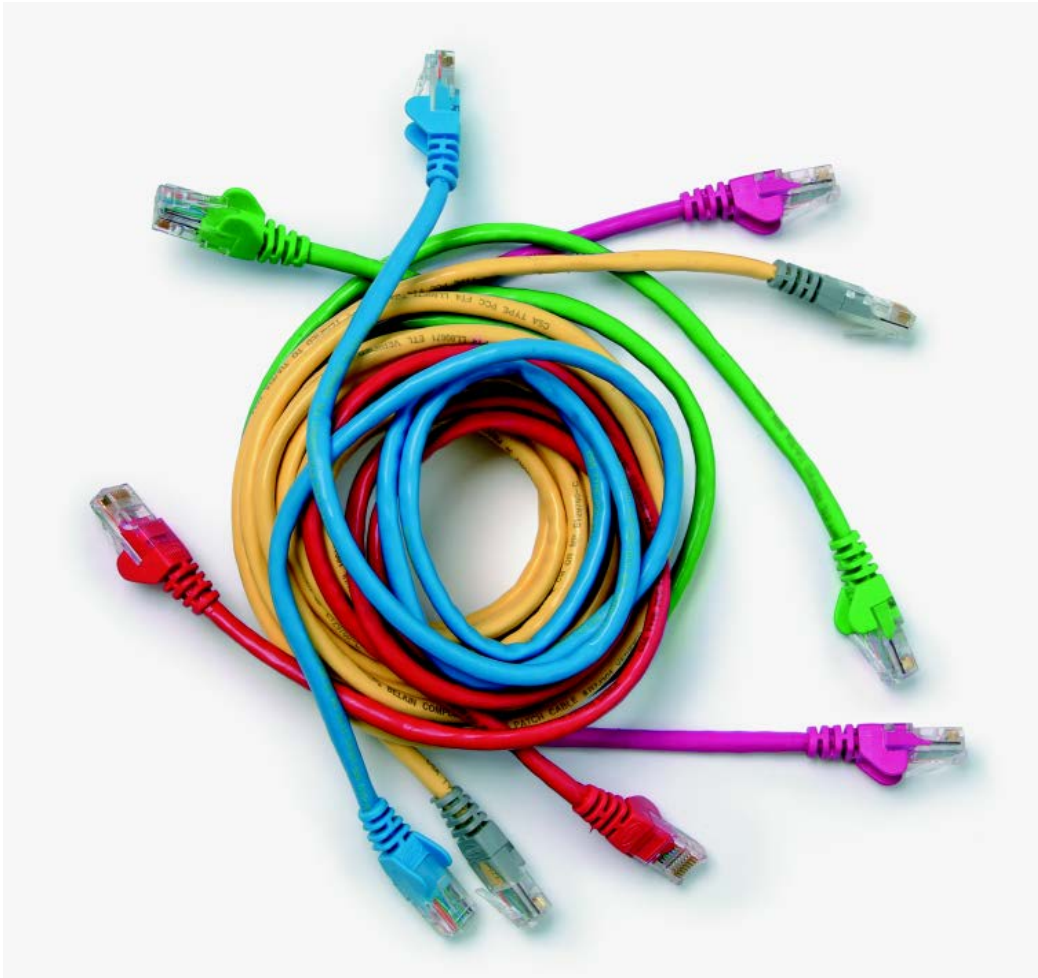


Level 3 Design and plan for an external overhead network cabling infrastructure (3667-303/7540-358/7630-325)

**Designing and Planning Communications Networks/
Systems and Principles (QCF)**
Assignment guide for Candidates
Assignment A



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Level 3 Design and plan for an external overhead network cabling infrastructure (3667-303/7540-358/7630-325)

Assignment A

Introduction – Information for Candidates

About this document

This assignment comprises all of the assessment for Level 3 Design and plan for an external overhead network cabling infrastructure (3667-303/7540-358/7630-325).

Health and safety

You are asked to consider the importance of safe working practices at all times.

You are responsible for maintaining the safety of others as well as your own. Anyone behaving in an unsafe fashion will be stopped and a suitable warning given. You will **not** be allowed to continue with an assignment if you compromise any of the Health and Safety requirements. This may seem rather strict but, apart from the potentially unpleasant consequences, you must acquire the habits required for the workplace.

