



National Vocational Certificate Level 4 in Urban Area Planning and Management

(Urban Area Supervisor)



Competency Standards

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



National Competency Standards
For
National Vocational Certificate Level 4 in Urban
Area Planning and Management
(Urban Area Supervisor)

NVQF Level 4

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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 4 in Urban Area Planning and Management “Urban Area Supervisor”	719UPM04

ENTRY REQUIREMENTS

- For National Vocational Certificate Level-4 in “Urban Area Supervisor”, the entry requirement is award of National Vocational Certificate Level-3 in “Assistant Supervisor”. The entry in informal sector is not prescribed.



QUALIFICATIONS DEVELOPMENT COMMITTEE

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

Sr. No.	Name	Designation	Organization
1.	Muhammad Abdul Moeez	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.	Establish and Maintain the Occupational Health and Safety System	4	1.8	18	4.2	42	6.0	60
2.	Perform Advance Communication	4	1.9	19	5.1	51	7.0	70
3.	Perform Environmental Management	4	2.5	25	7.5	75	10	100
4.	Perform 2D and 3D drawings using CAD Software	4	2.0	20	18	180	20	200
5.	Plan and Organise work	4	3.0	30	3.0	30	6.0	60
6.	Perform Setting out of Urban Project	4	2.0	20	9.0	90	11	110
7.	Perform Advance Survey	4	2.4	24	15.6	156	18	180
8.	Construct and Maintain water and waste water scheme	4	2.9	29	5.1	51	8.0	80
9.	Prepare Detailed Estimate	4	2.6	26	17.4	174	20	200
10.	Prepare Zone Plan	4	2.0	20	9.0	90	11	110
11.	Perform Basic Green Skills for Urban Area Planning and Management	4	0.9	9	2.1	21	3.0	30
Total			24	240	96	960	120	1200



719UPM04A - Competency Standard: Establish and Maintain the Occupational Health and Safety System

Overview: This competency standard covers the skill and knowledge required to establish, maintain and evaluate an occupational health and safety system in the work environment. This unit applies to workers who have either a legislated or delegated responsibility to implement OHS systems to meet the organization's policy requirements. These roles require significant role or delegated authority to allow effective implementation and review. Your underpinning knowledge will be sufficient to provide you the basis for your work

Competency Units	Performance Criteria
CU1. Examine hazards at workplace	<i>You must be able to:</i> P1. Identify potential hazards at work place P2. Check noise level at work place P3. Check adequacy of ventilation at work place P4. Check the illumination level at work place P5. Check the storage of hazardous materials P6. Adopt preventive measures
CU2. Follow emergency response protocol/procedure	<i>You must be able to:</i> P1. Identify nature of emergency. P2. Raise fire alarm. P3. Control fire by fire extinguishers P4. Evacuate the workplace. P5. Gather in assembly point. P6. Perform head count. P7. Rescue the trapped injured person. P8. Provide first aid to the rescue person



CU3. Carry out first aid	<i>You must be able to:</i> P1. Perform first aid treatment for bone fracture. P2. Perform first aid treatment for accidental severe bleeding. P3. Perform first aid treatment in simulated condition for eye injury. P4. Perform first aid treatment for electric shock
CU4. Report and investigate the accident at site.	<i>You must be able to:</i> P1. Check additional risk of danger at work place. P2. Check that victim of accident received the first aid. P3. Block the accident site P4. Collect the information about the incident P5. Develop the initial incident report
CU5. Maintain ergonomics condition at workplace	<i>You must be able to:</i> P1. Follow standard working posture/position at workplace P2. Maintain sufficient light at workplace P3. Use ergonomic workstations to avoid muscle fatigue P4. Follow standard exercise to avoid muscle fatigue

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:

- Risk assessment at workplace
- Hazard identification
- Ergonomic working condition
- Hierarchy of control (the preferred order of risk control measures from most to least preferred that is:
 - Elimination
 - Substitution
 - Engineering control
 - Administrative controls
 - And personal protective equipment



