



## INTRODUCTION

# Work Smart



**STAND OUT FROM THE  
CROWD**

22nd January 2003  
The Building Centre  
London

**Mike Gilmore**  
The Cabling Partnership



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Mike Gilmore, Senior Partner, The Cabling Partnership

## Work Smart



**Mike Gilmore**

Senior Partner,  
The Cabling Partnership

Managing Director  
e-Ready Building

#### Standards Activities



Member:

ISO/IEC JTC1 SC25 WG3: Generic Cabling  
ISO/IEC JTC1 SC25 Project Team: SOHO

Convenor:

ISO/IEC JTC1 SC25 WG3 IPTG: Industrial Premises Cabling



Convenor:

CENELEC TC215 WG1: IT Cabling  
CENELEC TC215 WG1 PTIP: Industrial Premises Cabling



Chairman:

BSI TCT7/-/1: IT Cabling  
BSI TCT7/-/3: IT Cabling Support Group

Technical and Standards Director:  
Fibreoptic Industry Association

e-mail: [mike.gilmore@btinternet.com](mailto:mike.gilmore@btinternet.com)

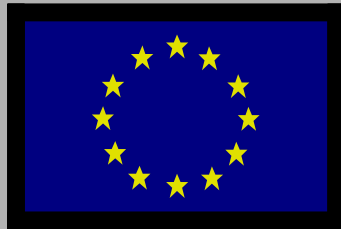
Mobile: +44 (0) 7860 110563



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## The End is Nigh



**EN 50173-1 (2002)**

Information technology  
-  
Generic cabling systems

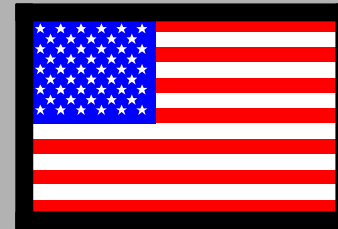
• published Q4, 2002



**ISO/IEC 11801 Ed.2 (2002)**

Information technology  
-  
Generic cabling for  
customer premises

• published Q4, 2002



**ANSI/TIA/EIA 568 B Series**

Commercial building  
telecommunications  
cabling standard

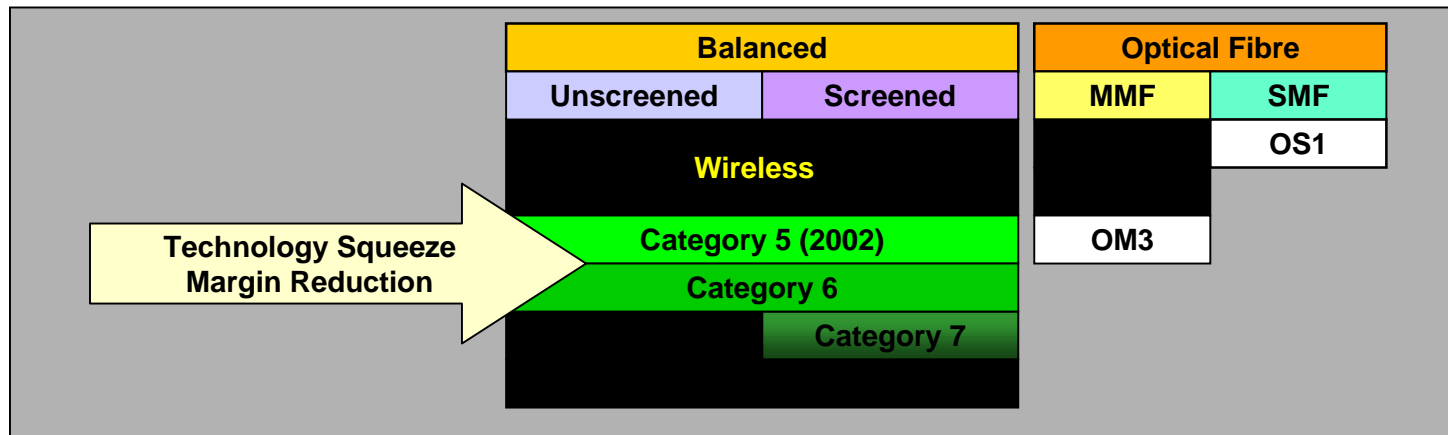
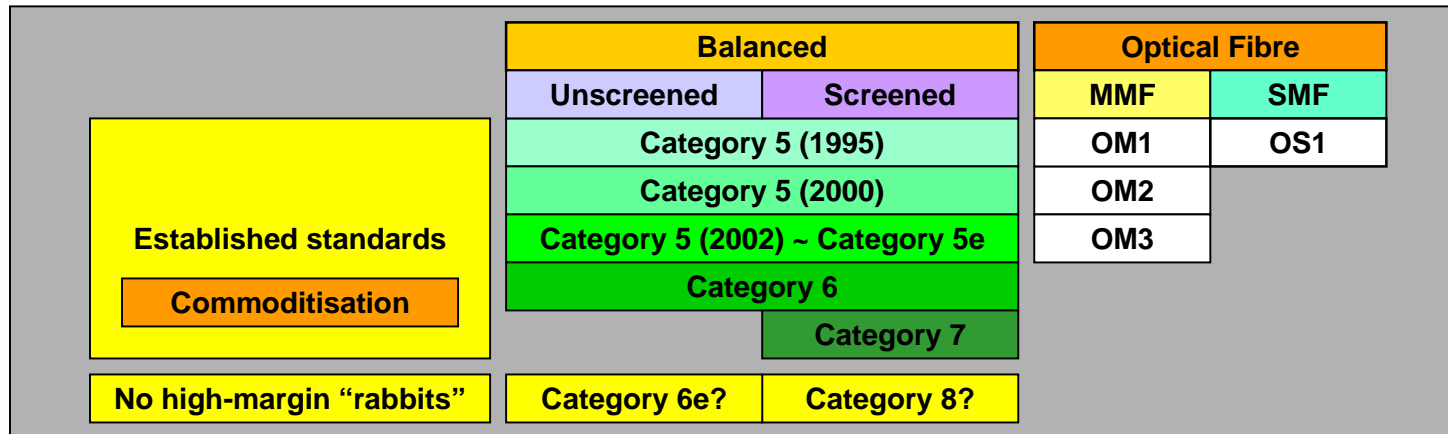
- B.1 General Requirements
  - published
- B.2 Balanced Cabling
  - published
  - Addendum 1
    - Category 6
      - published
- B.3 Optical Fibre Cabling
  - published



