TECHNICAL PROCUREMENT SPECIFICATION	8144-01-PS-005
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TPS No	8144-01-PS-005
STATUS	[X] ENQUIRY ☐ COMMITMENT
ORIGINATING DEPT.	Mechanical
P.O. / W.O. No.	
PROJECT	Construction of Educational building for National Institute of Technology, Nagaland.
LOCATION	Dimapur, Nagaland
CLIENT	NIT, Nagaland
PURCHASER	NIT, Nagaland
VENDOR	

ITEM : VRF AC SYSTEM FOR LIBRARY BUILDING

2	07.09.23	Third Issue	NK	LA	RM
1	05.09.23	Second Issue	NK	LA	RM
0	13.06.23	First Issue	KBK	LA	RM
REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED

TECHNICAL PROCUREMENT SPECIFICATION	ATTACHMENTS	8144-01-ATT-005
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TPS No. 8144-01-PS-005

Sl. No.	Doc. No	Description	No. of pages	Rev. No. with Issue			
				1	2	3	4
1	8144-01-IS-005	EQUIPMENT / ITEM TO BE SUPPLIED	1	0			
2	8144-01-SOW-005	SCOPE OF WORK	2	0	1		
3	8144-01-INS-005	SCOPE OF INSPECTION AND TESTS	1	0			
4	8144-01-VDR-005	VENDOR DATA REQUIREMENTS	1	0			
5	8144-01-VDI-005	VENDOR DATA INDEX	1	-			
6	00ES001/2010	VEDOR DATA SUBMISSION PROCEDURE	4	-			
7	8144-01-PS-005SPL	SPECIAL REQUIREMENTS OF THE PROJECT	11	0	1	2	
8	8144-01-DS -005	DATA SHEET - LB	2	0			
9	8144-01-LD-005	EQUIPMENT LUBRICATION DATA	1	0			
10	8144-01-PS-005 VL	SUGGESTED VENDOR LIST	1			0	
11	**DRAWINGS**						
11.1	8144-12-DG-00700	LIBRARY BLOCK GROUND FLOOR PLAN	1	0			
11.2	8144-12-DG-00701	LIBRARY BLOCK FIRST FLOOR PLAN	1	0			
11.3	8144-12-DG-00702	LIBRARY BLOCK SECOND FLOOR PLAN	1	0			
11.4	8144-12-DG-00703	LIBRARY BLOCK ROOF PLAN	1	0			
11.5	8144-12-DG-00704	LIBRARY BLOCK FRONT SIDE ELEVATION	1	0			
12	8144-01-PS-005 SIW	SCHEDULE OF ITEMS OF WORK	3	0	1		
13	8144-01-CS-005	COMPLIANCE STATEMENT	1	-			

REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
2	07.09.23	Third Issue	NK	LA	RM
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TECHNICAL PROCUREMENT SPECIFICATION	**EQUIPMENT / ITEMS TO BE SUPPLIED**	8144-01-IS-005
		PAGE 1 OF 1

TPS NO. 8144-01-PS-005

Sl. No.	Eqpt. No. / Tag No.	Description	Qty.	Remarks
1.0	**VRF AC SYSTEM FOR LIBRARY BUILDING**			
1.1		ALL-INVERTER VRF TYPE MODULAR OUTDOOR UNITS	1 Lot	
		WITH R410A/R32 REFRIGERANT COMPLETE WITH ALL		
		ACCESSORIES, CONFIGURED INTO COMBINATION		
		UNITS TO THE TOTAL REQUIRED CAPACITY .		
1.2		CEILING HANGING TYPE INDOOR UNITS OF SUITABLE	Nos.	To suit the
		CAPACITY COMPLETE IN ALL ASPECTS		requirement
1.3		REFRIGERANT NETWORK PIPING,	1 Lot	
		SUPPORTS AND ALL ACCESSORIES INCLUDING		
		THERMAL INSULATION AND ALL OTHER UTILITIES		

REV.NO.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
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TECHNICAL PROCUREMENT SPECIFICATION	**SCOPE OF WORK**	8144-01-SOW-005 PAGE 1 OF 2

TPS NO.	8144-01-PS-005
ITEM :	**VRF AC SYSTEM FOR LIBRARY BUILDING**
EQPT. NO.	

The scope of work for the equipments listed above shall include design, manufacture, supply of materials and engineering

Sl. No	Description	Reqd.	Remarks
1.0	Indoor Unit (IDU)		
	Air Filter	✓	
	Blower	✓	
	Drive Motor	✓	
	Cooling Coil	✓	
	Expansion Valve	✓	
	Louvers/Grilles	✓	
	Condensate Drain Pump	✓	
2.0	Outdoor Unit (ODU)		
	Compressor	✓	
	Drive Motor	✓	
	Heat exchange unit	✓	
	Oil System	✓	
	Louvers/Grilles	✓	
	Fan	✓	
3.0	Fresh Air Ducting/pipimg	✓	
	Supports		As applicable
	Diffuser with frame & fitting		
	Fire dampers		
	Face & bypass damper		
	Thermal insulation		
	Acoustic insulation		
	Relief dampers		
4.0	Minor civil works like grouting, drilling etc.	✓	
5.0	Refrigerant piping network	✓	
6.0	Drain piping network	✓	

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Sl. No	Description	Reqd.	Remarks
7.0	Thermal and acoustic insulation	✓	
8.0	Electrical panel and controls		
	Motor Control Centre	✓	
	Push Button Stations	✓	
	Cabling (Power & Control)	✓	
	Earthing	✓	
	Centralized and Induvidual Cordless	✓	
9.0	Thermal insulation of roof		
10.0	Other Accessories		
	Thermostat	✓	
	Humidistat		
	Temperature indicator	✓	
	Instrument tubing	✓	
11.0	Inspection and Testing	✓	By third party inspection agency
12.0	Painting		
	Prime coating only		
	Prime coating and finish paint	✓	
13.0	Packing		
	Domestic packing	✓	
	Export packing		
	Rust prevention for long term storage	✓	6 months
14.0	Special tools	✓	IF ANY
15.0	Spare parts		
	Construction and commissioning	✓	
	2 years operation		
16.0	Foundation bolts and nuts	✓	
17.0	Erection & commissioning	✓	
18.0	Drawings & documents	✓	As per VDR & VDSP

TECHNICAL PROCUREMENT SPECIFICATION	**SCOPE OF INSPECTION AND TESTS**	8144-01-INS-005
		PAGE 1 OF 1

TPS NO.	8144-01-PS-005
ITEM :	**VRF AC SYSTEM FOR LIBRARY BUILDING**
EQPT. NO.	

The following inspection and test shall be conducted and records submitted.

Sl No.	Description	Inspn. Reqd.	Witness Reqd.	Remarks
1.0	**Shop Test**	✓		
1.1	Visual Test	✓		
1.2	Dimensional Test	✓		
1.3	Mechanical run test of all rotating equipment	✓		
1.4	Material Test Certification	✓		
1.5	Leak test	✓	✓	
	Compressors	✓	✓	
	Condensers	✓	✓	
	Cooling Coils	✓	✓	
2.0	**Site Tests**			
2.1	Pneumatic pressure testing of refrigerant lines	✓	✓	24 hour holding With N_2
2.2	Performance Test	✓	✓	

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TECHNICAL PROCUREMENT SPECIFICATION	**VENDOR DATA REQUIREMENTS**	8144-01-VDR-005
		PAGE 1 OF 1

PROJECT : Construction of Educational building for National Institute of Technology, Nagaland.

ITEM : VRF AC SYSTEM FOR LIBRARY BUILDING

CLIENT : **NIT, Nagaland**

TPS No : **8144-01-PS-005**

STATUS : ☐ ENQUIRY ☐ COMMITMENT

PO No :

Sl. No	Grp Code	Description	Offer	After Commitment				Final@@
			Qty	Qty	Lead time in weeks			Qty
					Reqd	Prop@	Agrd	
1.0	A	Schematic flow sheets	S	S	2			S
2.0	A	Calculations for selection of refrigeration capacity		S	2			S
3.0	A	Dimensioned GA & cross sectional drawings (with MoC of parts)		S	2			S
		of Compressor and Condenser						
4.0	A	Layout of Refrigerant piping, condensate piping, outdoor units and Indoor units		S	2			S
5.0	B	Inspection & Tests Procedure		S	2			S
6.0	A	Duly filled in and signed Data Sheets of:						
		Compressor, Condenser , refrigerent coils and indoor unit		S	2			S
7.0	B	Foundation drawings with load details of the outdoor unit		S	2			S
8.0	B	Support and insert details of Refrigerant coil & Indoor Units		S	2			S
9.0	B	Control Panel: Dimensioned GA Drawing & Schematic Wiring diagram		S	2			S
6.0	C	Signed copy of the TPS document as acceptance of TPS conditions.	S	S				S
7.0	A	Utility Consumption		S	2			S
8.0	B	Equipment lubrication data sheets		S	2			S
9.0	B	Material test certificates		S	10 *			S
10.0	B	Test records			10 *			S
11.0	C	Installation, operation & maintenance manual						S
12.0	C	Technical literature & catalogues	S					S
13.0	C	Reference list of previous supplies	S					S
14.0	C	Storage instructions (if any)						S
15.0	C	Safety Instructions						S
16.0	B	Compliance statement (In the format with TPS)	S					S

Legend :

Group code : A - For review and detailed Engineering , B - For review , C - For information and record

Document type : S - Soft copy

Notes :

' @ ' Vendor shall fill in proposed lead time if different from the required lead time

' @@ ' Each set of final documents shall be submitted in a folder. Two such folders shall be packed and despatched with the equipment.

*** After Tests and before supply.**

REV NO	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
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01FT001B/03

TECHNICAL PROCUREMENT SPECIFICATION	**VENDOR DATA INDEX**	8144-01-VDI-005
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PROJECT : Construction of Educational building for National Institute of Technology, Nagaland.

PROJECT No. : 8144 VENDOR :

ITEM : VRF AC SYSTEM FOR LIBRARY BUILDING P.O. No. : DATE :

Sl. No.	Doc. / Drawing No.	Description	Rev. 0 Date	Rev. 1 Date	Rev. 2 Date	Rev. 3 Date	Rev. 4 Date	Rev. 5 Date	Relevent to This issue ✓

ISSUE No.										
DATE										
SIGNATURE										

FACT ENGINEERING AND DESIGN ORGANISATION

FEDO

00FT020 /94

CONTENTS

1.0.0. SCOPE

1.1.0. This document together with "VENDOR DATA REQUIREMENTS (VDR)" defines FEDO's requirements for vendor drawing and data for any enquiry, work order or purchase order.

1.2.0. Bidders unable to comply with these requirements must detail all exceptions in their proposal. The timely delivery of quality drawings and data is as crucial as delivery of the equipment itself and hence the same shall be strictly adhered to after commitment.

