

TENDER FOR PURCHASE OF LICENSES OF FINITE ELEMENT ANALYSIS PROGRAM

SPECIFICATIONS

1. OVERVIEW

- 1.1. These specifications identify the minimum requirements for the Licenses of two Finite Element Analysis Programs intended to be procured.
- 1.2. Other components, not identified or specified, which are necessary for the system to meet required functionality are understood to be proposed and provided by vendor.
- 1.3. The vendor has to state clearly those aspects of the products that are not compliant to specifications listed hereunder.
- 1.4. In the financial bid, costs of all the components have to be provided separately.
- 1.5. Only bids from vendors who have provided comparable solutions and have well-established technical training and assistance services will be considered.
- 1.6. The technical proposal should contain the following and should be placed in a separate envelope, and should not contain any financial information:
 - 1.6.1. Background of the company and the service offered in India for installation, maintenance and repair.
 - 1.6.2. Duly-filled checklist for the technical specifications.
 - 1.6.3. Details of comparable software solutions supplied by the vendor in India, with contact details for possible verification and inspection.
 - 1.6.4. Details of technical assistance and/or training that can be provided.

1. Five (5) User Licenses of ANSYS Academic Research Mechanical and CFD: Version 15.0

- 1.1. **The License type** should be:
 - 1.1.1. Network License
 - 1.1.2. Perpetual License; and
 - 1.1.3. With Unlimited Nodes.

1.2. The software should contain the following **MODULES**:

- 1.2.1. **ANSYS Multiphysics**: A general purpose FEA tool with the following capabilities;
 - 1.2.1.1. Structural
 - 1.2.1.2. Thermal
 - 1.2.1.3. Fluid
 - 1.2.1.4. Electrical
 - 1.2.1.5. Electrical Magnetics - Low Frequency
 - 1.2.1.6. Coupled Field Analysis
- 1.2.2. **ANSYS CFX**: CFD analysis software that uses a FE based Control Volume Formulation.
- 1.2.3. **ANSYS FLUENT**: CFD solver based on Finite Volume Method;
 - 1.2.3.1. Including advanced modules of Population Balance and NOX.
- 1.2.4. **ANSYS ICEM CFD**: Universal Pre- and Post-Processor with Advanced Mesh Generation Tool

- 1.2.5. **ANSYS® AUTODYN®:** Explicit analysis tool for modeling Non-linear Dynamics of solids, fluids and gases as well as their interaction.
- 1.2.6. **ANSYS WORKBENCH** - A cluster of simulation and analysis software including:
 - 1.2.6.1. **Design Modeler** - Parametric based modeling software;
 - 1.2.6.2. **Meshing** - Physics based meshing tool;
 - 1.2.6.3. **Resources (Engineering Data):** ANSYS Workbench materials database;
 - 1.2.6.4. **DesignXplorer:** Optimize design parameters using DOE, VT & Six Sigma;
 - 1.2.6.5. **DesignSpace:** Conceptualize, design and validate ideas using knowledge based simulation;
 - 1.2.6.6. **ANSYS Fatigue Module:** Simulates Structural Performance under cyclic loading conditions;
 - 1.2.6.7. **Rigid Body Dynamics:** Rigid body and mixed flexible/rigid body structural dynamics;
 - 1.2.6.8. **ANSYS User Programmable Features (USER300, etc.):** User - programmable elements available when using the traditional (PREP7) interface;
 - 1.2.6.9. **Finite Element Modeler-** Converts any FE model into ANSYS model.

1.3. The software should contain the following ADDITIONAL FEATURES:

- 1.3.1. **MCAD Connections** - Allows direct imports from other CAD packages;
- 1.3.2. **High Performance Computing** - 4 Nodes Parallel Processing;
- 1.3.3. **ANSYS Academic CFD Turbo Tools** - Consists of Blade Modeler & Turbo Grid: Specialized blade/turbo machinery pre-processing products intended for use with ANSYS CFX.
- 1.3.4. **ANSYS Fuel Cells Module** - Solid Oxide Fuel Cell (SOFC) & Polymer Electrolyte Membrane Fuel Cell (PEMFC).

2. Five (5) User Licenses of ANSYS Academic Teaching Mechanical & CFD: Version 15.0

2.1. The License type should be:

- 2.1.1. Network License
- 2.1.2. Perpetual License; and
- 2.1.3. With Structural: 256000 Nodes and CFD: 512000 Nodes.

