

Annexure-3

Detailed Technical Specifications of the items

Technical Specifications of Active Components

1. Core Switch

- Hardware and interface requirements
- The Switch should be a Layer 3 1U switch with all required hardware and software to meet below specifications
- Switch should have 48 x 1/10G/25G SFP/SFP+/SFP28 ports and minimum 8 x 40G/100G uplink ports from day 1.
- Should support stacking/MC-LAG/VPC or equivalent
- Switch should support 16 GB DRAM and 64 GB SSD Storage
- Switch should have an internal hot swappable redundant power supply and field-replaceable fan trays from day 1
- Switch should have front to back airflow

Performance requirements

- Should support wirespeed switching throughput of minimum 3.6 Tbps
- Should support distributed Layer 2 and Layer 3 forwarding of minimum 2.6 Bpps
- Switch should be able to work in both store and forward and cut through switching mode

Layer 2 Switching

- Switch should support minimum 256K MAC addresses
- Switch should support Jumbo frames – 9,000 bytes
- Switch Should support minimum 4000 VLAN's and VLAN ID's
- Switch Should support Port-based VLAN and MAC-based VLAN
- Switch Should support 802.1Q VLAN tagging
- Switch should support VRRP

Layer 3 Routing, Multicast

- Switch should have the following IPv4 & IPv6 routing enabled from day 1
- Static, RIPv1/v2, RIPv6, OSPFv2, OSPFv3. Required licenses to be installed from day 1
- Switch should support following IPv4 & IPv6 routing with an additional license - BGP, IS-IS & MPLS
- Switch should support PIM sparse mode (PIM-SM), source-specific multicast (SSM) and Bidirectional Forwarding Detection (BFD) for PIM from Day 1
- Switch should support Internet Group Management Protocol (IGMP) v1, v2, v3 and multicast listener discovery (MLD) v1 and v2 from Day 1
- Support for up to 300K IPv4 and 160K IPv6 routes per system
- Support for up to 32K multicast routes
- Switch should support RSVP and LDP based MPLS LSP's
- Switch should support VRF-lite and MPLS VPNs as described in RFCs 2547 and 4364

- Switch should support 802.1ag and 802.3ah
- Switch should support BFD
- Quality of Service (QoS) requirements
- Switch should support Layer 2 IEEE 802.1p (class of service [CoS])
- Switch should have minimum 10 hardware queues per port (8 unicast and remaining for multicast)
- Should support Layer 2 classification based on Interface, MAC address, Ethertype, 802.1p and VLAN
- Should support Priority-based flow control (PFC) - IEEE 802.1Qbb
- Should support Enhanced Transmission Selection (ETS)- IEEE 802.1Qaz
- Should support DataCentre Bridging Exchange Protocol (DCBX), DCBx, FCoE, and iSCSI

System Management and Administration

- CLI-based console to provide detailed out-of-band management
- Switch management using 10/100/1000-Mbps management or console ports
- Switch should have Port-based locator and beacon LEDs
- Switch should support Configuration synchronization & Configuration rollback
- Switch should support Secure Shell Version 2 (SSHv2) & Telnet
- Switch should support Authentication, authorization, and accounting (AAA) via TACACS+ and RADIUS
- Switch should have Syslog & provide an Embedded packet analyzer
- Switch should support SNMPv1, v2, and v3 and have Enhanced SNMP MIB support
- Switch should support XML (NETCONF) based configuration
- Switch should support integration with Openstack SDN orchestrator

Security features

- Switch should support Ingress & Egress ACLs
- Standard and extended Layer 2 ACLs: MAC addresses, protocol type
- Standard and extended Layer 3 and 4 ACLs: IPv4 and IPv6, Internet Control Message Protocol (ICMP and ICMPv6), TCP, User Datagram Protocol (UDP)
- Switch should have a DHCP Server
- Switch must support IP source guard, Dynamic ARP Inspection and DHCP Snooping

High Availability

- Switch must support ISSU (In Service Software Upgrade)
- Switch must support graceful failover of control plane with Non Stop switching and routing along with ECMP
- Switch should support EVPN & VXLAN
- Switch must support Active/Active cluster of two core switches to provide sub-second failover and full utilization of all links connected to the Core Switches

- Primary and Backup Routing Engines in a cluster should be kept synchronized at all times to enable rapid stateful routing engine failover and Non-Stop Forwarding in case of Routing Engine failures
- Switches should offer dual internal load- sharing AC power supplies and redundant variable-speed fans as standard features, protecting the switch from a single power supply or fan failure
- Switch should support MC-LAG/VRRP/VPC etc.

Certifications and Environment compliance

- Should be compliant to ROHS 6/6, CSA-C22.2, UL 60950-1 (2nd Edition)
- operating temperature - 0 to 40 degree Celsius and operating humidity 5% to 90% (non condensing)
- Should be NDDP v1.1 or higher certified
- Switch manufacturing should not be of china origin.
- OEM should be a leader in Gartner magic quadrant for wired and wireless LAN infrastructure from the last 3 years.

1. Distribution Switch

- Hardware and interface requirements
- An enterprise grade switch with Minimum 24 x 10/100/1000 Base-T and 4 x 1/10G ports (with required transceiver modules) and dedicated 4x1/10G ports that can be used as either stacking ports or convertible to uplink ports as needed.
- U Rack mountable and should provide stacking of minimum 8 switches with Minimum 80 Gbps of dedicated stacking/ equivalent bandwidth (All the stacking accessories should be included from day 1).
- The Switch should have minimum 4 GB DRAM and 8 GB internal Flash
- Performance requirements
- 208 Gbps or higher Backplane capacity and minimum 154 Mpps of forwarding rate
- Should support Non-blocking hardware architecture
- All interfaces should provide wire speed forwarding for both Fiber and copper modules

Layer 2

- Support for at least 4000 VLANs & 64k MAC address
- It should support IGMP snooping v1,v2 & v3
- Switch should support VRRP or equivalent
- Switch should support LACP (802.3ad)
- IEEE 802.1x support, IEEE 802.1D Spanning-Tree Protocol, IEEE 802.1p class-of-service (CoS) prioritization, IEEE 802.1Q VLAN, IEEE 802.3 10BASE-T specification, IEEE 802.3u 100BASE-TX

Layer 3

- Support for up to 32K IPv4 and 16K IPv6 routes per system
- Support for up to 8K multicast routes

- It should support static IP routing and OSPF alongwith PIM-SM, PIM-DM, PIM-SSM, Bidirectional Forwarding (BFD), Unicast reverse-path forwarding (uRPF)
- Switch should support 8 hardware queues per port
- Switch should support LLDP and LLDP-MED with VoIP integration capabilities
- Should support Flow-based Telemetry, per-flow level analytics, to monitor thousands of traffic flows per switch without impacting the CPU
- Should have support for EVPN-VXLAN and standard based micro segmentating using group based policies

Security

- Should support IP Source Guard , DAI and IPv6 Security feature like IPv6 RA Guard and IPv6 Neighbor Discovery Inspection
- Switch should support IEEE 802.1ae MACsec 256 on uplink ports, providing support for link-layer data confidentiality, data integrity, and data origin authentication
- Should support Secure Shell (SSH) Protocol and Simple Network Management Protocol Version 3 (SNMPv3).
- Switches should support NTP and Precision Time Protocol (PTP)
- Switch should support DHCP server and DHCP proxy
- Dynamic Host Configuration Protocol (DHCP) snooping
- System Management and Administration
- Switch needs to have console port for administration & management
- Management using CLI, GUI using Web interface should be supported
- Switch must have a dedicated out of band management port: 10/100/1000BASE-T ethernet
- Switch must have the configuration rollback and image rollback feature
- FTP/TFTP for upgrading the operating System
- Should support Energy Efficiency
- Switch should be manageable through both IPv4 & IPv6.

Certifications and Environment compliance

- Switch should be UL 62368-1 and 60950-1,FCC Part 15, VCCI Class - CISPR32, EN 55032, EN 55024, EN 300386, CAN/CSA 22.2 No. 62368-1 and 60950-1, IEC 60825, Reduction of Hazardous Substances (ROHS) 6 certified

Switch manufacturing should not be of china origin.

- OEM should be a leader in Gartner magic quadrant for wired and wireless LAN infrastructure from the last 3 years.

