



National Vocational Certificate Level 3 in Urban Area Planning and Management

(Assistant Supervisor)



Competency Standards

**National Vocational and Technical Training Commission (NAVTTC),
Government of Pakistan**



National Competency Standards

For

National Vocational Certificate Level 3 in Urban Area Planning and Management “Assistant Supervisor”

NVQF Level 3

DACUM Facilitator: Mr. Abdul Moez – DACUM Facilitator / Structural Engineer

NAVTTTC Coordinator: Mr. Shahzad Ahmad– Deputy Director SS&C, NAVTTTC HQs.



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INTRODUCTION

Urban area planning and management is an art of shaping and guiding the physical growth of the town creating buildings and environments to meet the various needs such as social, cultural, economic and recreational etc. and to provide healthy conditions for both rich and poor to live, to work and to play or relax, thus bringing about the social and economic well-being for the majority of mankind.

Keeping in view of the above the competency based national vocational qualifications have been developed by NAVTTC to train the unskilled human resource on the technical and entrepreneurial skills to be employed / self-employed and inevitably set sustainable impact on their lives by increase in their livelihood income.

Training Course is based on competency standards which are defined by the industry and the traditional role of a trainer changes and shifts towards the facilitation of training. A trainer encourages and assists trainees to learn for themselves. Trainees are likely to work in groups (pairs) and all doing something different. Some are doing practical tasks in the workshop, some writing, some not even in the classroom or workshop but in another part of the building using specialist equipment, working on computers doing research on the Internet or the library. As trainees learn at different pace they might well be at different stages in their learning, thus learning must be tailored to suit individual needs.

PURPOSE OF THE QUALIFICATION

The purpose of the training is to provide skilled manpower to improve the new and existing urban area management. This will improve the quality in town planning sector and the availability of skilled professionals will bring socio-economic benefits to all stakeholders. The specific objectives of developing these qualifications are as under:

- Improve the professional competence of managing urban area
- Capacitate the local community and trainers in modern CBT training, methodologies and processes as envisaged under NVQF



- Provide flexible pathways and progressions in the town planning and management sector
- Enable the trainees to perform their duties in efficient manner
- Establish a standardized and sustainable system of training for urban area management in Pakistan

DATE OF VALIDATION

This national vocational qualification (NVQ) has been validated by the Qualifications Development Committee (QDC) in 7th March to 11th March 2022 and will remain in currency until 1st March 2032

*Shall be reviewed after 3 years

CODE OF QUALIFICATION

Qualification Title	Code
National Vocational Certificate Level 3 in Urban Area Planning and Management “Assistant Supervisor”	719UPM03

ENTRY REQUIREMENTS

- For National Vocational Certificate Level-3 in Urban Planning and Management “Assistant Supervisor” the entry requirement is award of National Vocational Certificate Level-2 in “Field Assistant”. The entry in informal sector is not prescribed.



QUALIFICATION DEVELOPMENT COMMITTEE

The following members participated in the qualification development of these qualifications:

Sr. No.	Name	Designation	Organization
1.	Muhammad Abdul Moez	DACUM Facilitator/ Structural Engineer	RMCE Lahore
2.	Mr. Shahzad Ahmad	Coordinator	Deputy Director NAVTTTC, Islamabad
3.	Engr. Azhar Iqbal Shad	Retired Principal	GCT , Raiwand road Lahore
4.	Malik Liaqat Ali	Town Planning officer	MC Sahiwal
5.	Mr. Sikandar Hayat	Instructor	GCT , Raiwand road Lahore
6.	Mr. Hijaz Ali Shah	Field Worker in Civil	Peshawar
7.	Mr. Muhammad Usman Khan	Building Inspector	Local Body Board, Kasur
8.	Syed Ali Raza	Civil Engineer	Nespak Islamanad
9.	Engr. Ahmad Ali	Site Supervisor	Urban Unit, Lahore
10.	Mr. Tahir Mahmood	Senior Instructor	GTTI Mughalpura, Lahore
11.	Engr. Abdul Basit Mansoor	AEE	PWD Sialkot
12.	Mr. Osama Ahmed Sheikh	AM, Repair and Maintenance	Orange Line Lahore



QUALIFICATIONS VALIDATION COMMITTEE

The following members participated in the qualification validation of these qualifications:

