INE

INSTITUTO NACIONAL DE ESTADISTICA

Construction Production Index (COPI)

Methodology

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Contents

I Introduction

The aim of the Construction Production Index (CoPI) is to measure the monthly change in the activity of the companies that form part of the construction industry in Spain, based on their added value.

The CoPI statistical operation is produced in accordance with Regulation (EU) 2019/2152 of the European Parliament and of the Council of 27 November 2019 concerning European business statistics, repealing ten legal acts in the field of business statistics and Commission Implementing Regulation (EU) 2020/1197 of 30 July 2020, laying down technical specifications and modalities pursuant to Regulation (EU) 2019/2152 of the European Parliament and of the Council concerning European business statistics that repealed ten legal acts in the field of business statistics, making it compulsory for all Member States to produce this statistical operation

The objective of these Regulations is to establish a common legal framework for the development, production and dissemination of European business statistics. Within this framework, the production of European Community statistics on short-term developments in the economic cycle is specifically addressed.

Until December 2025, the measurement of the state of the construction sector was the responsibility of the Ministry of Transport and Sustainable Mobility, which calculated the Construction Industry Production Indices Survey (CoIPIS) on a monthly basis, and provided monthly production and employment indices to the European Union Statistical Office (Eurostat).

On 21 May 2025, the Agreement was signed between the Ministry of Transport and Sustainable Mobility (MTSM) and the National Statistics Institute (INE) for the transfer of the *Construction Industry Structural Survey* and the *Construction Industry Production Indices* statistical operations, whereby the data collection and exploitation in all phases of these statistical operations is transferred to the INE. Thus, the CoIPIS was renamed CoPI.

In said agreement it was agreed that ..."*from 1 January 2026 and on a monthly basis, the INE will be responsible for the collection of information and the compilation of all phases of the CoPI corresponding to the editions of the January 2026 reference month and subsequent months*".

This document details the main characteristics of the CoPI, as well as the implementation conducted by the INE on the basis of the CoIPIS calculated by the MTSM.

II Definitions

The objective of the CoPI is to measure changes in volume, in terms of value added, over a given reference period, in this case on a monthly basis.

A production index measures the short-term evolution of the volume of output companies produced, in terms of value added. It is defined as the ratio between the volume of output companies produce in a period of time *t* minus the consumption necessary for it, and the volume of output produced by these same industries in the base period minus the materials used in operations needed in that base period.

As it is a volume index, quantities (both produced and consumed) should be valued at base period prices:

$$I_t = \sum_{i=1}^{N} \frac{VAB_{i,0}}{\sum_{i=1}^{N} VAB_{i,0}} * \frac{p_{i,0} \times q_{i,t} - \sum_{j=1}^{M_t} a_{j,0} \times \delta_{j,t}}{p_{i,0} \times q_{i,0} - \sum_{j=1}^{M_0} a_{j,0} \times \delta_{j,0}}$$

Where:

t, is the reference period

N, is the number of elements that make up the index

$q_{i,t}$, is the quantity produced of product *i* in period *t*

$q_{i,0}$, is the quantity produced of product *i* in period *0*.

$p_{i,0}$, is the price of product *i* in period *0*

M_i, is the quantity of inputs needed in product *i*

M_0, is the quantity of inputs needed in period *0*

$\delta_{j,t}$ is the quantity of input *j* needed to make product *i* in period *t*

$\delta_{j,0}$ is the quantity of input *j* needed to make product *i* in period *0*

a_{j0}, is the price of input *j* in period *0*

In practice, the data necessary for the compilation of the index defined by the theoretical target are often not available on a monthly basis. The value added in the base period is available, which is used for the calculation of the weighting. But the monthly derivation of the value added from the base period is conducted by means of appropriate proxies.

One of these proxies is the deflated turnover. In this case it must be assumed that, in the short term, output evolves in a similar way to GVA.

