

**DEPARTMENT OF CIVIL ENGINEERING  
NATIONAL INSTITUTE OF TECHNOLOGY: TIRUCHIRAPPALLI - 620 015**

**DATE: 07.01.2014**

**Tender Notification No.: NITT/ F. No.: RES 005/ PLAN 2013-14/CIV dt: 27.12.2013**

With reference to the above tender notification and the pre-bid conference held on 07.01.2014 at 10.30 AM in the conference room of Civil Engineering Department, the following amendments are made. All other terms and conditions mentioned in the tender document remains same.

**Specification for Atomic Absorption Spectrophotometer (Graphite Furnace)**

Original tender specification	Amended specification
1. Model : Bench Top 2. Lamp mount : <ul style="list-style-type: none"> <li>• Minimum six or more lamps with facility to accommodate high efficiency/energy lamps with built in power supplies.</li> <li>• Lamp selection, alignments and operating current should be software controlled.</li> </ul> 3. System: <ul style="list-style-type: none"> <li>• Incorporate preferably a true double beam flame spectrometer</li> <li>• The sample and reference beams are measured simultaneously for enhanced precision and detection limits</li> <li>• Zeeman Graphite furnace atomizer in an integrated manner</li> </ul>	<b>No Amendment</b>
4. Monochromator : <ul style="list-style-type: none"> <li>• For automatic wavelength selection</li> <li>• Holographic grating with minimum of 1800 lines/mm</li> <li>• Wavelength range 195-850 nm</li> </ul>	4. Monochromator : <ul style="list-style-type: none"> <li>• For automatic wavelength selection</li> <li>• Holographic grating with minimum of 1800 lines/mm or better</li> <li>• Wavelength range 195-850 nm</li> </ul>
5. Automatic slit width: 0.2, 0.7 and 2.0 nm is preferred 6. Detectors: <ul style="list-style-type: none"> <li>• Segmented Solid State or Photomultiplier</li> <li>• Wavelength length 195-850 nm</li> </ul> 7. Background Correction: <ul style="list-style-type: none"> <li>• High speed deuterium background correction for flame operation and Longitudinal Zeeman-effect background correction</li> <li>• The magnet is automatically switched on during the atomization step</li> </ul> 8. Lamps:	<b>No Amendment</b>

- Wireless Coded Hollow Cathode Single element lamps for the elements viz. Na, K, Ca, Mg, Cr, Mn, Fe, Ni, Cu, Zn, Cd, Al, Si, P, Co
- High Efficiency lamps of single element for Pb, Hg, As.
- Suitable standards for all the elements need to be quote.
- Detection limits with best possible instrument configurations should specify for the above elements

9. Flame Atomizer:

- Software controlled oxidant and fuel monitoring
- Remote ignition of flame and safe switching between fuel gases
- Gas control must be programmable through software for every element in flame mode.
- Safety interlocking for burner, drain and gases
- Software controlled automatic alignment of flame in the light beam
- Inert spray chamber and corrosion resistant nebulizer
- Single slot titanium burner heads of 10 length suitable for air/acetylene and 5cm length for nitrous oxide

10. Graphite Furnace Atomizer:

- Fully computer controlled
- Uniform heating of Graphite Tube for better and consistent results
- Transversely Heated Graphite Atomizer with built in integrated platform for all the elements
- Temperature programme: ambient to 2300°C in a step of 10°C or better, minimum 12 programme
- Variable gas flow for furnace for low minimum consumption
- an external protective gas stream around the graphite tube prevents the entrance of outside air to maximize tube life
- An internal purge gas goes through the graphite tube to remove the volatilized matrix vapors during and thermal pretreatment
- The two gas streams are computer controlled independently
- Pneumatically operated software controlled furnace opening and closing
- Argon as inert gas with minimum gas consumption
- Imported Self-priming water recirculation cooling systems
- Furnace auto sampler with minimum 50 samples, references and pipette wars containers

**No Amendment**

<ul style="list-style-type: none"> <li>• Control of auto sampler through spectrometer software</li> <li>• Sample and Reagent with Wide Volume, Selectable in increments of 1 <math>\mu</math>l</li> </ul> <p>11. Furnace Viewing Color Camera:</p> <ul style="list-style-type: none"> <li>• For taking images of the events taking place inside the graphite furnace cuvette for easy sample viewing, optimization and method development.</li> </ul> <p>12. Software/System:</p> <ul style="list-style-type: none"> <li>• Licensed control, application, data management and complete quality control software package, compatible with windows 7 operating system with their respective license keys.</li> <li>• Branded desktop computer preloaded with latest operating system and AAS control/application software and laser printer.</li> </ul> <p>13. Accessories:</p> <ul style="list-style-type: none"> <li>• Suitable Imported air compressor for AAS</li> <li>• Fully automated continuous Flow Injection system for mercury and hydride-forming elements. (Should be coupled with Flame and Furnace technique to achieve the lowest possible detection limit) Elements Detection limit like As - 0.005ppb, Se – 0.005ppb and Bi – 0.006ppb.</li> <li>• Two numbers of Cylinders (with safety certificate) for all the required gases along with suitable two stage regulators, wall mountable filters and brackets and tubing for installation</li> <li>• Required exhaust/fume hood system for AAs – Supply and Installation.</li> <li>• Required tubing, connecting cables and fittings for installation and commissioning of AAS and accessories</li> </ul> <p>14. Warranty: Minimum 2 Years</p>	<p><b>No Amendment</b></p>
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