



जवाहरलाल नेहरु उन्नत वैज्ञानिक अनुसंधान केन्द्र
(मान्यता प्राप्त विश्वविद्यालय)
JAWAHARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH
(A Deemed University)

जक्कूर, बेंगलूर - 560 064, भारत / Jakkur P.O., Bengaluru - 560 064. INDIA

विज्ञान और प्रौद्योगिकी विभाग, भारत सरकार
Department of Science & Technology, Government of India

Tender enquiry for Conducting Electrical Safety & Energy Audit

Tender Reference No. : JNC/PUR/ELECTRICAL/18-19/WO/38

Tender Date : 29.08.2018

Last Date of Submission : 25.09.2018 at 3:00 PM

Date of opening of bids : 25.09.2018 at 4:30 PM

के. भास्करा राव / K. BHASKARA RAO
वरिष्ठ भंडार एवं क्रय अधिकारी / SR. STORES & PURCHASE OFFICER
जवाहरलाल नेहरु उन्नत वैज्ञानिक अनुसंधान केन्द्र
JAWAHARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH
जक्कूर, बेंगलूर - 560 064 / JAKKUR, BANGALORE - 560 064.

जक्कूर, बेंगलूर - 560 064, भारत / Jakkur P.O., Bengaluru - 560 064. INDIA

Ph: Off: (080) 2208 2750 / 2755 □ Fax: (080) 2208 2784 □ E-mail: purchase@jncasr.ac.in □ Website: <http://www.jncasr.ac.in>

1.1 Name of the work:

Conducting Electrical Safety & Energy Audit of JNCASR Labs and buildings at Jakkur Campus Bangalore.

1. Sealed tenders in **two parts Part I (Technical Bid) and Part II (Price Bid)** are invited in the prescribed format from the intending tenderers for conducting Electrical Safety & Energy Audit who should be professionally qualified degree holders / Agencies and experienced Electrical Safety & Energy Auditors / Agencies.
2. The firm should be enlisted in approved list of vendors/Engineers of Bureau of Energy Efficiency, Govt. of India, Ministry of Power. Firm shall submit the documentary proof of the same.
3. The firm should have the experience of carrying out at least **two Electrical Safety & Energy Audits** in Similar type of Laboratories/ Research Centres. Educational institutions, multistoried Lab, office buildings & any other electrical installations with a minimum connected load of 2000 KW in last 5 years (prior to date of issue of tender). Copy of work order/Completion certificate must be enclosed.

1.2 Important Information

a	The Bid Security / EMD and cost of tender shall be paid through Demand Draft in favour of Jawaharlal Nehru Centre for Advanced Scientific Research	Rs. 30,000/-
b	Tender documents can be downloaded from	www.jncasr.ac.in
c	Date and place of Pre-bid meeting	10.09.2018 at 11: 00 AM
d	Last date and place of submission of completed bid	25.09.2018 at 3:00 PM
e	Date & Time of opening of Part I (Technical Bids)	25.09.2018 at 4: 30 PM
f	Date & Time of opening of Part II (Price Bids)	Will be intimated later
g	Commencement Date	Immediately form the date of issue of Work Order
h	Timer period of completion audit	90 days from the date of issue of Work Order
i	Payment condition	100 % payment within 30 days from completion and handing over of the audit report and as built drawing to JNCASR in all respect as per scope of the work
j	Liquidity Damages	1% per week subject to maximum of 10% of the contract value
k	Value of the tender	90 days from the date of opening of Technical Bid
l	All disputes arising shall be subject to the jurisdiction of	Bangalore only.



