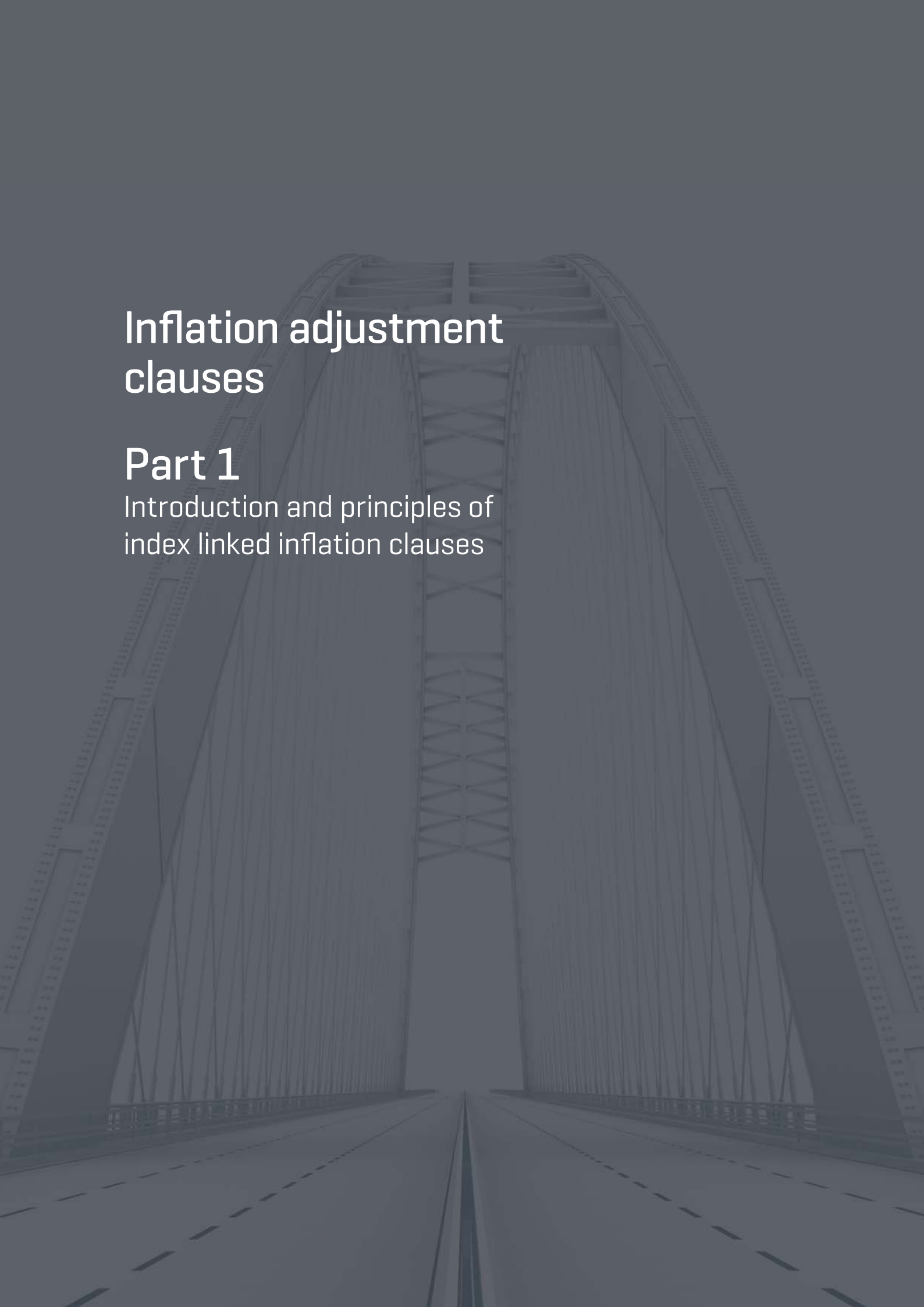


BCIS[®]

Inflation adjustment clauses





Inflation adjustment clauses

Part 1

Introduction and principles of index linked inflation clauses

Inflation indices

Inflation is, in former US Defence Secretary Donald Rumsfeld's term, a 'known unknown'. We know that prices tend to change over time but we do not know by how much or when. Therefore, when considering future expenditure this uncertainty is a risk.

The magnitude of the risk will be exacerbated by the length, size and location of a project. The longer the project the greater the uncertainty, the larger the project the greater the monetary value of the risk, and in some parts of the globe prices are more volatile than in others.

The most common method of allowing for inflation is by the use of indices. In the UK the most commonly used indices are the price adjustment formulae indices (PAFI) prepared by the Building Cost Information Service (BCIS) of RICS.

Over the past year BCIS has been reviewing the PAFI indices used in civil engineering contracts within the industry.

A couple of notes on terminology:

- Inflation adjustment clauses are referred to by different names in different contracts – fluctuations, variation of price, price adjustment for inflation, etc. – I have referred to them in this article as 'inflation adjustment clauses'.
- Inflation, strictly speaking, is increases in costs as distinct from deflation, which is falling prices. However, inflation adjustment clauses in contracts are designed to deal with both. Rising prices are the norm but with recent falls in fuel and commodity prices the impact of an inflation adjustment clause would be that the client receives the benefit of the savings rather than the contractor.

Why allow for inflation?

To ensure the best price on a contract, the risk for inflation should be taken by the party best able to manage it. Inflationary risks derived from the local market can probably be managed by a contractor and their supply chain, but the underlying inflation caused by wider pressures from the outside construction and global markets probably cannot.

So who should take the risk of inflation on a construction contract?

To quote from Crossrail's procurement strategy:

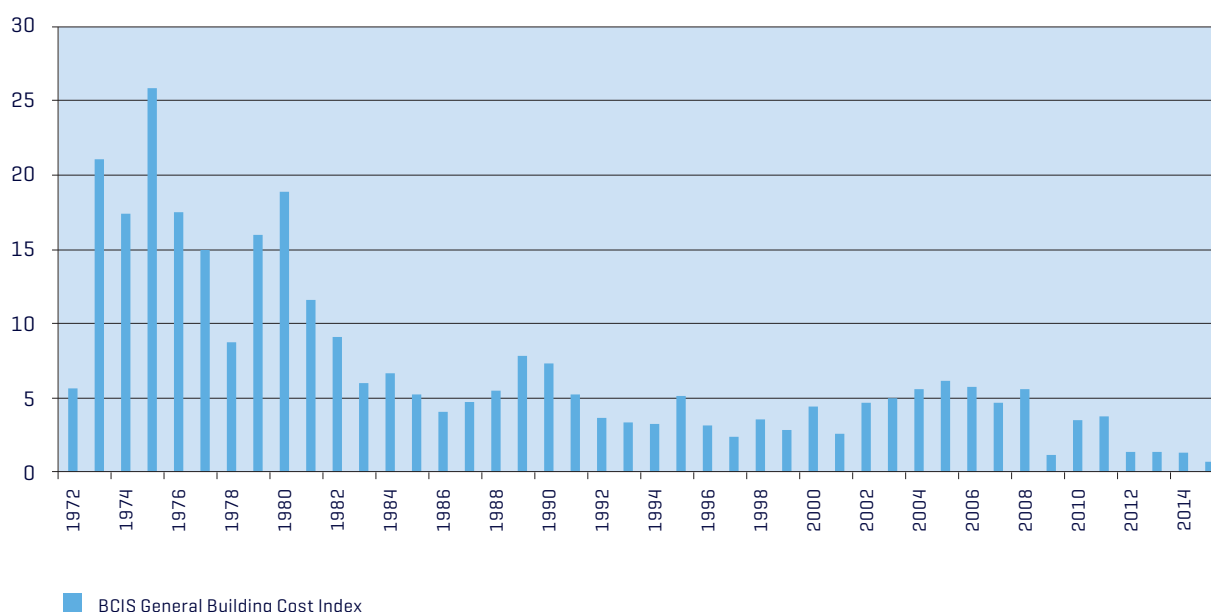
"It is considered that the achievement of best affordable value will be supported by a sensible and fair allocation of risks between the parties to the contracts. Requiring contractors to take responsibility for risks which they cannot assess or manage would be likely to result in either high risk premiums, or commercial pressures caused by insufficient provision."

Who is best able to 'asses and manage' the risk of inflation will vary from contract to contract depending on the nature of the client, the contractor and the work.

When should inflation adjustment clauses be considered?

- **Periods of high or uncertain inflation:** that the formulae method of price adjustment was developed in the 1970s is no surprise when you consider the levels of inflation at that time. **Figure 1** shows that construction costs (labour, material and plant) rose on average over 16% per annum in the period 1972 to 1980. Over the past 10 years (2006–15) the average was less than 3%. At the moment, when some underlying costs are falling, the client might consider that it should take the risk of

Figure 1: BCIS General Building Cost Index (Annual percentage change)



this benefit rather than asking contractors to build it into their prices. **Figure 2** shows the recent trends in DERV, steel reinforcement, electrical goods and bricks.

- **Big projects:** where the impact of inflation is significant in monetary terms. ‘Big’ needs to be judged in relationship to the size of the parties.
- **Long contracts:** the longer the contract the more difficult it is to predict the impact of inflation. This will apply both to projects that will take a long time and long term contracts such as framework contracts and maintenance contracts.
- **Complex contracts:** where different contractors will work at different periods during the project.

How to allow for inflation

Before the introduction of the price adjustment formulae, inflation adjustment clauses attempted to reimburse contractors for the actual changes in their resource costs. Contractors were asked to list in their tender the current prices of the resources that they wanted to be adjusted.

One of the drivers for the introduction of formulae price adjustment was the cost to both contractors and clients of administering the old contracts, which, despite the level of detail involved, resulted in imprecise recovery and were open to abuse.

The formulae method of inflation adjustment was introduced due to industry demand for a speedy yet credible way of calculating and reimbursing fluctuations in costs.

The method relies on resource cost indices for trades and individual resources. These can be weighted to represent the resources on a particular project so that the impact of inflation can be modelled. This allows the contractor to provide the best price in their tender confident that the inflation reimbursement will reflect their costs.

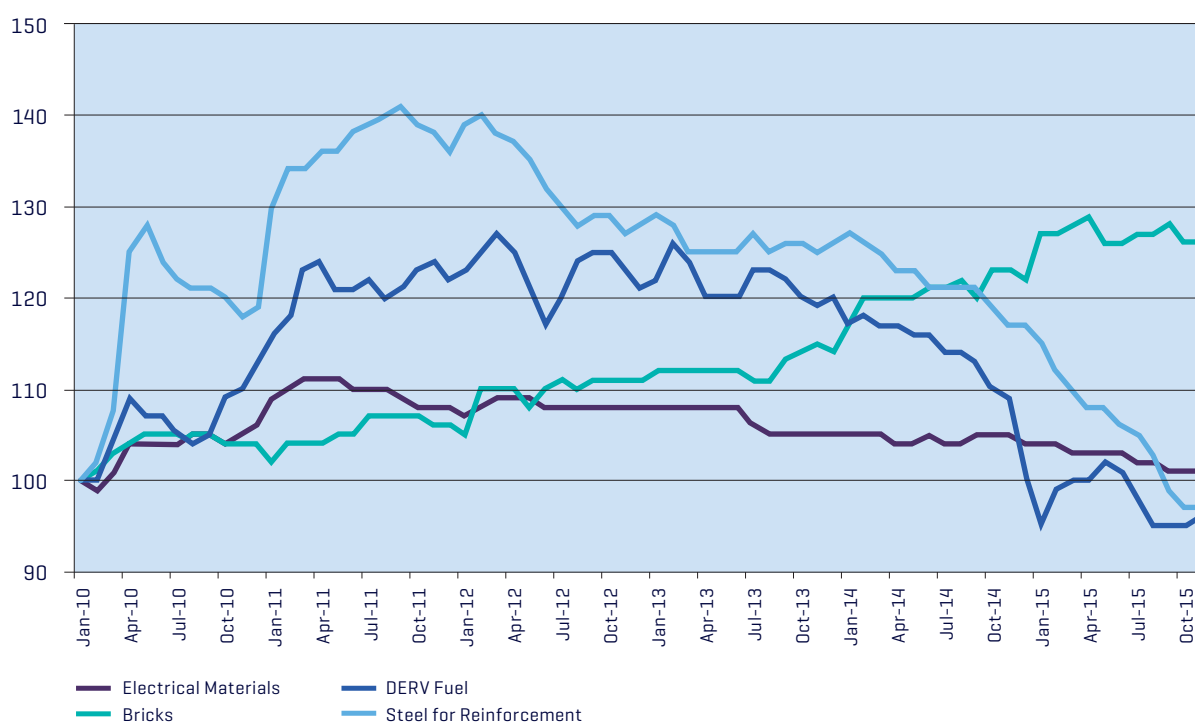
The original guide to the formulae stated:

“There is a fundamental difference between calculating price adjustment (up or down) on a range of actual costs and calculating price adjustment by formula methods. With actual costs, price adjustment is a net amount calculated from wages sheets, invoices and the like in accordance with the provisions of the contract. Price adjustment is applied only to those materials on an agreed basic list, and there is usually no specific provision for the adjustment of overheads and profit.

Formula price adjustment is calculated from the movement in index values irrespective of the actual extra costs (or savings) incurred by the contractor. Individual costs included in the build-up of a tender are not used in the price adjustment calculation. There is no need, therefore, to specify the materials subject to adjustment, no need to submit a list of basic materials prices and no need to take into account future changes in wages.

It is important that users of formula methods of calculating price adjustment should appreciate that it does not purport to reflect with accuracy every minor change in construction costs or resource prices. It is a method designed to reasonably compensate the contractor for increases and reduce the delays and labour associated with traditional methods of payment.