2. Access Switch

- Hardware and interface requirements
- The switch should be an enterprise class platform having 24/16/12/8 x 10/100/1000Base-T PoE+ ports and 4/2 x 1G/10G SFP/SFP+ uplink ports(as per the requirements after survey)
- The switch should support a stacking of 4 switches for single IP management

- The Switch should be provided with all the accessories like Rack Mount Kit and console cable.
- Switch should have minimum 2 GB DRAM and 2 GB Flash

Performance requirements

- Switch should support a switching bandwidth of 64 Gbps for line rate performance of a fully populated switch
- Switch should have minimum 45 Mpps Forwarding rate for line rate performance of a fully populated switch

Layer 2 Switching

- Switch should support minimum 16000 MAC addresses per system
- Switch should support Jumbo frames – 9,000 bytes
- Switch Should support minimum 1000 Active VLANs and VLAN IDs
- Switch Should support Port-based VLAN and MAC-based VLAN
- Switch Should support 802.1Q VLAN tagging
- Switch Should support Voice VLAN
- Switch should support LACP
- Switch Should support LLDP
- Switch Should support LLDP-MED with VoIP integration

Layer 3 Routing

- Switch should support IPv4 and IPv6 static routing
- Switch should support IGMP V1/V2/V3, OSPFV2/V3, RIPng and Bidirectional Forwarding Detection (BFD) by adding a feature license if required in future.
- Quality of Service (QoS) requirements
- Switch should support Class-based queuing with prioritization
- Switch should support Marking, policing, and shaping
- Switch should support WRED
- System Management and Administration
- Switch should support Software upgrades
- Switch should support SNMPv2c and SNMPv3
- Switch should support IPv6 Management including Neighbour discovery, Logging, Telnet, SSH, Web, SNMP, NTP and DNS, DHCP Server, DHCP Relay, and DHCP Proxy

Security features

- Switch Should support Port, VLAN and Router based Access control lists (ACLs)
- Should support a minimum 1K Security Access Control Entries
- Switch should support MAC limiting
- Switch should support Dynamic ARP Inspection (DAI)
- Switch should support DHCP snooping
- Switch should support L2-L4 ACL
- Switch should support Control plane DoS protection
- Switch should support RADIUS, TACACS+ authentication
- Services and Manageability

- Switch should be manageable through CLI, Web Interface, SSHv2 and HTTP/HTTPS
- Configuration backup via FTP/secure copy
- Switch should have configuration rollback and image rollback feature

Certifications and compliances

- Should be Reduction of Hazardous Substances (ROHS) 6 compliant
- "Should have FCC 47CFR Part 15 Class A, EN 55022 Class A, ICES-003 Class A, CISPR 22 Class A, NDPP/NDcPP"

3. Wireless Access Point with Central Console

- 802.11 a/b/g/n/ac/ax 4x4:4 MIMO, dual radio Access Point. The AP should have Dual Radio 802.11ax access point with OFDMA and Multi-User MIMO (MU-MIMO)
- The Access Point should have single 10/100/1000 Ethernet interfaces
- Access point should support Built-in technology that resolves sticky client issues for Wi-Fi 6 and Wi-Fi 5 devices
- Access point should have 3.55 Gbps aggregate data rates
- Access Point can have integrated internal antenna
- Should support 16x BSSID per AP radio.
- Access Point should be able to power up using standards 802.3 af at POE input
- Access point should have an option to connect with POE injector.
- Access point must incorporate radio resource management for power, channel, coverage hole detection and performance optimization
- The AP should support supports priority handling and policy enforcement for unified communication apps, including Skype for Business with encrypted video conferencing, voice
- Should support standalone/autonomous mode for specific requirement
- AP should be provided with proper mounting kit
- The Access point should support Transmit beamforming (TxBF) for increased signal reliability and range
- The Access point should support 802.11ax Target Wait Time (TWT) to support low-power client devices
- Regulatory Compliance FCC CE Marked BIS/UL/IEC/EN 60950
- Certifications Wi-Fi Alliance: - Wi-Fi CERTIFIED a, b, g, n, ac - Wi-Fi CERTIFIED 6 (ax) - WPA, WPA2 and WPA3
- Should support 0-45-degree operating temperature
- Should provide test report and certification of standards at the time of bidding: ETSI EN 300 328, ETSI EN 301 489-1, ETSI EN 301 489-17, ETSI EN 301 893, EN 55032:2015/A11:2020, BS EN 55032:2015/A11:2020 EN 55035:2017/A11:2020, BS EN 55035:2017/A11:2020 EN IEC 61000-3-2:2019, BS EN IEC 61000-3-2:2019 EN 61000-3-3:2013/A1:2019, BS EN 61000-3-3:2013/A1:2019, EN IEC 62311:2020, EN IEC 62368-1.

4. Wireless LAN Controller

- Storage: 250GB (SSD preferred, depend on retained data size)
- For up to 3000 Devices and 30000 Clients:
- CPU: Intel® Xeon® Silver 4210
- RAM: 16GB or above
- Storage: 250GB (SSD preferred, depend on retained data size)
- Deployment types
- Install rpm software package on CentOS
- Run OVA format file by virtual software or system
- Centralized Management
- Local data forwarding, no user traffic sent to the controller
- Bank-grade TLS encryption from end-to-end with X.509
- certificate based authentication
- User and privilege management, support multi-factor safety authentication
- Mobile app for iOS and Android
- Network-based management and unified device configuration
- Network/device/client/guest monitoring
- Network topology to display the visual information of device and client
- Layer2 and Layer3 based AP discovery
- Access Security and Control
- Supports access policy configuration (blacklist, whitelist, time policy schedule)
- Multiple WLAN security type including open, personal, enterprise, ppsk, etc
- Bandwidth rules for client access
- Supports firewall to control both wired and wireless client
- Rogue AP detection and alert
- Reporting and Monitoring
- Real-time devices and client monitoring
- Detailed reports by network, device, client, etc
- Retrieval of historical data for statistical observations
- Customize monitoring pannel (add and remove chart, adjust the display order)

5. Network Monitoring System

The quoted **Network Management System (NMS)** should support the following:

- Single NMS should be able to manage Wired and Wireless devices. It should be from same OEM of active network devices or open source which are being quoted by Vendor/Firm for compatibility. It should also cover existing network devices with new/upgraded network devices installed in the campus of University.
- Should have Powerful monitoring engine which can scale and manage 100s of hosts and servers.
- Should have Comprehensive web dashboard giving the visibility of complete network components and monitoring data.

- Should have multi-tenant capabilities where multiple users have access to NMS dashboard.
- Should have extendable architecture which can easily integrate with third-party applications with multiple APIs.
- Should have features like fast alerting system, sends alerts to admins immediately after any issue is identified.
- Should have multiple plugins, custom coded plugins can also be used with NMS
- Should have a good log and database system storing everything happening on the network with ease.
- Should provide a proactive planning feature that helps to know when it's time to upgrade the infrastructure.

11.2 *Technical Specifications of Passive Components*

1. 6 /12 CORE Single Mode Fiber Cable

- 6 / 12 core OS2 (9/125 micron) Single mode, Loose Tube water blocking jelly, two steel wire as strengthening component , Steel tape armouring, outdoor optical Fiber cable
- Outer Jacket HDPE (High Density Polyethylene)
- Strength Members, Two Steel wire
- Armouring - Corrugated Steel tape armouring
- Moisture Protection- Waterproof Tape
- Loose Tube construction Water blocking Jelly
- Loose Tube Diameter 2.3±0.2 mm
- Cable Outer Diameter 8.5±0.5 mm
- Tensile Load 2000 N as per IEC 60794-1-2-E1
- Crush Load 2000 N/100 mm as per IEC 60794-1-2-E3
- Colour Code ANSI/TIA/EIA-598-B
- Max attenuation ≤0.34 dB per km@1310 nm, ≤ 0.20 dB per km@1550nm
- Operating temperature - 20°C to 60°C
- Weight 90±10 kg/km (approx.).
- Standard Compliance ITU-T G.652.D Fiber, ISO/IEC 11801, ISO/IEC24702, ANSI/TIA/EIA 568C.3, IEEE 802.3z Gigabit Ethernet, ROHS compliant Directive 2002/95/EC
- Certification CE

1. 48 CORE Single Mode Fiber Cable

- 48 core OS2 (9/125 micron) Singlemode, Multi-loose tube water blocking jelly, Central FRP strength member as strengthening component, Steel tape armouring, Outdoor optical fiber cable
- Outer Jacket HDPE (High Density Polyethylene)
- Strength Member Central FRP Strength Member
- Armouring Corrugated Steel Tape Armouring

- Moisture Protection Waterproof Tape
- Loose Tube construction Water blocking Jelly
- Loose Tube Diameter 2.0 ± 0.5 mm
- Cable Outer Diameter 10 ± 0.5 mm
- Tensile Load 3000 N as per IEC 60794-1-2-E1
- Crush Load 2000 N/100 mm as per IEC 60794-1-2-E3
- Colour Code ANSI/TIA/EIA-598-B
- Max attenuation ≤ 0.34 dB per km@1310 nm, ≤ 0.20 dB per km@ 1550nm
- Operating temperature - 20°C to 70°C
- Weight 130 ± 10 kg/km (approx.).
- Standard Compliance ITU-T G.652.D Fiber, ISO/IEC 11801, ISO/IEC24702, ANSI/TIA/EIA 568C.3, IEEE 802.3z Gigabit Ethernet, ROHS compliant Directive 2002/95/EC/ CE Certification

2. Rack Mountable SC Type Fiber Patch Panel

- 19" Easy Front Access (EFA) Sliding Rack Mount SC Duplex type
- Material Cold rolled carbon sheet steel with electrostatic spraying
- Size 1U; Upto 24 SC Ports
- Adaptor plate mounting 4 nos. of adaptor plate module can be accommodated
- Environment Temperature - Relative -40 °C to +80 °C
- Intensity ≤ 15 kv(DC) / 1min.no spark-over and no flying arc
- Fibre Bending Radius ≥ 40 mm
- Clamps Cable clamps on the inner surface for fixing cables.
- Splice tray type Fixed type Splice tray to access pigtails available
- Lock Lockable front door on front with push button
- Easy Front Access Sliding patch panel for easy rework and maintenance.
- Standard Compliance EN 61587-1, Equipment - Tests for IEC 60917 and IEC 60297
- Climatic and Environment: EN 61587-1/4.2, IEC60068-2-1, IEC60068-2-2, IEC60068-2-30, Earth Bond: EN61587-1/6.2, Flammability: EN61587-1/6.3, RoHS/ CE Certification

