND
N

3. BUILDING SUBSTATIONS/ COMPACT SUB STATIONS:

Each building or group of building shall have its own 11 KV substation. For ease of maintenance, smaller size and compact design etc, we have envisaged compact substation of appropriate ratings. These prefabricated-compact secondary substations shall be designed for a) Compactness, b) fast installation, c) maintenance free operation, d) safety for worker/operator & public. Ratings of these substations shall be sufficient for building load. These substations shall have sufficient feeders on LT side for effective power distribution and easy fault identification.

All equipment and material for these substations shall be designed manufactured and tested in accordance with the latest applicable IEC standards. The 12KV Compact Substation Design must be as per IEC 61330.

Compact secondary Sub-station consisting of 11KV Non-Extensible SF6 Ring Main Unit + Transformer + Low Voltage Switchgear with all connection accessories, fitting & auxiliary equipment in an Enclosure to supply Low-voltage energy from high-voltage system as detailed in this specification. The complete unit shall be installed on a substation plinth (base) as Outdoor substation located at very congested places. 11KV Isolators controls incoming-outgoing feeder cables of the 11KV distribution system. The Vacuum Circuit Breaker shall be used to control and isolate the 11kV/433V Distribution transformer. The transformer Low Voltage side shall be connected to Low Voltage switchgear. The connection cables to consumer shall be taken out from the Low Voltage switchgear.

11KV power shall be controller through RMU. The SF6 RMU shall be Sealed for life, the enclosure shall meet the "sealed pressure system" criteria in accordance with IEC: 298 (a system for which no handling of gas is required throughout service life of approximate 25 years.) There shall be no requirement to 'top up' the SF6 gas. In addition, manufacturer shall confirm that maximum leakage rate is lower than 0.1% per year. It shall provide full insulation, making the switchgear insensitive to the environment. Thus assembled, the active parts of the switchgear unit shall be maintenance free.

The CB shall be fitted with microprocessor based self powered relay inside the front cover to avoid any tampering. The relay should be 2 Over Current + 1 Earth Fault, self powered type, fed by protection CTs mounted in the cable box. The details of the buildings being fed by each CSS is as follows:-

a) CSS 1- Lecture hall & tutorial Complex (1250 KVA)

b) CSS 2- Core lab complex & Library cum Computer centre (1250 KVA)

c) CSS 3 – Boys Hostel and

d) CSS 4- Triple seater hostel 2 nos

e) CSS 5- Boys Hostel

f) CSS 6- Girls Hostel & Student Activity Centre

g) CSS 7- Convention & Convention Hall & Administration Building.

h) CSS 8- Design Studios

i) CSS 9- Staff Residential Area

j) CSS 10- Staff Residential Area

4. EARTHING SYSTEM

Distribution earthing shall be carried all along the HT distribution system, or through local earth station and effectively bonding the cables / equipment as the case may be Separate and distinct earth stations and electrodes shall be provided for Neutral of DG set and Transformer and Lightening arrestors. Resistance for clean earth & for electrical system earth shall be kept below one ohm. Copper electrode shall be considered for all neutral earth pits. GI earth plate shall be used for body and lightning arrestors. Earth strip sizing shall be considered for fault level and touch and step potential.

5. Automation

Power Distribution System shall be equipped with latest SCADA features. From central substation, it shall be possible to monitor and control parameters related to substation at Entrance, DG Sets, Compact substations of individual buildings and central substation.

Interlocking shall be mechanical as well as electrical. On power failure DG sets shall start automatically and control the load in pre-defined manner on the basis of criticality.

PHASING OF THE ELECTRICAL DISTRIBUTION SYSTEM FOR THE CAMPUS

1) PHASE 1

a) **CTBT**- Pole mounted VCB for termination of 33 KV supply from MP electricity board before internal transfer to main substation.

b) **Main Substation** – 33 KV 4 MVA with Automatic Voltage Regulator for High Tension 33 KV / 11 KV.

c) **Diesel Generator**- 1 No. of 1000 KVA of 11 KV supply.

1 No. of 250 KVA for essential services

d) **CSS 1**- 1250 KVA for Lecture Hall & Tutorial complex.

e) **CSS 2**- 1250 KVA for Core Labs & Library cum Computer Centre, but since the library will come up later the extra capacity shall be used for supply of LT to external street lighting.

f)	**CSS 3-**	1250 KVA for Single seated boys hostel 1 & 2, but since hostel 2 is not being built right now it shall supply LT to Triple seater hostel for now which shall later shift to CSS-4.
g)	**33 KV HT Cabling-**	Complete 33 KV HT cabling from the gate to the main substation of sufficient capacity to cater for future expansions.
h)	**11 KV HT cabling-**	Complete 11 KV HT cabling in trenches for the entire campus power distribution system as mentioned earlier to prevent excavation & trenching later on.
i)	**11 KV Main Panel-**	Main panel for controlling the entire distribution of power to all the CSS. In Phase 1 the panel shall have switchgear for controlling the 3 CSS, 1 DG set and sufficient space for expansion to allow for future expansion.
j)	**Automation-**	Complete automation of the entire system for full functional running, efficient power distribution and energy conservation.
k)	**Earthing-**	The entire system has to be properly earthed including the cables that are running in trenches.

2) FUTURE EXPANSION OF CAMPUS

The advantage of doing the entire cabling will be seen when the institute starts to do the expansion of its various components. The institute shall have to spend much less money at that time since the main infrastructure will already have been laid, this will not only save them time, money but will also save the campus of being ravaged by trenches & digging every time a new expansion is to be done.

a) **CSS (4 to 10)** - The various other CSS shall come up as and when required depending on the buildings that are coming up first. The buildings being served by each CSS have already been mentioned.

b) **Expansion of Main Substation-** The second transformer of 4 MVA shall be added when required by the institute depending on the total loading.

c) **DG sets**- There is a provision of adding two more generators as required by the institute one of 1000 KVA and the other of 500 KVA.

