TATA INSTITUTE OF FUNDAMENTAL RESEARCH

(Autonomous Institution of the Department of Atomic Energy, Government of India)
Survey No.36/P, Gopanpally Village, Serilingampally Mandal,
Ranga Reddy District, Hyderabad - 500 107
Phone: 040-2020 3020, Email: purchase@tifrh.res.in

Date: 20-09-2017

Notice Inviting Tender
(Two Part Public Tender) for the following works:

Construction of Hangar Structure for Housing Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad.

Public Tender Ref. No.	**TFR/PD/F-302/170294**
Published on	**22-09-2017**
Estimated Tender Cost	**Rs. 90.00 Lakhs**
Tender Fees	**Rs. 500/- (Non-refundable) in the form of D.D. in favour of "TIFR Centre for Interdisciplinary Sciences", payable at Hyderabad to be enclosed with the Technical Bid (Part - I).**
EMD	**Rs. 1,80,000/- in the form of D.D. in favour of "TIFR Centre for Interdisciplinary Sciences", payable at Hyderabad to be enclosed with the Technical Bid (Part - I).**
Pre-Bid Meeting Date, Time & Place	**03-10-2017 at 11.00 AM at TIFR Gopanpally Campus.**
Time of Completion:	**03 (Three) Months**
Last Date for Submission of Bid	**12-10-2017 on or before 13.00 Hrs.**
Date of Opening Bids (Part I: Technical Bid)	**12-10-2017 at 15.00 Hrs.**

1. **Both TECHNICAL BID (PART 'I') and FINANCIAL BID (PART 'II')** to be submitted within the due date and time in separate envelopes and marked on top as TECHNICAL BID (PART 'I') and FINANCIAL BID (PART 'II'). These two sealed envelopes should be further put in one Master Envelope super scribed with the Tender No., Due Date in Bold Letters.
2. In case Part I & Part II bids are not sealed in separate envelopes the tender will be rejected.
3. The technical bid should not indicate any indication of the price.
4. The technical bid received without payment of tender fees and EMD shall be summarily rejected.
5. Contacts: For any Technical related queries please contact Mr. P Kasi Viswanath Tel: 040-2020 3007 and for any commercial related queries please contact Ms. J Rathna, Administrative Officer Tel: 040-2020 3020.

ADMINISTRATIVE OFFICER
TIFR HYDERABAD

Tata Institute of Fundamental Research
टाटा मूलभूत अनुसंधान संस्थान

INVITATION OF BIDS

FOR

Construction of Hangar Structure for Housing Workshop & Laboratory Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad

TECHNICAL BID

PART -I

Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Junction,
Post: Gopanpally, Hyderabad - 500 107

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SECTION-I	IMPORTANT INFORMATION

INTRODUCTION

The Tata Institute of Fundamental Research is a National Centre of the Government of India, under the umbrella of the Department of Atomic Energy, as well as a deemed University awarding degrees for master's and doctoral programs. Tata Institute of Fundamental Research Centre for Interdisciplinary Sciences, Hyderabad invites bids for the following work:

Name of work: Construction of Hangar Structure for Housing Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad

1. PARTICULARS:

a)	Gross considered plinth area	415 Square Mtr. (tentative, approx.)
b)	Location	**Survey No. 36/P, Gopanpally Village, Serilingampally (Mandal) Ranga Reddy Dist., Hyderabad**
c)	Pre-bid Meeting	**03-10-2017 at 11.00 AM at TIFR Gopanpally Campus.**
d)	Date & time of opening of Sealed Cover-I containing Technical Bid	**12-10-2017 on or before 13.00 hrs.**

2. GENERAL INSTRUCTIONS

a) TIFR shall award the contract for the project through the two Bid systems.
b) The Contractor are advised to visit and examine the site of work and its surroundings and obtain any information that may be necessary, in addition to those provided in this document. . The Contractor shall be deemed to have fully acquainted himself about the site condition, whether he inspects it or not.
c) The Contractor should adhere to the building bye-laws applicable for the area.
d) All clarifications shall be sought before the date of pre-bid meeting. The bidders may make suggestions which shall be considered during the Pre Bid Meeting. No further clarifications shall be issued after issue of noteworthy replies to the pre-bid queries.
e) The submission of the bid by Contractor would imply that they have carefully read and agreed to the terms and conditions contained in this bid document.
f) The bid for the work shall remain open for acceptance for a period of 180 (One Eighty) days from the date of submission of the bids, which period may be extended by mutual agreement and the Contractor shall not cancel or withdraw the offer during this period.
g) This bid document shall form a part of the contract agreement.

3. SUBMISSION OF BIDS

Bids shall be submitted to The Administrative Officer, TIFR, Survey No. 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad-500 107 in a sealed Master envelope super scribed "Bid for Construction of Hangar Structure for Housing Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga

Reddy District, Hyderabad" with our enquiry no. and due date, containing two separate sealed covers clearly super scribed as "Technical Bid" and "Price Bid" before the closing date and time of submission in the following manner:

a) "Technical Bid": This will contain Technical part, Eligibility Documents along with testimonials. Earnest Money Deposit (EMD) & Tender Drawings.
b) "Price Bid": This will contain the complete bidding document with duly filled in Schedule of Financial Quote of Price Bid.

The Bids without signature of the authorized person of bidder and seal, without EMD, with conditions or conditional rebates shall be summarily rejected.

4. EVALUATION OF BID:

a) **EVALUATION OF TECHNICAL BID:** The bids received will first be first opened and will be examined for EMD, Eligibility Criteria, Conditions, signed tender drawings etc. Conditional Tenders and Tenders without EMD shall be summarily rejected.
b) **EVALUATION OF PRICE BID:** The Price Bid should contain the complete bid document with duly filled in Schedule of Financial Quote of Price Bid. Price Bids of Technically qualified Bidders will only be opened. Work will be awarded to techno commercially accepted lowest bidder (L1) based on their quotes after making necessary arithmetical checks.

5. SCOPE & OBJECTIVE

The Objective of the tender is to construct **Hangar structure for Housing Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad as per the specifications and Bill of quantities mentioned in the Price Bid.**

Period of Completion of Work: 3(Three) months from the date of issue of work order

Defect Liability Period: 12 months from the date of handing over of completed structure as per tender.

6. PAYMENT SCHEDULE:

The contractor shall submit the bills for payments along with detailed statement showing the actual works carried out under different heads of items in the format specified by the TIFR. Minimum value of the work for interim payment (Running Bills) shall be **Rs. 30,00,000/-.** All interim and final bills will be settled based on the joint measurements of each item of works and certified by TIFR Engineer. All interim bills will be paid after submission of all documents, original bills with certification of TIFR Hyderabad Engineer-in-Charge.

A. Eligibility Criteria for Tender Qualification

1. The Agencies/Contractors will be qualified for construction of hangar structure of 4,500 sft. of Built Up Area for housing Workshop and Laboratory Space along with site development and approach roads at 36/P, Gopanpally Village, Serilingampally Mandal, Rangareddy District, Hyderabad.
2. Eligibility criteria:

1. The Agencies/Contractors shall hold valid labour license issued by appropriate authority and must be valid throughout the contractual period
2. The Agencies/Contractors should have average annual turnover of Rs 90 lakhs during three previous financial years ending March 31, 2017. The Audited Annual Turnover is to be certified by Chartered Accountant (CA) for the Last 3 Years (Format Attached at Schedule – F).
3. The Agencies/Contractors shall be in profit for last three financial years and should have valid PAN from Income Tax Authority, PF Registration No., GST registration No. etc. and any other registration applicable/mandatory for contract.
4. The Agencies/Contractors should have executed successfully at least one similar work costing Rs. 70 lakhs or two similar works costing Rs. 45 lakhs or 3 similar works costing Rs. 35 Lakhs during last 7 financial years ended on March 31st 2017 for Research Institutes, Universities, Private Laboratories, R & D institutes, etc. in any Government /PSU/Private organizations of repute.
5. The Agencies/Contractors should furnish copies of work orders, completion certificates from the clients in support of the above.
6. The Agencies/Contractor shall be registered with Government / Semi Government/Municipal Authorities of any other Public Organization. (Enclose certified copies of document as evidence)
7. Solvency certificate for Rs. 50 Lakhs from any Nationalized Bank
8. IT Returns for the last three consecutive financial years ended on March 31, 2017 audited by CA.
9. Agencies/Contractors should have full-fledged in-house project management team to undertake the jobs.

10. The Agencies/Contractors shall **strictly furnish** aforesaid information in the formats/schedules given. **Non adherence to furnishing of information in the given format/schedules given will lead to disqualification of tender.**

11. Instructions to Agencies/Contractors for furnishing the information is given as under:

i. Each page of the application shall be signed by a person having necessary authority to do so.

ii. If the space in the proforma is insufficient for furnishing full details, such information may be given in separate sheets.

iii. Applicants are required to furnish information against each item of the application. In case certain item is not applicable, please write NA. Application containing incorrect and or inadequate information is liable to be rejected.

iv. For any further clarification, the applicant may contact Administrative Officer, Tata Institute of Fundamental Research, Survey No. 36/P, Gopanpally Junction, Post: Gopanpally, Serilingampally, Hyderabad – 500 107.

SCHEDULE – A

BASIC INFORMATION

1. Name of the firm :

2. a) Address :
   b) Telephone/ Fax No. :
   c) Mobile No. Contact Person :
   d) PAN No. :
   e) PF/ESI Registration Details:
   f) GST Registration No. :

3. Branch Office if any in Hyderabad :

4. Type of Orgnisation (Proprietorships/ Partnership) Ltd. Co. / Co-Operative) (Copy of relevant document to be enclosed) :

5. Date of Incorporation :

6. Nature of Business :

7. Experience as prime Agencies/Contractors (in Yrs.) :

8. Name and address of Bankers. :

9. Organization chart of the Company including names and positions of directors / key personnel/ :

_____

Signature of the Applicant (s)

Schedule – B

Major Hangar works executed (Copies of the completion certificate to be enclosed)

A. Similar work of costing Rs. 70 lakhs or two similar works of costing Rs. 45 lakhs or 3 similar works of costing Rs. 35 Lakhs during last 7 financial year ending March 31st 2017 for Research Institutes, Universities, Private Laboratories, R & D institutes, etc.

Sr. No.	Name of the Project & Address	Description of work in brief	Name of the Architect	Name of the Client. Also indicate whether Govt. or semi Govt. or Pvt. Body with full postal address.	Contract Amount in (Rs.)	year of commencement	Date of Completion		Whether work was left incomplete or contract was terminated from either side? Give Details	Any other relevant information
							Stipulated	Actual		

B. List of works in progress above Rs. 35 lakhs.

Sr. No.	Name of the project & Address	Description of work in brief	Name of the Architect with full postal address.	Name of the Client. Also indicate whether Govt. or semi Govt. or Pvt.	Contract Amount in (Rs.)	Date of Completion	Present stage of work with reasons if the work is getting delayed	Any other relevant information

Contractor's Signature & Seal

				Body with full postal address				
1.								
2.								

Signature of the Applicant (s)

Contractor's Signature & Seal

SCHEDULE – C

TECHNICAL PERSONNEL & SPECIAL EXPERIENCE

List of technical personnel in your establishment giving details about their technical qualification and experience

Sr No.	Name	Age	Qualifications	Project Experience	Nature of works handled	Name of the project Handled	Date from which employed in your organization	Indicate special experience in Advance Management Techniques like CPM / PERT and the projects in which such techniques were employed
1								
2								

2. Indicate other points if any to show your technical and managerial competency to indicate any important point in your favour.

Signature of the Applicant (s)

Contractor's Signature & Seal

SCHEDULE – D

FINANCIAL POSITION AND WORKING RESULTS

			2014-15	2015-16	2016-17
1.	Annual turnover		:	Rs.	
2.	Net Profit		:	Rs.	
3.	Credit Facilities from the Bank		:	Rs.	
	a)	Cash Credit	:	Rs.	
	b)	Overdraft Limit	:	Rs.	
	c)	Guarantee	:	Rs.	
	d)	Others	:	Rs.	
4.	Certificate from the Bankers regarding financial soundness of the applicant		:	Enclosed (Yes / No)	
5.	Solvency Certificate from the Bankers		:	Enclosed (Yes / No)	

Signature of the Application (s)

SCHEDULE – E

MICELLANEOUS INFORMATION

1. Whether it would be possible to process Bank Guarantee for various advances during execution of the work.
2. Details of Civil Suits / Litigations arised during execution of the contracts in the last 5 years.
3. Latest Income Tax Clearance Certificate
4. Name of the two senior official of Organizations preferably Govt./Semi Govt/ Autonomous/ Public Sector Organization for whom you have executed important major Civil & Electrical works, who may be directly contracted by TIFR to gather information about your ability, competence and capacity of your work/organization/etc.

1. Number of Supplementary sheets attached.

Signature of the Applicant (s)

SCHEDULE – F

Audited Annual Turnover to be certified by Chartered Accountant (CA) for the Last 3 Years.

S.No.	Financial/ Accounting Year	Profit (Rs.)	Loss (Rs.)	Annual Turnover (in Rs.)
1.	2016-2017			
2.	2015-2016			
3.	2014-2015			

Signature of Chartered Accountant with seal

Note: The above Audited Annual Turnover is to be certified by Chartered Accountant (CA) on the Letterhead for the Last 3 Years.

1. Sealed item rate tenders in the prescribed form are invited from Administrative Officer, Tata Institute of Fundamental Research, Centre for Interdisciplinary Services, Hyderabad, for the following:

Tender Notice No.	**TFR/PD/F-302/170294**
Name of Work	**Construction of Hangar Structure for Housing Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad.**
Estimated Cost	**Rs. 90,00,000/-**
Time Limit	**3 (Three) Months**
Earnest Money Deposit	**Rs 1,80,000/- (Rs One Lakh Eighty Thousand Only)**
Pre-bid meeting	**03-10-2017 at 11.00 AM at TIFR Gopanpally Campus.**
Last Date & Time of Submission of Tender	**12-10-2017 upto 13:00 hrs.**
Date & Time of Opening of Technical Bid	**12-10-2017 at 15:00 hrs. at TIFR Gopanpally Campus.**

2. Submission of Tender & Opening: Tenders shall be submitted in a sealed envelope super scribed with Tender enquiry No., Due Date and with heading as "Construction of Hangar Structure for Housing Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad" containing two separate sealed covers clearly super scribed as "TECHNICAL BID" and "FINANCIAL BID" on or before the closing date and time of submission in the following manner:

"TECHNICAL BID": This will contain the following:

a) Tender Fees
b) Earnest Money Deposit as stipulated
c) Schedules giving information on Eligibility Criteria specified for tender qualification.

"FINANCIAL BID": Signed copy of the Financial Bid quoting amount in the stipulated format and signed copies of the tender drawings.

3. Performance guarantee: The tenderer, whose tender is accepted, will be required to furnish a performance guarantee of
5% of the tendered amount within 7 (seven) working days from the date of intimation. This guarantee shall be in the form Demand Draft / Pay Order / Banker's cheque / Deposit or Government Securities / Fixed Deposit Receipt (FDR) or Guarantee Bonds (BG) of any Scheduled Bank in accordance with the form as Annexure – I hereto. In case a fixed deposit receipt of any Bank is furnished by the contractor to TIFR as part of the performance

guarantee and the Bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to TIFR to make good the deficit.

The Performance Guarantee shall be one year from the date of successful completion plus 60 days beyond that. In case the time for completion of work gets enlarged, the contractor shall get the validity of performance Guarantee extended to cover such enlarged time from completion of work. The performance guarantee shall be returned to the contractor, without any interest, after completion of the validity period for the work by the competent authority.

The Engineer-in-charge shall make a claim under the Performance guarantee for amounts to which TIFR entitled under the contract (notwithstanding and / or without prejudice to any other provisions in the contract agreement) in the event of:

a) Failure by the contractor to extend the validity of the Performance Guarantee as described herein above, in which event the Engineer-in-charge may claim the full amount of the Performance guarantee.

b) Failure by the contractor to pay TIFR, Hyderabad any amount due, either as agreed by the contractor or determined under any of the Clauses / Conditions of the agreement, within 30 days of the service of notice to this effect by Engineer-in-charge.

In the event of the contract being determined under provisions of any of the relevant clauses of the agreement, the performance guarantee shall stand forfeited in full and shall be absolutely at the disposal of TIFR, Hyderabad.

6. Security Deposit: The tenderer, whose tender is accepted, will also be required to furnish by way of Security Deposit for fulfillment of his contract, an amount equal to 5% of the tendered value of the work in the form of Demand Draft.

or

The successful tenderer shall permit TIFR, Hyderabad at the time of making any payment to him for work done under the contract to deduct a sum at the rate of 5% of the gross amount of each running bill till the sum along with the sum already deposited as earnest money, will amount to security deposit of 5% of the tendered value of the work. Such deductions will be made and held by TIFR by way of Security Deposit unless he has / they have deposited the amount of Security at the rate mentioned above in the form or Fixed Deposit Receipts.

In case a fixed deposit receipt of any bank is furnished by the contractor to TIFR, Hyderabad as part of the security deposit and the bank is unable to make payment against the said fixed deposit receipt, the loss caused thereby shall fall on the contractor and the contractor shall forthwith on demand furnish additional security to TIFR, Hyderabad to make good the deficit.

All compensation or the other sums of money payable by the contractor under the terms of this contract may be deducted from, or paid by the sale of a sufficient part of his security deposit or from the interest arising therefrom, or from any sums which may be due to or may become

due to the contractor by TIFR or any account whatsoever and in the event of his Security Deposit being reduced by reason of any such deductions or sale as aforesaid, the contractor shall within 10 days make good in fixed deposit receipt tendered by the State Bank of India or by scheduled banks (if deposited for more than 12 months) endorsed in favour of the TIFR, HYDERABAD, any sum or sums which may have been deducted from, or raised by sale of his security deposit or any part thereof.

Security Deposit as deducted above can be released against Bank Guarantee issued by a Scheduled Bank. Bank Guarantee should be submitted which will be valid up to the expiry of defect liability period.

7. Acceptance of Tender: The competent authority, on behalf of TIFR, Hyderabad does not bind itself to accept the lowest or any other tender, and reserves to himself the authority to reject any or all the tenders received, without assignment of any reason. All tenders, in which any of the prescribed condition is not fulfilled or any condition, including that of conditional rebates is put forth by the tenderer, shall be summarily rejected.

The Competent Authority, on behalf of TIFR, Hyderabad reserves to itself the right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at the rates quoted. The officer inviting tenders shall have the right of rejecting all or any of the tenders and will not be bound to accept the lowest tender or any other tender.

8. Validity of Tender: The tender for the work shall remain open for acceptance for a period of 180 days from the last date of submission of tenders. If any tenderer withdraws his tender before the said period, or before issue of Letter of Intent, whichever is earlier, or makes any modifications in the terms and conditions of the tender which are not acceptable to the Department, then TIFR, Hyderabad shall, without prejudice to any other right or remedy, be at liberty to forfeit the said EMD. Further the tenderer shall not be allowed to participate in the retendering process of the work.

9. Levy / Taxes payable by contractor:

i. GST or any other tax on materials and services in respect of this contract shall be payable by the contractor and TIFR shall not entertain any claim whatsoever in this respect.

ii. The contractor shall deposit royalty and obtain necessary permit as required for supply of the sand, aggregate, stone etc. from local authorities.

10. Deduction of Income Tax : As per Section 194-C of Income tax Act 1961, as amended by letter No. 275/9/72/9-TJ (Circular No. 86) dated 19.5.72 and No. 275/14/91-IT (B) (Circular No. 593) dated 5.2.91, received from Ministry of Finance, Department of Revenue, Central Board of Direct Taxes, New Delhi, The applicable taxes/GST will be deducted as per the GST regime / or any other amended rate by Ministry of Finance from Time to Time.

11. Site visit by the tenderer before tendering: Tenderers are advised to inspect and examine the site and its surroundings during working hours and satisfy themselves before submitting their tenders as to the nature of the ground and sub-soil (so far as is practicable),

the form and nature of the site, the means of access to the site, the accommodation they may require and in general shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. 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.

12. Signing of Tender and receipts for payments: In the event of the tender being submitted by a firm, it must be signed separately by each partner thereof or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power-of-attorney authorizing him to do so, such power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act-1952. Receipts for payments made on account of work, when executed by a firm, must also be signed by all the partners, except where contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the authorized partners, or by some other person having due authority to give effectual receipts for the firm.

13. Tenderer's responsibilities: The tenderer shall be responsible for arranging and maintaining at his own cost all materials, tools & plants, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that they have read this notice & all other contract documents, and has made himself aware of the scope & specifications of the work to be done and local conditions and factors having a bearing on the execution of the work.

14. Signing of contract: The Notice Inviting Tender shall form a part of the contract document. The successful tenderer / contractor, on acceptance of his tender by the Accepting Authority, shall, within 15 days from the stipulated date of start of the work, sign the contract consisting of: the Notice Inviting Tender, all the documents including all conditions, specifications and drawings, if any, forms the tender as issued at the time of invitation of tender and acceptance thereof together with any correspondence leading thereto.

16. Canvassing, either directly or indirectly, in connection with the tenders is strictly prohibited and the tenders submitted by the contractors who resort to canvassing will be liable to rejection and may be barred from the future participation in TIFR works.

17. All other standard terms & conditions as per TIFR.

UNDERTAKING BY THE TENDERER

I / We have read and examined the Tender document including terms & conditions, specifications, bill of quantities, drawings and designs, general rules & directions, General Conditions of Contract, Special Conditions of Contract and all relevant other documents, publications and rules referred to in the Conditions of Contract and all other contents in the tender documents for the work.

I / We, hereby tender for execution of the work specified for the TIFR, Hyderabad within the time specified and in accordance in all respects with the specifications, designs, drawings and instructions in writing.

We agree to keep the tender open for **One Eighty (180) days** from the last date of its submission and not to make any modifications in its terms and conditions. A sum of Rs ..... has been deposited in receipt treasury challan / deposit at call receipt of scheduled bank / fixed deposit receipt of scheduled bank / demand draft of a scheduled bank / Bank Guarantee issued by a Scheduled Bank as earnest money. If I / we, fail to furnish the prescribed performance guarantee within prescribed period, I / we agree that the said TIFR, Hyderabad or its authorized officer shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I / we fail to commence work as specified, I / we agree that the TIFR, Hyderabad shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said EMD and the performance guarantee absolutely, otherwise the said earnest money shall be retained by TIFR, Hyderabad towards security deposit to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein.

Further, I / We agree that in case of forfeiture of earnest money or both Earnest Money & Performance Guarantee as aforesaid, I / We shall be debarred for participation in the re-tendering process of the work.

I / We hereby declare that I / We shall treat the tender documents, drawings and other records connected with the work as secret / confidential documents and shall not communicate information derived there-from to any person other than a person to whom I / We am / are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Seal & Signature of Contractor
Postal Address

Dated

Witness

Address

Occupation

i. **Definitions:**

a) The **'Contract'** means the documents forming the tender and acceptance thereof and the formal agreement executed between the Competent authority on behalf of the TIFR, Hyderabad and the Contractor together with the documents referred to therein including these conditions, the specifications, designs, drawings and instructions issued from time to time by the Engineer-in-charge and all these documents taken together, shall be deemed to form one contract and shall be complementary to one another.

b) The expression **'Works'** or **'Work'** shall, unless there be something either in the subject or context repugnant to such construction, be construed and taken to mean the works by or by virtue of the contract contracted to be executed whether temporary or permanent and whether original, altered, substituted or additional.

c) The **'Site'** shall mean the land or other places on, into or through which work is to be executed under the contract or any adjacent land, path or street through which work is to be executed under the contract or any adjacent land, path or street which may be allotted or used for the purpose of carrying out the contract.

d) The **'Contractor'** shall mean the individual, firm or company, whether incorporated or not, undertaking the works and shall include the legal personnel representative of such individual or the persons composing such firm or company or the successors of such firm or company and the permitted assignees of such individual, firm or company.

e) The **'Engineer-in-Charge'** means the Engineer / Officer, who shall supervise and be in charge of the work on behalf of TIFR, Hyderabad.

f) **'Temporary Work'** means all temporary works of every kind required in or about the execution, completion and maintenance of the works.

g) **'Market Rate'** shall be the rate as decided by the Engineer-in-Charge on the basis of the cost of materials and labour at the site where the work is to be executed plus 15% to cover, all overheads and profits. h) **'TIFR'** means TIFR, Hyderabad.

h) **'Tendered value'** means the value of the entire work as stipulated in the letter of award.

i) **Time Limit:** The time allowed for carrying out the work reckoned from 10th day of the date of issue of work order.

ii. **Opening of Tenders: Tenders shall be opened by the authorized committee of TIFR in the presence of intending** bidders or their authorized representatives at the scheduled date and time.

iii. **Declaration by tenderer:** The tenderers shall sign a declaration under the Official Secret Act-1923 for maintaining secrecy of the tender documents, drawings or other records connected with the work given to them. The unsuccessful tenderers shall return all the drawings given to them.

iv. **Filling up of rates:** All rates shall be quoted on the tender form by the tenderers in figures and words, and the amount in figures only. All rates shall be quoted on the prescribed tender form. The amount for each item should be worked out and requisite totals given.

a. The rate(s) must be quoted in decimal coinage. Amounts must be quoted in full rupees by ignoring fifty paise and considering more than fifty paise as rupee one.

b. If a discrepancy is found, the rates which correspond with the amount worked out by the contractor shall, unless otherwise proved, be taken as correct.

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

d. Where the rate quoted by the tenderer in figures and in words tally but the amount is not worked out correctly, the rate quoted by the tenderer will, unless otherwise proved, be taken as correct and not the amount.

e. In event no rate has been quoted for any item(s), leaving space both in figure(s), word(s), and amount blank, it will be presumed that the contractor has included the cost of this / these item(s) in other items and rate for such item(s) will be considered as **zero** and work will be required to be executed accordingly.

v. **Quoted rates to includes all taxes:** GST or any other tax on materials and services in respect of this contract, including state Sales tax and Turnover tax on transfer of property as per Works Contract Act etc. if any, shall be payable by the contractor and TIFR will not entertain any claim whatsoever in respect of the same. As per the directives of the Sales Tax Authorities, the tax due at the rates notified by the State Government from time to time, shall be deducted from the bills payable to the Contractors, for which TDS certificate shall be issued by the Department. GST rule will be applicable if any with effect from 01.07.2017 as per GST regime.

vi. **Action in case of un realistic rates:** In the case of any tender where unit rate of any item (s) appear unrealistic, such tender will be considered as unbalanced and in case the tenderer is unable to provide satisfactory explanation, such a tender is liable to be disqualified and rejected.

vii. **Contractor to depute his representative at site:** The successful tenderer for the work should have responsible and responsive representative with adequate powers to take speedy decisions during the entire period of execution at the Work place. On acceptance of the tender, the name of the accredited representative(s) of the contractor, who would be responsible for taking instructions from the Engineer-in-Charge, shall be communicated in writing to the Engineer-in-Charge.

viii. **Sufficiency of Tender:** The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Bill of Quantities, at which rates and prices shall, except as otherwise

provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance of the works.

ix. **Signing of Contract:** The successful tenderer / contractor, on acceptance of his tender by the Accepting Authority, shall, within 15 days from the stipulated date of start of the work, sign the contract consisting of complete tender document including conditions, bill of quantities, drawings, if any, and acceptance thereof together with any correspondence leading thereto along with DAE Safety Code and Model Rules for the protection of health, sanitary arrangements for workers employed by DAE or its contractors, DAE Contractor's Labour Regulations, List of Acts and omissions for which fines can be imposed. No payment for the work done will be made unless contract is signed by the contractor

1. Compensation for delay: If the contractor fails to maintain the required progress in terms of contract or to complete the work and clear the site on or before the stipulated or extended date of completion, he shall, without prejudice to any other right or remedy available under the Law to the Govt. on account of such breach, pay as agreed compensation the amount calculated at **1.5% per month of delay to be computed on per day basis** on the amount of tendered value of the work for every completed day / month (as applicable) that the progress remains below that specified or that the work remains incomplete. Provided always that the total amount of compensation for delay to be paid under this condition shall not exceed 10% of the tendered value of work or of the tendered value of the item or group of items of work for which a separate period of completion is originally given.

