An Phríomh-Oifig Staidrimh
Central Statistics Office

Production in Building and Construction Index

Introduction to Series (Base year 2010=100)

and methodological notes

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Introduction

Introduction to Series

(Base: Year 2010 = 100)

Background

The CSO's Quarterly Survey of Production in Building and Construction (QSC) provides a short-term indicator of output in the construction sector. It is compiled on a quarterly basis. The primary purpose of the index is to measure changes in "Value Added "of construction work done at constant prices. These statistics are required for EU comparison under Council Regulation (EC) No 1165/98 which deal with short-term economic statistics and is amended by Regulation (EC) No. 1893/2006.

Coverage

The survey is designed to cover the entire construction sector as defined by NACE Rev. 2, Sector F (41-43). The NACE Rev. 2 classification defines the construction sector (i.e. Sector F) as

"general construction and special trade[1] construction for buildings and civil engineering, building installation and building completion. It includes new work, repair, additions and alterations, the erection of pre-fabricated buildings or structures on the site and also constructions of a temporary nature."

The sampling register used for the QSC includes all enterprises classified to Sector F of NACE Rev 2.

The EU requirement is for three indicators of production in the sector:

- Building (excluding Civil Engineering)
- Civil Engineering
- Total Building and Construction.

Data Collection

Data are collected for three categories of Building and Construction output distinguishing separately New Construction work and Repair and Maintenance work. Respondents are asked to supply data for these categories on the value of work done in the quarter and also on the value of new contracts and orders obtained. The QSC is a statutory survey, conducted under Statistics Order 2009, Number 73, made under the 1993 Statistics Act.

1 Special trade construction includes the construction of parts of buildings and civil engineering works or preparation for this purpose. It is usually specialized in one aspect common to different structures, requiring specialized skills or equipment. Activities such as pile-driving, foundation work; water well drilling, concrete work, brick laying, stone setting, scaffolding, roof covering, etc. are covered.

Results

Results are published in index form to base: year 2010 = 100. The indices are calculated using a matched sample of respondent companies between quarters. The advantages of publishing the results in index form include:

- Ease of comparability with other indicators
- Ease of calculation of change between two time periods
- Assists in ensuring confidentiality of data providers

The results from 2003 onwards have been calculated from the survey returns. In the absence of survey data prior to 2003, a retrospectively derived series was calculated using a combination of data sources. See appendix 3 for a detailed description of the derived series prior to 2003.

The QSC results are presented in the form of indices. Five sets of indices are produced quarterly. See appendix 1.

The five indices are:

Seasonally Adjusted Production in Total Building and Construction
Seasonally Adjusted Production in Total Building (excluding Civil Engineering)
Seasonally Adjusted Production in Total Civil Engineering
Seasonally Adjusted Production in Total Residential Building
Seasonally Adjusted Production in Total Non-Residential Building

A back series commencing with 2006 has been included. See appendix 2.

Please see the CSO databank for series commencing from reference years 2000 and 2005:

http://cso.ie/shorturl.aspx/226

Index formula

The QSC Index is calculated using a modified fixed weight Laspeyres index:

$$\left[\left(\frac{\sum W_{q-1}\left(\frac{CT_q}{CT_{q-1}}\right)}{\sum W_0}\right)\right]\times 100$$

Where:

W_0 and W_{q-1} are the base weights and updated values respectively.

CT_q and CT_{q-1} are the category values of production (or output) for the current and previous quarter respectively.

In the case of the QSC, 3 base weights are used, one for each category of construction work (i.e. Residential, Non-Residential and Civil Engineering). The compilation of the index for the current quarter (q) is based on the percentage change in the value of quarterly production (based on a matched sample) over the previous quarter.

Volume Indices (Constant prices)

Volume of production indices exclude the effects of price changes. They are calculated by deflating the value indices using price indices derived from the Capital Goods Price Index for Building and Construction. *See appendix 6.*

Confidentiality

The data provided by respondents is treated as strictly confidential in accordance with Part V of the Statistics Act, 1993. Data on respondent companies are not disclosed by the CSO to any other Government Department or outside body. The CSO wishes to express its appreciation for the co-operation and assistance received from respondents.

Limitations

The QSC is designed as a short-term indicator, so while it provides good estimates of quarter-on-quarter change, it should not be used to examine long term or structural changes in the construction sector.

The first results of the QSC were published in August 2007. Table B below compares these survey results with some other indicators for the sector. The CSO will continue to monitor the quality and comparability of this data series.

Table B: Comparison of Building and Construction sector indicators

	New CSO Series			Other Indicators		
	Seasonally Adjusted Volume of production in building and construction[3]	Seasonally Adjusted Volume of production in civil engineering[3]	Seasonally Adjusted Volume of production in residential building[3]	Persons Employed in the Construction Sector[1]	House Completions[2]	House Commencement Notices[2]
	Index 2010=100	Index 2010=100	Index 2010=100	No.	No.	No.
2006	339.7	140.3	814.2	251,700	88,187	75,602
2007	308.8	153.7	672.7	273,900	78,027	48,876
2008	227.0	149.2	384.6	246,100	51,724	22,852
2009	141.5	128.0	159.3	158,200	26,420	8,599
2010	100.1	99.6	100.2	126,500	14,602	6,391
2011	81.0	75.0	71.4	106,400	10,480	4,365
2012	79.8	88.1	63.0	99,600	8,488	4,042
2013	89.3	93.0	70.2	102,700	8,301	4,708

[1] Quarterly National Household Survey, April - June quarter, NACE Rev. 2.

[2] Source Department of the Environment, Community and Local Government.

[3] Seasonally Adjusted series introduced in Q1 2010.

