CRITERION 6	Facilities and Technical Support	Max. Marks: 80 Claimed: 75

6.1 ADEQUATE AND WELL-EQUIPPED LABORATORIES, AND TECHNICAL MANPOWER (37)

The Department of Civil Engineering has well equipped laboratories and technical manpower as shown in Table below:

S. No	Name of laboratory	No of students per batch (Batch size)	Name of important equipment's	Weekly utilization status (all the course for which the lab is utilized	Technical manpower support		
					Name of the technical officer	Designation	Qualification
1	**Fluid mechanics Lab**	35	1. Tilting Flume (S6-Mk II) with Flow meter, Pitot Tube, wear 01 No., Venturi meter 01 No., Sluice Gate 01 No, Automating Lifting and Manual Lifting, Sump Tanks 03 Nos. Dimensions of Flume: Length=7.50 m, Width=30 cm, Depth=45 cm. 2. Metacentric Height Determination Apparatus (Ship Model) with stand. 3. Double Ring Infiltrometer, 05 sets.	12 Hours	Shiraj u din Shiekh	Technical Assistant	Under Matriculation

			4. Darcy Apparatus with manometer. 5. River Flow Simulator 6. Pipe Networks Model 7. Tilting Flume.Dimensions: Length=24 m, width=1 m, depth=60 cm. (Automatic Lifting is not working). 8. Tilting Flume. Dimensions: Length=7.50 m, width=30 cm, depth=30 cm. 9. Tilting Flume with Length=3.50 m. 10. Turbines (Kaplan, Francis). 11. Permeability Apparatus, 03 Nos. 12. Minor Pipe Loss Apparatus. 13. Tilting Flume, width=25 cm, depth=30cm (Hydraulic Jump) with collecting tank (70cm width, 80 cm length cross section)				

			14. Hydraulic Bench of size 180*120*80 cm 15. A set of: a) Impact of Jet apparatus b) Bernoullies Theorm apparatus c) Flow measurement by Venturimeter d) Pitot Static Tube apparatus e) Orifice and Mouth piece apparatus f) Notch apparatus g) Pipe friction apparatus h) Losses in pipe friction apparatus i) Heleshaw apparatus j) Reynolds apparatus k) Free and forced vortices apparatus **2017-2018** Hydraulic Bench and accessories				

			2018-2019 Metacentric Ground water flow unit HSN code 9023 **2019-2020** 1. Nut and Bolts 2. Five Inch Blind Flange 3. M.S. Blind Flange (6”) 4. Making Holes and Finishing of M.S. Blind Flanges 5. Laptop HP 6. Rive Flow simulator 7. Pipe Surge and Water Hammer 8. Fluid Properties and Hydrostatic Bench HD 9. Pipe Network Model HD third 10. Cavitation Demonstration Model – 115				

2	**Structural Engineering Lab**	35	1. Universal Testing Machine-100 Ton Capacity 2. CTM- 100 Ton Capacity, Fully Computerized 3. Electric Hydraulic Jack-200 Ton 4. Actuator-10 Ton 5. Loading Frame-50 Ton 6. Hydraulic Jack manual (100 Ton & 20 Ton) 7. Deflection of Curved beam apparatus 8. Portal Frames. 9. Elastically Coupled beam apparatus. 10. Dial gauges- 6 No. **<u>2017-2018</u>** 1. 200 Ton capacity both manual and electric loading jack with detectable shaped body with flat top chrome plated loading plunge **<u>2018-2019</u>** Nil	12	1.Gulam Nabi Kathu 2.Gulam Rasool Teli 3.Abdul Rasheed Raina	Senior Technical Assistant Technical Assistant Technical Assistant	Under Matriculation Under Matriculation Under Matriculation

			<u>2019-2020</u> 1. Deflection of curved membrane apparatus 2. Portal frame apparatus 3. Deflection of truss apparatus 4. Unsymmetrical Bending apparatus 5. Elastically coupled beam apparatus 6. Redundant joint apparatus 7. 2 Hinged arch apparatus 8. Coloumn buckling load apparatus 9. Maxwell theorem apparatus **<u>2020-2021</u>** Nil				
3	**Concrete Technology Lab**	35	1. Concrete Mixer 2. Table Vibrator 3. Needle Vibrator 4. Vicat Apparatus-4 in no. 5. Weighing Balance	12	1. Gulam Nabi Kathu	Senior Technical Assistant	Under Matriculation

