COMPETENCY STANDARD

FOR

INSTALLATION OF HEATING, VENTILATION & AIR CONDITIONING (HVAC)

(CONSTRUCTION SECTOR)

Skills for Industry Competitiveness and Innovation Program (SICIP)
Finance Division, Ministry of Finance

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INTRODUCTION:

The Skills for Industry Competitiveness and Innovation Program (SICIP) has the overall objective of developing a skilled workforce adept at handling new technologies, especially for emerging industries in Bangladesh. It will expand skills training and strengthen the development of the training ecosystem to address the skills requirements of the SICIP-selected industry sectors. The program aims to (i) increase the technology-oriented skilled workforce across emerging and priority sectors, (ii) promote inclusive skilling and upskilling opportunities for women and socially disadvantaged groups, (iii) incentivize industry-university partnerships to nurture innovation capacity and improve industry competitiveness, and (iv) foster skills for climate-resilient manufacturing processes and green technologies. The program is expected to benefit about 220,000 new and existing workers over a 6-year implementation period from 2024-2029.

The SICIP Program has, therefore, taken the initiative to enhance the employability and productivity of trainees by implementing market-responsive and job-focused training programs through public and private training providers. This will require the development of competency standards for each of the occupations/trades which will provide a structured framework in the learning process to guide training providers, ensure consistent training quality, and create an alignment between the skills provided by the training institutes and the needs of the industry.

The Competency Standard also suggests integration of YouTube or similar platforms or downloaded clips into classroom practice to ensure simulated creation of the contents so that learners are exposed to visual demonstrations before classroom instruction or practical session, which aligns with modern learning preference and supports flipped classroom models.

This competency standard is therefore developed to improve skills following the job roles and skill sets of the occupation and ensure that the required skills are aligned with industry requirements.

The document details the format, sequencing, wording, and layout of the Competency Standard for an occupation which comprises Units of Competence and its corresponding Elements.

OVERVIEW:

A **Competency Standard** is a written specification of the knowledge, skills, and attitudes required for the performance of a job or occupation or trade corresponding to the standard of performance required in the workplace.

Competency standard:

- provides a consistent and reliable set of components for training, recognizing, and assessing people's skills, and may also have optional support materials.
- enables industry-recognized qualifications to be awarded through direct assessment of workplace competencies
- encourages the development and delivery of flexible training that suits individual and industry requirements
- encourages learning and assessment in a work-related environment which leads to verifiable workplace outcomes.

Competency Standard has been reviewed and updated by a working group comprised of occupation-specific experts from the industry/institution and relevant consultants of SICIP.

Competency Standards describe the skills, knowledge, and attitude needed to perform effectively in the workplace. Competency Standards acknowledge that people can achieve vocational and technical competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With Competency Standards, assessment and training may be conducted at the workplace, at training organization, during regular work, or through work experience, work placement, work simulation or any combination of these.

A Unit of Competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of Competency are documented in a standard format that comprises:

- Reference to Industry Sector, Occupational Title and Occupational Description
- Unit code
- Unit title
- Unit descriptor
- Unit of Competency
- Elements and performance criteria
- Variables and range statement
- Evidence guides

Together all the parts of a Unit of Competency:

- Describe a work activity
- Guide the assessor in determining whether the candidate is competent.

Identification and validation of units of competency and elements for each occupation were made by experts from Construction industry in consultative workshop.

The ensuing sections of this document comprise a description of the respective occupation with all the key components of a Unit of Competence:

- An overview of all Units of Competence for the occupation and their corresponding duration required for completion of training.
- The Competency Standards that include the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide, and Assessment Evidence Guide.

Units & Elements at a Glance:

Generic Competencies (40 hrs.)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
SICIP-CON-HVA-01-G	Apply occupational health and safety (OHS) practice in the workplace	1. Identify OHS policies and procedures. 2. Apply personal health and safety practices. 3. Report hazards and risks 4. Respond to emergencies.	20
SICIP-CON-HVA-02-G	Carry out workplace interaction	1 Interpret workplace communication and etiquette. 2 Read and understand workplace documents. 3 Participate in workplace meetings and discussions. 4 Practice professional ethics at work	08
SICIP-CON-HVA-03-G	Operate in a team environment	1 Identify team goals and work processes. 2 Identify own role and responsibilities within team. 3 Communicate and co-operate with team members. 4 Practice problem solving within the team.	12
		Total Hour	**40**

Sector Specific Competencies (40 hrs.)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
SEIP-CON-HVA-01-S	Apply green practices	1. Interpret green concepts 2. Minimize resource use in the workplace 3. Implement waste management practices	10
SEIP-CON-HVA-02-S	Use Hand and Power Tools	1. Identify and inspect hand and power tools 2. Use hand tools properly and safely 3. Operate power tools properly and safely. 4. Clean and maintain hand and power tools	30
		Total Hour	**40**

Occupation Specific Competencies (280 hrs.)

