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# Construction Material Price Indices: Sources and Methods

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## **Preface**

Three of the principal price indices in the system of economic statistics – the consumer price index (CPI), the producer price index (PPI), and the export and import unit value price indices (XMUVI) – are well known and closely watched indicators of macroeconomic performance. These price indices are direct indicators of the purchasing power of money in various types of transaction and other flows involving goods and services. As such, they are also used to deflate nominal measures of goods and services produced, consumed, and traded to provide volume measures of these variables.

This sources and methods manual aims to provide users with an understanding of the composition and compilation of the construction materials price indices (CMPI) published by Statistics South Africa (Stats SA). This publication includes the contract price adjustment provisions (CPAP) that were published for many years, and the construction input price indices (CIPI) that were introduced more recently to complement the CPAP, and represent a significant addition to the coverage of price changes that affect South Africa's construction material and plants costs.

The CPAP are produced in collaboration with a number of organisations and have their own sources and method manual published by the Association of the South African Quantity Surveyors – ASAQS. Visit <https://www.asaqs.co.za/> for more information.

The CIPIs are based on a subset of product indices found in the PPI and will be the focus of this manual.

Users can access a range of methodological information on price indices, including the PPI sources and methods manual, on the Stats SA website: [https://www.statssa.gov.za/?page\\_id=2528](https://www.statssa.gov.za/?page_id=2528).

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## **1. Introduction to the construction material price indices (CMPI)**

### **1.1 Definitions**

#### **1.1.1 Defining the CMPI**

The CMPI publication comprises two main categories of indices, the contract price adjustment provisions (CPAP) and the construction input price indices (CIPI). Additional tables published include the mining and construction plant and equipment indices, mechanical and electrical engineering input price indices, and finally the civil engineering material price indices. For each of these indices, changes in the index reflect the effects of price changes on the cost of achieving a constant standard of business activities. These will be defined in the following sections.

#### **1.1.2 Defining the CPAP**

The CPAP work group indices are derived from changes in the cost structures prevailing in 37 different sectors of the building industry and are published by Statistics South Africa (Stats SA) on a monthly basis. The indices reported on in this publication are mainly based on a combination of PPI, Steel and Engineering Industries Federation of Southern Africa (SEIFSA) and CPI indices for the particular month. These indices are used for making adjustments based on cost fluctuations in labour, plant and materials.

The CPAP Steering Committee is the oversight structure for the CPAP and comprises representatives of the following industry associations and organisations: ASAQS, Electrical Contractors Association of South Africa (ECASA), Master Builders South Africa (MBSA), the South African Institute of Architects (SAIA), the National Department of Public Works and Infrastructure (DPWI) and Stats SA.

The CPAP are structured as follows:

- 38 work groups are defined into which the work contained in a building contract can be subdivided;
- work groups 180 and 181 are combinations of other work groups;
- each work group consists of a number of subindices reflecting price movements of labour, plant and materials;
- each subindex is allocated a weight based on its contribution to the overall cost of that work group; and
- each subindex is sourced from the PPI, CPI or SEIFSA indices.

The updated CPAP manuals “CPAP Application Manual” and “CPAP Work Groups Composition and Weighting of Sub-Indices” can be obtained from the ASAQS website: [www.asaqs.co.za](http://www.asaqs.co.za).

#### **1.1.3 Defining the CIPI**

The CIPI is a current social and economic indicator constructed to measure changes over time in the general level of prices of material goods that construction companies acquire, use, or pay for in the process of conducting their business activities. The index measures changes in construction material prices over time by measuring the cost of acquiring a fixed basket of material goods of constant quality and similar characteristics. The products in the basket are selected to be representative of specific construction industry’s expenditure during a specific year.

#### **1.1.4 Defining the mining and construction plant and equipment price indices**

These indices measure changes in mining and construction plant and equipment prices over time by measuring the cost of acquiring a fixed basket of plant and equipment of constant quality and similar characteristics. The products in the basket are selected to be representative of the total supply of such plant and equipment in South Africa during a specific year.

#### **1.1.5 Defining the mechanical and electrical engineering input price indices**

The mechanical and electrical engineering input price indices measure changes in material prices over time by measuring the cost of acquiring a fixed basket of material goods of constant quality and similar characteristics. The products in the basket are selected to be representative of the mechanical and electrical engineering industry's expenditure during a specific year.

#### **1.1.6 Defining the civil engineering material price indices**

The civil engineering material price indices measure changes in material prices over time by measuring the cost of acquiring a fixed basket of material goods of constant quality and similar characteristics. The products in the basket are selected to be representative of specific civil engineering industry's requirements.

## 1.2 The South African CIPI

### 1.2.1 Uses of construction price indices

Construction price indices are used for a variety of different purposes. There has always been substantial interest in, and demand for, price indices from the private sector, the public sector, the general public, and international agencies. These indices fulfil three important functions:

1. A short-term indicator of inflationary trends – the monthly indices with detailed product and industry data allows short-term price inflation to be monitored for different construction industries.
2. Contract price adjustments – indexing long-term contracts takes the inflationary risk out of the contract.
3. A deflator in the compilation of national accounts – a fundamental use of the indices is as a deflator in the national accounts. Therefore, the concepts underlying the indices are generally aligned with those underlying the national accounts.

### 1.2.2 Alignment with international best practice in CIPI compilation

In compiling the South African CIPI, Stats SA largely follows the methodology guidelines in the *Sources and Methods Construction Price Indices* published jointly by the Statistics Directorate of the Organisation for Economic Co-operation and Development (OECD) and the Statistical Office of the European Communities (EUROSTAT), as well as the *Producer Price Index Manual: Concepts and Methods* published jointly by the International Monetary Fund (IMF), International Labour Organization (ILO), United Nations Economic Commission for Europe (UNECE) and the World Bank. We shall refer to the latter as the PPI Manual. It is the main reference for PPI concepts and definitions and aims to give methodological and practical guidelines for the compilation of the PPI.

Sources and Methods Construction Price Indices:

<http://www.oecd.org/industry/business-stats/2372435.pdf>

PPI Manual:

<https://www.imf.org/external/pubs/ft/ppi/2010/manual/ppi.pdf>



## 2. Types of construction price indices

### 2.1 Overview

There are three main types of construction price indices: the input, output and seller's price indices. Each of these differs in terms of what is included in the price index. Figure 1 illustrates their composition (OECD, 1997:13).

