REPUBLIC OF CROATIA
CROATIAN BUREAU OF STATISTICS

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QUALITY REPORT FOR STATISTICAL SURVEY

Quarterly Report on Construction (GRAĐ-21/3M)
For 2017

Organisational unit: Construction Statistics Department

Prepared by: Srećko Palej

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0. Basic information

- Purpose, goal, and subject of the survey

  The purpose of the Quarterly Report on Construction is to provide data on the works done on constructions in the Republic of Croatia, by types of constructions and works.

  As short-term indicators, volume indices of construction works and the value of construction works done are used rather to determine the dynamics and structural changes in construction works over time than their level.

  The value of new orders of construction works is used to predict future works.

  Observation units are business entities (legal entities and crafts) classified in the Statistical Business Register under section F Construction (divisions 41, 42, 43) and legal entities that are not classified under Construction activity in the NKD 2007, but contain parts (working units, plants and parts of legal entities) that perform construction works (e.g. HEP, public utility companies, etc.).

- Reference period

  Quarter

- Legal acts and other agreements

  The legal bases for the Quarterly Report on Construction (GRAĐ-21/3M form) are the following:

  - Official Statistics Act (NN, Nos. 103/03, 75/09 and 59/12 – consolidated text)
  - Programme of Statistical Activities of the Republic of Croatia
  - Annual Implementation Plan of Statistical Activities of the Republic of Croatia
  - Council Regulation (EC) No 1165/98 of 19 May 1998 concerning short-term statistics
  - Regulation (EC) No. 1158/2005 of the European Parliament and of the Council of 6 July 2005 amending Council Regulation (EC) No 1165/98 of 19 May 1998 concerning short-term statistics
  - Commission Regulation (EC) No 1503/2006 of 28 September 2006 implementing and amending Council Regulation (EC) No 1165/98 concerning short-term statistics as regards definitions of variables, list of variables and frequency of data compilation
  - Regulation (EC) No 1893/2006 of the European Parliament and of the Council of 20 December 2006 establishing the Statistical Classification of Economic Activities NACE Rev. 2 and amending Council Regulation (EEC) No 3037/90 and certain EC Regulations on specific statistical domains

  The obligation of reporting units to submit data is based on Article 38 - Official Statistics Act (NN, Nos. 103/03, 75/09 and 59/12 – consolidated text)

  Refusing to provide data, providing incomplete and inaccurate data, or failing to provide data within the prescribed deadline will be subject to the penalty provisions laid down in Articles 69 and 70 of the aforementioned Act.

- Classification system

  National Classification of Activities, 2007 version

  National Classification of Types of Constructions

- Statistical concepts and definitions

  Observed variables in the Quarterly Report on Construction are the following:

  1) Hours of work done by workers on sites in the reporting month by types of constructions (at the level of two-digit numerical code of the National Classification of Types of Constructions – NKVG) and types of works (new constructions and other works). The hours of work actually done by workers directly on construction sites are included, as follows:

     - hours worked according to collective and other contracts as well as written and verbal agreements

     - hours worked in overtime, night-time work, work done on Sunday and national holidays

     - hours worked by workers hired by agencies or borrowed employees of other units or business entities

     - hours worked by owners of (smaller) business entities and members of their families if they directly participated in works on construction sites

     - hours worked by pupils during their traineeship.

     Hours worked also include short interruptions during work-time, but do not include longer breaks such as those that occurred e.g. due to lack of building material, loss of electricity, construction machines breaking down, etc.

     These hours actually worked are included regardless of whether they were paid for or not or if they are not going to be paid for or not.

     Paid working hours for non-working periods (e.g., hours of workers on a grace period, vacation, sick leave, strike, etc.) and hours of managerial and clerical personnel connected with construction activity are not included.

     According to the Eurostat guidelines, working hours on construction sites are a good alternative for calculating the volume of construction works and measuring construction production in monthly dynamics. The main reason for this is that the working hours on construction sites are closely related to the production process in the reporting period and are available on a monthly basis.

     Based on hours actually worked, the volume index of construction works is compiled for construction in total and for two sub-indices: for buildings and civil engineering works. The volume index of construction works is an important short-term indicator for construction statistics which is used for the analysis of a business cycle and as input for national accounts for the calculation of the gross domestic product (GDP).

