INDIAN INSTITUTE OF ASTROPHYSICS

2ND BLOCK, KORAMANGALA, SARJAPUR ROAD
BANGALORE – 560034

TENDER DOCUMENT

Name of Work: **REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I PhD LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE – 34.**

Tender Notice No: 01/IIA/CIVIL/BNG/IPhD/2011-12

Ph.25530672-676, **Fax**: 25534043
Website: www.iiap.res.in, **E-mail:** astron@iiap.res.in

INDIAN INSTITUTE OF ASTROPHYSICS

2nd BLOCK, KORAMANGALA, SARJAPUR ROAD
BANGALORE-560 034

PUBLIC TENDER NOTICE NO: 01/IIA/CIVIL/BNG/IPhD/2011-12

DATED: July 18, 2011 **(TWO BID SYSTEM)**

The Indian Institute of Astrophysics invites sealed item rate tenders on behalf of The Director in "Two part" in the prescribed form from appropriate registered contractors in state PWD, CPWD, MES, Scientific institutions and private body competent contractors who have executed works of similar nature.

Sl. No	Name of the work	Estimated cost in Rs.	Time for completion	EMD Rs.	Cost of tender document Rs.
1.	REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I Ph.D LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE-34	32.77 Lakhs	5 Months	65000.00	1000=00

The Tender Document can be viewed and downloaded from our website www.iiap.res.in/tenders.htm. The interested tenderers may at their option down load the same, **as "NO" hard copies of Tender document shall be provided from this office** and submit their offers along with EMD (refundable) & Tender fee (non-refundable) prescribed therein, only in the form of Demand Draft drawn in favour of Director, IIA.

The Offers should be submitted in two sealed covers one super scribed "Technical Bid" and other "Price Bid". Both covers shall be put in another sealed cover super scribing the envelope with "Tender for Remodeling of proposed I PhD laboratory at the premises of Indian Institute Of Astrophysics campus, Bangalore., Notice No. and due date", shall be submitted addressed to The Director, Indian Institute of Astrophysics, Bangalore – 560 034. The last date of submission of bid is **August 12, 2011 on or before 3:00 pm.** The Technical bids will be opened at **3.30 pm.** on the same day in the presence of attending tenderers or their authorized representatives.

After opening of Technical bid, the capability and suitability of the bidders shall be evaluated and Price bid of the qualified bidders shall only be opened in the presence of the attending bidders. The date of opening of Price bid will be informed to the qualified bidders.

Following are the Qualifying Criteria:

1) Should have completed at least one similar work costing not less than Rs.30.00 lakhs including Civil & Electrical during previous 3 Years for Government / Semi Government/Reputed corporate clients.

Or

Three similar works each costing not less than Rs 15.00 lakhs including Civil & Electrical, during previous three Years for Government / Semi Government/Reputed corporate clients.

The intending Bidders shall furnish the relevant experience certificates duly signed by the competent Authority not less than the rank of Executive Engineer.

2) The tenderers should submit latest Audited Balance Sheet duly certified by the Chartered Accountant and also the latest TDS Certificate indicating the Income Tax deducted by the client for the execution of similar works.

The Director, IIA reserves the right to accept or reject any or all tenders without assigning any reason thereof.

Administrative Officer
For Director

3. INSTRUCTIONS TO THE TENDERERS

1. The tenderers should submit the entire documents (Technical bid and Price Bid) with all the pages of document duly signed.

2. The Offers should be submitted in two sealed covers one super scribed "Technical Bid" and other "Price Bid". Both covers shall be put in another sealed cover super scribing the envelope with "Tender for Remodeling of proposed I PhD laboratory at the premises of Indian Institute Of Astrophysics campus, Bangalore., Notice No. and due date".

3. If any clarification is required should be obtained before filling Tender Document.

4. If any discrepancy is there between figures and words for quoted rates, the lower of the two will be considered for the purpose of evaluation.

5. The tenderers who do not fulfill all or any of the tender conditions or if the tender is Incomplete in any respect, will be summarily rejected.

6. The Institute is not bound to accept the lowest tender.

7. Even though the Tenderers meet the above criteria, they are subject to be disqualified if they have (The Institute reserves the right to verify the particulars furnished by the tenderers.)

- Made misleading or false representations in the forms, statements and attachments submitted in proof of the qualification requirement, Conditional bid / proposal: and / or

- Record of poor performance such as abandoning the works, not properly completing the contract, inordinate delays in completion, litigation history, or financial failures etc.

8. Any effort by the contractor to influence the client in the bid evaluation, bid comparison or contract award decision results in rejection of the contractors bid.

9. Incomplete Technical Bids are liable for rejection. Commercial/price bids will be Considered for opening only for the Qualified Technical Bidders, which are recommended by the Technical evaluation committees being constituted for the purpose.

10**.** Late/delayed offer will not be considered at all.

11. IIA is not responsible for any delay / loss of documents in transit.

12. No bids will be considered if prescribed Tender Fee and EMD is not found with Technical bids (Part I).

13. All overwriting and corrections shall be duly attested.

14. Corrigendum's / modifications / corrections, if any, will be published in the website only.

15. The Director, Indian Institute of Astrophysics reserves the right to accept or reject the tenders in full or part without assigning any reason thereof.

16. Performance certificates of the completed works issued by the clients to be enclosed in the technical bid.

17.The committee constituted by the director may inspect the previously completed or the ongoing works of the bidders to asses their technical suitability for the tendered work.

18.All the pages of the tender document to be signed by the contractor and submit them in the respective sealed covers.

INDIAN INSTITUTE OF ASTROPHYSICS,
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BANGALORE – 560034.

TECHNICAL BID

Name of Work: **REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I Ph.D LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE.**

Tender Notice No: 01/IIA/CIVIL/BNG/IPhD/2011-12

Name of
The Firm: _____

Address: _____
_____
_____

Phone No: _____

Last date for submission: **August 12, 2011 up to 3:00 PM.**

FORMAT FOR SUBMISSION OF TECHNICAL & ORGANISATIONAL DETAILS.

NAME OF THE FIRM :

1. OFFICE SET UP OF THE FIRM

1.1 Office Address : ……
……
……

1.2 Year of Establishment: ……

1.3 Contact Person Shri……..
With Designation ……
Ph No……..
Fax No…….
E-mail……..

1.4 Details of registration if any: …….
…….

1.5 Organizational setup of the firm
Total staff strength both technical
and Administration with their name, age
qualification and experience : ……

1.6 Details of the staff as per the following format.

Sl. No	Profession/discipline	Name	Age	Qualification	Experience (total years)	Field of experience
	Civil					
	Electrical					

2 **TENDERER'S EXPERIENCE**

Details of Works carried out and on hand during last five years with details such as name of work, year of completion, client name and address, cost of work, time period of construction, nature of work, etc., (It shall enclose a certificate from the owner that the service rendered by the firm has been satisfactory)

Sl. No	Name & description of work	Value of work and date.	Period of construction and date.	Client persons to whom reference may be made.

3. TOOLS AND EQIPMENT LIST

The tenderer shall indicate herein below the equipment he has in possess and the equipment he proposes to bring to the site, in case the work is awarded to him.

Sl. No	Type and Description of the equipment.	Numbers the bidder has in possession	Numbers he proposes to bring on to site

Tenderers hereby confirms that the quantity and type of tools he will employ for construction will not be less than those listed above and agree to bring more equipment if so warranted in the opinion of the Engineer-in-charge.

4. FINANCIAL

Bank Name: _____

Branch: _____

Account No.: _____

Average Annual Turnover for last 5 Years: _____

6. INSURANCE

Accident Insurance

Insured with: _____

Policy No.: _____

7. Details of Arbitration cases : ……

8. Any other detail you would like to intimate in support of your technical bid for appointment : ……

Signature of the authorized
Person with seal of the firm

(Note: Attach separate sheet for furnishing information in case the space in the format is insufficient)

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PRICE BID

Name of Work: **REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I Ph.D LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE.**

Tender Notice No: 01/IIA/CIVIL/BNG/IPhD/2011-12

Name of
The Firm: _____

Address: _____
_____
_____

Phone No: _____

Last date for submission: **August 12, 2011 at 3.00 P.M**

TENDER FOR THE REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I Ph.D LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE.

Conditions of contract.

Sealed item rate tenders are invited by Indian institute of Astrophysics for the above mentioned work

Estimated cost	: Rs 33.77 Lakhs (Thirty Three lakhs Seventy Seven thousand only)
Time of completion	: Five Months.
Period of commencement	: 7 days from the date of receipt of work order
Percentage of retention money:	: 5% to be deducted from each RA bill and shall be released as under i)(50% on completion of works and along the final bill .ii) Balance 50% less recovery, if any towards the cost of defects rectified by employer due to lack of response of the contractor on completion of defects liability period and on certification by the engineer – in charge.
Defects liability period	: 12 Months.
Amount of liquidated damage	: 1%(one percent) per week subjected to the maximum of 10% of the value of contract.
Escalation	: In view of the short duration of the contract, no escalation will be paid to the contractor on account of changes in the market prices of any items of work or changes in the cost of living indices etc.

The Director, Indian institute of Astrophysics reserves the right to reject any or all the tenders without assigning any reason whatsoever.

The scope of the work and explanatory notes given below are neither complete nor exhau

-stive but are added to assist the contractor to understand the scope of the work.

The site is located at the ground floor of the Optics tower section, north east corner of the IIA campus at Koramangala adjacent to the optics block. The mezzanine floor and the external staircase needs to be added to the ground floor . Tenderers are advised to inspect and examine the site and its surroundings and satisfy themselves before submitting their tenders as to nature of the site, the means of access to the site. A tenderer shall be deemed to have full knowledge of the site whether he inspects it or not and no extra charges consequent on any misunderstanding or otherwise shall be allowed, in general shall themselves obtain all necessary information.

The tenderer shall be responsible for arranging and maintaining at his own cost all **materials, tools and plants, water, electricity,** facilities **for workers, safety norms** and all other services required for executing the work.

Timely completion of work and quality of workmanship are of prime importance and the work shall be completed within the stipulated period. **Cement consumption must match with standard theoretical calculations. Recovery to be effected in the event of not fulfilling the cement consumption.**

I/ We have read the tender notice, specifications, schedule, drawings, general rules and all other contents of the tender conditions, and Understand that you are not bound to accept the lowest or any tender you may receive.

I/ we hereby tender for the execution for the Director for the work specified above within the time specified above, at the rates specified in the attached schedule of quantities and in all respects with these specifications, design, drawings and instructions.

I/we agree that should I/we fail to commence the work specified in the above memorandum an amount equal to amount of earnest money mentioned in the form of invitation of tender shall be absolutely forfeited to the Director.

Dated: ---------- **Signature of the Contractor**
With stamp

General conditions of contract.

Item rate tender for works.

- The Institute reserves the right to alter the scope /or reduce quantum of work before issue of work order and the contractor shall not have any claim what so ever on this account.

- Rates quoted by the contractor in item rate tender in figures and words shall be accurately filled in so that there is no discrepancy in the rates written in figures and words. However if a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall be taken as correct.

- If the amount of an item is not worked out by the contractor or it does not correspond with the rate written either in figures or words, then the rate quoted by the contractor in the words shall be taken as correct.

- When the rates quoted by the contractor in figures and in words tally but the amount is not worked out correctly the rate quoted by the contractor will be taken as correct and not the amount.

- The contractor shall take all precautionary measures to prevent entry of dust, dirt and noise pollution to the adjacent buildings and keep the premises neat and tidy, remove surplus materials and rubbish and shall not cause inconvenience to the staff of IIA. If the contractor or his working people or servants shall break, deface, injure or destroy any part of a building in which they may be working or any buildings, road, kerbs, fence, enclosure, water pipes cables, drains, electric and telephone posts or wire, trees grass or garden. The cost of any such damage and risks arising out of this shall be entirely borne by the contractor.

- A bill shall be submitted by the contractor each month on or before the date fixed by the Engineer- in charge. All the measurements of the work may be recorded jointly by the Engineer-in charge and the contractor or their respective representatives. The measurements will be taken at site, as per latest IS code of practice for measurements. All measurements shall be taken with steel tapes only.