Thus, the construction production index is summarised as follows:

$$I_t = \sum_{i=1}^{N} W_{i,0} * \frac{VAB_t}{VAB_0} = \sum_{i=1}^{N} W_{i,0} * \frac{K * p_{i,0} \times q_{i,t}}{K * p_{i,0} \times q_{i,0}} = \sum_{i=1}^{N} W_{i,0} * \frac{p_{i,0} \times q_{i,t}}{p_{i,0} \times q_{i,0}}$$

By multiplying and dividing by the prices in *t*

$$I_t = \sum_{i=1}^{N} W_{i,0} * \frac{p_{i,0} \times q_{i,t}}{p_{i,0} \times q_{i,0}} * \frac{p_{i,t}}{p_{i,t}} \qquad I_t = \sum_{i=1}^{N} W_{i,0} * \frac{p_{i,t} \times q_{i,t}}{p_{i,0} \times q_{i,0}} * \frac{p_{i,0}}{p_{i,t}}$$

Replacing price per quantity for turnover:

$$I_t = \sum_{i=1}^{N} W_{i,0} * \frac{VN_{i,t}}{VN_{i,0}} * \frac{p_{i,0}}{p_{i,t}} \qquad I_t = \sum_{i=1}^{N} \frac{VAB_{i,o}}{\sum_{i=1}^{N} VAB_{i,0}} * \frac{VN_{i,t}/VN_{i,0}}{p_{i,t}/p_{i,0}}$$

The Construction Production Index can therefore be obtained as an aggregate index of the Turnover Indices of each activity, deflated by the construction sector cost index and weighted, depending on the value added of that activity, in relation to the total value added generated by all construction sector activities.

Turnover in Construction

Corresponds to the value of the company's turnover in the reference month from the sales of goods and the provision of construction services, considering both those conducted by the company itself and those subcontracted to third parties.

The definition of turnover excludes VAT and other taxes levied on the transaction, as well as sales returns. Government subsidies and those received from European Union Institutions are not included either.

The value of turnover shall include all charges passed on to the customer even if they are invoiced separately.

From a practical standpoint, the definition is derived from the accounting definitions used by enterprises in the General Accounting Plan for Construction Companies, and is fully harmonised with that of the Structural Business Survey: Construction Sector and, therefore, with the ESA-2010 of the National Accounts.

Subcontracting

According to the NACE-2009, the National Classification of Economic Activities, the term *subcontracting* refers to the contractual arrangement whereby the principal requests the contractor to perform certain specific tasks, such as parts of the construction process or even the entire construction process, services related to human resources or certain support services.

CLASSIFICATION OF PRINCIPAL AND CONTRACTOR

In the case of Construction Subcontracting, both the principal and the contractor are classified in Section F (Construction).

TREATMENT OF SUBCONTRACTING WITHIN TURNOVER

The treatment of subcontracting within turnover is as follows: the principal must consider as turnover the revenue from sales of products manufactured by the subcontractor; the subcontractor must include in its turnover the amounts invoiced for services rendered under subcontracting.

This treatment therefore results in double counting, as the services rendered and product sales are considered by both units (principal and subcontractor) in their turnover figures. This problem is solved by eliminating the subcontracted part from turnover.

Stock variation for work in progress and completed works

Defined as the difference between stock in works in progress and in completed and started works (at the end and at the beginning of the data reference month) for the different products (including finished, semi-finished, in progress, by-products, waste and recovered materials) manufactured/produced by the company.

The variation of works in progress and completed works compared to the previous month shall be accounted for at production cost, excluding VAT.

III Scope of the Survey

1 Population scope

The population scope of the Construction Production Index is made up of the units that conduct an economic activity included under **section F** *Construction* **of the NACE-2009**. Annex I lists the activities that make up the population scope.

2 Time scope

There is a monthly reference period.

3 Geographical Scope

The indices provide data at the national level, including Ceuta and Melilla.