2. Determination of contract: Subject to other provisions contained in this clause, the Engineer-in-Charge may, without prejudice to his any other right or remedy against the contractor in respect of any delay, inferior workmanship, any claim for damages and /or any other provisions of this contract or otherwise, and whether the date for completion has or has not elapsed, by notice in writing absolutely determine the contract in any of the following cases:

i. If the contractor having been given by the Engineer-in-Charge a notice in writing to rectify, reconstruct or replace any defective work or that the work is being performed in an inefficient or otherwise improper or unworkman-like manner shall omit to comply with the requirements of such notice for a period of 7 days thereafter.

ii. If the contractor has, without reasonable cause, suspended the progress of the work or has failed to proceed with the work with due diligence so that in the opinion of the Engineer-in-Charge (which shall be final and binding) he will be unable to secure completion of the work by the date for completion and continue to do so after a notice in writing of 7 days from the Engineer-in-Charge.

iii. If the contractor fails to complete the work within the stipulated date or items of work with individual date of completion, if any stipulated, on or before such date(s) of completion and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge.

iv. If the contractor persistently neglects to carry out his obligations under the contract and / or commits default in complying with any of the terms and conditions of the contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge.

v. If the contractor shall offer or give or agree to give to any person in TIFR or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other contract for TIFR.

vi. If the contractor shall obtain a contract elsewhere as a result of wrong tendering or other non-bonafide methods of competitive tendering.

vii. If the contractor assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work, shall not be deemed to be subletting) or otherwise parts with or attempts to assign, transfer, sublet or otherwise parts with the entire works or any portion thereof without the prior written approval of the Engineer-in-Charge.

viii. If the work is not started by the contractor within l / 8th of the stipulated time.

ix. When the contractor has made himself liable for action under any of the cases aforesaid, the Engineer-in- Charge on behalf of the TIFR, Hyderabad shall have powers:

a) To determine the contract as aforesaid (of which termination notice in writing to the contractor under the hand of the Engineer-in-Charge shall be conclusive evidence). Upon such determination, the Earnest Money Deposit, Security Deposit already recovered and Performance Guarantee under the contract, shall be liable to be forfeited, and shall be absolutely at the disposal of TIFR, Hyderabad.

b) After giving notice to the contractor to measure up the work of the contractor and to take such whole, or the balance or part thereof, as shall be unexecuted out of his hands and to give it to another contractor to complete the work. The contractor, whose contract is determined as above, shall not be allowed to participate in the tendering process for the balance work

x. In the event of above courses being adopted by the Engineer-in-Charge, the contractor shall have no claim to compensation for any loss sustained by him by reason of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the contract. And in case action is taken under any of the provisions aforesaid, the contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this contract unless and until the Engineer-in-Charge has certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid the value so certified.

3. Contractor liable to pay compensation even if contract is not determined: In any case in which any of the powers conferred upon the Engineer-in-Charge under the contract, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default by the contractor and the liability of the contractor for compensation shall remain unaffected. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the contractor), use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the site thereof, belonging to the contractor, or procured by the contractor and intended to be used for the execution of the work / or any part thereof, paying or allowing for the same in account at the

contract rates, or, in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final and binding on the contractor, his clerk of the works, foreman or other authorized agent to remove such tools, plant, materials, or stores from the premises (within a time to be specified in such notice); in the event of the contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the contractor's expense or sell them by auction or private sale on account of the contractor and at his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expenses of any such sale shall be final and conclusive against the contractor.

4. Time Extension for delay: The time allowed for execution of the works as stipulated in the contract or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from such time period as mentioned in contract. If the Contractor commits default in commencing the execution of the work as aforesaid, TIFR shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the earnest money & performance guarantee absolutely.

As soon as possible after the Contract is signed, the Contractor shall submit a Time and Progress Chart for each mile stone and get it approved by the Department. The Chart shall be prepared in direct relation to the time stated in the Contract documents for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades of sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor within the limitations of time imposed in the Contract documents, and further to ensure good progress during the execution of the work, the contractor shall in all cases in which the time allowed for any work, exceeds one month (save for special jobs for which a separate programme has been agreed upon) to complete the work as per the mile stones given.

If the work(s) be delayed by:

i. Force majeure, or
ii. Abnormally bad weather, or
iii. Serious loss or damage by fire, or
iv. Civil commotion, local commotion of workmen, strike or lock out, affecting any of the trades employed on the work, or
v. Delay on the part of other contractors or tradesmen engaged by Engineer-in-Charge in executing work not forming part of the Contract, or
vi. Any other cause which, in the absolute discretion of the Engineer-in-Charge is beyond the Contractor`s control, then upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavors to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in- Charge to proceed with the works.

Request for rescheduling of Mile stones and extension of time, to be eligible for consideration, shall be made by the Contractor in writing within 14 days of the happening of the event causing delay on the prescribed form. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired. In any such case the **Engineer-in-Charge** may give

a fair and reasonable extension of time and reschedule the mile stones for completion of work. Such extension shall be communicated to the Contractor by the Engineer- in- Charge in writing, within 3 months of the date of receipt of such request. Non application by the contractor for extension of time shall not be a bar for giving a fair and reasonable extension by the Engineer-in-Charge and this shall be binding on the contractor.

5. Measurements of work done: Engineer-in-Charge shall, except as otherwise provided, ascertain and determine by measurement, the value in accordance with the contract of work done. All measurement of all items having financial value shall be entered in Measurement Book and/or level field book so that a complete record is obtained of all works performed under the contract. All measurements and levels shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the contractor or his authorized representative from time to time during the progress of the work and such measurements shall be signed and dated by the Engineer- in-Charge and the contractor or their representatives in token of their acceptance. If the contractor objects to any of the measurements recorded, a note shall be made to that effect with reason and signed by both the parties. If for any reason the contractor or his authorized representative is not available and the work of recording measurements is suspended by the Engineer-in-Charge or his representative, the Engineer-in-Charge and the Department shall not entertain any claim from contractor for any loss or damages on this account. If the contractor or his authorized representative does not remain present at the time of such measurements after the contractor or his authorized representative has been given a notice in writing three (3) days in advance or fails to countersign or to record objection within a week from the date of the measurement, then such measurements recorded in his absence by the Engineer-in-Charge or his representative shall be deemed to be accepted by the Contractor.

The contractor shall, without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements and recording levels. Except where any general or detailed description of the work expressly shows to the contrary, measurements shall be taken in accordance with the procedure set forth in the specifications notwithstanding any provision in the relevant Standard Method of measurement or any general or local custom. In the case of items which are not covered by specifications, measurements shall be taken in accordance with the relevant standard method of measurement issued by the Bureau of Indian Standards and if for any item no such standard is available, then a mutually agreed method shall be followed.

The contractor shall give, not less than 7 days' notice to the Engineer-in-Charge or his authorized representative in-charge of the work, before covering up or otherwise placing beyond the reach of measurement any work in order that the same may be measured and correct dimensions thereof be taken before the same is covered up or placed beyond the reach of measurement and shall not cover up and place beyond reach of measurement any work without consent in writing of the Engineer-in-Charge or his authorized representative in-charge of the work who shall within the aforesaid period of seven days inspect the work, and if any work shall be covered up or placed beyond the reach of measurements without such notice having been given or the Engineer-in-Charge's consent being obtained in writing, the same shall be uncovered at the Contractor's expense, or in default thereof no payment or allowance shall be made for such work or the materials with which the same was executed.

Engineer-in-Charge or his authorized representative may cause either themselves or through another officer of the department to check the measurements recorded jointly or otherwise as aforesaid and all provisions stipulated herein above shall be applicable to such checking of measurements or levels. It is also a term of this contract that recording of measurements of any item of work in the measurement book and/or its payment in the interim, on account or final bill shall not be considered as conclusive evidence as to the sufficiency of any work or material to which it relates nor shall it relieve the contractor from liabilities from any over measurement or defects noticed till completion of the defects liability period.

6. Completion Certificate: Within ten days of the completion of the work, the contractor shall give notice of such completion to the Engineer-in- Charge and within fifteen days of the receipt of such notice, the Engineer-in- Charge shall inspect the work, and if there is no defect in the work, shall furnish the contractor with a certificate of completion, otherwise a provisional certificate of physical completion indicating defects (a) to be rectified by the contractor and / or (b) for which payment will be made at reduced rates, shall be issued. But no final certificate of completion shall be issued, nor shall the work be considered to be complete until the contractor shall have removed from the premises on which the work shall be executed, all scaffolding, surplus materials, rubbish and all huts and sanitary arrangements, required for his/their work people on the site in connection with the execution of the works as shall have been erected or constructed by the contractor(s) and cleaned off the dirt from all wood work, doors, windows, walls, floors or other parts the building, in, upon, or about which the work is to be executed or of which he may have had possession for the purpose of the execution thereof, and not until the work shall have been measured by the Engineer-in-Charge. If the contractor shall fail to comply with the requirements of this clause as to removal of scaffolding, surplus materials and rubbish and all huts and sanitary arrangements as aforesaid and cleaning off dirt on or before the date fixed for the completion of the work, the Engineer-in-Charge may at the expense of the contractor remove such scaffolding, surplus materials and rubbish, etc., and dispose off the same as he thinks fit and clean off such dirt as aforesaid; and the contractor shall have no claim in respect of scaffolding or surplus materials as aforesaid except for any sum actually realised by the sale thereof.

7. Contractor to keep site clean: When the annual repair and maintenance of works are carried out, the splashes and droppings from white washing, colour washing, painting etc. on wall, floors, doors, windows etc. shall be removed and the surface cleaned simultaneously with the completion of these items of work in the individual rooms, quarters or premises etc. where the work is done without waiting for the actual completion of all the other items of work in contract. In case the contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get this work done at the cost of the contractor either departmentally or through any other agency. Before taking such action, the Engineer-in-Charge shall give **10** days' notice in writing to the contractor.

8. Completion plans to be submitted by the contractor: The contractor shall submit completion plan required as per Specifications for Civil & Electrical works as applicable within 30 days of the completion of the work. In case, the contractor fails to submit the completion plan as aforesaid, he shall be liable to pay a sum equivalent to 2.50% of the value of the work

subject to a ceiling of Rs.15,000/- as may be fixed by the Engineer-in-Charge and in this respect the decision of the Engineer-in-Charge shall be final and binding on the contractor.

9. Payment of Running & Final Bill: Contractor is allowed 2 Running Bills and Final bill for the work. Minimum net value of each running bill shall not be less than Rs. 30,00,000/-. The final bill shall be submitted by the contractor in the same manner as specified in interim bills within three months of physical completion of the work or within one month of the date of the final certificate of completion furnished by the Engineer-in-Charge whichever is earlier. No further claims shall be made by the contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payments of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and rates as approved by Engineer-in-Charge, will, as far as possible be made within the period specified herein-under, the period being reckoned from the date of receipt of the bill by the Engineer-in-Charge or his authorized representative, complete with account of materials issued by the Department and dismantled materials.

i. If the Tendered value of work is upto Rs. 15 lakhs, 3 months
ii. If the Tendered value of work exceeds Rs. 15 lakhs 6 months

10. Materials to be provided by the contractor: The contractor shall, at his own expense, provide all materials, required for the works other than those specified otherwise. The contractor shall, at his own expense and without delay, supply to the Engineer-in-Charge samples of materials to be used on the work and shall get these approved in advance. All such materials to be provided by the Contractor shall be in conformity with the specifications laid down or referred to in the contract. The contractor shall, if requested by the Engineer-in-Charge furnish proof, to the satisfaction of the Engineer-in-Charge that the materials so comply. The Engineer-in- Charge shall within thirty days of supply of samples or within such further period as he may require intimate to the Contractor in writing whether samples are approved by him or not. If samples are not approved, the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval, fresh samples complying with the specifications laid down in the contract. When materials are required to be tested in accordance with specifications, approval of the Engineer-in-Charge shall be issued after the test results are received.

The Contractor shall at his risk and cost submit the samples of materials to be tested or analysed and shall not make use of or incorporate in the work any materials represented by the samples until the required tests or analysis have been made and materials finally accepted by the Engineer-in-Charge. The Contractor shall not be eligible for any claim or compensation either arising out of any delay in the work or due to any corrective measures required to be taken on account of and as a result of testing of materials.

The contractor shall, at his risk and cost, make all arrangements and shall provide all facilities as the Engineer- in-Charge may require for collecting, and preparing the required number of samples for such tests at such time and to such place or places as may be directed by the Engineer-in-Charge and bear all charges and cost of testing unless specifically provided for otherwise elsewhere in the contract or specifications. The

Engineer-in- Charge or his authorized representative shall at all times have access to the works and to all workshops and places where work is being prepared or from where materials, manufactured articles or machinery are being obtained for the works and the contractor shall afford every facility and every assistance in obtaining the right to such access.

The Engineer-in-Charge shall have full powers to require the removal from the premises of all materials which in his opinion are not in accordance with the specifications and in case of default, the Engineer-in-Charge shall be at liberty to employ at the expense of the contractor, other persons to remove the same without being answerable or accountable for any loss or damage that may happen or arise to such materials. The Engineer-in- Charge shall also have full powers to require other proper materials to be substituted thereof and in case of default, the Engineer-in-Charge may cause the same to be supplied and all costs which may attend such removal and substitution shall be borne by the Contractor.

The contractor shall at his own expense, provide a material testing lab at the site for conducting routine field tests. The lab shall be equipped at least with the testing equipment as specified in the contract.

11. Excavated / dismantled material will be TIFR's property: The contractor shall treat all materials obtained during dismantling of a structure, excavation of the site for a work etc. as TIFR property and such materials shall be disposed off to the best advantage of TIFR according to the instructions in writing issued by the Engineer-in- Charge.

12. Work to be executed in accordance with specifications, drawings, orders, etc. : The contractor shall execute the whole and every part of the work in the most substantial and workman like manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The contractor shall also conform exactly, fully and faithfully to the designs, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge. The several documents forming the Contact are to be taken as mutually explanatory of one another, detailed drawings being followed in preference to small scale drawing and figured dimensions in preference to scale. The following order of preference shall be observed:

a) Description of Bill of Quantities.
b) Particular Specifications and Special Clauses, if any.
c) Drawings.
d) Department of Atomic Energy Specifications
e) C.P.W.D. Specifications.
f) Indian Standard Specifications of B.I.S.
g) Manufacturer's specifications

The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The

Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction The contractor shall comply with the provisions of the contract and with the care and diligence execute and maintain the works and provide all labour and materials, tools and plants including for measurements and supervision of all works, structural plans and other things of temporary or permanent nature required for such execution and maintenance in so far as the necessity for providing these, is specified or is reasonably inferred from the contract. The Contractor shall take full responsibility for adequacy, suitability and safety of all the works and methods of construction. Contractor shall be required to submit a guarantee bond for all the water proofing works carried out by him as per Annexure- I. Contractor shall use the items of approved makes as per Annexure-II.

13. Deviations / Variations : Extent And Pricing: The Engineer-in-Charge shall have power (i) to make alteration in, omissions from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and (ii) to omit a part of the works in case of non-availability of a portion of the site or for any other reasons and the contractor shall be bound to carry out the works in accordance with any instructions given to him in writing signed by the Engineer-in- Charge and such alterations, omissions, additions or substitutions shall form part of the contract as if originally provided therein and any altered, additional or substituted work which the contractor may be directed to do in the manner specified above as part of the works, shall be carried out by the contractor on the same conditions in all respects including price on which he agreed to do the main work except as hereafter provided.

A. Deviation and Time Extension: The time for completion of the works shall, in the event of any deviations resulting in additional cost over the tendered value sum being ordered, will be extended, if requested by the contractor, as follows:

i. In the proportion which the additional cost of the altered, additional or substituted work, bears to the original tendered value, plus
ii. 25% of the time calculated in (i) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

B. Extra Items and Pricing: In the case of extra item(s) which cannot be determined under Part-B of the schedule of quantities, the contractor may within fifteen days of receipt of order or occurrence of the item(s), claim rates, supported by proper analysis, for the work and the Engineer-in-charge shall within one month of the receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

In the case of substituted items, the rate for the agreement items (to be substituted) and substituted item shall also be determined in the manner as mentioned in the **following** para:

C Substituted Items and Pricing:

i. If the market rate for the substituted item so determined is more than the market rate of the agreement item (to be substituted) the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so increased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

ii. If the market rate for the substituted item so determined is less than the market rate of the agreement item (to be substituted) the rate payable to the contractor for the substituted item shall be the rate for the agreement item (to be substituted) so decreased to the extent of the difference between the market rates of substituted item and the agreement item (to be substituted).

D. Deviated Quantities, Pricing: In the case of contract items, substituted items, contract cum substituted items, which exceed the limits of 30% for building work, 100% for foundation work and 50% for maintenance work 50%, the contractor may within **15 days** of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper analysis, for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the schedule of quantities, the Engineer-in-Charge shall within one month of receipt of the claims supported by analysis, after giving consideration to the analysis of the rates submitted by the contractor, determine the rates on the basis of the market rates and the contractor shall be paid in accordance with the rates so determined.

The provisions of the preceding paragraph shall also apply to the decrease in the rates of items for the work in excess of the aforesaid limits, and the Engineer-in-Charge shall after giving notice to the contractor within one month of occurrence of the excess and after taking into consideration any reply received from him within **15 days** of the receipt of the notice, revise the rates for the work in question within one month of the expiry of the said period of **15 days** having regard to the market rates.

The contractor shall send to the Engineer-in-Charge once every **3 months** an upto date account giving complete details of all claims for additional payments to which the contractor may consider himself entitled and of all additional work ordered by the Engineer-in-Charge, which he has executed during the preceding quarter, failing which the contractor shall be deemed to have waived his right. However, the Engineer-in- Charge may authorize consideration of such claims on merits.

For the purpose of operation of this clause the following works shall be treated as works relating to foundation.

i. **For buildings, compound walls:** plinth level or 1.2 metres (4 feet) above ground level, whichever is lower, excluding items of flooring and D.P.C. but including base concrete below the floors.

ii. **For abutments, piers, retaining walls of culverts and bridges, walls of water reservoirs:** the bed
of floor level.

iii. **For retaining walls where floor level is not determinate:** 1.2 metres above the average ground
level or bed level.
iv. **For roads:** all items of excavations and filling including treatment of sub-base and soling work.
v. **For water supply lines, sewer lines, underground SWD & similar works:** all items of work below
ground level except items of piping work.
vi. **For open storm water drains:** all items of work except lining of drains.

Any operation incidental to or necessarily has to be in contemplation of tenderer while filing tender, or necessary for proper execution of the item included in the Bill of Quantities mentioned above, whether or not, specifically indicated in the description of the item and the relevant specifications, shall be deemed to be included in the rates quoted by the tenderer. Nothing extra shall be admissible for such operations.

14. Foreclosure of contract due to abandonment or reduction in scope of work: If at any time after acceptance of the tender, TIFR, Hyderabad shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-charge shall give notice in writing to that effect to the contractor and the contractor shall act accordingly in the matter. The contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

15. Suspension of work:

i. The contractor shall, on receipt of the order in writing of the Engineer-in-Charge, (whose decision shall be final and binding on the contractor) suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in- Charge may consider necessary so as not to cause any damage or injury to the work already done or endanger the safety thereof for any of the following reasons:

a. on account of any default on the part of the contractor or;

b. for proper execution of the works or part thereof for reasons other than the default of the contractor; or c. for safety of the works or part thereof.
The contractor shall, during such suspension, properly protect and secure the works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

ii. If the suspension is ordered for reasons (b) and (c) in sub-para (i) above:

a. the contractor shall be entitled to an extension of time equal to the period of every such suspension PLUS 25%, for completion of the item or group of items of work for which a separate period of completion is specified in the contract and of which the suspended work forms a part, and;

b. If the total period of all such suspensions in respect of an item or group of items or work for which a separate period of completion is specified in the contract exceeds thirty days, the contractor shall, in addition, be entitled to such compensation as the Engineer-in-Charge may consider reasonable in respect of salaries and/or wages paid by the contractor to his employees and labour at site, remaining idle during the period of suspension, adding thereto 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within fifteen days of the expiry of the period of 30 days.

iii. If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than three months at a time, except when suspension is ordered for reason (a) in sub-para (i) above, the contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within fifteen days from receipt by the Engineer-in-Charge of the said notice, to proceed with the work or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the contractor, if he intends to treat the suspension, where it affects only a part of the works as an omission of such part by TIFR or where it affects whole of the works, as an abandonment of the works by TIFR, shall within ten days of expiry of such period of 15 days give notice in writing of his intention to the Engineer-in-Charge. In the event of the contractor treating the suspension as an abandonment of the contract by TIFR, he shall have no claim to payment of any compensation on account of any profit or advantage which he might have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to such compensation, as the Engineer- in-Charge may consider reasonable, in respect of salaries and/or wages paid by him to his employees and labour at site, remaining idle in consequence adding to the total thereof 2% to cover indirect expenses of the contractor provided the contractor submits his claim supported by details to the Engineer-in-Charge within 30 days of the expiry of the period of 3 months.

16. Action in case of work not done as per specifications: All works under or in course of execution or executed in pursuance of the contract, shall at all times be open and accessible to the inspection and supervision of the Engineer-in- charge, his authorized subordinates in charge of the work and all the superior officers of the Department or any organization engaged by the Department for Quality Assurance and of the Chief Technical Examiner's Office, and the contractor shall, at all times, during the usual working hours and at all other times at which reasonable notice of the visit of such officers has been given to the contractor, either himself be present to receive orders and instructions or have a responsible agent duly accredited in writing, present for that purpose. Orders given to the Contractor's agent shall be considered to have the same force as if they had been given to the contractor himself.

If it shall appear to the Engineer-in-charge or his authorized subordinates in-charge of the work or his subordinate officers or the officers of the organization engaged by the Department for Quality Assurance or to the Chief Technical Examiner or his subordinate officers, that any work has been executed with unsound, imperfect, or unskillful workmanship, or with materials or articles provided by him for the execution of the work which are unsound or of a quality inferior to that contracted or otherwise not in accordance with the contract, the contractor shall, on demand in writing which shall be made within twelve months (six months

in the case of work costing Rs. 10 Lakh and below except road work) of the completion of the work from the Engineer-in-Charge specifying the work, materials or articles complained of notwithstanding that the same may have been passed, certified and paid for forthwith rectify, or remove and reconstruct the work so specified in whole or in part, as the case may require or as the case may be, remove the materials or articles so specified and provide other proper and suitable materials or articles at his own charge and cost. In the event of the failing to do so within a period specified by the Engineer-in-Charge in his demand aforesaid, then the contractor shall be liable to pay compensation at the same rate as under clause III(1) of the contract (for non completion of the work in time) for this default In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates. Decision of the Engineer-in-Charge to be conveyed in writing in respect of the same will be final and binding on the contractor.

17. Contractor liable for damages, defects during Maintenance (Defect Liability Period): If the contractor or his working people or servants shall break, deface, injure or destroy any part of building in which they may be working, or any building, road, road kerb, fence, enclosure, water pipe, cables, drains, electric or telephone post or wires, trees, grass or grassland, or cultivated ground contiguous to the premises on which the work or any part of it is being executed, or if any damage shall happen to the work while in progress, from any cause whatever or if any defect, shrinkage or other faults appear in the work within **12 months (6 months** in the case of work costing **Rs. 10,00,000/- and below** except road work**)** after a certificate final or otherwise of its completion shall have been given by the Engineer-in-Charge as aforesaid arising out of defective or improper materials or workmanship, the contractor shall upon receipt of a notice in writing on that behalf make the same good at his own expense, or in default, the Engineer-in-Charge cause the same to be made good by other workmen and deduct the expense from any sums that may be due, or at any time thereafter may become due to the contractor, or from his security deposit, or the proceed of sale thereof or of a sufficient portion thereof. The security deposit of the contractor shall not be refunded before the expiry of **12 months (6 months** in the case of work costing **Rs. 10,00,000/- and below** except road work**)** after the issue of the certificate final or otherwise, of completion of work, or till the final bill has been prepared and passed whichever is later. Provided that in the case of road work, if in the opinion of the Engineer-in-Charge, half of the security deposit is sufficient to meet all the liabilities of the contractor under this contract, half of the security deposit will be refundable after **6 months** and the remaining half after **12 months** of the issue of the said certificate of completion or till the final bill has been prepared and passed whichever is later. Performance Security shall be refunded to the contractor after completion of the work and recording the completion certificate.

18. Contractor to supply tools & plants etc.: The contractor shall provide at his own cost all materials (except such special materials, if any, as may in accordance with the contract be supplied from the Engineer-in-Charge's stores), machinery, tools & plants. in addition to this, appliances, implements, other plants, ladders, cordage, tackle, scaffoldings and temporary works required for the proper execution of the work, whether original, altered or substituted and whether included in the specification or other documents forming part of the contract or referred to in these conditions or not, or which may be necessary for the purpose of satisfying or complying with the requirements of the Engineer-in-Charge as to any matter as to which under these conditions he is entitled to be satisfied, or which he is entitled to

require together with carriage therefore to and from the work. The contractor shall also supply without charge the requisite number of persons with the means and materials, necessary for the purpose of setting out works, and counting, weighing and assisting in the measurement or examination at any time and from time to time of the work or materials. Failing his so doing, the same may be provided by the Engineer-in-Charge at the expense of the contractor and the expenses may be deducted, from any money due to the contractor, under the contract and/or from his security deposit or the proceeds of sale thereof, or of a sufficient portions thereof.

19. Recovery of compensation paid to workmen : In every case in which by virtue of the provisions of section 12 sub-section (1) of the Workmen's Compensation Act. 1923, TIFR is obliged to pay compensation to a workman employed by the contractor, in execution of the works, TIFR will recover from the contractor the amount of the compensation so paid; and, without prejudice to the rights of TIFR under Section 12, sub-section (2) of the said Act, TIFR shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by TIFR to the contractor whether under this contract or otherwise. TIFR shall not be bound to contest any claim made against it under section 12, sub-section (1) of the said Act, except on the written request of the contractor and upon his giving to TIFR full security for all costs for which TIFR might become liable in consequence of contesting such claim.

20. Ensuring payment and amenities to workers if contractor fails: In every case in which by virtue of the provisions of the Contract Labour (Regulation and Abolition) Act, 1970 and of the contract labour (Regulation and Abolition) Central Rules, 1971, TIFR is obliged to pay any amounts of wages to a workman employed by the contractor in execution of the works, or to incur any expenditure in providing welfare and health amenities required to be provided under the above said Act and the Rules, under Clause 19 H or under the DAE Contractor's Labour Regulations, or under the rules framed by Government from time to time for the protection of health and sanitary arrangements for workers employed by Department of Atomic Energy contractors, TIFR will recover from the contractor the amount of wages so paid or the amount of expenditure so incurred; and without prejudice to the rights of TIFR under Section 20, sub-section (2) and Section 21, sub-section (4) of the contract labour (Regulation and Abolition) Act, 1970, TIFR shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by TIFR to the contractor whether under this agreement or otherwise. TIFR shall not be bound to contest any claim made against it under Section 20, subsection (1) and section 21, sub-section (4) of the said Act, except on the written request of the contractor and upon his giving to TIFR full security for all costs for which TIFR might become liable in contesting such claim.

21. Labour laws to be complied by the contractor: The contractor shall obtain a valid license under the Contract Labour (R & A) Act, 1970 and the Contract Labour (Regulation and Abolition) Central Rules, 1971, before the commencement of the work, and continue to have a valid license until the completion of the work. The contractor shall also abide by the provision of the Child Labour Prohibition & Regulation) Act-1998. The contractor shall also comply with the provisions of the building and other Construction Workers (Regulation of Employment & Conditions of Service) Act, 1996 and the building and other Construction Workers Welfare

Cess Act, 1996. Any failure to fulfill these requirements shall attract the penal provisions of this contract arising out of the resultant non execution of the work.

22. Minimum wages act to be compiled with: The contractor shall comply with all the provisions of the Minimum Wages Act, 1948, Contract Labour (Regulation and Abolition) Act, 1970 and rules framed thereunder and other labour laws affecting contract labour that may be brought into force from time to time.