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## Market Conditions - A Bleak Future

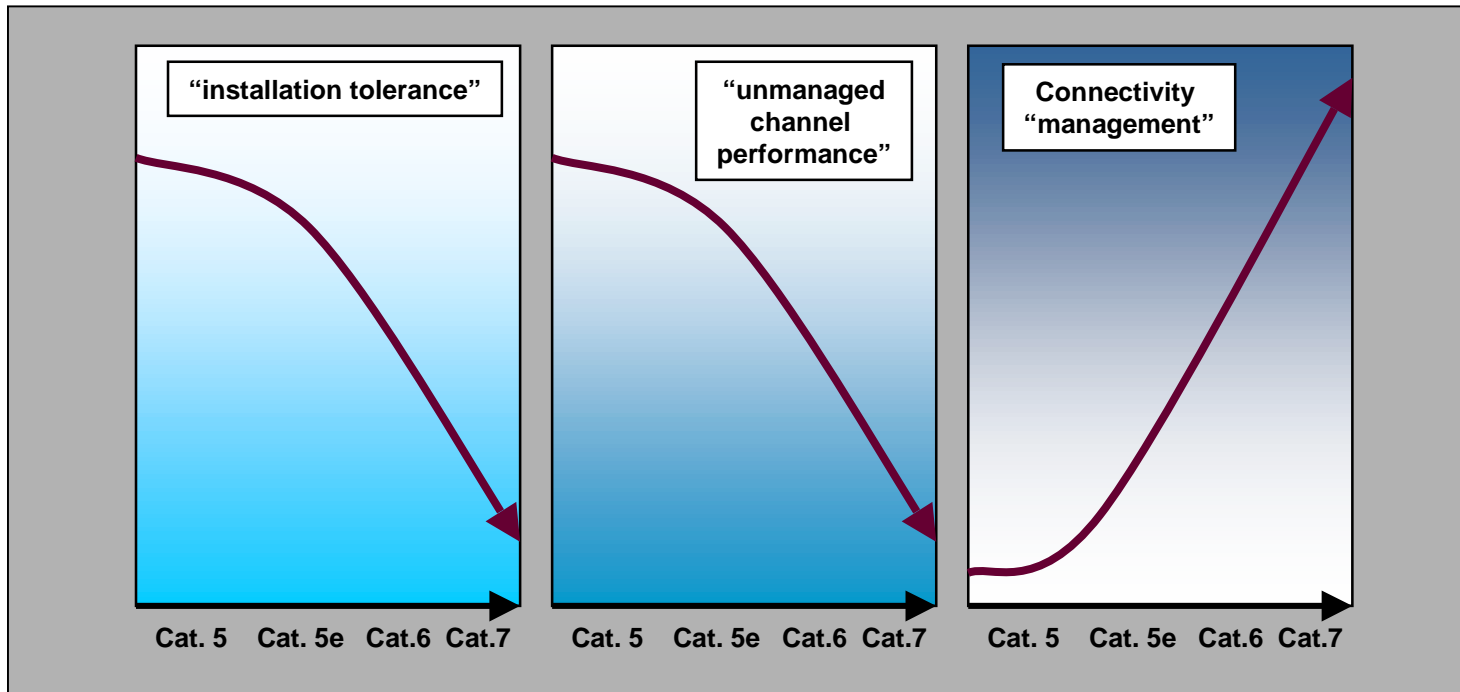




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## Copper - A Nightmare Scenario?



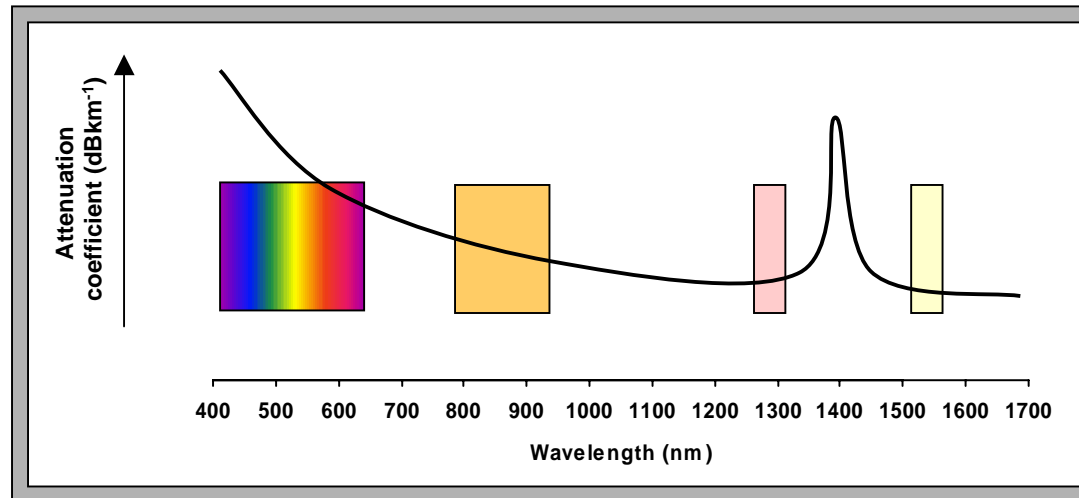
plus the undermining of the reference implementation approach



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# 1GbE Performance Margin - What Margin?



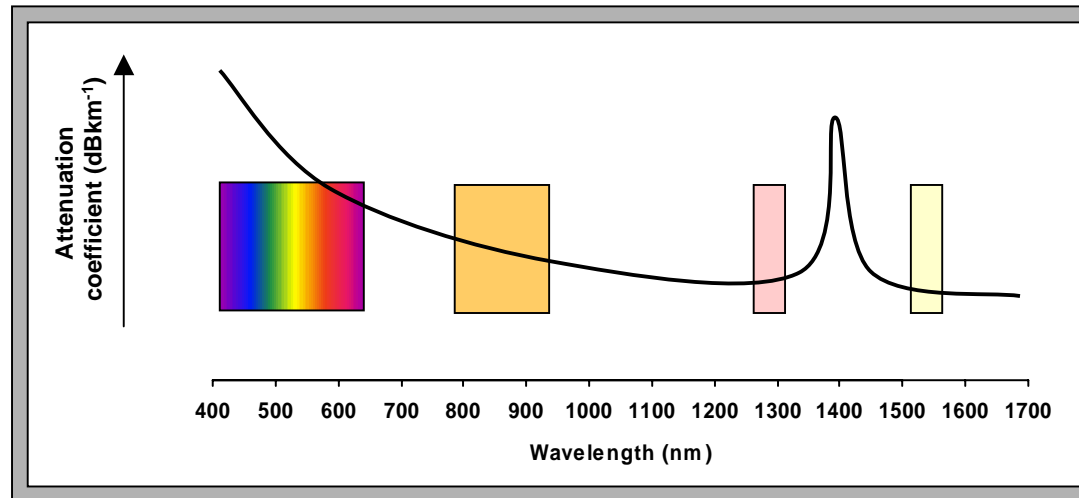
	850nm		1300nm		1310nm
	62.5/125	50/125	62.5/125	50/125	SMF
OFL Modal Bandwidth (MHz.km)	200	500	500	500	
Assumed OF attenuation (dBkm <sup>-1</sup> )	3.75	3.50	1.5	1.5	0.5
	1000BASE		-SX		-LX
			830nm	1270nm	
Maximum channel length (m)	275	550	550	550	5000
Max. OF cable attenuation (dB)	1.1	2.06	0.85	0.85	2.57
Connecting hardware allowance (dB)	1.5	1.5	1.5	1.5	2.0
Maximum Channel Insertion Loss (dB)	2.60	3.56	2.35	2.35	4.57