Chapter 1

Survey Questionnaire, Sample Selection, and Editing Procedures

Questionnaire

The questionnaire was designed following consultation with external and internal users. The data is categorised into new construction and repair and maintenance, and the composition of each is classified into three categories. *See table below and see also appendix 4 –Quarterly Survey of Construction Survey Form.*

Residential	Including: Local Authority and Voluntary Housing Affordable Housing Private Housing
Non-Residential	*Public and Private* *Including:* Education, Health and other public or semi-state buildings Commercial Industry Agriculture Tourism Sport & Recreation Other
Civil Engineering Works	*Including:* Transport - Roads - Public Transport - Seaports/Airports Water Sanitary Energy Telecommunications Other

The QSC survey form and instructions are also available in Irish.

Sample Selection

The QSC is a sample survey. Approximately 2,200 companies are surveyed each quarter. The STS Register provides the sampling frame from which the companies are drawn.

A Neyman Allocation is used to optimally select the samples by sizeclass and NACE Rev 2 Group for sizeclasses A (1-4 employees) and B (5-19 employees), while all of sizclasses C and D (20 or more employees) are included.

See chapter 2 for definition of a size class.

Response rate

QSC data are collected by means of e-forms together with a postal survey. Extensive follow up of non-responding companies is carried out by e-form reminders, a postal reminder and may also be followed up by telephone.

The QSC was initiated in the fourth quarter of 2003. The response rate is approximately 55% both in terms of number of companies and of employment covered.

Data Capture and Editing

A number of edit procedures are in place. Note that these have evolved through the course of the survey and that editing procedures on the commencement of the survey were less comprehensive.

Firstly the returned survey forms are scrutinised. Following this the data is inputted into the processing system by means of scanning. Comparison checks are run for each category of work done and for new orders against previous returns and data values exceeding certain thresholds are queried.

Possible double counting of the value of work done is a concern. The survey seeks to collect the value of work done which should include work carried out by labour-only sub contractors but not non labour-only sub contractors. Respondent companies can sometimes include the value of this work but it should be picked up in the scrutiny procedures. When queried, respondent companies often indicate that they find this difficult to report and hence often have to approximate results.

Chapter 2

Output Categories, Size Classes & Cells

Keywords:

- Output Catetories
- Size Classes
- Cells

The description of the methodology of the QSC makes reference to (a) Output Categories, (b) Size Classes and (c) Cells.

These are defined as:

(a) Output Categories

There are 3 main output "Classes" namely:

- *Residential* building and construction
- *Non-Residential* building and construction
- *Civil Engineering* works.

(b) Size Classes

Within each Category there are 4 Size Classes. These Size Classes are defined according to number of employees i.e. enterprises are categorised into 4 groups (or size classes) according to the number of employees engaged in the company.

The 4 size classes are:

Size Class	Number of Employees
A	0-4
B	5-19
C	20-99
D	100+

(c) Cells

Information provided by enterprises in the same Output Category and same Size Class is collectively known as a cell. For example, all information on the value of work done on residential building by enterprises with between 5 and 19 employees belongs in the same cell. A cell total is calculated by summing the value of work done for all enterprises in that cell.

Chapter 3

Calculating Weights and Values

Keywords:

- Base Weights
- Updated Values

Base Weights

The current base year for the QSC is reference year 2010. The weights that correspond to the base period are referred to as base weights. By convention, base year weights are expressed as 100 (i.e. Base Year = 100). The base weights are derived from the 2010 annual value of construction output figures as per the Society of Chartered Surveyors Ireland (SCSI) report, “The Irish Construction Industry in 2012”, which presents annual output for reference year 2010. See Appendix 5.

Updated Values

Base Weights are updated every quarter to give an updated value of the base weight. Updating is done by applying the appropriate relative (See chapter 4) to the updated weight for the previous period. An updated weight is generally referred to as an Updated Value. So by convention, “weights” typically mean base weights and “updated values” mean any updated weights thereafter.

$$W_0(R_1) = W_1$$

.

.

.

$$W_{q-1}(R_q) = W_q$$

Where:

W_0 is the base weight

R_1 is the relative for the first quarter 1.

W_1 is the updated value for the first quarter 1.

W_{q-1} is the updated value for the previous quarter.

R_q is the relative for the current quarter q.

W_q is the updated value for the current quarter q.

Chapter 4

Calculating a Relative

Keywords:

- Cell Relative
- Matched Samples
- Output Category Relative

What is a relative?

The ratio of the value of production for a single output category (group or cell) between two particular time periods is called a relative. For the QSC indices, the relatives in question are ratios of the value of production output in successive quarters.

Calculation of the Cell Relative

Before an output category relative can be calculated, the 4 cell relatives (or size class relatives) must first be calculated for that output category.

Once production cell totals are calculated they can be compared with previous periods. A cell total for the current quarter CT_q is compared with the cell total for the previous quarter CT_{q-1} to produce the cell relative R_c.

$$R_c = \left(\frac{CT_q}{CT_{q-1}} \right)$$

Where:

R_c is the cell relative

and

CT_q is the current cell total

and

CT_{q-1} is the previous cell total

Example 1: Quarter 1 2006 compared with Quarter 4 2005

Business Group - Residential

Size Class - A

There are 4 enterprises in this cell.

Residential – Size Class A Quarter 4 2005	
Enterprise Name	**Value of Production (€)**
AAA	11,000
MMM	20,000
CCC	9,000
XYZ	19,000
Total	**59,000**

The total value of production for this cell is €59,000.

Residential – Size Class A Quarter 1 2006	
Enterprise Name	**Value of Production (€)**
AAA	13,000
MMM	24,000
CCC	10,000
XYZ	21,000
Total	**68,000**

The total value of production for this cell is €68,000.