IV Framework, reporting unit and sample

1   Framework of the survey

The sampling framework is the Central Business Directory (CBD), a list of companies that is updated annually from official administrative sources, mainly tax and Social Security sources. It is also updated with information from the statistical operations of INE.

The CBD contains information on the main economic activity and on the number of employees, variables that are used in the sample design, and on identification and location data, which are necessary for accurate information collection.

2   Respondent unit and reporting unit

The **reporting unit** is the unit for which the statistical information is to be requested. Regulation (EU) 2019/2152 of the European Parliament and of the Council of 27 November 2019 on European Business Statistics states that the basic statistical unit (or reporting unit) is the kind-of-activity unit. For the CoPI, this is defined as an activity that carries out a single activity, at the two-digit level within section F of NACE-2009.

In practice, in the absence of an appropriate framework for such units, the company is used as the reporting unit and will be asked for disaggregated information on the different economic activities it carries out.

The **respondent unit** to which the questionnaires are addressed will be the company, which will provide the information disaggregated according to the different activities it carries out.

3   Sample

The CoPI sample size is approximately 3,600 units.

4   Sample Design

Stratified random sampling is applied retaining as much as possible the methodology of the Construction Industry Production Index (EIPIC) carried out until December 2025 by the Ministry of Transport and Sustainable Mobility. In each stratum, a random sample is obtained, except the one formed by companies with 100 or more employees, in which all form part of the sample. For the calculation of the sample size an optimal allocation is applied keeping as much as possible the allocation of the 2025 EIPIC.

Stratification

Each stratum is formed by cross-referencing the main economic activity according to the NACE09 (9) and the size group (4), measured by the number of salaried employees.

The nine activity groups within each division of the construction sector, are as follows:

– Division 41: 411 and 412

– Division 42: 421, 422 and 429

– Division 43: 431, 432, 433 and 439

The size groups are defined according to the following employee tiers:

– Tier 1: 1 to 19 employees

– Tier 2: 20 to 49 employees

– Tier 3: from 50 to 99 employees

– Tier 4: 100 or more employees

Tier 4 is studied exhaustively. Some units with fewer than 100 employees but with a high turnover are also added in an exhaustive manner.

Sample size

The sample size for 2026 has been determined by combining the following two procedures:

– The application of optimal allocation, which determines the minimum necessary sample size by ensuring that the sampling error of the stratified estimator of total turnover does not exceed 5% in each division.

– Minimising the variations from the 2025 IPIC allocation used in the 2025 IPIC.

In this way, the changes associated with the methodological transition from IPIC to IPCO are minimised.

Sample selection

An attempt is made to maintain the same sample as the EIPIC and it is completed with the exhaustive units according to the CBD to reach 3,600 units.

Rotation of sampling units

European Regulations require base changes every 5 years. At such times, the sample is renewed in order to reflect the new population distribution. However, in order to avoid respondent fatigue and sample ageing, without losing representativeness with respect to the current population, an annual rotation of between 20 and 25% of the sample is carried out in the sample strata. Rotations take place in January each year.

The criterion used is to replace companies that have been cooperating in calculating the Index for approximately 4-5 years, and all those that have been de-listed, are untraceable, were included by mistake and have merged or been taken over. New units with 100 employees or more or with high turnover are also added to the sample.

V Data Collection

Information collection is carried out through the INE Provincial Delegations and Central Services. The collection system is by means of a monthly questionnaire completed by the reporting unit.

Respondents can use different ways to return completed questionnaires (internet via the IRIA system, electronic questionnaires by e-mail, post or fax).

The following table presents the work that is carried out in each phase prior to the publication of results, and the timeframe in which this work is performed.

