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Guidance on using NEC contracts for ground investigations

NEC contracts have been designed to be used in most types of work relating to the built environment. Ground investigation contract works can be procured using NEC forms. This guidance gives advice on how to implement this and deal with the specific requirements of ground investigation contracts.

Ground investigation works generally consist of two parts:

- the physical work of drilling, boring, excavation, sampling, in situ testing and monitoring, and
- surveying, analysis, laboratory testing and reporting of findings.

Because of the nature of the physical work, one of the "works" contracts in the NEC family will normally be appropriate, either the Engineering and Construction Contract (ECC) or the Engineering and Construction Short Contract (ECSC). Whilst a Professional Service Contract (PSC) could be appropriate for desk studies, guidance and reporting, it is not suitable for site works.

For simple, straightforward ground investigations the ECSC could be suitable. For larger scale, more complex and higher risk projects the ECC would normally be used.

Whichever of these forms is used, the detailed requirements for the investigation are set out in the Scope. This should include any constraints on how the work is done, for example restrictions on access and reinstatement of access routes. The way the Scope is drafted will allow flexibility where needed for the investigation. For example, it may give specific depths for boring, or it may require specific strata to be investigated.

The purpose of a ground investigation is to provide data that will be used to assess the ground conditions. A contract that allows flexibility in obtaining this data is essential in providing the best information for a proposed project.

ECC and ECSC both provide for compensation when specified events occur. Of particular relevance to the ground investigation contract is the compensation event relating to physical conditions. This provides compensation for conditions which have "such a small chance of occurring that it would have been unreasonable to have allowed for them". For more complex investigations, it may be appropriate for a client to specify "reference conditions" which identify the conditions beyond which a contractor will be compensated. These should be defined in ECC through "additional compensation events" in Contract Data part one or a Z clause, and in ECSC by including "additional conditions" in the Contract Data.

The dates for starting and completing the work are stated in the Contract Data. The ECC provides substantial detail of what a contractor must include in its programme for the work, which would normally be appropriate only for the more complex projects. The ECSC allows a client to specify the level of detail required in the programme, and the interval when the programme is to be updated. This provides the flexibility needed to manage a simpler ground investigation.



If using the short contract, payment for the work is made through the prices in the Price List. These can be quantity related or lump sum payments for specified activities. The quantities at the time of awarding the contract would normally be those estimated by the client, whilst payment would be based on the actual quantities encountered. If payment for analysis and reporting is made on a time basis, then again estimated quantities of time for particular categories of people should be included within the Price List. The method of measurement for these quantities needs to be explained, either by reference to a published model or by including statements in the Price List, setting out the method and rules used.

If using the ECC, a number of pricing models are available. Normally for ground investigation the bill of quantities option would be used in which a client takes the risk of the actual quantities of the work. In the ECC this is payment option B. 'Priced contract with bill of quantities'.

If a client wanted to use a target contract to better encourage collaboration, but still needed to retain the risk of the quantities the ECC's option D (Target contract with bill of quantities) could be used. However, the client would then need to measure the quantities of the work and to audit the contractor's costs.

In an extreme case where the level of investigation was likely to be identified only during the investigation stage itself, a cost reimbursement option could be adopted. In ECC that would be option E.

The bill of quantities for options B or D needs to be prepared by the client and included for completion by the bidder in the bidding document. The approach to preparing this should be similar to that used for the Price List in the ECSC but may need to be more detailed. Again, the method of measurement needs to be specified to ensure that both parties are recording quantities on the same basis.

Further details setting out the key differences between the ECC and the ECSC <u>can be found</u> here.

A commonly used specification for ground investigations, particularly in the UK is that published by the Institution of Civil Engineers (ICE), which includes a standard Bill of Quantities and method of measurement. Further guidance on how to use the ICE's Specification and the documents that it requires in an NEC contract is detailed below.



