

# City & Guilds 3466 Scheme Review 2000

## ***Syllabus Update Questionnaire***

### **Objectives of this questionnaire**

This questionnaire follows on from a favourable industry response to the proposal for an update, to the City & Guilds 3466 series that was issued to interested parties in Summer 2000.

It is increasingly apparent that the City & Guilds scheme is the most popular qualification in the comms cabling industry as hundreds of awards are made every month. Given the popularity of the scheme it is important that the quality of the programme is assured so that the value of the qualification that has been established by the leading training providers is maintained.

As highlighted in the original proposal, there are a number of issues that need to be addressed, including: scheme titles; syllabus update & control of the quality of training provision. The attached questionnaire has been put together in order to obtain industry input to the future content/syllabus of the City & Guilds 3466 scheme.

### **Syllabus update**

The following paragraph from the syllabus on City & Guilds vocational schemes should be noted:

*1.2 City & Guilds does not itself provide courses of instruction, specify entry requirements or length of study. However for the purpose of making provision for resources, centres may wish to note that on average 40 guided learning hours would be required. Its approved centres use the syllabuses on page 11 onwards to design and implement courses to meet the needs of their own students or trainees and to arrange assessments.*

So, whilst the reputable training providers with expert knowledge will have already updated their courses, many others have not. This update of the syllabus will contribute to ensuring that all training provision under this scheme is up-to-date.

## Completing the questionnaire

### **The aim of the 3466 qualifications**

The overall aim of the qualification is to produce personnel capable of fulfilling a professional installer role. This is defined as someone who has the knowledge and skills to carry out an installation of the relevant type, knows what they are doing, understands why they are doing it, and can recognise when there is a problem and initiate appropriate remedial action.

### **An employer's perspective**

In reviewing this scope and the following questionnaire we suggest that you consider yourself in the role of an installation or project manager hiring new staff. What knowledge and skills would you expect from a well-trained professional installer? If they have this qualification what would you expect them to be able to do?

### **Four separate qualifications**

There are currently three versions of the qualification and a fourth has been proposed. This questionnaire goes through each qualification in turn. Please answer this questionnaire on the qualifications that are relevant to you.

The three existing versions of the qualification are described below. Each consists of a number of "outcomes". These descriptions are based on the existing syllabus with the underlined text denoting additional clarification that has been added for this review.

### **Entering your comments**

The questionnaire has been formatted to make feedback as easy as possible.

Each major section (outcome) has been described in terms of the knowledge and skills required to perform the task. Against this description you are invited to agree or disagree with the scope and to provide any comments.

Where there are significant changes proposed in a section the proposed changes are detailed with a justification and again you are invited to agree or disagree and comment upon the suggested amendments.

If anyone wants to refer to the full original syllabus (45 pages) it is hoped to make it available as a PDF file on the websites of relevant trade associations - FIA, TIA.

### **Returning your questionnaire**

Please return your completed questionnaires to the relevant trade association as soon as possible. Overall responses will be co-ordinated in early January.

## Fibre optic cabling for datacomms - unit content

This unit is concerned with the installation, splicing, connectorisation, termination and testing of fibre optic cabling in typical datacomms environments. These installations are typically for campus and building backbone applications, and increasingly for fibre to the desk applications. Such installations are typically characterised by:

- relatively low fibre cables (usually less than 24 fibres per cable)
- short cable runs less than 2km usually with no requirement for in-line cable joints
- cables terminated in a benign indoor environment, either by direct termination or splicing on pigtails inside suitable patch panel enclosures.

There are five outcomes to this unit

1. Follow recommended installation procedures
2. Prepare fibre optic cable for fibre splicing or connectorisation
3. Splice together optical fibres
4. Terminate fibre optic cables by fitting connectors
5. Test fibre optic links

This version of the qualification is also appropriate for those involved in installing fibre optic cabling for CCTV and security systems.

