

Unforeseen ground conditions under NEC3 ECC

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Introduction

The NEC3 construction contract provides for compensation events arising under unforeseen “physical conditions” within the Site, which include issues related to ground conditions, such as contamination or underground obstructions.

Although many NEC3 contracts and subcontracts, within their amendments / Z-clauses, deal with the above in more detail (sometimes introducing clauses where the Contractor is deemed to have allowed for all risks associated with ground conditions or underground obstructions), it is interesting to explore the way the NEC3 ECC standard conditions provide for such events.

Which physical conditions qualify as compensation events

In accordance with clause 60.1(12), a compensation event arises if a 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 for the Contractor to have allowed for them.

Only the difference between the physical conditions encountered and those for which it would have been reasonable for the Contractor to have allowed for, is taken into account when assessing the compensation event (an example applying to a marine piling project is provided hereinafter).

Clause 60.2 goes further as regards the “judging” of physical conditions. It states that the Contractor is assumed to have taken into account

- the Site Information and publicly available information referred to therein
- information obtainable from visual inspection of the Site
- other information which an experienced Contractor could be reasonably expected to obtain

The NEC3 ECC Guidance Notes suggest that introduced Z-clauses could state “boundary” conditions to enable contractors to tender on a common basis, allowing for the occurrence of physical conditions within those boundary conditions in their pricing. The boundary conditions would cover matters such as soil characteristics, rock/soil interface, groundwater levels, permeability limits and overbreak in rock excavation.

Finally, clause 60.3 states that if there is ambiguity or inconsistency within the Site Information, including information referred to in it, the Contractor is assumed to have allowed for the physical conditions more favourable to doing the work, i.e. the Contractor is encouraged to assume the lower-risk scenario if there is inconsistency or ambiguity within the Site Information.

The justification and assessment principles of a compensation event arising under unforeseen ground conditions are shown in the following example. It is assumed that the compensation event is notified by the Contractor after the delay occurred and the work was done, within the time frame allowed by the Contract in accordance with clause 61.3. For brevity, the processes of early warning, quotation submission, acceptance and implementation are not discussed.

UNFORSEEN GROUND CONDITIONS EXAMPLE: MARINE PILING PROJECT

A marine piling contractor submits a tender regarding the installation of mooring monopiles for the construction of a new berth, under an NEC3 ECC, Option A contract (“the Contract”).

The Site Information includes a Technical Report, undertaken by the Employer’s consultants as part of the site investigation, with results of a number of boreholes close to the monopiles’ locations albeit some of them did not penetrate enough to reach rockhead.

The Technical Report shows:

- ground profiles for the monopile locations where rockhead was reached; and
- “assumed” ground profile for the rest; the assumptions are based on the successful boreholes (where penetration reached the rockhead)

The assumed ground profile specifies level of rockhead at -20m CD, maximum rock Uniaxial Compressive Strength (UCS) of 18 MPa and Rock Quality Designation (RQD) 50% from rockhead level downward to the design toe of the monopile.

An older site investigation on the landside which is mentioned in the Technical Report indicates much harder rock (UCS 60MPa and RQD 100%). Due to the fact that those boreholes were further away from the piling area, the old report is not taken into account for the ground profiles.

The Contractor, in its submitted tender price, allows for drilling equipment suitable to rock strength in accordance with the Technical Report ground profiles, and estimates the duration of the works based on the expected output of a suitable drilling rig.

Notification of the compensation event

The day that the Contractor commences drilling at the first of the locations with assumed ground profile, although it encounters the rockhead at the level shown, the drilling is much slower than expected and the drilling equipment gets damaged after having reached half of the design depth for the rock socket. It contacts the plant supplier, who advises that the rock is probably harder than estimated and different drilling tools should have been used. The Contractor issues an early warning to the Project Manager and takes any necessary mitigation measures for the pending stand-down period.

The supplier arranges the replacement the drilling tools with more suitable – however the Contractor incurs the costs of replacement / upgrade and suffers delay up to the delivery of the new tools.

When drilling is resumed, the Contractor takes samples which it sends to the laboratory. The results reveal UCS values of approx. 45MPa combined with RQD at 100% from rockhead level downward.