Sr. No.	Name	Designation	Organization
1.	Muhammad Abdul Moez	DACUM Facilitator/ Structural Engineer	RMCE Lahore
2.	Mr. Shahzad Ahmad	Coordinator	Deputy Director NAVTTC, Islamabad
3.	Engr. Azhar Iqbal Shad	Retired Principal	GCT , Raiwand road Lahore
4.	Mr. Nadeem Zaigham	Sr. Instructor	GCT , Raiwand road Lahore
5.	Mr. Sikandar Hayat	Instructor	GCT , Raiwand road Lahore
6.	Mr. Hijaz Ali Shah	Field Worker in Civil	Peshawar
7.	Ms. Sadia Saleem	Quality Checker	Interloop, Faisalabad
8.	Mr. Tahir Mahmood	Senior Instructor	GTTI Mughalpura, Lahore
9.	Engr. Abdul Basit Mansoor	AEE	PWD Sialkot
10.	Mr. Usama Ahmed Sheikh	Track and Infrastructure Engineer	Orange Line Lahore
11.	Mr. Waqar Khan	Lab Engineer	NUML Rawalpindi
12.	Mr. Muhammad Adnan	Secretary	PBTE Lahore
13.	Engr. Muhammad Ibrar	Manager site	DHA Bahawalpur
14.	Muhammad Maroof	Representative of STEVTA	Hyderabad
15.	Syed Zafar Ayub Hussain Shah	Project Coordinator ZKB	Peshawar
16.	Mr. Abdul Samad	Civil Contractor	FSB



SUMMARY OF COMPETENCY STANDARDS

Code	Competency Standards	Level	Theory		Practical		Total	
			C	Hr.	C	Hr.	C	Hr.
1.	Maintain Safety at Workplace	3	1.0	10	3.0	30	4	40
2.	Process Consumer Complaint	3	1.0	10	3.0	30	4	40
3.	Perform Basic Plumbing	3	2.0	20	9.0	90	11	110
4.	Produce Civil Engineering Drawings	3	1.6	16	8.4	84	10	100
5.	Prepare Rough Cost Estimation	3	1.7	17	6.3	63	8	80
6.	Collect and Organize Field Survey Data	3	2.0	20	6.0	60	8	80
7.	Perform Basic Survey and leveling	3	2.7	27	12.3	123	15	150
Total			12	120	48	480	60	600



719UPM03A - Competency Standard: Maintain Safety at Workplace

Overview: This competency standard covers the skills and knowledge required to maintain safe work condition at workplace and emergency response activity. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Maintain safe work condition at Site	<i>You must be able to:</i> P1. Recognize the safety signs and symbols P2. Identify potential hazards at work site P3. Identify the risk of slip, trip and fall at work place P4. Perform fall protection measures as per job requirements
CU2. Perform fire fighting	<i>You must be able to:</i> P1. Identify source of fire. P2. Identify classes of fire P3. Raise fire alarms P4. Select suitable fire extinguishers P5. Check expiry of fire extinguisher P6. Check wind direction P7. Locate emergency exits P8. Perform PASS (Pull, aim, squeeze and sweep) on fire extinguisher
CU3. Carry out basic first aid	<i>You must be able to:</i> P1. Follow COVID-19 SOP's P2. Identify basic elements for first aid kit P3. Maintain a fully stacked first aid kit P4. Check expiry date of medicines P5. Perform mock first aid treatment for minor injuries



CU4. Perform Basic electrical work safely at workplace	<i>You must be able to:</i> P1. Check the connectivity of earthing with power equipment P2. Check leads and cable for any visual damage before use P3. Tag damaged lead, cable and connection points and report to the supervisor
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Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- Unsafe act and unsafe conditions
- Electrical safety
- Safety signs and symbols
- First Aid treatment
- Source of fire
- Firefighting techniques
- Housekeeping at workplace
- Emergency exits at workplace
- Types of fire extinguisher
- Classes of fire
- Types of hazardous materials and relevant safety procedures
- Use of required PPE for different situations

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform first aid treatment for minor cut
- Perform mock firefighting on a source of fire



719UPM03B - Competency Standard: Process Consumer Complaint

Overview: This competency standard deal with learning the competencies needed to process consumer complaint. That includes preparation for responding to consumer complaint and referring it according to instructions. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Respond to consumer complaint	<i>You must be able to:</i> P1. Process the complaint as per organization SOP. P2. Maintain complaint register
CU2. Refer complaint	<i>You must be able to:</i> P1. Identify the complaint to be referred P2. Forward all the documents and investigation report P3. Follow the reported complaint P4. Provide feedback to the complainant