			6. Seives 7. Seive Shaker 8. Cemenrt Cube Vibrator 9. 150mm Cube moulds-20 in no. 10. 10X10X50cm beam moulds-12 in no. 11. Cylinder mould-15cm Diameter and 30cm height-13 in no. 12. Slump cone apparatus. 13. Compaction Factor apparatus. 14. PS 20 Reinforcement Detector. 15. Compression Testing Machine -100 Ton **2017-2018** Nil **2018-2019** Nil **2019-2020** Nil **2020-2021** a) Pycnometer (100ml) b) Glass Jar (1000 ml) c) Glass Jar (500 ml) d) Glass Jar (250 ml)		2.Gulam Rasool Teli 3.Abdul Rasheed Raina	Technical Assistant Technical Assistant	Under Matriculation Under Matriculation

			e) Glass Funnel (100mm diameter) f) Glass Plate (5mm) g) Glass Beaker (100ml) h) Glass Beaker (500 ml) i) Glass Beaker (250 ml) j) Plastic Measuring jar (100ml) k) Plastic Measuring jar (500 ml) l) Plastic Measuring jar (250 ml) m) Plastic Measuring jar (100 ml) n) Wash Bottle (500 ml)				
4	**Pavement Engg. Laboratory**		1. Electronic Balance (Max. 30.0 kg , Precision 2.0g) 2. Counter Weighing Balance (Max. 15kg) 3. Bitumen Thin Film Oven 4. Benkelman Beam	12	Abdul Rashid Sheikh	Technical Assistant	ITI

			5. Falling Weight Deflectometer 6. Viscometer 7. Electronic Digital Top Balance (Max. 1.0 kg, Precision 1.0mg) 8. Universal Bitumen penetrator 9. Laboratory Electric Oven 10. Crushing Value Apparatus 11. Aggregate Impact Value Apparatus 12. Cylindrical Measure for determination of unit weight of aggregates 13. Multipurpose Stirrer 14. Metallic Steel Frame for Buoyancy Balance 15. Bitumen Mix Compaction mould 16. Marshall Stability Test Apparatus 17. Deep Freezer 18. Los Angles Abrasion Testing Equipment 19. Battery Bank with UPS 20. Portable Skid Resistance Friction Tester 21. Binder Extractor, electrically operated				

			22. Sieve Set (Brass) 23. Sieve Set (GI) 24. Tension and Compression Proving Ring (50 kN) 25. Tension and Compression Proving Ring (25 kN) 26. Steel Strain Dial Gauges 27. Bitumen Ductility Testing Machine 28. Axle Load Measurement Plate 29. Dynamic Shear Rheometer 30. Automatic Road Unevenness Bump Integrator 31. Data Analysis Machine (PC) 32. Bitumen Extractor 33. Riffle Sample Divider 34. Brookfield Viscometer 35. Pressure Ageing Vessel 36. C.P.U no. 18KZXC2 3784171394 Mounites no. FEN2Y72 **2017-2018** a) 45/4 C.P.U no. ISGV X C2 3898198658				

			Mounites no. SGN 2Y72 b) 46/1 C.P.U no. ISJV X C2 3903330818 Mounites no. 5YW3172 c) 47/2 C.P.U no. 180YX C2 3772367426 Mounites no. CHNZY72 d) 48/3 C.P.U no. 18CZ3X2 3770734466 Mounites no. 3JN2Y72 e) 42/1 C.P.U no. 18GVX X C2 3777266306 Mounites no. 48X3Y72 f) 43/2 C.P.U no. IRNZX C2 3847996802 Mounites no. 2GN2Y72 g) 44/3 C.P.U no. IPW X C2 3741994370 h) Flash and Fire Point (Open cup)				