     Until 2015, volume indices of construction works were compiled on the basis of hours of works done by workers on construction sites, but they were not adjusted for a productivity factor. In order to improve the level of compliance of official statistics in the Republic of Croatia with the recommendations of Eurostat, the adjustment of working hours for the productivity factor was carried out. The productivity factor is estimated on an annual basis from the deflated value of works and hours worked, separately for buildings, and separately for other civil engineering works. The fluctuation of individual values of the productivity factor is alleviated by using the exponential smoothing of the time series. After the calculation of indices for buildings and for civil engineering works, the next phase includes the calculation of the index for the total construction indirectly by aggregating these two semi-indices by applying the Laspeyres' formula. Weights are defined according to the share of the value added from section F – Construction, taking into account the production factors' costs from structural business statistics in a base year.

The new method has been applied to monthly indices since January 2000.

Since the productivity factor is estimated on an annual basis on the basis of the data from the previous year, the data for the whole reference year will be issued as provisional data. After the calculation of the actual productivity for the reference year is done, the final results are published.

2) Value of orders by types of constructions. The value of orders is the total value of contracts made in a reference month with ordering parties. An order is considered to be made on the day when a contract is signed between the ordering party and the contractor. Orders should also include construction for own needs, i.e. the needs of a business entity that performs construction works and other cases when there is no written contract with the ordering party.

   On the basis of data on the value of new orders, the dynamics of construction activities, future works and the structure of investments can be predicted.

3) The value of construction works by types of constructions and works is presented at current prices and includes works actually done during the reporting period, irrespective of whether they are paid for or not. The value of construction works done includes the value of work, building material, complete units and structures, propulsion material and electricity, expenses of construction machinery usage and equipment and other expenses related to the work in question.

   The value of construction works done excludes value added tax, purchase costs of the land, project costs, surveying of land and supervising of services.

   Note: in 2015, in order to reduce the burden on the reporting units, the number of required variables in the Quarterly Report on Construction (GRAĐ-21/3M form) was reduced by cancelling the collection of data on residential construction.

- Statistical units

  Observation units are business entities (legal entities and crafts) classified in the Statistical Business Register under section F Construction (divisions 41, 42, 43) and legal entities that are not classified under Construction activity in the NKD 2007, but contain parts (working units, plants and parts of legal entities) that perform construction works (e.g. HEP, public utility companies, etc.).

- Statistical population

  Section F – Construction from NKD 2007

  The survey is based on a cut-off sample, which means that a very detailed survey is conducted for business entities with 20 or more employees. For business entities with less than 20 employees, data are not collected and sampling is not applied.

  The target population are all active business entities that are classified in sections 41, 42 and 43 in the Register of Business Entities or the Crafts Register and that employ 20 or more employees.

1. Relevance

1.1. Data users

Users of statistical data from the Quarterly Report on Construction can be found in all areas of economic and social life, starting from business entities, the media, economic analysts, researchers and students, to state administration bodies, professional business organisations (Croatian Chamber of Economy), non-profit organisations (Croatian Chamber of Trades and Crafts, Croatian Employers' Association), financial institutions (Croatian National Bank, Raiffeisen bank, etc.) and internal users from the Croatian Bureau of Statistics (national accounts).

1.1.1. User needs

Users of statistical data from the Quarterly Report on Construction can be found in all areas of economic and social life, starting from business entities, the media, economic analysts, researchers and students, to state administration bodies, professional business organisations (Croatian Chamber of Economy), non-profit organisations (Croatian Chamber of Trades and Crafts, Croatian Employers' Association), financial institutions (Croatian National Bank, Raiffeisen bank, etc.) and internal users from the Croatian Bureau of Statistics (national accounts), which use data series of volume indices of construction works, value of orders and value of completed construction works.

1.1.2. User satisfaction

Not available.

1.2. Completeness

Volume indices of construction works are available at a one-digit level of the NKVG (for buildings, civil engineering works and total) on a monthly basis for national needs and quarterly for Eurostat. It is in line with Council Regulation (EC) No 1165/98.

1.2.1. Data completeness rate

Data completeness rate is 100%.