**Figure 1 – Composition of input vs output vs seller's price**

| Input price (elements paid by contractor)  | Output price (elements paid by client)   | Seller's price (elements paid by final owner)   |
|--|--|---|
| <ul style="list-style-type: none"> <li>• Materials</li> <li>• Labour</li> <li>• Plant &amp; equipment</li> <li>• Energy</li> <li>• Transport</li> <li>• Other costs</li> </ul> | <ul style="list-style-type: none"> <li>• Materials</li> <li>• Labour</li> <li>• Plant &amp; equipment</li> <li>• Energy</li> <li>• Transport</li> <li>• Other costs</li> <br/> <li>• Contractor's Profit Margin</li> <li>• Productivity Overheads</li> </ul> | <ul style="list-style-type: none"> <li>• Materials</li> <li>• Labour</li> <li>• Plant &amp; equipment</li> <li>• Energy</li> <li>• Transport</li> <li>• Other costs</li> <br/> <li>• Contractor's Profit Margin</li> <li>• Productivity Overheads</li> <br/> <li>• Value-added tax (VAT)</li> <li>• Land</li> <li>• Architect's fees</li> <li>• Other costs</li> <li>• Client's profit margins</li> </ul> |

Source: OECD, 1997: 13

### 2.2 Input price indices

The construction price indices are input price indices. Input price indices measure changes in the price of inputs to the construction process by monitoring separately the cost of each factor (OECD, 1997:12). An input price index is a weighted index of price indices for representative baskets of elements such as labour, materials, machinery, transport, energy, and other costs (Statistics Norway, 2007). It excludes land, profit from the construction activity and architectural costs.

Input price indices only provide a reflection of changes in the prices of construction inputs. The indices produced are production cost rather than production price indices.

### 2.3 Structure of the CMPI release

The CMPI currently includes material, and plant and equipment prices. The publication includes tables for different aggregations of construction materials. It provides for mining and construction plant and equipment price indices, mechanical and electrical engineering input price indices, as well as specific civil engineering material price indices.

The tables published in the current CMPI statistical release are shown in Table 1.

**Table 1 – Structure of the CMPI statistical release**

| <b>Table</b>  | <b>Table number in the monthly CMPI release</b> |
|---|---|
| CPAP work group indices                                   | 1   |
| CIP: material purchases by type of service                | 2   |
| CIP: material purchases for the whole industry            | 3   |
| Mining and construction plant and equipment price indices | 4   |
| Mechanical and electrical engineering input price indices | 5   |
| Civil engineering material price indices                  | 6   |

Unless otherwise stated, the following sections refer to Tables 2-6.

Annexures 3, 4, 5, 6 and 7 provide the detailed composition of Tables 2, 3, 4, 5 and 6.

### 3. Classification

#### 3.1 Background

The construction price indices are derived from the PPI in that each aggregate is comprised of one or more elementary indices originally compiled for the PPI. The PPI uses two classification systems, the Central Product Classification (CPC) and Standard Industrial Classification (SIC). The CPC is a classification based on the physical characteristics of goods or on the nature of the services rendered. Each type of good or service distinguished in the CPC is defined in such a way that it is normally produced by only one activity as defined in SIC.

The CPC covers products that are an output of economic activities, including transportable goods, non-transportable goods and services (OECD, 2006).

Each product grouping is assigned an industry classification according to SIC based on the classification of the establishment purchasing the materials. SIC v5 and CPC v2.1 are used.

#### 3.2 Structure of classification

The structure of the tables is based on 1-digit, 2-digit, 3-digit, 4-digit, 5-digit and 9-digit CPC levels, where the 9-digit code is an indicator product or elementary index attached to a weight.

For example, Table 2 shows the hierarchy of product description for the prices of products commonly referred to as “cement”.

**Table 2 – Central Product Classification (CPC) PPI hierarchy**

| Product hierarchy                                 |               | Product description  |
|---|---------------|--|
| CPC section                                       | 3             | Other transportable goods, except metal products, machinery and equipment                                    |
| CPC division                                      | 37            | Glass and glass products and other non-metallic products n.e.c.  |
| CPC group   | 374           | Plaster, lime and cement   |
| CPC class   | 3744          | Portland cement, aluminous cement, slag cement and similar hydraulic cements, except in the form of clinkers |
| CPC sub-class                                     | 37440         | Portland cement, aluminous cement, slag cement and similar hydraulic cements, except in the form of clinkers |
| Indicator product (for sub-class 37440)           | 374400001     | Cement   |
| Sampled product (for indicator product 374400001) | 374400001 (1) | 22,5 Masonry – Cashbuild – retail, bags  |
|   | 374400001 (2) | All purpose cement 42,5N 50kg palletised   |

Each product is also classified according to the economic activity based on SIC. Contrary to the PPI, where products are classified based on the SIC activity that produces them, in the construction price indices, products are classified based on the SIC activity in which they are used. In this context, a product can be used in the process of performing several different activities and thus fall within several SIC categories. For example, cement can be used in the site preparation process as well as during the building of civil engineering structures. Table 3 shows the five different SIC categories relevant to the construction material purchases table.

**Table 3 – Major groups of the construction industry (SIC 5)**

| SIC 3-digit | Description   |
|-------------|---|
| 501         | Site preparation  |
| 502         | Building of complete constructions or parts thereof and civil engineering |
| 503         | Building installation   |
| 504         | Building completion   |
| 505         | Renting of construction or demolition equipment with operators            |

### 3.3 Indicator products

The indicator products of the construction price indices are a subset of the PPI indicator products. In order to collect prices, CPC sub-classes are divided into meaningful groups of indicator products, which represent the elementary indices of the PPI. These are typical groupings of products at a lower level than the CPC sub-class. Indicator products are chosen in a manner that will ensure that they represent the majority of the output of the sub-class they represent. These groupings are sourced from industry associations or data from Stats SA industry surveys, such as the manufacturing and construction large sample surveys (LSS).

According to the IMF PPI Manual (2004:214), some key concepts underlie the construction of elementary indices:

- they should be fairly homogeneous;
- they should consist of products that may be expected to have similar price movements, minimising a wide dispersion of price changes; and
- they should be appropriate to serve as strata for sampling purposes for data collection.

In certain cases, intermediate aggregation structures have been created to group selected indicator products in order to improve their relevance to the construction industry. The exact composition of these groupings is provided in Annexure 3.

### 3.4 Sampled products

Sampled products are the actual products that are priced in the PPI process. Each sampled product will be priced consistently over time to ensure comparability. Sampled products are chosen in a manner that will ensure their price movements reflect the price movements of the indicator product they represent. These specific products are sourced from dominant role players.