Tasks to be performed	Date
Delivery of questionnaires to the reporting units	Last week of the month t
Arrival of questionnaires at the provincial office	From day 1 of month $t+1$
Recording and filtering	Continuously from reception
Receipt of questionnaires at Central Services (CS)	For each reference month (t), CS receives three different deliveries, the first on the 19th day of $t+1$, the second on the 27th day of $t+1$ and the third on the 5th day of $t+2$
Selective filtering, calculation of the indices	From the first delivery received at Central Services (CS)
Publication of results	According to the INE short-term statistics availability calendar, approximately 43 days after the reference month

VI Base year and reference years

Commission Implementing Regulation (EU) 2020/1197 of 30 July 2020, which lays down technical specifications and modalities under European Parliament and Council Regulation (EU) 2019/2152 on European Business Statistics, stipulates that the base indices are to change every five years, with base years ending in zero or five, with the exception of the year 2021. All indices must be adapted to the new base year within three years from the end of the new base year.

In the Construction Production Index, the base year (the year in which the arithmetic mean of the twelve-month indices equals 100) is 2021. The reference period (the period for which comparisons of the different situations are made and which is chosen for the calculation of the elementary indices) is January 2021. Finally, the weightings reference period (the period in which the weightings are used to structure the system) is also 2021.

The Construction Production Index started to be disseminated in base 2021 in March 2024, coinciding with the publication of the January 2024 data. The data series from January 2021 is published in base 2021.

VII National Classification of Economic Activities. NACE-2009

The European Parliament and the Council adopted the new classification of economic activities for statistical purposes within the European Union, called NACE Rev.2, on 20 December 2006 by means of Regulation (EC) No 1893/2006. This Regulation also stipulates the use of the new classification in Community-wide statistics in order to ensure a harmonised implementation of the new classification. These statistics include short-term statistics, such as the Construction Production Index.

Commission Regulation (EC) No 472/2008 on the transmission in NACE Rev.2 of short-term statistics was adopted on 29 May 2008, establishing European guidelines for the dissemination of results in the new classification. In accordance with the provisions of this Regulation, as of the reference month January 2009, the indices began to be published in the new classification, NACE-2009.

VIII Formulation of the indices

The Construction Production Index is a volume index whose purpose is to measure the evolution of the value added of construction activities of the market in the short term.

Methodologically, therefore, they are formulated in the same way as other production indices.

$$I_t = \sum_{i=1}^{N} \frac{VAB_{i,0}}{\sum_{i=1}^{N} VAB_{i,0}} * \frac{p_{i,0} \times q_{i,t} - \sum_{j=1}^{M_t} a_{j,0} \times \delta_{j,t}}{p_{i,0} \times q_{i,0} - \sum_{j=1}^{M_0} a_{j,0} \times \delta_{j,0}}$$

Where:

t, is the reference period

N, is the number of elements that make up the index

$q_{i,t}$, is the quantity produced of product *i* in period *t*

$q_{i,0}$, is the quantity produced of product *i* in period *0*

$p_{i,0}$, is the price of product *i* in period *0*

M_i, is the quantity of inputs needed in product *i*

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$\delta_{j,t}$ is the quantity of input *j* needed to make product *i* in period *t*

$\delta_{j,0}$ is the quantity of input *j* needed to make product *i* in period *0*

$a_{j\,0}$, is the price of input *j* in period *0*

In practice, the data necessary for the compilation of the index defined by the theoretical target are often not available on a monthly basis. The value added in the base period is available, which is used for the calculation of the weighting. But the monthly derivation of the value added from the base period is conducted by means of appropriate proxies.

One of these proxies is the deflated turnover. In this case it must be assumed that, in the short term, output evolves in a similar way to GVA.