Code	Unit of Competency	Elements of Competency	Duration (hours)
SICIP-CON-HVA-01-O	Interpret HVAC system	1. Identify HVAC system and components. 2. Identify HVAC tools, equipment and materials 3. Interpret HVAC drawings and diagrams.	20
SICIP-CON-HVA-02-O	Carry out HVAC works	1. Perform riveting. 2. Perform Brazing.	40
SICIP-CON-HVA-03-O	Carry out central heating system work	1. Identify central heating system work. 2. Install central heating system.	40
SICIP-CON-HVA-04-O	Perform chilled water system	1. Interpret chilled water system 2. Install chilled water system	52
SICIP-CON-HVA-05-O	Install Fan Coil Unit (FCU) and Air Handling Unit (AHU)	1. Identify Fan Coil Unit (FCU) 2. Identify Air Handling Unit (AHU) 3. Carry out FCU installation 4. Carry out AHU installation 5. Carry out ventilation work	68
SICIP-CON-HVA-06-O	Perform HVAC System maintenance	1. Conduct routine inspection 2. Clean and service HVAC components 3. Replace faulty parts 4. Maintain service record	60
		Total Hours	**=SUM(ABOVE) 280**

COMPETENCY STANDARD: INSTALLATION OF HEATING, VENTILATION, AIR CONDITIONING (HVAC)

Generic Competencies

Unit of Competency: **APPLY OCCUPATIONAL HEALTH AND SAFETY (OHS) PRACTICE IN THE WORKPLACE**	**Nominal Duration:** 20 hrs.	**Unit Code:** SICIP-CON-HVA-01-G
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to apply occupational health and safety (OHS) practices in the workplace. It specifically includes the tasks of identifying OHS policies and procedures, applying personal health and safety practices, reporting hazards and risks and responding to emergencies.		

Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	**Performance Criteria**
1. Identify OHS policies and procedures	1.1 **OHS policies** and safe operating procedures are interpreted 1.2 Safety signs and symbols are identified and followed. 1.3 Response, evacuation procedures and other contingency measures are interpreted correctly.
2. Apply personal health and safety practices	2.1 OHS policies and procedures are interpreted in the workplace including **personal protective equipment (PPE).** 2.2 Common health issues are recognized. 2.3 Common safety issues are identified and applied.
3. Report hazards and risks	3.1 Hazards and risks are identified. 3.2 Hazards and risks assessment and controls are interpreted 3.3 Hazards and risk assessment are reported
4. Respond to emergencies	4.1 Respond to alarms and warning devices. 4.2 **Emergency response plans and procedures** are responded to. 4.3 **First aid procedures** during emergency situations are identified.

Range of variables:

Variables	**Range** (may include but not limited to)
1. OHS policies	1.1 Organizational OHS polices 1.2 International OHS requirements 1.3 Fire safety rules and regulations

2. Personal protective equipment	2.1 Safety glasses 2.2 Ear plugs 2.3 Gloves 2.4 Apron 2.5 Helmet 2.6 Mask 2.7 Safety shoes
3. Emergency response plans and procedures	3.1 Firefighting procedures 3.2 Earthquake response procedures 3.3 Emergency response plans and procedures 3.4 Medical and first aid
4. First aid procedure	4.1 Washing of open wound 4.2 Washing chemically infected area 4.3 Applying bandage 4.4 Taking appropriate medicine

Curricular Content Guide

1. Underpinning knowledge	1.1 Workplace OHS policies and procedures 1.2 Work safety procedures 1.3 Emergency response procedures: 1.3.1 Firefighting 1.3.2 Earthquake response 1.3.3 Accident response 1.4 Types of hazards (biological, chemical and physical) and their effects 1.5 OHS awareness 1.6 Personal protective equipment (PPE) 1.7 Malfunctions and resolutions
2. Underpinning skill	2.1 Identifying OHS policies and procedures 2.2 Applying personal health and safety practices 2.3 Reporting hazards and risks 2.4 Responding to emergencies
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Eagerness to learn 3.6 Tidiness and timeliness 3.7 Respect for rights of peers and seniors in the workplace 3.8 Communication with peers, subordinates and seniors in the workplace
4. Resource implications	The following resources must be provided: 4.1 Workplace (simulated or actual) 4.2 Workplace documents, signs and symbols 4.3 Codes of conduct 4.4 Projector 4.5 Learning manual

	4.6 Tools, equipment and facilities appropriate to the process or activities. 4.7 Materials are relevant to the proposed activity.

Assessment Evidence Guide

1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Identified OHS policies and procedures 1.2 Applied personal health and safety practices (including PPE) 1.3 Reported hazards and risks 1.4 Responded to emergencies.
2. Methods of assessment	Methods of assessment may include but not limited to: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

Unit of Competency: **CARRY OUT WORKPLACE INTERACTION**	**Nominal Duration:** 08 hrs.	**Unit Code:** SICIP-CON-HVA-02-G
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to carry out workplace interaction. It specifically includes the tasks of interpreting workplace communication and etiquette, reading and understanding workplace documents, participating in workplace meetings and discussions and practicing professional ethics at work.		

Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	**Performance Criteria**
1. Interpret workplace communication and etiquette	1.1 Workplace codes of conduct are interpreted as per organizational guidelines. 1.2 Appropriate lines of communication are maintained with supervisors and colleagues. 1.3 Workplace interactions are conducted in a **courteous manner** to gather and convey information. 1.4 **Workplace procedures and matters** are comprehended.
2. Read and understand workplace documents	2.1 Workplace documents are interpreted correctly. 2.2 Visual information/symbols/signage are understood correctly and followed. 2.3 Specific and relevant information are accessed from **appropriate sources**. 2.4 Appropriate medium is used to transfer information and ideas.
3. Participate in workplace meetings and discussions	3.1 Team meetings are attended on time. 3.2 Meeting procedures and etiquette are followed. 3.3 Active participation is ensured, opinions are expressed and heard. 3.4 Inputs are provided and interpreted in line with the meeting purpose.
4. Practice professional ethics at work	4.1 Responsibilities as a team member are performed. 4.2 Tasks are performed in accordance with workplace procedures. 4.3 Confidentiality is maintained. 4.4 Inappropriate and conflicting situations are avoided.