Figure 2: Material cost inflation – DERV, Electrical



The quantity surveyor or engineer should not expect their task to be translated into mere mechanical activity. Professional skill and judgment are required in the use of the formula methods.

The contractor can take into account any advantages or disadvantages which they foresee in using the formula methods when building up their tender.”

When the formulae method was introduced, the weightings of the indices were linked to items in the bill of quantities so that they were applied differently at each valuation. However, the alternative single index method has become the standard practice so that the weightings of the indices are set, usually by the client, at the outset of the contract and applied to all payments.

Spending time choosing the right mix of indices, and discussing it with the contractors where there is early contractor involvement or competitive dialogue, will help in ensuring that the contractors are comfortable that they are protected from underlying inflation and so offer the best current price. As **Figure 2** illustrates, the cost of resources can move in very different ways.

As the practice of using indices in inflation adjustment clauses has become standard practice, the choice of indices has proliferated, not always wisely. The point of the indexation is to match the indices as closely as possible to the work to be carried out.

Therefore, using a general inflation index such as the Retail Prices Index (RPI) or applying a general construction index to specific sectors such as the use of the all new construction output price index (COPI) to water projects, imposes a double risk for the contractor to account for both the risk of the inflation measured by the index and the risk of inflation in his actual costs.

The same applies to the practice of main contractors applying an all trades index to a specific subcontractor. Applying an inappropriate index or indices will never achieve the desired effect of attracting the best prices.

BCIS has published six golden rules for choosing an index:

1. Be clear about what you want to measure and how you want to apply it.
2. Choose an index that is measuring the costs that most closely match (1).
3. If you are using the index linking something in a contract or agreement, be clear that it meets your needs, particularly in respect of:
 - frequency of the publication (monthly, quarterly, annual)
 - updating and revisions policy
4. Understand the inputs to the index and the calculation methodology.
5. Read the notes and definitions.
6. Never ever choose an index because of its past performance.

Depending on the procurement method the index can be applied either to the contract sum or the target cost.

Price Adjustment Formulae indices

When the formulae method of calculating fluctuations in contracts was introduced in 1973, the Price Adjustment Formulae Indices were produced to facilitate its implementation.

The indices were set up under the aegis of the National Economic Development Organisation (NEDO). The series were devised by two committees, one for civil engineering under the chairmanship of J W Baxter and one for building under J G Osborne. As a result, the Price Adjustment Formulae Indices are colloquially referred to as the NEDO indices, the ‘Baxter Indices’ (civil engineering) and the Osborne indices (building).

The indices were initially calculated by the Property Services Agency (PSA). The responsibility for the indices followed the PSA successor departments responsible for construction price and cost indices and other statistics, latterly the Department for Business, Innovation and Skills (BIS). In 2009 BCIS took over the responsibility for the indices from BIS.

The indices are intended to represent the underlying inflationary pressures not the actual costs on a particular project. However, the range of indices is intended to allow those underlying inflationary pressures to represent the resources being used on a project.

The indices represent the movement in factory gate prices and nationally agreed wage awards and are for national (UK) application.

They are not intended to represent the effect of market pressures, national or local, on prices from subcontractors, merchants, factors, etc. The management of these is the commercial concern of the contractor.

The indices are currently published online as four series:

- building
- specialist engineering
- civil engineering
- highways maintenance.

The indices used in civil engineering contracts (civil engineering, specialist engineering and highways maintenance) have undergone an industry review over the past 12 months involving clients, contractors, subcontractors, materials suppliers, consultants, the government, the Office of National Statistics and BCIS.

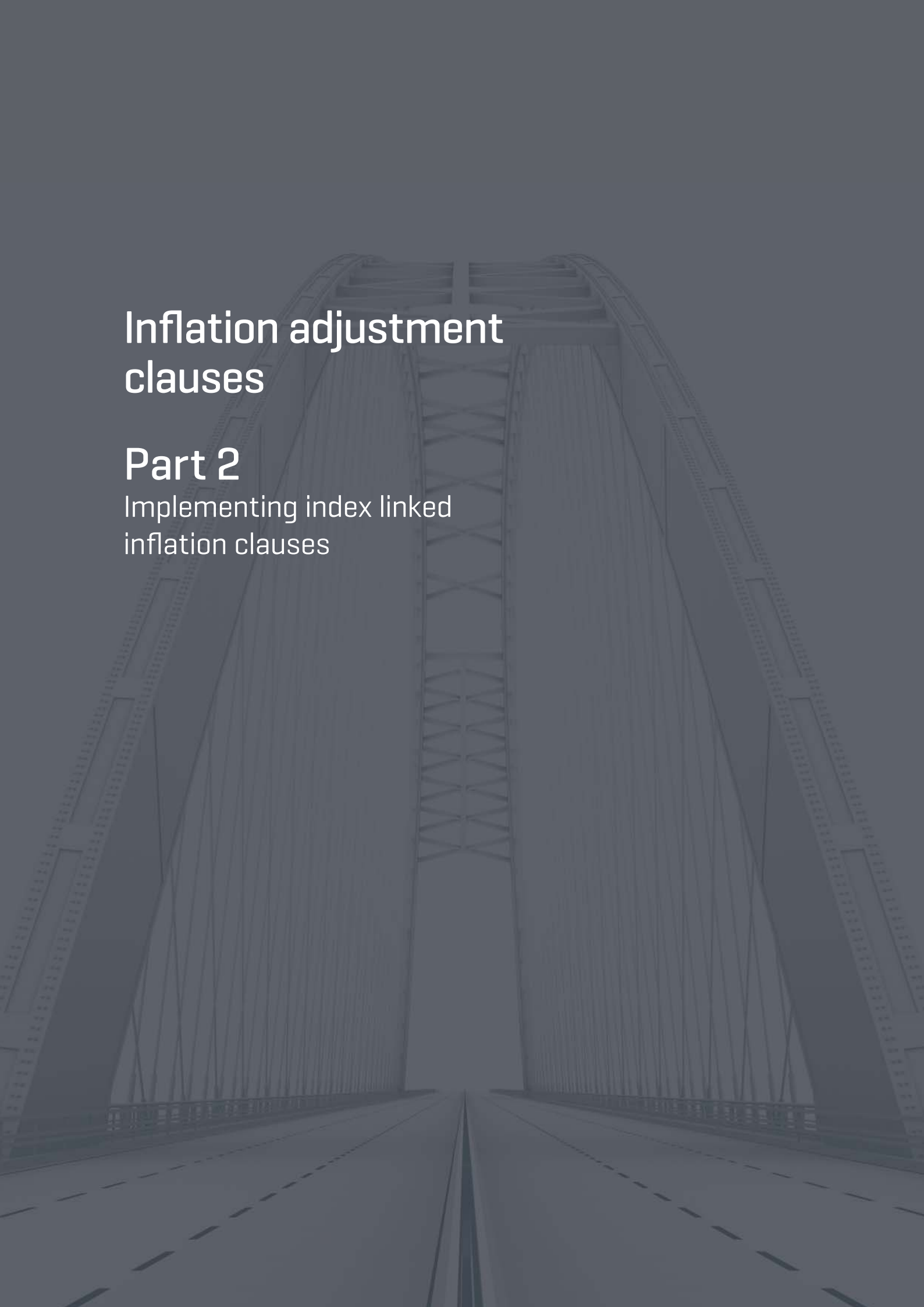
The new series will be available early in 2016.

