

**THE NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL
EDUCATION AND TRAINING**



***MANUALS FOR ESTABLISHING A VET CENTRE
FOR
CIVIL AND BUILDING ENGINEERING SECTOR***

DAR ES SALAAM

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LIST OF ABBREVIATIONS

- CBET** - Competence Based Education and Training
- FTC** - Full Technician Certificate
- TT** - Trade Test
- VET** - Vocational Education and Training
- NACTVET** - National Council for Technical and Vocational Education and Training
- VTC** - Vocational Training Centre
- VTTC** - Vocational Teachers Training College

PREAMBLE

Vocational Education and Training in Tanzania is governed by the National Council for Technical and Vocational Education and Training, established under the National Council for Technical and Vocational Education and Training Act, Cap. 129. This act empowers NACTVET to oversee and coordinate the provision of technical and vocational education in non-university institutions across the country. This manual therefore, gives guiding parameters so as to meet the minimum required standards set by the NACTVET Governing Council having in mind that one of its major roles is to ensure that vocational education and training provision satisfies the demands of the labour market with employees who have the required knowledge, skills and attitudes in order to improve production and productivity of our economy. When preparing the manual the following key areas were considered as essential for establishing Vocational Training Centres.

- A clearly defined organisation structure showing all the key positions for the efficient and effective operation of the Centre.
- NACTVET has set the standard required qualifications and competences which must be met by Vocational Teachers. The vocational teachers will be licensed and categorised by NACTVET according to their qualifications and experiences.
- This manual also provides criteria for a standard Vocational Training Centre (VTC) which will allow them to be registered and categorised accordingly. If the standards are not met, then the VTC will not be registered and Training Programmes will not be allowed.
- For the purpose of proper financial control of Centre funds, each VTC must keep proper records of all financial transactions showing the incomes and expenditures of the centre.
- Standard floor area requirements for workshops, classrooms, hostels, dining hall, offices, stores, library, toilets, playing fields etc, must be maintained. External and internal environment must also be conducive for training.
- Basic machines, equipment, tools and furniture must be provided to workshops and classrooms. Inventories must be well kept and updated. The items mentioned above must appear by proper name and specification in the inventory. Architectural drawings for all buildings, drawings for electrical wiring and drainage systems must be well kept by the Principal of the Centre.

NACTVET being vested with the role of overseeing and regulating the provision of Vocational Education and Training of other Providers will strictly observe these guidelines during the process of registration and categorisation of Vocational Training Centres.

Finally, it is believed that a VTC operating under these guidelines will produce the right outputs for the labour market, thereby increasing the productivity of our economy. It is also hoped that this manual will not remain static but is subject to updating when the conditions require so.

PART ONE

1. INTRODUCTION

The kind of VET system that is needed to spearhead socio-economic development in Tanzania will demonstrate itself in the kind of VTCs it will establish. There will be a close relationship between quality VTCs and products (trainees and services) it will produce. Countries with properly established VET centres are invariably placed to produce quality products.

This manual is intended to provide necessary information regarding requirements for the establishment of VTCs. In this manual quality parameters are defined. This will help to maintain consistency in training delivery.

Quality parameters are defined basing on three major areas which seek to address implementation of the Competence Based Education and Training (CBET) concept. These key areas are quality and sufficiency of tools and equipment, governance of the centre and infrastructure.

Vocational education and training is offered in 12 sectors which cover National vocational Award 1-3. The sectors include Civil and Building Engineering, Commercial and Business Support, Hospitality and Tourism, Automotive, Agriculture and Food Processing, Mining, Clothing and Textile Technology, Cosmetology, Transport, Mechanical and Printing. However, this manual focuses on the Agriculture and Food Processing occupations.

To ensure that each registered centre offers training according to its capacity. Registration of VET centres will be done according to the following categories:

1.1. Categorization of VTCs.

A Centre will be registered under any of the categories listed in Table R1.

Table R1: Criteria for Categorization of VTCs

CATEGORIZATION	CRITERIA	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
1. Occupation.	1.1. Number of occupations.	Minimum eight (8) occupations for multi-sectoral Centres or four (4) for sector specific Centres.	Minimum five (5) occupations for multi-sectoral Centres or two (2) for sector specific Centres.	Minimum one (1) occupation.	Minimum one (1) occupation.
	1.2. Qualifications levels.	Minimum of four (4) occupations offered above level II.	Minimum of two (2) occupations offered above level II.	Minimum of one (1) occupation offered up to level II.	Minimum of one (1) occupation up to level I.
2. Staff Qualifications 2.1 Principal	2.1.1 Academic qualifications	Minimum Form VI or equivalent.	Minimum Form VI or equivalent.	Minimum Form VI or equivalent.	Minimum Form IV or equivalent.
	2.1.2 Professional qualifications.	1 st Degree in technical/vocational education or equivalent for VTCs with training up to level IV and Master above level IV.	1 st Degree in technical/vocational education or equivalent for VTCs with training up to level IV and Master above level IV.	1 st Degree in technical/vocational education or equivalent for VTCs with training up to level IV and Master above level IV.	Certificate in technical education or equivalent
	2.1.3 Work Experience in relevant field.	Minimum three (3) years.	Minimum three (3) years.	Minimum three (3) years.	Minimum five (5) years.
2.2 Vocational teacher	2.2.1 Academic qualifications.	Minimum Form IV.	Minimum Form IV.	Minimum Form IV.	NA
	2.2.2 Professional qualifications.	Minimum one level above the level taught in a relevant occupation or field. TEACHER MINIMUM LEVEL III.	Minimum one level above the level taught in a relevant occupation or field. TEACHER MINIMUM LEVEL III.	Minimum one level above the level taught in a relevant occupation or field. TEACHER MINIMUM LEVEL III.	National vocational certificate of competence or equivalent
	2.2.3 Teaching qualifications.	Minimum Teacher Certificate in education.	Minimum Teacher Certificate in education.	Minimum Teacher Certificate in education.	Minimum Instructional Methods Certificate (IMC).
	2.2.4 Work Experience in relevant field.	Minimum three (3) years.	Minimum three (3) years.	Minimum three (3) years.	Minimum five (5) years in relevant field.
2.3 Training Coordinator/ Registrar	2.3.1 Academic qualifications.	Minimum Form IV.	Minimum Form IV.	Minimum Form IV.	NA
	2.3.2 Professional qualifications.	Minimum Ordinary Diploma in technical field or equivalent for VTCs with training up to level IV and 1 st Degree above level IV.	Minimum Ordinary Diploma in technical field or equivalent for VTCs with training up to level IV and 1 st Degree above level IV.	Minimum Ordinary Diploma in technical field or equivalent for VTCs with training up to level IV and 1 st Degree above level IV.	NA
	2.3.3 Work Experience in training	Minimum three (3) years.	Minimum three (3) years.	Minimum three (3) years.	NA
2.4 Accountant	2.4.1. Academic qualifications.	Minimum Form VI.	Minimum Form IV.	Minimum Form IV.	NA
	2.4.2. Professional qualifications	Minimum Diploma or equivalent in relevant field	Minimum Diploma or equivalent in relevant field	Certificate equivalent in relevant field	NA
	2.4.3. Work Experience in relevant field	Minimum three (3) years.	Minimum three (3) years.	Minimum three (3) years.	NA

CATEGORIZATI ON	CRITERIA	CATEGORY A	CATEGORY B	CATEGORY C	CATEGORY D
3 Centre Capacity.	3.1 Teacher trainee's ratio per class.	1:20	1:20	1:20	1:5
	3.2 Infrastructure.	As per Manual for establishing VET Centres.	As per Manual for establishing VET Centres.	As per Manual for establishing VET Centres.	Enough for five (5) trainees as per programme requirements
	3.3 Tools and equipment.	As per Manual for establishing VET Centres.	As per Manual for establishing VET Centres.	As per Manual for establishing VET Centres.	Enough for five (5) trainees as per programme requirements

We hope that the guidelines will be useful not only to those who would like to establish a VTC for specific occupations but also to providers who wish to improve their existing VTCs for the purpose of registration.

The manual is divided into five main parts, namely: centre governance, staffing, centre financial management, infrastructure, tools and equipment.

PART TWO

2. VOCATIONAL TRAINING CENTRE GOVERNANCE

Good governance is an important aspect in establishing a VET centre. It ensures accountability, participation, transparency, equity and rule of law in operation of the VET centre. This will also play part in making the centre sustainable. Involvement of stakeholders in governing the centre is imperative. It is therefore mandatory for a VET centre with categories A - C to have an Advisory Board/Board of Trustees.

The composition of the Board will have the following representation:

- i. Centre owner;
- ii. Parents;
- iii. Employers;
- iv. Government at District /division level;
- v. Centre employees; and
- vi. Principal-Secretary to the Board.

PART THREE

3. STAFFING

Staffing of a Centre will consist of the following personnel:

(a) Principal

The Principal is the Chief Executive of the centre. He/she will develop strategies and policy matters that included soliciting donor fund, centre and VET promotion, sensitize stakeholders with view to meet the centre goals and plan. For the centre with categories A-C, he/she will be the secretary to the Centre Advisory Board/Centre Board of Trustees.

Under these categories the Principal will be assisted by the following titles- Training Coordinator, Centre Administrator, Accountant, Entrepreneurship and Short course coordinator.

Minimum Qualifications of a Centre Principal:

For category A, B and C VET centres

- i. Degree in Technical / Vocational Education or equivalent.
- ii. Three (3) years work experience in the relevant field.

For category D VET centres

- i. Certificate in Technical / Vocational Education or equivalent.
- ii. Five (5) years work experience in the relevant field.

(b) Training Coordinator

The functions of a training coordinator in a VTC will be those activities related to training which include trainees' enrolment, coordination of trainees' assessment, monitoring training, discipline, guidance and counselling, Trainees' welfare in general and preserving centre

environment. The coordinator will be supported by Head of departments, warden/matron and head cook.

Minimum Qualifications of a Training Coordinator

- i. Ordinary Diploma or equivalent in any technical education field;
- ii. Certificate in teaching;
- iii. Three (3) years experience in training.

(c) Human Resource Officer

The Human Resource Officer will provide support for day to day administrative activities which include; staff welfare, staff development, security matters and stores.

Minimum Qualifications of a Human Resource Officer

- i. Certificate in Human Resources Management;
- ii. Three (3) years experience in relevant field.

(d) Accountant

The Accountant will keep all financial and accounts records of the centre.

Minimum Qualifications of the Accountant

- i. Diploma in accountancy;
- ii. Three (3) years experience in relevant field.

(e) Secretary

The secretary will be a personal assistant to the Principal and will perform all duties related to secretarial responsibilities.

Minimum Qualifications of the Secretary

- i. Form IV education;
- ii. Stage III certificate.