Appendix 1 - Guidance on the use of UK specification for ground investigation

Interface between NEC contracts and the ICE Specification for Ground Investigation

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1. Purpose of this document

This document is to set out guidance to properly incorporate the well-used ICE Specification for Ground Investigation 3rd Edition 2022 (the 'Specification') into an NEC contract. Ground investigation works can be procured using either:

- the NEC Engineering and Construction Contract (ECC), usually Option B, priced contract with bill of quantities or
- the NEC Engineering and Construction Short Contract (ECSC).
- Separate guidance on the choice between the ECC and the ECSC is included above and available on the NEC website.

There are some differences relating to the Specification between the requirements of

- the ECC and
- the ECSC.

These differences are addressed in this document.

The convention of using italics for terms which are identified the Contract Data and capital initials for terms defined in the relevant NEC4 contracts has been used in the section of the guidance.

2. Scope and Site Information

Key documents in an NEC contract are the Scope and the Site Information. In both ECC and ECSC the Scope is defined as: 'Scope is information which

- specifies and describes the works or
- states any constraints on how the Contractor Provides the Works

and is either

- · in the documents which the Contract Data states it is in or
- in an instruction given in accordance with the contract.'

Hence the Scope will usually include drawings and specifications.

The conditions of contract point to the Scope for certain information.

The NEC's guidance notes 'Preparing an engineering and construction contract' and 'Preparing an engineering and construction short contract' include guidance on the preparation of and a possible contents list for the Scope.

The Site Information is a separate document in ECC and ECSC. This is defined as: 'Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in.'



Unlike that of the Scope, this definition does not actually explain what the Site Information is for. Site Information is provided in the contract so that the *Contractor* can understand the physical conditions likely to be encountered and so prepare for and price the risk through its method of working, programme and designs.

The Site Information may include factual information such as

- · geotechnical information,
- as built drawings,
- · surveys of existing services and
- other surveys unexploded ordnance, contamination etc.

In the UK this factual information about the physical conditions is, in any case, required to be passed to the bidder in the Pre-Construction Information required by the Construction (Design and Management) Regulations (2015).

The ECC has a compensation event for physical conditions at clause 60.1(12):

'The Contractor encounters physical conditions which

- are within the Site,
- are not weather conditions and
- an experienced Contractor would have judged at the Contract Date to have such a small chance of occurring that it would have been unreasonable to have allowed for them.

Only the difference between the physical conditions encountered and those for which it would have been reasonable to have allowed is taken into account in assessing a compensation event.'

The compensation event in the ECSC (Clause 60.1(8) is the same.

The compensation event must be read in conjunction with Clause 60.2:

'In judging the physical conditions for the purposes of assessing any compensation event, the *Contractor* is assumed to have taken into account

- the Site Information,
- publicly available information referred to in the Site Information,
- information obtainable from a visual inspection of the site and
- other information which an experienced *Contractor* could reasonably be expected to have or to obtain.'

Site information is therefore a key document in determining whether a compensation event has occurred.

3. Entries in the contract

Specific issues in the body of the Specification



2.2 Investigation Supervisor

The 'Investigation Supervisor' is the person acting for the *Client* to manage the contract. The duties of the Investigation Supervisor' under an ECC contract will be carried out by the *Supervisor* in relation to quality related issues, but by the *Project Manager* for other issues. If the ground investigation is only a part of the *works*, the *Supervisor* or the *Project Manager* may find it appropriate to appoint delegates (under Clause 14.2) to act as the Investigation Supervisor in accordance with the Specification. In an ECSC contract, the *Client* may find it appropriate to appoint a delegate (under Clause 14.5) to act as the Investigation Supervisor in accordance with the Specification.

3.3 Quality Management

The Specification 3.3 includes:

'When specified in Schedule S1.8.2, all work shall be carried out in accordance with a quality management system(s) established in accordance with BS EN ISO 9001:2015, BS EN ISO 14001:2015 and BS OHSAS 18001:2007/BS ISO 45001:2018.' In the ECC and the ECSC the *Contractor* must comply with the Scope (clause 20.1). If the words in Specification 3.3 are included, there is no need to say more about quality management.

In addition ECC Clause 40.1 states:

'The *Contractor* operates a quality management system which complies with the requirements stated in the Scope'

further underlining the obligation of the *Contractor* to operate the quality management system.