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# 10GbE Performance Margin - What Margin?



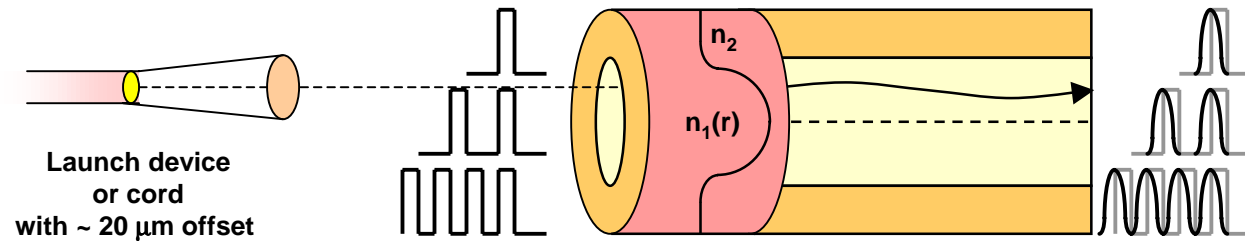
	850nm		1300nm	1310nm		1550nm
	62.5/125	50/125	MMF	SMF		
OFL Modal Bandwidth (MHz.km)	200	500	500			
Assumed OF attenuation (dBkm <sup>-1</sup> )	3.50	3.50	1.5	0.4		0.5
<b>10GBASE</b>	<b>-SR/SW</b>		<b>-LX4</b>	<b>-LR/LW</b>	<b>-LX4</b>	<b>-ER/EW</b>
	830nm		1269-1356 nm	1270nm	1269-1356 nm	1550nm
<b>Maximum channel length (m)</b>	<b>33</b>	<b>82</b>	<b>300</b>	<b>10000</b>	<b>10000</b>	<b>40000</b>
Max. OF cable attenuation (dB)	0.12	0.30	0.46	4.20	4.20	
Connecting hardware allowance (dB)	1.5	1.5	1.5	2	2	
<b>Maximum Channel Insertion Loss (dB)</b>	<b>1.62</b>	<b>1.80</b>	<b>2.46</b>	<b>6.20</b>	<b>6.20</b>	<b>10.9</b>



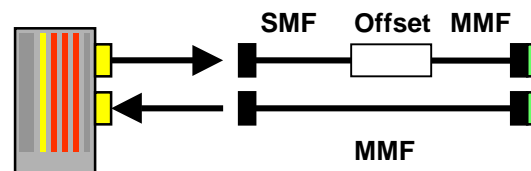
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# Application-specific Cordage



1000BASE				
-SX		-LX		
62.5/125	50/125	62.5/125	50/125	SMF
830nm		1270nm		1270nm
Internal to eqmt		Cord required		NA