## Fibre optic cabling for telecomms - unit content

This unit is concerned with the installation, splicing, ~~connectorisation~~, termination and testing of fibre optic cabling in typical telecomms environments. These installations are typically in an outside plant environment for public telecommunications networks. They may also be for Cable TV networks or the private networks of major utilities.

Such installations are typically characterised by:

- High fibre count cables with a minimum of 24 fibres and often 48, 96, 144 or more fibres per cable)
- long cable runs typically up to 80km in trunk networks with many in-line cable joints
- cables terminated in a benign indoor environment by splicing on pigtails inside an optical distribution frame (ODF)
- testing involves bi-directional, dual wavelength insertion loss measurements and OTDR testing

There are four outcomes to this unit

1. Follow recommended installation procedures
2. Prepare fibre optic cable for fibre splicing
3. Joint and terminate fibre optic cables by splicing
4. Test fibre optic links

## Copper cabling for datacomms - unit content

This unit is concerned with the installation, safety, termination and testing of ~~data communications cable~~ generic cabling for typical datacomms and telephony applications.

These installations are typically for horizontal cabling and some building backbone applications in accordance with relevant European or International standards.

Such installations are typically characterised by:

- Use of balanced cables terminated at one end in a patch panel at a wiring cabinet and at a telecomms outlet at the other end.
- Telephony wiring which may be integrated into the data cabling or may run on separate balanced cabling.

There are four outcomes to this unit

1. Understand basic electrical communications theory and electrical safety with reference to data communications cabling
2. Install copper communications cabling, following recommended installation procedures as per EN50173 and/or ISO11801 (current versions)
3. Terminate copper communications cabling
4. Test FTP, UTP and multicore copper

### **Copper cabling for telecomms - unit content**

This unit is concerned with the installation, jointing, termination and testing of external plant copper cabling for telecomms applications. These installations are typically for cabling in telecomms access networks.

Such installations are typically characterised by:

- Underground cables containing many pairs (400+) on the exchange side of the networks
- Lower pair count cables on the distribution side of the networks in both underground and overhead environments.

There are five outcomes to this unit

1. Follow safe working practices in an outside plant environment
2. Prepare copper cables for jointing or termination
3. Joint copper cables using approved techniques and joint housings
4. Terminate copper cables
5. Test pairs and locate faults

<b>Proposed change</b>	<b>Reason for change</b>	<b>Opinion</b>
The overall title of the scheme should be changed from "Optical Fibre Installation and Testing" to "Communications Cabling"	For some years the scheme has also covered structured cabling systems incorporating twisted pair for voice and data. A new qualification is also proposed for external plant metallic media.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Proposed change	Reason for change	Opinion
<b>3466-02</b> – Optical Fibre Installation & Testing – (Multimode) is to be renamed “Fibre optic cabling for Datacomms”	Many datacomms applications will now include an element of singlemode fibre. The datacomms work environment and skills required are, however, quite different from external plant cabling for telecomms	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		
‘Test fibre optic links’ should be changed to ‘Test fibre optic links with a dual light source & power meter and OTDR	This needs to be more specific to ensure delegates know how to use both power loss meters and OTDRs.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		
The delegate should be knowledgeable in multimode graded index fibres and G.652 single mode fibre.	Due to high data rate application in the backbone, ordinary single mode fibre is now becoming common place in LANs.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		
Currently the delegate should be knowledgeable in operational bandwidth. This needs to be more specific and should include the consequences of using LEDs, VCSELs or Lasers. Bandwidth restricted length limitations for certain applications such as 1Gbit Ethernet should be understood as well.	Technology has changed and continues to do so. Delegates need to be aware of market pressures and customers desires to run ever more faster networks	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		
The delegate should be able to describe the construction of multimode fibre cable. This should be extended to include singlemode	Single mode is being use in the building backbone as well as the campus backbone.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		
The section on splicing needs to be more specific. The delegate should learn how to splice on a wide range of splicers from manual to fully automated splicers.	It is critical that the delegate understands the variety of fusion splicers available and their applicability to splicing multimode and singlemode fibres	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		
The delegate shall terminate a variety of connectors. As a minimum, this shall be ST, SC and one small form factor connector.	In the current wording it is only necessary to terminate one type of connector. This does not bring the skills needed to cope with current and future connector styles and termination methods.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		
The delegate should be able to terminate connectors using epoxy & polish techniques and a number of suitable rapid termination techniques such as hot melt, anaerobic adhesive and crimp style.	Delegates may be faced with numerous techniques depending on which job / company they are working for.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Proposed change	Reason for change	Opinion
<b>3466-03</b> – Optical Fibre Installation & Testing – (Singlemode) is to be renamed “Fibre optic cabling for Telecomms”	Many datacomms applications will now include an element of singlemode fibre. The datacomms work environment and skills required are, however, quite different from external plant cabling for telecomms	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Include different fibre types including G.652, G.653, G.655 and metro fibres.	Installers are faced with a variety of singlemode fibre these days	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Basic appreciation of DWDM	Choice of fibre type and system configurations may be based on the requirements of DWDM systems. They may also pose an increased laser safety hazard.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Add the New Roads & Streets Work Act or relevant local legislation	This is a legislative requirement for the UK. Also make reference to other countries national requirements as many contractors are working overseas.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Add mini loose tube / microsheat and ribbon fibres	These cable constructions are becoming more common.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Include the measurement of connector and splice losses using an OTDR	These are requirements for singlemode contracts.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Proposed change	Reason for change	Opinion
<b>3466-04</b> – Data Communications Cable Installation & Testing (Copper) is to be renamed “Copper cabling for Datacomms” .	More manageable title consistent with format of other qualifications.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