			Pensky Martens Apparatus i) Ring & Ball Softening Point j) Electrically operated Hot Plate k) Laboratory Water Bath l) Cast iron spheres for LA Abrasion test m) Buoyancy balance for aggregate specific gravity and water absorption n) Electronic Digital Top Balance (60 kg) o) Electronic Digital Top Balance (Max. 5.0 kg) p) Electronic Digital Top Balance (Max. 10.0 kg) q) Battery Bank with UPS r) Compression Testing Machine (2000 kN) s) Accelerated Aggregate				

			Polishing Machine t) Portable Skid Resistance Tester **2018-2019** 1. Desktop Computer accessories: a) Hp Color Laser printer b) Five HP compressor with drain valve c) Rheometer d) Rhoe compass TM e) Pertise Temperature control device f) AC Anodized g) Inset – PP 08/CV /X h) Inset -PP 25/CV/CX i) Disposable plate D-PP25/SS/57 j) Disposable plate D-PP08/SS/57 k) Silicon Mold for asphalts binder (pp25)				

			l) Silicon Mold for asphalts binder (pp08) m) Dry pursuit air dryer with air filter unit n) Asphalt mixture performance tester o) Universal Testing Machine p) Roller Compactor q) Bitumen Mixture Mixer r) Cutting Machine s) Core Drilling Machine t) Air Compressor u) Drill steady stand for shear mixture v) Electric motor 2 hp speed 2500-4000 rpm w) S.S. Shaft x) Metallic Container **<u>2019-2020</u>** Nil				

			2020-2021 1. Brooke field viscometer 2. Pressure aging vessel				
5	**Environmental Engineering Lab**	30	1. Distillation apparatus 2. Waste testing kit 3. Turbidity meter 4. Tds meter 5. Ph meter 6. Do meter digital. **2017-2018** 1. D.O Meter 2. Distillation Apparatus 3. Water Testing Kit 4. Digital Water Thermometer 5. Turbidity Meter Digital (0-1999ppm) 6. TDS Digital Meter 7. Ph Meter Digital Range (0-4) **2018-2019** Nil	6 hours	Mr. A. M. Mir	Technical assistant	Under Matriculation

			2019-2020 1. Water testing kit Jaltara 2. TDS Meter **2020-2021** 1. Condenser (5ltr) 2. Stand, iron 3. Autocut and autodevice 4. Receiving tube 5. Rubbing tubing				
6	**CAD Lab**	35	1. 46 PCs Software's 2. Autocad 2017 3. MATLAB 4. Optum G2 5. GEO Suite 6. Battery Amaron Quanta 22 AH/12V smf **2017-2018** 1. UPS 1 KV Microtek 2. Software for Geotechnical Engineering Plaxis 3D 3. Samsung printer 4. UPS Microtek 16 CUFHD- 167820	12	Ashok Kumar Pandit	Technical Assistant	Matriculation

			5. Desktop HP 202 inch for Geotechnical computational lab **2018-2019** 1. RAM 4 Gb, Samsung, Dell 2. HP Printer 5810 for HOD **2019-2020** 1. Software for Geotech computational lab Surfer V.16, Grapher version 13, geo-5 package of 10 networks, sofistick software 2. Printer Epson L6190 **2020-2021** Nil				
7	**Traffic Engg. Lab**	35	1. Traffic Network and Isolated Intersection Study Tool- 2. Palm Top GPS set 3. Traffic Recording Camera 4. Traffic Recording Visual Display Unit 5. Speed Gun	12	Abdul Rashid Sheikh	Technical Assistant	Matriculation ITI

			6. Traffic Volume Count Pads **<u>2017-2018</u>** 1. Speed gun for vehicle speed 2. Driver Testing Equipment 3. Scientific Data Analysis and Graphing Software - Sigma Plot 12.5 4. TRANSYT(Software) function 5. Traffic Data Analysis Machines (PCs) 6. LCD Projector 7. Battery bank with UPS 8. Traffic Volume count pads 9. Stop Watches 10. Reflective Safety Jackets 11. Automatic Pneumatic Loop Based Traffic Counter				