23. Settlement of Disputes & Arbitration: Any dispute arising from this contract will be referred to two arbitrators one to be appointed by you and one by us. The two arbitrators, in the event of their disagreement will appoint an Umpire. The decision of the Umpire shall be final and binding. The arbitration will proceed as per Indian Arbitration Act, 1940, as amended upto date.

24. Confidential Information : The drawings, specifications, proto-type, samples and such other information furnished to the contractor relating to the supply / work, sub-systems / equipment etc. are to be treated as confidential which shall be held by the contractor in confidence and shall not be divulged to any third party without the prior written consent of the Department. The contractor, therefore, binds himself, his successors, heirs, executors, administrators, employees and the permitted assignees or such other persons or agents directly or indirectly concerned with the work / supply to the confidential nature of the drawings, specifications, proto-type samples etc. It is a further condition of the contract that the contractor shall not, without prior written permission from the Department, transmit, transfer, exchange, gift or communicate any such confidential information, and also the component, sub assembly, products, by-products etc. pursuant to the fabrication under taken by the contractor, to any third party.

25. Safety with Scaffolding and Mobile Elevated Platform: Every scaffold or mobile elevated platform and its supporting members, railings, Tee-boards, ropes should be designed to support given load, with a safety factor of at least four. No alterations should be made that might impair the strength of such structures, no improvised, make-shift or substandard scaffold should be permitted even for the most temporary use. All work in connection with such structures, including construction, operation, maintenance, alteration and removal should be carefully done under the direction and supervision of persons with specialized experience in such works. A safe and convenient means of access should be provided to the platform or scaffold. Means of access may be a portable ladder, fixed ladder, ramp or it may be a stairway. The use of cross braces or frame work as means of access to the working surface should not be permitted.

I GENERAL

1. Special Conditions of Contract (SCC) shall be read in conjunction with the General Conditions of Contract (GCC) also referred to as General Terms & Conditions of Works Contract, Schedule of Quantities, specifications of work, drawings and any other document forming part of this Contract wherever the context so requires.

2. Notwithstanding the sub-division of the document into these separate sections and volumes, every part of each shall be deemed to be supplementary of every other part and shall be read with and into the Contract so far as it may be practicable to do so.

3. Where any portion of the GCC is repugnant to or at variance with any provisions of the Special Conditions of Contract, then unless a different intention appears, the provision(s) of the Special Conditions of Contract shall be deemed to override the provision(s) of GCC only to the extent that such repugnancy or variations in the Special Conditions of Contract are not possible of being reconciled with the provisions of GCC.

4. Wherever it is stated in this Bidding Document that such and such a supply is to be affected or such and such a work is to be carried out, it shall be understood that the same shall be affected and /or carried out by the Contractor at his own cost, unless a different intention is specifically and expressly stated herein or otherwise explicit from the context. Contract Price shall be deemed to have included such cost.

5. The materials, design & workmanship shall satisfy the applicable relevant Indian Standards, the job specifications contained herein & codes referred to. where the job specifications stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied. In the absence of any Standard / Specifications / Codes of practice for detailed specifications covering any part of the work covered in this bidding document, the instructions / directions of Engineer-in-Charge will be binding upon the Contractor.

6. In case of contradiction between relevant Indian standards, GCC, Special Conditions of Contract, Specifications, Drawings and Schedule of Rates, the following shall prevail in order of precedence.

    a) Detailed Purchase Order along with statement of agreed variations, if any, and its enclosures.
    b) Letter of Intent(LOI)
    c) Schedule of Quantities
    d) Special Conditions of Contract
    e) Instructions to Bidders
    f) General Conditions of Contract
    g) Technical Specifications
    h) Relevant Indian Standards.
    i) Drawings/ Data Sheets

II. THE WORK

1. Scope of Work & Scope of Supply

The scope of work covered in this Contract will be as described in scope & objective of work provided in Section-I of important information to bidders, Schedule of Quantities, Technical Specifications, Drawings, etc.

2. Time Schedule

The Completion period for this job shall be as given in this bid document. Time is the essence of this Contract. The period of completion given includes the time required for mobilization as well as testing, rectifications, if any, retesting, demobilization and completion in all respects to the satisfaction of the Engineer-in-Charge.

A joint programme of execution of work will be prepared by the Engineer-in-Charge and Contractor. This programme will take into account the time of completion period of the Contract.

Monthly execution programme will be drawn up by the Engineer-in- Charge jointly with the Contractor based on availability of materials, work fronts and the joint programme of execution as referred to above. The Contractor shall scrupulously adhere to the Targets / Programme by deploying adequate personnel, Construction Equipment, Tools and Tackles and also by Timely Supply of required materials coming within his scope of supply as per Contract. In all matters concerning the extent of target set out in the monthly programme and the degree of achievement, the decision of the Engineer-in-Charge will be final and binding upon the Contractor.

Contractor shall give every day category-wise labour and equipment deployment report along with the progress of work done on previous day in the pro-forma prescribed by the Engineer-in-Charge.

3. Temporary Works

All temporary works, enabling works, including dewatering of surface and subsoil water, preparation and maintenance of temporary drains at the work site, preparation and maintenance of approaches to working areas, adequate lighting, wherever required, for execution of the work, shall be the responsibility of the Contractor and all costs towards the same shall be deemed to have been included in the quoted prices.

4. Quality Assurance

Detailed quality assurance program to be followed for the execution of Contract under various divisions of works will be mutually discussed and agreed to.

The Contractor shall establish, document and maintain an effective quality assurance system as outlined in the specifications and various codes and standards.

The Owner/Consultant or their representative shall reserve the right to inspect/witness, review any or all stages of work at shop/site as deemed necessary for quality assurance and / or timely completion of the work.

In case Contractor fails to follow the instructions of Engineer-in- Charge with respect to above clauses, next payment due to him shall not be released unless and until he complies with the instructions to the full satisfaction of Engineer-in-Charge.

5. Labour License

Before starting of work, Contractor shall obtain a license from concerned authorities under the Contract Labour (Abolition and Regulation) Act 1970, and furnish copy of the same to Owner.

6. Labour Relations

In case of labour unrest/labour dispute arising out of non-implementation of any law, the responsibility shall solely lie with the Contractor and they shall remove/resolve the same satisfactorily at his cost and risk.

The Contractor shall at all times take all reasonable precautions to prevent any unlawful, riotous or disorderly conduct by or amongst his staff and labour and to preserve peace and protection of persons and property in the neighborhood of the Works against such conduct.

7. Site Cleaning

The Contractor shall clean and keep clean the work site from time to time to the satisfaction of the Engineer-in-Charge for easy access to work site and to ensure safe passage, movement and working.

The Contractor shall dispose off the unserviceable materials, debris etc., to the earmarked area within the premises or any other location outside the premises as per the Contract and/or as decided by the Engineer-in-Charge. No extra payment shall be paid on this account.

8. Review/Approval of Drawings, Design and other documents submitted by Contractor

TIFR, HYDERABAD/Consultant will normally require and utilize a maximum time frame of seven (07) working days from the date of Receipt for Review/Approval of Drawings and other documents submitted by Contractor. Upon Review of the submitted documents, TIFR, HYDERABAD may give their comments and ask for modification/resubmission after necessary rectifications/ modifications and the time frame of 7 working days will be applicable for same.

9. Protection of Existing Facilities

Contractor shall obtain all clearance (work permit) from the Owner, as may be required from time to time, prior to start of work. Work without permit shall not be carried out within the existing premises.

Contractor shall obtain plans and full details of all existing and planned facilities/services/utilities from the Owner and shall follow these plans closely at all times during the performance of work. Contractor shall be responsible for location and protection of all facilities/utilities and structures at his own cost.

Despite all precautions, should any damage to any structure / utility etc. occur, the Contractor shall contact the Owner / authority concerned and Contractor shall forthwith carry out repair

at his expenses under the direction and to the satisfaction of Engineer-in- Charge and the Owner/concerned authority.

Contractor shall take all precautions to ensure that no damage is caused to the existing facilities etc., during construction. Existing structures/ facilities/ utilities damaged / disturbed during construction shall be repaired and restored to their original condition by Contractor after completion of construction to the complete satisfaction of Owner.

10 Work Front

The work involved under this Contract may include such works as have to be taken up and completed after other agencies have completed their jobs. The Contractor will be required and bound to take up as and when the fronts are available for the same and no claim of any sort whatsoever shall be admissible to the Contractor on this account. Only extension of time limit shall be admissible, if the availabilities of work fronts to the Contractor are delayed due to any reason not attributable to the Contractor and the same is clearly recorded.

11. Site Facilities

The Contractor shall arrange for the following facilities at site, for workmen deployed/engaged by him / his sub- contractor, at his own cost:

a) Arrangement for First Aid.
b) Arrangement for clean & potable drinking water.
c) Contractor's Site Office and Stores

Owner shall provide land only for contractor's site office and stores and fabrication yard, if any at site. However, same shall be dismantled prior to submission of Final Bill.

The Contractor shall remove all temporary buildings / facilities etc., before leaving the site after completion of works in all respect.

12. Construction Power and Water

Owner shall not provide power and the Contractor shall be exclusively responsible to make his own arrangements for supply of power, without any extra cost to the Owner.

Water required for the works shall be arranged by the Contractor. The contractor has to make all necessary arrangement for drawing water including making temporary storage, pumping etc.

13. Cement & Steel :

Cement required for execution of the job under the scope of this tender shall be supplied by the contractor at his own cost. Cement used shall be 53 grade Ordinary Portland cement (OPC) for all concrete works and 43 Grade Ordinary Portland cement (OPC) for other works. In case 43 grades OPC is not available, Portland Slag Cement or Portland Pozzolanic Cement may be permitted by TIFR, HYDERABAD after review of the same. Contractor to include the cost of cement required for execution of various items included in this tender in their quoted rates. Cement shall be of Grade as specified in the SOQ and shall conform to relevant BIS standards of latest edition.

The contractor will be required to maintain a stock register for receipt, issuance and daily consumption of cement at site. Cement shall be regulated on the basis of 1st receipt to go as 1st issue. Cement not consumed within 3 months after bringing to site shall not be used and shall be removed from site with prior written permission of EIC.

Contractor shall construct suitable temporary godown at site for storage of cement under his lock and key. The contractor will be fully responsible for safe custody of cement.

TIFR, HYDERABAD will not entertain any claims by the Contractor for theft, loss or damages to cement. Contractor shall not remove from the site any cement bags at any time.

Entire quantity of reinforcement steel required for the project shall be supplied and provided at site by the contractor at his own cost. TIFR, HYDERABAD shall not supply any reinforcement steel. The contractor shall make necessary arrangement at his own cost for unloading, storage of steel in the open duly fenced under locking arrangement. The Contractor shall produce invoice for the reinforcement steel to EIC for every batch of procurement along with Manufacturer's Test Certificate.

No payment will be made or measurement recorded for binding wires which shall be of specified gauge and shall be provided by the contractor. All binding wires required for tying the reinforcement in position etc. will be supplied by the contractor. Cost of this binding wire and labour will be included in the item for binding and placing reinforcement in position.

It will be necessary that the contractor get the cement and steel tested at his own cost at TIFR, HYDERABAD approved laboratory as per the testing schedule or as per the EIC's advise.

The contractor will be required to maintain a register for recording details of steel receipt, steel utilised and balance at site.

In every case, it shall be the contractor's responsibility to ensure the standard of quality and the correctness of quantity of steel procured at site by him.

14. Rules and Regulations

Contractor shall observe in addition to Codes specified in respective specification, all national and local laws, ordinances, rules and regulations and requirements pertaining to the work and shall be responsible for compliance to the same.

15. Procedures

Various procedures and method statements to be adopted by Contractor during the construction as required & sought by TIFR, HYDERABAD and as per the respective specifications shall be submitted to Engineer-in-Charge in due time for approval.

16. Security

As the premises at TIFR, HYDERABAD is a protected area, entry into the area shall be restricted and may be governed by issue of photo gate passes. The Contractor shall arrange to obtain through the Engineer-in-Charge, well in advance, all necessary entry permits/gate passes for his staffs and labourers and entry and exit of his men and materials shall be subject to vigorous

checking by the security staff. The Contractor shall not be eligible for any claim or extension of time whatsoever on this account.

It shall be the responsibility of the contractor to safeguard all his materials/owned from theft, damage etc. For this purpose the contractor shall be allowed to keep his own security inside TIFR, HYDERABAD premises.

17. Drawings and Documents

Drawings accompanying the Bidding Document are indicative of scope of work and issued for bidding purpose only. Purpose of these drawings is to enable the bidder to make an offer in line with the requirements of the owner.

The contractor as per `scope of work' shall carry out preparation of detailed drawings. Detailed drawings as needed shall be prepared by contractor and got reviewed/ approved by Engineer-in-Charge/ Consultant before taking up the work.

18. Contractor's Billing System

TIFR, HYDERABAD will provide an approved format for Measurement sheets, Bill Summary and Bill Abstract. Contractor has to ensure that these data are updated for each subsequent RA and Final Bill.

TIFR, HYDERABAD will utilize these data for processing and verification of the Contractor's bill. Contractor's RA Bills shall be accompanied by progress photographs.

19. Site Organization

The Contractor shall without prejudice to his overall responsibility to execute and complete the works as per specifications and time schedule progressively deploy adequate qualified and experienced personnel together with skilled / unskilled manpower and augment the same as decided by Engineer-in-Charge depending on the exigencies of work to suit the construction schedule without any additional cost to Owner.

The Contractor shall provide all necessary superintendence during the execution of the Works and as long thereafter as the Engineer-in-Charge may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract Such superintendence shall be given by sufficient persons having adequate knowledge of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents) for the satisfactory and safe execution of the Work. The workmen deployed by the Contractor should also possess the necessary license etc., if required under the existing laws, rules and regulations.

20. Responsibility of Contractor

It shall be the responsibility of the contractor to obtain the approval for any revision and/or modifications decided by the contractor from the Owner / Engineer-in-Charge before implementation. Also such revisions and / or modifications if accepted / approved by the Owner / Engineer-in-Charge shall be carried out at no extra cost to the owner. Any change required during functional requirements or for efficient running of system, keeping the basic parameters unchanged and which has not been indicated by the contractor in the data /

drawings furnished along with the offer shall be carried out by the contractor at no extra cost to the owner.

All expenses towards mobilization at site and demobilization including bringing in equipment, work force, materials, dismantling the equipment, clearing the site etc. shall be deemed to be included in the prices quoted and no separate payments on account of such expenses shall be entertained.

It shall be entirely the contractor's responsibility to provide, operate and maintain all necessary construction equipment, steel scaffoldings and safety gadgets, cranes and other lifting tackles, tools and appliances to perform the work in a workman like and efficient manner and complete all the jobs as per time schedule.

Preparing approaches and working area for the movement of his men and machinery.

The procurement and supply in sequences and at the appropriate time of all materials, and consumables shall be entirely the contractor's responsibility and his rates for execution of work will be inclusive of supply of all these items.

21. Coordination with other agencies

Contractor shall be responsible for proper coordination with other agencies operating at the site of work so that work may be carried out concurrently, without any hindrance to others. The Engineer – in – Charge shall resolve disputes, if any, in this regard, and his decision shall be final and binding on the Contractor.

22. Underground and overhead structures

The Contractor will familiarize himself with and obtain information and details from the Owner in respect of all existing structures, and utilities existing at the job site before commencing work. The Contractor shall execute the work in such a manner that the said structures, utilities, etc. are not disturbed or damaged, and shall indemnify and keep indemnified the Owner from and against any destruction thereof or damages thereto.

23. Documents required with final bill

Statement of final bills – issue of No Claim/ No Due Certificate

The Contractor shall furnish a No-Claim/No-Due declaration indicating that there are no balance dues to his sub-vendor/sub- contractors /labour contractors along with the Final Bill.

24. Working hours

The work shall be carried out if required on round-the clock basis including holidays as it is a Greenfield site. Contractor's quoted rates are deemed to include expenditure towards working on round-the clock basis and holidays. However, Contractor's representative shall be available for overseeing the works at all times.

25. Electrical Cable Works:

The length and depth of the cable trench depends on site conditions and requirements. Excavation and refilling work may be carried out either by manual labors or by excavator as

per the site conditions. This will become known and will be intimated during the start of the work.

a) Transport of labors/ machinery/tools etc to the actual working site during the execution of work will be in contractor's scope.
b) Payment will be made on actual measured length/cubic meters basis after the completion of the work.

III. TESTS, INSPECTION AND COMPLETION

1. Tests and Inspection

The Contractor shall carry out the various tests as enumerated in the technical specifications of this Bidding Document and technical documents that will be furnished to him during the performance of the work at no extra cost to the Owner.

All the tests either on the field or at outside laboratories concerning the execution of the work and supply of materials by the Contractor shall be carried out by Contractor at his cost.

The work is subject to inspection at all times by the Engineer-in- Charge. The Contractor shall carry out all instructions given during inspection and shall ensure that the work is being carried out according to the technical specifications of this bidding document, the technical documents that will be furnished to him during performance of work and the relevant codes of practice.

All results of inspection and tests will be recorded in the inspection reports, pro-forma of which will be approved by the Engineer-in- Charge. These reports shall form part of the completion documents. Any work not conforming to execution drawings, specifications or codes shall be rejected and the Contractor shall carry out the rectifications at his own cost.

2. Final Inspection

After completion of all tests as per specification the whole work will be subject to a final inspection to ensure that job has been completed as per requirement. If any defect is noticed, the Contractor will be notified by the Engineer-in-Charge and he shall make good the defects with utmost speed. If, however, the Contractor fails to attend to these defects within a reasonable time (time period shall be fixed by the Engineer-in-Charge) then Engineer-in-Charge may have defects rectified at Contractor's cost by engaging a third party.

3. Inspection of Items

All inspection and tests on the items shall be made as required by specifications forming part of this contract. Various stages of inspection and testing shall be identified after receipt of Quality Assurance Program from the contractor / manufacturer. All incoming materials shall be accompanied by a IMIR (Incoming Material Inspection Report)

Inspection calls shall be given for association of Owner, as per mutually agreed program in prescribed pro-forma, giving details of item and attaching relevant test certificates and internal inspection report of the contractor.

The contractor shall ensure full and free access to the inspection engineer of Owner at the contractor's premises at any time during contract period to facilitate him to carry out inspection and testing assignments.

The contractor shall provide all instruments, tools, necessary testing and other inspection facilities to inspection engineer of Owner free of cost for carrying out inspection.

Where facilities for testing do not exist in the contractor's laboratories, samples and test pieces shall be drawn by the contractor in presence of Inspection Engineer of Owner and duly sealed by TIFR, HYDERABAD engineer and sent for tests in TIFR, HYDERABAD approved lab at the contractor's cost.

The contractor shall comply with the instructions of the Inspection Engineer fully and with promptitude.

All inspections and tests shall be made as required by the specifications forming part of this contract. All costs towards testing etc. shall be borne by the contractor within their quoted rates.

4. Documentation

Upon completion of work, the Contractor shall complete all drawings to "As built" status (including all vendor / Sub – vendor's drawings for bought out items) and provide the Owner, the following:

5. Supervisory Personnel

Qualification and experience of key supervisory construction personnel to be deployed for this works shall be as given hereunder. CONTRACTOR shall submit bio data of key supervisory personnel meeting the requirement as given hereunder, after award, which will be reviewed and approved by Engineer-in- charge. However, deployment of qualified and experienced supervisory personnel of the CONTRACTOR shall be commensurate with the project work load and as approved by Engineer-in-Charge and / or OWNER .

Designation/ Category	Minimum Qualification	No. of Personnel	Discipline to which should belong
RESIDENT CONSTRUCTION MANAGER / RESIDENT ENGINEER / SITE-IN-CHARGE	Degree in Engg./Diploma with relevant field experience of minimum 5 years	1	Mechanical/ Civil
ELECTRICAL ENGINEER	Degree in Engg./Diploma in Electrical with relevant field experience as and when	1	Electrical

1. SCOPE

The following works are the scope of the contractor

1.a. Supplying of LT 1100 Volts, 3.5 Core, 300 sq.mm, Aluminium conductor, XLPE, armoured cables confirming to IS: 1554 Part 1/IS 7098 Part-1 with latest amendments which shall be capable of operating at a sustained conductor temperature of 90°C and suitable for a maximum conductor short-circuit temperature of 250°C. This specification gives the general requirement of cables. Cut lengths will not be accepted.

1.b. Excavation/digging of cable trench of size: 0.50 Meter wide × 0.90 Meter (minimum) to 1.5 Meter (maximum) deep × 250 Meters +/-15% long, at a site, including all types of soils and surfaces like hard gravel soil, BC soil, Red soil, Stone earth, CC & BT along the road including chiseling of rocks as required, **including asphault surface, concrete surface, if any including removing and refixing of foot path stone slabs If any pavement kerb stones etc.** in the earth of soil and soft or hard murum and / or rock as encountered during the excavation work and refilling the trench after cable laying with the excavated material.

1.c. Laying the 4 lengths of cable above 1.a in the existing cable trays and trench.

1.d. Laying the 4 lengths of cable mentioned in 1.a in the trench dug under 1.b.

1.e. Supplying and putting the sand below & above the cable for cushion, bricks over the length of cable to protect and hume pipes (NP-2) while road crossing in the trench dug under 1.b.

1.f. Cutting of concrete road or Bituminous road to make trench as mentioned in 1.b. and Liaising for obtaining road cutting permission from state R & B and GHMC.

1.g. Construction of cable inspecting chambers of size 1mtr (wide)X 1mtr(long)X 1mtr(depth) using brick work and provides hole provisions to pass the cables and provide MS chequer plates Wherever specified, trenches shall be filled with fine sand and covered with steel chequered trench covers or RCC slabs.

1.h Termination of above mentioned (Sr. No. 1.a) cable in the panels.

1.i Testing, inspection and commissioning of above mentioned (Sr. No. 1.a) cable

2. REFERENCE CODE AND STANDARDS

The materials covered by this specification shall unless otherwise stated as designed, constructed, manufactured and tested in accordance with latest revisions of the relevant Indian Standards.

IS 7098 (Part I)- 1988: XLPE insulated & sheathed cables for Working voltages Up to and including 1.1 KV.

IS 5831 - 1984 : PVC insulation & sheath of electric cables.

IS 8130 - 1984 : Conductors for insulated electric cables.

3 GENERAL

a) The cables will be used for connection of power, control and instrumentation circuits of the auxiliary electrical systems.

b) Cables are to be suitable for transmission of signals and measuring values, which require protection against disturbances caused by stray fields.

c) Cables will be generally laid in ladder type trays or, drawn through rigid steel conduits or may be directly buried in ground.
d) The insulation and sheath materials shall be resistant to oil, acid and alkali and shall be tough enough to withstand mechanical stresses during handling. The outer sheath of cables shall be FRLS.
e) For continuous operation at specified rating, maximum conductor temperature shall be limited to permissible value as per relevant standard and / or this specification.
f) Armoring shall be single round wire of galvanized steel for multi core cables and aluminium for single core cables
g) Core identification for multi core cables shall be provided by colour coding.

4. OPERATING CONDITIONS

Electric system Voltage	:	433 V, 3 Phase, AC
Frequency	:	50 Hz.
Environment Ground temperature	:	45°C.
Ambient air temperature	:	50°C.
Atmospheric conditions	:	Humid, salty and dusty

5. CONSTRUCTION:

5.1 CONDUCTORS: The most acceptable metals for conductor is aluminium due to their higher conductivity and ductility. Aluminium oxide film which is always present on Aluminium conductor surface acts as barrier and it protects the Aluminium conductor from corrosion in fumes laden atmosphere. The conductor shall be of circular/sector stranded Aluminium to IS: 8130 / IEC 60228/ BS 6360. . It shall be clean, reasonably uniform in size & shape smooth & free from harmful defects. Any other form of conductor may also be accepted if in line with modern trends.

5.2 INSULATION: XLPE – IS: 7098 Part 2, IEC: 60502 Part – 2, BS:6622, BS:7835. The insulation shall be super clean XLPE compound applied by extrusion and vulcanized to form a compact homogenous body.

5.3 CORE IDENTIFICATION: 3.5 core: Red, yellow, blue and black. For reduced neutral conductors, the insulation colour shall be black.

5.4. RATING: The cable shall be rated for a voltage rating of 650/1100 Volts.

5.5. ARMOURING: The armoring of multi core cable consists of either GI round steel wires and in case of single core cable armoring shall be of non-magnetic material such as hard drawn aluminium or aluminium alloy wires or strips. Galavnised Steel Round Wire as per IS 3975, IEC 60502-1, BS 10257.

5.6. OUTER SHEATH:

1) The tough outer sheath, black coloured best resisting PVC polyethylene compound type ST-2 as per IS : 5831 for the operating temperature of the cable shall be provided over the armour as specified in relevant standards by extrusion process and shall be of FRLS type only.

2) Outer sheath of all PVC cables shall be black in colour and the minimum value of oxygen index shall be 29 at 27.2 deg. C. In addition suitable chemicals shall be added to the PVC compound of the outer sheath to protect the cable against rodent and termite attack.
3) The outer sheath shall be applied by extrusion over the armouring.

5.7. IDENTIFICATION:
The cables shall be clearly and permanently marked with following information throughout the length. (1) Voltage grade.
(2) Manufacturer's name or trade mark.
(3) Year of manufacture.
Cross sectional area of conductor and no of cores.

5.8 GENERAL REQUIREMENT: All cables shall be adequately protected against any risk of mechanical damage to which they may be liable in normal conditions of handling during transportation, loading, etc

6. PACKING, MARKING AND TRANSPORT:
The cables shall be supplied in strong, non-returnable wooden drums of heavy construction. Each cable drum is marked with particulars of cable size, voltage class, length, direction of rolling, position of outer gross weight, ISI certification marking etc.

7. STORING, LAYING AND TERMINATIONS:
7.1 All the cables shall be supplied in drums, on receipt of cables at site, the cables shall be inspected and stored in drums with flanges of the cable drum in vertical position.
7.2 LAYING:

i. The cables shall be thoroughly inspected for transit damage and irregularity in sheath etc.
ii. Sufficient manpower with necessary equipment like jacks, rollers shall be provided for unwinding and laying the cables and dragging and twisting shall be avoided. Proper unwinding methods shall be used to avoid twists & cable should be meggered before starting laying.
iii. Cables shall be laid at a depth of at least 0.90mtr from ground level with 80mm sand bedding, brick box with cushion for protection. Bending radius provision of at least 12 D shall be kept while laying. The trenches shall be refilled with same excavated material.
iv. H.T. and L.T. cables shall not be laid in same trench.
v. Cables laid on existing trenches shall be supported at every 600mm for vertical run and every 450mm for horizontal run. Suitable clamps shall be provided for fixing and support. Vertical runs near ground level shall be protected by GI Pipes of suitable size up to the height of at least 1200 mm.
vi. The length of the cables in schedule will be approximate and actual site measurements shall be taken by contractor prior to cutting any cable.
vii. Cable identification tags shall be provided at appropriate location throughout length of cables and at both ends.
viii. The cable shall first be laid in excavated trench 80 mm layer of sand and shall be spread over the cable. The cable then shall be lifted and placed over the sand bed. The second layer of 80 mm sand shall then be sprayed over the cable. The relative position of the cables, laid in the same trench shall be preserved and the cables shall not cross each

other as far as possible. at all changes in directions in horizontal and vertical planes, the cable shall be bent smooth with a radius of bend not less than 12 times the diameter of cable, Minimum 3 meters long loop shall be provided at each end of cable.

Cables shall be laid as per the specification given below:

a) Cables in Outdoor Trenches :

Cables shall be laid in outdoor trenches wherever called for. The depth of the trenches shall not be less than 900mm. from the Formed Ground Level (FGL) which has to be ascertained from the E.I.C. The width of the trenches shall not be less than 500 mm. A spacing of not less than the cable diameter shall be allowed between the cables. The trenches shall be cut square with vertical side walls and with uniform depth.