3. SC Singlemode Fibre Adaptor

- SC Singlemode Duplex Adapter
- Sleeves Phosphor Bronze
- Adaptor Material High Impact flame retardant thermoplastic UL94-V0
- Capillary diameter tolerance 126 ± 0.5 μ m (SM)
- Operating Temperature -40 °C to +75 °C
- Mating durability > 500 Mating Cycles
- Insert. Loss/Adaptor 0.2 dB Max. (0.15 dB typ.)
- Pull strength ≥ 98 N

- Standard Compliance IEC 61300-2-18, IEC 61300-2-19, IEC 61300-2-1, IEC 61300-2-2/ CE Certification

4. SC Singlemode 1.5m Fibre Pigtail

- SC Singlemode Pigtail
- Fiber Type Singlemode OS2 as per ITU-T G.652.D
- Tight buffered 900µm
- Jacket Low Smoke Zero Halogen (LSZH)
- Flame Test IEC 60332-1
- Other LSZH standard IEC 60754, IEC 61034
- Crush Load 800 N
- Impact 0.2 Nm
- Bend Radius 50mm (min)
- Length 1.5 meter
- Operating Temperature -40°C to +85°C
- Max attenuation ≤0.34 dB/km @ 1310 nm, ≤0.20 dB/km @ 1550 nm
- Standard Compliance ITU-T G.652.D OS2 Fiber, ISO/IEC 11801, EN50173 -1, ANSI TIA/EIA 568B/CE Certification

5. CAT 6 UTP CABLE

- Unshielded Twisted Pair, Category 6, TIA / EIA 568-C.2 & ISO/IEC 11801
- Conductors 23 AWG solid bare copper
- Insulation High Density Polyethylene
- Jacket FR PVC
- Pair Separator Cross-member (+) fluted Spline
- Operating temperature -10 °C to +65 °C
- Frequency Tested up to Minimum 250 MHz
- Packing Box 305 Meters/Box
- Cable Outer Diameter 6.3 +/- 0.4 mm
- Bend Radius 4 * Cable Diameter
- Impedance 100 Ohms + / - 15 ohms, 1 to 250 MHz
- Mutual Capacitance 5.6 nF MAX /100 Mtr
- Conductor Resistance 73 Ohms Max / KM nominal
- Propagation Delay Skew 35 ns/100 Mtrs. MAX
- Max. Tensile strength 110N
- Standard Compliance ANSI/TIA-568 C.2 category 6, ISO/IEC-11801, Class E/ IEC 61156-5: category 6
- Application IEEE 802.af and IEEE 802.3at for PoE
- Certification UL, CE, ETL, ETL channel tested

6. CAT 6 PATCH Cord

- Cable Conductor Stranded Bare Annealed Copper
- Wire Insulation SFS PE
- Jacket Low Smoke Zero Halogen (LSZH)

- Bend Radius > 23 mm without load
- Flame Test IEC 60332-1
- Gas Emissions testing IEC 60754
- Smoke Density Testing IEC 61034
- Conductor Resistance < 73 Ω /km
- Tensile Strength 96N min
- Durability 1000 Mating Cycles
- Propagation Delay 1-250MHz: < 25 ns/100m
- Current rating 1.0A max
- Insulation resistance 150 M ohm/km
- Voltage rating 72 V DC
- Contact resistance 20 M ohm (max) per contact
- Length 1 meter
- Standards Compliance ANSI/TIA-568-C.2 and ISO/IEC-11801 (2nd Edition), IEC 61156-2, EN 50173; EN 50288-6-2 Category 6 standard
- Application IEEE 802.af, IEEE 802.3at for PoE applications
- Certification CE, UL & ETL Channel tested

7. Patch Panel CAT6 24 Port Unloaded

- Powder Coated Steel
- Ports 24 Port
- Size 483mm X 44.2mm (1U)
- Colour Black
- Mounting Style Tool Less (Module)
- Compatible Compatible with both T568A and T568B wiring options.
- Backward compatible with Category 5e cabling standards
- AWG Support Supports solid 22-24 AWG wires and stranded 24-26 AWG
- Connector Module Holder High Impact, Flame-Retardant Plastic Compound
- Flammability Rating UL 94V-0
- Safety Rating UL1863
- Identification Each port of the panel is numbered and has a designated label area for clear port identification
- Cable Management Rear cable management bar which should act as stress reliever for terminated cables
- Standards Compliance ISO/ IEC 11281:2002, IEC 60603-7
- TIA-968-A (formerly FCC Part 68 Subpart F)
- Application IEEE 802.3an, IEEE 802.3af (PoE), IEEE 802.3at (PoE+)
- Certification UL, CE

8. PATCH CORD FIBER PATCH

- SC-LC Duplex Type Patch Cord, 3 meter
- Fiber Type Singlemode OS2 as per ITU-T G.652.D
- Jacket Low Smoke Zero Halogen (LSZH)
- Flame Test IEC 60332-1

- Other LSZH standard IEC 60754, IEC 61034
- Durability 500 cycles (0.2 dB max increase), 1000mate/demate cycles
- Operating Temp-20 °C to +70°C
- Ferrule Concentricity < 1µm, Other Ferrule Concentricity < 1µm
- Max attenuation ≤0.34 dB/km @ 1310 nm, ≤0.20 dB/km @ 1550 nm
- Insert. Loss/Adaptor 0.2 dB Max. (0.15 dB typ.)
- Pull strength ≥ 98 N
- Standard Compliance Telcordia (formerly Bellcore) GR-326-CORE, IEC 874-1, ANSI/TIA-568-C.3, ISO/IEC 11801 2nd Ed., CENELEC, EN 50173, ITU-T G.652.D , RoHS/ CE Certification

10. I/O Cat 6

- High Impact, Flame-Retardant Plastic Compound/Category 6
- Insertion/Extraction life 750 cycle minimum
- Jack Contact Material 50µ Nickel over gold
- Conductor Compatibility Range 22-26AWG solid cable
- IDC Type Dual (110 Or Krone) Type
- Current rating 1.5A max
- Insulation resistance 500 M ohm (min)@100 Vdc
- Contact Resistance 20 M ohm (max) per contact
- Retention 50N
- Voltage rating 230 V rms max.
- Flammability Rating UL 94V-0
- Safety Rating UL1863
- Colour Coding As Per 568 A/B Standards
- Standards Compliance ANSI/TIA-568-C.2, ISO/IEC-11801, EN50173-2
- Application IEEE 802.af, IEEE 802.3at for PoE applications
- Certification UL, CE

11. RACK

- Rack 12U with 550 MM Width X 400 MM Depth X 350 MM Height.
- Rack Front Door is 4.0 MM Toughened Glass with Lock.
- Rack Sides are perforated & fixed or CKD.
- Mounting Channels are of 1.2 MM Thickness, Fixed.
- Provision of Cable Entry/Exit from Top and Bottom of Rack.
- Rack is wall mount and have light Grey Color
- RAL 7035, Two Fans with lead, One 6 Socket 5 amp PDU with MCB,
- One PVC Cable Manager, One Hardware Packet