- The Engineer-in-Charge shall have full powers to the removal from the premises of all materials and bad workmanship, which in his opinion are not in accordance with the specifications.

- The Engineer–in-Charge may require the contractor to dismiss or remove from the site of the work any person or persons in the contractors employ upon the work who may be in competent or misconduct himself.

- For working on Sundays, holidays and late hours prior permission will be accorded by the Engineer-in charge on the application made by the contractor.

- All works under the contract shall be executed under the direction and subject to the approval in all respects of the Engineer-in-Charge who shall be entitled to direct at what point or points and in what manner they are to be commenced and from time to time carried on.

- The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work etc as institute's property and such materials shall be disposed off to the best advantage of the Institute.

- The contractor shall execute the whole and every part of the work in the most substantial and workman like manner and in strict accordance with the specifications of the CPWD / DOS / Bureau of Indian Standards. In case of any class of work for which there is no such specifications the contractor shall carry out the work in all respects in accordance with the instructions in writing of the Engineer- in-Charge.

- The Engineer-in-Charge shall have powers to make any alterations in, omissions from, additions to or substitutions for the original specifications, drawings, designs and instructions that may appear to him necessary or advisable during the progress of the work and the contractor shall carry out the work in accordance. The rates for such additional, altered or substituted items of work shall be worked out in accordance with the standard procedure followed in CPWD / DOS.

- If at any time after the commencement of the work, the director shall for any reason whatsoever not require the whole thereof as specified in the tender to be carried out, the Engineer- in-Charge shall give notice in writing of the fact to the contractor who shall have no claim to payment of compensation whatsoever on account of any profit

or advantage which he might have derived from the execution of the work in full, but which he did not derive in consequence of the full amount of the work not having been carried out, neither shall he have any claim for compensation by reason of any alterations having been made in the original specifications, drawings, designs and instructions which shall involve any curtailment of the work as originally contemplated.

- The contractor shall obtain a valid license under the Contract Labour (R&A) act 1970 and the contract labour (Regulation & Abolition) central rules, 1971 before the commencement of the work and continue to have a valid license until the completion of the work. No labour below the age of eighteen years shall be employed on the work. The contractor shall pay to labour employed by him either directly or through sub contractors, wages not less than fair wages as defined in the provision of the contract labour (R&A) act 1970 and the contract labour (R&A) central rules 1971 wherever applicable.

- The contractor shall at his own expenses arrange for the safety provision as per safety code framed from time to time and shall at his own expenses provide for all facilities in connection therewith.

- The contractor shall comply with all the provisions of the payment of wages act 1936, Minimum Wages Act 1948, Employees liability act 1938, Workmen's Compensation act 1923, Industrial Disputes Act 1961 and the Contractors Labour (R&A) Act 1970 or the modifications thereof or any other laws relating thereto and the rules made there under from time to time. The regulations aforesaid shall be deemed to be a part of this contract and any breach thereof shall be deemed to be a breach of this contract. Security deposit will not be refunded till clearance certificate from Labour Officer is obtained by contractor.

- The contractor shall make his /their own arrangements for water required for the works and nothing extra will be paid for the same, as the water available from the institute source may not be sufficient to meet the construction.

- The contractor shall have all the tools and plants necessary to carry out the work such as concrete mixer, vibrator and hoist. The contractor shall employ one graduate engineer during the execution of the work.

- Certified plumbers should be employed by the contractor on the plumbing and sanitary work.

- The standard sectional weights referred to as standard tables in para 5.3.3 in CPWD specifications for works 1977 vol. 1 to be considered for conversion of length of various sizes of M.S bars and tor steel bars in to weight.

  Size (diameter MM) Weight Kg/M

6	0.222
8	0.395
10	0.617
12	0.888
16	1.579
18	1.999
20	2.467
22	2.985
25	3.855
28	4.836
32	6.316

- The entire work is to be completed within the period stipulated i.e. FOUR MONTHS from the 15th day of issue of Letter of Intent/Work Order. The period includes monsoon period also. Time shall be the essence of the contract. After the work awarded, the contractors shall furnish detailed time schedules for the approval of the Engineer-in charge which after approval shall form part of the contract and are to be strictly adhered to.

- The maintenance period for the work shall be twelve months and any defects noticed during the period shall have to be rectified by contractor at his cost, failing which the action taken for maintenance Engineer-in-Charge shall be final over which the contractor will not have any claim.

- The contractor shall extend all co-operation to the contractors executing works such as electrical, air conditioning etc. who might be working at the site and shall permit to use scaffolding etc. already put up by him.

- The Engineer-in-Charge will have the right to get any item of the work included in this tender or not executed through other agencies. Schedule of probable quantities in respect of the work and specifications are enclosed. The schedules of probable quantities are liable to alterations by emission, deduction or additions at the discretion of the Engineer-in-Charge.

- The rates quoted by the tenderer in the schedule shall be inclusive of all taxes and levies payable under respective statues, inclusive of all sales taxes, sales tax on components/ materials/ consumables and also sales tax on works contract in pursuant to constitution (forty sixth amendment) act 1982, control duty and /or any other duty levied by the government or other public bodies. The rates shall be firm and shall not be subject to exchange variations, labour conditions or any condition.

- Sales tax will be deducted from the amount payable to the contractor as per the relevant sales tax act, applicable for the contracted work as amended from time to time, at the rates specified from time to time.

- Samples of all materials to be incorporated in the works shall be submitted to the Engineer-in charge for his approval without claiming any extra cost. Materials not confirming strictly to the samples are liable to be rejected.

- The employment of any sub-contractors will be subjected to the approval of the Engineer-in-Charge. If at any time during the progress of the work the Engineer-in charge determines that any sub-contractor is incompetent or undesirable the contractor shall take steps immediately to cancel such sub-contractor. The contractor shall be entirely responsible for all the work included in the contract whether executed by him or through his sub-contractors. In particular it may be noted that the contractor shall obtain steel doors and windows from a reputed manufacturer and before placing order for these, the contractor shall obtain the concurrence of the department for the agency from whom he proposes to obtain steel doors and windows.

- The contractor shall prepare a CPM / PERT /BAR chart/ detailed estimate program within a weeks time of issue of Work Order.

- All materials and articles brought by the contractor to the work site shall have to be declared at the security gate. Similarly no materials shall be taken out from the departmental premises without proper gate pass which will be issued by the Engineer-in -Charge.

- Unless otherwise provided in the schedule of quantities the rates tendered by the contractor shall be all inclusive and shall apply to all heights, lifts, leads and depths of the building and nothing extra shall be payable to him on this account.

- Sample of various materials required for testing shall be provided free of charge by the contractor. Testing charges, if any unless otherwise provided, shall be borne by the department. All other expenditure required to be incurred for taking the samples, conveyance, packing etc. shall be borne by contractor himself. In case of concrete and

reinforced concrete work, the contractor shall be required to make arrangement for carrying out compression strength tests at his own cost including preparation of cubes curing etc. complete.

- For the purpose of recording measurements and preparing running account bills, the abbreviated nomenclature shall be accepted along with the item number.

- The contractor shall along the tender submit a schedule of machinery to be used on the work in support of his assurance to adhere to the time schedule specified in the proforma given.

- I /We declare that the work will be carried out as per the specifications in tender document and as per the specifications said above. The items of work not covered in the specifications said above will be carried out as per the specifications in the relevant CPWD specifications, and if not covered in CPWD specifications the work will be carried out as in the relevant IS specifications, and if not covered in the any of the above, the work will be carried out as directed in writing by the Engineer-in-Charge.

- I / We declare that the rates quoted by me/us are on the basis of the above.

Dated: ----------

Signature of the Contractor with stamp

TENDER FORM

To,

The Director,
Indian institute of Astrophysics,
Koramangala,
Bangalore – 560034.

Dear Sir,

Sub: Tender for project "REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I Ph.D LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE-34"

With reference to the tender invited by you for the above proposed work, I /we write this after having:

a). Examined the designs, drawings, detailed specifications to tenders, agreement, the general conditions of contract and special conditions of contract annexed there to (here in after called 'the contract documents') relating to construction.

b). Visited and examined the site of the proposed work and acquired the requisite information relating to or affecting the tender. We are agreed to the decisions of the pre bid meeting by signing and stamping the minutes of the meeting which is enclosed along with this tender.

I/We undersigned hereby offer to construct the proposed work in strict accordance with the contract document for the consideration to be calculated in terms of the priced schedule of quantities.

I/We undertake to complete the whole of the works as per the attached schedule from the date of issue of intimation by you that our tender has been accepted and up on being permitted to enter site. I/We further undertake that on failure, subject to the conditions of contract relating to extension of time, I/We shall be agreed 'Liquidated damages' for the period during which the work shall remain incomplete.

I/We hereby deposit with you as earnest money **Rs…….. (RUPEES …….ONLY)** [carrying no interest] and I/We fail to take up the contract when called up on to do so.

Our Bankers are:

1.

2.

Place:
Date:

Signature of the tenderer
Name of the partners of the firm
Or
Name of the person having power of attorney to sign the contract

SPECIAL CONDITIONS

GENERAL:

SPECIAL CONDITIONS OF CONTRACT shall be read in conjunction with GENERAL CONDITIONS OF CONTRACT and both form an integral part of contract. Where the two are at variance, the conditions stipulated in this as SPECIAL CONDITIONS shall supersede relevant GENERAL CONDITIONS.

1. SPECIAL CONDITIONS:

HELMETS :

As a measure of safety, persons employed on the site, Engineers and Supervisors shall wear a helmet of approved make at all times when they are at the site. No visitors shall be allowed on work site without wearing helmet.

Contractors shall make arrangements to provide safety helmets to all the persons employed on the site, Engineers and Supervisors at his cost.

Contractors shall display safety and warning signs at strategic locations at the site.

CHILD LABOUR:

Contractor or his Sub-contractor shall not employ any child labourers on the work site, either permanently or temporarily. It shall be the responsibility of the main Contractor to make sure that no child labour is employed at the site. Contractor shall indemnify the Employer against any consequences statutory or otherwise, that may arise out of employing child labour on the site.

TEMPORARY ELECTRICAL WIRING:

It shall be the responsibility of the main Contractor to make sure that the temporary wiring for construction activity shall adhere to minimum safety precautions as per Electricity Act. All wires / cables shall be drawn on wooden poles properly fixed and shall be drawn overhead.

2 LABOUR SHEDS:

Labour sheds shall be constructed with non-combustible materials like GI sheets or Asbestos sheets. Contractor will not be permitted to use combustible materials such as palm leaves etc., for the construction of the labour sheds.

3. MATERIALS SUPPLY / PROCUREMENT:

No materials will be supplied by the owner. If any increase on the material procurement cost/ labour, P&M will not be entertained for any

kind of escalation till completion of the project.

4. BILLING, CERTIFICATION & PAYMENT OF BILLS:

BILLING:

The contractor shall prepare measured bills after completing the quantum of work mentioned In the Appendix-A and submit the same to the Architects for checking and issue of Certificates for Payment.

PAYMENT OF BILLS:

The contractor shall be paid by the Employer from time to time based on the certificate for payment issued by the architects as mentioned in the Appendix A.

5. REPAIR OF WORKS DONE BY OTHER AGENCIES:

The civil contractor shall make up any deficiency in the finishing of the areas damaged by other agencies in a workmanlike manner to achieve uniform finishing of the building at no extra cost.

6. MATERIAL TESTS:

The contractor shall provide such assistance, instruments, machines, labour and materials as are normally required for examining, measuring and testing.

The contractor shall install a compression testing machine at site to test concrete cubes and solid blocks.
The contractor shall maintain a record of all the test results in an approved format and periodically submit the same for Architect's/Employer's scrutiny.

7. PLANT & MACHINERY:

The contractor is obliged to furnish to the Employer, detailed list of equipment, plant, machinery & personnel proposed to be deployed in this project.