- Types of emergencies at workplace
- Storage and disposal of hazardous material
- Emergency protocol/procedure for fire, hazardous chemical spills, major power failure and terrorism activity and nature disasters
- Current safety principles and practices used at workplace
- Standard exercises
- Procedure to maintain emergency response
- Identification of unsafe condition
- Procedure for head count
- Initial incident report
- Occupational health and safety environment (OHSE)
- First aid bone fracture, electric shock, bleeding and eye injury

Critical Evidence(s) Required

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

- Perform hazard identification at the workplace
- Respond to emergency situation as per standard procedure
- Carry out first aid to electric shock victim
- Investigate and report the accident at work place



719UPM04B - Competency Standard: Perform Advance Communication

Overview: This competency standard covers the skill and knowledge required to outcomes, skills and knowledge required to develop advance communication skills used professionally. It covers developing documentation skills and managing meeting at workplace. Your underpinning knowledge will be sufficient to provide you the basis for your work

Competency Units	Performance Criteria
CU1. Develop workplace documentation skills	<i>You must be able to:</i> P1. Select information P2. Write important points from information P3. Select format and structure of the document. P4. Draft document P5. Check and correct draft for mistakes
CU2. Manage meeting at workplace.	<i>You must be able to:</i> P1. Prepare meeting agenda as per instructions P2. Identify meeting participants P3. Check meeting arrangements P4. Maintain focus on the meeting proceedings P5. Take meeting notes. P6. Prepare the minutes of the meeting. P7. Develop follow-up document with timelines.

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 :

- Professional skills
- Advanced language skills
- Explain the usage of resources (Dictionary, Operational manual, codes of practice organization rules & regulations and policies.)



- Explain the reading procedures of standards & codes
- Describe the ways to write and sequence paragraphs according to the required purpose of written material.
- Elaborate spelling, punctuation and grammar for workplace document.
- Business letters, memos, job applications, resumes, meeting agendas and minutes
- Sequencing and gaps in content.
- Elaborate the methods of proofreading and editing documents
- Explain meeting terminologies and facilities.
- Explain group dynamics in relation to managing meetings.
- Relevant organizational procedures and policies regarding conduct of meetings, chairing and minutes.
- Time management skills
- Minutes of meetings
- Meeting agendas
- Understand the organizational formats for minutes and agendas.
- Describe the methods of recording and storing the meeting documents.
- Assessment and trainees feedback methods
- Direct and indirect communication methods

Critical Evidence(s) Required

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

- Prepare report on plan and organize work
- Conduct a staff meeting on specified issues or job targets, after issuing the agenda, take meeting notes, prepare minutes of meeting.



719UPM04C - Competency Standard: Perform Environmental Management

Overview: This competency standard deal with learning the competencies needed to perform environment management. This includes collecting water samples and determining and managing noise, air and water pollution. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Collect sample of water and wastewater.	<i>You must be able to:</i> P1. Select sampling locations, number of samples and timing from sampling plan P2. Identify hazards associate with the sampling P3. Select required sampling tool and accessories P4. De-contaminate the sample container and sampling tools P5. Collect samples according to sampling plan P6. Take temperature of water P7. Perform physical tests as per standard procedures P8. Prepare sub samples P9. Seal and label samples in the presence of witness P10. Take photos of sampling site and sample P11. Record the data in sampling document
CU2. Find out Water Pollution	<i>You must be able to:</i> P1. Prepare apparatus and reagents for test P2. Measure dissolved oxygen in water P3. Check turbidity of water P4. Check total suspended solids in water P5. Check PH value of water P6. Check Electrical conductivity of water P7. Measure Chlorides and Sulfate content P8. Measure BOD and COD P9. Fill in the lab sheet P10. Compare with the NEQS