Thus, the construction production index is summarised as follows:

$$I_t = \sum_{i=1}^{N} W_{i,0} * \frac{VAB_t}{VAB_0} = \sum_{i=1}^{N} W_{i,0} * \frac{K * p_{i,0} \times q_{i,t}}{K * p_{i,0} \times q_{i,0}} = \sum_{i=1}^{N} W_{i,0} * \frac{p_{i,0} \times q_{i,t}}{p_{i,0} \times q_{i,0}}$$

By multiplying and dividing by the prices in *t*

$$I_t = \sum_{i=1}^{N} W_{i,0} * \frac{p_{i,0} \times q_{i,t}}{p_{i,0} \times q_{i,0}} * \frac{p_{i,t}}{p_{i,t}} \qquad I_t = \sum_{i=1}^{N} W_{i,0} * \frac{p_{i,t} \times q_{i,t}}{p_{i,0} \times q_{i,0}} * \frac{p_{i,0}}{p_{i,t}}$$

Replacing price per quantity for turnover:

$$I_t = \sum_{i=1}^{N} W_{i,0} * \frac{VN_{i,t}}{VN_{i,0}} * \frac{p_{i,0}}{p_{i,t}} \qquad I_t = \sum_{i=1}^{N} \frac{VAB_{i,o}}{\sum_{i=1}^{N} VAB_{i,0}} * \frac{VN_{i,t}/VN_{i,0}}{p_{i,t}/p_{i,0}}$$

The Construction Production Index can therefore be obtained as an aggregate index of the Turnover Indices of each activity, deflated by the construction sector cost index and weighted, depending on the value added of that activity, in relation to the total value added generated by all construction sector activities.

1 Turnover Index

The turnover indices for the construction sector are Laspeyres-type indices obtained on a monthly basis as follows:

The elementary index, with a baseline year of 2021, is defined as:

$$_{2021}I_e^{mt} = \frac{\hat{Y}_e^{mt}}{\hat{\bar{Y}}_e^{2021}} x100$$

where $\hat{Y}_e^{m,t}$ and $\hat{\bar{Y}}_e^{2021}$ refer to the turnover estimates of the elementary aggregate *e* for one month *m* of year *t* and the average of the base year (2021), respectively.

This expression is equivalent to:

$$_{2021}I_e^{mt} = \frac{\hat{Y}_e^{m,t}}{\hat{\bar{Y}}_e^{2021}} x \frac{\hat{Y}_e^{m-1,t}}{\hat{Y}_e^{m-1,t}} x100 = {_{2021}I_e^{m-1,t}} x \frac{\hat{Y}_e^{m,t}}{\hat{Y}_e^{m-1,t}}$$

where:

$\hat{Y}_e^{m-1,t}$ is the estimate of turnover for month *m-1* of year *t*, and

$_{2021}I_e^{m-1,t}$ $_{2015}I_e^{m-1,t}$ is the index of the elementary aggregate *e* for month *m-1* of year *t* with baseline year 2021.

ESTIMATORS AND SAMPLING ERRORS

Estimators

As it is a stratified simple random sampling, the estimator of the expansion of the total of the variable $Y = $ "turnover", in a domain *d* is given by the following expression:

$$\hat{Y}_d = \sum_{h=1}^{L} \sum_{j=1}^{n_h} F_h \cdot y_j \cdot z_j$$

where:

- $F_h = \frac{N_h}{n_h}$: elevation factor of the stratum h.

- N_h: number of units within the stratum h.

- n_h: number of sampling units in the stratum h.

- y_j value taken by the variable y in unit j.

- z_j : random variable that takes on the value 1 if the unit j belongs to domain d j or value 0 otherwise.

Sampling errors

To obtain a measure of the quality of the indices, an approximate relative sampling error is calculated for the year-on-year change rates of the turnover and total employee variables.

The expression of the estimated relative sampling error for a domain d and a period t, assuming negligible bias, is given by

$$\widehat{CV}\left(\hat{R}_{t,d}\right) = 100 \cdot \frac{\sqrt{\hat{V}_{mues}\left(\hat{R}_{t,d}\right)}}{\hat{R}_{t,d}}$$

$$being \quad \hat{R}_{t,d} = \frac{\hat{Y}_{t,d}}{\hat{Y}_{t-1,d}}$$

$\hat{R}_{t,d}$ is the combined ratio estimator in the domain d, given by the quotient of the estimate of total turnover Y in month m of year t, $\hat{Y}_{t,d}$, and the same estimate obtained in month m of year t-1, $\hat{Y}_{t-1,d}$.