12. UPS

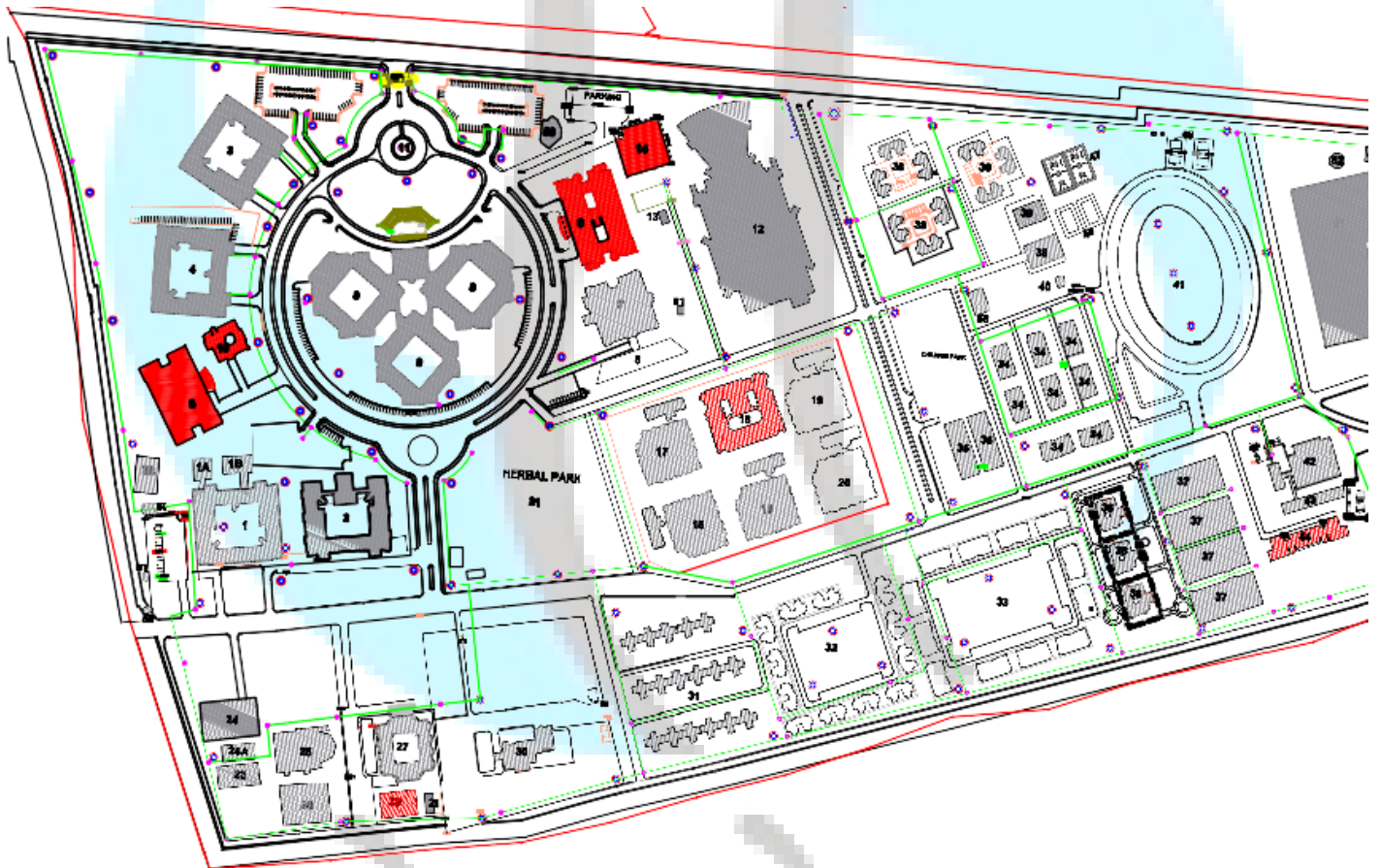
- Rating (in KVA) 1
- Technology MOSFET-PWM
- Inverter Efficiency (%) 60% or better

- Batteries : 2 x Internal 7 AH Battery Backup time (Minutes) on Full Load 15Min
- Target countries and Regions INDIA
- Safety IEC62040-1 1st Edition



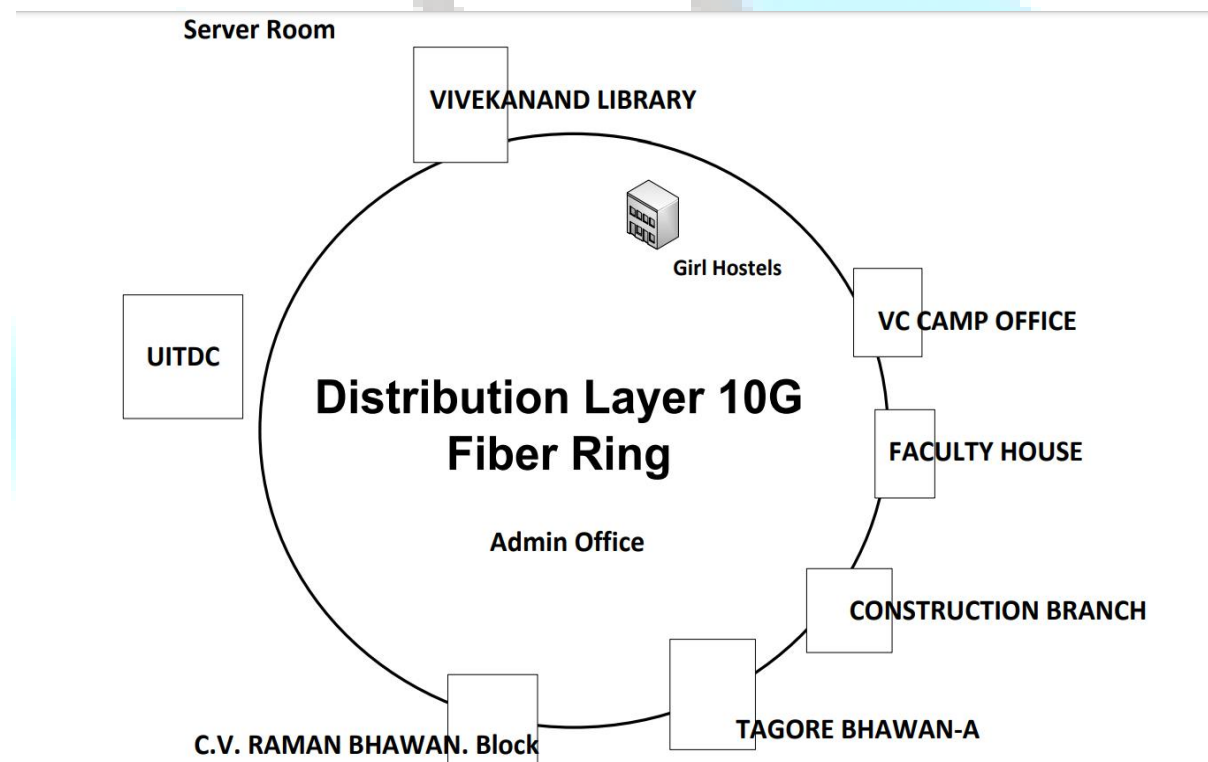
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Optical Fiber Laying Structure