2. Accuracy and reliability

2.1. Sampling error

It is not possible to determine sampling errors because the sample is not based on random sampling. Given that there is no secondary source of data for the entire population, it is not possible to estimate the accuracy of the change in the occurrence of the selected model. It is only possible to estimate the accuracy of the change in the occurrence on a monthly, quarterly and annual level. The estimate of the non-sampled part of the population (business entities with less than 20 employees) is not carried out due to the specific nature of construction activity (a large number of small business entities that perform all works regardless of the registered activity). Based on the registered activity, it is not possible to determine how much work these business entities did on buildings, nor on civil engineering works.

The reasons why sampling was not applied are the following: a large number of small units that should be included in the sample, a large burden on the reporting units, and high costs of data collection for the Croatian Bureau of Statistics.

2.1.1. Sampling error indicators

The indicator is not applicable.

2.2. Non-sampling error

Non-sampling errors are related to all other errors that are not connected with the sample selection – coverage, measurement, processing, non-response.

They are regularly calculated and controlled.

2.2.1. Coverage error

Non-coverage

It occurs mainly due to the incorrectly stated activity of an enterprise in the Statistical Business Register (the enterprise is classified in an activity other than construction, but actually performs construction

works). No record is kept of the number of non-covered reporting units due to the incorrectly stated activity. Given that at the time of forming the contingent of reporting units, there is no possibility of comparing data from the SBR with some other data source (because there is no other data source), no assessments are made for these units either, because their importance is unknown. Therefore, in this survey, the target population is limited to the one covered by the framework, while the impact of non-covered units is neglected. However, the Croatian Bureau of Statistics makes great efforts to reduce this error, so that expert departments/units regularly send all collected information (on incorrect data on reporting units, e.g. wrong address, engaged in some other activity) to the SBR, which regularly updates the file. That is why there will be fewer and fewer such mistakes in the SBR.

Over-coverage

As in the case of non-coverage, it occurs mainly due to the incorrectly stated activity of an enterprise in the SBR (the enterprise is classified in a construction activity, but actually performs an activity other than construction). This error is detected during the collection and checking of data and contacting with the reporting units. In 2017, nine companies were included in the coverage, which were actually engaged in an activity other than construction, which is 0.8% of all units included in the coverage. The largest part of these units was engaged in industrial activity or trade. The obtained information were sent to the Statistical Business Register in order to update the data.

Duplication

The risk/probability for this error is zero, because coverage is formed from the SBR. So far, multiple coverage of reporting units has not been recorded.

2.2.2. Over-coverage rate

Over-coverage rate is 0.8%.

2.2.3. Measurement error

Although there is no other source of data, i.e. databases/registries with which data obtained from the Monthly/Quarterly Report on Construction could be compared and thereby establish measurement errors, the Construction Statistics Department compares movements in the volume index of construction works with the data on movements in the number of persons employed in construction from the Labour Market Statistics Department. However, in this comparison, different data collection methodologies should be taken into consideration. According to the methodology of the Labour Market Statistics Department, persons are employed as long as they have an employment record book in a business entity, regardless of whether they actually work and receive a salary or not, while the volume index of construction works is based on the hours actually worked on the construction site and therefore, in the case of economic difficulties, the total number of persons employed in construction is falling more slowly than the indices of construction production. However, despite the differences in the methodology, when comparing the annual data for working hours (GRAĐ-21/M and GRAĐ-21/3M forms) and the total number of persons employed in construction (data from the Labour Market Statistics Department), it can be concluded that there is a strong connection between these two variables. The correlation coefficient for the period 2000 – 2017 is 0.90.

In addition, if we compare the annual data on the value of orders (GRAĐ-21/M and GRAĐ-21/3M forms) with the estimated value of works from the Monthly Report on Issued Building Permits (GRAĐ-44a), it can be concluded that there is a strong connection between these two variables. The correlation coefficient for the period 2001 – 2017 is 0.82.