The floor of the trench shall be rammed level. Cable unreeling from drums shall be done only with the help of cable drum rolling supports. The cable drum shall be rolled in the direction of the arrow for rolling. Wherever cables are bent, the minimum bending radius shall not be less than 12 times the diameter of the cable. 15 cms thick layer of sand cushioning to be provided full of stones and pebbles. Cable shall be taken lifted and placed over this and cushion. The cable shall then be covered with a 15 cms thick sand cushion, where cable is laid in rocky situation. Extra thick cushioning of sand as may be required/decided by E.I.C shall be done without extra charge. Over this, a course of cable protection tiles or brick shall be provided to cover the cables by 80 mm on either side. Unless otherwise specified, the cable shall be protected by concrete tiles/stone slabs of minimum 25 mm thick placed on top of the trench breadth wise for the full length of the cable.

Trench shall be back filled with earth and consolidated. Cables shall be laid in Hume pipes at all road crossings and in GI pipes / PVC pipes at the wall entries. Approved cable markers made of concrete blocks indicating the voltage grade and the direction of run of the cables shall be installed at regular intervals of 25 Mtrs. The depth of concrete blocks shall be at least 100 mm below ground and 50 mm above ground.

b) Cables in existing cable trays:

Cables shall be laid in cable trays wherever specified. Suitable UV resistant tie wraps shall be used for securing the cables in position at an interval not more than 450 mm. All chases and passage if necessary for the laying of service cables at the entry or of premises shall have to be cut and made good to the satisfaction of E.I.C.

All cables entries into the buildings/cable trenches/ducts, etc. shall be suitably sealed as required by the E.I.C without extra cost.

Protection of Cables

The cables shall be protected by bricks on the top layer of the sand for the full length of underground cable. Where more than one cable is running in the same trench, the bricks shall cover all the cables and shall project a minimum of approximately 80mm on either side of the cables. Cables under road crossings and any other places subject to heavy traffic, shall be protected by running them through Hume Pipes of suitable size. The depth of the Hume Pipe shall be 1 meter below the finished floor level.

7.3 Joints in Cables

Strictly no joint shall be allowed. The entire single length of cable laid shall be single piece only.

8. EXCAVATION OF TRENCH & BACK FILL

Excavation/digging of cable trench of size: 0.50 Meter wide × 0.9 Meter (minimum) to 1.5 Meter (maximum) deep × 250 Meters +/-15% long, at a site, in the earth of soil and soft OR hard murum and / or rock/ CC road / BT road as encountered during the excavation work and back filling the trench with the excavated material.

All excavation and back fill including timbering, shoring and pumping required for the installation of the cables shall be carried out by the Contractor in accordance with the requirements laid down elsewhere. Trenches shall be dug as per the specified size, true to line and grades. Back fill for trenches shall be filled in layer not exceed 150-mm. Each layer shall be properly rammed and consolidated before laying the next layer. The contractor shall restore all surface, road ways, side walks, curbs, walls of other works cut by excavation to their original condition, satisfactory to the E.I.C.

9. END TERMINATIONS:

Each termination shall be carried out using Electroplated Brass double compression glands and copper cable sockets. Hydraulic crimping tool shall be used for making the end terminations. The cables on panel side are connected to bus bars Cu or Al, Care should be taken to avoid heating & corrosion at the joints. Cable gland shall be bonded to the earth by using suitable copper wire with earth tag's. The cable armoring is to be earthed properly so that the earth continuity is maintained.

10. CABLE ROUTE MARKER:

Cable route marker shall oval shaped cast iron of minimum 150 mm length. The voltage levels shall be specifically marked on cable route markers. The cable route marker shall have 20 mm GI pipe or 20 x 20 x 3 mm MS angle support of suitable length grouted in 150 x 150 x 150 mm 1:3:6 concrete block buried in ground.

11. TESTING:

Cables shall be tested at factory as per the regulations of IS:1554 Part I. The tests shall incorporate routine tests, type tests and acceptance tests. Copy of such test certificates shall be furnished to the TIFR.

Factory and Shop inspection shall be offered for routine tests if specifically asked for.

Cables shall be meggered as soon as they are brought to site. Insulation resistance shall also be tested.

a) After cutting.

Following test shall be taken after completing the installation.

a) Cable continuity.

b) Earth continuity.

c) Insulation resistance.

1000V Megger shall be used for testing 3 phase 415 Volt systems.

Insulation resistance between conductors and neutral and conductors and earth. Cables shall be tested at site after installation and results shall be submitted to E.I.C.

12. TOOLS and INSTRUMENTS

Contractor has to arrange all required tools like excavation material / JCB, jacks, supporting structure to hold cable drums, rollers, hydraulic crimping tool, Megger, clamp meter, etc. to complete the works in all respect.

ANNEXURE-I

FORM OF PERFORMANCE GUARANTEE (BY BANK GUARANTEE)

1. *In consideration of the TIFR, Hyderabad having agreed under the terms and conditions of Letter of Intene / Agreement No…… dated…….. made between ……..……and*
…….. (hereinafter called " the said Contractor{s}") .for the work
……. (hereinafter called " the said Letter of Intent / Agreement") having agreed to production of a irrevocable bank Guarantee for Rs. …… (Rupees
…….. only), as a security / guarantee from the contractor(s) for compliance of his obligations in accordance with the terms and conditions in the said agreement, we
……..(Indicate the name of the Bank) (hereinafter referred to as "the Bank")
hereby undertake to pay to TIFR an amount not exceeding Rs. …… (Rs……only) on demand by TIFR.

2. *We ……. (indicate the name of Bank) do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from TIFR stating that the amount claimed is required to meet the recoveries due or likely to be due from the said Contractor(s). Any such demand made on the bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs……. (Rupees……only).*

3. *We, the said bank, further undertake to pay to TIFR any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any Court or Tribunal relating thereto, our liability under this present being absolute and unequivocal. The payment so made by us under this bond shall be a valid discharge of our liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.*

4. *We…….. (indicate the name of Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of TIFR under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till Engineer-in-charge on behalf of the TIFR certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.*

5. *We …….. (indicate the name of Bank) further agree with TIFR that TIFR shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said Contractor(s) from time to time or to postpone for any time or from time to time any of the powers exercisable by TIFR against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall*

not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor(s) or for any forbearance, act of omission on the part of TIFR or any indulgence by TIFR to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to sureties would, but for this provision, have effect of so relieving us.

6. *This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).*

7. *We, …….. (indicate the name of Bank) lastly undertake not to revoke this guarantee except with the previous consent of TIFR in writing.*

8. *This guarantee shall be valid up to ……., unless extended on demand. Notwithstanding anything mentioned above, our liability against this guarantee is restricted to Rs. …… (Rupees …….. only) and unless a claim in writing is lodged with us within six months of the date of expiry or the extended date of expiry of this guarantee, all our liabilities under this guarantee shall stand discharged.*

Signed and sealed

Dated the ……. day of …… for ……(indicate the name of Bank)

* * * (Note: The Letter of Intent shall form part of the Agreement)

Contractor's Signature & Seal

ANNEXURE-II

List of Approved Makes/Manufacturers

Sl. No.		Description of materials	List of Manufacturers
1	a	Ordinary Portland Cement of Grade	ACC, Birla Rajshree, Ultratech, Narmada
	c	White Cement	J.K. Cement & Birla White
2	a	HYSD Bars (TMT Bars)	M/s TISCO, SAIL, RINL
3		Structural Plates and Steel Sections	M/s SAIL, RINL
5		Anti-Termite treatment	M/s PARAGON, PEECOPP , Express Pesticides Corporation, Elite Corporation, Pest Control (I) Ltd. & NOCIL Chemicals,
6		Tiles:	
	a	Terrazzo Tiles	M/s NITCO, BHARAT, G.K. BANSAL, Acme Tiles & Super Tiles
	b	Ceramic Tiles	H.R. Johnson (I) Ltd., Sornany, Kajaria
	c	Glazed Tiles	M/s H.R. Johnson (I) Ltd., Somany, Kajaria
	d	Vitrified Floor Tiles	M/s H.R. Johnson, RAK Ceramics, Bell Granito
	e	P V C flooring	M/s Premier Vinyl Flooring Ltd., Royal Cushion Vinyl Product Ltd., Armstrong, Responsive Industries Ltd.
	f	Paver Blocks, Polymer molded Paver Blocks, Chequered concrete Floor Tiles	Super Tiles
7		Metallic Floor Hardner	Triveni Colour Industries (Floor), Heatly & Gresham (India) Ltd., De Rust Chemical Corporation of India (Fermonite), Cement Research Corporation (stilonite), Ironite India Ltd.
8		Pressed Steel Door Frame	M/s. Sen Harvic, TECHOME, Nishan Solid Door Frame, Anjali Enterprises, M/s SUNBEAM, Windoors Bharat Steel Industries, Pune, M/s AGEW, Strategic, Building Systems
9		Wooden Doors	
	a	Flush Door Shutter	Indian Plywood, Kitply, Sitapur, Kutty Flush Doors, Mysore Plywood, Shreejee, Anand Wood Crafts, Sejpat and others (Anand Doors)
	b	Factory made panel door shutter	Wooden Design — Bangalore, Shankar Ramchandra & Joinery

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	c	Masonite Wooden Panel Doors	Kutty flush doors, Sejpal & others
	d	FRP Door Shutter	Advance FRP & House of Doors
	e	Pressed steel doors & fire resistant steel doors	Godrej, Windoors, Strategic Building Systems & Kutty Flush Doors
	f	Mild Steel Rolling Shutters, G I	SWASTIC, Windoors. Dodia,
		Shutters, Stainless steel & aluminum rolling shutters	Trupti, Bharath & Larsen Engineering
	g	Block Board	Wood India — Calcutta, Sejpal & others Pioneer Timber Products, Chandigarh, Northern Door
	h	Ply Wood	Indian Plywood Mfg. Ltd., Kitply, Century Plywood, Nuboard & Nashik Plywood Industries
	i	Pre Laminated & Plain Particle Boards	NOVAPAN, Anchor
	j	Adhesive for wood	Fevicol, Vamicol, Dunlop, Araldite
10		Aluminium Grills	M/s Alurniprofiles, DecogriIIs
11		Fittings & fixtures	M/s Jayant Metal, Shalimar hardware, Everite, Garnish, Diamond, Navbharat, SAIF Enterprises, Hardwin Traders, Godrej, DE Lock Industries, Explore Engineers, Garg Hinges
12		Aluminium Extruded Sections	Jindal, Indal, Hindalco & Bhoruka
13		Aluminium Powder Coated	Bilmate, Elite
15		Lime	Janatacem, Asian Paint
16		Neeru	More (Peacock), Kamal
17		Cement Based Paint	M/s Snowcem India Ltd. (Super snowcem, Sandex Matt), N1TCO (Nitcocom) Paints, Hindustan Colour Chemical, Jayant colour, Surfa coat, Terraco, Berger- Rabiacem, Apporva Buildcare & Decocem
18		Distemper & Paints	MA Asian Paints, Kansai Nerolac Paints Ltd., ICI Paints, Noble Paints, Berger Paints India Ltd., Jenson Nicholson, Garware Paints Ltd. & Shalimar Paints
19		Integral Water proofing compound	Sunanda Chemicals, Mc-Bauchemie, FOSROC, Pidilite, Roffe,
21		Water stops	M/s Omai Plastics, Basecon **Pask,** Asian Engineering Products, Caprihans India Ltd., R.C. Enterprises, Kanta Polymers (Kanta flex) & Fixopan
22		Expansion Joint Boards &	M/s Shalitex, S.T.P. Ltd., Lloyd Insulation, Tiki Tar Industries
23		Expansion Joint Filters	M/s Shalitex, S.T.P. Ltd., Lloyd Insulation & BASF Chemicals
24		Glass for Doors / Windows	Modi Guard, Continental, Emirates, Saint Gobain, Asahi & Sejal

25	Plain Glass Mirror	M/s Modi Float Glass, Eagle, Atul, Saint Gobain, Asahi
26	Sanitary Wares	M/s Parryware, Hindustan, Cera, Neycer
27	C.P. Brass Fittings & Fixtures	GEM, Techno, Lalsons KINGSTON, JAGUAR, Metro, ESSCO, MARC
28	C.P. Brass Coupling and Bottle	ESSCO, GEM, Kingston, Jaguar, Metro, Marc
29	C.I. Flushing Cistern	Mis A-1 (J.S.), HJN, JAMCO, Neco, HIF
30	C.P. BRASS Urinal Waste & Flush	Orient, PARKO, Elite, Jaguar & Metro
31	Plastic Sheet & Cover	M/s Commander, Diplomat, Admiral, Patel, Champion, Parryware & Hindvvare
32	S.S. Sink	M/s Diamond, Niraii
33	G.I. Pipes	M/s TATA
34	G.I. Pipes other than TATA make if specified	Zenith, Jindal or ISI mark
35	G.I. Finings	PEG, MJM, Sims!, R-Brand, UNIK, Plumb well and other brands approved by ISI mark
36	G.M. Gate / Globe Valves	Nets, SANT, M/s Leader Valves
37	Copper ball Valve	Techno, M/s GEM, ESSCO, Leader, A-1 JS
38	Air Valve	Leader, Sant, HAWN M/s Kirloskar
39	Water Meter	Capstan, Keycee, Paramount
40	Sluice Valves	Kirloskar, Minoti, ESSCO & Burn, Hawa
41	C I water quality pipes	Deem) steel castings, Jindal, Lanco
42	Cast Iron Valves	KirIoskar, Leader, HAWA
43	C.1. Soil Quality pipes	NECO, BC, RIFCO3 ASP, A-1, PARAS, HIF, Kajeriwal
44	S.W. Pipes & Gully Trap	Perfect, Kashrnira, BURN, RK, ANAND, ISI marked
45	RCC Hume Pipes	Mis Indian Hume Pipes, Pranali, Cement pipe, Ghambir, Kore Cement confirm to ISI
46	HDPE Pipes & HDPE fittings	Prince, Gautam M/s Hastil, Sangir pipes, Supreme
47	RCC frame, covers & SFRC	M/s Pratibha, Bharath, Vikrant
49	PIG LEAD	M/s Hindustan Zinc Ltd.
50	CL frame & covers	RIFCO, NECO, PARAS, A-1, M/s. Ashok Iron, Foundry, HIF
51	CPVC, UPVC, SWR Pipes	Finolex, Prince & Supreme
52	Poly Propylene — R Pipes	Supreme & Sakthi Polymers
53	PVC Plastic High / Low level cistern	Commander, Elite Dual, Champion, Parryware-similine, Hindware
54	PVC Inlet connection & Waste Pipes	Kohinoor, ECCSO, GEM & Elite

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55	CP Brass towel rods and accessories	Elite, GEM, Jacquar, ESSCO
56	Concrete Admixtures	Sunanda Chemicals, Mc-Bauchemie, FOSROC, Pidilite, Roffe, BASF
57	Asbestos Roofing Sheets	Everest, Charminar & Asbestos Cement Ltd.
58	Colour Coated Steel / Zinc-alu alloy roofing sheets	Kirby, Steelfah & Colour Roof India Ltd.
59	UPVC Doors / windows	Fenesta, Aluplast, Lingel, Shuco, Winpro, Rehau

Tata Institute of Fundamental Research
टाटा मूलभूत अनुसंधान संस्थान

INVITATION OF BIDS

FOR

Construction of Hangar Structure for Housing
Workshop & Laboratory Space at 36/P, Gopanpally Village,
Serilingampally Mandal, Ranga Reddy District, Hyderabad

FINANCIAL BID

PART -II

Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Junction
Post: Gopanpally Village, Serilingampally Mandal,
Hyderabad - 500 107

SCHEDULE OF QUANTITIES

Construction of Hangar Structure for Housing Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad

ABSTRACT OF BILL OF QUANTITIES

Sr. No.	Description	Amount in Rs. (Both in Figures and Words)
A.	TOTAL FOR CIVIL & STRUCTURAL WORKS FOR HANGAR BUILDING	
B.	TOTAL FOR ELECTRICAL CABLE WORK FOR HANGAR BUILDING	
	GRAND TOTAL (A + B)	
	GRAND TOTAL IN WORDS:	

Contractor's Signature & Seal

SCHEDULE OF QUANTITIES
Construction of Hangar Structure for Housing Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad

A. CIVIL AND STRUCTURAL WORK FOR HANGAR

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
1	Site Clearance including uprooting of rank vegetation, grass, brushwood, trees and saplings of girth upto 30cm measured at a height of 1m above ground level, clearing grass , including disposal of rubbish upto a distance of 5 Km outside the periphery of the area cleared etc. complete all as per the directions of Engineer - in - Charge.	Sqm	1600		
2	EXCAVATION Earthwork in excavation below Ground Level in all kinds of soils up to hard strata to a maximum depth of 2.0 m below existing FGL; staking out of work as per specifications; taking spot levels on edges & centerline @ 3m c/c as per specifications; bailing out of water if encountered; providing side strutting if required, segregating the excavated earth in to serviceable and unserviceable earth; stacking the serviceable earth separately for enabling reuse for backfilling or any other purpose as per instructions of TIFR, HYDERABAD; carting away and disposing the unserviceable earth and disposing off beyond site boundaries to suitable dumping spots/unobjectionable places; obtaining approval from Mining Department/Applicable departments by payment of royalty; Right of way payments; loading at TIFR, HYDERABAD premises; transportation to dumping spots/unobjectionable places; unloading & leveling at dumping spots/unobjectionable places;				
2.a	For depth up to and including 1.5 M	Cum	160		
2.b	For depth above 1.5 M and upto and including 3.0 M	Cum	20		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
3	BACK FILLING Backfilling around sub-structure with serviceable & reusable soils available from excavation and stacked earlier within the new site boundary including re- excavating, shifting to the site of backfilling, backfilling in layers of 200 mm; watering; compacting; testing to achieve 95% MDD as per lab results all complete as per instructions of TIFR-TCIS, HYDERABAD.				
3.a	UPTO 1.5 M	Cum	160		
3.b	FROM 1.5 M TO 3 M	Cum	20		
4	Banking / filling with approved Murrum having obtained from borrow pits outside the Project Site premises at the cost and arrangement of the contractor including transportation , loading , unloading and spreading in layers not exceeding 200 mm in depth, breaking clods, watering, (rolling each deposited layer with 8-10 tonne mechanical Vibro roller to achieve required compaction, gradient and camber) Ramming by hand rammer (where ever area is not available for compaction by Mechanical Vibro roller) , including necessary soil test /core test, under optimum moisture condition to achieve atleast 95% of the maximum dry density (proctor density), etc., complete all as specified (Payment shall be made for consolidated thickness complete as per standard specification).	Cum	425		
5	ANTITERMITE TREATMENT Supply, diluting and injecting approved quality chemical emulsion in sealed containers with emulsifiable concentrate of 20% with 1% concentration for **PRE-CONSTRUCTIONAL Anti-Termite Treatment** and creating a continuous chemical barrier (Only ground floor plinth area of the building will be measured for payment).The work shall be carried - out by specialised agency and as per IS 6313 (Part II 2001). The anti - termite treatment shall be guaranteed for a period of 10 (Ten) Years.	Sqm	440		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
6	PLAIN CEMENT CONCRETE Supplying and Laying Plain Cement Concrete of Grade 1:4:8 with stone aggregate of 40mm down size (including shuttering if required) in all leveling courses under Foundation, Floors, Pipelines, Pits, trenches etc., at all depths complete all as per Drawings and Specifications and instruction of the Engineer.	Cum	55		
7	CONCRETE FOR PLINTH PROTECTION Supplying and Laying Plain Cement Concrete of following Grades (including Shuttering if required) in Plinth Protection, foundation, floors, aprons, pits, drains and other mass Concrete works, Steps, Coping of wall etc., at all level as per Drawings, Specifications and instruction of Engineer.				
7.a	b) 1:2:4 Grade Concrete using 20, mm downgraded coarse aggregate.	Cum	26		
8	Providing and laying in position M-25 grade concrete for reinforced cement concrete work, using cement content as per approved design mix, including the cost of centering, shuttering finishing, cost of admixtures in recommended proportions as per IS : 9103 to accelerate/ retard setting of concrete, improve workability without impairing strength and durability as per direction of the Engineer - in - charge. (Note :- Cement content considered in this item is @ 330 kg/cum. Excess/less cement used as per design mix is payable/recoverable separately).				
8.a	M-25 Grade Design Mix Concrete, using 20 mm downgraded coarse aggregate IN SUB-STRUCTURE	Cum	35		
8.b	M-25 Grade Design Mix Concrete using 20 mm downgraded coarse aggregate IN SUPER- STRUCTURE	Cum	10		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
9	REINFORCEMENT STEEL Supplying and Fabricating and Fixing in position TMT Steel Reinforcements of Grade Fe-500 conforming to IS at all levels and positions including the Cost of transport, Straightening, Cutting, Bending, Cranking, Binding, Welding, Provision of necessary Chairs and Spacers, Preparation of bar bending schedule, Drawings, getting the same approved etc., as per Drawings and Specifications and including Cost of binding wire, Labor etc., all complete for Reinforced Concrete. Only approved chairs, spacers & overlaps shall be used.	MT	5		
10	BRICK WORK Providing and construction of brick work using M-.50 grade bricks(with minimum compressive strength of 50kg/sq cm) in cement mortar 1:6 (1 cement : 6 coarse sand) in superstructure at all heights and locations including scaffolding, staging ,curing etc., complete all as per the directions of the Engineer -in - charge.	Cum	100		
11	Providing and construction of brick work of half brick thickness using M - 50 grade bricks in Cement Mortar 1:4 (1 cement : 4 coarse sand), proportions in walls at all heights and levels as per specifications including scaffolding, curing including providing and placing in position 2 Nos. of 6mm dia MS Bars at every third course etc., complete at levels and locations and as directed by engineer in charge (Rate to be inclusive of MS bars)	Sqm	30		
12	COURSED RUBBLE MASONRY IN SUBSTRUCTURE Supplying, Providing and laying coursed rubble stone masonry in CM 1:5 for sub-structure & up to plinth level using approved quality rubble stones including payment of all applicable royalty payments, leads & lifts, any other levies, etc. Rate to include cost of stones, watering prior to laying, providing and laying bond stones (Header)at 1mC/C that is @ 1bond stone/ 0.50 sq.m surface area of wall for super-structure & sub-structure & marking the same with oil paint , supplying & providing key stones, raking the joints upto a depth of minimum 6mm below ; curing the masonry after construction, providing scaffolding required if any, etc., complete in all respect as per Tender Specification/Scope of Work etc and as directed by TIFR-TCIS, HYDERABAD Engineer –in-charge. The stones must be properly dressed and laid to plumb.				

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S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
12.a	Same as above in substructure without dressed stone joints shall be struck flush and finished at the time of laying.	Cum	50		
12.b	Same as above for plinth over the ground level with dressed stone recessed pointing in CM 1:3	Cum	35		
13	DAMP PROOF COURSE Laying DPC upto 50 mm thick with plain cement concrete (1:2:4) prop nominal mix using 10 mm downgraded machine crushed HBG metal including c/c of all materials, cost of seignorage charges on all materials, using approved water proofing admixture conplast 421 IC of M/S FOSROC or equivalent at rate of 150 ml per one bag of cement, laying, labour etc. and other incidental works complete.	SqM	125		
14	Providing and laying water proofing treatment tovertical and horizontal surfaces of depressedportions of W.C., Bath, Kitchen and the likeconsisting of : i) 1st course of applying cement slurry @ 4.4.Kg/SqM mixed with water proofing compound`Impermo' of Snowcem or equivalent conforming toIS 2645 in recommended proportions. ii) 2nd course of 20mm cement plaster 1:3 (1cement: 3 coarse sand) mixed with water proofingcompound in recommended proportions. iii) 3rd course of applying blown or residualbitumen applied hot at 1.7 Kg. Per SqM of area iv) 4th course of 400 micron thick PVC sheet (Overlaps at joints of PVC sheet should be 100 mmwide and pasted to each other with bitumen @ 1.7Kg/SqM.)	Sqm	30		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
15	Providing and laying integral cement based water proofing treatment including preparation of surface as required for treatment of roofs, balconies, terraces etc consisting of following operations: a) Applying a slurry coat of neat cement using 2.75 kg/sqm of cement admixed with water proofing compound conforming to IS. 2645 and approved by Engineer-in-charge over the RCC slab including adjoining walls upto 300 mm height including cleaning the surface before treatment. b) Laying brick bats with mortar using broken bricks/brick bats 25 mm to 115 mm size with 50% of cement mortar 1:5 (1 cement : 5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge over 20 mm thick layer of cement mortar of mix 1:5 (1 cement :5 coarse sand) admixed with water proofing compound conforming to IS : 2645 and approved by Engineer-in-charge to required slope and treating similarly the adjoining walls upto 300 mm height including rounding of junctions of walls and slabs.	Sqm	30		
16	Providing and laying **Anti SkidCeramic glazed floor tiles** of size of thickness upto 8-10mm and 300x300 mm of 1st quality conforming to IS: 15622 of approved make in colours such as White, Ivory, Grey, Fume Red Brown, laid on 20 mm thick cement mortar 1:4 (1 Cement : 4 Coarse sand), including pointing the joints with white cement and matching pigment etc., complete all as directed by Engineer - in - Charge.	Sqm	25		
17	Providing and fixing 1st quality **5 mm to 6 mm thick ceramic glazed wall tiles** conforming to IS: 15622 of size 300x450 mm of approved make, in all colours, shades except burgundy, bottle green, black of any size as approved by Engineer-in-Charge, in skirting, risers of steps and dados, over 12 mm thick bed of cement mortar 1:3 (1 cement : 3 coarse sand) and jointing with grey cement slurry @ 3.3kg per sqm, including pointing in white cement mixed with pigment of matching shade complete etc., all as directed by Engineer - in - Charge.	Sqm	80		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
18	EXTERNAL PLASTER 20 MM THICK Providing 20 mm thick external sponge finish cement plaster 1:4 (1 cement : 4 sand) as per architectural shapes marked in the drawings, at all depths and heightsin two coats of 12mm & 8mm. 2nd coating 8mm shall be finished with sand faced plastering on faces of walls, pillars, projection, bands, cornices, fins, sills, etc., including raking out joints if any left out, necessary dabbing, curing, scaffolding, providing chicken mesh at junctions of columns, beams etc., complete at all heights as per specification and drawings, second layer with water proofing compound (to be paid under relevant items).	Sqm	400		
19	INTERNAL PLASTER 12 MM THICK Providing 12 mm thick cement plaster 1:4 (1 cement: 4 sand) smooth finish with water proofing compound (to be paid under relevant items) as per architectural shapes marked in the drawings, at all depths and heights in one layer on internal faces of walls, pillars, projection, bands, cornices etc., including necessary dabbing, curing, scaffolding, providing chicken mesh at junctions of columns, beams etc. complete at all heights as per specification and drawings.	Sqm	500		
20	PLASTER 6 MM THICK Providing 6 mm thick cement plaster 1:4 (1 cement: 4 sand) to ceiling of slabs, chajjas including drip course, bands, beams, columns, loft slabs, staircases, and any other location at all heights wherever required with all bye works dabbing, curing, scaffolding, including providing chicken mesh at junction of columns, beams etc. complete at all heights and levels as per specification and drawings.	Sqm	25		
21	PLASTER 20 MM THICK WITH CEMENT FLOAT Providing 12mm thick cement plaster CM 1:4 (1 cement :4 sand) to apron, drain and any other location at all heights including floating coat of neat cement @ 2.2 kg/sqm wherever required with all bye-works dabbing, curing, complete all heights and levels as per specification and drawings and as directed by engineer.	Sqm	40		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
22	ACRYLIC EXTERNAL PAINTING OVER SAND FACED PLASTER Painting external surfaces with two coats of exterior grade Acrylic emulsion paint of Apex Ultima of M/s. Asian paints of approved colour and shade over one coat of cement based water repellent paint of approved make and shade as mentioned below all as per manufacturer's recommendations and as per the approved sample including providing necessary scaffolding, cleaning the surface with water to remove all coating, dust, filling up cracks & crevices with approved putty, curing the surface etc. complete as per specifications and as directed by Engineer inCharge.	Sqm	400		
23	INTERNAL PAINTING				
23.a	Providing and applying 1.5mm thick cement base wall care putty in two coats of M/s Birla white at all floors and locations plastered surfaces finished smooth to correct line, level, plain, plumb etc. including preparing the surfaces , scaffolding, smoothen the putty surfaces with very fine water proof emery paper to get a glossy finish etc. complete per manufacturers specifications drawing & as directed by the Engineer in Charge	Sqm	350		
23.b	Painting plastered/putty smooth finished surfaces with two coats of Acrylic Emulsion Paint of approved colour over a coat of approved primer coat including preparing the surfaces, filling with putty wherever required, scaffolding and cleaning etc, complete as per specifications, drawings and as directed by the Engineer-in-Charge.	Sqm	500		
24	Supplying and fixing of Un Plasticised Poly Vinyl Chloride (UPVC) 2 Track–2 Panel Sliding Doors duly manufactured using UPVC reinforcedprofiles(Composition of profile shall consists aminimum of 5.5 PHR of TiO2 and not more than 12PHR of CaCo3 for every 100 parts of PVC resin) of 60mm x 45 mm x 2.20 mm with reinforcement of 1.2mm thickness, super sash with overall size of 39 mmx 75 mm x 2.20 mm with for sliding door shutterframes capable of mounting single glazing system,structurally reinforced with hot dip	Sqm	10		