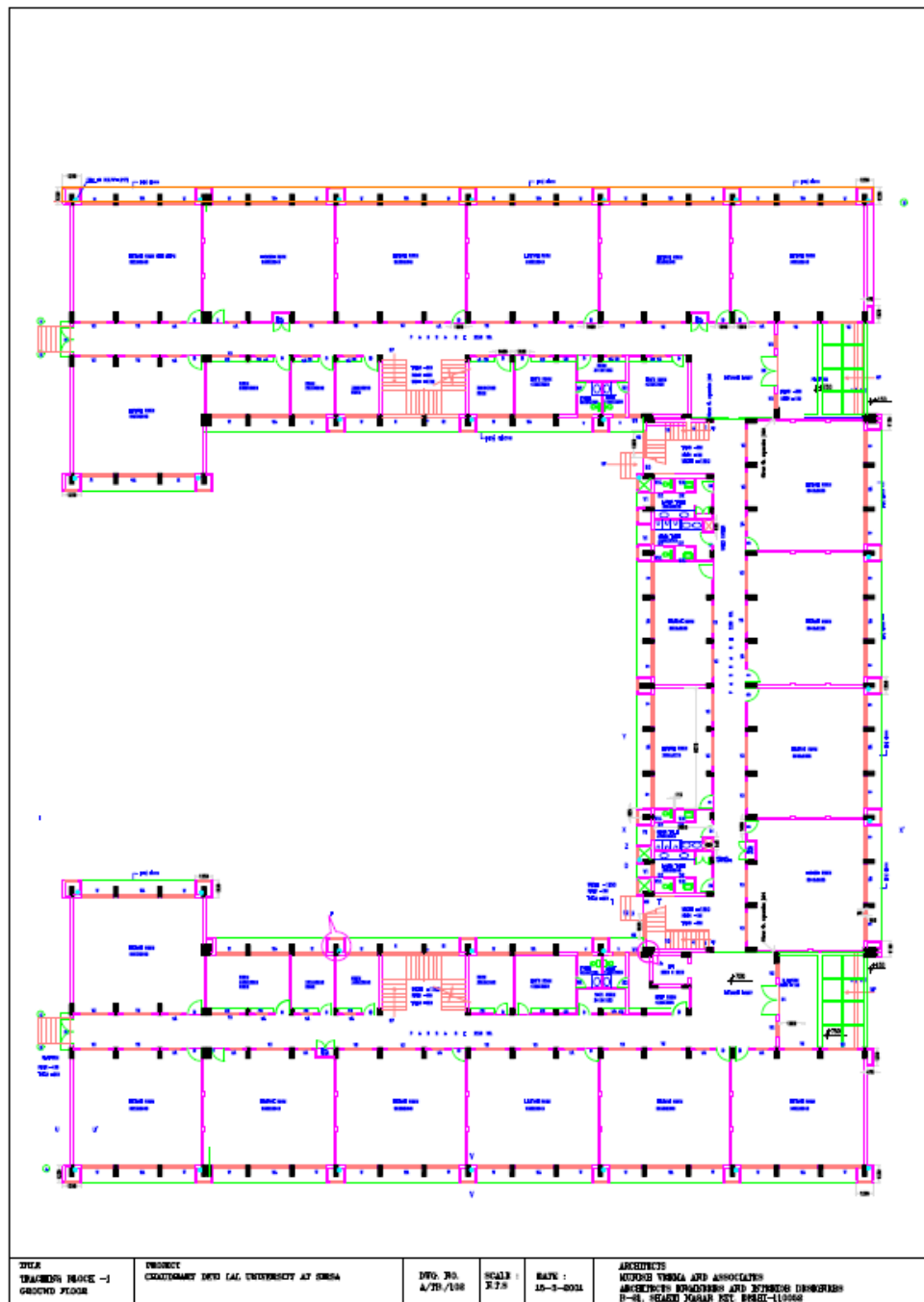


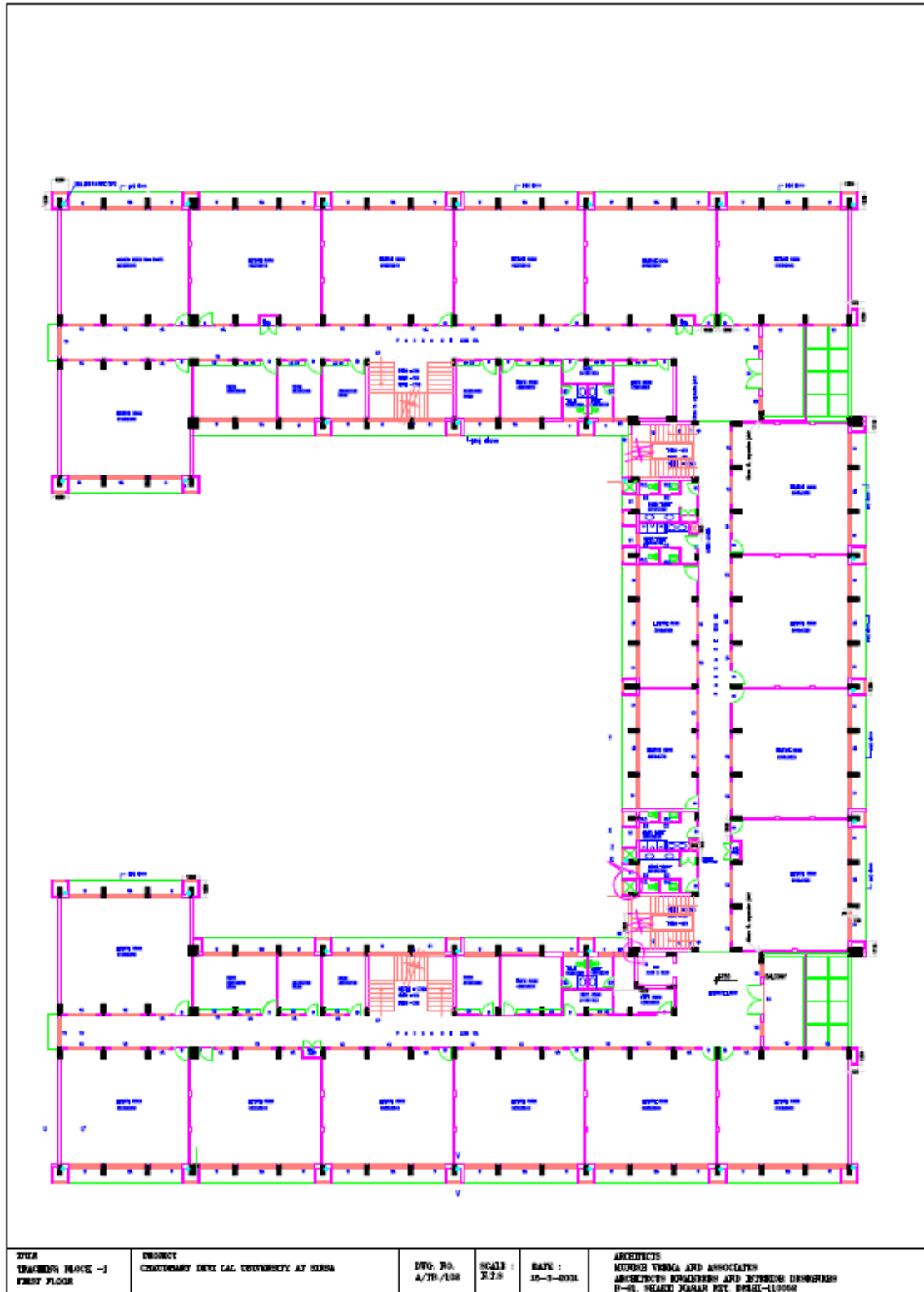
Starting & Termination end of the Optical Fiber will be at New Building of UITDC in such a way that existing Server Room at Second Floor, Vivekananda Building (to be shifted to New Building of UITDC) may also be connected until shifting of existing Server Room to New Building of UITDC.

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1.

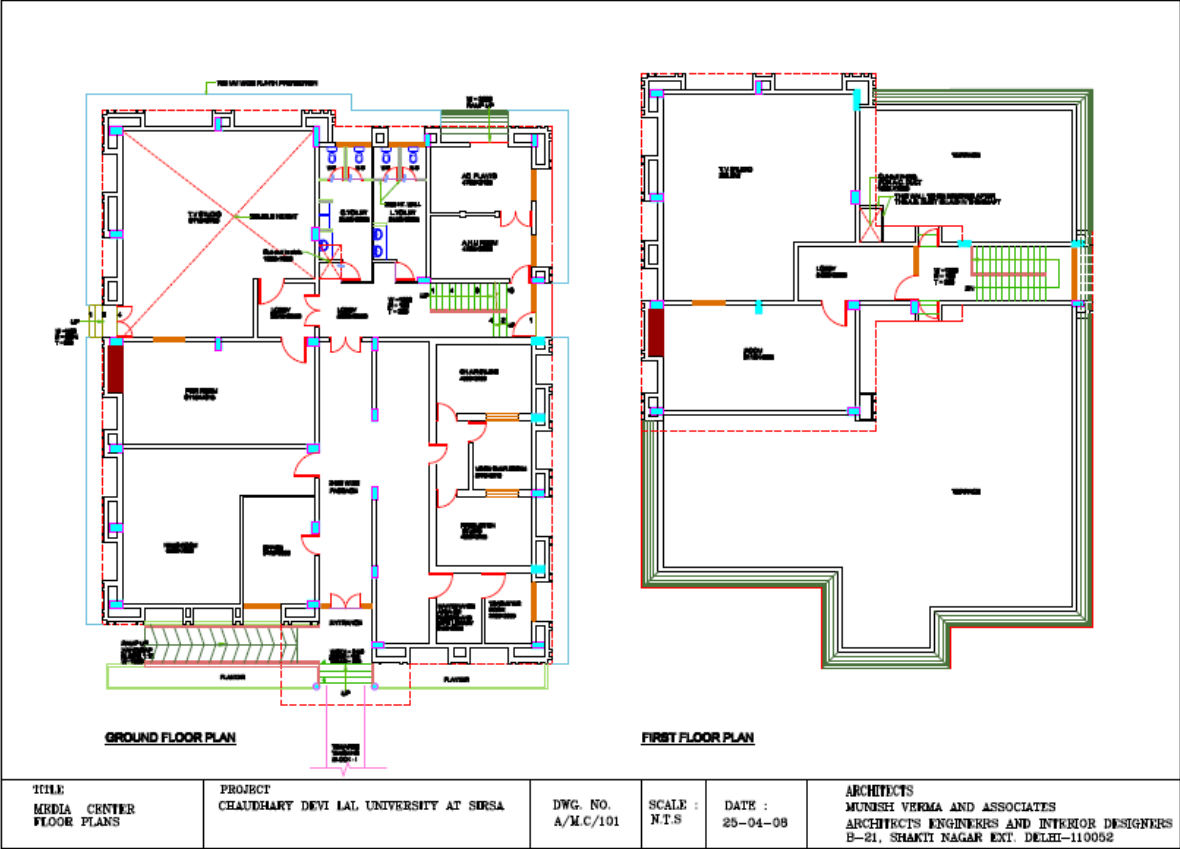
Tagore Bhawan (Ground Floor, Ist Floor , IInd Floor)





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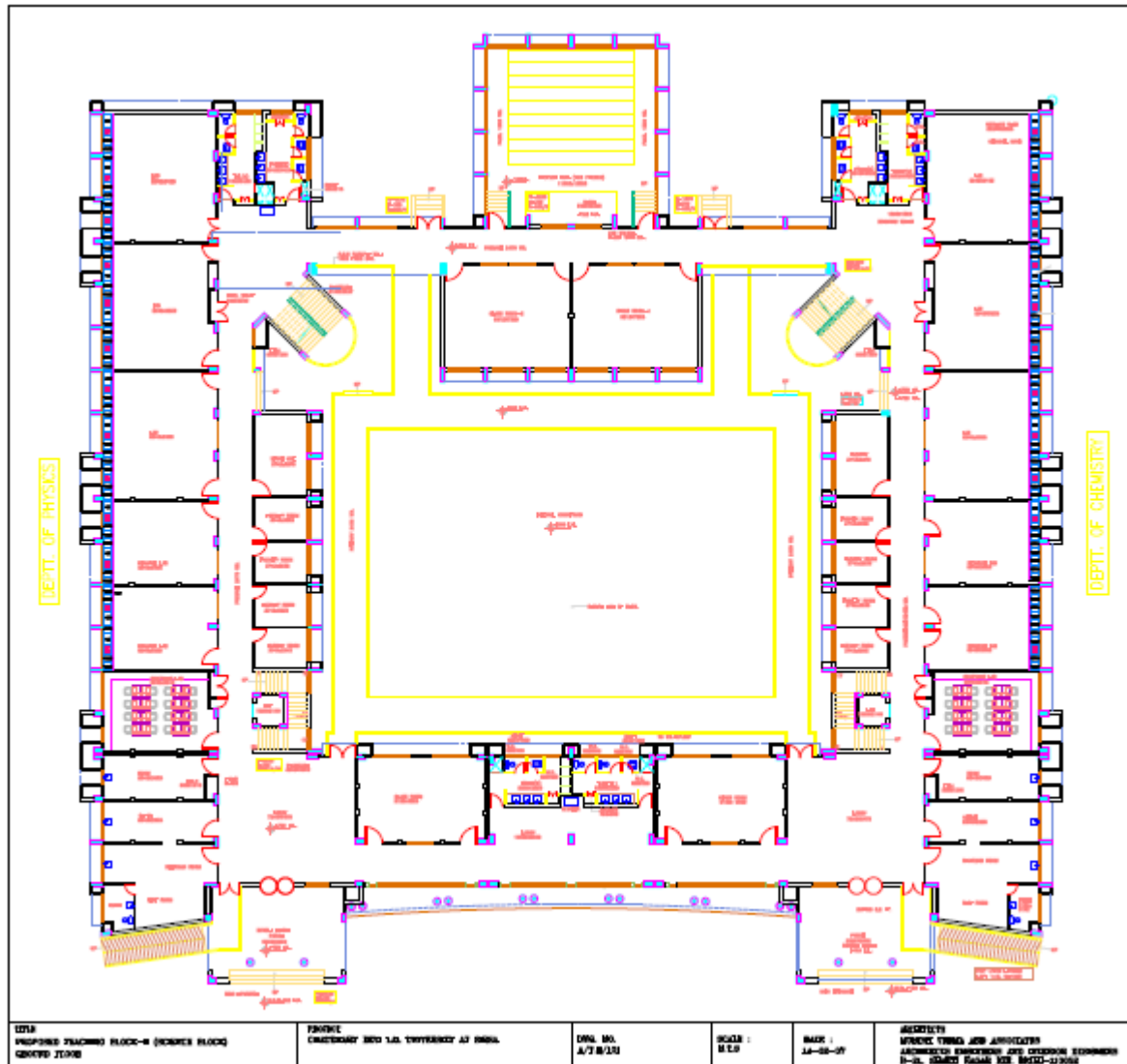
Media Centre (Ground and First Floor)