m	Contact Person for communication in connection with this TENDER	For Commercial clarification Sr. Stores & Purchase Officer Contact No: 2208 2756 For Technical clarification Mr. Sujeeth Kumar Contact No: 2208 2763
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- 1.3 Vendors are required to furnish Technical and Commercial covers separately. The **Technical Cover** should contain all the technical information and EMD. All the commercial terms and conditions are also should be part of Technical Bid without price information. **Commercial Cover** should contain Price Bid Format as well as the price information.
- 1.4 Your employees can not claim any right for the employment from the Centre.
- 1.5 Centre does not have any liability for the injuries or the mishap of your employees when they are on the job. You should compensate for the damages any caused to the Centre by your personnel on the Campus.
- 1.6 You should comply all the statutory requirements to full fill labour law for deploying your personnel on the Campus.
- 1.7 You are required to provide all the necessary implements and the safety gadgets to your personnel while they are on the job.
- 1.8 Any change in the man power deployment and the scope of work, you need to obtain necessary approvals from the competent authority of the Centre.
- 1.9 Any legal obligations are subject to the Bangalore Jurisdiction only.
- 1.10 The proposal should be addressed to **Sr. Stores & Purchase Officer, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bangalore 560 064** with superscript on the cover as Tender for conducting Electrical Safety & Energy Audit of JNCASR.
- 1.11 Vendors are required to indicate contact details of at least 3 clients from whom, Centre if decides would get a feed back about their performance.
- 1.12 Vendor should furnish financial statement for the last 3 years certified by their Auditors.
- 1.13 Vendor should mention the turnover for last three years.
- 1.14 The Centre reserves a right to accept or reject any part or whole tender without assigning any reasons.
- 1.15 The Vendor should do a site visit before submission of tender and obtain approval from JNCASR.


Sr. Stores & Purchase Officer





Jawaharlal Nehru Centre for Advanced Scientific Research

Jakkur

Bangalore-560 064

Part-I / Technical Bid

Tender enquiry for Conducting Electrical Safety & Energy Audit of JNCASR

Name of the firm:

Address:

Email:

Telephone:

Fax:

Name of contact person for the work:

Mobile Number:

Email:

No. & Date of submission of the tender:



Form of Tender

Place _____

Date _____

To,
The Senior Stores and purchase Officer
Jawaharlal Nehru Centre for Advanced
Scientific Research, Jakkur
Bangalore – 560 064

Dear Sir,

We have carefully examined the specifications, designs and schedule of quantities relating to the Electrical Safety & Energy Audit specified in the memorandum hereinafter set out and having visited and examined the site of the Electrical Safety & Energy Audit as specified in the said Memorandum and having acquired the requisite information relating thereto as affecting the tender. We hereby offer to conduct the Electrical Safety & Energy Audit as specified in the said Memorandum within the time specified in the said memorandum at the rates mentioned in the attached Price Bid Format and in accordance in all respects with specifications, designs and instructions in writing referred to general instructions to the tenderers and special conditions, conditions hereinbefore referred to, specifications, data sheet and Price Bid Format and with such equipment's as are provided for, by and in all other respects, in accordance with such conditions so far as they may be applicable.

MEMORANDUM

a	Description of work	Conducting Electrical Safety & Energy Audit of JNCASR, Jakkur
b	Terms of Payment	100 % payment within 30 days from completion and handing over of the audit report and as built drawing to JNCASR in all respect as per scope of the work
c	EMD of Tender	Rs. 30,000/-
d	Time allowed for completion of work	90 days from the date of Work Order.

2. We also agree that our tender will remain valid for acceptance by JNCASR for 90 days from the date of opening of the tender and this period of validity can be extended for such period as may be mutually agreed between JNCASR and us in writing.

3. Should this Tender be accepted, I/We hereby agree to abide by and fulfil all the terms and conditions of the Tender and in default thereof, to forfeit and pay to you or your successors, or assignees or nominees such sums of money as are stipulated in the conditions contained in the tender together with the written acceptance of the contract.



4. I/We understand that you reserve the right to accept or reject any or all the tender either in full or part without assigning any reason thereof.
5. We have deposited a sum of Rs.30,000/- as EMD which amount is not to bear any interest. Should we fail to execute the contract when called upon to do so, we do hereby agree that this sum shall be forfeited.

Dated this _____ day of _____ 2018.