Range of variables:

Variables	**Range** (may include but not limited to)
1. Courteous manner	1.1 Effective questioning 1.2 Active listening

	1.3 Speaking skills 1.4 Writing skill 1.5 Email etiquette
2. Workplace procedures and matters	2.1 Notes 2.2 Arranging a meeting 2.3 Agenda 2.4 Simple reports such as progress and incident reports 2.5 Job sheets 2.6 Operational manuals 2.7 Brochures and promotional material 2.8 Visual and graphic materials 2.9 Standards 2.10 OHS information 2.11 Signs
3. Appropriate sources	3.1 Human Resources (HR) Department 3.2 Managers 3.3 Supervisors 3.4 Management Information System (MIS)

Curricular Content Guide

1. Underpinning knowledge	1.1 Workplace communication and etiquette 1.2 Workplace documents, signs and symbols 1.3 Meeting procedure and etiquette 1.4 Professional ethics
2. Underpinning skill	2.1 Demonstrating workplace communication and etiquette 2.2 Interpreting workplace instructions and symbols 2.3 Demonstrating active participation in workplace meeting 2.4 Applying professional ethics at work
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Eagerness to learn 3.6 Tidiness and timeliness 3.7 Respect for rights of peers and seniors in the workplace 3.8 Communication with peers, subordinates and seniors in the workplace
4. Resource implications	The following resources must be provided: 4.1 Workplace (simulated or actual) 4.2 Standard operating procedure 4.3 Workplace documents, signs and symbols 4.4 Codes of conduct 4.5 Projector 4.6 Learning manual 4.7 Tools, equipment and facilities appropriate to the process or activities. 4.8 Materials are relevant to the proposed activity.

Assessment Evidence Guide

1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Interpreted workplace communication and etiquette 1.2 Interpreted workplace instructions and symbols 1.3 Performed active participation in workplace meetings
2. Methods of assessment	Methods of assessment may include but not limited to: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

Unit of Competency: **OPERATE IN A TEAM ENVIRONMENT**	**Nominal Duration:** 12 hrs.	**Unit Code:** SICIP-CON-HVC-03-G
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to operate in a team environment. It specifically includes the tasks of identifying team goals and work processes, identifying own role and responsibilities within team, communicating and cooperating with team member, and practicing problem solving within the team.		

Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Identify team goals and work processes	1.1. Roles and objectives of the team are identified and interpreted. 1.2. Roles and responsibilities of team members and work processes are identified and interpreted.
2. Identify own role and responsibilities within team	2.1. Personal role and responsibilities are identified within the team environment. 2.2. Importance of relationships within and outside the team are interpreted .
3. Communicate and co-operate with team members	3.1. Other teammates' tasks are identified and support provided when requested. 3.2. The team is encouraged through **sharing information** or expertise, working together to solve problems, and putting team success first. 3.3. Views and opinions of other team members are interpreted and respected.
4. Practice problem solving within the team	4.1. Problems faced at the individual and team level are identified and showed insight into the root-causes of the problems. 4.2. A range of solutions and courses of action are identified together with benefits, costs, and risks associated with each. 4.3. The good ideas of others to help develop solutions are recognized and advice sought from those who have solved similar problems. 4.4. It is looked beyond the obvious and not stopped at the first answers.

Range of variables:

Variables	**Range** (may include but not limited to)
1. Sharing information	1.1. Agenda 1.2. Minutes 1.3. Progress and incident reports 1.4. Operational manuals 1.5. Visual and graphic materials 1.6. Emails and SMS 1.7. Policy, procedure and standards 1.8. OHS information

Curricular Content Guide

1. Underpinning knowledge	1.1. Team goals and work processes 1.2. Roles and responsibilities of the team 1.3. Finding problems and solving them 1.4. Importance of views and opinions of other team members
2. Underpinning skill	2.1. Identifying own role and responsibilities within team 2.2. Communicating and co-operating with team members 2.3. Demonstrating problem solving within the team
3. Underpinning Attitudes	3.1. Commitment to occupational health and safety 3.2. Promptness in carrying out activities 3.3. Sincere and honest to duties 3.4. Eagerness to learn 3.5. Tidiness and timeliness 3.6. Environmental concerns 3.7. Respect for rights of peers and seniors at workplace 3.8. Communication with peers and seniors at workplace
4. Resource implications	The following resources must be provided: 4.1. Workplace (simulated or actual) 4.2. Workplace documents, Projector 4.3. Learning manual 4.4. Tools, equipment and facilities appropriate to the process or activities. 4.5. Materials are relevant to the proposed activity.

Assessment Evidence Guide

1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Identified own role and responsibilities within team 1.2 Communicated and co-operated with team members 1.3 Demonstrated problem solving within the team

2. Methods of assessment	Methods of assessment may include but not limited to: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

The Sector Specific Competencies

Unit of Competency: **APPLY GREEN PRACTICES**	**Nominal Duration:** 10 hrs.	**Unit Code:** SICIP-CON-HVC-01-S
Unit Descriptor: This unit covers the knowledge, skills and attitudes required to apply green practices. It specifically includes the tasks of interpreting green concepts, minimizing resource use in the workplace, and implementing waste management practices.		

Elements and Performance Criteria:
(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Interpret green concepts	1.1 **Principles of green practices** are explained. 1.2 **Sources of environmental impacts** during construction activities are identified. 1.3 Work activities contributing to environmental degradation, improper disposal of materials and excessive energy use are explained. 1.4 **Ways of mitigating environmental impacts** in construction sector are explained.
2. Minimize resource use in the workplace	2.1 Water, energy, and raw material consumption are documented. 2.2 **Recyclable and non-recyclable items** are identified. 2.3 Procedures to reduce resource consumption are implemented. 2.4 Sustainable alternatives to fossil-based energy resources are explored and applied.
3. Implement waste management practices	3.1 **Different types of waste** are identified. 3.2 Hazardous waste is disposed of according to environmental regulations. 3.3 Green habits to reduce waste in personal and professional life are practiced.