8. CLIENT'S & ARCHITECT'S OFFICES & FACILITIES:

The contractor shall supply, erect and satisfactorily maintain in good repair until final completion of works, a well lighted temporary site office.

The contractor shall provide at all times for the duration of the contract survey instruments for the exclusive use of consultants as directed by consultants for carrying out of his duties in connection with the contract.

Such instruments which must be approved by the Architect, shall include but not limited to the following:

- One theodolite & tripod capable of reading to 20 seconds

- One level with horizontal circle and tripod.

- Two metric leveling staffs not less than 3.5mtr high.

- One 100 metre rustless steel band, one 30 metre rustless steel tape and two 30 metre linen tapes.

- An adequate number of ranging rods drop arrows, wooden setting-out pegs, etc.

The contractor shall be solely responsible for all such instruments and equipment's and shall ensure that they are at all times in good repair and adjustment.

9. SANITATION & DRAINAGE DURING CONSTRUCTION:

The contractor shall provide sanitation and drainage facilities on the site as stated subsequently.

The contractor shall strictly control the labour so that the site is not polluted, made dirty or littered with debris, wastes or the likes. Any person found creating mess or litter or pollution shall be removed from the site immediately at contractor's cost.

The contractor shall provide sanitation facilities at convenient locations on site to preserve the cleanliness of the site. The effluent shall be directed as follows:

- Waste water	:	Collection and pumping out and disposal off from the site in approved manner.
- Sewage	:	Septic tank provision - sludge to be collected and disposed off at intervals as directed.

The location of the above provisions shall be as marked on the site mobilization scheme drawing.

10. DISCREPANCIES:

The contractor shall bring to the notice of the Architect any discrepancies within or between contract drawings and/or the other contract documents prior to preparation of working drawings and commencement of work and shall not proceed with work until the Architect gives clarifications and instructions to proceed.

11. REPORTS BY CONTRACTOR:

11.1 The contractor shall file daily category-wise labour return. The report shall indicate scheduled requirement against actual strength.

11.2 The contractor shall prepare weekly reports of planned and actual progress of work and subsequent week's scheduled work. These will also include material procurement status. These reports shall be submitted to Architect and shall be reviewed during weekly co-ordination meeting.

11.3 The contractor shall submit monthly report along with monthly bills.

11.4 Further progress charts and schedules shall be prepared by the contractor as directed by the Architect.

11.5 The contractor shall submit re-conciliation statement of all the materials supplied by the Client, if any, along with every running bill.

TECHNICAL SPECIFICATION

The work shall be carried out as per the specification of **CPWD Works Manual or IS specification** unless otherwise specified in the tender. The detail technical specification will be issued to the contractor after issuing the work order. The technical specification shall be read and signed on all pages which shall become the part of the contract document.

LIST OF APPROVED MATERIALS

CIVIL

Sl.No.	Material	Make
1	Steel	SAIL – TMT, VIZAG STEEL
2	Acrylic Exterior Emulsion	Asian Paints, Berger Paints
3	Plastic Emulsion Paint	Asian Paints, Berger Paints
4	Enamel Paint	Asian Paints, Berger Paints
5	Aluminium	Jindal, Indal, Hindalco
6	Glass	Saint Gobain, Modi
7	Flush Door	Kutty's Bond Wood
8	Patch Fittings	Ozone

WATER SUPPLY AND SANITARY WORKS

Sl.No.	Material	Make
1	G.I. Pipes	
2	G.I .Fittings	
3	PPR	Kisan/Amitex
4	UPVC	a) Kisan / Prince
5	Ball valves	Hawa / R.B.
6	G.M. non-return valves	Kirloskar/Zoloto
7	Sanitary ware	Hindware/approved equivalent
8	C.P. Fittings	Jaquar/approved equivalent
9	Bathroom accessories	Jaquar/approved equivalent
10	SFRC manhole frame and Covers	Southern Concrete Industries/approved equivalent
11	Kitchen sink	Nirali/ Approved Equivalent
12	Anchor bolts/pipe support system	Hilti / approved equivalent
13	CI Grating & MH frame & cover	NECO/ Approved equivalent

ELECTRICAL

SL. No.	Material	Make
1	MCCB	ABB/ L& T
2	HT/LT CABLES XLPE	UNISTAR / FINOLEX / CCI
		ASIAN/FINOLEX/HAVELLS/RALLISON
3	CABLE GLANDS	SUNIL/SMI
4	CABLE LUGS	DOWELL
5	MCB/MCB DISTRIBUTION	LEGRAND/ABB
	BOARDS , MCB / ELCB	
6	INDUSTRIAL SOCKET	BEST&CROMPTON/CROMPTON
	OUTLETS	GREAVES/CUTLER HAMMER/
7	INDICATING METERS	AE/IMP/MECO/RISHAB
8	CTS-RESIN CAST	KAPPA/IMP/AE/KALPA/VOLTAMP
9	SELECTOR SWITCHES	L&T/SIEMENS/KAYCEE
10	INDICATING LAMPS	EE/BCH/TECHNIK/SIEMENS
11	LIGHT FITTINGS	PHILIPS/WIPRO/ BAJAJ
12	FRLS GRADE WIRE	FINOLEX
13	PVC CONDUITS 2MM THICK &	VIP (FRLS GRADE)
	ACCESSORIES	
14	LIGHT & FAN SWITCHES,	ANCHOR ROMA
	ELECTRONIC REGULATORS	CLIPSAL
15	TELEPHONE CABLES	FINOLEX / TVS
16	FLUROSCENT TUBE	PHILIPS
17	TELEPHONE/LAN	KRONE/SIEMENS/AYOMA/R & M/AMP
	ACCESSORIES	
18	METAL CLAD SOCKETS / BOXES	LEGRAND / ABB
19	MODULAR SWITCHES AND SOCKETS	MK / ROMA (ANCHOR)
20	CASING AND CAPING	MODI
21	CAT 5e / CAT 6 CABLE	FINOLEX, / TVS / D_LINE
22	RJ-11 , RJ - 45 SOCKETS	MK / ROMA ANCHOR
23	PVC TRUNKING	MK / LK
24	VOLTMETER & MDM	CONZERV

* Employer/Architect/Consultant reserves the right to supply major equipments and such that the Contractors rate quoted for erection deemed to the cost of installation, testing and commissioning.

Note: * Employer/Architect/Consultant reserves the right to choose any one of the makes of materials and their decision is final.

The floor mounting boxes should be water proof so that floor cleaning water / liquid should not ingress into it and not to degrade the insulation.

SIGNATURE OF THE TENDERER

SCHEDULE OF QUANTITIES

NAME OF THE WORK: REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I Ph.D LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE – 34.

ABSTRACT COST

Sl.No	Description	Amount (Rs.)
1.	Total value of civil works	
2	Total value of Electrical works	

Grand Total Rs.

(Rs……)

SCHEDULE OF QUANTITIES
CIVIL

NAME OF WORK : **REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I Ph.D LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE.**

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
1.0	**EARTHWORK**				
1.1	Earthwork in excavation for Foundation Trenches for depth not exceeding 1.5 Mts. in all ordinary soils including dressing of sides ramming of bottom, disposing the surplus excavated materials within a distance of 50m and lift upto 1.50mts complete as per specifications. (Disposed soil to be leveled by breaking clods if any and neatly dressed.)	12.0	Cum		
1.2	Filling available excavated approved earth (excluding rock) in trenches, sids of foundation, plinth, etc; in layers not exceeding 15cm depth, breaking clods, consolidating each deposited layer by ramming, watering and dressing, etc; complete for lead up to 50m and all lifts etc; complete as per specifications	5.0	Cum		
2.	**PLAIN CEMENT CONCRETE:-** Providing and laying cement concrete using 20mm nominal size graded hard granite stone aggregate obtained from approved quarry including compaction, finishing top surface to level, curing but including cost of formwork, etc; complete as per specifications. Mix ratio specified is for (cement: coarse sand : graded stone aggregate In foundation and flooring: P.C.C 1: 3: 6	10.0	Cum		
3	**POST CONSTRUCTIONAL ANTITERMITE** Treatment of junction of walls and floor (by drilling holes of 12mm dia 300mm apart at junction of wall and floor and injecting chemicals like chlorophyripos with water in 1:19 ratio to achieve 1% concentration (i.e. 1 liter of chemical to 19 liters of water). The emulsion is injected till the soil underneath soaks and then holes are to be sealed).	50.0	Mts		

