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The RIBA has responded to members feedback and your stated learning needs, and the drastic changes and disruption in architecture and construction. The result is a modern update of the RIBA CPD Core Curriculum, fit for 21st century practice, a changing world, and your needs as architects and business people. This is a CPD curriculum to help you to contend with disruption, to future-proof yourself, and to help your practices flourish.

We have also introduced an entirely new topic: architecture for social purpose. This is where we and you can make a positive impact. This exciting new topic is about understanding the social value and, economic and environmental benefits architecture brings for individuals and communities – improving life chances, social identity and cohesion, and well-being, and having the knowledge and skills to make informed, fair, and ethical choices and influence the project team and supply chain.

The RIBA’s mandatory CPD curriculum 2017 update is now in place, and outlined in this document.

**What is the RIBA CPD Core Curriculum?**

The RIBA CPD Core Curriculum defines ten key mandatory topics of yearly study within your CPD obligations. All chartered members are expected to obtain at least two hours of learning in each of the ten every year, utilising proper knowledge management and research methodology.

(Knowledge management is the systematic organisation of a practice’s knowledge to create value and facilitate organisational learning. Research is a process of systematic and original investigation undertaken in order to gain knowledge and understanding and to de-risk innovation.)

This approach helps members to spend their CPD time maintaining competence in basic architectural skills. At the same time, it gives them the freedom to tailor their CPD to their personal and professional needs and circumstances. As members are obliged to attain 35 hours CPD a year, the core requirement represents only a portion of the yearly attainment.

<table>
<thead>
<tr>
<th>Two hours x topic x year</th>
<th>Learning levels</th>
<th>Either</th>
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<tbody>
<tr>
<td>Architecture for social purpose</td>
<td>microlearning</td>
<td>structured</td>
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<tr>
<td>Business, clients and services</td>
<td>general awareness</td>
<td>or</td>
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<tr>
<td>Procurement and contracts</td>
<td>detailed knowledge</td>
<td>informal</td>
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<td>Legal, regulatory and statutory compliance</td>
<td>deep knowledge</td>
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<td>Health, safety and wellbeing</td>
<td>advanced skills</td>
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<td>Design, construction and technology</td>
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© RIBA 2017
What is this document?
This document sets out a comprehensive, but not exclusive, framework of what target issues practitioners might wish to engage with in each topic, by which ever method and from whatever source.
These study notes represent scores of possible learning in each of the ten mandatory topics. In other words, they are potential approaches to competency in each of the ten. The notes are merely a guide and are not mandatory.

What kind of CPD can I do?
Can you learn from it? Then it can count as CPD. By “CPD” we mean any relevant learning activity, from informal microlearning to advanced skills. The CPD you do depends on your circumstances. Most members will be doing microlearning or general awareness in the ten just through activities such as reading, knowledge transfer and similar. The more detail you need for your own personal and professional circumstances, the more detailed your CPD is likely to be. Thus anything from reading to additional qualifications can count as CPD, with numerous allowable activities in between those extremes.

How does it pertain to me?
The curriculum is mandatory for all chartered members. You are however expected to personalise it to your own circumstances. How you manage the obligation however is entirely up to you. You are invited to – and expected to – make all your CPD relevant to your circumstances. The RIBA’s approach allows for both the maintenance of competence, and the personal and professional future-proofing.

Can I choose my own learning?
Yes, you are encouraged to do so. You can choose the learning level, medium, type (structured or informal), subject, supplier and more. The RIBA doesn't specify how you have to obtain your CPD. We do provide CPD for you, but you are not obliged to use ours.

What if I am doing other things?
Again, the curriculum is general enough to ensure that most people will attain at least two hours per year in each of the ten. This represents a mere 25 minutes per week at the minimum. Many people exceed this because the definition of what counts is so broad. Also, as learning becomes more organically integrated into practice and personal life, many of us are learning constantly.
What are the learning levels? Whether face to face, online or distance, these are the possible levels:

- Microlearning: quick informal updates of up to 30 minutes, usually digital, and self-directed
- General awareness: usually free, one hour’s duration: doesn’t lead to expertise
- Detailed knowledge: structured CPD of two hours to a half day’s duration
- Deep learning: courses on a single subject of one or two days’ duration
- Advanced learning: courses of at least three days’ duration potentially leading to additional specialisations, certification or qualifications

Finally a note on time
35 hours per year equals 45 minutes per week: the 20 hour core requirement within that 35 hours equates to only 20 minutes per week.
This competency potentially covers

**Background**

The positive impact of architecture and the social value and economic and environmental benefits it brings for individuals and communities – improving life chances, social identity and cohesion, and wellbeing.

**Codes and modes of conduct and duty of care**

Current RIBA and ARB codes of conduct and discipline, including professional ethics and business ethics

RIBA Guidance Note 8: Employment and creating equal opportunities

The architect’s obligation to society and the protection of the environment

Equality Act 2010 and understanding the 9 protected characteristics

<table>
<thead>
<tr>
<th>The nine protected characteristics under the Equality Act 2010:</th>
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<td>Age</td>
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<tr>
<td>Disability</td>
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<tr>
<td>Gender reassignment</td>
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<tr>
<td>Marriage and civil partnership (in employment only)</td>
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<td>Pregnancy and maternity</td>
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<td>Race</td>
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<td>Religion and belief</td>
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<tr>
<td>Sex</td>
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<td>Sexual orientation</td>
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**Professionalism in a global context**

The UN Global Compact: how it affects you and your company

www.architecture.com/about/ungc

Ethical and sustainable sourcing, specification and supply chains

Working ethically in other countries in the absence of legislation: cultural awareness, respect and how to make decisions

Disaster preparedness, relief and reconstruction, and how to work with and for the benefit of affected communities

International development work and relief and humanitarian shelter and settlement coordination

Design appropriate and sympathetic to local culture and history
**Topic 1**

**Architecture for social purpose**

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**Ethics of architecture, construction and business management**

- Developing ethical, social and environmental awareness
- Understanding the ethics of regeneration
- Social purpose in building conservation and heritage
- Social purpose of health, safety and wellbeing
- Fire safety strategy and legislation
- Understanding and knowing how to calculate social value

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The *Social Value Act* came into force in April 2013. The Act requires public authorities to have regard to economic, social and environmental wellbeing in connection with public services contracts; and for connected purposes. It applies to all English and some Welsh public bodies, including the NHS, local authorities, other government departments, housing associations and emergency services.

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**Equitable and inclusive planning and placemaking**

**Equitable placemaking**

Mechanisms and processes that make people of all backgrounds feel welcome, as co-creators and collaborators, in the making of their communities, and in communities they feel reflects them.

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**Collaboration and respect: staff, clients, stakeholders and communities**

- Understanding community engagement
- Effective engagement with stakeholders
- Understanding who should be your key stakeholders
- The importance of maintaining professional relationships
- Achieving effective client interaction
- Creating a stable work/life balance for your employees
- Understanding team working in the professional environment
- Community regeneration and how you can help
- Understanding Local Authorities' development plans for creating better environments for their communities
- Understanding and ensuring positive community engagement
- Working pro-actively with communities and stakeholders
- Engaging with clients and understanding the economics of architecture with social purpose
Equality, diversity and inclusion

Understanding and promoting the business benefits of equality, diversity and inclusion in the workplace and in your work and projects
Understanding inclusive environments and accessible buildings
Developing ethnic and cultural awareness
Understanding mental health issues
Understanding the difference between equality, diversity and inclusion

Equality is the quality or state of being equal; of knowing and understanding that everybody’s value in terms of status, rights or opportunities is the same and, by extension, treating them equally. In order to achieve equality, individuals must be fair and respect differences in people and their characteristics, recognising that such differences should not justify different or unfair treatment and that all people should be afforded the same rights and opportunities, irrespective of their differences.

Diversity is the quality or state of being diverse; it encompasses all the characteristics that make people different from each other. Diversity is a state of having and accepting differences, including age, condition, race, gender, religion or belief and sexual orientation.