Then:

CT_q = €68,000

and

CT_{q-1} = €59,000

$$R_c = \left(\frac{68{,}000}{59{,}000} \right) = 1.1525424$$

Matched samples

Cell totals are calculated on a matched sample basis. This means an enterprise will only be included in the calculation of the cell total if there are figures for both current and previous quarters.

In other words, if in the first quarter 2006 there are only 3 returns instead of 4 in the cell, then only the same 3 enterprises will be included when calculating a matching CT_{q-1} for the fourth quarter of 2005.

So, even though there are 4 returns in the cell for the fourth quarter of 2005, because there are only 3 in the first quarter of 2006, only the matching 3 enterprises will be included in the calculation for q1 2006 and q4 2005 to ensure a meaningful comparison. If this matching isn't done, then non-response could lead to a negative cell relative R_c where no actual decline has occurred. *See example 1b below.*

Example 1b: Q1 2006 compared with Q4 2005 again

Business Group - Residential

Size Class - A

This time assume Enterprise CCC doesn't return a production of Residential Building figure for the first quarter of 2006, then the total cell production figures CTq is €58,000 instead of €68,000.

Residential – Size Class A Quarter 1 2006	
Enterprise Name	**Value of Production (€)**
AAA	13,000
MMM	24,000
CCC	–
XYZ	21,000
Total	**58,000**

If €58,000 is compared with the Q4 2005 total (€59,000) on a non matched sample basis, we get a cell relative of 0.983051 which clearly doesn't make any sense as the value of production has increased for every enterprise where we have comparable data. Therefore, the corresponding cell total must be calculated for Q4 2005 by excluding the production value for Enterprise CCC.

Residential – Size Class A Q4 2005	
Enterprise Name	**Value of Production (€)**
AAA	11,000
MMM	20,000
CCC	-
XYZ	19,000
Total	**50,000**

Excluding Enterprise CCC data, we get a cell total of €50,000.

Then:

$$R_c = \left(\frac{58{,}000}{50{,}000} \right) = 1.16$$

Output Category Relatives

Each Output Category relative (R_{oc}) is calculated as the weighted average of its 4 size class or cell relatives R_c. The weights used are employment proportions by size class, derived from the Quarterly National Household Survey (QNHS) results. Three separate sets of weights are used which correspond with the three main classes of output category.

$$R_{oc} = \left[\frac{\sum w.R_c}{\sum w} \right]$$

Where:

R_{oc} is the category relative

R_c is the cell relative.

W are the size class weights (These weights are based on the size class proportions derived from QNHS results).

Chapter 5

Calculating and Updating Value Indices

The quarterly base year weights are calculated at the beginning of the series and a set of base year indices is constructed.

The formula for calculating an output category value index is

$$VAL_q = \frac{W_q}{W_0} \times 100$$

Where:

VAL_q is the output category value index for current period

W_q is the updated value for the current quarter *q*.

W_o is the base weight

A modified version of this formula is used for calculation purposes, namely:

$$VAL_q = \left[\frac{W_{q-1} \times R_o}{W_0} \right] \times 100$$

Which can be expressed more simply as

$$VAL_q = \left(VAL_{q-1} \times R_o\right)$$

Where:

W_o is a the base weight

W_{q-1} is the updated value for the previous quarter.

W_q is the updated value for the current quarter q.

VAL_q is the output category value index for current period

VAL_{q-1} is the output category value index for previous period

R_o is the output category relative for current period

Chapter 6

Calculating and Updating Volume Indices

Value indices are a function of price and quantity. Consequently, interpretation of value indices can be difficult, as a change in the value of production may be the result of an actual increase or decrease in production, the result of inflation or deflation or a combination of both.

Volume indices exclude the effects of price changes and so may be thought of as quantity indices i.e. price effects are held constant. Volume indices are calculated by deflating value indices using specially constructed price deflators P. In the case of the QSC, the price deflators P are derived from the CSO Capital Goods Price Index for Building and Construction (see appendix 6).

The base year volume indices are calculated at the beginning of the series. Thereafter, the volume indices are updated for each quarter. The formula for updating a volume index is:

$$VOL_q = \frac{W_{q-1}}{W_o} \times \left[R_{oc} \times \left(\frac{P_{q-1}}{P_q} \right) \right]$$

Which can be expressed more simply as

$$VOL_q = VOL_{q-1} \times \left[R_{oc} \times \left(\frac{P_{q-1}}{P_q} \right) \right]$$

Where:

VOL_{q-1} is the volume index for previous period.

W_{q-1} is the updated value for the previous quarter.

W_o is the base weight

R_{oc} is the output category relative for current period.

P_q and P_{q-1} are the price deflators for the current and last period respectively.

VOL_q is the volume index for the current period.

Chapter 7

Seasonal Adjustment

Background

Seasonal adjustment is conducted using the direct seasonal adjustment approach. Under this approach each individual series is independently adjusted, e.g. aggregate series are adjusted without reference to the component series. *Each individual seasonally adjusted series is calculated based on unadjusted data spanning from Quarter 1, 2000 to the current period.*

Each individual QSC series or sub-index is seasonally adjusted separately using the model that best fits the characteristics of that series. Individual series models will be reviewed once every 12 months and series models and parameters adjusted if required.

The revised series are published on the CSO website at: www.cso.ie

Modelling Methodology

The adjustments are completed by applying the X-12-ARIMA model, developed by the U.S. Census of the Bureau to Working Day Adjusted data. This methodology allows seasonal factors to be estimated whilst also taking into consideration factors that impact on the quality of the seasonal adjustment such as:

- Calendar effects, e.g. the timing of Easter,
- Outliers, and level shifts in the series.

For additional information on the use of X-12-ARIMA see (Findley, D.F., B.C. Monsell, W.R. Bell, M.C. Otto, and B. Chen (1998), "New Capabilities and Methods of the X-12-Arima Seasonal Adjustment Program", Journal of Business & Economic Statistics, 16, pp. 127-177.) and www.census.gov/srd/www/x12a/.