3.4.3 Risk assessment and method statements.

Clause 3.4.3 of the Specification incudes:

'At tender stage or during early Contractor involvement in the project the Client shall provide a Designer's Risk Assessment or (safety) risk register (including mitigation) to the Contractor'.

Whilst this is true, the Scope should not state what is to be done 'at tender stage' (ie prior to award). However, the Designer's Risk Assessment or (safety) risk register (including mitigation) should be provided to tenderers in a single stage tender process or passed to the *Contractor* during 'Stage One' of an early *Contractor* involvement (ECI) process. Note that neither the ECC nor the ECSC include a 'Designer's Risk Assessment' or a'(safety) risk register'.

In the ECC (but not the ECSC) there is an entry in the Contract Data part one 'The following matters will be included in the Early Warning Register.'

This has the same effect as an 'early warning' after award of contract. It gets the item on the Early Warning Register and so on the agenda for early warning meetings. It does not



change risk allocation. It may be appropriate to include in this list some of the matters on the Designers Risk Assessment or (safety) risk register if they could affect time, cost or quality. If the (safety) risk register (including mitigation) includes things that the *Client* has decided it wants the *Contractor* to be required to actually do, then these requirements must be included in the Scope.

Clause 3.4.3 of the Specification also states:

'Pre-construction Information (in accordance with CDM 2015), including a Desk Study and field reconnaissance information, shall be provided by the Client to the Principal Designer and Designer.'

This part of the Specification only applies to contracts in the UK. The Pre-construction Information is not part of the contract but is required by CDM to be provided by the *Client* to bidders. This would normally be provided as an appendix to the instructions to tenderers. It may be appropriate for some or all of the factual Pre-Construction Information to be included in the contract as Site Information.

Clause 3.4.3 of the Specification also states:

'Prior to the start of site operations, the Contractor shall assess the available information and provide to the Investigation Supervisor developed site-specific risk assessments and method statements covering all aspects of their work to be carried out.'

The Management of Health and Safety at Work (Amendment) Regulations 2006 (The 'Management Regulations') require the Contractor to carry out a risk assessment and design a safe method of working. However, neither the Management Regulations or the Construction (Design and Management) Regulations 2015 (CDM) explicitly require a 'method statement'. However, in the UK it has become standard practice for a contractor to prepare method statements for its operations showing how they will be carried out safely.

In the ECC (but not the ESCS) there are detailed requirements of things to be included in the programme (Clause 31.2 and 32.1). Clause 31.2 requires the ECC programme to include:

'• for each operation, a statement of how the *Contractor* plans to do the work identifying the principal Equipment and other resources which will be used'

The ECC's 'statement of how' is not intended to be a full 'method statement' of how the *Contractor* plans to carry out the works but should be sufficiently detailed for the project manager to understand the programme.

If the *Client* requires detailed method statements under an ECC or ECSC (in addition to the statements provided as part of the programme (in the ECC)), then the Scope must include:

- what is required to be submitted by the Contractor,
- whether such documents are to be submitted to the *Project Manager / Client* for information or for acceptance,



- if for acceptance then whether the *Contractor* has to obtain acceptance from the *Project Manager/ Client* prior to doing the work and
- in the ECC, if for acceptance, then to follow the standard procedure in the contract, what would be acceptable reasons for the *Project Manager* to not accept a method statement.

Those 'reasons' might include that 'the method statement does show how the work is to be carried out safely'.

Note that if the *Project Manager/ Client* is required to accept such method statements, they must have the competence – or have access to competent parties to do such a review and acceptance.

The *Client* must decide if there is merit in requiring the *Project Manager* (ECC) or *Client* (ECSC) to review and accept the method statements.

It is considered good practice to require the *Contractor* to name (as a key person in the case of the ECC) its 'Temporary Works Coordinator' and require all method statements to be approved by that Temporary Works Coordinator.