			2018-2019 Video Camera/Memory card **2019-2020** 1. Sound level Meter Accessories 2. Noise Dosimeter accessories 3. EMME4.4.2 software 4. DYNAMEQ Software **2020-2021** 1. Gas Analyser (EPM1601) G0744 along with software for data analysis 2. Sound Plan noise professional package Software				
8	**Survey Lab**	35	1. Alidade 2. Alidade telescopic 3. Binoculars 4. Barometer Anoride 5. Prismatic Compass 6. Chains	12 hours/week	1. Mohd. Maqbool Rather	Technical assistant	Below matriculation

			7. Chain pin 8. Survey Compass 9. Ghat tracer 10. Abney level 11. Level spirit 12. Goneometers 13. Mallets 14. Plumbing fork 15. Planimeter 16. Protector 17. Sextant 18. Level staff 19. Tents 20. Total Stations (TOP CON) 21. Level Nikkon 22. Dumpy level 23. Auto level 24. Prismatic compass 25. Theodolite 26. Computer Dell **2017-2018** Nil **2018-2019** Automatic Level **2019-2020** Nil				

			2020-2021				
9	**Geotechnical Engg. Lab**	35	1. Loading Frame with Proving rings 100kN, 50kN, 10kN, 5kN, 4kN, and 2kN 2. Digital Motor Sieve Shaker 3. Labotronics pH Meter 4. Direct Shear Test 5. Large Scale DST 6. Digital DST with DAS 7. Digital LL Penetrometer 8. Motorized LL Device 9. Mechanical Loading Frame 10. Screw Type Loading Frame 11. Oedometer (1D-C) 12. Permeability Test Apparatus 13. SPT with Accessories 14. Lab. Vane Shear Apparatus 15. Field Vane Shear Apparatus 16. Hydrometer Shaker 17. Standard Cone Penetrometer 18. Electric Resistivity Apparatus 19. Hot Air Oven 20. Rapid Moisture Meter	12 hours/week	1.Md. Ismail 2. Ad. Aziz	Senior technical assistant Technical Assistant	I.T.I Below matriculation

			21. Infrared Moisture Meter 22. Air Compressor 23. Static Plate Load Test Apparatus with all Accessories 24. All in one Seismic and Vibration Digital Recorder with software along with MOHO Trigger 25. Lab Weighing (Digital/ electronic) Scale balance **2017-2018** 1. MASW- Multi Channel Analysis of Surface Waves **2018-2019** 1. Slurry Mixer with Mould and other accessories 2. Stainless steel slurry mould and leading frame for consolidation 3. Automatic Volume change device 4. Triaxial conversion kit 5. Hand pallet truck 2.5 ton capacity				

			2019-2020 1. Fabrication of double acting motorized electric operated compressor 2. TML Earth soil pressure guage 3. Digital dial guage 4. Analogue dial guage 5. Standard test sieves 6. Automatic volume change device 7. Automatic Triaxial System **2020-2021** 1. Moho trigger 2. TROMINO-BLU 3. Water Jacket Assembly (Shear Box 30”x30”) 4. Base plate, Porous Stone, Temperature control bath-freezer, etc 5. Temperature Controlled Chamber 6. Pipe connections				

			7. Xeroz MFD -2020 daf, 20 ppm 8. De-aired water system 9. Automatic Triaxial System as per IS 2720				
10	**Engineering Geology lab**	35	1. Weighing balance **<u>2017-2018</u>** Nil **<u>2018-2019</u>** Nil **<u>2019-2020</u>** 1. Nikon DSLR D7 200 Camera 2. Epson M205 printer 3. C11CD07501 4. Research Polarizing microscope 5. Proton Procession magnetometer 6. Global Positioning System (Juno SA) 7. Geological Backpack (Brunton Compass,	12 hours/week	1. Mohd. Ismail	Sr. Technical Assistant	ITI

			Hammer, magnifying lens, scrubber, etching pen, measuring tape, bag) **<u>2020-2021</u>** 8. Direct Shear Outfit Electronic Complete with Star DAQ system 201390 9. Cylindrical Core cutter, rammer, dolly, shear box assembly, Compression Tension proving Ring with pads 10. Canon PIXMA G5070 11. Garmin Etrex 32 X 12. Garmin Etrex 20X 13. Brunton Compass Truarac 20K 14. Voltas Becko Refrigerator 250 L 15. Hot Air oven 16. Xerox Versalink C7020 17. Power Generator 18. HP Workstation Intel Xeon 16 GB				