33 KV cabling lenghts

Location		Distance in Mtr.
Metering point to Main Sub station		1000

11 KV cabling lengths

Location		Distance in Mtr. from main substation	Remark
Lecture Hall & Tutorial Complex	CSS1	454	
Core Lab Complex	CSS2	454	
S S Hall of Residence 1& 2	CSS3	706	
T S Hall of Residence 1 & 2	CSS4	706	
PG Hostels	CSS5	750	
Girls Hostel & Student Center	CSS6	272	
Convocation & Convention Hall, Admin Building	CSS7	1161	
Design Studio	CSS8	450	
Residential Area	CSS 9, 10	1547	
		6500	

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ANNEXURE A - ELECTRICAL LOAD SHEET FOR PLANNING

SR NO	BLOCKS	TOTAL AREA SQ. MT	TOTAL AREA SQ. FT.	LIGHTING LOAD IN KW	POWER LOAD IN KW	AIR CONDITIONING LOAD IN KW	TOTAL LOAD IN KW	LOAD FACTOR	ACTUAL LOAD IN KW
1	**ACADEMIC BLOCKS**								
1.1	Academic building - 50% AC	9,639.00	103,715.64	155.57	311.15	414.86	881.58	0.70	617.11
1.2	Core labs Complex - 50% AC	1,650.00	17,754.00	26.63	53.26	71.02	150.91	0.70	105.64
1.3	Professional Labs Complex - 50% AC	2,500.00	26,900.00	40.35	80.70	107.60	228.65	0.70	160.06
1.4	Computer Center- 100% AC	819.00	8,812.44	13.22	26.44	70.50	110.16	0.70	77.11
1.5	Central library - 100% AC	1,500.00	16,140.00	24.21	48.42	129.12	201.75	0.70	141.23
1.6	Technology incubator park - 50% AC	1,000.00	10,760.00	16.14	32.28	43.04	91.46	0.70	64.02
1.7	Utility load for pumps / FFTG / ventilation etc				250.00		250.00	0.70	175.00
	TOTAL LOAD FOR ACEDEMIC BLOCK		**184,082.08**	**276.12**	**802.25**	**836.14**	**1,914.51**		**1,340.16**
	ADDITIONAL FUTURE DEMAND @ 20%			**55.22**	**160.45**	**167.23**	**382.90**		**268.03**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**331.35**	**962.70**	**1,003.37**	**2,297.41**		**1,608.19**
2	**ADMINISTRATIVE BLOCK**								
2.1	Administrative block - 80% AC	7,000.00	75,320.00	112.98	225.96	482.05	820.99	0.70	574.69
2.2	Utility load for pumps / FFTG / ventilation etc				100.00		100.00	0.70	70.00
	TOTAL LOAD FOR ADMIN. BLOCK		**75,320.00**	**112.98**	**325.96**	**482.05**	**920.99**		**644.69**
	ADDITIONAL FUTURE DEMAND @ 20%			**22.60**	**65.19**	**96.41**	**184.20**		**128.94**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**135.58**	**391.15**	**578.46**	**1,105.19**		**773.63**
3	**HOSTELS**								
3.1	Hostels	111,000.00	1,194,360.00	1,194.36	2,388.72		3,583.08	0.60	2,149.85
3.2	Utility load for pumps / FFTG / ventilation etc				450.00		450.00	0.70	315.00
3.3	Kitchen equipments for mess				150.00		150.00	0.70	105.00
	TOTAL LOAD FOR HOSTEL BLOCK		**1,194,360.00**	**1,194.36**	**2,988.72**	-	**4,183.08**		**2,569.85**
	ADDITIONAL FUTURE DEMAND @ 20%			**238.87**	**597.74**	-	**836.62**		**513.97**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**1,433.23**	**3,586.46**	-	**5,019.70**		**3,083.82**
4	**RESIDENCES**								
4.1	Residences - 4 AC in director / 2 AC in three bed / 1 AC in 2 bed	59,620.00	641,511.20	641.51	1,924.53	1,283.02	3,849.07	0.50	1,924.53
4.2	Utility load for pumps / FFTG / ventilation etc				250.00		250.00	0.70	175.00
	TOTAL LOAD FOR HOSTEL BLOCK		**641,511.20**	**641.51**	**2,174.53**	**1,283.02**	**4,099.07**		**2,099.53**
	ADDITIONAL FUTURE DEMAND @ 20%			**128.30**	**434.91**	**256.60**	**819.81**		**419.91**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**769.81**	**2,609.44**	**1,539.63**	**4,918.88**		**2,519.44**
5	**COMMUNITY BUILDINGS**								
5.1	Health Center - 30% AC	353.00	3,798.28	5.70	11.39	9.12	26.21	0.70	18.35
5.2	Sports Facility								