3.5.1 Utilities

Clause 3.5.1 of the Specification includes:

'The Client, or the Designer where instructed by the Client, shall supply all available utilities drawings and documentation with the Pre-construction Information, as required by CDM 2015. The positions of all known mains, utilities, drains, sewers, tunnels and pipelines owned by statutory undertakers, public authorities and private individuals, shown on the drawing(s) detailed in Schedule S1.7, are based on information extracted from the records of the various bodies and shall be regarded as approximate only.'

The Pre-construction Information is not part of the contract but is required by CDM to be provided by the *Client* to bidders. This would normally be as an appendix to the instructions to tenderers. As noted in section 0, the drawings in Schedule S1.7 showing the location of utilities should be Site Information rather than Scope.

3.5.2 - 3.5.8 Other information

These sections cover factual information relating to:

- 3.5.2 Hazardous ground and land affected by contamination
- 3.5.3 Protected Species
- 3.5.4 Notifiable and invasive species
- 3.5.5 Natural and anthropogenic cavities
- 3.5.6 Archaeology
- 3.5.7 Designated sites
- 3.5.8 Past ground investigations or water wells



In each case the Specification requires information to be included in the Schedules.

In each case this information should be included in the Site Information.

4.3 Site establishment

Clause 4.3.1 of the Specification includes:

'The Designer shall provide an initial estimation of the plant, equipment and utilities necessary to complete the works and include itemisation in Bill A of the Bill of Quantities.

The Contractor shall review the minimum itemisation provided by the Designer in Bill A and identify any additional such items to complete the works. Where additional items or quantities are identified i.e., independent post-delivery pre-use inspections of drilling machines, the Contractor shall make appropriate amendments to the proposed Bill A items and quantities and add additional contract-specific items, if required.'

The 'Designer' is not defined in the Specification but is clearly the person designing the required investigation and writing the Scope. The text here is unusual. It will normally be left to the *Contractor* to determine the 'plant, equipment and utilities necessary to complete the works'. If the Designer has done this in the Bill of Quantities then, as part of the tender process the *Contractor* might propose amendments to the Bill of Quantities but it is most unusual for the *Contractor* to be allowed to change the Bill of Quantities in this way.

To enable this, it would be necessary to define a procurement process that allowed for changes to the bill to be proposed by tenderers and reviewed by the *Client*.

The scope should not include requirements relating to the tender stage (ie prior to award), so this section should not form part of the Scope.

4. Schedules within the Specification

The Schedules are specific contract-specific information which are stated to 'form part of the Specification' (Clause 1.1).

The Schedules are:

- Schedule 1. Information and site-specific requirements
- Schedule 2. Exploratory holes
- Schedule 3. Investigation Supervisor's facilities
- Schedule 4. Specification amendments
- Schedule 5. Specification additions.

Some elements in the Schedules risk overlapping specific data in an NEC Contract.

Schedule 1. Information and site-specific requirements

S1.1 Name of Contract.



In the NEC there is no specific place for the 'Name of the Contract' and 'contract' is not a defined term. It will be logical, however, to have the 'Name of the Contract' here consistent with the entry for the *works* in Contract Data part one.

S1.6 Geology and ground conditions.

The guidance for the completion of this section states:

'A summary description is required of the geology and ground conditions expected to exist at the site. This should be based on information obtained from the British Geological Survey (BGS) website (https://www.bgs.ac.uk), and from BGS maps and memoirs, other readily accessible publications and records, and any previous investigations. Difficult ground or groundwater conditions, mine workings, and so on should also be noted. Where hazardous or contaminated ground is known to exist, full details must be made available'.

In NEC this information is Site Information and not Scope.

S1.7 Schedule of drawings (and documents).

This Schedule must separate

- those drawings which are Scope from
- those drawings which show factual information about the site including utilities and which, in NEC, are Site Information.

The relevant documents must be included in either Scope or Site Information. S1.8.3 Project management, supervision and execution personnel.

This section of the Specification is for the requirements of a contractor's team.

In both ECC and the ECSC the *Contractor* is required to comply with these requirements as they will be included in the Scope.

The ECC (but not the ECSC) has the concept of 'key people'. The jobs of those key people can be included by the *Client* in the Contract Data part two along with the minimum required qualifications and/or minimum experience for the jobs, The bidder then offers stated people for the roles. The *Contractor* is then required by Clause 24.1 to provide the named key persons or propose alternatives with equivalent qualifications and experience.