For and on behalf of M/s _____

(Signature with seal)

Name _____

Designation _____

Place _____

Date _____



Conditions

1. The tenders for the above work shall be submitted in separate sealed covers for Part I and Part II and one another cover for containing both envelope of Part I and Part II addressed to The Senior Stores and Purchase Officer, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur Bangalore – 560 064, so as to reach not later than **3.00 P.M.** hours on **25/09/2018**. The envelope shall be super-scribed "**Tender for conducting Electrical Safety & Energy Audit for JNCASR campus at Bangalore (Part-I/ Part-II)**". Part I of the tender will be opened on **25/09/2018** at 4.30 P.M. hours.
2. Part – II of the tender will be opened on subsequent date under intimation to all the tenderers. Tenderers are advised to use only the forms supplied by the JNCASR and not to use any other forms. Incomplete tenders are liable for rejection. No terms and conditions or any other information/ enclosures shall be included in the tender Part-II.
3. The tenders shall be valid for acceptance by the JNCASR for a period of 90 days from the date of opening of tender and shall be extended by such period as may be mutually agreed to.
4. **Prices:** The price quoted for the work shall be firm till completion of the work and shall include GST as applicable and cost of transportation/accommodation etc. of the equipment and persons deputed.
5. This contract is a fixed lump sum contract in respect of the entire Electrical Safety & Energy Auditing and to be paid for according to, at the rates contained in the schedule of rates and as provided in the said conditions.
6. The employer reserve to itself the right of altering the items to be executed by adding to or omitting any items without prejudice to this contract. However, the Auditor shall not be entitled to any payment for the works done exceeding the tender quantities unless specifically approved in writing by the JNCASR.
7. **Completion Period:** The time for completion of the entire work is 90 days from the date of award of work. The site survey, data collection/measurements and draft report shall be completed in 60 days and the final report shall be submitted within 15 days thereafter. The work completion means submission of safety audit report & as built drawings to the JNCASR in all respect as per scope of the work.
8. **Liquidity Damages:** If work does not completed within stipulated time period as mentioned clause 10 a liquidity damage of 0.5% per week for the delayed period and amount subject to maximum up to 10% of contract amount.
9. JNCASR does not bind itself to accept the lowest or any tender and reserves to itself the right to accept or reject any or all the tenders, either in whole or in part, without assigning any reasons for doing so.
10. **Payment :** 100 % payment within 30 days from completion and handing over of the audit report and as built drawing to JNCASR in all respect as per scope of the work.



List of clients

(For whom similar scope has been completed in the last 5 years.)

Sr. No.	Details	Name of client (1)	Name of client (2)	Name of client (3)
1	Establishment name, location and address.			
2	Telephone and email address			
3	Connected load of Building			
4	Brief details of the work			
5	Date of award of contract			
6	Date of completion of work			
7	Work order detail			
8	Whether the Establishment is with central air-conditioning system			

Copy of work order/Completion certificate must be attached



Scope of work

Introduction

JNCASR, Bangalore intend to conduct Electrical Safety & Energy Audit of the Electrical/Electromechanical, electronic and laboratory installations of Jakkur Campus at Bangalore. The JNCASR receives power supply from the BESCOM and have HT & LT Ring Mains. In addition, we have 11 KV HT diesel generator sets of suitable capacities have been installed.

The Agencies requested to visit the JNCASR, Jakkur Campus premises before quoting the rates. To facilitate your visit, you may contact Mr. Sujeeth Kumar, Electrical Engineer during office hours.

Objective

- The objective of conducting Electrical Safety & Energy Audit is to review the condition of the existing electrical installation and to recommend measures for further strengthening the system in order to eliminate/reduce the electrical/fire hazards and to improve the safety of the personnel. The audit shall mainly focus on:
- Identifying the potential electrical/fire hazards
- Boosting employee morale by providing safe working environment.
- Smoothening the operation and maintenance of electrical installation.
- Avoiding loss of properties, human life and costly equipment.
- Ensuring the compliance with relevant codes and practice, statutory rules and regulations.
- Establishing procedures and process of safe working in electrical installation.

A. Statutory Requirements:

Electrical Safety & Energy Audit (ESA) of the Building and Electrical Installations shall be carried out with reference to applicable Indian Standard, Indian Electricity Rules(IE), PD Manual (Para 4.11), and other relevant codes of Practice to identify potential electrical hazards to prevent or minimize accidents. The Audit should be carried out using calibrated instruments and personal protective equipment during field visits for inspection and data collection. During the Audit, the audit team should ensure that in addition to other provisions of the IE rules as per IE Act, the provisions contained in Para 29 of the IE act specifically listed as under are complied with:

Para 29:- Construction, installation, protection, operation and maintenance of electric Supply lines and apparatus-



1[(1) All electric supply lines and apparatus shall be of sufficient ratings for power, insulation and estimated fault current and of sufficient mechanical strength, for the duty which they may be required to perform under the environmental conditions of installation, and shall be constructed, installed, protected, worked and maintained in such a manner as to ensure safety of 2[human beings, animals and property].]