SR NO	BLOCKS	TOTAL AREA SQ. MT	TOTAL AREA SQ. FT.	LIGHTING LOAD IN KW	POWER LOAD IN KW	AIR CONDITIONING LOAD IN KW	TOTAL LOAD IN KW	LOAD FACTOR	ACTUAL LOAD IN KW
5.2.1	Hockey and Foot Ball Field 500 Seats			50.00			50.00	0.70	35.00
5.2.2	Indoor Gymnasium 200 Capacity	3,250.00	34,970.00	52.46	69.94		122.40	0.70	85.68
5.2.3	Tennice Court			5.00			5.00	0.70	3.50
5.3	Utilities	1,540.00	16,570.40	16.57	16.57		33.14	0.70	23.20
5.3.1	Cafeteria - 50% AC	800.00	8,608.00	12.91	25.82	34.43	73.17	0.70	51.22
5.3.2	Canteen 300 Capacity	800.00	8,608.00	8.61	25.82		34.43	0.70	24.10
5.3.3	Auditorium 1000 Capacity - 100% AC	3,550.00	38,198.00	76.40	76.40	305.58	458.38	0.70	320.86
5.4	Utility load for pumps / FFTG / ventilation etc				150.00	-	150.00	0.70	105.00
5.5	Kitchen equipment loads		-	-	250.00		250.00	0.70	175.00
	TOTAL LOAD FOR COMMUNITY BLOCK		**110,752.68**	**227.64**	**625.95**	**349.13**	**1,202.72**		**841.90**
	ADDITIONAL FUTURE DEMAND @ 20%			**45.53**	**125.19**	**69.83**	**240.54**		**168.38**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**273.17**	**751.14**	**418.96**	**1,443.26**		**1,010.28**
6	**COMMON SERVICES**								
6.1	Street lighting / area lighting / security lighting		-	50.00	-	-	50.00	0.70	35.00
6.2	Pumping station				250.00		250.00	0.70	175.00
6.3	STP				100.00		100.00	0.70	70.00
6.4	Borewells		-	-	100.00		100.00	0.70	70.00
	TOTAL LOAD FOR COMMUNITY BLOCK			**50.00**	**450.00**	**-**	**500.00**		**350.00**
	ADDITIONAL FUTURE DEMAND @ 20%			**10.00**	**90.00**	**-**	**100.00**		**70.00**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**60.00**	**540.00**	**-**	**600.00**		**420.00**
	TOTAL LOAD FOR SWITCHYARD - KW								**9,415.36**
	OVER ALL DIVERSITY - 65% - KW								**6,119.98**
	ACTUAL LOAD IN KVA WITH PF OF 0.8 IN KVA								**7,649.98**
	PROPOSED SWITCHYARD SHALL BE WITH 2 NOS 4MVA TRANSFORMERS								**2 X 4000 KVA**

PDPM Indian Institute of Information Technology Design & Manufacturing Jabalpur

Name of Work : Preliminary Estimate for External Electrification Management System Phase 1

Sr No.		Description	Qty	Unit	Rate	Amount	Location
		33 KV Power Distribution					
1		Main 33kV pole mounted Outdoor autorecloser with control cubicle, numerical relay, battery, charger, control transformer, lightening arrestors, pole structure and necessary civil works etc.	1	No.	1,524,950.00	1,524,950.00	At Incomer
2		33kV Outdoor pole mounted unmanned station with one no 33kV incomer and one no 33kV outgoing autorecloser complete with control cubicle, numerical relay, lightening arrestors, pole structure and civil works etc.	1	No.	3,397,709.00	3,397,709.00	At 33KV Substation
3		Supply, laying, testing and commissioning 3CX240 Sqmm XLPE insulated Aluminum conductor 33K V (E) armored cable on existing trench and cable trays as per IS 1255: 1983.	850	Metre	2,959.00	2,515,150.00	Metering point to Main Sub Station
4		Supplying and making cable end terminations for the following size of 11 KV grade, XLPE aluminium conductor armoured cable including termination kit complete heat shrinkable sleeve etc.					
a		Termination for 3 Cx240 Sqmm Outdoor	3	No.	26,348.00	79,044.00	
b		Termination for 3 Cx240 Sqmm indoor	1	No.	16,223.00	16,223.00	
c		Straight Through Joint 3CX 240 Sqmm	1	No.	29,723.00	29,723.00	

Sr No.		Description	Qty	Unit	Rate	Amount	Location
5		Supply Installation and Commissioing of 4MVA ONAN Star-Star 33KV/11KV Power Transformer with OLTC +5 to -15% in steps of 2.5% with AVR and Automatic Tap changer complete with first filling of Transformer Oil.	1	No.	6,298,571.00	6,298,571.00	At 33KV Substation
6		Supplying & laying of following 1100 volt grade PVC insulated sheathed copper conductor armoured cable as per specification in existing trenches, cable trays ducts over bed of sand, clamped to wall with suitable clamps, including fixing bolts, connecting testing and commissioning.					
a		Control Cables 19CX2.5 Sqmm	30	Mtr	492.00	14,760.00	
b		Control Cable 7Cx2.5 Sqmm	30	Mtr	230.00	6,900.00	
7		Supply Installation and commissioing of Combined CT/PT Unit with Class 0.5 accuracy in the suitable sealable enclosure with provision of mounting TVM for SEM metering purpose.	1	No.	230,922.00	230,922.00	
		11KV Power Distribution:					

Sr No.		Description	Qty	Unit	Rate	Amount	Location
8		11kV, 630A, 25kA Indoor Main HT VCB panel switchboard with one transformer incomer, two 11kV DG incomers, one buscoupler and five outgoings complete with composite microprocessor based numerical relay with remote communication with HMI, Software, Fiber optic cable with IEC 61850 protocol. The software to give following minimum functions. a) Single Line diagrams b) Data view c) Control of breakers d) Event lists e) Alarm lists f) System supervision g) Disturbance data upload h) On line parameter settings	1	No.	8,412,563.00	8,412,563.00	At 33KV/11 CentralSubstation
9		Silent DG Set 1000 KVA 11KV with AMF and synchronising auto load sharing along with exhaust,fuel piping,tanks and Cooling System etc.DG set system equipped with automatis SCADA system as per specifications.	1	No.	11,610,028.00	11,610,028.00	
10		Supply, laying, testing and commissioning of following size XLPE insulated Aluminum conductor 11K V (E) armored cable including excavation of earth, sand/brick protection refilling, watering & ramming or providing to earth etc. as per IS 1255: 1983.					
a		3CX 300 Sqmm Cable	6500	Metre	1,913.00	12,434,500.00	
11		Supplying and making cable end terminations for the following size of 11 KV grade, XLPE aluminium conductor armoured cable including termination kit complete heat shrinkable sleeve etc.					
a		11KV 3CX300 Sqmm Indoor Terminations	12	Nos.	8,798:00	105,576.00	