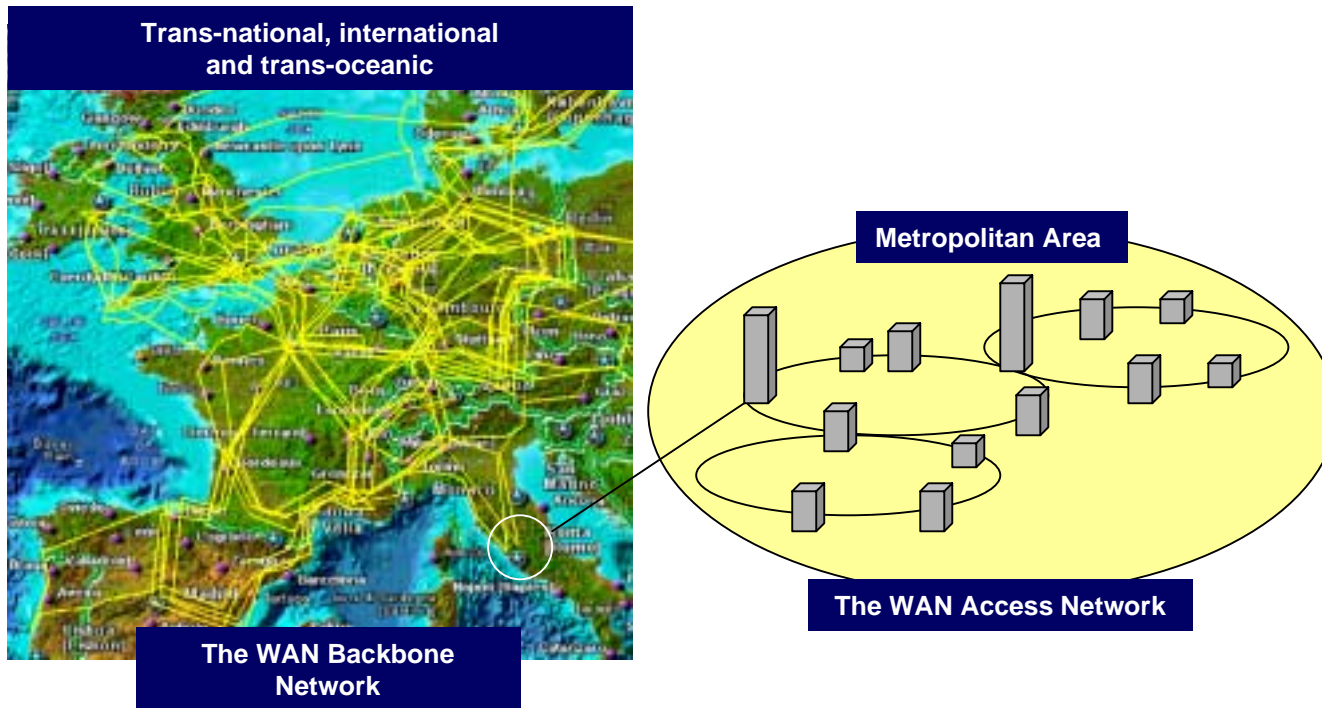
Mode conditioning cord



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## WAN Opportunities?



