Model Curriculum

1. Assistant Surveyor

SECTOR: Construction
SUB-SECTOR: Real Estate and Infrastructure Construction
OCCUPATION: Surveying
REF ID: CON/Q0901, V1.0
NSQF LEVEL: 2

Certificate

CURRICULUM COMPLIANCE TO QUALIFICATION PACK – NATIONAL OCCUPATIONAL STANDARDS

is hereby issued by the

CONSTRUCTION SECTOR SKILLS COUNCIL

for the

MODEL CURRICULUM

Complying to National Occupational Standards of
Job Role/ Qualification Pack: 'Assistant Surveyor' QP No. 'CON/Q 0901 NSQF Level 2'

Date of Issuance: January 31st, 2017

Valid up to: August 23rd, 2017

* Valid up to the next review date of the Qualification Pack

Authorised Signatory
(Construction Skill Development Council)

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Assistant Surveyor

CURRICULUM / SYLLABUS

This program is aimed at training candidates for the job of a "Assistant Surveyor", in the "Construction" Sector/Industry and aims at building the following key competencies amongst the learner

Program Name	**Assistant Surveyor**		
Qualification Pack Name & Reference ID. ID	CON/Q0901, v1.0		
Version No.	1.0	**Version Update Date**	23-08-2017
Pre-requisites to Training	Preferably 5th standard		
Training Outcomes	**After completing this programme, participants will be able to:** • **Identify, select, use and store appropriate tools and instruments as per instructions: -** To correctly identify, select & handle various tools, tackles and instruments required in various types of surveys that are carried out for construction works • **Provide support in various surveying works: -** To Assist the surveyor in conducting various types of surveys by understanding and following all instructions provided by the surveyor. • **Work according to personal health, safety and environment protocol at construction site:** Importance of Health & Safety aspects & measures to be followed while working.		

This course encompasses 3 out of 3 National Occupational Standards (NOS) of "Assistant Surveyor" Qualification Pack issued by "Construction Skill Development Council of India".

Sr. No.	Module	Key Learning Outcomes	Equipment Required
1	**Introduction** **Theory Duration** (hh:mm) 04:00 **Practical Duration** (hh:mm) 00:00	• Introduction to the construction industry • Introduction to Surveying occupation • Introduction to the task and responsibilities of an Assistant Surveyor • Expected personal attributes to perform as an Assistant Surveyor • Brief description about course content, mode of learning and duration of course • Future possible progression and career development provisions on completion of the course	1. Classroom of 30 students capacity 2. Black/White board 3. Projector/LED Monitor 4. Computer 5. Trade specific charts and other teaching aids
2	**Identify, select, use and store appropriate tools and instruments as per instructions** **Theory Duration** (hh:mm) 30:00 **Practical Duration** (hh:mm) 70:00 **Corresponding NOS Code** CON/N0901	**Theory:** • Identification and classification of various surveying instruments o Liner Measurement instruments used in chain and compass surveying which are chains, tapes, offsets, poles, compass, pegs etc. All Classification of these instruments, their purpose and areas of applications. o Level and bearing measuring instruments: like dumpy level, auto level, tilting level etc. Their differences and purposes, identification of each o Different types of like levelling staff, arrows, pegs, their application and method of using the same o Level and Angle measuring instruments like tachometer, theodolite, total station etc. their differences and purposes, identification of each. o Identification of various other instruments used in other surveys like GPS units, instruments used for photogrammetry, different types of transits etc. • Storing and stacking of surveying tools and instruments, as per standard practices, manufactures guidelines	Liner Measurement instruments 1. chains 2. tapes 3. offsets 4. poles 5. compass Level and bearing measuring instruments 1. dumpy level 2. auto level 3. tilting level 4. tripods Levelling tools 1. levelling staff 2. arrows 3. Pegs Level and Angle measuring instruments 1. Tachometer 2. Theodolite 3. Total station Hand Tools 1. lime 2. strings 3. hurdles 4. paints

