

Mentor Handbook - Technician Membership

Contents

- 04 Introduction
- 05 Guidance to mentors
- 10 Core Objectives for Technician Membership: Guidance Notes
- 16 Portfolio Guidance and Check List
- 19 CPD and Activity Record
- 22 Examples of IPD Final Report Forms
- 29 Relevant forms to be completed by the candidate
- 33 Mentor experience record

Introduction

The Institution

The Institution of Structural Engineers is the preeminent global professional body for structural engineering and is recognised internationally for the high technical and professional competence of its members. The vision of the Institution is *'working together to promote world-class standards of safety, efficiency and excellence in structural engineering'*.

The Institution sets and maintains standards for professional structural engineers and implements these through a qualifying Professional Review (incorporating an interview and written examination), Code of Conduct and a policy for Continuing Professional Development (CPD). The interview and examination is internationally available and is taken in a number of centres throughout the world.

Members of the Institution have a high degree of professional knowledge and expertise in structural engineering. They display judgement in making the best use of resources in the interests of public health and safety and in the care of the environment. Technician Members are entitled to use the designatory letters 'TStructE'. They may also be registered as Engineering Technicians (EngTech) with Engineering Council.

Becoming an Engineering Technician

Becoming an Engineering Technician is a great achievement and a recognition of professional experience and competence as a structural engineer. This builds on a candidate's education qualifications and is recognised by their peers, clients and other industry professionals. Through the Institution, Technicians have access to a lifetime of professional development opportunities and an international network of professional engineers.

Technician Members of the Institution will be able to demonstrate:

- a sound understanding of core structural engineering principles
- An awareness of relevant existing technology, coupled with the ability to locate and use new research and development to benefit their work and structural engineering generally
- use of structural engineering knowledge and understanding to apply technical and practical skills.
- an ability to contribute to the construction design process
- the capability to function as a reliable member of a team involved in solving complex structural engineering problems.
- commitment to the public interest in all aspects of their work, including health, safety, risk, financial, commercial, legal, environmental, social, energy conservation and sustainability
- effective communication and interpersonal skills
- knowledge of the statutory and other regulations affecting current practice in structural engineering
- a significant base of information technology skills
- commitment to the profession of structural engineering, particularly with regard to the Institution's Code of Conduct and the requirement for Continuing Professional Development

There are three stages in becoming a Technician Member of the Institution:

- 1 Achievement of the required educational base
- 2 A period of responsible work experience initially under guidance and supervision, known as Initial Professional Development (IPD)
- 3 Success in the Institution's Professional Review (PR)

Note: Completion of the educational base and IPD can run concurrently but both must be completed before applying.

Many of the activities undertaken during an individual's period of IPD can be considered as appropriate CPD and one of the requirements of IPD is that candidates show evidence of CPD and a commitment to future professional development. Technician Members must gain at least 90 hours CPD over three years.

Guidance to mentors

Mentoring

Mentoring is a process that occurs when two individuals enter into an agreement to spend time sharing questions, insights, knowledge, ideas, and experiences, for the development of the mentee (and in many instances, also the mentor). A mentor will normally be an experienced engineer in a position to provide guidance, advice and training to candidates in the workplace.

A mentor should preferably be a member of The Institution of Structural Engineers (Technician Member, Associate-Member, Chartered Member or Fellow) or an individual of equivalent standing.

Benefits of mentoring in the workplace

To graduates:

- a chance to test ideas and strategies
- insight into the organisation's goals, structure and values
- assistance in defining personal career and other developmental objectives
- someone to talk to outside of the day-to-day work environment
- transfer of knowledge, skills and/or expertise
- personal growth and reflection
- guidance and assistance through the application process for Chartered Membership

To mentors:

- enhanced communication and coaching skills
- professional development opportunity (CPD)
- contribution to ongoing development of less experienced employees

To the Institution:

- focussing candidates to work towards the Technician Membership Professional Review
- increased awareness of the Institution within the workplace
- helps provide a more enhanced support system outside HQ

Guidance

Please note that these guidance notes should be read in conjunction with the Institution's full IPD regulations for progression to Technician Membership which may be found on the Institution's website.

The mentor has a very important and crucial job to perform. It is vital that the candidate is genuinely in a position to pass the Professional Review Interview when they apply. The reviewers at the interview will rely to a certain degree on the mentor's integrity and judgement in ensuring that only appropriately prepared candidates apply for the review. The Institution would not wish candidates to make a submission if they have insufficient experience.

The route to Technician Membership

As a mentor you will be required to assist and guide candidates in satisfying their Initial Professional Development requirements in preparation for the Professional Review Interview.

Initial Professional Development (IPD)

The Institution defines IPD as follows:

'IPD comprises the acquisition and development of the specialist knowledge and skills, and their practical application that are needed to practise as a structural engineer.'

IPD is basically the period of time between satisfying the academic requirements of the Institution and being in a position to demonstrate compliance with the Institution's training requirements.

However, you should be aware that the IPD regulations do state under section 3.3 that 'all relevant experience may be taken into account, including pre-graduate experience from "sandwich", part-time or vacation work.' You may therefore be approached by candidates who have yet to satisfy the minimum academic requirement.

There are three routes candidates can follow through the IPD regulations:

Individually Managed IPD: Candidates who are responsible for managing their own training with the assistance of a personal mentor.	Accredited Training Scheme: Candidates who are following an accredited training agreement with their ICE, KKIE.	Retrospectively Collated IPD: Candidates who have no formal training records and as such a mentor will normally not have been involved in this route.
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For full descriptions of the routes please refer to the IPD regulations.

As a mentor you will only be required to be involved in assisting candidates progressing through the Individually Managed IPD route; however you may choose to act as a mentor to any candidate regardless of the route they are applying through.

All relevant experience may be taken into account, including pre-graduate experience from 'sandwich', part-time or vacation work. However, the amount of pre-graduate experience which may be included will depend on the quality of the experience gained by the individual and its relevance to the Core Objectives.