(f) Teaching staff

Vocational teachers have the central role of making the training relevant. Vocational teachers are the first-line practitioners of vocational training. A befitting vocational teacher to carryout vocational training within the Tanzanian VET system will have the following attributes:

- i. Critically alert;
- ii. Imaginative, innovative, proactive, creative;
- iii. A cultivated person with the courage and ability to face and solve problems;
- iv. Active in the pursuit of truth and goodness within the overall accepted aspirations of a nation at large; and
- v. Willingness to learn.

To ensure efficiency and effectiveness in training delivery, the maximum vocational teacher – trainee’s ratio will be 1:20.

Minimum Qualifications of a Vocational Teacher

Vocational teachers shall be licensed and categorised according to their qualifications and the level (s) in which they are allowed to teach. The required qualifications for vocational teachers are as described hereunder:

Vocational teachers for level I-III shall have the following qualifications:

- i. Holders of FTC, Diploma or other equivalent qualifications in the relevant field;
- ii. Teaching certificate obtained from VTTC or any other recognised institution; and
- iii. At least three (3) years of post training relevant practical work experience in his/her field of specialisation.

Vocational teachers for level I-II shall have the following qualifications:-

- i. Form IV secondary certificate;
- ii. Vocational Certificate of Competence or equivalent;
- iii. Teaching certificate obtained from VTTC or any other recognised institution; and
- iv. At least five (5) years of post training relevant work experience in his/her field of specialization.

Competences of a vocational teacher

A Vocational Teacher must possess the following competences:

- i. Able to interpret occupational training standards into learning process;
- ii. Evaluate training process and outcomes;
- iii. Compare training offered and the demand from the labour market;
- iv. Prepare report on training implementation in his/ her own workshop;
- v. Prepare maintenance schedule for training tools and equipment;
- vi. Counsel and guide trainees in the workshop; and
- vii. Ability to maintain a conducive environment for learning.

NB : Permanent teachers should be two thirds ($\frac{2}{3}$) of all teachers in the centre.

PART FOUR

4. CENTRE FINANCIAL MANAGEMENT

Proper management of centre finances is very important. It is therefore advised for anyone who aspires to establish a VET centre at categories A-C has to ensure that proper systems for managing finances are in place. These will ensure stability and sustainability of a VTC in a long run.

The following are important pre requisites:

- a) Bank account;
- b) Qualified staff;
- c) Reliable sources of funds; and
- d) Management of Cash Flow

PART FIVE

5. INFRASTRUCTURE

Infrastructure of a VTC with categories A-C include, among other things, workshops, classrooms, trainees hostel, conference hall, storage facilities, staff houses, and external environment. All building infrastructure should be able to accommodate people with special needs.

For the VTC with category D should have proper premises to facilitate practical and theoretical training. It should have some storage facilities and provision facilities for hygiene.

In deriving the size of the area suitable for training, the following factors have been taken into account:

- i. The number of trainees in one workshop;
- ii. Type of equipment;
- iii. Air circulation in a room; and
- iv. Movement of users within a room and around the building for various activities.

The provided schematic drawings demonstrate how a workshop or a training space should look like. It is not obligatory to use the same design but one should adhere to specifications provided in the Table 1. Users are strongly advised to seek for technical expertise from professionals who will help them translate information contained in this work into proper architectural and engineering drawings required for erection of buildings.

In this respect, construction of centres should consider standards as elaborated in the Table 1.

TABLE 1: INFRASTRUCTURE SPECIFICATIONS

S/N	ITEM/DESCRIPTION	NORM/SPECIFICATIONS
1.	Vocational teacher– Trainee Ratio.	1:16 -20 (Capacity for a single class/workshop is between 16 to 20 trainees).
2.	Area per trainee. <ul style="list-style-type: none"> Workshops (without offices). Classrooms (without offices). Conference Hall (without offices). Dining Hall (without kitchen). Library. Kitchen facility. 	<ul style="list-style-type: none"> 5 -14sqm per Trainee (workshop with light equipment like tailoring, computer applications – 5sqm/trainee; those with large equipment e.g. machinery fitter, etc. 12 – 14sqm/trainee can be used). 2.5 – 3 sq m per trainee. 1.5 – 2.5 sq m per trainee. 1.5 – 2.5 sq m per trainee. 2.5 – 3.5 sq m per trainee. 0.2 – 0.3 sq m per trainee.
3.	Areas for other general facilities. <ul style="list-style-type: none"> Administration Block. Office (for a teacher, officer etc). Office for Head of section/department 	<ul style="list-style-type: none"> 200 – 250 sq m. 10 – 16 sq m. 16 – 25 sq m.
4.	Toilets and change rooms. <ul style="list-style-type: none"> Number of persons per toilet Unit. Minimum unit area. Change rooms. 	<ul style="list-style-type: none"> 4 - 5 persons per toilet unit (staff). 8 -10 trainees per toilet unit (trainees). 1.5 – 2 sq m. 1 – 1.5 sq m per trainee (it is advised that each workshop should have a change room, which must be gender sensitive. Provision of washing basin and showers in a change room will depend on the type of occupation).
5.	Storage facilities. <ul style="list-style-type: none"> General store. Office store. Workshop store. 	<ul style="list-style-type: none"> 12 - 30 sq m. 2 – 6 sq m. 10 – 30 sq m (the shape of which has to depend on the type and nature of materials to be stored).
6.	Trainees Hostel. <ul style="list-style-type: none"> 4 trainees per room. 	<ul style="list-style-type: none"> 16-24 sq m per room with height 3.0m Provide study room for at least 20 trainees.
7.	Staff house.	100 – 200 sq m per single family house.

S/N	ITEM/DESCRIPTION	NORM/SPECIFICATIONS
8.	Location.	Suitable location of the training facilities required; workshop with heavy duty equipment preferably to be located on the ground floor. Location should consider other surrounding activities.
9.	Floors.	Strong floors capable of withstanding operations of a particular occupation
10.	Structure condition.	The structure and materials to be used should be durable, sound, safe, strong, Impurities free, attractive and available at local market.
11.	Internal environment.	<ul style="list-style-type: none"> • Should be smoke/dust free; well ventilated/air conditioned; enough natural and artificial lighting; appropriate colours in walls and ceiling necessary furniture and fixtures should be available. • Height of head room to be not less than 3m and above • Room relationship to be considered to minimize unnecessary movement. • Type of floor finish to match with the nature of activity performed.
12.	External environment	Provide access roads landscaping, walkways to allow movement people with disability.
13.	Utilities.	Proper electrical installation and power supply ² ; enough water supply; adequate sewerage disposal system; adequate solid waste disposal system; well functioning telecommunication facilities; fire fighting/prevention facilities as per regulations; dust/smoke removing mechanism for dust/smoke generating workshops.
14.	First – Aid facilities and safety gears.	Standard first-aid box with basic medication installed in a conspicuous position; safety gears must be available for both vocational teacher and trainees.
15.	<p>Legality of VET Centre in guidelines and Council Regulations.</p> <ul style="list-style-type: none"> • Birds class layer type • Broiler birds 	<p>NACTVET plays a role of establishing and monitoring guideline to VET provider and not authorizing permission to commence construction activities. The respective regulatory Body is obliged to administer their regulations.</p> <ul style="list-style-type: none"> • Brooding space 20-30 birds/m² • Growing space 10-20 birds/ m² • Layer’s birds 5-6 birds/ m² • Brooding space 20-30/ m² • Growing space 10-12 birds/ m²
16.	Space for seedling production (horticulture)	<ul style="list-style-type: none"> • Extra 1-5 Acres required for horticulture practical • Provide reliable source of water for irrigation purposes. • Head room height not less than 3.6 m high.
17.	Chick space:	38cm ² per layer chick, 52cm ² per broiler chick
18.	Size of foundation	The depth of the foundation to be determined at/in site, also nature of soil water table and the load to be imposed. But also the materials to be used
19.	Safety awareness	Adherence to occupational health and safety should be taken on board to enhance high productivity and keep good working

S/N	ITEM/DESCRIPTION	NORM/SPECIFICATIONS
		environment
20.	Others.	Master timetable placed at conspicuous area; at least one wall clock in each workshop; at least one suggestion box for each VTC. Each VTC has to have indoor or outdoor sports areas.

PART SIX

6. BASIC TOOLS AND EQUIPMENT

The minimum requirements of tools and equipment for a VTC with categories A-C for each occupation are provided. The same specifications of tools and equipment can be used for category D, but quantity and type will depend on curriculum contents to be covered.

The purpose of this list is to provide guidance and help management and authorities of vocational institutions to plan their equipment requirements with accuracy and produce precisely defined technical specifications.

It is advisable when purchasing tools and equipment to consider their durability, serviceability, accuracy, versatility and low operating costs.

APPENDIX 1
LIST OF TOOLS AND EQUIPMENT

**BASIC TOOLS AND EQUIPMENT FOR FIBREGLASS BOAT
(15 TRAINEES)**

A: EQUIPMENT

A1: DESIGN AND DRAW (Graphic Communication)

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Drawing Equipment Drawing set board.	A1 A3	Set Set	1:15 1: 1			√
2.	Mould Lofting floor and Equipment	Maximum size of the Boat	Set	1:15	√	√	√
3.	Measuring Equipment: • Length • Level	Size: 20m length	Pcs	1:15	√	√	√
	– measuring tapes	5m length	Pcs	1:1	√	√	√
	– ruler	1m length	Pcs	1:5	√	√	√
	– spirit level • Gravity	Horizontal/Vertical 50cm	Pcs	1:5	√	√	√
	Plumb bob	250gm	Pcs	1:5	√	√	√
4.	Computer set:- • Input Scanner/Camera/Digitizing table	A3	Pc	1:15			√
	• Output – printer/plotter	A3	Pc	1:15			√
	Processor	Capable of handling CAD – Software	Pc	1:15			√

NB: Computer set is optional

A2: WOOD CUTTING EQUIPMENT (CONSTRUCTING FRAMEWORK FOR MOULDLESS CONSTRUCTION)

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Band Saw Machine	12" (304mm) Throat band saw	Pcs	1:15	√	√	√
2.	Circular saw Machine	10" (254mm) sliding table	Pcs	1:15	√	√	√
3.	Thickness Machine	9" - 20" (225-:508mm) by 10" (254mm)	Pcs	1:15	√	√	√
4.	Planing Machine.	9" - 20" (225-508mm)	Pcs	1:15	√	√	√

A3: - JOINING EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Mortiser Machine	Hollow chisel type or chain mortiser from ¼ " (6mm) – 1" (2.5mm)	Pcs	1:15	√	√	√
2.	Drilling Machine	½" (13mm) capacity chuck	Pcs	1:15	√	√	√
3.	*Arc-Welding Set	160 Amps machine	Pcs	1:15	√	√	√
	*Oxy-acetylene Set	Standard set	Set	1:15	√	√	√

*optional

A4 – FINISHING EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Air Compressor machine	Delivery-5 bar	Pcs	1:15	√	√	√
2.	Spray painting machine	Standard set	Set	1:15	√	√	√

TOOLS
B1: TOOLS FOR WORKING FRP.