Range of Variables

Variable	Range May include but not limited to:
1. Principles of green practices	1.1 Reducing energy consumption 1.2 6R for waste management 1.2.1 Refuse 1.2.2 Reduce 1.2.3 Reuse 1.2.4 Recycle 1.2.5 Recover 1.2.6 Repair

	1.3 use of sustainable materials with low environmental impact 1.4 Recycling materials 1.5 Sustainable transportation
2. Sources of environmental impacts	2.1 Air pollution 2.1.1 Dust generation 2.1.2 Emission from machinery and vehicles 2.2 Water pollution 2.2.1 Debris and sediments 2.2.2 Chemical's leakage 2.3 Noise pollution 2.4 Waste generation 2.4.1 waste 2.4.2 Non-recyclable and hazardous materials 2.5 Resource Depletion 2.5.1 Excessive use of raw materials 2.5.2 Non-renewable material uses like use of fossil fuel, steel cement etc.
3. Ways of mitigating environmental impacts	3.1 Utilizing Energy-Efficient Equipment 3.2 Adopting Renewable Energy Sources 3.3 Implementing Site Protection Measures 3.4 Using Reusable Materials 3.5 Choosing Sustainable Materials 3.6 Using Noise-Reducing Equipment and scheduling work appropriately 3.7 Optimizing Logistics and Delivery
4. Recyclable and non-recyclable items	4.1 Recyclable items 4.1.1 Metal 4.1.2 Wood 4.1.3 Brick 4.1.4 Concrete 4.2 Non-recyclable items 4.2.1 Paints and coatings 4.2.2 Contaminated materials like lead paint, asbestos 4.2.3 Treated wood
5. Different types of waste	5.1 Wood waste 5.2 Metal waste 5.3 Plastic waste 5.4 Asbestos waste 5.5 Gypsum board waste 5.6 Packaging waste 5.7 Organic waste 5.8 Chemical West 5.9 Fuel/Oil west

Curricular Content Guide

1. Underpinning Knowledge	1.1 Principles of green practices in construction sector 1.2 Key terms and symbols related to environmental sustainability in construction drawings 1.3 Sources of environmental impacts in construction 1.4 Methods to minimize resource consumption (water, energy, raw materials) 1.5 Waste management practices 1.6 Sustainable alternatives to fossil-based energy resources 1.7 Personal and workplace habits for reducing environmental impact
2. Underpinning Skills	2.1 Identifying environmental impacts in construction activities 2.2 Applying methods to minimize resource use in the workplace 2.3 Implementing waste management practices 2.4 Following procedures to safely dispose of hazardous materials 2.5 Documenting water, energy, and material consumption in the workplace 2.6 Performing green practices in personal and professional activities
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincerity and honesty to duties 3.4 Environmental concerns 3.5 Eagerness to learn 3.6 Tidiness and timeliness 3.7 Respect for rights of peers and seniors in the workplace 3.8 Communication with peers, subordinates and seniors in the workplace
4. Resource Implications	4.1 Workplace (simulated or actual) 4.2 Different types of construction hand tools and power tools 4.3 Safety gear 4.4 Pens 4.5 Papers 4.6 Work books 4.7 Operation and maintenance manuals 4.8 Waster segregation bins

Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 Explained the principles of green practices in construction sector 1.2 Identified sources of environmental impacts 1.3 Implemented procedures to minimize resource use (water, energy, raw materials) 1.4 Disposed of hazardous waste in compliance with safety and environmental standards 1.5 Practiced green habits to reduce waste in both personal and professional life
2. Methods of Assessment	Competency should be assessed by: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of Assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

Unit of Competency: **USE HAND AND POWER TOOLS**	**Nominal Duration:** 30 hrs.	**Unit Code:** SICIP-CON-HVC-02-S
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to use hand and power tools. It specifically includes the task of identifying and inspecting hand and power tools for usability, using hand tools properly and safely, operating power tools properly and safely and cleaning and maintaining hand and power tools after use.		

Elements and Performance Criteria:

(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Identify and inspect hand and power tools	1.1 Appropriate hand and power tools are identified. 1.2 Application of hand and power tools is recognized. 1.3 Usability of hand and power tools is checked and verified.
2. Use hand tools properly and safely	2.1. Appropriate **hand tools** are selected. 2.2. Safety precautions are ensured before using hand tools. 2.3. Unsafe or faulty hand tools are identified and marked for repair. 2.4. **Measuring tools** are checked and calibrated before use. 2.5. Use hand tools properly and safely to perform work activity.
3. Operate power tools properly and safely	3.1. Appropriate **power tools** are selected. 3.2. Power supply outlet and electrical cord are inspected and confirmed safe for use in accordance with established workplace safety requirements. 3.3. Safety precautions are ensured before using power tools in accordance with manufacturer's operating specification. 3.4. Proper sequence of operation applied for using power tools. 3.5. Unsafe or faulty power tools are identified and marked for repair. 3.6. Operate power tools properly and safely to perform work activity.
4. Clean and maintain hand and power tools	4.1. Dust and foreign matter is removed from hand and power tools in accordance to workplace standards. 4.2. Condition of hand and power tools is checked after use and reported. 4.3. Appropriate lubricant is applied after use and prior to storage.