A key element of a managed training programme is the production of regular reports which, by recording the activities undertaken and the lessons learned in relation to the objectives, not only act as a first source for future reference, but also demonstrate your progress towards and achievement of the Core Objectives. Even if you are not following either an accredited training scheme, recognised by the Institution as satisfying its Core Objectives, or an individually managed programme we recommend completing the IPD quarterly report forms every three to four months as an aide memoire towards finalising the IPD final report forms and compiling a portfolio of work.

These 12 Core Objectives are covered in full in the Institution's IPD regulations. It is important to note that whilst the new IPD system is no longer time based, it would only be in exceptional circumstances that a candidate would be able to satisfy the Core Objectives with less than four years professional working experience.

Progression through the Individually Managed IPD route and the mentor's role and responsibilities

Candidates following the Individually Managed IPD route take responsibility for their own professional development. Such candidates should approach a mentor or mentors who will be able to guide them through the Institution's 12 core objectives. It is important to recognise that a candidate may have a number of mentors if they so wish – some mentors may have the relevant experience in analysis and design, whilst another mentor may have detailed knowledge of law or health and safety.

You must keep records of your training and experience to indicate your progressive achievements against the Core Objectives. The Institution has IPD quarterly report forms and progress summary records for this purpose.

You should keep these updated on a quarterly basis. To aid in this the Institution recommends the use of a personal development diary which you should update on a weekly basis. This diary should be used to include all IPD related activities making it easier to complete your quarterly reports as you will have week by week guide to refer to. It is important that you have regular meetings with your personal mentor to review your progress in meeting the Core Objectives and agree your action plan.

You should also maintain your own record of continuing professional development (CPD). Further information on CPD can be viewed in section

You should keep a professional development action plan of your training objectives for subsequent periods of your training.

Mentors should meet with the candidate on a regular basis (at least every three months) and complete the IPD Quarterly Report Form and Progress Summary Record.

IPD Quarterly Report Form

The IPD Quarterly Report Form is split into five sections. The first three sections cover the three groups of Core Objectives: personal, engineering, management and commercial. In each of these three sections the candidate will be required to list training or experience they have received in the preceding two or three months which contribute to specific Core Objectives. For example, if the candidate attended a branch meeting of the Institution this would contribute to Core Objective 1.1 and consequently the candidate would note this down on the IPD Quarterly Report Form.

The IPD Quarterly Report Form is designed to simply list very brief details of the activities undertaken. If the candidate wishes to add further information they may use additional sheets, providing each sheet is signed by both the candidate and mentor. Alternatively, the candidate may prefer to write a report expanding on each of the bullet points and this report may be attached to the IPD Quarterly Report Form. Although the Institution does not wish candidates to write lengthy reports, it is advisable for the candidate to keep detailed records of their training and experience. These detailed records will help the candidate complete the IPD Final Report Forms, perhaps three or four years later.

The fourth section of the form is the candidate's Development Action Plan where they should list activities they plan to undertake in the next two/three month period to satisfy other objectives.

The mentor should complete the fifth section of the form, and both the candidate and the mentor should sign the form and each additional page.

Progress Summary Record

The Progress Summary Record shows the candidate's logical progression through the Core Objectives. At a glance the mentor and the candidate can see where work needs to be done, and at the Professional Review Interview the reviewers can see how the candidate has progressed through each objective.

For example, for Core Objective 2.2 Analysis and Design a candidate should have an appreciation (standard A) of this upon graduation from university. However, after a short period (three to six months) within a company the graduate may have increased their knowledge of design and analysis (standard K).

Therefore, in filling in the forms, the candidate should simply note the date of the meetings with their mentor and the level of attainment reached at that date.

The required level of attainment that will satisfy the Core Objectives

There are four different standards that apply to the Core Objectives:

- A A general appreciation of the subject is required, as well as an understanding of how the subject may affect, or integrate with other subjects.
- K A knowledge and understanding of the subject and its application is required.
- E Sufficient experience is required to enable the subject to be performed independently or under supervision.
- B An ability to perform the subject without supervision and be competent to advise others.

It is important to note that candidates are not required to be experts in all of the objectives; they are simply required to satisfy the minimum standard as specified in the objective. As far as attainment levels are concerned, the guidance notes under each Core Objective highlight some of the ways in which candidates may satisfy the objective. However, the guidance notes are, as the name suggests, simply guidance notes! The notes are not intended to be either comprehensive or exhaustive.

Other activities may also contribute to a specific objective and may be recorded.

However, whilst the notes are designed to guide candidates and should not be used as a tick box exercise, it should be noted that if candidates have not undertaken a number of activities specified in the notes they may find it difficult to demonstrate that they have met the minimum requirement of the objective.

The candidate who has satisfied all 12 Core Objectives

Once the candidate and, more importantly, the mentor is satisfied that all the Core Objectives have been completed, the candidate should consider applying for the Professional Review. Immediately before applying for the review the candidate should complete the IPD Final Report Form for each of the 12 Core Objectives. Again, additional sheets may be used provided they are signed by the candidate and mentor.

The IPD Final Report Forms are the candidate's statement summarising how all of their experience and training has enabled them to satisfy the requirements of the objective.

Candidates are strongly advised to read the objective and include appropriate and relevant statements. For example, under core objective 1.1 (Institution), candidates are required to have knowledge of the Institution and involvement in Institution affairs. Candidates should not write a two-page report on the history and development of the Institution. Reviewers do not want to read that the Institution was formed in 1908 or that it gained its Royal Charter in 1934. The reviewers want to know how the candidate gained the knowledge and what activities they have been involved in.

We have produced example IPD Final Report Forms to assist candidates and these are available on page 22.

We are conscious of the fact that the experiences of engineers can differ significantly across the world and we want the IPD forms/portfolio to reflect the individual experiences of these applicants, and we do not wish to prescribe a particular way of completing them as being 'correct'.