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
4	**BRICK MASONRY** :				
4.1	Providing and constructing BRICK MASONRY in cement mortar as per mixes stipulated below using approved well burnt bricks of "CLASS DESIGNATION" (classification as per I.S. 1077-1986) as specified below, including raking out joints 10mm deep, scaffolding, curing, etc; complete all as per specifications in superstructure up to roof level. (the mix ratio specified is for cement : coarse sand). USING BRICKS OF CLASS DESIGNATION "5.0" (Minimum Average Compressive Strength not less than 5N/sq. mm) In CM 1:6	30.0	Cum		
5	**REINFORCED CEMENT CONCRETE :** Providing and laying reinforced cement concrete 1:1.5:3 using graded hard granite stone aggregate of 20mm nominal size obtained from approved quarry including mechanical mixing, vibrating, compaction, finishing, curing, etc: complete all as per specifications but excluding cost of form work and steel reinforcement up to roof slab.(Rate to include labour for keeping embedment if any, wherever required while casting). Mix ratio specified is for(cement: coarse sand: graded stone aggregate). Including form work.				
5.1	Footing and Pedestal for MS stair case.	1.0	Cum		
5.2	Roof Slab (Mezzanine Floor)	10.0	Cum		
6	**STEEL WORK- REINFORCEMENT STEEL:** Steel reinforcement for all RCC items including decoiling, cutting, hooking, bending, cranking, fabricating to required shape, placing in position and tying the system with soft drawn annealed binding wire of diameter not less than 1mm with 2 strands etc; complete all				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	as per specifications at all heights(binding wire will not be measured for payment).with TMT bars.				
6.1	Roof Slab (Mezzanine Floor)	1.5	MT		
7.	**FINISHING:**				
7.1	Plastering 20mm thick with cement mortar specified below, finished smooth with lime neeru including scaffolding, curing, etc; complete for internal surfaces of the walls, beams, ribs, sills, jambs, ceiling, etc; complete all as per specifications up to roof level. Mix specified is for cement: fine sand. Cement mortar 1:4	200.0	Sqm		
8.	**PAINTING:**	.			
8.1	Painting plastered **INTERNAL SURFACE** with two or more coat of acrylic emulsion paint asian make of I quality and approved colour on New work to give an even shade, including cleaning the surfaces, filling the crevices with a coat of primer and patti, scaffolding, etc; complete all as per specification	800.00	Sqm		
8.2	Painting **EXTERNAL PLASTERED SURFACE** with two or more coats of 100% acrylic exterior emulsion paint of approved make and color – Apex, having protection against fungal growth, flaking, fading, alkali and UV degradation and to give an even shade with required finish including cleaning the surfaces, filling the crevices with approved filler, scaffolding, curing, etc. complete all as per specifications.	600.00	Sqm		
8.3	Painting wood work/MS work with two or more coats of SYNTHETIC ENAMEL PAINT of I quality and approved colour to give an even shade over a coat of synthetic enamel primer including cleaning the surfaces, filling the crevices with approved filler, scaffolding, etc; complete all as per specification. (Rate to include cost of				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	synthetic primer also).	200.00	Sqm		
9	**FLOORING:**				
9.1	Providing and installing **RAIAN ESD FLOORING TILES** of size 30 X 30 cm, thickness 2mm and make : HK Special Materials Co. including accessories such as conductive adhesive, welding rod, copper tape etc. complete. The work to be carried out as per the instruction of the Engineer –In – charge and manufacturer specification for laying and testing shall be followed.	250	Sqm		
9.2	SUB – FLOOR PREPARATION with Self-leveling compound thickness 2mm to 3mm.	150	Sqm		
9.3	Providing and installing ESD EARTH BONDING POINT (EBP) to connect the copper tape from ESD floor to the ground.	8	Nos		
9.4	Providing and installing vinyl flooring tiles of size 30 X 30 cm , thickness 2mm and make : Armstrong. Including accessories such as adhesives etc. complete. The work to be carried out as per the instruction of the Engineer –In – charge.	100	Sqm		
10.	Supplying, fabricating, assembling, hoisting/ erecting fixing in position in all heights and with all leads, structural steel work of welded built up sections, all as per detailed specification.(for materials and workmanship) in the situations described herein after including a) cutting of component to required length/width and shapes/ profiles b) Smooth machining of edges/ faces, c) welding(electric arc welding) at joints of built-up sections/ single sections for required weld lengths and sizes and d) painting all over with two coats of synthetic enamel paint of approved quality make and colour/ shade over one coat of zinc chromate primer with surfaces duly prepared to receive painting etc., complete all as				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	directed by EIC. **Note:** The contractor shall submit the fabrication shop drawings for work involved based on construction drawings(that may be issued during construction period) for approval by EIC. The fabrication work shall start only after approval to fabrication drawings any change required in the fabrication drawings shall be carried out at no extra cost over the coated rates. The fabrication shall be in a perfectly workman ship like manner as provided in section 5 and 6 of IS 800 and IS 7215. Welding shall be carried out by qualified workers. Electrodes for welding, the procedure, selection, test and Specification shall confirm to IS 816, IS 818, IS 822, and IS 833. Erection/ hoisting shall commence only after passing of fabricated parts by EIC. Structural steel work of built up and frame with MS channels, MS ISMB, MS Plates, MS angles, MS Pipes, MS Flats, MS Tee sections and like. For supporting mezzanine slab and MS External and internal staircase.	4.5	M.T.		
11	Providing and supplying heavy duty chemical anchors for fixing of insert plates using HVA system (HVU Capsule and HAS-E Rod) sizes from M16-M39 of HILTI make. The anchor should be made of vinyl urethane, dibenzyl peroxide and quartz granules pre-weighed capsule and threaded HAS-E (Galvanised coated or Stainless Steel Version) rod. The installation and the setting instructions should be strictly followed as per the manufacturers recommendations.	104	Nos.		
12.	Demolishing brick work in cement mortar including stacking of serviceable material and disposal of unserviceable within 50mts lead.	10.0	Cum		
13.	Demolishing R.C.C work including stacking of steel bars and disposal of unserviceable materials within 50mts lead.	10.00	Cum		
14.	Dismantling and removing the existing damaged rolling shutters without making any				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	damages to the existing structures including necessary and making good the damages etc; and handed over the dismantled rolling shutter to the section store as instructed by Engineer-in-charge.	40	Sqmt		
15.	Dismantling the old plaster or skirting, raking out joints and cleaning the surface for plaster including disposal of rubbish to the dumping ground within 50mts lead.	290.00	Sqmt		
16.	Dismantling A.C sheet roofing including ridges, hips, valleys and gutters etc; and stacking the materials within 50mts lead.	22.0	Sqmt		
17.	Dismantling H.C.I or A.C rain water pipe with fittings and clamps including stacking the materials with 50mts lead.75 TO 150MM DIA	24.0	Mts		
18.	Taking out doors, windows and clerestory window shutters (steel or wood) including chowkhats, archi-trave, hold fasts etc stacking within 50mts lead Of area beyond 3Sqm	15	Nos		
19.	Dismantling steel work in single sections in channels, angles tees and flats including dismembering and stacking within 50mts lead.	100	Kgs		
20.	**WATER PROOFING:** **1. SURFACE PREPARATION:** Surface preparation should be made and fungus loose particles should be removed cleaning with brushes and solvents. Surfaces will be cleaned with solvents and with acid, if necessary creating "V" grooves for ½" for all visible cracks on existing surface. **2. POROSITY AND VOIDS REDUCTION (PRIMER APPLICATION)** Applying wetting agent as base (Acrylic monomer, co-polymer liquid and				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	crystalisation liquid) on existing surface and "V" grooves and cracks, it will penetrate into the concrete, if the concrete has hair line crack, (thinner than invisible cracks) it tends to close them off as it expands inside the concrete, seals, eliminates or reduces further cracking and also it removes water vapour inside the structure which react with the free line and calcium carbonate. It fills and seals the pores and capillaries to harden and make the surface seal proof. **3. SEALANT APPLICATION:** Cracks will be sealed using suitable sealant. Sealants make them ideally suited for joints treatment. Its adhesion is very strong and binds with the building materials such as concrete, and take care of expansion and contraction in the structure. **4. FLEXIBLE CEMENTATIOUS MEMBRAME (F.C.M) COATING:** Acrylic with CCC ISOPROOF/ and cementatious flexible silica sand powder mixed with proper proportion is applied on the existing structure to get strong and hardened surface which will become an integral part of the structure and also become the base for Geo-textile application. **5. 40gsm GEO-TEXTILE APPLICATION (REINFORCEMENT APPLICATION)** Non woven Geo-fabric 40 g.s.m will be applied on f.c.m. coating as reinforcement to get durability and protection. It acts as sealer and is puncture resistant which is of prime importance. 6. 1st COAT OF CCC ISOPROOF/ : CCC ISOPROOF/ is a single component waterproof coating based on flexible, elastomeric, seamless, monolithic membrane which is applied with (1:1)				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	dilution on the 2nd geo-textile membrane along with quartz and sand to get tensile strength of wear and tear. **7. FINAL COAT (THERMAL INSULATION COATING):** Give one coat of CCC ISOROOF/ ; Allow it to dry for a minimum of 24 hours. Film setting time is also resistant for U.V rays and slab controlling minimum 30% of heat reduction. (Rate for items 1 to 7)	200.0	Sqm		
21.	Providing and fixing normal cold rolled steel decking for mezzanine floor using 1mm thick DECK SPAN sheet with a minimum bearing of 50mm fixed at a spacing of 600 C\C to structural steel frame work using shot fired nails or self drilling or self tapping screws over ISMB girders.	80.0	Sqm		
22.	**MS Doors of Shakti Met Dor Limited.** FIRE DOORS (120 Minutes) (CONFORMS TO IS 3614 (PART 2) 1992 BS476 (PART 20 & 22) AND ISO834 TESTED AT CBRI, ROORKEE **MATERIAL** Door Frames and Leaves are made form Galvanized Steel. **DOOR LEAVES** Constructed from 1.25mm thick galvanized steel sheet formed to provide a 46mm thick fully flush, double skin door shell with lock seam joints at stile edges. Internal Reinforcements are provided at top, Bottom and Stile Edges for Fire Rating. The internal construction of the door is a specially designed Honey Comb structure with reinforcements at top, bottom and stile surrounds. The internal construction of the door varies with the degree of Fire Rating as				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	tested. For doors having overall height in the excess of 2300mm the shutters shall essentially have double latching. (DOUBLE SHUTTER) **DOOR FRAMES** Produced from 1.6 MM thick galvanized steel sheet formed to double rebate profile of size 143mm X 57mm (+/- 0.3mm) with a maximum bending radius of 1.4mm. The doorframes may be built into the brick or block walls using corrugated "TEE" Anchors not welded to the frame (first fix). Frames may also be fixed on plastered openings with the help of Metallic Expansion Shield with counter sunk screw (second fix). Door Frames are supplied to knockdown form with butt joints for bolted assembly at site. VISION GLASS Fire Rated Vision Glass with 6mm thick clear glass can be provided for a maximum of 2 hours fire rating. The Vision Glass can be provided in 380mm Dia, Rectangular in standard dimensions of 200mm X 300mm. **FINISH** The door frames and door shutters are primed with Zinc-Phosphate Staving Primer and finished with Polyurethane Aliphatic grade or epoxy paint as required. Size Limitations : Maximum 1500x2400mm Clear Wall Opening **IRONMONGERY** **HINGES** Stainless Steel Ball Bearing Butt Hinges (101x89x3) mm thick fixed flush to the frame and shutter. (5NOs/ per shutter). **LOCK** Mortise Dead Bolt(ML 100 D),with				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	both side key operations cylinder. (1 No). SS 'D' handle 254mm without Rose. (4 No). **FLUSH BOLTS (DOUBLE DOOR)** Concealed extended lever action flush bolts provided on the top of the door to the leading stile edge. **DOOR CLOSERS** Doors closers with STD Arm Ryobi 8803 without cover. (1 No) Concealed flush Bolt 600mm. (1 No). Automatic Door Bottom - 914 mm Concealed (1NO). Float Vision Glass (5mm) of Size 350 x 750 mm - Double Glazed Adhesive Tape and Silicone Sealent. Doors (1500x2400)mm. Rate inclusive of supply and installation.	5	Nos.		
23.	Providing and fixing European water Closet suite (Double symphonic type) a).best Indian make white glazed vitreous chinaware European water closet double syphonic pattern of approved make with trap as mentioned below conforming to IS:2556-part II fixed to floor with necessary teak wood plugs, CP brass screws No. 8x37 etc. b)White glazed vitreous chinaware low level flushing cistern 10 Ltrs. Capacity suitable for double syphonic water closet bearing ISI mark with all internal fittings mounted suitably over closet with necessary fixtures. c) 15mm heavy quality flexible PVC inlet connection with CP brass hexagonal check nuts with washer at both ends.				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	d) Black plastic seat & cover of approved make with CP pillar hinges conforming to IS:2548 bearing ISI mark suitable for double syphonic water closet. e)15 mm n.b. CP brass angle-cock/stop cock conforming to IS:781 of approved make with a minimum weight of 400gms on the inlet to the cistern.Complete all as specified above with approved fittings. With 'S'/P trap (Wall Mount) (Cascade)	2	each		
24.	Providing and fixing Indian make wash hand basin counter bottom (with cp bottle trap) comprising of size (450 x 300): with 20mm thick granite counter. a)Best Indian make white glazed vitreous chinaware wash hand basin of approved make of size mentioned below conforming to IS: 2556 part- IV with single tap hole and bearing ISI mark supported on a pair of painted CI brackets conforming to IS: 775. b)one 15mm CP brass pillar cock of approved make with hot or cold water indications as required conforming to IS:1795 with minimum weight of 577gm. c)one 15mm heavy quality flexible PVC inlet pipe with CP brass hexagonal check nuts with washers at both ends d) 15mm n.b CP brass angle cock /stop cock conforming to IS : 781 of approved make with a minimum height of 400gm on the inlet to the basin. e) one 32mm heavy quality CP brass waste coupling with rubber plug and CP chain. f) one 32mm heavy quality CP brass bottle trap with extension piece and wall flange etc. g)one 32mm heavy quality GI waste				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	pipe with specials from extension piece of the bottle trap to the floor trap, length not exceeding 1mts concealed in wall h)one no. 40mm GI bend and 40 mm dia. 250mm long GI pipe connecting waste pipe to floor trap. All as per specification and as directed with approved fittings. (Rate including granite counter).	2	each		
25.	Providing and fixing 1. Best quality liquid soap holder 2. CP towel rods 600 mm long 25mm diameter. 3.CP towel rings	2 2 2	each each each		
26.	Supplying and laying and fixing in Position under floor, against wall in Chases PVC SWR drainage pipe and Specials rubber rings conforming to IS: 13952 "supreme" make as per manufacturers specification including cutting the pipes to required lengths, necessary excavation chasing and restoring to original conditions, testing etc. complete . a)110mm dia.	40	Mtr		
27.	Construction of inspection chamber of internal clear dimension as mentioned below in 230mm thick brick masonry using first class country bricks in CM 1:3 over a bed of 150 mm thick 1:2:4(20 mm metal) cement concrete, plastering with CM 1:2 ,12 mm thick on internal, external, top surfaces & internal & exposed top surfaces finished smooth with a floating coat of neat cement ,plain cement concrete 1:2:4 for benching, channeling, providing &fixing pre-cast RCC M15 frame and cover including cost of necessary steel reinfor -cement encasing sewers connection to chamber in PCC 1:2:4 etc. Complete all as specified & directed. 600x600x600 mm with 600 X 600 RCC frame & cover	2	Each		