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	galvanized up to50 microns of minimum thickness of 1.5 mmprefabricated & welded through fusion welding thedoor sash shall be fitted with 6 mm thick clear floatglass of reputed make duly fixed with Grey colourTPV Gasket for sash & Glazing bead shall be coextruded with Grey colour soft PVC. Door shall beprovided with standard hardware & multi pointlocking system of bent handle espagulate . The systemis to be installed at the site using anchor fastenerssilicon rubber sealant, easy glazing/ deglazing at siteetc., including cost and conveyance of all materials,accessories, labour charges for transportation,erection at site complete for finished item of work.				
25	Providing & Fixing of Scientific Doors with metal door frames and door shutters made of galvanize steel (base steel as per IS 513 of 0.58 mm thick D quality, galvanized as per IS 277 with Zinc of 120 GSM). coated with Zinc Phosphate Primer to receive any paint on site or finished with Thermosetting Polyurethane paint of Aliphatic Grade providing high levels of scratch resistance and durability/Epoxy polyester powder for powder coating paint thickness 50-60 microns (Dry film thickness) outer frame section of 100 x 58 mm x 1.2 mm thick, shutter section of 0.80 mm thick galvanized steel sheet pressed (roll formed) for 46mm thick fully flush, double skin door shell seam joints at stile edges, in-fill of honeycomb kraft paper used to give the required rigidity and effective acoustic insulation with 6" Tower bolt – 2 Nos., 6" D handles – 2 Nos., 10" Aldrop – 1 No., Butt Hinges – 6 Nos, Mortise Lock of approved quality – 1 No, frames fixed to the concrete/masonry wall by means of self-expanding screws complete for finished item of work for Double leaf Door	Sqm	30		
26	MS WINDOW GRILL Supplying, fabricating and fixing MS guard bars/grill made out of MS flats, rods, square bars, etc., to steel windows / ventilators including two coats of synthetic enamel paint over primer coat, all complete as per drawing/approved designs, specifications and directions of the Engineer.	KG	100		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
27	ALUMINIUM VENTILATOR Supplying, Providing & fixing in position coloured anodized (25 micron in Bronze / Brown / Black colour) extruded aluminium ventilators fixed with louvered ventilators such that handle is provided for operating the louvers as per detailed drawings with all necessary fittings such as openable handles shutter rollers with zinc plated screws, etc. of reputed make with 5 mm thick Reflective glass of approved colour shade fixed with EPDM gasket lining. All joints should be sealed with similar colour poly-sulphidesealant. All aluminium sections should be machine cut & mechanically assembled etc. complete as directed by Engineer in charge. The glass shall be 5mm thick(min). Outer frame shall be 25mm x75mm x 1.5mm thk coloured anodized (12 micron in Bronze / Brown / Black colour) extruded aluminum section. Louvers shall be box type.	Sqm	1.20		
28	Supply and Fixing Door Frames made of Skin pass galvanized Iron Sheet (conform to Base Steel as per IS 513 "D" Quality, Galvanized as per IS 277 with Hot Zinc Coating of 120 grams/ Sq.mtr) with pure polyester powder coating of 60 - 65 Microns (Dry Film thickness) manufactured from 1.2 mm thick galvanized steel sheet formed to single rebate profile of size 100 mm x 58 mm fitted with "TEE" anchors and supplied to knock down /welded form with Miter Joint for Bolted Assembly at site, cleaned and coated with Polyurethane powder coating of thickness 65 – 75 microns (Dry Film Thickness) & Oven Baked at 200 Degree Centigrade for black finish, Stainless Steel Ball Bearing Butt Hinges of 102 x 76 x 3mm thick fixed flush to the frame.	Rmt	30.00		
29	Supply and fixing FLUSH Doors single shutter door to existing frame as per approved drawings and of 30 mm thick solid bond wood block board type with teak veneer on one face and commercial ply on another face (One side Teak) teak wood internal lipping as per drawing including fixing of 6 Nos. MS Z hold fasts of size 300 x 40 x 5mm size including cost of Powder Coated/ Chromium Plated Mild Steel fixtures of 3 Nos. butt hinges 150 x 31.75 x 3.5 mm, 2 No tower bolt of 250x12mm dia, 1 No. CP Aldrops - 300 mm long and 2 Nos. CP handles of 150 mm size & 1 No. 63 mm long door stopper including fixing the fixtures to door with required	Sqm	12		

	no.of brass screws, bolts and nuts including labour charges for fixing the frame in position, fixing the shutter to the frame etc., complete for finished item of work as per APSS 1001 & 1002.				
30	PVC RAIN WATER DOWNTAKE PIPES Supplying, jointing, cutting and fixing in position U PVC rain water down HG pipes of 110mm dia of following diameters conforming to IS : 13592 Type A including all necessary specials like bends, shoes, tees, clamps etc. jointing as per manufacturer's recommendation, complete as per specifications, drawings and directions of the Engineer.	Rmt	5.00		
31	HUME PIPE 150 DIA: Supplying and laying in position RCC pipes of size 150 mm with collars, conforming to IS:458 for pipe culverts, cable crossings etc. including cutting the pipe if necessary, lowering, laying in position to proper levels, slopes etc. caulking the joints with spun yarn soaked in neat cement slurry and finishing with cement mortar 1:2 (1 cement : 2 sand) curing etc. all complete as per drawings, specifications and directions of Engineer-in-Charge. The excavation, PCC, backfilling, compaction in layers and curb wall at ends shall be paid under relevant items.	RM	50		
32	STRUCTURAL STEEL WORK: Supplying, fabricating, hoisting and erecting in position HS structural steel works similar to Pre-Engineering building structures using columns, canopies, rafter , sub rafters and Purlins at all elevations/levels/heights including aligning/leveling, providing and fixing bolts, nuts, washers, angles, channels, joists, rails, tees, plates, rounds, squares,etc., of various sizes and other structural steel sections conforming to latest IS 2062-Grade A & B as applicable including straightening, cutting, welding, bending to shape, bolting, cleaning the rust and scales. Scope is inclusive of following finishes ie.Grit / sand blasting and applying one coat of Red Oxide Primer DFT 30 Microns and synthetic enamel paint DFT 35 microns. Only paint touchup wherever needed to be done after erection. The rate to include the cost of all materials, labours, tools, tackles, cranes, devices, fasteners, welding, connection required for work shop and packing pieces, fabrication in the work shop, transportation to site and erection at site as per specifications and drawing complete.				

	a) For Primary Members ie. Columns, Rafters, gable frame, Canopies at all levels and heights-Grade 50(345 MPa)ASTM A 572M	Kg	7500		
	b) For Secondary Members ie. Z & C Purlins- Grade 50(345 MPa) 120 GSM Galavanized coil	Kg	5500		
	c) Rod Members, Anchor Bolts, Sag Rods and Brace Rods, Angles, Clips,etc – Grade 36(250 MPa)	Kg	1200		
33	Puff Panel Roofing and Cladding				
33.a	Supply and fixing of Self Supporting Sandwich Puff Roof Panels Glamet manufactured on Continuous line (mandatory) of METECNO or Equivalent make, comprising of 0.4mm TCT Colour Coated Profiled Sheet on exposed side and 0.5 mm TCT on unexposed side with Trough Depth of 38 mm (minimum), Trough pitch 333mm (minimum) with 3 stiffing ribs at equi - distance in pan centre of each pitch to improve strength and aesthetics with covered width of 1000mm. The Colour Coated sheets will have substrate of Galvalume 150 AZ and Yield Strength 320 MPA on external surface and Galvalume 100 AZ and yield strength 320 MPA on the internal surface as per ASTM A 792. Coating shall be of Regular Modified Polyester on both the external and internal steel wall facings of 30 micron finish as per EN -10326. The void between the sheets will be HCFC free. Puff foam of Density 40 kg/m3, thermal conductivity of 0.024 W /m K, closed cell contents greater than 90% with adhesion strength Metal to Foam 80-100 KPa. The thickness of Panel shall be 50 mm outer to outer excluding the profile i.e. 88 mm (minimum) from crest height to bottom sheet. The length of the Panel shall be to suit the site length requirement. The side lapping and overlapping joints of the self-supporting Panels should be vapour tight. Side to side overlap should have foam gasket compressed to 60% on assembly to ensure leak free roofing. The. The PIR Panels supplied shall have guard film protection on all exposed surfaces & shall confirm to EN 14509. The Quoted rate should be inclusive of single/double scaffolding with safety net below the working area to suit the safety working condition at site,transportation and erection at site are included	Sqm	500		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
33.b	Supply and fixing of Self Supporting Sandwich PUFF Monowall panels or of equivalent specification, Sandwich PUF Panels (Wall Cladding Purpose) manufactured on continuous line (mandatory) of METECNO or Equivalent make, comprising 0.4mm TCT/ 0.5mm TCT Colour Coated Sheets on external side with light cutting grooves with trough pitch of 62.5 mm (maximum) to improve strength and aesthetics, internal plain sheet with covered width of 1000 mm. The Colour Coated sheets will have substrate of Galvalume 100 AZ and Yield Strength 320 MPA as per ASTM A 792. Coating shall be of Regular Modified Polyster on both the external and internal steel wall facings of 25 micron finish Puff foam of Density 40 kg/m3 and thermal conductivity of 0.024 W /m K. The thickness of Panel shall form 80mm outer to outer including the profile. The length of the Panel shall be to suit the site length requirement. The groove portion of the panel should have foam gasket to ensure air/ vapour tight joint. The PUF Panels supplied shall have guard film protection on all exposed surfaces & shall confirm to EN 14509. The Quoted rate should be inclusive of single/double scaffolding with safety net below the working area to suit the safety working condition at site	Sqm	200		
33.c	Providing and fixing Color **Coated GALVALUME ROOF SHEET of 26 Gauge for Roof and Cladding**. The material shall be cold rolled steel,550Mpa yield stress (ASTM A446 Grade E) With hot dipped metallic coating of aluminium Zink alloy(150gms/sqm total of both sides, AZ 150 as per ASTM A792 or AS per IS 1397),0.5mm total coated thickness. The rate should be inclusive of transportation, erection at site, laps, wastages, preparation of shop drawings,scaffoldings,screws,fasteners etc complete.(Laps either with same or with other Galvalume sheet will not be considered for payment) The Quoted rate should inclusive of single/double scaffolding with safety net below the working area to suit the safety working condition at site.	Sqm	120		
34	Providing and fixing BARE **GALVALUME SHEET for Ridge**.The material shall be cold rolled steel, 550Mpa yield stress(ASTM A446 Grade E) With hot dipped metallic coating of aluminium Zink alloy (150gms/sqm total of	RM	25		

	both sides, AZ 150 as per ASTM A792 or AS per IS 1397), 0.5mm total coated thickness. The rate should be inclusive of fabrication, transportation, laps, wastages, preparation of shop drawings, scaffoldings, screws, fasteners, erection at siteetc complete.(Laps either with same or with other Galvalume sheet will not be considered for payment) The Quoted rate should be inclusive of single/double scaffolding with safety net below the working area to suit the safety working condition at site and as per drawing.				
35	Providing and fixing COLOUR COATED GALVALUME SHEET for Flashing.The materialshall be cold rolled steel,550Mpa yield stress (ASTM A446 Grade E) With hot dipped metallic coating of aluminum Zink alloy (150gms/sqmtotal of both sides, AZ 150 as per ASTM A792 or AS per IS 1397), 0.5mm total coated thickness. The rate should be inclusive of las, wastages, preparation of shop drawings, scaffoldings, screws, fasteners, fabrication, transportation and erection at site complete.(Laps either with same or with other roofing materials will not be considered for payment). The Quoted rate should be inclusive of single/double scaffolding with safety net below the working area to suit the safety working condition at site	RM	300		
36	FLOORING				
36.a	Providing and laying **vacuum dewatered flooring 125 mm thick** with M25 Grade Concrete with minimum cement content of 325 kg per cum of concrete and water cement ratio not more than 0.5 laid in alternate strips using reinforcement as per detailed drawing including chairs, leveling, necessary shuttering using MS channels of required depth with pre drilled holes for reinforcement, consolidation with vibrating table, drawing out the excess water and finishing with compactor / power trowel and finishing the surface neat & smooth as per standard manufactures specifications etc., all complete to be laid over bed concrete(PCC 1:4:8) using 40 mm thick metal of 75 mm thick and as directed by Engineer - in - Charge. **Note : Reinforcement if any shall be measured separately and paid under regular Reinforcement steel item and Groove Cutting shall be done for Longitudinal and Transverse Joints within 24 hours**	Sqm	470		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
37	SANITARY ITEMS				
37.a	Supply, Installation and commissioning approved make floor mounted EWC (suit) CASCADE of Parry ware or equivalent model 'P' or 'S' trap with dual flush porcelain cistern fixed on EWC with all internal parts of dual flush cistern, ultra solid seat cover of approved make with rubber buffer and cap 15 mm angle stop cock 450 mm long PVC inter connection pipe wall flanges all of approved make etc. complete for finished item of work in all respects: White Colour.	Nos	4		
37.b	Supplying & Fixing Indian make Flat Back Wash Hand Basin (HSW/Parryware/ Neycer) 1st quality conforming to IS:2556-Part-4:1972 with waste fittings like rubber plug, chain, 32 mm nominal size C.P. Fitting with parallel pipe thread conforming to IS:2963-1979 and fitted with 15 mm nominal bore Chromium Plated Pillar Tap of 1st quality Indian make 400 grams Seiko/ Senior/ Nice/ Esso or equivalent complete with standard CI brackets including wooden block: 550 x 400 mm - Single C.P. Pillar cock	Nos	4		
37.c	Supply & Fixing of Angular stopcock with wall flange Jaquar Continental series, Chrome finish with 7 years warranty / Jupiter Aqua Lines-JALor equivalent series	Nos	4		
37.d	Supply fixing of Waste coupling Jaquar make, Chrome finish with 7 years warranty / Jupiter Aqua Lines-JALor equivalent series	Nos	4		
37.e	Supply & Fixing of Bottle Trap Jaquar make, Chrome finish with 7 years warranty / Jupiter Aqua Lines-JALor equivalent series	Nos	4		
37.f	Supplying & fixing of soap dish of approved make (Jaquar 1131)	Nos	4		
37.g	Supplying & fixing of soap dispenser of approved make (Jaquar ESS)	Nos	4		
37.h	Supplying & fixing of HAND DRIER of approved make (Jaquar ESS)	Nos	2		
37.i	Supplying & fixing of TOILET PAPER HOLDER (Jaquar 1151)	Nos	4		
37.j	Supply & Fixing of towel coat hook Jaquar make Queen series with 7 years warranty: Chrome plated / Jupiter Aqua Lines-JALor equivalent series	Nos	4		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
37.k	Supplying & Fixing white glazed flat back half stall **urinals** 1st quality conforming to IS:2556-1995 with standard C.P. Spreader of overall size 95 x 95 x 57 mm conforming to IS:2556-Part6, Sec-6-1974 fixed with screws complete Indian make (HSW/Parry/Neycer) : 590 x 375 x 390 mm	Nos	3		
37.l	Supplying & Fixing 38.1 mm C.P waste coupling Half or Full Thread 1st Quality Indian make Parryware or equivalent	Nos	3		
37.m	Supplying & Fixing 12.7 mm dia NP push cock Ist quality	Nos	3		
37.n	Supplying & fixing of glass round edged frame less mirror of approved make fixed by solution to wall/ tile complete, Size: 600mm x 450mm	Nos	4		
37.o	Supplying and fixing GI pipe Medium Grade properties & weight as per IS 1239 ISI mark with GI fittings such as bends, sockets, unions, reducers etc. including the cost of pipe & its fittings &labour charges complete				
	i) 15mm dia	Rmt	10		
	ii) 25mm dia	Rmt	25		
	iii) 50mm dia	Rmt	200		
37.p	Providing and fixing cast iron soil pipes, waste and vent pipes **(IS 1 3989)** only including all fittings (plain or with inspection door) e.g bends, junctions,offsets, access piece, caulking with cement, including cutting holes in walls and floors, and making good. GI bat clamps of adequate size shall be provided at every 2m c/c or at every joint. Rate to include painting with 3 coats of enamel paint with primer and surface preparation, testing for leaks etc., complete.				
	i) 100mm dia	Rmt	30		
	ii) 75 mm dia	Rmt	30		
37.q	Supply and fixing (class 5, 10kgf/sq.cm) rigid pvc pipes (IS 4985 :2000) laid under floor with solvent cement as jointing material as waste line with necessary specials & making necessary bores in foundation wall, ceiling etc, & rendering the bores in cement morter in 1:4 etc., & complete.				
	i) 32mm dia	Rmt	10		
	ii) 50mm dia	Rmt	20		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
37.r	Providing and laying in position salt glazed stoneware pipes conforming to IS 651, to correct alignment and gradient as per the drawing including excavation of trenches in all types of soil, sealing the joints with tarred gasket and finishing with 1:3 cement mortar and testing of joints, refilling the trenches with excavated earth, watering, ramming etc. complete.				
	i)150mm dia	Rmt	50		
37.s	Providing and fixing trap of self cleansing design with screwed down or hinged grating with or without vent arm complete, including cost of cutting and making good the walls and floors 100 mm inlet and 100 mm outlet.	No	6		
37.t	Supplying & fixing CI floor traps 1st quality ISI marked conforming to IS:1729-1979 with C.P. Grating fixing with white cement as per site requirements with standard practice for 100 mm dia Inlet- 75 mm (3") outlet pipe.	No	14		
37.u	GATE VALVES				
	S & F Gunmetal (GM) Ball valve with SS Ball and SS Spindle as per IS - Class - I, Indian make heavy type including cost and conveyance of all materials and labour charges, Overheads & Contractors profit complete for finished item of work-				
	i) 25mm dia	No	4		
	ii) 50mm dia	No	2		

S.No	Item Description	Unit	Qty	Rate (Rs)	Total Amount (Rs)
37.v	Providing and fixing square-mouth S.W. gully trap class SP-1 complete with C.I. grating brick masonry chamber with water tight C.I. cover with frame of 300 x300 mm size (inside) the weight of cover to be not less than 4.50 kg and frame to be not less than 2.70 kg as per standard design	No	4		
38	Constructing 904.0 mm (3'0") dia brick masonry inspection chamber as per IS - 4111: Part-1:1986 with cement mortar (1:6) prop using 2nd Class Clay Bricks of 225 mm thick from approved source having a minimum crushing strength of 5 N/sq.mm including plastering with cement mortar 1:3 prop; ½" thick both inside and outside fitted with 20" dia RCC manhole covers and frames including excavating pits up to a **depth of 1524 mm (5'-0"**) in all sorts of soils (excluding rock) and laying cement concrete (1:4:8) 150 mm thick using 40 mm HBG Metal and P.C.C. 1:2:4 benching and channel 100 mm thick as per Standard specification and including cost and conveyance of all materials like cement, sand, bricks, water etc., to site, cost of seigniorage charges on all materials and all incidental and operational, labour charges like mixing cement mortar, constructing masonry, lift charges, curing etc. including cost of CI Cover & frame, complete for finished item of work as per Standard specification.	No	4		
39	Providing and placing on terrace Sintex tank with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes with fittings and the base support for tank, complete for the finished item of work	Ltr	2000		
	Total Item Cost (From S.No 1 to S.No 39) in Rs.:				
	GST / Taxes / Other Charges etc. in Rs.				
	Grand Total for Civil & Structural work for Hangar (A) (Inclusive of all GST, Taxes etc.) in Rs.				

Contractor's Signature & Seal

SCHEDULE OF QUANTITIES

Construction of Hangar Structure for Housing Data Centre, Workshop & Laboratory Space at 36/P, Gopanpally Village, Serilingampally Mandal, Ranga Reddy District, Hyderabad

B. ELECTRICAL CABLE WORKS FOR HANGAR

Sr. No	Work Description	Unit	Qty	Rate	Amount
01	Supply laying, installation, testing and commissioning of LT 1100 Volts, 3.5 Core, 300 sq.mm, Aluminium stranded sector shaped conductor with XLPE insulation, extruded PVC inner sheath G.I. wire armoured, extruded FRLS grade antirodent & antitermite PVC(ST-2) outer sheath cable confirming to IS: 1554 Part 1/IS 7098 Part-1 with latest amendments fixed on wall/column/slab/ or in cable tray or in existing hume pipe/trench/shaft/pit on 5mm thick MS flat/ GI spacer/angle/support fixed with coach screws /anchor fasteners, 2mm thick GI fabricated saddles, all fixing accessories, etc. or in a ground at a depth of 900mm below ground level (cost of excavation shall be measured separately) sand bedding, laying of baked bricks on side & top backfilling, dewatering, consolidation, disposal of excess earth and making good to the original finish etc providing brass cable number tags as per the enclosed technical specifications & as per the E.I.C. Note: 1. Supply of sand, bricks, hume pipes and fish wire shall be in the scope of work 2. Sealing of hume pipes with wooden buses after cable laying shall be included in the scope of work 3. Clamping of cables on trays including supply of clamping materials as per instructions of E.I.C. shall be included				

Contractor's Signature & Seal

	in the scope of work. 4. LT Cable: Polycab RR/ Finolex or equivalent 5. Cable tray (wiremesh): Cablofoil (Legrand) or equivalent				
1.1	On cable tray/wall/existing trench	RMT	320		
1.2	In 150mm hume pipe (NP-2)/G.I pipe	RMT	180		
1.3	In ground (in the trench dug under 01 above)	RMT	800		
02	Supply and erections of Electroplated Brass double compression glands and Al lugs of suitable size for above mentioned cable in Sr. No. 1 and termination of cables in panels	Nos	8		
03	Cable trays Supply and installation of Electro zinc wire mesh of size 300mm (width) X 54mm (depth) including all accessories to fix the cable tray as per site conditions.	RMT	50		
04	Excavation/digging of cable trench of size: 0.5 Meter to 1.0 Meter wide × 0.9 Meter to 1.5 Meter depth for 250 Meters length(ie. +/-15% variation) at a site, in the earth of soil or soft/hard murum or rock/ CC road / BT road as encountered during the excavation work and refilling the trench with the excavated material.	CuM	225		
05	Liaising for obtaining road cutting permission from R & B and GHMC.	Lumps um	1		
	Total Item Cost (From S.No 1 to S.No 5) in Rs.:				
	GST / Taxes / Other Charges etc. in Rs.				
	Grand Total for Electrical work for Hangar (B) (Inclusive of all GST, Taxes etc.) in Rs.				

Contractor's Signature & Seal

Note:

1. Tender Bid amount will be considered together for both Civil & Structural work (A) and Electrical work(B) for Hangar and the amount shall be indicated in the abstract sheet for evaluation of bid amount (C=A+B).

2. TIFR, Hyderabad has right to delete any of above items from scope of work or may reduce quantities as per its requirement during execution of work. No claim or compensation for such deletion/decrease will be accepted/paid to contractor. Payment will be made as per actual quantities executed at tender rates, limited to the tender quantity.

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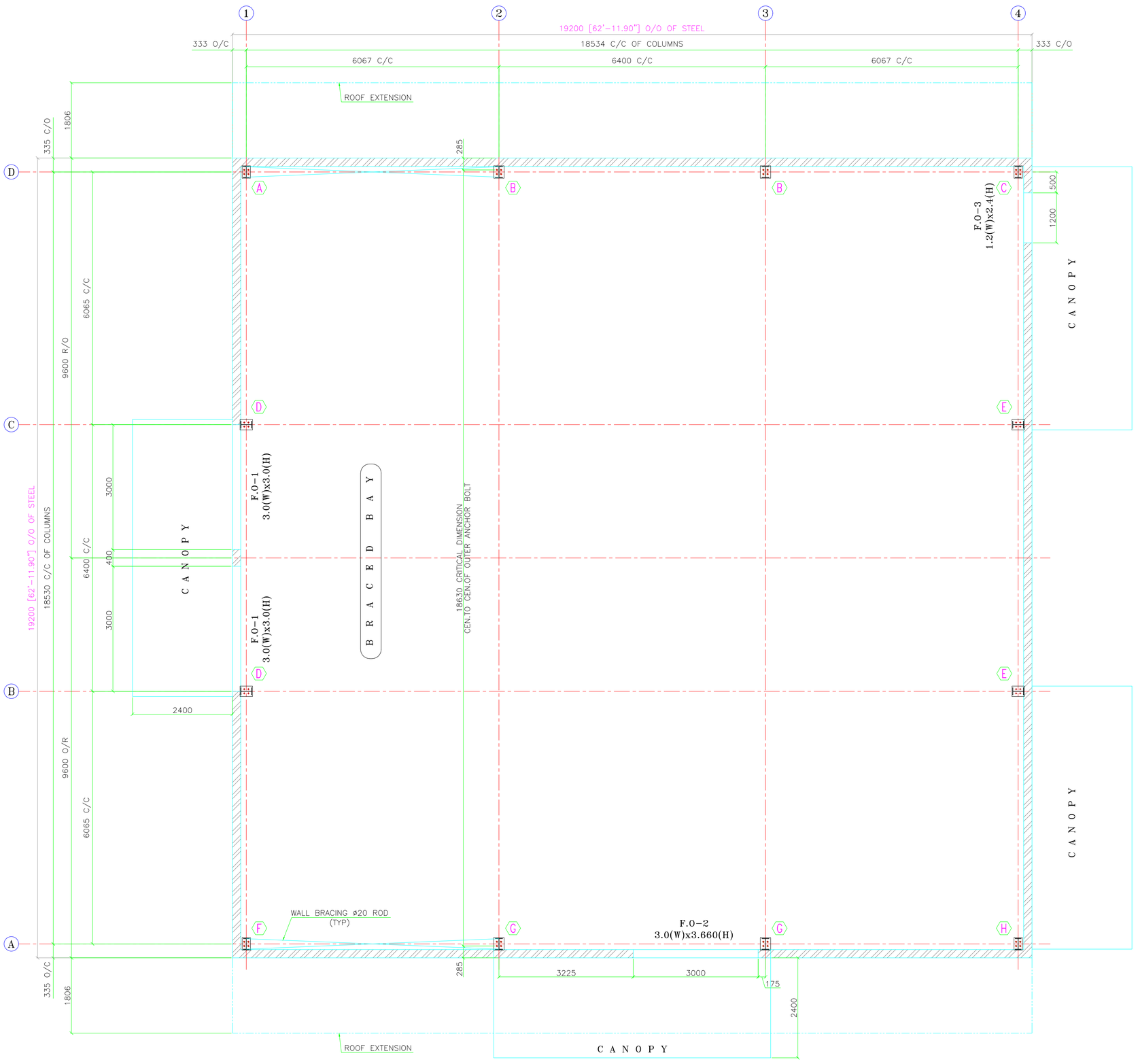


ANCHOR BOLT SETTING PLAN
1:50

USE 345 GRADE STEEL FOR FRAME WORK

N

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL LEVELS ARE IN METERS UNLESS SPECIFIED OTHERWISE
2. ALL ANCHOR BOLT DIMENSIONS ARE IN MILLIMETERS AND ANCHOR BOLT PROJECTION MUST BE ACCORDING TO DESIGN. THE THREADS SHOULD BE KEPT CLEAN.
3. ANCHOR BOLT SHALL BE KEPT PERPENDICULAR TO THE THEORETICAL BEARING SURFACE U.N.O
4. THE CUSTOMER IS RESPONSIBLE FOR THE ACCURATE LOCATIONS OF THE BUILDING LINES AND BENCH MARKS AT THE BUILDING SITE
5. THE SLAB OR EDGE BEAM SHOULD BE SQUARE AND LEVEL TO WITHIN 5MM TOLERANCE. ANCHOR BOLT SHOULD BE SET TO THE GIVEN DIMENSIONS AND PROJECTION WITH THE MAXIMUM DEVIATION OF 5MM. ANCHOR BOLT THREADS SHOULD BE PROTECTED DURING CONCRETING OPERATION OR THOROUGHLY CLEANED AFTER POURING OF CONCRETE. ALL TEMPLATES SHOULD BE REMOVED AFTER CASTING OF ANCHOR BOLTS
6. IN ANY CIRCUMSTANCE TAKES NO RESPONSIBILITY OR LIABILITY FOR THE COLUMN FOUNDATIONS, SLABS DESIGN AND CONSTRUCTION. FOUNDATIONS SHOULD BE DESIGNED BY CONSIDERING THE GIVEN REACTIONS AS A MINIMUM.
7. THE INSTALLATION OF ANCHOR BOLTS AND EMBEDDED ITEMS MUST BE DONE IN ACCORDANCE WITH THE CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS OF AISC SECTION-7. ANCHOR BOLTS AND FOUNDATION BOLTS SHALL BE SET BY THE CUSTOMER (OR HIS CIVIL CONTRACTOR) IN ACCORDANCE WITH ZAXIS ANCHOR BOLT SETTING PLAN AND DETAILS MARKED WITH "ISSUED FOR CONSTRUCTION" MAXIMUM ALLOWABLE TOLERANCES FOR ANCHOR BOLT CASTING ARE AS FOLLOWS:
   a) 3MM CENTER TO CENTER OF ANY TWO ANCHOR BOLTS WITHIN AN ANCHOR BOLT GROUP
   b) 6MM CENTER TO CENTER OF TWO ANCHOR BOLT GROUPS
   c) ELEVATION OF THE TOP OF ANCHOR BOLTS ±12MM
   d) MAXIMUM ACCUMULATION OF 6MM PER 30M ALONG THE ESTABLISHED COLUMN LINE MULTIPLE ANCHOR BOLT GROUPS, BUT THIS SHOULD NOT EXCEED 25MM ON TOTAL.
   e) 6MM FROM THE CENTER OF ANY ANCHOR BOLT GROUP TO THE ESTABLISHED COLUMN LINE THROUGH THAT GROUP
   f) THE TOLERANCES FOR POINTS b, c AND d APPLY TO OFFSET DIMENSIONS SHOWN ON THE PLANS, MEASURED PARALLEL AND PERPENDICULAR TO THE NEAREST ESTABLISHED COLUMN LINE FOR INDIVIDUAL COLUMNS SHOWN ON THE PLANS TO BE OFFSET FROM ESTABLISHED COLUMN LINE.
8. IN ANY CIRCUMSTANCE TAKES NO RESPONSIBILITY OR LIABILITY FOR THE EXISTING CONCRETE STRUCTURES, WHEN REQUIRED FOR CALCULATIONS DAI ASSUMES CONCRETE STRENGTH OF fck = 20 N/mm²
9. THE LOADS ARE CONSIDERED AS DEADLOAD – 11 KG/M²
   LIVELOAD – 250 KG/M²
10. THE LOADS ARE CALCULATED FOR WIND SPEED OF 44M/S AND DESIGNED AS PER MBMA CODE
11. THE FRAME IS DESIGNED AS PER I.S STANDARD (IS-800).