	4.4. Defective hand and power tools are inspected and repaired or replaced. 4.5. Hand and power tools are stored and secured in accordance with workplace requirements.

Range of Variables

Variable	**Range** May include but not limited to:
1. Hand tools	1.1. Hammer 1.2. Bench vice 1.3. Files 1.4. Punches 1.5. Chisels 1.6. Wrenches 1.7. Pliers 1.8. Scriber 1.9. Scraper 1.10. Screwdrivers 1.11. Dividers 1.12. Surface plate 1.13. Gauge 1.14. Tap sets 1.15. Die sets 1.16. Hacksaw 1.17. Socket spanners 1.18. Spanners 1.19. Vice grip 1.20. Wire cutters 1.21. Drills 1.22. Drill buts 1.23. Grinder 1.24. Clamps 1.25. Jacks
2. Power tools	2.1 Drills 2.2 Rivet gun 2.3 Grinders 2.4 Pneumatic wrenches 2.5 Press machine 2.6 Cutting 2.7 Saws 2.8 Soldering iron
3. Measuring tools	3.1 Micrometer 3.2 Testers 3.3 Megger 3.4 Measuring tape 3.5 Hose level

	3.6 Water level 3.7 Calipers 3.8 Steel rule 3.9 Meter rule 3.10 Spirit level 3.11 Protractor 3.12 Tri-square 3.13 Gauges

Curricular Content Guide

1. Underpinning Knowledge	1.1 Information on types of hand and power tools, their functions and use 1.2 Procedures for safely using hand and power tools
2. Underpinning Skills	2.1 Identifying hand, power and measuring tools 2.2 Following safety precautions when using hand, power and measuring tools 2.3 Using hand and measuring tools correctly and safely in accordance with manufacturer's operating specification 2.4 Operating power tools correctly and safely in accordance with manufacturer's operating specification 2.5 Cleaning and maintaining hand and power tools after use 2.6 Applying appropriate lubricant on hand and power tools after use and prior to storing
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Eagerness to learn 3.6 Tidiness and timeliness 3.7 Respect for rights of peers and seniors in the workplace 3.8 Communication with peers, subordinates and seniors in the workplace
4. Resource Implications	4.1 Workplace (simulated or actual) 4.2 Standard operating procedure 4.3 Workplace documents, signs and symbols 4.4 Codes of conduct 4.5 Projector 4.6 Learning manual 4.7 Tools, equipment and facilities appropriate to the process or activities. 4.8 Materials are relevant to the proposed activity.

Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 identified and selected appropriate hand and power tools for work to be performed 1.2 identified and used measuring and testing tools appropriate to work activity 1.3 followed safety precautions when using hand and power tools 1.4 operated power tools safely and pursuant to manufacturer's operating specification 1.5 performed cleaning and maintenance of hand and power tools after use and prior to storing
2. Methods of Assessment	Competency should be assessed by: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of Assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

The Occupation Specific Competencies

Unit of Competency: **INTERPRET HVAC SYSTEM**	**Nominal Duration:** 20 Hrs.	**Unit Code:** SICIP-CON-HVA-01-O
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to interpret HVAC system. It specifically includes the task of identifying HVAC system and components, Identifying HVAC tools, equipment and materials and interpreting HVAC drawings and diagrams.		

Elements and Performance Criteria:
(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	**Performance Criteria**
1. Identify HVAC system and components	1.1 HVAC system is defined. 1.2 **Cycles** of HVAC system are identified 1.3 **Components** of HVAC are identified and described. 1.4 **Auxiliary devices** of HVAC are identified and described
2. Identify HVAC tools, equipment and materials	2.1 **Tools and equipment** are identified for HVAC work. 2.2 **Materials** are used for HVAC system
3. Interpret HVAC drawings and diagrams	3.1 Signs and symbols used in HVAC are identified and defined. 3.2 Drawings and diagrams used for HVAC are identified and interpreted. 3.3 Components of HVAC are located using drawings and diagrams.

Range of Variables

Variable	**Range** (Includes but not limited to):
1. Cycles	1.1 Primary (Direct Expansion System) 1.2 Secondary (Chilled water system) 1.2.1 Cooling System 1.2.2 Heating System 1.3 Humidification & Dehumidification 1.4 Ventilation
2. Components	2.1 Compressor 2.2 Condenser 2.3 Expansion device 2.4 Evaporator
3. Auxiliary devices	3.1 Mechanical 3.1.1 Liquid receiver 3.1.2 Filter dryer 3.1.3 Solenoid Valves 3.1.4 Pressure sensor

	3.1.5 Liquid Indicator 3.2 Electrical & Electronics 3.3 Compressor Motor 3.4 Fan Motor 3.5 Control panel 3.6 Temperature Controller 3.7 Transducer
4 Tools and equipment	4.1 Power drill 4.2 Four-foot step ladder 4.3 Hammer 4.4 Screwdriver set 4.5 Hex-head nut drivers 4.6 Spirit Level 4.7 Pliers 4.8 Wrenches 4.9 Snipers 4.10 Shears 4.11 Folding bar 4.12 Drive bender 4.13 Hand steamer 4.14 Crimpers 4.15 Scratch awl 4.16 Staple gun 4.17 Tube cutter 4.18 Gauge manifold 4.19 Vacuum pump 4.20 Refrigerant scale 4.21 Leak detector 4.22 Refrigerant recovery Unit 4.23 Gas regulators (Nitrogen, Oxyacetylene) 4.24 Grinding machine 4.25 Allen key 4.26 Jet water pump 4.27 Riveting gun
5 Materials	5.1 Refrigerants (R-134a, R-410a, R-32) 5.2 Copper pipes 5.3 Insulation materials 5.4 Brazing rod 5.5 Flux 5.6 Lubrication oil 5.7 Grease 5.8 Nitrogen gas 5.9 Oxyacetylene gas 5.10 Rivets

