

# Certified Data Centre Design - CDCDP™

## Course Overview

This course, held over three days, is aimed at teaching best practice design principles for the design, construction and operation of computer rooms and data centres. It consists of a number of subsections that address the fundamental requirements of a successful design such as physical infrastructure, electrical power supply, air conditioning and data cabling. Best practice is achieved by bringing together the requirements of British, European, US and International standards. Several case studies are considered to see examples of good and bad practice in real situations. The unit is principally assessed by an ongoing design exercise that leads the delegates through all the steps and decision points needed to arrive at a baseline design of a modern data centre.

All the Data Centre Courses have been fully updated to take into account the requirements of the 2009 EU Code of Conduct on Data Centres Energy Efficiency.

## Course Content

### 1 What is a data centre?

- ▶ The Data Centre stack
- ▶ TIA 942 spaces and hierarchical model
- ▶ Types of Data Centre
- ▶ Location Considerations

### 2 The importance of design project management

- ▶ Main design considerations
- ▶ Developing a project plan

### 3 Scoping the requirement

- ▶ Identifying key stakeholders
- ▶ Market and political drivers
- ▶ Global, US and European standards
- ▶ Availability and resilience classifications
- ▶ Introduction to Uptime Model of Tiering
- ▶ Services and facilities
- ▶ TIA 942 recommendations for location, size, heights, floor loading, lighting and decor
- ▶ BICSI 002

### 4 Raised access floors

- ▶ Global, US and European standards
- ▶ Recommended floor heights
- ▶ Airflow and sealing
- ▶ Ramps and access
- ▶ Seismic protection

### 5 Cabinets

- ▶ Requirements of a cabinet
- ▶ Security, safety and stabilisation
- ▶ Clearance, accessibility and ventilation
- ▶ Cable Management
- ▶ Common design issues

### 6 Power

- ▶ Some electrical principles, volts, amps, watts, kVA, power factor and three phase
- ▶ Regulations and Codes
- ▶ The meaning of N, N+1, 2(N+1) etc
- ▶ Power delivery and losses
- ▶ Uninterruptible Power Supply (UPS) options
- ▶ Generator considerations
- ▶ Power Distribution Units
- ▶ Power distribution to and in a rack
- ▶ Emergency Power Off (EPO)
- ▶ Estimating power requirements

### 7 Cooling

- ▶ Global, US and European Standards
- ▶ Basics of air conditioning principles
- ▶ CRAHs and CRACs
- ▶ Operational parameters
- ▶ Underfloor plenum approach
- ▶ Hot aisle/cold aisle model
- ▶ Psychrometric charts
- ▶ Min and max throw distances for underfloor air
- ▶ Bypass and recirculation
- ▶ Airflow Management
- ▶ Chilled water racks, CO2, Passive Air

### 8 Earthing & Bonding

- ▶ Applicable standards
- ▶ The terminology of earthing, grounding and bonding
- ▶ Equipotential bonding
- ▶ ESD
- ▶ Functional earths
- ▶ The Signal Reference Grid (SRG)

### 9 Cable Containment, Management and Protection

- ▶ Applicable standards
- ▶ Separation of power and data cables
- ▶ Administration and labelling
- ▶ Types of conduit, trunking, tray etc available
- ▶ Earthing and bonding
- ▶ Fill rules
- ▶ Cable management in and to a rack
- ▶ European fire
- ▶ Fire stopping

### 10 Delivering the IT Strategy

- ▶ Data centre equipment
- ▶ Functions and protocols, current and future
- ▶ Data centre connections
- ▶ Cabling requirements
- ▶ Cabling standards
- ▶ Cabling options
- ▶ The impact of 40G and 100G
- ▶ The impact of virtualisation

### 11 Copper Cabling Connectivity

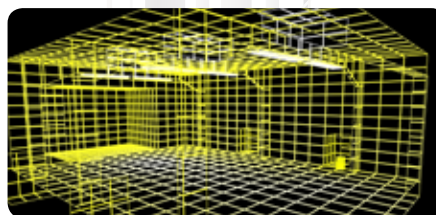
- ▶ Cabling standards
- ▶ Cable Standards, 10GBASE-T and CAT6A, Cat 7A
- ▶ Screened v unshielded cables
- ▶ High density patching
- ▶ Alien Crosstalk
- ▶ Design for growth management
- ▶ How many connectors in a channel?
- ▶ Connection topologies

### 12 Optical Fibre Connectivity

- ▶ Optical connectors, past and present
- ▶ Optical fibre management
- ▶ Types of optical cable
- ▶ Pre-terminated cabling
- ▶ Advantages and disadvantages of pre-terminating cables
- ▶ Optical component loss and link power budgets
- ▶ Application link loss
- ▶ The MPO and MTP ribbon connector
- ▶ Some manufacturers' examples

**“Very relevant to everyday working environment”**

**- Major City Bank**



### I3 Designing for Safety and Manageability

- ▶ Regulations and Codes
- ▶ Fire Safety Plan
- ▶ Emergency signage
- ▶ Emergency power systems
- ▶ Emergency lighting
- ▶ Design for low fire risk
- ▶ Fire detection, monitoring and suppression
- ▶ Pre-action sprinkler system
- ▶ Approved gaseous fire suppression chemicals (clean agent)
- ▶ Siting of fire/smoke detectors
- ▶ Cables for smoke detectors and alarm systems
- ▶ The riser and plenum grade of cable
- ▶ Limited combustible cables
- ▶ Insurance perspectives
- ▶ Relative costs
- ▶ Security, access control, CCTV and BMS

### I4 Commissioning and Handover

- ▶ The commissioning process
- ▶ Information sets



## 3-day course

Classroom based with instructor led discussion and ongoing assessments  
Final online assessment and case study

#### ▶ Qualification

BTEC Advanced Award in Practical Data Centre Design  
BICSI CECs: 21 RCDD, 21 ITS, 21 NTS  
CNet Certificate

#### ▶ Who Should Attend

Any individual involved or responsible for the management of an existing Data Centre or those looking at the best practice for the design of new facilities

#### ▶ Related Training

CDCDP™ - Certified Data Centre Design Professional  
CDCT™ - Certified Data Center Technician  
Data Centre Power - DCP  
Data Centre Cooling - DCC  
Data Centre Management - DCM  
Data Centre Efficiency - DCE  
CDCM™ – Certified Data Centre Management  
CDCMP™ – Certified Data Centre Management Professional RCDD

#### ▶ Course Objectives

To understand the best practice of design principles, construction, operation and ongoing management of computer rooms and data centres ensuring they are efficient and compliant

#### ▶ Prerequisites

Experience of the data centre environment is essential