## 4. Weighting sources and derivation

### 4.1 Introduction

The weights (except for CMPI Table 4) represent the proportion of purchase value by local construction or engineering companies in a specific period. Each indicator product in each table has a weight attached to it, reflecting its relative importance in the overall index of its table. This determines the impact that a price change in a product has on the overall index. The weighted average of changes in the price of specific products provides the rate of inflation. While prices are updated on a monthly basis, the weights are partially updated annually (except for CMPI Tables 4 and 6), with a more thorough review of the weights every three to four years.

There are three levels of weights:

- the CPC 3-digit level weights per activity (SIC 3-digit level) based on use values from the supply and use tables (SUTs) from the national accounts;
- the material level sub-weights based on industry surveys; and
- the indicator product level sub-weights within each of these materials, based on additional sources.

The weights of CMPI Table 4 represent the supply of mining and construction plant and equipment to the country in the reference year. These weights are refreshed following the release of a new manufacturing LSS – approximately every three to four years.

The weights for CMPI Table 6 are updated when requested by the relevant industry associations.

In terms of geographic coverage, all construction purchases within the boundaries of South Africa are included.

### 4.2 Updating weights

According to international standards, the weights and basket of price indices should be updated at least every five years to ensure that changes in industry use patterns are reflected in the weighted aggregates of the measure of inflation.

The weights of the construction, and mechanical and electrical engineering material purchases (CMPI Tables 2, 3 and 5) indices are partially updated every year, in the January statistical release, based on the latest SUTs compiled by National Accounts. The SUT information is published three years after the reference period.

A more detailed weight and basket review (including for CMPI Table 4) is conducted approximately every three to four years, with the release of the new construction and manufacturing LSS<sup>1</sup>, to reflect the most current economic conditions.

The most recent weight updates were introduced for CMPI Tables 2, 3 and 5 in January 2023, while the baskets for Tables 2-5 were last updated in January 2022.

#### 4.2.1 Source data for updating the weights

According to the OECD construction price indices manual (1997:28), if construction indices are used to deflate components of the national accounts, the item content of the construction input price index should as far as possible, correspond to the value coverage of the national accounts item that it will be used to deflate.

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<sup>1</sup> Dependent on availability.

As a general framework, the 2008 System of National Accounts (SNA) incorporates the concepts, classification and methods of the PPI and the CIPI. The national accounts information on output by industry incorporates the relevant survey data and makes any required adjustments. The SUTs are updated every year, whereas industry surveys are conducted less frequently.

In the South African CIPI (CMPI Tables 2 and 3), the higher-level material weights (generally CPC 3-digit level) per construction activity (SIC 3-digit level) as well as those for mechanical and electrical engineering (CMPI Table 5) are based on the intermediate consumption (use) values provided in the SUTs. While these tables do not provide the same level of product detail as an industry survey, they have the advantage of deriving production estimates from a wide range of data sources.

A range of additional data sources were employed to fill the gaps and determine what sub-weight to allocate to a specific material within each of these higher-level categories. These include Stats SA survey data (e.g. construction and manufacturing LSS), South African Revenue Service (SARS) customs data, and industry association information. Where updated data were not available at detailed product level, the existing proportions are retained, with adjustments being made at higher-level aggregates.

Table 4 below shows which specific sources were used to compile the weights.

**Table 4 – Sources of the 2023 weights**

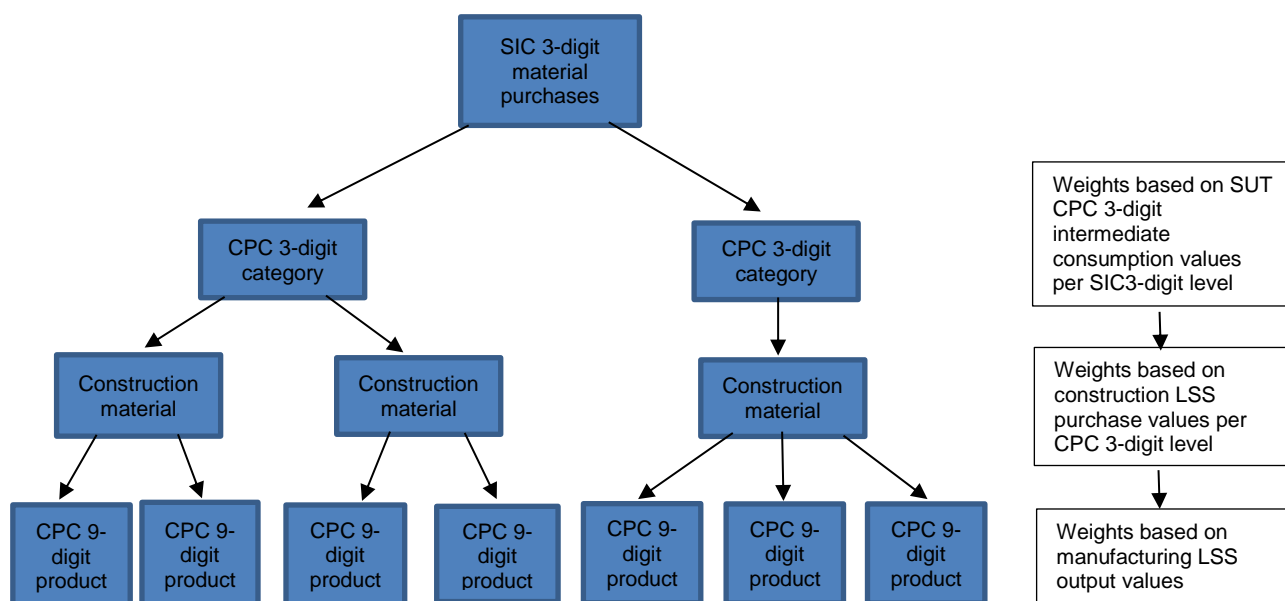
| Table   | Higher-level weight (CPC 3-digit) | Lower-level weight (CPC 5-digit)   | Elementary weight (CPC 9-digit)                            |
|---|-----------------------------------|------------------------------------|--|
| CIPI: material purchases (Tables 2-3)                               | SUTs (2019)                       | Construction LSS purchases (2017)  | Manufacturing LSS output (2017)                            |
| Mining and construction plant and equipment price indices (Table 4) | N/A                               | N/A                                | Manufacturing LSS output (2017) and SARS trade data (2017) |
| Mechanical and electrical engineering input price indices (Table 5) | SUTs (2019)                       | Manufacturing LSS purchases (2017) | Manufacturing LSS output (2017)                            |
| Civil engineering material price indices (Table 6)                  | SAFCEC and SAICE                  | SAFCEC and SAICE                   | SAFCEC and SAICE   |

#### 4.2.2 Selection of materials for CIPI

The high-level material weights are based on the intermediate consumption values of the construction industry in the SUTs. Within each SIC 3-digit construction industry, a first selection is conducted for the top 80% 3-digit material categories. Within each of these selected material categories, the construction LSS purchase values are used to determine which specific material to select and what proportion of the SUTs material category value to allocate to each.