Table B.6.1a

Additional facilities created for improving the quality of learning experience in laboratories

S. No	Facility Name	Details	Reason(s) for Creating Facility	Utilization	Area in which students are expected to have enhanced learning	Relevance to Pos/PSOs
1.	**Additional Equipments**	1. Cube mould 100mm 2. Lateral Extensometer 3. Rebound Hammer 4. Load cells 5. Cellular concrete mixer and foam generator. 6. MR Dampers 7. Small electrical concrete mixer. 8. Acid curing tanks 9. Brick moulds – 5.	1. Student project 2. Faculty research 2. Research Students	1. Student project 2. Faculty research 3. Research Students	Acquire knowledge beyond curriculum	Helps in speedy and effective attainment
2.	**Wi-Fi**		Wireless access of internet	Can access Wi-Fi anywhere in the campus 24 x 7	For knowledge sharing	
3.	**Hitech Rooms**	With Projectors, Cameras, ACs, LED TVs	For conducting Seminars, Guest lectures	Students and staff	For sharing knowledge	
4.	**Committee Room**	With Projectors, Cameras, ACs, LED TV	For conducting Seminars,	Students and staff	For sharing knowledge	
5.	**White Boards**	All labs are equipped	with white board	For explaining	experiments	
6.	**Generator**	Generator in the campus	Power failure	Power failure	Acquire knowledge without interruption	
7.	**Cabins for research scholars**	Cabins, PCs, Net facility	All labs are provided with cabins for research scholars in their respective field.	Research Scholars	Study and Research	

Table B.6.1b

6.2 LABORATORIES: MAINTENANCE AND OVERALL AMBIANCE (10/10)

General

- Students are allowed to use all labs at all time.
- White boards are made available in all labs.
- Extra lab hours are provided for students if required.
- Sufficient labs are present in department as per curriculum requirements.
- All the labs are equipped with good technical support staff available during working hours and beyond (as and when required by the students or faculty).

Computer lab

- CADD lab in the department is well equipped with sufficient number of PCs with internet connectivity.
- This lab is provided with un-interrupted power supply (UPS).
- Each student can use single PC for their lab work assigned /Project purpose.
- Labs are equipped with sufficient licensed software to run program specific curriculum.

Other laboratories

- All labs have ample working space for all lab works.
- All labs are well ventilated and well lit.
- Calibration, servicing and cleaning of equipments are done regularly.

All the labs are under the charge of specific faculty members and are maintained in good and working condition. Any funds required for maintenance are provided by the institute on submitting of an application by the I/C faculty member/s.

Ambiance

1.Survey Lab

The lab has different types of equipment stored in different sections and in a well-organized manner. The equipment is categorized into conventional and state-of-the-art types.

2. Computer Lab

A well-equipped computer lab with sufficient number of computers makes student easy in learning all software's. This lab consists of software's like CAD, STAAD pro, and Surferetc. which are helpful for structural design.

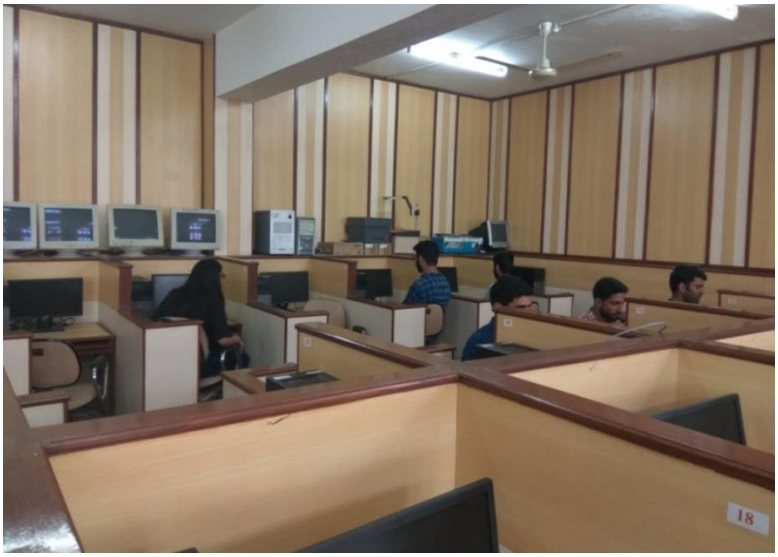

Figure B.6.2a

3. Geotechnical Engineering Lab

Geotechnical engineering lab is well equipped with latest equipments for determination of soil properties, and almost each equipment is more than two in number. This lab is used for research and consultancy purpose also.