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
28.	Providing ,laying ,jointing ,fixing, Testing ,painting, commissioning GI Pipes, medium grade ,conforming to IS 1239 with a minimum weight as follows including GI specials ,cutting the pipes to the required lengths, threading, jointing the pipes ,chasing the walls & floors ,making the holes ,clamping to walls using wooden spacers or clamps & restoring the same to the original condition ,necessary excavation ,testing, refilling etc. complete all as per specified & directed. i). 15 mm n.b.(1.23 Kg/mtr) ii). 25 mm n.b. (2.46 Kg/mtr) iii) 20 mm n.b.(1.59 kg/mtr)	 20.0 25.0 20.0	 Mtr. Mtr. Mtr.		
29.	Providing & fixing in position approved Make 15mm n.b. cp brass screw down Bib tap conforming to IS: 781 with a Minimum weight of 400 gms.	6	Each		
30.	Providing and fixing in position best Indian make granite partition slab for Urinals. Size of granite slab 610×1150 × 20mm thick polished on both sides and machine cut edges with exposed corners rounded etc.	4	Each		
31.	Providing and fixing in position large urinal comprising of: a) White glazed vitreous chinaware of approved make large urinal of size 600x400x375mm with necessary fixtures conforming to IS : 2556 part – VI bearings ISI mark. b) 15mm n.b.CP brass concealed stop cock of approved make conforming to \ IS:781 on flushing line one for each urinal in the range. c) CO brass distribution pipe and spreader of best approved quality to the urinal with necessary CP brass specials, clamps etc. one for each urinal in a range. d) One number 32mm CP brass waste Coupling-one for each urinal. e)One number 32mm PVC waste pipe				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	and specials from each urinal to floor trap/half round channel. Complete all as specified with approved fittings.	2	Each		
32	Providing 10mm thick plaster of paris (gypsum anhydrous) ceiling up to a height Of 6m above floor level over first kail wood Strips 25 X 6 with 10mm gap in between And reinforced with rabit wire mesh fixed To wooden frame for flat surface including The cost of frame work etc Complete work.	30	Sqm		
33	Fixing in position 12MM thick toughened available Glass of size 3 mtr X 1.5mtr or more using Aluminum U channel. The price is inclusive of the cost of Aluminum U channel. Glass supplied by the Department.	5	Each		
34	Providing fabricating and installing on site Fenesta U- PVC side hung (open able windows) casement windows, at locations made out of U-PVC multi chambered profiles with built in grooves to fix EPDM gaskets / hardware like S.S friction stays , shutter stoppers, multi point locking mechanism and glasses are fixed with clear float of 5mm from St. Gobian / Modi /Asahi with suitable appropriate snap fit beading with EPDM gaskets. Suitable weep holes are provided to drain out water. Each open able window shutter side hung is fixed with heavy duty locking handles and heavy duty S.S friction stays to perform better and to take the loads as specified in the tender technical specifications and drawings. All profile members are reinforced with GI. Profiles of appropriate sizes and corners are welded and finished neatly to the satisfaction of the Engineer. Appropriate EPDM gaskets are provided in the grooves for smooth operations of the windows and to avoid total air / water leakages. All windows to be fixed to the concrete masonry walls with appropriate anchors fasteners and window perimeter to be				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	sealed both inside and outside with appropriate silicone sealants as mentioned in technical specifications / drawings to suit the following overall sizes. Providing and fixing Casement UPVC (Unplasticized Poly Vinyl Chloride) Window using 1) Outer Frame of Width 56mm and Height 48 mm.) 2) Window Sash of width 56 mm and Height 54.5mm. 3) All Outer Frames, Sash Frames are fully reinforced with Galvanized Steel. 4) Glazing: Windows are glazed with 5mm Clear Float Glass. 5) EPDM Gaskets are to be used. 6) Co Extruded Beadings are to be used for Glazing. 7) Cockspur/Espagnolette Handles is to be used in Casement Windows as Locking System 8) Fixing is done on to the wall using Fasteners and Sealing using Silicon Sealant	70	SQM		
35.	Providing and fixing in position best Indian make Laboratory sink comprising of A) Best Indian make white glazed vitreous, B) one number 32 mm dia CP brass waste coupling C) One number suitable 32 mm PVC waste pipe bent to shape to discharge in to floor trap length not exceeding 1mtr to discharge in to the floor trap through GI elbow and 40mm F1 medium class pipe 250 MM long .complete all as specified with approved fittings supported on a pair of CI painted brackets confirming to Is 775 500×350 ×150mm	2	Each		
36	Providing and fixing aluminium work for doors, windows, ventilators and partitions with extruded built up standard tubular sections/ appropriate Z sections and other				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	sections of approved make conforming to IS: 733 and IS : 1285, fixed with rawl plugs and screws or with fixing clips, or with expansion hold fasteners including necessary filling up of gaps at junctions, at top, bottom and sides with required PVC/neoprene felt etc. Aluminum sections shall be smooth, rust free, straight, mitred and jointed mechanically wherever required including cleat angle, Aluminum snap beading for glazing / paneling, C.P. brass / stainless steel screws, all complete as per architectural drawings and the directions of Engineer-in-charge. (Glazing and paneling to be paid for separately)				
	For fixed portion Polyester powder coated aluminum (minimum thickness of polyester powder coating 50 micron)	140.00	Sqm		
	For shutters of doors, windows & ventilators including providing and fixing hinges/ pivots and making provision for fixing of fittings wherever required including the cost of PVC / neoprene gasket required (Fittings shall be paid for separately). Polyester powder coated aluminum (minimum thickness of polyester powder coating 50 micron)	20.00	Sqm		
	Providing and fixing 12mm thick prelaminated particle board flat pressed three layer or graded wood particle board conforming to IS: 12823 Grade l Type ll, in panelling fixed in aluminum doors, windows shutters and partition frames with C.P. brass / stainless steel screws etc. complete as per architectural drawings and directions of engineer-in-charge. Pre-laminated particle board with decorative lamination on both sides.	100.00	Sqm		
	Providing and fixing glazing in aluminum door, window, ventilator shutters and				

Sl No.	Description of Item	Qty	Unit	Rate (Rs)	Total (Rs)
	partitions etc. with PVC/ neoprene gasket etc. complete as per the architectural drawings and the directions of engineer-in-charge . (Cost of aluminum snap beading shall be paid in basic item): With float glass panes of 5.50 mm thickness **Providing and fixing IS : 3564 marked aluminum extruded section body tubular type universal hydraulic door closer** with double speed adjustment with necessary accessories and screws etc. complete. **Providing and fixing 100mm brass locks** (best make of approved quality) for aluminum doors including necessary cutting and making good etc. complete **Providing fixing aluminum round shape handle of outer dia 100mm** with SS screws atc. Complete as per direction of Engineer-in-charge Polyester powder coated minimum thickness 50 micron aluminum.	70.00 3 3 3	Sqm Each Each Each		
37	Clearing debris outside the campus Including loading unloading all leads and Lifts	50	Cum		
	TOTAL				

SCHEDULE OF QUANTITIES
ELECTRICAL

ELECTRICAL WORK

NAME OF WORK : REMODELING OF 2.34 M OPTICAL POLISHING MACHINE AREA FOR THE PROPOSED I Ph.D LABORATORY AT INDIAN INSTITUTE OF ASTROPHYSICS CAMPUS, BANGALORE.

SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
1.0	**MEDIUM VOLTAGE SWITCH BOARDS** Supply, store, Installation, Testing and Commissioning of 3 Phase, 4 wire, 415 Volts, 3 Phase, 50 Hz. panels. The fabrication shall be made with 14/16SWG cold rolled sheet with M/C pressing. The surface shall be rigorously treated for derusting in 7 tank process with dephosphating and painting with at least 2 coats of approved paint. The panel shall be totally enclosed metal clad type with double gasketting with rubber / resin lining. The panel shall be off white painted inside and shall be having control directory pasted inside the panel. The panel shall be mounted on existing trench and shall have cable entry provision from the top and bottom with suitable alley as the case may be. The panel shall be tested for the same KA rating of the relevant highest rating MCCB /MCB/MPCB All components shall be from ISO-9001 companies and shall have relevant IS/IEC approvals without fail. (Fabrication, drawing and list of components and panel detail shall be got approved by consultants before fabrication). complete as required. Erection rate rate shall include base channel, grouting/grip bolts etc.				
1.1	**DISTRIBUTION PANEL** Incomer- ELR with CBCT, RYB indicator, Voltmeter & Sel.switch 125A TPN MCCB 25 KA 70-100% Ther.setting 125/5A 3Nos CTs with MDM meter,150A TPN AL Bus bar . Outgoing - 4 Nos 63A TPN MCBs 4 Nos 32A TPN MCBs 4 Nos 20A DP MCBs	1.00	Each		

SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
2.0	**FACTORY-BUILT MCB DISTRIBUTION BOARDS** Supply, store, erection, testing and commissioning of MCB Distribution Boards, wall-mounted (either surface or recessed type). The erection rates shall include fixing of DB on wall including supply of all fixing accessories, civil works etc. space provision shall be made for mounting ELCB in the incomer MCB. The rate shall be same for any combination of outgoings.				
	DOUBLE DOOR TYPE (C/D -Type MCB)				
2.1	Horizontal type TPN DB				
2.1.1	8 -Way TPN DB with 63Amps TPN MCB incomer and 24 Nos 1-Pole 6A to 20A MCB	1.00	Each		
2.1.2	6 -Way TPN DB with 63Amps TPN MCB incomer and 18 Nos 1-Pole 6A to 20A MCB	1.00	Each		
2.1.3	4 -Way TPN DB with 63Amps TPN MCB incomer and 12 Nos 1-Pole 6A to 20A MCB	1.00	Each		
2.2	MCB DB Accessories :				
2.2.1	4-pole Residual current circuit breaker (RCCB) with normal current rating of 63A and sensitivity of 100 mA.	2.00	Each		
3.0	**POWER AND CONTROL CABLES**				
3.1	Supply & Laying Supply, laying & testing of 1.1KV Grade PVC insulated aluminum /Copper conductor steel armoured power cables as per IS specification. The rates quoted shall be for laying in trays, cable trenches (indoor and outdoor), pipes, etc.				
3.1.1	3.5 Core x 50 Sq. mm Aluminum Armourd Cable (PVC)	15.00	Mtr.		
3.1.2	4 Core x 25 Sq. mm Aluminum Armourd Cable (PVC)	5.00	Mtr.		
3.2	Cable End Termination : Supply and providing the end terminations with copper cable lugs, single compression brass cable glands, taping, crimping, gland and armour earthing, etc. Complete as required.				
3.2.1	3.5 Core x 50 Sq. mm AL/Copper Armourd Cable (PVC)	2.00	Nos		
3.2.1	4 Core x 25 Sq. mm AL/Copper Armourd Cable (PVC)	2.00	Nos		

SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
4.0	**SOCKET OUTLETS** Commercial Type : Supply, erection, testing and commissioning of power points by providing following switches/sockets mounted flush on to the furniture partition wall or fixed to surface or recessed MS boxes with all fixing and wiring accessories.				
4.1	6/16 Amps, 6-pin (250Volts) single phase universal socket with 16 Amps single pole switch including recess mounted GI box. The pin configuration shall be round type. Plug tops are excluded from the scope of supply.	31.00	Each		
4.2	Gang of 3X 6 Amp 5-pin (250Volts) single phase commercial socket with 16 Amp, SP switch including recess mounted MS box type.	25.00	Each		
4.3	6 Amp 5-pin (250Volts) single phase commercial socket with 5 Amp, SP switch including recess mounted GI box type. Plug top is excluded from the scope of supply.	5.00	Each		
4.4	20 Amp 3-pin (250Volts) single phase Metal clad socket type. Plug top is included and 20 A DP MCB	4.00	Each		
4.5	32 Amp 5-pin (415Volts) single phase Metal clad socket type. Plug top is included and 32A 4P MCB	4.00	Each		
4.6	RJ 11 Telephone socket	6.00	Each		
4.7	Supply and fixing of Telephone socket outlet comprising RJ-45 socket.	25.00	Each		
5.0	**SUBMAINS / CIRCUIT MAINS / POWER WIRING: supply and Erecting 2 mm thick FRLS conduits with all mounting accessories.** **(Open/Consealed Conduiting)**				
5.1	20mm PVC. conduit	150.00	Mtrs.		
5.2	25mm PVC conduit	250.00	Mtrs.		

SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
5.3	32mm PVC conduit	300.00	Mtrs.		
5.4	50mm PVC conduit	25.00	Mtrs.		
5.5	Supply and running of 1100 V grade FRLS insulated				
	4 Runs x 16 sqmm sqmm Copper FRLS wire	25.00	Mtrs.		
5.6	Supply and running of 1100 V grade FRLS insulated				
	4 Runs x 10 sqmm sqmm Copper FRLS wire	25.00	Mtrs.		
5.7	Supply and running of 1100 V grade FRLS insulated				
	4 Runs x 6 sqmm sqmm Copper FRLS wire	50.00	Mtrs.		
5.8	Supply and running of 1100 V grade FRLS insulated				
	2 Runs x 4 sqmm & 1x2.5 sqmm Copper FRLS wire	650.00	Mtrs.		
5.9	Supply and running of 1100 V grade FRLS insulated				
	2 Runs x 2.5 sqmm & 1x1.5 sqmm Copper FRLS wire	300.00	Mtrs.		
5.1	CAT-5E Cable	150.00	Mtrs.		
5.11	CAT-6 Cable	550.00	Mtrs.		
6.0	POINT WIRING Moudular switch and Sockets Supply and Erection Point wiring with all accessroies and with 2 x 1.5 Sq mm FRLS insulated 1100V grade copper conductor wires and 1x1.0 Sq.mm FRLS insulated earth wire in 2mm thick 20 mm PVC. conduit./Cassing capping A separate neutral shall be run for each circuit.				
6.1	Single light point controlled by 6 Amps switch	45.00	Each		
6.2	Two light point controlled by 16 Amps switch (combined rate for two points)	2.00	Each		
6.3	wall fan point with wall-mounted 5A 3-pin socket near fan location and 6 Amps single pole controlling switch located independently.	15.00	Each		

SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
6.4	Two Way light point controlled by 6 Amps switch	3.00	Each		
7.0	SUPPLY, ERECTION & COMMISSIONING OF LIGHTING FIXTURE/LAMPS/CEILING FANS/ Supply and Erection of Indoor Lighting Fixture : with **Electronic/ copper ballast**, HPF Condenser, starters, Control gear, connecting wire etc,. WITH LAMPS / TRULITE TUBES etc. complete as required.				
7.1	2x36W CFL surface mounted mirror optics light with P5 paralite louvers suitable for 36 W CFL lamps. (Wipro type: WVP 44236 SWG or approved equivalent). With Electronic Ballast	12	Each		
7.2	2x36W CFL surface mounted mirror optics light with Double parabolic louvers suitable for 36 W CFL lamps. (Wipro type: WVP 45236 SWG or approved equivalent). With Electronoc Ballast	2	Each		
7.3	2x36W FTL surface mounted mirror optics light with Double parabolic louvers suitable for 36 W FTL lamps. (Wipro type: WVF 41236 SWG or approved equivalent). With Electronoc Ballast	25	Each		
7.4	1x36W FTL surface mounted opal acrylic cover light suitable for 36 W FTL lamps. (Wipro type: WCF 51140 SWG or approved equivalent). With Electronoc Ballast	2	Each		
7.5	1x36 Watts slim channel ceiling mounted fluorescent (Wipro type: WIF14136 or approved equivalent).	9	Each		
7.6	1x18 Watts FTL Decorative wall mounted fluorescent fixtures with tubes (Wipro type: WRF 21118 or approved equivalent).	2	Each		
7.7	Surface/wall mounted, 1x60W GLS bulk head fixture with lamp (Wipro type: WKG 13060 or equivalent)	2	Each		
7.8	Supply 450 mm sweep oscillating type, wall mounting 1440 rpm with speed regulator, over heat protection unit, totally enclosed, flame proof motor suitable for 230 V supply.	15	Each		

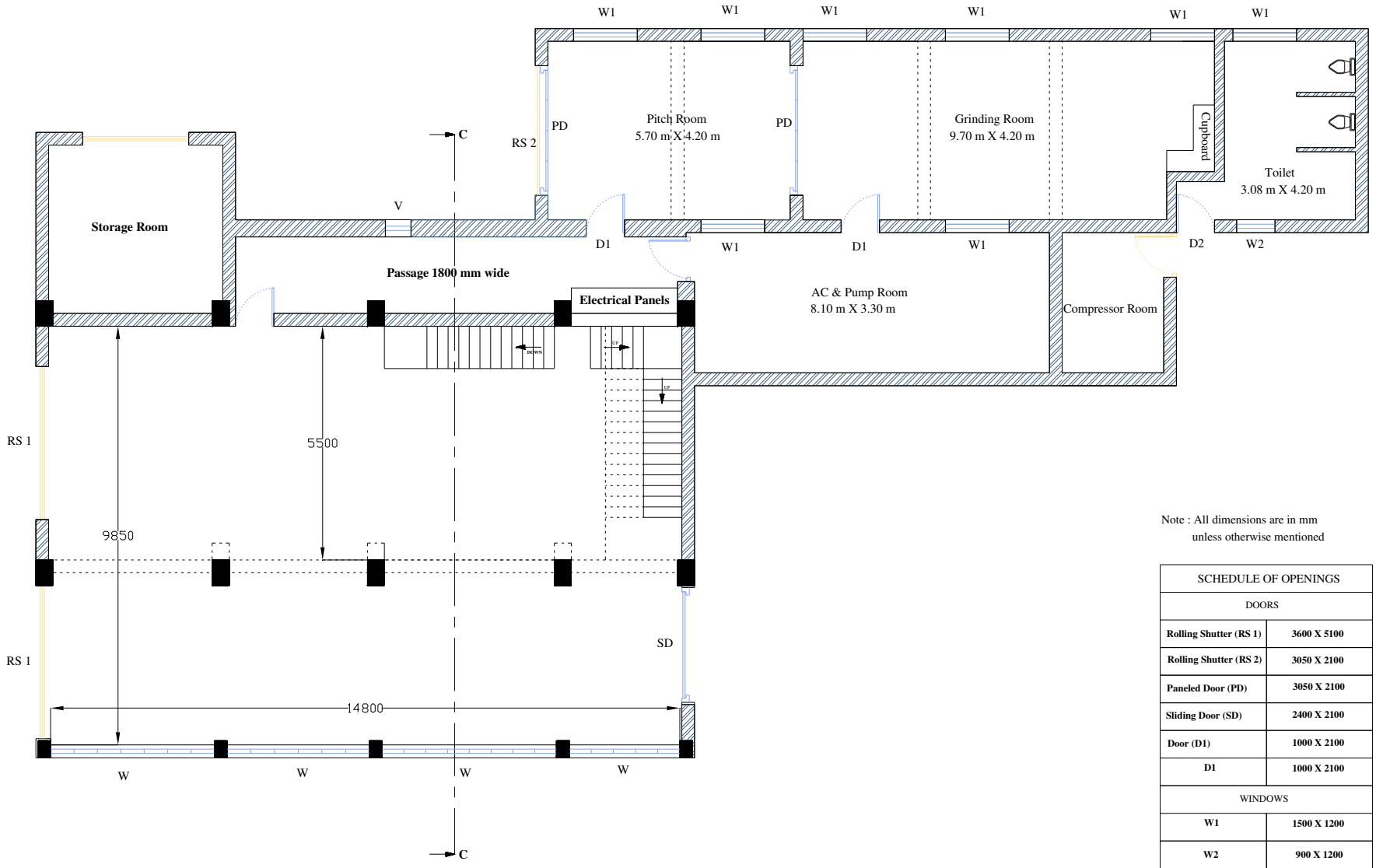
SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
8.0	POWER EARTHING SYSTEM Earthing Stations : Providing the earth stations with necessary materials, labour, civil works, etc. as per Indian Standard specification IS:3043 etc. complete.				
8.1	3 mtrs long 50 mm dia. G.I. plate electrode earth station. The chamber size shall be 450x450 mm with C.I. Cover plate. The identification number shall be provided both inside and outside.	2.00	Each		
8.2	600x600x3.15 mm copper plate electrode earth station. The chamber size shall be 450x450 mm with C.I. Cover plate. The identification number shall be provided both inside and outside.	2.00	Each		
	Earthing Tapes / Wires : Supply & running of earth tapes/wires as per specification, complete. Erection rate shall be for both indoor and outdoor inclusive of earth excavation work.				
8.3	25 X 6 mm GI tape	50.00	Mtr.		
8.4	25 X 3 mm GI tape	50.00	Mtr.		
8.5	25 X 6 mm CU tape with sleeve on insulator	15.00	Mtr.		
8.6	8 SWG Copper wire	10.00	Mtr.		
8.7	25 X 6 mm CU Strip of 750mm Length formed U-clamp with holes and bolt/ nuts mounted on Insulators	2.00	Mtr.		
9.0	MISCELLANEOUS ITEMS				
9.1	Steel items, cable Trays: Supply, fabrication, erection painting of steel items as required as per specification complete. Generally steel items include angles, flats, pipes used for cable trays and supporting arrangements and any other steel items not covered in other items of schedule of quantities. The rate shall also include painting with two coats of red oxide and primer and two coats of synthetic enamel paint of approved shade.	0.25	Ton		

SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
9.2	50 mm GI pipe A class including fixing accessories,	5.00	Mtr.		
9.3	PVC trunking 50X50mm with Front Plate mounting Accessories, Bends, Tees, End Cap etc. Make: LK India	50.00	Mtr.		
9.4	PVC trunking 100X50mm with Front Plate mounting Accessories, Bends,Tees, End Cap etc. Make: LK India	30.00	Mtr.		
9.5	Metallic Raceways: Supply, fabrication of raceways, made out of 14 Guage M.S. sheet with top cover. The race will be fixed to wall/ceiling. The MS sheets shall be surface treated such as phosphating, pickling etc. and painted with approved colour of paint.The race way shall be complete with interconnection piece, top cover, fixing screwm nut, bolts etc. sample to be approved by consultants before fabrication. These raceways will be used as raceways for network cabling/power distribution.				
	Main raceway of size 300mm X 40 mm	10	Mtrs.		
	Main raceway of size 200mm X 40 mm	10	Mtrs.		
9.6	Metallic Floor Boxes: Supply, fabrication of floor boxes, made out of 14 Guage M.S. sheet with top cover. The race will be fixed to floor The MS sheets shall be surface treated such as phosphating, pickling etc. and painted with approved colour of paint.The race way shall be complete with interconnection piece, top cover, fixing screwm nut, bolts etc. sample to be approved by consultants before fabrication. These floor boxeswill be used as raceways for network cabling/power distribution.				
	Floor box of size 450mm X 40 mm	6	Each		
	Floor box of size 300mm X 40 mm	6	Each		

SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
9.7	Floor Raceways : Supply & erection of the following sizes GI anodised Floor Raceways with all connecting /Mounting acessories etc. including Tees, Elboe, Cross etc..				
	40 x 300 mm wide.	5	Mtr.		
	40 x 200 mm wide.	5	Mtr.		
9.8	Casing-N-Capping Supply and fixing of PVC casing and capping wiring system complete with all accessories.				
	20mm width.	60	Mtrs.		
	25mm width.	75	Mtrs.		
	38mm width.	50	Mtrs.		
9.9	Under floor Acess Box 250 X250 X 53 mm depth				
	MK India type USB 250/3/3 OR apporved make	4	Each		
9.1	Rubber mats of 1.1 kV grade 1.8 Mtrs x 0.9 Mtrs and of sufficient thickness as required by the Electrical				
	Inspectorate and confirming to IS 5424.	2.00	Each		
10.0	DISMANTLING WORKS				
1.0	Light fixtures				
a)	2 x 36 W FTL light fixtures	15	Nos.		
b)	1 x 36 W FTL light fixtures	10	Nos.		
2.0	Power - UPS/Raw power Sockets				
a)	1 No. 6 A soc. Controlled by 6 A SP switch	10	Nos.		
b)	1 No. 6/16 A soc. Controlled by 16 A SP switch.	15	Nos.		
3.0	MCCB/MCBs in MS Enclosure				
a)	DB/63 A MCB in MS Enclosure	4	Nos.		
b)	20/32 A Industrial plug & Socket - Single Phase	4	Nos.		
4.0	wiring /conduits/cables system				
a)	2R x 4 Sq, mm + 1R x 2.5 Sq. mm wires.	100	Mtrs.		
b)	2R x 2.5 Sq, mm + 1R x 1.5 Sq. mm wire	100	Mtrs.		