Annexure 3 contains a detailed table of the materials, material subcomponents and their respective weights in the overall construction industry.

Figure 2 illustrates the material purchases aggregation structure and the top-down selection and proportion derivation.

**Figure 2 – CIPI aggregation weighting structure per SIC 3-digit level**

#### 4.2.3 Mining and construction plant and equipment

Since there is no breakdown of the various types of plant and equipment purchased in the SUTs or the construction LSS, the weights of the different types of plant and equipment are based on the manufacturing LSS output values for each of these, minus their respective export values plus their respective import values obtained from SARS customs data for the corresponding year. The weights for mining and construction plant and equipment are available in Annexure 4.

#### 4.2.4 Mechanical and electrical engineering

The weights of the mechanical and electrical engineering indices are based on the material use by the corresponding industries in the SUTs, and derived in the same manner as the construction material weights. The material sub-weights, however, are derived from the manufacturing LSS purchases values. The detailed breakdowns are available in Annexures 5 and 6.

#### 4.2.5 Civil engineering material

The weights of the material used by specific civil engineering activities were provided by the South African Forum of Civil Engineering Contractors (SAFCEC) and the South African Institution of Civil Engineering (SAICE).

### 4.3 Weights reference period

With effect from January 2023, the weights reference period for the:

- CIPI and the mechanical and electrical engineering input price indices is 2019, based on the latest available SUTs; and
- mining and construction plant and equipment price indices is 2017.

#### **4.4 Index reference period**

Re-referencing (or rebasing) the indices is important to limit the impact of historical inflation on current readings. It is good practice to re-reference the indices when updating weights, revising the basket, or introducing significant methodological or classification changes. The indices are re-referenced approximately every three to four years, when the detailed weights and basket for CMPI Tables 2-5 are updated. All indices were re-referenced to 100 in December 2021. Re-referencing simply changes the level of the indices, and does not affect the rates of change previously published.

When re-referencing, the new index based on the new weights is linked to the old index, thereby creating a continuous (or linked) index that is not distorted by the change in weights.



## **5. Basket of goods**

### **5.1 Introduction**

The basket is a list of specific products which forms the sample for price collection.

The product baskets of CMPI Tables 4 and 6 are based on user requirements, so the following sections apply specifically to the CIPI and the mechanical and electrical engineering input price indices.

The national accounts estimates as well as Stats SA industry surveys and external industry information guides the selection of indicator products to be included in the baskets.

### **5.2 Selection criteria for the basket of goods**

The objective of the basket selection process is to ensure that those products which represent the greatest share of purchases within a group are included in the index. Stats SA uses results from the construction and manufacturing LSS together with additional data sources to select items for the basket.

All materials with a high relative importance in the national accounts at the 3-digit CPC group level are included.

Additional sources are used to obtain sales values for a group to select indicator products within each industry group. For products to be included in the basket, it should fall into the top 80 cumulative percentage of its group. This ensures that at least 80% of groups are covered in the basket and insignificant products are excluded.

Before dropping, combining, or preserving indicator products, further considerations are given to factors such as similarity to another existing product, observations by the PPI data collection teams, basket stability, industry association feedback and user requirements.

The details of the basket of products for the different CMPI tables are provided in Annexures 3 to 7.

## **6. Sampling, data collection, processing and imputation**

The CMPIs are derived from the PPI elementary indices. The PPI Sources and Methods manual contains information on the sampling, data collection, processing, and imputation of these indices. The PPI Sources and Methods manual can be found on the Stats SA website at [https://www.statssa.gov.za/?page\\_id=16474](https://www.statssa.gov.za/?page_id=16474).

## 7. CMPI compilation

The CMPI measures price changes by comparing the price of a fixed basket of products over time.

The CMPI (excluding CPAP) is derived from the PPI elementary indices. The compilation of the South African PPI is based on prices in the current and previous survey periods. A survey period is equivalent to one month. In the first stage of calculation, for each of the products for which prices are collected, an elementary index is calculated using the Jevons index number formula. The Jevons index is defined as the unweighted geometric mean of the price ratios.

**Figure 3 – Jevons index**

$$I_J^{0:t} = \prod \left( \frac{p_i^t}{p_i^0} \right)^{1/n} = \frac{\prod (p_i^t)^{1/n}}{\prod (p_i^0)^{1/n}}$$

The month-to-month price ratios are chained together monthly through successive multiplication.

The second stage of calculating the CMPI does not involve individual prices or quantities. Instead, a higher-level index is calculated as a Young index in which the elementary price indices are averaged using a set of predetermined weights.

**Figure 4 – Young index**

$$I^{0:t} = \sum w_i^b I_i^{0:t}, \sum w_i^b = 1$$

In Figure 4,

- $I^{0:t}$  denotes the overall CMPI, or any high-level index, from period 0 to t;
- $w_i^b$  is the weight attached to each of the elementary price indices; and
- $I_i^{0:t}$  is the corresponding elementary price index.

The elementary indices are identified by the subscript  $i$ , whereas the higher-level index carries no subscript. The weights are derived in period  $b$ , which in practice has to precede period 0, the index reference period.

The following numerical example shows the calculations applicable to the different levels of aggregation.