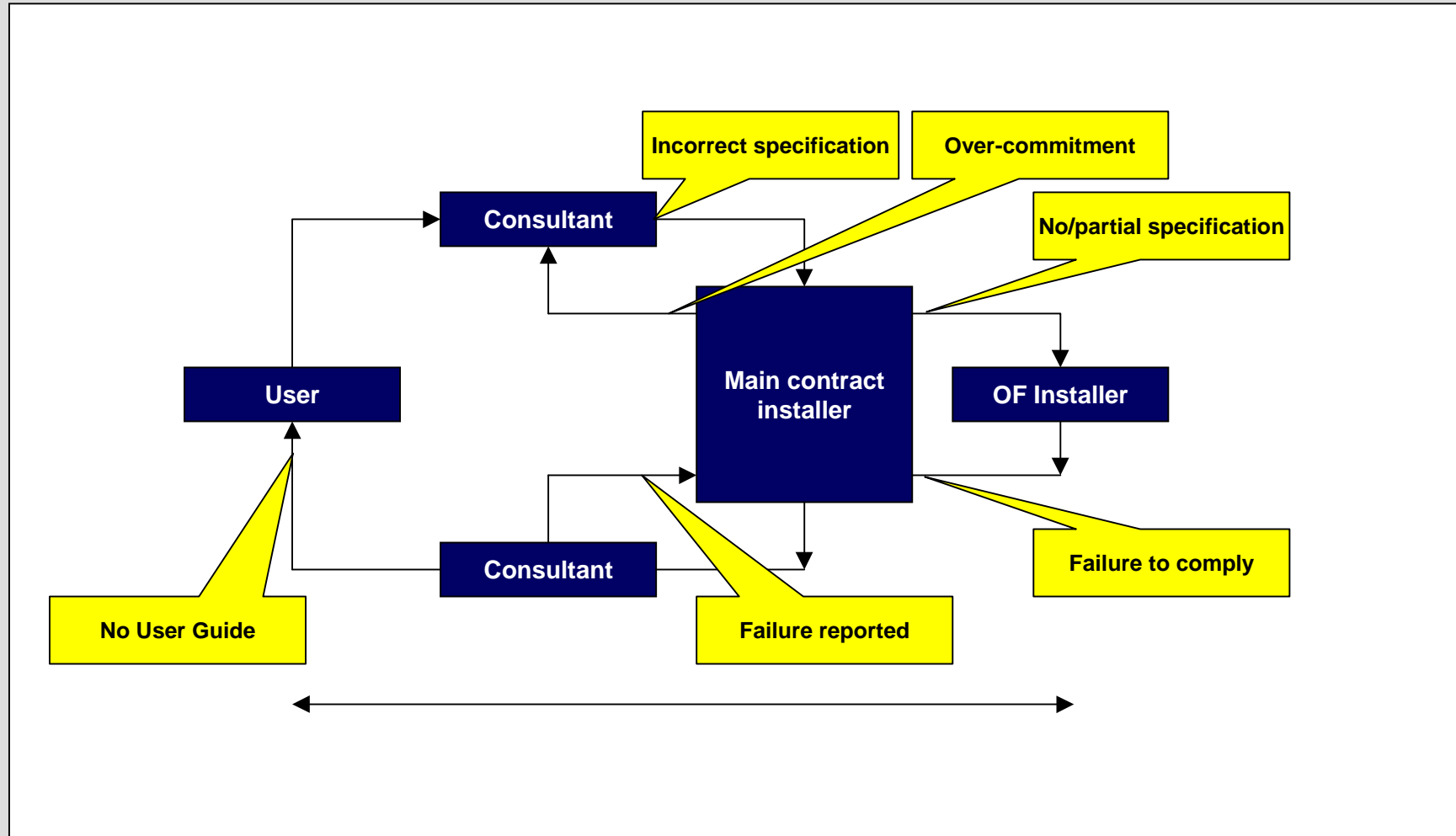
- G.652 - Characteristics of a single-mode optical fibre cable
- G.653 - Characteristics of a dispersion-shifted single-mode optical fibre cable
- G.654 - Characteristics of a cut-off shifted single-mode optical fibre cable
- G.655 - Characteristics of a non-zero dispersion shifted single-mode optical fibre cable