Figure B.6.2b

4. Pavement Engineering Lab

Pavement Engineering Lab is well equipped with the facilities like testing and design of bitumen and bituminous mixes, aggregates and other materials. This is also equipped with various types of equipment required for field studies of pavements. This lab is also used for PG and research purpose. This lab is also equipped with state of the art equipment.

Figure B.6.2c

5. Fluid Mechanics Lab

Fluid mechanics lab is equipped with advanced equipments which can be used for research purpose also along with UG level. This lab is also used for consultancy purposes.

Figure B.6.2d

6. Structural Analysis Lab

Structural Analysis lab is sufficiently equipped with the experiments required for UG level students.

Figure B.6.2e

6.3 SAFETY MEASURES IN LABORATORIES (10)

Many safety measures are in place in the laboratories of the department. Students too have to strictly follow some of the safety measures during lab hours. Below are safety measures provided in the labs: Same safety measures are adopted in other labs.

SL. No.	Name of the Laboratory	Safety measures
1	**Transportation Engineering Laboratory**	1.Fire safety (fire extinguisher) 2. Safety Jackets 3. First Aid Box 4. Additional MCB for each equipment 5. Lightning Arrest 6. Working Gloves
2	**Geotechnical Engineering Laboratory**	1.Fire safety (fire extinguisher) 2. First Aid Box 3. Additional MCB for each equipment 4. Lightning Arrest
3	**Survey Lab**	1.Fire safety (fire extinguisher) 2. First Aid Box 3. Additional MCB for each equipment 4. Lightning Arrest
4	**Strength of materials lab**	1.Fire safety (fire extinguisher) 2. First Aid Box 3. Additional MCB for each equipment 4. Lightning Arrest
5	**Environmental Engineering Laboratory**	1.Fire safety (fire extinguisher) 2. First Aid Box 3. Additional MCB for each equipment 4. Lightning Arrest

6	**Concrete Technology Lab**	1.Fire safety (fire extinguisher) 2. First Aid Box 3. Additional MCB for each equipment 4. Lightning Arrest
7	**Fluid Mechanics lab**	1.Fire safety (fire extinguisher) 2. First Aid Box 3. Additional MCB for each equipment 4. Lightning Arrest

Table B.6.3

6.4 PROJECT LABORATORY/FACILITIES (18)

All the laboratories are well equipped with equipment for conducting B.Tech Projects. The Labs have all the necessary equipment including the equipment required for field studies. Both analytical and experimental tools are available. For example those students who are doing their project work in the area of Pavement Engineering or Traffic Engineering have all the Pavement material characterization equipment available in the lab besides equipment required for design of Bituminous, WMM, WBM mixes. Also, softwares for the analysis of data and field equipment like Benkelman Beam, Light FWD, Bump Integrator, Weighing Axle Load Plate, Traffic Recording Camera, Speed Gun, Count Pads, Stop Watches, Automatic Pneumatic Loop Based Counter, Reflective Safety Jackets etc. are available for project work of students. Many of the facilities available for project work of students are shown in Table 1 and Table 2 above.

Any funding required for fabrication of equipment, purchase of equipment, purchase of material, with regard to the project work of the students, is readily provided by the NIT Srinagar administration on submission of an application by the students through their supervisors/ guides. There is a separate dedicated account-head for project work of the students. There are also some centralized facilities available in the institute where the students can do a part of their project work, if required, like Central Research Facility Lab where advanced equipment like XRD, SEM etc. are installed. The facilities available in other departments are also utilized and there is no restriction for that. A student doing project work in some area of Civil Engineering can use any lab in the department where the facility required for his/ her project work is available. This allows optimum utilization of the facilities.