Errors in measurements while collecting data occur due to lack of knowledge, negligence, lack of appreciation of importance of statistics, not knowing how to respond and conscious/unconscious presenting of inaccurate data by respondents. Problems arising from unclear questions in the questionnaire, measurement units or ambiguous instructions for filling in the forms are minor due to the fact that the availability of data was taken into consideration while defining their content. In addition, the

reporting units are welcome to contact regional offices of the Croatian Bureau of Statistics and the Administrative Body of the City of Zagreb competent for official statistics issues (which provide assistance to the reporting units in filling in reports and control the completeness and accuracy of data before they are submitted to the Croatian Bureau of Statistics), or directly the Croatian Bureau of Statistics.

These measurement errors do not represent a major issue, since they are revealed during the visual and calculation control of data before they are entered in the computer as well as by the default computerised data editing during data processing. When such illogicalities or errors are detected, the reporting units are contacted for the check-up of inaccurate and incomplete data and for the correction of inaccurate data.

2.2.4. Non-response errors

Unit non-response

The non-response rate is 0.6%. For other reporting units, all data are available within the given deadlines. If some data are missing or the reporting units are late in delivering the data, those reporting units are contacted by phone and asked to deliver the data.

Item non-response

There were no non-responses for variables. In the data processing phase, the reporting units that have not fully completed the questionnaire are contacted by phone and asked to provide corrected or missing data. Every quarter, the response rate is 100%.

2.2.5. Unit non-response rate

Unweighted non-response rate:

%

Domain	Domain value	Comment	Q1	Q2	Q3	Q4	Average
Croatia	Croatia		0,5	0,5	0,7	0,9	0,6

2.2.6. Item non-response rate

Unweighted non-response rate for certain variables:

%

Variable	Domain	Domain value	Comment	Q1	Q2	Q3	Q4	Average
Non-response rate for all variables	Croatia	Croatia		0	0	0	0	0

2.2.7. Processing errors

The most common processing errors occur due to the incorrectly stated activity of the reporting units. This happens due to the lack of updating of the Statistical Business Register, which is the basis for population selection. In order to update the Statistical Business Register, we submit all the information we receive in the course of conducting the survey, which are related to any organisational changes, to the Statistical Business Register.

2.2.8. Imputation rate

The indicator is not applicable.

2.2.9. Model assumption error

Not available.

2.3. Data revision

2.3.1. Data revision – policy

The users of statistical data are informed about revisions (provisional data, final data) on the website of the Croatian Bureau of Statistics.

Revisions are done for correcting errors or major changes in classifications or methodology.

Routine revisions are not carried out since all data are available according to deadlines.

Notices about minor changes are announced in First Releases at the time the change has been introduced.

The same revision policy is applied to data publishing, both for national purposes and when submitting data to Eurostat.

The data publishing revision policy of the Croatian Bureau of Statistics includes the following:

1) updating of the Calendar of Statistical Data Issues

   The data publishing revision policy of the Croatian Bureau of Statistics, which is carried out according to the defined deadlines, is carried out by updating the Calendar of Statistical Data Issues. According to the Official Statistics Act, changes in publishing deadlines for publications/data are announced in advance. The Croatian Bureau of Statistics is obliged to announce each change in publishing deadlines (updating of the Calendar of Statistical Data Issues) at least three days prior to the date originally announced in the Calendar of Statistical Data Issues on their website.

   The update of publishing deadlines for data or publications (Calendar update) is announced without delay on the website of the Croatian Bureau of Statistics by updating the date in the Calendar and putting a notice next to the Calendar, which says: updated, and specifying the accurate new date.

   Therefore, the Calendar that contains the original publishing deadline for a particular publication/statistical information is replaced with the new Calendar, which includes the updated publishing deadline. The original Calendar is kept in the Publishing Department, which registers every change in publishing deadlines for publications in the Calendar Update Base.

2) publishing corrections of the released data

   In cases when an error is observed in the published data, the Croatian Bureau of Statistics publishes a correction as soon as possible and as simple as possible in order to help users to clearly see what has been changed in comparison to the originally published data. The correction is carried out by marking the incorrect data with an asterisk and creating the correction.

2.3.2. Data revision – practice

Major changes in the methodology and changes of the base year are published in the First Release at the time when the change has been introduced.

The general practice is to explain all changes in the methodology when the data based on the new methodology are published for the first time.