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		• handle, stack and store different surveying materials such as lime, strings, hurdles, paints etc. according to standard practices or instruction **Demonstration/ practical:** • Demonstrate the identification of: ○ different type of chain and tapes ○ different types of levels ○ different types of angle measuring instruments ○ different angle and distance measuring instruments ○ different tools used • storage of all the instruments and tools related to surveying • upkeep of all the tools related to surveying	
3	**Provide support in various surveying works** **Theory Duration** (hh:mm) 60:00 **Practical Duration** (hh:mm) 140:00 **Corresponding NOS Code** **CON/N0902**	Theory: • Basics of numeracy and arithmetic's For preparatory works: • Ergonomic principles to be followed for lifting and shifting of long, heavy and sharp objects • Different types of tripods based upon the instrument to be used • Importance of placing the tripod at the exact location of marking For assisting in linear measurements of distances and lengths: • Introduction to ranging • Standard procedure for linier measurements For assisting in angular measurement, leveling and setting out: • different types of staffs to be used for different types of instruments and method of holding the staff • standard procedure for marking various points and symbols • procedure for application of lime • importance of correct setting out • procedure for application of paints • procedures for installing hurdles and profiles as per requirement **Demonstration/ Practical:** • Preparatory works for surveying including:	Liner Measurement instruments 1. chains 2. tapes 3. offsets 4. poles 5. compass Level and bearing measuring instruments 1. dumpy level 2. auto level 3. tilting level 4. tripods Levelling tools 1. levelling staff 2. arrows 3. Pegs Level and Angle measuring instruments 1. Tachometer 2. Theodolite 3. Total station Hand Tools 1. lime 2. strings 3. hurdles 4. paints

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		○ Identification and selection of required tools and instruments ○ Shifting of tools and materials following the ergonomic principles ○ Identifying the location and placing tripod on the same • Liner measurements of distances ○ Unfolding the chain as per standard practices ○ Understanding the hand signals and responding accordingly while ranging ○ Fix and collect arrows to mark the chain lengths • angular measurement, leveling and setting out ○ selection, holding in position and marking points for holding the measuring staff ○ installation of hurdles and profiles at instructed locations ○ marking the location of the setting out points and connecting the same with thread ○ marking the excavation lines with lime.	
4	**Work according to personal health, safety and environment protocol at construction site** **Theory Duration** (hh:mm) 15:00 **Practical Duration** (hh:mm) 35:00 **Corresponding NOS Code** CON/N9001	**Theory: -** • Common types of hazards involved in construction sites • Types of hazards involved in Surveying works • Safe working methods as per standard norms and actions to be taken under emergency situations • Identification of unsafe act and unsafe condition and how to report the same • Basic concept of: - 1. First Aid process 2. Use of fire extinguisher 3. Classification of fires and fire extinguisher 4. Safety drills and its purpose 5. Types and use of PPEs required for surveying works • Standard procedure of handling, storing and stacking material	**Personal protective equipment:** 1. Hand gloves 2. Safety shoes 3. Safety helmet 4. Jump suit 5. Safety harness 6. Nose mask 7. Ear muffs

Sr. No.	Module	Key Learning Outcomes	Equipment Required
		• What is safe disposal of waste depending upon type of waste **<u>Demonstration/ Practical: -</u>** • Select PPEs and use them appropriately as per the requirements of the survey to be carried out • Practice handling, storing, stacking and shifting of material, tools and equipment's • Demonstration of locations, situations/ circumstances, malpractices which can be hazardous for surveying works • Describe use of fire extinguisher and standard practice of storing & stacking firefighting equipment's/ materials at work locations • Describe disposal of waste materials as per their nature and effects on weather	
	Total Duration **Theory Duration 109:00** **Practical Duration 245:00**	**Unique Equipment Required:** <u>Liner Measurement instruments</u> chains , tapes , offsets, poles, compass, Level and bearing , measuring instruments, dumpy level, auto level, tilting level tripods, Levelling tools, levelling staff, arrows, Pegs, Level and Angle measuring instruments, Tachometer, Theodolite, Total station, <u>Hand Tools</u> Lime, strings, hurdles , paints	