Sr No.		Description	Qty	Unit	Rate	Amount	Location
b		11KV 3CX300 Straight Through Joint Kit	14	Nos.	12,848.00	179,872.00	
12		OUTDOOR Compact Substations at various places given below alongwith necessary software / SCADA Compact s/s comprising HT: SF6 RMU with two nos incoming motorised isolators and one nos motorized vacuum circuit breaker T/F: 11/0.433kV, 1250kVA oil type transformer LT: - One no 4-pole fixed motorized 2500A, 415V ACB I/C with built-in microprocessor based protection release -One no 4-pole 1600A fixed motorized , 415V ACB O/g with built-in microprocessor based protection release - One no 4-pole 1000A fixed motorized , 415V ACB O/g with built-in microprocessor based protection release - One no 4-pole 125A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One 400kVAr APFC panel - One no 4-pole 320A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One no 4-pole 125A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One 125kVAr APFC panel	3	No.	4,200,000.00	12,600,000.00	Core Lab Complex, Lecture Hall & Tutorial Complex, SS Hall of Residence 1

Sr No.		Description	Qty	Unit	Rate	Amount	Location
13		OUTDOOR Compact Substations at various places given below alongwith necessary software / SCADA Compact s/s comprising HT: SF6 RMU with two nos incoming motorised isolators and one nos motorized vacuum circuit breaker T/F: 11/0.433kV, 500kVA oil type transformer LT: - One no 4-pole 320A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One no 4-pole 125A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One 125kVAr APFC panel	1	No.	1,600,000.00	1,600,000.00	essential / critcal services, UPS, student centre etc.
14		Silent DG Set 250 KVA with AMF along with exhaust,fuel piping,tanks and Cooling System etc.DG set system equipped with automatis SCADA system as per specifications.	1	No.	2,250,000.00	2,250,000.00	essential / critcal services, UPS charrging, external lighting, security etc.
15		Comprehensive SCADA, PLC and software of controlling CSS HT / LT switchgears in conjunction with DG incomers of Main HT panel	1	No.	2,268,340.00	2,268,340.00	Central Substation
		Earthing System:					
16		Providing and laying of 600 x 600 x 6.3 mm thick GI plate electrode, with 2 nos. 50 X 6 mm GI strips from earth plate electrode to inspection chamber, 50 mm dia medium class GI pipe, CI funnel with 20 gauge GI wire mesh, masonry chamber 1000 X 500 mm with concrete base CI manhole cover with frame painted with bitumastic paint and packing with mixture of charcoal and common salt around plate electrode including digging of pit not less than 3 meters and back filling as required.	40	Nos.	7,448.00	297,920.00	

Sr No.		Description	Qty	Unit	Rate	Amount	Location
17		Supplying and fixing of following bare GI tapes including all necessary fixing accessories and effecting connections.					
a		GI Strip 50X6 mm	9560	Mtr	229.00	2,189,240.00	
b		GI Strip 32X6 mm	100	Mtr	155.00	15,500.00	
18		Communication Cable for Connecting CSS,33KV Substations and 11KV Boards to Central Contol Station.	6500	Mtr	181.00	1,176,500.00	From Main Sub Station to CSS
19		Steel Support for Cables	25	Ton	74,426.00	1,860,650.00	
20		Providing and laying of 600 x 600 x 3.15 mm thick tined copper plate electrode, with 2 Nos 50 x 6 mm copper strips from earth plate electrode to inspection chamber, 50 mm dia medium class GI pipe, CI funnel with 20 gauge GI wire mesh, masonry chamber 1000 x 500 mm with concrete base C I heavy duty / chequered plate manhole cover with frame painted with bitumastic paint and packing with mixture of charcoal and common salt around plate electrode including digging of pit upto permanent moisture level and as per soil condition but not less than 3 meters and back filling as required.	10	No	24,323.00	243,230.00	
21		Trenching work for 33 KV line	850	Mtr	1,000.00	850,000.00	
22		Supplying and fixing of following bare copper tapes including all necessary fixing accessories and effecting connections.					
a		Copper Strip 50X6 MM	200	Mtr	1,647.00	329,400.00	
		Total				**72,537,271.00**	

B&WC/2008-09: 2. 04 **Provision for Cost Escalation Factor for the Preliminary Estimates of Buildings & Works Approved by the Board**

The Preliminary Estimates for building and works prepared by the architects are framed on CPWD Delhi Plinth Area Rates (DPAR) enhanced with prevalent cost index as applicable. Though in major cities these rates get updated frequently, in the city of Jabalpur, being an area with not much construction activities going on, CPWD index does not get updated for years.

In awarding earlier construction works, the Institute faced many problems due to the campus site being a remote area with a poor transport system and no facility of water and electricity. Further, skilled and specialized manpower for doing many jobs were also to be brought from outside. Enhanced costs to be met out by the contractors to overcome such site-related problems are not included in Delhi Plinth Area Rates followed by the CPWD.

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Due to (a) the absence of timely updating of CPWD index in Jabalpur and (b) factors pertaining to the campus site being a remote area on the outskirts of Jabalpur, it is suggested that the Buildings & Works Committee (B&WC) gives an "in-principle" approval of the above factors which escalate the costs and proposes to the Finance Committee to recommend to the Board the administrative and financial sanction of an enhancement up to a maximum of 20% over the Preliminary Estimates. This may be also be considered applicable TSH1 and LHTC which were approved by the Board in its meeting held on November 07, 2007.