NO.	DESCRIPTION	REV.BY	CHK.BY.	APP.BY.	DATE
B	ISSUE FOR CONSTRUCTION	SOM	SOM	SOM	01.02.17
A	RELEASED FOR APPROVAL	SOM	SOM	SOM	09.01.17

REVISION

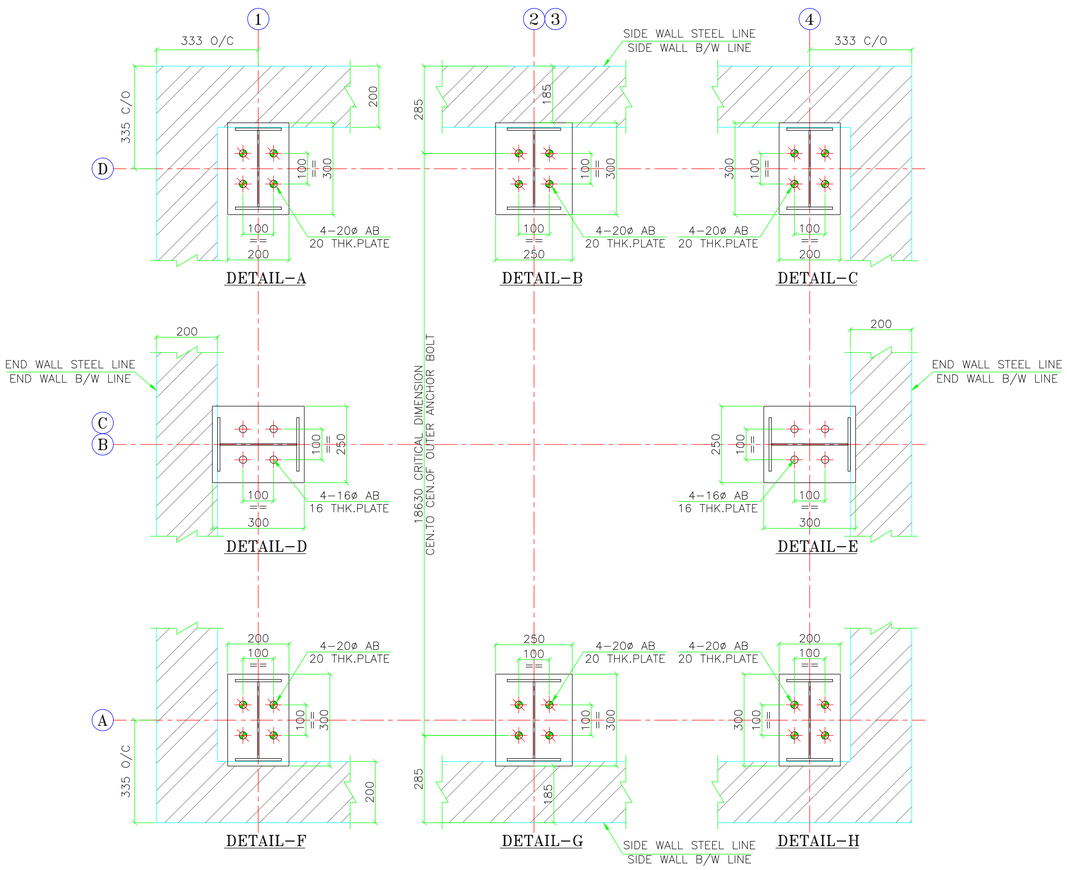
PROPOSED HANGAR STRUCTURE FOR HOUSING DATA CENTRE , WORKSHOP & LABORATORY FACILITIES AT SURVEY NUMBER 36/P GOPANPALLY, SERILINGAMPALLY, HYDERABAD FOR M/s. TATA INSTITUE OF FUNDAMENTAL RESEARCH

STRUCTURAL CONSULTANT:
Z-AXIS ENGINEERING SOLUTIONS
#401, S V LAXMI APPARTMENTS, TARNAKA
SECUNDERABAD - 17 PH: +91 40 2700 1377

ANCHOR BOLT SETTING PLAN

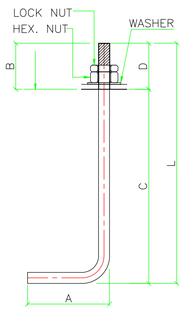
DESIGN	SOM		06.01.17	PROJECT NO:-	SCALE:- AS SHOWN
DRAWN	SOM		09.01.17		
CHECKED	SOM		09.01.17	DRAWING NO.	REV.
APPROVED	SOM		09.01.17	1-TIF-G-01	B

1-TIF-G-01-B



ANCHOR BOLT SETTING DETAILS
1:10

NOTE: ALL STIFFINERS ARE 8MM THK.
BOLT MATERIAL = ASTM A36/250

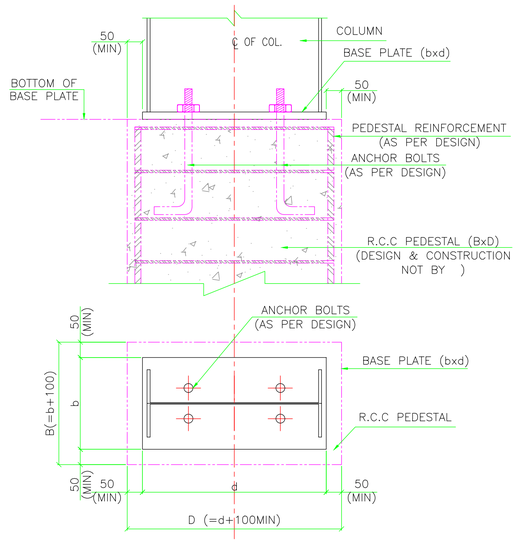


TYP. 20ø & 16ø ANCHOR BOLT DETAIL
1:10

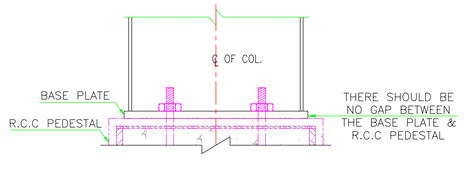
ANCHOR BOLT SETTING

ANCHOR BOLT SCHEDULE -- BOLTS BY:-

SYMBOL	QUANTITY	DIAMETER	L	A	B	C	D	PIECE MARK
	16	16	410	100	75	335	75	
	32	20	535	120	100	435	100	–
	--	25	685	150	100	585	100	–
	--	32	1000	200	125	875	125	
	--	36	1350	200	150	1200	200	
	--	40	1650	250	150	1500	200	
	--	50	1650	300	150	1500	200	



SAMPLE DETAIL OF
MINIMUM PEDESTAL REQUIREMENT
1:10



USE 345 GRADE STEEL
FOR FRAME WORK

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL LEVELS ARE IN METERS UNLESS SPECIFIED OTHERWISE
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9. THE LOADS ARE CONSIDERED AS DEADLOAD – 11 KG/M²
   LIVELOAD – 250 KG/M²
10. THE LOADS ARE CALCULATED FOR WIND SPEED OF 44M/S AND DESIGNED AS PER MBMA CODE
11. THE FRAME IS DESIGNED AS PER I.S STANDARD (IS–800).

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REVISION

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STRUCTURAL CONSULTANT:
Z-AXIS ENGINEERING SOLUTIONS
#401, S V LAXMI APPARTMENTS, TARNAKA
SECUNDERABAD - 17 PH: +91 40 2700 1377

ANCHOR BOLT SETTING DETAILS

DESIGN	SOM		06.01.17	PROJECT NO:-	SCALE:- AS SHOWN
DRAWN	SOM		09.01.17		
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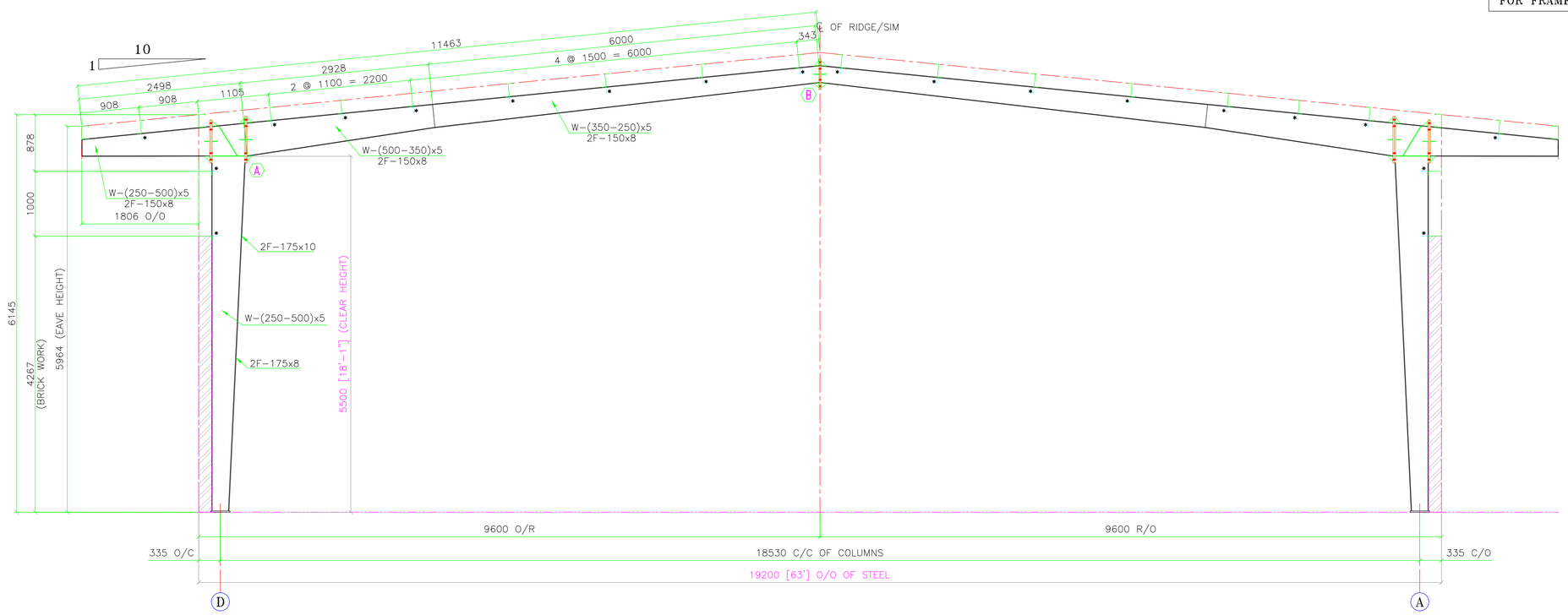
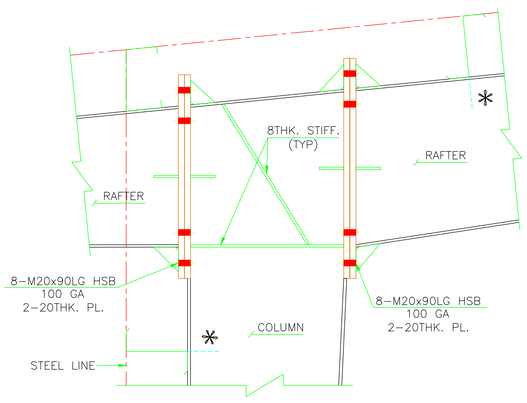
APPROVED	SOM		09.01.17	1–TIF–G–02	A

1–TIF–G–02–A

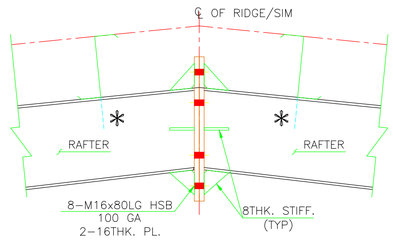
USE 345 GRADE STEEL FOR FRAME WORK



CROSS SECTION @ GL-2 & 3
1:40



DETAIL-A
1:10



DETAIL-B
1:10

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. THE STRUCTURE UNDER THIS CONTRACT IS DESIGNED AND DETAILED FOR THE LOADS STIPULATED AND SHOWN ON THESE DRAWINGS. ANY ALTERATIONS TO THE STRUCTURAL SYSTEM OR REMOVAL OR ADDITION OF OTHER CONSTRUCTION MATERIALS OR LOADS MUST NOT BE DONE WITHOUT PRIOR CONSENT OF DAI
3. ALL STEEL FRAMING MEMBERS EXCEPT BOLTS AND FASTENERS SHALL RECEIVE ONE COAT OF 25MICRON SHOP PRIMER COMPARABLE TO THE PERFORMANCE REQUIREMENT OF THE U.S. FEDERAL SPECIFICATION TT-P-636C WHICH PROVIDES TEMPORARY PROTECTION FOR THE MEMBERS DURING TRANSPORTATION AND ERECTION ONLY. ADDITIONAL PAINT PROTECTION SUITABLE FOR BUILDING USAGE AND ENVIRONMENT MUST BE ADDED BY THE CUSTOMER/OWNER
4. HIGH STRENGTH BOLTS HAVE YELLOW DI-CHROMATED COLOR WHILE MACHINE BOLTS ARE ELECTRO-GALVANIZED
5. HIGH STRENGTH BOLTS TO BE LUBRICATED AND FREE KEPT FROM DUST AND DEBRIS. NUTS WITH LUBRICANT MUST BE ROTATED FROM THE SNUG TIGHT CONDITION REQUIRED FOR FULL TENSIONING OF BOLTS WITHOUT STRIPPING. IF THE ERECTOR NOTICED ANY LACK OF SUCH LUBRICATION HE IS REQUIRED TO LUBRICATE THEM AT SITE, BEFORE TIGHTENING.
6. ALL SECONDARY CONNECTIONS REQUIRE 12MM DIA ELECTRO-PLATED MACHINE BOLTS CONFORMING TO ASTM A-307 U.N.O
7. THE CORRECT TYPE OF BOLTS MUST BE USED AS CALLED FOR ON THE DETAILS. USING WRONG TYPE OF BOLTS MAY CAUSED BUILDING FAILURE AT ERECTOR'S RESPONSIBILITY
8. CONTINUOUS MACHINE SUBMERGED ARC WELDING (S.A.W) MEET THE APPLICABLE REQUIREMENTS OF THE AMERICAN WELDING SOCIETY (A.W.S) D1.1-1996.
9. WEB TO FLANGE WELDS ARE SINGLE SIDE FILLET WELDS IN ACCORDANCE WITH THE NINTH EDITION OF THE AISC TABLE J2.4 PAGE 5-67 U.N.O
10. WEB BUTT WELDS ARE COMPLETE PENETRATION USING FLUX BACK-UP (16MM PLATE MAXIMUM)
11. FLANGE BUTT WELDS ARE ON BOTH SIDES WITH COPPER BACK-UP. FLANGES 19MM OR HIGHER ARE BEVELED PRIOR TO ASSEMBLY
12. BUILT-UP SECTIONS ARE MADE FROM HOT ROLLED PLATES CONFORMING TO ASTM A-36 WITH A MINIMUM YIELD STRENGTH OF 250MPa
13. ALL SECONDARIES i.e., PURLINS AND GIRTS ARE MADE FROM COILS CONFORMING TO GRADE-50 WITH A MINIMUM YIELD STRENGTH OF 345MPa
14. THE LOADS ARE CONSIDERED AS DEADLOAD – 11 KG/M^2
    LIVELOAD – 250 KN/M^2
15. THE LOADS ARE CALCULATED FOR WIND SPEED OF 44M/S AND DESIGNED AS PER MBMA CODE
16. THE FRAME IS DESIGNED AS PER I.S STANDARD (IS-800).
17. THE BUILDING IS DESIGNED AS ENCLOSED BUILDING WITH MAXIMUM OF 5% OPENING.

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REVISION

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CROSS SECTION AND DETAILS

DESIGN	SOM		06.01.17	PROJECT NO:-	SCALE:- AS SHOWN
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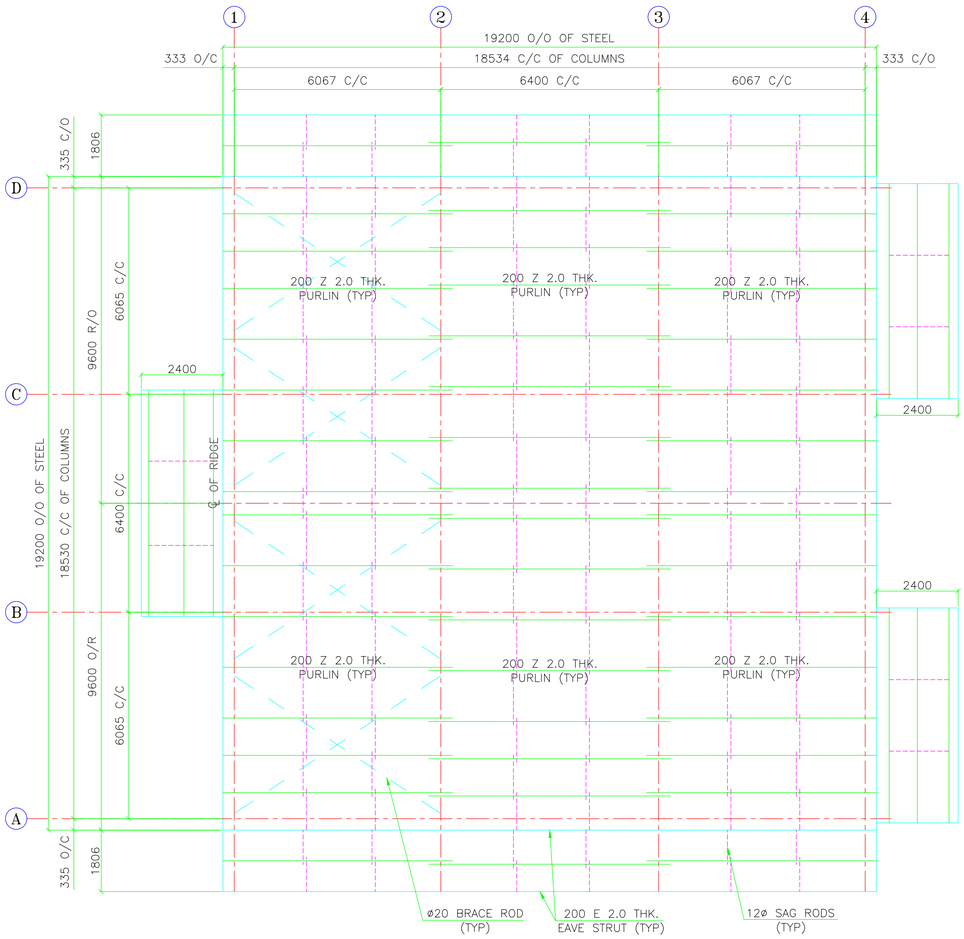
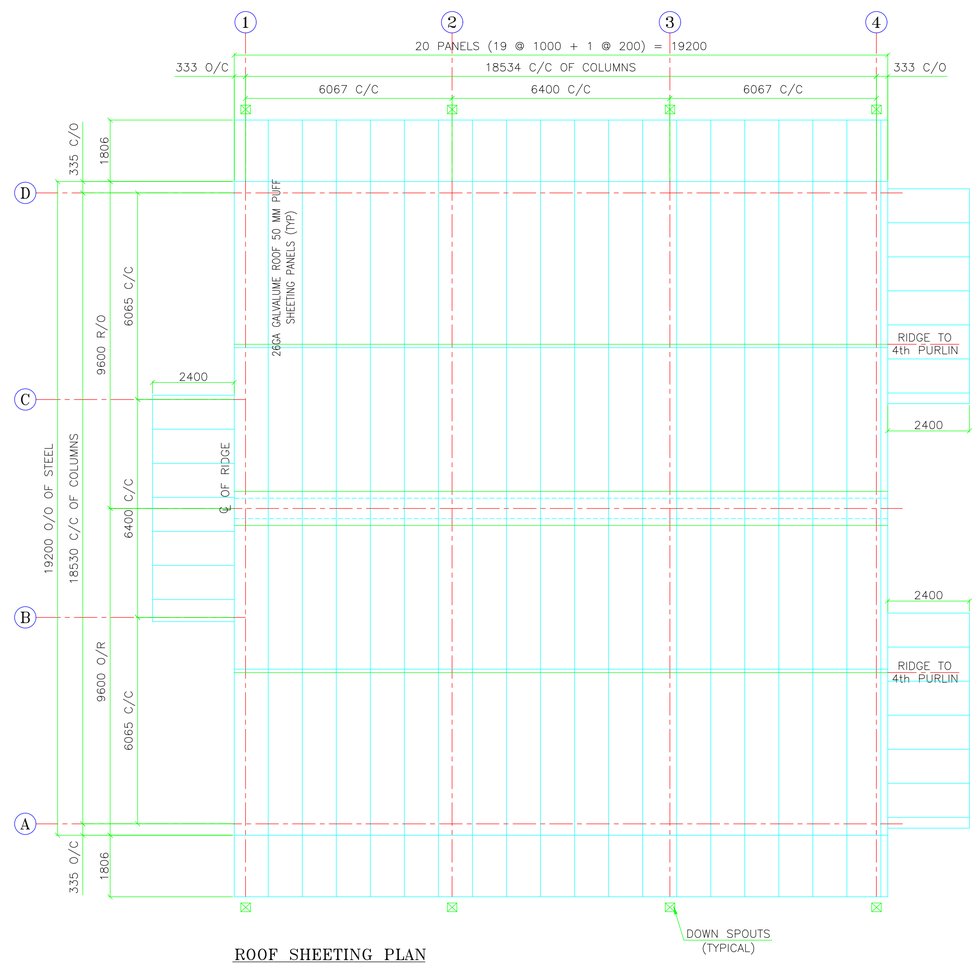
APPROVED	SOM		09.01.17	1-TIF-G-03	B

1-TIF-G-03-B



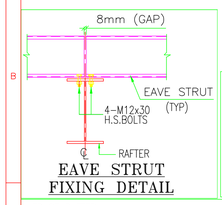
ROOF FRAMING PLAN
1:90



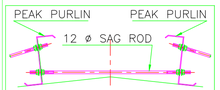
ROOF SHEETING PLAN
1:90

GENERAL NOTES:–

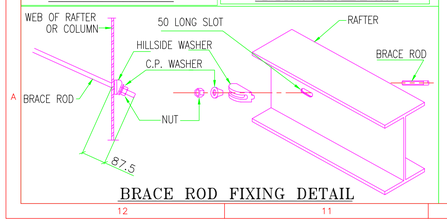
1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. BRACING IS TO BE INSTALLED AS PER THE ERECTION DRAWINGS AND MUST REMAIN TIGHT DURING THE LIFE OF THE BUILDING. DO NOT REMOVE ANY BRACING WITHOUT THE WRITTEN CONSENT FROM DAI
3. PLACING PERMANENT BRACING AND TEMPORARILY GUYING THE STRUCTURE DURING ERECTION PRIOR TO PLACING SHEETING / CLADDING IS EXTREMELY IMPORTANT. THE REMOVAL OF PERMANENT BRACING AND/OR PROVIDING INSUFFICIENT TEMPORARY GUY LINES MAY CAUSE THE COLLAPSE OF THE BUILDING DURING OR AFTER ERECTION WHICH WILL BE THE CONTRACTOR'S / OWNER'S RESPONSIBILITY
4. GUSSET PLATES FOR FLANGE BRACES ARE WELDED ON BOTH SIDES OF THE COLUMN AND RAFTER, HOWEVER FLANGE BRACES ARE REQUIRED AT ONE SIDE (UNLESS FOR AESTHETIC REASONS, OR NOTED OTHERWISE) PREFERABLE TO INSTALL THEM ALL AT THE SAME SIDE OF COLUMN AND RAFTER. THE SIDE CHOSEN DEPENDING ON ERECTION SEQUENCE.
5. START ERECTION AT THE BRACED BAY.
6. USE TEMPORARY GUY WIRES AND RATCHET PULLERS FOR STABILITY.
7. INSTALL PERMANENT BRACING I.E. CABLES, RODS, ANGLES, AND FLANGE BRACES.
8. GUY WIRES SHOULD BE ATTACHED TO AN IMMOVABLE OBJECT SUCH AS CAST IN ANCHOR BOLTS, OR HEAVY OBJECT.
9. PLUMB & ALIGN THE FIRST BAY BEFORE PROCEEDING.
10. USE HIGH STRENGTH BOLTS(A325) WHERE INDICATED.
11. TIGHTEN ALL HIGH STRENGTH BOLTS AFTER FINAL ALIGNMENT OF THE BUILDING.
12. FRAME ALIGNMENT SHOULD BE WITHIN 1:300 TOLERANCE.
13. USE TEMPORARY SUPPORTS TO ALIGN GIRTS BEFORE FIXING SHEETS.
14. DO NOT APPLY ANY LIVE LOADS TO PURLINS BEFORE ROOF SHEETING IS COMPLETE.
15. THE YIELD STRENGTH OF ALL PANELS AND TRIMS IS 34.5KN/CM2 AND SHALL CONFORM TO ASTM A792M GRADE B.
16. TRIMS ARE PROVIDED IN STANDARD LENGTHS. TRIMS QUANTITIES ARE PROVIDED TO COVER THE WHOLE LENGTH OF THE TRIM USING 50MM END LAPS. REFER TO DETAILS OF ROOF SHEETING PLAN. IF LAP LENGTH SPECIFIED (50MM) IS EXCEEDED DURING ERECTION THEN SHORTAGE IN LENGTH MAY RESULT. IF THE LAP LENGTH IS REDUCED THEN LEAKAGE AND APPEARANCE PROBLEMS MAY RESULT. ALWAYS CUT ANY EXCESS TRIM LENGTH AT THE END OF TRIM LINE.
17. ROPE SEALING TAPE MUST BE PLACED CAREFULLY OVER THE PANEL PROFILE TO AVOID STRETCHING.
18. PANELS ARE TO BE FIELD CUT TO SUIT OPENINGS.
19. TRIMS ARE TO BE FIELD CUT TO THE REQUIRED DIMENSIONS.