(2) Save as otherwise provided in these rules, the relevant code of practice of the 3[Bureau of Indian Standards] 4[including National Electrical Code] if any may be followed to carry out the purposes of this rule and in the event of any inconsistency, the provision of these rules shall prevail.

(3) The material and apparatus used shall conform to the relevant specifications of the 3[Bureau of Indian Standards] where such specifications have already been laid down.

1. Subs. by GSR 358, dt. 30.4.1987, w.e.f. 9.5.1987.

2. Subs. by GSR 45, dt. 1.1.1993, w.e.f. 23.1.1993.

3. Subs. by GR. 466, dt. 18.7.1991, w.e.f. 17.8.1991.

4. Ins. by GSR 358, dt. 30.4.1987, w.e.f. 5.9.1987.

Relevant Codes of Practices:

Some of the relevant codes of practice are enumerated below:

- a. Indian Electricity Rules, 1956 (as amended up to date)
- b. IS: 5216 (Part-I) Recommendations on Safety Procedures and practices in Electrical Work.
- c. IS: 5216 (Part-II) Recommendations on Safety Procedures and practices in Electrical Work.
- d. IS: 1646-1961 Code of Practice for fire safety (General) : Electrical works
- e. IS: 4770: 1968 – Specifications for Rubber gloves for Electrical Purpose
- f. IS: 2309 Protection of Buildings and Allied Structures against Lighting
- g. Gazette Notification dated 20th September 2010 issued by Central Electricity Authority regarding Regulations for measures relating to safety and Electric Supply.
- h. National Building Code, 2005 (as amended up to date)
- i. Para 4.11 of PD Manual “Guidelines for operations and maintenance of various installations in the Bank’s properties
- j. Any other local guidelines / bylaws as applicable.



B. Scope of work

The scope of work for the Electrical Safety & Energy Audit shall include but not limited to:

1. **Study of existing safety measures**, procedures and system for controlling electrical hazards being followed in the office with respect to statutory and regulatory requirements, electricity rules etc. and suggest for further measures in case of any gap.
2. **Preparation of single line diagram (SLD) of Electrical Installation** from HT panel to Floor panels, covering transformers, main LT panel, capacitor panel, DG set, UPS Panel, Buildings main panels, SDB, DB, Lighting & Power points upto the end user point& identification by marking/ tagging etc. The SLD should indicate the ratings of the equipment, feeders (wherever possible) etc.
3. **Preparation of earthing layout** encompassing all the accessible and working earth pits in the office premises. Each earth pit should be given a unique identification number and marked on building plan.
4. **Earth Resistance Testing**
 - The earth resistance testing shall be carried out to measure the earth resistance on all the earth pits and its compliance with respect to Indian Electricity Rules may be verified.
 - The continuity of earth strip/conductor from the earth pit the earth terminal of the respective electrical equipment shall be checked and verified.
5. **Identification of any unbalancing of loads.** The unbalancing/overloading, if any, in the electrical installation viz. transformers, LT panels, Emergency panel, Floor Distribution Panels, Distribution Boards etc. shall be identified with the help of measuring equipment.
6. **Identification of Hot Spots using thermal camera:** The hot spots, if any, in the electrical installation panels and distribution boards shall be identified with the help of thermal imaging/thermography.
7. **Checking of Elevators** for passenger and freight/bullion movement and passenger safety testing including testing of door safeties, alarms, overload protection and Automatic rescue devices, firemen control/switch, wiring in shaft and machine room etc Provided in the lift installations and gaps if any shall be identified and indicated in the audit report.
8. **Physical inspection of the sources of power supply** viz Transformers, substation equipment, DG set , UPS installations, AC, Chiller Plant and associated power distribution electrical installations including power supply systems & wirings for server rooms, IT equipment etc shall be done with reference to applicable Indian standards, Indian Electricity Rules and other relevant codes of practice. Any leakage of oil in transformer, capacitor banks, diesel/water/oil in DG sets, leakage of oil/refrigerant in AC plant, leakage of water in lift shaft, leakage of water over any electrical equipment etc to be checked.