CU3. Evaluate Air Pollution	<i>You must be able to:</i> P1. Select the sampling site P2. Check the functionality of particulate collector P3. Install the particulate selector at site P4. Evaluate environment quality standards in air P5. Measure air quality index P6. Weight and load the blank filter P7. Adjust the flow rate for a specific duration P8. Re-weight the filter P9. Calculate the mass of particulate matter P10. Calculate the concentration of particulate matter P11. Fill in the lab sheet
CU4. Measure Noise Pollution	<i>You must be able to:</i> P1. Select the sampling site as per sampling plan P2. Check the functionality of the sound meter P3. Select and calibrate instrument P4. Record the reading of sound level at specified interval P5. Compile the collected data P6. Compare with NEQS P7. Prepare the report

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:

- Pollution and its types
- Sources of water pollution
- Composition of sewage
- Procedure to calculate water pollution tests
- Treatment and preventive measures for pollution
- Sources of Air pollution



- Properties of water and waste water
- Air Quality standards
- Air Quality Index (AQI)
- Management plans
- Procedure to measure air quality
- Methods to control air pollution
- Source of noise pollution
- Procedure to measure sound quality
- Sound level standards
- Procedure to control noise pollution
- Chemical oxygen demand (COD) and Biochemical oxygen demand (BOD)
- Procedure of COD and BOD test
- Sampling document
- Chlorides and Sulfate test procedure
- Preventive and corrective measures for pollution
- Solid waste disposal methods
- Management plan development
- National Environmental Quality Standards (NEQS)
- Procedures to develop managing plans for pollution control
- Sampling plan and procedures
- Sampling tools and its types

Critical Evidence(s) Required

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

- Determine pH value, Total dissolved solids, BOD, COD and turbidity of water
- Determine AQI of Air
- Determine Sound quality



719UPM04D - Competency Standard: Perform 2D &3D Engineering Drawings using CAD Software

Overview: This competency standard deal with learning the competencies needed to create 2D and 3D drawings by using various tools and commands in computer. You can create and modify objects and drawings in CAD software to meet specific intentions according to job requirements. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Draw 2D shapes	<i>You must be able to:</i> P1. Setup user interface settings for required drawing. P2. Create different 2D shapes with given measurements. P3. Edit different 2D shapes to meet requirement. P4. Insert dimensions and symbols as per requirement P5. Save the file in different drawing formats
CU2. Prepare final sets of 2D drawings	<i>You must be able to:</i> P1. Develop 2D Drawing with given project specification and measurements. P2. Plot drawing on scale according to required size & orientation.
CU3. Develop 3D Objects	<i>You must be able to:</i> P1. Setup 3D user interface settings for required drawing. P2. Create different 3D objects with given measurements.
CU4. Manipulate 3D objects using 3D Editing Tools	<i>You must be able to:</i> P1. Modify 3D objects in line with the requirements. P2. Make customized 3D models according to the requirement of



	given job. P3. Generate orthographic views from 3D model P4. Generate sectional/auxiliary views from 3D model as per requirement
CU5. Render 3D Model	<i>You must be able to:</i> P1. Apply material to required 3D Model as per given specification P2. Render and print the 3D model according to required size & orientation. P3. Apply texture to 3D model as per requirement.

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:

- AutoCAD commands
- Drawing techniques in CAD software
- 2D CAD drawings
- Dimensioning techniques and drawing symbols
- 3D modeling in AutoCAD
 - 3D solids
 - surfaces
 - meshes
 - Wireframe objects
 - Difference between Surface Modeling and Solid Modeling.
- Boolean operation on 3D solid model
 - Subtraction
 - Intersection
 - Union
- 3D Navigate control
 - Pre-set views such as isometric, top, bottom, front, left, etc.
 - Perspective projection and parallel projection



- Constrained Orbit
- Material and light control
- Insert Standard parts from CAD library

Critical Evidence(s) Required

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

- Portfolio
- 2D Drawings with given project specification and measurements.
- Make customized 3D models and generate different 2D/3D views on layout according to the requirement of given job.