2.2. The software should contain the following **MODULES**:

2.2.1. **ANSYS Multiphysics**: A general purpose FEA tool with the following capabilities;

- 2.2.1.1. Structural - 2,56,000 Node Limit
- 2.2.1.2. Thermal - 2,56,000 Node Limit
- 2.2.1.3. Fluid(FLOTRAN CFD, Element Based) - 10,24,000 Nodes Limit
- 2.2.1.4. Electrical - 2,56,000 Nodes Limit
- 2.2.1.5. Electrical Magnetics - Low Frequency - 5,12,000 Nodes Limit
- 2.2.1.6. Coupled Field Analysis - 2,56,000 Node Limit

2.2.2. **ANSYS CFX**: 5,12,000 Nodes Limit - CFD analysis software that uses a FE based Control Volume Formulation;

2.2.3. **ANSYS FLUENT**: 5,12,000 Nodes Limit - CFD solver based on Finite Volume Method.

- 2.2.3.1. Including advanced modules of Population Balance and NOX.

2.2.4. **ANSYS ICEM CFD**: Universal Pre- and Post-Processor and Advanced Mesh Generation Tool;

2.2.5. **ANSYS® AUTODYN®** - 2,56,000 Node Limit; An explicit analysis tool for modeling Nonlinear dynamics of solids, fluids and gases as well as their interactions;

2.2.6. **ANSYS WORKBENCH**: A Cluster of simulation and analysis software including:

- 2.2.6.1. Design Modeler - Parametric based modeling software;
- 2.2.6.2. Meshing - Physics based meshing Tool;
- 2.2.6.3. Resources (Engineering Data) - ANSYS Workbench materials database;
- 2.2.6.4. DesignXplorer - Optimize design parameters using DOE, VT & Six Sigma;
- 2.2.6.5. DesignSpace - Conceptualize, design and validate ideas using knowledge based simulation;
- 2.2.6.6. ANSYS Fatigue Module - Simulates Structural Performance under cyclic loading conditions;
- 2.2.6.7. Rigid Body Dynamics - Rigid body and mixed flexible/rigid body structural dynamics;

2.3. The software should contain the following **ADDITIONAL FEATURES**:

2.3.1. **MCAD Connections** - Allows direct imports from other CAD packages.

2.3.2. **ANSYS Academic CFD Turbo Tools** - Consists of Blade Modeler & Turbo Grid: Specialized blade/turbo machinery pre-processing products intended for use with ANSYS CFX.

2.3.3. **ANSYS Fuel Cells Module** - Solid Oxide Fuel Cell (SOFC) & Polymer Electrolyte Membrane Fuel Cell (PEMFC).

3. Five (5) User Licenses of Civil FEM Academic Research V.14.5.7

3.1. The License type should be:

- 3.1.1. Network License
- 3.1.2. Perpetual License; and
- 3.1.3. With Unlimited Nodes

3.2. The software should contain the following MODULES:

- 3.2.1. CivilFEM
- 3.2.2. Bridges & Civil Non-linear
- 3.2.3. Advanced Pre-stressed RCC
- 3.2.4. Geo Technical and Foundation
- 3.2.5. Construction Process simulation

3.3. Should be COMPATIBLE with other Civil Software should including:

- 3.3.1. FLAC 3D
- 3.3.2. REVIT
- 3.3.3. MS Excel
- 3.3.4. Robot

4. Five (5) User Licenses of Civil FEM Academic Teaching Advanced V.14.5.7

4.1. The License type should be:

- 4.1.1. Network License
- 4.1.2. Perpetual License; and
- 4.1.3. With Structural 128000 Nodes limit.

4.2. The software should contain the following MODULES:

- 4.2.1. CivilFEM
- 4.2.2. Bridges & Civil Non-linear
- 4.2.3. Advanced Pre-stressed RCC
- 4.2.4. Geo Technical and Foundation
- 4.2.5. Construction Process simulation