The Building & Works Committee is requested to consider the proposal and recommend the same through the Finance Committee for Administrative and Financial Approval from the Board of Governors.

B&WC/2008-09: 2. 05 Provision for Contingencies as per prevalent CPWD norms

Provision for contingencies in the estimates the work was taken as per CPWD Manual 2003. The same has been revised to 3% in the CPWD Works Manual 2007. The BoG is requested to accord Administrative Approval and Financial Sanction for provision of contingencies for the works of TSH 1 and LH&TC

The Building & Works Committee is requested to consider the proposal and recommend the same through the Finance Committee for Administrative and Financial Approval from the Board of Governors.

5

B&WC/ 2008-09: 2. 06 **Any other item with the Permission of the Chair**

6

3. BUILDING SUBSTATIONS/ COMPACT SUB STATIONS:

Each building or group of building shall have its own 11 KV substation. For ease of maintenance, smaller size and compact design etc, we have envisaged compact substation of appropriate ratings. These prefabricated-compact secondary substations shall be designed for a) Compactness, b) fast installation, c) maintenance free operation, d) safety for worker/operator & public. Ratings of these substations shall be sufficient for building load. These substations shall have sufficient feeders on LT side for effective power distribution and easy fault identification.

All equipment and material for these substations shall be designed manufactured and tested in accordance with the latest applicable IEC standards. The 12KV Compact Substation Design must be as per IEC 61330.

Compact secondary Sub-station consisting of 11KV Non-Extensible SF6 Ring Main Unit + Transformer + Low Voltage Switchgear with all connection accessories, fitting & auxiliary equipment in an Enclosure to supply Low-voltage energy from high-voltage system as detailed in this specification. The complete unit shall be installed on a substation plinth (base) as Outdoor substation located at very congested places. 11KV Isolators controls incoming-outgoing feeder cables of the 11KV distribution system. The Vacuum Circuit Breaker shall be used to control and isolate the 11kV/433V Distribution transformer. The transformer Low Voltage side shall be connected to Low Voltage switchgear. The connection cables to consumer shall be taken out from the Low Voltage switchgear.

11KV power shall be controller through RMU. The SF6 RMU shall be Sealed for life, the enclosure shall meet the "sealed pressure system" criteria in accordance with IEC: 298 (a system for which no handling of gas is required throughout service life of approximate 25 years.) There shall be no requirement to 'top up' the SF6 gas. In addition, manufacturer shall confirm that maximum leakage rate is lower than 0.1% per year. It shall provide full insulation, making the switchgear insensitive to the environment. Thus assembled, the active parts of the switchgear unit shall be maintenance free.

The CB shall be fitted with microprocessor based self powered relay inside the front cover to avoid any tampering. The relay should be 2 Over Current + 1 Earth Fault, self powered type, fed by protection CTs mounted in the cable box. The details of the buildings being fed by each CSS is as follows:-

a) CSS 1- Lecture hall & tutorial Complex (1250 KVA)

b) CSS 2- Core lab complex & Library cum Computer centre (1250 KVA)

c) CSS 3 - Boys Hostel and

d) CSS 4 Triple seater hostel 2 nos

e) CSS 5- Boys Hostel

f) CSS 6- Girls Hostel & Student Activity Centre

g) CSS 7- Convention & Convention Hall & Administration Building.

h) CSS 8- Design Studios

i) CSS 9- Staff Residential Area

j) CSS 10- Staff Residential Area

4. EARTHING SYSTEM

Distribution earthing shall be carried all along the HT distribution system, or through local earth station and effectively bonding the cables / equipment as the case may be Separate and distinct earth stations and electrodes shall be provided for Neutral of DG set and Transformer and Lightening arrestors. Resistance for clean earth & for electrical system earth shall be kept below one ohm. Copper electrode shall be considered for all neutral earth pits. GI earth plate shall be used for body and lightning arrestors. Earth strip sizing shall be considered for fault level and touch and step potential.

5. Automation

Power Distribution System shall be equipped with latest SCADA features. From central substation, it shall be possible to monitor and control parameters related to substation at Entrance, DG Sets, Compact substations of individual buildings and central substation.

Interlocking shall be mechanical as well as electrical. On power failure DG sets shall start automatically and control the load in pre-defined manner on the basis of criticality.

PHASING OF THE ELECTRICAL DISTRIBUTION SYSTEM FOR THE CAMPUS

1) PHASE 1

a) **CTBT-** Pole mounted VCB for termination of 33 KV supply from MP electricity board before internal transfer to main substation.

b) **Main Substation –** 33 KV 4 MVA with Automatic Voltage Regulator for High Tension 33 KV / 11 KV.

c) **Diesel Generator-** 1 No. of 1000 KVA of 11 KV supply.

1 No. of 250 KVA for essential services

d) **CSS 1-** 1250 KVA for Lecture Hall & Tutorial complex.

e) **CSS 2-** 1250 KVA for Core Labs & Library cum Computer Centre, but since the library will come up later the extra capacity shall be used for supply of LT to external street lighting.

f)	[illegible]	1250 KVA for Single seated boys hostel 1 & 2, but since hostel 2 is not being built right now it shall supply LT to Triple seater hostel for now which shall later shift to CSS-4.
g)	33 KV HT Cabling-	Complete 33 KV HT cabling from the gate to the main substation of sufficient capacity to cater for future expansions.
h)	11 KV HT cabling-	Complete 11 KV HT cabling in trenches for the entire campus power distribution system as mentioned earlier to prevent excavation & trenching later on.
i)	11 KV Main Panel-	Main panel for controlling the entire distribution of power to all the CSS. In Phase 1 the panel shall have switchgear for controlling the 3 CSS, 1 DG set and sufficient space for expansion to allow for future expansion.
j)	Automation	Complete automation of the entire system for full functional running, efficient power distribution and energy conservation.
k)	Earthing	The entire system has to be properly earthed including the cables that are running in trenches.