More information

To subscribe to the Price Adjustment Formulae Indices: bit.ly/1WNSx3a

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Inflation adjustment clauses

Part 2

Implementing index linked inflation clauses

Joe Martin looks at how index-linked inflation clauses are applied, using Crossrail's procurement strategy as a case study.

Indexed linked inflation adjustment

Indexed linked inflation adjustment clauses provide a simple and transparent method of calculating and reimbursing fluctuations in the underlying costs on a project. They allow contractors to price and manage a contract knowing that they do not need to price in the risk of inflation.

Such clauses can be used on all types of procurement but will be applied differently depending on the contract:

- On design and build and traditional lump sum contracts the agreed tender price will be adjusted for inflation in valuations for stage payments
- On target cost contracts the target cost is adjusted for inflation
- On framework and term contracts the value of the individual contracts is adjusted.

When index linked contracts were first introduced in the 1970s, lump sum contracts based on bills of quantities were the norm and the practice was to allocate all the bill items to an index so that the inflation adjustment in each stage payment reflected the mix of work carried out in that period.

From the start, however, an alternative method was adopted by some clients where the mix of indices was used to calculate a single index based on predetermined weightings. This latter method has become the standard approach with the contract identifying the indices to be used and their weighting and this is applied in each valuation.

Other clients have adopted the unfortunate practice of applying single, non-construction, indices such as the Retail Prices Index (RPI). However, this creates a double risk to the contractor. The introduction of these risks will result either in risk premium being built into the initial price or pressures on the contractor due to insufficient provision for inflation.

This practice usually results from funders or regulators reimbursing based on RPI or similar and this inflation mechanism being passed straight down the layers of the supply chain; the perception is that this does not subject funders and regulators to any risk, regardless of the fact that each link in the supply chain also incorporates an element of risk into their rates.

Considerations when implementing indexation

1. Define clearly the work that is subject to review in line with the index.
2. Ensure that the mix of indices represents the work being undertaken. The indices selected will affect the price change recorded and should be chosen carefully to best represent the work subject to indexation and the intention of the parties.
3. Ensure that the reference to the chosen indices is clear and unambiguous. The indexation clause of a contract should identify the indices selected by its complete title, index number and any identifying codes.
4. Check the availability and frequency of the index.
5. State the base date for the updating.
6. State the frequency of price adjustment. The indexation clause should specify whether price adjustments are to be made at fixed intervals, such as monthly, quarterly, semi-annually, or annually; or at stages or the beginning or end of the contract.
7. Specify the date the price adjustment calculations are to be made and what index is to be used, normally the latest version of the index available on the date specified.
8. Be clear on how to deal with the changing status of the indices, e.g. provisional, firm, etc. Some contracts allow for the inflation to be recalculated in later periods when provisional indices become firm. For simplicity some do not.
9. State how to implement revisions to the index, changes to the index base date, discontinuation, etc. With the Price Adjustment Formulae Indices revisions are rare and the indices will continue to be calculated on superseded series. When series are discontinued advice is given on the use of newer series to continue the discontinued series through to the end of a contract.
10. Define the method for calculating the inflation adjustment. The normal method is to calculate the percentage change from the base date for each index and multiply it by the weighting in the contract to give an overall percentage change.
11. Define the number of decimal places to be used in the calculation.

Case study: Crossrail

“At Crossrail we have administered NEC3 Contracts with Secondary Option X1 clauses using the BCIS Price Adjustment Formulae Indices (PAFI). By using the BCIS Indices we have been able to procure contracts where inflation is identified as an Employers’ risk which could otherwise have been priced by our Tier 1 Contractors at a potentially high risk premium. The biggest benefit of using the BCIS Price Adjustment Formulae Indices is that it promotes a collaborative commercial arrangement between the project manager and contractor by setting out in the contract tender process exactly how the impact of inflation will be measured and how the Contractor will recover costs through the administration of a periodic Price Adjustment”.

Robert Stockwell, Crossrail Ltd (CRL)

BCIS and Crossrail Limited (CRL) have produced a case study on CRL’s procurement strategy to award a number of delivery contracts where the employer takes on the risk associated with inflation by letting NEC3 contracts including the secondary option X1. These contracts use the Price Adjustment Formulae Indices (PAFI) to identify the impact of inflation, measured against the contract base date, and to periodically change the contract ‘Total of the Prices’ by way of a Price Adjustment.

Crossrail’s procurement strategy for contracts of a certain construction duration and commodity mix was to request the contractors not to price for the risk of inflation but instead confirm that the employer would be allocated the risk. This procurement strategy had two effects:

1. initial tender returns that excluded contractors’ inflation allowances based on broad assumptions over long periods of time
2. an agreed contractual and accurate method to measure the impact of inflation during the contract and to amend the ‘Total of the Prices’ accordingly.

With the widely reported trend of decreasing and flat lined inflation in recent years it could be argued that this procurement strategy and risk allocation has saved CRL in the initial contract award values.

The Crossrail Project

Crossrail is one of the biggest transportation projects in Europe. Crossrail is the new high frequency, convenient and accessible railway for London and the South East. The project value is £14.8 billion. From 2018, Crossrail trains will travel from Maidenhead and Heathrow in the west to Shenfield and Abbey Wood in the east via 21km of new tunnels under central London. It will link Heathrow Airport, the West End, the City of London and Canary Wharf.

The project will include the upgrade of 28 existing surface stations (11 of which are major reconstructions), 21km of new sub-surface twin-bore railway, the upgrade of 90km of existing surface network and the construction of 9 sub-surface stations.

Contracting arrangements

Crossrail adopted the NEC3 suite of contracts (amended as appropriate) as the standard form of contract for delivering their requirements. The choice of NEC option was largely determined by the scope of work, the maturity of the design and the nature of the risks. Most contracts were let on either Option A or B (lump sum) or Option C (target price).

For NEC3 Option C contracts the incentive mechanism provides an equitable share of savings and provides a real incentive to control costs to deliver within the Target Price.

Crossrail’s procurement strategy considered that the achievement of best affordable value would be supported by a sensible and fair allocation of risks between the parties to the contracts. Requiring contractors to take responsibility for risks which they cannot assess or manage would be likely to result in either high risk premiums or commercial pressures caused by insufficient provisions.