Curricular Content Guide

1. Underpinning Knowledge	1.1 HVAC system 1.2 Cycles of HVAC system 1.3 Components of HVAC 1.4 Auxiliary devices 1.5 HVAC tools, equipment and materials 1.6 HVAC drawings and diagrams 1.7 Sign and symbol of HVAC
2. Underpinning Skills	2.1 Identifying HVAC system and components 2.2 Identifying HVAC tools, equipment and materials 2.3 Interpreting HVAC drawings and diagrams 2.4 Identifying Signs and symbols used in HVAC
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Tidiness and timeliness 3.6 Concerned for proper use of tools
4 Resource Implications	The following resources must be provided: 4.1 Workplace (simulated or actual) 4.2 Personal protective equipment (PPE) 4.3 Tools and equipment 4.4 Materials 4.5 HVAC drawings and diagrams 4.6 Projector 4.7 Stationary 4.8 Learning manual

Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 Identified HVAC system and components 1.2 Identified HVAC tools, equipment and materials 1.3 Interpreted HVAC drawings and diagrams 1.4 Identified Signs and symbols used in HVAC
2. Methods of Assessment	2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of Assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

Unit of Competency: **CARRY OUT HVAC WORK**	**Nominal Duration:** 40 Hrs.	**Unit Code:** SICIP-CON-HVA-02-O
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to carry out HVAC work. It specifically includes the task of performing riveting and performing brazing.		

Elements and Performance Criteria:
(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Perform riveting	1.1 Safe work practice is followed 1.2 personal protective equipment (PPE) is selected and worn. 1.3 **Riveting tools, equipment and materials** are selected. 1.4 Specific work to be performed is identified and confirmed as per standard operating procedure. 1.5 Riveting is carried out as per job requirement and in accordance with occupational health and safety (OHS) practice. 1.6 Work area is cleaned and waste material disposed as per standard operating procedure.
2. Perform brazing	2.1 Appropriate brazing tools, equipment and materials are identified and selected. 2.2 Appropriate personal protective equipment (PPE) is worn 2.3 Specific work to be selected and performed 2.4 Defects and faults are identified 2.5 Repair and rectification work are performed 2.6 Work done is confirmed as per standard operating procedure. 2.7 Brazing is carried out as per job requirement and in accordance with occupational health and safety (OHS) practice. 2.8 Defects are identified and work is undertaken to repair and rectify defects. 2.9 Work area is cleaned and waste material disposed as per standard operating procedure.

Range of Variables

Variable	**Range** (Includes but not limited to):
1. Riveting Tools, equipment and materials	1.1 Sponge 1.2 Iron holder 1.3 Soldering iron 1.4 Soldering station 1.5 Soldering wire

Curricular Content Guide

1. Underpinning Knowledge	1.1 Riveting process and technique 1.2 Brazing process and technique 1.3 Defects and faults are identified 1.4 Repair and rectification work
2. Underpinning Skills	2.1 Carrying out riveting 2.2 Carrying out brazing 2.3 Identifying defects and faults 2.4 Performing repair and rectification work
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Eagerness to learn 3.6 Tidiness and timeliness 3.7 Respect for rights of peers and seniors in the workplace 3.8 Communication with peers, subordinates and seniors in the workplace
4 Resource Implications	4.1 Workplace (simulated or actual) 4.2 Personal protective equipment (PPE) 4.3 Tools and equipment 4.4 Materials 4.5 HVAC drawings and diagrams 4.6 Projector 4.7 Stationary 4.8 Learning manual

Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 carried out riveting and identified defects 1.2 carried out brazing and identified defects 1.3 carried out repair and rectification work
2. Methods of Assessment	Competency should be assessed by: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of Assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

Unit of Competency: **CARRY OUT CENTRAL HEATING SYSTEM WORK**	**Nominal Duration:** 40 Hrs.	**Unit Code:** SICIP-CON-HVA-03-O
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to carry out centre heating system works. It specifically includes the tasks of identifying central heating systems, and installing central heating system.		

Elements and Performance Criteria:
(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Identify central heating system work	1.1 **Types of heating system** are identified and described. 1.2 **Basic components of heating system** are identified. 1.3 Functions of heating system are identified and explained.
2. Install central heating system	2.1 **Heating accessories** are identified and described. 2.2 Appropriate tools, equipment and materials for installation works are identified and selected. 2.3 Appropriate personal protective equipment (PPE) is identified and worn. 2.4 Installation of heating accessories is carried out as per job requirement and in accordance with occupational health and safety (OHS) practice). 2.5 Installation of central heating system is carried out 2.6 Work area is cleaned and waste material disposed of as per the standard operating procedure.