In 2015, a revision of data on construction work indices was carried out. The revision is comprised of an improved method for the calculation of construction works, which includes the adjustment of working hours with the productivity factor. The new method is applied to monthly and quarterly indices since

2000. Information on methodological changes are provided in the Notes on Methodology that are a part of all related paper or electronic publications.

Since the productivity factor is estimated on an annual basis on the basis of the data from the previous year, the data for the whole reference year are issued as provisional data. After the calculation of the actual productivity for the reference year is done, the final results are published. The average difference between the provisional and final data for 2017 is 0.15 percentage points.

Due to the replacement of estimated data with subsequently obtained data, routine revisions are not carried out since all data are available in accordance with deadlines.

However, if an error occurs, corrected data are published in the next issue of the First Release. Data changed in relation to the previously released ones are disseminated with a comment.

Data on the values of orders and completed works are disseminated as final and as such they are not subject to any revision. For this reason, numeric information on the size of typical revision and regular sources of revisions are not applicable.

2.3.3. Data revision – average size

Data revision – average size is:

Statistics	Domain	Domain value	Comment	Q1	Q2	Q3	Q4	Average
Volume index of construction works	Croatia	Croatia		0,24	0,05	0,11	0,20	0,15

2.4. Seasonal adjustment

1) The seasonal and working-day adjustment of the volume index of construction works was done by applying the "JDemetra+" programme interface (version 2.0.0.), using the X13 ARIMA method on the monthly index series (Ø 2010 = 100), which starts with the index for January 2000. The calculated series of the volume indices of construction works are comparable to those published by Eurostat.

2) The seasonal and working-day adjustment is not carried out for data on the value of orders and the value of completed works.

3. Timeliness and punctuality

3.1. Timeliness

For national purposes, quarterly indicators are published T + 69 days after the end of the reporting quarter as final data.

Quarterly indicators are sent to Eurostat in a given form (for construction in total, buildings and civil engineering works). The legal deadline is T + 60 days from the end of the reporting period (for countries that are obliged to prepare indices on a quarterly basis).

Forms are sent to the reporting units (which did not choose filling in electronic questionnaires) once (for the entire year), at the beginning of the year. The deadline for answers is the 20th of the month for the previous period. Data collection was completed approximately 20 days after the response deadline.

3.1.1. Timeliness – first results

The indicator is not applicable.

3.1.2. Timeliness – final results

Time lag – final results is T + 69 days.

3.2. Punctuality

All First Releases are published in accordance with the deadlines from the Calendar of Statistical Data Issues. There is no time lag between the actual data publishing date and the date announced in the Calendar of Statistical Data Issues.

3.2.1 Punctuality –delivery and publication

Delivery and publication is 1.

4. Accessibility and clarity

Volume indices of construction works are published in the following statistical publications: monthly First Releases, Statistical Yearbook, and in Excel tables on the website of the Croatian Bureau of Statistics under the link "Statistics in Line" (in Croatian and English).

Values of new orders and values of completed works are published in quarterly First Releases and in Excel tables on the website of the Croatian Bureau of Statistics under the link "Statistics in Line" (in Croatian and English).

These publications also contain short methodological explanations.

Publications are available to users in printed and electronic form on the website of the Croatian Bureau of Statistics https://podaci.dzs.hr/hr/podaci/gradevinarstvo/.

All publications are released simultaneously to all users at 11 a.m.

No one has advantage in accessing data.

4.1. News releases

Monthly data on the volume of construction works are published regularly in First Releases “Construction Works Indices”, seven weeks after the end of the month.

Quarterly data on the value of orders and completed works are published regularly in First Releases “Completed Construction Works and Orders, Business Entities Employing 20 or More Persons”, nine weeks after the end of the quarter.

All published data are available on the website of the Croatian Bureau of Statistics at https://podaci.dzs.hr/hr/podaci/gradevinarstvo/.

4.2. Online database

Not available.

4.3. Micro-data access

The conditions under which certain users can access microdata are regulated by the Ordinance on the Conditions and Manner of Using Confidential Statistical Data for Scientific Purposes.

4.4. Documentation on methodology

Volume indices of construction works are published in the following statistical publications: monthly First Releases, Statistical Yearbook, and in Excel tables on the website of the Croatian Bureau of Statistics under the link "Statistics in Line" (in Croatian and English).