**Table 5 – Creating the index**

| Description  | New index | Weight in CIPI | Weighted index |
|--|-----------|----------------|----------------|
| Electric motors  | 138,5     | 0,02           | 2,8            |
| Generators sets  | 142,5     | 0,16           | 22,8           |
| Power transformers   | 141,3     | 0,27           | 38,2           |
| Construction electric motors, generators or transformers       |           | 0,45           | 141,6          |
|  |           |                |                |
| Description  | New index | Weight in CIPI | Weighted index |
| Construction electric motors, generators or transformers       | 141,6     | 0,45           | 63,7           |
| Construction structural and reinforcing steel                  | 140,2     | 0,43           | 60,3           |
| Cement   | 130,7     | 0,23           | 30,1           |
| Pre-mixed asphalt  | 135,7     | 0,24           | 32,6           |
| Ready-mix concrete   | 128,9     | 0,17           | 21,9           |
| Construction stone and sand                                    | 132,4     | 0,14           | 18,5           |
| Total site preparation material purchases                      |           | 1,66           | 136,8          |
|  |           |                |                |
| Description  | New index | Weight in CIPI | Weighted index |
| Site preparation   | 136,8     | 1,66           | 227,1          |
| Civil engineering; building of complete structures             | 152,2     | 63,96          | 9 734,7        |
| Building installation  | 165,4     | 16,28          | 2 692,7        |
| Building completion  | 174,9     | 15,96          | 2 791,4        |
| Renting of construction or demolition equipment with operators | 146,3     | 2,14           | 313,1          |
| <b>Total construction material purchases</b>                   |           | <b>100,00</b>  | <b>157,6</b>   |

**Annexure 1 – Glossary**

|  |  |
|--|--|
| <b>Basket of goods</b>   | The basket is a list of specific products which forms the sample for the CIPI.   |
| <b>Central Product Classification (CPC)</b>                          | A classification based on the physical characteristics of goods or on the nature of the services rendered.   |
| <b>Construction Input Price Indices (CIPI)</b>                       | A current social and economic indicator constructed to measure changes over time in the general level of prices of material goods that construction companies purchase in the process of conducting their business activities.   |
| <b>Contract Price Adjustment Provisions (CPAP) Committee</b>         | The CPAP Committee is the oversight structure for the Construction Price Adjustment Provisions published by Stats SA and comprises representatives of the following industry associations and organisations: The Association of South African Quantity Surveyors (ASAQS), Electrical Contractors' Association South Africa (ECASA), Master Builders South Africa (MBSA), the South African Institute of Architects (SAIA), the National Department of Public Works and Infrastructure (DPWI) and Stats SA. |
| <b>Jevons index</b>  | Defined as the unweighted geometric mean of the price ratios, which is identical to the ratio of the unweighted geometric mean prices.   |
| <b>Index reference period</b>  | The period in which the index is set to 100 (also referred to as the base period).   |
| <b>Indicator products</b>  | In order to collect prices, CPC sub-classes are divided into meaningful groups called indicator products, which represent the elementary indices of the PPI.   |
| <b>Standard Industrial Classification of All Economic Activities</b> | The 1993 edition of the Standard Industrial Classification of All Economic Activities (SIC), Fifth Edition, Report No. 09-90-02, was used to classify the statistical units in the survey. The SIC is based on the 1990 International Standard Industrial Classification of All Economic Activities (ISIC) with suitable adaptations for local conditions. Each enterprise is classified to an industry which reflects its predominant activity.   |
| <b>Input price indices</b>   | Measure changes in the price of inputs to the construction process by monitoring separately the cost of each factor.   |
| <b>Sampled products</b>  | Actual products that are priced in the PPI process. Each sampled product will be priced consistently over time to ensure comparability.  |
| <b>Weights reference period</b>                                      | The period covered by the data used to calculate the weights. Usually, the weights reference period is a year.   |
| <b>Young index</b>   | Young index in which the elementary price indices are averaged using a set of predetermined weights. The index, price and weight reference periods are not necessarily the same.   |

**Annexure 2 – Abbreviations**

|          |  |
|----------|--|
| ASAQS    | Association of the South African Quantity Surveyors            |
| CIPI     | Construction Input Price Indices                               |
| CPAP     | Contract Price Adjustment Provisions                           |
| CPC      | Central Product Classification                                 |
| CPI      | Consumer Price Index   |
| CMPI     | Construction Material Price Indices                            |
| DPWI     | Department of Public Works and Infrastructure                  |
| ECASA    | Electrical Contractors Association of South Africa             |
| EUROSTAT | Statistical Office of the European Communities                 |
| ILO      | International Labour Organization                              |
| IMF      | International Monetary Fund                                    |
| MBSA     | Master Builders South Africa                                   |
| LSS      | Large Sample Surveys   |
| OECD     | Organisation for Economic Co-operation and Development         |
| PPI      | Producer Price Index   |
| SAFCEC   | South African Forum of Civil Engineering Contractors           |
| SAICE    | South African Institution of Civil Engineering                 |
| SAIA     | South African Institute of Architects                          |
| SARS     | South African Revenue Service                                  |
| SEIFSA   | Steel and Engineering Industries Federation of Southern Africa |
| SIC      | Standard Industrial Classification                             |
| Stats SA | Statistics South Africa  |
| SUTs     | Supply and Use Tables  |
| XMUVI    | Export and Import Unit Value Indices                           |

**Annexure 3 – Construction material purchases weight and structure**

| SIC 3-digit | Industry description                               | Construction material description                        | Product code | Product description   | Weight (%)    |
|-------------|--|--|--------------|---|---------------|
| <b>500</b>  | <b>Construction</b>                                | <b>Total material purchases</b>                          |              |   | <b>100,00</b> |
| 501         | Site preparation                                   | Construction electric motors, generators or transformers | 461120001    | Electric motors   | 0,02          |
|             |  |  | 461130001    | Generators sets   | 0,16          |
|             |  |  | 461210001    | Power transformers  | 0,27          |
|             |  | Construction structural and reinforcing steel            | 421200006    | Steel door and window frames  | 0,11          |
|             |  |  | 421900004    | Reinforcing metal work  | 0,15          |
|             |  |  | 421900005    | Equipment for scaffolding, shuttering and propping                    | 0,03          |
|             |  |  | 421900006    | Welded angles, shapes and sections for use in manufactured structures | 0,14          |
|             |  | Cement   | 374400001    | Cement  | 0,23          |
|             |  | Pre-mixed asphalt  | 379300001    | Pre-mixed asphalt   | 0,24          |
|             |  | Ready-mix concrete                                       | 375100001    | Ready-mix concrete  | 0,17          |
|             |  | Construction stone and sand                              | 153100001    | Aggregate stone   | 0,10          |
|             |  |  | 153100002    | Sand  | 0,01          |
|             |  |  | 151300004    | Granite   | 0,03          |
| 502         | Civil engineering; Building of complete structures | Construction structural and reinforcing steel            | 421200006    | Steel door and window frames  | 5,35          |
|             |  |  | 421900004    | Reinforcing metal work  | 7,64          |
|             |  |  | 421900005    | Equipment for scaffolding, shuttering and propping                    | 1,40          |
|             |  |  | 421900006    | Welded angles, shapes and sections for use in manufactured structures | 6,90          |
|             |  | Ready-mix concrete                                       | 375100001    | Ready-mix concrete  | 9,73          |
|             |  | Cement   | 374400001    | Cement  | 7,06          |
|             |  | Construction pipes, tubes and fittings                   | 415100001    | Tubes, pipes, tube-fittings and pipe-fittings of copper               | 0,92          |
|             |  |  | 375500001    | Concrete pipes  | 0,29          |
|             |  |  | 363200001    | Construction plastic pipes, tubes and fittings                        | 3,50          |
|             |  | Construction bricks and tiles                            | 373500001    | Clay bricks   | 1,01          |
|             |  |  | 375400002    | Cement or concrete bricks   | 1,75          |