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Appendices

Appendix 1

Classification of Types of Construction

The five indices published on a quarterly basis are:

1. Seasonally Adjusted Production in Total Building and Construction
2. Seasonally Adjusted Production in Total Building (excluding Civil Engineering)
3. Seasonally Adjusted Production in Total Civil Engineering
4. Seasonally Adjusted Production in Total Residential Building
5. Seasonally Adjusted Production in Total Non-Residential Building

The unadjusted series are also available on the CSO databank at:

http://www.cso.ie/px/pxeirestat/Database/eirestat/Production%20in%20Building%20and%20Construction%20Index/Production%20in%20Building%20and%20Construction%20Index_statbank.asp?SP=Production%20in%20Building%20and%20Construction%20Index&Planguage=0

These groupings have a hierarchical structure.

Total Building and Construction comprises total Building (excluding Civil Engineering) and total Civil Engineering.

Total Building (excluding Civil Engineering) comprises total Residential Building and total Non-Residential Building.

Appendix 2

Value and Volume Indices of Production in the Building and Construction Sector

Table 1(a) Seasonally Adjusted Indices of Production in all Building and Construction[1]

Base Year: 2010=100

Period		Value of Production			Volume of Production		
		Index	% change on previous period	Annual % change	Index	% change on previous period	Annual % change
2006		339.7			365.5		
2007		308.8		-9.1	316.1		-13.5
2008		227.0		-26.5	225.5		-28.6
2009		141.5		-37.7	144.1		-36.1
2010		100.1		-29.2	100.3		-30.4
2011		81.0		-19.1	83.7		-16.5
2012		79.8		-1.6	80.0		-4.5
2013		89.3		11.9	89.3		11.7
2006	1st quarter	341.6	7.0	19.3	369.8	0.7	12.4
	2nd quarter	328.2	-3.9	5.7	358.5	-3.1	0.3
	3rd quarter	330.4	0.7	2.8	364.3	1.6	-0.7
	4th quarter	358.5	8.5	12.2	369.3	1.4	0.5
2007	1st quarter	323.6	-9.7	-5.3	345.4	-6.5	-6.6
	2nd quarter	324.3	0.2	-1.2	336.0	-2.7	-6.3
	3rd quarter	300.2	-7.4	-9.1	303.4	-9.7	-16.7
	4th quarter	287.0	-4.4	-19.9	279.5	-7.9	-24.3
2008	1st quarter	263.0	-8.4	-18.7	262.8	-6.0	-23.9
	2nd quarter	242.0	-8.0	-25.4	240.8	-8.4	-28.3
	3rd quarter	217.2	-10.2	-27.6	210.1	-12.7	-30.8
	4th quarter	185.9	-14.4	-35.2	188.4	-10.3	-32.6
2009	1st quarter	168.3	-9.5	-36.0	165.8	-12.0	-36.9
	2nd quarter	147.0	-12.7	-39.3	148.6	-10.4	-38.3
	3rd quarter	134.2	-8.7	-38.2	141.7	-4.6	-32.6
	4th quarter	116.3	-13.3	-37.4	120.4	-15.0	-36.1
2010	1st quarter	107.6	-7.5	-36.1	105.7	-12.2	-36.2
	2nd quarter	105.1	-2.3	-28.5	105.2	-0.5	-29.2
	3rd quarter	96.4	-8.3	-28.2	99.7	-5.2	-29.6
	4th quarter	91.3	-5.3	-21.5	90.4	-9.3	-24.9
2011	1st quarter	82.4	-9.7	-23.4	84.1	-7.0	-20.4
	2nd quarter	78.9	-4.2	-24.9	81.1	-3.6	-22.9
	3rd quarter	80.9	2.5	-16.1	83.4	2.8	-16.3
	4th quarter	81.9	1.2	-10.3	86.1	3.2	-4.8
2012	1st quarter	81.9	0.0	-0.6	82.1	-4.6	-2.4
	2nd quarter	77.0	-6.0	-2.4	78.0	-5.0	-3.8
	3rd quarter	77.1	0.1	-4.7	77.7	-0.4	-6.8
	4th quarter	83.0	7.7	1.3	82.0	5.5	-4.8
2013	1st quarter	83.6	0.7	2.1	85.9	4.8	4.6
	2nd quarter	88.6	6.0	15.1	89.1	3.7	14.2
	3rd quarter	92.3	4.2	19.7	91.2	2.4	17.4
	4th quarter	92.6	0.3	11.6	91.1	-0.1	11.1
2014	1st quarter	92.9	0.3	11.1	94.2	3.4	9.7
	2nd quarter[2]	98.4	5.9	11.1	98.1	4.1	10.1

[1]Based on Seasonal Patterns up to Quarter 2, 2014

[2]Provisional

Table 1(b) Seasonally Adjusted Indices of Production in Building (Excluding Civil Engineering)[1]