1.3.0. Failure to provide adequate preliminary data / drawing may render a proposal non-responsive and hence may be rejected. After commitment failure to provide documents as per purchase order may delay progressive payments and adversely affect future invitation to bids.

2.0.0 VENDOR DATA REQUIREMENTS (VDR)

2.1.0 FEDO will provide a partially completed VDR form along with each enquiry. This form explains group code of the document, quantity of each document required and lead time for submission. Columns are available for the vendor to fill in his deviations, if any, from FEDO's requirements.

2.2.0 The vendor shall forward a filled-in VDR form along with his offer, if he has got any deviation from FEDO's requirements. In the absence of a filled-in VDR form along with the offer, it will be presumed that the vendor is accepting FEDO's requirements specified in the VDR.

3.0.0. CLASSIFICATION OF DOCUMENTS

3.1.0. Documents are classified based on their status and nature of content.

3.1.1. Status of documents:

1. Preliminary documents required along with the offer.
2. Documents to be submitted after commitment.
3. Final documents.

3.2.0. The documents are further classified into Groups A,B and C, depending on the nature of the documents as explained below.

3.2.1. Group A requirements

These documents are urgent in nature and contain information that is required for proceeding with the detailed engineering of surrounding / down stream equipments in the plant and hence are to be submitted on priority basis.

3.2.2. Group B requirements

These documents are to be reviewed by FEDO for compliance with the purchase order / work order specifications but are not essential for other engineering activities of FEDO.

3.2.3. Group C requirements

Documents in this group contains data / information / records which are final in nature and that are required for the equipment user and need not be reviewed by FEDO.

4.0.0. VENDOR DATA INDEX (VDI)

4.1.0. Vendor shall forward a filled up and updated VDI along with each vendor data transmittal. VDI shall list out all documents that are being prepared for the particular order, their current revision status and indicate the documents included in the present transmittal. A blank VDI is attached along with this document, which shall be used for this purpose.

5.0.0. QUALITY OF VENDOR DRAWINGS

5.1.0. Vendor drawing and data shall be supplied in full size drawings, reproducible and CDs as specified in the VDR.

5.2.0. All drawings / documents shall be clear, legible, right reading and made out of originals prepared in black ink. English language and metric units shall be used for the preparation of all documents.

5.3.0. The documents shall be prepared n any of the following standard sizes.

5.3.1. A1: 594 mm x 840 mm
5.3.2. A2: 420 mm x 594 mm
5.3.3. A3: 297 mm x 420 mm
5.3.4. A4; 210 mm x 297 mm

5.4.0. All documents submitted to FEDO shall be folded into A4 size (210 x 297 mm) except originals / re-producible which may be rolled. All reproducible shall be in high quality polyester films. Soft copies shall be furnished in CD for final drawings / documents.

5.5.0. Each drawing / document shall have a title block at the right hand bottom corner with the following information.

5.5.1. Name of Vendor.
5.5.2. Drawing title.
5.5.3. Name of Project, Owner and location.
5.5.4. Name of Consultant: FEDO
5.5.5. FEDO Purchase Order Number.
5.5.6. Equipment name & Number
5.5.7. Drawing number, revision and page number.

5.6.0. All drawings shall be drawn to some standard scales only and the same shall be indicated in the drawing.

5.7.0. The status of the document like "PRELIMINARY, FINAL, FOR REVIEW" etc. shall be stamped on all copies forwarded to FEDO.

5.8.0. All documents shall have a block of 100 mm x 100 mm space left vacant for FEDO to put their stamp after review.

5.9.0. All drawing/document shall have a revision block explaining revision number, revision description, data of revision, revision authorization etc. When the revised drawings are submitted all currently revised area shall be clearly demarcated by clouding. Any revisions made on other parts of the documenting will not be reviewed by FEDO.

5.10.0. When drawings are received back from FEDO with comments, vendor shall incorporate all the comments and resubmit the same. If the vendor is not in a position to incorporate certain comment made by FEDO, then the reason for such deviation shall be highlighted in the forwarding letter to FEDO.

5.11.0 The respective engineering specification and other purchase order spec. Will explain the minimum data / details required in various drawings. In the absence of any such information in the purchase order documents, vendor shall follow the standard good engineering practices in detailing the drawing.

6.0.0. CONDITIONS OF FEDO REVIEW

6.1.0. FEDO and / or its client reserve the right to review the vendor documents. FEDO's REVIEW WITH OR WITHOUT COMMENTS OF THE VENDOR DOCUMENTS SHALL NOT RELIEVE THE VENDOR OF RESPONSIBILITY TO COMPLY WITH ALL PURCHASE ORDER TERMS AND CONDITIONS, including all implied requirements relating to fitness for service and good engineering practices. Approval or acceptance does not imply or infer any determination relating to compliance by the vendor with its full

responsibilities under the purchase order.

6.2.0. FEDO's comments are limited to identifying requirements within the scope of the purchase order or failure by the vendor to comply with the requirements of purchase order, as revealed by the limited review. Oversights in the above limited review cannot be taken as approval for the vendor to deviate from the purchase order conditions. FEDO reserve the right to point out any such deviations at any stage of the order execution. The vendor shall comply with all such requirements without any price / delivery implications.

6.3.0. FEDO review will be authorized by an official stamp as given below, properly filled and signed by the concerned. Comments if any will be indicated in red ink or clouded in the case of copies of commented drawings.

Appropriate comment in the 'comments' column and 'status of review' column will be marked.

Comment	Status of Review
As noted	Revise and resubmit for review
No comments	Proceed as noted and submit revised docs. For records
Not reviewed	No further review required
	Forward final docs. As per P.O.

6.4.0. All documents received in FEDO shall be dispatched after review within 15 days from the date of receipt. Vendor shall notify FEDO of non-receipt of reviewed documents in time immediately, to take corrective actions.

6.5.0. The delivery of the equipment shall in no case be linked with the review of the vendor drawings and data by FEDO. It is the sole responsibility of the vendor to execute the job as per the purchase order conditions. If required the vendor shall depute his technical personnel to FEDO after submission of documents for timely finalisation of documents.

****

1.0 INTRODUCTION

1.1. This specification covers the design, supply, installation, testing and commissioning of **VRF AC System** to be installed in the Library Building of NIT, Nagaland Campus at Dimapur. This specification forms a part of bid document and shall be read in conjunction with the same.

1.2. All items / equipment offered shall be complete in all respects and any specific item not covered or mentioned in this specification but essential for proper functioning, installation or maintenance of the supplied item or equipment, shall be included by the bidder in the offer with reference to such inclusions.

1.3. All material, components, parts and equipment covered in this specification shall be designed, manufactured, assembled, tested, erected and commissioned in accordance with the latest applicable codes and standards mentioned in this document.

1.4. CODES&STANDARDS

The latest edition or revision of the following Codes and Standards relative to building design, specification and construction at the time of contract award, shall form part of this specification.

a. ASHRAE-American Society for Heating, Refrigerating and Air Conditioning Engineers handbooks and standards (latest/revised) including but not limited to.
   - Fundamentals (2013)
   - AC Applications(2012)
   - AC Systems and Equipment (2011)
   - Refrigeration(2010)

b. ISHRAE-Indian Society for Heating, Refrigerating and Air Conditioning Engineers handbooks and standards

c. NBC (Part-8, Section-3) – Air Conditioning, Heating and Mechanical Ventilation.

d. NFPA 90A – Standard for the Installation of Air Conditioning and Ventilating System.

NOTE: a. In addition to the above, all relevant Indian Standards shall also be followed.

b. The Contractor / Vendor shall execute all required design work and submittals for the VRF AC System in compliance with all applicable laws, codes and regulations and shall obtain required certificates, permits and inspections required by Authorities having jurisdiction for the project site. All liaising for obtaining of approvals shall be in vendor‟s scope. All statutory fees shall be reimbursed by NIT, Nagaland on submission of original receipts.

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2.0 SITE CONDITION *

Ambient temperature ^{O}C	:	Minimum: 9.5^{o}C,	Maximum: 36.9^{o}C
Altitude	:	79 m from MSL	
Environment	:	Non Industrial.	

3.0 GENERAL

3.1. All documents as detailed in „Vendor Data Submission Procedure" & "Vendor Data Requirements" attached shall be submitted by Vendor for review by FEDO. A scanned soft copy of complete offer documents except price bid shall be submitted along with the hardcopy.

3.2. All items indicated in "Scope of Work" attached shall be included in the Scope of Vendor.

3.3. Inspection / Tests shall be carried out by Vendor as detailed in "Scope of Inspection and Tests". Witnessing of tests where specified will be done by FEDO or their authorized representative.

3.4. Data sheets of VRF AC system are enclosed. Vendor shall submit all data sheets duly filled up along with other documents / drawings indicated in "Vendor Data Requirements", with the offer. Changes if any required for meeting system / operational requirements shall be indicated with reasons thereof.

3.5. Bidders or Representative of bidders shall visit the site and familiarize themselves of the site conditions before submitting their bid with prior permission from FEDO/NIT, Nagaland. The bidder shall collect the necessary additional data as well as purchaser"s requirements before quoting so that full coverage of the scope will be ensured in the offer itself.

3.6. All equipment shall be properly tagged, packed, securely anchored and protected for domestic shipment by rail / truck or suitable for ocean transport as the case may be. Rust inhibitors shall be applied to the equipment to prevent rusting during shipment and site storage for minimum of 6 months.

3.7. All safety devices to protect the equipment from damage due to conditions of overload shall be incorporated as per standard practice.

3.8. The commissioning spares , if required, shall be included in the lump-sum price.

3.9. Deviations, if any, from the specifications shall be clearly spelt out in the "Compliance Statement "attached failing which it will be taken to understand that there are no deviations from the specifications.

4.0 SCOPE OF WORK

4.1. The scope of work attached enlists the indicative items to be supplied, erected and commissioned under this tender and attached drawings/specifications. The contractor/vendor has to do the design, basic and detailed engineering and preparation of drawings & documents to meet the requirement of AC System.

4.2. The items covered under scope of work of the successful bidder shall include all items for the proper construction and working of the AC System, but not limited to the following:

a. AC-VRF equipment and materials including control systems.
b. Shop drawings of equipment and installations.
c. Complete and proper installation of AC Systems as per the codes and standards.
d. Automatic temperature control system.
e. Fresh air supply
f. Insulation of piping
g. Vibration and noise isolation for AC equipment.
h. Commissioning Spares
i. Complete testing of AC System including PGTR, as applicable
j. Operation and maintenance manuals for the entire AC System.
k. Start-up of the AC System.
l. Testing and Inspection with report submission.
m. As-Built Drawings of the AC System.
n. Training of owner‟s staff.
o. Any other equipment necessary for the proper working/installation of the system.