**Annexure 3 – Construction material purchases weight and structure (continued)**

| SIC 3-digit | Industry description                                  | Construction material description                           | Product code | Product description  | Weight (%) |
|-------------|---|---|--------------|--|------------|
| 502         | Civil engineering;<br>Building of complete structures | Construction bricks and tiles                               | 375400001    | Roof tiles   | 1,04       |
|             |   |   | 373700002    | Ceramic tiles  | 1,77       |
|             |   | Construction stone and sand                                 | 153100001    | Aggregate stone  | 3,37       |
|             |   |   | 153100002    | Sand   | 0,41       |
|             |   |   | 151300004    | Granite, sandstone and other monumental and building stone     | 0,95       |
|             |   | Pre-mixed asphalt   | 379300001    | Pre-mixed asphalt  | 3,65       |
|             |   | Construction electric motors, generators or transformers    | 461120001    | Electric motors  | 0,11       |
|             |   |   | 461130001    | Generators sets  | 0,71       |
|             |   |   | 461210001    | Power transformers   | 1,30       |
|             |   | Bituminous mixtures   | 379400001    | Bituminous mixtures  | 1,76       |
|             |   | Construction electricity distribution and control equipment | 462110001    | Electricity distribution and control equipment                 | 1,54       |
|             |   | Electrical cable  | 463500001    | Steel wire armoured (SWA) cable                                | 1,06       |
|             |   | Vinyl sheeting or flooring                                  | 369500001    | Vinyl sheeting or flooring                                     | 0,57       |
|             |   | Electrical components                                       | 471600002    | Electronic security systems                                    | 0,17       |
| 503         | Building installation                                 | Electrical cable  | 463500001    | Steel wire armoured (SWA) cable                                | 4,57       |
|             |   | Construction electricity distribution and control equipment | 462110001    | Electricity distribution and control equipment                 | 4,13       |
|             |   | Electrical components                                       | 471600002    | Electronic security systems                                    | 2,74       |
|             |   | Construction basic metal products                           | 412400001    | Bars and rods of iron or steel                                 | 1,00       |
|             |   |   | 412500001    | Angles, shapes, sections and similar products of iron or steel | 0,44       |
|             |   |   | 412630001    | Wire of iron or steel  | 0,24       |
|             |   | Construction electric motors, generators or transformers    | 461120001    | Electric motors  | 0,07       |
|             |   |   | 461130001    | Generators sets  | 0,43       |
|             |   |   | 461210001    | Power transformers   | 0,78       |
|             |   | Construction structural and reinforcing steel               | 421200006    | Steel door and window frames                                   | 0,31       |

**Annexure 3 – Construction material purchases weight and structure (continued)**

| SIC 3-digit                            | Industry description  | Construction material description                           | Product code | Product description   | Weight (%) |
|--|-----------------------|---|--------------|---|------------|
| 503                                    | Building installation | Construction structural and reinforcing steel               | 421900004    | Reinforcing metal work  | 0,44       |
|  |                       |   | 421900005    | Equipment for scaffolding, shuttering and propping                    | 0,09       |
|  |                       |   | 421900006    | Welded angles, shapes and sections for use in manufactured structures | 0,40       |
|  |                       | Construction pumps, compressors and refrigeration machinery | 439130001    | Commercial and industrial refrigerating and freezing equipment        | 0,21       |
|  |                       |   | 432200001    | Pumps   | 0,43       |
| 504                                    | Building completion   | Construction structural and reinforcing steel               | 421200006    | Steel door and window frames  | 0,84       |
|  |                       |   | 421900004    | Reinforcing metal work  | 1,19       |
|  |                       |   | 421900005    | Equipment for scaffolding, shuttering and propping                    | 0,22       |
|  |                       |   | 421900006    | Welded angles, shapes and sections for use in manufactured structures | 1,08       |
|  |                       | Construction bricks and tiles                               | 373500001    | Clay bricks   | 0,51       |
|  |                       |   | 375400002    | Cement or concrete bricks   | 0,89       |
|  |                       |   | 375400001    | Roof tiles  | 0,53       |
|  |                       |   | 373700002    | Ceramic tiles   | 0,90       |
|  |                       | Paints  | 351100001    | Paints  | 2,30       |
|  |                       | Carpets (excluding mats and rugs)                           | 272900001    | Carpets (excluding mats and rugs)                                     | 2,05       |
|  |                       | Bituminous mixtures   | 379400001    | Bituminous mixtures   | 1,40       |
|  |                       | Ceiling boards  | 375300001    | Ceiling boards  | 0,93       |
|  |                       | Adhesives and sealants                                      | 354200001    | Adhesives and sealants  | 0,64       |
|  |                       | Vinyl sheeting or flooring                                  | 369500001    | Vinyl sheeting or flooring  | 0,71       |
|  |                       | Electrical components                                       | 471600002    | Electronic security systems   | 0,63       |
|  |                       | Boards of wood  | 314300001    | Boards of wood  | 0,33       |
| Construction pipes, tubes and fittings | 415100001             | Tubes, pipes, tube-fittings and pipe-fittings of copper     | 0,06         |   |            |



**Annexure 3 – Construction material purchases weight and structure (concluded)**

| SIC 3-digit | Industry description   | Construction material description                           | Product code | Product description                            | Weight (%) |
|-------------|--|---|--------------|--|------------|
| 504         | Building completion  | Construction pipes, tubes and fittings                      | 375500001    | Concrete pipes                                 | 0,02       |
|             |  |   | 363200001    | Construction plastic pipes, tubes and fittings | 0,21       |
|             |  | Construction electricity distribution and control equipment | 462110001    | Electricity distribution and control equipment | 0,22       |
|             |  | Electrical cable  | 463500001    | Steel wire armoured (SWA) cable                | 0,16       |
|             |  | Builders' carpentry of wood                                 | 316000001    | Builders' carpentry of wood                    | 0,14       |
| 505         | Renting of construction or demolition equipment with operators | Nails, screws and other metal fasteners                     | 429440006    | Nails, screws and other metal fasteners        | 1,12       |
|             |  | Roof sheeting   | 421900001    | Roof sheeting                                  | 0,55       |
|             |  | Construction tyres  | 361110001    | Tyres  | 0,36       |
|             |  | Bituminous mixtures   | 379400001    | Bituminous mixtures                            | 0,11       |