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Organizational policies and procedures for dealing complaints
- Importance of consumer complaints
- Importance of good communication
- Individual role in processing customer complaint
- Methods of investigation
- Complaint register
- Customer Complaint Steps
- Importance of feedback



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Produce a referral report of complaint
- Maintain complaint register



719UPM03C - Competency Standard: Perform Basic Plumbing

Overview: This competency standard deal with learning the competencies needed to perform basic plumbing. That includes identification of plumbing tools and equipment, performing pipe cutting, threading and reaming and joining PPRC and G.I pipes and fittings according to instructions. Your underpinning knowledge will be sufficient to provide you the basis for your work

Competency Units	Performance Criteria
CU1. Identify plumbing tools and equipment	<i>You must be able to:</i> P1. Draw required layout drawing P2. Identify plumbing tools & equipment
CU2. Perform pipe cutting, threading & reaming	<i>You must be able to:</i> P1. Perform pipe cutting P2. Perform pipe threading P3. Perform pipe reaming
CU3. Join PPRC pipes & fittings	<i>You must be able to:</i> P1. Select required pipes and fitting P2. Join PPRC pipes using heating tool P3. Allow the joint to cool down P4. Take pipe leakage test
CU4. Join G.I pipes and fittings	<i>You must be able to:</i> P1. Select required pipes and fitting P2. Select required die P3. Perform cutting and threading of pipe P4. Select required socket P5. Join G.I pipe with socket P6. Take pipe leakage test



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Plumbing
- Types of plumbing tools (pipe wrench, spanner, screw drivers, pipe cutters etc.)
- Types of plumbing equipment (Threading die, Hack Saw, Bench Vice, Leg Vice and reamer)
- Procedures for using plumbing tools
- Types of pipes and fittings
- Different pipe joints
- Procedure for pipe cutting, threading, reaming
- Tool calibration
- Procedure for PPRC pipe joining
- Types of G.I pipes and fitting
- Coupling of G.I pipes
- Procedure to join G.I pipe
- Hot and cold-water line
- Water supply system symbols
- Safety valves
- Teflon tape
- Pipe water leakage test
- Types of dyes for threading

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Draw layout of plumbing lab
- Perform cutting, threading and reaming on G.I pipe
- Perform different PPRC pipe joints
- Perform different G.I pipe joints



719UPM03D - Competency Standard: Produce Civil Engineering Drawings

Overview: This Competency Standard identifies the competencies required to produce civil engineering drawings. That includes preparing detailed drawings and different cross sections. Your underpinning knowledge regarding computer applications will be sufficient to provide the basis for your work.

Competency Units	Performance Criteria
CU1. Prepare detailed drawings	<i>You must be able to:</i> P1. Draw required plan with details P2. Draw required front and side elevation P3. Draw required site plan, layout plan P4. Draw required cross section
CU2. Prepare layout plan for services	<i>You must be able to:</i> P1. Draw layout plan for water supply and sanitation for public building P2. Draw the details of services structures P3. Draw cross section of streets

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Buildings and their types
- Types of roads
- Types of streets
- Types of drains
- Working drawings
- Model structures
- Submission drawings
- Detail drawings (cross section, working plan, elevation etc.)
- Types of Elevation
- Types of plans (site plan, layout plan etc.)
- Types of utility services



- Service structures
- Cross sections of drain, roads and street

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Produce drawing of cross section and front elevation of single-story residential building.
- Produce drawing of layout of a housing society
- Produce drawing of cross section of streets
- Produce drawing of a layout plan for water supply and sanitation for domestic building