719UPM04E - Competency Standard: Plan and Organize work

Overview: This Competency Standard identifies the competencies required in planning the job in accordance with the organizational guidelines and procedures. Candidate will be able to interpret drawing, estimate the manpower requirement, manage facilities & utilities and manage sub ordinates. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Interpret drawing and job order.	<i>You must be able to:</i> P1. Read job order and interpret drawings P2. Measure the dimensions of site P3. Verify the specification details with available resources P4. Prepare list and generate the demand of the components and accessories.
CU2. Estimate manpower requirement.	<i>You must be able to:</i> P1. Identify manpower requirements P2. Calculate the man hours as per job. P3. Calculate the cost of labor services.
CU3. Manage Facilities and utilities	<i>You must be able to:</i> P1. Develop a plan for transportation of material P2. Identify and report the physical hazards at workplace P3. List the required facilities and utilities P4. Provide the required facilities and utilities
CU4. Manage Sub ordinates	<i>You must be able to:</i> P1. Assign housekeeping task to the sub ordinates.



	P2. Monitor the working of sub ordinates
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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 knowledge of:

- Manpower
- Calculation of Manpower
- Job order
- Procedure for man hour cost calculation.
- Facilities and utilities required at the worksite
- Planning methods & techniques
- Mode of transportation of material

Critical Evidence(s) Required

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

- Calculate man hours and labor cost according to job
- Arrange facilities and utilities according to job



719UPM04F - Competency Standard: Perform Setting out of Urban Project

Overview: This competency standard deal with learning the competencies needed to carryout layout. That includes preparation for work and carryout layout for building, sewer line and road. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Prepare for works	<i>You must be able to:</i> P1. Interpret layout plan of the project P2. Select required tools and equipment P3. Select required PPE P4. Plan the sequence of the work P5. Assign duties among the sub ordinates
CU2. Carryout layout for building	<i>You must be able to:</i> P1. Establish control points in the surrounding with total station P2. Mark the grid points with total station P3. Establish the temporary benchmark P4. Mark out the excavation with lime powder P5. Establish the profile boards/offset pegs P6. Mark out bed level pegs
CU3. Carryout layout for sewer pipeline	<i>You must be able to:</i> P1. Establish control points along the sewer line with total station P2. Mark the deflection points and manhole of the supply line P3. Mark the centre line P4. Erect sight rails P5. Establish the temporary benchmark P6. Calculate the invert levels of supply line P7. Set the invert level with boning rod



CU4. Carryout layout for road	You must be able to: P1. Establish control points with total station P2. Establish the deflection points and offset with total station P3. Establish the temporary benchmark P4. Mark the centre line P5. Set earthing profiles at required distance
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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:

- Water layout system
- Layout plans
- Water source and reservoirs
- Types of water sources
- Types of benchmarks
- Knowledge about grid system
- Water conveyance system
- Types of water supply system (gravity, pressure)
- Water supply layout standards
- Types of sewers
- Catchment area
- Sewer scheme components
- Pumping stations for sewerage system
- Self-cleaning velocity of Sewer
- Sewer line gradient
- Drawing Interpretation
- Centre line of sewer
- Masonry levels
- Water Supply line Branches (Main, Sub Main etc)
- Earthing profiles



Critical Evidence(s) Required

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

- Interpret water supply scheme layout
- Indicate water reservoir
- Mount pipe for sewer
- Install pump for sewerage system
- Maintain connection from house to manhole



