

Inspection & Test Plans (ITP's)

A Step by Step Guide to Producing an ITP

Based on the generic template provided, the following guidance takes you through the process for establishing an ITP:

Step 1 Scope:

A simple summary of scope of the works applicable to the ITP should be included. It may also be useful to specify what is NOT included to provide additional clarification for anyone reading the ITP.

ITP Scope Description
This ITP relates to the installation of a concrete slab. The ITP does not include details of the installation for the substrate (refer to ITP Ref. XYZ)

Figure 1: ITP Scope Summary

Step 2: Determine the Criteria / Gather the Relevant Documents

Most people associate the criteria for the works with the drawings and specifications. Although, these are likely to be the most significant sources of information, there are others and it is important to consider them. Drawings and specification often refer to and require compliance with other documentation (e.g. a specification for concrete may refer to the National Structural Concrete Specification). Therefore, the following may be a list of relevant items to consider although this is not exhaustive:

- a) Drawings (including notes on the drawings)
- b) Design specifications
- c) British / European / International Standards
- d) Other standards (e.g. National Structural Steelwork Specification, National Structural Concrete Specification)
- e) Manufacturers' requirements
- f) Contract requirements
- g) Planning conditions
- h) Building Control requirements
- i) National House Building Council requirements
- j) Legislative requirements
- k) Lessons learnt workshops
- l) Business Management System of the organisation

Step 3: Work out the stages of the delivery

When producing an ITP it is often useful to think about the stages of delivery in chronological order and assign the assurance activity items (produced in Steps 4 and 5) to a relevant stage as shown in Figure 2. Further information about each stage is provided below.

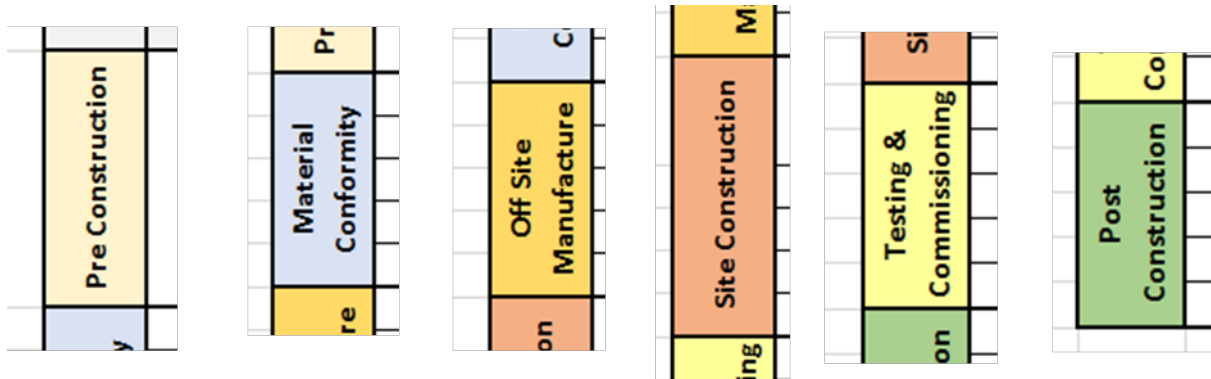


Figure 2: Delivery stages

Pre-Construction: There may be items which need to be inspected & witnessed before the works start. For example, it would be prudent to undertake a check to make sure that the design is suitably developed. There may be a requirement for design prior to any manufacture or site works, e.g. structural steel fabrication drawings. This may require drawing approvals, checking of calculations etc. There may also be a requirement for the submission and approval of samples or mock-ups to verify design requirements. These should be referenced where appropriate. Additionally, the Risk Assessment / Method Statements may require approval and a check might need to be completed to ensure persons undertaking the works are suitably competent.

Material Conformity: What actions need to be completed to ensure the materials are compliant? Do materials need to be approved? How must materials be stored? Do materials need specific certification?

Off Site Manufacture: In cases where a product is manufactured away from site, appropriate consideration is often not given to how the principal contractor or contractor will ensure and demonstrate the product is compliant. However, it is extremely important. Once the product arrives on site, if incorrect, it will be too late and may have significant implications for the programme. Therefore, it is important to consider how compliance of these work will be assured. For example, it may be necessary to visit the factory, undertake Factory Acceptance Tests (FAT's), or request specific assurance documentation. In some situations, a completely separate ITP may be produced by the principal contractor for an element of the works which is manufactured off site.

Generally, where a proprietary product is used, a Certificate of Conformity will often suffice as a means to demonstrate compliance.

Site Works: In most cases, the site works section of the ITP will constitute the most significant proportion by volume of the ITP. This section will specify how the physical construction works on site will be inspected and tested.

Where specified or appropriate, requirements for establishing benchmarks to set workmanship standards for quality requirements, should be incorporated into the ITP.

Testing & Commissioning: Although, as described earlier, the ITP document collectively describes testing / inspection activities, this section usually specifies the testing of the completed works and is often most significant for Mechanical, Electrical and Public Health packages. However, testing is still required for many other civil and building elements of the works such as cube and slump tests for concrete, mortar cube tests, hammer drop tests for screed, noise attenuation testing for internal partitions and air leakage testing for building control acceptance to name a few.

Post Construction Activities: Although the physical works element may be completed, there are other activities which may still need to be undertaken post completion. For example, ‘snagging’ of the works may be required and the Operating & Maintenance Manual information provided. Works may also have an inspection and handover process to the client. One of the most important elements of this stage may be how the works are to be protected in readiness for works by follow on trades.

Step 4 & 5: Detail each individual item on the ITP

Steps 4 & 5 will most likely take the most time and effort to complete. The outcome from these steps will be to have all quality assurance activities relevant to the specified scope of the works (stage 1) listed on the ITP.