However, the general advice we would give to candidates is:

- 1 Personal: the reviewers will not be interested in what the candidate's company does, they are only interested in what the candidate has done. Therefore, ensure that they state what they have personally undertaken and try to avoid generic statements about how their company operates.
- 2 Positive: This is an interview after all, so candidates must focus on their strengths and not highlight weaknesses – if there are limitations these will be picked up by the reviewers during the interview; there is no need to state them on the IPD Final Report Forms. Try to avoid statements such as 'I have limited/some experience' – the candidate either has experience or not. Also try and ensure that the correct words are applied to the relevant objectives – e.g. if it's an 'ability' objective, do not use 'experience' or 'knowledge' always use 'ability'. This may seem unnecessarily pedantic, but it can remove some possible concerns the reviewers may have.

- 3 Practical: Ensure the candidate states how they have achieved the Core Objective standards – all too often candidates fall into the trap of simply describing the objective or stating why it is important. This is not what the reviewers will want to know. There is no benefit in describing the properties of various materials (for objective 2.3) as the reviewers will already know this; what they need to know is how the candidate has developed their understanding of materials and what practical experience they have. So be sure they detail how they have gained the appropriate standard for each Core Objective, and in what ways they have utilised the aforementioned in their professional career.

Mentors are required to write their comments on each of the IPD Final Report Forms, supporting the statements made by the candidate and confirming that they have satisfied the minimum requirements of the objective. Comments should be specific to the candidate/projects and be positive. See IPD Final Report Form examples (page 22).

The Professional Review Interview

The Professional Review Interview is designed to test the candidate's ability and ensure that they have satisfied all 12 Core Objectives. The length of the interview will vary according to the different routes and the length of time it takes for the reviewers to determine whether the candidate has reached the required standard in each objective. The reviewers will ask candidates to make a presentation of no more than 15 minutes (no electronic aids will be allowed) and consequently an interview is likely to last an average of 60 minutes.

Whilst the reviewers will try to help the candidate by asking appropriate questions, it is important that candidates realise that the onus is on them to demonstrate that they have achieved the stated attainment levels for all 12 Core Objectives. In order to pass the interview candidates must pass all 12 objectives. Failure in one objective will constitute a failure in the interview and candidates will be required to reapply the following year.

However, a candidate who fails up to three of the Core Objectives will only be required to be re-assessed on the failed objectives. Those candidates who fail four or more objectives will be assessed on all 12 objectives. If you fail three or less objectives you will be re-interviewed on those objectives only. If you fail four or more objectives you will be required to re-sit the full interview. In both cases an updated and improved submission will be required.

Core Objectives for Technician Membership: Guidance Notes

1.0 PERSONAL

1.1 INSTITUTION (Minimum standard K)

Objective: Knowledge of the Institution and involvement in Institution affairs

Guidance Note: The candidate should demonstrate knowledge of the structure and purpose of the Institution of Structural Engineers, together with an awareness of the Institution's Code of Conduct.

Candidates are strongly encouraged to support Institution activities in universities, colleges and schools by giving careers talks, lecturing, providing case studies, assisting in the marking/critiquing of project work, etc.

Where appropriate and practical the candidate is expected to have an involvement in Institution affairs, for example attendance at technical meetings and seminars. The objective could typically be met by attendance at three Institution events per year or equivalent involvement in other professional institution or relevant CPD activities. The candidates may list their involvement with a brief overview of all activities and a brief commentary on two events.

The candidates should have an appreciation of the institutions of other disciplines (e.g. ICE, CIBSE, RICS, RIBA, IEE, IMechE, IEl, HKIE, Engineers Australia, SAICE, etc.)

- Regular attendance at regional group meetings/seminars over a prolonged period of time
- Regular contact with members of the regional group committee
- Knowledge of and adherence to the Institution's Code of Conduct
- Knowledge of the Institution's Council and committee structure and the work of those committees
- Regular use of the Institution's website
- Regular review of *The Structural Engineer* magazine
- Knowledge of the Institution services including CPD courses and the library
- Knowledge of the international dimension of the Institution
- Knowledge of other institutions and disciplines
- Industrial engagement with a local university/college in terms of delivering lectures, assisting in the marking of project work and mentoring

1.2 COMMUNICATION (Minimum standard B)

Objective: Ability to demonstrate effective communication and interpersonal skills

Guidance Note: The candidates should demonstrate competence in effective communication and inter-personal skills using written, oral and visual media. Where resources permit the candidate should demonstrate the ability to communicate via IT links, produce spreadsheets and database documents.

The Candidate should develop drafting skills to be able to produce drawings to illustrate general arrangements and initial design details.

The candidate should have an appreciation of the skills of other professionals in the construction team and demonstrate an ability to work as an effective member of the team.

Candidates should be able to demonstrate ability in communication and interpersonal skills. This will be assessed in the interview and via the documentation submitted by candidates. It is important that candidates have an understanding of the principles of effective communication and can highlight how they have developed the abilities as stated in the core objective guidance note.

Candidates may choose to record involvement in the following:

- In-house presentations
- Formal communication e.g. technical report writing
- Presentations to schools
- Team building exercises
- Institution competitions e.g. Young Structural Engineers' International Design Competition or other competitions supported by other institutions

2.0 ENGINEERING

2.1 STRUCTURAL SOLUTIONS - CONCEPTUAL DESIGN (Minimum standard A)

Objective: Appreciation of the process of producing viable structural solutions, within the scope of a design brief

Guidance Note: The candidate should demonstrate an appreciation of conceiving approximated scheme solutions to assess the viability of alternative materials and forms of construction.

In producing designs candidates should be able to demonstrate that they have an appreciation of the following:

- Assessment of the brief
- Various types of static and dynamic loading
- Load transfer and overall stability
- Foundations and soil/structure interactions
- Function of frame system
- Progressive or disproportionate collapse
- Location and use of the structure
- Sustainability and environment
- Construction methods, materials and costs
- Buildability and construction techniques

2.2 STRUCTURAL SOLUTIONS - ANALYSIS AND DESIGN (Minimum standard K)

Objective: Knowledge of the processes involved in the analysis and design of basic structures

Guidance Note: The candidate should demonstrate an appreciation of conceiving approximated scheme solutions to assess the viability of alternative materials and forms of construction.