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Drilling Machine	13mm Chuck	Pcs	1:15	√	√	√
2.	Hole saw	25mm – 100mm	Pcs	1:5	√	√	√
3.	High speed twist drills	3 – 18mm	Pcs	1:15		√	√
4.	Jig saw with metal cutting blades	Standard	Pcs	1:15			√
5.	Angle grinder	100mm disk	Pcs	1:15			√
6.	Hacksaw	18/24 point blade	Pcs	1:15	√	√	√
7.	Rasp	Standard	Pcs	1:5	√	√	√
8.	Files	Flat, half round and round.	Pcs	1:5	√	√	√
9.	Stanley knife and standard blades	Standard	Pcs	1:5	√	√	√
10.	Wood saw for foam cutting	Standard	Pcs	1:5	√	√	√
11.	Scissor	Tailoring Quality	Pcs	1:5	√	√	√
12.	Wet and Dry abrasive	100 – 1000 grit	Pcs	1:5	√	√	√
13.	Cork sanding blocks	Standard	Pcs	1:5	√	√	√
14.	Spirit levels	250mm and 750mm	Pcs	1:5	√	√	√
15.	Plumb bob	Standard	Pcs	1:5			√
16.	Chalk line	Standard	Pcs	1:5	√	√	√
17.	Rubber mallet	1 2kg	Pcs	1:5	√	√	√
18.	Brushes	25 – 100mm	Pcs	1:5	√	√	√
19.	Squeegees Metal	Rubber and plastic for resin and putty spreading.	Pcs	1:5	√	√	√
20.	Masking tape	12mm – 50mm	Pcs	1:5	√	√	√
21.	Weighing scales	To 25kg	Pcs	1:5	√	√	√
22.	Buckets plastic	5 litres.	Pcs	1:5	√	√	√
23.	Cleaning rags	Lump sum	Pcs	1:5	√	√	√
24.	Soap powder	Lump sum	Pcs	1:5	√	√	√
25.	Mohair rollers	Various sizes for applying resins	Pcs	1:5	√	√	√
26.	Laminating rollers	Paddle or washer type for consolidating laminator	Pcs	1:5	√	√	√
27.	Squeegee	Flat, hard rubber pad 150mm x 75mm with tapered edge (replaces 25, 26).	Pcs	1:5	√	√	√

B2: MACHINERY INSTALLATION TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Spanner set	8mm – 32mm	Set	1:5	√	√	√
2	Screw driver set	Flat & star	Set	1:5	√	√	√
3	Allen key set	5mm – 12mm	Set	1:5	√	√	√
4	Filler gauge	Standard	Set	1:5			√
5	Piano wire	24m		1:5			√
6	Chain block	3 ton	Pcs	1:15	√	√	√
7	Hydraulic Jack	3 ton	Pcs	1:15	√	√	√
8	Pipe wrench	2" – 5"	Set	1:15	√	√	√

NB: Lifting and moving equipment has been omitted purposely.

BASIC TOOLS AND EQUIPMENT FOR WOODEN BOAT (15 TRAINEES)

A: EQUIPMENT

A1: DESIGN AND DRAW (Graphic Communication)

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Drawing Equipment: Drawing set board.	A1	Set	1:15			√
		A3	Set	1:1	√	√	√
2.	Lofting floor and Equipment	Maximum size of the Boat	Set	1:15	√	√	√
3.	Measuring equipment: <ul style="list-style-type: none"> • Length <ul style="list-style-type: none"> – measuring tapes – ruler • Level <ul style="list-style-type: none"> –spirit level • Gravity <ul style="list-style-type: none"> – Plumb bob 	Size: 20m length	Pcs	1:15	√	√	√
		5m length	Pcs	1:1	√	√	√
		1m length	Pcs	1:5	√	√	√
		Horizontal/Vertical 50cm	Pcs	1:5			√
		250gm		1:5			√
4.	Computer set:- <ul style="list-style-type: none"> • Input Scanner/Camera/Digitizing table • Output printer/plotter • Processor 	Capable of handling CAD – Software		1:15			√

NB: Computer set is optional

A2: WOOD CUTTING EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Band Saw Machine	12" (304mm) Throat band saw	Pcs	1:15	√	√	√
2.	Circular saw Machine	10" (254mm) sliding table	Pcs	1:15	√	√	√
3.	Thickness Machine	9" - 20" (225-508mm) by 10" (254mm)	Pcs	1:15	√	√	√
4.	Planing Machine.	9" - 20" (225-508mm)	Pcs	1:15	√	√	√

A3: - JOINING EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Mortiser Machine	Hollow chisel type or chain mortiser from ¼ " (6mm) – 1" (25mm)	Pcs	1:15	√	√	√
2.	Drilling Machine	½" (13mm) capacity chuck	Pcs	1:15	√	√	√
3.	*Arc-Welding Set	160 Amps machine	Pcs	1:15	√	√	√
	*Oxy-acetylene Set	Standard set	Set	1:15	√	√	√

* Optional

A4 – FINISHING EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Air Compressor machine	Delivery 5 bar		1:15	√	√	√
2.	Spray painting (optional)			1:15	√	√	√

B: TOOLS

B1: DESIGN AND GRAPHIC COMMUNICATION.

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Measuring tools	T - square	Pcs	1:5	√	√	√
		combination – square	Pcs	1:5	√	√	√
		Mitre - square			√	√	√
		Sliding bevel square.			√	√	√

B2: WOOD CUTTING TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Hand saw (Manual/Powered)	Medium size (standard)	Pcs	1:5	√	√	√
	• Cutting saw						
	• Ripping saw	Standard	Pcs	1:5	√	√	√
	• Tenon saw	Standard	Pcs	1:5	√	√	√
	• Hack saw	Standard	Pcs	1:5	√	√	√
	• -Back saw	Standard	Pcs	1:5	√	√	√
	• Jig saw	Standard	Pcs	1:5			
	• -Pincer pliers	Standard	Pcs	1:5	√	√	√
	• Jack plane	Standard	Pcs	1:5	√	√	√
	• Smoothing plane	Standard	Pcs	1:5	√	√	√
• Rabbet plane	Standard	Pcs	1:5	√	√	√	
• Boring tool	Standard	Pcs	1:5				

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
	• Ratchet brace	Standard	Pcs	1:5	√	√	√
2.	Chisels:-						
	• Adze	Standard	Pcs	1:5	√	√	√
	• Axe	Standard	Pcs	1:5	√	√	√
	Sharpening stone	Standard	Pcs	1:5	√	√	√
3.	Hand tools Striking or Driving Tools						
	• Claw hammer	Standard	Pcs	1:5	√	√	√
	• Claw bar	Standard	Pcs	1:5			
	• Screwdrivers	Flat and Star	set	1:5			

B3: JOINING TOOLS:

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Clamps/Vices	10 pcs medium size	Set	1:5	√	√	√
2	Sealant Guns	Standard	Pcs	1:5	√	√	√
3.	Caulking Iron	Standard	Pcs	1:1	√	√	√
4.	Putty knife	Standard	Pcs	1:1	√	√	√
5.	Glue pots	Standard	Pcs	1:5	√	√	√

B4: FINISHING TOOLS:

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Wood files	Flat, half/round surround	Set	1:5	√	√	√
2	Portable sand machine	Standard	Pcs	1:5	√	√	√
3.	Scrappers	Standard	Pcs	1:5	√	√	√
4.	Brushes	Standard	Pcs	1:5	√	√	√
5.	Roller	Standard	Pcs	1:5	√	√	√

B5: MACHINERY INSTALLATION TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Spanner set	8mm – 32mm	Set	1:5	√	√	√
2	Screw driver set	Flat & Star	Set	1:5	√	√	√
3.	Allen key set	5mm – 12mm	Set	1:5	√	√	√
4.	Filler gauge		Set	1:5			√
5.	Piano wire	24m	Set	1:5			√
6.	Chain block	3ton	Set	1:5	√	√	√
7.	Hydraulic Jack	3 ton	Set	1:5	√	√	√
8.	Pipe wrench	2" – 5"	Set	1:15	√	√	√

NB: Lifting and moving equipment has been omitted purposely.

BASIC TOOLS AND EQUIPMENT FOR STEEL BOAT (FOR 15 TRAINEES)

A: EQUIPMENT

A1: DESIGN AND DRAW (Graphic Communication)

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Drawing Equipment: Drawing set board.	A1	Set	1:15			√
		A3	Set	1:1	√	√	√
2.	Lofting floor and Equipment	Maximum size of the Boat	Set	1:15	√	√	√
3.	Measuring equipment: <ul style="list-style-type: none"> • Length <ul style="list-style-type: none"> – measuring tapes – ruler • Level <ul style="list-style-type: none"> – spirit level • Gravity <ul style="list-style-type: none"> – Plumb bob 	Size: 20m length	Pcs	1:15	√	√	√
		5m length	Pcs	1:1	√	√	√
		1m length	pcs	1:5	√	√	√
		Horizontal/Vertical 50cm 250gm	Pcs	1:5			√
4.	Computer set:- <ul style="list-style-type: none"> • Input Scanner/Camera/Digitizing table • Output – printer/plotter 	A3	Pc	1:15			√
		A3	Pc	1:15			√
		Capable of handling CAD – Software	Pc	1:15			√

NB: Computer set is Optional

A2: STEEL CUTTING EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Oxy – Acetylene set or Oxy-Propane set	Complete set with standard accessories for cutting up to 10mm thickness	Set	1:15	√	√	√
2.	Shearing machine	6mm thickness shearing	Set	1:15			√

NB: Shearing machine is optional

A3: WELDING EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	AC Welding	200 amps	Set	1:5	√	√	√
2.	DC Welding	160 amps	Set	1:15	√	√	√

A4: FINISHING EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Sand blasting set	Equipped with standard nozzles	Set	1:15	√	√	√

B1: TOOLS:

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Marking out						
	Scribers	Bent, straight	Pcs	1:5	√	√	√
	Punches	Dot and Centre punches	Pcs	1:5	√	√	√
	Squares	Standard	pcs	1:5	√	√	√
	Spirit level	Standard	Pcs	1:5	√	√	√
	Chalk line	Standard	Pcs	1:5	√	√	√
2.	Welding tools:				√	√	√
	Chipping hammer	Standard	Pcs	1:1	√	√	√
	Welding gloves	Standard	Pcs	1:1	√	√	√
	Welding goggles	Standard	Pcs	1:1	√	√	√
	Steel brush	Standard	pcs	1:5	√	√	√
3.	Hand tools:				√	√	√
	Angle grinder	With cutting & grinding disks	Set	1:15	√	√	√
	Hammers	5kg, 3kg, 2kg	set	1:5	√	√	√
	Files	Flat, Half round, Square	set	1:5	√	√	√
	Saw	Hacksaw	pcs	1:5	√	√	√
	Chisel	Flat, cross cut, Round nosed	set	1:5	√	√	√
	G-clamps	Standard	Pcs	1:5	√	√	√
Hand drill	13mm chuck	pcs	1:15	√	√	√	

B2: MACHINER INSTALLATION TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Spanner set	8mm – 32mm	Set	1:5	√	√	√
2.	Screw driver set	Flat & star	Set	1:5	√	√	√
3.	Allen key set	5mm – 12mm	Set	1:5	√	√	√
4.	Filler gauge	Standard	Set	1:5	√	√	√
5.	Piano wire	24m	pcs	1:5	√	√	√
6.	Chain block	3 ton	pcs	1: 5	√	√	√
7.	Hydraulic Jack	3 ton	pcs	1:15	√	√	√
8.	Pipe wrench	2" – 5"	Set	1:15	√	√	√

NB: Lifting and moving equipment has been omitted purposely.