719UPM03E - Competency Standard: Prepare Rough Cost estimation

Overview: This competency standard deal with learning the competencies needed to prepare rough cost estimation. That includes preparing rough cost estimations of construction works by different methods. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Prepare rough cost estimate by unit rate method.	You must be able to: P1. Interpret line plan. P2. Divide plan into small units P3. Calculate number of units P4. Calculate unit rate P5. Compile results of estimate
CU2. Prepare Rough Cost estimate by plinth area method.	You must be able to: P1. Calculate covered area of building P2. Calculate cost per square unit P3. Calculate cost estimate
CU3. Prepare Rough cost Estimate of pipe lines	You must be able to: P1. Measure lengths of each diameter pipe. P2. Prepare analysis of rate for pipe line. P3. Calculate amount of pipe line.
CU4. Prepare Rough cost Estimate of water supply scheme	You must be able to: P1. Collect the population and hydraulic data. P2. Calculate the demand of water P3. Calculate capacity of tank in gallons. P4. Calculate length of the supply line and appurtenance P5. Calculate cost of construction of tank.
CU5. Prepare Rough cost Estimate of sewer scheme	You must be able to: P1. Measure lengths of each diameter pipe. P2. Prepare analysis of rate for sewer line. P3. Prepare the analysis of rate for manhole P4. Calculate amount of sewer line.



CU6. Prepare estimate of urban road/street	You must be able to: P1. Calculate area of road site. P2. Calculate the volume of earthworks P3. Calculate volume of sub base and base course of road P4. Calculate area of surfacing P5. Measure items of road marking and sign boards. P6. Prepare abstract of cost.
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Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Rough cost estimation
- Construction work units
- Types of estimation (unit area method, plinth area method)
- Line plan
- Methods of rough cost estimation
- Specifications of building classes and roads
- Types of construction works
- Analysis of rate
- Procedure for abstract of cost
- Procedures for quantity calculations
- Classes of buildings
- Cross section and L-section of roads and street
- Components of a building
- Parts of road structure and their specifications
- Components of water supply scheme and its appurtenance
- Types of hydraulic data
- Components of sewerage scheme
- Components of water tank and septic tanks
- Units of measurements (FPS, MKS, SI)
- Unit conversions



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Prepare rough cost estimate of water supply scheme with tanks
- Prepare rough cost estimate of sewer scheme with manholes



719UPM03F - Competency Standard: Collect and Organize Field Survey Data

Overview: This competency standard deal with learning the competencies needed to collect and organise field survey data. That includes preparation of tools for direct data collection, conduct data collection using direct data collection and existing sources and organize data according to instructions. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Prepare tools for direct data collection	<i>You must be able to:</i> P1. Identify expected data outcomes P2. Select the population P3. Select data collection method P4. Prepare the survey vehicle/questionnaire P5. Identify sample size P6. Test vehicle/questionnaire P7. Correct vehicle/ questionnaire if required
CU2. Conduct data collection using direct collection tools	<i>You must be able to:</i> P1. Select target population P2. Collect required data using tools
CU3. Conduct data collection using existing sources	<i>You must be able to:</i> P1. Identify resources for information P2. Select the required source P3. Collect the data
CU4. Organize data	<i>You must be able to:</i> P1. Segregate collected data P2. Record the data in required format P3. Record the data outcome



Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- Survey data
- Survey vehicle
- Different between census and survey data
- Primary and secondary sources of data
- Advantages and disadvantages of different sources of data
- Different data collection methodologies
- Sampling and population methodologies
- Data collection tools
- Limitations of secondary data
- Types of data collection tools
- Accuracy of survey data
- Digital data logging
- Data segregation methods

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Produce secondary source of data
- Record the data in required format by using e tools.



719UPM03G - Competency Standard: Perform Basic Survey and leveling

Overview: This competency standard deal with learning the competencies needed to perform leveling. That includes performing simple and fly leveling and preparing contour map. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Perform Linear measurements	<i>You must be able to:</i> P1. Select the measuring instruments P2. Measure distance on horizontal surface P3. Measure distance on sloppy surface P4. Perform corrections in linear measurements P5. Take offsets and record data
CU2. Perform Demarcation of land by conventional method	<i>You must be able to:</i> P1. Interpret land map (shajrah) P2. Trace the reference burji P3. Mark the khasra number P4. Demark the required property
CU3. Carryout plane table survey	<i>You must be able to:</i> P1. Select the tools and instruments P2. Perform reconnaissance survey of the area P3. Select the required method for plane tabling P4. Perform centering and orientation of plane table P5. Carry out plane table survey by radiation P6. Carry out plane table survey by intersection P7. Draw conventional symbols of object P8. Draw the plan
CU4. Perform Traversing by Compass	<i>You must be able to:</i> P1. Select the traverse station P2. Set compass on a traverse station