719UPM04G - Competency Standard: Perform Advance Survey

Overview: This competency standard deal with learning the competencies needed to perform advance survey. It covers measuring distance by total station, measure angle by total station, measure area and perimeter by total station, finding out occupied point coordinates and preparing topographic plan by total station. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Measure distance by total station	<i>You must be able to:</i> P1. Setup total station on a point P2. Input data (coordinates, instrument and prism height) P3. Orientate the total station horizontally and vertically P4. Target the prism on far point P5. Compute the horizontal and vertical distance
CU2. Measure angles by total station	<i>You must be able to:</i> P1. Setup total station on a point P2. Input data (coordinates, instrument and prism height) P3. Orientate the total station horizontally and vertically P4. Measure horizontal angles of the station P5. Measure vertical angle of the object P6. Measure height of the object using REM mode
CU3. Measure area and perimeter of traverse by total station	<i>You must be able to:</i> P1. Setup total station on a point P2. Input data (coordinates, instrument and prism height) P3. Orientate the total station horizontally and vertically P4. Target the stations of traverse one by one P5. Calculate area by using area mode of total station P6. Measure the perimeter of traverse by MLM mode



CU4. Find out occupied point coordinates	You must be able to: P1. Setup total station on unknown coordinates station P2. Input data (instrument and prism height) P3. Input coordinates of control points P4. Target the control points one by one P5. Apply PLM mode
CU5. Prepare topographic plan	You must be able to: P1. Setup total station on a point P2. Input data (coordinates, instrument and prism height) P3. Orientate the total station horizontally and vertically P4. Select coding for station point P5. Target the locations in the vicinity one by one P6. Download data to the computer P7. Plot the topographic plan

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:

- Explain the procedure of setting out an angle and prolonging a line
- Explain the procedure of fixing inter-mediate points between two given points
- Repetition and reiteration method
- Define terms; centering, transiting, face left, Face right, swinging the telescope, axis of level tube, horizontal & vertical axis
- REM, MLM and PLM mode in total station
- Total station and its components
- Traversing and its types
- Methods of traversing
- Stadia survey
- Types of Error adjustments



- Procedure of temporary adjustment of total station
- Procedure to calculate angles with total station
- Formulas used by total station
- Functions of Total station
- Procedure to calculate area by total station
- Topographic Map

Critical Evidence(s) Required

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

- Measure distance and angle by total station
- Measure area by total station
- Measure coordinates of occupied point using total station



719UPM04H - Competency Standard: Construct and Maintain water and waste water scheme

Overview: This competency standard deal with learning the competencies needed construct and maintain water and waste water scheme. It covers preparatory activities, construct and install water and waste water pipelines and its maintenance and repair. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Perform preparatory activities	<i>You must be able to:</i> P1. Identify work requirements P2. Perform site check to prevent damage to utilities P3. Select the required equipment P4. Calculate required manpower P5. Identify potential risks to public and environment P6. Select required PPE
CU2. Construct and install pipelines	<i>You must be able to:</i> P1. Perform setting out of pipeline plan P2. Check Excavation alignment and invert level P3. Join pipes and fittings P4. Calculate backfill excavation
CU3. Finalize work	P1. Perform leakage test as per requirement P2. Check, maintain and store equipment, tools and materials P3. Restore work site to meet environmental and organizational requirements. P4. Complete workplace records and constructed drawings
CU4. Conduct maintenance and repairs	<i>You must be able to:</i>



	P1. Isolate the work area. P2. Select required repair method P3. Decontaminate material before installing P4. Perform water leakage test
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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:

- Disinfection procedures
- Waste water scheme layout plans
- Repairing procedures
- Types of excavation
- Waste water scheme
- Water leakage detection test
- Material safety data sheet
- Organization legislation and policies regarding water supply schemes
- Knowledge of water meter
- Self-cleaning velocity