S1.8.5 Hazardous ground, land affected by contamination and notifiable and invasive weeds.

\$1.8.6 Additional information on utilities not shown on Contract drawings.

\$1.8.7 Known/suspected mine workings, mineral extractions, etc.

S1.8.8 Protected Species.

S1.8.9 Archaeological remains.

In NEC all these items (S1.5.5 to S1.8.9) are Site Information and not Scope.



5. Documents in the NEC contract

Scope

Most of the Specification will be included as part of the Scope of an NEC contract. However, the NEC document needs to be clear that the following parts of the Specification's Schedule 1 are Site Information and not Scope.

- S1.6 Geology and ground conditions.
- S1.7 Schedule of drawing(s) (and documents) the subset of those drawings (and documents) that are factual information about the Site. Hence the list of drawings should be clearly split between Scope and Site Information.
- S1.8.5 Hazardous ground, land affected by contamination and notifiable and invasive weeds (Clauses 3.5.2 and 3.5.4).
- S1.8.7 Known/suspected mine workings, mineral extractions, etc. (Clauses 3.5.2 and 3.5.5).
- S1.8.8 Protected species.
- \$1.8.9 Archaeological remains.

The Specification document also gives guidance on the required Bill of Quantities. In the NEC, the pricing document is separate from the Scope. The pricing document is

- an Activity Schedule in an ECC Option A or C
- a Bill of Quantities in an ECC Option B or D and
- a Price List in an ECSC contract.

Hence the Bill of Quantities that is provided as part of the Specification and used to produce the pricing document pre-contract and must not be included in the NEC's Scope.

In writing the NEC's Scope note that many issues, e.g. welfare facilities and quality management are already covered by the Specification. The additional Scope should not duplicate provisions that are already in the Specification.

The ECSC was developed with the intention that the Parties could write in their requirements in the NEC's standard document. However, the document may be put together electronically, in which case it is essential that the Scope and other documents (Price List, Site Information) are adequately identified as part of the contract.

Site Information

The Site Information should include the information included in parts of the Specification identified above.

In addition to the material identified in the Specification, there may be other Site Information that should also be included in the document called 'Site Information'.

Payment documents

In the NEC, the pricing document is separate from the Scope. The pricing document is



- an Activity Schedule in an ECC option A (priced contract with activity schedule) or Option C (target contract with activity schedule)
- a Bill of Quantities in an ECC option B (Priced contract with bill of quantities) or
 Option D (target contract with bill of quantities) or
- a Price List in an ECSC.

For most contracts for ground investigation a Bill of Quantities is most likely to be appropriate. This is clearly why a model Bill of Quantities is included within the Specification. In an ECSC contract, the Bill of Quantities is used to create the Price List

ECC Bill of Quantities

If a Bill of Quantities option is chosen, the Bill of Quantities needs to be prepared by the *Client* based on the model of the Bill of Quantities in the Specification. The Specification gives standard words for the preamble to the Bill of Quantities and suggestions relating to the items in the Bill of Quantities. These standard words should be included as appropriate, and added to if necessary, as a preamble to the Bill of Quantities.

The entry in the ECC Contract Data part one for the *method of measurement* should be 'the preamble in the bill of quantities.'

Note that in clause 60.6 there is a compensation event if:

'The *Project Manager* gives an instruction to correct a mistake in the Bill of Quantities which is

- a departure from the rules for item descriptions or division of the work into items in the *method of measurement* or
- due to an ambiguity or inconsistency.'

Clearly the Bill of Quantities must be prepared and checked carefully.

Note that in an ECC contract if the Scope is changed the default process to evaluate the effect on the 'Prices' is based on the *Contractor*'s Defined Cost (clause 63.1). It does not automatically use the rates for items in the Bill of Quantities. However, under clause 63.2, the *Project Manager* and the *Contractor* can agree instead of Defined Cost to use any 'rates or lump sums'. Therefore the *Project Manager* and the *Contractor* may choose to agree to use the rates in the Bill of Quantities.

