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By Ms. S.C. Elfering

Explanation of symbols

.	= data not available
*	= provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
–	= (between two figures) inclusive
0 (0,0)	= less than half of unit concerned
niets (blank)	= not applicable
2003–2004	= 2003 to 2004 inclusive
2003/2004	= average of 2003 up to and including 2004
2003/'04	= crop year, financial year, school year etc. beginning in 2003 and ending in 2004
2001/'02–2003/'04	= crop year, financial year, etc. 1993/'94 to 2002/'03 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

Rebasing the price indices of civil engineering works

By Ms. S.C. Elfering

Statistics Netherlands calculates quarterly price indices of civil engineering works to monitor developments in the prices of these activities in the Netherlands. Five series are calculated, each one referring to a branch of civil engineering: construction of roads with brick pavement, construction of roads with concrete pavement, sewerage construction, earth moving activities and road maintenance. Starting from the figures for January 2005, the price indices of civil engineering works are published with 2000 as the new base year, and the number of series has been increased to eight. The new series will be calculated ex post for January 2000 and afterwards. The consequence of the rebasing is that the price indices of civil engineering works for January 2000 to December 2004 differ from the index for the same period based on 1995=100. This paper examines the changes involved in the rebasing, and the differences between the index series based on 1995=100 and 2000=100.
The first section contains a short description of how price indices were calculated on base 1995=100. Next, the changes made in the rebasing to 2000=100 are discussed. The third and fourth sections look into the effect of the base shift on the series already published on the old base, and on the new series introduced with this new base. Lastly some recommendations are given on how to link the old and the new series.

Price indices of civil engineering works

Statistics Netherlands publishes five branch price indices for the construction of civil engineering works with base year 1995: for construction of roads with brick pavement and of roads with concrete pavement, sewerage construction, earth moving activities and road maintenance. No overall index was published on base 1995=100. Each branch price index for civil engineering works is calculated on the basis of price developments of three components: materials, equipment and labour. The three components are weighed together for each branch to form one price index. The weights are based on the results of a survey carried out by Statistics Netherlands up to 1995.
The three components for the series based on 1995=100 are determined as follows:

– *Materials*: The weights for the materials are based on a number of construction specifications of the Department of waterways and public works (RWS). These specifications concern costs and volume of a representative construction project and specify which kinds of materials were used in 1995 and what they cost. On this basis weights per type of material were calculated. The weight was subsequently linked to the producers' price index (PPI) of the material concerned. After aggregation, this resulted in a price index for each branch that reflects the price developments in the materials.
– *Equipment*: Up to and including 2001 the price indices of contracting equipment produced annually by BouwNed/ VGBouw were used to calculate the prices of equipment used in construction. When this source was discontinued, the PPIs of the various types of equipment were used. The various types of equipment were weighed on the basis of the results of the above-mentioned Statistics Netherlands survey. The weights were linked to the PPIs of the types of equipment concerned, which resulted in a price index for the equipment for each branch of civil engineering works.
– *Labour*: This is based on the updated wage costs statistics for the sector civil engineering works. As this is a quarterly figure, it can be used integrally in the calculation of price indices of civil engineering works.

Review of changes in the price indices of civil engineering works

Price indices are rebased once every five years. The reason this is done is that in the course of time ratios change in the production by, and thus in the various branches within, civil engineering construction. If a price index is to give an accurate description of price developments, the weight schemes must be adjusted regularly to reflect the most recent production ratios. This is the main purpose of a base shift. Therefore, whenever price indices are rebased, the weighting scheme is also adjusted as standard practice. However, a base shift is also a good time to introduce other changes, for example those based on improved surveying methods or new insights. The changes introduced with the base shift to 2000=100 for price indices of civil engineering works are described below.

1. New weighting

Weights were adjusted in three areas in the price indices. First for each separate branch of civil engineering works, there are weighting schemes for the materials and equipment elements so that product groups can be weighed together. Secondly, the materials, equipment and labour components can be weighed together to form one price index for one branch of civil engineering works. Lastly, there is a weighting scheme to combine the price indices for the various branches of civil engineering works which results in one total price index for civil engineering works.