BASIC TOOLS AND EQUIPMENT FOR CARPENTRY AND JOINERY MAKING (FOR 16 TRAINEES)

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Planing machines	<ul style="list-style-type: none"> • Combination machines for professional wood working with • Circular saw solid adjustable table with ball bearing • Surface and filister, planner with quick control lever for adjustment of chip thickness • Thickness with automatic feed by two feed rolls • Vertical spindle moulder with three speed fitted milling attachment 30 mm milling spindle total weight 560 kg • Motor rating 22 KW circular saw table size 730 x 57 mm cutter speed r/m 550mm planing width 235 mm 	Each	1:16	√	√	√
2.	Circular saw with adjustable centre 0-90°	<ul style="list-style-type: none"> • Cuts and saws at all angles saw blade adjustable for mitering 90°-45° • 3 phase 380 volt saw table dimension • table dimension 630 x 660 mm working height 850 mm • Maximum sawing height 90°, 108 mm motor power KW 2.2, net weight 75 kg 	Each	1:16	√	√	√
3.	Universal Circular saws for cutting ripping and trimming material up to 600mm width	<ul style="list-style-type: none"> • The swivel moment is fitted with ball bearing saw table dimension 440 x530mm, • Working height 800mm, • Spindle speed r/min 3560 maximum, • Sawing height 90° 70 mm • Motor voltage 3 phase 380, motor rating KW 1.1 	Each	1:16	√	√	√
4.	Band saw for sawing timber and non-ferrous metal	<ul style="list-style-type: none"> • Pulley diameter 280 mm • Saw blade length mm 1870mm • Maximum. sawing height 155 mm • Table size 320 x 320 mm • Saw blades speed stand 260mm • Motor rating KW HP 0.55 • Net weight 25 kg 	Each	1:16		√	√
5.	Welding equipment for welding and saw blades	<ul style="list-style-type: none"> • Jointed by butt welding without using of 50 idler blade width 3-25 mm, • Input KVA 2 dimension approximately. 220 x 270 x 200 • Gross weight 28 kg 	Each	1:16			√
6.	Bench grinder	<ul style="list-style-type: none"> Grinding wheel 200 x 32 x 20 mm • Distance between grinding wheels 420 mm • Speed 2800r/m • Motor power 0.65 KW – 0.9 H.P • Weight 30 kg 	Each	1:16	√	√	√
7.	Wood turning lathe – complete leather	<ul style="list-style-type: none"> • Motor 380 V 3 phase • Centre height 210 mm 	Each	1:16		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
	with large centre height built on a heavy duty frame	<ul style="list-style-type: none"> • Spindle thread m 24 x 3 • Speed rpm, 400, 1000, 2000, 3000 • Motor rating 750 W • Weight 38 kg. 					
8.	Saw sharpening machine	Grinding wheel diameter 305 mm Minimum. And maximum saw blade diameter 250 mm – 1200 mm <ul style="list-style-type: none"> • Speed 2050 r/m • Weight 48 kg 	Each	1:16			√