Grand Total Course Duration: **354 Hours, 0 Minutes**

*(This syllabus/ curriculum has been approved by **<u>Construction Skill Development Council of India)</u>***

Trainer Prerequisites for Job role: "Assistant Surveyor" mapped to Qualification Pack: "CON/Q0901, v1.0"

Sr. No.	Area	Details
1	**Description**	To deliver accredited training service, mapping to the curriculum detailed above, in accordance with the Qualification Pack "CON/Q0901".
2	**Personal Attributes**	Aptitude for conducting training, and pre/ post work to ensure competent, employable candidates at the end of the training. Strong communication skills, interpersonal skills, ability to work as part of a team; a passion for quality and for developing others; well-organised and focused, eager to learn and keep oneself updated with the latest in the mentioned field
3	**Minimum Educational Qualifications**	ITI/12th
4a	**Domain Certification**	Trainer/Assessor-80% in each NOS of Qualification Pack "MEP/Q0102" or "MEP/Q0104" and Lead trainer/Lead Assessors- 90% in each NOS of Qualification Pack "MEP/Q0101" or "MEP/Q0103"
4b	**Platform Certification**	Trainer/Assessor-50% in each NOS of Qualification Pack "MEP/Q0101" or "MEP/Q0103"& 80% overall, Lead trainer/ Lead Assessors- 50% in each NOS of Qualification Pack "MEP/Q0101" or "MEP/Q0103"and overall 90%
5	**Experience**	Technical Degree holder with minimum five years of Field experience and preferably two years of teaching experience, or, ii. In case of a Diploma Holder seven years of field experience and preferably two years of teaching experience or, iii. In case of ITI/12th minimum ten years of field experience and preferably two years of teaching experience.

CRITERIA FOR ASSESSMENT OF TRAINEES

Job Role	Assistant Surveyor
Qualification Pack	CON/Q0901
Sector Skill Council	Construction

Guidelines for Assessment

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the knowledge part will be based on knowledge bank of questions created by Assessment Bodies subject to approval by SSC
3. Individual assessment agencies will create unique question papers for knowledge/theory part for assessment of candidates as per assessment criteria given below
4. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/training center based on assessment criteria.
5. The passing percentage for each QP will be 50%. To pass the Qualification Pack, every trainee should score a minimum of 50% individually in each NOS.
6. The Assessor shall check the final outcome of the practices while evaluating the steps performed to achieve the final outcome.
7. The trainee shall be provided with a chance to repeat the test to correct his procedures in case of improper performance, with a deduction of marks for each iteration.
8. After the certain number of iteration as decided by SSC the trainee is marked as fail, scoring zero marks for the procedure for the practical activity .
9. In case of successfully passing only certain number of NOS's, the trainee is eligible to take subsequent assessment on the balance NOS's to pass the Qualification Pack within the specified timeframe set by SSC.
10. Minimum duration of Assessment of each QP shall be of 4hrs/trainee.