In producing designs candidates should be able to demonstrate that they have an appreciation of the following:

- Assessment of the brief
- Various types of static and dynamic loading
- Load transfer and overall stability
- Foundations and soil/structure interactions
- Function of frame system
- Progressive or disproportionate collapse
- Location and use of the structure
- Sustainability and environment
- Construction methods, materials and costs
- Buildability and construction

The candidate should have the ability to use the appropriate standards/Codes of Practice, specifications, Institution publications, technical agency publications, bulletins, reports, commercial and relevant publications from other professional institutions, etc., and have knowledge of how the controlling requirements of these documents are applied within specification or design criteria within their own discipline.

The candidate should have knowledge of the processes which lead to the development of specifications and method statements.

Candidates should be able to perform the following tasks without supervision and be confident to advise others:

- Basic beam and frame interaction
- Braced and unbraced frame analysis
- Movement joints
- The software packages involved in the analysis/design process
- Structural planning
- Soil-structure interaction techniques

2.3 PRODUCTION OF ENGINEERING DOCUMENTS (Minimum standard B)

Objective: Ability in the production of structural engineering documents

Guidance Note: Candidates should be able to demonstrate ability in:

- i. General arrangement drawing. Detailing and scheduling of reinforced concrete work, structural steel work and other structural materials.
- ii. Working with relevant regulations
- iii. The use of various forms of construction details, interface and connection details between different materials and elements in a structure e.g. sub-structure, superstructure, weathering details etc.

The candidate should be able to demonstrate ability in the following:

- Production of drawings which coordinate information issued by other designers on the project in relation to the structure.
- Generating job specific details of structural components.
- Organising and recording information issued and received on a project and the preparation of document issue sheets.
- Preparation of schedules to be used for quantifying material or components on a project including lintel schedules, bar bending schedules and reinforced concrete drawings.

Use of standard draughting methods of showing various materials and components on drawings.

Such methods being as described in the various national codes of practice, commonly accepted drawing office guides or company procedures.

2.4 MATERIALS (Minimum standard K)

Objective: Knowledge of how materials are specified and incorporated into the structure

Guidance Note: Candidates should develop a knowledge of the properties and behaviour of the primary construction materials, i.e. steel, concrete, masonry and timber, and knowledge of their use in structural elements.

Candidates should also have an appropriate knowledge of relevant materials and their specifications, e.g. bolts, rebar systems, steel connections, dpms, tanking systems, etc.

Steel: grades and types of steel and other metals including their physical properties and their limitations. Their use as primary or secondary materials e.g. beams or rebar fixings, protection requirements, etc.

Concrete: grades and types of concrete – its use, durability and properties including thermal shrinkage etc.

Masonry: types of masonry – its use, durability and properties including thermal shrinkage etc.

Timber: grades and types of timber.

Other materials including glass, plastics, etc. can also be considered.

2.5 ENVIRONMENT (Minimum standard K)

Objective: Knowledge of relevant environmental and conservation legislation

Guidance Note: The candidate should demonstrate knowledge of the relevant environmental and sustainability objectives, issues and legislation.

The candidate should demonstrate knowledge of relevant environmental and conservation legislation. For example, a candidate could demonstrate appreciation of potential sources of contamination, investigation measures required and design solutions adopted to mitigate risk. Some candidates may have knowledge of the conservation of structures and restoration techniques and demonstration of this type of work would also help satisfy this core objective.

The Candidate should appreciate the different mitigation measures required for the control of contaminants which may be present in the form of solids, liquids or gases.

Candidates must promote the message of sustainability through their words and actions.

Candidates may choose to develop knowledge of:

- Protection of vegetation and wildlife at the planning, design and construction stages
- Environmental legislation
- Methane/radon gas
- Sustainability (and knowledge of the Institution's Panel on this matter)
- Brownfield sites
- Contaminated land
- Environmental Impact Assessments
- Recycling in construction

2.6 CONSTRUCTION (Minimum standard E)

Objective: Experience in construction techniques

Guidance Note: The candidate should demonstrate experience in basic construction techniques, construction plant and machinery, temporary support systems, material testing procedures, construction programmes, construction sequencing, etc.

Ideally, the candidate should gain construction experience by visiting sites. The checking of reinforcement, structural steelwork and other structural elements on site would assist the candidate in providing additional relevant experience for this core objective.

Candidates should have a basic understanding of civil works especially drainage systems and other services, e.g. mechanical or electrical, which are relevant to construction sites.

Candidates should be encouraged to gain knowledge and experience in some or all of the areas listed below:

- Demolition
- Setting out
- Materials testing
- Defects and their investigation
- Temporary works
- Substructure construction
- Superstructure construction
- Construction programming and sequencing
- Site construction plant
- Health and safety

3.0 MANAGEMENT AND COMMERCIAL

3.1 MANAGEMENT SKILLS (Minimum standard K)

Objective: Knowledge of management skills for programming and control

Guidance Note: The candidate should demonstrate knowledge of the management and control of design team resources and administrative support necessary for the successful delivery of projects. The candidate should demonstrate knowledge of the interfaces and exchanges of information with other disciplines.

This knowledge may be gained through:

- Attendance at project meetings (design and contract)
- Liaison with colleagues
- Involvement in Quality Assurance procedures
- The development of time management and delegation skills

3.2 HEALTH AND SAFETY (Minimum standard K)

Objective: Knowledge of Health and Safety requirements and legislation

Guidance Note: The candidate should demonstrate knowledge of health and safety standards and reports on structural and construction safety, publications produced by public authorities, relevant trade bodies and professional Institutions, including for example in the UK CDM Regulations, Health and Safety Executive documentation and any other statutory documentation relevant to the candidate's location.