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Tape measure	Enclosed chromium plated plastic case with flat bottom metric Length 3 m, width 13 mm	Each	1:1	√	√	√
		Enclosed chromium – plated with clip box fixing to belt length 5 m width 13 mm	Each	1:1	√	√	√
2.	Measuring tape	Fibre glass tapes plastic frame with blade handle and fold away rewinding handle length 30 m width 13 mm	Each	1:4		√	√
3.	Folding rule with special red marking	Setting angles 90 ⁰ and 45 ⁰ length 1 m, Width 17 mm	Each	1:1	√	√	√
4.	Marking gauge	With point all steel Length of gradual 90 mm Bar length 150 mm	Each	1:2	√	√	√
		<ul style="list-style-type: none"> With gauge from hard plastic With knife for scribing press button lock Length 200 mm 	Each	1:2	√	√	√
5.	Hand saws	<ul style="list-style-type: none"> Hardened teeth Plastic handle Length 550 mm, 7 teeth/250 mm 	Each	1:2	√	√	√
		<ul style="list-style-type: none"> Universal teeth Length 550 mm 	Each	1:2	√	√	√
		<ul style="list-style-type: none"> Cross cutting and ripping. Plastic handle Length 500 mm, universal teeth 					
		Width of cutter 54 mm	Each	1:2	√	√	√
6.	Plane	<ul style="list-style-type: none"> Smoothing plane with smooth sole, single iron handle and knob of plastic Overall length 230 mm, Width of cutter 45 mm 	Each	1:4	√	√	√
		Jack plane corrugated sole. Double iron adjustment depth of cut overall length 335 mm, width of cutter 50 mm	Each	1:4	√	√	√
		<ul style="list-style-type: none"> Rebate plane Adjustable mouth, Overall length 10 mm Width of cutter 28 mm 	Each	1:4	√	√	√
7.	Wood chisels	Firmer chisels width 8 mm, Plastic handle	Each	1:1	√	√	√
		<ul style="list-style-type: none"> Long model bevelled, Plastic handle, width 10 mm 	Each	1:1	√	√	√
		<ul style="list-style-type: none"> Long model bevelled, Plastic handle, width 12 mm 	Each	1:1	√	√	√
		Long model chamfered, Plastic handle width 6 mm	Each	1:4	√	√	√
		Long model chamfered, Plastic handle width 10 MM	Each	1:4	√	√	√
		Long model chamfered plastic handle width 16 mm	Each	1:4	√	√	√
		Firmer gouges, half round plastic handle width 8 mm	Each	1:4		√	√
		Firmer gouges, half round plastic handle width	Each	1:8		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		10 mm					
8.		Firmer gouges, half round plastic handle width 18 mm	Each	1:8		√	√
		Firmer gouges, half round plastic handle width 25 mm	Each	1:8		√	√
9.	Mortise chisels	Plastic handle width 3 mm	Each	1:4	√	√	√
		Plastic handle width 5 mm	Each	1:4			
		Plastic handle width 10 mm	Each	1:4			
10.	Carpenter's hammers "claw hammer"	<ul style="list-style-type: none"> Wooden handles, Weight with handle 575 grams Diameter of face – 28 mm 	Each	1:1	√	√	√
		<ul style="list-style-type: none"> Wooden handle with round face and octagonal neck. Chromium plated, weight with handle 675 gram Diameter of face 27 mm 	Each	1:1	√	√	√
		<ul style="list-style-type: none"> Wooden handle with round face and octagonal neck. Chromium plated weight with handle 790 gram. Diameter of face 29 mm with magnet and groove in face Round face and octagonal neck weight with handle 675 gram. Face diameter 28 mm. 	Each	1:4	√	√	√
11.	Engineer's ball pein hammers	Round face and ash handle weight with handle 220 g. Diameter of face 20 m	Each	1:4	√	√	√
		Round face and ash handle weight with handle 450 gr. Diameter of face 26 mm	Each	1:4	√	√	√
12.	Engineer's cross pein hammers	Round face and ash handle weight with handle 300 gr. Diameter of face 21 mm	Each	1:4	√	√	√
13.	Squares	<ul style="list-style-type: none"> Try and mitre square cast stock with mitre hardened rustles blade. Length 250 mm 	Each	1:2	√	√	√
		<ul style="list-style-type: none"> Try square Moulded face of glass fibre reinforced plastic. Blade of hardened aluminum on both sides blade length 250 mm 	Each	1:2	√	√	√
		Try square moulded face of glass fibre reinforced plastic. Blade of hardened aluminum on both sides blade length 300 mm	Each	1:2	√	√	√
14.	Hand drills	Cast gear, single pinion drive three jaw chuck. Maximum. drill diameter 6 mm overall length 230 mm	Each	1:4	√	√	√
		<ul style="list-style-type: none"> Cast gear, single pinion drive three jaw chuck. Maximum drill diameter 8 mm Overall length 325 mm 	Each	1:4	√	√	√
		Enclosed gears, two speed – adjustable crank, Supporting handle, three jaw chuck	Each	1:4	√	√	√
15.	Brace bit drills	<ul style="list-style-type: none"> Alligator jaws. Twelve tooth ratchet self centering chuck with universal jaws. Ball 	Set	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		bearing head, <ul style="list-style-type: none"> Plastic handle. Nickel plated. Sweep 250 mm 					
		<ul style="list-style-type: none"> Alligator jaws. Four jaw with eight tooth ratchet nylon bearing head 	Set	1:4	√	√	√
16.	Screw drivers	<ul style="list-style-type: none"> Set of 6 combination blades with nickel plated blade Plastic handle 	Set	1:4	√	√	√
		Set of 6 screwdrivers with nickel plated	Set	1:4	√	√	√
		<ul style="list-style-type: none"> Star screw driver round nickel plated blade plastic handle. Length of blade 80 mm Length of handle 70mm	Each	1:1	√	√	√
		<ul style="list-style-type: none"> Star screwdriver round nickel plated blade. Length of blade 100 mm, <ul style="list-style-type: none"> Length of handle 90 mm 	Each	1:1	√	√	√
		Star screwdriver Length of blade 30 mm, Length of handle 55 mm	Each	1:2	√	√	√
17.	Benches	Wooden 180 cm x 106 cm, with the height of 82 cm. Incorporated with wooden vice	Each	1:2	√	√	√
18.	Spray gun	<ul style="list-style-type: none"> Heavy duty – Aluminum body with accessory – 1 litre, 200 mm long 	Each	1:8		√	√
19.	Ladders	<ul style="list-style-type: none"> 3 m long metal aluminum 6 m long metal aluminum 	Each Each	1:8 1:8	√	√	√
20.	Scaffolding	Tubular 6 m long	Each	1:16	√	√	√
21.	Brushes	<ul style="list-style-type: none"> Poster canel long, wooden handle size, Set of six (1-3") Enamel brush with wooden handle size 1" to 3" (set of five) Enamel brush with wooden handle ½" 	Set Set Set	1:82 1:8 1:8	√	√	√
22.	Clamps	<ul style="list-style-type: none"> Malleable cast iron, plastic coated with T-handle. Jaw opening 160 mm, throat depth 80 mm, bar dimensions 25 x 6 	Each	1:4	√	√	√
		<ul style="list-style-type: none"> G Clamp Forged steel with back jointed shoe with sliding T-handle. Jaw opening 100 mm, throat opening 70 mm, frame 38 x 12 mm, Weight 1.8 kg 	Each	1:4	√	√	√
23.	Clamps	Sash bar cramps. JF type: Zinc plated spring steel bar jaw opening 600 mm, bar length 35 x 6 m, weight 2.5 kg.	Each	1:2	√	√	√
		Sash clamp zinc-plated spring steel bar. Jaw opening 2000 mm. Bar dimensions 38 x 6 mm. Weight 4.5 kg	Each	1:4	√	√	√
		Sash clamp zinc-plated spring steel bar. Jaw opening 150 mm, Bar dimensions 38 x 5 mm, Weight 3.2 kg	Each	1:4	√	√	√
24.	Bench vice	<ul style="list-style-type: none"> Steel drop forged with fixed wide pipe jaws under the smooth jaws fully enclosed Spindle 	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		with double acme thread with anvil. Jaw width 120 mm, <ul style="list-style-type: none"> Capacity 150 mm, Jaw depth 80 mm, Anvil size 75 x 70 mm and Weight 10 kg 					
25.	Spirit level	0.5 m Aluminum or plastic	Each	1:4	√	√	√
		1.0 m aluminum, or plastic or wooden	Each	1:4	√	√	√
		1.5 m aluminum plastic wooden	Each	1:4	√	√	√
26.	Plumb bob	Iron with steel point, bright turned finish with brass knob, weight 200 g.	Each	1:4	√	√	√
		Iron with steel point, bright turned finish with brass knob, weight 500 g	Each	1:8	√	√	√
		Iron with steel point, bright turned finish with brass knob, weight 1 kg	Each	1:8	√	√	√
27.	Files	Flat:Length – 250 mm, Width – 24.5 mm, Thickness – 6.5 mm	Each	1:1	√	√	√
		Round Length – 100 mm – 350 mm, diameter – 4 mm – 16 mm	Each	1:1	√	√	√
		Half round <ul style="list-style-type: none"> Length 100 mm – 350 mm 11 mm x 3 mm – 32.5 mm x 10.5 mm 	Each	1:1	√	√	√
28.	Grinding stones	Grinding wheels 200 mm x 32 mm x 20 mm pair of rough and fine	Pair	1:8	√	√	√
29.	Pincer	<ul style="list-style-type: none"> Single joint polished back finish Length 160 mm, 210 mm, Jaw width – 16 mm 	Each	1:4	√	√	√
30.	Sliding levels	Paint finished light alloy stock steel blade. Blade length 200 mm	Each	1:1	√	√	√
		Plastic stock, nickel – plated steel blade Length 200 mm	Each	1:2	√	√	√
31.	Adjustable spanner	Jaw opening 44 mm, Length 380 mm	Each	1:4	√	√	√
32.	Spanner	In sets composed of combination spanners, chromium plated with ground heads. Jaw width 10,12,13,14,17,19,22,24	Set	1:4	√	√	√
33.	Knife	Blades for knife <ul style="list-style-type: none"> Handle no x N - 100 	Each	1:4		√	√
34.	Straight edge	3 M: Wooden (Hardwood), or Steel (hollow section)	Each	1:4	√	√	√
35.	Hand tile cutting machine	56 CM steel with chrome handle	Each	1:16			√
36.	Wheel barrows	Seam less tray – 889 mm x 687.5 mm	EACH	1:8	√	√	√
37.	Pickaxe	Steel and wooden handle <ul style="list-style-type: none"> Weight 2.5 kg should be hardened Length 400 mm x width 75 mm Thickness 2.5 mm 	Each	1:4	√	√	√
38.	Hoe	<ul style="list-style-type: none"> Steel with wooden handle Width – 150 mm and Length – 260 mm 	Each	1:4	√	√	√
39.	Crow bar	Dimensions:	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		<ul style="list-style-type: none"> The crow bar to be of 3.2 cm in diameter, 183 cm long shaped to a chisel form at one end and a four flat at the other. Materials steel with C 45/55 carbon content hardened and tempered. Weight 11 kg - Marking manufacturer's name/trade mark 					
40.	Rubber mallet	86 mm x 54 mm (310 g)	Each	1:4			√
41.	Wooden mallet	100 mm x 45 mm (500 g)	Each	1:4	√	√	√
42.	Plastic mallet	155 mm x 85 mm x 35 mm (500 g)	Each	1:4	√	√	√
43.	Cold chisel	<p>Special steel to be hardened with impact resistant head.</p> <ul style="list-style-type: none"> Length 300 mm x width 16 mm Length 400 mm x width 18 mm 	Each EACH	1:4 1:4	√	√	√
44.	Knapping hammer	<ul style="list-style-type: none"> Ash handles, Square face and cross pein Weight with handle 125 g. 	Each	1:4			√
45.	Glass cutters	<ul style="list-style-type: none"> With six steel wheels nickel plated with flat wooden handle in plastic case. Overall length 130 mm For glass thickness 3 – 6 mm 	Each	1:4	√	√	√
46.	Strapping tools	All parts to be made of forged steel. The levers nickel – plated and provided with wooden handles. Adjustable between 13 mm, 16 mm and 20 mm width of steel strip. Weight 2.75 kg	Each	1:16			√
47.	Mitre snips	<ul style="list-style-type: none"> For mitre 45° cutters from steel plastic insulated handles with built in spring and locked lever Length 215 mm, maximum mould width 25 mm 	Each	1:8		√	√
48.	Wire rope cutter	Plastic covered handles.with Length 600 mm	Each	1:8		√	√
49.	Bolt cutter	<p>With clipper cut jaws for cut wire lock and piano wire.</p> <p>Tubular steel handles handleless and Length 379 mm</p>	Each	1:8		√	
50.	String lines	100 m manila type Thickness 4 mm	Each	1:8	√	√	√
51.	Tenon saw	<p>Tooth points hardened.</p> <p>Finely polished blade with profiled back plastic handle and Length 300 mm</p>	Each	1:2	√	√	√
52.	Dovetail saw	Bent wooden handle. Steel back teeth filed and set blade length 250 mm blade width 55 mm	Each	1:2	√	√	√
53.	Bow saws	<p>28 mm oval section, steel tubing with lower front end the upper end of the tensions arm.</p> <ul style="list-style-type: none"> Length 760 mm, Width of blade 20 mm 	Each	1:8		√	√
54.	Auger bit for brace drill	<ul style="list-style-type: none"> Straight shank with flat surface in sheet metal holder 	Set	1:8	√	√	√
55.	Coping saw	<ul style="list-style-type: none"> With rotatable links for links for setting blade at the desired angle. Wooden handle blade length 165 mm Frame depth 120 mm 	Each	1:4		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
56.	Countersinks	<ul style="list-style-type: none"> Seven flutes, straight shank, countersink angle 86° diameter 13 mm, shank diameter 6 mm 	Each	1:4	√	√	√
57.	Joiner level	<ul style="list-style-type: none"> From east aluminum. Parallel machined contact surfaces and sides length 400 mm/600 mm 	Each	1:4			√
58.	Vanier caliper	<ul style="list-style-type: none"> Stainless steel capacity 140 mm 	Each	1:8		√	√
59.	Disc sanding machine	<ul style="list-style-type: none"> With all standard accessories abrasive discs, mitre attachments 220/380 V 3 phase 50HZ (4) HP AC Motor table size 740 mm x 280 mm Table adjustment range (tilting) 10°, 0° – 45°, Machine lamp 	Each	1:16		√	√
60.	Belt sanding machine	<ul style="list-style-type: none"> With all standard accessories and continuous abrasive beltsrous (assorted grit) Surface belt sander Table sizes 2000 mm x 600 mm Cross travel of table 600 mm Rise adjustment 0 – 700 mm Sanding belt size 120 mm x 4900 mm Rotted Motor power KW 1.5 Belt roller diameter 150 mm 	Each	1:16		√	√
61.	Portable circular saws	<ul style="list-style-type: none"> With guard over circular saw blade which functions automatically in all positions. Easily adjusted for different depths of cut and for mitring at 45° with adjustable width stop. Fitted motor for 220 volts 1 phase AC supplied completed with 2 m rubber cable and plug, clearing knife, Width stop carbide tipped circular saw blade and key. Circular saw blade diameter x hole 160 mm x 16 mm. Diameter of plunges 44 mm. Maximum depth of cut vertical 55 mm. Spindle speed no load r/min.-4500. Power consumption W-1200. Net weight 4.9 kg 	Each	1:16		√	√

BASIC TOOLS AND EQUIPMENT FOR CIVIL DRAUGHTING (FOR 20 TRAINEES)

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Ammonia Printing machine	<ul style="list-style-type: none"> Blue print machine or white print machine A₀ size sheet of ammonium paper sheet. A₀ size sheet white print paper. 	Each	1:20	√	√	√
2.	Computer (Auto CAD programme)	<ul style="list-style-type: none"> Processor Color Screen Colour printer – A3 	Each	1:16	√	√	√
3.	Plotter	A ₀ size for printing purpose of Architectural drawing.	Each	1:20	√	√	√
4.	Paper cutter	<ul style="list-style-type: none"> Trimming machine A₁ – A₀ Metal/ wooden material. 	Each	1:20	√	√	√