Critical Evidence(s) Required

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

- Prepare a waste water scheme for an existing block area



719UPM04I - Competency Standard: Prepare Detailed Estimate

Overview: This competency standard deal with learning the competencies needed to prepare detailed estimate. It covers preparing a detailed annual and special cost and quantity estimation of building and road with all necessary components with material statement. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Work out quantities for building	<i>You must be able to:</i> P1. Draw the center lines in plan. P2. Sum up the lengths of center lines. P3. Calculate the quantities of items of work for building P4. Calculate the quantity of water and sanitary item of works P5. Calculate the quantity of electrical item of works P6. Implement the principles of deduction for surface rendering.
CU2. Prepare Abstract of Cost	<i>You must be able to:</i> P1. Draw Abstract of Cost table. P2. Calculate the amount of each item of work. P3. Add contractor's profit on amounts of relevant rates. P4. Add contingencies. P5. Add building Services charges for the building. P6. Add other overhead charges for the building.
CU3. Prepare road estimate.	<i>You must be able to:</i> P1. Calculate the quantity of vegetation P2. Calculate area of site for surveying and leveling. P3. Calculate area of permanent land. P4. Calculate the volume of earth work. P5. Calculate area of temporary land. P6. Calculate volume of sub-base and base course of site. P7. Calculate area of surfacing



	P8. Prepare abstract of cost
CU4. Prepare estimate for special repair	You must be able to: P1. Take the manual measurements from site. P2. Calculate the volume of dismantling base & sub-base. P3. Calculate volume of sub-base and base course of road. P4. Calculate area of surfacing P5. Prepare abstract of cost
CU5. Prepare Annual repair estimate of building/road	You must be able to: P1. Identify the items of work for Annual Repair of building/road. P2. Calculate quantities of items of work for Annual Repair. P3. Prepare Abstract of Cost for Annual Repair for building/road.
CU6. Prepare estimate of water supply scheme	You must be able to: P1. Calculate the quantity of trench work P2. Calculate quantities of pipes. P3. Calculate the quantities of appurtenance P4. Calculate the quantities of tank & taps. P5. Prepare abstract of cost.
CU7. Prepare Rate analysis of building items of works	You must be able to: P1. Identify materials and their rate P2. Calculate materials and their cost by input rates (MRS). P3. Calculate the labour charges for job P4. Calculate the carriage charges for the ingredients. P5. Add sundries lump sum charges P6. Sum up the amounts and add contractor's profit. P7. Add water charges



CU8. Prepare material statements	You must be able to: P1. Select materials required for work P2. Evaluate the proportion of different materials in mix/mortar P3. Calculate the number of bricks P4. Fill the quantities in schedule of material statement
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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:

- Types of buildings and their categories
- Abstract of cost table
- Detailed Estimation
- Methods of calculating detailed estimation
- Classification of buildings
- Components of water supply installation
- Components of sewerage line installation
- Components of road
- Annual repair and special repairs
- Types of buildings and roads
- Quantity analysis
- Construction works
- Substructure components
- Superstructure components
- Material statement
- Labor rates and their types
- Types of cement concrete mix and their use
- Types of cement sand mix and their use
- Types of cement mortar mix and their use
- Procedure to calculate rate analysis
- Types of walls and their components
- Procedure to make material statement
- Marginal rate of substitution (MRS)
- Sundries lump sum charges
- Contractor's profit



Critical Evidence(s) Required

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

- Prepare detailed estimate of a single-story building Analysis of rate for cement concrete (1:6:12).
- Analysis of rate for cement concrete (1:2:4).
- Analysis of rate for Brick work in cement mortar (1:6) in foundation and plinth.
- Analysis of rate for Brick work in cement mortar (1:6) in superstructure.
- Analysis of rate for dry brick paving on edge.
- Analysis of rate for cement plaster in C/S (1:6) on walls.
- Analysis of rate for cement plaster in C/S (1:2) on walls.
- Analysis of rate for white washing on plaster.
- Prepare material statement for Brick work in C/S (1:6)



719UPM04J - Competency Standard: Prepare Zone Plan

Overview: This competency standard deal with learning the competencies needed to prepare zone plan. That includes preparation of location plan and land use percentage plan. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Prepare location plan	<i>You must be able to:</i> P1. Select scale for location plan P2. Select location of site on survey map P3. Draw outline of site plan P4. Draw main features on site plan P5. Draw surrounding properties on site plan P6. Draw legend and North direction on site plan
CU2. Prepare zoning map with percentage plan	<i>You must be able to:</i> P1. Draw boundary line on survey map P2. Calculate site map P3. Mark different zone on survey map P4. Draw land use percentage legend P5. Compare the calculated zone area with standards P6. Draw ultimate waste disposal of scheme P7. Prepare land use percentage legend