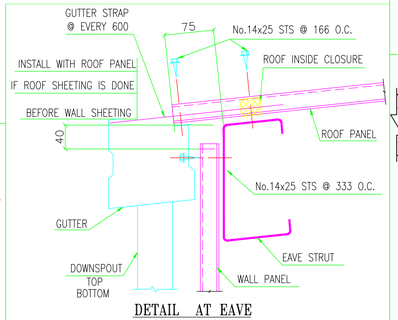
EAVE STRUT FIXING DETAIL



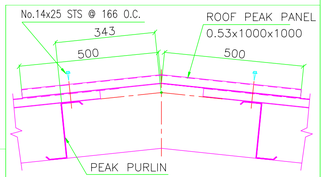
SAG ROD DETAIL AT PEAK



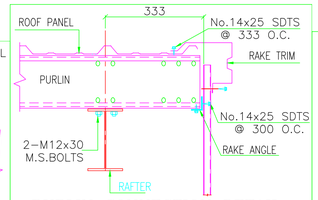
BRACE ROD FIXING DETAIL



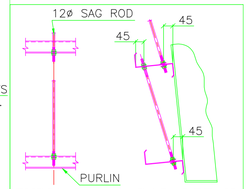
DETAIL AT EAVE



SHEETING AT RIDGE

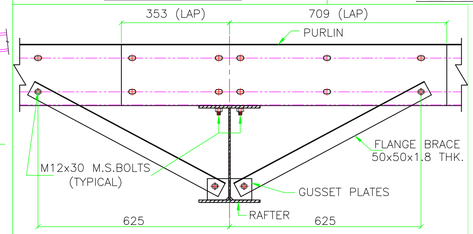


PURLIN CONNECTION DETAIL @ GL–1 & 4

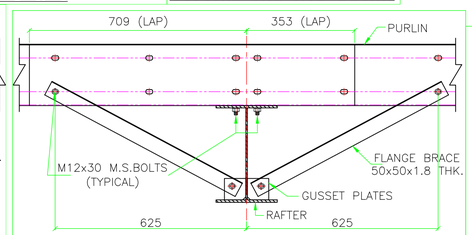


TYPICAL SAG ROD DETAIL

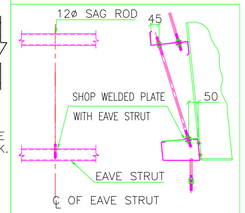
USE 345 GRADE STEEL FOR FRAME WORK



PURLIN CONNECTION DETAIL AT GRID–2



PURLIN CONNECTION DETAIL AT GRID–3



SAG ROD DETAIL AT EAVE STRUT

NO.	DESCRIPTION	REV.BY	CHK.BY	APP.BY	DATE
B	ISSUED FOR CONSTRUCTION	SOM	SOM	SOM	01.02.17
A	RELEASED FOR APPROVAL	SOM	SOM	SOM	09.01.17

REVISION

PROPOSED HANGAR STRUCTURE FOR HOUSING DATA CENTRE , WORKSHOP & LABORATORY FACILITIES AT SURVEY NUMBER 36/P GOPANPALLY, SERILINGAMPALLY, HYDERABAD FOR M/s. TATA INSTITUE OF FUNDAMENTAL RESEARCH

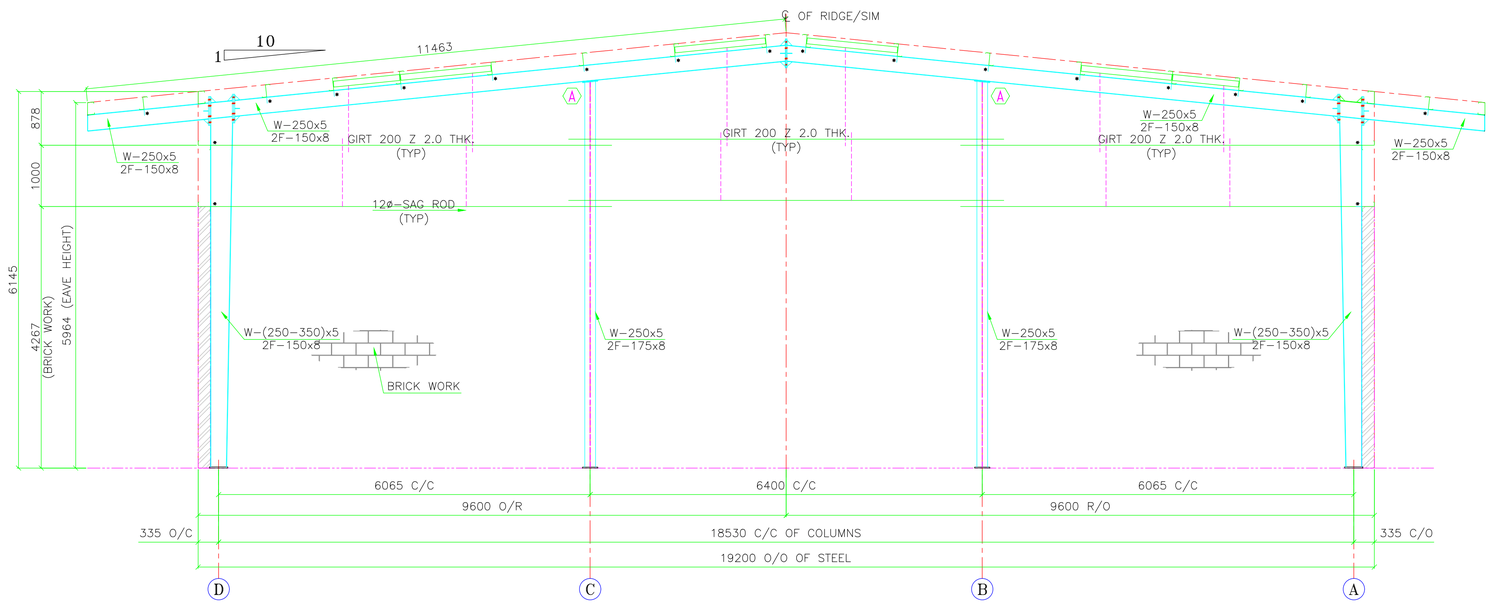
STRUCTURAL CONSULTANT:
Z-AXIS ENGINEERING SOLUTIONS
#401, S V LAXMI APPARTMENTS, TARNAKA
SECUNDERABAD - 17 PH: +91 40 2700 1377

ROOF FRAMING AND SHEETING PLANS & DETAILS

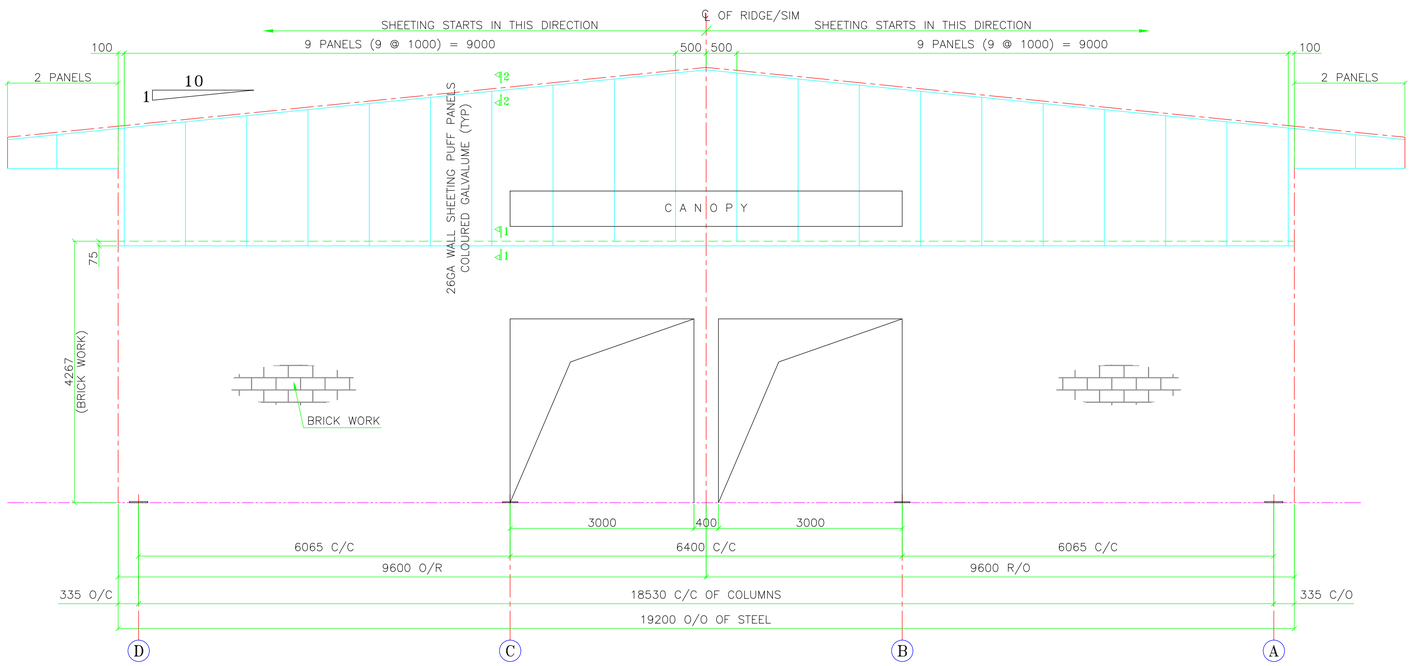
DESIGN	SOM		06.01.17	PROJECT NO:–	SCALE:– AS SHOWN
DRAWN	SOM		09.01.17		
CHECKED	SOM		09.01.17	DRAWING NO.	REV.
APPROVED	SOM		09.01.17	1–TIF–G–04	B

1–TIF–G–04–B

USE 345 GRADE STEEL FOR FRAME WORK

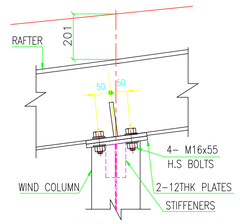


END WALL FRAMING ELEVATION @ GL- 1
1:50

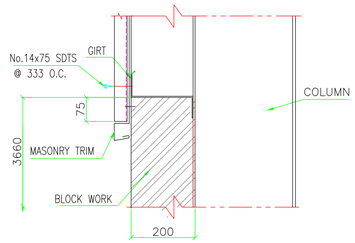


END WALL SHEETING ELEVATION @ GL- 1
1:50

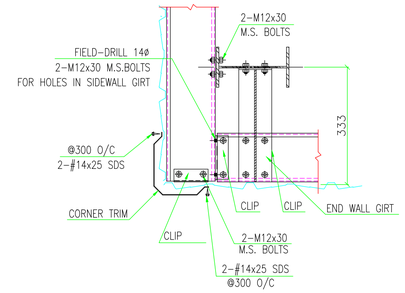
OPENING SIZES	
F.O-1	3000(W)x3660(H) 10'-0"(W)x12'-0"(H)



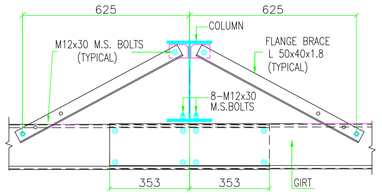
DETAIL-A



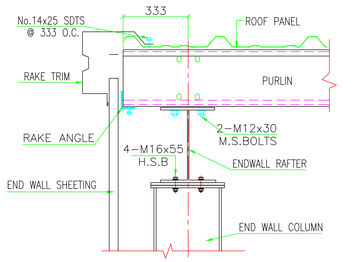
SECTION 1



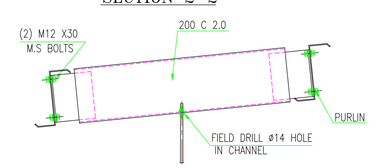
GIRT CONNECTION DETAIL @ D & A



GIRT CONNECTION DETAIL
AT INTERMEDIATE BAYS (630 LAPS)



SECTION 2-2



E.W SAG ROD DETAIL

GENERAL NOTES:-

1. ALL DIMENSIONS ARE IN MILLIMETERS AND ALL LEVELS ARE IN METERS UNLESS NOTED OTHERWISE.
2. THIS BUILDING MUST BE ERECTED ACCORDING TO THE ERECTION DRAWINGS AND SAFE ERECTION PRACTICES. SSSES IS NOT RESPONSIBLE FOR ANY STRUCTURAL INADEQUACY OR ODD APPEARANCE THE ABOVE REQUIREMENT WAS NOT FOLLOWED. ERECTOR MUST KNOW ERECTION PRACTICES BEFORE STARTING THE ERECTION. ALSO PLEASE CONTACT OUR OFFICE FOR TECHNICAL ERECTION ASSISTANCE IF NEEDED.
3. BRACING IS TO BE INSTALLED AS PER THE ERECTION DRAWINGS AND MUST REMAIN TIGHT DURING THE LIFE OF THE BUILDING. DO NOT REMOVE ANY BRACING WITHOUT THE WRITTEN CONSENT OF SSSES
4. START ERECTION AT THE BRACED BAY.
5. USED TEMPORARY GUY WIRES AND RATCHET PULLERS FOR STABILITY.
6. INSTALL PERMANENT BRACING I.E., CABLES, RODS, ANGLES, AND FLANGE BRACES.
7. GUY WIRES SHOULD BE ATTACHED TO AN IMMOVABLE OBJECT SUCH AS CAST IN ANCHOR BOLTS, OR HEAVY OBJECTS.
8. PLUMB & ALIGN THE FIRST BAY BEFORE PROCEEDING.
9. USE HIGH STRENGTH BOLTS(A325) WHERE INDICATED.
10. TIGHTEN ALL HIGH STRENGTH BOLTS AFTER FINAL ALIGNMENT OF THE BUILDING.
11. FRAME ALIGNMENT SHOULD BE WITHIN 1 : 300 TOLERANCE.
12. USE TEMPORARY SUPPORTS TO ALIGN GIRTS BEFORE FIXING SHEETS.
13. THE YIELD STRENGTH OF ALL PANELS AND TRIMS IS 34.5KN/CM2 AND SHALL CONFORM TO ASTM A792M GRADE B.
14. TRIMS ARE PROVIDED IN STANDARD LENGTHS. TRIMS QUANTITIES ARE PROVIDED TO COVER THE WHOLE LENGTH OF THE TRIM USING 50MM END LAPS. REFER TO DETAILS OF ROOF SHEETING PLAN. IF LAP LENGTH SPECIFIED (50MM) IS EXCEEDED DURING ERECTION THEN SHORTAGE IN LENGTH MAY RESULT. IF THE LAP LENGTH IS REDUCED THEN LEAKAGE AND APPEARANCE PROBLEMS MAY RESULT. ALWAYS CUT ANY EXCESS TRIM LENGTH AT THE END OF TRIM LINE.
15. ROPE SEALING TAPE MUST BE PLACED CAREFULLY OVER THE PANEL PROFILE TO AVOID STRETCHING.
16. PANELS ARE TO BE FIELD CUT TO SUIT OPENINGS.
17. TRIMS ARE TO BE FIELD CUT TO THE REQUIRED DIMENSIONS.

NO.	DESCRIPTION	REV.BY	CHK.BY	APP.BY	DATE
B	ISSUED FOR CONSTRUCTION	SOM	SOM	SOM	01.02.17
A	RELEASED FOR APPROVAL	SOM	SOM	SOM	09.01.17

REVISION

PROPOSED HANGAR STRUCTURE FOR HOUSING DATA CENTRE , WORKSHOP & LABORATORY FACILITIES AT SURVEY NUMBER 36/P GOPANPALLY, SERILINGAMPALLY, HYDERABAD FOR M/s. TATA INSTITUE OF FUNDAMENTAL RESEARCH

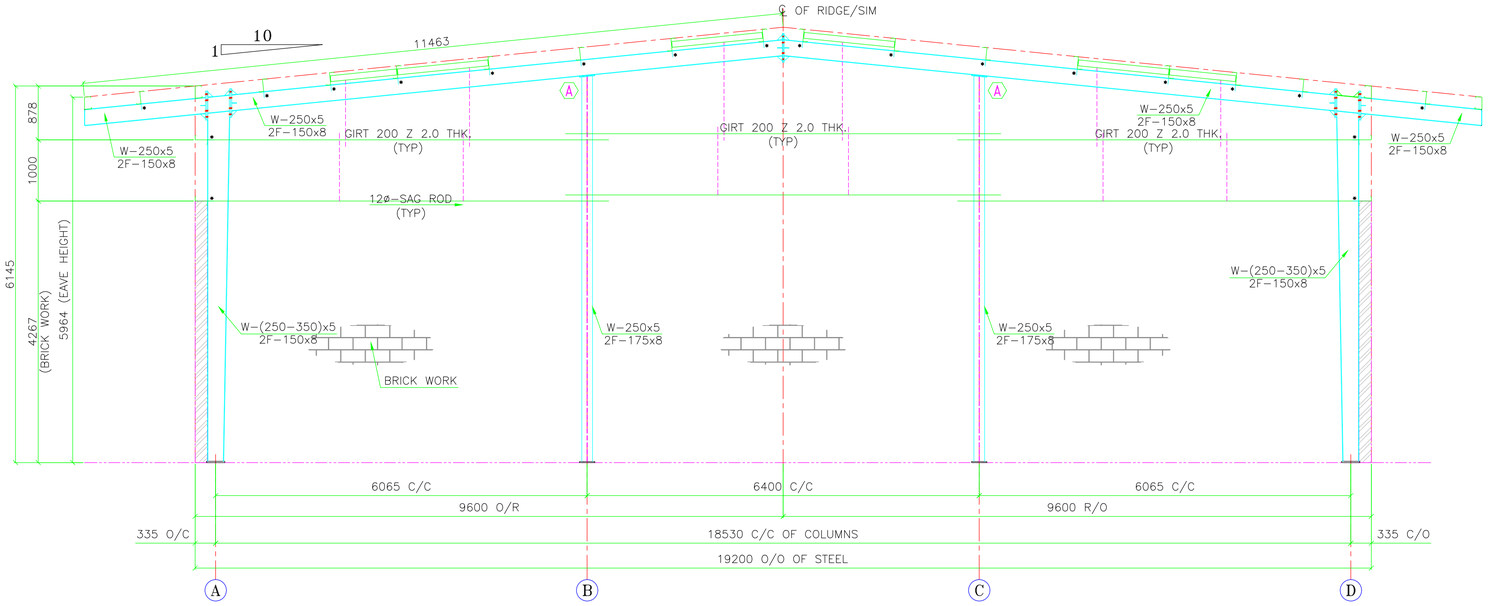
STRUCTURAL CONSULTANT:
Z-AXIS ENGINEERING SOLUTIONS
#401, S V LAXMI APPARTMENTS, TARNAKA
SECUNDERABAD – 17 PH: +91 40 2700 1377

END WALL FRAMING,SHEETING ELEVATIONS AND DETAILS ALONG GL-1

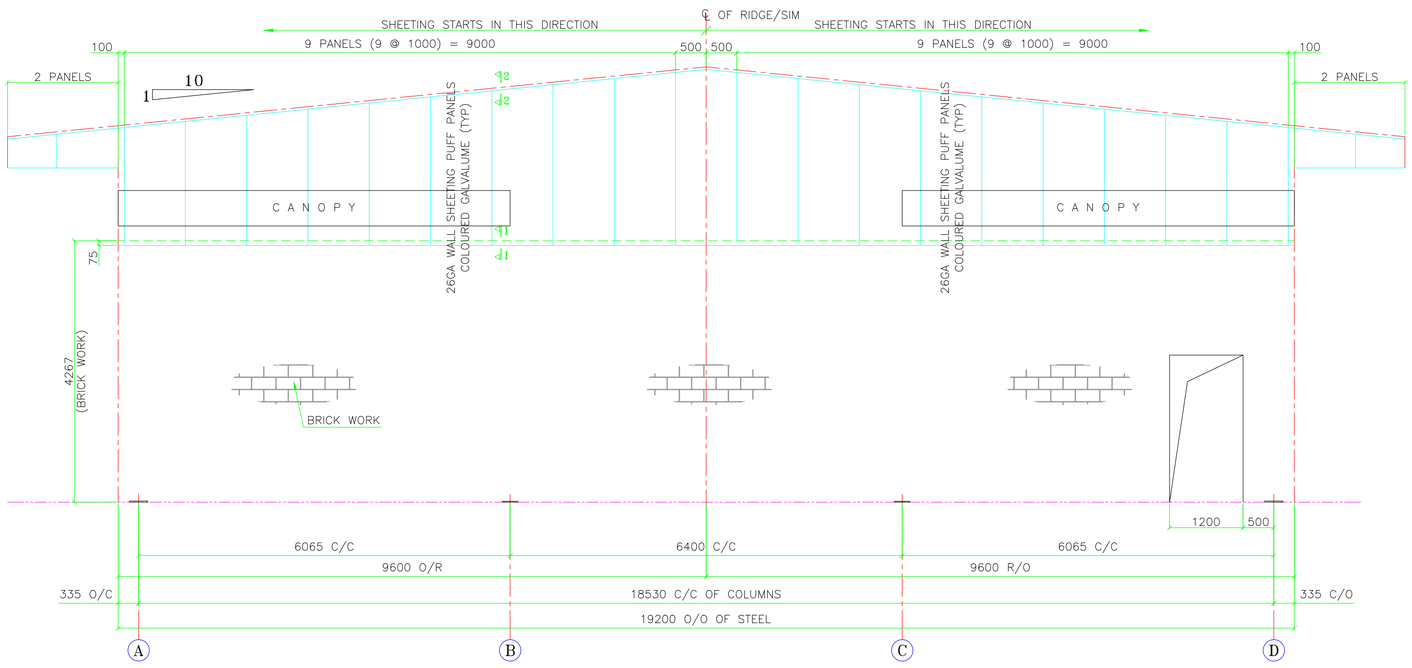
DESIGN	SOM		06.01.17	PROJECT NO:-	SCALE:- AS SHOWN
DRAWN	SOM		09.01.17		
CHECKED	SOM		09.01.17	DRAWING NO.	REV.
APPROVED	SOM		09.01.17	1-TIF-G-05	B

1-TIF-G-05-B

USE 345 GRADE STEEL
FOR FRAME WORK

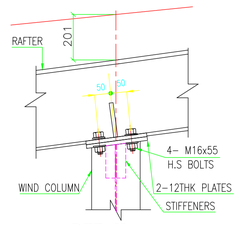


END WALL FRAMING ELEVATION @ GL- 4
1:50

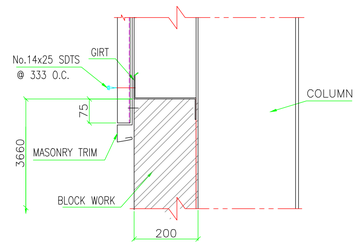


END WALL SHEETING ELEVATION @ GL- 4
1:50

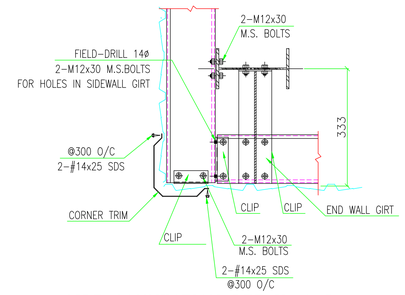
OPENING SIZES	
F.O-3	1200(W)x2400(H) 4'-0"(W)x8'-0"(H)



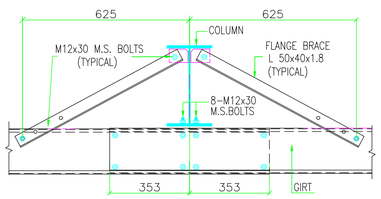
DETAIL-A



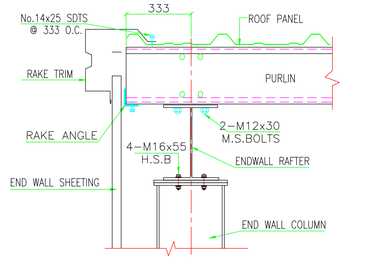
SECTION 1



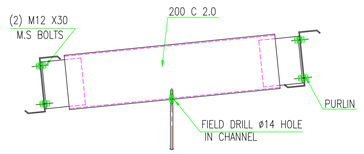
GIRT CONNECTION DETAIL @ D & A



GIRT CONNECTION DETAIL
AT INTERMEDIATE BAYS (630 LAPS)



SECTION 2-2



E.W SAG ROD DETAIL

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NO.	DESCRIPTION	REV.BY	CHK.BY	APP.BY	DATE
B	ISSUE FOR CONSTRUCTION	SOM	SOM	SOM	01.02.17
A	RELEASED FOR APPROVAL	SOM	SOM	SOM	09.01.17

REVISION

PROPOSED HANGAR STRUCTURE FOR HOUSING DATA CENTRE , WORKSHOP & LABORATORY FACILITIES AT SURVEY NUMBER 36/P GOPANPALLY, SERILINGAMPALLY, HYDERABAD FOR
M/s. TATA INSTITUE OF FUNDAMENTAL RESEARCH

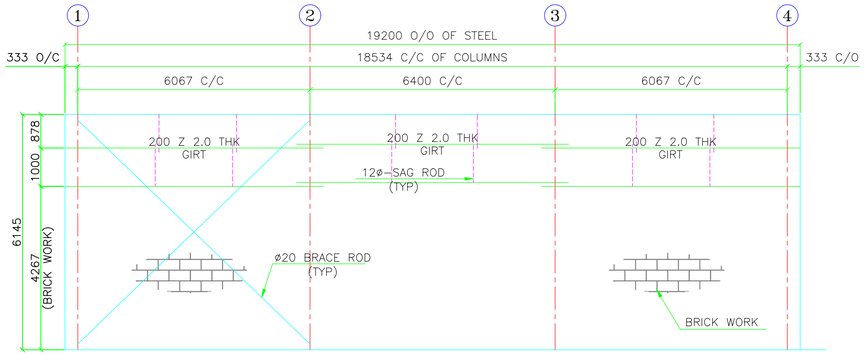
STRUCTURAL CONSULTANT:
Z-AXIS ENGINEERING SOLUTIONS
#401, S V LAXMI APPARTMENTS, TARNAKA
SECUNDERABAD - 17 PH: +91 40 2700 1377

END WALL FRAMING,SHEETING
ELEVATIONS AND DETAILS ALONG GL-4

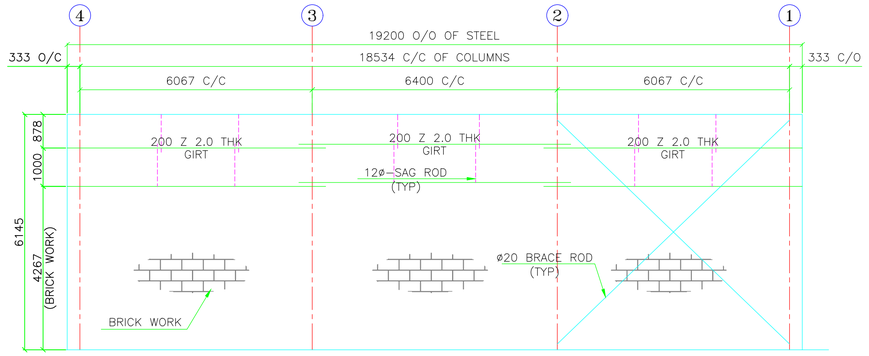
DESIGN	SOM		06.01.17	PROJECT NO:-	SCALE:- AS SHOWN
DRAWN	SOM		09.01.17		
CHECKED	SOM		09.01.17	DRAWING NO.	REV.
APPROVED	SOM		09.01.17	1-TIF-G-06	B