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Drawing board	A ₂ size	Each	1:1	√	√	√
2.	T-square T-square	Length 72cm Length 100cm	Each	1:1	√	√	√
3.	Set square	<ul style="list-style-type: none"> 30°/ 60° large size and 45°/ 90° large size Plastic material (transparent) 	Set	20	√		
4.	Adjustable set square	0° – 90° Plastic material (transparent)	Each	1:1	√	√	√
5.	Drawing paper	<ul style="list-style-type: none"> A₂ = size 420 x 594mm roll A₃ = size 297mm x 420mm 	Each Each	1:4 1:4	√	√	√
6.	Geometrical set	Mechanical drawing instrument (mathematical drawing set)	Each	1:1	√	√	√
7.	French curves	<ul style="list-style-type: none"> For drawing curved line which is not easy to draw by using mechanical instrument. Plastic material transparent. 	Each	1:4	√	√	√
8.	Templates	<ul style="list-style-type: none"> Plastic material circle Medium size Elliptical medium size Square medium size Polygons medium size Triangle medium size. 	Each	1:4	√	√	√
9.	Protractor	Range from 0° – 180° medium size	Each	1:4	√		
10.	Drawing pen	Set of 4 pens	Set	1:1	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		<ul style="list-style-type: none"> Rotring or febre castle Size ranges from 0.1, 0.3, and 0.5 or 0.25, 0.35 and 0.7					
11.	Drawing pencil	<ul style="list-style-type: none"> Fine liner (dotch) Clutch pencil size 0.3, 0.5 and 0.7 (Mechanical pen) Manual HB or B pencils (Medium). Steel or plastic material pen. 	Each	1:1	√	√	√
12.	Lettering stencil	For various pens 0.25, 0.35, 0.4, 0.5, 0.7, 0.8 and 0.18 <ul style="list-style-type: none"> Plastic material stencils 	Set	10	√	√	√
13.	Furniture stencil	<ul style="list-style-type: none"> Plastic material with scale of 1:50 - furniture stencil 1:100 - furniture stencil 1:75 - furniture stencil 1:20 - furniture stencil 1:10 - furniture stencil	Each	1:2	√	√	√
14.	Rubbing brush	<ul style="list-style-type: none"> Dust brush (for removing dust) Made with soft hair and polished wooden handle. 	Each	1:2	√	√	√
15.	Rubber/ eraser	<ul style="list-style-type: none"> Used for rubbing unwanted portion. Made with plastic material. 	Each	1:1	√	√	√
16.	Architectural scale	<ul style="list-style-type: none"> Plastic material Length 300mm Graduated and calibrated including scale of 1:75 	Each	1:1	√	√	√
17.	Razor blade/ sharpener	<ul style="list-style-type: none"> For sharpening pencil Handle plastic material Stainless steel 	Each	1:1	√	√	√
18.	Filling cabinet	<ul style="list-style-type: none"> Wooden (HW) with shelves and hanger. Width 1.5m Length 1.8m 	Each	1:20	√	√	√
19.	Files	<ul style="list-style-type: none"> Newsletters file Flat file Spring file 	Each	1:1	√	√	√
20.	Tracing papers	<ul style="list-style-type: none"> Transparent paper 90, 110/ 115 Does not spread drawing ink. 	Roll	1:2	√	√	√
21.	Sketching paper	<ul style="list-style-type: none"> Transparent paper 50/ 90 g 	Roll	1:2	√	√	√
22.	Ammonium paper	Changes color from <ul style="list-style-type: none"> Yellow colour stored in black colour plastic material. 	Roll	1:2	√	√	√

BASIC TOOLS AND EQUIPMENT FOR MASONRY AND BRICKLAYING (FOR 20 TRAINEES)

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Block Making Machine ▪ Light duty ▪ Hand Operated	- 450x230x150mm - 215x102.5x65mm	Each	1:5	√		
2.	Mould Box ▪ Large ▪ Small	450x230x150mm 215x102.5x65mm	Each	1:5	√		
3.	Concrete mixer	Light duty maximum capacity 1.8cm, drum diameter 76.2cm	Each	1:20	√		
4.	Tyrolean machine	For splash coating interchangeable steel brush roller, adjustable weight 1.9kg.	Each	1:4	√	√	√
5.	Compactor	Hand compactor	Each	1:4		√	√
6.	Poker vibrator	High frequency 40mm	Each	1:20	√	√	√
7.	Hand tile cutting Machine	56cm steel with chrome handle/cutting where diameter x thickness x hole 25x4x7mm	Each	1:10	√	√	√

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Building square 30cmx80cm	Steel	Each	1:4	√	√	√
2.	1. Measuring tape – - 3m - 5m - 15m - 20m - 30m - 50m - 100m	Chromium case/plastic Stainless steel tape/plastic. Chromium plated brass frame Plastic case chromi	Each	1:1	√	√	√
3.	Tripod stand	With spirit bubble	Each	1:20			√
4.	Levelling staff	Metric with levelling bubble	Each	1:20	√	√	√
		Plumb bob 0.5 kg	Each	1:2	√	√	√
		Plumb bob – 1.0kg	Each	1:4	√	√	√
		Plumb bob – 1.5 kg	Each	1:5	√	√	√
5.	Levelling Instrument	Standard	Each	1:20			√
6.	Ranging poles	Ra 2.5m, 2m, wooden with steel tip	Each	1:1	√	√	√
7.	Hand saw	61cm/56cm stain less steel wooden/plastic handle	Each	1:5	√	√	√
8.	String lines 100m (manila type)	Chrome wire	Each	1:20	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
9.	Spirit level 0.5m 1.0m	- 0.5m-aluminium or plastic - 1.0m-aluminium or plastic wooden - 1.5m aluminium or plastic wooden	Each	1:2 1:4 1:4	√ √ √	√ √ √	√ √ √
10.	Pick axe	- Steel and wooden handle - Weight 2.5kg should be hardened - Length 400mmxwidth 100mm - Thickness 2.5mm	Each	1:5	√	√	√
11.	Panga (Bush Knife)	- Plastic handle or wooden - Length – 610mm, blade width 75mm - Thickness 2.5mm	Each	1:4	√	√	√
12.	Straight edge	- Wooden (hardwood), steel (Hollow section) - Length 3m or 2m with 1-2 m	Each	1:2	√	√	√
13.	Wheel barrows	Seam less tray – 889mmx 687.5mm	Each	1:5	√	√	√
14.	Water container/ reservoir,	Plastic/Metal 10ltrs or 20 litres	Each	1:4	√	√	√
15.	Water basket	Metal/plastic not less than 10ltrs	Each	1:10	√	√	√
16.	- Shovel long handle - Shovel long handle	- Round point 685mmx250mmx290mm, square point 685mmx250mmx305mm	Each	1:2 1:2	√ √	√ √	√ √
17.	Batching box	- 30cmx30cmx40cm steel or wooden, - 15cmx15cmx20cm – steel or wooden	Each	1:5 1:5	√	√	√
18.	Masonry line	Fishing line 3 m	Each	1:1	√	√	√
19.	Steel square	- 30cmx80cm - 15cmx40cm	Each	1:2 1:2	√	√	√
20.	Steel trower/brick trowel	- 25cmx15cm - 29cmx15cm - 31cmx15cm - Steel with wooden handle	Each	1:1 1:1 1:1	√	√	√
21.	Margin trowel pointing trowel	- 13cmx5xm - 20cmx2.5cm	Each	1:2 1:2	√	√	√
22.	Brick jointer	Metal with wooden handle 19cmx3cm	Each	1:2	√	√	√
23.	Brick axe	12.5cmx7.5cm – metal with wooden handle	Each	1:2	√	√	√
24.	Mortar pan Mortar buckets	Metal Plastic, round bar, steel handle max diameter 38.5cm	Each	1:2	√	√	√
25.	Wooden float	Wooden/plastic	Each	1:1	√	√	√
26.	Steel float	Steel	Each	1:1	√	√	√
27.	Ladders 3m	Aluminium Steel Wooden		1:10	√	√	√
28.	Spanners	For scaffolding (stainless steel)	Set	2		√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
29.	Hacksaw frame	Plastic 300m long Steel 450mm long	Each	1:5	√	√	√
30.	Claw hammer	Steel with wooden or steel handle (o.5kg)	Each	1:4	√	√	√
31.	Face hammer	Rubber with wooden handle	Each	1:4			√
32.	Sledge hammer	Steel with wooden handle (2kg)	Each	1:5	√	√	√
33.	Slot chisel	240mmx26mm-x7mm-D	Set	1:20	√	√	√
34.	Flat chisel	100mm-1x15mm-wx7mm-D	Set	1:10		√	√
35.	Tile chisel	80mm-x6mm-X7mm-D	Set	1:10		√	√
36.	Hand Rammer/Tamping Rod	- Wooden or metal plate (4.5kg) - Straight steel bar circular gross section 16mm diameter - 600mm long Hemispherical	Each	1:5	√	√	√
37.	Slump test instrument	Steel with wooden or plastic ruler (capacity 0.15m ³ Size of slump Diameter : base 200+2mm Height 300 + 2mm Diameter: top 100mm+2mm Slump height 200mm Hand Rammer cont Weight 8kg, Height 1400mm	Each	1:10	√	√	√
38.	Mortar board	Metal Steel (metal) wooden (capacity 105m ³)	Each	1:5	√	√	√
39.	Rubber mallet	86mmx54mm(310gm)	Each	1:4	√	√	√
40.	Wooden mallet	100mmx45mm(500gm)	Each	1:4			√
41.	Plastic mallet	155mmx85mm(500gm)	Each	1:4		√	√
42.	Cold chisel	Special steel to be hardened with impact resistant head a) 300mm-Lx16mm-W b) 400mm-Lx18mm-W	Each	1:5 1:5	√	√	√
43.	Roller	Manual or mechanical with weight of 25-55kg	Each	1:20			√
44.	Scaffolding	Timber or metal tube and timber platform 6m	Each	1:20	√	√	√
45.	Knapping hammer	Ash handle square face and cross pein weight with handle 125g	Each	1:4			√
46.	Claw bar	I. Dimension: The claw bar to be for 3.2cm in diameter 183cm long shaped to a chisel from at one end and a four flat at the other II. Materials steel with c 45/55 carbon content hardened and tempered III. Weight – 11kg marking manufacturer's name/Trade Mark	Each	1:4	√	√	√

BASIC TOOLS AND EQUIPMENT FOR PAINTING AND SIGN WRITING (FOR 16 TRAINEES)

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Tyrolean machine	Approx work area per filling 5m ² - Weight 1.9 kg reparable sprayer	Each	1:2	✓	✓	✓
2.	Spray Air compressor 1 ½ H.P Heavy duty high pressure reserve tank	- Safety valve setting 75kg - Tank capacity 20 gal pressure tested to 13.6kg - Compressor type single piston 2 2/8", bare x 2" stroke twin - Pressure gauge 0-9.91kg - With air horse pipe (rubber covered) ¾" I.D Horse to 50M	Each	1:8	✓	✓	✓
3.	Spray gun (heavy duty production)	Aluminium body with accessory	Each	1:4	✓	✓	✓
4.	Spray gun (light duty)	Volume I litre length 200mm with accessories	Each	1:4	✓	✓	✓

B. TOOLS

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Putty knives	Forticel handle stiff blade 4 ½" or (115mm)	Each	1:2	✓	✓	✓
2.	Artist water colours	Plastic tray of 8 oval pan colours size	Each	1:4	✓	✓	✓
3.	Artist oval pan refills solid colours black, green	- 1 gross@ colour carton - Black - Green	Each Each	1:16 1:16	✓	✓	✓
4.	Coloured pencils	1 box of 12 full length pencil	Each	1:2	✓	✓	✓
5.	Chalk-line, chalk – o matrix	15 meters diameter cast Aluminium case	Each	1:2	✓	✓	✓
6.	Adjustable wooden board (18"x24")	Top cross piece of easel is used as tray to hold brushes	Each	1:2	✓	✓	✓
7.	Water colour artist brushes	Size – 2 to 14 wooden handle set of ten pieces	Set	1:4	✓	✓	✓
8.	Flat shape art utility brushes size	- 3/16 to 1" width and hair length 7/16" to 1 3/8" - Wooden handle - Set of seven pieces	Set	1:4	✓	✓	✓
9.	Round shape, wash brushes	Size 2 cm to 12cm wooden handle (set of 6 pieces)	Set	1:4	✓	✓	
10.	Oil colour brushes size	2-12(set of pieces wooden handles	Set	1:8	✓	✓	
11.	Oval shape brushes	Size 1-3 width ½" to 1"(set of 3 pieces)	Set	1:5	✓	✓	
12.	Round shape, bristle brushes	Size 2 to 12 wooden handle set of 6 pieces)	Set	1:8	✓	✓	
13.	Brushes	paster – canel long wooden handle (set of six pieces	Set	1:4	✓	✓	