l) FUTURE EXPANSION OF CAMPUS

The advantage of doing the entire cabling will be seen when the institute starts to do the expansion of its various components. The institute shall have to spend much less money at that time since the main infrastructure will already have been laid. This will not only save them time, money but will also save the campus of being ravaged by trenches & digging every time a new expansion is to be done.

a) **CSS (4 to 10)** The various other CSS shall come up as and when required depending on the buildings that are coming up first. The buildings being served by each CSS have already been mentioned.

b) **Expansion of Main Substation-** The second transformer of 4 MVA shall be added when required by the institute depending on the total loading.

c) **DG sets** There is a provision of adding two more generators as required by the institute one of 1000 KVA and the other of 500 KVA.

33 KV cabling lenghts

Location		Distance in Mtr.
Metering point to Main Sub station		1000

11 KV cabling lengths

Location		Distance in Mtr. from main substation	Remark
Lecture Hall & Tutorial Complex	CSS1	454	
Core Lab Complex	CSS2	454	
B.E Hall of Residence 1&2	CSS3	706	
I.T Hall of Residence 1 & 2	CSS4	706	
SB Hostels	CSS5	750	
New Hostel & Student Center	CSS6	272	
Administration & Convention Hall, Admin Building	CSS7	1161	
Design Studio	CSS8	450	
Residential Area	CSS 9, 10	1547	
		6500	

SR. NO.	BLOCKS	TOTAL AREA SQ. MT	TOTAL AREA SQ. FT	[illegible] LOAD IN KW	POWER LOAD IN KW	[illegible] CONDITIONING LOAD IN KW	TOTAL LOAD IN KW	[illegible] FACTOR	ACTUAL LOAD IN KW
1	ACADEMIC BLOCKS								
1.1	Academic building - 50% AC	9,639.00	103,715.54	155.57	311.15	414.86	881.58	0.70	617.11
1.2	Core labs Complex - 50% AC	1,650.00	17,754.00	26.63	53.26	71.02	150.91	0.70	105.64
1.3	Professional Labs Complex - 50% AC	2,500.00	26,900.00	40.35	80.70	107.60	228.65	0.70	160.06
1.4	Computer Center- 100% AC	819.00	8,812.44	13.22	26.44	70.50	110.16	0.70	77.11
1.5	Central library - 100% AC	1,500.00	16,140.00	24.21	48.42	129.12	201.75	0.70	141.23
1.6	Technology incubator park - 50% AC	1,000.00	10,760.00	16.14	32.28	43.04	91.46	0.70	64.02
1.7	Utility load for pumps / FFTG / ventilation etc				250.00		250.00	0.70	175.00
	TOTAL LOAD FOR ACEDEMIC BLOCK		**184,082.08**	**276.12**	**802.25**	**836.14**	**1,914.51**		**1,340.16**
	ADDITIONAL FUTURE DEMAND @ 20%			**55.22**	**160.45**	**167.23**	**382.90**		**268.03**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**331.35**	**962.70**	**1,003.37**	**2,297.41**		**1,608.19**
2	**ADMINISTRATIVE BLOCK**								
2.1	Administrative block - 80% AC	7,000.00	75,320.00	112.98	225.96	482.05	820.99	0.70	574.69
2.2	Utility load for pumps / FFTG / ventilation etc				100.00		100.00	0.70	70.00
	TOTAL LOAD FOR ADMIN. BLOCK		**75,320.00**	**112.98**	**325.96**	**482.05**	**920.99**		**644.69**
	ADDITIONAL FUTURE DEMAND @ 20%			**22.60**	**65.19**	**96.41**	**184.20**		**128.94**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**135.58**	**391.15**	**578.46**	**1,105.19**		**773.63**
3	**HOSTELS**								
3.1	Hostels	111,000.00	1,194,360.00	1,194.36	2,388.72		3,583.08	0.60	2,149.85
3.2	Utility load for pumps / FFTG / ventilation etc				450.00		450.00	0.70	315.00
3.3	Kitchen equipments for mess				150.00		150.00	0.70	105.00
	TOTAL LOAD FOR HOSTEL BLOCK		**1,194,360.00**	**1,194.36**	**2,988.72**	-	**4,183.08**		**2,569.85**
	ADDITIONAL FUTURE DEMAND @ 20%			**238.87**	**597.74**	-	**836.62**		**513.97**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**1,433.23**	**3,586.46**	-	**5,019.70**		**3,083.82**
4	**RESIDENCES**								
4.1	Residences - 4 AC in director / 2 AC in three bed / 1 AC in 2 bed	59,620.00	641,511.20	641.51	1,924.53	1,283.02	3,849.07	0.50	1,924.53
4.2	Utility load for pumps / FFTG / ventilation etc				250.00		250.00	0.70	175.00
	TOTAL LOAD FOR HOSTEL BLOCK		**641,511.20**	**641.51**	**2,174.53**	**1,283.02**	**4,099.07**		**2,099.53**
	ADDITIONAL FUTURE DEMAND @ 20%			**128.30**	**434.91**	**256.60**	**819.81**		**419.91**
	LOAD TO BE CONSIDERED FOR MASTER PLANNING			**769.81**	**2,609.44**	**1,539.63**	**4,918.88**		**2,519.44**
5	**COMMUNITY BUILDINGS**								
5.1	Health Center - 30% AC	353.00	3,798.28	5.70	11.39	9.12	26.21	0.70	18.35
5.2	Sports Facility								