				Marks Allocation	
Assessment outcomes	Assessment Criteria for outcomes	**Total Mark**	**Out Of**	**Theory**	**Skills Practical**
CON/N0901: Identify, select,use and store appropriate tools and instruments as per instructions	PC1. identify and handle type of chain based upon its lengths	**100**	10	1	9
	PC2. identify different types of tapes on basis of material, marked units, total length		10	1	9
	PC3. identify & differentiate between different types of offsets and handle them accordingly		10	1	9
	PC4. identify different types of levels such as dumpy level, auto level, tilting level etc		10	1	9
	PC5. identify different types of angle measuring instruments like tachometer, theodolite etc		10	1	9
	PC6. identify different angle and distance measuring instruments like digital theodolite, total station etc		10	1	9
	PC7. identify and handle other tools used in surveying like levelling staff, arrows, pegs etc		10	1	9
	PC8. identify other miscellaneous instruments used in various surveys like GPS, instruments of photogrammetry, different types of transits etc		10	1	9
	PC9. store and stack the surveying tools and instruments, as per standard practices, manufactures guidelines		10	1	9
	PC10. handle, stack and store different surveying materials such as lime, strings, hurdles, paints etc. according to standard practices or instruction		10	1	9
		Total	**100**	**10**	**90**
CON/N0902:Provide support in various surveying works	PC1. identifythe tools and instruments to be used for surveying as per the instruction of surveyor	**100**	10	1	9
	PC2. count and collect the required numbers of tools as per the instructions of the surveyor				
	PC3. shift materials, tools and equipments to the instructed location as per the instruction of the surveyor		10	1	9
	PC4. follow the ergonomic principals while lifting, shifting and using the surveying tools and equipment's				
	PC5. place the tripod approximately on the station mark and fix the instrument to the same		5	0.5	4.5
	PC6. report to seniors in case of any ambiguity or deviations		5	0.5	4.5
	PC7. unfold the chain or tape as per standard practices		5	0.5	4.5

	PC8. fix the ranging rod at the indicated point to mark the start point as per instruction		5	0.5	4.5
	PC9. start the measurements from the exact point as per instructions		5	0.5	4.5
	PC10. interpret correctly and follow the hand signals shown by surveyor for ranging		5	0.5	4.5
	PC11. fix arrows at every chain length for reference off the follower		5	0.5	4.5
	PC12. collect and count all tools and instruments after completion of survey		5	0.5	4.5
	PC13. shift the tools back to the store and stack the same as per standard practice				
	PC14. select the staff based on the type of instrument being used		15	1.5	13.5
	PC15. locate and confirm the staff point as instructed by the surveyor				
	PC16. place the staff at exact instructed point				
	PC17. place the staff vertical or normal to the surface of base as per instruction				
	PC18. mark the points instructed by surveyor by suitable means		5	0.5	4.5
	PC19. install hurdles/profiles at instructed location		5	0.5	4.5
	PC20. fix the profiles maintaining their top at approximately same level		5	0.5	4.5
	PC21. install nails to mark the location of setting out points as per instructions		5	0.5	4.5
	PC22. mark symbols using appropriate paints to denote the identification of point				
	PC23. connect line thread /strings to respective nails on profile for marking appropriate points		5	0.5	4.5
	PC24. mark layouts for excavations using lime post setting out works				
		Total	**100**	**10**	**90**
CON/N9001: Work according to personal health, safety and environment protocol at construction site	PC1. identify and report any hazards, risks or breaches in site safety to the appropriate authorities	**100**	10	1	9
	PC2. follow emergency and evacuation procedures in case of accidents, fires, natural calamities				
	PC3. follow recommended safe practices in handling construction materials, including chemical and hazardous material whenever applicable		10	1	9

	PC4. participate in safety awareness programs like Tool Box Talks, safety demonstrations, mock drills, conducted at site		5	0.5	4.5
	PC5. identify near miss , unsafe condition and unsafe act		5	0.5	4.5
	PC6. use appropriate Personal Protective Equipment (PPE) as per work requirements including: • Head Protection (Helmets) • Ear protection • Fall Protection • Foot Protection • Face and Eye Protection • Hand and Body Protection • Respiratory Protection (if required)		10	1	9
	PC7. handle all required tools, tackles , materials & equipment safely		10	1	9
	PC8. follow safe disposal of waste, harmful and hazardous materials as per EHS guidelines		10	1	9
	PC9. install and apply properly all safety equipment as instructed		10	1	9
	PC10. follow safety protocol and practices as laid down by site EHS department		10	1	9
	PC11. collect and deposit construction waste into identified containers before disposal, separate containers that may be needed for disposal of toxic or hazardous wastes		10	1	9
	PC12. apply ergonomic principles wherever required		10	1	9
		Total	**100**	**10**	**90**