The candidate should develop knowledge of commonly used materials and activities, and be familiar with the precautions and procedures required to avoid and reduce the design, construction and users risk, and the appropriate risk assessments with respect to construction personnel, the general public and user.

The candidate should be responsible for their safety in the workplace.

Candidates are required to develop their knowledge in health and safety issues including:

- Health and safety legislation
- Hazards and risk assessments
- Health and safety standards and reports of safety, e.g. SCOSS reports
- Insurance
- Risk management

3.3 COMMERCIAL AWARENESS (Minimum standard A)

Objective: Appreciation of commercial and financial constraints

Guidance Note: The candidate should develop an appreciation of the costs of commonly used materials and construction methods, the total component cost and the costs of the structural frame relative to the whole project cost.

Candidates are required to have an appreciation of commercial issues including:

- Costs and the impact of national and international affairs on the demand and supply of raw materials, labour and manufacturing processes
- Value engineering and whole life project costing
- Bill of quantities
- Competitive tendering
- Fee assessment and quotations
- Monitoring the control of project costs within their office

3.4 QUALITY SYSTEMS (Minimum standard K)

Objective: Knowledge of quality systems

Guidance Note: The candidate should develop an understanding of the requirements for quality systems and a knowledge of the specific procedures required to achieve quality in design and construction including:

- Total Quality Management
- Quality Management Systems e.g. BS ISO 9001; 2000
- Project Quality Plans
- Environmental Management Systems (EMS)

Portfolio guidance

Engineers are encouraged to build a portfolio of work to help demonstrate experiences and skills gained, and their applicability to the Institution's Core Objectives. The work diary should be updated periodically and should be used to record/reference designs, sketches, drawings, letters, reports, etc. which are compiled in the appended portfolio.

Guidance on submission of portfolio

1. All candidates are required to prepare a portfolio of work in support of their IPD final report forms, which will need to be submitted to your regional group in due course. However, in order to avoid unnecessary delays in the interview process the portfolio must be ready for submission at the time when you make your interview application to headquarters. Submission instructions for the portfolio will then be confirmed by your regional group after receipt and processing of the PRI application.
2. Two copies of the completed portfolio will need to be submitted. If you are following the individually managed or accredited training scheme routes you will also have to submit your supporting documents (i.e. IPD quarterly report forms, training records, etc.) with your portfolio. Remember, if you cannot provide your portfolio within the timescales required by your reviewers you may be prohibited from attending the interview.
3. The portfolio must demonstrate that you have attained at least the minimum level of competence and responsibility for Technician membership. It is a vital element of the PRI process, and you should devote the necessary time and care to its production. Remember, it is in your interest to submit a quality and comprehensive portfolio, as it will make the interview itself more straightforward.
4. Core Objective 1.2 is ability in communication, and your IPD final report forms and portfolio will contribute to the assessment of this objective. It is therefore important to ensure that your documentation is of a high standard.
5. The portfolio must be A4 size and not more than 40 mm (single-sided) or 25 mm (double-sided) in thickness, excluding the folder/binding. If you exceed this amount your reviewers will be unable to assess all of the submitted information in detail, and consequently may reject your portfolio and can decline to interview you.
6. The pages of text within the portfolio must also be A4 size, i.e. you cannot reduce your pages to A5 to fit two pages onto an A4 sheet. Drawings must be no greater than A3 size, and folded to suit. The font size used in your portfolio and IPD final report forms must be no smaller than Arial 9 and must be printed single-sided.
7. The portfolio must contain evidence relating to all of the core objectives on which you are being assessed, and allow easy cross-referencing with the IPD Final Report Forms. We recommend that you are judicious in your assessment of what to include, as it will not benefit you to overwhelm your reviewers with stacks of information. The overriding principle is to ensure that it is relevant and relates directly to the core objectives and how you have achieved the standards associated with each objective.
8. Candidates will be expected to include examples of work from a variety of projects that they have worked on, and its format must comply with one of the following two options:
 1. Sub-divided into the core objectives, with the evidence provided in each subsection relating specifically to the associated core objective.or
 2. Sub-divided chronologically by project, with a coversheet at the beginning of each subsection giving an overview of the candidate's specific involvement and responsibilities on the project, and stating clearly which core objectives are covered (and how).

9. Where appropriate, candidates should provide hand written comments/annotations on the submitted information to help demonstrate an understanding of the work and its relevance to the core objectives.
10. All work included within the portfolio must be clearly attributable to the candidate, and relevant to the core objectives.
11. Although not intended as an exhaustive list, the following are examples of information that could be expected in a typical portfolio:
 - Evidence of attendance at in-house lunchtime seminars or external CPD events, e.g. attendance certificates, personal notes, etc.
 - Correspondence by the candidate, e.g. letters, faxes, emails, site notes, meeting notes, etc.
 - Hand drawn sketch details by the candidate.
 - Basic calculations by the candidate, e.g. foundation loads/widths, beam designs, drainage designs, etc.
 - CAD project drawings by the candidate, e.g. foundation drawings, superstructure drawings, external works layouts, drainage layouts, etc. ideally covering a range of structure/project types.
 - Evidence of an understanding of health and safety issues, i.e. risk assessment procedures, drawing CDM notes, PPE requirements, etc.
 - Evidence of an understanding of environmental/sustainability issues, either by personal involvement on a project or background reading, i.e. SUDS solutions, ground contamination, etc.
 - Evidence of any site experience, e.g. photographs taken during site visits, site notes, etc.
 - Evidence of quality assurance systems, e.g. in-house issuing procedures, in-house checking procedures, checking of subcontract/specialist design information, etc.
 - Candidates should avoid submit

Portfolio checklist Technician Member

All candidates must complete this checklist and include a signed version as the first page of their portfolio. By completing the checklist you are confirming that you have complied with the Institution's requirements in terms of the layout and variety of evidence provided within the portfolio. Remember also that your portfolio must be A4 size and not more than 25mm (double-sided) or 40mm (single-sided) in thickness (excluding the folder/binding).