**Annexure 4 – Mining and construction plant and equipment weight and structure**

| <b>Category description</b>  | <b>Product code</b> | <b>Product description</b>   | <b>Weight (%)</b> |
|--|---------------------|--|-------------------|
| <b>Plant and equipment total</b>   |                     |  | <b>100,00</b>     |
| Lifting and handling equipment and parts thereof   | 435000001           | Lifting and handling equipment and parts thereof   | 5,55              |
| Moving, grading, levelling, scraping, excavating, tamping, compacting and extracting machinery                         | 444220001           | Graders and scrapers   | 0,61              |
|  | 444240003           | Tamping machines and road rollers  | 0,25              |
|  | 444250001           | Front-end shovel loaders, self-propelled   | 2,00              |
|  | 444270001           | Mechanical shovels, excavators and shovel loaders  | 4,32              |
|  | 444280001           | Dumpers designed for off-highway use   | 4,60              |
| Machinery for sorting, screening, separating, washing, crushing, grinding, mixing or kneading of construction material | 444400008           | Machinery for sorting, screening, separating, washing, crushing, grinding, mixing or kneading of construction material | 6,16              |
| Lorries, trucks and vans exceeding 3,5 tons  | 491140002           | Lorries, trucks and vans exceeding 3,5 tons  | 76,51             |

**Annexure 5 – Mechanical engineering material purchases weight and structure**

| Material description   | Product code | Product description  | Weight        |
|--|--------------|--|---------------|
| <b>Mechanical engineering material purchases total</b>   |              |  | <b>100,00</b> |
| Primary products of iron and steel metallurgy (e.g. pig iron, ferro-alloys)                                | 411120001    | Ferro-manganese  | 5,55          |
|  | 411130001    | Ferro-chromium alloy   | 6,86          |
| Semi-finished products (e.g. castings) of basic iron and steel, including stainless steel                  | 411200001    | Semi-finished products and ingots of iron and steel                        | 4,80          |
| Flat-rolled, not further worked than hot or cold rolled of iron and alloy steel, including stainless steel | 412110001    | Flat rolled non-alloy steel products                                       | 5,26          |
|  | 412320001    | Flat rolled stainless steel products                                       | 6,39          |
| Tubes, pipes and hollow profiles; tube or pipe fittings of iron and alloy steel, including stainless steel | 421900007    | Steel pipes  | 6,04          |
| Bars and rods of iron and alloy steel, including stainless steel   | 412400001    | Bars and rods of iron or steel   | 4,96          |
| Basic precious metals (e.g. gold, platinum, silver) or metals clad with precious metals                    | 413300001    | Unwrought or semi-manufactured platinum                                    | 4,91          |
|  | 416030001    | Manganese metal (electrolytic manganese)                                   | 2,64          |
|  | 415320001    | Aluminium products   | 1,46          |
| Wire of iron and alloy steel, including stainless steel  | 412630001    | Wire of iron or non-alloy steel  | 2,47          |
| Fasteners, springs and articles of wire  | 429440006    | Nails, screws and other metal fasteners                                    | 1,37          |
| Hand tools, materials and components used in production  | 429210003    | Hand tools and parts thereof   | 0,77          |
| Chains, padlocks and locks   | 429920001    | Locks and padlocks, clasps, keys and parts thereof of base metal           | 0,31          |
| Pumps, compressors, valves and parts therefor  | 432200001    | Pumps  | 3,98          |
|  | 432400001    | Taps, cocks and valves   | 2,56          |
| Bearings, gears, gearing and driving elements and parts therefor   | 433100001    | Ball or roller bearings  | 1,23          |
|  | 433200001    | Gears and gearing  | 1,96          |
| Ovens and furnace burners and parts therefor   | 439110001    | Industrial heating and cooling systems                                     | 0,87          |
| Other general purpose machinery and parts therefor   | 439140001    | Filtering or purifying machinery and apparatus (except for air or engines) | 2,06          |
|  | 439150001    | Filters for engines  | 2,84          |

**Annexure 5 – Mechanical engineering material purchases weight and structure (concluded)**

| <b>Material description</b>   | <b>Product code</b> | <b>Product description</b>   | <b>Weight (%)</b> |
|---|---------------------|--|-------------------|
| Machinery for mining, quarrying and construction and parts therefor | 439310001           | Industrial ventilating fans and blowers  | 3,32              |
|   | 444100001           | Continuous-action elevators, cutters, tunnelling, boring and sinking machinery   | 2,84              |
|   | 444220001           | Graders and scrapers   | 0,09              |
|   | 444240003           | Tamping machines and road rollers  | 0,01              |
|   | 444250001           | Front-end shovel loaders, self-propelled   | 0,13              |
|   | 444270001           | Mechanical shovels, excavators and shovel loaders  | 3,55              |
|   | 444280001           | Dumpers designed for off-highway use   | 2,12              |
|   | 444400008           | Machinery for sorting, screening, separating, washing, crushing, grinding, mixing or kneading of construction material | 5,59              |
|   | 444600001           | Parts of machinery for mining, quarrying and construction  | 4,59              |
| Agricultural or forestry machinery and parts therefor               | 441000001           | Irrigation pipe systems  | 2,50              |
| Domestic appliances and parts therefor                              | 448110001           | Fridge-freezer   | 2,34              |
|   | 448170001           | Geysers  | 0,16              |
|   | 448170003           | Stoves and ovens   | 3,47              |