Inflation risk management

The procurement strategy provides that the NEC3 contracts with secondary option X1 (Price adjustment for inflation) are let on lump sum options A & B and target option C. The calculation of the Price Adjustment Formula (PAF) varies depending on which form of contract is applied (A,B,C,D or E). The NEC3 contract provides the calculation to be applied using the indices, proportions and base date information as set out in the contract data of each option X1 contract. With all data and calculations being clearly defined in the contract data, and agreed between the parties as part of the contract negotiation process, this leaves limited opportunity for the inflationary measure (price adjustment) to be open to interpretation and promotes a collaborative commercial arrangement between the project manager and the contractor.

The secondary option X1 was applied to a number of stations, systems and civil engineering contracts, where the commodity mix and contract duration was deemed to represent the best opportunities for CRL to take on the cost risk associated with inflation.

Crossrail has used the PAFI published by BCIS. Each contract has a different mix and weightings of the indices modelled to the works that are to be delivered. The index series that are used have been selected from:

- Price Adjustment Formulae Indices Building Series 3
- Price Adjustment Formulae Indices Civil Engineering 1990 Series
- Price Adjustment Formulae Indices Specialist Engineering Series 3.

Choosing the indices and weightings

Each contract was procured with its own unique set of data used to measure the impact of inflation to ensure an accurate Price Adjustment is applied resulting in the contractor recovering the full entitlement of budget to match the cost impact of the inflation incurred. The indices to be used in the measurement, the proportions that those indices would represent, any non-adjustable percentage and the base date were allocated based upon the type of activities to be carried out in delivering the scope of works and the proportion that these activities represent versus delivery of the scope of works as a whole. These were then agreed between the parties as part of the contract negotiation and document execution.

Implementation in contract admin systems

In order that each of the 14 contracts that Crossrail procured with secondary option X1 were administered consistently across the programme, Crossrail specified, designed and developed a contract management application providing an online tool where all data and calculations are stored and reports generated. This limited the individual user to entering data only and ensured that there was no opportunity for differing interpretations of the contractual requirements. This application was also designed in such a way that it interfaced directly with the existing cost management system. This ensured accurate and consistent reporting of budgets and performance throughout the business.

The indices are downloaded from the BCIS online service as a CSV file and imported into the application directly (note: these indices can also be downloaded as XML files). The application then applies the necessary calculations, taking into consideration the form of contract (A, B or C), and provides the relevant inflationary measure (PAF) for each contract. This is then applied to the 'Price of the Work Done to Date', taken from the periodic assessment of the Contractor's application, to provide the periodic Price Adjustment.

This in turn provides an accurate adjustment to the contractor's 'Total of the Prices' for the impact of inflation. It is therefore paramount that when 'Implementing a Compensation Event' (ICE) it is assessed at base date values. This means that any aspect of the agreed quotation making up the ICE that is not already priced at the contract base date must be deflated back to the contract base date set out in the contract data. If ICEs are not implemented at base date values there is the potential that the contractor will receive an assessment of inflation twice (over recover), once with the ICE and again when the periodic Price Adjustment is applied. Again, the application developed by CRL provides this calculation for the user in accordance with the details set out in the NEC3 suite.

Conclusions and lessons learned

On a project the size and complexity of Crossrail implementing a centrally administered application controlling the assessment and process of any budgetary requirement has proved invaluable.

With thanks to Robert Stockwell, Programme Cost Manager of Crossrail Limited, and Sue White, BCIS Head of Indices, for their help preparing this content paper.

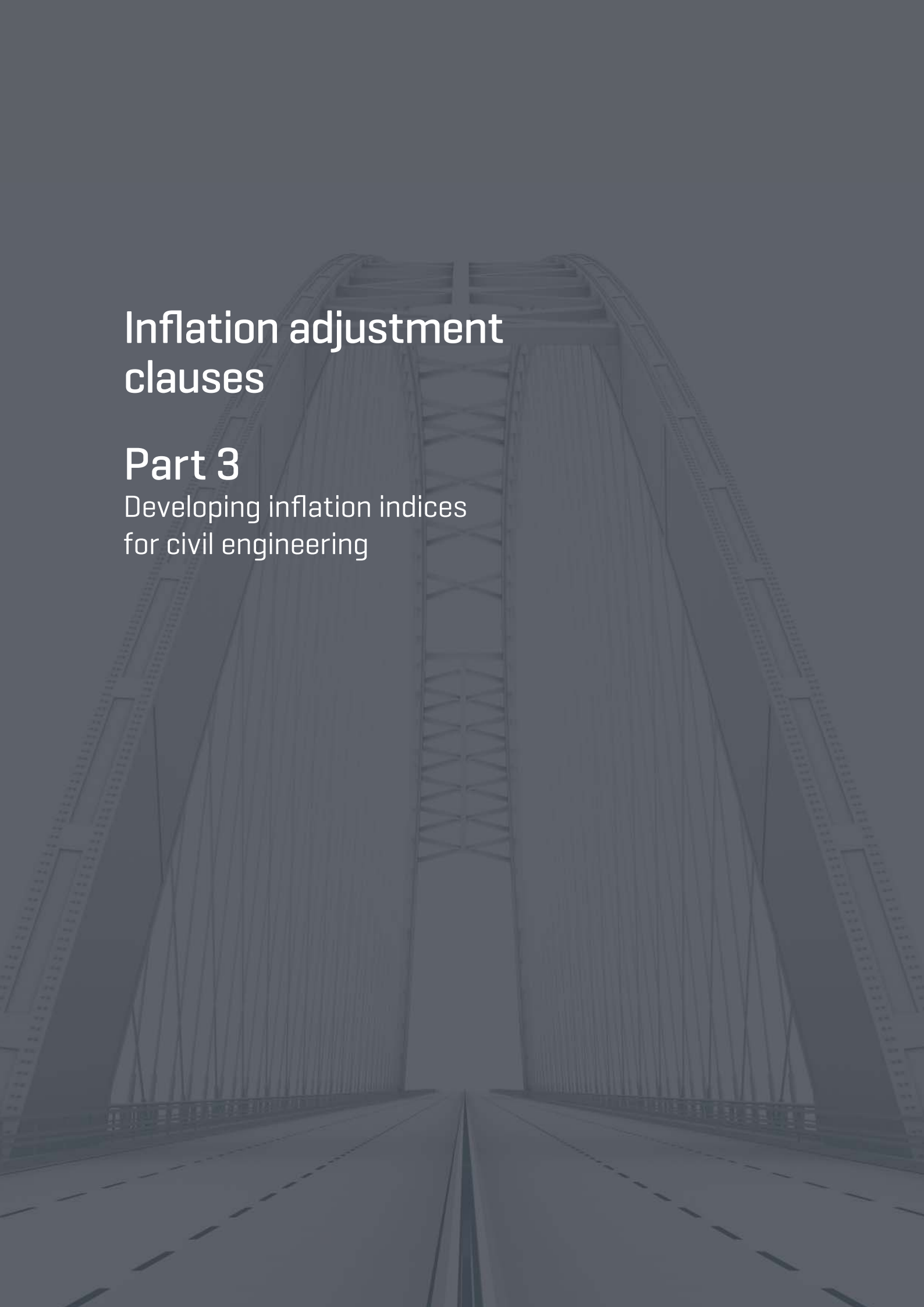
More information

A full version of the Crossrail case study is available at: rics.org/crossrail

To subscribe to the Price Adjustment Formulae Indices: bit.ly/1WNSx3a

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Inflation adjustment clauses

Part 3

Developing inflation indices for civil engineering

Developing inflation indices for civil engineering

This paper describes the development and consultation process that produced the new Price Adjustment Formulae Indices for civil engineering and related specialist engineering.