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		Enamel brush with wooden handle size 1" to 3"(set of 5 pieces)	Set	1:4	√	√	√
		Distemper brush nylon width 6" wooden handle	Set	1:16	√	√	√
		Stencil brushes 3/8" to 7/8" (set of four) wooden handle	Set	1:4	√	√	√
14.	Plumb bob	Bright steel along with width plate 9mm or o.17 kg	Each	1:4	√	√	√
15.	Scraping knives	Size 4 1/2" or 11.5cm spear point	Each	1:1	√	√	√
16.	Palate knife	Size 8" or 20cm	Each	1:4	√	√	√
17.	Home decorator set paratte	Putty and 2 scraping knives	Each	1:1	√	√	√
18.	Glass cutter	Diamond point Wooden handle circle DIAMOND glass cutter 40mm diameter	Each	1:4		√	√
19.	Pointing trowel	6" or 150mm plain handle	Each	1:2	√	√	√
20.	Utility flat brush	1/2" to 2" or 12.7mm to 50mm set of pieces.	Each	1:2		√	√
21.	Folding rule	2m long graduated metric (zig zag)	Each	1:2	√	√	√
22.	Filling knives	size 8cm and 3cm	Each	1:4	√	√	√
23.	paint strainer, removable 34 x 25cm x 15cm	34cm x 25cm x 15cm	Each	1:8	√	√	√
24.	Spare filters for paints spraying	Standard	Each	1:8	√	√	√
25.	Claw hammer	With wooden /metal handle (25og)	Each	1:4	√	√	√
26.	Pincers 6" or 15cm	6"x15cm length	Each	1:4	√	√	√
27.	Screw drivers	12" or 30.5cm with flat tip and wooden handle	Set	1:4	√	√	√
28.	Painting roller brushes	For wall painting or plastering	Each	1:2	√	√	√
29.	Structure rollers	For wall painting plastic handled soft hairs	Each	1:2	√	√	√
30.	Blow lamp	2 litres capacity made of metal sheet	Each	1:4	√	√	√
31.	Gas paint burner	Complete with torch handle with gas tube	Each	1:8	√	√	√
32.	Wire brush	Wooden handle, 30 cm long	Each	1:2	√	√	√
33.	Dust brush	Wooden handle with worse hairs	Each	1:4	√	√	√
34.	Spirit level	Metal steel, plastic, and wooden	Each	1:4	√	√	√
35.	Safety gears	Helmet hard plastic with sponge inside, size – adjustable, weight 320,	Each	1:1	√	√	√
		Goggles – plastic materials with 420mm – length 345 mm x 200mm weight 190g, 125g PVC length Non inflammable and shutter proof.	Each	1:1	√	√	√
		Dust mask	Each	1:1	√	√	√
		- Groves - 420 mm length - Leather and cloth) washable	Pair	1:16	√	√	√
36.	Stopping knives	- Wooden handle - Stain less steel	Each	1:4	√	√	√

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
		- 200 – 250mm long					
37.	Painting trough	- 30cmx30cm slanted in the interior part - Wooden or plastic	Each	1:2	√	√	√
38.	Painting bucket	- Diameter 30cm - Depth 45cm - Plastic material - Smooth surface	Each	1:2	√	√	√
39.	Ladders	3m long ladder metal – aluminium with rubber foot	Each	1:4	√	√	√
40.	Scaffolding	Tubular 6m long	Each	1:16	√	√	√
41.	Steel trowel	Plastic handle steel plate, stain less	Each	1:4	√	√	√
42.	Tile cutter machine	56cm steel with chrome handle	Each	1:8	√	√	√
43.	Soft hammer	Rubber with wooden handle 2kg	Each	1:4	√	√	√
44.	Tape measure	3m –with metal casement	Each	1:4	√	√	√
		5m – with plastic case	Each	1:4	√	√	√
		10m – long with metal case	Each	1:4	√	√	√
45.	Stencil knife	Wooden handle stainless steel	Each	1:4	√	√	√
46.	Lettering brush	Scrabble brush horse hair flexible	Set	1:4	√	√	√
47.	Shave hook	Blade width 100mm, 125mm metal handle	Each	1:4	√	√	√
48.	Spade	Long handle round point 685 x 250x290mm	Each	1:8	√	√	√
49.	Mortar pan	Metal steel	Each	1:8	√	√	√

BASIC TOOLS AND EQUIPMENT FOR PLUMBING AND DRAINAGE (16 TRAINEES)

A. EQUIPMENT

S/N	ITEM	SPECIFICATIONS	UNIT	RATIO	LI	LII	LIII
1.	Copper tube bending machine	Rigid - Tube diameter external GMM -12 mm - Radial of curvature 12-38mm	Each	1:4	√	√	
2.	Pipe bending spring	- 12mm and 15 Mm - Centre radius 28.5mm– 37.5mm - External diameter 6mm – 13mm	Each	1:4	√	√	
3.	Hydraulic bending machine	- Maximum pressure 80-180 KN - Weight 29KG – 12KG	Each	1:16	√	√	
		- Internal diameter 10mm – 32mm - 10mm – 8mm - For pipe external diameter 17mm-889mm	Each	1:16	√	√	
4.	Portable pipe bender	Manual with stand to bend 3/8" diameter - Interchangeable former and guide	Each	1:8	√	√	
5.	Drilling and tapping machine	For tapping water main to obtain a branch of ¾ to 1"	Each	1:16		√	
6.	Drilling machine (bench model)	3-jaw chuck and key Drilling capacity steel 13mm Threat 195mm Rectangular table 345x465mm Overall height 940mm Overall depth 685mm Overall width 370mm Speed for standard range 620 1100, 1840 and 3240(RMM)	Each	1:8	√	√	√
7.	Threading machine manual	Stock and die Adjustable and interchange dies ½" to 2 ratchet chaser dies stock type	Each	1:4	√	√	√
		Ratchet drop head die stock ½" – 1 ½"		1:4	√	√	√
		Ratchet receder die stock ½" – 2"		1:8	√	√	√
8.	Machine – Power Pipe threading machine.	Rigid No. 300A - Threading capacity. - Pipe threads radius 1/8" – 2" - Bolt threads UNC – W ¼" – 2"	Each	1:16	√	√	√

		<ul style="list-style-type: none"> - Speed revolution per minutes 38 - Weight 63kg 					
		Rigid No. 535 – 213 Threading capacity revolution 1/8"-2". <ul style="list-style-type: none"> - Bolt threads UNC – W 1/4" – 2" - Bolt threads M 6 – 50 - Speed K/M 36 - Speed 35/70 power rating 370 – 380 net weight 125 kg 	Each	1:16	√	√	√
9.	Oxy – acetylene plant	Welding nozzles set of 13 pieces with welding torch <ul style="list-style-type: none"> - Cutting attachment - Two stage oxygen regulator - Two stage acetylene regulator - Set of oxy-acetylene regulator - Set of oxy-acetylene spanner - Welding goggles 	Pair	1:8		√	
10.	Riveting machinery	Length – 230 MM for gap rivet 2.4mm, 3.2mm, 4.0mm Standard pack SB 5 Width with adaptor No. 13179 For rivet 4.8MM	Each	1:16	√	√	
			Each	1:16	√	√	
11.	Rolling machine	Working length 1020 mm-1270mm For maximum sheet length (400N/mm ²) 1.5mm and 1.25MM Upper and tower diameter 60MM Rear roller diameter 65mm Net weight 175 kg 215 kg	Each	1:16	√	√	√
12.	Bending and folding machine	Working length 1250 mm-2550mm Maximum sheet thickness 1.5mm – 3mm Adjustment length of top former 1000mm, 100mm, 2000mm and 175mm	Each	1:16	√	√	√
13.	Grinding machine	Pedestal 178mm with 200mm/25mm and 15mm Grinding wheels Grinding wheels course and	Each	1:8	√	√	√

		fine					
14.	Flanging and bending machine with standard accessories	Max. thickness 1 mm - Working height 250 mm - Working depth 200 mm Distance shaft centers – 50 mm	Each	1:16	√	√	√
15.	Arc welding machine	DC rectifier 250AMPS	Each	1:16		√	√
16.	Shearing machine	Peldinghauns - Cuts steel plate maximum thickness 8MM - Cuts round bar maximum diameter 20MM - Cuts square bar maximum size 18MM - Cuts angle and T-section maximum size - Length of blade 175MM - Net weight 43KG	Each	1:16	√	√	√
17.	Power hacksaw machine	Capacity 125mm 125mmx125mm - Diameter 100mm - Adjust hook up bar, built in coolant tank and pump. - Blade 308mm/355mm long 4 speed - 400x38mmx2mm mortar rating 0.75KW - Weight 160kg - Stroke per min 70-100	Each	1:16	√	√	√
18.	Rules	Steel - Length –150mm width-18mm thickness – 0.5mm	Each	1:1	√	√	√
		Length – 300mm	Each	1:1	√	√	√
		Length – 1000mm W=35mm, thickness 1.5mm should be hardened strip steel/graduated in mm	Each	1:8	√	√	√
		Folding - Length 1000mm(1M) - Graduation front M per M - Number of sections 10.	Each	1:2	√	√	√
19.	Stocks and – die	Drop head ratchert - Capacity ½” to 2” - Material used hardened steel	Each	1:4	√	√	√