5.3	Utilities										
5.3.1	Cafetena - 50% AC										
5.3.2	Canteen 300 Capacity										
5.3.3	Auditorium 1000 Capacity - 100% AC	3,550.00	38,190.00								
5.4	Utility load for pumps / FFTG / ventilation etc				150.00	-					
5.5	Kitchen equipment loads	-	-		250.00						
	TOTAL LOAD FOR COMMUNITY BLOCK	**110,752.68**	**227.64**		**625.95**	**340.13**					
	ADDITIONAL FUTURE DEMAND @ 20%		**45.53**		**125.19**	**68.03**					
	LOAD TO BE CONSIDERED FOR MASTER PLANNING		**273.17**		**751.14**	**411.96**					
6	**COMMON SERVICES**										
6.1	Street lighting / area lighting / security lighting	-	50.00	-		-	50.00	0.70	35.00		
6.2	Pumping station				250.00		250.00	0.70	175.00		
6.3	STP				100.00		100.00	0.70	70.00		
6.4	Borewells	-	-		100.00		100.00	0.70	70.00		
	TOTAL LOAD FOR COMMUNITY BLOCK		**50.00**		**450.00**	**-**	**500.00**		**350.00**		
	ADDITIONAL FUTURE DEMAND @ 20%		**10.00**		**90.00**	**-**	**100.00**		**70.00**		
	LOAD TO BE CONSIDERED FOR MASTER PLANNING		**60.00**		**540.00**	**-**	**600.00**		**420.00**		
	TOTAL LOAD FOR SWITCHYARD - KW										**9,415.36**
	OVER ALL DIVERSITY - 65% - KW										**6,119.98**
	ACTUAL LOAD IN KVA WITH PF OF 0.8 IN KVA										**7,649.98**
	PROPOSED SWITCHYARD SHALL BE WITH 2 NOS 4MVA TRANSFORMERS										**2 X 4000 KVA**

Name of Work : Preliminary Estimate for External Electrification Management System Phase 1

Sr No.		Description	Qty	Unit	Rate	Amount	Location
		33 KV Power Distribution					
1		Main 33kV pole mounted Outdoor autorecloser with control cubicle, numerical relay, battery, charger, control transformer, lightening arrestors, pole structure and necessary civil works etc.	1	No.	1,524,950.00	1,524,950.00	At Incomer
2		33kV Outdoor pole mounted unmanned station with one no 33kV incomer and one no 33kV outgoing autorecloser complete with control cubicle, numerical relay, lightening arrestors, pole structure and civil works etc.	1	No.	3,397,709.00	3,397,709.00	At 33KV Substation
3		Supply, laying, testing and commissioning 3CX240 Sqmm XLPE insulated Aluminum conductor 33K V (E) armored cable on existing trench and cable trays as per IS 1255: 1983.	850	Metre	2,959.00	2,515,150.00	Metering point to Main Sub Station
4		Supplying and making cable end terminations for the following size of 11 KV grade, XLPE aluminium conductor armoured cable including termination kit complete heat shrinkable sleeve etc.					
a		Termination for 3 Cx240 Sqmm Outdoor	3	No.	26,348.00	79,044.00	
b		Termination for 3 Cx240 Sqmm indoor	1	No.	16,223.00	16,223.00	
c		Straight Through Joint 3CX 240 Sqmm	1	No.	29,723.00	29,723.00	

Sr No.		Description	Qty	Unit	Rate	Amount	Location
5		Supply Installation and Commissioing of 4MVA ONAN Star-Star 33KV/11KV Power Transformer with OLTC +5 to -15% in steps of 2.5% with AVR and Automatic Tap changer complete with first filling of Transformer Oil.	1	No.	6,298,571.00	6,298,571.00	At 33KV Substation
6		Supplying & laying of following 1100 volt grade PVC insulated sheathed copper conductor armoured cable as per specification in existing trenches, cable trays ducts over bed of sand, clamped to wall with suitable clamps, including fixing bolts, connecting testing and commissioning.					
a		Control Cables 19CX2.5 Sqmm	30	Mtr	492.00	14,760.00	
b		Control Cable 7Cx2.5 Sqmm	30	Mtr	230.00	6,900.00	
7		Supply Installation and commissioing of Combined CT/PT Unit with Class 0.5 accuracy in the suitable sealable enclosure with provision of mounting TVM for SEM metering purpose.	1	No.	230,922.00	230,922.00	
		11KV Power Distribution:					

Sr No.		Description	Qty	Unit	Rate	Amount	Location
8		11kV, 630A, 25kA Indoor Main HT VCB panel switchboard with one transformer incomer, two 11kV DG incomers, one buscoupler and five outgoings complete with composite microprocessor based numerical relay with remote communication with HMI, Software, Fiber optic cable with IEC 61850 protocol. The software to give following minimum functions. a) Single Line diagrams b) Data view c) Control of breakers d) Event lists e) Alarm lists f) System supervision g) Disturbance data upload h) On line parameter settings	1	No.	8,412,563.00	8,412,563.00	At 33KV/11 CentralSubstation
9		Silent DG Set 1000 KVA 11KV with AMF and synchronising auto load sharing along with exhaust,fuel piping,tanks and Cooling System etc.DG set system equipped with automatis SCADA system as per specifications.	1	No.	11,610,028.00	11,610,028.00	
10		Supply, laying, testing and commissioning of following size XLPE insulated Aluminum conductor 11K V (E) armored cable including excavation of earth, sand/brick protection refilling, watering & ramming or providing to earth etc. as per IS 1255: 1983.					
a		3CX 300 Sqmm Cable	6500	Metre	1,913.00	12,434,500.00	
11		Supplying and making cable end terminations for the following size of 11 KV grade, XLPE aluminium conductor armoured cable including termination kit complete heat shrinkable sleeve etc.					
a		11KV 3CX300 Sqmm Indoor Terminations	12	Nos.	8,798.00	105,576.00	