Remove ‘Basic atomic structure’, ‘Electrical potential’ and ‘Capacitance and Inductance’.	This has no relevance. Removing this would allow extra time to be allocated elsewhere within the syllabus for the new requirements of Cat5e and the proposed Cat6.	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
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Comments:

<p>The delegate shall be able to explain :-</p> <ul style="list-style-type: none"><li>• Return Loss</li><li>• ELFEXT</li><li>• Powersum Calculations</li><li>• Delay Skew</li><li>• Propagation delay</li><li>• ACR</li></ul> <p>in addition to the Length, Wiremap, Attenuation, NEXT which are the current requirements specified in 3466.</p>	<p>Current C&amp;G recognises only Category 5, this is now obsolete by the market place and by the standards. The level entry for new installations is Category 5e, these additional parameters are specified in Category 5e. ACR is not specified in Category 5e, but in ISO and EN standards. This section should take into account all three standards bodies for cabling.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/></p>
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Comments:

<p>'Categories of cabling up to category 5' should be extended to Category 5e, 6, Class D, E and F.</p>	<p>Category 5e is the level entry for cabling. Although Cat6 / Class E &amp; F are currently draft, the delegate should be aware of the differences. They will finalise the standards in the lifetime of this qualification</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/></p>
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Comments:

<p>Under the section 'Correct methods of measuring', the following additional parameters should be included :-</p> <ul style="list-style-type: none"><li>• Return Loss</li><li>• ELFEXT</li><li>• Powersum Calculations</li></ul>	<p>These are required by Category 5e, 6 / Class D, E &amp;F.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/></p>
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Comments:

<p>The practical assignments should be more specific. The delegate should</p> <ul style="list-style-type: none"><li>• terminate at least three different manufacturers' connectors.</li><li>• Build at least 4 Category 5e links</li><li>• Build at least 2 Category 6 (Draft) links</li><li>• Test the links, and diagnose any faults</li></ul>	<p>The qualification aims to build generic skills, so it is important to gain exposure to a variety of products. Good quality training companies offering 3466 do this, however since it is not a formal requirement in the syllabus, there are those who do not.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/></p>
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Comments:

<p>The following standards should be incorporated into the syllabus</p> <p>EN50310, Application of equipotential bonding and earthing in buildings with information technology equipment</p> <p>EN50174 –1, Specification and quality assurance</p> <p>EN50174-2, Installation planning and practices inside buildings</p> <p>IEC61935-1, Specification for the testing of balanced communication cabling in accordance with ISO/IEC</p>	<p>By the time the syllabus has been approved, these standards will be published.</p>	<p>Agree <input type="checkbox"/> Disagree <input type="checkbox"/></p>
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11801		
Comments:		

<b>Proposed change</b>	<b>Reason for change</b>	<b>Opinion</b>
<b>3466-05</b> A new qualification is proposed, to be called "Copper cabling for Telecomms"	To provide a qualification for external plant copper telecomms installation and testing	Agree <input type="checkbox"/> Disagree <input type="checkbox"/>
Comments:		

## **PROPOSAL FOR PR ACTIVITY TO RAISE THE FIA PROFILE DURING 2001**

**Prepared for Andrew Watson,  
Commercial Director, Fibreoptic Industry Association  
By Nigel May, Parkfield.**

### **Objective**

The objective is to raise the profile and presence of the FIA with the identified key sectors: contractors and installers, manufacturers, consultants and specifiers, facility managers and end users. With the increasing exposure of the FIA name and its repeated association with best practice in the fibre industry, the benefits of membership should become more obvious and attractive to a wider range of organisations.

The current membership, although increasing in absolute numbers, is heavily skewed towards specialist networking installers. The objective of the proposed campaign is to raise the FIA's visibility with the currently under-represented sectors. End users are the most difficult specifically to target, because of the divergent nature of the companies involved and the industries in which they operate. I think that we should aim at known decision makers within the various industry sectors who are in a position to be interested in what we have to say.

### **Proposed press activities**

Given the broad spread of FIA activities: standards development, training, publications and member services, it is important that these strengths be communicated in the round to the various market sectors. There are two main ways of achieving this. Up to now, we have used the association method: providing authoritative articles authored by FIA committee members on relevant topics, with the objective that a reader will see the FIA as a reputable and knowledgeable body. This method is obviously still valid.

The alternative tactics are more direct, with key books (see below) being given the opportunity to conduct interviews for publication with FIA committee members. In this case, the article is on the FIA itself, not one of the relevant topics. I think that we should aggressively explore the opportunities for placing such overview articles in the key books we have identified.

To achieve both these objectives, the primary thrust of the PR is to develop close relations with the leading magazines in the following media sectors:

### **Electrical and specialist cabling infrastructure books**

Rob Shepherd, *Network Cabling News*  
David Boothroyd, *Cabling Installation and Maintenance Europe*  
Andrew Brister, *Electrical Contractor*  
Alex Evans, *Professional Electrician*

### **Electronics**

Chris Edwards, *Electronics Times*  
Graham Pitcher, *New Electronics*  
Paul Marsh, *Components in Electronics*

### **Networking/Computing**

Douglas Heywood, *Computing*  
Rob Jones, *Network News*

### **“New economy” media**

Despite the recent fall-out in high tech shares and the general decline in the attractiveness of e-commerce companies, the so-called new economy – web hosting, internet hotels, ASPs and so on, is growing at a huge rate. Since the constant cry in this sector is “give me more bandwidth, and keep it coming”, what better than fibre for the infrastructure? Given that the UK is one of the European leaders in the internet hotel and collocation

markets, we should target this sector. However, as ever, the print media is relatively slow to serve such emergent industries.

I am only aware of one book, the snappily-titled "*Colocation Network Europe*". I will investigate. Some publishers are making a half-hearted attempt to update their offering: for instance, *The VAR*, a well-respected computer resellers' book, has been rebranded and relaunched as [ch@nel2000](mailto:ch@nel2000), to what end I am unclear.

### **Training**

We should continue our relationship with *Quest* to ensure that skilled people leaving the Services are aware of the benefits of individual membership; equally importantly, member companies will have access to a pool of high quality people.

We should also work with training businesses and publications to promote SkillsMatch.