The Price Adjustment Formulae Indices (PAFI) have been the industry standard for use in index-linked inflation adjustment clauses in the UK since they were introduced in the early 1970s.

The 1970s and early 80s was a period of high inflation. In the 10 years from 1973, the annual average increase in building cost inflation was nearly 16%, over the past 10 years it has averaged less than 3%. PAFI were introduced to help deal with the high levels of inflation and in 1974 two thirds of building contracts were let on a fluctuating basis with an inflation adjustment clause (based on contracts submitted to BCIS for analysis). With the more moderate rates of inflation in recent years the use of fluctuating contracts has almost disappeared for buildings.

However, the longer periods involved in civil engineering contracts and the more volatile nature of the costs has meant that inflation adjustment clauses are still prevalent in this sector. BCIS has estimated that they are used on an estimated £2.5bn worth of UK work annually.

Index-linked inflation clauses are also still widely used in longer framework contracts and maintenance term contracts both for buildings and civil engineering.

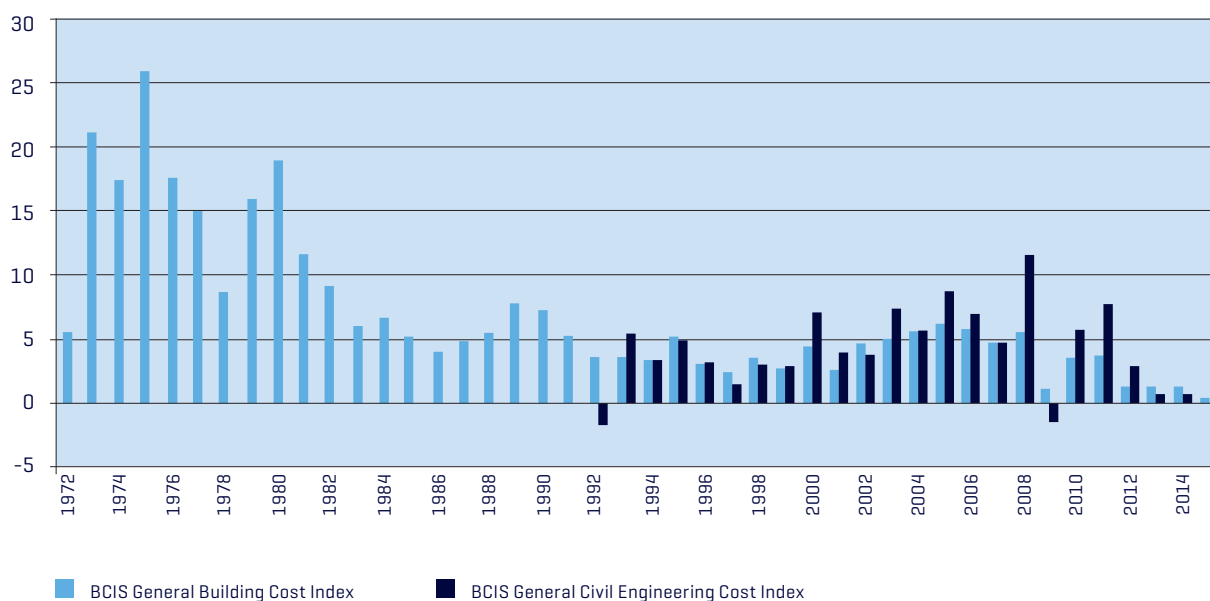
Industry need

BCIS has been responsible for the indices since 2009. In 2010, it was approached by the Highways Term Maintenance Association to set up a series of price adjustment formulae indices for the highways maintenance sector to provide indices that more closely matched the Association's members' work rather than using the general civil engineering series.

Following this involvement with the industry, and in discussions with the Civil Engineering Contractors Association (CECA), the need for a review of the civil engineering series became apparent. It is important that the range of indices provided reflects the techniques, materials and specialisms used in current infrastructure projects, both those that represent a large portion of the costs and those that are subject to large price movements. It is also important that the movement of the indices reflects the underlying inflation pressures that are outside the contractor's control. It was agreed that both the scope and the calculation of the indices should be reviewed in light of changes in the industry since they were last revised in the early 1990s.

On large infrastructure contracts it is apparent that indices from the Building, Civil Engineering and Specialist Engineering series are used in combination. Therefore the review covered the Specialist Engineering indices that

Figure 3: Construction cost inflation – annual percentage change (BCIS General Building Cost Index and General Civil Engineering Cost Index)



Developing inflation indices for civil engineering

are used on civil engineering schemes as well as the Civil Engineering series.

Commenting on the review Alasdair Reisner, CECA Chief Executive, said.

“The fair allocation of risk is key to achieving the best value on a contract. Requiring contractors to take responsibility for risks they cannot assess or manage will result in either a high risk premium or commercial pressures caused by insufficient provision. The availability of PAFI allows the inflation risk to be modelled to the contract. We therefore welcome this review and are keen to participate in its delivery.”

Steering group

The review was organised by BCIS in its guardianship role for the indices. While the PAFI series are produced by BCIS they ‘belong’ to the industry and BCIS was therefore keen that the consultation process embraced all organisations whose members may be affected by the indices.

BCIS set up an industry steering group to help direct the review and the delivery of the indices.

The steering group included representatives from the CECA, Institution of Civil Engineers, Chartered Institution of Civil Engineering Surveyors, Association of Consulting Engineers, Construction Products Association, Highways Agency, Crossrail, Highways Term Maintenance Association, Office of National Statistics, Cabinet Office, the RICS Infrastructure Forum and individual contractors, sub-contractors and consultants.

The review looked at the scope of the indices, to ensure that all appropriate costs were covered, and the compilation of the individual indices to ensure that they were representative of the resources included.

One of the issues discussed by the steering group was the name of the indices. They have always been called the price adjustment formulae indices, however the civil engineering series is often referred to as the ‘Baxter’ indices after the chairman of the committee that set them up. All the indices are also sometimes referred to as the ‘NEDO’ indices after the National Economic Development Office that produced the initial report. It was felt that a descriptive title might be appropriate but in the end it was decided that adding another possible name would only add more confusion, so PAFI indices they remain.