4.3. The scope of work of the successful bidder shall also include but not be limited to the following:

a. Contractor / Vendor shall offer the complete system on a lump sum basis. However, unit rates shall also be indicated for all variable items like piping, tubing, insulation, etc. to work out the cost impact due to any major changes made by purchaser after order (if any). No extra payment is admissible for change in quantities during detailed engineering unless it is due to changes effected by purchaser after order.
b. Total project management of AC System Collection of additional site data/information to comply with the NBC/ASHRAE requirements.
c. Detailed Engineering for the individual items/systems coming under AC System as the case maybe (if any).
d. Preparation of drawings and document based on detailed engineering, submission of documents to NIT Nagaland / FEDO for approval.
e. Procurement of all Piping / Tubing / Machinery / Accessories for items coming under AC system / Raw material for minor civil construction / modification etc. and all items coming under the contract.
f. Transportation of all equipment and material to site including loading, unloading, storage, insurance and maintenance.
g. Installation, erection of all mechanical, electrical, instrumentation items, construction/modification of minor civil works.
h. Obtaining all Government approvals/clearances etc. as applicable.
i. Pneumatic testing of refrigerant piping/tubing and commissioning. Pneumatic testing may be done with N_2.
j. Performance guarantee test runs (PGTR).
k. Trial run of AC system with owner‟s representative/training to owner‟s representative, final handing over of AC System.

4.4. Any deviation at the execution stage, which becomes unavoidable, shall be submitted for approval of NIT Nagaland /FEDO. Contractor shall not proceed with change till the acceptance of deviation. NIT Nagaland / FEDO shall make all possible efforts to ensure that processing of deviations will not be held up unreasonably.

4.5. Contractor / Vendor shall comply with Quality Assurance Requirements and submit its Quality Assurance Plan (QAP) for NIT Nagaland / FEDO"s review and approval. For inspection category and Inspection and Test Plan (ITP), Contractor shall comply with the requirement of Inspection /Monitoring Methodology.

4.6. The Contractor / Vendor shall also follow the safety procedures and norms during the execution of the works within the campus area (as the case may be) and comply with all safety regulations as specified, accepted safety practices and in addition, all statutory/central/state government regulations as appropriate for this work.

4.7. Any defect observed during construction / testing / commissioning or till the defect liability period of work, shall be rectified and removed by the Contractor/Vendor without any time and cost implication to NIT Nagaland irrespective of the fact whether the same has been reviewed and approved by NIT Nagaland / FEDO or not. The Contractor / Vendor shall also carry out whatever modification or reconstruction is needed for the purpose of completion of scope to the entire satisfaction of NIT Nagaland /FEDO without any extra time and / or cost implication to NIT Nagaland.

4.8. Contractor / Vendor shall ensure and take all the required precautions so that there is no damage to any nearby existing facility whether owned by NIT Nagaland or a third party. Financial implications, if any, for the damage to any existing facility and its consequences during execution, shall be to Contractor"s account and shall be recovered from the Contractor.

4.9. Any item that was not covered in the document but required, as per assessment of the Bidder to meet / fulfilling the performance of the system, contractor / vendor may indicate the same with techno-economic justification for consideration of NIT Nagaland along with the BID.

4.10. The schedule of work given in the price bid is indicative and shall enable LSTK contractor to have an idea of major items to be covered under the scope for bidding purpose. However the bidder shall confirm all individual items and its quantities for the safe and smooth functioning of the AC System conforming to the aforesaid codes & standards in the bid under vendor"s scope of supply & erection.

4.11. Civil Works:

All drilling and other minor civil works necessary for the best performance of the AC system and not available at site, shall be in the scope of the Contractor/Vendor

4.12. Electrical Works :

All associated electrical works listed below are excluded from the scope of this contract. These shall be installed by other agencies in accordance with the shop drawings and under supervision of the air conditioning contractor.

4.12.1 Providing power supply with earthing at the incoming of the control panel in AC units.

4.12.2 Providing power outlet within reach of fan coil units at locations called for air-conditioning.

4.13. Drawings

4.13.1 The space intended for accommodating the outdoor unit of the AC system is provided on the roof of the Library Building and is shown in the, Drg. No: 8144-12-DG-00703, Library Block Roof Plan. If additional space is required for the equipment, they shall bring out this point clearly in the offer itself. Any modification required on the existing site/structure is under the scope of vendor at his own expense, and shall be done only with prior permission from the NIT Nagaland/FEDO.

4.13.2 Space allocated for major air-conditioning equipment shall be taken into consideration before ordering the equipment and they shall fit into the space provided with required clearances all round as per relevant regulations.

4.13.3 The drawings attached to these specifications are architectural drawings only which are general in nature and cannot be regarded as working drawings. The supplier shall prepare his own detailed working drawings and get them approved by Owners / Consultant before execution. Prior to submission for approval, the supplier shall be responsible for thoroughly checking all drawings to ensure that they comply with the intent and the requirements of the contract specifications and that they fit in with the overall building layout.

4.14. By-Laws and Regulations

The installations shall be in conformity with the by-laws and regulations and standards of the local authorities concerned, in so far as these become applicable to the installations. But if these specifications and drawings call for a higher standard of material and / or workmanship than those required by any of the above regulations and standards then these drawings and specifications shall take precedence over the said regulations and standards. However if the drawings and specifications require something which violates the by-laws and regulations, then the by-laws and regulations shall govern the requirement of the installations.

4.15. Fees and Permits

The contractor shall obtain all permits / licenses and pay for any or all fees required for inspection, approvals and commissioning of their installations as the case may be.

5.0 TECHNICALDETAILS

5.1. GENERAL:

5.1.1 NIT Nagaland intends to get supply, installation & testing and commissioning of Air Conditioning system for all the floors of the Library Building of their Dimapur Campus. It‟s proposed to install Variable Refrigeration Flow (VRF) system in the room to provide year round thermal environmental control.

5.1.2 The system design, basis of design, requirements and other relevant data are outlined in this section. The detailed specifications and specific requirements are outlined in the subsequent sections.

5.2. Location:

The Library Building is at the Dimapur Campus of NIT, Nagaland.

5.3. MECHANICAL:

5.3.1 Basic Design

Station Name - Dimapur, Nagaland

Latitude - 25.9091^0N

Altitude - 79 m from MSL

Daily Range - 0-10.9°C (MDBR)

Outside Design Conditions - As per ASHRAE climatic design conditions of the nearest weather station.

5.3.2 Indoor Design Conditions:

The AC shall be designed to satisfy the following indoor conditions where applicable.

a. Temperature
b. Air quality
c. Noise levels
d. Pressures

5.3.3 The AC equipment and system shall be selected/designed to maintain the conditions listed below with the maximum ambient conditions prevailing in the area.

Area Description		Total Area (m^2)	Indoor Design conditions			Load(Indicative)(TR)
			Temperature	**Relative Humidity**	**Pressure type**	
Library Building	3 floors	2150*	**25°C**		**(+)**	**160**

*All area of the building except wash room and lift well portions shall be covered by the AC system.

Room Heat loads

Ground floor
Lighting load- 8kW
Computers and server- 6kW

First floor
Lighting load- 5.75kW
Computers-2kW

Second floor
Lighting load- 7.2kW

Occupancy

Ground Floor - 100 persons

First Floor - 75 persons

Second Floor - 75 persons

5.3.4 The cooling load indicated is approximate only and shall be considered as minimum. Bidder shall calculate the actual cooling load during detailed engineering and submit the same with supporting calculations for review and approval. Higher cooling load, if required, shall be offered without price implication.

5.3.5 The system shall be designed according to the latest applicable standards and guidelines for Safety of air conditioning systems in India.

5.4. VARIABLE REFRIGERANT FLOW SYSTEM

5.4.1 General

5.4.1.1 Design, Engineering, supply and installation of inverter type Variable Refrigerant Flow System, Factory assembled, factory charged, factory run tested of mentioned capacity. System should consist of accessible Scroll type compressors, Air-cooled condenser, steel base for mounting the above components, refrigeration piping, fittings, valves, refrigerant and oil, controls and ancillaries and numbers of various types of indoor units.

5.4.1.2 The Contractor/Vendor shall design the required equipment for achieving the desired conditions as mentioned in 5.3.**(Indoor temperature: 25 °C and air quality)**

5.4.1.3 The location of Outdoor Units (ODU) and Indoor Units (IDU) along with piping network shall be as per relevant codes, standards and practices.

5.4.1.4 System shall provide stable, trouble free and safe operation and provide flexibility in operation of indoor units with independent control of each indoor unit including partial operation. The system should be provided Multi-compressor circuit for better flexibility. The system should be self-intelligent to run on low outdoor temperature for better power consumption irrespective of numbers of indoor units in operation.

5.4.1.5 Modular system shall be incorporated for all required control for parallel operation of Compressors, Condenser fans and Indoor units along with all refrigerant liquid control. The system should be designed for proper oil return to compressor along with distribution of all in each compressor.

5.4.1.6 The fans shall be statically and dynamically balanced and designed for silent operation at required airflow rates against required static pressure. The filters shall be washable synthetic media type arranged for convenient cleaning and replacement, fixed to an integrally moulded plastic frame.

5.4.1.7 Operation of the VRF system shall be through independent cordless remote controllers and through Central Controller as specified.

5.4.1.8 The system shall be complete with electrical panel boards, power cabling, control cabling, earthing and controls.

5.4.2 Outdoor Unit

5.4.2.1 Contractor/Vendor shall select the combination of modular units for the outdoor units to be kept at suitable location so as to maximize energy efficiency and minimize piping required. Contractor/Vendor shall size and select individual units to suit site conditions.

5.4.2.2 All the Outdoor units of the system shall be suitable for operation with 415V+/-10%, 50Hz, 3Ph, AC supply whereas all indoor units preferable should be with 230 V, 50Hz Single Phase supply only. System should include all protection devices / Controls to with stand fluctuation / variation in power supply.

5.4.2.3 Outdoor units shall be able to operate over a range of outdoor ambient Temperature from 4°C to32 °C. Sound pressure levels of the outdoor units shall not exceed 75 dBA at 1m from the unit. The sound data should be measured in accordance with ARI standard 575.

5.4.2.4 The Condenser coil shall be Air-cooled type with copper tubes and aluminum fins. The condenser coils shall be of adequate size and shall have an integral sub cooler circuit for sub-cooling of the liquid.

5.4.2.5 The outdoor unit shall have sufficient protection to withstand all-weather conditions like inclement weather, rains, direct sunlight etc.

5.4.2.6 All the compressors of the outdoor units must be hermetically sealed scroll type. Each module of outdoor unit must have separate inverter compressor, suitable to operate at heat load proportional to indoor requirement.

5.4.2.7 "Anti-Corrosive" treatment (Blue Fins) for fins of Condenser Coils is mandatory and shall carry warranty of at least Five (5) years. The treatment should be suitable for areas of high pollution.