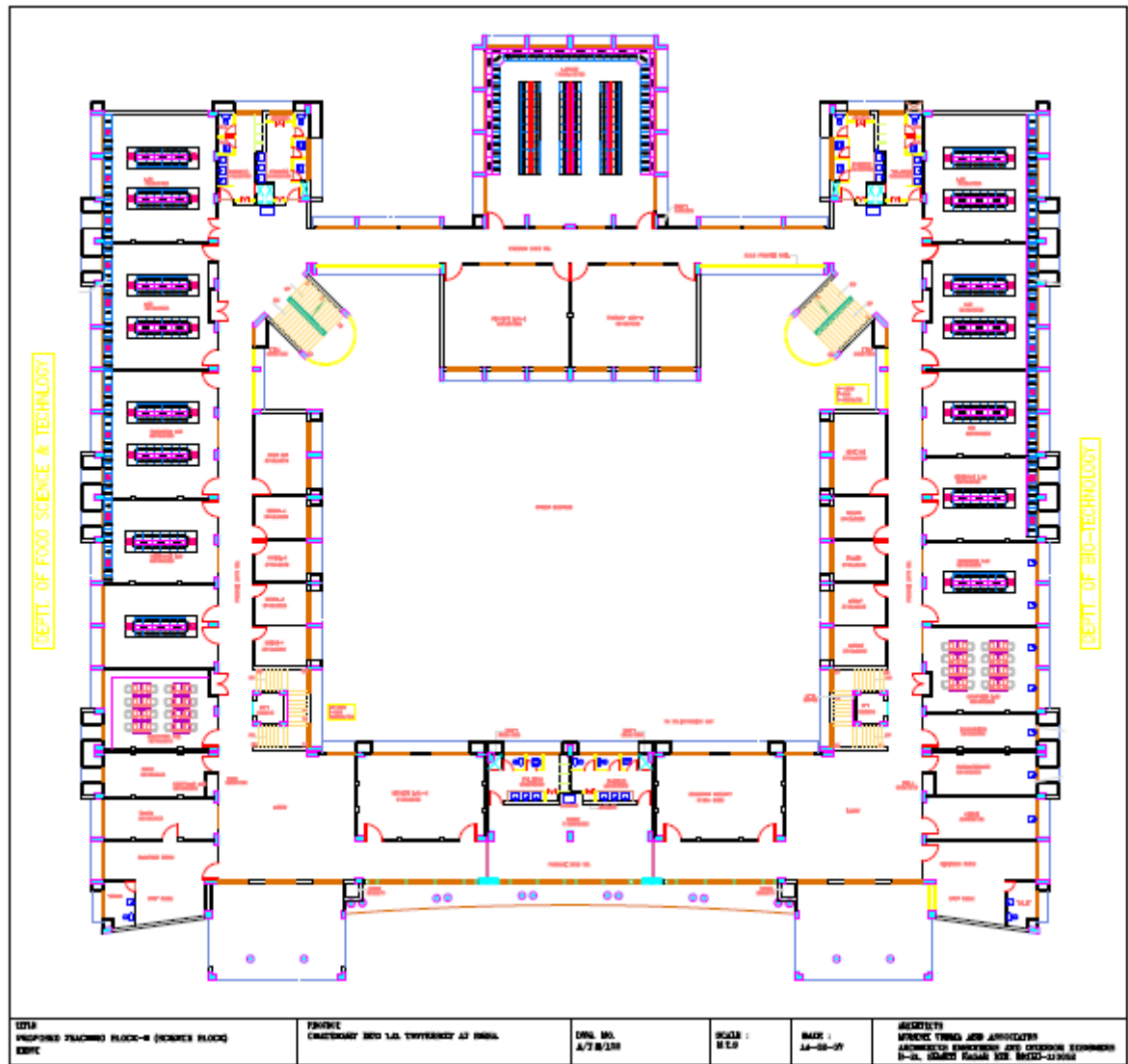


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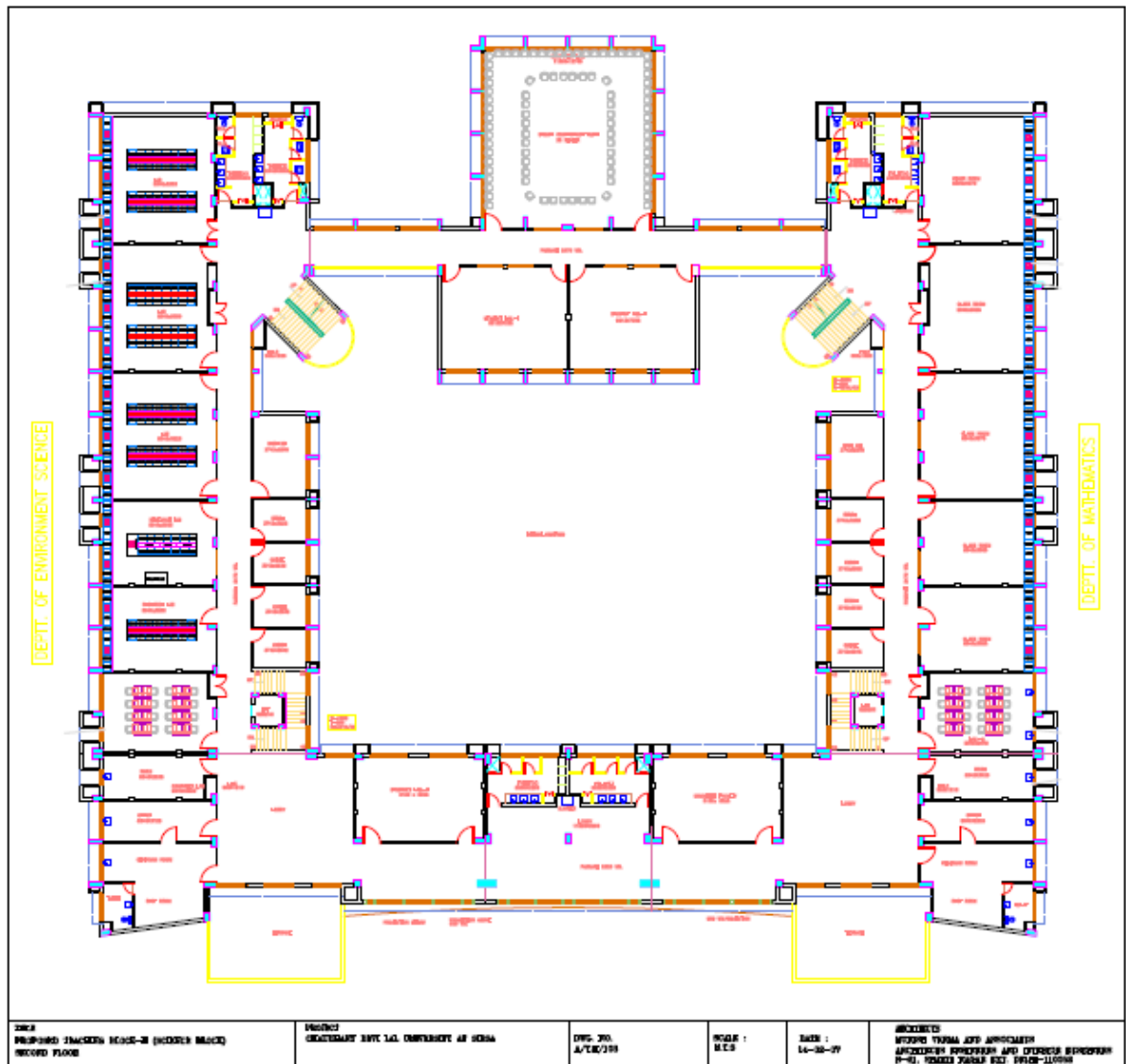
2.