Following completion of drilling with the upgraded equipment, the Contractor notifies the Project Manager of a compensation event in accordance with clause 61.3 for the additional cost and delay due to the much harder rock encountered. The Contractor submits that in accordance with clause 60.1 (12) it would have been unreasonable to allow for the such ground conditions, as it based the tendered price on the ground profiles of the Site Information.

The Project Manager argues that, given the inclusion of the older site investigation results within the Site Information, an experienced Contractor would have anticipated that harder rock could be encountered and therefore would have allowed for different (and more expensive) drilling equipment in its price, in which case the output would remain uninterrupted and the additional costs and delay avoided.

The Contractor replies that pursuant to clause 60.3, upon pricing the works, took into account the ground conditions which were more favourable to doing the work, i.e. the assumed ground profile that was estimated by the other boreholes in close proximity (and promoted in the current site investigation) and not the older site investigation on the landside.

The Project Manager accepts the Contractor’s reasoning and the event as a compensation event and instructs the Contractor to submit its quotation.

Assessment of the compensation event

a. Assessment of delay

The Accepted Programme shows that the Contractor has allowed a total of 7 days for each monopile as follows:

- 1 day for towing from the previous location / setting up of jack-up barge into position, and piling gate preparation
- 1 day for driving the external casing to rock level and removal of internal soil plug
- 2 days for drilling the rock socket
- 1 day for pitching of mooring pile, inspection by the Supervisor and grouting / sand filling
- 1 day for grout curing and removal of external casing
- 1 day programme float

Based on the site records, the period from breakdown until recommencement of drilling was 6 days. The Contractor with the new tools completed the remaining rock drilling in 2 days. The completion of the monopile installation was delayed by a total of 8 days (6+2).

The compensation event delay is assessed taking into consideration the following:

- The Contractor had excavated half of the rock socket depth before the breakdown, so effectively utilised 1 day of the 2 days as per the conditions originally allowed for by the Contractor
- The float (1 day) allowed in the programme are absorbed

Therefore, the delay assessed is 8 days – 1 day for remaining drilling as per previous conditions – 1 day float = 6 days.

As a result, planned Completion is delayed by 6 days and hence the Completion Date is also moved by 6 days in accordance with clause 63.3 – the Contractor's terminal float is not affected.

b. Assessment of cost

The cost impact is assessed as the Defined Cost for the work already done plus the Fee (cl. 63.1). The Defined Cost in accordance with the Shorter Schedule of Costs Components (SSCC) comprises the following:

- People; the additional cost of people (including management) due to the breakdown such as any required overtime, standing down time and procurement within the Working Areas.
- Equipment; down-time for the 6 days (taking into account any off-hiring or stand-down discounts by the suppliers) and additional costs due to the breakdown, such as:
 - Collection of damaged and delivery of new tooling by the supplier
 - The hire cost of the new / upgraded tooling over and above the cost allowed for by the Contractor for the remaining 1-day drilling shown in the Accepted Programme
 - The additional cost of hiring the new tooling for the remaining period of the works (it is highly unlikely that the Project Manager would instruct the Contractor to revert to tooling of lower capacity for the remainder of the works)

- Plant and Materials; materials purchased for the repair of the damaged tooling and the cost of the samples / testing (unless required by the Contract)
- Charges; people's overheads as stated in Contract Data Part 2, cancellation charges, additional consumables provided by the Contractor for the Project Manager's and Supervisor's office (if applicable) for the 6 days and any additional specialist services required
- Manufacture and fabrication costs for the new tooling, provided that it is wholly or partly designed specifically for the works outside the Working Areas (e.g. supplier's workshop)
- Design; if required and resulting from the new ground conditions – rates and overhead percentage as stated in Contract Data Part 2
- Insurance; any of the above costs that the Contractor receives payment for from the insurance or that the Contractor was required by the Contract to insure are deducted

The Fee (direct fee and subcontracted fee where applicable) as stated in Contract Data Part 2, is applied to the above.

Conclusion

The way the NEC3 ECC treats the unforeseen physical (including ground) conditions seems to be consistent with the general philosophy of the NEC3 compensation event mechanism which is to bring the Contractor to the same position which it would have been but for the compensation event. This approach is admittedly more favourable than other contract forms (with the exception of FIDIC Red and Yellow Books) and the common law position.

For assistance, you can contact us at info@pronea.co.uk

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