Inclusion is the action or state of positively including and being included within a group, structure or organisation; ensuring all people are embraced and not excluded. Inclusion is about removing or altering ‘barriers’ that may discourage people from actively participating – often the things that we cannot see, such as attitudes and prejudice.

Outreach: mentoring, volunteering and architecture in education

Understanding how to effectively volunteer your time and skills
Understanding your role as a mentor or a mentee
Secondary school and sixth form engagement
Understanding your non-executive role in the third sector (e.g. school governor, parish councillor)
How to deliver workshops and presentations to schools on architecture as a career choice
Transferring your knowledge through design tutoring
Charity movements in architecture: how you can get involved
Giving your skills to your church, mosque, synagogue or temple
Reflecting on and assessing the soft or technical skills you gain from volunteering.
This competency potentially covers

**Legislative framework**

Construction (Design and Management) (CDM) Regulations 2015 (and see below)
Health and Safety at Work etc. Act 1974 (HSWA)
The Construction (Health, Safety and Welfare) Regulations 1996
The Management of Health and Safety at Work Regulations 1999
The Regulatory Reform (Fire Safety) Order 2005

- Fire safety strategy and legislation

Work at Height Regulations 2005
Corporate Manslaughter and Corporate Homicide Act 2007
Control of Asbestos Regulations 2012
Personal Protective Equipment Regulations 2002
Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR)

**CDM Regulations (acquaintance with the terms and L153 locations)**

- Duty Holders – their roles and responsibilities
- Advising the client
- Differences for domestic’ projects
- Design risk identification and management methodology
- The Principles of Prevention and their proportionate application to design
- Absolute and qualified duties in CDM 2015
- Identification of “Significant” design risks, not ‘all risks’
- Pre-Construction Information- deliverables
- Construction Phase health and safety plan
- Health and safety file
- HSE and industry guidance
- Understanding of the concept of “so far as is reasonably practicable” (SFARP) and its application
- Notification of HSE by client
- CDM identification on drawings
- CDM analysis methods,
- Tracking of design risk management process
- Case studies and exemplar projects
The design risk management process

RIBA Plan of Work – health and safety
Understanding pre construction information
CDM strategy brief
Designer's duties and liabilities
Concept of 'so far as reasonably practicable' SFARP
Absolute and Qualified Duties under CDM 2015
Exemplar design risk management processes
Risk review meetings at all stages collaboratively
Principles of Prevention a Framework for consideration for health and safety in design
Hazard Awareness and Risk Identification
Design risk registers and analysis of significant and unusual risks/hazards
Communicating risk by visual methods
What is not required!

The design risk management procedure in practice

© RIBA Publishing and APS 2015 from Principal Designer's Handbook and Guide to the CDM 2015 Regulations
Designing for safety and health

Constructability analysis
Designing to improve the long-term health prospects of workers
Safety issues, including temporary works
Health issues, including asbestos, dust and particulates, noise and vibration
Safe access for maintenance and repair
Visiting the site safely
Wellness accreditation systems

The project hazards and risks

Hazard identification and control with respect to designers
  • Hazardous substances
  • Physical and ergonomic hazards (noise, manual handling)
  • Biological hazards
  • Hygiene and welfare facilities
  • Working at heights and depths
  • Excavations and confined spaces
  • Site electricity (overhead, overground and underground)
  • Fire during construction and in use
  • Plant/moving vehicles
  • Temporary works, underpinning
  • Trespass and security
  • Protection of the public
**Topic 2**  
**Health, safety and wellbeing**

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**Practice management**

- Employers’ and employees’ responsibilities  
- Risk assessments  
- Fire safety strategy and legislation  
- Electrical safety  
- COSHH  
- First aid  
- Lone working  
- Staff safety out of office – on site (CSCS) and/or surveying  
- Managing health and safety at special events  
- Mental health  
- Visiting the site safely; provision and use of PPE

**Health, safety and wellbeing accreditation systems**

- Safety schemes in procurement including CHAS, SSIP, SMAS  
- Considerate Constructors  
- Safe Contractor  
- CSCS card scheme  
- BS OHSAS 18001 – to be replaced by ISO 45001  
- Occupational health and safety management systems (2018)  
- WELL Building Standard
**Topic 3**

**Business, clients and services**

*This competency potentially covers these knowledge areas and skills*

**The legislative framework and due diligence**

Intellectual property rights, copyright law
Insurance, employers, PI and liability
Duty of care, professional liability, negligence and professional indemnity, including insurance warranties
Obligations to stakeholders, warranties and third party rights
Employment law [www.gov.uk/browse/employing-people](http://www.gov.uk/browse/employing-people)
The Equality Act 2010 and the 9 protected characteristics
Health and Safety at Work Act [www.hse.gov.uk/legislation/hswa.htm](http://www.hse.gov.uk/legislation/hswa.htm)
Workplace pension provision [www.gov.uk/browse/employing-people/pensions](http://www.gov.uk/browse/employing-people/pensions)
Risk management strategies
Data protection and data management policies and strategies

(See also the *Architecture for social purpose* and *Legal, regulatory and statutory topics*).

**Contracts, client agreements and forms of appointment**

Understanding the different contracts and forms of appointment
Contracts for professional services
Contracts for building projects
RIBA agreements for the appointment of architects and specialist consultants
Architects’ contracts (eg, as lead or sub consultant), terms of engagement, scope of services, clear letters of appointment, relevant legislation
Advising the client on the right/best form of contract to be used, and keeping up to speed on updates and amends on the various forms of contract.

(see also the *procurement and contracts* topic)

**Overall business set up and strategy**

Practice structures and legal status
Business styles
Time management, recording, planning and review
Practice finance, business planning, funding and taxation
Administration,
Quality management, QA systems
Topic 3
Business, clients and services

Recording and review
Risk management strategies
Project management
Having an effective data management strategy and approach
Succession planning and retirement planning
Proprietary business management software

The client offer

Please see the RIBA Client Services publication, What Do Clients Think of Architects

Client relationship management
Understanding your client’s language and requirements
Developing and interpreting the brief
Knowing how to explain design proposals
Effective communication, presentation, pitching, confirmation and recording
Understanding the client’s commercial drivers, and having commercial understanding
Value adding activities through design and services
Having a clear technical design specification
Communication, progress reporting and appropriate and timely advice
Understanding engagement and consultation
Systems for adhering to the programme
Post occupancy evaluation
Managing the handover process
The effect the project has on the function and maintenance of the building
Per cent of clients who are ‘very’ or ‘fairly’ satisfied with the project, overall

Per cent of clients who are ‘very’ or ‘fairly’ satisfied with architects’ technical design performance (mean average of all scores)

Per cent of clients who are ‘very’ or ‘fairly’ satisfied with architects’ process management performance (mean average of all scores)

Per cent of clients who are ‘very’ or ‘fairly’ satisfied with architects’ design performance (mean average of all scores)

© RIBA 2017, from What Clients Think of Architects
Selling and marketing strategy

Marketing and promoting the practice
Building a brand and reputation
Building and maintaining a website
Having a strategy for social media, and understanding what to use and when
Blogging, using press, and case histories
Agreeing a social media policy and strategy
Good photography and leveraging Instagram and Pinterest
Leveraging Google and other search engines and understanding search engine optimisation (SEO)
Competitions, procurement and bids strategies (see Procurement and Contracts topic)

Financial management

Fee calculation, costing, pricing, negotiation, and bidding
Resource management and job costing
Cash flow monitoring and control
Cost monitoring and control and financial management
Programming of services appropriate to appointment
Taxation accounting and planning
Foreign exchange planning
Macro-economic monitoring
Contingency planning
Management accounting

Project management

Project Management qualifications
Project management soft skills
Programming of services appropriate to appointment
Coordination and integration of design team input
Time management, recording, planning and review
Quality control
Tools and checks for adhering to budgets
Topic 3
Business, clients and services

Team and people management

Employment contracts
Equality, diversity and inclusion in the workplace
Staff management and development
A CPD management system
Performance reviews and appraisals
Team working, team building and leadership
Recruitment strategy and hiring the right people
Staff retention strategy
Retirement planning
Understanding mental and emotional wellbeing of your team