To determine the items which need to be listed on the ITP, the most straightforward way is probably to go through each of criteria documents in turn in a systematic manner and pick out the items which need to be listed on the ITP.

It is then necessary to consider each item in turn and provide details of how the criteria will be met, the evidence which will be produced, who should be involved in the assurance activity and finally the type of inspection or test involved.

To help with steps 4 and 5, ITP templates are often split into a series of columns with one column dedicated to each piece of information.

Ref.	What is the activity or quality input?	Requirement		What will be done to ensure compliance	How will compliance be demonstrated?	Evidence		Who has responsibility for this closing out this requirement?	What resources are required?	Inspection / Test Details & Parties Involved				
		Where from?	What is the requirement?			Description	Location			S / C	PC	PC Client	Other 1	Other 2
1	Approval of Concrete Plant used for concrete batching	Concrete Specification Clause 1.2	The batching plant must be UKAS registered	Relevant UKAS certification will be obtained from the batching plant prior to first concrete order and checked to ensure it is in date and appropriate for the works.	A copy of the UKAS certificate will be made available for inspection as required.	UKAS Certification of batchin plan.	Assurance Folder: Section X	Project Engineer	d	H	H	n/a		

Figure 3: An activity item for an ITP with information split into columns

There is no standard which states which columns should be included and generally each organisation develops their own preferred template. On occasion, clients may also specify the use of a particular template. The attached template provides an example but may be adapted as required.

Using the attached template:

Step 4a: Firstly, the quality assurance activity is specified:

STAGE	Ref.	What is the quality assurance activity?	
Pre Construction	1	Approval of Concrete Plant used for concrete batching	Co Spe Cla

Figure 4: Assurance Activity

Step 4b: Next, details of the criteria should be provided. It is useful (for future reference) to include full details of the exact source document which should also include the revision number (as revisions of the same document could differ) and location within the document (e.g. specification clause number):

nce	Requirement		W
	Where from?	What is the requirement?	
	Concrete Specification ABC Rev 1.0 Clause 1.2	The batching plant must be UKAS registered	Rele be o plan and date worl

Figure 5: Requirement

Step 5a: A description of the activity which will be undertaken to ensure compliance should then be provided:

	What will be done to ensure compliance?	
ent?		
st be	Relevant UKAS certification will be obtained from the batching plant prior to first concrete order and checked to ensure it is in date and appropriate for the works.	A copy will be made available for inspection as required.

Figure 6: Compliance

Step 5b: A corresponding description of how compliance will be demonstrated should then be specified:

	How will compliance be demonstrated?	
ure		
will ng order n e	A copy of the UKAS certificate will be made available for inspection as required.	UKAS batching

Figure 7: Demonstration

Step 5c: Details of the evidence to demonstrate compliance should be provided including information on where it may be located.

	Evidence		Who is responsible?
	Description	Location	
ate will ection	UKAS Certification of batching plan.	Assurance Folder: Section X	Project

Figure 8 Evidence

Step 5d: It is useful to include information on who is responsible for ensuring the assurance activity is completed satisfactorily and the resources required:

	Who has responsibility for closing out this requirement?	What resources are required?
er:	Project Engineer	The project engineer will dedicate appropriate time to completing this activity.

Figure 9: Activity Ownership & Resource

Step 5e: Finally, the parties or persons involved in the inspection activity should be specified. Very often this information is presented with one column dedicated to each party / person. Codes are usually developed which summarise the type of test and level of involvement:

re	Inspection / Test Details & Parties Involved				
	S / C	PC	PC Client	Other 1	Other 2
				BCO	
will time activity.	I / H	W (100)	I (10)	n / a	

Figure 10: Parties / individual involved; Type of Test

As with the ITP template, there are no standard ‘codes’ and organisations usually develop their own preferred method. However, there are some standard accepted types of inspection and test. The following are the most common categories of inspection / test activity. Suggested abbreviations are included in brackets:

Witness (W): The activity will be verified by the party / individual acting as a witness to the satisfactory completion of the item.

Inspection (I): The activity will involve a party or person undertaking an inspection of the item.

Hold Point (HP): The next stage must not commence until the item is completed satisfactorily.

Surveillance (S): A ‘surveillance’ is essentially a mini audit which reviews an aspect of the works in more detail to verify compliance.

Audit (AU): An audit would require that a competent auditor undertakes an audit to verify the item is satisfactorily completed (e.g. for off site manufacture).

Often, it is not necessary or practicable for every party to fully witness or inspect all works activities but, dependent on contractual relationships, a representative sample may be used to gain confidence of compliance. For example, the ‘owner’ of the ITP (often the trade contractor) will likely need to verify compliance of all aspects. However, the principal contract may witness only a

representative percentage and the project client select a small sample still. Therefore, it is often useful to indicate the level to which the party / individual will be involved (e.g. 10%, 50%, 100% etc.). In the above example (Figure 10), the ITP column for Principal Contractor specifies 'W(100)' indicating 100% witnessing of the activity although the principal contractor's client inspects 10% 'I (10)'.

Hold points are a critical part of the quality assurance process. In the above example (Figure 10), the subcontractor may not proceed to order concrete until the UKAS accreditation is completed. Therefore, the subcontractor inspects the document but this is also a hold point (H / I).

Rev 2.1: Article written by Mike Buss (14/7/17) & reviewed by Jon Adshead (20 / 07 / 2017) and Simon Ellis (8/8/17) on behalf of the Construction Special Interest Construction Working Group (ConSIG CWG). Article peer reviewed and accepted for publication by ConSIG 09 / 08 / 2017. The ITP template provided should be treated as indicative only.