– *Weighting schemes for materials and equipment components*
Just as in 1995, RWS [1)] supplied specifications for projects in a number of branches of civil engineering construction in 2000. The specifications contain information on the labour required, types of materials used and types of equipment used, including the costs involved for the types of civil engineering construction concerned. The materials and equipment types in the specifications were allocated to commodity groups of the PPI. Subsequently the total costs per goods group were calculated. The result for each component is a weighting scheme with a weight per commodity group which reflects the share in the costs of the materials and equipment type within the branch. Combined with the corresponding PPI, these weights result in a price index for the materials component and a price index for the equipment component for each branch of civil engineering works.

– *Weighting schemes of components per branch*
Subsequently, the price indices of the materials and the equipment components are weighted together with the wage component to form one price index for the branch concerned. Information from the RWS specifications is used to calculate the ratios between materials, equipment and labour. The total costs per component per branch constitute the weights with which the three components are weighed.

– *Weighting scheme of branches*
Lastly, the weighting scheme with which the branches are combined to give one total price index for civil engineering works is composed on the basis of data from the national accounts for 2000. Turnover data per branch are taken from the national accounts on the basis of which the size of the share of each

branch is determined in the total turnover of civil engineering sector.

2. New wage cost index

Statistics Netherlands has been calculating a new series for contractual wage costs (CLK) since June 2004. This series is based on wage costs as laid down in collectively negotiated contracts (CAO). Starting from the base shift, this new series will be used for developments the labour component. The reasons for this revision are that the series presently used the GLK will be discontinued in mid 2005; and secondly, the new series uses a wage cost concept that fits well with the concept of an input price index, mainly because it includes the employer's share of the wage costs.

3. Additional areas

On the previous base, 1995=100, five different series were published for different branches within civil engineering works: sewerage construction, construction of roads with brick pavement, construction of roads with concrete pavement, earth moving activities and road maintenance. Starting form the base shift to 2000=100, three series have been added: execution of hydraulic engineering works, structural works [2)], and railway construction. The series for road maintenance will be discontinued.

4. Total price index for civil engineering works

Up to now no overall price index has been published for civil engineering works as a whole, only price indices for the separate branches within the sector. Starting from the base shift to 2000, we now have a weighting scheme which enables us to add the various branches together, resulting in a total price index. For this reason the total price index for civil engineering works will be published starting from the base shift.

Results of the existing areas

For the four original series published on the old basis, the changes mentioned above have led to differences between the price indices based on 2000=100 and those based on the old base year 1995. The differences are explained below.

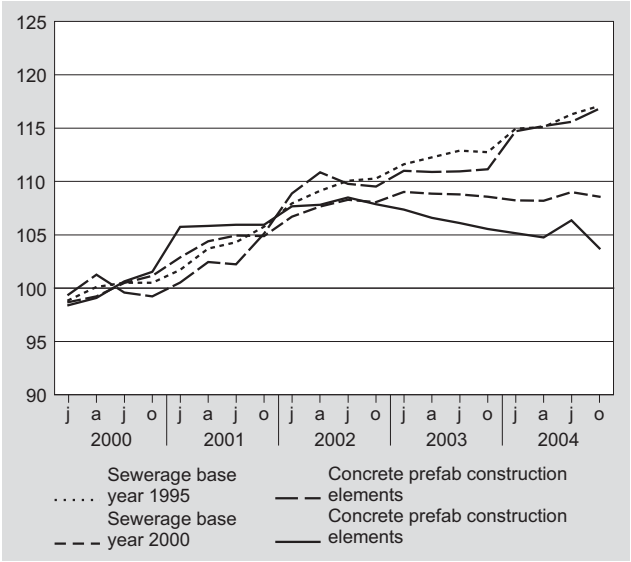
The old series based on 1995=100 are all rescaled in such a way that 2000=100.

Sewerage construction

The graph shows the price indices for the branch sewerage construction on base 1995=100 and on base 2000.