9. Identification of Electrical hazards such as loose wire hanging, cables not dressed properly, broken switches, plugs and sockets etc. shall be done.
10. Checking of the protection devices in upstream and downstream switchgears and their settings to ensure that the same are in the desired graded manner as designed as per the requirements of existing standards including setting/adequacy of ELCB and their ratings for earth leakage protection.
11. Checking of the Lightning protection system of the building and ensuring that lightning arrestors are connected to two isolated earth pits. These pits should not be connected to electrical system earth.
12. Checking of Illumination level in various working area as per standard and identifying gaps/shortfalls if any as per process/area requirement.
13. Checking of the provision of electrical shock treatment chart in Hindi and local language near electrical equipment and substation. Checking the record of the training provided to the electrical staff on electrical safety, shock treatment and to handle emergencies and artificial respiration.
14. Checking of the provision of Danger sign Boards indicating the voltage at a prominent location of electrical installation.
15. Checking of the cable terminations at various panel and distribution boards to avoid phase and earth fault.
16. Checking of the provision of protective guards and belt covers for all the rotating electrical equipment.
17. Checking the provision of fire fighting equipment and fire alarm system detectors near all the electrical installations, Labs, Buildings, etc.
18. Making as built Drawings Soft Copy & hard Copy & Identification by numbering/Tags etc. for each Loads.ie..Power points, Light Points, etc.
19. To check the provision of insulated mats of ISI mark in front of all the electrical panels.
20. To check the provision and use of proper height, strong and properly insulated ladders for the maintenance work.
21. To check the provision of proper ventilation of electrical panel rooms, UPS and battery rooms etc.
22. In addition to above, checking for any shortfalls in the existing electrical systems which impact on human and fire safety



C. Electrical Energy & Safety Audits Scope of work includes physical inspection of the individual laboratories(**Approx 37 Buildings/Load centre**) & make as built drawings up to the end of the user points with reference to the applicable Indian Standards, Indian Electrical Rules & other relevant codes of practice & identify electrical hazards(shocks, fires etc...)

- Review of role of electrical safety in the total safety system.
- Review of Protection device/system of the Electrical Installation.
- Review of adequacy of labs & common area lighting, protection system as per national & international standards to suggest recommendation as per applicable standards.
- Review of the Hazardous area.
- Critical study of operation of the following equipments.
 1. Electric Motors.
 2. Pumps, Blowers & Fans.
 3. Air Compressors
 4. Refrigeration & Central A/C Plants.
 5. Cooling Towers.
 6. Electrical Power System.
 7. Lighting.
 8. Electrical furnaces.
- Electrical Measurements namely, voltage, current, power factor & power input of all important loads.
- Measurement of Mechanical parameters of pumps, fans & blowers to the extent practically possible.
- Air compressor capacity tests & air leakage tests, Sp, Energy Consumption analysis.
- Measurement of Chiller/ Air-conditioning operation parameters, water /brine/air flow estimation, compressor power, Sp, Power consumption in kW per TR.
- Measurement of illumination & lighting power.
- Study of variation & improvement in Maximum Demands, Power factor & Load factor.
- Technical upgradation to SAVE ENERGY.
- ELECTRICAL Distribution losses.
- All Types of Spinning Machines.

Power Supply Optimization & Control

1. Power factor
2. Distribution loss

Power & Lighting System

1. Lighting Level V/S needs
2. Efficient Lamp & Ballast
3. Cost benefits
4. Efficient Lighting Fixtures
5. Maintenance Techniques
6. Power analyzing of critical loads
7. Harmonic analysis
8. Lighting control



Final Recommendations

1. Short Term Recommendations
2. Long Term Recommendations
3. Economic Feasibility

D: Equipment/measuring instruments

All the equipment/instruments required for carrying out the Electrical Safety & Energy Audit will have to be arranged by the firm without any extra payment to the JNCASR. The firm should have the following minimum equipment/instruments for Electrical Safety & Energy Audit:

- Three-phase Power analyser
- Thermography camera
- Earth tester
- Megger
- Any other equipment/instrument

Please note that the JNCASR will not provide any kind of assistance in the form of men/material and the firm will have to make their own arrangement for all assistance

E. Work at site

The firm may visit the premises and ascertain site conditions. The work has to be carried out in working Lab, office building without causing inconvenience to the normal working of the Labs. No power shut down will be provided. Power shut down required for the work will be given on holidays and after office hours at the discretion of the JNCASR. No extra claims will be admissible later on these grounds.