5.4.2.8 All ODU shall have multiple Scroll Compressors and be able to operate even in case one of the compressors is out of order.

5.4.2.9 Back up operation, in case of failure of one of the compressors of outdoor unit, for single module outdoor units or failure of one of the modules in case of multiple modules outdoor units shall be possible. The VRF outdoor unit shall always be supplying at least 33% of back up operation, of the full load capacity.

5.4.2.10 Outdoor unit should be provided with anti-corrosive treatment with powder-coated finish. Unit will be skid - mounted type and should be installed on suitable size cushy foot mount for vibration control.

5.4.2.11 Refrigerant control in the outdoor unit shall be through Electronic Expansion Valve. Complete refrigerant circuit, oil balancing/ equalizing circuit shall be factory assembled & tested.

5.4.2.12 Outdoor unit shall be supplied with

a. Installation manual
b. Operation Manual
c. Connection Pipes
d. Clamps

5.4.3 Indoor units

5.4.3.1 Unit shall be suitable for **ceiling hanging arrangement**. The unit includes pre-filter, fan section, Heat Exchange section, condensate pump and fresh air inlet. The housing of unit shall be light weight powder coated galvanized steel.

5.4.3.2 The supply air discharge shall be **directed downwards to the room area.**

5.4.3.3 The cooling coil circuit shall be fed with liquid refrigerant through the expansion device and distributor.

5.4.3.4 The cooling coil shall be made out of seamless copper tubes and have continuous aluminum fins. The fins shall be spaced by collars forming an integral part. The tubes shall be staggered in the direction of airflow. The tubes shall be hydraulically/mechanically expanded for minimum thermal contact resistance with fins.

5.4.3.5 The fan shall be dual suction, aerodynamically designed turbo, multi-blade type, statically & dynamically balanced to ensure low noise and vibration free operation of the system

5.4.3.6 The unit will be connected in series to a suitable outdoor unit & it must be possible to operate the unit independently, through cordless remote.

5.4.3.7 The unit shall be supplied with the following from the factory

a. Operation Manual
b. Installation Manual
c. Paper pattern for installation

d. Drain hose/Clamp metal/ Washer fixing plate/ Sealing pads/Clamps/Screws
e. Cordless controller

5.4.4 Noise and Vibration control

5.4.4.1 The air conditioning contractor must take all necessary precautions to have minimum noise generation and its transmission. Minimum vibration as permitted by NBC part 3 and IS relevant codes shall be ensured

5.4.4.2 The air-conditioning contractor shall take all other precautions or shall make his own arrangements even if not specified in the tender documents for eliminating high noise levels & shall minimize vibrations in all mechanical equipment without any additional cost

5.4.5 Refrigeration and Drain piping

5.4.5.1 Refrigerant shall be R-32/R-410A

5.4.5.2 The entire condensing unit & evaporative unit should be factory assembled and tested. The units should come with an initial charge of referred R-32/R-410A from the factory. Any additional required refrigerant shall be added at site free of cost & loss of refrigeration due to defect in equipment or workmanship shall also be filled up free of cost during execution and guarantee period.

5.4.5.3 The piping shall be according to ASME B31.5 and other related standards. All standard practices and codes shall be adhered to in the piping supply and installation.

5.4.5.4 The refrigerant piping construction and arrangements shall be in accordance with good practices within the air conditioning industry, and are to include charging connections, suction line insulation and all other items normally forming part of proper refrigerant circuits.

5.4.5.5 All joints in copper piping shall be sweat joints using low temperature brazing and or silver solder. The piping shall be continuously kept clean of dirt etc. while constructing the joints. Subsequently, it shall be thoroughly blown out using nitrogen.

5.4.5.6 The refrigerant piping shall be factory tested and certified before erection. All necessary testing as per ASME B31.5 shall be carried out.

5.4.5.7 The suction line pipe size and the liquid line pipe sizes shall be selected according to the manufacturers specified outside diameter. All refrigerant pipe shall be properly supported and anchored to the building structure using steel hangers, anchors, brackets, and supports which shall be fixed to the building structure by means of inserts or expansion shields of adequate size and number to support the load imposed thereon.

5.4.5.8 The IDU shall be connected to the drain pipe made of rigid heavy duty HDPE. All necessary frames and supports shall be in Contractor"s/Vendor"s scope.

5.4.5.9 Drains pump for condensed water pumping from indoor unit shall be provided by vendor.

5.4.6 Pipe Insulation

5.4.6.1 <u>Insulation Material</u>

a. Insulation material shall be supplied by approved manufacturers and shall be of the type specifically intended for the services required.

b. Insulation material shall have anti-microbial product, which is EPA (Environmental Protection Agency), approved, as an integral part of insulation that cannot be washed off or worn off.

c. It shall give enhanced level of protection against harmful Microbes such as bacteria, mold, mildew and fungi.

d. The Insulation materials should be with self-adhesive type and with Aluminum Foil faced to protect against mechanical damage.

5.4.6.2 Piping and accessory insulation application shall be as follows:

a. All codes and standards relevant to the thermal insulation of the system shall be followed by the Contractor/Vendor. Refrigerant and Drain piping shall be insulated

b. Pipes shall be thoroughly cleaned with wire brush and rendered free from all rust and grease.

c. First 2 coats of specified Insulation adhesive shall be applied then the Insulation shall be fixed tightly on the surface taking care to seal all joints.

d. Adequately sized PVC self-adhesive tape shall be provided to seal all joints afterwards Al cladding shall be done as per requirements.

5.4.7 Testing and Commissioning

5.4.7.1 All equipment and components supplied may be subjected to inspection and tests during manufacture, erection/installation and after completion. No tolerances at the time of inspection shall be allowed other than those specified or permitted in the relevant approved standards, unless otherwise stated. Approval at the time of inspection shall not be construed as acceptance unless the equipment proves satisfactory in service after erection.

5.4.7.2 All inspection and test specified in codes like NBC: Part 8 and similar shall be carried out as per due procedure in respective standards. These shall be in the scope of the contractor/vendor.

5.4.7.3 All equipment shall be factory-tested. Mechanical run-test shall be done for rotating equipment and leakage tests shall be carried out for the piping.

5.4.7.4 Completed refrigerant piping and drain piping shall be tested as per latest standards.

5.4.7.5 Testing and balancing shall be carried out for the system. Final Performance Guarantee test run shall be done as per standard testing procedures. Vendor shall submit procedure/methodology for PGTR at offer stage itself.

5.5. ELECTRICAL

5.6. 415V,63A 50 Hz, 3 phase power supply or 230V,16A/20A,50HZ single phase power supply as required for the equipment shall be made available by the Purchaser(by providing TPN/DP MCBs) near each equipment Further distribution of power is included in the vendor"s scope. All equipment supplied shall be suitable for the above rated power supply. Earthing of individual equipment in the package is also included in the vendor"s scope. Vendor shall furnish details of power supply requirements and earthing details along with the offer.

6. SCOPE OF SHOP INSPECTION AND SITE TESTS

6.1 Scope of inspection shall be as indicated in document “SCOPE OF INSPECTION AND TESTS “ or as specified elsewhere in this specification.

6.2 The vendor has to arrange inspection by third party inspection agency (TPIA) for all equipment from the following list of approved third party inspection agencies. Necessary expenses for the same to be borne by the Vendor.

- Bureau Veritas Industrial Services (I) Pvt. Ltd.
- Certification Engineers International Ltd.
- Det Norske Veritas Certification
- Indian Register of Shipping Inspection Services.
- Lloyds Register Industrial Services (I) Pvt. Ltd

6.3 Statutory approvals required for any of the components of the system shall be in the scope of the Contractor/Vendor

6.4 All systems shall be commissioned at site after completion of the erection. Proper functioning of all systems and controls shall be verified during commissioning.

6.5 Defects / deficiencies noted during commissioning shall be rectified by the vendor within the specified completion period.

6.6 Contractor shall supply following for the commissioning and tests:

- Initial fill of lubricants and their replenishment during commissioning and performance tests.
- Any other instruments, consumables required for testing and commissioning.
- Spares for commissioning and testing

7. PACKING AND DESPATCH

7.1 All equipment / parts covered under this specification shall be packed domestic packing in non-returnable boxes.

7.2 All items covered in this specification shall be despatched in one consignment or as per specific consignment schedule if agreed.

8. ERECTION AND COMMISSIONING

8.1 The vendor/contractor shall carry out erection/commissioning of the entire AC system.

8.2 All tools, tackles, skilled and unskilled labour and consumables required for the work shall be arranged by the vendor/contractor.

8.3 All materials required for civil work (minor works) shall be arranged by Contractor/Vendor.

8.4 Contractor/Vendor shall be responsible for the safety of the personnel employed by him.

8.5 All prevailing rules and regulations regarding employment of labour in force at site shall be observed by the contractor.

9. PERFORMANCE GUARANTEE

9.1 The item/equipment covered in this specification will be checked for performance after commissioning on actual operating conditions up to the specified operating parameters.

9.2 The Contractor/Vendor shall rectify and make good any deficiency in performance of the equipment. This shall include free replacement of deficient parts / whole equipment without extra cost to Purchaser.

9.3 The Purchaser on successful completion of performance guarantee shall issue final acceptance certificate tests.

9.4 All items / equipment and system covered in the above specification shall be warrantied against any defect in material, manufacturing, assembly, testing, painting, etc., for a period of 12 months from the date of final acceptance after commissioning.

DATA SHEET	AC SYSTEM - VRF	8144-01-DS-005
		PAGE 1 OF ?