Please tick to confirm which of the following two options you have chosen for the layout of your portfolio:

Sub-divided into the core objectives, with the evidence provided in each subsection relating specifically to the associated core objective.	
Sub-divided chronologically by project, with a coversheet at the beginning of each subsection giving an overview of the candidate's specific involvement and responsibilities on the project, and stating clearly which core objectives are covered (and how).	

Please tick to confirm that your portfolio includes as many of the following as is practicable:

Evidence of attendance at in-house lunchtime seminars or external CPD events, e.g. attendance certificates, personal notes, etc.	
Correspondence by the candidate, e.g. letters, faxes, emails, site notes, meeting notes, etc.	
Hand drawn sketch details by the candidate.	
Basic calculations by the candidate, e.g. foundation loads/widths, beam designs, drainage designs, etc.	
CAD project drawings by the candidate, e.g. foundation drawings, superstructure drawings, external works layouts, drainage layouts, etc. ideally covering a range of structure/project types.	
Evidence of an understanding of health and safety issues, i.e. risk assessment procedures, drawing CDM notes, PPE requirements, etc.	
Evidence of an understanding of environmental/sustainability issues, either by personal involvement on a project or background reading, i.e. SUDS solutions, ground contamination, etc.	
Evidence of any site experience, e.g. photographs taken during site visits, site notes, etc.	
Evidence of quality assurance systems, e.g. in-house issuing procedures, in-house checking procedures, checking of subcontract/specialist design information, etc.	

Name:	Signature:

CPD Activity Record

Continuing Professional Development (CPD)

At the Professional Review Interview candidates will be assessed on their commitment to CPD which is defined by the Institution as: *'The systematic maintenance, improvement and broadening of knowledge and skill and the development of personal qualities necessary for the execution of professional and technical duties throughout the practitioner's working life.'*

All members of the Institution have an obligation to keep their skills and knowledge up to date and as a mentor you will be expected to understand this commitment in order to assist the candidate. Evidence of their CPD can be demonstrated by regular use of a development action plan, a personal development record in the form of a diary and keeping a portfolio of their work and responsibility during the period of their IPD.

During their period of IPD they are strongly advised to participate in professional and technical activities. If they are not following a managed training programme and have not been keeping records then they will be required to show evidence of their IPD including a portfolio with examples of their work, and a commitment to future CPD. Please note that the Institution has introduced a mandatory reporting of CPD policy which applies to all those elected to Fellow, Chartered, Associate, Associate-Member and Technician from January 2011. Please visit the Institution's website for further details.

Please note that the example on the following page is generic and should be seen as guidance only and not prescriptive. It is included to better advocate the Institution's philosophy as to how the Activities Record should be completed.

In this example, the number of hours have not been stipulated as the Institution does not wish to provide examples which may be seen as indicative of the amount of time a particular activity should take; it is very much up to the individual member to assess the number of hours spent on an activity and this information must be included against all activities.

The benefits gained from each activity have been included as it is recognised that some members may have difficulty in understanding what is expected of them in this regard and some guidance may therefore be necessary.

Continuing Professional Development: Activity Record

Name: S T Engineer	Membership No: 022222222
Year: 2010 (January - December)	Job description/role: Designer in partnership covering varied structures <i>(Please include organisation type, e.g. sole practitioner, partner, etc):</i>
Branch/Division: Lancashire and Cheshire	

I am a member of an organisation whose CPD system is recognised by the Institution (please provide details below)

Name of organisation: Please ensure you sign the declaration at the end of this Activity Record
--

Note: You must gain at least 90 hours CPD over three years. If you have been unable to attain the required number of CPD hours please detail the reasons why below:

--

YOU MUST INCLUDE THE NUMBER OF HOURS SPENT ON EACH ACTIVITY *Please retain a copy for your own records.*

CPD Categories	Description of Activities (please describe your DEVELOPMENT, not just your job)	Benefits Gained	Hours
1. Work-based learning e.g. mentoring, project related research, development of organisational skills/IT, etc	Training Officer for East Lancs office – ongoing	Keeps me abreast of new developments in industry, especially related to bridge construction	
	Discussions with colleagues/literature investigations regarding: – bridge and culvert inspection	Ensuring H&S of inspection staff and ensuring risk assessments are completed correctly	
	– fire engineering	Produced economical design of composite floor	
	– resin injection techniques to deal with subsidence	Developed resin injection knowledge and competence	
	Mentoring two graduates aiming for Chartered status	Developed knowledge of IPD system and helped keep up to date with new technical processes	
	Sub-total for Work-based learning		
2. Self-directed study e.g. journals/ technical publications, distance-learning, post-grad study, etc	Suitability testing of materials to absorb lateral stresses behind integral bridge abutments. CARDER, D. R. and others, 2002	Developed knowledge of materials in relation to lateral stress	
	Professionally qualified CSCS card	Better appreciation of site safety and risks	
	Structural Engineer, 19th May 2009: Effectiveness of punching shear reinforcement to EN 1992-1-1:2004	Increased understanding of contribution of upper bound section shear resistance	
	Structural Engineer, 16th June 2009: Challenges of post-tensioning in Dubai – a designer’s perspective	Raised awareness of construction situation in Dubai generally and post-tensioning specifically	