Going digital: developing understanding of

Collaboration tools
Knowledge and document management software
Digital platforms for team collaboration such as Yammer, Trello and Slate
Leveraging Google and other search engines for your commercial benefit
Knowledge of coding and programming
(see also design, construction and technology topic)
Embedding research in practice

Research strategy for practice, including a research impact strategy
Qualitative and quantitative research methods
Developing a research proposal
Undertaking literature reviews
Systematic reviews vs rapid appraisals
Modelling vs experimentation
Formalising case study approaches for client persuasion
Using research to inform projects
Capitalising on skills relating to uncertainty and risk
- Appraisal of financial viability
- Ability to maximise investment potential
- Efficient business practice
- Conversance with patterns of consumption
- Maintaining standards while maximising value

Writing up research
Accessing tax credits for research and development

Please see the RIBA’s resources on this issue [www.architecture.com/knowledge-and-resources/resources-landing-page/knowledge-and-research-in-practice](http://www.architecture.com/knowledge-and-resources/resources-landing-page/knowledge-and-research-in-practice)
Topic 4
Legal, regulatory and statutory compliance

See the relevant notes on the other nine topics.
Topic 5
Procurement and contracts

This competency potentially covers

The legislative framework
WTO GPA (World Trade Organisation Government Procurement Agreement)
EU Directive 2014/24
Public Contract Regulations 2015 and what it allows and requires
The Social Value Act
Small Businesses and Enterprise Bill
English, Welsh, Scottish and Northern Ireland Regulations and authorities standing orders
Threshold values of OJEU (Official Journal of the European Union)
Obligations on tenders below thresholds under trade treaties and regulations
Restraint on abnormally low tenders
RIBA Plan of Work 2013: procurement task bar
RIBA Ten Principles for Procuring Better Outcomes

What is possible and what to look out for
Preliminary Market Engagement (PME)
How procurement tender and its value is defined
Award criteria: cost effectiveness, life cycle costing, balanced score cards and MEAT
(most economically advantageous tender)
Appropriate cost/quality ratio
Understanding requirements and evaluating detailed brief requirements
The programme, resources and cost of competing

Reading an OJEU notice
The contract value
The contracting authority
The object of the contract, including whether variants are acceptable and consortia are allowed
Legal, financial and technical information
Economic and financial ability and whether the service is reserved for a particular profession
Likely number of procurement stages
The cost quality weighting in the assessment
The procedural type route and contract terms and conditions revealed
Complementary information
Topic 5
Procurement and contracts

Accessing detailed briefs and bid uploading facilities
Understand OJEU layouts, notice access, the CPV (common procurement vocabulary) and NUTS (Nomenclature of Territorial Units for Statistics) codes

Developing a proactive practice procurement strategy

How to decide which competitions to enter and being clear on why you are entering
How to evaluate your chances and if you meet the baseline criteria
Attend preliminary market engagement opportunities to learn what the client is looking for
How to evaluate the time, effort and level of competition and opportunity of different procedures
Learn how and when to consider consortia or partnerships to meet economic, capacity and experience requirements

Tactics in tendering for work

Pre qualification:
how to use centralised purchasing arrangements and pre qualification services;
learn what a good EOI (expression of interest) looks like
learn how to complete a PQQ (pre qualification questionnaire);
learn how to demonstrate track record and previous experience.

Tendering:
What a good tender return looks like
How to submit cost effective bids
How to demonstrate social value demanded by a Social Value Levy
How to demonstrate cost-effectiveness through quality criteria (MEAT and balanced score cards)
How to demonstrate a design approach that meets client outcomes
How to demonstrate that you understand and can deliver client outcomes in a negotiation or dialogue
How to get onto frameworks and getting called off

Frameworks
Selection off a framework by mini competition
The third competitive stage assessment
Assessment models for design, fee bid or other
Other techniques: full house or pack thinned; by lot, rotational, randomised, ranking from initial assessment, level playing fields

**Understanding the client (see also core topic, Business, Clients and Services)**
Understand client drivers in consultant selection: eg, project certainty, complexity, design solution or team, capacity or emerging talent, design approaches and previous projects, project definition, time pressure
How to have positive conversations with clients in interviews to demonstrate your interest and capability
Understanding the client's fields of enquiry and their weighting matrix for assessment

**Things to do better**
Understand your practice strengths and weaknesses
Identify your practice's unique qualities and distinctions and learn how to articulate them
Learn how to communicate your values
Ensure that your fee bid or matrix is well considered and researched
Respond in clear, succinct and simple language, and relevantly to the specific questions, in the format requested
When writing text, avoid excessive listings of matters
Wherever possible, allow sufficient time to get oversight on your bid
Network and establish bid ready consortia
Develop arrangements in consortia for regularly screening bids, and doing the initial evaluations, consideration and reporting
Share consortia bid costs and feedback

**Procurement methods**
Selecting the appropriate procurement method
Nature and scope of work proposed;
How the risks are to be apportioned
How and where design responsibility is placed
How the work is coordinated
On what price basis the contract is to be awarded.
- Traditional
- Design and build
- Management
The effect of different procurement routes on programme, cost, risk, quality
Design responsibility and third-party rights
Claims, litigation and alternative dispute resolution methods
Collaboration and briefing in construction and provisions for team working
Site processes, quality monitoring, progress recording, payment and completion

The right contract

Understanding the different contracts and forms of appointment
Advising the client on the right/best form of contract to be used, and keeping up to speed on updates and amends on the various forms of contract.
Duties and powers of a lead consultant and contract administrator
Agreeing and knowing how specific contracts are to be adjudicated and adjudication agreements
Collateral warranties
Contract law and case law

Contracts for professional services
Contracts for building projects

- Standard forms of contract
- Non standard forms of contract

Selecting the appropriate type of contract

Traditional
- Lump sum
- Measurement
- Cost reimbursement

Management
- Management contracts
- Construction management contracts
- Design, manage, construct and in some cases maintain

Design and build

RIBA Contracts for domestic and simple commercial projects

RIBA agreements for the appointment of architects and specialist consultants
Other types of contracts and agreements for specific issues:
Public sector consultancy agreements
Framework agreements and guides
Homeowner contracts
Intermediate building contracts
Major projects
Minor works
Pre-construction services
Prime cost
Repair and maintenance

The authors are indebted to Walter Menteth and Lucy Carmichael.
This competency potentially covers

**Background and context: understanding of**

- Climate change and climate change science and impact of both mitigation and adaptation
- The impact and magnitude the built environment has on greenhouse gas emissions
- Sustainable design from inception to completion and handover including post-occupancy evaluation and feedback and how this fits within a wider aim of resource efficiency
- The links and differences between low energy and low carbon design
- Design decisions on the whole life of our built environment, including how to design with total cost in mind (including maintenance, durability and end of life scenarios) and the role of data to assist with smarter buildings and cities
- The link with digital construction as an enabler for creating more stable built environments
- Sustainability checkpoints in the RIBA Plan of Work


**Legislation: understanding of**

- **Primary legislation (acts or orders) such as**
  - Clean Air Act
  - Clean Neighbourhoods and Environment Act
  - Climate Change Act
  - Energy Act
  - Environmental Protection Act
  - Flood and Water Management Act
  - Natural Environment and Rural Communities Act
  - Water Resources Act
  - Wildlife and Countryside Act
- The key points laid out in NPPF regarding presumption in favour of sustainable design

- **Secondary legislation (regulations) and standards such as**
  - Relevant Building Regulations such as L1 and L2 and the devolved nations’ equivalents
  - Conservation of Habitats and Species Regulations
  - Energy Performance of Buildings (Certificates and Inspections) (England and Wales) Regulations
Topic 6

Sustainable architecture

BS EN 15804:2012 Environmental product declarations. Core rules for the product category of construction products
Environmental Permitting (England and Wales) Regulations
Site Waste Management Plan Regulations
Town and Country Planning Regulations (environmental impact assessment) (England and Wales)
SUDS legislation and the need to respond to predicted future flood conditions
Code for Sustainable Homes
The PassivHaus Standard
BREEAM standards
PAS 1192
ISO 20400: Sustainable Procurement Standard
Fire safety strategy and legislation

Client briefing and management

Understanding and prioritising energy efficiency in low carbon design over whole life
Energy efficiency as underpinning the more general aim of low carbon emissions
Communicating the ethical and pragmatic importance of low carbon design
Low energy and high comfort together resulting in good outcomes for client and planet
Communicating the importance of the selection of low carbon materials and systems
The importance of life cycle analysis in aiding the understanding of a buildings physical performance over its life
Understanding stakeholders, clients, planning and legislative authorities
Defining the brief whilst balancing sustainability targets
Importance of commissioning and building management – soft landings as a process from start to finish
Building performance metrics such as kWhr.m²a kgCO₂/m²
KPI’s and which ones should be used and comfort indices such as IAQ, CO₂ levels, temperature.