Base Year: 2010=100

Period		Value of Production			Volume of Production		
		Index	% change on previous period	Annual % change	Index	% change on previous period	Annual % change
2006		448.8			484.4		
2007		393.0		-12.4	405.4		-16.3
2008		269.4		-31.5	268.7		-33.7
2009		148.7		-44.8	150.4		-44.0
2010		100.0		-32.8	100.0		-33.5
2011		84.4		-15.6	86.5		-13.5
2012		75.6		-10.5	76.9		-11.1
2013		87.3		15.5	88.2		14.7
2006	1st quarter	452.2	6.1	16.5	493.9	4.1	11.7
	2nd quarter	434.4	-3.9	3.6	476.1	-3.6	-1.4
	3rd quarter	431.1	-0.8	1.9	474.1	-0.4	-3.9
	4th quarter	477.4	10.7	12.0	493.4	4.1	4.0
2007	1st quarter	412.9	-13.5	-8.7	429.1	-13.0	-13.1
	2nd quarter	418.2	1.3	-3.7	435.6	1.5	-8.5
	3rd quarter	378.4	-9.5	-12.2	392.3	-9.9	-17.3
	4th quarter	362.6	-4.2	-24.0	364.5	-7.1	-26.1
2008	1st quarter	321.1	-11.4	-22.2	320.5	-12.1	-25.3
	2nd quarter	290.2	-9.6	-30.6	290.4	-9.4	-33.3
	3rd quarter	252.5	-13.0	-33.3	252.7	-13.0	-35.6
	4th quarter	213.6	-15.4	-41.1	211.0	-16.5	-42.1
2009	1st quarter	184.6	-13.6	-42.5	185.3	-12.2	-42.2
	2nd quarter	157.1	-14.9	-45.9	159.3	-14.0	-45.1
	3rd quarter	136.1	-13.4	-46.1	138.4	-13.1	-45.2
	4th quarter	116.9	-14.1	-45.3	118.4	-14.5	-43.9
2010	1st quarter	104.8	-10.4	-43.2	105.3	-11.1	-43.2
	2nd quarter	99.3	-5.2	-36.8	99.5	-5.5	-37.5
	3rd quarter	100.6	1.3	-26.1	100.2	0.7	-27.6
	4th quarter	95.1	-5.5	-18.6	95.0	-5.2	-19.8
2011	1st quarter	88.0	-7.5	-16.0	89.3	-6.0	-15.2
	2nd quarter	84.0	-4.5	-15.4	86.4	-3.2	-13.2
	3rd quarter	82.7	-1.5	-17.8	85.0	-1.6	-15.2
	4th quarter	82.9	0.2	-12.8	85.2	0.2	-10.3
2012	1st quarter	79.5	-4.1	-9.7	81.2	-4.7	-9.1
	2nd quarter	75.1	-5.5	-10.6	76.1	-6.3	-11.9
	3rd quarter	73.9	-1.6	-10.6	75.0	-1.4	-11.8
	4th quarter	73.8	-0.1	-11.0	75.2	0.3	-11.7
2013	1st quarter	79.5	7.7	0.0	80.2	6.6	-1.2
	2nd quarter	86.2	8.4	14.8	86.7	8.1	13.9
	3rd quarter	90.1	4.5	21.9	90.9	4.8	21.2
	4th quarter	93.4	3.7	26.6	94.9	4.4	26.2
2014	1st quarter	93.7	0.3	17.9	93.6	-1.4	16.7
	2nd quarter[2]	96.3	2.8	11.7	96.0	2.6	10.7

[1]Based on Seasonal Patterns up to Quarter 2, 2014

[2]Provisional

Table 1(c) Seasonally Adjusted Indices of Production in Civil Engineering [1]

Base Year: 2010=100

Period		Value of Production			Volume of Production		
		Index	% change on previous period	Annual % change	Index	% change on previous period	Annual % change
2006		140.3			151.5		
2007		153.7		9.6	158.3		4.5
2008		149.2		-3.0	148.5		-6.2
2009		128.0		-14.2	129.4		-12.9
2010		99.6		-22.2	99.7		-22.9
2011		75.0		-24.8	77.0		-22.8
2012		88.1		17.5	89.7		16.5
2013		93.0		5.6	93.9		4.7
2006	1st quarter	136.6	5.2	36.2	151.2	3.0	29.9
	2nd quarter	134.0	-1.9	21.3	145.4	-3.8	15.6
	3rd quarter	138.5	3.4	6.1	149.2	2.6	0.1
	4th quarter	151.9	9.7	16.9	160.0	7.2	9.0
2007	1st quarter	154.2	1.5	12.9	161.3	0.8	6.7
	2nd quarter	154.3	0.1	15.1	159.6	-1.1	9.8
	3rd quarter	152.0	-1.5	9.7	155.2	-2.8	4.0
	4th quarter	154.3	1.5	1.6	156.9	1.1	-1.9
2008	1st quarter	152.2	-1.4	-1.3	153.0	-2.5	-5.1
	2nd quarter	156.8	3.0	1.6	156.2	2.1	-2.1
	3rd quarter	149.6	-4.6	-1.6	148.3	-5.1	-4.4
	4th quarter	138.0	-7.8	-10.6	136.4	-8.0	-13.1
2009	1st quarter	135.3	-2.0	-11.1	137.0	0.4	-10.5
	2nd quarter	130.4	-3.6	-16.8	132.1	-3.6	-15.4
	3rd quarter	129.1	-1.0	-13.7	130.8	-1.0	-11.8
	4th quarter	117.2	-9.2	-15.1	117.5	-10.2	-13.9
2010	1st quarter	111.5	-4.9	-17.6	113.8	-3.1	-16.9
	2nd quarter	116.9	4.8	-10.4	117.3	3.1	-11.2
	3rd quarter	85.6	-26.8	-33.7	84.0	-28.4	-35.8
	4th quarter	84.5	-1.3	-27.9	83.8	-0.2	-28.7
2011	1st quarter	74.0	-12.4	-33.6	76.3	-8.9	-33.0
	2nd quarter	70.9	-4.2	-39.3	72.9	-4.5	-37.9
	3rd quarter	75.3	6.2	-12.0	76.0	4.3	-9.5
	4th quarter	79.6	5.7	-5.8	82.7	8.8	-1.3
2012	1st quarter	86.7	8.9	17.2	89.3	8.0	17.0
	2nd quarter	81.5	-6.0	15.0	82.3	-7.8	12.9
	3rd quarter	82.4	1.1	9.4	81.4	-1.1	7.1
	4th quarter	101.6	23.3	27.6	105.8	30.0	27.9
2013	1st quarter	91.6	-9.8	5.7	92.7	-12.4	3.8
	2nd quarter	93.0	1.5	14.1	93.1	0.4	13.1
	3rd quarter	97.8	5.2	18.7	96.5	3.7	18.6
	4th quarter	89.6	-8.4	-11.8	93.2	-3.4	-11.9
2014	1st quarter	91.7	2.3	0.1	92.4	-0.9	-0.3
	2nd quarter[2]	102.0	11.2	9.7	101.0	9.3	8.5