The curve of the new price index with base year 2000 clearly differs from the curve based on 1995=100. To reveal the main cause of this difference two commodity groups are also depicted: 'prefabricated construction elements made of cement, concrete or artificial stone' and 'concrete pipes, drains, etc'. In accordance with the trends in the construction industry to increasingly use prefabricated materials, there has been a shift from the group 'concrete pies, drains, etc.' to 'prefab construction elements'. While the largest part of costs, namely 41 percent, was made in the group 'concrete pies, drains, etc.' in 1995, this had fallen to 32 percent in 2000. On the other hand, 'prefab construction elements' rose strongly, to 20 percent. The graph shows that prices for 'prefab construction elements' fell slightly, while those for 'concrete pipes, drains, etc.' rose. This explains the difference

1. Price indices for sewerage construction and the commodity groups 'concrete pipes etc.' and 'concrete prefab construction elements'

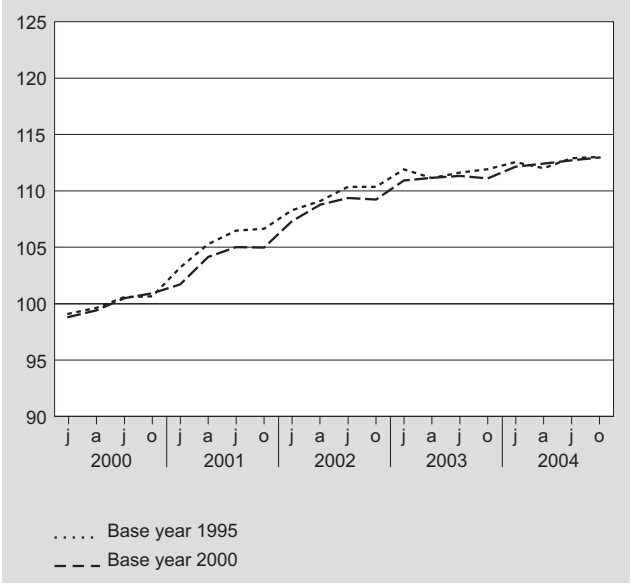


between the curve for the old base and that for the new base for sewerage construction.
The effect of the new series for wage costs is marginal. The course of wage costs according to the CLK hardly differs from the previously used GLK and thus does not result in big differences in the price indices for the branch. The same is true for the other three branches discussed in this section.

Construction of roads with brick pavement

Graph 2 shows the new series on base 2000=100, and the old series on base 1995=100. The graph shows there are no significant differences between the two series.

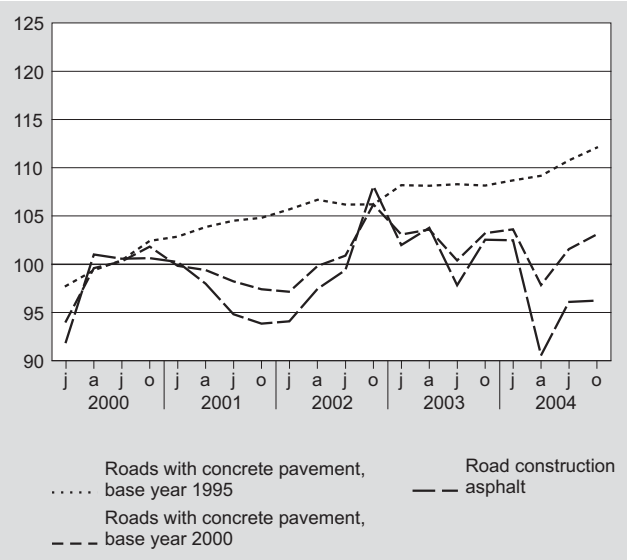
2. Price indices for construction of roads with brick pavement