Knowledge of low carbon skills and energy literacy

The thermal implications of building form and fabric, and how thermal performance can be improved

- The effects of location, shelter and shading on thermal performance and allied issues such as moisture
- The effects of building form on heat loss and solar aperture and how these can be modelled using software or simple maths
- The use of solar and internal heat gains and their contribution to overheating if not managed
- The use of building form to promote natural ventilation and cooling where appropriate
- Understanding the difference between summer and winter ventilation
- The importance of the continuity of insulation and air-tightness within a ventilation strategy
- The importance of minimising thermal bridging and air leakage
- Deploying constructions of high and low thermal mass appropriately
- Understanding how light and heavy structures can influence performance and may be appropriate or less so to certain building types
- U value and $\Psi$ value calculations

**Carbon emissions comparison**

![Carbon emissions comparison diagram](image-url)

© RIBA Publishing and Simon Sturgis: From *Targeting Zero* by Simon Sturgis
Building services systems that contribute to low carbon performance, and understanding the pros and cons of:

- Reducing cooling loads to avoid the need for cooling or air conditioning
- Ventilation options including natural cross-ventilation, passive stack ventilation, and mechanical supply and/or extract ventilation
- Ensuring efficient and responsive heating and cooling plant and heat emitters
- Responsive systems and controls to improve efficiency and permit the use of solar and internal gains
- Efficient internal and external lighting systems and controls, and understanding how to keep systems simple and not rely on bms

New and renewable energy systems and the ability to compare and evaluate systems

- Understanding how these systems work and what variables contribute to saving carbon
- Heat pumps
- Combined heat and power including micro CHP
- Solar water heating
- Biofuel heating systems
- Photovoltaic arrays
- Wind turbines

Embodied and Whole Life Carbon assessments for new construction work.

- Embodied carbon assessments through RIBA work stages.
- Optimize recycled content compatible with low carbon objectives.
- Life Cycle Analysis (LCA)
- LCA to establish durability of components, and flexibility of completed project.
- LCA to establish maintenance and replacement cycles.
- LCA to include ‘end of life’ assessment to ascertain resource efficient demolition and capacity for reuse of components and materials.

Energy and environmental assessment for new and existing buildings

- Domestic energy rating (SAP and NHER) including performance certification
- Understanding of SAP as current compliance tool. Knowledge of other modelling tolls such as IES and PHPP and understanding which model for which job.
- Non domestic energy rating systems (SBEM, etc) including performance certification
- Environmental assessment methodologies such as BREEAM and LEED
- Code for Sustainable Homes
• Domestic energy survey techniques and assessments
• Housing stock assessment and stock profiling
• Non domestic energy surveys

Airtightness and performance
• Building physics
• Condensation risk calculations, moisture management and avoidance of moisture
• Movement of moisture in building fabric
• Relative humidity, internal moisture control and moisture buffering
• Closing the performance gap and understanding the phenomena that create performance gap in the first place then understanding how to eliminate these issues
• Heat loss parameters and understanding the relationship between air tightness, insulation, glazing, heat loss and solar gain
• Understanding and designing for thermal comfort and the need for overheating risk mapping for future conditions
• Health and wellbeing, including indoor air quality

Whole building overview and process

Strategic definition: RIBA stage 0
Specification and tender
Procurement and cost management
Material selection, embodied energy, recycling and minimising waste
Whole life carbon foot printing
Life Cycle Analysis
Resource energy efficiency, materials, water, energy and behaviour
Thermal upgrade of historic and listed buildings
Using relevant insulation for listed buildings
Design for deconstruction, recycling and reuse (and reduction of waste)
Construction processes to mitigate impact – use of off-site construction (see also design, construction and technology core topic)
Water efficiency and flood resilience

Understanding and prioritising flood resilient design in new build and retrofit projects
Reducing demand: efficient systems and technologies
Rain water harvesting, grey water recycling, and re-use
Reducing run-off: site water management
Green roofs
Permeable paving
Sustainable Urban Drainage (SUDS) legislation

Energy efficiency and listed buildings: understanding of

Series of relevant published guidance by Historic England
Published guidance on responsible retrofit of Traditional Buildings by the STBA (sponsored by Historic England)
SPAB Energy Efficiency reports
Understanding the special interest of the listed building and how thermal upgrading may be effected without it being compromised
Understanding the requirement for listed building consent and the exemptions provided by approved document L (also in the case of buildings of traditional construction)
Topic 6
Sustainable architecture

Thermal upgrade of listed buildings, buildings in conservation areas, and of buildings of traditional construction
The use of the right insulation
The correct window upgrades
Understanding defects and behaviours of various materials
Approaches to repair and conservation techniques

Post occupancy evaluation and building performance evaluation
www.architecture.com/knowledge-and-resources/resources-landing-page/post-occupancy-evaluation#available-resources

Project delivery (client and project team experiences)
Project outcomes (review strategic brief, business case and sustainability aspirations)
Building use and occupant behaviour: analyse: building layout, building fabric and detailing, occupants use of building and systems, occupation patterns
Occupant feedback (surveys and interviews)
Energy use analysis (utility invoices and meter readings, metering strategy, equipment survey, embodied carbon, measurement and verification survey)
System behaviour (facilities managers experience): analysis of strategies: H+S, ventilation, heating and cooling, lighting, control, maintenance
Environmental performance: measure: light levels, thermal comfort, indoor air quality, acoustics, air tightness, heat loss (thermal imaging)
Comparison (intended building use and design performance predictions against actual, benchmark against public datasets)
Reporting (clients, FM, users, project team, open dissemination to industry)
This competency potentially covers

**Understanding and context**

The five principles of inclusive design (Design Council CABE)
www.designcouncil.org.uk/what-we-do/inclusive-environments

1. Diversity and difference, placing people at the heart of the design process
2. Offer choice when a single design solution cannot accommodate all users
3. Provision of flexibility in use
4. Communities that offer plenty of services, facilities and open space
5. Buildings and environments that are convenient and enjoyable for everyone to use

Four principles of an inclusive environment for built environment professionals from the Construction Industry Council

1. Buildings, places and spaces that can be used easily, safely, and with dignity, by all of us, regardless of age, disability or gender
2. Provides choice, is convenient and avoids unnecessary effort, separation or segregation
3. Goes beyond meeting minimum standards or legislative requirements
4. Recognises that we all benefit from improved accessibility
Topic 7
Inclusive environments

Legislation, regulations and best practice: understanding of

The Equality Act 2010
Regulatory Reform (Fire Safety) Order 2005 (RRO)
Special Educational and Disability Act 2001 (SENDA)
The 9 protected characteristics listed in the Equality Act
The relevant building regulations
Approved Document M, K and B
Design standards and policy
Principal guidance standards
National Planning Policy Frameworks and SPG’s
Fire safety strategy and legislation

Various sector specific documents, as necessary, but not limited to:
  • Accessible Stadia and SGSA Supplementary Guidance
  • Health Building Notes
  • Happi
  • Inclusive Mobility

Planning and placemaking: understanding of (and see also Places, Planning and Communities topic)