3. Course/ events/ seminars including institution, internal, external, etc	Seminar on displacement piles and precast foundation schemes (local Branch – 08/02/09)	Improved understanding of available techniques and outline costs. Also health and safety aspects of each	
	ICE/IStructE/SCOSS meeting ‘The unexamined role of the manager in failure’ by Richard Williams (held at ICE – 25/06/09)	Enlightening talk on the potential culpability of the project manager	
	The robustness of multi–storey buildings in fire (local Branch – 17/07/09)	Interesting and surprising presentation on robustness/fire issues	
	HILTI seminar - the use of small embedment fixings into cracked concrete (supplier-led, at workplace – 12/10/09)	Increased knowledge of use of embedment fixings	
	Latest Developments in Post-tensioned Flat Slab Design and Construction (Concrete Centre – 29/09/09)	Updated knowledge on post-tensioning	
	Sub-total for Courses/events/seminars		
4. Horizon -broadening activities appropriate TV programmes, institution work, community/ public service involvement, etc	Watched selected episodes of ‘Mega Structures’	Broadened awareness of significant structural engineering projects	
	Documentary on Leading Engineers of 20th Century	Broadening knowledge of significant engineers and their work and contribution to the art and science of structural engineering	
	School Governor	Developed knowledge in relation to Finance Committee	
	Trustee of a local charity assisting with the care of terminally ill children	No great professional development gained; it is good for the soul though	
	Sub-total for Horizon-broadening activities		
Total CPD hours for all categories for the year			

Please ensure that you retain any evidence of CPD activities (where possible) as these may be requested during audit.

I declare that I will undertake appropriate CPD over the coming 12 months. Potential CPD activities may include:	
Signature:	Date:

Examples of IPD Final Report Forms

EXAMPLE OF AN IPD FINAL REPORT FORM - POOR

IPD Final Report Form

Candidate Name:	M S Engineer			
Membership No:				
Core Objective:	2.1 - Conceptual Design			
Standard Achieved (please tick)	A	K	E	B
Date of Report:				✓
Report:				
<p>I have gained the ability through experience of conceptual design on various projects, not only to appraise the best solution in terms of structure but to work with the design team to find the best integrated solution to meet the needs of the particular project.</p> <p>This has been done through conceptual design discussions with the design team on subjects such as visual appearance, thermal mass, acoustics, buildability, air tightness, cost and the possibilities of integration of structure and service schemes to provide both energy and/or cost savings.</p> <p>The conceptual design is a key element of every tender when the best value for the project is sought from designers and contractors. An inappropriate design may lead to concerns regarding its viability as a structure or other health and safety issues.</p> <p>Any design should respond to the client's requirements in terms of cost, aesthetics and use.</p>				
Mentor's comments				
<i>Agreed</i>				
Candidate Signature:				
Mentor's Signature:			Mentor's name (print):	
			M Entor	

Rationale

Although the candidate attempts to state how they have achieved the necessary standard of the Objective, there is insufficient specific information provided for a proper judgement to be made. The lack of detail provided is likely to make the interview somewhat tougher as the reviewers probe the candidate for the information they require.

Although the candidate's mentor has taken the time to read and sign-off the IPD Final Report Form, the comment he has provided does not benefit the candidate. The reviewer's would prefer to see positive, informative statements being made by mentors.

*Please note that mentor's comments/signatures are only compulsory for candidates following the Individually Managed Route. However, mentor's comments are also welcomed from those candidates who have been mentored whilst following the Retrospectively Collated IPD or Accredited Training Scheme routes.

EXAMPLE OF AN IPD FINAL REPORT FORM - AVERAGE

IPD Final Report Form

Candidate Name:	M S Engineer			
Membership No:				
Core Objective:	2.1 - Conceptual Design			
Standard Achieved (please tick)	A	K	E	B ✓
Date of Report:				
Report:				
<p>I have been responsible for the production of conceptual schemes for numerous projects – new builds as well as refurbishments/extensions – in particular structural steel against reinforced concrete and masonry against timber framed structures.</p> <p>I have also prepared options for safely constructing retaining walls by either a bored piled retaining wall or a sequenced traditional reinforced concrete retaining wall. These projects involved both the superstructure and foundation options for tenders/contractor pricing.</p> <p>Refer to the following within my portfolio of work:</p> <ul style="list-style-type: none">• Hancock bridge strengthening• Burj Al Qatan• Cable-stayed bridge over Dnepr river• Arch dam				
Mentor's comments:				
<p>I confirm that Mr Engineer has undertaken the tasks detailed above to a standard of ability. This can be confirmed within his portfolio of work.</p>				
Candidate Signature:				
Mentor's Signature:			Mentor's name (print):	
			M Entor	

Rationale

Although the candidate has provided some specific information about the activities he has been involved in which contribute to this objective, the level of detail is insufficient.

The candidate should have provided specific information under the projects mentioned as well as providing references to where these projects are located in the supporting documentation that has been submitted.

The comments provided by the mentor are at least positive but they lack specific detail and could be made more personal which would help the reviewers in assessing the candidate's ability.

*Please note that mentor's comments/signatures are only compulsory for candidates following the Individually Managed IPD route. However, mentor's comments are also welcomed from those candidates who have been mentored whilst following the Retrospectively Collated IPD or Accredited Training Scheme routes.

EXAMPLE OF AN IPD FINAL REPORT FORM - GOOD

IPD Final Report Form

Candidate Name:	M S Engineer			
Membership No:				
Core Objective:	2.1 - Conceptual Design			
Standard Achieved (please tick)	A	K	E	B ✓
Date of Report: 01/05/10				
Report:				
<p>During my career I have displayed a strong ability to conceive viable alternate structures as per the client's brief. In so doing I take into account the costs, aesthetics, materials, durability and construction methods of the project. An ability in conceptual design has been demonstrated in the following projects; references refer to the portfolio of work where more detailed information can be found including comparisons of different materials, designs etc:</p> <ul style="list-style-type: none">• Ultrasonicated honey processing plant, Devon<ul style="list-style-type: none">o Ref: Section 2.1.1o £2.2m, 2 storey, masonry/fabricated steel structureo Complications included:<ul style="list-style-type: none">– the site being on a significant gradient– close proximity of river– required construction of retaining walls– ground investigation showed that ground bearing pressure was not sufficient to use traditional foundations– ground improvement required through use of piled foundations– close proximity of major road– required construction of retaining walls and removal of existing derby retaining wall as client wished the plant to be built 2m below the road level. Options for removing derby wall were presented to the client and a contiguous retaining wall constructed to support both• (Replacement) Arch bridge, River Isar, Munich<ul style="list-style-type: none">o Ref: Section 2.1.2o £1.5m, 2 storey (railway and two-lane roadway), steel bridge, three arch 250m spano Replacing a historic bridge which had been rendered unsafe due to an impact by a ferry				