SL. NO.	DESCRIPTION	QTY.	UNIT	RATE	AMOUNT
c)	20/25/32mm PVC conduits -	150	Mtrs.		
d)	Dismantling of Point wiring -	30	Points		
e)	power cables	50	Mtrs.		
	GRAND TOTAL				

CIVIL DRAWINGS

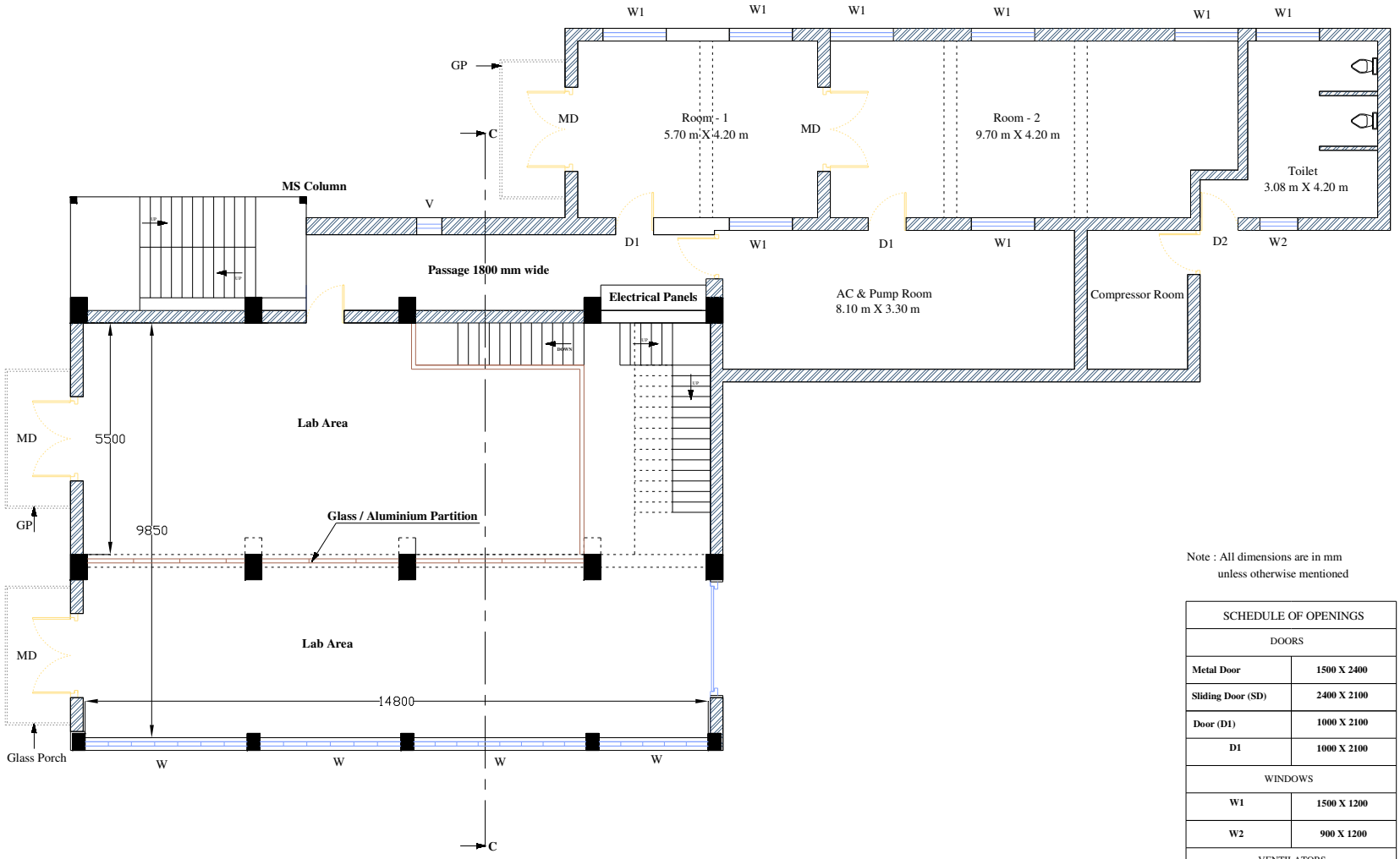


Note : All dimensions are in mm
unless otherwise mentioned

SCHEDULE OF OPENINGS	
DOORS	
Rolling Shutter (RS 1)	3600 X 5100
Rolling Shutter (RS 2)	3050 X 2100
Paneled Door (PD)	3050 X 2100
Sliding Door (SD)	2400 X 2100
Door (D1)	1000 X 2100
D1	1000 X 2100
WINDOWS	
W1	1500 X 1200
W2	900 X 1200
VENTILATORS	
V	600 X 600

Ground Floor (Existing) Plan

90" Telescope Tower
(Photonics Division)

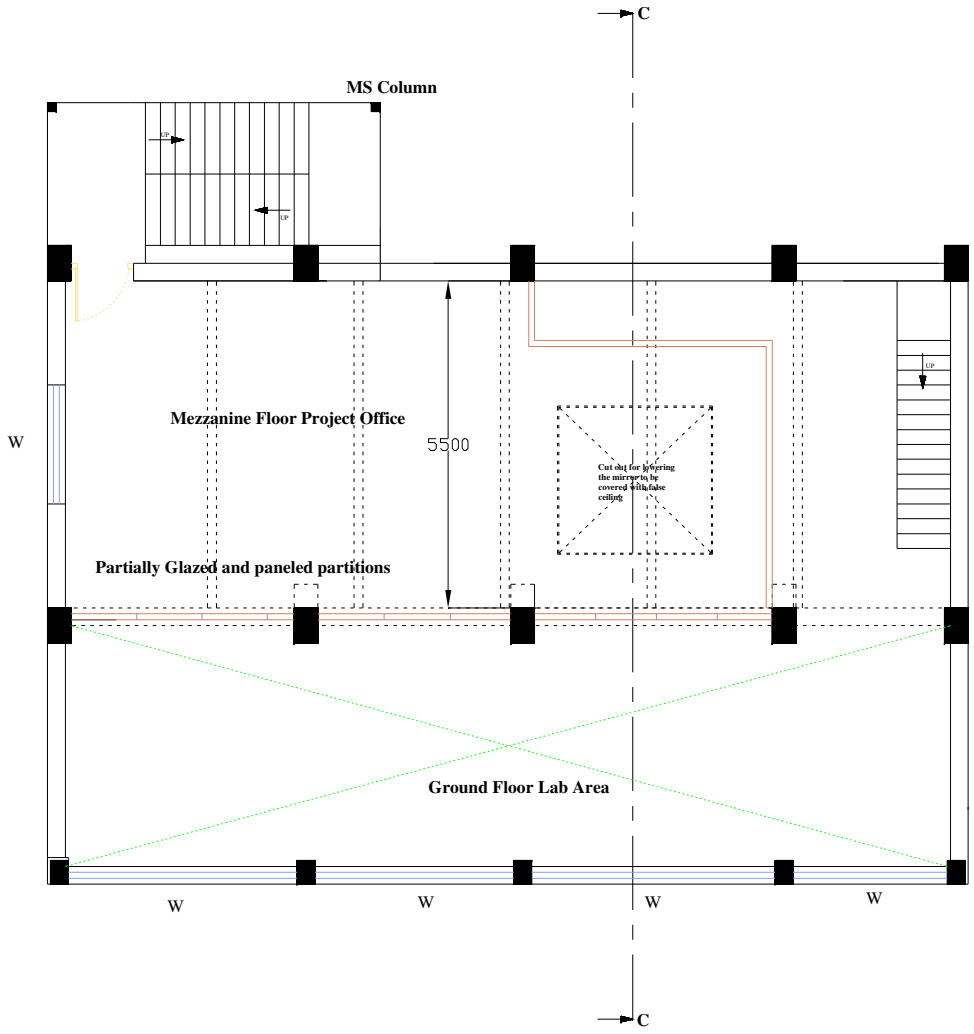


Ground Floor (Proposed) Plan

Note : All dimensions are in mm unless otherwise mentioned

SCHEDULE OF OPENINGS	
DOORS	
Metal Door	**1500 X 2400**
Sliding Door (SD)	**2400 X 2100**
Door (D1)	**1000 X 2100**
D1	**1000 X 2100**
WINDOWS	
W1	**1500 X 1200**
W2	**900 X 1200**
VENTILATORS	
V	**600 X 600**

90" Telescope Tower
(Photonics Division)