The firm should deploy only qualified and experienced Engineers/Technician having requisite licenses to carry out such works. Utmost care shall be exercised by the firm in carrying out the work to ensure that no damage is caused to persons and properties. The JNCASR will not be liable for any injury or damage to persons and any such happening will be entirely the responsibility of the firm. The persons carrying out the Electrical Safety & Energy Audit shall also use all the required Personnel protective equipment for their own protection.

Please see **Annexure I** for the details of Electrical installations / main power sources and list of load Centres for conducting Electrical Safety and Energy Audit.



F: Submission of Report

After completion of the audit, post audit review meeting shall be held with the JNCASR committee detailing about their observations. The audit report shall include the status of the entire electrical installation observed by the audit team during the safety audit. The report shall also include the recommendations of the audit team for improvement in the electrical installations.

Date:

Place:



Seal & Signature of Tenderer

के. भास्करा राव / K. BHASKARA RAO
वरिष्ठ भंडार एवं कय अधिकारी / SR. STORES & PURCHASE OFFICER
जवाहरलाल नेहरू उन्नत वैज्ञानिक अनुसंधान केंद्र
JAWAHARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH
जक्कूर, बेंगलूर - 560 064 / JAKKUR, BANGALORE - 560 064.





JAWAHARLAL NEHRU CENTRE FOR ADVANCED SCIENTIFIC RESEARCH.

Jakkur, Bangalore- 560 064

Price Bid Format

Name of Work: Tender for Conducting Electrical Safety & Energy Audit of JNCASR

Sl. No.	Description	Quantity	Amount (Rs.)	GST (Rs.)	Total Amount (Rs.)
(1)	(2)	(3)	(4)	(5)	(6)
1.	Rate for conducting Electrical Safety & Energy Audit and Submitting Electrical Safety & Energy Audit Reports & Making & Marking Electrical as built drawings up to the End user points for individual buildings/labs etc. (3 soft & odd copies) as per the scope specified in the tender.	Lumpsum			

Total Amount in words (6):

Date:

Seal and Signature of the Tenderer

Place:



ANNEXURE – I

Electrical Safety and Energy Audit

Major Electrical installations / Main Power Sources :

- a. CSS-1000KVA [11KV/440V] – 6 Nos.
- b. ONAN type transformers 500KVA –[11KV/440V] -2 Nos.
- c. 1000 KVA, 11 kv HT DG 2 SET , LT –DG set 500KVA -440V -1 set with AMF Panel.
- d. HT-RMU -3 Nos.
- c. LT RMU Panels – 30 Nos .
- e. LT Main Panels- 65 Nos.
- f. HT and LT UG cables.

List of Load Centres for Electrical Safety and Energy Audit :

- 1. Admin block I, II & III
- 2. Complab
- 3. Old EOB, Store & Purchase Office
- 4. TSU, Light Scattering
- 5. MBGU Block-Old
- 6. MBGU Block-New
- 8. HIV Lab
- 9. Old Animal House
- 10. New Animal house
- 11. New EOB,NSU
- 12. Staff Canteen
- 13. EMU
- 14. Hall of Science
- 15. Kanada Building
- 16. Collage Building
- 17. NCU Lab
- 18. Nano Lab
- 19. AMRL Conference Hall
- 20. AMRL Lab
- 21. ICMS
- 22. SSL
- 23. I House
- 24. Hostel I
- 25. Hostel II
- 26. Hostel III
- 27. Hostel IV
- 28. Dhanavantari
- 29. Quarters –Post Doc
- 30. Quarters –Staff



Contd....

- 31. Administrative Officer House**
- 32. STP**
- 33. AMRL Dining hall**
- 34. Basket Ball, Volley Ball and Tennis ground**
- 35. Street Lighting and Flood Lighting 350**
- 36. PUMP House I TO V**
- 37. New Auditorium**



A handwritten signature in blue ink, consisting of a stylized cursive script followed by a long horizontal stroke.