Equality and inclusion in placemaking
Accessible pedestrian environments and routes
Planning and access
Consultation of user groups
Design reviews and appraisal
Community consultation and engagement and working with user groups
Support for planning, including access statements
Accessible neighbourhoods, homes for life, wheelchair and specialist
Creation of safe places in which to play, socialise and participate
Creation of green spaces in proximity to where people live
Equitable placemaking, shaped by and for the diverse communities they serve
Topic 7
Inclusive environments

London Legacy Development Corporation (LLDC) inclusive design strategy for the 2012 London Olympics
Planning neighbourhoods with facilities that allow a wide range of disabled and older people to live independently within a community
Social infrastructure that provide places for everyone to meet
Housing that caters to changing needs over a person's lifetime
Suitable homes for wheelchair users that allow people, their equipment and their families to live together as a part of the community
Providing larger and affordable homes that can help create mixed, sustainable neighbourhoods
Accessible pedestrian routes that are designed to minimise travel distances
Accessible public toilets with separate baby changing facilities allowing all users to participate fully in community life
Street furniture that is positioned to create a feeling of confidence and security to allow especially people who have dementia or Alzheimer's to move around confidently and independently
Designing out crime by creating public spaces that are overlooked and less isolated
External environments that ensure wayfinding for all


Buildings and places in use: understanding of:

Inclusive lighting design
Accessible information
Accessible bathrooms
Wayfinding and signage
Refurbishment of historic and listed buildings and access
Analysis of the building management policies against legislative requirements
Different buildings and their uses and users
Using plans and understanding building access
Special issues for fire, security and egress

Detail design

The use of colour and contrast and understanding Light Reflectance Values (LRV's)
Acoustics and sound enhancement
Fixtures, fittings and equipment
Doors and ironmongery, receptions and other fixed furniture
Relevant product specification
Lifts, sizing and suitability
Accessible bedrooms (hotels and student accommodation)
Changing places
Sanitary and changing facilities
Kitchens
Wayfinding, signage and communications

**Understanding all users, and the nine protected characteristics with particular reference to people with disabilities**

Designing for diverse community, age, gender, religion, race …
Designing for those with multiple or profound needs
Designing for an aging population
Designing for dementia
Cognitive accessibility
Designing for those with sensory impairments (people with hearing impairments and who are deaf and those with visual impairments or blind).
Designing for those with physical limitations, dexterity, ambulant disabilities and wheelchair users

**Access statements and strategies**

Understanding, writing and implementing access statements
Access statements and strategies and how to write them
Access auditing and the Equality Act
Access audits of existing schemes audit of existing premises
Design reviews of schemes
This competency potentially covers

**Background and context**

The theories and objectives of urban design and the core characteristics that create successful places

- The relationship between the forms of any development (layout, scale, mass, materials) and the characteristics that create successful places.
- The importance of designing for the location and context of each development scheme and the role this has in reinforcing and creating positive local identity and character.
- Understanding of the importance of design at different spatial scales and the influence each can have on users, neighbours, communities, sites, places, neighbourhoods, cities and rural areas and landscapes.
- That design is both a process and an outcome, and the importance of putting people, those who will be effected by development, at the heart of both.
- Understanding the structure of places, the spatial interweaving and interrelationship between buildings, what they are used for, movement opportunities and public space networks and patterns.
- Understanding the relationship between objectives set out in planning and other policies (such as public health, inclusion, carbon reduction or crime prevention) and how these can be met.

**The legal basis of planning and governmental policy**

Statutory instruments: Town and Country planning regulations
Acts of Parliament

- The Housing and Planning Act
- The Environmental Protection Act
- Infrastructure Act
- Localism Act
- Local Democracy, Economic Development and Construction Act
- General Permitted Development Order (GPDO)
- The London Plan

Assets of Community Value


National Planning Policy Guidance (NPPG)

S106 (Section 106) obligations
Community Infrastructure Levy
Building Control
Community Right to Build Order
Approved Documents
Fire safety strategy and legislation

Planning and placemaking processes

Understand scheme development, negotiation, consultation and approval processes (pre app, app, plan making, formal and informal engagement, committee decisions, use of conditions and legal agreements)

Understand the different people involved in such processes, their roles and how these overlap (councillors, planners, communities, non architect professionals)

Know how to make good, and responsible, use of graphical and other communication materials (such as CGI's plans, photomontages, concept drawings)

See the Project for Public Spaces online publication What is Placemaking
www.pps.org/reference/what_is_placemaking

What Makes A Great Place?

© Project for Public Spaces 2017 https://www.pps.org/reference/grplacefeat/
Changing demographics, ways of living and public health issues

Designing cities and places changing and ageing populations
Designing for dementia
Designing age-friendly environments (cross-generational)
Lifetime homes and lifetime neighbourhoods
Co and communal housing, pocket living and other emerging housing forms
The impact of the built environment on health and well being, obesity, mental health, access to healthy food and health services

Engagement with clients and communities

The needs and aspirations of communities, and space and building users
Engaging with and understanding different stakeholders and their needs
Working with neighbourhood forums and parish councils
Community consultation and co design
Creating neighbourhood plans
  - How neighbourhood planning works and how to work with neighbourhood planning forums and develop neighbourhood plans space and building users
  - Community co design

Fairness, regeneration and community development

Understanding briefing, engagement, empowerment, cohesion and leadership and their impact on creating successful communities
The ethics of building and regeneration
The effects of regeneration on communities
Equitable and inclusive approaches to placemaking and cities
Stakeholders and their differing interests, including the agencies involved
Promoting urban social integration
Understanding place and poverty factors
Rural planning issues

Understanding of
The changing nature of rural areas, including the main agencies involved
Reconciling competing views of what the countryside is
Approaches to rural housing provision, including the exceptions policy
Approaches to rural settlement planning
Service provision and maintaining the local community
Planning for rural transport, and approaches to recreational transport
Conflicts between agriculture and the environment
Policies for forests, woodlands, water provision and management

The authors were inspired by the work of the Action with Communities in Rural England, The Citizens Institute on Rural Design, and UWE Bristol.

Environmental issues

Growth management (and managed change and decline)
• Regeneration and community development
• Resilient environments – places and buildings
• Environmental performance – places and buildings
• Protecting and enhancing valued landscapes
• Minimise impact on and enhance biodiversity
Topic 8
Places, planning and communities

Daylight, sunlight, wind effects on microclimates
- Dwelling indoor daylight
- Sunlight for dwellings
- Sunlight for outdoor spaces
- Light pollution
- Wind effects around tall buildings
- Street pollution flushing

Issues relating to climate change
- Energy targets and parts L and P of the Building Regulations
- Renewable energy generation
- Energy efficiency in buildings
- Embodied energy
- Dwelling over-heating
- Avoiding urban heat islands: very low energy buildings, electric vehicles, urban vegetation, avoiding continuous street canyons, use of vegetation canopies
- Flooding and flood prevention measures: sustainable urban drainage systems (SuDS), public-realm planting, streets trees, permeable surfaces
- Climate change minimization, adaptation and mitigation – including green and blue infrastructure
- Water management

Development and conservation

“Heritage Assets” – designated and undesignated – and the principle of assessed harm to them.

NPPF and PPG and positive strategies for the conservation and enjoyment of the historic environment.