Job No. 8144	Item No. :	TPS 8144-01-PS-005	
Applicable to :	◯ Proposal	◯ Puchase	◯ As Built
Site	: NIT, Nagaland, Dimapur	Model No.	:
Service	: VRF AC SYSTEM FOR LIBRARY BLOCK	Location	◯ Outdoor ◯ Indoor
No. required	: 1	Drive motor	◯ Vendor ◯ Purchaser

DESIGN PARAMETERS

Total Floor area (A/C)	2258.4 (3 floors) m^2	Room Volume (A/C)		10162.8	m^3
Internal Load	kW	Light	kW	Appliances	kW
Outside design condition (As per ASHRAE climatic design conditions of nearest weather station.	Max.Dry Bulb Temp.	°C	Min. Dry Bulb Temp.		oC
	Relative Humidity	%			
A/C Room Conditions	Temperature	25 °C	Relative Humidity		%
Positive Pr. Requirement	mmWG	No. of Fresh Air Changes / Hr			
Site Elevation above MSL	79 m	Barometric Pr.	Max.	Min.	mmHG

VENDOR DETAILS

Type of A/C system	Variable refrigerant flow	Sub-type	Modular with Inverter scroll comp.	
1.0 Refrigerent used	R-410A/R-32	No of units:	Outdoor	Indoor

2.0	**OUTDOOR UNIT**				
2.1	Make/Model No		Tag No. ODU -	No. of Units In combination	
INDIVIDUAL-UNIT 1	Type of unit	Modular with Inverter scroll comp.	BHP		HP
	Comp. type x quantity		Oil/Type		
	Motor Rating	kW	Comp. Speed/ Motor speed		RPM
	Cooling capacity	kW	Heating capacity		kW
	Capacity control	%	Airflow rate		m3/min
	Sound level	dBA	Refrigerant charge		kg
	Dimesions (in mm)	L x B x H	Weight		kg
	Power supply	3 phase-415 V, 50 Hz	Power input		kW
	Rated Current	A	Piping conn. (Liquid/Gas)		mm/mm
INDIVIDUAL-UNIT 2	Type of unit	Modular with Inverter comp.	BHP		HP
	Comp. type x quantity		Oil/Type		
	Motor Rating	kW	Comp. Speed/ Motor speed		RPM
	Cooling capacity	kW	Heating capacity		kW
	Capacity control	%	Airflow rate		m3/min
	Sound level	dBA	Refrigerant charge		kg
	Dimesions (in mm)	L x B x H	Weight		kg
	Power supply	3 phase-415 V, 50 Hz	Power input		kW
	Rated Current	A	Piping conn. (Liquid/Gas)		mm/mm
INDIVIDUAL-UNIT 3	Type of unit	Modular with Inverter comp.	BHP		HP
	Comp. type x quantity		Oil/Type		
	Motor Rating	kW	Comp. Speed/ Motor speed		RPM
	Cooling capacity	kW	Heating capacity		kW
	Capacity control	%	Airflow rate		m3/min
	Sound level	dBA	Refrigerant charge		kg
	Dimesions (in mm)	L x B x H	Weight		kg
	Power supply	3 phase-415 V, 50 Hz	Power input		kW
	Rated Current	A	Piping conn. (Liquid/Gas)		mm/mm

4					PROJECT	VRF AC SYSTEM FOR LIBRARY BUILDING OF NIT, NAGALAND, DIMAPUR	
3							
2					CLIENT	NIT, NAGALAND	
1					P.O No.		
0	13.6.23	KBK	LA	RM	VENDOR		
Rev	DATE	PRPD.	CHKD.	APPRD.			

FACT ENGINEERING AND DESIGN ORGANISATION

1FT056C/94

DATA SHEET	AC SYSTEM - VRF	8144-01-DS-005 PAGE 2 OF 2

3.0 INDOOR UNITS

INDOOR UNIT	Make/Model No.						Tag no.			
	Type of unit		1-way Cassette	☐	Ceiling suspended		Concealed split		Floor-standing	
			2-way Cassette		Wall-mounted split		Ducted		Other	
			4-way Cassette				If other, specify			
	Addl. Unit detail		(Condensate water pump required-Yes)				Unit Capacity		4 TR	
	Cooling capacity		kW				Heating capacity		kW	
	Sound level		dBA				Airflow rate		CFM	
	Dimesions (in mm)		L x		B x	H	Weight		kg	
	Air filter						Fan speed			
	Number of motor						Motor output		kW	
	Power supply		Single phase-230 V, 50 Hz				Input power		kW	
	Rated Current		A				Piping size(Liquid/Gas)		mm/mm	
	Drain piping size		mm				Control method			
	Control method						External static		Pa	

INDOOR UNIT	Make/Model No.						Tag no.			
	Type of unit		1-way Cassette	☐	Ceiling suspended		Concealed split		Floor-standing	
			2-way Cassette		Wall-mounted split		Ducted spli		Other	
			4-way Cassette				If other, specify			
	Addl. Unit detail		(Condensate water pump-Yes)				Unit Capacity		TR	
	Cooling capacity		kW				Heating capacity		kW	
	Sound level		dBA				Airflow rate		CFM	
	Dimesions (in mm)		L x		B x	H	Weight		kg	
	Air filter						Fan speed			
	Number of motor						Motor output		kW	
	Power supply		3 phase-415 V, 50 Hz				Input power		kW	
	Rated Current		A				Piping		mm/mm	
	Drain piping size		mm				Control method			
	Control method						External static		Pa	

FRESH AIR SYSTEM	Make						Model No.			
	Nominal capacity		TR				External static		Pa	
	Capacity(Cooling/Heat		kW				Airflow rate		CFM	
	Air filter						Refrigerant type			
	Type x						Motor output		kW	
	Dimesions (in mm)		L x		B x	H	Weight		kg	
	Refrigerant charge		kg				Drain piping size		mm	
	Power Input/ Rated						Power supply			
	Piping		mm				Sound level		dBA	
	Duct size		mm							
Ducting	Material						Thickness			
	Area Considered						Diffusers(Frames&Fittings)			
	Volume Control						Fire Dampers			
	Themal Insulation		M^2				Face & Bypass			
	Thermal		mm				Relief Dampers			
	Accoustic Ins. Thick		mm							

4.0 PIPING AND INSULATION

	Ref. piping Material		Ref piping total	m
	Piping connection			
	Branch distribution jt.		Distribution joint	
	Drain piping Material		Drain piping total	m
	Thermal Ins.Material		Thermal	

PS: The area and volume indicated is apprximate only. Vendor shall calculate room area, volume, and TR based on drawings enclosed.

FACT ENGINEERING AND DESIGN ORGANISATION FEDO

TECHNICAL PROCUREMENT SPECIFICATION	**EQUIPMENT LUBRICATION DATA**	8144-01-LD-005
		PAGE 1 OF 1

PROJECT : Construction of Educational building for National Institute of Technology, Nagaland.

PROJECT NO : 8144 LOCATION : Dimapur, Nagaland

TPS NO : 8144-01-PS-005 VENDOR :

CLIENT : NIT, Nagaland

SL NO	DESCRIPTION	ITEM NO	
1	Type of Lubrication System (State Grease-Gun, Grease Packed, Drip, Splash, Continuous)		
2	Recommended Lubrication for Break in (list two Indian alternatives by trade name and number)		
3	Quantity of Lubricant required for initial fill (Litres or Kg)		
4	Recommended Break - in period for Initial application (Hours)		
5	Recommended Lubrication for normal operation (List two Indian alternatives by trade name and number)		
6	Refill quantities if different from initial charge (Litres or Kg)		
7	Quantity of Lubricant shipped with initial order (Hours)		
9	Expected annual consumption of Lubricant (Litres or Kg)		

Remarks :

REV NO	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED
0	#REF!	First Issue	KBK	LA	RM

FACT ENGINEERING AND DESIGN ORGANISATION FEDO

01FT304/03

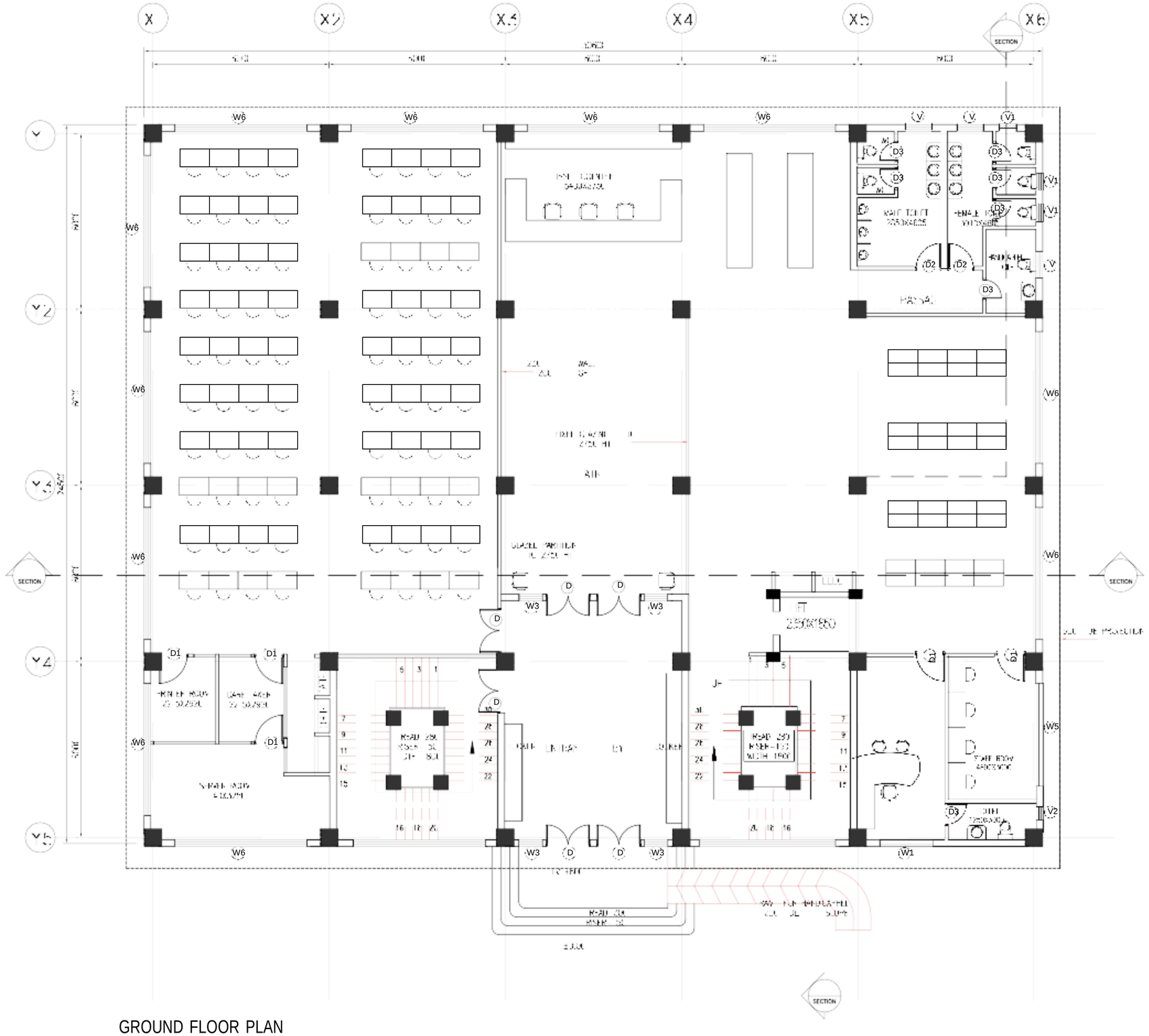
I **Indoor Units and Outdoor units**

i. BLUESTAR
ii. CARRIER
iii. DAIKIN
iv. VOLTAS
v. MITSUBISHI
vi. LG
vii CARRIER
viii LLOYD
ix TOSHIBA

Note:

Supply of all IDUs (Indoor Units) and ODUs(Out door units) as per the above vendor list is mandatory.