### **Facilities management**

I am unconvinced of the value of this sector to you. The publications cover such a wide range of topics that the circulation wastage will inevitably be high, and there does not seem to be one pre-eminent book. I am inclined to disregard publications in this sector for any focussed activity.

### **Actions**

#### **Meetings and articles**

We should achieve this by setting up individual meetings with the key editors so that we can brief them individually about the FIA's aims and objectives; the FIA should then be at the forefront of the editor's mind when he is thinking about relevant topics. Once we have done the ground work, I will concentrate on obtaining a presence in relevant features, offering articles on appropriate topics. I am putting together the 2001 features lists at the moment; I will forward them on to you as we receive more lists from the publishers.

It would also be beneficial if we could do special offers with selected books on your publications. If, for example, a new publication is priced at £25 to members and £75 to non-members, we could offer it through a particular book at £50 to their readers, with a further incentive that they will be refunded the additional £25 if they join the FIA within three months. I assume that, in any event, you send out the corporate information pack with any publication ordered by non-members. If we set up such an arrangement, the book will normally give a half or full page coverage. We can extol the benefits of membership as well as highlighting the particular publication and the other activities of the FIA.

We should invite the key editors to attend the breakfast seminars and other meetings that may be of interest to them, either for their own education or for publication.

To help in writing articles, I think it will be beneficial if I form direct relationships with other Council members, so that while the overall direction of the PR activities is under your control, I can be briefed directly by the appropriate person once I have placed an article.

It will also be useful if I could have a stock of generic photographs, particularly training, application and installation shots, preferably as digital images. Could you organise this? The individual company will obviously receive a credit for the use of the picture. A stock of product shots would also be useful, but probably less relevant than more general ones showing fibre network installations and/or prestigious buildings.

#### **Press releases**

We should press release seminars and new publications (delaying the general distribution if we do a deal with a specific book), and any other items of interest – new standards, FIA involvement with training schemes and so on.

#### **Other activities**

## **Direct mail**

The number of e-mail newsletter is increasing; I already send your material to them as part of the general distribution. It could well be a good idea to e-mail a sample newsletter to their distribution lists: I can arrange this if you would like me to. This should be a low-cost distribution method, although I do not have precise figures.

## **Inserts**

A simple insert in the key books to promote the seminars might be a good idea although you will have to pay; we could take one as a trial and see what sort of response we get.

## **Web site**

It might be a good idea to make the "Join the FIA" links bigger on the home page, probably the same size as the FAQ link.

## **Budget 2001**

My time is charged at £450 per day, which covers my time, expenses and communication costs and the admin costs of maintaining the PR database, issuing reports and attending routine meetings with you. External costs such as airfares, photography, UK mileage at 50 pence per mile, and postage and editorial separations are charged extra.

To give you some ideas of cost, a press release is costed at half a day, which covers taking, writing and distributing the release. To pre-place and write a feature article is costed at one and a half to two days, depending on complexity. This would give two or three A4 pages of editorial coverage, at a cost that compares favourably with advertising, which is around £1500 per four-colour page. You also gain the added bonus of the "third-party endorsement" as the editor has considered the material to be of interest to his readers. To arrange, attend and follow-up an editorial meeting is costed at one day. Within these figures, you receive a monthly status report and I would normally visit your offices once per month for a routine review and progress meeting.

For budget purposes, a suggested PR activity plan for 2001 would be eight individual editorial meetings, eight articles and six press releases. Budgeting £600 for each editorial meeting to cover lunch and travelling, £700 for each article and allowing £350 per press release to cover distribution costs and bulk prints, the total for the year to achieve this level of activity would be £12500 worst case. In practice, I would expect the costs to be lower.

## **Conclusions**

I think that if we agree to the programme outlined above, we will build on the work we have already done and give the FIA name greater prominence. I have already mentioned some of these ideas to a couple of the electronics industry editors; they were both interested in my ideas. Obviously, we would target the offering to the particular book to ensure a favourable response.

Nigel May  
Parkfield  
27 November 2000