Issues to manage and consider
- Significance, and handling significance
- Establishing an evidence base
- Identifying non-designated heritage assets
- Impact and harm
- Enabling development
• Setting
• Heritage statements
• Heritage at risk
• Conservation advice

Public spaces

The distinction between public space and publicly accessible private space
The difference between formal and informal spaces
Forms of regulation for public spaces

• Planning controls to sanction new public space proposals
• Highway orders, focusing on changes to the highways themselves
• Listed building consents
• Street trading licensing

Creating diverse, safe and inclusive public spaces
Designing for long-term maintenance
Designing public spaces that are

• Delineated: clearly public or clearly private
• Have designed in actives uses where appropriate
• Incorporated amenities and features
• Encouraging for social engagement
• Balanced between traffic and pedestrians
• Comfortable, safe and relaxing
• Robust, adaptable and distinct

Small scale development

Assessing small schemes
Local design guidance on residential or small scale development
Management of issues such as

• Siting
• Context and character
• Massing and building height
• Facades and windows
• Sunlight, daylight, privacy and outlook
• Outdoor space and access
• Recycling, rubbish and services
• Safety and security
• Car and cycle parking

**Housing**

Delivering a wide choice of high-quality homes for different users, for current and future needs
Self-build and custom build housing
Volume housing/large scale development and offsite construction
Understanding the allowance for windfall sites
Housing White Paper
Lifetime Homes and Lifetime Neighbourhoods
Viability and affordable housing --- including coverage of the different types of affordable housing which have differing affects on viability
Right to Buy

**Layout, density and typology**

Density and methods of measuring, presenting and using density data
The density performance of differing typologies
Public transport, accessibility, supporting walking, cycling and public transport, and reducing the need to own and use cars.
Parking – amounts and handling
Smart cities, planning, data and IOT
Design Review – purposes, practices etc. What to expect as someone who sits on a panel; and what to expect as someone presenting.
Mixed use building and neighbourhood solutions
Tall buildings

Height and planning policies
Suitable locations for tall buildings
The role of tall buildings in an area
Accommodating floor space
The parts of a tall building and their various zones of impact (base for surrounding streets, middle for the neighbourhood, top for the skyline)
Fire safety and relevant Building Regulations
Fire management strategies
Negotiating tall building proposals
Assessing a scheme

- Availability of execution
- Wind and microclimate
- Sun, sky, and shadow
- Visual impact
- Function and impact

a. Local transport
b. Amenities
c. Geographical access
d. Flow of people
e. Deliveries and maintenance

Landscape design

Principles of landscape design
Different elements of landscape from structural to individual plants or pieces of furniture
Understanding potential use of space and how this can be accommodated and managed
Using landscape to support and complement the use of buildings

- Well-maintained spaces
- Designs consider the long term
- Designs support the proposed use of the space
• Designs allow for different uses to co-exist
• Elements have more than one function
• Desire lines have shaped the design
• Aspect and topography have been taken into account
• The scheme supports biodiversity
• Leftover space is managed carefully

Elements to consider
• Structural planting
• Pathways
• Drainage
• Boundary treatments
• Water features
• Seating
• Lighting
• Art and culture
• Plants, trees, wildlife-friendly planting and biodiversity

Streets
Understand the modal hierarchy set by government and applicable to street design and management: pedestrian, cyclists, public transport user, private vehicle user

Streets that are designed to be
• Accommodating and balancing a locally appropriate mix of movement and place-based activities
• Functional and accessible for all
• Safe and attractive public spaces
• Reflective of urban design qualities as well as traffic management considerations

Understanding how decisions about streets are made

Understanding important design considerations
• Function of the street
• Degree of separation
• Reflecting character
• High quality materials and workmanship
• Avoiding over-elaboration
• Thinking of local needs
• Clean, simple and straightforward
• Designed for what they need to do

Understanding the language of streets
• User hierarchy
• Highways
• Carriageways
• Pavements
• Junctions
• Sightlines and radiuses
• Traffic calming
• Segregation, separation and shared space
• Level surfaces
• Tactile paving

Masterplanning: understanding of:

Differences between strategic (cities, regions) or project based (specific sites with definable boundaries) masterplans

Preparing for the masterplanning process
Defining who the client is and work the client has done to support the masterplan
Assembling the client team
Key drivers that have brought about the masterplan (economic, or social regeneration, environmental improvements, rebranding)
Other relevant issues (social context, environmental context, infrastructure and services, energy sources, connectivity, future needs)
The physical changes required

Managing the design process
Defining and preparing the project brief
Generating and testing detailed options
Adopting of approving a master plan
Preparing the design brief
Designing the final masterplan
Managing implementation
Implementing the masterplan and managing that implementation
Developing mechanisms to deliver quality
Preparing a design code

Safer places

The attributes of safer places and Secured by Design Principles (with thanks to Secured by Design and Police Crime Prevention Initiatives)

Access and movement: places with well-defined routes, spaces and entrances that provide for convenient movement without compromising security

Structure: places that are structured so that different uses do not cause conflict

Surveillance: places where all publicly accessible spaces are overlooked

Ownership: places that promote a sense of ownership, respect, territorial responsibility and community

Physical protection: places that include necessary, well-designed security features

Activity: places where the level of human activity is appropriate to the location and creates a reduced risk of crime and a sense of safety at all times

Management and maintenance: places that are designed with management and maintenance in mind, to discourage crime in the present and the future

The authors are indebted to invaluable advice provided by Urban Design London, and The Design Companion for Planning and Placemaking (RIBA Publishing, 2017, Principal Author Esther Kurland, Urban Design London; Editor Rob Cowan, Urban Design Skills) www.ribabookshops.com/item/the-design-companion-for-planning-and-placemaking/89458/
Please note that some of these topics are more relevant to accredited conservation professionals and crafts people.

This competency potentially covers

**Background and context: understanding of**

- Historic Assets (buildings, areas, monuments, gardens and parks, whether designated yet or not) and their settings
- Designations
- National and international organisations and charters
- International Council on Monuments and Sites (ICOMOS) guidelines
- Understanding common conservation terms
- The repair, alteration/extension, refurbishment and management of historic assets

**Legislation and published governmental and other guidance**

- Planning (Listed Buildings and Conservation Areas) Act 1990
- BS7913: 2013
- NPPF and government policy
- Assets of Community Value
- Special considerations in the application of approved documents (including Building Regulations)
- The Equality Act
- Fire safety strategy and legislation
- Statutory consents, requirements and processes
- Enabling Development and the Conservation of Heritage Assets
- UNESCO conventions and recommendations

**Significance: understanding of**

- Historical significance
- Social, cultural and emotional significance
- Architectural and aesthetic significance

How to determine significance based on evidence and plan for conservation
- Researching the historic development of a building and its setting using archival sources
- New designs in designated and historic contexts
Making judgments and collaboration: ability to

Make balanced judgements based on shared ethical principles,
Accept responsibility for the long-term welfare of cultural heritage;
Recognise when advice must be sought by different specialists
Give expert advice on maintenance strategies, management policies and the policy framework for environmental protection and preservation
Document works executed and make same accessible
Work in multi-disciplinary groups using sound methods
Work with inhabitants, administrators and planners to resolve conflicts and to develop conservation strategies appropriate to local needs, abilities and resources

Reading and understanding a monument: ability to

Read a monument, ensemble or site
Identify its emotional, cultural and use significance
Understand the history and technology in order to define their identity, plan for their conservation
Interpret the results of this research
Understand the setting in relation to other buildings, gardens or landscapes
Find and absorb all available sources of relevant information

International and historic context: understanding of

Antiquity
C18 Grand Tour
C19 restoration and the search for antiquity
Early C20 legislation
C20 architecture
Post war developments

Surveys and investigations: understanding of

Site surveys
Destructive and non-destructive analysis
Recording, documentation and communication
Reading the building
Topic 9
Building conservation and heritage

Determining and understanding defects and causes of decay
Understanding defects and behaviours of various materials
Approaches to repair and conservation techniques
Lime mortar
Cleaning historic buildings

Materials: understanding of
Traditional and modern
The conservation of stonework, brickwork, timber and concrete
Thermal upgrade of listed buildings, buildings in conservation areas, and of buildings of traditional construction
The use of the right insulation
The correct window upgrades
Breathability of fabric

Conservation strategy: understanding of
Grants, funds and funding organisations
Climate change and special considerations applicable to the historic environment
Implementation and management of conservation works
Procurement and contract administration
Being accredited as a recognised conservation architect
This topic potentially covers any of the following competencies

**Legislative framework**

Building Regulations and Approved Documents  
British Standards  
Party Wall Act  
Fire safety strategy and legislation  
(see also relevant legislation in the other topics)