Consultation

BCIS carried out an online survey of current subscribers to the PAFI and other stakeholders to establish how the indices were used and whether anything was missing.

A question about the size of contracts on which the indices were used generated a mixed response – everything from £100,000 to £billions – but it seems that length of

contract was more important than value (where responses suggested that the indices were used on individual contracts in excess of two years and contracts let under a longer term contract or framework). It also showed that the indices were used internationally.

The results also showed that the indices were most widely used on NEC contracts (66%), but also with ICC/ICE/CECA contracts (24%) and FIDIC contracts (10%).

The survey also asked about the use of the indices in sub-contracts. This seemed to be a fairly common practice but some respondents pointed out that the sub-contracts were often subject to the same indexation as the main contract rather than indices that directly related to the sub-contract. This practice is to be avoided as the inflation adjustment is unlikely to reflect the sub-contractors’ cost inflation therefore introducing a risk that the sub-contractor will need to price.

Responses to a question about how the weightings of the indices were set on contracts suggested that in most cases they were predetermined by the client but where there was early contractor involvement they were agreed with the contractor during the competitive dialogue. It also showed that on the majority of projects weightings were set for the contract, effectively applying a single index to all valuations. Less than 10% of the respondents reported that they worked on contracts where the individual resource indices were applied to the work in individual valuations, which was the prevalent method of application when the formulae method of index linking contracts was introduced.

The survey also showed that the indices were used for purposes other than calculating price adjustment for inflation in contracts, including contract administration, estimating, cost planning, inflation guidance and in contracts for mineral agreements.

We asked what indices other than PAFI were used in inflation adjustment clauses. This received a low response but showed that general inflation indices (retail prices RPI or consumer prices CPI) are the most common alternative, with some use of other Office for National Statistics (ONS) and BCIS general construction cost indices. There was also reference to the BEAMA specialist indices for electrotechnical equipment.

We have previously commented on the use of RPI in this series of articles, which introduces a double risk to the contractor: the risk of retail price inflation and the risk due to inflation in their own costs. The introduction of these risks will result either in a risk premium being built into the initial price or pressures on the contractor due to insufficient provision for inflation.

There was a suggestion that we might produce predetermined combined indices by trade or sector in addition to the resource cost indices, but the steering group felt that this might be confusing and that publishing the resource cost indices only provided the most flexibility.

Developing inflation indices for civil engineering

The suggestions for expanding the scope of the indices fell into three broad categories:

1. Indices that reflected the changing role of the contractor in modern procurement methods such as professional services, administration and management, and overheads items such as site accommodation and transport.
2. Indices for additional materials. There were not many of these as the issues raised were generally dealt with in the review of the calculation of the indices.
3. Specialist engineering. In the existing series the specialist engineering indices related mainly to buildings. We have introduced a whole new section of specialist engineering indices related specifically to civil engineering contracts covering:
 - structural steelwork
 - electrical engineering (including cables)
 - mechanical engineering
 - sprinklers
 - lifts and escalators.

The consultation process was a splendid example of the industry coming together with RICS to improve working practices. The engagement from the infrastructure sector particularly from contractors and clients who are the contracting parties to inflation adjustment clauses, brought industry experience and expertise to the exercise. It was sometimes difficult to match the desire for more detail with the practicalities of applying the indices and some specific requests did not have general application or could not be matched with available data. The enthusiasm of the steering group helped us concentrate on the art of the possible, setting us a realistic task in producing the new series.

Developing the new series

The new Price Adjustment Formulae Indices (PAFI) series comprises 42 resource indices:

- 3 labour indices
- 5 plant indices (including site accommodation and transport)
- 21 materials indices
- 6 specialist labour indices
- 7 specialist materials indices

For existing resources, BCIS reviewed the weights and the data sources. For new resources, we consulted with the steering group and manufacturers to set weightings and identify appropriate data sources.

BCIS reviewed the weightings and the inputs into all the resource cost indices.

Resource cost indices

The indices represent the underlying movement in factory gate prices and nationally agreed wage awards. They are not intended to represent the effect of market pressures (national or local) on prices from sub-contractors, merchants, factors, etc.; the management of these is the commercial concern of the contractor.

The labour indices for individual trades are based on:

- nationally agreed wage awards
- overtime, based on an assumption on working hours derived from the ONS Annual Survey of Hours and Earnings (ASHE) – this will be reviewed annually
- allowances for travelling, tools, etc. covered by the appropriate working rule agreement (the employment terms agreed between the unions and employers)
- holiday pay covered by the working rule agreement (may also be influenced by statute)
- pension contribution covered by the working rule agreement (may also be influenced by statute)
- sick pay covered by the working rule agreement or statute
- national insurance.

The indices are for national UK application and relate to calendar months. The monthly indices are compiled such that changes will be included in the index for the month in which they occur by weighting them according to the number of days to which the changes apply.

The Management and Administration, and Professional Services indices are based on:

- earnings for individual occupations defined by their Standard Occupation Classification (SOC2010) from the ASHE survey
- national insurance contributions
- pension contributions derived from the Annual ONS Occupational Pension Schemes Survey statistics.

The monthly indices are compiled such that the earnings are adjusted annually in the January following publication of the ASHE. Changes in national insurance will be included in the index for the month in which they occur by weighting them according to the number of days to which the changes apply. The pension contributions will be reviewed when the annual survey is published.

Material indices are, where possible, the Producer Price Indices (PPI), Import Price Indices (IPI) or Services Producer Price Indices (SPPI), prepared by the ONS. Where there is no appropriate ONS index or where the coverage of the closest index includes too disparate a range of materials then BCIS has, with the help of manufacturers, prepared specially constructed indices for the PAFI following the principles used by the ONS indices.

Developing inflation indices for civil engineering

The PPIs represent the changes in factory gate prices of goods sold by UK manufacturers, net of VAT and after any discounts. They relate to manufacturers' prices in the UK market and take account of raw materials and manufactured components imported into the UK for incorporation into goods manufactured in the UK.

The IPIs represent the price changes of imported goods from EU or non-EU countries, net of VAT and after any discounts. In the construction of the IPIs, prices are converted to sterling from a number of different currencies as part of the monthly calculation. They measure price levels in respect of manufactured items imported into the UK for direct incorporation into the work.

The SPPIs represent the quarterly changes in the prices received for services provided in the UK on a 'Business to Business' (B2B) basis. This means that prices are only collected for services that are provided by one business to another business or government department. All transactions to private individuals and households are excluded.

The indices represent groupings of types of materials and manufactured components. In some cases, particularly for the import indices, the groupings are very broad. PPIs, IPIs and SPPIs are defined by reference to UK Standard

Industrial Classification of Economic Activity 2007 codes (SIC Codes).

PPIs and IPIs are monthly indices and are based on prices in the month to which the index number refers. The indices measure average prices for each month.