Values of new orders and values of completed works are published in quarterly First Releases and in Excel tables on the website of the Croatian Bureau of Statistics under the link "Statistics in Line" (in Croatian and English).

These publications also contain short methodological explanations.

Publications are available to users in printed and electronic form on the website of the Croatian Bureau of Statistics https://podaci.dzs.hr/hr/podaci/gradevinarstvo/.

National documents:

a) Brief notes on methodology are available in monthly, quarterly and annual publications.

b) More detailed notes on methodology for this survey are published on the website of the Croatian Bureau of Statistics https://podaci.dzs.hr/hr/podaci/gradevinarstvo/.

International documents and manuals:

a) Methodology of Short-Term Business Statistics, Interpretation and Guidelines, 2006, contains a comprehensive set of recommendations on the compilation of the STS statistics for volume indices of construction works.

b) Detailed definitions of variables are available in Commission Regulation (EC) No 1503/2006 of 28 September 2006 implementing and amending Council Regulation (EC) No 1165/98 concerning short-term statistics as regards definitions of variables, list of variables and frequency of data compilation.

c) Guidelines for compiling the monthly Index of Production in Construction, Eurostat, 2011

5. Coherence and comparability

5.1. Asymmetry for mirror flows statistics

Not available.

5.2. Comparability over time

Data series on indices of construction works have been available since 2000, they are comparable and have no breaks in series.

Revisions:

a) The survey coverage was expanded in 2010, due to the inclusion of crafts and trades. Until 2010, data were collected only for legal entities employing 20 or more persons. Since January 2010, data for crafts and trades have been collected according to the same methodology. After a series of data was created based on three years of statistical observation, the data were evaluated, using a linear regression model, for the period when data for crafts and trades were not collected (from 2000 to 2009).

b) In 2015, a revision of data on construction work indices was carried out. The revision is comprised of an improved method for the calculation of construction works, which includes the adjustment of working hours with the productivity factor. The new method has been applied to monthly and quarterly indices since 2000.

Data series on the value of orders and the value of completed works have been available since 2000. However, the data series are not comparable in the entire period due to the inclusion of crafts and trades in 2010. For the period from 2000 to 2009, no data evaluation was performed. The average share of crafts and trades in the total recorded data for three years is 2.2% for the value of orders, 2.2% for the value of completed works and 2.3% for the number of completed dwellings.

5.2.1. Length of comparable time series

Length of comparable time series is:

Domain	Domain value	Comment	Q1	Q2	Q3	Q4
Croatia - New orders	Croatia	Data series on the value of orders have been available since 2000. However, the data series are not comparable in the entire period due to the inclusion of crafts and trades in 2010. For the period from 2000 to 2009, no data evaluation was performed. The average share of crafts and trades in the value of orders is 2.2% in the total recorded data for three years.	29	30	31	32
Croatia - Value of completed works	Croatia	Data series on the value of completed works have been available since 2000. However, the data series are not comparable in the entire period due to the inclusion of crafts and trades in 2010. For the period from 2000 to 2009, no data evaluation was performed. The average share of crafts and trades in the value of completed works is 2.2% in the total recorded data for three years.	29	30	31	32

5.2.2. Reasons for break in time series

Data series on the value of orders and the value of completed works are not comparable in the entire period due to the inclusion of crafts and trades in 2010. For the period from 2000 to 2009, no data evaluation was performed. The average share of crafts and trades in the total recorded data for three years is 2.2% for the value of orders, 2.2% for the value of completed works and 2.3% for the number of completed dwellings.

5.3. Coherence – sub-annual and annual statistics

Coherence – short-term and structural data is:

Statistics	Domain	Domain value	Comment	Average
Correlation coefficient, 2008 – 2017	Croatia	Croatia	Correlation coefficients between the value of completed works (GRAĐ-21/3M) and the value of production from structural business statistics	0,91

5.4. Coherence – national accounts

The indicator is not applicable.

5.5. Coherence – administrative sources

The indicator is not applicable.

6. Cost and burden

6.1. Cost

Total costs of the Croatian Bureau of Statistics amount to 3 806 hours per year.

6.2. Burden

Not available.