**RIBA Plan of Work**

Knowledge of the RIBA Plan of Work stages  
Knowledge of the sustainability checkpoints in each stage  
Familiarity with the suggested key support tasks  
Learning to adapt stages 0 and 7 to use on briefing and evaluation  
Ability to adapt the plan, and manipulate the task bars, to your own use  
Knowledge of specific touchpoints and aspects: health and safety, sustainability, information exchanges, design management, project leadership, contract administration, town planning, conservation

**Techniques for developing a design brief**

Knowledge of evidence-based design and briefing  
Understanding of client leadership and collaboration  
Listening to the client  
Advising clients in terms of appropriate and effective means of procurement and forms of contract which will enable greater efficiency, including the increasing use of pre-manufactured elements, and improved outcomes in terms of time, cost and quality.  
Establish change management procedures.  
Minimising change and the cost, disruption and potential waste it represents.
Topic 10
Design, construction and technology

Sector-specific building uses and types

Knowledge of client needs and sectors and design for
- Housing – volume
- Housing – individual
- Retail
- Leisure
- Hotels
- Sports
- Commercial
- Offices
- Educational
- Religious
- Industrial

Structures and services: understanding of

Using relevant specialist consultants
Integration and coordination of teams into the design and project
Systems for environmental comfort within the relevant precepts of sustainable design
Strategies for building services and the integration within a design project
Optimum physical, thermal and acoustic environments

Specification and materials: understanding of

Technical innovations in materials
Working with suppliers and manufacturers
Specification writing and selecting materials and products
Production information
Alternative structural, construction and material systems
Ethical supply chains and products
Production information.
Design proposals and detailing complete and fully co-ordinated before construction commences to avoid delays, disruption and change resulting in waste and additional cost
Classification systems: Uniclass and CiSFB
Alternative structural, construction and material systems
Understanding waste in all its forms, physical, time, intellect, and seek to minimise
This is not just digitalisation as an end in itself but a means to improve the construction process and productivity. Consider how digitisation can improve the information for construction, a means to collaborate with others contributing to the design and correctly integrate their work (including pre-manufactured elements), to avoid errors, potential site delays and costs and to visualise work so that its assembly can be fully understood and planned, including construction logistics, enable the application of lean thinking and through building visualisation enable the client to be fully engaged with project development to minimise or eliminate later, disruptive change. Roger Burton, nvirohaus

Knowledge of the changes and drivers to architecture and construction with digital technology, and resulting improvements, such as

**Data driven and digital design**
- 3D modelling
- 3D and 4D printing
- Advanced robotics
- Parametric design
- The internet of things (in design and in buildings and cities)
- Smart cities, planning and architecture
- Smart buildings
- Using, leveraging and understanding big data
- Artificial reality, enhanced reality and virtual reality for presentation (and improvements in client engagement and briefing), for information exchange on projects and for training (e.g., health and safety)
- CAD, modelling and mapping
- Wireless technology
- User feedback loops
- Familiarity with presentation platforms and technologies
Building Information Modelling (BIM)

Building Information Modelling (BIM) is the management of information through the whole life cycle of a built asset, from initial design all the way through to construction, maintaining and finally de-commissioning, through the use of digital modelling. BIM is all about collaboration – between engineers, owners, architects and contractors in a three dimensional virtual construction environment (common data environment), and it shares information across these disciplines.

Building Information Modelling allows design and construction teams to communicate about design and coordinate information across different levels that has been unseen before. This information remains with the project, from before beginning construction, right throughout its lifetime. It also helps to analyse any potential impacts. David Miller, David Miller Architects

Understanding your BIM maturity amongst the four levels thereof
Understanding the context and requirements of BIM Level 2
Speaking “BIM” by understanding the terms and acronyms
The detailed foundations of BIM Level 2:
  • Employers Information Requirements (IERs)
  • BIM Execution Plan (BEP)
  • Project Information Model (PIM)
BIM Level 2 standards, with particular reference to
Understanding the role of the information manager
Understanding BIM as a management and collaboration tool
Understanding the benefits of BIM, to your business and clients
Developing your BIM strategy and implementation
Using common data environments and applying the Standards:
  • BS 1192:2007 +A2:2016
  • PAS 1192-2:2013
  • PAS 1192-3: 2014
  • PAS 1192-4: 2014
  • CIC BIM Protocol
Understanding Design Responsibility and the Digital Plan of Work (NBS BIM Toolkit)
Understanding BIM security issues – PAS 1192-5: 2015
Understanding intellectual property/liability in the BIM context
Applying (Government) Soft Landings and briefing for FM (BS 8536-1: 2015)
Offsite construction and modern methods of construction: understanding of

The use of pre-manufactured elements with a view to improving cost, time and quality parameters and gaining improvements in productivity

Design for manufacture and assembly (DfMA) and RIBA POW DfMA overlay

Developing your DfMA strategy, and with particular reference to Stage 2 of RIBA PoW
The benefits of modern methods of construction and pre-manufactured elements

- Time: shorter time onsite, predictable completion dates, levels of productivity
- Improving information flow and sharing
- Cost certainty and reduction and reduced risk
- Better construction quality
- Choosing more efficient components and systems
- Improving health and safety
- Better environmental outcomes and performance and waste reduction
- Site improvements: improved safety, reduced noise and dust, less storage space, fewer deliveries

Use of the Periodic Table of BIM is governed by the terms and conditions and license at theNBS.com

Find support on your BIM journey at theNBS.com/BIM

Thanks to: BIM Task Group, Mark Bew and Mervyn Richards. © BIM Task Group
The stages of construction industrialisation

- Design for manufacture and assembly
- Offsite manufacture
- Logistics
- Onsite assembly
- Design for maintenance

The levels of building off site

- Level 1: Component sub assembly
- Level 2: Non-volumetric preassembly
- Level 3: Volumetric preassembly
- Level 4: Complete buildings
  - Flat pack
  - Hybrids or semi-volumetric

### Level 1: Component sub assembly
Covers approaches that fall short of being classified as offsite systems. Typically, the term refers to simplified components like stairs, doors and windows which are manufactured in factories.

### Level 2: Non-volumetric preassembly
Either classified as ‘open’ or ‘closed’ with open panels normally being non-insulated and closed panels being insulated. Enhanced panels are also referred to and these panelised systems have been enhanced beyond the closed state to include windows and doors, services (electrical or plumbing) or other finishes such as external cladding or internal lining.

### Level 3: Volumetric preassembly
Volumetric is the term used to describe units prefabricated in a factory that enclose usable space that are typically fully finished internally, such as toilet/bathroom pods and plant rooms which are then installed within or onto a building or structure.

### Level 4: Modular buildings
As volumetric but where the completed usable space forms part of the completed building or structure finished internally (lined) and externally (clad).

### Flat pack
Prefabricated elements or systems that are transported to site as 2D elements, rather than modular units.

### Hybrids or semi-volumetric
A combination of more than one discrete system or approach and normally a combination of both volumetric and panelised systems.
Topic 10
Design, construction and technology

Manufacturing processes
- Offsite supply chain
- Right first time / Quality
- Lean thinking
- Continuous improvement process
- Mass customisation
- Timber hybrid structures
- 3D printing
- Open source architecture

Construction logistics
- Just in time delivery
- Consolidated logistics
- Flying factories
- Kit of parts
- Materials handling design
- Integration with design and development stage

Onsite processes
- Impact on programme, quality, safety, waste, environmental sustainability
- Lean construction
- Timber frame
- Light steel frame
- Precast concrete
- Hybrid systems
- Multi-skilled operatives

Design for maintenance and for whole life
- Intelligent and Smart (monitored and controllable) components
- Building performance monitoring
- Post occupancy evaluations
- Predictive maintenance
- Condition based monitoring
- Mean time to repair
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Peter Kent
Esther Kurland (and Urban Design London)
Nitesh Magdani
Nicola Mathers
Eleni Makri
Anne Markey
Frank McCloskey
Walter Menteth
David Miller
Peter Oborn
Nigel Ostime
Lucy Pedler (and the Green Register)
Robert Prewett
Lisa Raynes
Ruth Reed PPRIBA
Jane Rendall (and the Bartlett School of Architecture)
David Roberts (and the Bartlett School of Architecture)
Craig Robertson
Flora Samuel
Rosslyn Stewart (and the Royal Town Planning Institute)
Simon Sturgis
Elaine Toogood
Chris Williamson
Jane Simpson