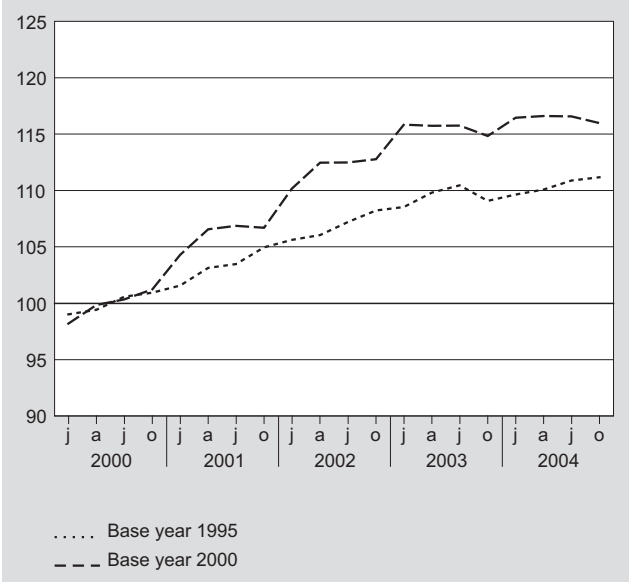
Construction of roads with concrete pavement

This branch refers to the construction of roads with asphalt. Graph 3 shows the curves for this branch for base year 1995, base year 2000 and for the commodity group 'road construction asphalt'.

3. Price indices for construction of roads with concrete pavement and commodity group road construction asphalt



4. Price indices for earth moving activities



There are very substantial differences between the two series for roads with concrete pavement. While the old series is quite smooth, the new series fluctuates much more. If we look at the composition of the two series, there is an important difference. The share of the commodity group 'asphalt for road construction' has risen strongly since 1995 and has a weight of 51 percent in the new weighting scheme. In 1995 its share was only 25 percent. The difference is intensified as the old series did not include all of the group of 'asphalt for road construction', but only a few products. And within the group as a whole, these products showed a deviant reasonably stable development. This in contrast to the very volatile price developments in the group 'asphalt for road construction' as a whole, which is included in the new series. The turbulent developments in the group 'asphalt for road construction' are caused by the relation of the price of bitumen to that of petroleum. Bitumen is the main raw material used for asphalt. The strong correlation between developments in prices of 'asphalt for road construction' and developments in the new series is obvious from graph 3.

Earth moving activities

The differences for the price indices of the branch earth moving activities between base 1995=100 and 2000=100 are illustrated in graph 4.

Here, too, the curve for the new series 2000=100 differs from that with base year 1995. One reason that can be indicated for this is that in the old series the material 'sand' was not included in the calculations. In the new weighting scheme it was attributed a very large part i.e. 80 percent of total costs. The reason for this change in the weighting scheme, is a change in insight. When the weighting scheme for 1995 was compiled, the costs of the required sand were considered as a cost for the client, not the contractor. However, now the cost of sand is attributed to the contractor and thus has to be included in the weighting scheme.

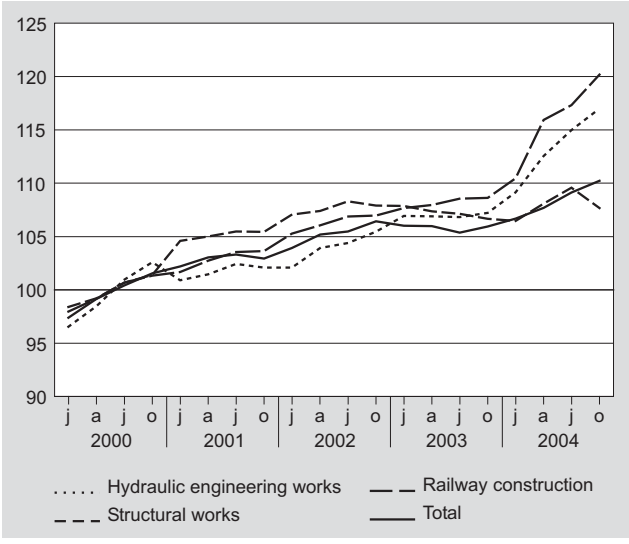
Results for the new branches and for the total price index for civil engineering works

From the base shift onwards, price indices will be published for a number of additional branches. Moreover an overall price index for the total sector of civil engineering construction will also be published. This section discusses the new series. The series concerned are illustrated in graph 5.