ECSC Price List

The Price List needs to be prepared by the *Client* based on the model of the Bill of Quantities in the Specification. The Specification gives standard words for the preamble to the Bill of Quantities and suggestions relating to the items in the Bill of Quantities. The ECSC's method and rules used to compile the Price List should refer to the preamble in the Bill of Quantities.

Note that under ECSC 14.3 '

'The Client gives an instruction to correct a mistake in the Price List which is



- a departure from the method and rules stated in the Price List and used to compile it or
- due to an ambiguity or inconsistency.'

And this is a compensation event under 60.1(12).

Clearly the Price List, like all other parts of the draft contract must be carefully prepared and thoroughly checked.

Note that in an ECSC contract (unlike in the ECC contract) if a compensation event (e.g. from a change in Scope) only affects the quantities of work shown in the Price List the rates in the Price List are used to assess the change to the Prices (clause 63.1). Defined Cost (the default process for assessment in ECC) is used only if the compensation event does not 'only affect the quantities of work shown in the Price List' (clause 63.2).

6. Other issues

Rates for people

The Bill of Quantities included within the Specification includes under 'A20 Provide project management, supervision and execution personnel' a list of names and roles calling for a daily rate from the bidder.

The *Client* will decide whether or not this is appropriate or whether the bidder should include for people in the rates for other items.

If such rates are included, they will be used to pay for the work in the Scope. However, the assessment of people costs for compensation events is made using the 'People Rates' plus the Fee for both ECC Option B and the ECSC. The *Client* should logically use the same categories of staff for the People Rates as are included in part A20 of the Bill of Quantities of the Specification. The *Client* might require in its instructions to tenderers that the People Rates + Fee are equal to the rates given in the Bill of Quantities.

Expenses

The Bill of Quantities within the Specification has items (M11-M14) allowing for certain stated expenses to be paid. The Bill of Quantities will include an estimate of the quantity of each type of expense. Any expenses in the Bill of Quantities will therefore be included in the Price for Work Done to Date when they are measured.

ECC

The ECC has limited reference to expenses – but any included in the bill of quantities will be included in the Price for Work done to Date when they are measured.

ECC Option B includes the 'Short Schedule of Cost Components (SSCC), which defines what is included in Defined Cost. Defined Cost is used only for compensation events.



ECSC

The ECSC has no reference to expenses – but any included in the Price List will be included in the Price for Work Done to date when they are measured.

Physical conditions

The *Client* should check that the standard compensation events are appropriate for the works and decide if any further compensation events are required to reflect any risks that the *Client* wants to retain so that the *Contractor* does not have to price the risk of the event happening.

ECC

Additional compensations events can be added in the Contract Data, but any changes to standard compensation events must be made by additional conditions of contract (Option Z).

ECSC

Additional compensations events or changes to standard compensation events must be included in the 'additional conditions' at the end of the *Client*'s Contract Data.

People

Clause 2.3 of the Specification includes:

'Categories of personnel who may be required by the Contract are as follows:

- (a) Technician
- (b) Graduate ground engineer
- (c) Experienced ground engineer
- (d) Registered Ground Engineering Professional
- (e) Registered Ground Engineering Specialist
- (f) Registered Ground Engineering Adviser'

S1.8.3 of the Specification deals with project management, supervision and execution personnel. The NEC's means of specifying requirements for particular roles is covered in the comment on Specification part S1.8.3.

7. Defined Terms

8. Definitions

The following text is required as a preface to the ICE Specification for Ground Investigation, under the heading of 'Preface to the Specification'. It should state:

Terms in the Specification are replaced with the following.

ECC and ECSC

'Contractor' means Contractor.

'Contract 'means this contract.

Any requirement for 'approval' by or 'agreement of' the Investigation Supervisor or the Employer means 'acceptance'.



ECC

'Employer' means *Client*.

'Investigation Supervisor' means "Supervisor" for actions which the Supervisor carries out in the contract, and 'Project Manager' for other actions.

ECSC

'Employer 'means Client.

'Investigation Supervisor' means Client.

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