		<ul style="list-style-type: none"> Oilcan – Brass pump 1/2 pts 					
20.	Wheel pipe cutter	One thin cutting wheel and two rotters <ul style="list-style-type: none"> For pipe diameter 1/8" – 2" and 1 1/2-3" 	Each	1:4	√	√	√
		Flue cutting wheels <ul style="list-style-type: none"> For pipe diameter 1/8" – 2" and 1 1/2-3" 	Each	1:4	√	√	√
21.	Reamers	For inside de-burring of steel tube of square shank <ul style="list-style-type: none"> For pipe diameter 6mm-38mm and 6mm – 50mm 	Each	1:4	√	√	√
22.	Hacksaw frame	<ul style="list-style-type: none"> Adjustable for fixing blade length 250mm to 300mm Overall length 420mm Material tubular steel frame with elliptic cross section 22 teeth inch (flexible back) 	Each	1:1	√	√	√
23.	Stillson pipe wrenches	<ul style="list-style-type: none"> For maximum pipe diameter 1/2"-2" 	Each	1:4	√	√	√
		<ul style="list-style-type: none"> Length 250mm 	Each	1:4			
		<ul style="list-style-type: none"> 350mm 	Each	1:4			
		<ul style="list-style-type: none"> 500mm 1200mm 	Each	1:8			
24.	Foot print wrench	1/4" to 3" capacity 6.5mm to 75mm	Each	1:8	√	√	√
25.	Basin wrench	Swivel head for 1/2" to 3/4 nut	Each	1:4		√	
		Shetack patent for basin, sink and bath nut	Each	1:8	√	√	√
26.	Chain wrench	Heavy duty model in exchangeable jaws <ul style="list-style-type: none"> Capacity maximum 2", 2 1/2", 3", 5" Minimum 1/8" Length less chain 325mm, 450mm, 600mm, 900mm 	Each	1:8		√	√
27.	Pipe vice (bench)	Hinged drop forged steel <ul style="list-style-type: none"> Hardened Maximum pipe diameter 2", 3", 4" 6kg, 10kg, 14kg Minimum pipe diameter 3/8" 	Each	1:2	√	√	√
28.	Portable tripod stand pipe vice	<ul style="list-style-type: none"> Folding type Angle iron from with 	Each	1:4	√	√	√

		<ul style="list-style-type: none"> tool tray - Wood foot boards - Max diameter 2", 3" - Overall height 1150mm and 1125mm - Weight 25kg 					
29.	Chain pipe vice	<ul style="list-style-type: none"> - Folding type - Tubular steel stand with tool tray - Overall height 1200mm and 1125mm - Weight 20kg 	Each	1:8	√	√	√
30.	Files	<ul style="list-style-type: none"> - Length 250mm and 300mm - Width – 24.5mm thickness 6.5mm 	Each	1:1	√	√	√
	• Flat						
	• Round	Length 100mm – 350mm diameter 4mm-16mm	Each	1:1	√	√	√
	• Half round	Length 100mm – 350mm 11mmx3mm-32.5mmx10.5mm	Each	1:1	√	√	√
31.	Hammer	Ball pein wooden handle 250 gm	Each	1:1	√	√	√
		Wooden handle 500gm	Each	1:1	√	√	√
		Cross pein hammer wooden handle 250gm	Each	1:1	√	√	√
		Wooden handle 500gm	Each	1:1	√	√	√
		Sludge hammer steel with wooden handle 4kg(weight)	Each	1:1	√	√	√
32.	Soldering iron	Straight wooden handle 400gm	Each	1:4	√	√	
		Hatchet bit wooden handle weight 250 gm	Each	1:4	√	√	√
33.	Portable electric drill up to 13mm capacity	Back handle drill opening with 4m approx 3 – core cable chuck and key handle	Each	1:8	√	√	√
34.	Hacking knife	<ul style="list-style-type: none"> - Wooden or plastic handle - Blade length 95mm - Overall length 190mm 	Each	1:4	√	√	
35.	Spirit level	<ul style="list-style-type: none"> - Aluminium /plastic - Length 0.5m - Bubble in closed clean glass 	Each	1:4	√	√	√
		Length 1m	Each	1:8	√	√	√
		250mm	Each	1:4	√	√	√
		magnetic made of plastic and aluminium fitted with two built in magnetic length 230mm	Each	1:4	√	√	√
36.	Cold chisel	Flat chisel special hardened impact resistant head – length 200mm width 25mm	Each	1:2	√	√	√
		Flat chisel hardened impact resistant head length 400mm	Each	1:4	√	√	√

		Width 34mm					
37.	Ladder	<ul style="list-style-type: none"> - Aluminium 3m - Aluminium 6m 	Each Each	1:8 1:8	√	√	√
38.	Pump pliers	<ul style="list-style-type: none"> - Heavy duty type chromel made vanadium steel - Capacity 32mm - Length 250mm 	Each	1:4		√	√
39.	Combination pliers	<ul style="list-style-type: none"> - Heavy duty handles - Single joint serrated jaws and pipe grip - Length 100mm, 21mm 	Each	1:4	√	√	√
40.	Pincers	Single joint polished back finish length 160mm, 210mm Jaw width – 16mm	Set	1:4	√	√	√
41.	Flat nose pliers	Width diagonal centres single joint long jaws serrated gripping surface length 140mm cut steel wire 2mm	Each	1:8	√	√	√
42.	Round nose pliers	Heavy duty handles <ul style="list-style-type: none"> - Single joint precision ground round jaws polished - Length 140mm - Died of tips 25mm 	Each	1:4	√	√	√
43.	Self grip wrench	<ul style="list-style-type: none"> - Special jaws - Self locking plane jaws with pain grip length 220mm capacity 0-30mm 	Each	1:4	√	√	√
44.	Adjustable spanner	15° jaw angles made form chromium vanadian steel ground head hole at end handle bright finish. <ul style="list-style-type: none"> - Capacity 14mm - Length 110mm - Length 205mm capacity 27 - Length 455mm capacity 53 	Each	1:4	√	√	√
45.	Brick trowel	<ul style="list-style-type: none"> - Steel with wooden - Handle 25mmx25mm - Anvil – weight 50kg drop forged with hardened place work surface width – 100mm - Height – 225mm. 	Each	1:4	√	√	√
46.	Chain cutter	<ul style="list-style-type: none"> - For parting off cast iron pipes of various diameters - Type k6 = for normal pipes 	Each	1:8		√	√

		<ul style="list-style-type: none"> - Type K8 – 20 for thick wall pipe - For pipe diameter 2 1/2" - 6, 4"-8", 6"-9" - No of cutting wheels 7,8,9,10,13,16 					
47.	Rawl plug drill	Set consisting of two plug drills, holder and tapered knocking out pin bit diameter 5mm and 6mm	Each	1:4	√	√	√
48.	Spade/shovel	<ul style="list-style-type: none"> - With long handle - Round point 685mmx215mmx290mm 	Each	1:4	√	√	√
49.	Pickaxe	<ul style="list-style-type: none"> - Hardened and tempered, wooden handle - Length 700mm weight 4kg - Eye diameter 72mmx40mm 	Each	1:4	√	√	√
50.	Brick axe	<ul style="list-style-type: none"> - With frame hardened bitch handle - Weight – 0.3kg - Length – 300mm 	Each	1:4	√	√	√
51.	Screw drivers	<ul style="list-style-type: none"> - Flat end - Round nickel plated blade plastic handle - Length of handle 60mm - Length of blade 50mm 	Each	1:8	√	√	√
52.	Stubby type	- Square nickel plated blade	Set	1:16	√	√	√
		- length blade 25mm - length of handle 50mm - With star up	Set	1:16			√
53.	Round nickel plated blade	<ul style="list-style-type: none"> - With starting length of blade 60mm - Length of handle 75mm 	Set	1:16			√
54.	Washer cutter	For cutting washer of 1/2" to 2" Steel handle	Set	1:16	√	√	√
55.	Portable forge	Hand operate blower 450mm, V fan back blast hand blower type studidy leg base	Each	1:16	√	√	√
56.	Chalk line	15m aluminium	Each	1:4	√	√	√
57.	Wire brush	Wooden handle cast steel wire <ul style="list-style-type: none"> - 0.3mm circular section - length – 290mm 	Each	1:2	√	√	√
58.	Twisted drill bits	Finished reamer in high speed steel, taper shank no. 4 –20 Electric soldering iron 220 watt	Set	1:8	√	√	√

		Concrete drills for ordinary drills Diameter 6mm-20mm					
59.	Blow lamp	2lts capacity	Each	1:1	√	√	√
60.	Snips	Straight	Each	1:8	√	√	√
		Carve snip	Each	1:8			
61.	Angle grinder	For depressed grinding wheels Centre wheel diameter 180mm spindle thread UNC-3/8 speed r/min 500 weight 3kg	Each	1:16	√	√	√
62.	Try and mitre squares	Cast stock with mitre hardened, nussless blade Graduated in mm on both sides and both external and internal angle Blade length 250mm	Each	1:1	√	√	√
63.	Centre punches	Hexagonal ground point length 100mm diameter 2.5mm	Each	1:1	√	√	√
		Round ground knurled shank	Each	1:1			
		Length 100mm diameter at point 1.5mm	Each	1:1			
		Tapered point hexagonal diameter of point 1.5mm length 100mm					
64.	Wing dividers	Steel, rectangular shanks with hardened pints side – mounted length 150mm max capacity 170mm.	Each	1:1	√	√	√
65.	Spring dividers	Outside calliper with flat shanks and hardened points Max capacity 225mm length 200mm	Each	1:1	√	√	√
66.	Scriber	Eclipse with one straight and one bent steel point hardened and ground. Round knurled handle Length – 17mm diameter 6.5mm	Each	1:1	√	√	√
		With tungsten carbide point quality , knurled handle with crip Length 140mm diameter 6mm	Each	1:1	√	√	√
67.	Safety gears	Leather apron	Each	1:1	√	√	√
		Hand shield	Each	1:1	√	√	√
		Welding goggles	Each	1:1	√	√	√
		Clear goggles	Each	1:1	√	√	√
		Noise ear plugs	Each	1:1	√	√	√
		Leather gloves pair	Each	1:1	√	√	√
		Helmet	Each	1:1	√	√	√
68.	Hand drills	Milled gears support handle	Each	1:14	√	√	√

		three jaw chuck supplied with support handle max drill diameter 8mm Overall length 300mm					
69.	Drill brace	Alligator jaws twelve- tooth ratchet, self cantering chuck with universal jaws , ball , bearing , head plastic handle nickel plated set with anger bits sweep 250mm	Each	1:4	√	√	√
70.	Stakes	Horse heads highly polished working surface Round bottom shallow round deep round flat	Set	1:16		√	√
71.	Knapping hammers	Ash handle, square face and cross pein weight with handleless 125g	Each	1:4	√	√	√
72.	Letter punches	Alphabet punches height 15mm, shank square 21mm	Each	1:4	√	√	√
73.	Measuring tapes	Enclosed chromium plated plastic case with flat bottom spring return. - Length – 5mm - Width – 19mm	Each	1:1	√	√	√
74.	Measuring tapes	Glass fibre tape with attachment hook measuring lengths – 10m - Width – 12mm	Each	1:4	√	√	√
75.	Bench Vice	Steel drop forged smooth jaw fully enclosed spindle with double acme thread with anvil jaw width, 120 mm capacity 150 mm, jaw depth 80 mm Anvil size 75 mm x 70 mm Weight 10 kg	Each	1:4	√	√	√
76.	Tongs	Forged type	Each	1:8		√	
77.	Spark lighter	Print type	Each	1:4		√	
78.	Chipping hammer	300 g	Each	1:8		√	
79.	Electrode holder	500 amp asbestos type	Each	1:4		√	

APPENDIX 2

SCHEMATIC DRAWING OF WORKSHOP AND CLASSROOM