[1] Based on Seasonal Patterns up to Quarter 2, 2014

[2] Provisional

Table 2(a) Seasonally Adjusted Indices of Production in Residential Building [1]

Base Year: 2010=100

Period		Value of Production			Volume of Production		
		Index	% change on previous period	Annual % change	Index	% change on previous period	Annual % change
2006		814.2			877.2		
2007		672.7		-17.4	692.9		-21.0
2008		384.6		-42.8	383.9		-44.6
2009		159.3		-58.6	161.2		-58.0
2010		100.2		-37.1	100.3		-37.8
2011		71.4		-28.8	73.2		-27.1
2012		63.0		-11.7	64.2		-12.3
2013		70.2		11.4	70.9		10.4
2006	1st quarter	820.4	9.9	14.2	891.8	5.5	9.5
	2nd quarter	791.8	-3.5	0.8	858.2	-3.8	-3.8
	3rd quarter	784.3	-0.9	1.0	861.4	0.4	-5.0
	4th quarter	860.3	9.7	15.2	897.2	4.2	6.1
2007	1st quarter	718.0	-16.5	-12.5	748.8	-16.5	-16.0
	2nd quarter	732.9	2.1	-7.4	758.0	1.2	-11.7
	3rd quarter	639.6	-12.7	-18.4	659.6	-13.0	-23.4
	4th quarter	600.1	-6.2	-30.2	605.1	-8.3	-32.6
2008	1st quarter	493.1	-17.8	-31.3	497.3	-17.8	-33.6
	2nd quarter	426.0	-13.6	-41.9	424.6	-14.6	-44.0
	3rd quarter	356.1	-16.4	-44.3	352.5	-17.0	-46.6
	4th quarter	263.2	-26.1	-56.1	261.0	-26.0	-56.9
2009	1st quarter	211.0	-19.8	-57.2	213.8	-18.1	-57.0
	2nd quarter	168.2	-20.3	-60.5	170.5	-20.3	-59.8
	3rd quarter	138.9	-17.4	-61.0	139.9	-17.9	-60.3
	4th quarter	119.2	-14.2	-54.7	120.7	-13.7	-53.8
2010	1st quarter	105.3	-11.7	-50.1	106.6	-11.7	-50.1
	2nd quarter	102.8	-2.4	-38.9	103.4	-3.0	-39.4
	3rd quarter	101.8	-1.0	-26.7	100.4	-2.9	-28.2
	4th quarter	90.9	-10.7	-23.7	90.9	-9.5	-24.7
2011	1st quarter	78.6	-13.5	-25.4	79.8	-12.2	-25.1
	2nd quarter	69.2	-12.0	-32.7	71.6	-10.3	-30.8
	3rd quarter	67.1	-3.0	-34.1	68.7	-4.1	-31.6
	4th quarter	70.6	5.2	-22.3	72.6	5.7	-20.1
2012	1st quarter	66.1	-6.4	-15.9	67.1	-7.6	-15.9
	2nd quarter	62.5	-5.4	-9.7	63.6	-5.2	-11.2
	3rd quarter	63.6	1.8	-5.2	64.4	1.3	-6.3
	4th quarter	59.9	-5.8	-15.2	61.5	-4.5	-15.3
2013	1st quarter	71.0	18.5	7.4	70.9	15.3	5.7
	2nd quarter	71.3	0.4	14.1	71.7	1.1	12.7
	3rd quarter	69.3	-2.8	9.0	70.1	-2.2	8.9
	4th quarter	69.2	-0.1	15.5	70.7	0.9	15.0
2014	1st quarter	67.2	-2.9	-5.4	66.7	-5.7	-5.9
	2nd quarter[2]	65.9	-1.9	-7.6	65.4	-1.9	-8.8

[1] Based on Seasonal Patterns up to Quarter 2, 2014

[2] Provisional

Table 2(b) Seasonally Adjusted Indices of Production in Non-Residential Building [1]