The estimate of the sampling variance $\hat{V}_{mues}\left(\hat{R}_{t,d}\right)$ is obtained by applying the Bootstrap resampling technique , following the following steps for each replicate b:

- We start from the samples of periods t and t-1.

- A replicate b of these samples is carried out by resampling with replacement in each period, following the sampling design.

- The year-on-year rate of change of the estimates of total turnover in domain d is calculated on that replicate b, described by $\hat{R}_{t,d}^{b}$

The process is repeated B=1000 times and the empirical variance of these rates is calculated:

$$\hat{V}_{mues}\left(\hat{R}_{t,d}\right) = \frac{1}{B-1}\sum_{b=1}^{B}\left(\hat{R}_{t,d}^{b} - \overline{\overline{R}}_{B}\right)^{2}, \text{siendo } \overline{\overline{R}}_{B} = \frac{1}{B}\sum_{b=1}^{B}\hat{R}_{t,d}^{b}$$

Once the basic indices are calculated, the aggregate indices are obtained as weighted sums of the basic indices.

$$_{2021}I_K^{mt} = \sum_{\forall e \in K} {}_{2021}W_{e/K} * {}_{2021}I_e^{m,t}$$

where:

$_{2021}I_e^{m,t}$ $_{2015}\mathrm{I}_e^{\mathrm{mt}}$ is the elemental index for month *m* of year *t*.

$_{2021}W_{e/K} = \frac{F_e^{2021}}{F_K^{2021}}$ $_{2015}\mathrm{W}_{e/A} = \frac{\bar{\mathrm{F}}_e^{2015}}{\bar{\mathrm{F}}_A^{2015}}$ is the weight of the elementary aggregate *e* over the functional aggregate *K* in the base year 2021.

In the case of the Construction Production Index, the aggregate index is considered to be that of section F of NACE 2009.

The weightings involved in the calculation of the aggregate indices are obtained from data in the Structural Business Statistics: Construction Sector.

2   Weightings

The weightings involved in the calculation of the aggregate indices are obtained from data in the Structural Business Statistics: Construction Sector. The fundamental objective of is survey, of a structural nature and annual periodicity, is to provide accurate, reliable and timely information on the different sectors that make up the activity of construction.

The weighting of each elementary aggregate represents the ratio between the amount of Value Added of the construction activities that make up that elementary aggregate and the total Value Added of the construction activities that form the population scope of these indices (section F of the NACE-2009).

$$W_i = \frac{Value\ added\ of\ the\ activities\ of\ the\ basic\ aggregate\ i\ in\ 2021}{Total\ value\ added\ of\ the\ construction\ sector\ (section\ F), 2021}$$

3   Deflator

The deflator used is the cost indices of the construction sector.

4 Formulation of the Production Indices

The Construction Production Index is a Laspeyres-type index.

The following sections define the elementary and aggregate indices.

– Elemental aggregates:

An elementary aggregate is the component with the lowest level of aggregation for which indices are obtained and in whose calculation no weightings are involved. The indices of these aggregates are called elementary indices or simple indices.

In the case of the CoPI, the divisions of section F of the NACE 2009 are considered to be elementary aggregates.

– Elementary indices:

The elementary indices of the CoPI are obtained as the ratio between the Turnover Index for that elementary aggregate and the Cost Index of that aggregate.

$$_{2021}IPCO_m = \frac{_{2021}ICN_e^m}{_{2021}IC_e^m}$$

– Aggregate indices:

An aggregate index is obtained as a weighted sum of the elementary indices belonging to that level of aggregation, using as weightings the Value Added generated in that activity or sector in the base year with respect to the Value Added generated by all the activities or sectors included in that level.

$$_{2021}IPCO_m = \sum_{e=1}^{N} \frac{VAB_{e,2021}}{\sum_{e=1}^{N} VAB_{e,2021}} \times _{2021}IPCO_e^m = \sum_{e=1}^{N} W_{e,2021} \times _{2021}IPCO_e^m$$

The source of information to obtain the weighting is the Structural Business Statistics: Construction Sector from the base year.