Range of Variables

Variable	**Range** (Includes but not limited to):
1. Types of heating system	1.1 Electrical 1.2 Central 1.3 Thermal
2. Basic components of heating system	2.1 Air handling unit 2.2 Water heater 2.3 Water to air heater 2.4 Boiler 2.5 Radiator 2.6 Heat exchange 2.7 Dehumidifier

3. Heating accessories	3.1 Venting kits 3.2 Brackets 3.3 Air deflector hood 3.4 Two-point suspension kit 3.5 On-off toggle switch 3.6 Discharge transition 3.7 Vent pipe 3.8 Vent cap 3.9 Leak lock joint sealer 3.10 Pipe hanger kit 3.11 Trim kit

Curricular Content Guide

1. Underpinning Knowledge	1.1 Types of heating systems 1.2 Functions of heating systems 1.3 Main components of heating system 1.4 Heating accessories
2. Underpinning Skills	2.1 Identifying different types of heating systems and their functions 2.2 Identifying main components of heating system 2.3 Carrying out installation of central heating system 2.4 Carrying out installation of heating accessories
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Tidiness and timeliness 3.6 Concerned for proper use of tools
4 Resource Implications	4.1 Workplace (simulated or actual) 4.2 Personal protective equipment (PPE) 4.3 Tools and equipment 4.4 Materials 4.5 HVAC drawings and diagrams 4.6 Projector 4.7 Stationery 4.8 Learning manual

Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 identified different types of heating systems 1.2 described the functions of heating systems 1.3 identified main components of heating system 1.4 carried out installation of central heating system 1.5 carried out installation of heating accessories
2. Methods of Assessment	Competency should be assessed by: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of Assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

Unit of Competency: **PERFORM CHILLED WATER SYSTEM**	**Nominal Duration:** 52 Hrs.	**Unit Code:** SICIP-CON-HVA-04-O
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to perform chilled water system. It specifically includes the tasks of Interpreting chilled water system and installing chilled water system.		

Elements and Performance Criteria:
(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Interpret chilled water system	1.1 **Major components** of chilled water system are identified and described. 1.2 **Chilled water pipes with accessories** are identified 1.3 Chilled water system is interpreted.
2. Install chilled water system	2.1 Chilled water pipes are installed as per job requirements. 2.2 Chilled water fittings are installed. 2.3 Chilled water systems are installed and tested.

Range of Variables

Variable	**Range** (Includes but not limited to):
1. Major components	1.1 Chilled water pumps 1.2 Valves and accessories 1.3 Pressure and temperature measuring devices
2. Chilled water pipes with accessories	2.1 MS pipe 2.2 Carbon steel pipe 2.3 Flexible pipe joint 2.4 Supports and hangers 2.5 Pipe insulation

Curricular Content Guide

1. Underpinning Knowledge	1.1 Chilled water system 1.2 Major components of chilled water system 1.3 Chilled water pipes and fitting
2. Underpinning Skills	2.1 Interpreting chilled water system 2.2 Identifying major components of chilled water system 2.3 Carrying out installation of chilled water system
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Tidiness and timeliness 3.6 Concerned for proper use of tools

4 Resource Implications	4.1 Workplace (simulated or actual) 4.2 Personal protective equipment (PPE) 4.3 Tools and equipment 4.4 Materials 4.5 HVAC drawings and diagrams 4.6 Projector 4.7 Stationary 4.8 Learning manual

Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 Interpreted chilled water system 1.2 Identified and described major components of chilled water system 1.3 Identified chilled water pipes with accessories 1.4 Installed chilled water pipes 1.5 Installed chilled water fittings
2. Methods of Assessment	Competency should be assessed by: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of Assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

Unit of Competency: **INSTALL FAN COIL UNIT (FCU) AND AIR HANDLING UNIT (AHU)**	**Nominal Duration:** 68 Hrs.	**Unit Code:** SICIP-CON-HVA-05-O
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to Install Fan Coil Unit (FCU) And Air Handling Unit (AHU). It specifically includes the tasks of identifying fan coil unit (FCU), Identifying air handling unit (AHU), carry out FCU installation, carrying out AHU installation and carrying out ventilation work.		

Elements and Performance Criteria:
(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Identify Fan Coil Unit (FCU)	1.1 Fan coil unit (FCU) is identified and described. 1.2 Use of controlling device is described.
2. Identify Air handling unit (AHU)	2.1 Air handling unit (AHU) is identified and described. 2.2 Use of controlling device is described.
3. Carry out FCU installation	3.1 Fan coil unit (FCU) is installed 3.2 Fan coil unit (FCU) is tested.
4. Carry out AHU installation	4.1 Air handling unit (AHU) is installed. 4.2 Air handling unit (AHU) is tested.
5. Carry out ventilation work	5.1 Ventilation requirements are identified. 5.2 Ducting system is installed. 5.3 Force ventilation equipment is installed. 5.4 Force ventilation is tested.

Curricular Content Guide

1. Underpinning Knowledge	1.1 Fan coil unit (FCU) 1.2 Air handling unit (AHU) 1.3 Ducting system 1.4 Ventilation and its equipment
2. Underpinning Skills	2.1 Identifying Fan Coil Unit (FCU) 2.2 Identifying Air handling unit (AHU) 2.3 Caring out FCU installation 2.4 Caring out AHU installation 2.5 Caring out ventilation work 2.6 installing ducting system
3. Underpinning Attitudes	3.1 Commitment to occupational health and safety 3.2 Promptness in carrying out activities 3.3 Sincere and honest to duties 3.4 Environmental concerns 3.5 Tidiness and timeliness 3.6 Concerned for proper use of tools
4. Resource Implications	4.1 Workplace (simulated or actual)

	4.2 Personal protective equipment (PPE) 4.3 Tools and equipment 4.4 Materials 4.5 HVAC drawings and diagrams 4.6 Projector 4.7 Stationery 4.8 Learning manual

Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 Identified different types of heating systems 1.2 Identified Fan Coil Unit (FCU) 1.3 Identified Air handling unit (AHU) 1.4 Carried out FCU installation 1.5 Carried out AHU installation 1.6 Carried out ventilation work 1.7 Installed ducting system
2. Methods of Assessment	Competency should be assessed by: 2.1 Written examination 2.2 Practical demonstration 2.3 Oral questioning 2.4 Portfolio review
3. Context of Assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

Unit of Competency: **PERFORM HVAC SYSTEM MAINTENANCE**	**Nominal Duration:** 60 Hrs.	**Unit Code:** SICIP-CON-HVA-06-O
Unit Descriptor: This unit covers the skills, knowledge and attitudes required to perform HVAC system maintenance. It specifically includes the tasks of conducting routine inspection, cleaning and servicing HVAC components, replacing faulty parts and maintaining service record.		