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## The Project Model

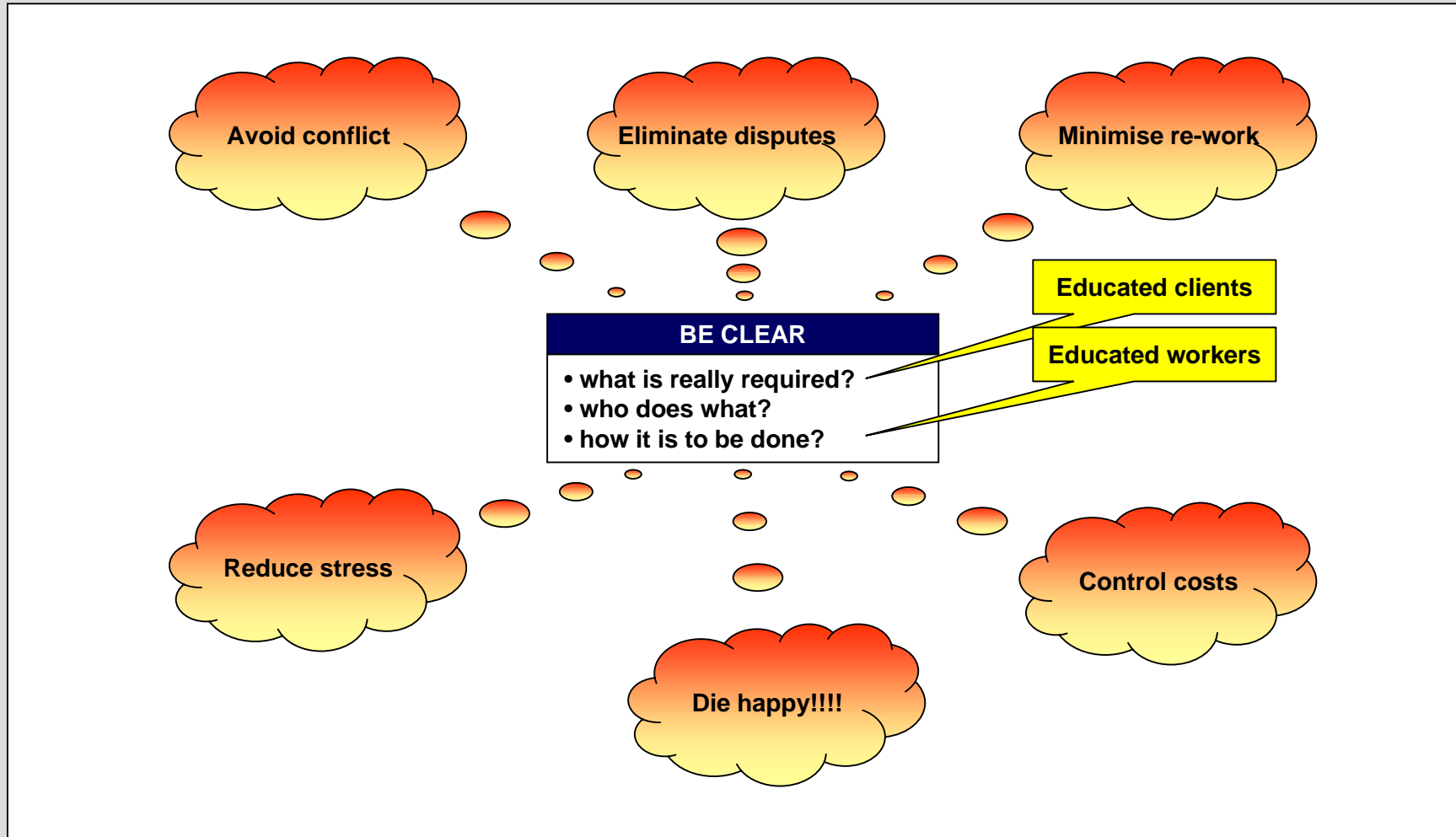




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## Installation Standards - Increasing Regulation




	<b>BS EN 50174-1</b>	<b>Information technology - Cabling installation- Part 1: Specification and Quality Assurance</b>
	<b>BS EN 50174-2</b>	<b>Information technology - Cabling installation- Part 2: Installation planning and practices inside buildings</b>
	<b>BS 6701</b>	<b>Code of Practice for the installation of apparatus intended for connection to certain telecommunications systems</b>
	<b>BS 7718</b>	<b>Code of Practice for the installation of fibre optic cabling</b>
	<b>IEC 60825-2</b>	<b>Safety of Laser Products Part 2: Safety of optical fibre communication systems</b>
	<b>BS 7671</b>	<b>Requirements for electrical installations: IEE Wiring Regulations: Sixteenth Edition</b>



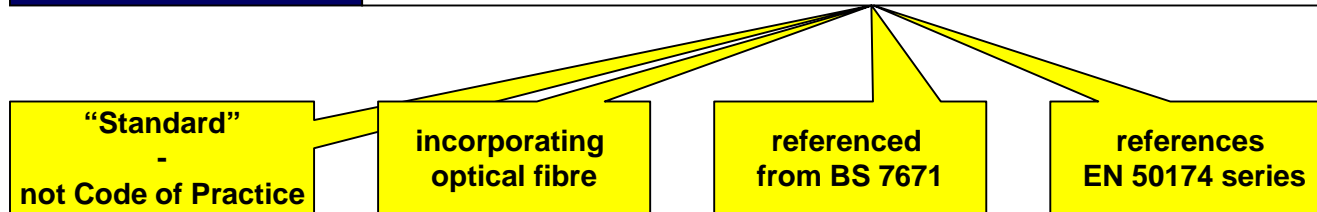
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## Installation Standards - Changes Ahead

	BS EN 50174-1 (2001)	Information technology - Cabling installation- Part 1: Specification and Quality Assurance
	BS EN 50174-2 (2001)	Information technology - Cabling installation- Part 2: Installation planning and practices inside buildings
	BS EN 50174-3 (2003)	Information technology - Cabling installation- Part 3: Installation planning and practices between buildings

	BS 6701 (2003)	<i>Installation of apparatus and cabling to support telecommunications systems</i>
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	IEC 60825-2	Safety of Laser Products Part 2: Safety of optical fibre communication systems
	BS 7671	Requirements for electrical installations: IEE Wiring Regulations: Sixteenth Edition






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## Testing Standards - Spoilt for Choice?