In the case of the CoPI, the index obtained for section F of the NACE 2009 is considered as the aggregate index.

5 Imputation and imputation errors

Imputation

When the monthly turnover of a sample unit is not obtained, it is imputed. For this purpose, a Machine Learning (ML) model is used, which estimates the missing value based on auxiliary information from the CBD, from different monthly and quarterly official administrative files, and from the survey collection history itself.

Consequently, the value of the variable y_j used in the estimations is the value collected from the survey or imputed by the model when the unit does not respond. This leads to elevation factors F_j remaining constant over the course of a year until the populations and samples are updated.

Imputation errors

To measure the effect of imputation on the quality of the estimates, the imputation variance $\hat{V}_{imp}(\hat{R}_{t,d})$ is calculated by applying Bootstrap resampling techniques, with the following steps for each m replicates:

– We start from the theoretical samples for periods t and t-1.

– A replicate m of these samples is carried out by resampling with replacement of non-responding units from each period, following the sampling design.

– Missing values are imputed using the ML model for each period after retraining with the m replica.

– We estimate the year-on-year rate of change of turnover in domain d on the sample obtained and the imputed values on the training in this replica m, described by $\hat{R}_{t,d}^m$.

The process is repeated M=500 times and the empirical variance of these rates is calculated:

$$\hat{V}_{imp}(\hat{R}_{t,d}) = \frac{1}{M-1} \sum_{m=1}^{M} \left(\hat{R}_{t,d}^m - \overline{\hat{R}}_M \right)^2 , \text{ being } \overline{\hat{R}}_M = \frac{1}{M} \sum_{m=1}^{M} \hat{R}_{t,d}^m$$

IX Construction Production Index adjusted for seasonal and calendar effects

The Construction Production Index is published adjusted for seasonal and calendar effects in base 2021.

The seasonal adjustment of these indicators is carried out in accordance with the *INE Standard for the correction of seasonal and calendar effects in short-term series*[1] that is available in INEbase. This standard follows the recommendations of the European Union contained in the *ESS guidelines on seasonal adjustment*.

The series adjusted for calendar effects and the series adjusted for seasonal and calendar effects are obtained using the JDemetra+ software (version 2.2.2)[2], starting with the publication of data in base 2021. JDemetra+ has been officially recommended by Eurostat since February 2015 for performing seasonal and calendar adjustments in the official statistics of the European Union.

The time series analysis methodology recommends a periodic review of the models in order to incorporate the most current information. This makes the corrected series of calendar effects and seasonal and calendar effects always provisional.

1   Indices adjusted for calendar effects

The European Regulation regarding short-term business statistics, for the purpose of harmonising all of the indicators compiled by the different European Union countries and achieving the greatest comparability possible, requests that the indices are provided in net terms, that is, eliminating the calendar effect, among others.

The calendar effect is defined as the impact produced in the time series of a variable due to the different structure that months (or quarters) have in the different years (in both length and composition), even if other factors influencing said variable remain constant.

The length of the month is not completely absorbed by the seasonal component, as the number of days in February may not be the same each year. This non-seasonal portion of a month's duration component must be removed in series adjusted for calendar effects.

On the other hand, the composition of the month refers to the variations in Construction Output caused by the different number of public holidays of the same month in successive years and of days of the week, i.e. Monday, Tuesday, etc., of the same month in successive years.

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[1] http://www.ine.es/clasifi/estandar_efectos_estacionales.pdf
[2] https://github.com/jdemetra/jdemetra-app/releases/tag/v2.2.2

The method used for the correction of calendar effects is based, following the INE standard and according to Eurostat recommendations, on regARIMA models (regression models with stationary ARIMA errors). In particular, regARIMA models with centred regressors for the calendar effect have been used to capture the following three effects:

1. Effect of composition of working days

   The adjustment of the working-day effect is done using the default "Trading Days" regressors calculated in JDemetra+, taking into account national holidays and the construction work schedule. These regressors account for the different composition of working days in the month, as each day of the week may behave differently.