RIBA, RIBA Enterprises and NBS staff

Alex Bulford
Sarah Burgess
Lucy Carmichael
Ian Chapman
Robin Cordy
Anne Cosentino
Steven Cross
Gemma Dart
Adrian Dobson
Rob Earl
Andrew Forth
Gesine Kippenberg
Donata Lawrence-Grossman
Emilia Plotka
Carys Rowlands
Linda Stevens
Alex Tait
Mark Winterburn

Other organisations

The NBS
RIBA Bookshop
Design Council CABE
Construction Industry Council
Project for Public Spaces
Town and Country Planning Association
ACRE (Action With Communities in Rural England)
Buildoffsite
Supply Chain School
The Royal Town Planning Institute
Urban Design London
Secured by Design
Police Crime Prevention Initiatives
Green Register
Links to other organisations

Architecture for Social Purpose
ASF-UK  www.asf-uk.org
UN Global Compact  www.un.org/Depts/uni/GLC
Fluid Diversity Mentoring Programme  https://fluidmentoring.org
The Joseph Rowntree Foundation  www.jrf.org.uk

Health, Safety and Wellbeing
HSE, CDM Legislation and legal guidance  www.hse.gov.uk/Construction
International Institute of Risk and Safety Management (IIRSM), risk management advice, training and updates  www.iirsm.org
Association for Project Safety (APS)  www.aps.org.uk
CIC, Health and Safety Committee reports and papers  http://cic.org.uk/networks-and-committees/
Health-safety-panel.php
Construction Industry Advisory Committee (CONIAC) Industrywide H&S Committee guidance and papers  www.hse.gov.uk/aboutus/meetings/iacs/coniac/index.htm
Designers Initiative on Health and Safety (DIOHAS) Architectural practice events and guidance on CDM & H&S  www.diohas.org.uk
Design Best Practice (DBP) CDM Case Studies  www.dbp.org.uk
CITB, Industry CDM Guidance  www.citb.co.uk/health-safety-and-other-topics
WELL Certified  www.wellcertified.com

Business, Clients and Services
ACAS  www.acas.org.uk
CIPD (Chartered Institute of Personnel and Development)  www.cipd.co.uk
APM (Association for Project Management)  www.apm.org.uk
Confederation of British Industry (CBI)  www.cbi.org.uk
Business in the Community (BiTC)  www.bitc.org.uk/
Institute of Directors (IoD)  www.iod.com/
Chambers of Commerce  www.britishchambers.org.uk/
Federation of Small Businesses  www.fsb.org.uk/
The Freelancer and Contractor Services Association  www.fcsa.org.uk
The Creative Industries Federation  www.creativeindustriesfederation.com
Barclays Digital Wings  https://digital.wings.uk.barclays/
Enterprise Nation  www.enterprisenation.com

Procurement and Contracts
Joint Contracts Tribunal (JCT)  www.jct.org.uk
OJEU  www.ojeu.com

Sustainable Architecture
Forest Stewardship Council  www.fsc-uk.org/en-uk
WWF  www.wwf.org.uk
Green Register  www.greenregister.org.uk
BedZed  www.bioregional.com/bedzed
American Institute of Architects sustainable architecture resources  www.aia.org/topics/41-energy
UK Green Building Council (UK-GBC)  www.ukgbc.org
Business Green  www.businessgreen.com
The Woodland Trust  www.woodlandtrust.org.uk
Bat Conservation Trust  www.bats.org.uk
And other organisations listed here  www.sustainabilityexchange.ac.uk/organisations
Links to other organisations

LEED https://new.usgbc.org
BREEAM www.breeam.com
Carbon Buzz www.carbonbuzz.org

Inclusive Environments
RNIB www.rnib.org.uk/rnib-business
Design Council CABE www.designcouncil.org.uk/what-we-do/inclusive-environments
Centre for Accessible Environments http://cae.org.uk
National Register of Access Consultants (NRAC) www.nrac.org.uk
Access Association www.accessassociation.co.uk
Sport England www.sportengland.org/facilities-planning/design-and-cost-guidance/accessible-facilities
Disabled Persons Transport Advisory Committee (DPTAC) www.gov.uk/government/organisations/disabled-persons-transport-advisory-committee
Habitat www.habitat.org.uk
The Thomas Pocklington Trust www.pocklington-trust.org.uk
Action for Hearing Loss www.actiononhearingloss.org.uk
The National Autistic Society www.autism.org.uk/about/what-is/asd.aspx

Places, Planning and Communities
Royal Town Planning Institute (RTPI) www.rtpi.org.uk
Town and Country Planning Association (TCPA) www.tcpa.org.uk
Action with Communities in Rural England (ACRE) www.acre.org.uk
Urban Design London (UDL) www.urbandesignlondon.com
Project for Public Spaces (PPS) www.pps.org
Urban Design Skills www.urbandesignskills.com
Campaign for the Protection of Rural England (CPRE) www.cpre.org.uk
Planning Aid Direct https://planningaid.zendesk.com/hc/en-us
Landscape Institute www.landscapeinstitute.org
Citizens Institute on Rural Design http://rural-design.org

Building conservation and heritage
International Council on Monuments and Sites (ICOMOS) www.icomos.org/en
Society for the Protection of Ancient Buildings (SPAB) www.spab.org.uk
Institute of Conservation https://icon.org.uk
Council on Training in Architectural Conservation (COTAC) www.cotac.org.uk
Understanding Conservation www.understandingconservation.org
The Institute of Historic Building Conservation (IHBC) www.ihbc.org.uk
Ecclesiastical Architects’ and Surveyors’ Association (EASA) www.easenet.co.uk
Sustainable Traditional Buildings Alliance http://stbauk.org
Historic England: www.historicengland.org.uk
Heritage Lottery Fund: www.hlf.org.uk
Church Buildings Council www.churchcare.co.uk/churches/church-buildings-council
Victorian Society www.victoriansociety.org.uk
Georgian Group https://georgiangroup.org.uk
20th Century Society https://c20society.org.uk
Canal and River Trust https://canalrivertrust.org.uk
Links to other organisations

Design, Construction and Technology

**Background**
- NBS www.thenbs.com
- RIBAJ www.ribaj.com

**Design for Manufacture and Assembly (DfMA) and offsite construction**
- Supply Chain School www.supplychainschool.co.uk/uk/default-home-main.aspx
- Build Offsite www.buildoffsite.com

**BIM**
- UK BIM Alliance www.ukbimalliance.org
- BIM Task Group www.bimtaskgroup.org
- NBS BIM knowledge resources https://www.thenbs.com/knowledge/bim-building-information-modelling

**Other professional bodies**
- Chartered Institute of Building Services Engineers (CIBSE) www.cibse.org
- The Chartered Institute of Architectural Technologists (CIAT) www.ciat.org.uk
- British Standards Institute (BSI) www.bsigroup.com
- Institution of Civil Engineers (ICE) www.ice.org.uk
- Institution of Structural Engineers (IstructE) www.istructe.org
- Royal Institution of Chartered Surveyors (RICS) www.rics.org
- Constructing Excellence http://constructingexcellence.org.uk
- British Institute of Interior Design www.biid.org.uk

**Innovation and digital**
- NESTA www.nesta.org.uk
- Digital Catapult https://digital.catapult.org.uk
- Dezeen resources on digital design www.dezeen.com/tag/digital-design

**Research**
- Construction Industry Research and Information Association (CIRIA) www.ciria.org
- Building Services Research and Information Association (BSRIA) www.bsria.co.uk
- Designing Buildings Wiki www.designingbuildings.co.uk/wiki/Home
- Building Research Establishment (BRE) www.bre.co.uk