Elements and Performance Criteria:
(Terms in the performance criteria that are written in **bold and underlined** are elaborated in the range of variables).

Elements of Competency	Performance Criteria
1. Conduct routine inspection	1.1 **Inspection guidelines** are identified and comprehended. 1.2 Maintenance schedule is prepared and maintained 1.3 Inspection procedures are followed as per the manufacturer's guidelines and maintenance schedule.
2. Clean and service HVAC components	2.1 Clean and service procedures are interpreted. 2.2 Air filters, duct and coils are regularly checked. 2.3 Appropriate tools and materials for cleaning filter, duct and coils are identified. 2.4 Air filters, duct and coils are cleaned using appropriate tools and materials.
3. Replace faulty parts	3.1 Components are regularly checked. 3.2 Defective components are identified. 3.3 Defective components are replaced as per the specifications. 3.4 System performance is tested.
4. Maintain service record	4.1 Maintenance record book is developed and maintained 4.2 Maintenance records are updated accurately and in a timely manner.

Range of Variables

Variable	**Range** (Includes but not limited to):
1. Inspection guidelines	1.1 Assessment 1.2 Thermostat Check 1.3 Air Filter & Airflow 1.4 Heating System Inspection 1.5 Cooling System Inspection 1.6 Electrical Components 1.7 Ventilation & Exhaust 1.8 System Performance

Curricular Content Guide

1. Underpinning Knowledge	1.1 Routine inspection 1.2 Inspection guidelines 1.3 Maintenance schedule 1.4 Cleaning and servicing procedures
2. Underpinning Skills	2.1 Conducting routine inspection 2.2 Cleaning and servicing HVAC components 2.3 Replacing faulty parts 2.4 Maintaining service record
3. Underpinning Attitudes	3.1. Commitment to occupational health and safety 3.2. Promptness in carrying out activities 3.3. Sincere and honest to duties 3.4. Environmental concerns 3.5. Eagerness to learn 3.6. Tidiness and timeliness 3.7. Respect for rights of peers and seniors in the workplace 3.8. Communication with peers, subordinates and seniors in the workplace
4. Resource Implications	4.1 Workplace (simulated or actual) 4.2 Standard operating procedure 4.3 Workplace documents, signs and symbols 4.4 Codes of conduct 4.5 Projector 4.6 Learning manual 4.7 Tools, equipment and facilities appropriate to the process or activities. 4.8 Materials are relevant to the proposed activity.

Assessment Evidence Guide

1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 Conducted routine inspection 1.2 Cleaned and serviced HVAC components 1.3 Replaced faulty parts 1.4 Maintained service record
2. Methods of Assessment	Competency should be assessed by: 2.1 Written test 2.2 Practical Demonstration 2.3 Oral Questioning 2.4 Portfolio (Optional)
3. Context of Assessment	3.1 Competency assessment must be done in an assessment/training center or in an actual or simulated work place after completion of the training. 3.2 Assessment should be done by a nationally certified assessor or occupation-specific industry expert.

End of the Competency Standard

Workshop/Lab Facility Standard

Course Name:	Installation of Heating, Ventilation & Air Conditioning (HVAC)
Number of Trainees:	25

Course-wise Training Space (Theoretical Classroom, Workshop/ Lab/ Classroom cum Workshop):

- Classroom – 350 sft (33 sqm)
- Workshop/ lab – 800 sft (75 sq) OR
- Classroom cum workshop – 1000 sft (93 sqm)

Major Training Equipment and Training Facilities:

Sl. No.	Major Equipment and Training facilities	Required facilities
1.	Chiller	1
2.	Pump (Primary and Secondary)	2
3.	Fan coil unit	1
4.	Air handling unit	1
5.	Ventilation fan	1
6.	MS Pipe (2” Dia) each of 20’	4
7.	MS Pipe (1” Dia) each of 20’	4
8.	Copper tube (1/2”, 3/4”, 1” Dia) each of 1 coil	3
9.	Gate valve (2”, and 1” Dia) each of 6 pcs	2
10.	Chilled water control valve (1” and 2” Dia) each of 2 pcs	4
11.	Flexible pipe joint (2”, and 1” Dia) each of 4 pcs	8
12.	Cooling tower (8 ton)	1
13.	Electrical control system	1

The following conditions must be fulfilled –

- The institute shall not use the same facilities for any other projects/organizations offering a similar course.
- The institute must provide sufficient evidence to prove ownership of the proposed training equipment.

The list denotes the minimum training equipment and facility required to effectively conduct training for a specific course. Additionally, the institute must ensure that all other necessary training tools, equipment, and furniture are available to meet the requirement of competency standards (CS) provided by SICIP.

For the operation of training course on Heating, Ventilation & Air Conditional (HVAC) , the institute must ensure the availability of at least 80% of the major training equipment and training facilities (according to the CS) to be eligible for SICIP training delivery. If the score is below 80%, the remaining equipment and facilities need to be installed before the commencement of the training.

The institute will also provide all other hand tools and power tools as per CS for 25 trainees. Also, they will arrange adequate seating arrangement and classroom setup for the 25 trainees.