Base Year: 2010=100

		Value of Production			Volume of Production		
Period		Index	% change on previous period	Annual % change	Index	% change on previous period	Annual % change
2006		169.9			183.7		
2007		180.0		6.0	185.6		1.0
2008		181.5		0.8	180.9		-2.5
2009		140.4		-22.6	142.0		-21.5
2010		99.6		-29.1	99.7		-29.8
2011		95.6		-4.0	98.0		-1.6
2012		86.4		-9.6	87.9		-10.4
2013		102.0		18.0	103.0		17.2
2006	1st quarter	173.7	4.4	27.0	191.6	1.9	21.6
	2nd quarter	168.6	-2.9	14.0	183.7	-4.1	8.1
	3rd quarter	165.4	-1.9	6.2	178.0	-3.1	0.1
	4th quarter	171.9	3.9	3.3	181.5	2.0	-3.5
2007	1st quarter	179.4	4.4	3.3	187.3	3.2	-2.2
	2nd quarter	181.8	1.3	7.8	188.1	0.4	2.4
	3rd quarter	184.0	1.2	11.2	187.7	-0.2	5.4
	4th quarter	174.9	-4.9	1.7	179.1	-4.6	-1.3
2008	1st quarter	186.4	6.6	3.9	186.5	4.1	-0.4
	2nd quarter	188.5	1.1	3.7	187.4	0.5	-0.4
	3rd quarter	177.7	-5.7	-3.4	176.4	-5.9	-6.0
	4th quarter	173.3	-2.5	-0.9	173.1	-1.9	-3.4
2009	1st quarter	161.8	-6.6	-13.2	162.6	-6.1	-12.8
	2nd quarter	149.8	-7.4	-20.5	151.2	-7.0	-19.3
	3rd quarter	135.2	-9.7	-23.9	137.3	-9.2	-22.2
	4th quarter	114.9	-15.0	-33.7	116.7	-15.0	-32.6
2010	1st quarter	103.2	-10.2	-36.2	103.9	-11.0	-36.1
	2nd quarter	95.8	-7.2	-36.0	95.6	-8.0	-36.8
	3rd quarter	100.7	5.1	-25.5	100.5	5.1	-26.8
	4th quarter	98.7	-2.0	-14.1	98.6	-1.9	-15.5
2011	1st quarter	95.7	-3.0	-7.3	97.2	-1.4	-6.4
	2nd quarter	96.8	1.1	1.0	99.5	2.4	4.1
	3rd quarter	96.4	-0.4	-4.3	99.3	-0.2	-1.2
	4th quarter	93.6	-2.9	-5.2	96.1	-3.2	-2.5
2012	1st quarter	91.2	-2.6	-4.7	93.0	-3.2	-4.3
	2nd quarter	86.0	-5.7	-11.2	87.3	-6.1	-12.3
	3rd quarter	83.2	-3.3	-13.7	84.6	-3.1	-14.8
	4th quarter	85.3	2.5	-8.9	86.6	2.4	-9.9
2013	1st quarter	87.1	2.1	-4.5	88.0	1.6	-5.4
	2nd quarter	99.2	13.9	15.3	100.2	13.9	14.8
	3rd quarter	108.0	8.9	29.8	109.1	8.9	29.0
	4th quarter	113.6	5.2	33.2	114.5	4.9	32.2
2014	1st quarter	117.4	3.3	34.8	118.0	3.1	34.1
	2nd quarter[2]	123.6	5.3	24.6	123.6	4.7	23.4

[1] Based on Seasonal Patterns up to Quarter 2, 2014

[2] Provisional

Appendix 3

Description of the Derivation of the Production in the Building and Construction sector prior to 2003

The annual figures for the value of output in the construction sector as per the

DKM Economic Consultants annual review of the Construction Industry were taken as a starting point. These are presented in appendix 5.

These were aggregated into three annual series

- Value of construction in residential construction
- Value of construction in non-residential construction
- Value of construction in civil engineering.

Residential Construction
The quarterly national accounts Gross Fixed Capital Formation (GFCF) residential data series was used to apportion the annual series into a quarterly series.

Non-Residential Construction
The number of persons in employment in the construction sector as per the Quarterly National Household Survey was taken as starting point. This series was adjusted to create calendar quarters (the QNHS at that time only published data on a seasonal quarter basis). The adjusted series was used to apportion the annual value of non-residential output series into a quarterly series.

Civil Engineering
The same method was used as with the non-residential construction series.

Appendix 4

Quarterly Survey of Construction Survey Form

CONFIDENTIAL

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Enquiries to:
LoCall: 1890 313 414 (ROI)
0808 2347581 (UK/NI)
Cork (021) 4535177, 4535257,
4535522, 4535528
Fax No. (021) 4535553
E-mail: qsc@cso.ie
www.cso.ie

If above details are incorrect, please amend and mark (X) in this box ☐

Quarterly Survey of Construction
(including the Allied Trades)

Short Term Statistics
DCU - QSC
Central Statistics Office
Skehard Road
Cork

Your co-operation in this important inquiry is appreciated. Please complete this form regarding the Quarterly Survey of Construction for the quarter referenced above and return within **2 weeks**, in the free post envelope provided. The data sought by the Central Statistics Office in the questionnaire is **compulsory** under the Statistics (Quarterly Survey of Construction) Order 2009 (S.I. No. 73 of 2009). It is an offence for a person to refuse or fail to provide the information requested in this form.
The information you provide will be treated as **strictly confidential**. It will only be used for statistical purposes and will not be disclosed to any other Government Department or body.

If exact figures are not available, please use best estimates.

Pádraig Dalton
Director General

Results from the survey will be published on the CSO website at www.cso.ie
Type "Production in Building and Construction" into the search box and it will link you to the latest results.

Before completing this form please see the explanatory note on the next page.

1. Please describe the nature of your business:
(The nature of your business refers to your primary activity e.g. CIVIL ENGINEERING, etc.)

2. Number of Persons Engaged in the pay week ended:
INCLUDE - the number of persons actually at work, on holiday or on sick leave with pay. Proprietor(s), salaried/wage employees and "labour only" subcontractors.

Persons
Full Time + Part Time

3. Value of Construction Work Done
Please enter information on the value of work done (as distinct from sales), excluding the value of the land on which the work is being carried out, during the period

IF A FIGURE IS NIL, PLEASE LEAVE THE SQUARES BLANK.

	NEW CONSTRUCTION	REPAIR & MAINTENANCE
a) RESIDENTIAL - Local Authority & Voluntary Housing - Affordable Housing, Private housing		
b) NON-RESIDENTIAL - PUBLIC & PRIVATE (including Education, Health, and other public or semi-state buildings, Commercial, Industry, Agriculture, Tourism, Sport & Recreation, Other)		
c) CIVIL ENGINEERING WORKS Transport (Roads, Public Transport, Seaports / Airports) Water Sanitary, Energy, Telecommunications, Other		

QSC 2012 for Web

Official Use

Relevant Code

PLEASE TURN OVER →

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4. How many minutes did it take you to complete this form?