0	07.09.23	For Enquiry	KBK	LA	RM
REV.NO.	**DATE**	**DESCRIPTION**	**PREPARED**	**CHECKED**	**APPROVED**



CLIENT:

M/S NIT NAGALAND

PROJECT:

PHASE II EXPANSION AT NIT NAGALAND

NOTES :-

01. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
02. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. ANY DISCREPANCY IN THE DRAWINGS SHALL BE BROUGHT TO THE NOTICE OF THE ARCHITECT.
03. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS

S.N	TYPE	OPENINGS	SILL	LINTEL	LOCATION	REMARKS	QTY.
DOORS							
1.	D	1500 X 2750		2750	ENTRY DOOR	ALUMINIUM	5
2.	D1	1000 X 2100		2100	STA.+LIB.	FLUSH DOOR	2
3.	D2	900 X 2100		2100	TOILET	PVC DOOR	2
4.	D3	750 X 2100	-	2100	TOILET	PVC DOOR	7
WINDOWS							
1.	W	4860 X7800	-	-	READING HALL	STR.GLAZING	-
2.	W1	1800X1850	900	2750	LIB. ROOM	AL+GL+WM+SL	1
3.	W2	3220X1200	-	-		AL+GL+WM+SL	0
4.	W3	800X2750	-	2750	MAIN ENTRY	AL+GL+WM+SL	4
5.	W4	2000X1850	900	-	STAIRCASE	AL+GL+WM+SL	2
6.	W5	3500X1850	900	2750	STAFF ROOM	AL+GL+WM+SL	1
7.	W6	4500X1850	900	2750	READ. HALL	AL+GL+WM+SL	11
8.	V	900X1250	1500	2750	TOILET	AL+GL+WM+SL	4
9.	V1	600X1250	1500	2750	TOILET	AL+GL+WM+SL	3
10.	V2	450X1250	1500	2750	TOILET	AL+GL+WM+SL	

NOTE:-
ALL DIMENSIONS ARE IN MM.

WORKING DRAWING

PMC & EXECUTING AGENCY :-

FACT ENGINEERING &
DESIGN ORGANISATION
UDYOGMANDAL, KOCHI, KERALA - 683501

ASSOCIATE CONSULTANTS :-

BUILDCON SOLUTIONS
HEAD OFFICE :L-11,SARITA VIHAR,
NEW DELHI-110076
TELE FAX :- 011-40506870
EMAIL-buildconsolutions@gmail.com

DISCIPLINE:-

ARCHITECTURE

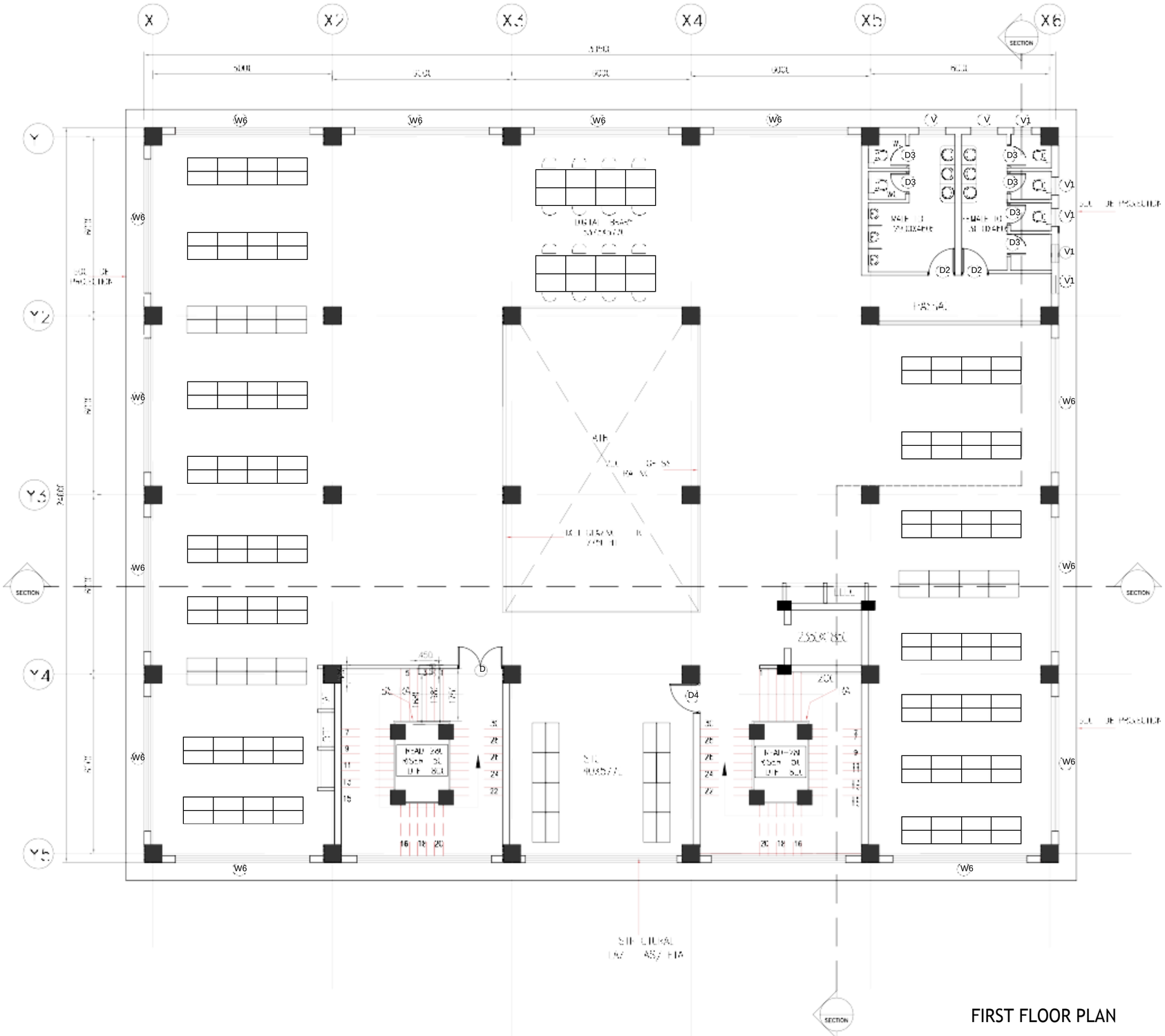
DRAWING TITLE:

LIBRARY BLOCK
GROUND FLOOR PLAN

DRAWING NO.-

8144-12-DG-00700

SCALE:		DATE:	18.8.2014
CHECKED BY: NITIN GAUTAM		APPROVED BY:	



FIRST FLOOR PLAN

CLIENT:

M/S NIT NAGALAND

PROJECT:

PHASE II EXPANSION AT NIT NAGALAND

NOTES :-

01. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
02. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. ANY DISCREPANCY IN THE DRAWINGS SHALL BE BROUGHT TO THE NOTICE OF THE ARCHITECT.
03. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS

S.N.	TYPE	OPENINGS	SILL	LINTEL	LOCATION	REMARKS	QTY
DOORS							
1.	D	1500 X 2750		2750	ENTRY DOOR	ALUMINIUM	5
2.	D1	1000 X 2100	-	2100	STA.+LIB.	FLUSH DOOR	2
3.	D2	900 X 2100	-	2100	TOILET	PVC DOOR	2
4.	D3	750 X 2100	-	2100	TOILET	PVC DOOR	7
WINDOWS							
1.	W	4860 X7800	-	-	READING HALL	STR.GLAZING	-
2.	W1	1800X1850	900	2750	LIB. ROOM	AL+GL+WM+SL	1
3.	W2	3220X1200	-	-		AL+GL+WM+SL	0
4.	W3	800X2750	-	2750	MAIN ENTRY	AL+GL+WM+SL	4
5.	W4	2000X1850	900	-	STAIRCASE	AL+GL+WM+SL	2
6.	W5	3500X1850	900	2750	STAFF ROOM	AL+GL+WM+SL	1
7.	W6	4500X1850	900	2750	READ. HALL	AL+GL+WM+SL	11
8.	V	900X1250	1500	2750	TOILET	AL+GL+WM+SL	4
9.	V1	600X1250	1500	2750	TOILET	AL+GL+WM+SL	3
10.	V2	450X1250	1500	2750	TOILET	AL+GL+WM+SL	

NOTE:-
ALL DIMENSIONS ARE IN MM.

REVISIONS:-

WORKING DRAWING

PMC & EXECUTING AGENCY :-

FACT ENGINEERING &
DESIGN ORGANISATION
UDYOGMANDAL, KOCHI, KERALA - 683501

ASSOCIATE CONSULTANTS :-

BUILDCON SOLUTIONS
HEAD OFFICE :L-11,SARITA VIHAR,
NEW DELHI-110076
TELE FAX :- 011-40506870
EMAIL-buildconsolutions@gmail.com

DISCIPLINE:-

ARCHITECTURE

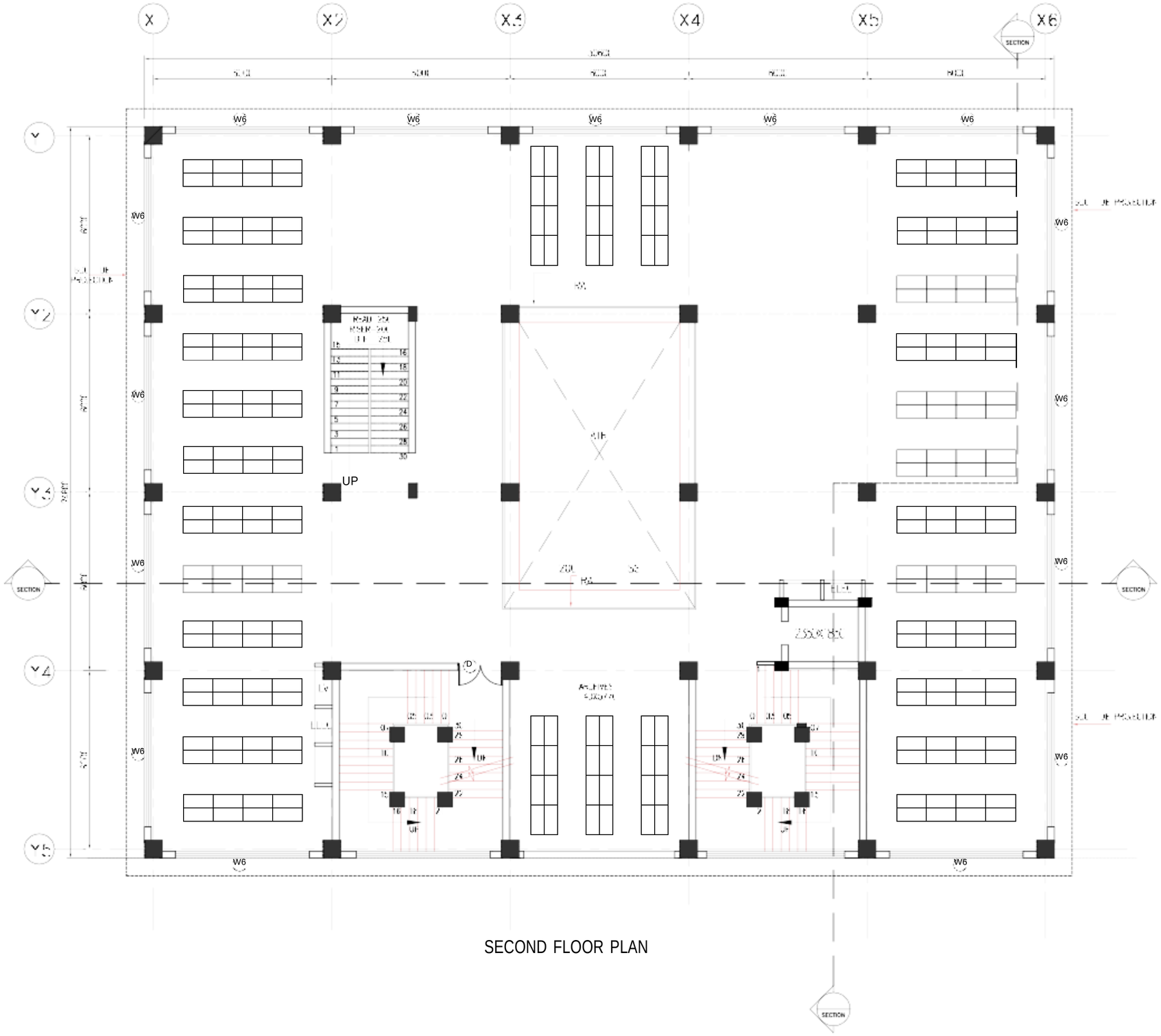
DRAWING TITLE:

LIBRARY BLOCK
FIRST FLOOR PLAN

DRAWING NO.-

8144-12-DG-00701

SCALE:		DATE:	18.8.2014
CHECKED BY: NITIN GAUTAM		APPROVED BY:	



SECOND FLOOR PLAN

CLIENT:

M/S NIT NAGALAND

PROJECT:

PHASE II EXPANSION AT NIT NAGALAND

NOTES :-

01. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
02. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. ANY DISCREPANCY IN THE DRAWINGS SHALL BE BROUGHT TO THE NOTICE OF THE ARCHITECT.
03. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS

S.N.	TYPE	OPENINGS	SILL	LINTEL	LOCATION	REMARKS	QTY.
DOORS							
1.	D	1500 X 2750	-	2750	ENTRY DOOR	ALUMINIUM	5
2.	D1	1000 X 2100	-	2100	STA.+LIB.	FLUSH DOOR	2
3.	D2	900 X 2100	-	2100	TOILET	PVC DOOR	2
4.	D3	750 X 2100	-	2100	TOILET	PVC DOOR	7
WINDOWS							
1.	W	4860 X7800	-	-	READING HALL	STR.GLAZING	-
2.	W1	1800X1850	900	2750	LIB. ROOM	AL+GL+WM+SL	1
3.	W2	3220X1200	-	-		AL+GL+WM+SL	0
4.	W3	800X2750	-	2750	MAIN ENTRY	AL+GL+WM+SL	4
5.	W4	2000X1850	900	-	STAIRCASE	AL+GL+WM+SL	2
6.	W5	3500X1850	900	2750	STAFF ROOM	AL+GL+WM+SL	1
7.	W6	4500X1850	900	2750	READ. HALL	AL+GL+WM+SL	11
8.	V						
9.	V1	900X1250	1500	2750	TOILET	AL+GL+WM+SL	4
10.	V2	600X1250	1500	2750	TOILET	AL+GL+WM+SL	3
		450X1250	1500	2750	TOILET	AL+GL+WM+SL	

NOTE:-
ALL DIMENSIONS ARE IN MM.

WORKING DRAWING

PMC & EXECUTING AGENCY :-

FEDO

FACT ENGINEERING &
DESIGN ORGANISATION
UDYOGMANDAL, KOCHI, KERALA - 683501

ASSOCIATE CONSULTANTS :-

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HEAD OFFICE :L-11,SARITA VIHAR,
NEW DELHI-110076
TELE FAX :- 011-40506870
EMAIL-buildconsolutions@gmail.com

DISCIPLINE:-

ARCHITECTURE

DRAWING TITLE:

LIBRARY BLOCK
SECOND FLOOR PLAN

DRAWING NO.-

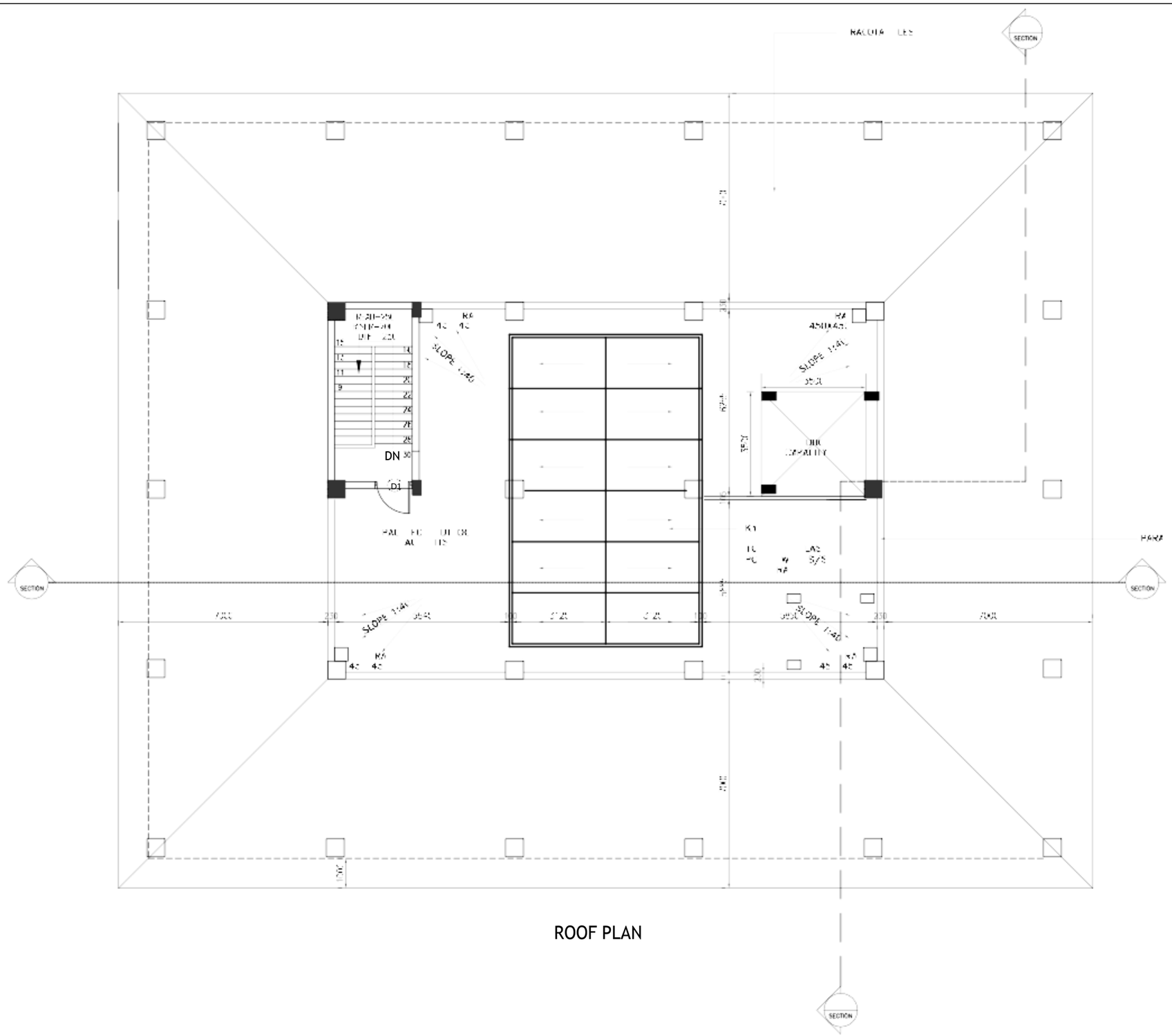
8144-12-DG-00702

SCALE:

DATE: 18.8.2014

CHECKED BY: NITIN GAUTAM

APPROVED BY:



ROOF PLAN

CLIENT:

M/S NIT NAGALAND

PROJECT:

PHASE II EXPANSION AT NIT NAGALAND

NOTES :-

01. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
02. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. ANY DISCREPANCY IN THE DRAWINGS SHALL BE BROUGHT TO THE NOTICE OF THE ARCHITECT.
03. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS

S.N.	TYPE	OPENINGS	SILL	LINTEL	LOCATION	REMARKS
DOORS						
1.	D	1500 X 2750	-	2750	ENTRY DOOR	ALUMINIUM
2.	D1	1000 X 2100	-	2100	STA.+LIB.	FLUSH DOOR
3.	D2	900 X 2100	-	2100	TOILET	PVC DOOR
4.	D3	750 X 2100	-	2100	TOILET	PVC DOOR
WINDOWS						
1.	W	4860 X7800			READING HALL	GLAZING
2.	W1	1800X1850	900	2750	LIB. ROOM	AL+GL+WM+SL
3.	W2	3220X1200			STAIRCASE	AL+GL+WM+SL
4.	W3	800X2750	-	2750	MAIN ENTRY	AL+GL+WM+SL
5.	W4	1800X1850			STAIRCASE	AL+GL+WM+SL
6.	W5	4650X1850	900	2750	COM. CENTRE	AL+GL+WM+SL
7.	W6	4500X1850	900	2750	READ. HALL	AL+GL+WM+SL
8.	V	900X1850	1500	2750	TOILET	AL+GL+WM+SL
9.	V1	600X1850	1500	2750	TOILET	AL+GL+WM+SL

NOTE:-
ALL DIMENSIONS ARE IN MM.