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:

- Types of site plans
- Conventional land use symbols
- North Mark



- Water and waste water scheme bylaws
- Bylaws of all regulatory organizations for urban development (Government and Private)
- Knowledge of different uses of land
- Procedure to calculate percentage land use.
- Survey symbols
- Planning procedures
- Waste disposal schemes
- Components of planning
- Road plan components

Critical Evidence(s) Required

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

- Prepare location plan
- Prepare land use percentage plan



719UPM04K - Competency Standard: Perform Basic Green Skills for Urban Area Planning and Management

Overview: This unit describes the performance outcomes, skills and knowledge required perform green skills for urban planning and management. It covers green skills in construction sector, developing green zones in urban area, green skills in transport and automotive and performing disposal of waste. Your underpinning knowledge will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Apply green skills in construction sector	<i>You must be able to:</i> P1. Identify building as per zone plan P2. Identify climate condition of the construction site P3. Avoid environmental degradation P4. Select eco-friendly material P5. Identify construction waste P6. Apply waste reduction techniques P7. Dispose unusable waste as per SOP P8. Transport recycling material to designated area
CU2. Develop green zones in urban area	<i>You must be able to:</i> P1. Prepare plantation plan at soft area and bank of canals P2. Arrange green resources P3. Develop plans for park installation P4. Manage resources efficiently P5. Arrange eco-friendly garbage disposal
CU3. Apply green skills in automotive and transport	<i>You must be able to:</i> P1. Identify the need of replacement of filters and oils P2. Identify green consumables P3. Identify recycle and reusable material



	P4. Segregate the scrap according to material
CU4. Perform safe storage and disposal of waste	You must be able to: P1. Identify different types of waste material P2. Identify types of containers to store the different types of waste material P3. Store the waste materials according to standards P4. Dispose-off waste material according to green and safety procedures

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:

- Green Skills.
- Principles of green skills
- Importance of green skills
- Traffic plans
- Removal of bottlenecks
- Parking lots and their importance
- Waste management practices
- Green consumables and non-consumables
- Eco friendly fuels
- Park Development Plans
- Recycle and reusable materials
- Horticulture
- Type of waste material
- Procedure for disposal of waste material
- Landscaping
- Transportation emission
- Health and safety measures



Critical Evidence(s) Required

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

- Prepare an eco-friendly development plan of an existing block area



COMPLETE LIST OF TOOLS AND EQUIPMENT

Sr. #	Description
1.	Application Software
2.	Safety helmet
3.	Safety goggles
4.	Safety gloves
5.	PPE
6.	Safety shoes
7.	Litmus paper
8.	Safety ma
9.	TDS meter
10.	First Aid Kit
11.	Dissolved oxygen meter
12.	Containers
13.	Air Quality Monitor
14.	Sound level meter
15.	AutoCAD
16.	Measuring tape
17.	Ranging rod
18.	Water Pipelines
19.	Waste water pipelines
20.	Boning rod
21.	Safety Harness
22.	Tee square



Sr. #	Description
23.	Set square
24.	Ruler
25.	Pen
26.	Pencil
27.	Notebook
28.	compass
29.	Safety Belt
30.	Scissor
31.	Calculator
32.	Pumping station
33.	Total station
34.	Computer
35.	Internet
36.	Fire Blankets
37.	Drawing sheet
38.	Umbrella with stand
39.	Prism rod
40.	Reagents for water test
41.	Sampling tools
42.	Battery chargers
43.	Pegs
44.	Lime powder
45.	Tags



Sr. #	Description
46.	Thermometer
47.	Zip lock bags
48.	Log book
49.	Containers with lid
50.	Ball Peen Hammer
51.	Chalk
52.	Scotch tape
53.	Particulate selector
54.	Alcohol wipes