**Annexure 6 – Electrical engineering material purchases weight and structure**

| <b>Material description</b>   | <b>Product code</b> | <b>Product description</b>   | <b>Weight (%)</b> |
|---|---------------------|--|-------------------|
| <b>Electrical engineering material purchases total</b>                        |                     |  | <b>100,00</b>     |
| Copper, nickel, aluminium, lead, zinc or tin, unwrought                       | 414310001           | Unwrought aluminium  | 34,46             |
| Tanks, casks, drums, cans, boxes and similar containers: stoppers, caps, lids | 422100001           | Reservoirs, tanks, vats and similar containers of iron, steel or aluminium | 1,81              |
| Wire of iron and alloy steel, including stainless steel                       | 429460001           | Wire for fencing of iron and steel   | 1,33              |
| Fasteners, springs and articles of wire                                       | 429440006           | Nails, screws and other metal fasteners                                    | 0,66              |
| Insulated wire and cable; optical fibre cables                                | 463500001           | Steel wire armoured (SWA) cable  | 28,56             |
| Accumulators, primary cells and primary batteries and parts therefor          | 464100001           | Batteries  | 12,68             |
| Electric motors, generators and transformers and parts therefor               | 461120001           | Electric motors  | 0,51              |
|   | 461130001           | Generators sets  | 3,70              |
|   | 461210001           | Power transformers   | 6,75              |
| Electricity distribution, protection and control apparatus and parts therefor | 462110001           | Electricity distribution and control equipment                             | 6,81              |
| Electronic components   | 471600002           | Electronic security systems  | 2,73              |

**Annexure 7 – Civil engineering material purchases weight and structure**

| Product description   | Civil engineering material (CEM) | CEM (excl. bitumen) | CEM (excl. reinforcing metal work) | CEM (excl. reinforcing metal work and bitumen) | CEM – structures (excl. bitumen) | CEM – roads, general | CEM – roads, general (excl. bitumen) | CEM – roads, refurbishment | CEM – roads, refurbishment (excl. bitumen) | CEM – roads, reseal | CEM – roads, reseal (excl. bitumen) | CEM – bulk earthworks | CEM – bulk earthworks (excl. bitumen) |
|---|----------------------------------|---------------------|------------------------------------|--|----------------------------------|----------------------|--------------------------------------|----------------------------|--|---------------------|-------------------------------------|-----------------------|---------------------------------------|
| Granite, sandstone and other monumental or building stone             | 2,41                             | 1,00                | 1,10                               | 1,20   | 1,30                             | 2,00                 | 2,50                                 | 1,90                       | 2,80                                       | 0,82                | 2,55                                | 1,80                  | 2,10                                  |
| Aggregate stone   | 8,56                             | 17,60               | 19,30                              | 21,50  | 22,60                            | 33,00                | 41,20                                | 32,20                      | 47,40                                      | 14,14               | 43,90                               | 30,50                 | 34,90                                 |
| Sand  | 1,03                             | 1,80                | 2,00                               | 2,20   | 2,40                             | 3,50                 | 4,30                                 | 3,40                       | 5,00                                       | 1,47                | 4,58                                | 3,20                  | 3,60                                  |
| Paints  | 0,00                             | 2,00                | 2,30                               | 2,50   | 0,20                             | 0,70                 | 0,70                                 | 0,30                       | 0,90                                       | 0,28                | 0,41                                | 0,00                  | 0,00                                  |
| Construction plastic pipes, tubes and fittings                        | 10,17                            | 2,30                | 2,40                               | 2,60   | 2,40                             | 0,80                 | 0,80                                 | 1,30                       | 1,70                                       | 0,39                | 1,11                                | 13,00                 | 13,30                                 |
| Clay bricks   | 2,39                             | 4,20                | 4,80                               | 5,10   | 0,90                             | 1,00                 | 1,60                                 | 0,20                       | 0,20                                       | 0,00                | 0,00                                | 0,50                  | 0,50                                  |
| Cement  | 21,77                            | 28,00               | 30,90                              | 34,10  | 21,90                            | 11,50                | 15,10                                | 14,80                      | 22,00                                      | 8,62                | 29,72                               | 19,80                 | 20,20                                 |
| Cement or concrete bricks   | 4,15                             | 6,40                | 6,90                               | 7,90   | 0,10                             | 1,60                 | 1,30                                 | 0,60                       | 0,80                                       | 0,29                | 0,81                                | 0,20                  | 0,20                                  |
| Concrete pipes  | 0,85                             | 0,50                | 0,50                               | 0,60   | 3,30                             | 7,00                 | 7,60                                 | 4,60                       | 6,40                                       | 0,40                | 1,51                                | 5,30                  | 5,40                                  |
| Bituminous mixtures   | 4,83                             | 0,00                | 28,00                              | 0,00   | 0,00                             | 19,50                | 0,00                                 | 31,60                      | 0,00                                       | 64,58               | 0,00                                | 6,60                  | 0,00                                  |
| Bars and rods of iron or steel  | 0,00                             | 17,90               | 0,00                               | 0,00   | 26,70                            | 9,80                 | 12,70                                | 2,40                       | 3,20                                       | 2,41                | 3,05                                | 5,60                  | 5,60                                  |
| Angles, shapes, sections and similar products of iron or steel        | 0,00                             | 2,40                | 0,00                               | 2,90   | 4,30                             | 2,70                 | 3,30                                 | 3,20                       | 5,00                                       | 3,30                | 0,81                                | 1,00                  | 1,40                                  |
| Tubes, pipes and tube or pipe fittings, of copper                     | 2,66                             | 1,60                | 1,80                               | 2,00   | 1,50                             | 0,10                 | 0,10                                 | 0,10                       | 0,10                                       | 0,00                | 0,00                                | 2,50                  | 2,50                                  |
| Reinforcing metalwork   | 19,75                            | 4,70                | 0,00                               | 5,70   | 2,50                             | 1,10                 | 1,80                                 | 0,20                       | 0,20                                       | 0,10                | 1,41                                | 3,70                  | 3,70                                  |
| Equipment for scaffolding, shuttering and propping                    | 3,61                             | 3,80                | 0,00                               | 4,60   | 8,90                             | 5,70                 | 7,00                                 | 3,20                       | 4,30                                       | 3,20                | 10,14                               | 6,00                  | 6,20                                  |
| Welded angles, shapes and sections for use in manufactured structures | 17,82                            | 5,80                | 0,00                               | 7,10   | 1,00                             | 0,00                 | 0,00                                 | 0,00                       | 0,00                                       | 0,00                | 0,00                                | 0,30                  | 0,40                                  |
| <b>Total</b>  | <b>100,00</b>                    | <b>100,00</b>       | <b>100,00</b>                      | <b>100,00</b>                                  | <b>100,00</b>                    | <b>100,00</b>        | <b>100,00</b>                        | <b>100,00</b>              | <b>100,00</b>                              | <b>100,00</b>       | <b>100,00</b>                       | <b>100,00</b>         | <b>100,00</b>                         |

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