Sl. No.		Description	Qty	Unit	Rate	Amount	Location
b		11KV 3CX300 Straight Through Joint Kit	14	Nos.	12,848.00	179,872.00	
12		OUTDOOR Compact Substations at various places given below alongwith necessary software / SCADA Compact s/s comprising HT: SF6 RMU with two nos incoming motorised isolators and one nos motorized vacuum circuit breaker T/F: 11/0.433kV, 1250kVA oil type transformer LT: - One no 4-pole fixed motorized 2500A, 415V ACB I/C with built-in microprocessor based protection release -One no 4-pole 1600A fixed motorized , 415V ACB O/g with built-in microprocessor based protection release - One no 4-pole 1000A fixed motorized , 415V ACB O/g with built-in microprocessor based protection release - One no 4-pole 125A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One 400kVAr APFC panel - One no 4-pole 320A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One no 4-pole 125A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One 125kVAr APFC panel	3	No.	4,200,000.00	12,600,000.00	Core Lab Complex, Lecture Hall & Tutorial Complex, SS Hall of Residence 1

Sr No.		Description	Qty	Unit	Rate	Amount	Location
8		11kV, 630A, 25kA Indoor Main HT VCB panel switchboard with one transformer incomer, two 11kV DG incomers, one buscoupler and five outgoings complete with composite microprocessor based numerical relay with remote communication with HMI, Software, Fiber optic cable with IEC 61850 protocol. The software to give following minimum functions. a) Single Line diagrams b) Data view c) Control of breakers d) Event lists e) Alarm lists f) System supervision g) Disturbance data upload h) On line parameter settings	1	No.	8,412,563.00	8,412,563.00	At 33KV/11 CentralSubstation
9		Silent DG Set 1000 KVA 11KV with AMF and synchronising auto load sharing along with exhaust,fuel piping,tanks and Cooling System etc.DG set system equipped with automatis SCADA system as per specifications.	1	No.	11,610,028.00	11,610,028.00	
10		Supply, laying, testing and commissioning of following size XLPE insulated Aluminum conductor 11K V (E) armored cable including excavation of earth, sand/brick protection refilling, watering & ramming or providing to earth etc. as per IS 1255: 1983.					
a		3CX 300 Sqmm Cable	6500	Metre	1,913.00	12,434,500.00	
11		Supplying and making cable end terminations for the following size of 11 KV grade, XLPE aluminium conductor armoured cable including termination kit complete heat shrinkable sleeve etc.					
a		11KV 3CX300 Sqmm Indoor Terminations	12	Nos.	8,798.00	105,576.00	

Sr No.		Description	Qty	Unit	Rate	Amount	Location
13		OUTDOOR Compact Substations at various places given below alongwith necessary software / SCADA Compact s/s comprising HT: SF6 RMU with two nos incoming motorised isolators and one nos motorized vacuum circuit breaker T/F: 11/0.433kV, 500kVA oil type transformer LT: - One no 4-pole 320A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One no 4-pole 125A fixed motorized , 415V MCCB O/g with built-in microprocessor based protection release - One 125kVAr APFC panel	1	No.	1,600,000.00	1,600,000.00	essential / critcal services, UPS, student centre etc.
14		Silent DG Set 250 KVA with AMF along with exhaust,fuel piping,tanks and Cooling System etc.DG set system equipped with automatis SCADA system as per specifications.	1	No.	2,250,000.00	2,250,000.00	essential / critcal services, UPS charrging, external lighting, security etc.
15		Comprehensive SCADA, PLC and software of controlling CSS HT / LT switchgears in conjunction with DG incomers of Main HT panel	1	No.	2,268,340.00	2,268,340.00	Central Substation
		Earthing System:					
16		Providing and laying of 600 x 600 x 6.3 mm thick GI plate electrode, with 2 nos. 50 X 6 mm GI strips from earth plate electrode to inspection chamber, 50 mm dia medium class GI pipe, CI funnel with 20 gauge GI wire mesh, masonry chamber 1000 X 500 mm with concrete base CI manhole cover with frame painted with bitumastic paint and packing with mixture of charcoal and common salt around plate electrode including digging of pit not less than 3 meters and back filling as required.	40	Nos.	7,448.00	297,920.00	

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Sr No		Description	Qty	Unit	Rate	Amount	Location
		Supplying and fixing of following bare G.I tapes including all necessary fixing accessories and effecting connections.					
a		GI Strip 50X6 mm	9560	Mtr	229.00	2,189,240.00	
b		GI Strip 32X6 mm	100	Mtr	155.00	15,500.00	
18		Communication Cable for Connecting CSS,33KV Substations and 11KV Boards to Central Contol Station.	6500	Mtr	181.00	1,176,500.00	From Main Sub Station to CSS
19		Steel Support for Cables	25	Ton	74,426.00	1,860,650.00	
20		Providing and laying of 600 x 600 x 3.15 mm thick tined copper plate electrode, with 2 Nos 50 x 6 mm copper strips from earth plate electrode to inspection chamber, 50 mm dia medium class GI pipe, CI funnel with 20 gauge GI wire mesh, masonry chamber 1000 x 500 mm with concrete base C I heavy duty / chequered plate manhole cover with frame painted with bitumastic paint and packing with mixture of charcoal and common salt around plate electrode including digging of pit upto permanent moisture level and as per soil condition but not less than 3 meters and back filling as required.	10	No	24,323.00	243,230.00	
21		Trenching work for 33 KV line	850	Mtr	1,000.00	850,000.00	
22		Supplying and fixing of following bare copper tapes including all necessary fixing accessories and effecting connections.					
a		Copper Strip 50X6 MM	200	Mtr	1,647.00	329,400.00	
		Total				**72,537,271.00**	

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