	P3. Read bearings of point P4. Record the data P5. Perform adjustments of data P6. Draw the traverse
CU5. Perform Simple Leveling	<i>You must be able to:</i> P1. Select the leveling equipment P2. Perform temporary adjustment of level P3. Read ranging staff on given bench Mark P4. Record the staff readings P5. Calculate reduced levels P6. Apply arithmetic checks
CU6. Carry out Fly Leveling	<i>You must be able to:</i> P1. Select the leveling equipment P2. Perform temporary adjustment of level near permanent benchmark P3. Take staff readings on benchmark and station point P4. Record the staff readings P5. Calculate reduced levels P6. Apply arithmetic checks P7. Check and adjust the closing error
CU7. Perform Profile Leveling on a strip	<i>You must be able to:</i> P1. Select the required tools and equipment P2. De-mark the centre line and cross sections at appropriate distance P3. Perform temporary adjustment of level near permanent benchmark P4. Draw the table for entering the staff reading P5. Take staff readings on centre line and cross section points P6. Calculate reduced levels P7. Apply arithmetic checks



	P8. Draw the profile P9. Draw the cross sections
CU8. Prepare Contour Map	<i>You must be able to:</i> P1. Select the required tools and equipment P2. Mark the grid points on the required site P3. Perform temporary adjustment of level near permanent benchmark P4. Draw the table for entering the staff reading P5. Take staff readings on grid points P6. Calculate reduced levels P7. Apply arithmetic checks P8. Draw grid plan on graph paper and mark R.L of each grid points P9. Interpolate the contours at specified contour interval

Knowledge & Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes:

- Explain basic terminologies of leveling
- Explain the tools and equipment used in levelling
- Purpose of leveling
- Different type of leveling (simple, fly, profile)
- Procedure of simple, fly and profile leveling
- Knowledge about benchmark and its types
- Knowledge of reduced levels
- Procedure to calculate reduced levels
- Knowledge of arithmetic checks for leveling
- Knowledge about adjustment of a level
- Define technical terms level line, level surface, datum, datum line, horizontal plane, vertical plane, horizontal line, vertical line, level line, line of collimation, axis of telescope, bubble tube axes, backsight, foresight, intermediate sight, change point, station point
- Basic terminologies related to contouring
- Uses of contour maps



- Methods of contouring
- Interpolation of contouring
- Knowledge about linear measurements and linear measurement corrections
- Procedure to measure horizontal and sloppy distance
- Knowledge about traversing
- Types of cross staff
- Knowledge about bearings
- Knowledge of plane table survey
- Explain Compass, its parts and measure bearings
- Knowledge about traversing
- Knowledge about area calculation from traverse
- Types of errors
- Parts of plane table
- Types of plane table survey
- Knowledge about different geometrical area formulas
- Procedure of plane table survey by radiation and intersection
- Types of conventional symbols and their importance
- Knowledge about base and checkline in traverse
- Method of calculating area using plane table survey
- Knowledge of conventional land record system
- Terminologies used in conventional land record system
- Procedure of transfer of land
- Land accusation process
- Property demarcation procedure

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Plot the traverse and calculate the area using compass
- Prepare a layout by linear measurement
- Prepare traverse by radiation and intersection method using plane table survey
- Perform the shifting of benchmark
- Prepare the profile and cross section of proposed road
- Prepare contour map



COMPLETE LIST OF TOOLS AND EQUIPMENT

Sr. #	Description
1.	Safety Helmets
2.	Safety Blankets
3.	Fire Extinguishers
4.	Board of Safety instructions.
5.	Chain Hoist
6.	Threading die
7.	Hack saw
8.	Bench vice
9.	Pencil
10.	Eraser
11.	Sharpener
12.	Calculator
13.	Set Square
14.	Measuring Scale
15.	Drawing sheet
16.	Measuring tape
17.	Field Book
18.	Leg Vice
19.	Plumbing wrench
20.	Pipe heating tool
21.	PPRC pipes
22.	G.I pipes



Sr. #	Description
23.	Reamer
24.	Plumbing spanners
25.	Plumbing pliers
26.	Screw driver set
27.	Compass
28.	Levelling staff
29.	Ranging rod
30.	Cross staff
31.	PPEs
32.	Tripod
33.	Pegs
34.	Chalk
35.	Thermometer
36.	Ball peen hammer
37.	Simple alidade
38.	Plane table with clamps
39.	U frame
40.	Spirit level
41.	Arrows
42.	Survey Chain
43.	Scotch tape
44.	Pipe cutter
45.	Computer



Sr. #	Description
46.	Internet