	<b>BS EN 61280-4-2</b>	<b>Fibre optic communication subsystem basic test procedures - Part 4-2: Fibre optic cable plant - Single-mode fibre optic cable plant attenuation</b>
	<b>BS EN 50346</b>	<b>Information technology - Cabling installation- Testing of installed cabling</b>







	<b>IEC 61280-4-1 (underway)</b>	<b>Fibre optic communication subsystem basic test procedures - Part 4-1: Fibre optic cable plant - Multimode fibre optic cable plant attenuation</b>
	<b>ANSI/TIA/EIA-526-14-A</b>	<b>OFSTP-14A Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant (ANSI/TIA/EIA-526-14A-98)</b>
	<b>ANSI/TIA/EIA-526-7</b>	<b>OFSTP-7 Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant (ANSI/TIA/EIA-526-7-98)</b>



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## Testing Standards - Changes Ahead

	<b>BS EN 61280-4-2</b>	Fibre optic communication subsystem basic test procedures - Part 4-2: Fibre optic cable plant - Single-mode fibre optic cable plant attenuation
	<b>BS EN 50346</b>	<b>Information technology - Cabling installation- Testing of installed cabling</b>
	<b>EN 50346 Ed.1 A.1</b>	<b>Information technology - Cabling installation- Testing of installed cabling</b>
<b>incorporating latest test methods for optical fibre cabling</b>		
	<b>IEC 61280-4-1 (underway)</b>	Fibre optic communication subsystem basic test procedures - Part 4-1: Fibre optic cable plant - Multimode fibre optic cable plant attenuation
	<b>ANSI/TIA/EIA-526-14-A</b>	OFSTP-14A Optical Power Loss Measurement of Installed Multimode Fiber Cable Plant (ANSI/TIA/EIA-526-14A-98)
	<b>ANSI/TIA/EIA-526-7</b>	OFSTP-7 Measurement of Optical Power Loss of Installed Single-Mode Fiber Cable Plant (ANSI/TIA/EIA-526-7-98)



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## FIA Technical Support

### The FIA Technical Support Documents

- providing interpretation
- delivering guidance
- “fast-track” standardisation



TSD	DESIGN
2000-1-1	OPTICAL FIBRE CABLING: LAN APPLICATION SUPPORT GUIDE
2000-1-3	OPTICAL FIBRE CABLING: DARK FIBRE SUPPORT GUIDE
TSD	OPERATION
2000-3-3	POLARITY MAINTENANCE
TSD	INSTALLATION
2000-4-2-1	TESTING OF INSTALLED CABLING: ATTENUATION USING LSPM EQUIPMENT
2000-4-2-2	TESTING OF INSTALLED CABLING: ATTENUATION USING OTDR EQUIPMENT
TSD	SAFETY
2000-5-1	OPTICAL POWER: SAFETY LEVELS
2000-5-2	OPTICAL FIBRE: HANDLING OF PROCESSING CHEMICALS
2000-5-3	OPTICAL FIBRE: DISPOSAL OF WASTE
MODELLING TOOLS	
CABLING STRUCTURES COST MODEL	



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## Smart Spade Work

### BE PRO-ACTIVE, NOT REACTIVE

- read the standards
- obtain expert advice
- produce statements of compliance
- develop a specification checklist
- produce accurate method statements for all aspects of the installation process
  - define the in-feed requirement
  - dictate the alternative
- produce the foundations for the generic User Guide

### MANAGE YOUR RESOURCE

- identify the true leaders
- identify an office-based project coordinator
- train each person appropriately in your procedures

### INVEST IN SOFTWARE

- web-browser production
- pdf creation
- CD production
- test result readers



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## Integration

### Fibreoptics Anonymous

e-mail link

### Installation Browser

User logo

User details

Consultant details

Main Contract Installer details

Quality Assurance

Specifications

User

Checklist

In-house

Quality Plan

Method Statements

Installation

Documentation

Test Methods

Test Result Administration

Component specifications

As-built Documentation

Connectivity spreadsheets

Schematics

User Guide

Channel Manager

Test Results

OTDR

LSPM

OTDR Reader

LSPM Reader



## e-Tools in Action

“e-Tools” are an integrated multi-platform documentation system

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Project Browser

Project Documentation

Architects Drawings

Cabling Schematics

Test Results

Connectivity Data

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Company IntraNet

Company Data

Policies

Method Statements



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## FIA Initiatives

### WorkSmart Programme