What is most noticeable in the graph is the very strong rise in the price indices of two branches of civil engineering works in 2004, namely railway construction and hydraulic engineering works. For both branches this rise is caused by the commodity groups 'construction materials made of iron or steel'. For railway construction this has an effect because of the use of iron and steel as materials for the construction of rails and bridges. In hydraulic engineering it is related to the use of pipes for the transport of sand and is thus more visible in the equipment component. The increase in the price indices of the commodities themselves can be explained by the rise in steel prices as a result of the increased demand and insufficient supply in 2004.

The total price index for civil engineering works also shows a rise in 2004. However, this was mainly because of the increasing prices of the branch construction of roads with concrete pavement, which accounts for a large share of the total index. The

5. Total price index for civil engineering works and price indices for the new branches railway construction, execution of hydraulic engineering works and structural works, base year 2000



branches with their total weights are illustrated in table 1. The total price index for civil engineering works is composed of eight branches.

Table 1
Share of branches in the total price index number

Branche	Share in price index number
	%
Sewerage	14
Roads with brick pavement	7
Roads with concrete pavement	19
Earth moving activities	7
Hydraulic engineering works	5
Structural works	10
Railway construction	5
Electrical engineering works	33

The above division into branches of civil engineering works corresponds with that in the national accounts. The weighting of the branch 'structural works' also includes civil engineering activities such as sinking piles, steel bending and maintenance of structural works. The price developments in the branch hydraulic engineering works are surveyed on the basis of two specifications: river bank reinforcement and the construction of a seawall. These specifications are available (in Dutch) on request. The branch railway construction refers only to the construction of rails and related structures, e.g. bridges and station platforms. The branch electrical engineering works is not published separately as it is a rest group. It includes among other things the construction of overhead wires for railways, road signal systems and excavation work for underground cabling. The price index for road signal systems is available separately on request (in Dutch).

Switching from base 1995=100 to 2000=100

At the same time as the publication of the new figure for January 2005, the figures for the series 1995=100 were revised for the last time based on the most recent producers' price indices and the wage figures. After this, the old series is declared definite and more recent figures are only available in the series 2000=100.

Series based on 1995=100 for four of the civil engineering branches can be linked to the new 2000=100 series: construction of roads with brick pavement, construction of roads with concrete pavement, sewerage construction and earth moving activities. Recommendations on how to do this are given below. Price indices for the remaining branches and the total price index for civil engineering works have only been published since the base shift and thus cannot be linked to previous series. The road maintenance series has been discontinued since the base shift, and has not been replaced by a corresponding series. The price developments in the branch construction of roads with concrete pavement can serve as an approximation for this branch.
If the results of the price indices of civil engineering works are used for indexation purposes, there are a number of options:

– The calculation of a price change over a period starting in or after January 1995 and ending no later than December 2004 is based on the series 1995=100.
– The calculation of a price change over a period starting in or after January 2000 and ending after January 2005 is based on the series 2000=100.
– The calculation of a price change over a period starting between January 1995 and December 1999, and ending after January 2005 is based on the linked series 1995=100. From January 2005 the percentage change with October 2004 must be calculated, as the price index for October 2004 is the last figure published on base 1995=100; this change must then be adjusted to the results for October 2004 of the series 1995=100 (see example).

Month	Price index 1995=100	Price index 2000=100	Linked series
October 2004	114.4	112.2	114.1
January 2005		112.9	115.1

– The January index of the linked series is calculated by calculating the difference between October 2004 and January 2005 according to the series on 2000=100 and multiplying this by the index for October 2004 according to the series 1995=100. In the example: (112.9/112.2) x 114.4=115.1 (rounded). For April 2005 the index is calculated analogously, where because of rounding problems the October figures must be used for the link.

This recommendation is based on two assumptions, namely that the price developments are calculated as much as possi ble within one published series, and adjustments ex post are avoided as much as possible. Statistics Netherlands itself does not compile long-term series with linked price indices for civil engineering works.

If you have any questions please contact the infoservice of Statistics Netherlands.

Notes

[1] Additional information was obtained from Prorail on use of materials, equipment and labour for railways.
[2] Structural works include structures such as bridges, viaducts, etc.