CV RAMAN BHAWAN (Ground ,First and Second Floor)





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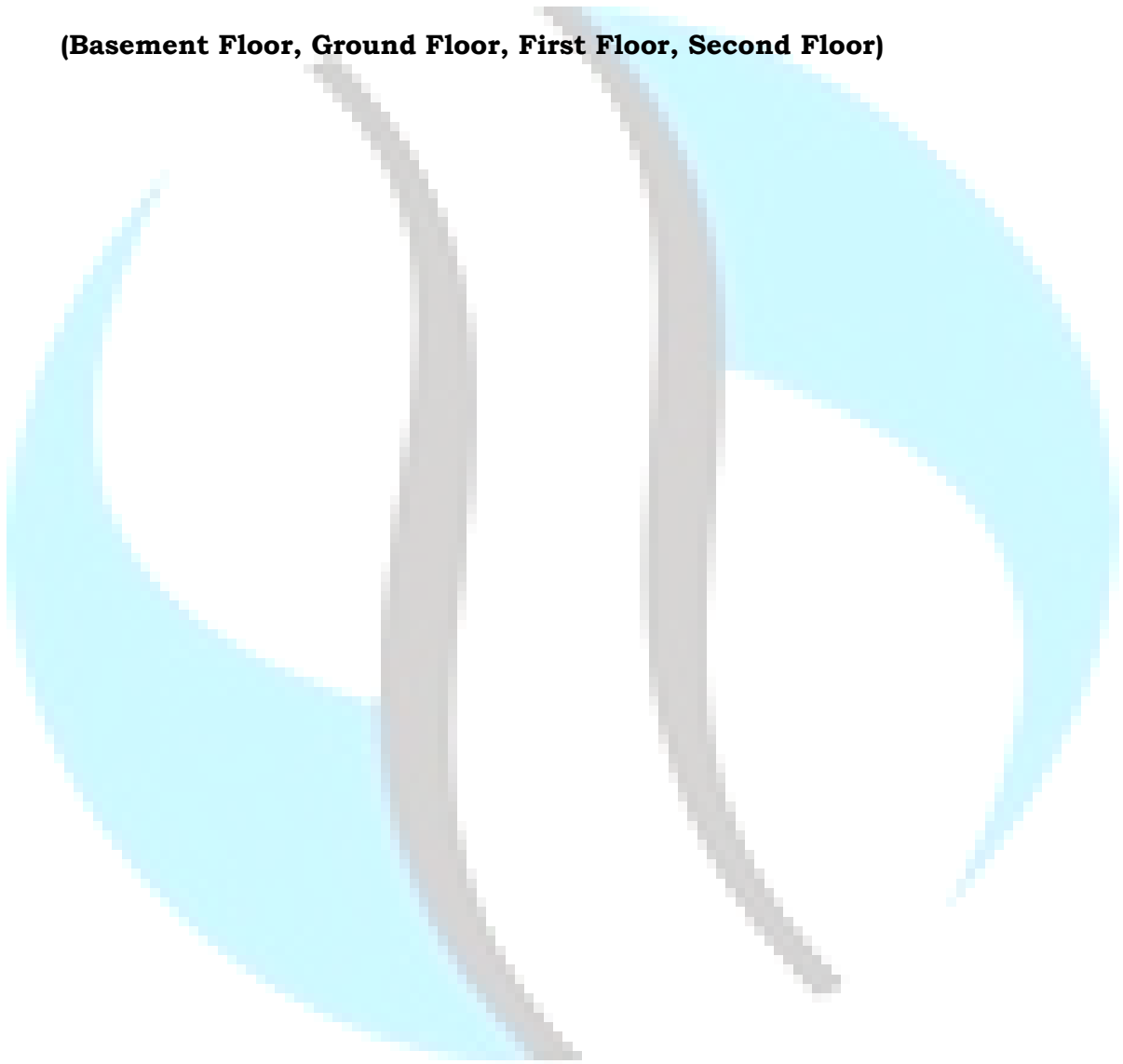


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3.

Vivekananda Library

(Basement Floor, Ground Floor, First Floor, Second Floor)

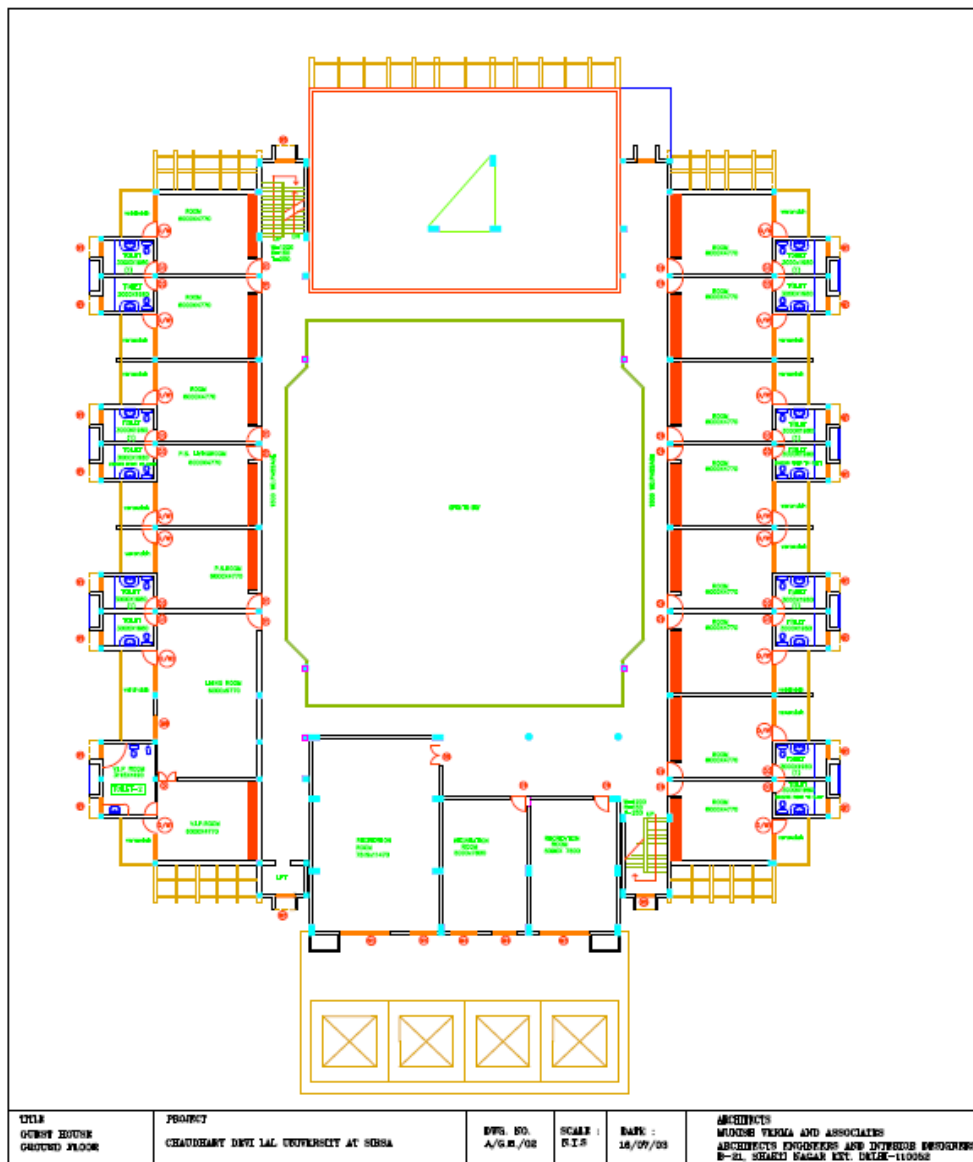


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4.