- o Improvements to the original design were possible:
 - steel replaced concrete due to quicker construction and lower weight demands
 - structural system improved by making all arches externally statically determinate. This was achieved by tying the arches throughout the bridge deck

- Exhibition centre, Liverpool

- o Ref: Section 2.1.3
- o £125m, 4 storey (with mezzanine), precast concrete/fabricated steel structure
- o Complications included:
 - client requested no columns within the main 36m² exhibition hall
 - structural steel truss used as economically viable and met the height requirements
 - numerous staircases and ramps, which were all treated as individual structures within the overall design
 - a combination of support systems (bearing walls, beams, hanging walls, etc) were used
 - flexibility of ground floor (main) exhibition hall – utilised a braced steel transfer frame with the floor beams using UC sections; beam deflection analysis was essential to assess the deflection from the dead load of the precast structure of the floors above

Mentor's comments:

Whilst acting as Mr Engineer's mentor for the last four years, I have witnessed a significant improvement in his ability regarding conceptual design. Initially Mr Engineer gained significant ability in designing 'traditional' structures but after only a short period of time was encouraged to undertake the design of more complex and challenging structures. Mr Engineer clearly relishes the challenges posed in designing more complicated structures or where there are underlying problems which must be surmounted for the project to succeed. His innovative approach can be seen in the foundation design (in which he has become something of an office expert) for the honey processing plant and the flexible use ground floor of the exhibition centre. I would not hesitate to assign major and challenging projects to Mr Engineer as I have every confidence that his ability in conceptual design will ensure that the project is a success.

Candidate Signature:

Mentor's Signature:

Mentor's name (print):

M Entor

Rationale

This is a strong IPD Final Report Form as it provides a general introductory paragraph detailing how the candidate approaches conceptual design. It then gives detailed information, related to specific projects, justifying the candidate's belief that they have met the standard expected of the Core Objective. This candidate has also provided references to the portfolio of work so that the reviewers can quickly and easily find the information they are looking for.

The candidate's mentor has given positive and specific comments and clearly takes his role as mentor seriously. By describing the candidate's development and skills, albeit briefly, the mentor has provided the reviewer's with an insight which may otherwise be unavailable to them; this will assist them as they begin the process of assessing the candidate's standard in this Core Objective.

*Please note that mentor's comments/signatures are only compulsory for candidates following the Individually Managed IPD route. However, mentor's comments are also welcomed from those candidates who have been mentored whilst following the Retrospectively Collated IPD or Accredited Training Scheme routes.

Relevant forms to be completed by the candidate

Note: The following documents are available online in both word and editable PDFs and can also be found in the IPD Regulations.

IPD Quarterly Report Form

Candidate Name:	
Membership No:	
Date:	
Period covered by Report:	
Report:	
1. Personal:	
2. Engineering:	
3. Management and Commercial:	
4. Development Action Plan/Objectives for next period:	
Mentor's Comments:	
Candidate Signature:	
Mentor's Signature:	Mentor's name (print):

Continue on separate sheet if necessary. Photocopying of form is permitted.

Initial Professional Development Progress Summary Record - Technician Member

Candidate Name:							
Membership No:							
Period covered by Report:							
Ref:	Core Objective	Minimum Standard	Level Attained at Date of Assessment				
			Date 1:	Date 2:	Date 3:	Date 4:	
1.0	Personal						
1.1	Institution Knowledge of the Institution and involvement in Institution affairs.	K					
1.2	Communication Ability to demonstrate effective communication and interpersonal skills.	B					
2.0	Engineering						
2.1	Structural Solutions - Conceptual Design Appreciation of the process of producing viable structural solutions, within the scope of a design brief.	A					
2.2	Structural Solutions - Analysis and Design Knowledge of the process involved in the analysis and design of basic structures.	K					
2.3	Production of Engineering Documents Ability in the production of structural engineering documents.	B					
2.4	Materials Knowledge of how materials are specified and incorporated into the structure.	K					

Initial Professional Development Progress Summary Record - Technician Member

Ref:	Core Objective	Minimum Standard	Level Attained at Date of Assessment			
			Date 1:	Date 2:	Date 3:	Date 4:
2.5	Environment Knowledge of relevant environmental and conservation legislation.	K				
2.6	Construction Experience in construction techniques.	E				
3.0	Management and Commercial					
3.1	Management skills Knowledge of management skills for programming and control.	K				
3.2	Health and Safety Knowledge of health and safety requirements and legislation.	K				
3.3	Commercial Awareness Appreciation of commercial and financial constraints.	A				
3.4	Quality Systems Knowledge of Quality Systems.	K				
	Candidate's Signature					
	Mentor's Signature (if applicable)					

List of Mentors Consulted During Period:		
	Name (Print)	Signature
1.		
2.		
3.		
4.		
5.		

Continue on separate sheet if necessary. Photocopying of form is permitted.

IPD Final Report Form

Candidate name:				
Membership number:			Date of report:	
Core objective:				
Standard achieved <small>(Candidate MUST indicate standard)</small>	A	K	E	B
Please indicate below how you have achieved at least the minimum standard citing specific examples from projects you have worked on				
Mentor's comments (if applicable):				
Mentor's signature:			Mentor's name (print):	

Continue on separate sheet if necessary. Photocopying of form is permitted.

The Institution of Structural Engineers
International HQ
47-58 Bastwick Street
London EC1V 3PS
United Kingdom
tel +44 (0)20 7235 4535
mail@istructe.org
www.istructe.org

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Registered Charity No 233392