SPPIs are quarterly indices and are based on the percentage change in the price of services in the quarter. BCIS applies the quarterly changes in the month following the publication of the SPPI. BCIS does not interpolate monthly indices from the quarterly figures.

The BCIS indices are based on increases reported in a monthly survey carried out by BCIS at the end of each month and therefore represent the average change in price for the month.

The plant indices are compiled from labour and resource PPIs, IPIs and SPPIs calculated and applied in the same way as for materials.

Weightings

The individual PAFI indices are built up from one or more resource indices representing the movement of individual or groups of labour, plant or materials. See example of electrical installation materials.

Electrical installation materials (PAFI Reference 4/CE/EL/02)

Resource index	Source	Source index name	Base weighting
Instrumentation – general	ONS PPI	Electronic components and boards	20%
Instrumentation – liquid/gas flow	ONS PPI	Measuring, testing and navigation equipment: watches and clocks	3%
Electrical distribution and control equipment	ONS PPI	Electricity distribution and control apparatus	17%
Computers	ONS PPI	Computers and peripheral equipment	1%
Cable trays	ONS PPI	Imported basic iron and steel and ferro-alloys – Non-EU	2%
Power supply and cables	ONS PPI	Wiring and wiring devices	40%
Lighting equipment	ONS PPI	Electric lighting equipment	7%
Power installation	ONS PPI	Electric motors, generators and transformers	6%
Communication equipment	ONS PPI	Communication equipment	4%

Developing inflation indices for civil engineering

Publication

The index numbers are generally published in the BCIS PAFI online service at noon on the Monday following the third Friday in the month. Publication outside of this schedule will be pre-announced as a news item on the service.

The only official source of the index numbers is the BCIS PAFI online service, published by BCIS. Users should not rely on indices obtained from any other source.

The indices are published as 'Provisional' in the first instance and are held 'Provisional' for up to three months after which they are confirmed or amended as 'Firm' indices.

BCIS has set up a PAFI working group with representation from the steering group. This will advise on the implementation of:

- any revisions to the indices
- the choice of alternative sources of information where the current sources cease to be available
- the interpretation of new legislation, working rules, etc.
- any other issues that affect the indices, their calculation or publication.

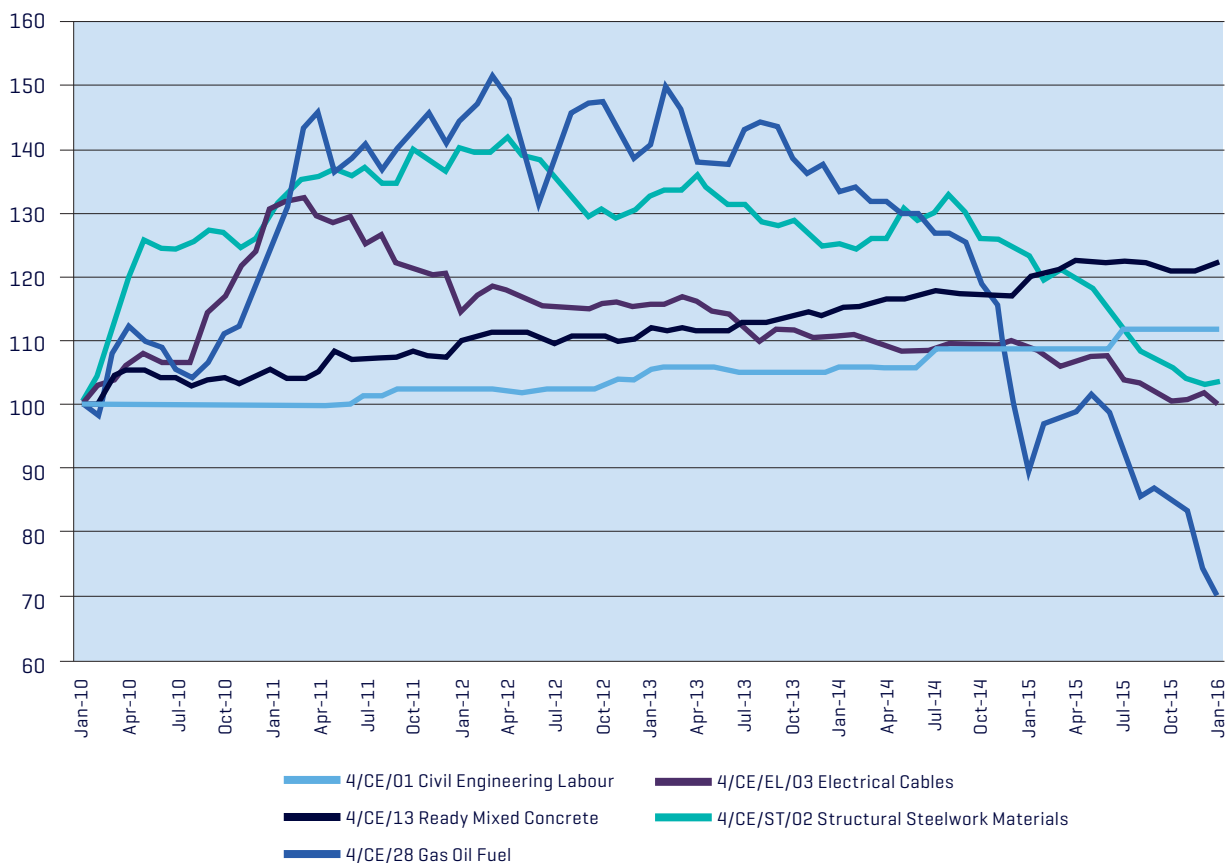
The new series will be published with a June 2015 = 100 base and BCIS has provided a series back to 2010. This back series shows the different volatility in the resource cost indices over the past five years; tumbling oil prices and instability in metal prices have impacted on fuel, steel and electrical cable prices while labour prices have been much more subdued. This highlights the importance of choosing the right mix of indices on a contract.

Highways indices

Because there is an overlap between the resources in the Civil Engineering and related Specialist Engineering indices and the Highways Maintenance indices a steering group was set up to look at the latter and a revised and updated series has been issued.

BCIS was commissioned by Highways England to provide a single index for use on its highways maintenance framework contracts and this has also been published as the Highways England Maintenance Cost Index.

Figure 4: Differential movement in resource costs



Further information

Full details of the source data and the weightings is included in the Guide to Price Adjustment Formulae Indices Series 4 – Civil Engineering and Related Specialist Engineering – Calculation, available from BCIS.

BCIS would like to acknowledge the following for their assistance in the production of the new series:

- the steering group
- the ONS
- Sue White, Head of indices, BCIS
- Martine Damon-De Waele, Construction data analyst, BCIS

More information

The new series is available to current subscribers to the PAFI online service: bit.ly/1PFdzyu

To subscribe to the Price Adjustment Formulae Indices: bit.ly/1WNSx3a

The series is also available to subscribers to the RICS Infrastructure Information Service bit.ly/1BQwhZW

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