Faculty House

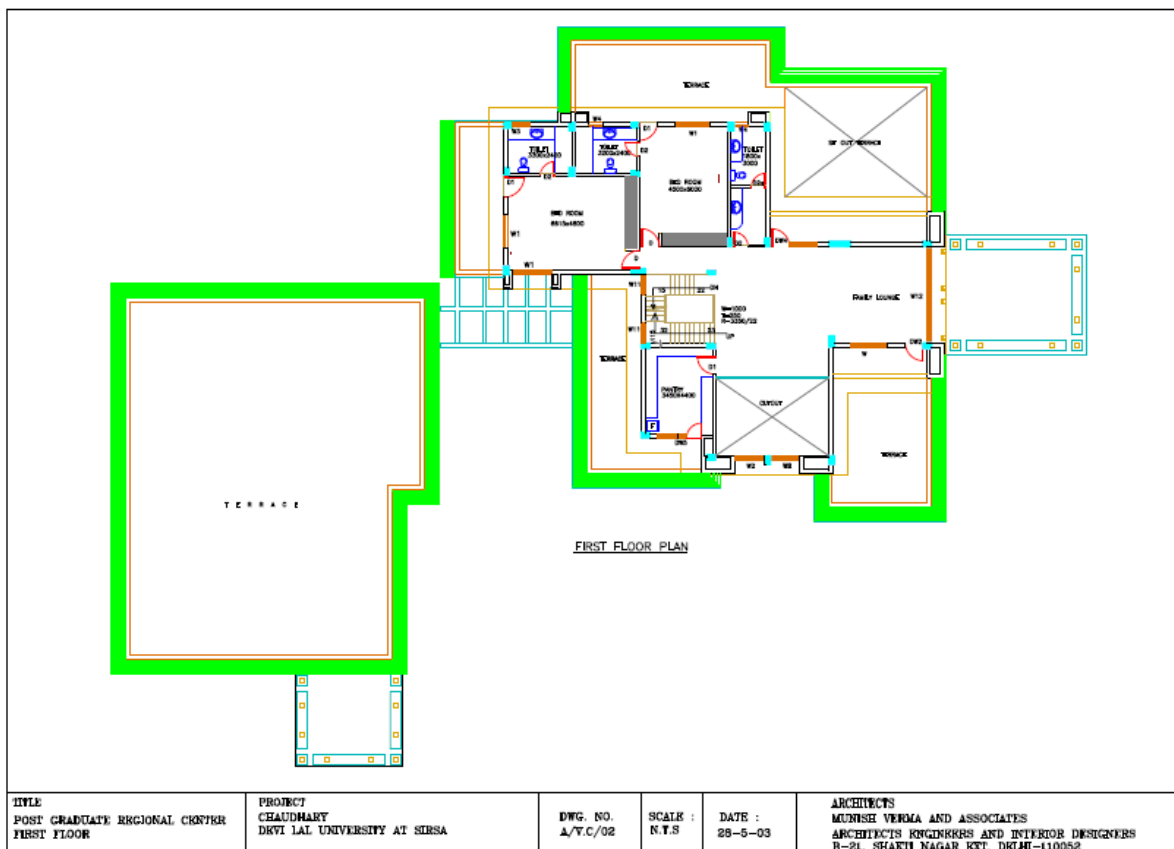
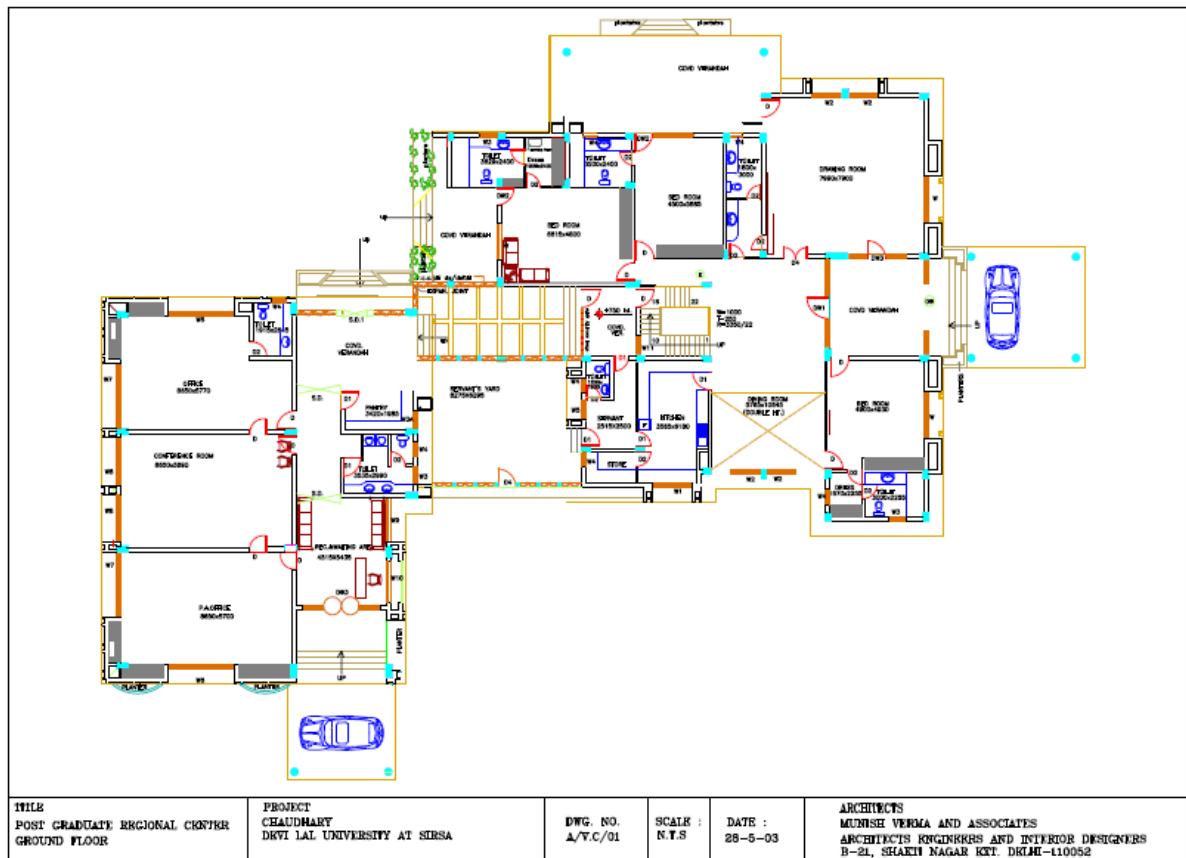
(Ground Floor, First Floor)



5.

VC Camp Office & VC Residence

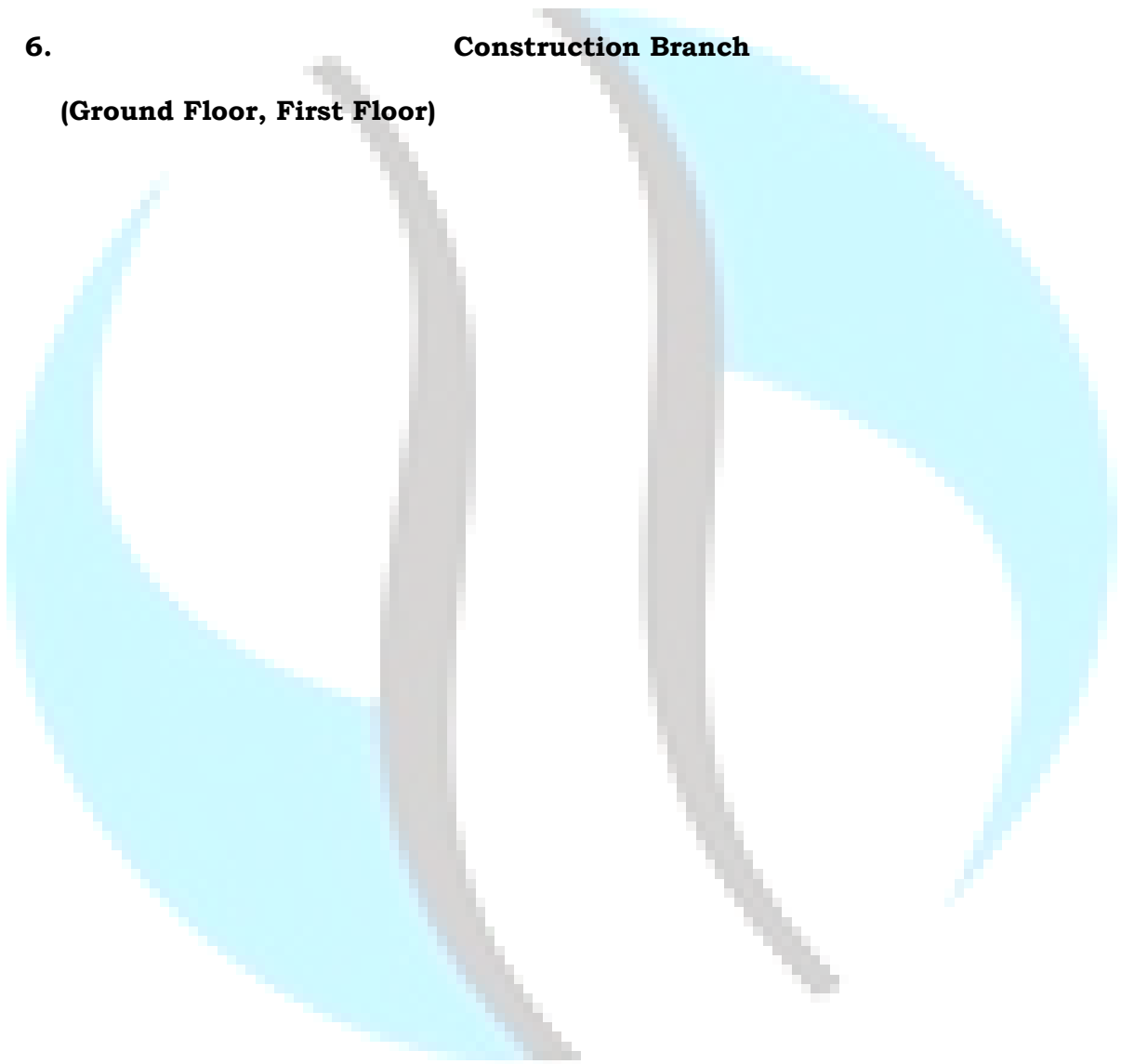
(Ground Floor, First Floor)



6.

Construction Branch

(Ground Floor, First Floor)



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RAILTEL