Comments: Please add any comments that would help explain major changes since the last quarter.

Please provide your email address below if you wish to receive electronic notification in the future.

E-mail

CERTIFICATION (Must be completed in all cases)

Name _____ **Signature** _____

Position _____

Date _____ **Phone**

Explanatory Notes

Description of Business: The nature of your business refers to your primary activity (i.e. Development of Building projects, Construction of residential and non-residential buildings. Construction of roads and railways, Construction of utility projects, Construction of other civil engineering projects, Demolition and site preparation, Electrical, plumbing and other construction installation activities, Building completion and finishing, Other specialised construction activities).

New Construction: Value of all new construction work, residential or non-residential, including demolition site preparation. Include building installation work such as electrical wiring, plumbing etc. and building completion work such as plastering and painting etc. Also include the renting of construction equipment when operators are supplied. Include major alterations, extensions and improvements of structures.

Repair and Maintenance: Value of repair and maintenance work on non-residential structures, residential improvements, house/apartment conversions etc. Include external and internal painting, tiling, decorating, replacement of roofs, electrical fixtures and fittings, plumbing etc. on existing buildings or structures.

Include
- value or estimated value of work done during the quarter; not the value of sales during the quarter
- work in Republic of Ireland
- materials your firm used, labour costs, overheads and profits
- **value of work done by labour only subcontractors**
- work on buildings which you hope to sell later for profit (speculative work)
- demolition & site preparation
- work done by your firm on its own business premises
- fixtures, equipment and tools your firm made and used in construction
- anything your firm supplied free to subcontractors

Exclude
- **work done by subcontractors (other than labour only subcontractors)**
- work in Northern Ireland, or overseas
- Value Added Tax (VAT)
- the value of land (but include the value of improvements to land such as drainage, reclamation, pipe laying, site preparation etc.)
- payments your firm made to consultants or architects from other firms
- fixtures, equipment and tools your firm made for sale
- materials your firm sold
- materials other firms supplied free to your firm

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Thank you for your participation in this survey.

Appendix 5

Annual Value of Construction Output

Value of construction output in current prices

€m

	2005	2006	2007	2008	2009	2010
Residential Construction						
Private Housing	20,192.9	23,862.1	22,023.9	15,909.5	6,378.4	3,828.0
Public Housing	1,263.6	1,351.2	1,368.4	1,582.9	1,272.7	1,062.0
Sub Total	**21,456.4**	**25,213.3**	**23,392.3**	**17,492.4**	**7,651.0**	**4,890.0**
Private Non-Residential Construction						
Industry	1,152.3	795.9	653.6	1,089.6	644.7	169.0
Commercial	3,637.4	4,356.1	4,713.9	2,860.2	1,185.1	250.0
Agriculture	266.0	312.2	668.3	1,298.2	300.7	150.0
Tourism	523.3	706.2	997.9	680.9	297.6	66.0
Worship	73.3	76.3	82.3	76.3	34.7	35.0
Sub Total	**5,652.3**	**6,246.6**	**7,116.0**	**6,005.2**	**2,462.8**	**670.0**
Productive Infrastructure						
Roads	1,863.4	2,082.9	2,416.6	2,862.2	2,364.8	1,345.0
Water Services	768.4	891.0	990.8	1,044.4	1,117.9	983.0
Airports / Seaports	158.6	182.1	307.9	437.7	490.2	117.0
Energy	1,388.3	1,484.2	1,096.8	1,152.3	1,169.9	1,300.0
Transport	365.4	334.3	586.5	705.2	567.8	485.0
Communications	256.5	307.2	366.6	415.5	276.0	240.0
Sub Total	**4,800.5**	**5,281.7**	**5,765.2**	**6,617.3**	**5,986.6**	**4,470.0**
Social Infrastructure						
Education	725.6	781.5	899.8	844.6	741.8	825.0
Health	463.7	328.3	366.8	439.3	455.9	348.0
Public Buildings	370.7	400.6	557.5	603.2	363.0	261.0
Other Social	309.4	379.0	503.1	590.8	387.0	237.0
Subtotal	**1,869.3**	**1,889.5**	**2,327.2**	**2,477.9**	**1,947.7**	**1,671.0**
Total All Construction	**33,778.4**	**38,631.3**	**38,600.5**	**32,592.7**	**18,048.2**	**11,701.0**
of which						
New Construction	**27,511.8**	**31,340.7**	**30,666.2**	**24,604.0**	**12,275.2**	**7,330.0**
Repairs, Maintenance and Improvements	**6,266.6**	**7,290.6**	**7,934.3**	**7,988.7**	**5,773.0**	**4,370.0**

Source: DKM Economic Consultants Review Of Construction Industry 2008 and Outlook 2009-2011

Source: DKM Economic Consultants Review Of Construction Industry 2009 and Outlook 2010-2012

Source: DKM Economic Consultants The Construction Industry in 2012

Appendix 6

Capital Goods Price Index for Building and Construction

Capital Goods Price Index (Base: Year 2010=100) for Building and Construction

	M01	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12
2010	99.1	99.2	99.3	99.6	100.1	100.0	100.4	100.5	100.5	100.4	100.4	100.5
2011	100.7	97.2	96.9	96.9	97.0	97.1	97.1	97.4	97.5	97.5	97.6	97.6
2012	97.7	97.8	97.9	98.4	98.5	98.4	98.7	98.7	98.4	98.5	98.6	98.8
2013	98.8	98.8	98.9	98.9	98.9	99.1	99.1	99.2	99.2	99.4	99.5	99.1
2014	99.1	99.5	99.4	99.6	100.2	100.3						

Source: CSO Capital Goods Price Index for Building and Construction (Materials and Wages)