1-TIF-G-06-B

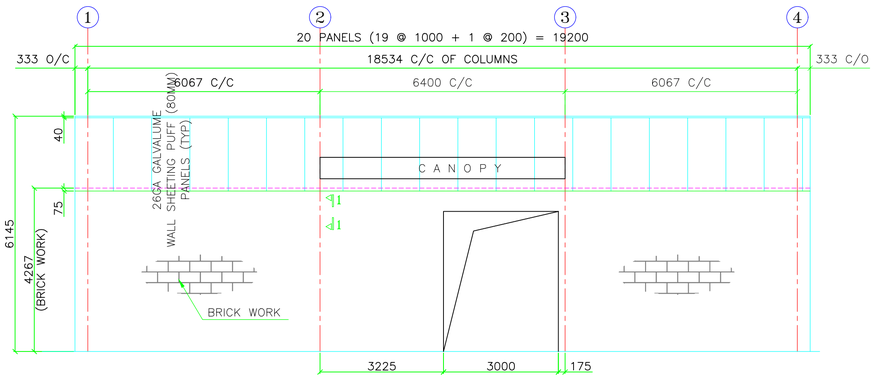
USE 345 GRADE STEEL FOR FRAME WORK



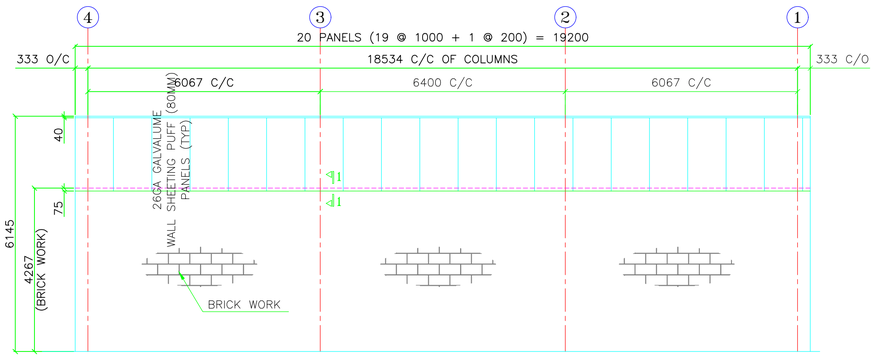
SIDE WALL FRAMING ELEVATION ALONG AXIS – A
1:80



SIDE WALL FRAMING ELEVATION ALONG AXIS – D
1:80



SIDE WALL SHEETING ELEVATION ALONG AXIS – A
1:80



SIDE WALL SHEETING ELEVATION ALONG AXIS – D
1:80

GENERAL NOTES:–

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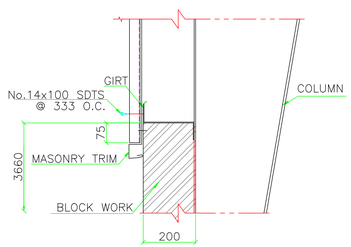
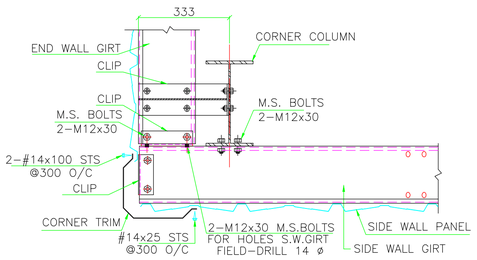
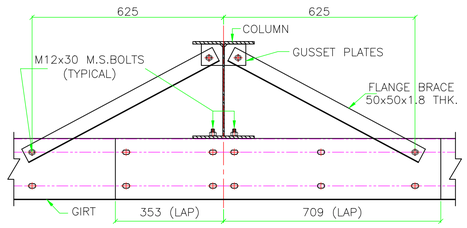


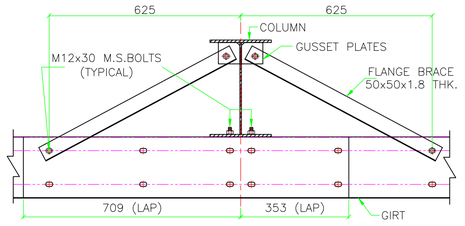
SECTION 1



GIRT CONNECTION DETAILS AT CORNER

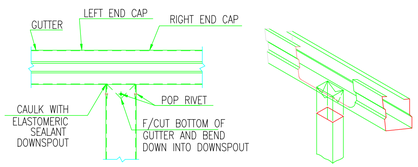


GIRT CONNECTION DETAIL AT GRID–2

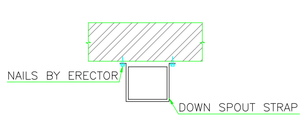


GIRT CONNECTION DETAIL AT GRID–3

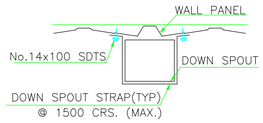
OPENING SIZES	
F.O–2	3000(W)x3660(H) 10'–0"(W)x12'–0"(H)



GUTTER AND DOWNSPOUT ASSEMBLY



DOWN SPOUT FIXING DETAIL AT BLOCK WALL



DOWN SPOUT FIXING DETAIL AT WALL PANEL

NO.	DESCRIPTION	REV.BY	CHK.BY.	APP.BY.	DATE
B	ISSUE FOR CONSTRUCTION	SOM	SOM	SOM	01.02.17
A	RELEASED FOR APPROVAL	SOM	SOM	SOM	09.01.17

REVISION

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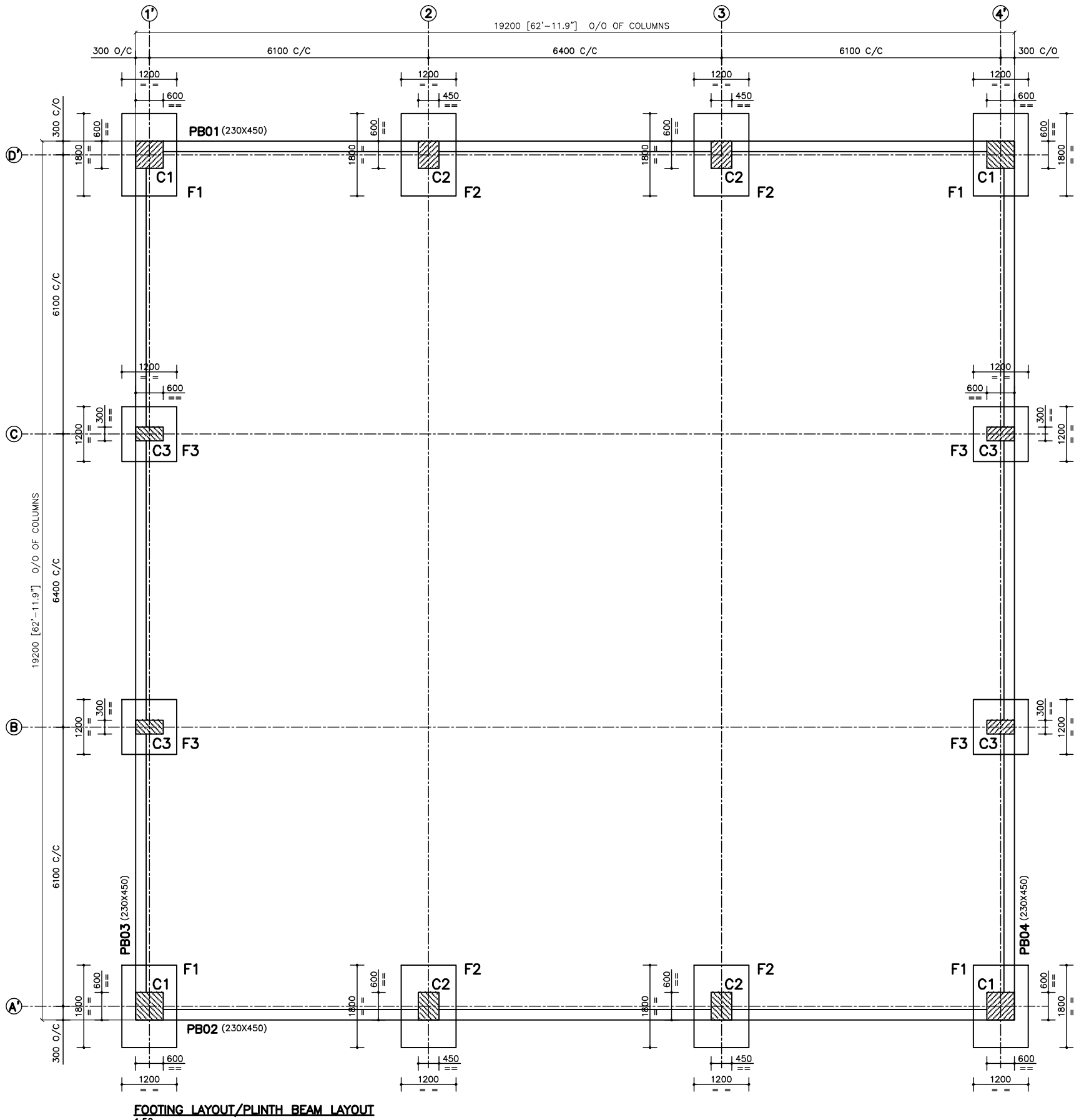
STRUCTURAL CONSULTANT:

Z-AXIS ENGINEERING SOLUTIONS
#401, S V LAXMI APPARTMENTS, TARNAKA
SECUNDERABAD - 17 PH: +91 40 2700 1377

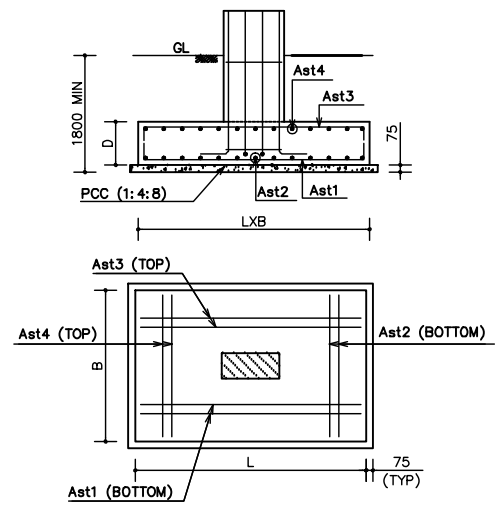
SIDE WALL FRAMING,SHEETING ELEVATIONS AND DETAILS ALONG AXIS @ A & D

DESIGN	SOM		06.01.17	PROJECT NO:–	SCALE:– AS SHOWN
DRAWN	SOM		09.01.17		
CHECKED	SOM		09.01.17	DRAWING NO.	REV.
APPROVED	SOM		09.01.17	1–TIF–G–08	B



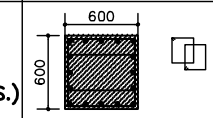
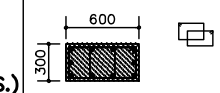
FOOTING LAYOUT/PLINTH BEAM LAYOUT
1:50

SLNO	FOOTING TYPE	FOOTING DIMENSIONS			BOTTOM STEEL		TOP STEEL	
		L	B	D	Ast1	Ast2	Ast3	Ast4
1	F1 (4 Nos.)	1800	1200	450	D12 @ 125 C/C	D12 @ 125 C/C	D12 @ 125 C/C	D12 @ 125 C/C
2	F2 (4 Nos.)	1800	1200	450	D12 @ 125 C/C	D12 @ 125 C/C	D12 @ 125 C/C	D12 @ 125 C/C
3	F3 (4 Nos.)	1200	1200	450	D12 @ 150 C/C	D12 @ 150 C/C	D12 @ 150 C/C	D12 @ 150 C/C



TYPICAL DETAIL FOR FOOTING F1, F2 & F3

SLNO	FOOTING TYPE	EXCAVATION DIMENSIONS		DEPTH
		L	B	
1	F1	1950	1350	1800
2	F2	1950	1350	1800
3	F3	1350	1350	1800

COLUMN TYPE	Level 0
C1 (4 NOS.)	 MAIN STEEL 16-D16 D8 @150c/c
C2 (4 NOS.)	 MAIN STEEL 12-D16 D8 @150c/c
C3 (4 NOS.)	 MAIN STEEL 10-D16 D8 @150c/c

NOTES

1. MEASURES IN MILLIMETER. LEVELS IN METER.
2. USE M20 GRADE CONCRETE FOR ALL RCC WORK.
3. USE Fe500 GRADE STEEL FOR REINFORCEMENT.
4. SBC OF SOIL TAKEN AS 300 KN/M²
5. CLEAR COVER OF FOOTING 50MM, COLUMN 40MM, BEAM 25MM
6. DO NOT SCALE THIS DWG

REFERENCE

1. FOR R.C DETAILS OF PLINTH BEAMS REFER DWG NO: 1-TIF-R-02

NO.	DESCRIPTION	REV.BY	CHK.BY.	APP.BY.	DATE
0	RELEASED FOR CONSTRUCTION	SOM	SOM	SOM	09.01.17

REVISION

STRUCTURAL CONSULTANT:

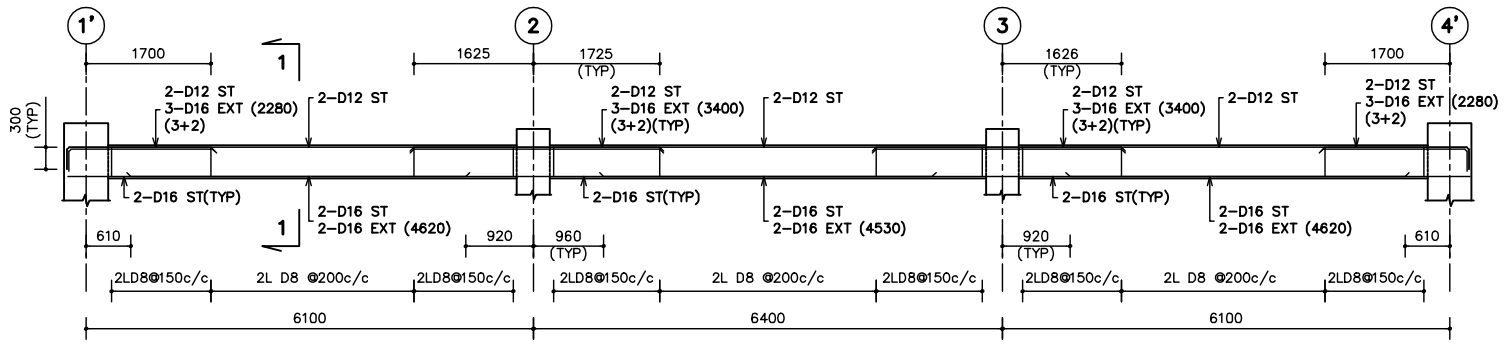
Z-AXIS ENGINEERING SOLUTIONS
#401, S V LAXMI APPARTMENTS, TARNAKA
SECUNDERABAD - 17 PH: +91 40 2700 1377

PROPOSED SHED FOR
M/s. TATA INSTITUE OF FUNDAMENTAL RESEARCH

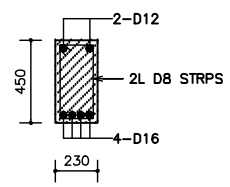
FOUNDATION LAYOUT & PLINTH BEAM LAYOUT
R.C. DETAILS OF FOOTING, COLUMNS

DESIGN	SOM		06.01.17	PROJECT NO:-	SCALE:-
DRAWN	SOM		09.01.17		
CHECKED	SOM		09.01.17	DRAWING NO.	REV.
APPROVED	SOM		09.01.17	1-TIF-R-01	0

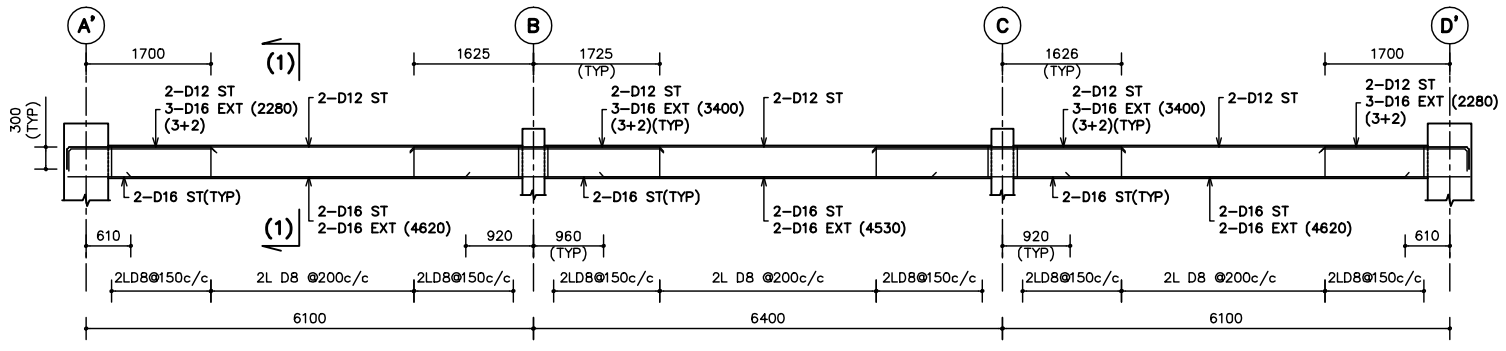
1-TIF-R-01-0



PB01 (PB02) (230x450) 2 Nos
1:50



SECTION 1
1:20



PB03 (PB04) (230x450) 2 Nos
1:50

NOTES

1. MEASURES IN MILLIMETER. LEVELS IN METER.
2. USE M20 GRADE CONCRETE FOR ALL RCC WORK.
3. USE Fe500 GRADE STEEL FOR REINFORCEMENT.
4. SBC OF SOIL TAKEN AS 300 KN/M²
5. CLEAR COVER OF FOOTING 50MM, COLUMN 40MM, BEAM 25MM
6. DO NOT SCALE THIS DWG

REFERENCE

1. FOR PLINTH BEAMS LAYOUT REFER DWG NO: 1–TIF–R–01

NO.	DESCRIPTION	REV.BY	CHK.BY.	APP.BY.	DATE
0	RELEASED FOR CONSTRUCTION	SOM	SOM	SOM	09.01.17

REVISION

STRUCTURAL CONSULTANT:

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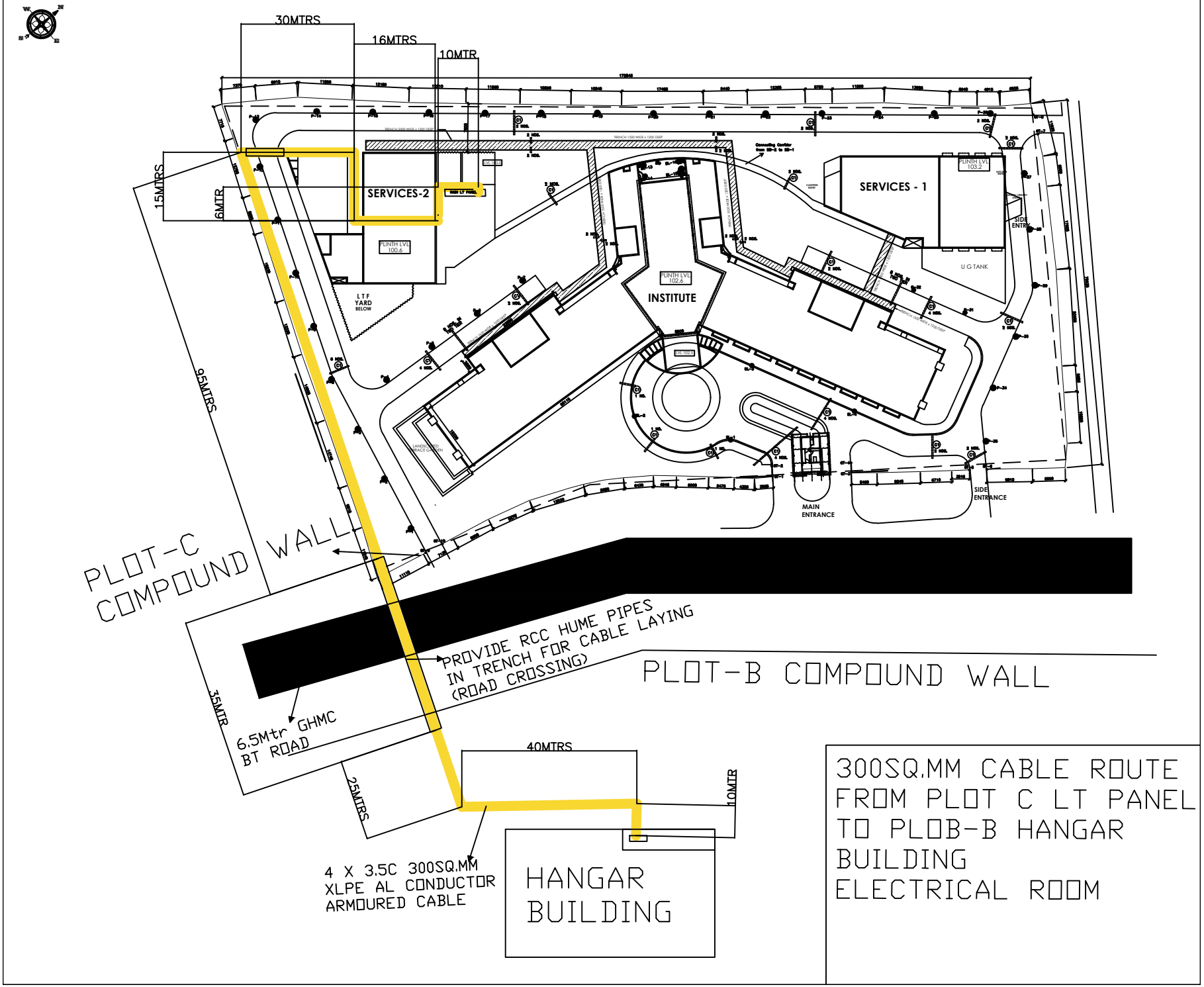
SECUNDERABAD - 17 PH: +91 40 2700 1377

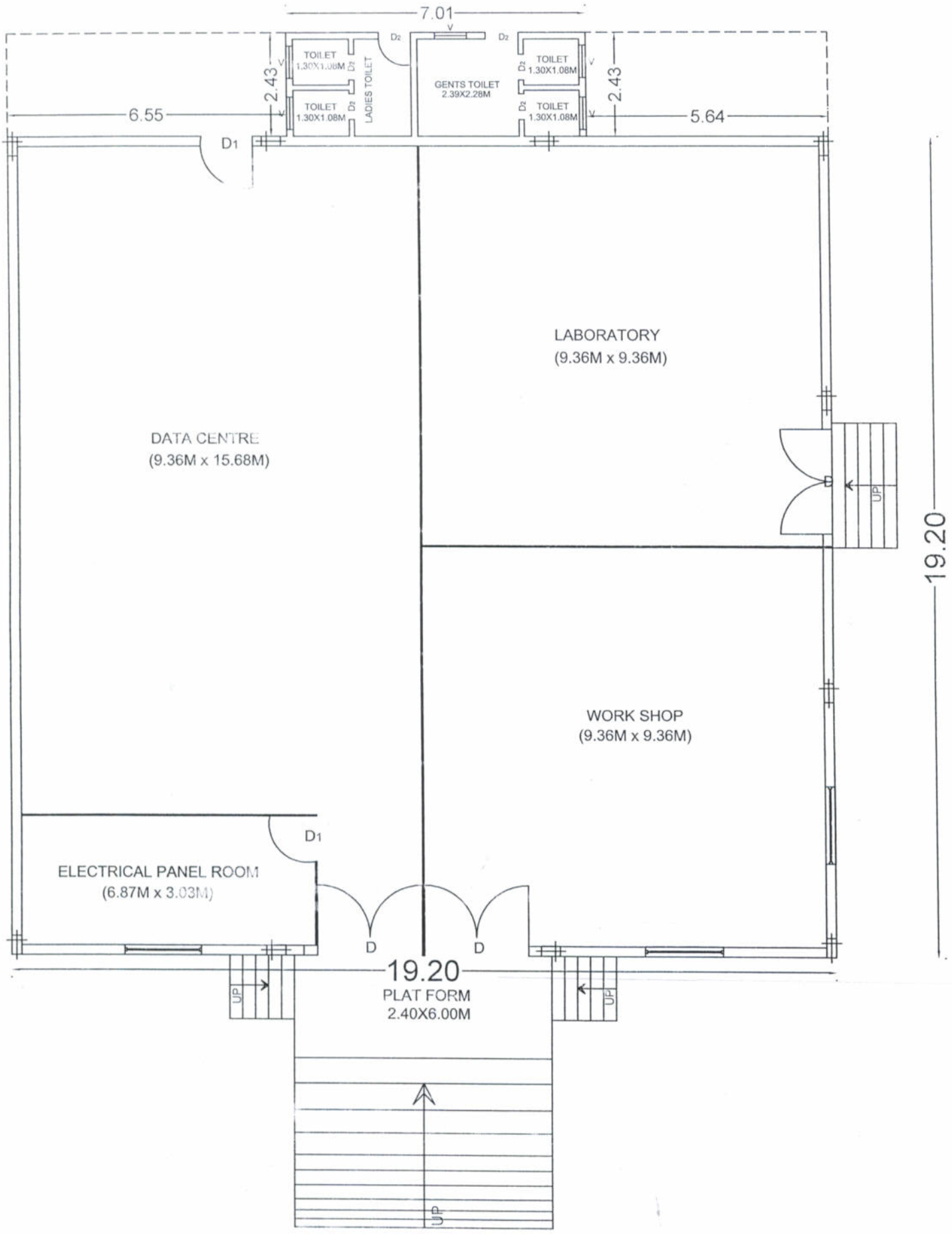
PROPOSED SHED FOR
M/s. TATA INSTITUE OF FUNDAMENTAL RESEARCH

R.C. DETAILS OF PLINTH BEAMS

DESIGN	SOM		06.01.17	PROJECT NO:–	SCALE:–
DRAWN	SOM		09.01.17		
CHECKED	SOM		09.01.17	DRAWING NO.	REV.
APPROVED	SOM		09.01.17	1–TIF–R–02	0

1–TIF–R–02–0


30MTRS
16MTRS
10MTR
15MTRS
6MTR
SERVICES-2
SERVICES - 1
INSTITUTE
PLINTH LVL 100.6
PLINTH LVL 102.6
PLINTH LVL 103.2
L T F YARD BELOW
U G TANK
SIDE ENTRANCE
MAIN ENTRANCE
95MTRS
PLOT-C COMPOUND WALL
PROVIDE RCC HUME PIPES IN TRENCH FOR CABLE LAYING (ROAD CROSSING)
PLOT-B COMPOUND WALL
35MTR
6.5Mtr GHMC BT ROAD
40MTRS
25MTRS
10MTR
4 X 3.5C 300SQ.MM XLPE AL CONDUCTOR ARMOURED CABLE
HANGAR BUILDING
300SQ.MM CABLE ROUTE FROM PLOT C LT PANEL TO PLOB-B HANGAR BUILDING ELECTRICAL ROOM


7.01
TOILET
1.30X1.08M
LADIES TOILET
GENTS TOILET
2.39X2.28M
TOILET
1.30X1.08M
TOILET
1.30X1.08M
TOILET
1.30X1.08M
2.43
2.43
6.55
5.64
D1
D2
LABORATORY
(9.36M x 9.36M)
DATA CENTRE
(9.36M x 15.68M)
UP
19.20
WORK SHOP
(9.36M x 9.36M)
D1
ELECTRICAL PANEL ROOM
(6.87M x 3.03M)
D
D
19.20
PLAT FORM
2.40X6.00M
UP
UP
UP