Time allowance

The recommended time allowance for this assignment is **12 hours**.

Level 3 Design and plan for an external overhead network cabling infrastructure (3667-303/7540-358/7630-325)

Candidate Instructions

Time allowance: 12 hours

Assignment set up:

This assignment is made up of **five** tasks:

- Task A – Prepare for and carry out a paper site survey
- Task B – Identify a range of options and select the optimum solution using suitable criteria
- Task C – Document the chosen option sufficiently for a decision to be made on whether it should proceed
- Task D – Identify the works packages that make up the project
- Task E – Prepare a PERT diagram for the project

Scenario

Expansion due to increased R & D within the current location requires the short to medium term erection of a series of 27 portable accommodations to enable staff to undertake this additional workload without moving off site. Due to planned redevelopment of the area at a later stage it is not feasible to install an Underground Communications network and the company has opted for Overhead distribution instead.

Your assignment is to develop a plan for an external overhead network cabling infrastructure to be installed to meet the requirements for the new R & D Section that will take over existing and new accommodation. To aid you in this task local maps/plans/drawings are provided by the centre.

Each Cabin will require a minimum of 2 pairs and at least 15 pairs should be stubbed within the complex for future development.

Plot an overhead route from Test Point A to Test Point B, on the map provided.

Assignment Information

Your tutor will provide you with the following information as part of the scenario:

- Information on other telecoms operators with nearby infrastructure. This may be provided in a variety of ways, and could be used to either consider leasing infrastructure eg shared poles.
- Critical project details such as maintaining milestones and meeting completion targets, or must not affect traffic flow during route construction.
- Distance between poles – span lengths of not greater than 60m
- Cable size to be 100 pairs of which 20 pairs are to be distributed from 1 point
- Route length of between 800m and 1.2km
- Construction period of 4 weeks
- Cables to be delivered in drums of 250m lengths.

Specification

Item	Rate (hrs)	Unit	Definition
Poles & Overhead Construction			
Manual Erect Pole per Pole	8.5	Per pole	Safe dig and provide a fully dressed pole by manual means. Reinststate/restore surface. Dispose of surplus soil. Make good walls, hedges and fences. Allow additional item if strut required.
PEU Erect Pole per Pole	2.5	Per Pole	Safe dig and provide a fully dressed pole by means of a Pole Erection Unit (PEU). Reinststate/restore surface, dispose of surplus spoil. Make good walls, hedges and fences. This would be a 2 man operation.
Fit Stay Anchor	1.4	Per Stay	Safe dig and provide stay anchor. Reinststate/restore surface. Dispose of surplus soil. Make good walls, hedges and fences.
Fit Stay Part	0.33	Per Stay	Provide Stay assembly to give added support to poles as required. The stay assembly includes all associated fittings.
Erect Aerial Cable (<=20 pr) per span	2	Per Span	All operations required to erect Aerial cable. Time allowed for the work is per span provide, includes any temporary route strengthening.
Erect Aerial Cable (>20 pr) per span	2.5	Per Span	All operations required to erect Aerial cable. Time allowed for the work is per span provide, includes any temporary route strengthening.