WORKING DRAWING

PMC & EXECUTING AGENCY :-

FACT ENGINEERING &
DESIGN ORGANISATION
UDYOGMANDAL, KOCHI, KERALA - 683501

ASSOCIATE CONSULTANTS :-

BUILDCON SOLUTIONS
HEAD OFFICE :L-11,SARITA VIHAR,
NEW DELHI-110076
TELE FAX :- 011-40506870
EMAIL-buildconsolutions@gmail.com

DISCIPLINE:-

ARCHITECTURE

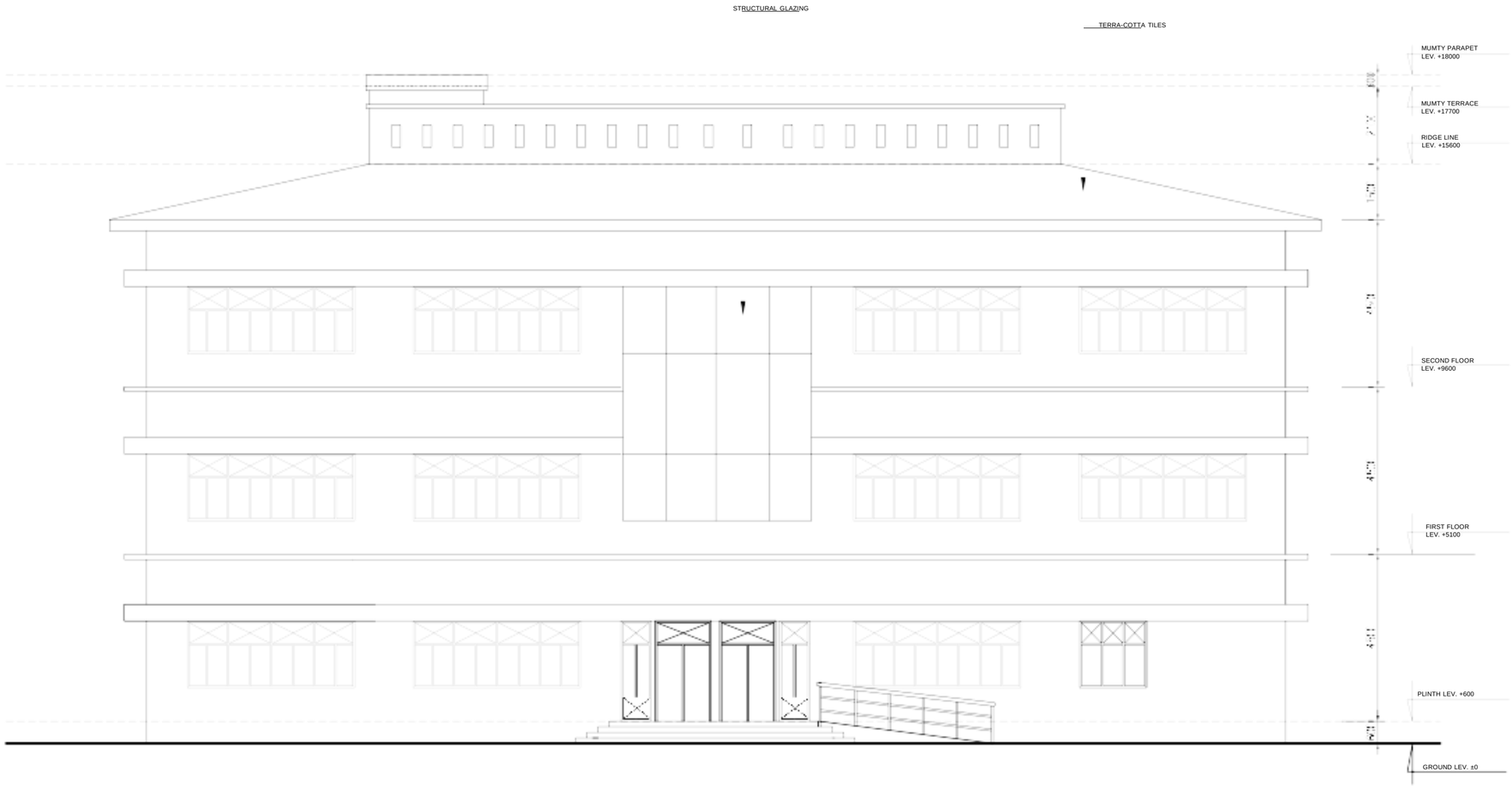
DRAWING TITLE:

LIBRARY BLOCK
ROOF PLAN

DRAWING NO.-

8144-12-DG-00703

SCALE:		DATE:	18.8.2014
CHECKED BY: NITIN GAUTAM		APPROVED BY:	



FRONT SIDE ELEVATION

CLIENT:

M/S NIT NAGALAND

PROJECT:

PHASE II EXPANSION AT NIT NAGALAND

NOTES :-

01. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.
02. WRITTEN DIMENSIONS ARE TO BE FOLLOWED. ANY DISCREPANCY IN THE DRAWINGS SHALL BE BROUGHT TO THE NOTICE OF THE ARCHITECT.
03. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH OTHER RELEVANT DRAWINGS

S.N.	TYPE	OPENINGS	SILL	LINTEL	LOCATION	REMARKS
DOORS						
1.	D	1500 X 2750	-	2750	ENTRY DOOR	ALUMINIUM
2.	D1	1000 X 2100	-	2100	STA.+LIB.	FLUSH DOOR
3.	D2	900 X 2100	-	2100	TOILET	PVC DOOR
4.	D3	750 X 2100	-	2100	TOILET	PVC DOOR
WINDOWS						
1.	W	4860 X7800			READING HALL	GLAZING
2.	W1	1800X1850	900	2750	LIB. ROOM	AL+GL+WM+SL
3.	W2	3220X1200			STAIRCASE	AL+GL+WM+SL
4.	W3	800X2750	-	2750	MAIN ENTRY	AL+GL+WM+SL
5.	W4	1800X1850			STAIRCASE	AL+GL+WM+SL
6.	W5	4650X1850	900	2750	COM. CENTRE	AL+GL+WM+SL
7.	W6	4500X1850	900	2750	READ. HALL	AL+GL+WM+SL
8.	V	900X1850	1500	2750	TOILET	AL+GL+WM+SL
9.	V1	600X1850	1500	2750	TOILET	AL+GL+WM+SL

NOTE:-
ALL DIMENSIONS ARE IN MM.

WORKING DRAWING

PMC & EXECUTING AGENCY :-

FACT ENGINEERING &
DESIGN ORGANISATION
UDYOGMANDAL, KOCHI, KERALA - 683501

ASSOCIATE CONSULTANTS :-

BUILDCON SOLUTIONS
HEAD OFFICE :L-11,SARITA VIHAR,
NEW DELHI-110076
TELE FAX :- 011-40506870
EMAIL-buildconsolutions@gmail.com

DISCIPLINE:-

ARCHITECTURE

DRAWING TITLE:

LIBRARY BLOCK
FRONT SIDE ELEVATION

DRAWING NO.-

8144-12-DG-00704

SCALE: | DATE: 18.8.2014

CHECKED BY: NITIN GAUTAM | APPROVED BY:

TECHNICAL PROCUREMENT SPECIFICATION	**PRICE BID - PART A (VRF AC System)**	8144-01-PS-005 SIW PAGE 1 OF 3	R1

PROJECT : VRF AC SYSTEM FOR LIBRARY BUILDING AT NIT NAGALAND, DIMAPUR

PROJECT No : 8144 VENDOR :

Enq. No. : DATE :

SL. No.	DESCRIPTION OF ITEM	UNIT	QTY	RATE (Rs.) Fig.	RATE (Rs.) Words	AMOUNT (Rs.)
(1)	(2)	(3)	(4)	(5)		(6)
1.0	**SUPPLY**					
	Design, manufacture, assembly, testing, packing and supply of Variable Refrigerent flow Air-Conditioning system with all equipment / accessories and Utiities listed for its safe operation including those listed below (but not limited to) to be installed in Library Building at NIT, Nagaland, Dimapur					
	a) Air-cooled all-inverter type modular outdoor units equipped with scroll compressors with R 410A/R32 Refrigerant, condensing unit, controls, in-built microprocessor panel, internal wiring, subcooling circuit etc. The units shall be configured into different combo unitsas per site conditions.	L/s	1			
	b) Ceiling hanging type indoor units complete with compact cooling coil, electronic expansion valve, multispeed fan motor, adjustable grilles/louvers, control systems etc. The capacity shall be estimated by the vendor	L/s	1			

Note :

i) All items specified in the Enquiry shall be included by Vendor / Contractor whether or not specifically indicated in the schedule.

ii) Vendor shall indicate bill of quantities with size wise break up against each item in Technical Bid. Price break up shall be furnished only

iii) Vendor shall furnish unpriced schedule along with the Technical Bid.

Rev.No	Date	Description	PRPD	CHKD	APPRD
1	06.9.23	Second issue	NK	LA	RM
0	13.6.23	First issue	KBK	LA	RM

FACT ENGINEERING AND DESIGN ORGANISATION

FEDO

PRICE BID - PART A (VRF AC System)

SL. No.	DESCRIPTION OF ITEM	UNIT	QTY	RATE (Rs.)		AMOUNT (Rs.)
				Fig.	Words	
(1)	(2)	(3)	(4)	(5)		(6)
	c) Refrigerant network and Drain network piping, supports and all accessories including thermal insulation	L/s	1			
	d) All other Utilities - Cabling, Control systems etc	L/s	1			
	Total Amount in Lakhs (Fig)					
	Total Amount in Lakhs (Words)					

VAT: OR Lumpsum Price : .....

..... % of Rs. ..... (Final Lumpsum : .....

FACT ENGINEERING AND DESIGN ORGANISATION

FEDO

TECHNICAL PROCUREMENT SPECIFICATION	**PRICE BID - PART B (VRF AC System)**	8144-01-PS-005 SIW PAGE 3 OF 3 R1

PROJECT : VRF AC SYSTEM FOR LIBRARY BUILDING AT RADAR FACILITY EQUIPMENT ROOM NIT NAGALAND, DIMAPUR	PROJECT No : 8144	VENDOR :
	Enq. No. :	DATE :

SL. No.	DESCRIPTION OF ITEM	UNIT	QTY	RATE (Rs.)		AMOUNT (Rs.)
				Fig.	Words	
(1)	(2)	(3)	(4)	(5)		(6)
1.0	**ERECTION & COMMISSIONING**					
	Erection, Installation, Testing and Commissioning including PGTR, as per all relevant standards, Handing over of above listed systems complete in all respect to be installed in Library Building at NIT Nagaland , Dimapur	L/s	1			
	Total Amount in Lakhs (Fig)					
	Total Amount in Lakhs (Words)					

Service Tax :	Lumpsum Price : .....
OR	..... % of Rs..... (Final : ----------

Grant Total Amount in Lakhs (A + B) (Fig)	
Grant Total Amount in Lakhs (A + B) (Words)	

FACT ENGINEERING AND DESIGN ORGANISATION

FEDO

TECHNICAL PROCUREMENT SPECIFICATION	**COMPLIANCE STATEMENT**	8144-01-CS-005
		PAGE 1 OF 1

TPS NO.	8144-01-CS-005

We state that our Quotation No. **.....** is in full compliance with the documents issued against the Enquiry No. ... except for the deviations listed below.

LIST OF DEVIATIONS

The scope of work for the equipments listed above shall include design, manufacture, supply of materials and engineering work as detailed below.

Sl. No	Description	Reasons for Deviation

Name of vendor :

Date Name and designation Seal & Signature

FACT ENGINEERING AND DESIGN ORGANISATION FEDO