2. The Holy Week Effect

   With regard to changeable holidays, the most important in Europe is Holy Week. The Holy Week regressor used is also calculated by JDemetra+ by default. It is worth noting that this regressor considers Easter Monday as a holiday.

3. The leap-year effect

   The intervention variable that covers the effect of the leap year distinguishes which months of February have 29 days from those that do not.

2 Indices adjusted for seasonal and calendar effects

Once the calendar effects are adjusted, a further step is taken and the indices of seasonal effects are adjusted. Seasonal fluctuations are movements that occur with a similar intensity each month, each quarter or each season of the year, and which are expected to continue occurring.

Seasonally-adjusted series, that is, those adjusted for seasonal and calendar effects, provide an estimate of what is "new" in a series (change in the trend, the cycle and the irregular component).

Annex I. Population scope according to the National Classification of Economic Activities NACE-2009

The scope of application of the Construction Production Index is section F (Construction) of the NACE-2009.

F Construction

This section includes general construction and specialised construction activities for buildings and civil engineering works. It includes new work, repair, additions and alterations, the erection of pre-fabricated buildings or structures on the site and also construction of temporary nature.

General construction is the construction of entire dwellings, office buildings, stores and other public and utility buildings, farm buildings etc., or the construction of civil engineering works such as motorways, streets, bridges, tunnels, railways, airfields, harbours and other water projects, irrigation systems, sewerage systems, industrial facilities, pipelines and electric lines, sports facilities etc.

This work can be carried out on own account or on a fee or contract basis. Portions of the work and sometimes even the whole practical work can be subcontracted out. A unit that carries the overall responsibility for a construction project is classified here.

Also included is the repair of buildings and engineering works.

This section includes the complete construction of buildings (division 41), the complete construction of civil engineering works (division 42), as well as specialised construction activities, if carried out only as a part of the construction process (division 43).

The renting of construction equipment with operator is classified under the specific construction activity carried out with this equipment.

This section also includes the development of building projects for buildings or civil engineering works by bringing together financial, technical and physical means to realise the construction projects for later sale. If these activities are not carried out for later sale of the construction projects, but for their operation (e.g. renting of space in these buildings, manufacturing activities in these plants), the unit would not be classified here, but according to its operational activity, i.e. real estate, manufacturing etc.

The following table presents the divisions of section F Construction that are part of the scope of the Construction Production Index.

Population scope according to NACE-2009

F. Construction

41	**Construction of buildings**
411	**Development of building projects**
4110	Development of building projects
412	**Construction of buildings**
4121	Construction of residential buildings
4122	Construction of non-residential buildings
42	**Civil engineering**
421	**Construction of roads and railways, bridges and tunnels**
4211	Construction of roads and motorways
4212	Construction of railways and underground railways
4213	Construction of bridges and tunnels
422	**Construction of utility projects**
4221	Construction of utility projects for fluids
4222	Construction of utility projects for electricity and telecommunications
429	**Construction of other civil engineering projects**
4291	Construction of water projects
4299	Construction of other civil engineering projects n.e.c.
43	**Specialised construction activities**
431	**Demolition and site preparation**
4311	Demolition
4312	Site preparation
4313	Test drilling and boring
432	**Electrical, plumbing and other construction installation activities**
4321	Electrical installation
4322	Plumbing, heat and air-conditioning installation
4329	Other construction installation
433	**Building completion and finishing**
4331	Plastering
4332	Joinery installation
4333	Floor and wall covering
4334	Painting and glazing
4339	Other building finishing
439	**Other specialised construction activities**
4391	Roofing activities
4399	Other specialised construction activities N.E.C.