Testing

Set up test point. per point	1.0	Per Point	All operations to create a workable environment, setting up test equipment at each end to be tested.
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Item	Rate (hrs)	Unit	Definition
Initial/Acceptance test non-fibre cable per pair	0.16	Per Pair	All operations to perform relevant tests and measurement on other than Optical Fibre cables. To be used in conjunction with 'Set up Test Point'.
Initial/Acceptance test fibre cable to Node per fibre	0.33	Per fibre	All operations to test a fibre link. To be used in conjunction with 'Set up Test Point'. Single end test
Initial/Acceptance test fibre cable for customer service per fibre	0.33	Per fibre	All operations to test a fibre link. To be used in conjunction with 'Set up Test Point'. Specifically for customer service provision testing from serving exchange. Single end test
Jointing			
Pairs jointed (largest cable in joint is 20 pr) Standard jointing method	1.83	Per Joint	Guard work area, set up jointing position, close down work area on completion. Includes preparing cable ends, verifying, colleting and jointing pairs, closing, coding and restraining joint as required
Modular method	1.6		
Pairs jointed (Largest cable in joint is 50 pr) Standard Jointing method	2.43	Per Joint	
Modular method	1.98		
Pairs jointed (Largest cable in joint is 100 pr) Standard Jointing method	3.43	Per Joint	
Modular method	2.7		
Fit Termination point per point	0.25	Per Point	Fit block terminal and tail/fit box connection (internal or external). Fit Insulation Displacement Connection (IDC) termination blocks, fit capping. Provide label/numbering as required. Includes cleating up to 9m tail on wall, or any length on pole, plus up to 5m in duct from pole to adjacent box.
Terminate			
Terminate per 10 pairs	0.42	Per 10 pairs	Guard work area. Fit IDC terminating blocks. Prepare cable ends for terminating, Terminate pairs. Provide label as necessary. Complete records. Includes terminating at Block Terminals and Box Connections.

Misc equipment	Cost
Pole erection unit	£75 p/day
Veh & cable trailer	£50 p/day
Traffic lights	£9 p/hr

Manpower rates	Cost
Cable installer/labourer	£15 p/hr
Cable jointer	£20 p/hr
Specialist (testing & commissioning)	£25 p/hr
Specialist (pole erection)	£25 p/hr

Task A – Prepare for and carry out a paper site survey

- 1 Locate Test point A and Test point B on the map provided and familiarise yourself with the topology.
- 2 Identify possible hazards that may be encountered and explain what actions can be taken to limit or eliminate their effect.
- 3 Explain why it is important to identify possible hazards at this stage of the planning process.
- 4 Carry out a preliminary survey of the area of interest and record all the relevant results.

Task B – Identify a range of options and select the optimum solution using suitable criteria

- 1 From the information given, calculate the size and type of cabling infrastructure required to meet the needs of the new R & D Section. Details of all assumptions and amendments should be recorded.
- 2 Evaluate all the available information and identify a range of design options that will meet the requirements of the forecast.
- 3 Using suitable criteria rank each of your route options in order of preference and select the optimum route. The justification for the selection or rejection of each route option should be fully recorded.

Continued over ...

Task C – Document the chosen option sufficiently for a decision to be made on whether it should proceed

- 1 Carry out a detailed survey on the optimum route.
- 2 Document the selected design in a format suitable for a decision to be made as to whether the project should proceed along the lines of the design. The documentation should be clear and concise and explain the design. It should identify:
 - type and quantities of major components
 - advantages of the design
 - possible timescales
 - broad costs
 - potential hazards or problems.

Task D – Identify the works packages that make up the project

Identify the works packages that make up the project, prepare detailed plans and calculate the overall costs of completing the project.

- 1 From the detailed survey completed in Task C, produce accurate diagrams in sufficient detail to identify the type and location of the plant or equipment that is required to be installed. You must include details of the following:
 - detailed route plan
 - pole top furniture diagrams
 - staying details
 - terminal pole configurations
 - hazards or issues.
- 2 Break down the selected design into identifiable packages of work in order to cost each package of work and produce an overall cost for the selected design. This should include:
 - cost of stores and materials
 - relocation costs if appropriate
 - installation costs
 - man-hour costs
 - contract costs where applicable.

Thought should also be given to the provision of a realistic contingency with respect to the cost.

Continued over ...

Task E – Prepare a PERT diagram for the project

Prepare a PERT diagram for the project and identify those work packages that are critical in meeting the overall timescale of the project and explain what measures would need to be put in place to ensure the project is completed on time.

- 1 Using the packages of work identified in Task D, construct a PERT diagram to show the relationship between the various packages.
- 2 Using the PERT diagram, identify the critical path and calculate the minimum time to complete the project.
- 3 Describe **three** measures that could be put in place to ensure the project is completed on time.

When you have finished working:

- Sign each document above your name and label all removable storage media with your name.
- Hand all paperwork and removable storage media to your assessor.

If the assignment is taken over more than one period, all paperwork and removable media must be returned to the test supervisor at the end of each sitting.

End of assignment

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