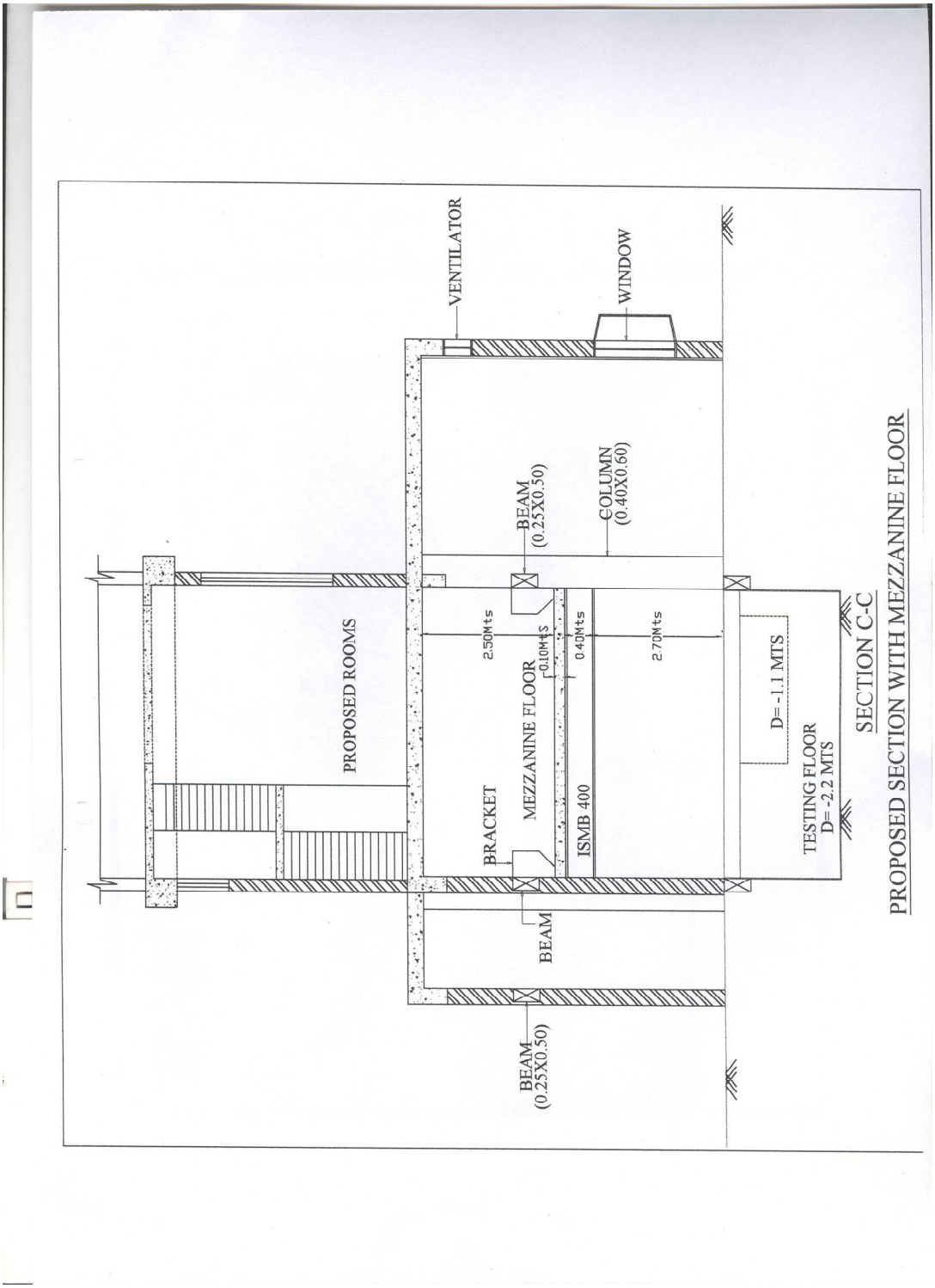


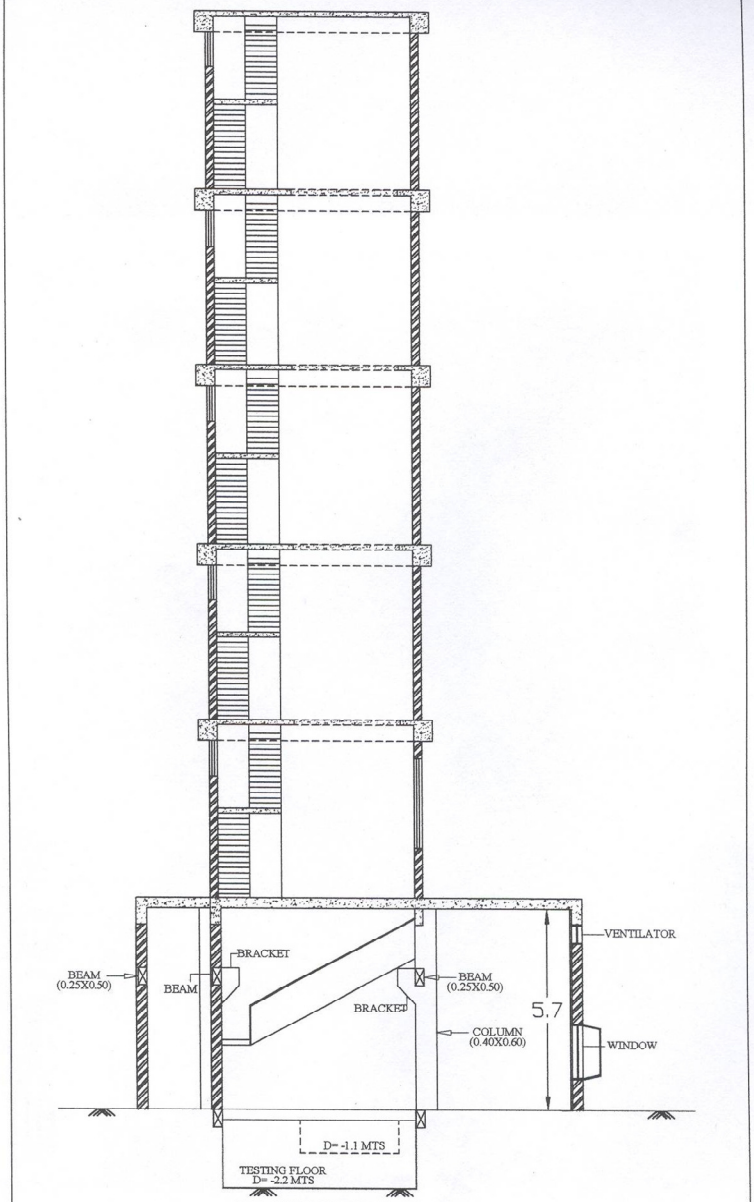
Mezzanine Floor (Proposed) Plan

Note : All dimensions are in mm
unless otherwise mentioned

SCHEDULE OF OPENINGS	
DOORS	
Metal Door	**1500 X 2400**
Sliding Door (SD)	**2400 X 2100**
Door (D1)	**1000 X 2100**
D1	**1000 X 2100**
WINDOWS	
W1	**1500 X 1200**
W2	**900 X 1200**
VENTILATORS	
V	**600 X 600**

90'' Telescope Tower
(Photonics Division)


VENTILATOR
WINDOW
BEAM
(0.25X0.50)
COLUMN
(0.40X0.60)
PROPOSED ROOMS
2.50Mts
0.10Mts
0.40Mts
2.70Mts
BRACKET
MEZZANINE FLOOR
ISMB 400
D= -1.1 MTS
TESTING FLOOR
D= -2.2 MTS
BEAM
BEAM
(0.25X0.50)
SECTION C-C
PROPOSED SECTION WITH MEZZANINE FLOOR



SECTION C-C

EXISTING SECTION

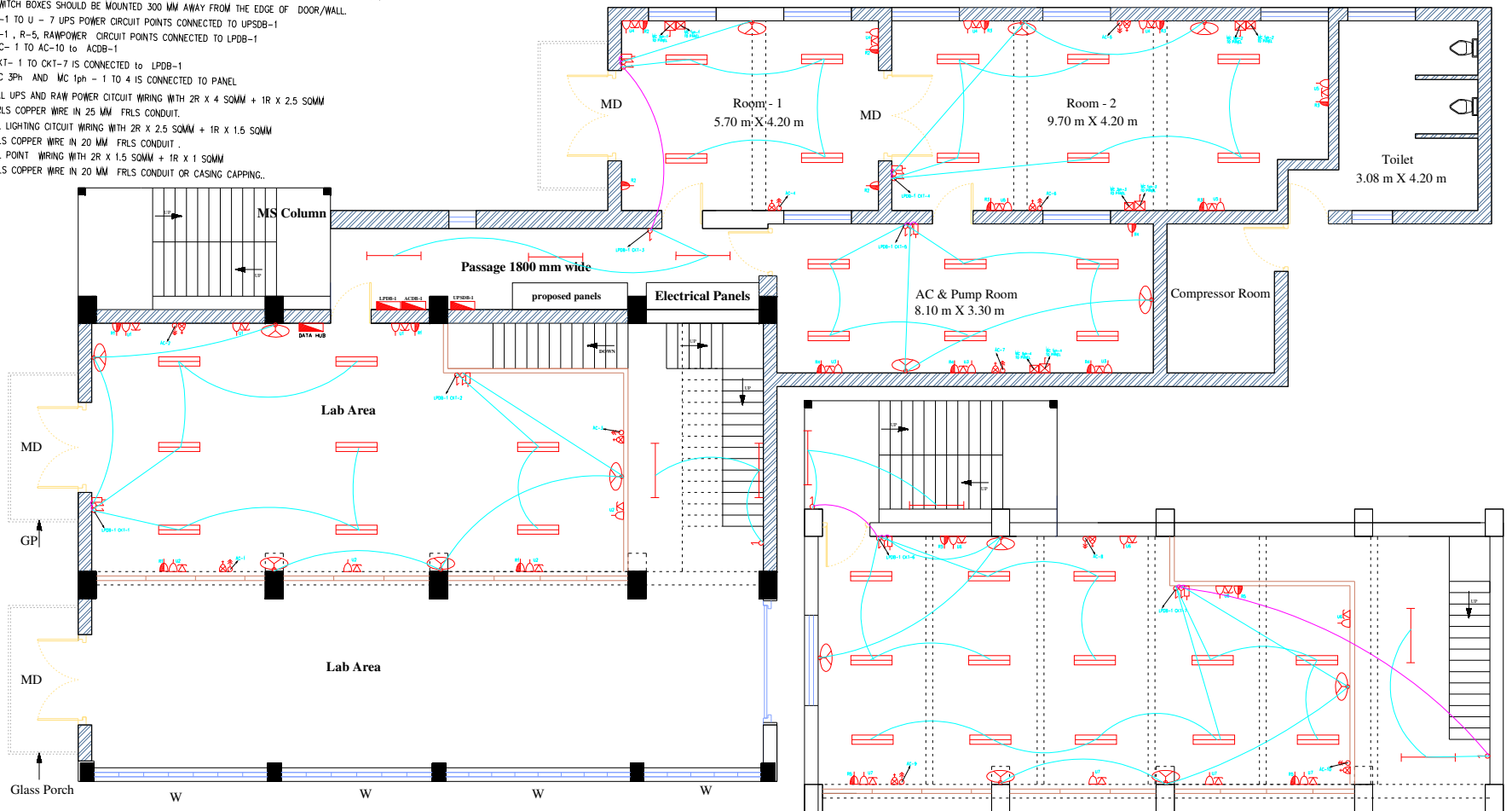
E

GROUND FLOOR
MEZANINNE FLOOR
COUPLER
W1
W2
W3
W4
W5
W6
Note: All Dimensions are in mm.
FENESTA BUILDING SYSTEMS, BANGALORE
CLIENT : ASTROPHYSICS
ARCHITECT:
DRAWN BY: HEMA
SCALE: NOT TO SCALE
DATE : 16.02.2009
PROJECT HANDLED BY : MR.B K RAMESH
PDF created with pdfFactory Pro trial version www.pdffactory.com

ELECTRICAL DRAWINGS

NOTE:

1. ALL THE DIMENSIONS SHELL BE CHECKED AND REFERED FURNITURE & ARCHITECTURAL LAYOUT.
2. SWITCH BOXES SHOULD BE MOUNTED 300 MM AWAY FROM THE EDGE OF DOOR/WALL.
3. U-1 TO U - 7 UPS POWER CIRCUIT POINTS CONNECTED TO UPSDB-1
4. R-1 , R-5, RAWPOWER CIRCUIT POINTS CONNECTED TO LPDB-1
5. AC- 1 TO AC-10 to ACDB-1
6. CKT- 1 TO CKT-7 IS CONNECTED to LPDB-1
7. MC 3Ph AND MC 1ph - 1 TO 4 IS CONNECTED TO PANEL
8. ALL UPS AND RAW POWER CITCUIT WIRING WITH 2R X 4 SQMM + 1R X 2.5 SQMM FRLS COPPER WIRE IN 25 MM FRLS CONDUIT.
8. ALL LIGHTING CITCUIT WIRING WITH 2R X 2.5 SQMM + 1R X 1.5 SQMM FRLS COPPER WIRE IN 20 MM FRLS CONDUIT .
8. ALL POINT WIRING WITH 2R X 1.5 SQMM + 1R X 1 SQMM FRLS COPPER WIRE IN 20 MM FRLS CONDUIT OR CASING CAPPING..



Ground Floor

Mezzanine Floor

SYMBOL	DESCRIPTION
	6/16A SOCKET SWITCH
	18/40 W FLUROSCENT
	6A SWITCH
	WALL FAN
	5A SOCKET SWITCH
	DATA SOCKET
	REGULATOR
	DISTRIBUTION BOARD
	3 PHASE INDUSTRIAL METALCLAD SOCKET
	SINGLE PHASE INDUSTRIAL METALCLAD SOCKET

U -- UPS CIRCUITS FOR PC
8 WAY MODULE BOX
3 WAY MODULE BOX
R -- RAW POWER CIRCUITS

REV.	DESCRIPTION	MADE	CHKD	APPD	DATE
0	ISSUE FOR APPROVAL	ANU	KB	KB	16.06.2015

REVISIONS

PROJECT :
PROPOSED OPTICS LAB-2 FOR
INDIAN INSTITUTE OF ASTRO PHYSICS

Electrical Consultant :-
PANCHMUKHI ASSOCIATES
05, 1st Floor, Old Post Office Road, 2 nd Block, TR Nagar
BANGALORE-560 028 Ph: 26765083 Mb: 9845758077

TITLE :
ELECTRICAL POWER AND LIGHTING LAYOUT
GROUND & MEZZ FLOOR

DWG. NO.
PA-IIAP-LTG-01