4.3. Should be COMPATIBLE with other Civil Software should including:

- 4.3.1. FLAC 3D
- 4.3.2. REVIT
- 4.3.3. MS Excel
- 4.3.4. Robot

CHECKLIST FOR TECHNICAL SPECIFICATIONS
Finite Element Analysis Program

1. Five User Licenses of ANSYS Academic Research Mechanical and CFD: Ver. 15.0

Parameter	Description	Availability	
		Yes	No
1.1 License Type:	1.1.1 Network		
	1.1.2 Perpetual		
	1.1.3 With unlimited Nodes		
1.2 Modules:	1.2.1 ANSYS Multi-physics:		
	1.2.1.1 Structural		
	1.2.1.2 Thermal		
	1.2.1.2 Fluid		
	1.2.1.4 Electrical		
	1.2.1.5 Electrical Magnetics-Low Frequency		
	1.2.1.6 Coupled Field Analysis		
	1.2.2 ANSYS CFX		
	1.2.3 ANSYS FLUENT: CFD solver		
	1.2.3.1 Advanced modules: Population Balance & NOX		
	1.2.4. ANSYS ICEM CFD		
	1.2.5 ANSYS® AUTODYN®		
	1.2.6 ANSHS WORKBENCH		
	1.2.6.1. Design Modeler		
	1.2.6.2. Meshing		
	1.2.6.3. Resources (Engineering Data)		
	1.2.6.4. DesignXplorer		
1.2.6.5. DesignSpace			
1.2.6.6. ANSYS Fatigue Module			
1.2.6.7. Rigid Body Dynamics			
1.2.6.8. ANSYS User Programmable Features			
1.2.6.9. Finite Element Modeler			
1.3 Additional Features	1.3.1. MCAD Connections		
	1.3.2. High Performance Computing		
	1.3.3. ANSYS Academic CFD Turbo Tools		
	1.3.4. ANSYS Fuel Cells Module		

2. Five User Licenses of ANSYS Academic Teaching Mechanical and CFD: Ver. 15.0

Parameter	Description	Availability	
		Yes	No
2.1 License Type:	2.1.1 Network		
	2.1.2 Perpetual		
	2.1.3 With Structural: 256000 Nodes CFD: 512000 Nodes		
2.2 Modules:	2.2.1 ANSYS Multi-physics:		
	2.2.1.1. Structural - 256000 Node Limit		
	2.2.1.2. Thermal - 256000 Node Limit		
	2.2.1.3. Fluid - 1024000 Nodes Limit		
	2.2.1.4. Electrical - 256000 Nodes Limit		
	2.2.1.5. Electrical Magnetics - 512000 Nodes Limit		
	2.2.1.6. Coupled Field Analysis - 256000 Node Limit		
	2.2.2 ANSYS CFX: 512000 Nodes Limit		
	2.2.3 ANSYS FLUENT: 512000 Nodes Limit		
	2.2.3.1 Advanced modules: Population Balance & NOX		
	2.2.4. ANSYS ICEM CFD		
	2.2.5 ANSYS® AUTODYN®: 256000 Nodes Limit		
	2.2.6 ANSHS WORKBENCH		
	2.2.6.1. Design Modeler		
2.2.6.2. Meshing			
2.2.6.3. Resources (Engineering Data)			
2.2.6.4. DesignXplorer			
2.2.6.5. DesignSpace			
2.2.6.6. ANSYS Fatigue Module			
2.2.6.7. Rigid Body Dynamics			
2.2.6.8. ANSYS User Programmable Features			
2.2.6.9. Finite Element Modeler			
2.3 Additional Features	2.3.1. MCAD Connections		
	2.3.2. ANSYS Academic CFD Turbo Tools		
	2.3.3. ANSYS Fuel Cells Module		

3. Five (5) User Licenses of Civil FEM Academic Research Version 14.5.7

Parameter	Description	Availability	
		Yes	No
3.1 License Type:	3.1.1 Network License		
	3.1.2 Perpetual License; and		
	3.1.3 With Unlimited Nodes		
3.2 Modules:	3.2.1 CivilFEM		
	3.2.2 Bridges & Civil Nin-linear		
	3.2.3 Advanced Pre-stressed RCC		
	3.2.4 Geo Technical and Foundation		
	3.2.5 Construction Process simulation		
3.3 Compatibility:	3.3.1 FLAC 3D		
	3.3.2 REVIT		
	3.3.3 MS Excel		
	3.3.4 Robot		

4. Five (5) User Licenses of Civil FEM Academic Teaching Version 14.5.7

Parameter	Description	Availability	
		Yes	No
4.1 License Type:	4.1.1 Network License		
	4.1.2 Perpetual License; and		
	4.1.3 With Structural 128000 Nodes limit		
4.2 Modules:	4.2.1 CivilFEM		
	4.2.2 Bridges & Civil Nin-linear		
	4.2.3 Advanced Pre-stressed RCC		
	4.2.4 Geo Technical and Foundation		
	4.2.5 Construction Process simulation		
4.3 Compatibility:	4.3.1 FLAC 3D		
	4.3.2 REVIT		
	4.3.3 MS Excel		
	4.3.4 Robot		